SERIES H MACHINES

Classes 1, 2, 6, 11 thru 16 and 20 thru 30

CARRIAGES

Symbol List

January 4, 1949

Issued _____

To _____

Of _____

Property of and to be returned to

BURROUGHS ADDING
MACHINE COMPANY
DETROIT 32, MICHIGAN

Printed in U. S. America 1-4-49

Form 2960

REPLACEMENT PARTS

WHERE DISCARDED SYMBOLS (NOT REQUIRED FOR REPAIRS) ARE REPLACED BY ACTIVE SYMBOLS, THE ACTIVE SYMBOLS ARE SHOWN IN PARENTHESES FOLLOWING THE DISCARDED SYMBOLS.

EXAMPLE: 1-8817¼ (3261B, 1-8801AZ STYLE 12 OR 20, 1-8817BR NO. 4, 8817½ZL, 8828¼C, 8828½B, 47¾, 49¼—2 PCS., 79543—2 PCS.)

SYMBOLS WHICH ARE NO LONGER AVAILABLE AND WHICH HAVE NOT BEEN REPLACED BY ACTIVE SYMBOLS HAVE BEEN REMOVED FROM THE VARIOUS PLATES.

MACHINE CONTROLS

NO-SPACE STROKE TOTAL MACHINE

STYLES (30 17 07) BAR NO.1

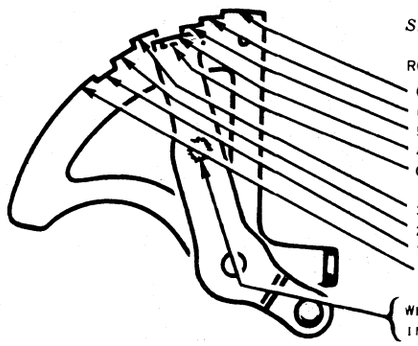
107-1
H

OB T.O. 1st 2nd Dr

GEAR - MANUAL							M(3)			M(2)			M(2)			G			G						G																	
°FORM POSITION	1			2			N.S. 3			4			5			6			7			8			N.S. 9																	
STOP NUMBER 36	6			6			6			6			6			6			6			34			12																	
+REGISTER NUMBER	1(2)			1(2)			3(4)			3(4) 5(6)			7(8)			9(10)			9(10)			3(4)			3(4)																	
OPERATION CONTROL LEVER POSITION	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
*REGISTER ADD OR NON-ADD AND/OR PRINTING CONTROL							N +	N +	S ⫫										S ⫫	S ⫫	S ⫫	S ⫫			N +	N +	N ⫫															
POSITION 8							0	0	3										3	3	3	3			0	0	1															
CROSSFOOTER ADD OR SUBTRACT							−	−	+	−	−														−	−	+															
ROLL SIZE							1	1	0	1	1														1	1	0															
CROSSFOOTER ADD OR NON-ADD							+	+	⫫							⫫	+	+	+	⫫	+	⫫																				
ROLL SIZE							0	0	3							3	0	0	0	3	0	3																				
~REPEAT AND TOTAL																ST	T	NO	T	NO	T																				
ROLL SIZE																3	1	0	0	0	1																				
PRINTING CONTROL POSITIONS 1 TO 8	2						2	2	8	2	2		2	2		3	3	3	6	7	5	7																				
ROLL SIZE	5						5	5	1	5	5		5	5		3	3	3	5	3	0	3																				
✓COUNT - C.F. AND/OR REG. OR MACHINE OPERATION	REG.						C.F. & REG.	REG.	NO.	C.F. & REG.	REG.		REG.	C.F. & REG.		NO	NO	REG.							C.F. & REG.	C.F. & REG.	C.F. & REG.															
	5						3	5	0	3	5		5	3		0	0	5							3	3	3															
SKIP OR RETURN ROLL SIZE										4	4		6	6		6	2	0	2	1	4	1			3	3	3															
RETURN LATCH RELEASE	3-4						4	4	4							0	0	4																							
SKIP RELEASE SHAFT MANUAL POS.1				3-4-⊗			3-4-⊗			-4-⊗			⊗			3-4-⊗			⊗			⊗			⊗																	
SKIP RELEASE SHAFT MANUAL POS.2				3-4-⊗			-4-⊗			-4-⊗			⊗			3-4-⊗			⊗			⊗			⊗																	
SKIP RELEASE SHAFT MANUAL POS.3				3-4-⊗			3-4-⊗			-4-⊗			⊗			⊗			⊗			⊗			⊗																	
SKIP RELEASE SHAFT MANUAL POS.4				3-4-⊗			-4-⊗			- 4-⊗			⊗			⊗			⊗			⊗			⊗																	

103 MOTOR BAR - WHEN DEPRESSED AND RELEASED IMMEDIATELY---1 PT. OF THROW
103 MOTOR BAR - WHEN DEPRESSED AND HELD DOWN ----------2 PTS. OF THROW
101 MOTOR BAR - WHEN DEPRESSED AND RELEASED IMMEDIATELY---2 PTS. OF THROW
C.F. SUB-TOTAL KEY----------3 PTS. OF THROW

SKIP LATCHES	#3	#4	#5
RETURN LATCHES	#3	#4	



SKIP AND RETURN LATCHES INDEXED THROUGH VARIOUS STEPS OF THE FANS

ROLL	SKIP LATCH	RETURN LATCH
0	5	NORMAL
6A	4	6
5A	3	5
4A (AUX. FAN ACTIVE)	2	4
0+3 PTS. OF THROW DISABLES AUX. FAN	1	3
3A	4	6
2A	3	5
1A	1	3
	2	4

WHEN THE MOVEMENT OF THE REGULAR FAN IS 5 OR MORE UNITS IT CONTACTS A STUD IN THE AUXILIARY FAN TO DISABLE THE LATTER.

NOTE: (60109 #4) REGISTER CONTROL CAM IN BASE

* REGISTER ADD OR NON ADD AND/OR PRINTING CONTROL - 8 POSITION.
"0" ROLL INDEX REGISTER ADD ONLY.
5 ROLL INDEX REGISTER ADD AND PRINTING CONTROL - 8 POSITION.
3 ROLL INDEX REG. NON-ADD AND PRINTING CONTROL - 8 POSITION.
1 ROLL INDEX REGISTER NON-ADD ONLY.

✓ COUNT CONTROL - STYLE 30 17 07.
5 ROLL COUNTS IN REGISTER WITH KEYS DEPRESSED.
3 ROLL COUNTS IN C.F. AND REGISTER WITH KEYS DEPRESSED

~ REPEAT AND TOTAL CONTROL.
3 ROLL USED TO CAUSE AUTOMATIC TOTAL AND REPEAT.
1 ROLL USED TO CAUSE AUTOMATIC TOTAL AND REPEAT OFF.
BOTH SIZE ROLLS PREVENT MACHINE OPERATION FROM BARS 101 AND 102.
EITHER SIZE ROLL ALLOWS ROTATION OF CAM SHAFT WITH CGE. NORMAL KEY DEPRESSED.

° FORM SPACE OR NON SPACE FROM MRC - STYLE 2-C.C. (ON STYLES 30 17 07 AND 30 14 07)
N.S. AHEAD OF FORM POSITION INDICATES NON-SPACE, ALL OTHER FORM POSITIONS SPACE.

CGE. OPEN ON	TAB. RET.					⊗					⊗		⊗		⊗																												

KEY TO ABBREVIATIONS

T	CROSSFOOTER OR REGISTER TOTAL	G	GEARED ADJUSTABLE CONTROL ROLL
ST	CROSSFOOTER OR REGISTER SUB-TOTAL	M	(2)(3) MANUAL ADJUSTABLE CONTROL ROLL (2 WAY) (3 WAY)
+	ADD	YES	CONTROL ACTIVE
#	NON-ADD	NO	CONTROL INACTIVE
-	SUBTRACT	⊗	CARRIAGE OPENING STUD
N	8 POINT NORMAL (PRTG.POS. 1 THRU 4)	NOS.	1 THRU 8 POSITION OF PRINTING CONTROL
S	8 POINT SHIFTED (PRTG.POS. 5 THRU 8)	C	AUTOMATIC COUNT
NS	NON-SPACE		
NU	NOT USED		

PRINTING CONTROLS

NORMAL

POSITION / ROLL SIZE	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*

8 POINT SHIFTED

POSITION / ROLL SIZE	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
6	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*

FOR OPTIONAL CONTROLS SEE PRINT 401-1 H

Printed in U. S. A. °O

MACHINE CONTROLS

107-1
H

NO-SPACE STROKE TOTAL MACHINES

STYLE 30 17 07 BAR NO. 1

SERVICE DIVISION
BURROUGHS ADDING MACHINE COMPANY

Printed in U. S. America

Reprinted 7-22-52

INDEX OF MECHANISMS

DESCRIPTION	Plate No.
Adjustable Bill Stops (for Public Utilities and Telephone Billing Machine)	67
Adjustable Journal Pressure Rolls, Journal Guides and Standard Ledger Plates (Classes 20 thru 30)	70–1
Air Cushion Assembly on Inside of Back Plate	34
Air Cushion Assembly on Outside of Back Plate	35
Air Cushion for Shuttle Carriage	33
Analysis Column Selector, Motor Bar Controlled (Classes 20 thru 30)	14–1
Aligning Reflector Lamp	25
Automatic Cross Tabulation Carriage Mechanism Classes 1 and 2	21
Balance Transfer Indexed from Operation Control Lever (Styles 23 13 05 and 23 17 45)	14–1A
Bill Ejector Carriage (automatic)	59–60–61
Bill Ejector Carriage (automatic) High Printing Line Construction	55–56–57
Bill Magazine and Ejector for Automatic Bill Ejector Carriage, Low Printing Line Construction	58
Carriage Opening and Closing Mechanism—Toggle Construction	81–1
Carriage Opening from Total Keys and Bars Without Tabulation, Including Manual Control (Classes 11 thru 16 and 20 thru 30)	75–1
Carriage Opening Mechanisms	72 thru 81
Carriage Paper and Aligning Tables (For Classes 20 thru 30)	68
Carriage Paper Guides (Type 20)	64
Carriage Parts Special to Left-Hand Platen Release	69
Carriage Platen Shields (For Public Utilities and Telephone Billing Machine)	67
Carriage Shafts (Classes 20 thru 26)	70
Carriage Tabulation from Number 14 Stop, Carriage Controlled (Classes 20 thru 30)	14–2
Carriage Tabulation from No. 14 Stop, Carriage and/or Motor Bar Controlled	14–3
Complete Adjustable Rolls	97
Complete Carriage	95
Complete Stop and Control Bars	96
Control Rolls (Standard)	84
Deep Ticket Box for Bill Ejector Carriage (Type 20)	62
Extended Line Finder (Type 20)	71
Form Chutes—Style 3	53–5
Form Magazine Carriage with Form Aligning Indicator Bail	53–1–2–3–4
Form Space or Carriage Return—Indexed from Motor Bar No. 101 and Carriage Skip Tabulation—Indexed from Motor Bar No. 103	17–1
Form Space Right or Left Side from M.R.C. (Carriage Controlled) Style 2	87–2
Friction Feed Carriage	1–2
Geared Pressure Rolls	36
Hangers and Rack (For Public Utilities and Telephone Billing Machine)	67
Injector and Ejector Device	23
Intermittent Carriage Return from Total Key (Selective)	93
Intermittent Carriage Return from Total Key Mechanism, with Carriage Controlled Disabling Mechanism	91
Intermittent Carriage Return Indexed from Total Key, Carriage Controlled	92
Journal Sheet Lock	71
Levers Assembled on Back Plate	82–83
M.R.C. Non-Space from Partial Carriage Opening Mechanism	86
M.R.C. Rack Bar Charts	51–1–2–3–4–5–6
M.R.C. Rack Braces	51–7
M.R.C. Space or Non-Space	87
M.R.C. Space or Non-Space (Manual Control)	85
M.R.C. Space Normalizer	71
Multiple Return Release Latches, Flexible (Classes 20 thru 30)	37–4
Multiple Skip and Return Mechanism	37–5
Multiple Skip—Plates 37 to 50, viz.:	
Carriage Opening from Return Mechanism	50
Key to Normalize Carriage Mechanism	49
Release Locked During Carriage Return (Classes 20 thru 30)	37–3
Return Mechanism	37–38
Return Mechanism Controlled from Return	44
Return Mechanism, Front View (Classes 20 thru 30)	37–1
Return Mechanism, Rear View (Classes 20 thru 30)	37–2
Return Mechanism Normalized from Total Keys and/or Carriage Control	45
Return Mechanism Repeat Machine Operation Normalizing Mechanism	46
Return Mechanism Timing Control	41–42–43
Return Mechanism to Open Pressure Rolls	48
Return Mechanism Total Keys and Upper Bars Controlled	40
Return Mechanism Vertical Space Bar	39
Return Release from Selective Operation Control	47
One Inch Spacing	90
Outer Carriage Frame (Classes 20 thru 30)	68
Paper Holders for Roll Paper	94
Passbook Guides (Type 20)	70
Platen Spacing from M.R.C. (Manual Adjusted to Space or Non-Space) Controlled from M.R.C. Rack	87–1
Platen Space or Non-Space Skid Controlled	88
Positive Feed Carriages	3–4
Positive Feed Carriage Detail, Bell, Bail, Paper Guides and Clamps	7
Positive Feed Carriage Detail Carriage Castings, End Plates, Paper Hangers, Carriage Release Lever, Paper Guides, Shafts and Brackets	10
Positive Feed Carriage Detail, Low and High Back Paper Guides	8
Positive Feed Carriage Detail, Pressure Rolls, Platen and Shafts and Paper Feed Mechanism	9
Positive Feed High Back Carriage (Old Style)	5–6
Pressure Roll Assemblies (Type 20)	70
Pressure Roll Opening Mechanism Disabled, Carriage Controlled (Classes 20 thru 30)	48–1
Roll Paper Holder for Form Ejector Carriage	94–1
Selective Debit and Credit	14
Selective Operation Control Feature (Two, three or four Position)	54
Semi-Automatic Cross Tabulating Mechanism	13
Shuttle Carriage Mechanism for Classes 1 and 2	22
Skip and Return Mechanism (Improved) With Carriage Controlled Normalized Tabulation	14–1B
Skip Stop Knockers (For Public Utilities and Telephone Billing Machine)	67
Skip Tabulation	14
Special Left Feed Pawl (Classes 20 thru 26)	71
Split and Normal Platen	26–27

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INDEX OF MECHANISMS (Continued)

DESCRIPTION	Plate No.
Spring Barrel Assembly (Exterior) (Classes 20 thru 30)	19–1
Spring Barrel Assembly (Large Spring) for Type 20 S.A.C.T. Carriage	19
Spring Barrel Assembly (Small Spring) for Classes 1, 2 and 6 A.C.T. and S.A.C.T.	18
Stop Bars (Classes 6, 11 thru 30)	70
Stop Bars and Stops	11
Tally Roll (Up Feed)	24
Telephone Billing Machine Carriage	65–66
Thin Rolls and Levers	82
Triple Spacing Mechanism	89
Variable Line Spacer (Type 20)	71
Vertical Spacing from Total Key Carriage Controlled (Early)	15
Vertical Spacing from Total Key Carriage Controlled (Later)	16
Vertical Spacing from Upper and Lower Auxiliary Motor Bars	17
Visible Aligning Bail	29
Visible Aligning Bail—Improved Bank Posting Machines	29–1
Visible Alignment Carriage	51–52–53

See Mic 487

LUBRICATING CHART
SERIES H MACHINES
(Plate A)

The following chart is offered as a guide for servicemen to assure that all working parts of the Series H Machine are properly lubricated.

Excess oil and grease should be removed following application of any lubricant, and the machine's exterior, including the apron and stand, should be left in clean condition.

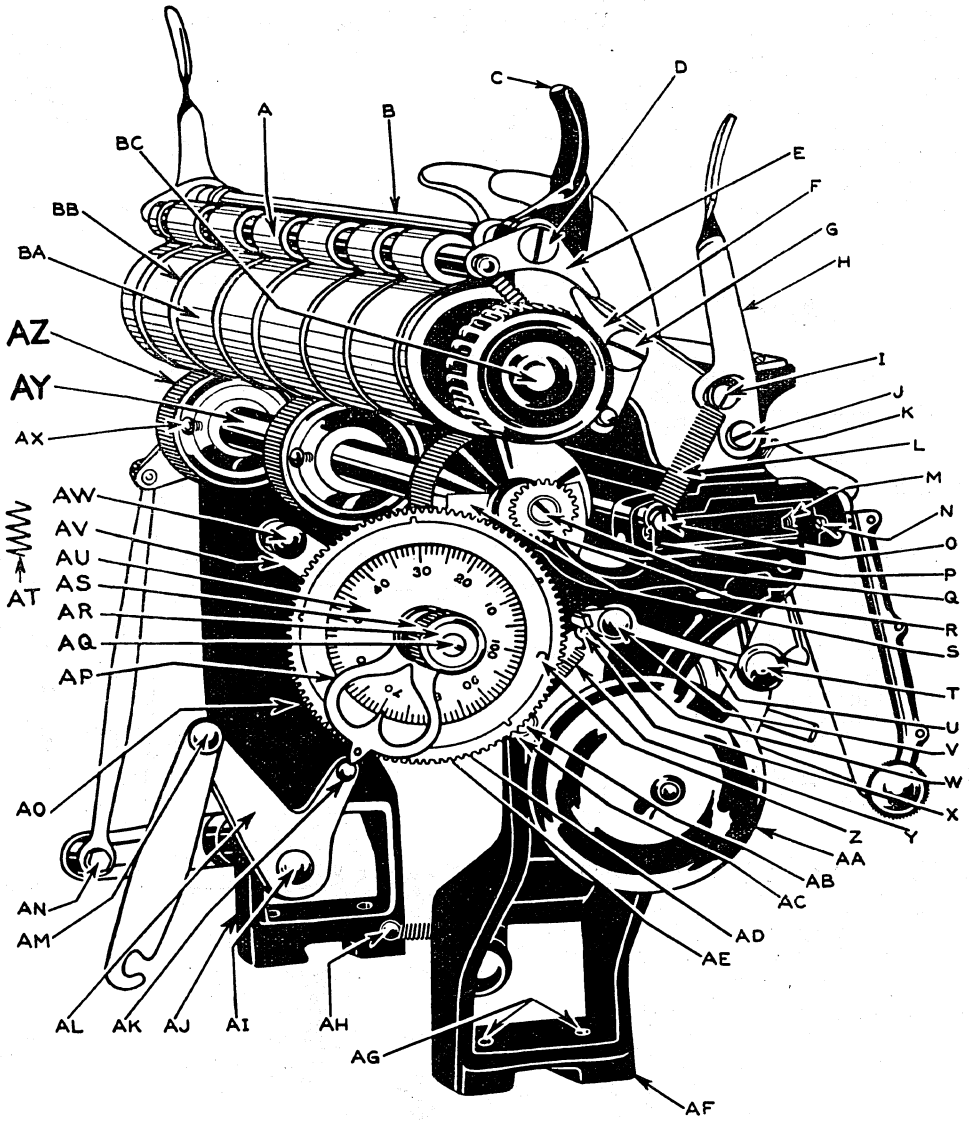
SECTION	POINTS OF LUBRICATION	LUBRICANT
Carriage	Raceways of carriage castings BC and BD (Plate 3, Carriage Symbol List) Ratchet roller I (Plate 5) Bearings with oil holes All light working parts Air cushions C (Plate 33), D (Plate 34), and M (Plate 35) All light working parts and bearings of the Air Cushion Mechanism All pivot points of the M.R.C. plate assembly	Machine Oil (Kit 131)
	Air cushion stop block M (Plate 34) All open contacts on both sides of back plate, including air cushion arms and Multiple Print Mechanism (Plates 27 and 27-1) All control levers at contact points with control rolls Carriage feed bail AZ (Plate 3) Pivoting points of pressure rolls Teeth of M.R.C. rack BD (Plate 14-1) All gears on the Selective Operation Control Mechanism (Plate 54) All heavy sliding contact points of the M.R.C. plate assembly Rollers on the right and left sides of the Carriage Opening Mechanism Throw back arm for the Carriage Opening Mechanism All open contacts on the M.R.C. unit plate and Throw Back Mechanism Plunger, cam, and all working arms of Commercial Power Assembly T (Plate 76) Spring and bearings of the Spring Drum Assemblies (Plates 19 and 19-1) Channel of clutch member AA (Plate 19-1, Power Symbol List) in which rides the stud in arm AD (Plate 19-1, Power Symbol List)	Bearing Grease (Kit 167¼)
	Internal bearing surface for the left member of the split platen	Light Grease (Kit 168⅞)
Keyboard	All working surfaces, turning points, slides and component parts of the Keyboard Mechanism. **Note:** Care should be taken that no oil gets on the inner surface of adding rack guides AC and AD (Plate 3, Keyboard Symbol List) Pivoting points of shaft Y (Plate 7) in the right and left side frames	Machine Oil (Kit 131)
	Gears Q and R (Plate 7) Arm E (Plate 7) at its point of contact with cam F (Plate 7) and roll A (Plate 7)	Bearing Grease (Kit 167¼)
Printing	All light working parts and bearings of the Hammer Assembly (Plate 4, Printing Symbol List) Fill oil cup S (Plate 24) Pivoting points of type sectors AF (Plate 1, Accumulation Symbol List) All light working parts of the Ribbon Feed and Reverse Mechanism (Plates 38, 38-1, and 39, Printing Symbol List)	Machine Oil (Kit 131)
	Upper surfaces of pawls AK (Plate 4) at their points of contact with type sectors E (Plate 50) Closed cam X and button stud AA (Plate 38) Open contacts of symbol designators O (Plate 8) and B (Plate 8-2) Hammer release and hammer resetting controls of the Single Operation Multiple Print Hammer Release and Driver Resetting Control (Plate 23-1) Slot in arm H (Plate 24) All open cams and slides of the Rotary Printing Controls (Plates 34, 35, and 36) The sliding surface of arm A (Plate 45) at the point of contact with screws C and AM (Plate 45) The roll operating in the slot of arm P (Plate 46) Point of contact of the stud in arm G (Plate 46) with ratchet F (Plate 46) Teeth of arm O (Plate 6) and the gear on shaft M (Plate 6)	Bearing Grease (Kit 167¼)
	Bearings, wheels, and plunger pins of the Rotary Calendar Feature and Rotary Numbering Device	Light Grease (Kit 168⅞)

Mr M R Lovejoy
Buffalo N Y Branch 10-5

LUBRICATING CHART (Plate A) Continued

SECTION	POINTS OF LUBRICATION	LUBRICANT
	All light working parts and bearings of the Register Section (Plate 29, Accumulation Symbol List) All light working parts and bearings of Crossfooter Section AG (Plate 4) Air cushion AT (Plate 46) All pivot points of assembly BG (Plate 58-1) All pivot points of the Motor Bar Release Mechanism For Overdraft Operation—Bank Posting Machines (Plate 68-1)	Machine Oil (Kit 131)
Accumulation	All heavy working parts of assembly BG (Plate 58-1) Camming surfaces of cams AN (Plate 46) Points of contact of arm Y (Plate 46) with pawl X (Plate 46) and screw Z (Plate 46) Rolls on assembly AT (Plate 82) Camming surfaces of detents T and AC (Plate 43) All pivot and friction points except button studs N and AT of Crossfooter Total and Sub-total Mechanism—Positive and Negative—Carriage Controlled, Improved, Style No. 2 With H903 (Plate 74-3) Rolls AF, AR, AU, and BQ, also roll in arm AD (Plate 74-5) Roll J (Plate 74-2) All friction points of Motor Bar Release Mechanism For Overdraft Operation—Bank Posting Machines (Plate 68-1)	Bearing Grease (Kit 167¼)
Power	Wick M (Plate 1, Power Symbol List) Pivoting points of the eyelets on springs F (Plate 1) Pivoting points of parts Q, S, and U (Plate 1) of the Toggle Mechanism Pivoting points of dashpot BT (Plate 1) on sleeve BW and shaft AL (Plate 1) All light working parts of the Operating Bar and Switch Control Mechanism (Plate 13) All light working parts of the Multiple Skip—Return Mechanism Timing Control (Plate 22-1) All shaft bearings (of the Power Mechanism) containing oil holes	Machine Oil (Kit 131)
	Two pivoting points of drive arm X (Plate 9)	Light Grease (Kit 168⅞)
	Tooth edge of segment A (Plate 27) All camming surfaces of assemblies K and A (Plate 1) Slot of arm I (Plate 1) Camming surfaces on the lower portion of arm U (Plate 2, Accumulation Symbol List) Gears M and AB (Plate 19-1, Power Symbol List) Universal joint between the motor and M.R.C. Unit Air cushion U of the Carriage Opening and Closing Actuating Mechanism (Plate 76, Carriage Symbol List) All open contacts on Motor Drive	Bearing Grease (Kit 167¼)
	M.R.C. gear box is to be lubricated with 1/3 ounce of M.R.C. Drive Oil. **Note:** No More than 1/3 ounce of this lubricant should be used as it will cause a resistance to the motor, resulting in excess wattage and the burning of the contact points.	M.R.C. Drive Oil (Kit 168½)
	Cup W (Plate 15, Power Symbol List) to be filled at least one-half full with Extra Light Grease	Extra Light Grease (Kit 167 ¾E)
	Fill the dashpot to 1½" from the top when the plunger assembly is removed	Dashpot Oil (Kit 134)
	The Drive Unit should periodically be drained and thoroughly flushed to prevent an accumulation of foreign matter. The correct procedure for flushing the Drive Assembly is as follows: With the machine sitting level to facilitate draining, and all fluid oil drained off, pour in two ounces of solvent, and operate the machine for approximately ten minutes (holding the motor bar depressed) to permit the cleaning of the clutch members. Drain the dirty solvent and repeat this application until the solvent drains clear. Pour in two ounces of the approved mineral spirits being used in the branch for cleaning machines, operate the machine for two minutes, and drain.	Solvent (Kit 131¾)
	Refill the Drive Unit with two ounces of Drive Oil.	Drive Oil (Kit 165½B)
	Fill the grease cups on early type motors containing sleeve bearings.	Motor Bearing Grease (Kit 167½E)

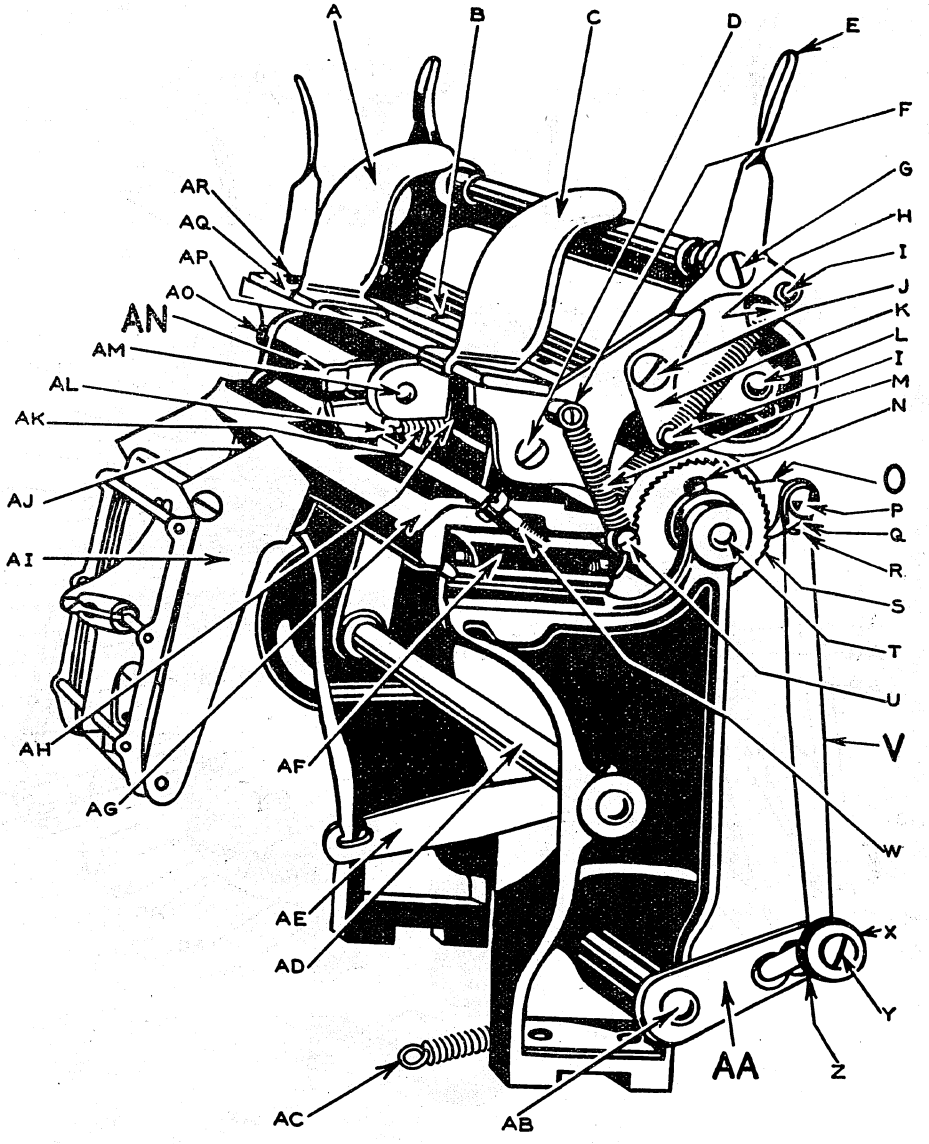
FRICTION FEED CARRIAGE (Plate 1)



SYMBOLS (Plate 1)

A **1-1502 Style 9 or 13** Only
D **2854⅛ (103508)**
F **1524** Pressure roll lever
G **259½** Screw
H **1528** Lever
1-1508 Shaft includes H and J
I **1563½** Screw spring stud
J **2858¼A** Screw
K **1587** Spring for lever "H"
L **2086 (12384)**
M **3463½** Screw (8 required)
O **1562½ (501 Fte. 214)**
P **72906** Ball bearings (4 required)
S **1986** Flat friction spring
T **1593**
V **1552** Shoulder stud
X **162⅝ Fte. 104** Stud
Y **284** Spring
AA **1595¼** Bell
AB **1553** Rivet
AD **83 No. 1** Clock spring
AG **B1566 (1050⅝)**
AN **46** Nut
AQ **255¼** Screw
AW **1592** Handle
AX **B1535** Screw
AY **1506 Style 7, 13 or 15** Shaft
1-1506 Style 7, 9, 13 or 15 Shaft with rollers
BA **1Z-1598** Platen
1-1500A Platen and shaft
BC **1-8039¼A** Complete twirler including screw 2850⅛

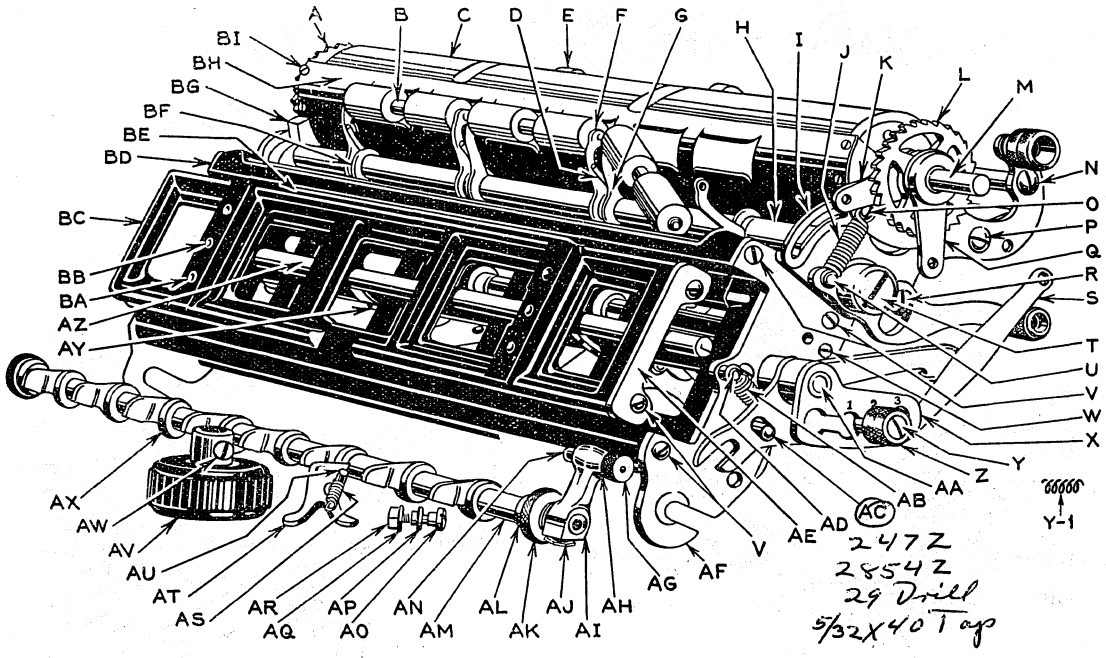
FRICTION FEED CARRIAGE (Plate 2)



SYMBOLS (Plate 2)

A **1528½R** Paper guide
B **B1510** (4 screws for paper cutter)
C **1528½L** Paper guide
D **1558½ (8059½)**
F **1562½ (501 Fte. 214)**
G **2854⅛ (103508)**
H **1582 (988)**
I **1-1502 Style 9 or 13** Only
J **259½** Screw
K **1524** Pressure roll lever
L **1500A** Shaft
M **2086 (12384)**
N **550¾** Screw
R **1586½** Spring
T **1506 Style 7, 13 or 15** Shaft
1-1506 Style 7, 9, 13 or 15 Shaft with rollers
U **1562½ (501 Fte. 214)**
W **B1566 (1050⅝)**
Y **1551 (103524A)**
Z **1589** Spring
AC **8085A** Spring
AE **1513¼** Link
AF **1-1565 Style 9** Only, complete casting with screws
AI **2Z-2811⅛** Complete paper hanger, refer to "2800" section for detail symbols, Plate 10
AJ **2851⅞** Screws holding paper hanger to casting
AK **1585** Spring
AM **1-1508** Shaft assembly, including finger lever and screw
AN **1-1534** Latch, includes stud
AP **1520¼ Specify style,** guide strip for paper guides
AR **1352A** Screws (2 required)

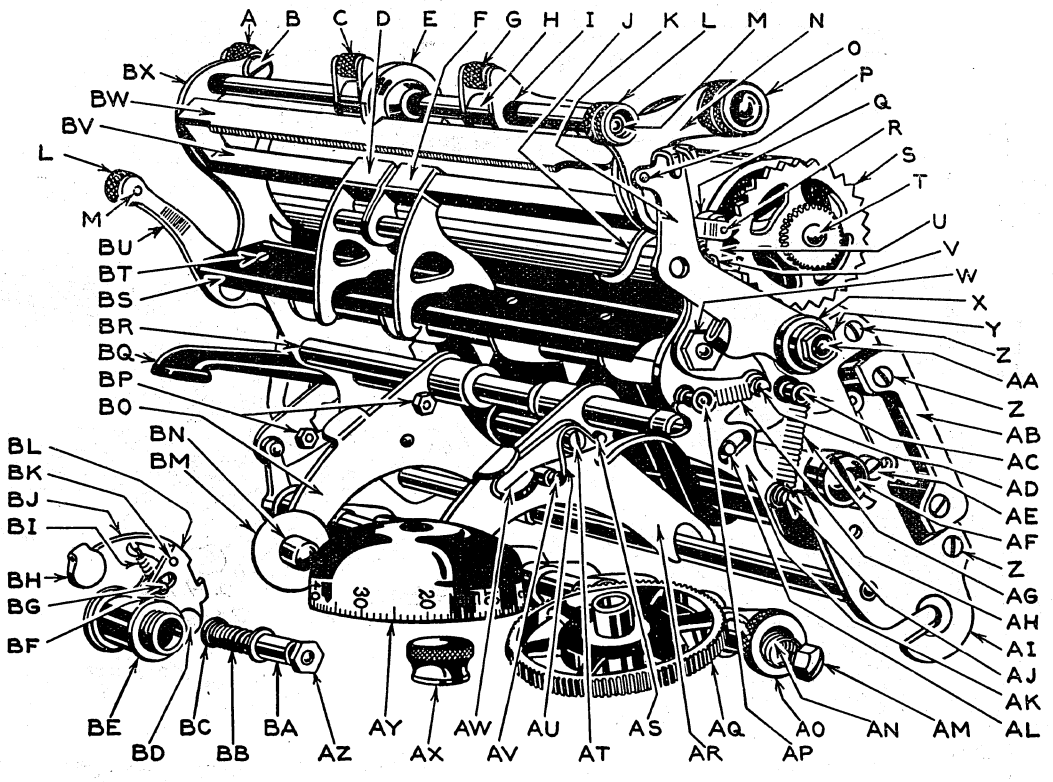
POSITIVE FEED CARRIAGE (Plate 3)



SYMBOLS (Plate 3)

B **1-1802** Pressure roll
C **1Z-1898 Style H or K** Platen without shaft
1-1800¼ Style H or K Platen and shaft assembly
D **1880** Spring
E **1-73641** Rubber roller
J **2886½** Spring
M **1800¼Z Style H** Only
N **1864¼** Screw
O **1861** Stud
P **1864¼** Screw
R **8058A** Screw
S **1822¼** Link
T **1836** Threaded cap on end of shaft
U **2851¼** Stud
V **2852 1/16** Screw
W **2862½** Screw
Y **1853¼** Screw
Y-1 **2888** Spring on "Y"
Z **1847A** Knob for feed adjustment
AA **1A-1803 Style H or K** Includes shaft
AB **2886¾** Spring
AC **2854** Stud
AD **2860¼** Stud (2 required)
AE **2818A (4918R or L, 4952 1/16 [2 req.])**
AF **1-1817AR** Carriage end plate
AG **2844¼** Knurled knob
AH **2881⅛** Spring
AI **1-2866 No. 1** Stop dog includes "AG," "AH," "AJ," "AN"
AJ **2862⅝** Screw
AL **1889½** Spring
AM **1B-3402½ Style K** Only, assembled stop bar as shown, specify number of stops required
AN **2854¾** Plunger
AO **2858 1/16** Screw
AP **2843¾** Shoulder collar
AQ **2820½** Washer
AR **46** Nut
AS **2887½** Spring
AT **1-2822** Pawl, includes stud
AU **2850½** Stud
AV **1-8039¼A** Complete twirler
AW **2850⅛** Screw
AX **1-1892** Stop dog
AY **2851¾** Screws for feed bail
AZ **1-2806½A Style H** } Feed
1-2806½A Style K No. 2 } bail
BA **1055⅛ (9251 3/16)**
BB **1055⅜ Style H** Screw (2 required)
BC **2865A Specify Style and H or K,** Carriage rail
BD **2867B Style H** Only, carriage casting
BE **2824CH (2824 Style 12 No. 2 [2 req.], 2837 1/16 Specify Number [20 req.])**
2824BK (2824 Style 18 No. 2 [2 req.], 2837 1/16 Specify Number [24 req.])
BG **1-1819AL** Left end plate on platen frame
BH **1825A Style K** Only, shield around platen
BI **2853¼** Screws (4 required)

POSITIVE FEED CARRIAGE (Plate 4)



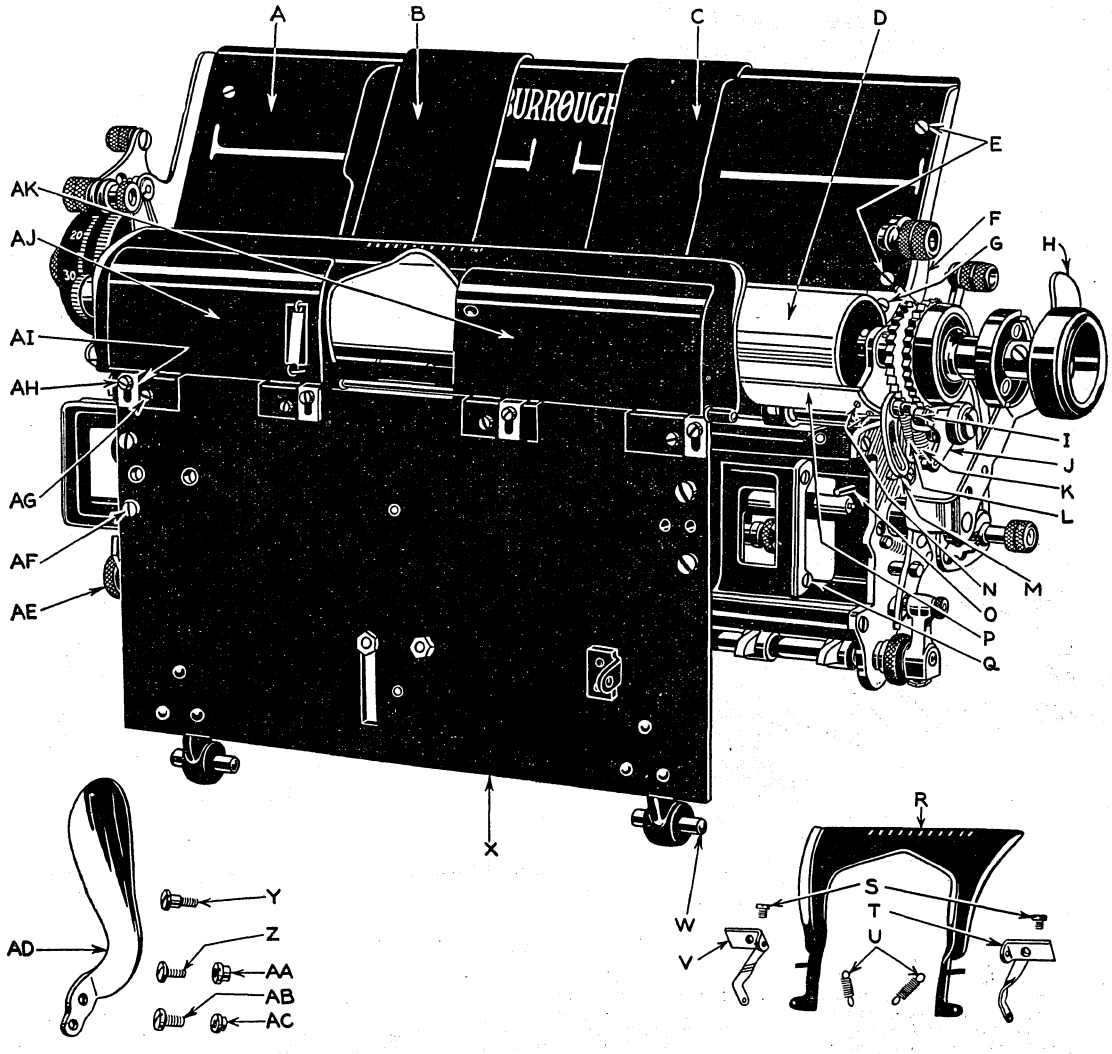
SYMBOLS (Plate 4)

B **1850¾ (2855⅜)**
C **1-1815½AR** Paper clamp, includes smaller rubber roller 1-73641
D **1-1827R** Sliding paper guide
F **1-1827L** Sliding paper guide
G **1-1815½AL** Paper clamp, includes small rubber roller 1-73641
I **87¼ Fte. 88** Spring
K **1-2821¾** Assembly includes "L," "M," "N," "O," and "P"
L **2835½** Knurled knob
M **2855⅜** Screw
N **1-2812⅜** Included with "K"
O **2846L** Knurled knob
1851¾ Screw
P **2859⅞** Shoulder stud
Q **2841¾A** Roll
R **1856⅜** Pin
T **1800¼Z Style H** Only
U **1-1816A** Detent assembly, includes parts attached
V **7282¼** Spring
2814¾ Pawl
W **1834** Hexagon head sleeve
X **2818½** Washer
Y **45** Nut
Z **2852⅛** Screw

AB **2818A (4918R or L, 4952⅛ [2 req.])**
AD **10764½** Spring stud
AE **2852¼** Screw stud
AF **2851⅝** Screw
AG **2881½** Spring
AH **1882½** Spring
AJ **1858A** Stud
AK **1829½** Latch
AL **1856½A** Pin
2841⅝A Roll
AM **1858¾** Screw
AN **2889¾** Spring
AQ **2890⅛** Gear
AR **1-2815⅜L** Paper roll holder
AS **2863⅞** Stud
AT **2862⅞** Screw
AU **2881⅞** Spring
AV **2863½** Stud
AW **1-2815⅝L** Locking lever
1-2815⅝R Locking lever is corresponding part on right side
AX **2842⅜** Knurled cap
AY **2812⅝** Bell
AZ **45** Nut
BA **2801¼** Shaft
BB **2886** Spring

BC **2864⅝** Screw
BD **2860⅝ (703587)**
BE **2-2825⅝** Assembly as shown
BF **2883⅛ (701807)** Spring
BG **2863⅛ (264⅝)**
BH **2826⅛** Bell tapper
BI **2883¾** Spring
BJ **2870½** Wire
BK **2861⅛ (60579)** Stud
2829⅞ (709143½) Washer
BL **1-2826⅞** Assembly, includes "BH," "BI," "BJ," "BK"
BO **1-2815⅜R** Right paper roll hanger
BP **46** Nut
BR **1-2805¼A Style H or K,** Shaft assembly, includes following items:
2882½ Spring
2861½ Knurled head screw
2862½ Plunger in end of shaft
BS **1825A Style K** Only, shield
BT **1654½** Screw
BU **1-2824¼** Pressure roll release lever
BV **1800 Style H** Only, shaft for paper guides
BW **1828¼ Style H** Only, paper cutter
BX **1819R** End plate

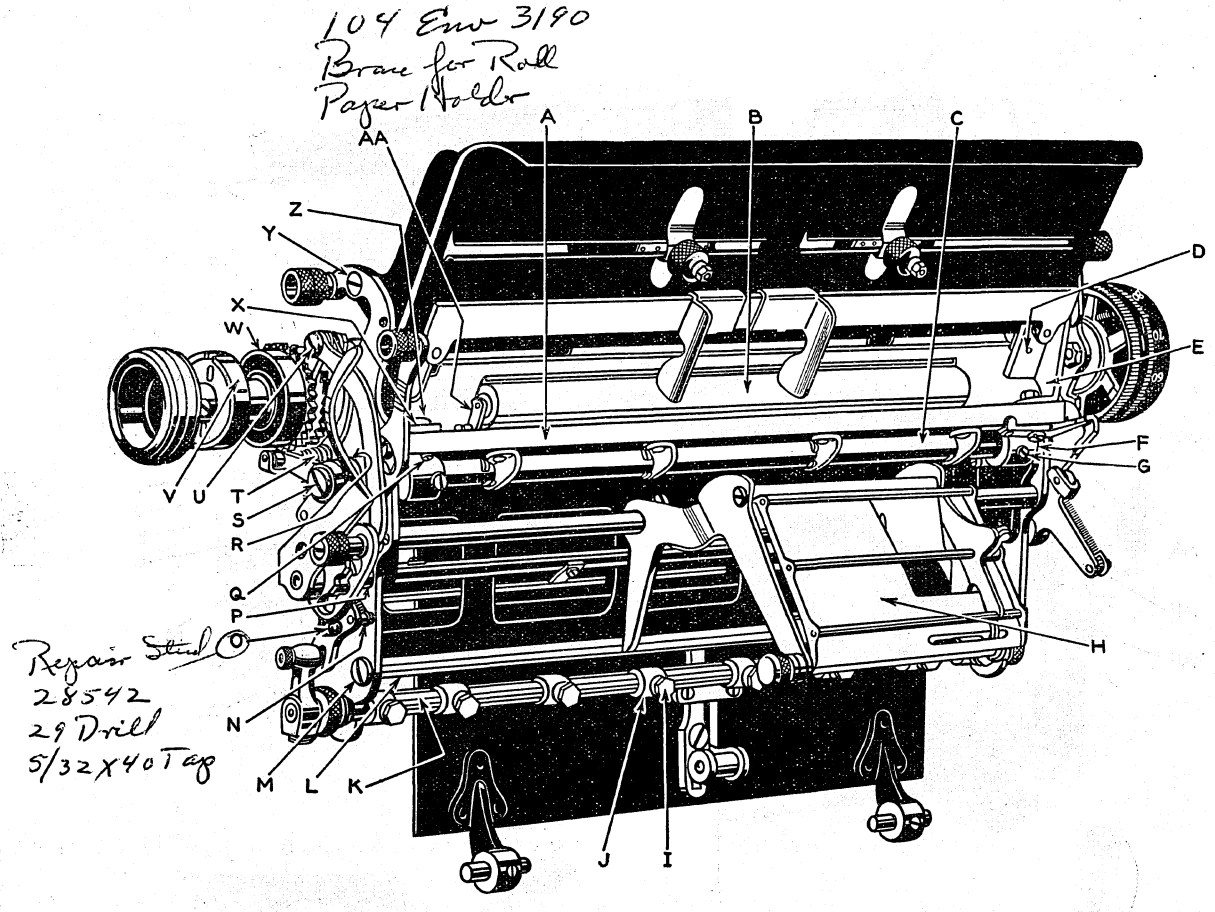
POSITIVE FEED HIGH BACK CARRIAGE (Plate 5)



SYMBOLS (Plate 5)

A **2827¾ Style H or K,** High back without paper guides
1-2827¾ Style H or K, Complete high back with paper guides and end brackets
B **1-2827 1/16AL** Left paper guide
2898½A Billiard cloth, upper
2898¾ Billiard cloth, lower use cement code 7647-2
C **1-2827 1/16AR** Right paper guide, same details as under "B"
D **1-2800¼A Style H or K** Platen and shaft
1Z-1898 Style H or K Platen without shaft
E **2859¾B** Bevel head screw (4 required)
46 Nut (4 required)
F **1-2819AR** Right end plate
1-2819AL Left end plate
G **2858¾** Screw (2 required)
H **1-2826** Carriage release lever
I **2841¼A** Roll
2858⅝ Pin
J **1-2816A (1-2816A No. 1)** Detent assembly
K **9582 (60809)**
L **2886½** Spring
N **2853¼** Screw (4 required)
O **1056¼** Pin
P **2825B Style H or K** Shield
Q **2852 1/16** Screw
R **2810¼ Specify Style** Line finder
S **1758½ (12055 5/16)**
U **3981** Spring
W **1055¾** Pin (2 required)
12055 5/16 Screw for pin (2 required)
X **1-12012½ No. 2 Style 9, 11, 13 or 17** Specify machine number
Y **2860** Shoulder screw
Z **2861 (2864½)**
AA **2844** Threaded round nut
AB **2858¼A** Screw
AC **2838¼A** Threaded round nut
AD **27½R Fte. 88** Shoe horn handle for tilting carriage, specify "L" when used on left end
AF **1055½ (9251 3/16)**
AG **252⅝** Screw (4 required)
AH **2857⅞ (4857½)**
AI **2812¾B** Hinge (4 required)
AJ **2813L Style 9**
2813⅜L Style 11, 13, or 17
AK **2813R Style 9**
2813⅜R Style 11, 13, or 17

POSITIVE FEED HIGH BACK CARRIAGE (Plate 6)

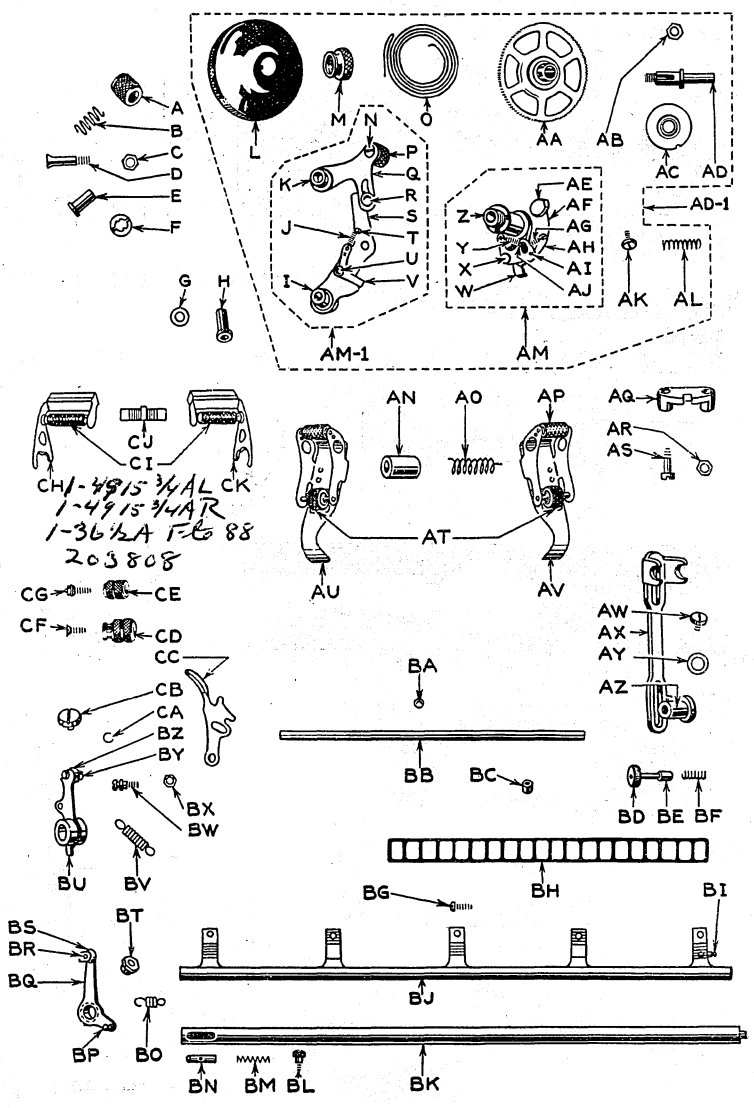


SYMBOLS (Plate 6)

B **1-2891½C** Style H, **1Z-2891½B** Style K — Pressure rolls, use brackets 1-2811⅛AR and AL when these parts are used for replacement
C **2808A Style H or K**
D **2858¾** Screw
E **2826½BL** Bracket
G **653¾** Screw
H **2-2810⅛** Complete paper hanger with bracket, refer to "Carriage Plate 10 Detail" for detail symbols
I **8862⅛** Screw
J **1-1892** Stop dog
K **1B-3402½ Style K** Only, assembled stop bar; specify number of stops required. Refer to Plate 11 for detail symbols
L **2802¾ Style H or K**
N **2863½** Spring stud
O **2854** Stud
P **2842⅛** Collar
Q **2857¾ (73659)**
S **2857½ (7355C)**
T **2856½** Stud
U **2858⅛** Shoulder screw
V **2841⅛B (73365)**
W **1-2849A** Ratchet wheel assembly
X **2826½BR** Bracket
Y **2858¼A** Screw
Z **46** Nut
AA **1-2811⅛AR or AL** Used when pressure roll "B" is used for replacements

POSITIVE FEED CARRIAGE DETAIL, BELL, BAIL, PAPER GUIDES AND CLAMPS
(Plate 7)

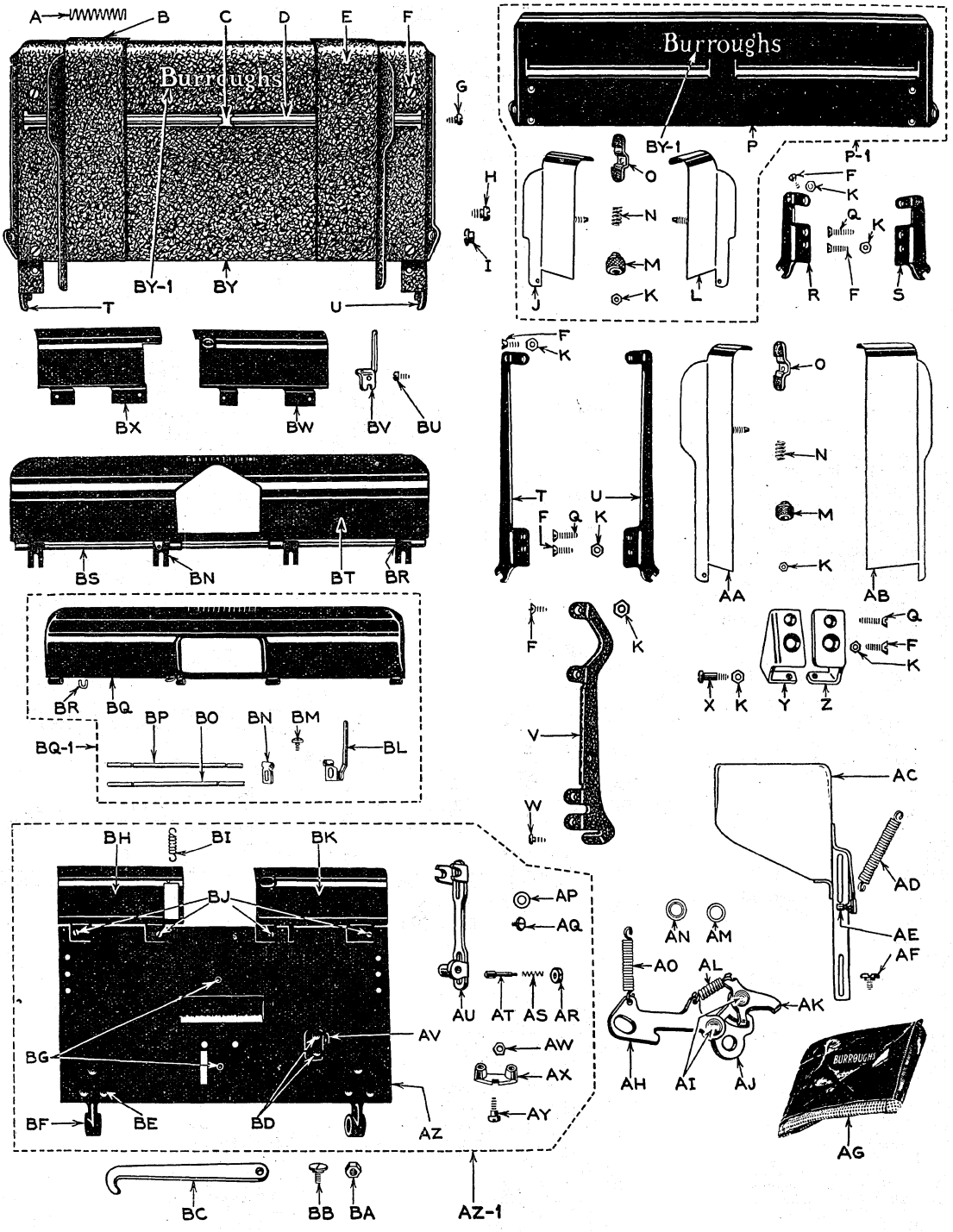
Parts to prevent raceway creep
75603 No1 Screw
1097 13/16 Washer
47
2818Z
72309



SYMBOLS (Plate 7)

A **2846L** Knurled knob
B **2880⅛** Spring
C **45** Nut
D **1851¾** Screw
E **2831⅝** Shoulder sleeve
F **2817½** Embossed washer
G **2818½** Washer
H **2834½** Shoulder sleeve
I 2842¾* Hub
J **7282¼** Spring
K 2835¾* Hub
L **2812⅝** Bell
M **2842⅜** Knurled cap for bell
N **2855/16** Screw
O **83 No. 1** Spring
P **2835½** Knurled knob
Q **1-2812⅜** Punching, included with "AM-1"
R **2859⅞** Shoulder stud
S 2821¾* Punching
T **2862⅛** Stud
U **2861¾** Shoulder stud
2814½ Washer
V **2814¾** Stop pawl
W 2825⅜* Punching
X **2860⅝ (703587)** Stud
Y **2883⅛ (701807)** Spring
Z 2841⅞* Hub, included with "AM"
AA **2890⅛** Gear
AB **45** Nut
AC **2811⅝** Spring drum cover
AD **2801¼** Shaft
AD-1 **2-2801¼** Complete bell assembly
AE **2826⅛** Bell tapper
AF **2870½** Wire
AG **2883¾** Spring
AH **2827⅜** Pawl
AI **2861⅛ (60579)** Stud
2829⅞ (709143½) Washer
AJ **2863⅛ (264⅝)**
AK **2864⅝** Screw
AL **2886** Spring
AM **2-2825⅜** Bell tapper assembly
AM-1 **1-2821¾** Punching assembly
AO **203808** Spring
AP 58½ Fte. 88* furnished with "AU" and "AV"
AQ **2890⅜** Stop block
AR **45** Nut
AS **2859⅝** Screw (2 required)
AT **1-73641** Roller assembly
AU **1-1815½AL** Paper clamp
AV **1-1815½AR** Paper clamp
AW **8054¾** Screw (2 required)
AX **1-2823¼** Feed slide for bail, includes "BD," "BE," "BF"
AY **811⅛** Washer (2 required)
AZ 2835⅜* Hub
BA **72906** Ball bearing
BC **2837¼A Specify Number 64, 65, 66 or 67 (2837⅛ Specify Number 64, 65, 66 or 67 and 2824 Style 12 or 18 No. 2) Note—"64" indicates .264**
BD **2835⅛** Knurled knob
BE **2859⅜** Pin
BF **2880¾** Spring
BG **2851¾** Screw (5 or more required)
BH **2824 Style 24 (2824 Style 24 No. 2 [2 req.], 2837⅛ Specify Number [48 req.])**
2824B Style K (2824 Style 18 No. 2 [2 req.], 2837⅛ Specify Number [24 req.])
2824C Style H (2824 Style 12 No. 2 [2 req.], 2837⅛ Specify Number [20 req.])
BI **4955⅛** Stud
BJ **1-2806½A Style H**
1-2806½A Style K (1-2806½ Style K No. 2)
BK **1-1805¼ H or K Style 13, 15 or 17** Only includes "BL," "BM," "BN"
BL **2861½** Knurled head screw
BM **2882½** Spring
BN **2862½** Plunger
BO **1882½** Spring
BP **10764½** Stud
BQ **1-1816A** Detent includes "BP," "BR," "BS"
BR **1856⅜** Pin
BS **2841¾A** Roll
BT **1834** Shoulder nut
BU **1-1813¼B** Detent includes "BY" and "BZ"
BV **2881½** Spring
BW **1858A** Screw stud
BX **46** Nut
BY **1856⅜** Pin
BZ **2841⅝A** Roller
CA **1889** Spring
CB **2851⅝** Screw
CC **1829½** Latch
CD **2846AR** Knurled knob
CE **2835½** Knurled knob
CF **1850¾ (2855⅜)**
CG **2855⅜** Screw for locking paper release lever in position
CH **1-1827R** Right paper guide
CI 1857* Knurled shaft
CJ **1884** Spring for paper guides
CK **1-1827L** Left paper guide

POSITIVE FEED CARRIAGE DETAIL, LOW AND HIGH BACKS AND PAPER GUIDES (Plate 8)



SYMBOLS (Plate 8)

A **2889¼A** Compression spring used on back of "B" and "E"

B **1A-2825¼BL** Left paper guide
2898A Billiard cloth, upper
2898⅜ Billiard cloth, lower
} Use cement Code 7647-2
1A-2825⅞L Left paper guide having long vertical straight edge in place of one shown

C **1-2819½A** Floating brace separating paper guides
2897 Billiard cloth (2 req.), use cement Code 7647-2

D **2809½ Style H, K or 24″**

E **1A-2825¼BR** Right paper guide, refer to "B" for details

F **2859⅞** Bevel head screw (6 required)
46 Nut

G **3256⅛** Screw for "D"

H **2858¼A** Screw (2 required)

I **2838¼A** Round head slotted nut

J **1-2827⅛AL** Left paper guide
2898½A Billiard cloth, upper
2898¾ Billiard cloth, lower
} Use cement Code 7647-2

K **46** Nut (2 req.)

L **1-2827⅛AR** Right paper guide, refer to "J" for details

M **2845A** Knurled knob (2 req.)

N **2889¾** Spring (2 req.)

O **1-2825⅝** Brace (2 req.)
2897 Billiard cloth, use cement Code 7647-2

P **2827¾ Style H or K**

P-1 **1-2827¾ Style H or K** Includes parts within dotted lines

Q **2859¾B** Screw (2 required)

R **2826½DL** Bracket

S **2826½DR** Bracket

T **2826¾BL** Bracket

U **2826¾BR** Bracket

V **2826¾** Bracket for Classes 1, 2, 6, 11 thru 16 equipped with 24″ carriage

W **7357½** Screw (1 required)

X **2857¾ (73659)**

Y **2826½CL** Bracket

Z **2826½CR** Bracket

AA **1-2825¼BL** Left paper guide

AB **1-2825¼BR** Right paper guide

AC **1-2820¾ Style 11, 13, 15 or 17**

AD **2887¾A** Spring

AE **2863¾** Stud

AF **2853⅝** Screw

AG **Hoods** (See Service Agreement and Business Machine Supplies Price List)

AH **1-712⅝** Assembly, includes "AI," "AJ," "AK," "AL," "AO"

AI **351½** Shoulder stud

AJ **712½** Punching

AK **712¾** Punching

AL **10686½** Spring

AM **1028 Style 15** Washer

AN **730** Shoulder washer

AO **787 (1080⅛)**

AP **811½** Washer

AQ **2855⅜** Screw

AR **2835⅛** Retaining collar

AS **2880¾** Spring

AT **2859 3/16** Pin

AU **1-2823¼** Slide includes "AP," "AQ," "AR"

AV **2821¼** Punching

AW **45** Nut (2 required)

AX **2890⅜** Stop block

AY **2859 5/16** Screw (2 required)

AZ **12012½*** Back plate

AZ-1 **1-12012½ Style 9, 11, 13, 17 No. 2** Specify machine number

BA **45** Nut

BB **2853⅜** Screw

BC **2821½** Hook for back plate

BD **2854⅛A** Rivet
2854¼ (103508) Screw

BE **12064⅞** Rivets

BF **12069 No. 1** Hinge — #1 long

BG **1035½** Threaded stud

BH **2813L Style 9** Shield — #3 short

BI **2887** Spring

BJ **252⅝** Screw

BK **2813R Style 9** Shield

BL **2812⅞L** Punching

BM **2857⅞ (4857½)**

BN **2812¾B** Brackets

BO **2806⅛R Style 13, 15 or 17**

BP **2806⅛L Style 13, 15 or 17**

BQ Refer to BQ-1

BQ-1 **1-2810 9/16 Style 11, 13, 15 or 17** Complete line finder as shown within dotted lines

1Z-2810 9/16 Style 13 Assembled line finder for rebuilt machines without tally roll made prior to 1926

BR **470** Wire

BS **2806 Style 9, 11, 13, 15 or 17**

BT **1B-2810¾ Style 9, 11, 13, 15 or 17** Includes "BR," "BS," "BN"

BU **2853¼** Screw

BV **2812⅞R** Punching

BW **2813⅜R Style 11, 13 or 17** Shield, use 252⅝ screw

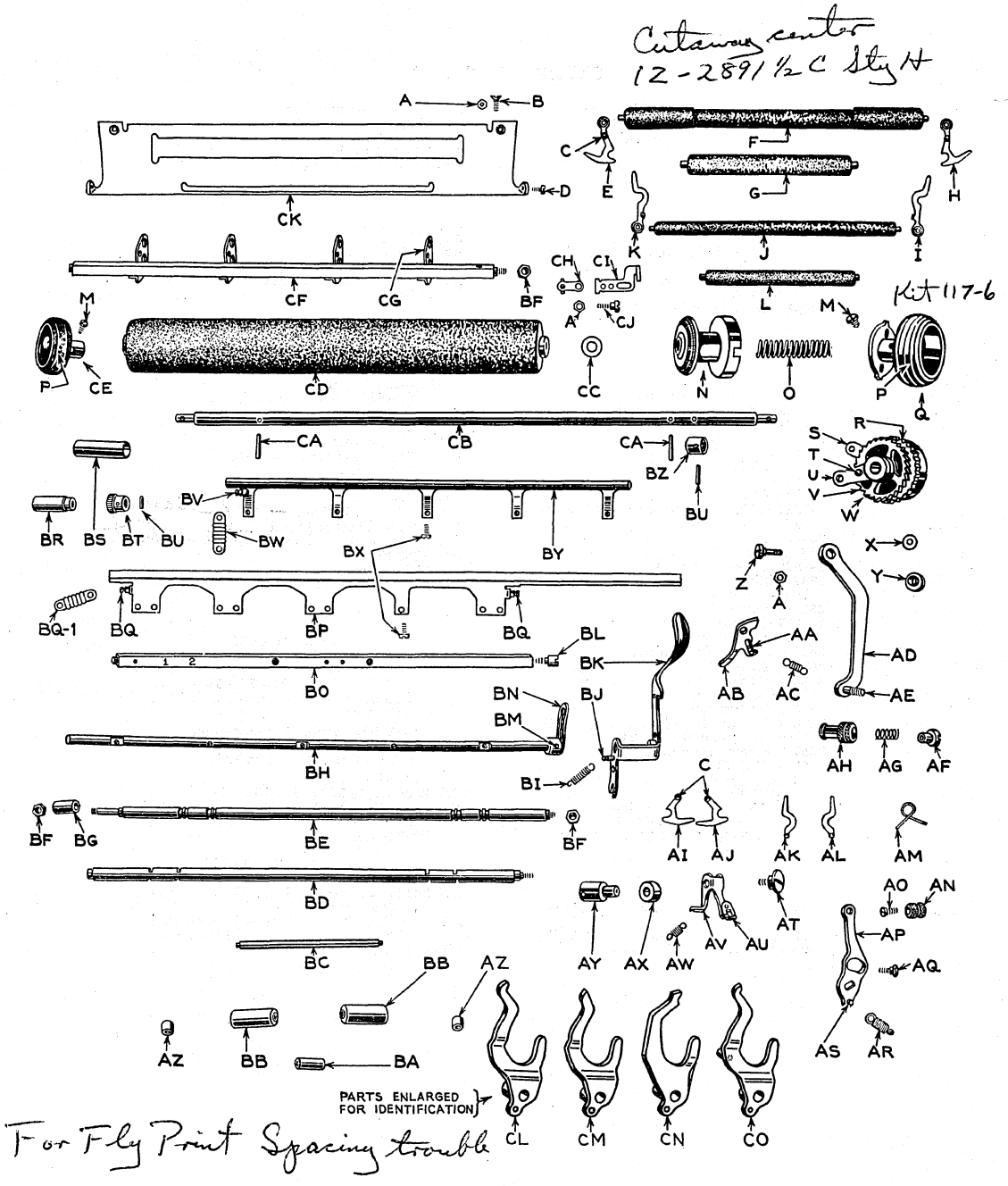
BX **2813⅜L Style 11, 13 or 17** Shield, use 252⅝ screw

BY **1-2825¾C Style H or K** } Assembled
1-2825¾ Style 24″ } high back

BY-1 **91A No. 1** Transfer

Printed in U. S. America 1-4-49

POSITIVE FEED CARRIAGE DETAIL, PRESSURE ROLLS, PLATEN AND SHAFTS AND PAPER FEED MECHANISM (Plate 9)



Mac 359

SYMBOLS (Plate 9)

A **46** Nut (2 required)
B **2859⅞** Screw (2 required)
C **2851⅛** Stud
D **7562** Screw (2 required)
E **1-2811⅛AL** Arm for pressure roll
F **1-2891½C Style H** Overall length of rubber 9 3/16″
1Z-2891½B Style H Overall length of rubber 9 3/16″
G **1-2891½D Style K** Overall length of rubber 4⅜, one or more required
1Z-2891½B Style K Overall length of rubber 15 5/16″
H **1-2811⅛AR** Arm for pressure roll
I **1-2811⅛BR** Arm for pressure roll
J **1-2802B Style H** Pressure roll
K **1-2811⅛BL** Arm for pressure roll
L **1-2802B Style K** Pressure roll, one or more required
M **2850⅛** Screw
N **2841⅛D** Inside sliding clutch
O **2881B** Spring
P **2896¼ No. 1** Smooth surface rubber
2896¼ No. 2 Ribbed surface rubber
Q **1-2839¼D** Twirler with smooth surface rubber, includes "M", "P"
11-2839¼D Twirler with ribbed surface rubber, includes "M" and "P"
R 2849D*
S 2813½A*
T 2852⅜* Stud
U 1-2813½A*
V 2828⅛A* Ratchet
W **1-2849D** Ratchet wheel assembly, includes "R" to "V"
1Z-2849D Ratchet wheel assembly for earlier construction with smaller diameter shaft
X **2820½** Washer
Y **2843¾** Shoulder washer
Z **2858 1/16** Shoulder screw
AA **2850½** Stud
AB **1-2822** Feed pawl, for Class 1, 2 or 6
1-2822 No. 2 Feed pawl, for Type 20 carriage
AC **2887½** Spring
AD **1-2822⅛** Link
AE **2853⅞** Stud
AF **2845½** Threaded shoulder round head nut
AG **2888** Spring
AH **2847** Knurled knob
AI **1-2811⅜L** Bracket
AJ **1-2811⅜R** Bracket
AK **2811¼L** Bracket
AL **2811¼R** Bracket
AM **2880** Spring used for pressure rolls 6″ or longer
2880½ Spring for standard pressure rolls
AN **2835½** Knurled knob
AO **2855 3/16** Screw
AP **1-2824¼** Assembly, includes "AO," "AN," "AS"
AQ **2859⅜B** Screw
AR **2886½** Spring
AS **2851¼** Spring stud
AT **2857½C** Shoulder screw
AU 2841¾B* Roller
2858 7/16A* Pin
2822⅜B* Plate
2856 9/16A* Stud
AV **1-2816A No. 1** Detent assembly for Classes 1, 2, 6, 11 thru 30
11-2816A No. 1 Detent assembly for Type 20 carriage with ¼″ spacing from MRC on right
AW **2886¾** Spring
AX **2842¼B** Space collar
AY **2841A** Threaded collar
AZ **2830** Roller (2 required)

BA **2840¾** Roller
BB **1A-2891** Rubber pressure rolls
BC **2802** Shaft
BD **2808B Style H or K**
2808 Style 24
BE **2807B Style H**
2807C Style K
2807 Style 24
BF **45** Nut
BG **2833½** Space collar
BH **1-2803B Style 12, 18 or 24,** For Classes 1, 2, 6, 11 thru 16 SACT const. two position feed
11-2803B Style 12, 18 or 24, For Classes 1, 2, 6, 11 thru 16 with or without SACT const. three position feed
21-2803B Style 12, 15 or 18, For Type 20 carriage, SACT const., two position feed. All assemblies under "2803B" include "BJ," "BK," "BM," "BN," and "BH"
BI **2886¾** Spring
BJ **2863½** Stud
BK **1A-2826E**
BL **2855 1/16B (200535½)**
BM **52** Pin
BN 1C-2816⅛* (two position)
1C-2816¾* (three position)
BO **12002⅞D Style 12¼″ or 18″,** Square shaft
12002⅞ Style 24″
BP **1-2806½A Style H**
1-2806½ Style K No. 2
1-2806½ Style 24
BQ **2855⅛A** Stud
BQ-1 **1-3383¼C Style H or K**
BR **2836A** Spacing collar on left end of platen shaft between twirler knob and bell gear
BS **4832¾** Long collar on left end of platen shaft between carriage end plate and twirler to cover shaft when bell is not used.
BT **2830½BZ** Pinion on left end of platen shaft
BU **64** Pin
BV **4955⅛** Stud
BW **1-3383¼B Style H**
1-808 Fte. 213 Style 18
BX **2851¾** Screw
BY **1-2806¼ Style H [1-2806½A Style H, 1-2803B Style 12″, 11-2803B Style 12″ and 2851¾** (10 or 14 req.)]
1-2806¼ Style 18 [1-2806½ Style K No. 2, 1-2803B Style 18″, 11-2803B Style 18″ and 2851¾ (10 or 14 req.)]
BZ **2832⅛AZ** Spacing collar used in place of gear
CA **63** Pin
CB **2800¼ BZ Style H or K** Platen shaft ⅜″ diameter
2800¼Z Style 24″ Platen shaft ⅜″ diameter
2800¼AZ Style H or K Platen shaft ¼″ diameter
CC **1025** Washer
CD **1AZ-2898¼ Style H or K Specify carbon.** Platen without shaft
1-2800¼B Style H or K Specify carbon. Platen assembled with BT, BU, BZ, CA and CB. For Classes 1, 2, 6, 11 thru 16. Carriage equipped with bell
11-2800¼ (24″) Specify carbon. Platen and shaft assembly for 24″ carriage without bell.
11-2800¼B Style H or K Specify carbon. Platen and shaft assembly for Style H or K carriage without bell
21-2800¼B Style H or K Specify carbon. Platen and shaft assembly for Type 20 carriage equipped with geared pressure rolls and without bell.
CE **1-2839½B** Twirler with smooth surface rubber includes "M" and "P"
11-2839½B Twirler with ribbed surface rubber includes "M" and "P"
CF **2801C Style H** Square shaft
1-2801C Style K Square shaft includes CG
1-2801 Style 24 Square shaft includes CG
CG 2817¼A*
CH **2829⅝** Leaf spring
CI **2829¾A** Punching sliding on shaft
CJ **2857⅛A** Shoulder screw
CK **1-2825 Style 24**
1-2825C Style H
1-2825D Style K
CL **1-2828¾R No. 1 (11-2828¾R No. 1, 203423 No. 2)** Space pawl, Classes 2, 6, 11 thru 16, platen spaced from MRC, right end
11-2828¾R No. 1 Space pawl, Type 20 platen spaced from MRC, right end, equipped with narrow hub
1-2828¾L No. 1 (11-2828¾L No. 1, 203423 No. 2) Space pawl, Classes 2, 6, 11 thru 16 with S and N platen spaced from MRC, left end
11-2828¾L No. 1 Space pawl, Type 20 with S and N platen spaced from MRC, left end, equipped with narrow hub
CM **1-2828¾R No. 2** Space pawl, Class 2, 6, 11 thru 16, platen spaced ¼″ from MRC, right end
11-2828¾R No. 2 Space pawl, Type 20 platen spaced ¼″ from MRC, right end
1-2828¾L No. 2 Space pawl, Class 2, 6, 11 thru 16, with S and N platen spaced ¼″ from MRC, left end
11-2828¾L No. 2 Space pawl, Type 20 with S and N platen spaced from MRC, left end
CN **1-2828¾R No. 3** Space pawl, Class 6, 11 thru 16, double platen spacing from MRC, right end
11-2828¾R No. 3 Space pawl, Type 20 platen spacing ⅛″ from MRC, right end
1-2828¾L No. 3 Space pawl, Class 2, 6, 11 thru 16, with S and N platen spacing from MRC, left end
CO **1-2828¾R No. 4** Space pawl, Type 20 with adjustable space or non-space from MRC, right end, manual controlled
1-2828¾L No. 4 Space pawl, Type 20 with S and N platen adjustable space or non-space from MRC, left end, manual controlled

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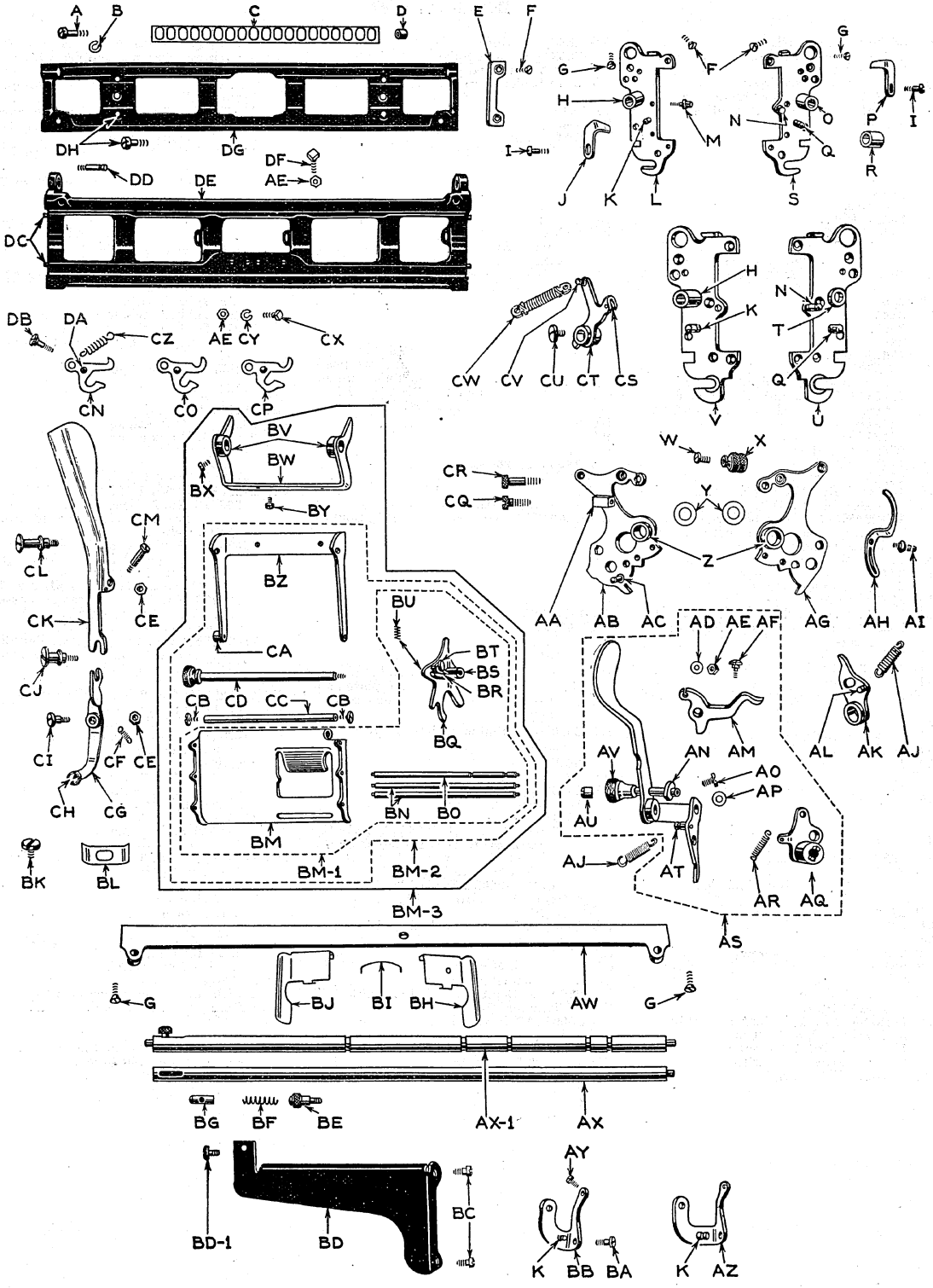
POSITIVE FEED CARRIAGE DETAIL, CARRIAGE CASTINGS, END PLATES, PAPER HANGER, CARRIAGE RELEASE LEVER, PAPER GUIDES, SHAFTS AND BRACKETS (Plate 10)



SYMBOLS (Plate 10)

A **1055⅜ Style H,** Screw (2 required)
B **1097¼** Lock washer (2 required)
C **2824 Style 24 (2824 Style 24 No. 2 [2 req.], 2837⅛ specify number [48 req.])**
2824B Style K (2824 Style 18 No. 2 [2 req.], 2837⅛ specify number [24 req.])
2824C Style H (2824 Style 12 No. 2 [2 req.], 2837⅛ Specify number [20 req.])
D **2837¼A Specify number 64, 65, 66 or 67 (2837⅛ specify number 64, 65, 66 or 67 and 2824 Style 12 or 18 No. 2)**
NOTE—"64" indicates .264
E **2818A (4918R or L, 4952 1/16 [2 req.])**
F **2852**1/16 Screw (4 required)
G **2859¾B** Screw
H 2831½L* Hub
I **2850**11/16 **(4456½)**
J **4924⅝A** Adjustable stop
K **2860¼** Stud
L **1-2817CL** Carriage end plate
M **2852¼** Screw stud
N **2860¼** Spring stud
O 2831½BR* Hub
P **2824⅝** Adjustable stop
Q **2854** Spring stud
R **2842⅛** Used on "O"
S **1-2817CR** Carriage end plate
T 2831½AR* Hub
U **1A-2817BR** End plate
V **1-2817BL** End plate
W **3450**5/16 Screw
Y **2818¼** Washer
Z 2835B* Hub
AA **2856⅛** Square stud
AB **1-2819DL** End plate
11-2819DL End plate without "AA"
AC **2851⅜A** Spring stud
AD **7919½A** Washer
AE **46** Nut
AF **2862** Shoulder screw
AG **1-2819DR** End plate
AH **2814¼** Cam arm
AI **2856½B** Shoulder screw
AJ **2886¾** Spring
AK **1-2826¼** Punching assembly
AL **3656¾ (60571A)**
AO **7357½** Screw
AP **2810⅝** Washer
AR **480B** Spring
AT **2863½** Spring stud
AV **2864¾** Knurled knob
AW **1-2820C Style H or K,** includes "BH," "BI," "BJ"
AX **1-2805¼A Style H or K,** includes "BE," "BF," "BG"
AY **2856⅞** Screw
AZ **1-2826⅝A** Bracket
2881¼ Spring used with bracket
BA **1055⅛ (9251**13/16**)**
BB **1-2826⅝** Bracket
BC **2851⅞** Screw
BD **4918¼R or L Style 13 H or K**
4918¼R or L Style 17K
4918¼R or L No. 2 Style 17K
BD-1 **2857⅞ (4857½)**
BE **2861½** Knurled head screw
BF **2882½** Spring
BG **2862½** Plunger
BH **2827¼AL** Left paper guide
BI **8027⅛** Flat pressure spring
BJ **2827¼AR** Right paper guide
BK **8054¾** Screw
BM **2810**1/16 Punching
BM-1 **1-2810**1/16 Assembly within dotted lines
BM-2 **2Z-2811**1/16 Assembly within dotted lines
BM-3 **2-2810⅛** Complete paper hanger with bracket
BN **2803½** Shaft (2 required)
BO **2801½** Shaft
BQ **1-2812⅛** Assembly, includes "BR," "BS," "BT," "BU"
BR **2852**5/16 Pin
BS 2832¼* Hub
BT **2813⅛** Lever
BU **2880¼** Spring
BV 2830¼* Hub
BW **1-2810⅛** Bracket for paper hanger
BX **550¾** Screw
BY **2851⅞** Screw (2 required)
BZ **1-2811**1/16 Bracket
CA 2830⅜* Hub
CB **2850⅜** Screw (2 required)
CC **2802¼** Shaft
CD **1-2800 (1-83001 12¼")**
CE **47** Nut
CF **2881¼** Spring
CG **1-2826⅜A** Lower lever on left end of carriage
1-2826⅜ Same as above item except lower part is without offset
CH **2850A** Stud
2838¾ Roller
CI **2856⅜** Screw
CJ **2854⅝A** Short shoulder screw
CK **2826⅛** Upper lever on left end of carriage
CL **2854⅝** Long shoulder screw
CM **2856⅝** Shoulder screw
CN **1-2823½R** for Class 1 or 2 without TR
1-2823½L
1-2823½ No. 2 for Class 1, 2, 6 and 11 thru 16 SACT const.
CO **1-2823¾** for Class 2 or 6
1-2823¾ No. 2 for Class 1, 2, 6, 11 thru 26 SACT const.
CP **11-2823¾** for Class 1, 2 and 6 SACT const.
11-2823¾ No. 2 for Class 2, 6, 11 thru 26 SACT const. with skip tab stop blocks
CQ **2857⅜** Knurled head screw used with "AB"
CR **2857¼B** Knurled head screw used with "AB"
CS **2841⅝B** Roll
2858½C Pin
CT **1-2813¼D** Assembly, includes parts attached
CU **2851⅝** Screw
CV **2858⅜** Spring stud
CW **1-209800 No. 4**
1-2885½B for low back carriage
CX **2859⅛** Square head screw
CY **1097¾** Lock washer
CZ **2881½** Sprlng
DA **2852**13/16 Stud
DB **2854⅞ (84618)**
DC **2860⅜** Stud (4 required)
DD **3350¾** Spring stud
DE **1Z-2867C Style H or K** Includes "F," "G," "L," "S," "DB," "DC"
1Z-2867C Style 24 Includes "F," "G," "L," "S," "DB," "DC".
DF **2859⅝A** Square head screw (2 req.)
DG **2865C Style 7, 9, 11, 13, 15, 17 H or K**
DH **1055⅛ (9251**13/16**)**

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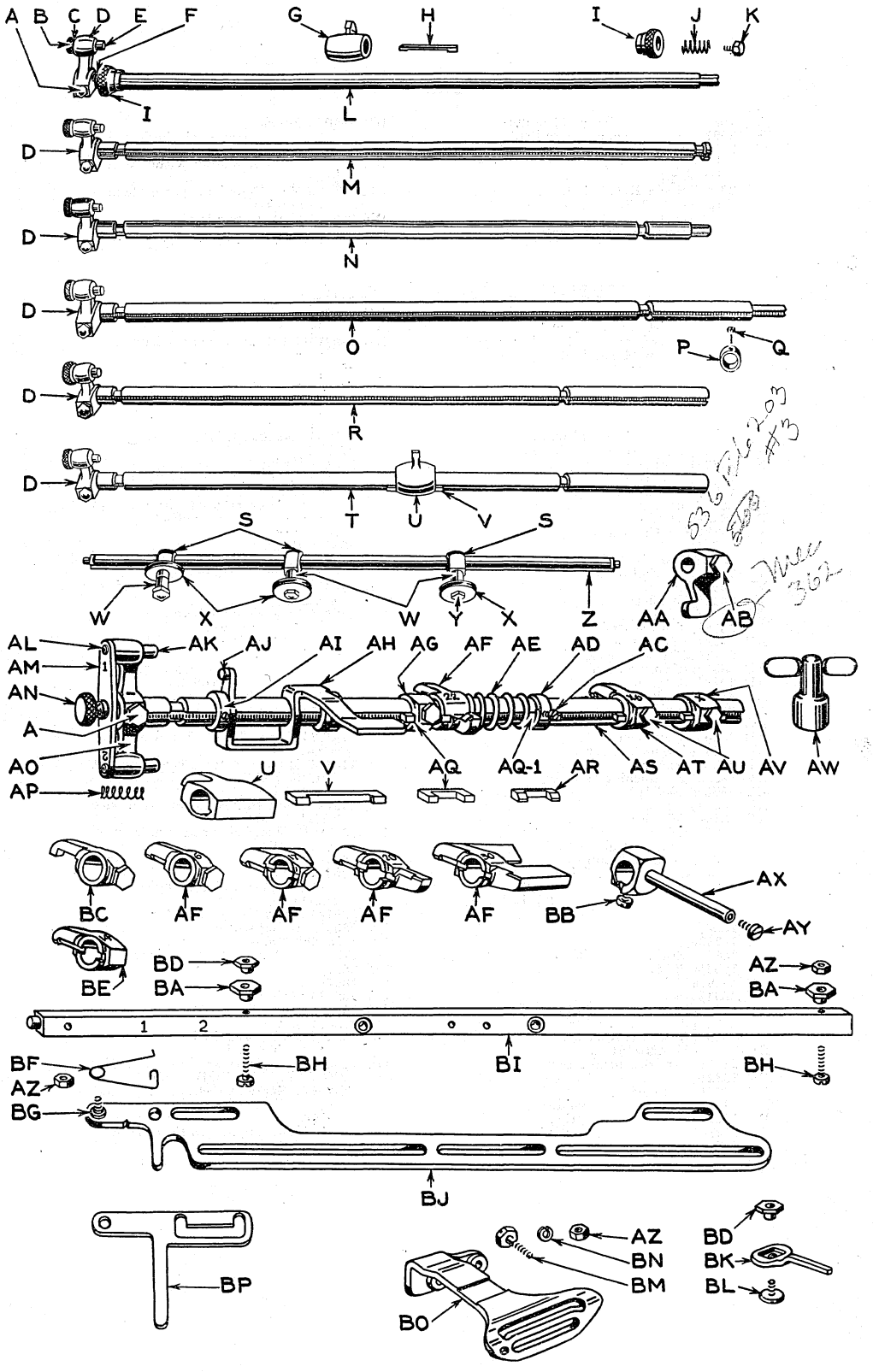
STOP BARS AND STOPS (Plate 11)



SYMBOLS (Plate 11)

A **2862⅝** Hexagon head screw
B **2844¼** Knurled knob on pin
C **2881⅛** Spring for pin "D"
D **1-2866 No. 1** Casting includes "A," "B," "C," "E"
1-2866 No. 2 Casting assembly, used on stop bar with extension on right end.
E **2854⅜** Pin
F **1889½** Spring
G **1890½A** Frictional stop
H **1812¾A** Sliding key for "G"
J **2889¾** Spring
K **1858¾** Hexagon head screw
L **1B-3402½ Style K** only
M **1-2804½A Style H or K (1-2804¾ Style H or K)**
N **1-2804B Style H or K**
O **1-2804C Style H or K**
P **1-2840⅞** Collar includes "Q"
Q **70512** Screw
R **1-2804¾ Style H or K** } Not
1-203012 15" } Extended
1-2804¾ Style 12", 15", 18" No. 2 } Extended on left, specify overall length
1-2804¾ Style 12", 15", 18" No. 3 } Extended on left, specify overall length
1-2804¾ Style 12", 15", 18" No. 4 } Extended on left, specify overall length
2804¾A Style 12", 15", 18" No. 5 } Requires 1-2866 No. 2 extended on right, specify overall length
2804¾A Style 12", 15", 18" No. 6 } Requires 1-2866 No. 2 extended on right, specify overall length
2804¾A Style 12", 15", 18" No. 7 } Requires 1-2866 No. 2 extended on right, specify overall length
T **112-2804¾ Style H or K**
U **2890½** Frictional stop
V **2890¼** Sliding key
W **12042⅜** Small collar
X **4443A** Roll
Y **4457¼** Screw
Z **3203 Style H or K**
AA **1-2899½** Stop used for Class 1, 2 or 6 statement const. used on left end of bar
AB **2862¾** Screw
AC **70512** Screw
AD **1-2840⅞** Collar includes screw
AE **2882¼** Spring
AF **2893A Specify No. 16, 19, 20, 21, 22, 23, 24, 27, 30, 31 or 32**
1-2893A Specify No. 1, 2, 3, 4, 6, 10, 12, 13, 14, 15, 17, 18, 25, 26, 28, 29, 33, 34 or 35. Use 2862¼ screw
AG **1-2893¾** Floating stop without projections includes screw 2862¼
AH **1-245A Fte. 203** Skip stop latch
AI **1-349 Fte. 203** Collar includes screw 4557A
AJ **571 Fte. 203** Stud
AK 568 Fte. 203* Pin (2 required)
AL **243 Fte. 203** Washer (2 required)
AM **1-244 Fte. 203** Assembly, includes "AN"
AN 567 Fte. 203* furnished with "AM"
AO **1-909 Fte. 203** Assembly, includes "AK," "AL," "AM," "AN," "A," "AP"
AP **2881⅛** Spring (2 required)
AQ **2890¾** Sliding key for stops, when required grind off either end to suit purpose
AQ-1 **2890¾** Sliding key with one end projection removed, refer to "AQ"
AR **2890¾ No. 2** Sliding key with projections chamfered for stop "AU"
AS **23 Fte. 203 Styles (12") (15") or (18")** Stop bar without accessories
1-23 Fte. 203 Styles (12") (15") or (18") Stop bar equipped with parts "AK" to "AP" inclusive and including "A"
2-23 Fte. 203 Styles (12") (15") or (18") Complete assembled stop bar including stops and parts "AK" to "AP"
AT **1-920 Fte. 203 No. 1, 2, 3, 4, 6, 10, 14 or 15**
AU **536 Fte. 203 No. 2** Screw
AV **1-921 Fte. 203** Specify number
AX **10045⅞ Specify No. 1, 2, 3, 4, 5, 6, 8, 9, 11, 12, 21, 22, 24, 25**
10045⅞R or L Specify No. 1, 2, 3, 13, 14, 15, 16, 17, 18
1-10045⅞B No. 10
1-10045⅞ No. 23 R or L
1-10045⅞ Specify No. 19 or 20
AY **7357½** Screw
or
10051⅞ No. 2 Long shoulder screw
AZ **46** Nut
BA **12044⅞** Shoulder nut
BB **4462¼** Screw
BC **1-901 Fte. 137** Stop includes screw 2862¼
BD **12046⅜₆** Shoulder screw
BE **2893½ No. 6 (1-2893A No. 6)**
2893½ No. 14 (1-2893A No. 14)
BF **12089½** Spring
BG **12053⅜₆** Stud
BH **2850⅜₆A** Screw
BI **12002⅞D Style H or K** square shaft
12002⅞ Style 24
1A-12002⅞D Style H assembly for Class 11 thru 16, includes "AZ," "BA," "BD," "BF," "BG," "BH," "BK," "BL"
1A-12002⅞D Style K No. 1, assembly for Class 1, 2, 6, 11 thru 16 with combination bars for 10" forms, consistency is same as above item.
1A-12002⅞D Style K No. 2 Same description as above item except for 6" or 8" forms
BJ **1-12012⅞ Style H** Slide for Classes 1, 2, 6, 11 thru 16 machines
1-12012⅞A Style K No. 1 Same description as above item except is for 10" forms
1-12012⅞A Style K No. 2 Same as above item except is for 6" or 8" forms
BK **1-12020⅞B** Punching
BL **12051⅞** Screw
BM **12054¾** Screw (2 required)
BN **1097¾** Lock washer (2 required)
BO **12026⅞B** Punching
BP **12015⅜₆** Punching

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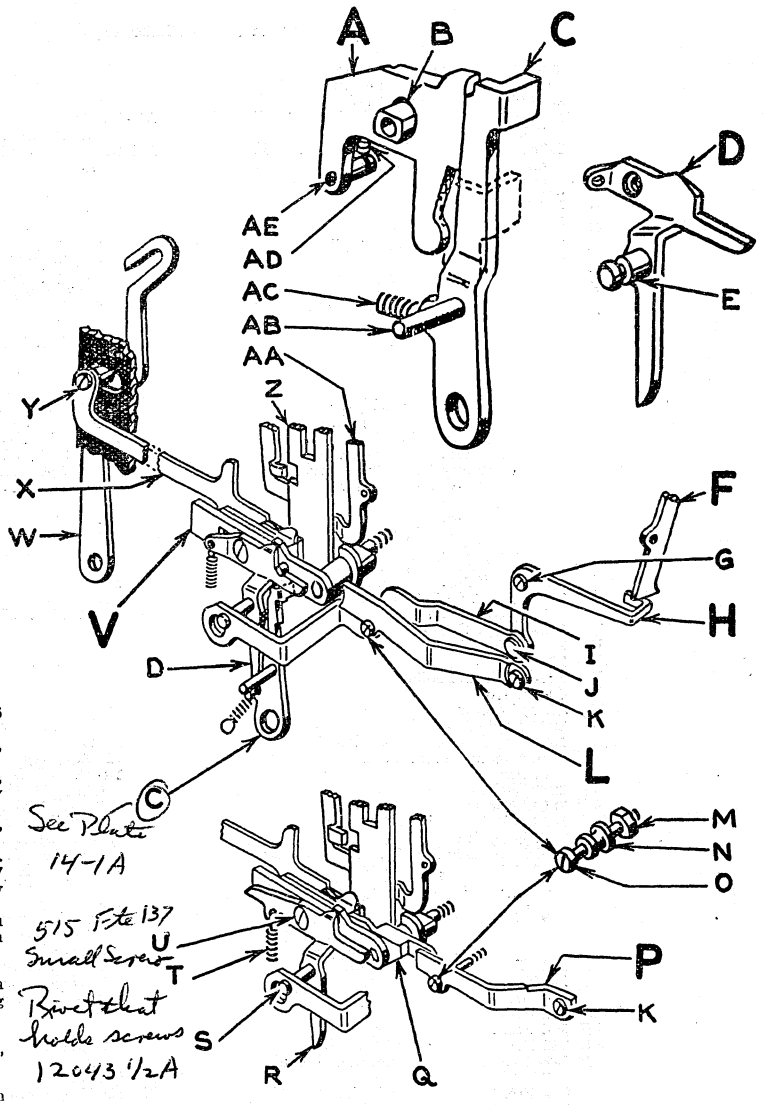
SEMI-AUTOMATIC CROSS TABULATING MECHANISM, CLASSES 11 THRU 16, 20 THRU 30 (Plate 13)

(Plate 12 is in "Carriages" Instruction Book only)

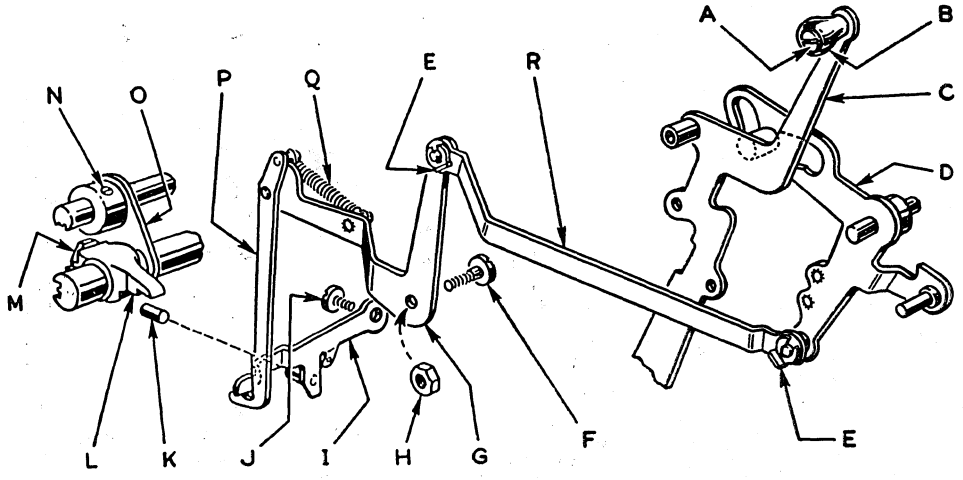


Mm 251
1AZ 10023 1/2
1-12014 7/8 No 2
12044 3/4 B
12059 1/8 A
99803
1-12014 3/16

SYMBOLS (Plate 13)

A **1-12015⅝** Pawl
B **12044¾A** Block for Classes 2 and 6 SACT air cushion const.
12044¾ No. 2 for Type 20 and 30, early carriage return
12044¾ No. 3 for Type 20 and 30, skip tab. stop block const., early carriage return
C **1-12014⅝ No. 2 (1-12014⅝A No. 2, 1-12015⅜A, 1AZ-10023½, 12044¾B, 12059⅛A, 1-12014⅞ No. 2, 10788, 12019¾B Style 13 or 17 No. 2)** for Type 20 and 30 early carriage return
1-12014⅝ For Classes 1, 2, 6, 11 thru 16 and Classes 2 and 6 MRC with 6-7 mechanism
4453¾ Screw holding "C" to slide
D **1-10014¼ No. 3** Latch held in position by screw 12059⅛ No. 2, use spring 10086
E **12054⅛ (84609)**
F **12216½A** for Class 2 or 6 SACT const., use 10180 spring
G **7357½** Screw
H 12014⅛* Punching furnished with assembly "I"
I 12019¼A* Styles 11, 13 or 17
1-12019¼A Styles 11, 13 or 17 includes "H," "J"
J **12052⅝** Rivet
K **103534A** Screw
L **12021⅛ No. 1 Styles 13 or 17** for Classes 1, 2, 6, 11 thru 30, SACT const., not skip stop const.
12021⅛Z No. 1 Style 17 for Class 1, 2, 6, 11 thru 16, 20 thru 30, SACT const. with extremely close set ups
M **46** Nut
N **12031⅛ No. 1** Space collar (⅝" long)
12031⅛ No. 2 Space collar (½" long)
O **756⅛** Screw
P **12021⅛ No. 2 Styles 13 or 17** for Classes 1, 2, 6, 11 thru 30, skip tab. stop block const.
Q **1A-125 Fte. 137** Stop block for Classes 1, 2, 6, 11 thru 16 and 20 thru 30
1B-125 Fte. 137 Use for Class 2, 6, 11 thru 16 Type 20 SACT, use small spring 804 Fte. 137
47 Nut
1097¼ Lock washer
R **1-10014¼A No. 2** Latch for Type 20 and 30
S **12054⅝ (83568)**
T **10086** Spring
U **12059⅛ No. 2** Screw
V **1-10023⅛A** Stop block for Classes 1, 2, 6, 11 thru 16 for VHB const.
1A-10023½ (1AZ-10023½, 12044¾B, 12059⅛A, 1-12014⅞ No. 2, 10788) Stop block for Class 6 air cushion
1B-10023½ (1-10023½A, 1-12014⅞ No. 2, 10788, 12044¾B, 12059⅛A) Stop block for Classes 1, 2, 11 thru 16, Type 20 SACT const.
W **1-4419¼** Link
X **12019¼A Style 9** for Class 2 Style 9, SACT not variable hammer block const.
12019⅛A Style 11, 13 or 17 for Class 2 and 6 MRC with 6-7 mechanism not VHB const.
12019⅛A Style 15
12019¾B Style 9 for Class 2 Style 9 crossfeed ribbon, upfeed TR, SACT const. with air cushion
12019¾B Style 11, 13 or 17 for Class 2 and 6 SACT const.
12019¾B Style 15
12019¾B Style 13 or 17 No. 2 for Type 20 except skip tab stop block const.
Y **957½** Screws
Z **12010⅛** Outside slide
AA **200104A** Latch
AB **3653⅛***
AC **10784** Spring
AD **10180** Spring
AE **9750** Stud

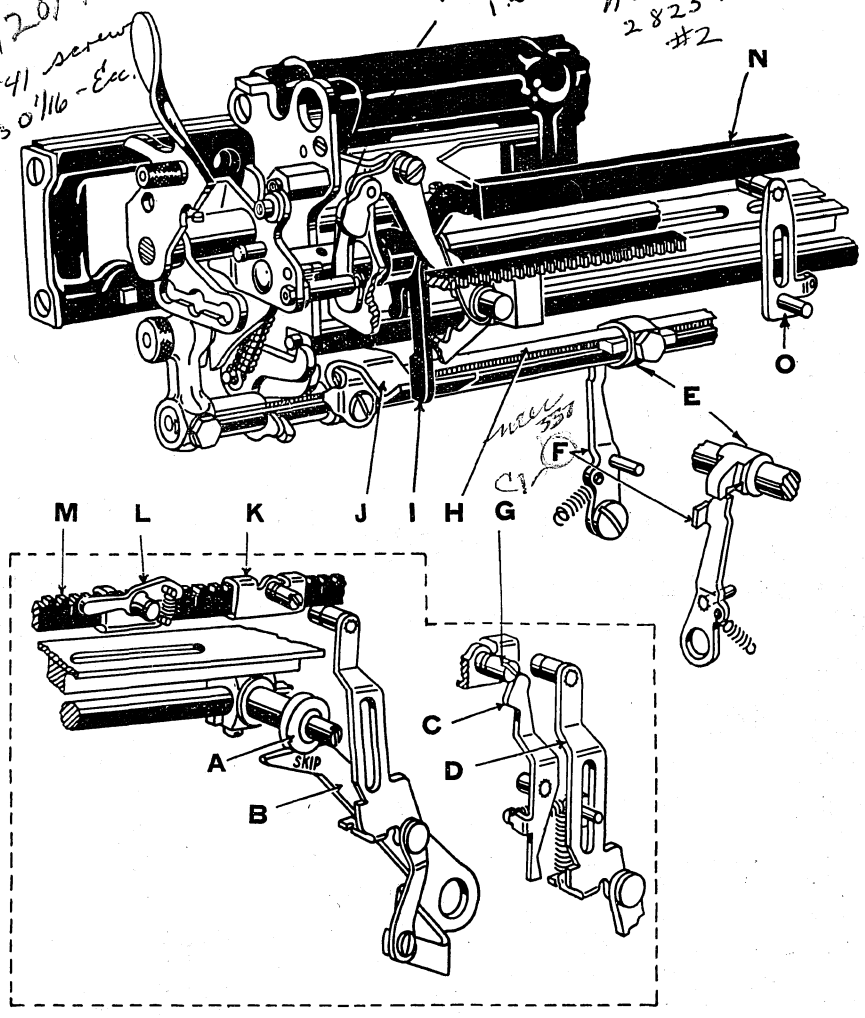
CARRIAGE TABULATION CONTROLLED FROM REGISTER TOTAL INDEXING LEVER—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 13-1)



SYMBOLS (Plate 13-1)

A	**60547** screw, use 46 nut
B	**60347**
C	**1-60100 No. 5**
D	**61-62103**
E	**21 No. 8**
F	**200560½**
G	**1-200294** includes P
H	**47**
I	**1-200284¼** includes K
J	**957½**
K	1053⅝* included in I
L	**2893A No. 36**
M	**2862¼** screw
N	**4462¼** screw
O	**1-3227⅛** includes N
P	1-200293¼* included in G
Q	**10086**
R	**200293**

SKIP TABULATION (Plate 14)



SYMBOLS (Plate 14)

A Control Roll (kinds on Plate 84)

B **1-12028⅛A Style 11, 13**
1-12028⅛B Style 17

C **1-12011½A** Use spring 10180

D **1A-12013 1/16 Style 11** Use spring 3489
1A-12013 1/16 Style 13 (1-12013 No. 3, 12027¾ No. 2 Style 13, 259½, 1097¾, 46)
1-12013 1/16A Style 17 (1-12013 No. 3, 12027¾ No. 2 Style 17, 259½, 1097¾, 46)

E **1-2893A No. 6**

F **1-12014 3/16** Use spring 10784

G **12057¼**

H Stop Bar (kinds on Plate 11)

I **1-12020¼A**

J **12029¼**

K **1-12023**

L **1A-12023⅛** Use clip 12029⅛

M **1-12011⅜ Style H, K or 24**
1A-203116 Style 12", 15", 18" (11-203166 Style 12", 15", 18") For Type 20

N **1-12011⅛ Style H or K (1-12011⅜ Style H or K)**

O **1-12313** Multiple skip slide

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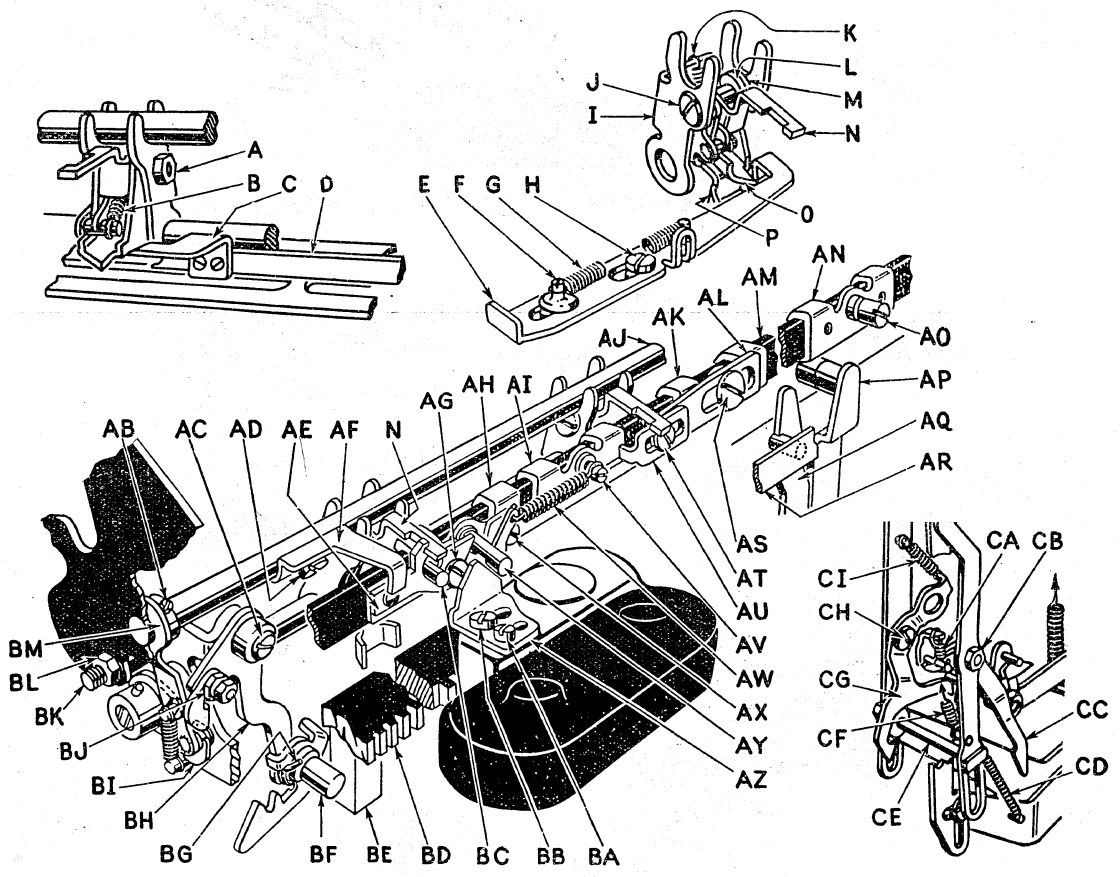
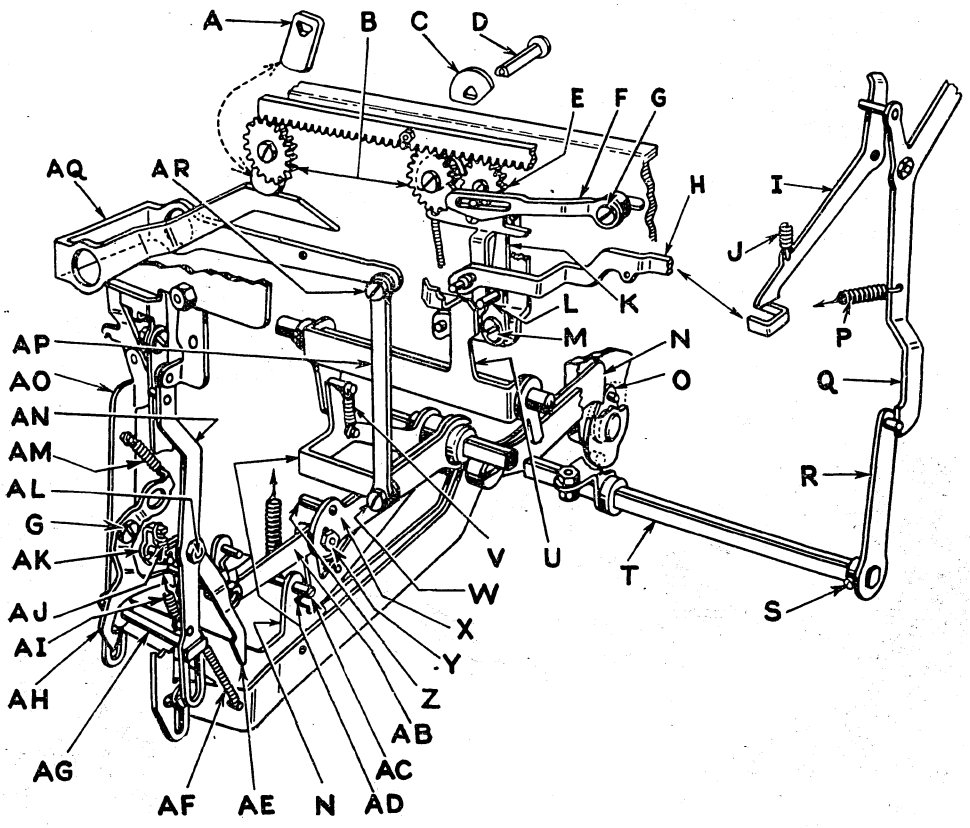
ANALYSIS COLUMN SELECTOR, MOTOR BAR CONTROLLED CLASSES 20 THRU 30 (Plate 14-1)



SYMBOLS (Plate 14-1)

A **46**
B **2887½** Spring
C **203136½R&L** Use 83577 rivets
D **1-12020⅝ Specify Style** and machine number
E **1-12014⅝ No. 3**
F **12062⅞**
G **75817**
H **105502** Screw
I **203278** Complete assembly, 11-203278 includes A, B, I, J, K, L, M, N, O, P
J **203631**
K **10180** Spring
L **428** Washer (3 req.)
M **629** Thin washer
N **203279½**
O **203280**
P **1-203279**
AB **12055⅝**
AC **203642** Screw
AD **71517** Screw
AE **1-203131½**
AF **203133½**
AG **75582**
AH **11-12023**
AI **1-12023**
AJ **203003A Style 12**
203003 Style 15, 18
AK **1-12023**
AL **1-203132½ No. 2**
AM **11-203166 Style 12, 15, 18 No. 3**
AN **1-12023**
AO **12057¼**
AP **1-12013 No. 3**
AQ **1-12011½A**
AR **1-12015A**
AS **8054¾**
AT **108623** Screw, **1097¾** lock washer
AU **1-203135½**
AV **69562**
AW **75814**
AX **952¾** Screw
AY **12057⅞*** included in AH
AZ **203134½** Cam
BA **12052**
BB **73514**
BC 82502* Included in AL
BD See rack bar charts, plates 51-1 thru 51-6
BE **12060⅝*** Included in BD
BF **12053⅞A*** Included in BH
BG **203816A** Coil spring
BH **1-203189** Includes BF, BG, BI, BJ
BI 203190*
BJ **79333 No. 1** Eccentric, 69108 washer, 46 nut, 203576 No. 2 screw
BK **203518A**
BL **45**
BM **1-203130½** Includes AB
CA **72815**
CB **46** Nut, **4456½** screw, **3237¾** collars
CC **1-12018⅝ No. 3**
CD **483**
CE **12061⅝**
CF **480¼**
CG **12018⅝B No. 1**
CH **259½**
CI **44808**

BALANCE TRANSFER INDEXED FROM OPERATION CONTROL LEVER STYLES 23 13 05 AND 23 17 45 (Plate 14-1A)

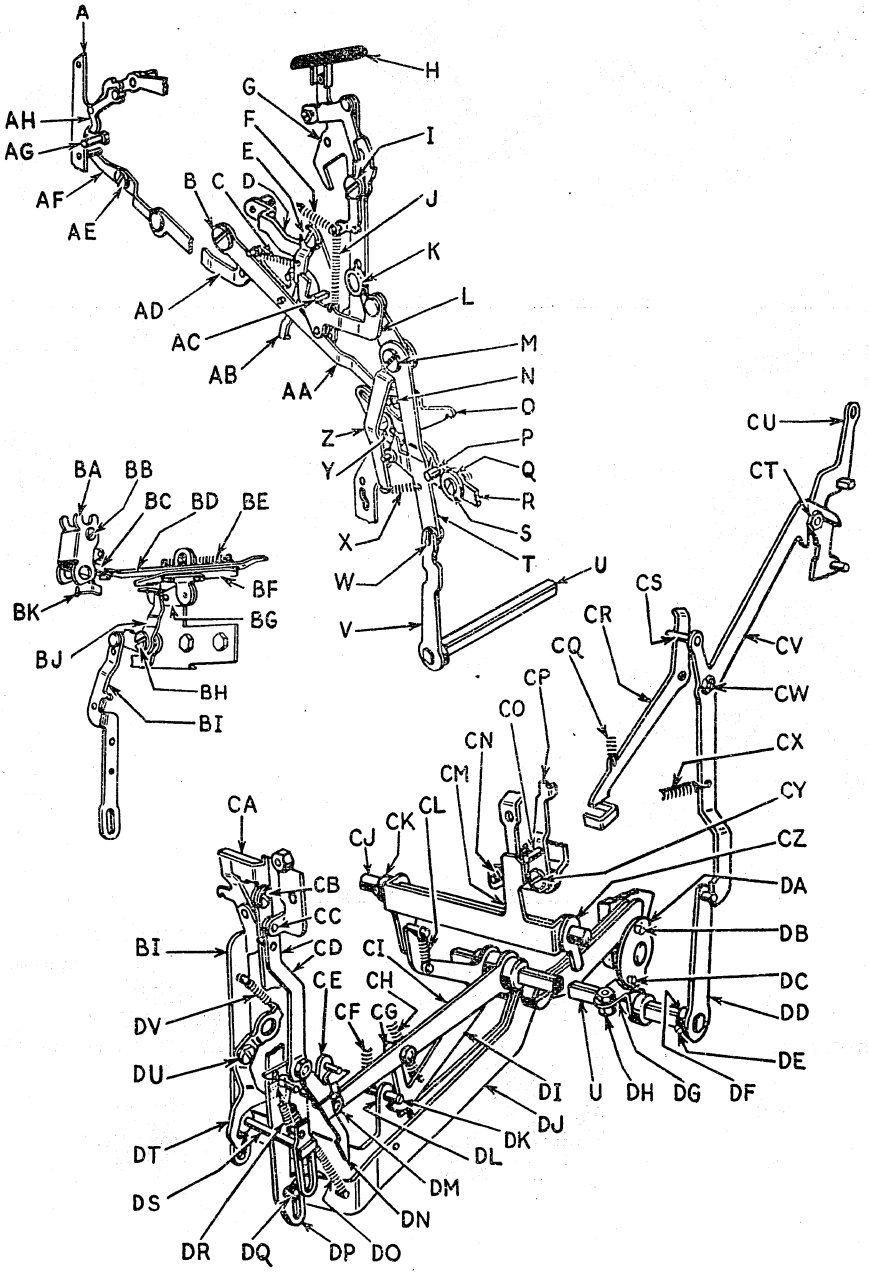


SYMBOLS (Plate 14-1A)

A **10026 15/16**
B **10042 3/8 No. 3**
C **10026 7/8 No. 1 or 2**
D **10042 1/4 No. 14**
E **1-10042 3/8 No. 8** Use 73611 screw
F **1-12022 3/8**
G **259 1/2**
H **1-200108 Style 13, 17**
I **12216 1/2A**
J **10180**
K **1-12014 3/16**
L 12357 1/2* Included in K
M **4453 3/4**
N **1-200263 No. 4**
O 1-201147*
P **10982**
Q **1-60148B**
R **1-12025 No. 37** Includes S
S **72573**
T **12008 No. 1 Style 13, 17**
U **1-12018 9/16 No. 2 Style 13, 17**
V **99800B**
W **9259 5/8** Use 3237 3/4 collar
X **1-12025 5/16**
Y **47** Nut, 8858B stud
Z **12352 1/2** Stud
AB **1-12025 No. 18**
AC **705554** Ecc. stud, 200399 nut
AD **1-12025 7/16 No. 2 Style 13**
1-12025 7/16 No. 2 Style 17 (1-12025 7/16 Style 17 Env. 3056)
AE **1-12018 5/16 No. 3**
AF **483**
AG **12061 5/8** Use 8436 washer, 46 nut
AH **12018 5/16B No. 1**
AI **480 1/4**
AJ **72815** Spring
AK **1-12018 5/16**
AL **4456 1/2** Screw, use 3237 3/4 collars (2 req.)
AM **44808**
AN **21-203161**
AO **1-12018 3/16A**
AP **12025 1/16**
AQ **200180 No. 3**
AR **203505 1/2**

Printed in U. S. America 1-4-49

SKIP AND RETURN MECHANISM, IMPROVED, WITH CARRIAGE CONTROLLED NORMALIZED TABULATION (CLASSES 1, 2, 6, 11-16, 20-30 MACHINES) (Plate 14-1B)



SYMBOLS (Plate 14-1B)

A **1-12021¼A**
B **12051⅞ No. 2**
C **82809**
D **1A-12024⅝A No. 3** Early
1-12024⅝B No. 3 Later
E **12051⅝ No. 4**
F **108804 No. 2 (69807 Style 17)**
G **1-200241C No. 2**
H **1-12016¼B** Specify color and description, use 12051⅜ screw, 46 nut
I **200550A**
J **986**
K 60315A* Included in G
L 12027⅛* Included in Z
M **103654** Screw, 10021¾ washer, 8436 bushing
N 12055⅝B* Included in 21-12016⅛
O **12024⅜B No. 3**
P 1350⅜* Included in R
Q **200350** Collar
R **11-200280 No. 2**
S **79603** Screw
T **1-12027⅝**
U **12008 No. 1 Style 13, 17**
V **1-12025 No. 3**
W **12057⅛** Screw, 46 nut
X **2886¾**
Y **75615** Screw, 12031⅞ roller
Z **1-12027⅞A**

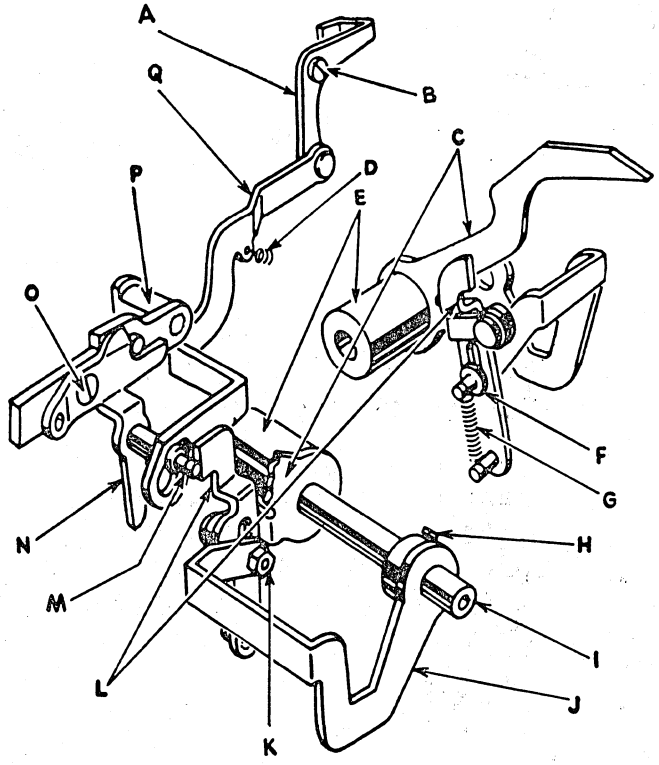
AA **1-200144 No. 3**
AB **200244A No. 3**
AC 701512* Included in D
AD **1-200144 No. 3**
AE **12051⅛**
AF **1-200233 No. 2**
AG **12053⅝** Screw stud
AH **12017⅛** Use 753½ No. 3 shoulder stud
BA **1-203278** Includes BB, BC, BK

SEE EXPLANATION ON INSIDE OF FRONT COVER

SYMBOLS (Plate 14-1B) Continued

BB **203631** screw, 428 washer, 629 washer, 46 nut
BC **203280** use 2887½ spring
BD **1-12014⅜ No. 3**
BE **75817**
BF **1A-12014¼ No. 2**
BG 1-12018⅜A* included in BF
BH **12062⅝**
BI **1-12018⅜A**
BJ 12018⅛A* included in BI
BK **1-203279**
CA **1-12013 No. 3**
CB **12051⅞** screw, 308336 No. 1 nut
CC **351½** stud included in CD
CD **21-203161**
CE **1-12018½** use 259½ screw, 46 nut
CF **9280¾**
CG **8858B** ecc., 47 nut
CH **74806** use 20 No. 79 spring anchor
CI **1-12025 No. 18** includes 72573 screw
CJ **83000 (6″) No. 3** for Style 13
200004R Style 17 No. 6 for style 17
CK **1-75332** collar includes 75618 screw
CL **99800B**
CM **1-12018⅜ Style 13, 17**
CN **10784** spring
CO 12357½* stud included in CP
CP **1-12014⅜**
CQ **10180**
CR **12216½A**
CS 60576* included in CV
CT **328 Fte. 207** bushing, 304 Fte. 133 roller
CU **11-60100**
CV **1-60148B**
CW **12055¼B No. 2** screw
CX **10982**
CY **4453¾**
CZ **1-12114½A No. 1**
DA 1-201147* assembled shaft 51-201002A includes DA, BD, DC
DB 201516* included in DA
DC 200351A* included in DA
DD **1-12025 No. 37** includes DE, DF
DE **72573** screw
DF 12038¾ No. 2* included in DD
DG **12022L** brace
DH **3645**
DI **1-12025 7/16**
DJ **1-200263 No. 5**
DK **705554** ecc. stud, 200399 spring anchor nut
DL **1-200263 No. 4**
DM **45** nut, 12061⅞A screw
DN **12018 5/16B No. 2**
DO **483**
DP **12028½ No. 3**
DQ **10761¼** screw, 46 nut
DR **480¼**
DS **12061⅝** use 46 nut, 8436 washer
DT **12018⅜B No. 1**
DU **259½** screw, 46 nut
DV **44808**

CARRIAGE TABULATION FROM NUMBER 14 STOP, CARRIAGE CONTROLLED, CLASSES 20 THRU 30 (Plate 14-2)



SYMBOLS (Plate 14-2)

A 12014 1/16* included in Q
B **7357½**
C **1-12110 No. 2** shown
11-129 Fte. 137 No. 2 Env. 1471 for thick lever construction
1-100 No. 2 Env. 1471 for thin lever construction
(Used with rotary consecutive numbering device and safeguard symbol printing)
D **16880** spring
E 12130 No. 2* included in C
F **12058¾**
G **75814**
H **75618** screw
I **12001⅛A No. 2** use 1-12315¼B brace, and two lock nuts 20045¾
J **1-60212A No. 10 Env. 1471** shown, for thick lever construction
1-12112 for thin lever construction
K **46**
L **12026⅜** included in C, for thick lever construction
102 Env. 1471 for thin lever construction
M 56 Fte. 132* included in N
N **1-10014¼ No. 3 Env. 1471** use 10086 spring
O **10059⅛**
P **1A-10023½ (1AZ-10023½, 12044¾B, 12059⅛A, 1-12014⅞ No. 2, 10788)**
Q **1-12019⅜ Style 9, 11, 13 or 17**

Printed in U. S. America 5-1-49 For Form 2960
(Replaces Plates 14-2 and 14-3 dated 1-4-49)

CARRIAGE TABULATION FROM NO. 14 STOP, CARRIAGE AND/OR MOTOR BAR CONTROLLED CLASS 20-30 (Plate 14-3)

FIG. 1

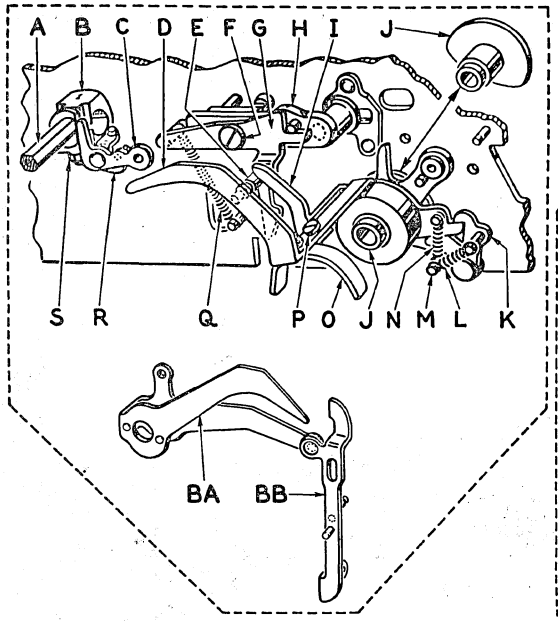
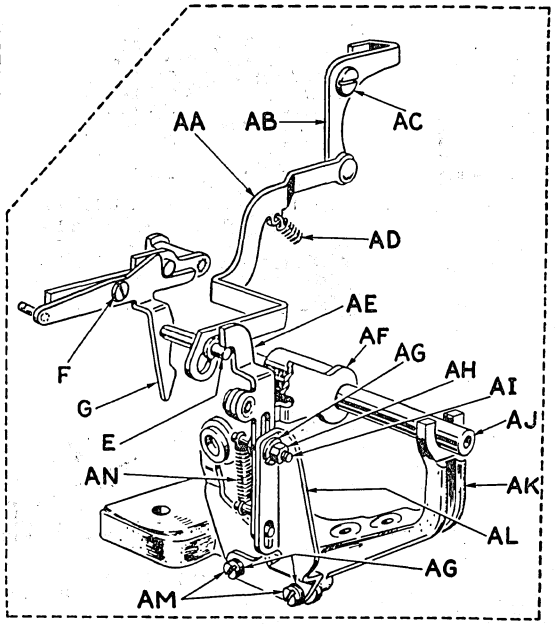


FIG. 2



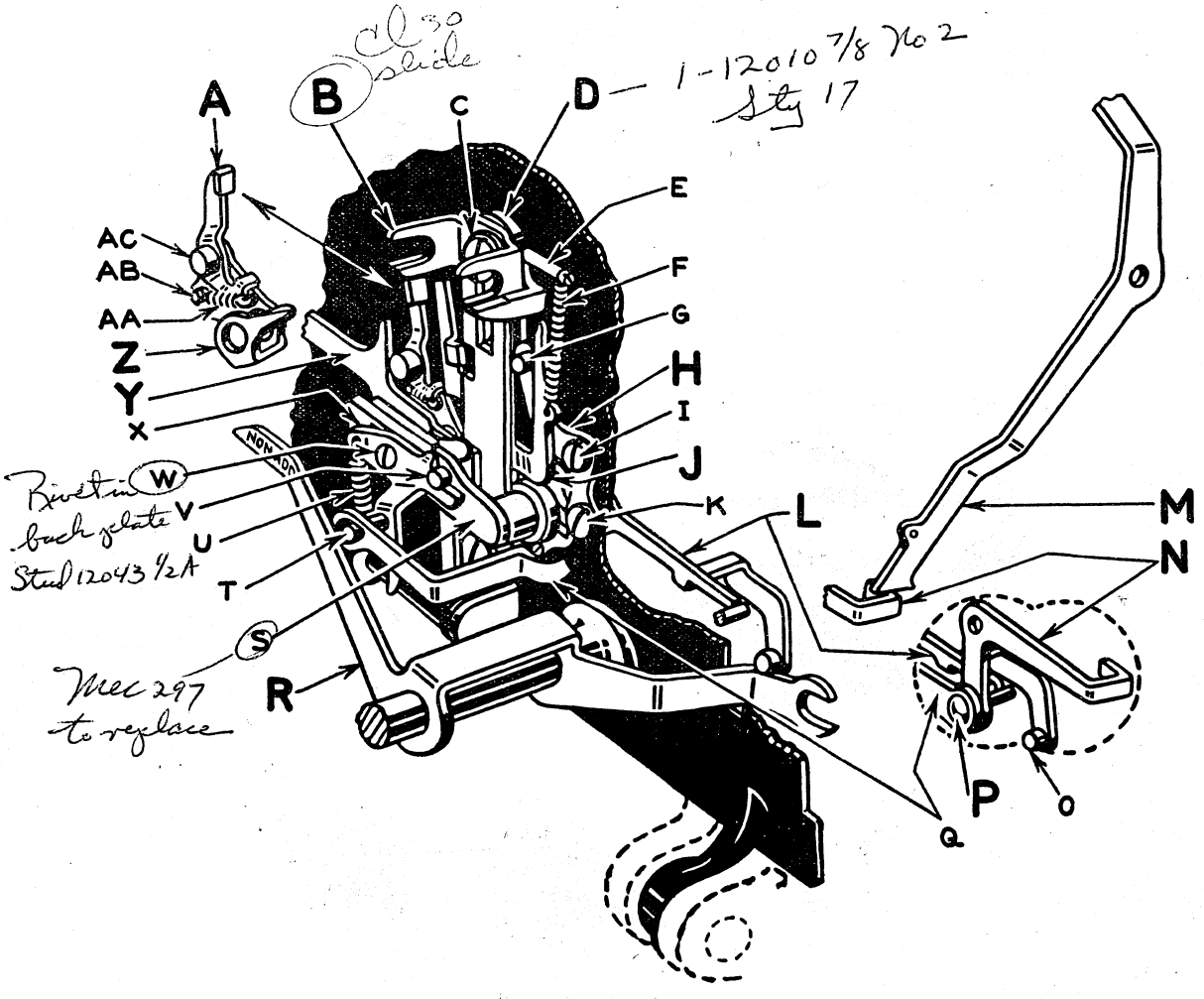
SYMBOLS (Plate 14-3)

A **10042¼D No. 1 Env. 3056**
B **10045⅞ No. 1 Env. 3056**
C 1-113 Env. 3056* included in R
D **2-108 Env. 3056**
E 12054⅛A* included in G
F **12059⅛A**
G **1-12014⅞ No. 2**
H **1-10023½A**
I 1-109 Env. 3056* included in D
J **12046⅛B Env. 3056**
K 1-115 Env. 3056* included in D
L **3981**
M **7760¼ Style 10**
N **3480½**
O **112 Env. 3056**
P **545 Fte. 217** (2 req.)
Q **10788**
R **2-107 Env. 3056**
S **45⅞** nut, **2853⅜** screw

AA **1-200108 Style 17**
AB 12014⅛* included in AA
AC **7357½**
AD **16880**
AE 12026⅜A No. 2* included in AF
AF **1-12110 No. 2A** specify Cge. or motor bar controlled
AG **1097¾**
AH **46**
AI **12058¾**
AJ **12001⅛ No. 3**
AK **12165**
AL **12112½**
AM **72567**
AN **3284½**
BA **1-100A Env. 1471** lever in pos. 8, cge. controlled only
1-100A No. 3 Env. 1471 lever in pos. 8, motor bar controlled
BB Included in BA

Mr M R Lovejoy
Buffalo N Y Branch 10-5

VERTICAL SPACING FROM TOTAL KEY CARRIAGE CONTROLLED (EARLY) (Plate 15)

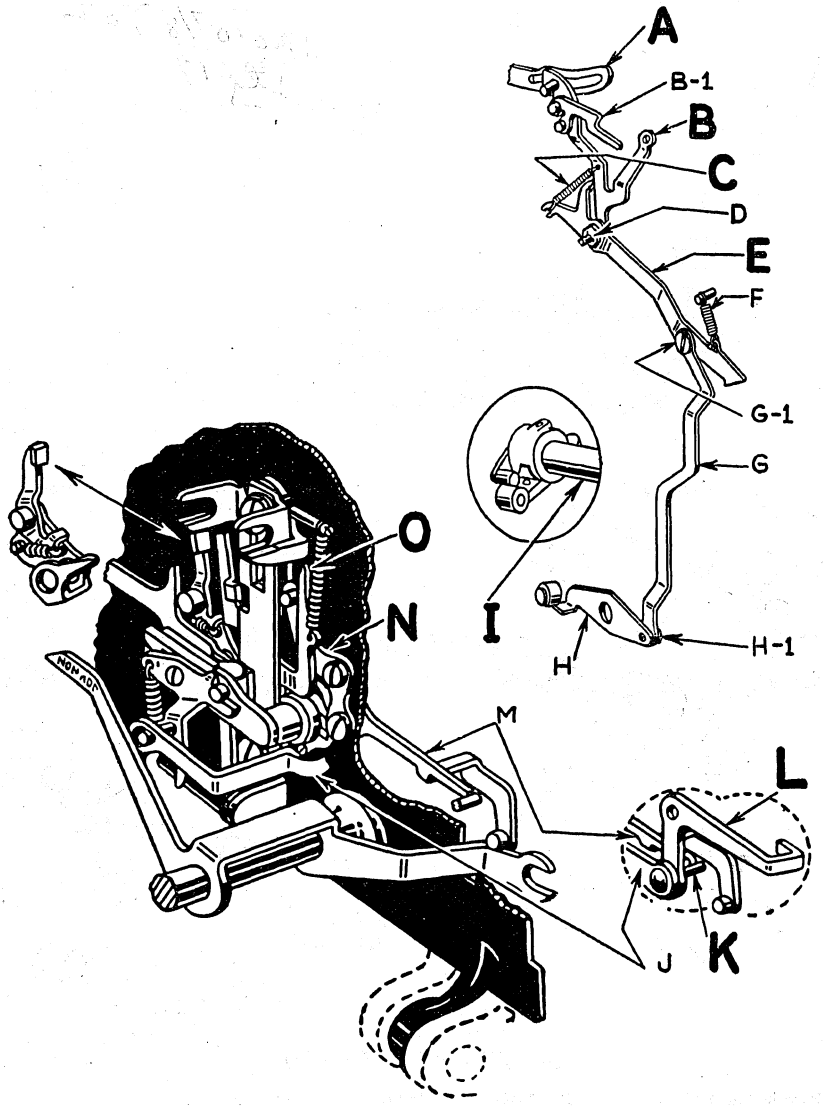


SYMBOLS (Plate 15)

A 12027¼B* Pawl included with "Z"
B **12010⅛** Outer slide for feed bail
C **3455⅜** Screw (2 required)
520¼ Washer (2 required)
E **200506A** Spring stud
F **3480½** Spring
G **264¾** Stud
H **1-200107** Pawl includes "G"
I **7357½** Screw
J **200104A** Latch
K **7357½** Screw
L **1-200105B Style 13 or 17** use spring 69806
M **12216½A** For Class 2 or 6 SACT const., use 10180 spring
12216½ No. 2 (1-12216⅝C, 12238, 12055¼B No. 1, 83348½) For Classes 1, 2, 6, 11 thru 30, vertical space from total and sub-total key, carriage controlled, use springs 10180 and 60804A
N 12014⅛* Punching furnished with "Q"
O **450¾** Stud for Style 13
3464⅞ Stud for Style 17
P **200503** Shoulder stud
Q 12019¼A Style 13 or 17*
1-200108 Style 13 or 17 Assembly includes "N," "O" and 12019¼A*
R **1-10027A Style 11, 13 or 17** for Classes 1, 2 and 6 SACT and MRC const.
1-10027 Style 17 No. 2 for Type 20 with crossfooter totals and sub-totals carriage controlled for positive and negative balances
1-10027 Style 13 or 17 No. 3 for Type 20 with vertical space from total and sub-total keys
1-10027¼ Style 11 for Style 11 Class 2 V.H.B. const.
S **1-10023⅛A** Stop block for Classes 1, 2, 6, 11 thru 16 for V.H.B. const.
1A-10023½ (1AZ-10023½, 12044¾B, 12059⅛A, 1-12014⅞ No. 2, 10788) Stop block for Class 6 air cushion
1B-10023½ (1-10023½A, 1-12014⅞ No. 2, 10788, 12044¾B, 12059⅛A) Stop block for Classes 1, 2, 11 thru 16, Type 20 SACT const.
T **12054⅛ (84609)** Stud 7/16" long
12054⅝ (83568) Stud 11/32" Long
U **10086** Spring
V **10052¼** Stud
W **12059⅛ No. 2** Screw, used for 1-10014¼A No. 2 and 1-10014¼ No. 3 refer to "X"
10059⅛ Screw, used for 10014¼, refer to "X"
X **1-10014¼ No. 3** Latch as shown equipped with long stud "T," Type 20 and 30, early carriage tabulation
1-10014¼A No. 2 Latch equipped with short stud "T" and extension where spring is attached, Type 20 and 30 skip tab. stop block
10014¼ Latch without stud, Class 6
Y **12019⅛A Style 9** for Class 2 Style 9, SACT not variable hammer block const.
12019⅛A Styles 11, 13 or 17 for Class 2 and 6 MRC with 6-7 mechanism not V. H. B. const.
12019⅛A Style 15
12019¾B Style 9 for Class 2 Style 9 crossfeed ribbon upfeed TR, SACT const. with air cushion
12019¾B Styles 11, 13 or 17 for Class 2 and 6 SACT const.
12019¾B Style 15
12019¾B No. 2 Style 13 or 17
Z **1-12015¾B** Assembly, includes "A," "AB," "AC"
AA **12087A** Spring
AB **12057¾** Spring stud
AC **12059¼B** Shoulder stud

Printed in U. S. America 1-4-49

VERTICAL SPACING FROM TOTAL KEY CARRIAGE CONTROLLED (LATER) (Plate 16)



SYMBOLS (Plate 16)

A **1-202225** for Type 20, specifying carriage throw back or non-throw back from total key
11-202225 (21-202225) for Type 20 with crossfooter totals and sub-totals carriage controlled for positive and negative balances

B **1-12216⅝ No. 2** for Type 20 with crossfooter total and sub-total carriage controlled for positive and negative balances with repeat operation following crossfooter total carriage controlled
11-12216⅝ No. 2 for Type 20 with crossfooter total and sub-total const. for positive and negative balances **(without repeat of machine operation followlng crossfooter totals)**

B-1 1-12217¼* Punching without spring stud, use shoulder rivet 12251
11-122217¼* Punching with spring stud 75593, use shoulder rivet 12251

C **60804A** Spring

D **12055¼A No. 2** Shoulder stud
75615 Screw

E **12216½A** for Class 2 or 6 SACT const.
12216½ No. 2 (12216⅝C, 12238, 12055¼B No. 1, 83348½) for Classes 1, 2, 6, 11 thru 30, vertical space from total and sub-total key, carriage controlled

F **10180** Spring

G **1-12216¼** for Styles 23 17 40, 23 17 42, Classes 1, 2, 6, 11 thru 30 with vertical space from total and sub-total keys, carriage controlled
1Z-12216¼ for Classes 1, 2, 6, 11 thru 30 with vertical space from total and sub-total keys, carriage controlled
1-12216¼ Style 13 (1A-12216¼) for Classes 1, 2, 6, 11-16 Type 20 with vertical space from total and sub-total keys, carriage controlled
11-12216¼ Style 13 (1A-12216¼) same description as above item except is for Classes 27, 28, 29, 30

G-1 **71542** Screw

H 12216¼* Punching
12059½ Shoulder screw, hexagon head
12046 Shoulder nut, hexagon head
2820½ Washer

H-1 **351½** Shoulder stud

I **2-60000 Style 13** Assembled section for Class 6 duplex subtractor, specify machine number
2A-60000 Style 17 for Classes 20 thru 26, specify machine number
42-60000 Style 13-17 for Type 20 with crossfooter, total and sub-total carriage controlled for positive and negative balances

J **1-200108 Style 13 or 17** Link assembly

K **200503** Long shoulder stud

L 12014 1/16* Link

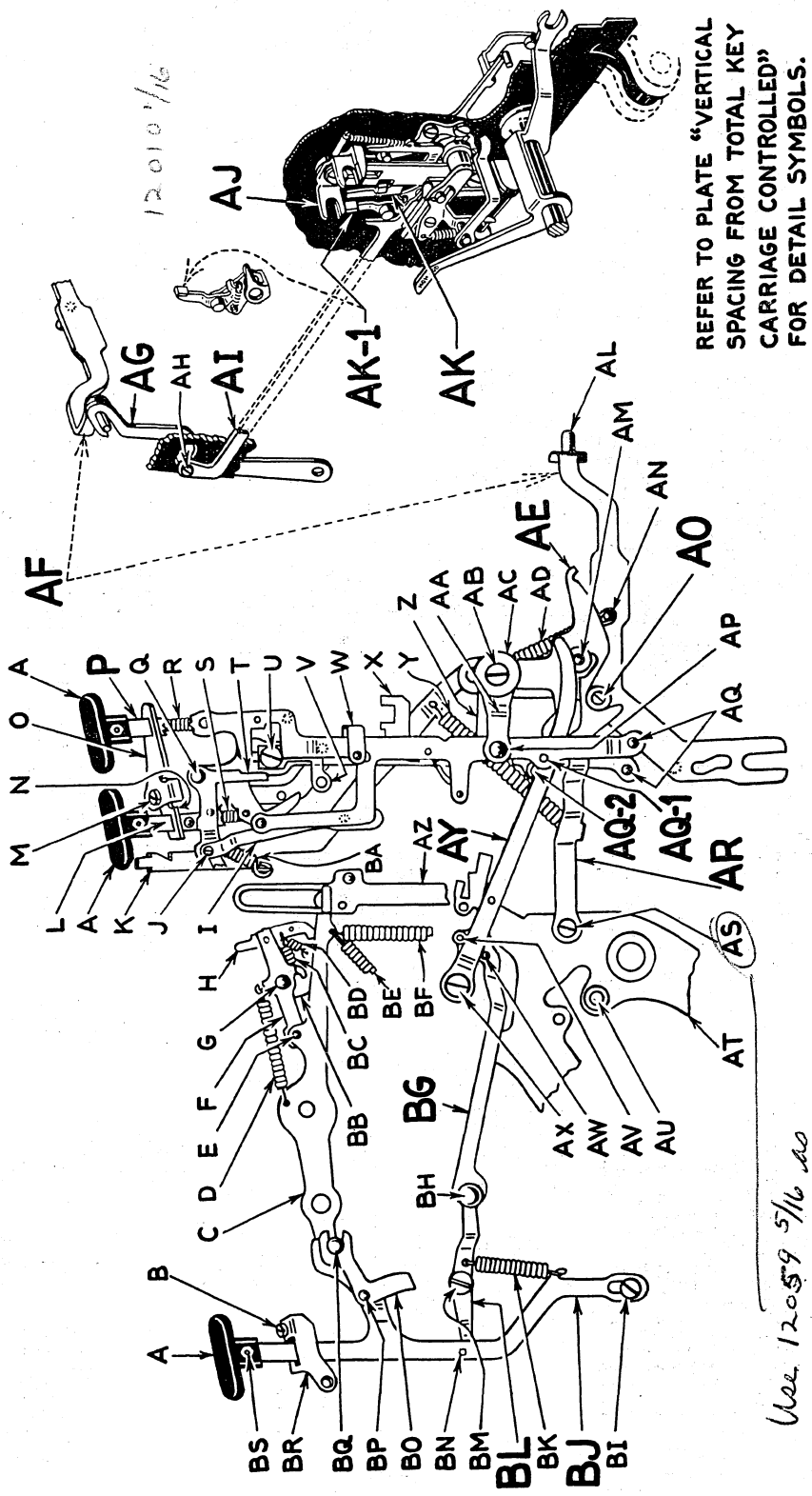
M **1-200105B Style 13 or 17** Lever

N **1-200107** Lever

O **200104A** Latch

SEE EXPLANATION ON INSIDE OF FRONT COVER

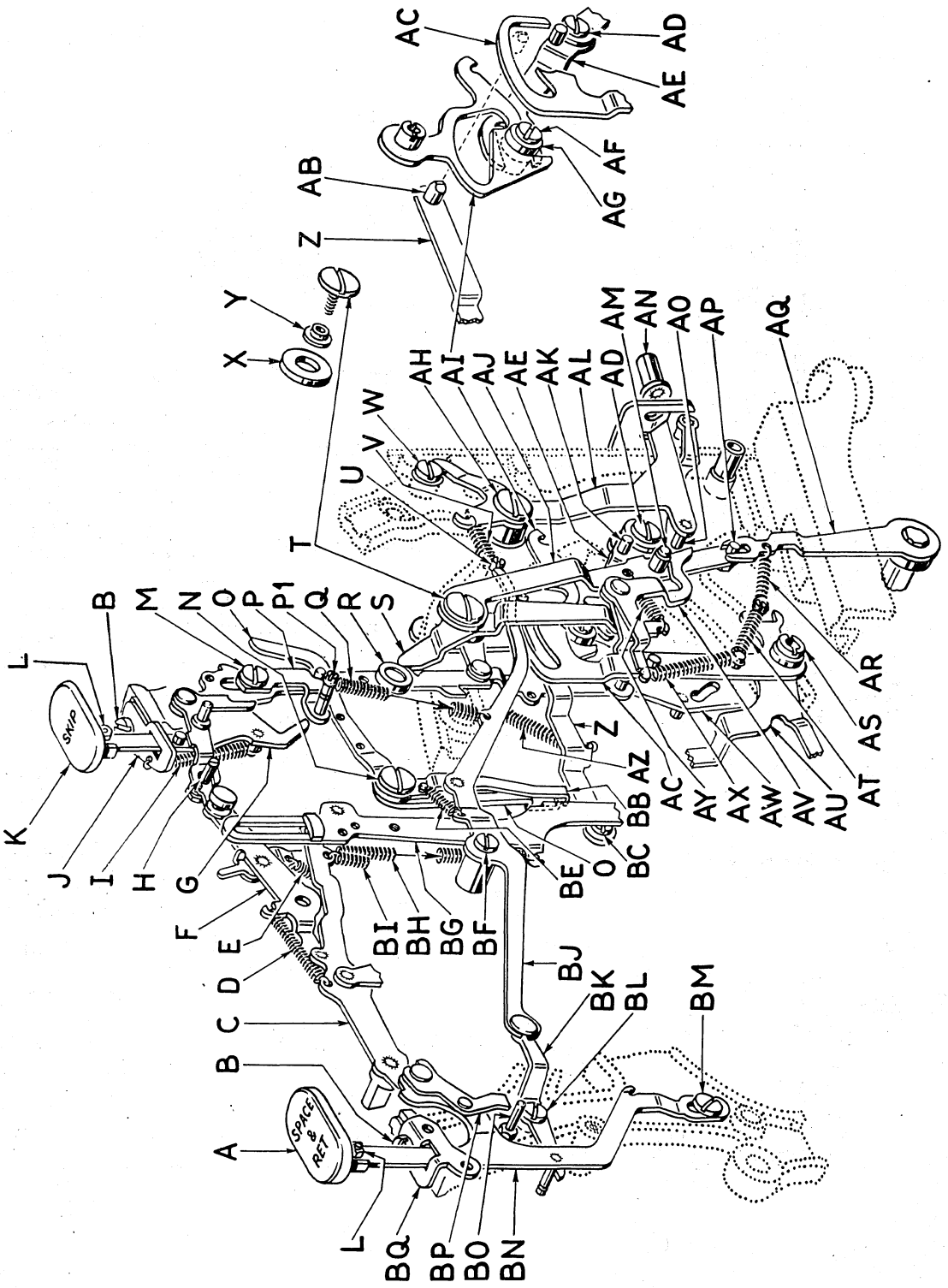
VERTICAL SPACING FROM UPPER AND LOWER AUXILIARY MOTOR BARS (Plate 17)



SYMBOLS (Plate 17)

A **1-12016¼B Specify Color and Description,** Keytop
B **7059** Screw
C **1-201123 (1A-201123, 1-201121A)**
D **7283A Style 10** Spring
E **3655¼A** Stud
F **1A-201121 (1-201121A, 1A-201123)** For Classes 1, 2, 6, 11 thru 16, 20 thru 26 repeat print mechanism
1-201121 No. 2 (1-201121A, 1A-201123) For Type 20 bank posting machine, English currency
G 201309* (1-201121A, 1A-201123)
H **1-201122** Latch held to assembly with shoulder stud 351½
I **200246A** Link, for Classes 2, 6, 11 thru 16, 20 thru 26 specifying uppermost auxiliary motor bar
200246 No. 2 for Type 20 bank posting with upper and uppermost auxiliary motor bars, English currency
J **203533½** Ecc. screw, 1097¾ lock washer, 49¼ nut—used with upper bar
201538 Ecc. screw, 75210 washer, 49¼ nut—used with uppermost bar
K **1-12220 No. 1** Keystem Classes 1, 2, 6, 11 thru 30 vertical space bar const., spring not shown, used at bottom is 986
1-12220 No. 2 Type 20 automatic total with folio repeat and vertical space bar, bank posting
12220 No. 3 Classes 2, 6, 11 thru 16 cycle const. or Class 2 crossfeed ribbon, upfeed tally roll, SACT with air cushion, not Type 20
11-12220 No. 3 Classes 6, 11 thru 16 cycle const.
12220 No. 4 Type 20 with key in place of counters, normal key to print symbol, held to side frame with screw 12050⅝ using spring 10281 on formed ear using 20 No. 73 wire hook up
1-12220⅜A Classes 2, 6, 11 thru 26 for 1/12 fractions
1-12220⅜ No. 2 (1-12220⅜A No. 2, 31-12016⅛) Classes 1, 2, 6, 11 thru 30 £.s.d. or £.s.d.f. const. vertical space bar
L **1-200241B No. 2** Keystem for Type 20 with automatic machine operation for positive totals from crossfooter carriage controlled, bank posting machine
11-200241B No. 2 Classes 1, 2, 6, 11 thru 30 with uppermost bar const.
21-200241B No. 2 Classes 1, 2, 6, 11 thru 30 with lock for motor bar when carriage is open, without upper auxiliary motor bar
31-200241B No. 2 (1-200241B No. 2) Type 20 bank posting machine, English currency const.
1-200241B No. 4 Type 20 with automatic machine operation for positive totals from crossfooter, carriage controlled, bank posting machine, with lock down auxiliary motor bar
11-200241B No. 4 Type 20, not bank posting, with lock down upper auxiliary motor bar indexing "X"
M **1050⅝** Screw
N **200245 No. 2** Plate
O **200245** Plate
P **1A-200235** Keystem for Classes 2, 6, 11 thru 16, 20 thru 26, uppermost auxiliary motor bar
1-200235 No. 2 for Type 20 and 30 automatic total, bank posting machine
Q **7262½** Shoulder stud
R **10086** Spring
S **79813 No. 1** Spring for 1-200241B No. 2, 1- No. 4, refer to "L"
72806 Spring for 11-200241B No. 2, 21- No. 2, 11-No. 4, refer to "L"
T **1-200242 No. 2** Pawl for Type 20 and 30 automatic total const, skip tab. bar controlled, bank posting machine
1-200242 No. 3 (1-200242A No. 2) for Type 20 bank posting machine, English currency const.
1-200242 No. 1 for Classes 1, 2, 6, 11 thru 16, 20 thru 30, upper auxiliary bar const.
U **200550A** Screw
V **200163½** Punching
200347A Square headed bushing used previous to above item
W **1-200265** Punching fastened to keystem with rivets 75537
X **1-200276A No. 1 (1-200276A No. 3)** Latch for Type 20 automatic machine operation for positive totals from crossfooter, carriage controlled, bank posting
1-200276A No. 2 (1-200276A No. 6) Type 20 £.s.d., same description as above
Y **983** Spring
Z **12017¼A** Punching fastened to keystem with shoulder stud 7262½
AA **200236** Punching, use shoulder stud 7262½
AB **12051⅞** Flat head screw
12050⅝ Bushing
200345 Bushing used with shoulder screw spring stud 200519A
12233¼ Small inside space collars
45 Nut
AC **10021¾** Washers (one or more req.)
AD **74809 No. 2 (986)**
AE **12024¾B** Punching included with "AR"
1-12024¾B No. 2 Punching with formed ear and includes stud 12063⅝ and roll 12033⅝
12088 Spring used with above item
AF **1-12215 No. 1** for Classes 1, 2, 6, 11 thru 16 and Type 20 with vertical space bar
11-12215 No. 1 for Classes 1, 2, 6, 11 thru 16 and Type 20 with vertical space bar with shaft on back plate inactive upon operation
21-12215 No. 1 for Class 2 with Type 20 carriage with repeat of machine operation and positive counter control except when crossfooter or register add or non-add is controlled thru shaft on back plate
1-12215 Style 9 or 17 No. 2 for Classes 1, 2, 6, 11 thru 30 with carriage normal key, not vertical space bar with key operating shaft on back plate
1-12215 No. 3 for Class 2 crossfeed ribbon, upfeed tally roll, SACT const. with air cushion
11-12215 No. 3 for Class 2, same description as above for vertical item space bar
1-12215 No. 5 for Classes 2, 6, 11 thru 16 cycle construction
AG **1-4419¼** Link
AH **957½** Screw
AI **12019⅛A Style 9, 11, 13, 15 or 17,** refer to "X" Plate 13 "tabulating mechanism" for additional information
AJ **12010⅛** Outside slide
AK **200104A** Latch
AK-1 **1-12015¾B**
AL **3257⅛** Stud
AM **12055⅝B** Stud
AN **450¾** Spring stud
AO **75615** Screw
12031⅞ Roller
12055⅛ Stud
AP **7262½** Shoulder stud
AQ **750¾ No. 1** Stud
AQ-1 **750¾ No. 1** Stud
AQ-2 **10739** Roller
10755½ Stud
AR **1B-12016⅛** Link assembly for Classes 1, 2, 6, 11 thru 16 and Type 20 with vertical space bar, includes "AE," "AM"
11B-12016⅛ Link assembly for Class 2 crossfeed ribbon, upfeed tally roll, SACT const. with air cushion, vertical space bar
21-12016⅛ Link for Type 20 bank posting machine
AS **259½** Shoulder screw
AT 1B-311⅛* Drive sector for Classes 1, 2, 6, 11 thru 30
2B-311⅛ for Classes 1, 2, and 6, not cycle
12B-311⅛ for Classes 11, thru 16, not cycle and Type 20, not automatic totals bank posting
22B-311⅛ Type 20 with automatic totals and bank posting mechanism
AU **1-3662¼** Roller and stud assembly, use 45 nut, equipped with roller ¼" wide
1-3662¼ No. 2 Equipped with roller 37/64" wide
AV **200652 (84623)** Spring stud, use 10086 spring
AW **1363½** Stud
AX **12051⅞ No. 2** Shoulder stud
AY **1-200144 No. 3** as illustrated, for Type 20 and 30, combination vertical space and carriage return bar
1-200144A for Classes 2, 6, 11 thru 26 MRC vertical posting bar, similar to above part but with curved extension on left end
1-200144 No. 4 Same as above item except is equipped with straight extension on left end, for Styles 23 13 03, 23 17 03, 23 17 41 bank posting machine with lower vertical space bar
1-200144 No. 7 Similar to item second above except is equipped with curved arms on each end, for Type 20 with lower motor bar to control any mechanism thru shaft under base
AZ **1-3627 No. 1** Trip arm for Classes 6, 11 thru 16, Type 20, arm is not equipped with lower threaded part 3651⅝ and screw 3651⅜, order separately
11-3627 No. 1 for Classes 1, 2, 6, 11 thru 16 and Type 20, completely assembled
21-3627 No. 1 Type 20 crossfooter total and sub-totals, carriage controlled for positive negative balances
BA **3489¾** Spring
BB 1-201125A* Furnished with "F"
BC **7681¼** Spring
BD **489** Spring
BE **780⅜** Spring
BF **3682** Spring
BG **1-200144 No. 6** Link for Type 20 Styles 23 13 03, 23 17 41, combination lower vertical space and carriage return bar and upper skip tab. bar
1-200144 No. 2 Link for Type 20 automatic total const., bank posting, with combination vertical space and carriage return bar
1-200144 No. 5 for Styles 23 13 03, 23 17 03, 23 17 41, bank posting machine with lower vertical space bar
BH **12050¼** Stud
BI **200517B** Shoulder screw
200357A Square head shoulder bushing
BJ **1-12021¼A** Keystem
BK **3683** Spring
BL **1-200233** Arm as shown for Classes 2, 6, 11 thru 26 MRC vertical posting bar
1-200233 No. 2 for Type 20 automatic total, bank posting
BM **12051⅝ No. 1** Shoulder screw for 1-200233, refer to "BL"
12051⅜ Shoulder screw for 1-200233 No. 2, refer to "BL"
BN **264¾** Stud
BO **12017½** Punching
BP **753½ No. 3** Shoulder stud
BQ **3657¼B** Stud
BR **12018⅞ No. 3** Punching
BS **12051⅜** Screw
46 Nut

FORM SPACE OR CARRIAGE RETURN—INDEXED FROM MOTOR BAR NO. 101 AND CARRIAGE SKIP TABULATION—INDEXED FROM MOTOR BAR NO. 103 (Plate 17-1)



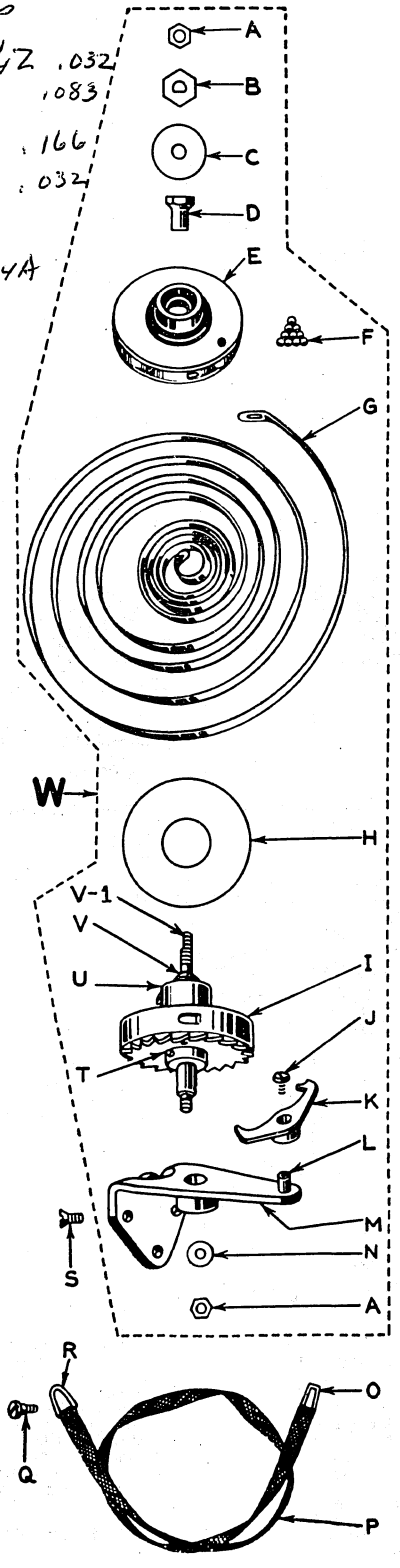
SYMBOLS (Plate 17-1)

A **1-12016¼B** Space and ret., specify color
B **7059**
C **11A-201123** (10 col. adding) **51-201123** up to 9 col. adding
D **7283A Style 10**
E **284** Flexible
F **1-201121A**
G **1-200241C No. 2** includes R
H **203533½** Use 1097¾ lock washer, 49¼ nut
I **10788**
J **200245 No. 2**
K **1-12016¼B** Skip, specify color
L **46** Nut, use 71517 screw
M **200550A**
N **12051/16 No. 4**
O **1-200244 No. 7**
P **200163½**
P1 **200501½**
Q **983**
R **60315A** use 351½ rivet
S **12027/16 No. 2**
T **103654**
U **3350⅜** Screw stud
V **681⅛**
W **200548½**
X **10021¾**
Y **8436**
Z **1-12016⅛ No. 2** includes AB
AB **12055/8 No. 2** included in Z
AC **12024/16** includes AV
AD **79603** Screw, use 200350 washer
AE **1-200280A** includes AK
AF **75615**
AG **12031/8**
AH **3450/16 Style 9**
AI **12024¾B No. 5**
AJ **1-12027/16 No. 2** included in AM
AK **1350⅜** included in AE
AL **1-200239 No. 3** Includes AN and AO
AM **83358A** Roller, use 83549A rivet, included in AJ
AN **312A Fte. 200 No. 3** Use 10750/16 Style 9 screw, 543 Fte. 200 No. 3 tapped stud, included in AL
AO **251¾** included in AL
AP **12057/16** use 46 nut
AQ **1-12025 No. 3**
AR **483**
AS **12031½ No. 2**
AT **483**
AU **1-200145A**
AV **12024/16*** included in AC
AW **11-12215 No. 1**
AX **9580**
AY **3480¾**
AZ **983**

BB **1-200244 No. 8**
BC **3961A**
BE **82809**
BF **203625 No. 2**
BG **1-3627 No. 1**
BH **3682**
BI **10788**
BJ **1-200144A No. 6**
BK **1-200233 No. 2**
BL **12051/16**
BM **200517B**
BN **1-12021¼A** Includes BP
BO **12053/8**
BP **12017/8*** Included in BN
BQ **12018/8 No. 3**

SPRING BARREL ASSEMBLY, SMALL SPRING, A.C.T. AND S.A.C.T. (Plate 18)

Shims
3325 3/4Z .032
.083
20120 .166
20220 .032
Screws
103534A



SYMBOLS (Plate 18)

A **45** Nut
B **3341 (3320⅝)**
C **3325⅞** Washer
D **3237¼A** Bevel head nut
E **1-3219** Upper section of spring barrel, for ACT carriage
1-3319 Style 13 Upper section of spring barrel, for SACT carriage
F **3298** Ball bearings (20 required)
G **83 No. 2 (83 No. 3)** for ACT carriage
83 No. 3 for SACT carriage
H **3224⅛** Circular plate
I **1AZ-3203¼ (1BZ-3203¼, 1-3222D)** Lower spring barrel assembly for ACT carriage "small spring"
1Z-3303¼ No. 1 (1Z-3303¼A No. 1, 1A-3322B, 3337¼A, 45 No. 3) Lower spring barrel for SACT carriage "small spring"
1Z-3303¼A No. 1 Same description as item above, except is equipped with left-hand thread using 45 No. 3 nut and 3337¼A cone nut which replaces "D"
J **73612** Screw
K **1-3222C** Escapement lever, for ACT carriage
1-3322B for SACT carriage
L **3351⅛** Tapped stud
M **1-3223½A** Bracket for spring barrel, for ACT carriage
1-3323½A No. 1 Bracket for spring barrel, for SACT carriage
1-3323½A No. 4 Bracket for Classes 2 and 6 SACT with crossfeed ribbon, upfeed tally roll, equipped with "short bend" and held to back plate with three screws in straight line
N **3415¼** Washer
O **3211A** Square end punching
P **11-203902 Style 12, 15, 18, 24**
1-203902 Style 24" Linen band
Q **3256⅛** Screw
R **3211⅛** Round end punching
S **3261B** Bevel head screw (3 required)
T **59½** Pin
U 3233⅛A* Collar furnished with "I," for ACT carriage
3333¼A* Collar furnished with "I," for SACT carriage
V 3236⅛* Bevel edge collar furnished with "I"
V-1 3203¼* Shaft
W **2-3223½A** Complete assembled spring barrel assembly for Classes 1, 2 and 6 machines for ACT carriages, small spring
2-3323½A No. 1 Complete spring barrel assembly for Classes 1, 2, 6, 11 thru 16, machines with SACT carriages, small spring

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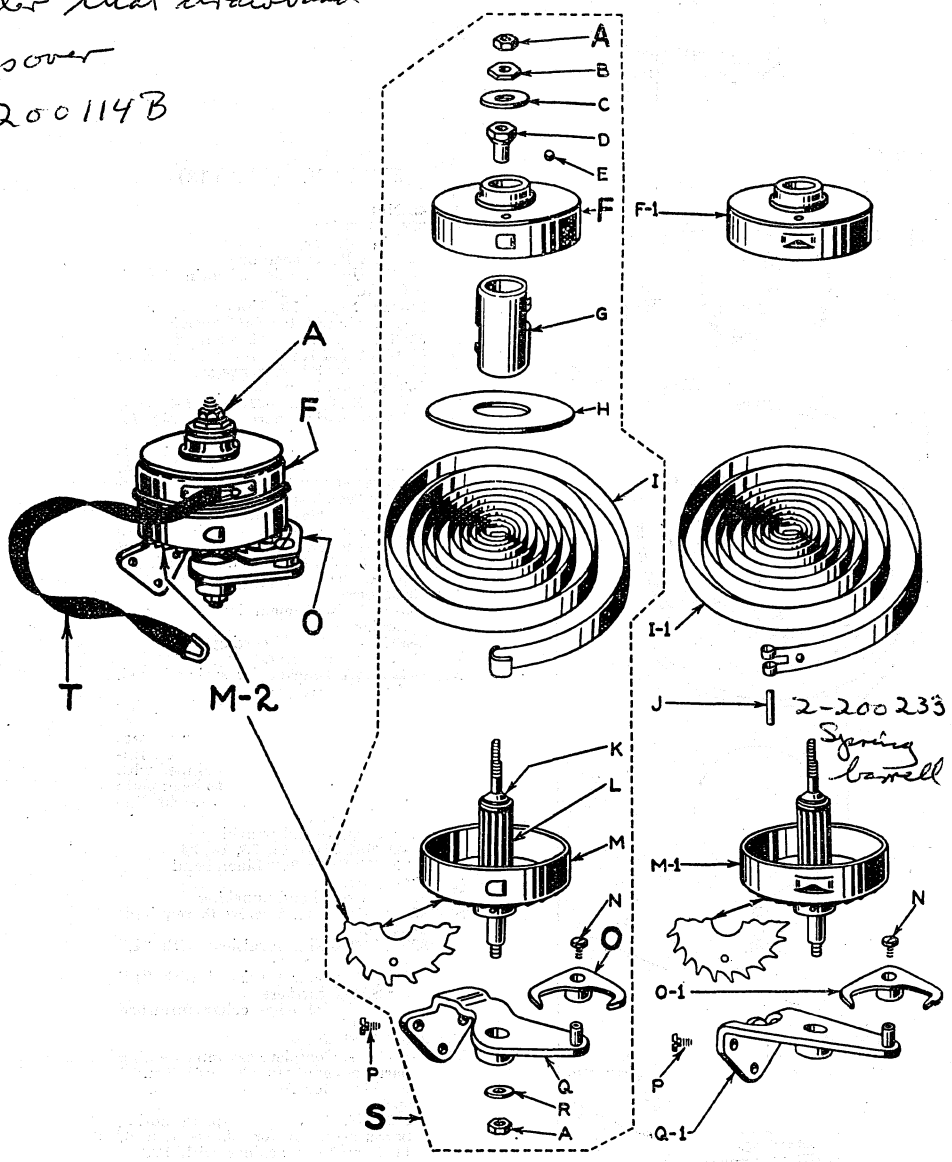
SPRING BARREL ASSEMBLY, LARGE SPRING FOR S.A.C.T. CARRIAGE (Plate 19)

Roller that drawband rides over
1-200114B

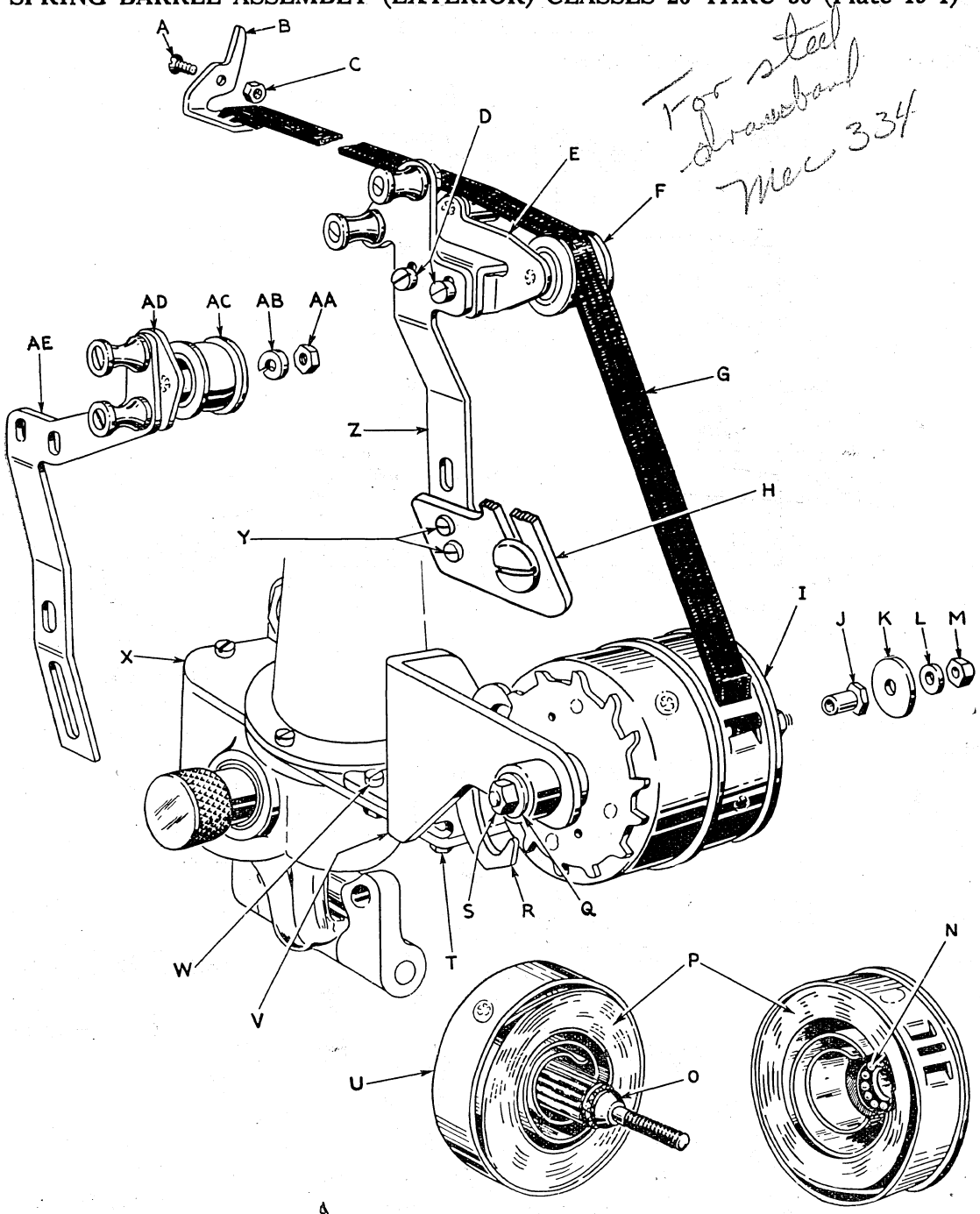


SYMBOLS (Plate 19)

A **45** Nut
B **3341 (3320⅝)**
C **3325⅞** Washer
D **3237¼A** Bevel head nut
E **3298** Ball bearings (20 required)
F **1-3319A Style 17** Upper assembly for large spring "I"
F-1 **1-3319 Style 17 (1-3319A Style 17, 83 No. 4A or 83 No. 5A)**
G **3334⅛** Collar
H **3324⅝ Style 17** Guard between upper and lower sections of spring barrel
I **83 No. 4A** Large spring
83 No. 5A Large spring, heavy duty
I-1 **83 No. 4** Large spring used with pin
83 No. 5 (83 No. 5A [2 req.], 1-3319A Style 17, 45 No. 3, 1Z-3303¼A No. 2, 1A-3322B, 3337¼A) Large spring, heavy duty, used with pin
J **3662¾ No. 1**
K 3236⅛* Furnished with "M"
L 1-3319⅛* Needle bearing cage furnished with "M"
M **1AZ-3303¼ No. 2 (1Z-3303¼A No. 2, 3337¼A, 45 No. 3)** for large spring
1Z-3303¼A No. 2 for large spring except is equipped with left-hand thread using 45 No. 3 nut and 3337¼A cone nut which replaces "D"
M-1 **1Z-3303¼ No. 2 (1Z-3303¼A No. 2, 45 No. 3, 83 No. 4A or 5A, 1A-3322B, 3337¼A)** for large spring used with pin anchorage
M-2 3220⅞* (9022⅞*)
N **73612** Screw
O **1A-3322B** Pawl
O-1 **1-3322B** Pawl
P **3361¼A** Screws (3 req.)
Q **1-3323½A No. 5** Bracket
Q-1 **1-3323½A No. 2** Bracket
R **3415¼** Washer
S **2-3323½A No. 5** Complete assembled spring barrel, large spring, **not heavy duty** for Classes 1, 2, 6, 11 thru 16 and Type 20
12-3323½A No. 5 Complete assembled spring barrel, large spring, **heavy duty** for Classes 1, 2, 6, 11 thru 16 and Type 20
T **1A-203902 Style 12″, 15″, 18″** Linen band
1-203902 Style 24″ Linen band

SEE EXPLANATION ON INSIDE OF FRONT COVER

SPRING BARREL ASSEMBLY (EXTERIOR) CLASSES 20 THRU 30 (Plate 19-1)



SYMBOLS (Plate 19-1)

Page 318

A **2859¾B**
B **203118¼**
C **46**
D **1050⅛** Lock washer 1097⅞, nut 47
E **1-203185½ No. 2 (1-203185½A, 203303A, 2820½, 46)**
F **1-203303 (203303A, 1-203185½A, 46, 2820½)**
G **203902 No. 3 Style 12, 15, 18**
H **203170A No. 2**
I **1-3319 No. 2** see letter V for complete assembly
J **3237¼A**
K **3325⅞**
L **3320⅝**
M **45**
N **3298** Ball bearings
O **3236⅛***
P **83 No. 18**
Q **3415¼** Washer
R **1A-3322B** use 7356½ screw
S **45**
T **47**
U **1-3303¼A No. 3**
V **1-3323½A No. 6** Bracket, 2-3323½A No. 6 complete assembled spring barrel brace, includes I, J, K, L, M, N, O, P, Q, R, S, U, V
W **71518** Washer 1097⅞
X **1-12010¾ No. 2**
Y **8451** Lock washer 1097¾, nut 46
Z **239 Fte. 203 (203185 No. 2)**
AA **49**
AB **1097⅝**
AC **1-203303 (203303A, 1-203185½A, 46, 2820½)**
AD **1-203185½ No. 1 (1-203185½A, 203303A, 46, 2820½)**
AE **195 Fte. 203 (203185½ No. 3)**

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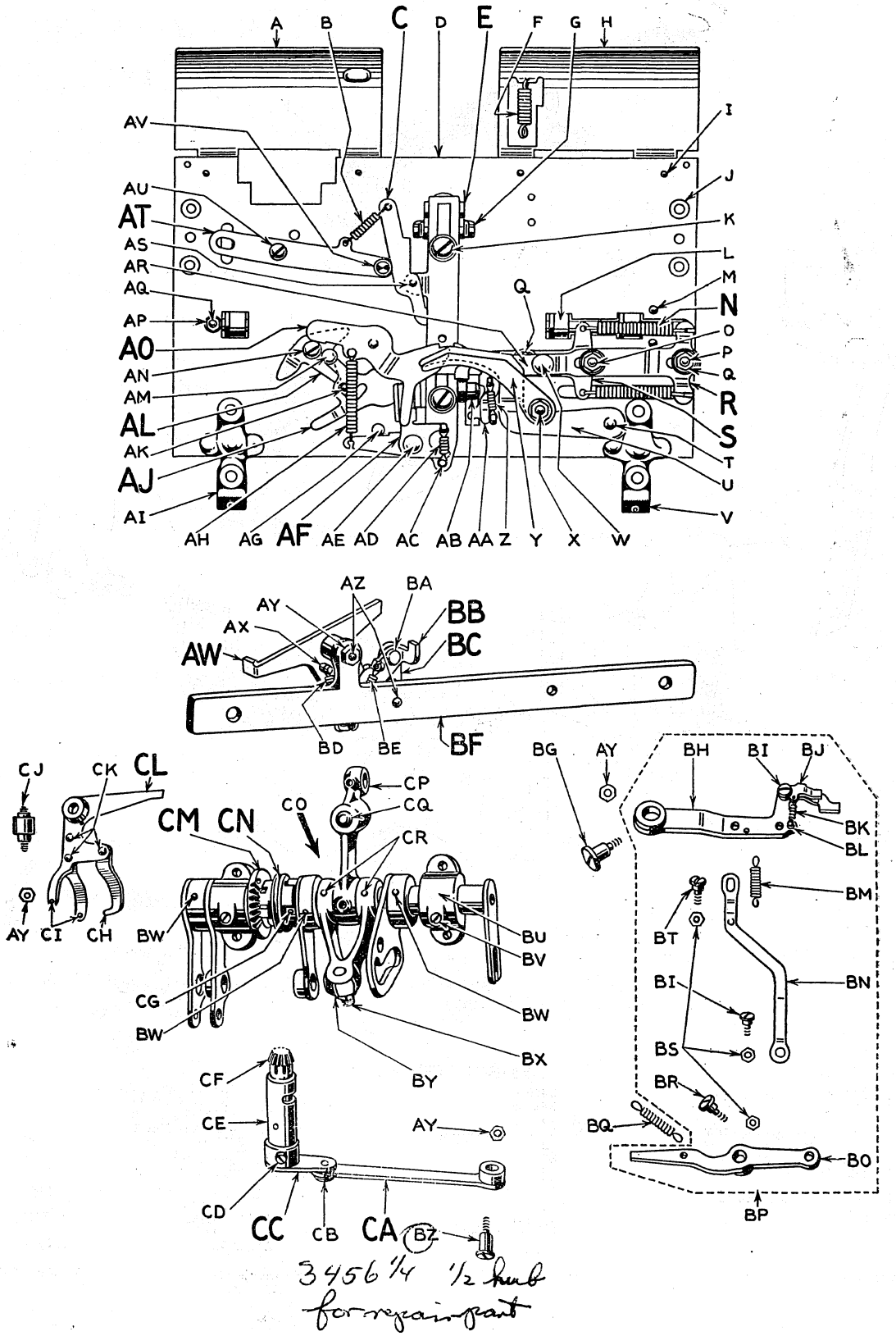
AUTOMATIC CROSS TABULATION CARRIAGE MECHANISM, CLASSES 1 AND 2 (Plate 21)

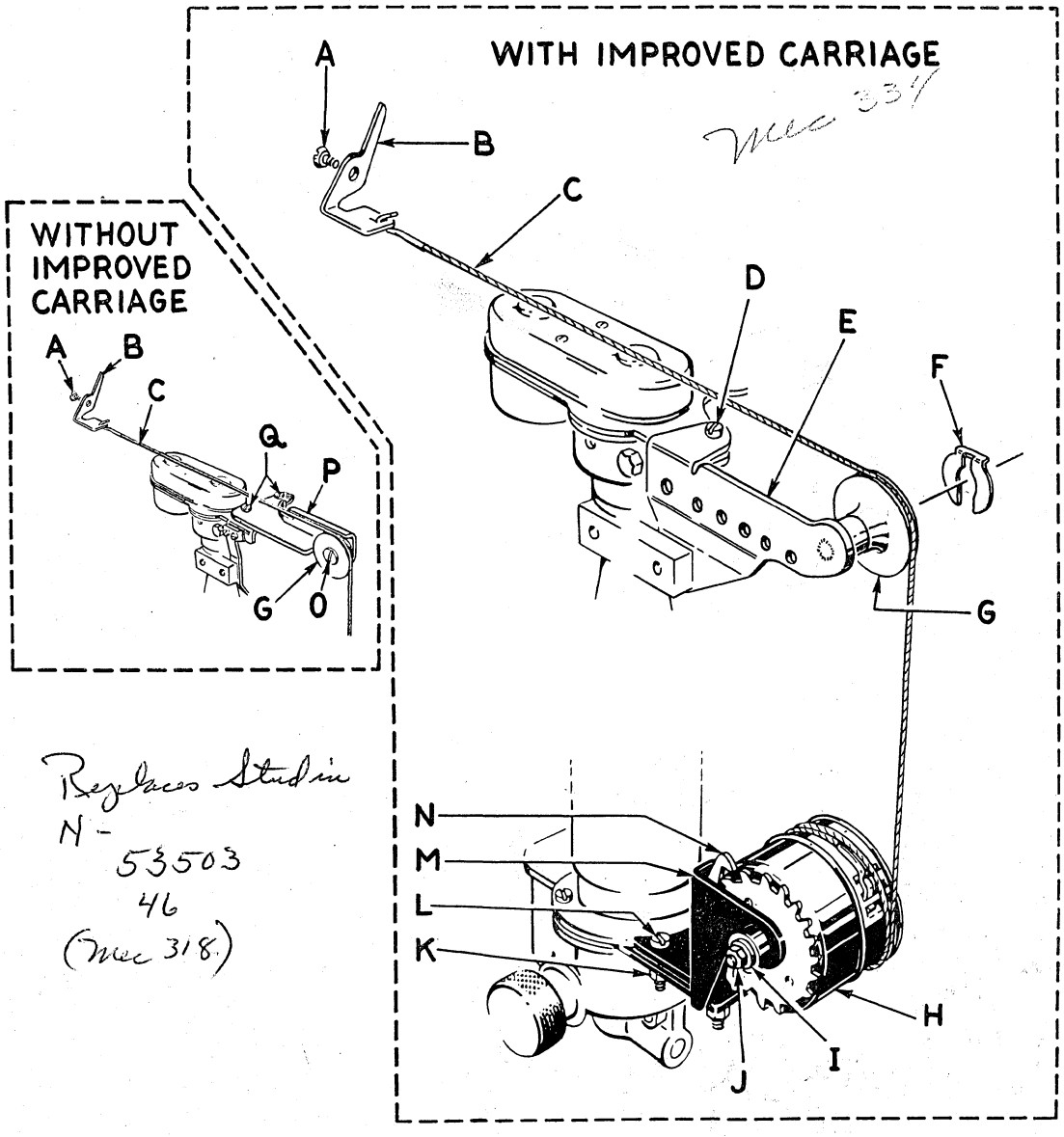
(Plate 20 is in "Carriage Instruction" Book only)



3456¼ ½ hub for repair part

SPRING BARREL CABLE FOR USE ON MACHINES WITH OUTSIDE BARREL (Plate 19-2)

Mr M R Lovejoy
Buffalo N Y Branch 10-5



SYMBOLS (Plate 19-2)

A	**2859¾B** use 46 nut	
B	**203118¼A**	
C	**1-203701 Styles 12, 15, 18**	
D	**1050⅛**	
E	**1-203185C**	
F	**21 No. 23**	
G	**203303C**	
H	**22A-3323½A No. 6** bank	complete assembled spring barrel; includes I, J, M, N
	32A-3323½A No. 6 commercial	
I	**3415¼** washer	
J	**45**	
K	**47¼** nut	
L	**1050⅛**	
M	**1-3323½A No. 6** black **21-3323½A No. 6** gray	
N	**1A-3322B** use 3357¼ screw and 46 nut	
O	**3450⅛ Style 9**	
P	**1-203185½AZ**	
Q	**4456½**	

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SYMBOLS (Plate 21)

A **2813R Style 9**
2813¾R Style 11, 13 or 17
B **3280⅛** Spring
C **3221⅛** Punching included with "E"
D **1-12012½ No. 3 Style 9, 11, 13, 15 or 17** Specify machine number, for Classes 1 and 2, includes studs and hubs only
E **1-3210¼** Outside slide includes "AC," "AE," "AF," "AS," "C"
F **2887** Spring, not included with assembled back
G **1-3210½** Inside slide includes "AB"
H **2813L Style 9**
2813¾L Style 11, 13 or 17
I **252⅝** Screw (4 req.)
J **12030½** Threaded bushings (4 req.)
K **3455⅜** Screw (2 req.)
811½ Washer (2 req.)
3435½ Threaded bushing (2 req.)
L **1-3200 Style 9, 11 or 13** Shaft assembly on back plate, Class 2 ACT, includes levers attached, shoulder screw 259½, nut 46 and spring 3282
1-3200 Style 15
11-3200 Style 11 or 13 Shaft assembly, same description as above for Class 2 ACT or SACT
1-3200A Style 17 for Class 2 ACT or SACT
N **3282½** Spring (2 req.)
O **3253⅜** Threaded stud
P **3256½** Threaded stud
Q **3415¼** Washers (one or more required)
811½ Washers (one or more required)
45 Nut (one or more required)
R **1-3218½** Slide assembly, includes "W," "AA"
S **3214** Slide for springs "N"
T 3250¾* Threaded pin furnished with "U"
1028 Style 15 Washer used on threaded end of 3250¾*
45 Nut
3216 Punching on threaded stud 3250¾* on inside of back plate fastened to link 3217¼ by screw 259½ and 46 nut
U **1-3226½ Style 9 or 15**
W **3259⅝** Shoulder rivet
X **45** Nut
3415¼ Washer
1-3228 Style 9, 11, 13 or 17 Stud with arm assembled on inside of back plate
Y **3226** Arm
Z **284** Spring
AA **3229¾** Latch included with "R"
3255½ Shoulder stud for latch
AB **3436¼** Roll
3460¼A Stud
AC **3450** Spring stud included with "E"
AD **3286½** Spring
AE **351½** Shoulder stud included with "E"
AF **3217⅜** Latch included with "E"
AH **3283½** Spring
AJ **3212¾** Punching included with "AL"
AK **3459⅛** Stud
AL **1-3211¾** Punching assembly includes "AJ," "AM"
AM **3258⅛** Stud
AN **3253⅞** Screw
3415¼ Washer
46 Nut
AO **1-3215⅛** Arm includes spring stud 3260 and is held to back plate with 45 nut and 3415¼ washer
AP **46** Nut
3220½ Washer
AQ **3450¼** Lug
AR **3210¾** Punching included with "R"
AS **351½** Rivet
AT **1-3220¾ Style 9, 11, 13 or 17** Punching includes stud and roll
AU **3259⅛A** Screw
3227½ Washer
AV **953⅛** Stud
932⅝ Roll
AW **1-3211¼** Punching includes spring stud and hub
AX **10961½** Spring stud
AY **45** Nut
AZ **3251⅞** Shoulder screw
BA **650A** Shoulder stud
BB **3214½** Pawl included with "BC"
BC **1-3216⅛** Punching includes "BA," "BC," and hub
BD **3284½** Spring
BE **480B** Spring
BF **1-3218 Style 9, 11, 13 or 17** Bar assembly, includes parts attached as shown
BG **3355½** Shoulder screw
BH 3320⅛* Arm included with complete assembly
BI **259½** Screw
46 Nut
BJ **3322½** Pawl
BK **284** Spring
BL **3454¾** Spring stud
BM **3283** Spring
BN **200224 No. 1** Link
BO **1-3424¾** Arm as shown includes hub
1-3324¾A Style 11 for Style 11
3324¾A Style 13 for Styles 13 or 17
BP **1-3320⅛** Assembly for Classes 1, 2, 6, 11 thru 26 with crossfooter non-add controlled from carriage
11-3320⅛ Style 11 for Style 11
11-3320⅛ Style 13 for Style 13 or 17
BQ **3489** Spring
BR **3453½** Shoulder screw
BS **46** Nut
BT **10761¼** Shoulder screw
BU **166B No. 1** Casting (2 req.)
BV **7159** Screw (2 req.)
BW **152A** Pin
BX **156 Style 9** use for Styles 9, 11, 15 or 17, headless screw
156 Style 13 use for Style 13, headless screw
BY **199 Style 9** Nut
BZ **3454⅜** Shoulder screw
CA **1-3213¾ Specify style,** Link assembled with hub
CB **3452⅛** Shoulder rivet
CC **2Z-3201½A Style 9, 11, 13, 15 or 17** Link assembly for replacements in the field, includes "CA," "CB," "CC," "CD"
CD **653¾** Screws (2 required when "CC" is used for replacements in the field)
CE **3246½** Sleeve for pinion
CF **1-3201½A** Pinion furnished only for repairs when "CC" is used
CG **3262** Pin
CH **3220¼** Punching, included with "CL"
CI **3251⅝** Stud
CJ **3250⅜** Threaded stud
CK **3955** Rivet
CL **1-3219½** Complete assembly
CM **1-3231¾A** Bevel gear
CN **3240¼** Sleeve
CO **2A-3200½ Specify Style and Machine Number,** assembled section
CP **1-191** Arm includes "CQ"
CQ **157A** Pin
182A Spring
138A Screw
CR **155** Pin

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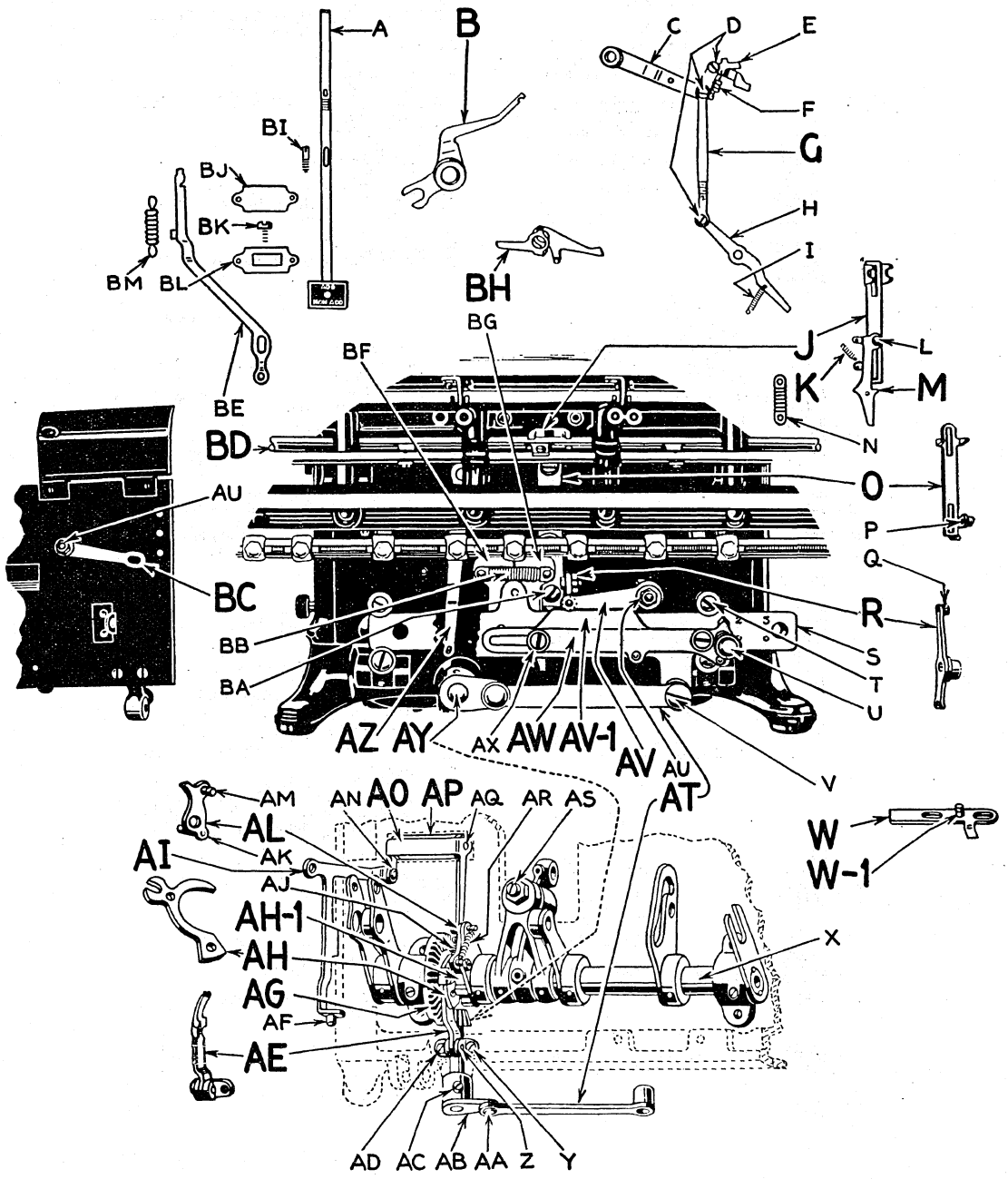
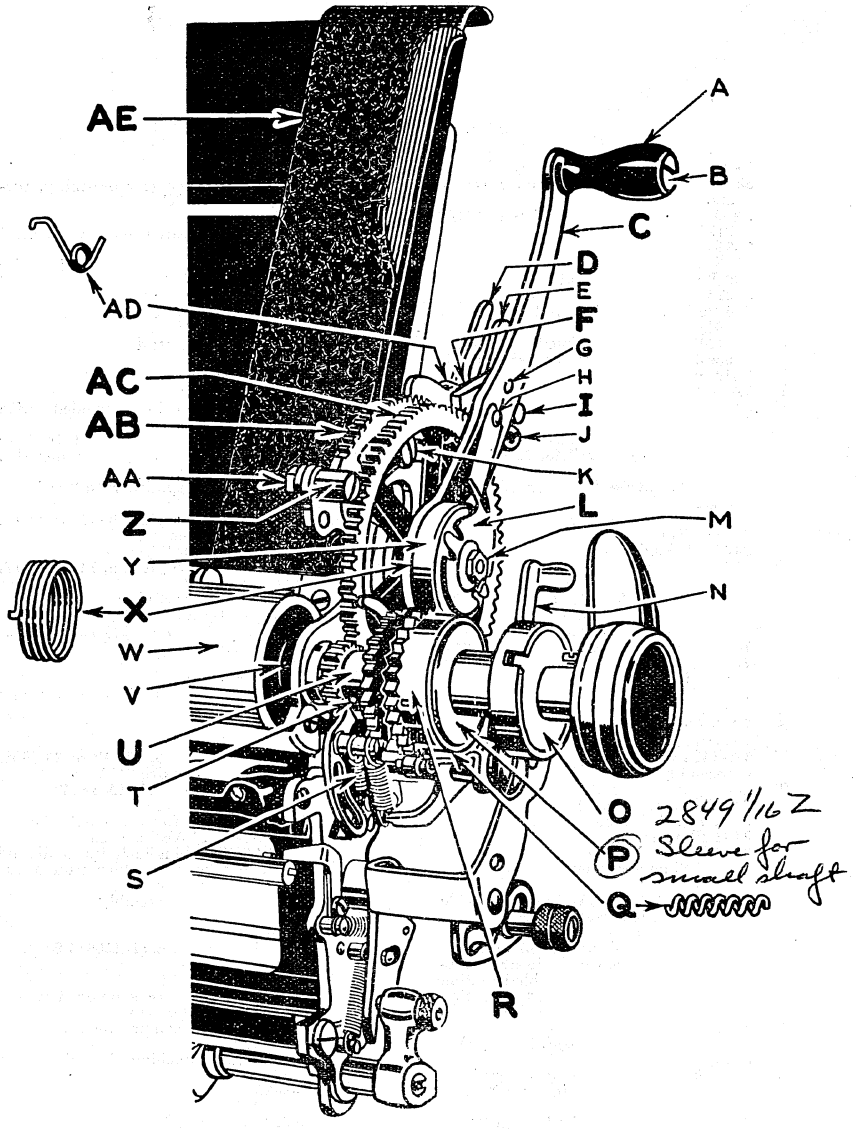
SHUTTLE CARRIAGE MECHANISM, CLASSES 1 AND 2 (Plate 22)



SYMBOLS (Plate 22)

A **1-10223** Signal plate assembly
C 3320⅛* use 3355½ shoulder screw and 45 nut
1A-3420⅛ Assembly, consists of "C," "D," "E," "F," "G," "H"
D **259**½ Screw
46 Nut
629 Washer, when required
E **3322**½ Pawl
F **284** Spring, use spring stud 3454¾
G **3420**¼ Link
H **1-3424**¾ Link assembled with hub, use 3453½ shoulder screw and nut 45
I **3489** Spring
J **1A-3410**¼ Slide, includes "L," "M"
K **3480**½ Spring
L **351**½ Rivet
M **3414A** Punching, included with "J"
N **1-3383¼C Style "H"** for 12¼" Carriage
1-3383¼C Style "K" for 18" Carriage
O **1-3410**½ Outside slide
P **3436**¼ Roll
3460¼A Stud
Q **763** Stud
749 Roll
R **1-3427 Style 9, 11, 13, 15 or 17** Connecting arm for spacing slide
764 Style 7 Shoulder screw for Style 7
764A Style 9 Shoulder screw for Style 9
764 Style 15 Shoulder screw for Style 11, 13 or 15
764A Style 17 Shoulder screw for Style 17
S **1A-3418¼ Style 9, 11, 13 or 17** Slide assembly
1A-3418 Style 9, 11, 13 or 17 Slide assembly
T **3449**½ Roll (4 req.)
3456¼ Screw (4 req.)
U **3441** Knurled knob
3461 Plunger
3482 Spring
V **3454**⅜ Shoulder screw
45 Nut
W **1-3426A Style 9, 11, 13 or 17** Slide included with assembly "S"
1-3426A Style 15
W-1 **3450** Spring stud, use 10085 spring
X **2A-3400½E Specify Style and Machine Number,** assembled section consists of parts attached to section only
Y **1054**½ Screw
Z **3453**⅛ **(3453⅛A, 3430⅛, 3490½A)**
AA **3452**⅛ Shoulder rivet
AB **2Z-3401**½ Link assembly for replacements in the field, includes "AA," "AB," "AC," "AT"
AC **653**¾ Screws, 2 required when "AB" is used for replacements in the field
AD **3459**⅞ Long screw
45 Nut
AE **3423¾A** Detent lever
AF **260**½ Stud
AG **1-3431¾A** Bevel gear assembly, furnished with "X"
AH **3419A** Cam
AH-1 3430¼A* Geared collars included with "AG"
AI **1Z-3403A** Link assembly, includes "AF," "AN," "AO," "AP," "AQ"
AJ **7285½A** Spring for "AE"
AK **3464**¼ Spring stud
AL **1-3424**⅛**A** Pawl
AM **3461**¾ Shoulder stud
3433½ Roll
3417½ Washer
AN **263** Shoulder rivet
AO 3416½A* Punching included with "AI"
AP 3415AZ* Punching fastened to base with 3459¼ screws (2 req.), included with "AI"
AQ 3403A* Shaft included with "AI"
AR **3486**½ Spring
AS **156 Style 9** for Style 7, 9, 11, 15 or 17, adjusting screw for drive
156 Style 13 for Style 13
199 Style 9 for Style 7, 9, 11, 15 or 17, adjusting nut
199 Style 13 for Style 13
AT **1-3413¾ Specify Style (1-3429½ Style 9, 11, 13 or 17)** Link assembled with hub
AU **45** Nut
3415¼ Washer
AV **1-3420¾A** Punching includes roll and stud
3460¾A Stud
3433¼A Roll
AV-1 **1-3418**½ **Style 9, 11, 13 or 17** Slide assembly, includes "U"
AW **1-3418**⅝ **Style 9, 11, 13 or 17**
AX **7357**½ Screw (2 req.)
AY **3401**½ Pinion, furnished only for repairs when "AB" is used
AZ **1-3421**¾ Punching includes small stud 962 and large shoulder stud 3460*
BA **3455**⅜ Screw (2 req.)
BB **1-3484**½ Spring assembly
BC **3416** Punching
BD **1-2806½A Style H**
1-2806½A Style K (1-2806½ Style K No. 2)
1-2806½ Style 24
BE **3420A** Keystem, use shoulder hexagon head screw 200519A
BF **1-3426¾R** Punching includes stud 3456⅞
BG **1-3426¾L** Punching includes stud 3456⅞
BH **1-3429⅛A** Punching includes stud 3450⅛
BI **3463**½ Screw
BJ **3490** Celluloid
BK **252**⅝ Screw (2 req.)
BL **3425**½ Metal frame
BM **3281**½ Spring

INJECTOR AND EJECTOR DEVICE (Plate 23)

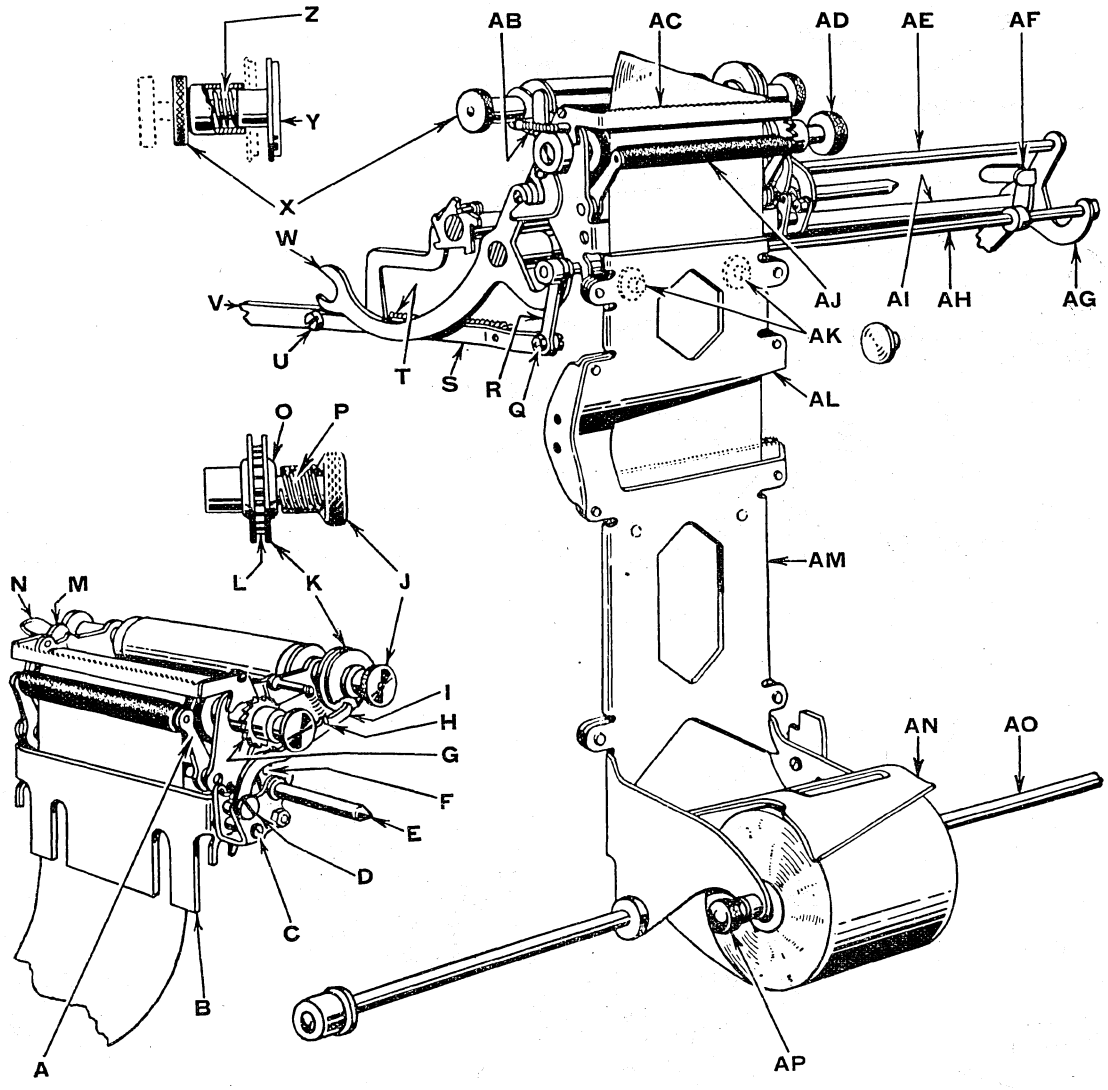


SYMBOLS (Plate 23)

A **4891A** Rubber grip on stud 4853A*
B **73612** Screw
C **1B-4811B** Injector and ejector handle, includes "A," "B," "F," "G," "H"
D **4813C** Three tooth spacing pawl
E **1-4812C** Finger arm for "D," includes studs
F **1-4892B** Pawl engaging gear wheel, includes stud 4858½A
G **4856** Stud
4857½ Screw for stud
H **4858½A** Stud in "F"
I 4857* Stud in "E"
J **4837A** Slotted round nut
4862A Shoulder screw for nut
K **4863** Shoulder screw
L **4818** Flat spring and guide for pawl "F"
M **1-4845½A** Flanged shoulder nut with left-hand thread
1-4945½ Flanged shoulder nut with right-hand thread
N **1-4824¼A** includes stud 2851¼
O **1-2839¼D** Twirler
P **2841⅛D** Inside sliding clutch
Q **2881B** Compression spring for "P"
R **1-2849D** Ratchet wheel assembly
S **2886½** Spring
T **203560** Pin, 2 required when gear is used on each end of shaft
4850Z Oversize pin for large hole
U **4830X** Small gear on platen shaft
2830½BZ Small gear used on left end of platen shaft when so equipped
V **63** Pin, 2 required, one on each end of platen
W **1AZ-2898¼ Style H or K Specify Carbon,** platen without shaft and gears
4800¼AZ Style H or K, Platen shaft drilled with four pin holes for replacements
1-4800¼B Style H or K Specify Carbon, Platen and shaft assembled with small gear on each end
11-4800¼B Style H or K Specify Carbon, Platen and shaft assembled with small gear on right end
4832¾ Long collar on left side of platen shaft used on carriages without bell
X **4881B** Coil spring under cap "Y"
4881A Clock spring under cap "Y"
Y **4810C** Metal cap for spring "X"
Z **4858A (8858B)**
AA **47** Nut
8846 Washer
AB **1-4819BR** End plate with gear for "D"
AC **4893B** Gear wheel
AD **4882** Spring for "D"
AE **1A-2825¼BR** Right paper guide
1A-2825¼BL Left paper guide

SEE EXPLANATION ON INSIDE OF FRONT COVER

UPFEED TALLY ROLL MECHANISM (Plate 24)



SYMBOLS (Plate 24)

2-44110 is complete assembly without Rewind Device

2-44120 is complete Rewind Device

A **1-44134L** uses 44800 spring
B **1-44120**
C **2850¾ (2855⅝)** Screw **44513** Bushing
D **44504**
E **1-44132 Style 9, 13**
F **44122** Pawl
G **1-44129** Ratchet
H **83880 (71806)** Spring
I **1-44141A**
J **1-44525**
K **44140**
L **44130**
M **44142 Style 9, 13** use 44808 spring
N **8052**
O **44406**
P **44807**
Q **12060½ and 46**
R 1-44135*
S **1-44137 Style 9, 13**
T **44804**
U **7357½**
V **1-44119**
W **1-44111R Style 9**
1-44111R Style 13 use for Styles 11, 13, 15, 17
X **44405**
Y **44524**
Z **44806**
AB **44886 (44808)** Spring
AC **1-44131**
AD **1-44007** includes knob 44400*, ratchet 1-44129* and platen 1Z-44998
AE **44003 Styles 9, 11, 13, 17**
AF 1-44138*
AG **1-44111L**
AH **1-44004 Style 9, 11, 13, 17** includes "R" and "AF"
11-44004 Style 11, 13, 17 includes "R" and "AF"
AI **1B-503 Style 9, 11, 13, 17** Specify machine No.
AJ **1-44006**
AK **44512**
AL **1-44110** includes AM
AM 1-44114*
AN **44133**
AO **1-44001 Style 9 (1-4401A Style 9)**
AP **1-44008**

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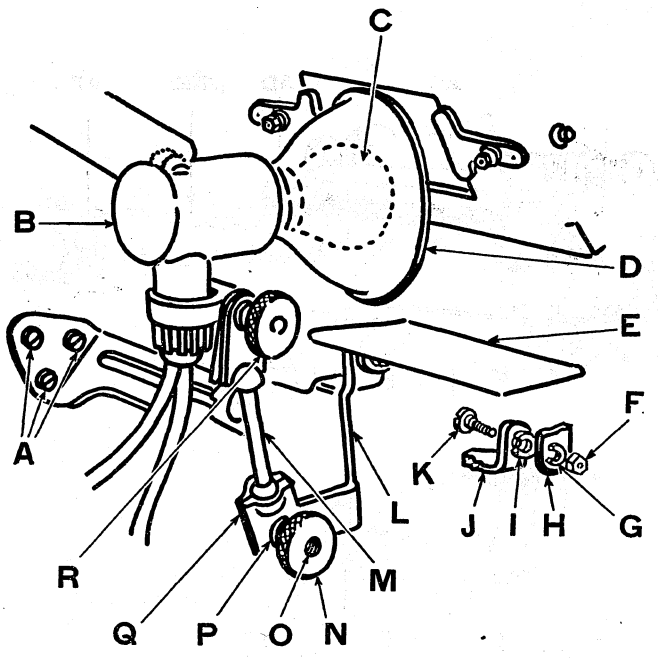
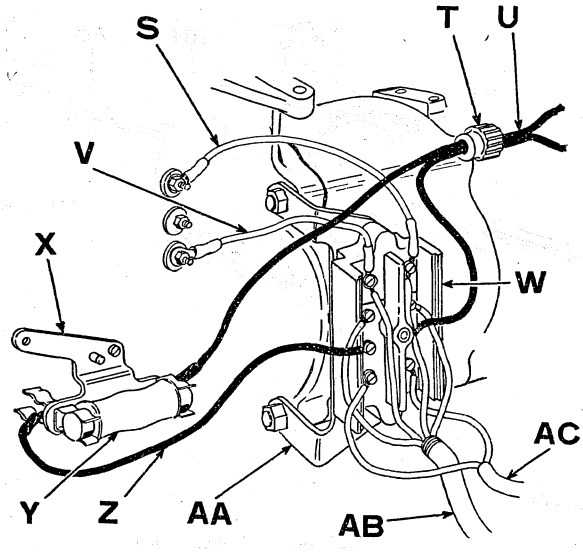
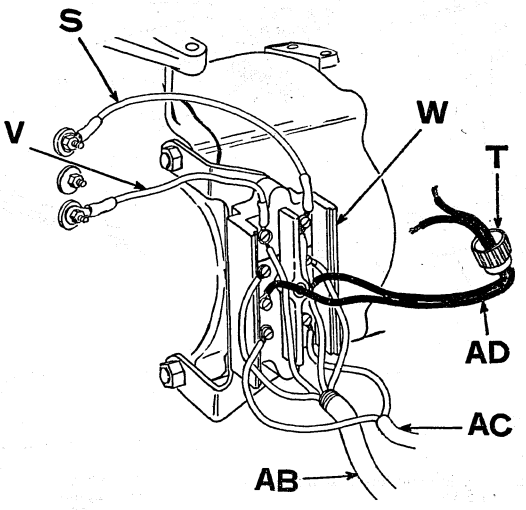
ALIGNING REFLECTOR LAMP (Plate 25)





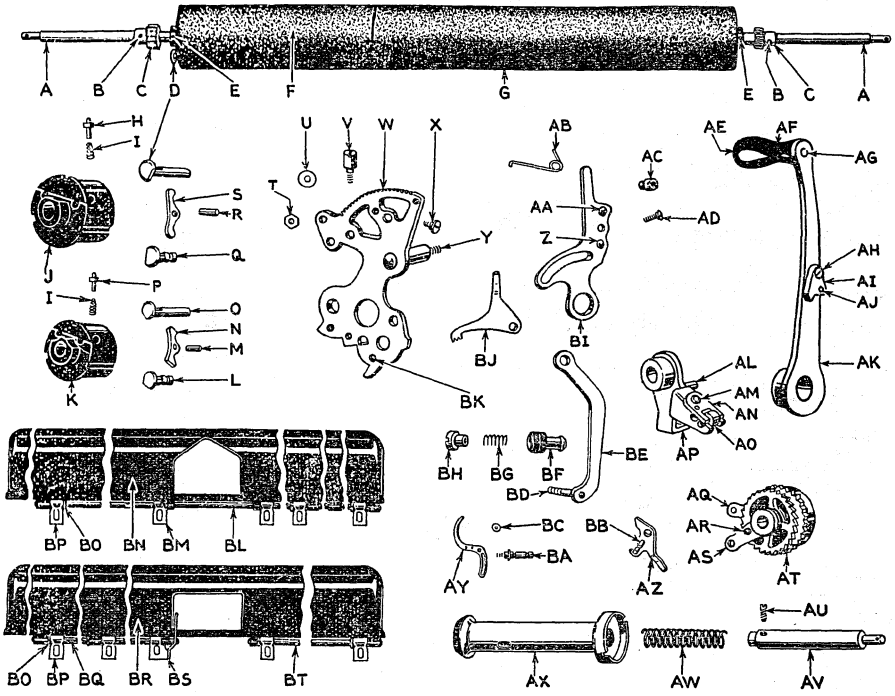


SYMBOLS (Plate 25)

A **2856⅞**
B **1-200925A** includes D
1Z-200925A Socket only
C **200906 No. 1**
D **200194A**
E **200196**
F **46**
G **1097¼**
H **200196**
I **200204**
J **200198BR**
K **12051¼**
L **200198BR**
M **200581 No. 2**
N **200570A**
O **200582A**
P **1417**
Q **200228**
R **200570A**
S **1-3673A No. 2**
T **200927A**
U **1-200907C No. 2**
V **1-3673A No. 1**
W **1-70903** use two 3455⅜ screws and two washers 1097¾
X **1B-200201**
Y **1B-200911 Specify resistance,** see chart, Plate 3-1 Series "H" Power Symbol List
Z **200908 No. 2**
AA **3611½**
AB Cable from motor
AC Cable from line
AD **1-200907B No. 1 (1-200907C No. 1)**

SEE EXPLANATION ON INSIDE OF FRONT COVER

SPLIT AND NORMAL PLATEN (Plate 26)



SYMBOLS (Plate 26)

A **11-4900C** Shaft WITH gear furnished with complete platen, refer to "G"
1-4900C Shaft WITHOUT gear having collar pinned to shaft in place of gear furnished with complete platen, refer to "G"
B **203560** Pin used as shown
64 Pin, used with collar 2832⅛AZ when used for replacements
C **4830X** Gear, use 64 pin
2832⅛AZ Collar, used for replacement of gear, use 64 pin
D **4958C** Plunger
E **63** Pin
F 1-4998½* Platen, furnished with "G"
G 1-4998* Platen furnished with following assemblies
21-4900C Style H, Split 3¾", 5" or 6" Specify Carbon } Complete assembled platen for Classes 11 thru 16 S&N
21-4900C Style K, Split 3¾", 5", 6" or 8" Specify Carbon } carriage, split right or left with I&E right and left
31-4900C Style H or K, Split 3¾" Specify Carbon, Complete assembled platen, collar 2832⅛AZ replaces gear "C," for Classes 1 thru 16 S&N carriage, I&E on one end only. Reverse platen for I&E on opposite end
41-4900C Style H or K Split 6" Specify Carbon } S&N on left I&E on right
41-4900C Style K Split 8" Specify Carbon } Same description as above item
51-4900C Style K Split 6" Specify Carbon, Complete assembled platen for Classes 1 thru 16 with S&N with I&E on right. Reverse for S&N and I&E on left
H **4964** Shoulder pin
I **4980A** Spring
J 1-4944C* Assembly in end of platen includes "D," "H," "I," "Q," "R," "S" for Classes 1, 2 and 6, S and N carriage, furnished with assembled platen
N **4915 No. 2** Rocker arm
Q **4958⅜** Plunger
R **4950¾** Pin
S **4915B** Rocker arm
T **47** Nut
U **8846** Washer
V **4858A (8858A)**
W **1-4919⅛L** Includes studs and hub
2-4919⅛L Assembled end plate, includes "T," "U," "V," "X," "Y," "Z," "AA," "AB," "AC," "AD," "BI," "BJ," "BK"
X **4863** Shoulder screw
Y 4952B* Shoulder stud
Z 4861* Stud

AA 4857* Stud
AB **4982½** Spring
AC **4837A** Shoulder screw
AD **4862A** Screw
AE **73612** Screw
AF **4891A** Rubber grip
AG 4853A* Stud for rubber grip
AH **4857½** Screw
AI **1-4992B** Pawl
AJ **4858½A** Stud in "AI," use flat forked spring 4818
AK **1A-4911B** Lever assembly on left end of platen for I and E mechanism
4981¾ Coil spring used inside of cap to move lever
AL **3459⅛** Stud
AN 2822¾B* Punching
AO 2841¾B* Roller
2858 7/16A* Pin
AP **1-4916A No. 1** Detent assembly, includes parts attached, use spring 2886¾
11-4916A No. 1 Same as above item except is without stud "AL," use spring 2886⅞
AQ 2813½A* Furnished with assembly
AR 2852⅜* Furnished with assembly
AS 1-2813½A* Furnished with assembly
AT **1-4949C** Ratchet wheel assembly
AU **4950 1/16A** Screw
AV **4900 1/16** Shaft
AW **2881B** Spring
AX **1-4941 1/16** Extension twirler
AY **4914¼A** Slotted cam
AZ **1B-4922** Feed pawl
1-4922 No. 2 Feed pawl, same as above item except upper part is cut vertically in place of angle cut as shown
BA **2856½B** Stud
BB **2850½** Stud
BC **7919½A** Washer
BD **2853⅞** Stud
BE **1-4922⅛** Includes stud
BF **2847** Knurled knob
BG **2888** Spring
BH **2845½** Shoulder nut
BI **1-4912½** Lever includes studs and is included with "W"
BJ **4913C** Spacing pawl
BK **2851⅜A** Spring stud
BL **4906¾A Style 11 or 13 H** Shaft
4906¾A Style 11, 13, 15 or 17 K Shaft
2806 Style 17 Shaft for Style 17 H
BM **4912¾** Hinge (one required)
BN **1-4910¾AR Style 11, 13 or 17 H or K** Assembled line finder with opening on the left side
1-4910¾AL Style 11, 13 or 17 H or K Assembled line finder with opening on the right side
1-4910¾AR or AL Style 11, 13 or 17 H or K No. 2, Same description as above except has extension on either right or left end
BO **470** Wire ring (one or more required)
BP **2812¾B** Hinge (one or more required)
BQ **4906⅝L Style 11 or 13 H**
4906⅝L Style 11, 13, 15 or 17 K
BR **1-4910 9/16R Style 11, 13 or 17 H or K** Assembled line finder with opening on left side
1-4910 9/16L Style 11, 13 or 17 H or K Assembled line finder with opening on right side
1-4910 9/16R Style 13 K No. 2 Assembled line finder with 2" extension, left end, with opening on left side for special forms
BS **2812⅞L** Hinge (one required)
BT **4906⅝R Style 11, 13, 15 or 17**

SEE EXPLANATION ON INSIDE OF FRONT COVER

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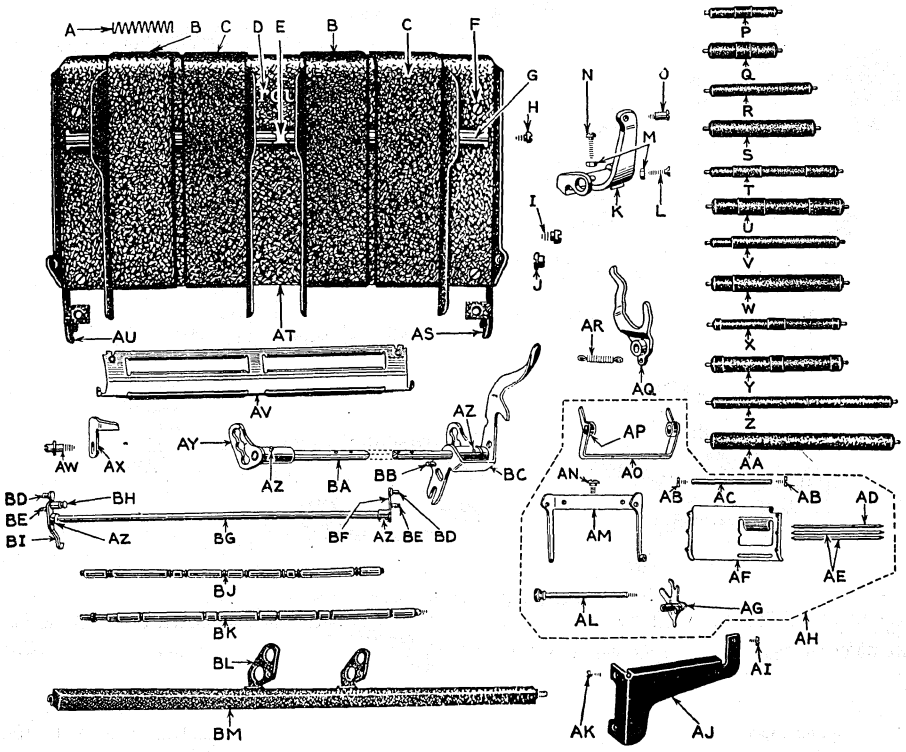
SPLIT AND NORMAL PLATEN (Plate 27)

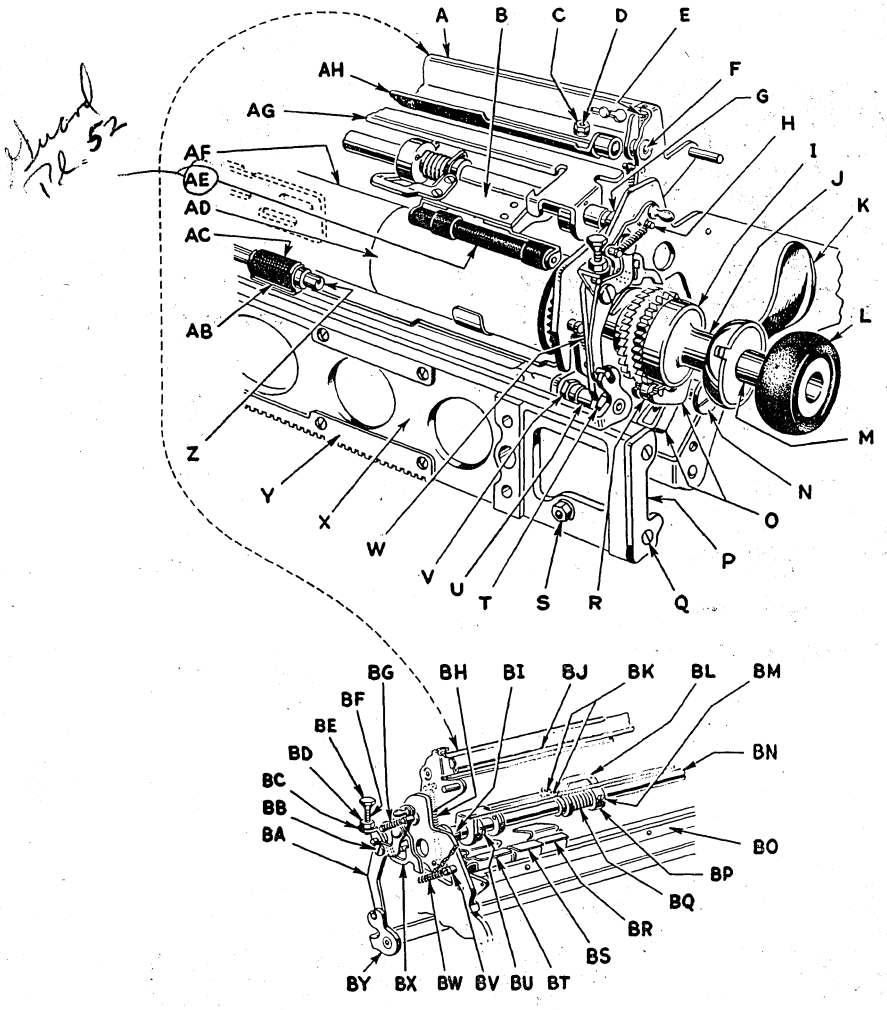


SYMBOLS (Plate 27)

A **2889¼A** Spring (4 req.)
B **1A-2825¼BL** Paper guide (2 req.)
C **1A-2825¼BR** Paper guide (2 req.)
2898A Upper billiard cloth
2898⅜ Lower billiard cloth, use cement Code 7647-2
D **91A No. 1** Transfer
E **1-2819½A** Floating brace
2897 Billiard cloth (2 req.)
F **2859⅞** Bevel head screw (6 req.)
46 Nut (6 req.)
G **2809½ Style H, K, 24**
H **3256⅛** Screw for "G"
I **2858¼A** Screw (2 req.)
J **2838¼A** Round head slotted nut (2 req.)
K **4926⅞A** Brace on back of carriage supporting shaft "BG"
L **4952⅞A** Bevel head screw
M **46** Nut
N **2850⅜A** Screw
O **12057⅝** Screw
P **1-4902B Length 3¾"** Pressure roll, length of rubber 2 13/32"
Q **1-4991½B Length 3¾"** Pressure roll, length of rubber 2 17/32"
R **1-4902 Style 8K** Pressure roll, length of rubber 3¾"
S **1-4991½ Style 8K** Pressure roll, length of rubber 3⅞"
T **1-4902⅛ Style 6** Pressure roll, length of rubber 4 1/16"
U **1-4991⅛ Style 6** Pressure roll, length of rubber 4 1/16"
V **1-4902A Style 5** Pressure roll, length of rubber 4 45/64"
W **1-4991½A Style 5** Pressure roll, length of rubber 4 1/16"
X **11-4902⅛ Style 6** Pressure roll, length of rubber 4 45/64"
Y **11-4991⅛ Style 6** Pressure roll, length of rubber 4 1/16"
Z **1-4902½ Style 8K** Pressure roll, length of rubber 6 19/32"
AA **1-4991½B Length 8⅝"** Pressure roll, length of rubber 7⅜"
1-4991¾ Style 8K Pressure roll, length of rubber 6 23/32"
AB **2850⅜** Screw
AC **2802¼** Shaft
AD **2801½** Shaft with groove
AE **2803½** Shaft, plain
AF **2810⅛** Punching
1-2810⅛ Assembly includes "AE" and "AG"
AG **1-2812⅛** Includes the following items:
2813⅛ Lever
2880⅛ Spring
2852⅝ Pin
AH **2A-4911½L** Complete paper holder
AI **2857⅞ (4857½)**
AJ **4918¼R or L Style 13 H or K**
4918¼R or L Style 17 K
4918¼R or L No. 2 Style 17 K
AK **2851⅞** Screw (2 req.)
AL **1-2800 (1-83001 Style 12¼)**
AM **1-2811⅛** Bracket
AN **2851⅞** Screw (2 req.)
AO **1-4910¼** Bracket
AP **550¾** Screw
AQ **1-2828¾L No. 1 (11-2828¾L No. 1, 203423 No. 2)**
AR **44810** Spring
AS **4926¾BR** Bracket
AT **1-4925¾C Style H or K** Complete assembled high back
1-4925¾ Style 24 Complete assembled high back
AU **4926¾BL** Bracket
AV **1-4925R or L 8K** for 8" split
1-4925 6⅜ Style H or K for 6" split
1-4925AR or AL Style 3¾ H or K for right or left split 3¾"
AW **2852¼** Shoulder screw stud
AX **4924⅝A** Adjustable stop
AY 1C-4916⅛*, 2 Position space arm
1C-4916¼*, 3 Position space arm
AZ **52** Pin
BA **1-4903¼D Style 12, 15, 18, 24** Platen feed shaft, 2 position
11-4903¼D Style 12, 18, 24 Platen feed shaft, 3 position
21-4903¼D Style 12, 15, 18 Platen feed shaft, 2 position, Type 20 SACT
BB **2863½** Spring stud
BC **1A-2826E** Lever
BD **12056¼ (4963½)** use 7357½ screw
BE **12063½ (4962½)** Spring stud
BF 1-4925½A* Furnished with "BG"
BG **1A-4900¾A Style H or K** Shaft assembly for Classes 1, 2 and 6 with MRC and S&N carriage
11A-4900¾A Style K for right hand split, double toggle feed
11-4900¾A Style 24
BH **12054⅞Z** Large stud
BI 1-12025½A* Furnished with "BG"
BJ **4907B Style H or K**
4907 Style 8 K for 8" split
4907 Style 24
BK **4908B Style H or K**
4908 Style 8 K for 8" split
4908 Style 24
BL 2817¼A*
BM **1-4901C Style H**

SEE EXPLANATION ON INSIDE OF FRONT COVER

SPLIT PLATEN FOR BANK POSTING MACHINES (Plate 27-1)



SYMBOLS (Plate 27-1)

A **1-203247¼ Style 15**
B **1-203205 (3½) No. 2**
C **46¼**
D **4557A** screw
E **2887½** spring
F **52521** screw
G **35 Fte. 69** collar
H **203555½** spring anchor screw
I **1-2849D**
J **2841⅛D**
K **1A-2826E** use 52 pin
1-4903¼DR&DL Style 15 complete shaft assembly, includes K
L **2896¼ No. 3** brown
M **21-2839¼D** includes L
N **2857½C**
O **1-2816A No. 1** includes R
P **4918R&L**
Q **4952⅛**
R **2841¾B** roller, use 2858 7/16A pin
S **46** nut, use 2859⅝A square head screw
T **203310R&L** shoulder nut
U **328B Fte. 213** collar
V **535D Fte: 213** screw stud
W **1-203800 No. 6** spring
X **2865 Style 17K No. 3**
Y **2824⅞ Style 17** (12) use 2854 9/16 screws
Z **1-18A Fte. 213** (12)

AB **1-109R&L Fte. 213 No. 3** bracket, use 12058⅜ screws
AC **1-332 Fte. 213 No. 4**
AD 1-4998½ (2⅞) 15 No. 2, 2 carbon* included in AF
AE **1-203024 (3½) No. 2** use 203543 screw
AF **2-4900C 2⅞ x 12⅛ 2 carbon** complete assembled platen, includes AD
AG **1A-203200 Style 15**
AH **1-203247B Style 15 No. 5**

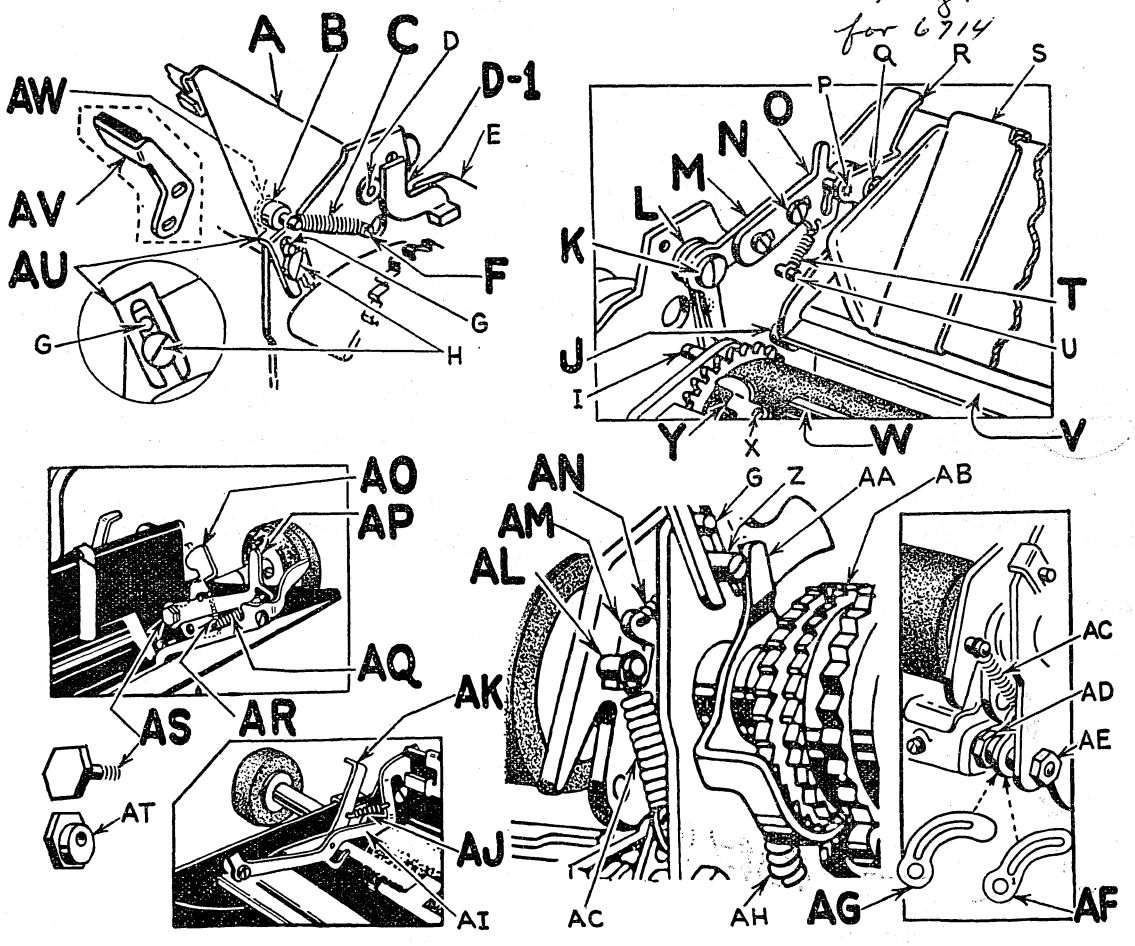
BA **1-203298**
BB **99539A**
BC **203183½R&L** bracket
BD **47¼**
BE **1-203497**
BF **203552½** screw

BG **480B**
BH **10788** spring
BI **203423 No. 2** collar
BJ **1-203131 Style 15 No. 2**
BK **203502½** screw, use 49¼ nuts
BL **203227½ No. 2**
BM **203557½** screw
BN **203029 (15) No. 2** shaft only
1-203029 (15) No. 2 Style 30 17 07 complete assembled tear-off blade; includes B, AG, BK, BL, BN, BP, BQ
BO **203030A Style 15 No. 3**
BP **1-203470L** collar, includes BM
BQ **203810AL No. 4**
BR **1-203272½L No. 7**
BS **1-203272½ No. 7**
BT **1-203272½R No. 7**
BU **703513½ No. 2** screw
BV **203637**
BW **1-203800 No. 6**
BX 1-203299* included in BA
BY **203299½ Style 15**

VISIBLE ALIGNING BAIL (Plate 29)

25 1/8 Fte 75
Gerard
25 1/16 Fte 75
Finger
for 6714

(Plate 28 is in "Carriages" Instruction Book only)



SYMBOLS (Plate 29)

A **1-203110C No. 4 Style 12, 15 or 18 (1-203110D No. 4 Style 12, 15 or 18)** aligning table for type 20 carriage
2-203110C No. 4 Style 12, 15 or 18 (2-203110D No. 4 Style 12, 15 or 18, 203246A, 203246½ No. 1, 506 Fte. 414, 952¾ (2 req.), 203398, 83802) includes studs and hubs

B **203570AL** Shoulder spring stud
C **10080** Spring
D **203524 No. 2** Shoulder screw
46 Nut

E 11-203118DR* Included in shaft assembly 11A-203006A Style 12, 15 or 18

F **7064⅜** Spring screw stud
G **7264** Stud
H **203569 (506 Fte. 209)**
I **203502** Spring stud, use spring 203800 No. 5

J **203472 No. 4** Roll
10750 3/16 Style 9 Screw
K **79581** Screw
L **203398** Shoulder collar

M **203246½ No. 1 (203246½ No. 2)**
203246½ No. 2 Punching for Type 20, full visible alignment carriage with bill magazine and geared pressure rolls
203246½ No. 3 Punching for Type 20, full visible alignment carriage with bank pressure roll construction

N **952¾** Screw (2 required)
O **203246A** Punching
P **203626** Spring stud
Q **203627** Shoulder screw
R 203247AR* Furnished with "V"
S **1-203114AR No. 7 (1-203114BR No. 7, 203479, 4557¼)**
203997A No. 3 Billiard cloth, use cement code 7647-2
T **83802** Spring
U **104591 (508 Fte. 149)** Spring stud
V **1A-203247 Style 12 or 15 (1-203247A Style 12 or 15)**
1A-203247 Style 18 (1A-203247B No. 3 Style 18) Aligning bail assembly

W **203024 Specify length 3½, 6, 9, 12, 15, 18** Roller shaft
X **77515** Screw
Y **203227½** Finger piece punching
Z **4462** Screw stud
AA **203113 Env. 1671** Punching
AB **1-4949C Env. 1671** Wheel assembly
AC **1-203800 No. 6** Spring assembly
AD **535C Fte. 213** Hexagon shoulder stud
AE **47¼** Nut
AF **203287R or L No. 1** Punching for Type 20 carriage except bill ejector or bill magazine const.
325B Fte. 213
302124 No. 2 (300153½)

AG **203287 No. 4** Punching for Type 20 bill ejector, bill magazine or geared pressure rolls

AH **75814** Spring
AI **1-203248AR**
1-203248AL (1-203248BL)
AJ **10086** Spring
AK **203249** Lever, for Type 20 full visible alignment bank posting machine
AL **203502** Spring stud
AM **100 Env. 1671** Lever, used on triple spacing carriages with visible aligning bail **only**, refer to plate "Triple Spacing" "B" for other construction
AN **79810** Spring
AO **1-203245A** Lever
203814 Spring used with lever
AP **1-203246** Lever
AQ **44808** Spring
AR **203814** Spring
AS **203624A** Screw
AT **72307** Eccentric shoulder nut
AU **203183A** Punching
AV **1-235R Fte. 203** Bracket acting as limit stop, specify L when used on left end
7357½ Screw used for bracket
AW **203443** Washer

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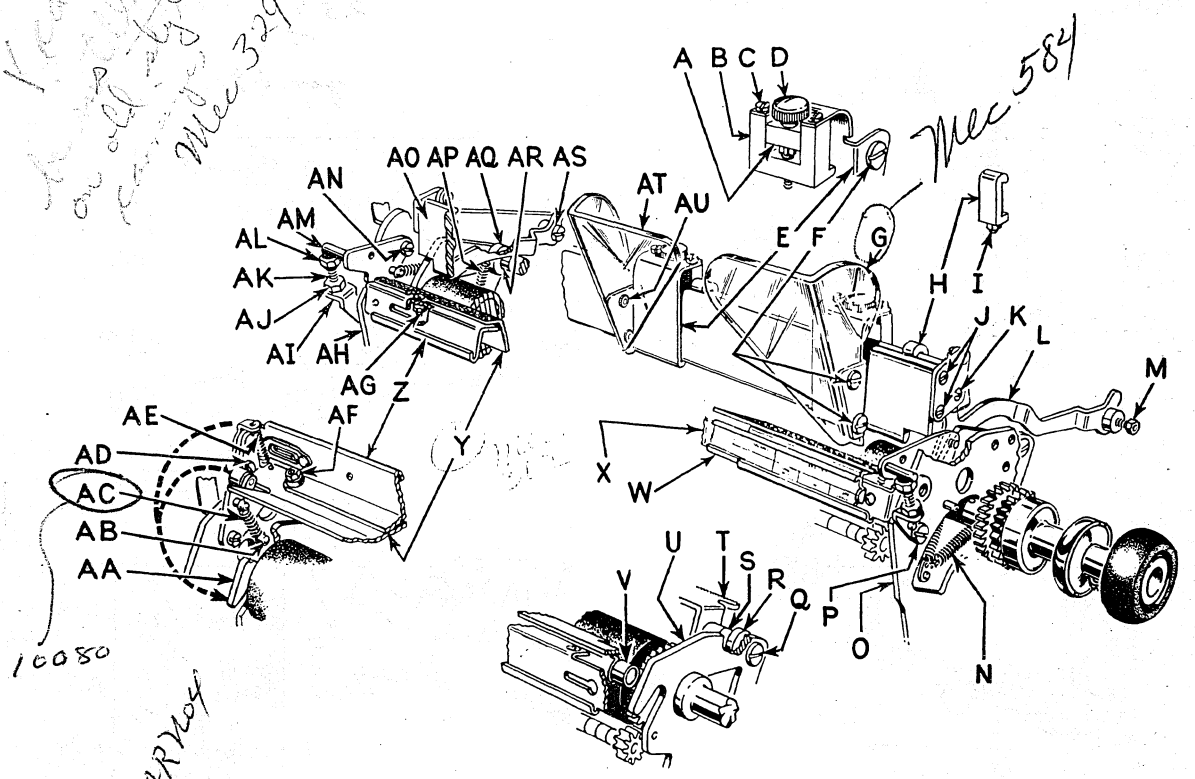
VISIBLE ALIGNING BAIL—IMPROVED BANK POSTING MACHINE
(Plate 29-1)

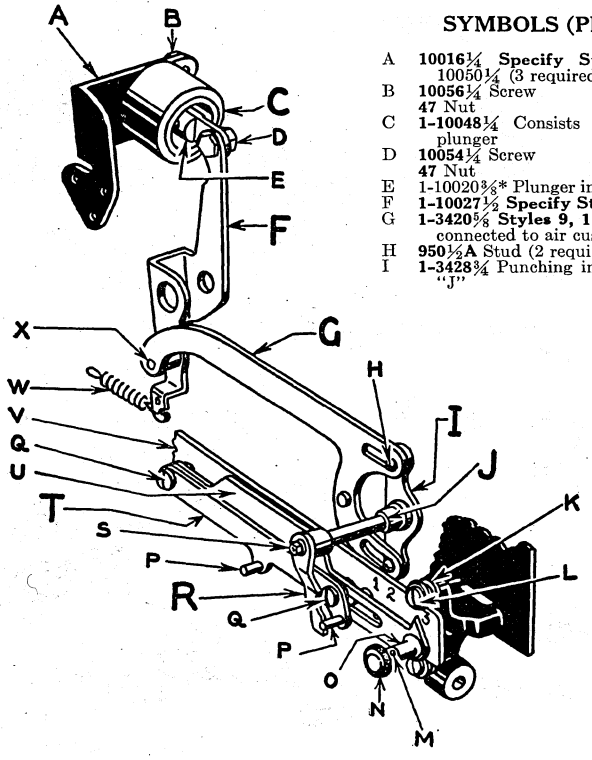


SYMBOLS (Plate 29-1)

A **1-403908** Includes D
B **403911**
C **16351A**
D **403514**
E ~~**403108L&R**~~
F **506 Fte. 209**
G **203237R No. 4**
H **403920**
I **403546** Screw
J **3952½**
K **3952½** Screw, use 1097¾ washer, 46 nut
L **1-203248R&L No. 2**
M **46¼**
N **1-203800 No. 6**
O **11-203118ER**
P **506 Fte. 209**
Q **73564A**
R **35 Fte. 69**
S **203423 No. 2** Collar
T **1A-203200 Style 15** Tear-off blade
U **1-158R Fte. 213 No. 2**
V 203311* Included in Y
W **1-203131 Style 15 No. 2**
X **403906 Style 15**
Y **1-203247B Style 15 No. 5** Includes ¼V
Z **1-203247¼ Style 15** Includes AM
AA **1-158L Fte. 213 No. 2**
AB **72574** Spring stud
AC **10788**
AD **52521** Screw
AE **2887½**
AF **46¼** Nut
AG **4557A**
AH **11-203118EL**
AI **203183½L&R**
AJ **47¼**
AK **203552½**
AL **1-103358A**
AM 9054¾* Included in Z
AN **73644 No. 2**
AO **203239 Style 15 No. 3**
AP **705828** Spring
AQ **103176**
AR **203423 No. 2** Collar
AS **203625 No. 3**
AT **203237L No. 4**
AU **403343** Insert

AIR CUSHION FOR SHUTTLE CARRIAGE (Plate 33)

(Plates 30, 31 and 32 are in "Carriages" Instruction Book only)



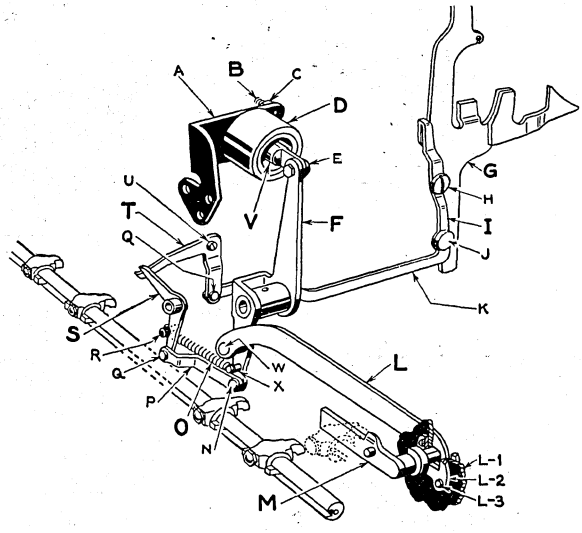
SYMBOLS (Plate 33)

A **10016¼ Specify Style** Use rivets 10050¼ (3 required)
B **10056¼** Screw
47 Nut
C **1-10048¼** Consists of cylinder and plunger
D **10054¼** Screw
47 Nut
E 1-10020⅜* Plunger included with "C"
F **1-10027½ Specify Style** Arm
G **1-3420⅝ Styles 9, 11, 13 or 17** Link connected to air cushion
H **950½A** Stud (2 required)
I **1-3428¾** Punching includes "H" and "J"
J 3452¾A* Long stud
K **3449½** Roller (4 required)
L **3456¼** Screw for "K" (4 required)
M **3456½** Pin
N **3441** Knurled knob
3461 Plunger
3482 Spring
O 3444* Hub
P **350⅜** Stud
3450½ Style 9 for SKS const.
Q **3455⅜** Screw (2 required)
R **3427¼** Punching
S **46** Nut
T **1-3418⅝ Styles 9, 11, 13 or 17 or SKS** includes "P"
1-3418⅝ Style 15
U **1-3418½ Styles 9, 11, 13 or 17 or SKS** Slide includes "M," "N," "O"
1-3418½ Style 15
V **1A-3418 Style 9, 11, 13 or 17** Slide assembly, includes "T," "U" and all parts attached
For Class 2 SKS, £.s.d. or £.s.d.f. shuttle carriage const.
1A-3418 Style 15
1A-3418¼ Styles 9, 11, 13 or 17 Slide assembly, includes "T," "U" and all parts attached
For Class 1 SKS, £.s.d. or £.s.d.f. shuttle carriage const.
1-3418¼ Style 15
Use small spring 10085 and large spring assembly 1-3484½
W **10085½** Spring
X 10044½* Threaded bushing
8054¾ Screw

AIR CUSHION ON INSIDE OF BACK PLATE, CLASSES 6, 11 THRU 16 AND CLASSES 20 THRU 30 (Plate 34)

SYMBOLS (Plate 34)

A **10016¼ Specify style** Use 10050¼ rivets, 3 required
B **10056¼** Screw
C **47** Nut
D **1-10048¼** Consists of cylinder and plunger
E **10054¼** Screw, **47** nut
F **2-10027½ Style 17** Includes "X," "N," "P," "Q," "S," use for Styles 11, 13 or 15
G **11-3627 No. 1** Includes studs and lower threaded part
H **10057¼A** Screw, 46 nut
I **1A-10025¾ (1-10025¾A, 10057¼B)** Includes "J," "K," "Q," "T," "U"
J **7050⅞** Rivet stud
K **10025½** Link
L **1-10020¼ Style 9** Link used for Style 9 SACT without variable hammer block
1-10020¼ Style 9 or 11 Link used for Class 2 crossfeed ribbon, upfeed TR, SACT const. with air cushion
1-10020¼ Style 15
1-10020¼ Style 13 or 17 for Class 2, 6, 11 thru 16, crossfeed ribbon, upfeed TR, SACT const., back plate equipped with one punching "L-1"
1-10020¼A Style 9 for Class 2, 6, 11 thru 16, crossfeed ribbon, upfeed TR, SACT const., back plate equipped with two punchings "L-1"
L-1 **10024⅛ No. 2** Punching on inside of back plate
L-2 **10024⅛** Punching on outside of back plate
L-3 **108576** Stud (2 required) when "L-2" is used alone
10054¼A Stud (2 required) when "L-1" and "L-2" are used together
M **1A-10023⅛A** Stop block for Class 11 thru 16 with non-tabulating carriage



1B-10023½ (1-10023½A, 1-12014⅞ No. 2, 10788, 12044¾B, 12059½A) Stop block for Class 1, 2, 6, 11 thru 16, Type 20, SACT
N **650A** Rivet stud
O **10085½** Spring
P **10026¾** Link included with "S"
Q **16655** Shoulder stud
R **10060¼** Stud
S **1-10026¼** Includes "P," "Q"
10454 Screw holding "S" to back plate
T **10025¼** Punching included with "I"
489 Spring for "T"
U **10058¾** Screw
V 1-10020⅜* Plunger included with "D"
W 10044½* Threaded bushing
8054¾ Screw for bushing
X **7564** Spring stud

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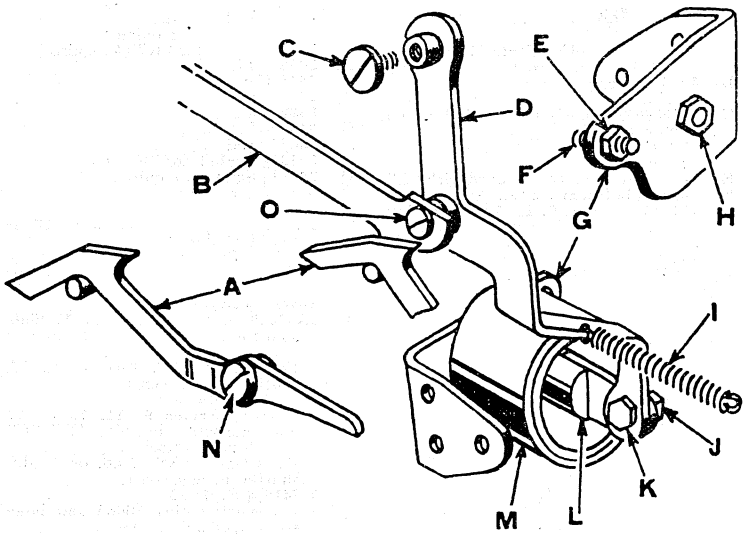
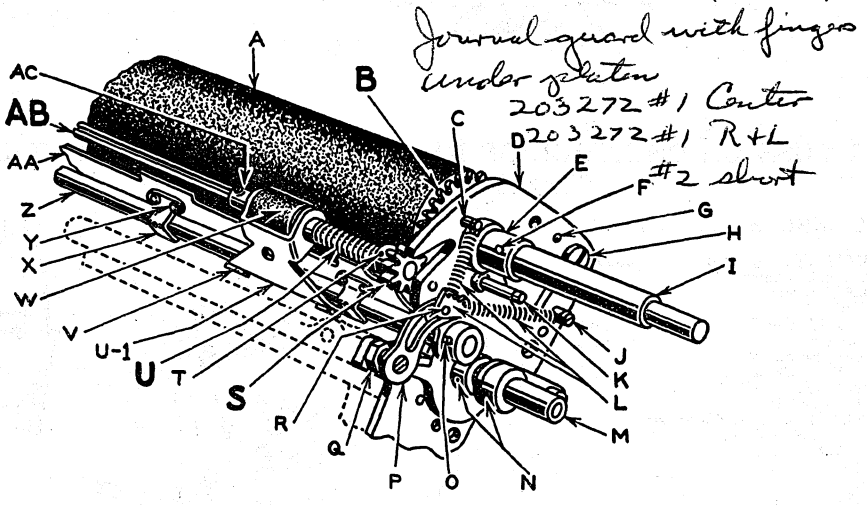
AIR CUSHION ON OUTSIDE OF BACK PLATE, CLASSES 20 THRU 30 (Plate 35)



SYMBOLS (Plate 35)

A **1-122A Fte. 217**
B **1-126B Fte. 217 Style 13, 17**
C **8054¼** Screw
D **1-124 Fte. 217**
E **47** Nut
F **10056¼** Screw
G **125 Fte. 217** Punching
H **393** Nut
I **10085½** Spring
J **47** Nut
K **10054¼** Screw
L 1-10020⅜* Part of M
M **1-10048¼** Cylinder and plunger assembled
N **10454** Screw
O **7357½ for Style 13**
12051⅞ for Style 17
Not shown—1-12012½ Style 13, 17 No. 22, back plate for Rotary Consecutive Numbering Device

GEARED PRESSURE ROLL CARRIAGE CONSTRUCTION (Plate 36)



Journal guard with fingers under platen
203272 #1 Center
203272 #1 R+L
#2 short

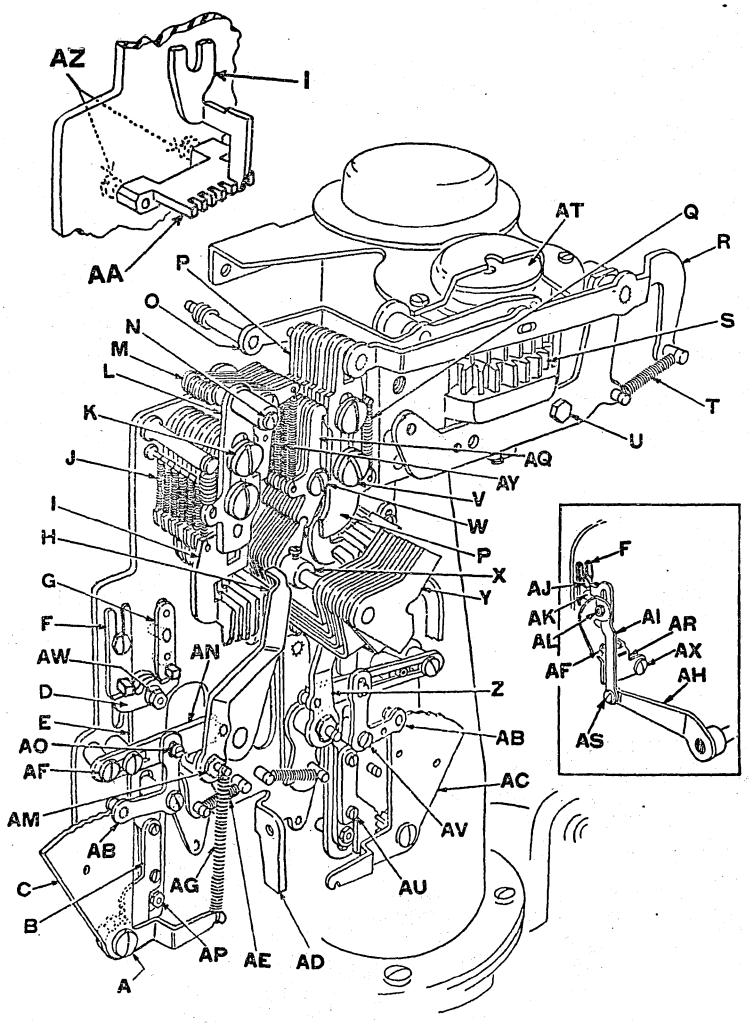
SYMBOLS (Plate 36)

A **21-203998 No. 2 Style 12, 15 or 18 Specify Carbon (11B-203998 No. 2 Style 12, 15 or 18 Specify Carbon)** Platen and shaft assembly for geared pressure rolls
B 1-203338 No. 2* Geared hub
51 Pin
C **203502** Spring stud
D 1-158R Fte. 213* Right end plate, furnished with "M"
1-158L Fte. 213* Left end plate used, furnished with "M," on opposite end
E **2832⅛AZ** Collar furnished with A
F **203560** Pin
G **203592A** Spring stud
H **73564A** Screw
I 2800¼B* Style 12¼" or 18" Shaft, furnished with "A"
203010* Style 15 Shaft furnished with "A"
J **203637** Screw spring stud
K **203503** Spring stud
L **1-203800 No. 6** Spring assembly, includes two springs and punching
M **1A-2A Fte. 213 Style 12 (21A-2A Fte. 213 Style 12, 203029 Style 12 or 1-203029 No. 2 Style 12, 950¾, 203423 No. 2)**
1A-2A Fte. 213 Style 15 (21A-2A Fte. 213 Style 15, 203029 Style 15 or 1-203029 No. 2 Style 15, 950¾, 203423 No. 2)
1A-2A Fte. 213 Style 18
N **64** Pin
O **52** Pin
P **203287R No. 1** Punching
203287L No. 1 Punching used on left end
328B Fte. 213 Collar used with punching
302124 No. 2 (300153½) Washer
Q **535C Fte. 213** Hexagon shoulder stud
R **53528** Spring stud, part of "Z"
S 338A Fte. 213* Gear furnished with "AB"
T **99513** Pin
U **73814** Spring
U-1 **1-109 Fte. 213 No. 3 R or L** Supports for pressure roll shaft, 2 or more required
V **7357½** Screw (2 required)
W **1-332 Fte. 213 No. 4** Rubber pressure roll (2 or more required)
X **203109A** Flat spring (4 required)
Y **203508** Rivet (8 required)
Z **21-4A Fte. 213 Style 12", 15", 18"** Shaft with punching on each end
AA **1-203108B Style 12", 15", 18"** Shield with springs "X" attached
AB **1-18A Fte. 213 Style 12", 15", 18"** Geared shaft supporting pressure rolls
AC **1A-339 Fte. 213** Collar (2 or more required)
544 Fte. 213 (570A Fte. 203) Screw in collar

SEE EXPLANATION ON INSIDE OF FRONT COVER

MULTIPLE SKIP—RETURN MECHANISM, CLASSES 20 THRU 30 (Plate 37)

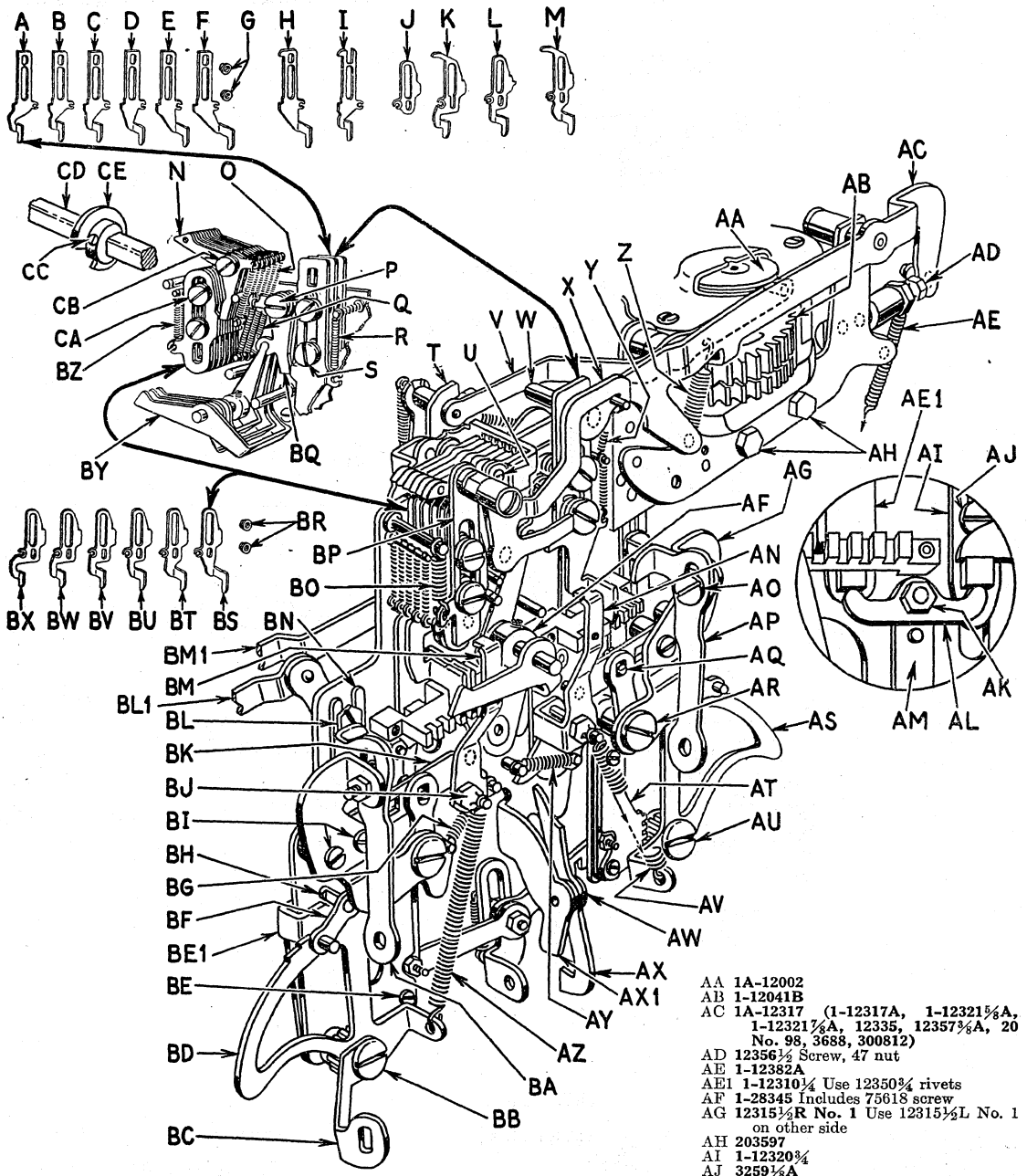
Mec 286 - easy clutch release parts



SYMBOLS (Plate 37)

A **8054¾** Screw
B **12312½**
C **1-12312¼L No. 1**
D **12311½**
E **1-12312¾**
F **1-12320¾**
G **1-12310¼**
H **1-12314½L (1-12314½AL, 295)**
I **12311 Nos. 1 to 7**
J **12381**
K **8054¾** Screw
L **1-12313**
M **12312 Nos. 1 to 6 (12312A Nos. 1 to 6)**
N **200352** Sleeve, **73611** Screw
O **1-12015 No. 2**
P **12314 Nos. 1 to 7**
Q **12381**
R **1-12317 (1A-12317¼, 12317⅜, 1-12317A, 1-12321⅝A, 1-12321⅞A, 12335, 12357⅜A, 20 No. 98, 3688, 300812)**
S **1-12040A Env. 1358**
T **12382**
U **203597**
V **8054¾**
W **8054¾**
X **1-8345** Collar includes screw **8359**
Y **12315 No. 1, 2, 3, 4, 5 or 6** Specify position
Z **1-12314½R (1-12314½AR, 295)**
AA **12390**
AB **1-12311¾R or L No. 1 (1-12311¾ AR or AL)**
AC **1-12312¼R No. 1** Specify position
AD **1-12310½ (1A-12310½, 1-12314½ AR and AL)**
AE **82809** Spring
AF **73611** Screw
AG **7382A**
AH **1-200004 Style 17 No. 9**
AI **12315¾R No. 1**
AJ **12059½** Screw
AK *Stud included with "F"
AL **7950¼ (12356¼)** Screw **46** Nut
AM **71614** Hexagon head screw spring stud
AN **12313¼ No. 1**
AO **12353½** Screw, **49¼** nut
AP **12354** Screw, **75210** washer, **49** nut
AQ **12314¼**
AR **12315½R No. 1**
AS **12355¼** Eccentric shoulder screw
AT **1-12002 No. 1 (1A-12002, 1-12041BZ, 12040 No. 1)** Clutch, includes 12080 spring
AU **73563** Screw
AV **3455⅜** Screw
AW **12353¾** Shoulder screw, **46** nut, **75210** washer
AX **3455⅜** Screw
AY **12380**
AZ **12058⅜**

MULTIPLE SKIP—RETURN MECHANISM, FRONT VIEW
CLASSES 20 THRU 30 (Plate 37-1)



SYMBOLS (Plate 37-1)

A **12314A No. 6** stamped No. 6
B **12314A No. 5** stamped No. 5
C **12314A No. 4** stamped No. 4
D **12314A No. 3** stamped No. 3
E **12314A No. 2** stamped No. 2
F **12314A No. 1** stamped No. 1
G **12331¾ No. 2**
H **12314⅜A Nos. 1 thru 6** Spec. stamping
I **12314⅝A Nos. 1 thru 6** Spec. stamping
J **12311 No. 7**
K **12311⅝ Nos. 1 thru 6** Spec. stamping
L **12311⅞ Nos. 1 thru 6** Spec. stamping
M **12311⅜ Nos. 1 thru 6** Spec. stamping
N **12312A Nos. 1 thru 6** Spec. stamping
O **12381**
P **8054¾** Screw, 12331¾ No. 1 space collars
Q **12381** Spring
R **12381** Spring
S **8054¾** Screw, 12331¾ No. 2 space collars
T **1-12321⅞A**
U **12359¾** Used with bail X
8054¾ Screw used without bail X
V **1-12015 No. 2**
W 12354¼* Included in AC
X **1-12323**
Y **72820** Spring
Z **12385 (709812)**
AA **1A-12002**
AB **1-12041B**
AC **1A-12317 (1-12317A, 1-12321⅝A, 1-12321⅞A, 12335, 12357⅜A, 20 No. 98, 3688, 300812)**
AD **12356½** Screw, 47 nut
AE **1-12382A**
AE1 **1-12310¼** Use 12350¾ rivets
AF **1-28345** Includes 75618 screw
AG **12315½R No. 1** Use 12315½L No. 1 on other side
AH **203597**
AI **1-12320¾**
AJ **3259⅛A**
AK **49** Nut, 75210 washer, 12353¾ screw
AL **12311½**
AM **1-12312¾**
AN **1-12314½AR**
AO **12356¼** Screw, 46 nut
AP **12315¾R No. 1**
AQ **12353½** Ecc., 49 nut
AR **3455⅜**
AS **1-12312¼R No. 1**
AT **12312½** Used on both sides
AU **3450⅛ Style 9**
AV **983**
AW **8054¾**
AX **1-12321½**
AX1 **1A-12310½** Complete slide
AY **82809**
AZ **983**
BA **12315¾L No. 1**

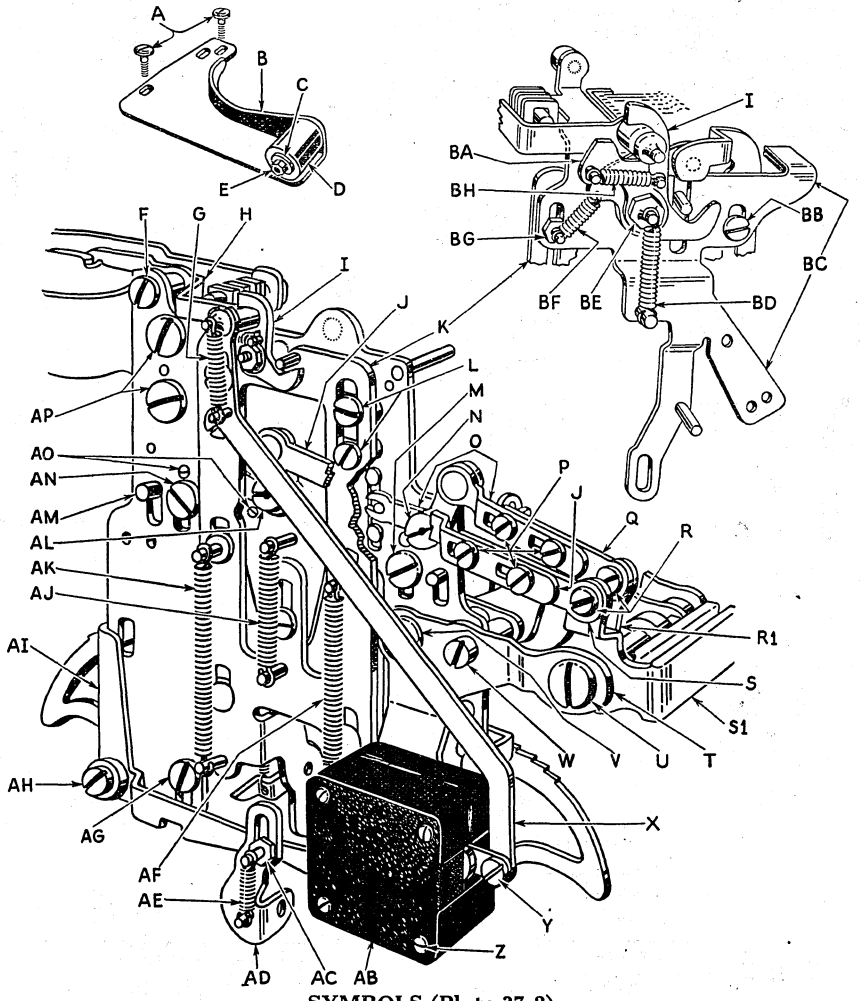
SEE EXPLANATION ON INSIDE OF FRONT COVER

SYMBOLS (Plate 37-1)—Continued

BB **120517/8**
BC **12317½A No. 1**
BD **1-12312¼L No. 1**
BE **73563**
BE1 **1-12321L**
BF **1-12311¾AL** Use 1-12311¾AR on other side
BG **82809**
BH 12353¼A* Included in BF
BI **73611**
BJ **71614**
BK **12313¼ No. 1**
BL **12059½**
BL1 **1-12316½A** Short link
BM **1-12314½AL**
BM1 **1-12316A** Long link
BN **1-12320¾**
BO **10785½**
BP **1-12313** Includes 73611 screw, 200352 roller, 12059 No. 2 nut
BQ **12314¼A**
BR **12331¾ No. 1**
BS **12311 No. 6** stamped No. 6
BT **12311 No. 5** stamped No. 5
BU **12311 No. 4** stamped No. 4
BV **12311 No. 3** stamped No. 3
BW **12311 No. 2** stamped No. 2
BX **12311 No. 1** stamped No. 1
BY **12315A No. 1, 2, 3, 4, 5 or 6 (12315B No. 1, 2, 3, 4, 5 or 6)** **12315⅜ No. 1, 2, 3, 4 or 5** See Carriage Instruction Book, Plate 37-1
BZ **12381** Spring

CA **120517/8** Use 203422A space collars under screws
CB **8054¾** Screw, 12331¾ No. 1 space collars, used without bail X
CC **203515½** Screw
CD **1-203033A No. 1 Style 12, 15 or 18**
CE **1-203475** Specify machine number and submit forms

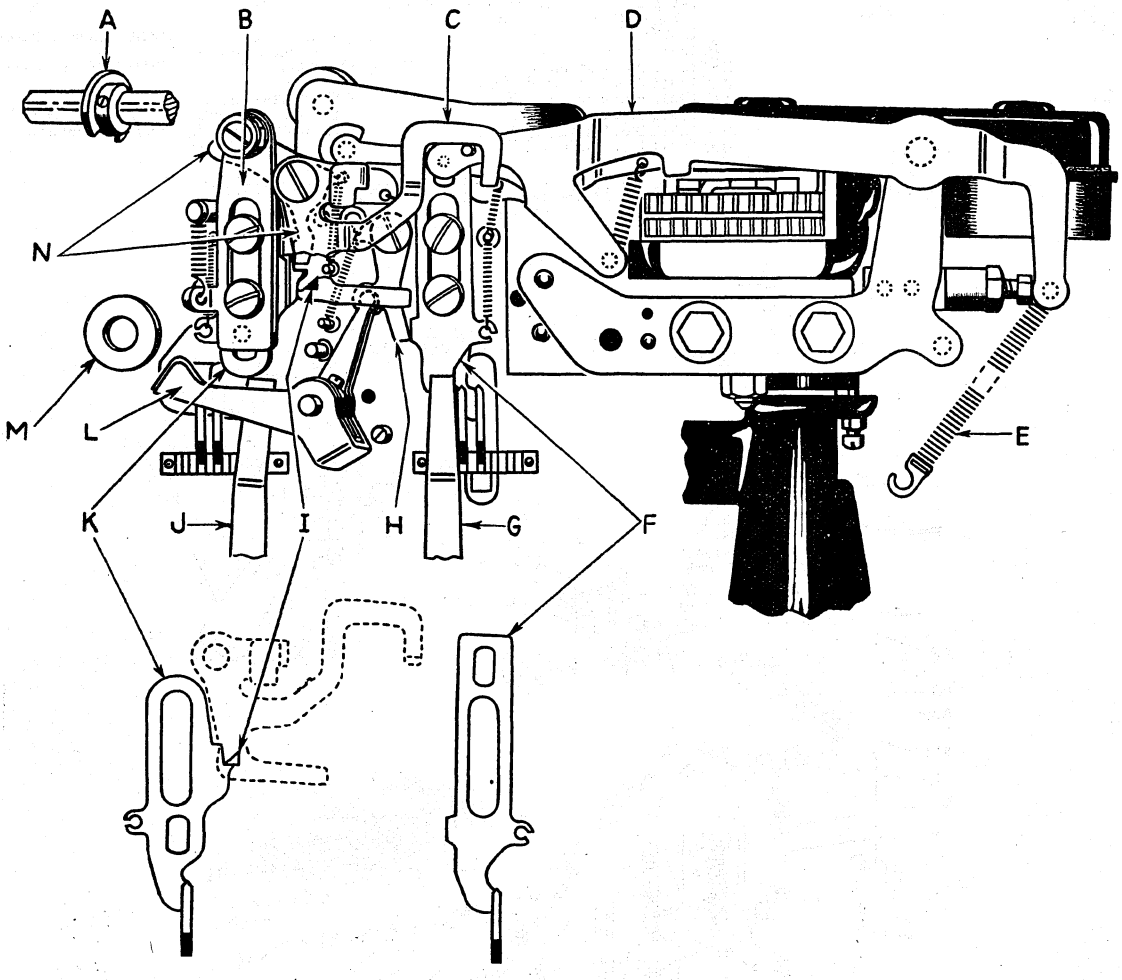
MULTIPLE SKIP—RETURN MECHANISM, REAR VIEW CLASSES 20 THRU 30 (Plate 37-2)



SYMBOLS (Plate 37-2)

A **4456½**
B **1-203185½A**
C **103181**
D **203303A**
E **46**
F **8054¾**
G **10082½**
H **1-12015 No. 2**
I **1-12321⅞A**
J **1-12316A**
K **1A-12310½**
L **8054¾**
M **12353¾** Screw, 75210 washer, 49 nut
N **310 Fte. 207** Bushing, 12059½ screw
O **1-12316½A**
P **957½**
Q **12316⅞**
R **9259⅝**
R1 **12110 No. 23A**
S **12316⅞**
S1 **12110 No. 22A**
T **1-12315¼A**
U **2851⅝**
V **3450 11/16 Style 9** Screw
W **72588 (12356⅜)**
X **1-12023⅞ No. 2**
Y **200621** Screw, 46 nut
Z **120583/8**
AB **12023½**
AC **12355½** Screw, 1097¾ lock washer, 46 nut
AD **1-12320½**
AE **8388**
AF **12383A**
AG **12354** Screw, 75210 washer, 49 nut
AH **12359½**
AI **1-12321R**
AJ **12384**
AK **12383A**
AL **310 Fte. 207** Bushing, 255¼ screw
AM 200525½* Stud
AN **12353¾** Screw, 75210 washer, 49 nut
AO **120583/8**
AP **12355** Screw **200204** Lock washer
BA **1-12321⅝**
BB **3455⅜** Screw, use 8436 bushing
BC **1-12322**
BD **705828**
BE **12357⅜**
BF **72803**
BG **12357¾** Use 8436 bushing
BH **44800**

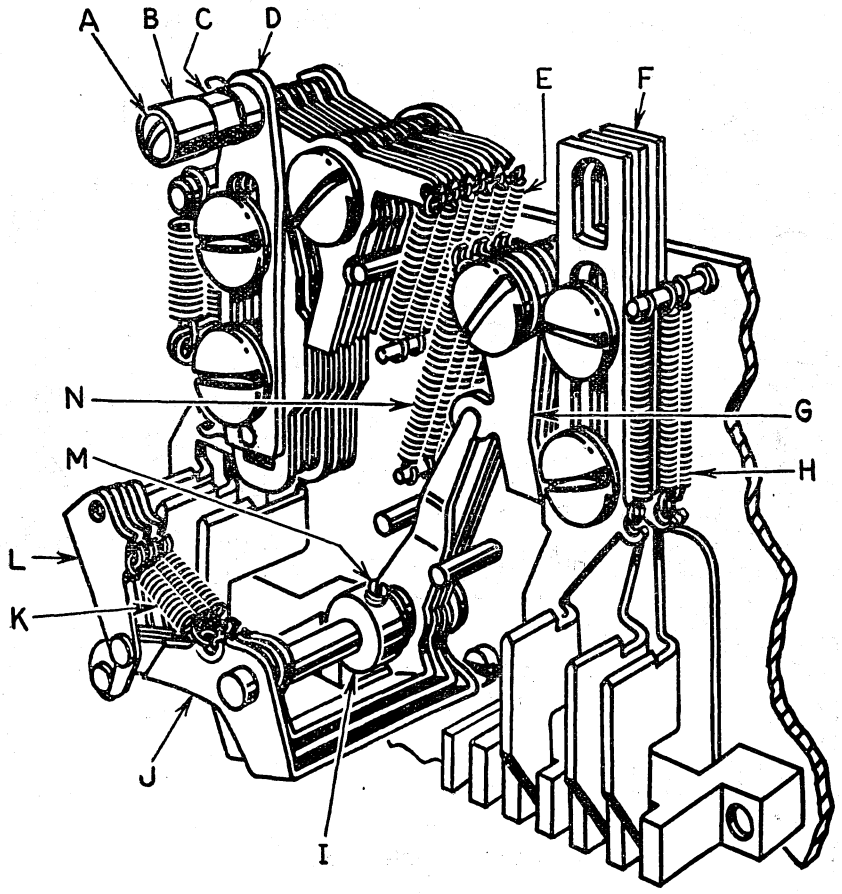
MULTIPLE SKIP RELEASE LOCKED DURING CARRIAGE RETURN CLASSES 20 THRU 30 (Plate 37-3)



SYMBOLS (Plate 37-3)

A **1-203475** Specify machine number and submit forms
B **1-12313** Includes 73611 screw, 200352 roller, 12059 No. 2 nut
C **1-12323**
D **1A-12317 (1-12317A, 1-12321⅝A, 1-12321⅞A, 12335, 12357⅜A, 20 No. 98, 3688, 300812)**
E **1-12382A**
F **12314A Nos. 1 thru 6** Specify stamping
G **1-12314½AR**
H **12314¼A**
I **12359¼*** Included in C
J **1-12314½AL**
K **12311⅞ Nos. 1 thru 6** Specify stamping
L **12315A No. 1, 2, 3, 4, 5 or 6 (12315B No. 1, 2, 3, 4, 5 or 6)**
M **10044⅝**
N **12312A Nos. 1 thru 6** Specify stamping

MULTIPLE RETURN RELEASE LATCHES, FLEXIBLE
CLASSES 20 THRU 30 (Plate 37-4)



SYMBOLS (Plate 37-4)

A **73611**
B **200352**
C **12059 No. 2**
D **1-12313** Includes A, B, C
E **12381**
F **12314A Nos. 1 thru 6** Specify stamping
G **12314¼A**
H **12381**
I **1-28345** Includes M
J **1-132 Nos. 1 thru 6 Env. 1834** Specify stamping
K **803 Env. 1834**
L 134 Env. 1834* Included in J
M **75618**
N **12381**

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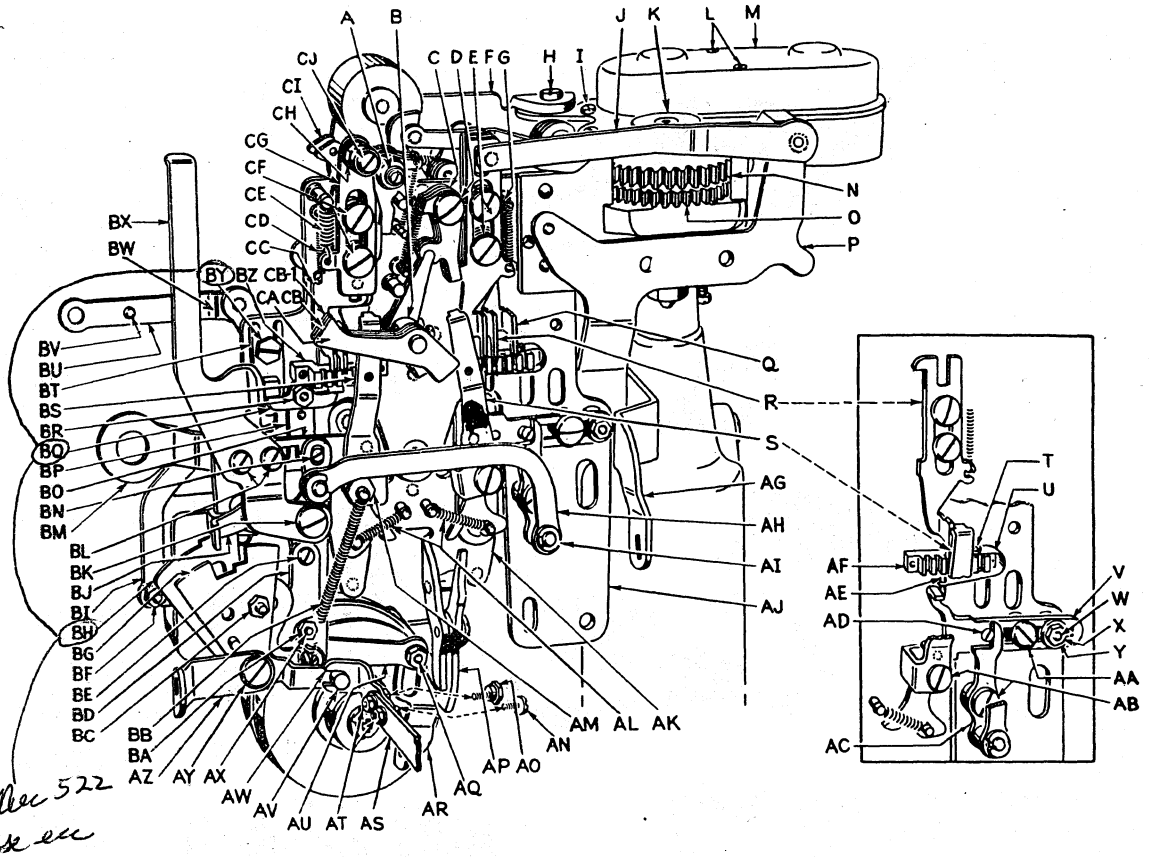
MULTIPLE SKIP AND RETURN MECHANISM—SIMPLIFIED (Plate 37-5)



Mec 522
use eee
202530

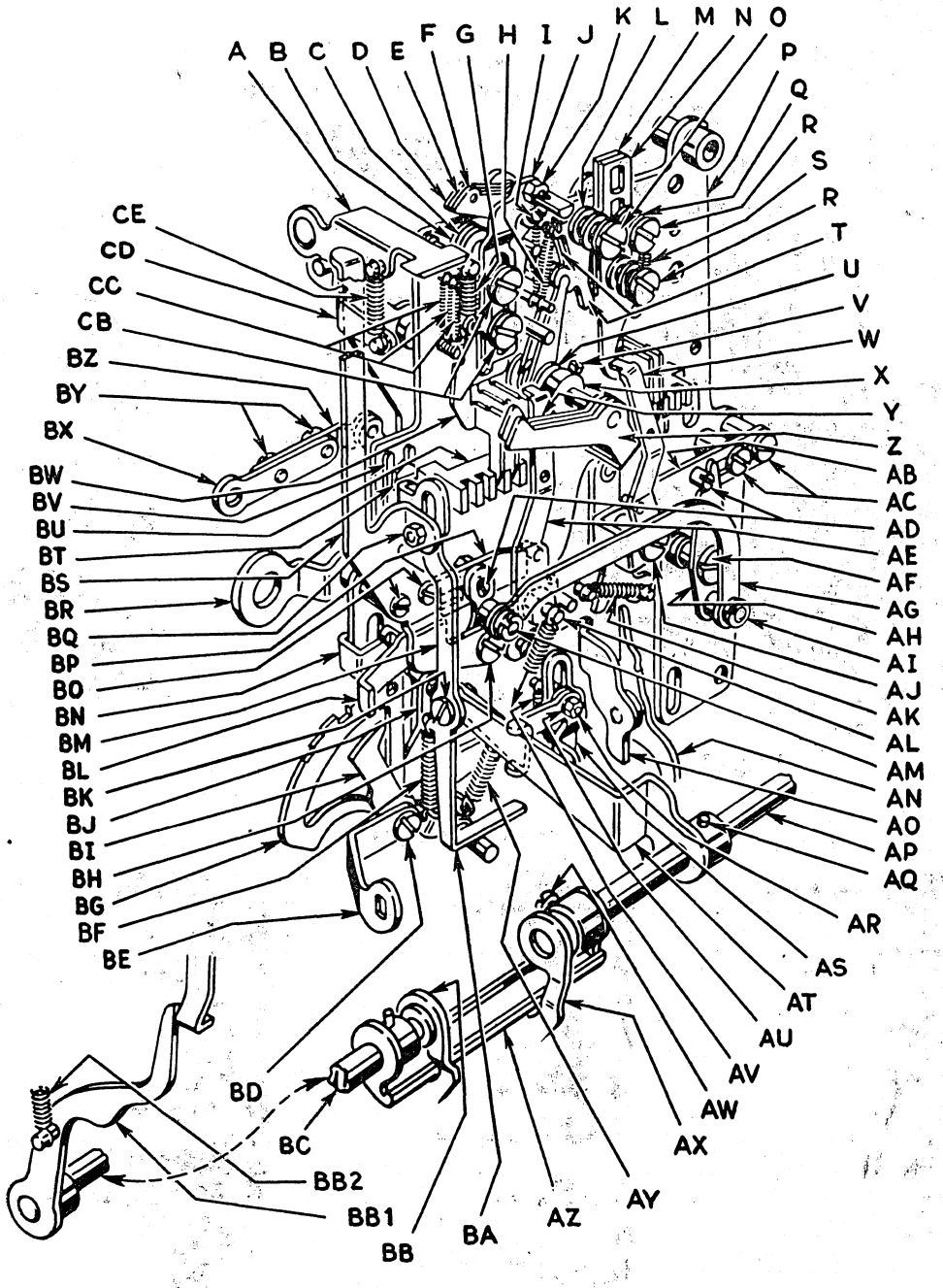
SYMBOLS (Plate 37-5)

A **73612**
B **1-28345** Includes 75618 screw
C **12314¼A**
D **12051⅞**
E **8054¾**
F **1-203185B**
G **12352** Included in AJ
H **1050⅛**
I **12052**
J **1-12317B** Use 8054¾ screw
K **1B-12002**
L **12053⅝**
M **12065¼A**
N **1-12041B**
O **12040A No. 1**
P **1-12317¼A**
Q **12314A No. 2 or No. 5 Specify stamping**
R **12314⅝A No. 4**
S **1-12314½AR**
T **73548**
U **12329**
V **12313¼R No. 3**
W **12359⅛**
X **46**
Y **3826½**

AA **957½**
AB **8054¾**
AC **1-12319½**
AD **12353½**
AE **12358⅜**
AF **12390 No. 2**
AG **145 Fte. 213 No. 3**
AH **1-12329¾**
AI **21 No. 2**
AJ **11-12310A** Includes G
AK **1A-12310½**
AL **7781A**
AM **71614**
AN **4456½**
AO **201540**
AP **1-12321½**
AQ **12355½**
AR **1-12320½**
AS **12025 No. 38**
AT **46**
AU **1-12321L**
AV 82502* Included in BG
AW **12025⅜**
AX **12062¼A** Screw
AY **204502**
AZ **12317½A No. 2**

BA **49**
BB **983**
BC **7355¼A** Stud, use 46 nut
BD **12312½**
BE **73563**
BF **46**
BG **1-12312¼L No. 3** Includes AV
BH **1-12312¼L No. 2**
BI **1-12023⅞ No. 2**
BJ **1-12311¾L No. 2**
BK **8054¾**
BL **73611**
BM **1-12315¼B**
BN **12353½**
BO **12313¼ No. 1**
BP **1-12312¾**
BQ **12311½**
BR **49**
BS **1-12314½AL**
BT **1-12320¾**
BU **12316⅞**
BV **957½**
BW **1-12316½A**
BX **12315½L No. 1**
BY **12059½**
BZ **12390**
CA **12315⅜B No. 2**
CB **12315B No. 4**
CB1 **12315B No. 5**
CC **12311 No. 2, No. 3, No. 6 Specify stamping**
CD **12381**
CE **10785½**
CF **12051⅞**
CG **1-12313**
CH **12059 No. 2**
CI **12312A No. 2, No. 3, No. 6 Specify stamping**
CJ **73611** Use 200352 collar

MULTIPLE SKIP AND RETURN MECHANISM, STYLE NO. 3 (Plate 37-6)



(OVER)

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SYMBOLS (Plate 37-6)

A 12310⅞* included in CD
B **12311 No. 5** stamped "5"
C **12311 No. 4** stamped "4"
D **12312A No. 5** stamped "5"
E **12312A No. 4** stamped "4"
F **12312A No. 3** stamped "3"
G **10785½**
H **12381**
I **73612** screw, use 12331¾ No. 1 spacers
J **1-12313 No. 2**
K **12359** use 12058⅜ screw
L **12331¾ No. 1**
M **12314A No. 3** stamped "3"
N **12314A No. 4** stamped "4"
O **12051⅞**
P **11-12310A**
Q **12331¾ No. 2** spacer
R **8054¾**
S **12381** spring
T **12314¼A**
U **12331¾ No. 2** spacer
V **8359** screw
W **1-12314½AR**
X **1-8345** collar, includes V
Y **12315B No. 4**
Z **12315B No. 3**

AB **12313¼ No. 1**
AC **957½**
AD **12353½ No. 2** eccentric screw, use 1097⅝ washer and 49 nut
AE **1-12314½AL**
AF **8054¾**
AG **1-12329¾**
AH **1-12329½**
AI **21 No. 2** clip
AJ **8054¾** screw
AK **7781A**
AL **71614** spring anchor screw
AM **21 No. 2** clip
AN **1-12321½** use 8054¾ screw and 709803 spring
AO **1A-12310½**
AP **11-200004 No. 9 Style 17** includes AT, AQ
AQ **51** pin
AR **12355½** spring anchor screw
AS **1-12320½**
AT **1-200221½**
AU **46** nut, use 1097¾ washer
AV **89800A** spring
AW **71541** screw
AX **1-12114½A No. 2** use 72567 screw and 1097¾ washer
AY **983**
AZ **1-200219¾ Style 17** use 52 pin

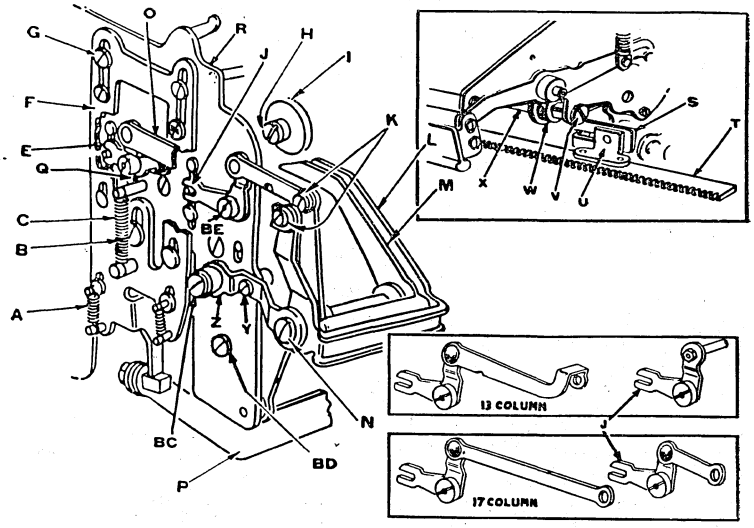
BA **200283¾**
BB **1-12114½A No. 3** use 72567 screw and 1097¾ washer
BB1 1-200219½ No. 3 Style 17* included in BC
BB2 **489**
BC **1-200004L No. 7 Style 17** includes AW, BB1
BD **204502** use 12338 shoulder washer
BE **12317½A No. 2**
BF **480B**
BG **1-12312¼L No. 5**
BH **8054¾**
BI **1-12312¼L No. 4**
BJ **12312½** blank, use 73563 screws
BK **12355¼** eccentric screw, use 75346 shoulder nut
BL **1-12311¾L No. 2**
BM **12315¾L No. 1**
BN **1-12321L** use 73605 screw
BO **73611**
BP **12313¼L No. 3**
BQ **46** nut, use 12356¼ screw
BR **1-12315¼B**
BS **12315½L No. 1**
BT **12059½** screw, use 310 Fte. 207 nut
BU **12390** use 12058⅜ screws
BV **1-12320¾**
BW **12311 No. 3** stamped "3"
BX **12316⅞**
BY **957½** screw
BZ **1-12316½A**

CB **12051⅞** use 12331¾ No. 2 spacer
CC **12381**
CD **1-12310¾** includes A
CE **3480¾**

MULTIPLE SKIP—RETURN MECHANISM, CLASSES 20 THRU 30 (Plate 38)

SYMBOLS (Plate 38)

A **9582 (60809)** Spring
B **8054¾** Screw
C **10084 (12384)** Spring
E **1-160 Env. 1358** Forked punching
F **1-12310½ (1A-12310½, 1-12314½AR and AL)**
G **8054¾** Screw
H **10052⅜ No. 1**
I **10044**
J **1-12316½ Style 17**
1-149A Env. 1358 Style 13 No. 2 for Style 13
K **200664 (200664A)** Eccentric shoulder screw stud
79598 Hexagon flat head screw
75342 Eccentric shoulder nut for Style 13
12355¼ Eccentric shoulder screw for Style 17
L **12110 No. 23 Style 13 or 17**
M **12110 No. 22 Style 13 or 17**
N **2851⅝ Env. 1358** Screw for Style 13
2851⅝ Screw for Style 17
O **1-12316 Style 17** Link assembly includes "E"
P **1-200263 No. 2** Specify machine No.
Q **320 Env. 1358** Collar
R **1-12310** Side plate assembly
S **1-12026¾L No. 2** Bracket—Refer to Plate 51-7
T See Rack Bar Charts, Plates 51-1 thru 51-6
U *Furnished with "T"
V **203512½** Shoulder screw

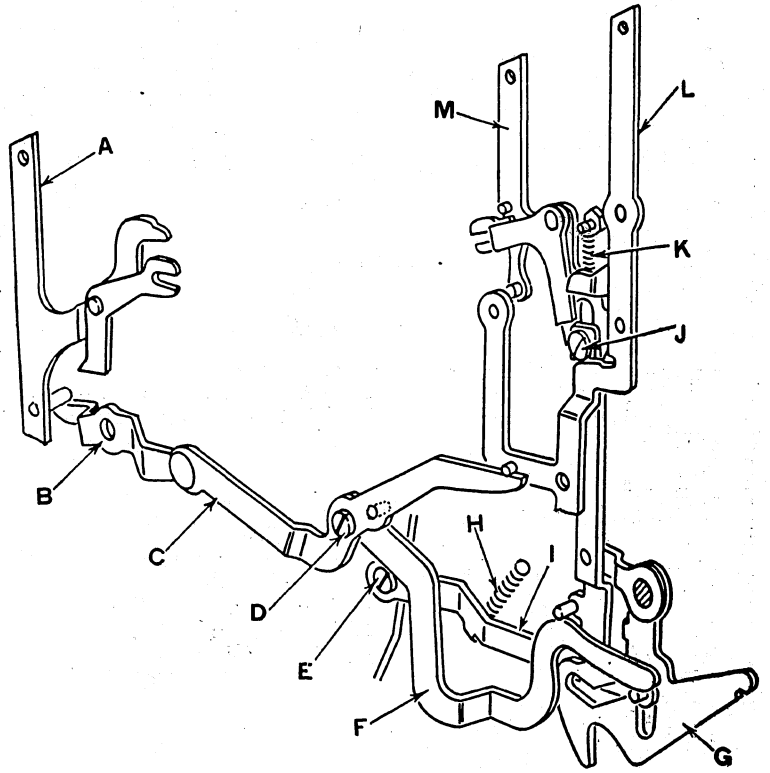


W **1-203475** | **11-203475** | **21-203475** | **31-203475** Collar, specify control, includes screw 203515½
X **2 Env. 1358 Style 12, 15 or 18 (1-203033A No. 3 Style 12, 15 or 18)** Octagon shaft
Y **73611** Screw
Z **12315¼**
BC **3450⅛ Style 9** Flat head shoulderless screw
BD **8054¾** Round head shoulderless screw
BE **310 Fte. 207** Threaded bushing
12059½ Hexagon head shoulder screw

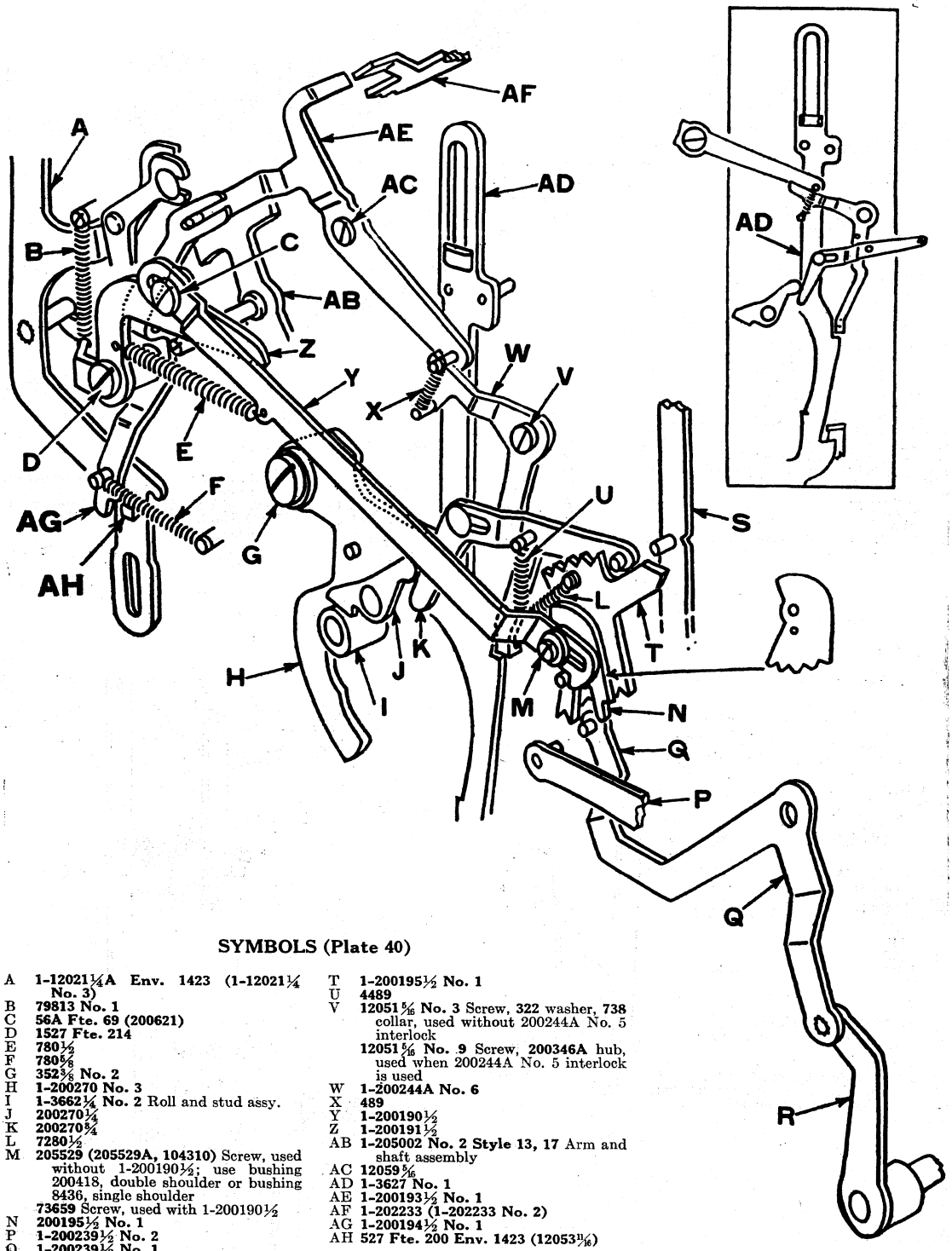
MULTIPLE SKIP—RETURN MECHANISM VERTICAL SPACE BAR CLASSES 20 THRU 30 (Plate 39)

SYMBOLS (Plate 39)

A **1-12021¼A Env. 1423 (1-12021¼ No. 3)**
B **1-200233 No. 3**
C **1-200144 (1-200144A, 1-200233)** Specify machine No.
D **9251⅜**
E **12059⅝**
F **1-200144 No. 3 Env. 1358** Specify machine number
G **12024¾B**
H **983**
I **1B-12016⅛** Includes G
J **200550A** Long shoulder screw
K **7286½**
L **1-200235 No. 3**
M **1-200241 Env. 1358 (1-200241B No. 5)** Used with non-space, non-tab bar, specify machine number



MULTIPLE SKIP—RETURN MECHANISM TOTAL KEYS AND UPPER BARS CONTROLLED, CLASSES 20 THRU 30 (Plate 40)

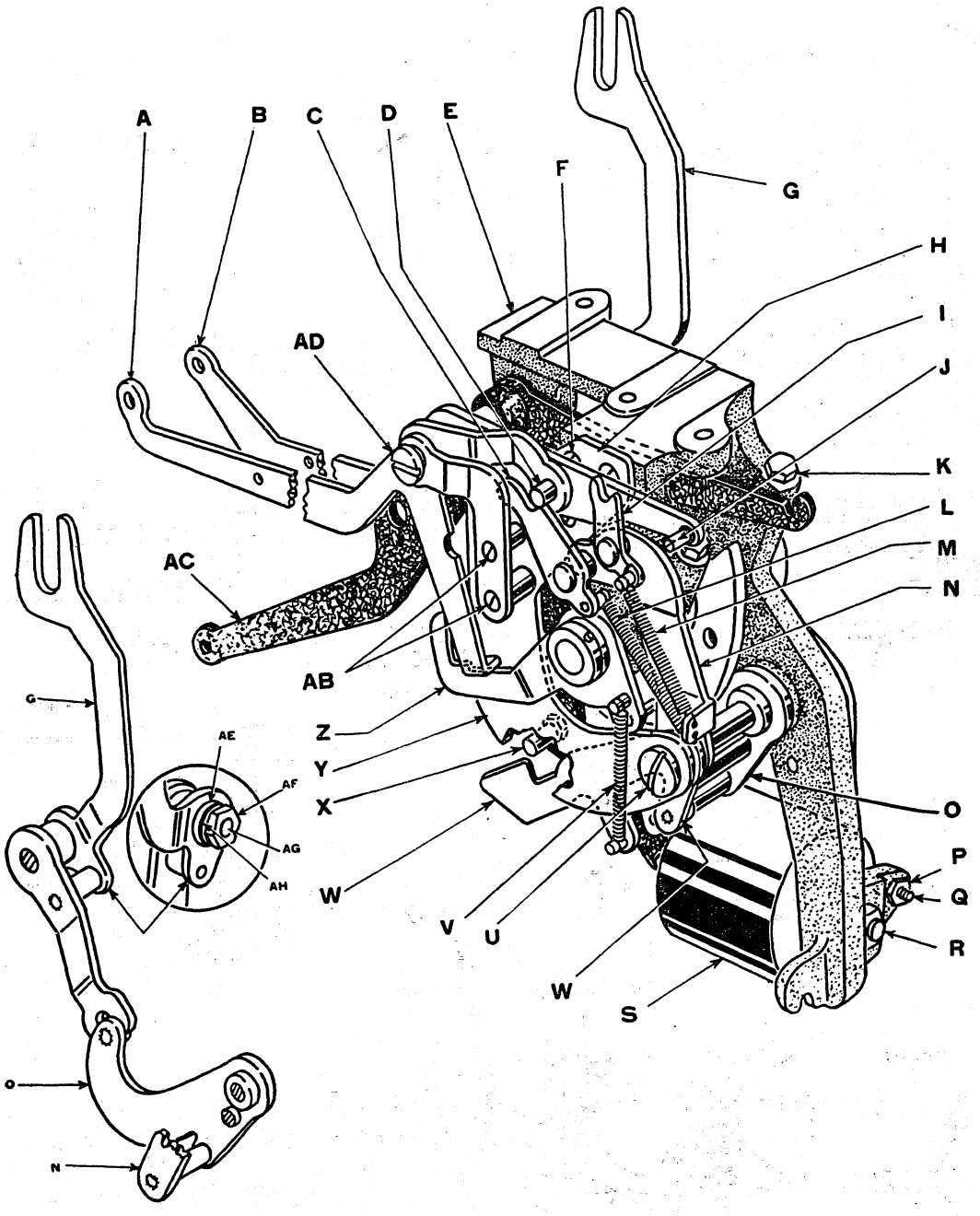


SYMBOLS (Plate 40)

A **1-12021¼A Env. 1423 (1-12021¼ No. 3)**
B **79813 No. 1**
C **56A Fte. 69 (200621)**
D **1527 Fte. 214**
E **780½**
F **780⅝**
G **352⅜ No. 2**
H **1-200270 No. 3**
I **1-3662¼ No. 2** Roll and stud assy.
J **200270¼**
K **200270¾**
L **7280½**
M **205529 (205529A, 104310)** Screw, used without 1-200190½; use bushing 200418, double shoulder or bushing 8436, single shoulder
73659 Screw, used with 1-200190½
N **200195½ No. 1**
P **1-200239½ No. 2**
Q **1-200239½ No. 1**
R **1-200004 Style 17 No. 9**
S **1-200235 No. 3** Uppermost bar
1-200241B No. 5 Upper bar
11-200241B No. 5 Upper bar with non-space, non-tab
T **1-200195½ No. 1**
U **4489**
V **12051⅝ No. 3** Screw, **322** washer, **738** collar, used without 200244A No. 5 interlock
12051⅝ No. 9 Screw, **200346A** hub, used when 200244A No. 5 interlock is used
W **1-200244A No. 6**
X **489**
Y **1-200190½**
Z **1-200191½**
AB **1-205002 No. 2 Style 13, 17** Arm and shaft assembly
AC **12059⅝**
AD **1-3627 No. 1**
AE **1-200193½ No. 1**
AF **1-202233 (1-202233 No. 2)**
AG **1-200194½ No. 1**
AH **527 Fte. 200 Env. 1423 (12053¹¹⁄₁₆)**

SEE EXPLANATION ON INSIDE OF FRONT COVER

MULTIPLE SKIP—RETURN MECHANISM TIMING CONTROL
CLASSES 20 THRU 30 (Plate 41)



SYMBOLS (Plate 41)

A **1-201134 No. 1**
B **1-200263 No. 3 (1-200263 No. 6)**
C **1-201141**
D **68502** Stud, included with "A"
E **1-201665 No. 3 (1A-201665 No. 3)**
F **300561A** Screw
G **1-201136 Style 17 (1A-201136 Style 17)**
H **1-201129 No. 2**
I **1-201142 (1-201142A, 201520A)**
J **200512½ (200512½A)** Screw
47 Nut
K **3650⅛**
L **1-201803**
M **1-201804**
N **1-201139** Assembly
O **1-201140**
P **49¼**
Q **201512** Headless screw
R 201447* Part of S
S **1-201448** Plunger and cup assy.
U **201521**
V **780⅝**
W **1-201135**
X **201513**
Y **1-201129 No. 2**
Z **1-201133**
AB **10750⅜ Style 9** Screws, **201533** studs
AC **1A-201107B (1-201107C)**
AD **352⅜ No. 2**
AE **201326** Sleeve
AF **393** Nut
AG **201504B** Short threaded shaft
201504A No. 2 Used with multiple skip
AH **201321** Collar

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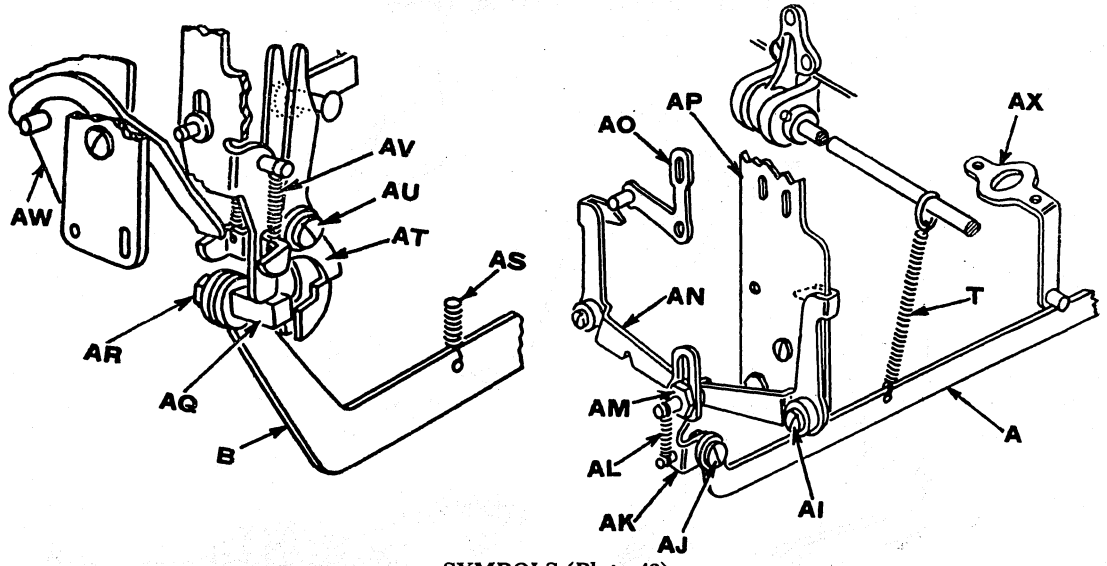
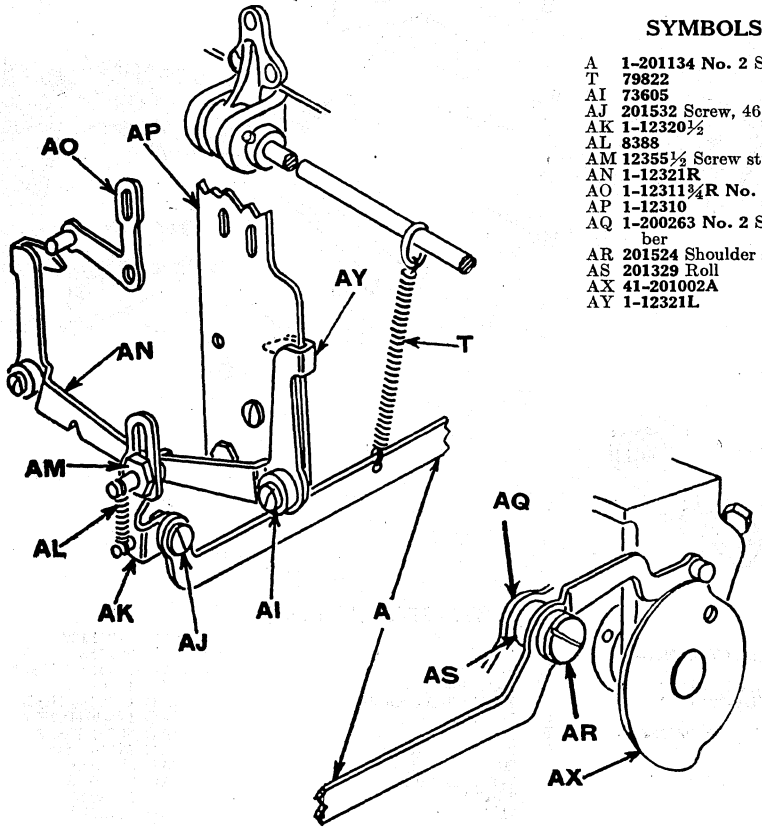
MULTIPLE SKIP—RETURN MECHANISM TIMING CONTROL CLASSES 20 THRU 30 (Plate 42)



SYMBOLS (Plate 42)

A **1-201134 No. 2** Specify machine No.
B **1-200263 No. 2** Specify machine No.
T **79822**
AI **73605** Shoulder screw for 1-12321L
AJ **201532**
AK **1-12320½**
AL **8388**
AM **12355½** Hexagon screw spring stud
AN **1-12321R**
AO **1-12311¾R No. 1 (1-12311¾AR)**
AP **1-12310**
AQ **200511½** Square screw stud
AR **72167½** Washer, **1097¾** lock washer, and **46** nut
AS **79822**
AT **1-12321½** Specify machine number
AU **319 Env. 1358** Collar, **12331** threaded flanged bushing, and **8054¾** screw
AV **82809**
AW **1-12312¼L No. 2** Specify machine No.
AX **1-219 Env. 1358** Specify machine No.

MULTIPLE SKIP—RETURN MECHANISM TIMING CONTROL No. 1 CLASSES 20 THRU 30 (Plate 43)

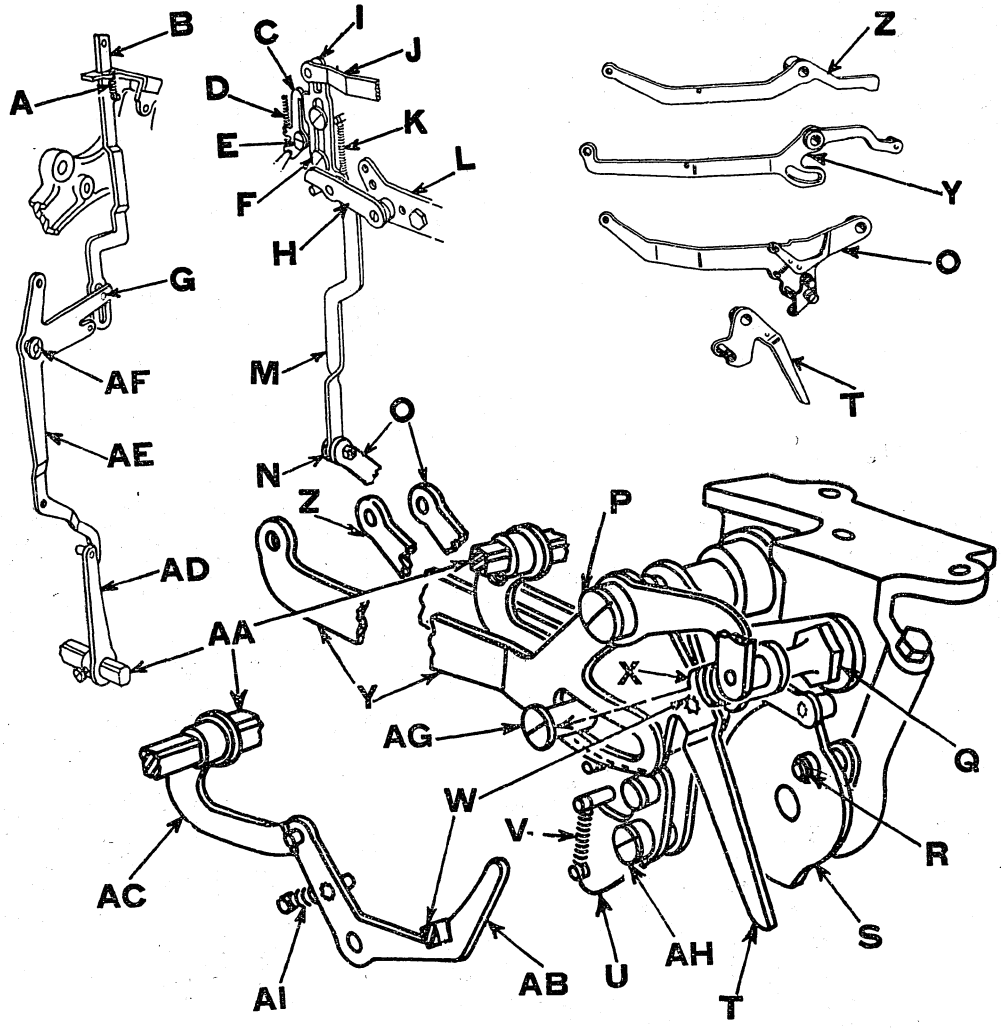


SYMBOLS (Plate 43)

A **1-201134 No. 2** Specify machine No.
T **79822**
AI **73605**
AJ **201532** Screw, 46 nut
AK **1-12320½**
AL **8388**
AM **12355½** Screw stud
AN **1-12321R**
AO **1-12311¾R No. 1 (1-12311¾AR)**
AP **1-12310**
AQ **1-200263 No. 2** Specify machine number
AR **201524** Shoulder screw
AS **201329** Roll
AX **41-201002A**
AY **1-12321L**

SEE EXPLANATION ON INSIDE OF FRONT COVER

MULTIPLE SKIP—RETURN MECHANISM CONTROLLED FROM RETURN KEY CLASSES 20 THRU 30 (Plate 44)



SYMBOLS (Plate 44)

A **10180**
B **1-104 No. 2 Env. 401C**
C **12314¼**
D **12380**
E **8054¾**
F **8054¾**
G **351½** Rivet
H **1-172 Env. 1358**
I **12314 No. 6**
J **1-12317 (1-12317A, 1-12321⅝A, 1-12321⅞A, 12335, 12357⅜A, 20 No. 98, 3688, 300812, 1A-12317¼, 12317⅜)**
K **12381**
L **1-12317¼ (1-12317A, 1-12321⅝A, 1-12321⅞A, 12335, 12357⅜A, 20 No. 98, 3688, 300812, 1A-12317¼, 12317⅜)**
M **1-228 Env. 1358** Includes H
N **12060½** Screw, **46** nut
O **1-223 Env. 1358**
P **201524** Screw, 201329 bushing
Q **580 Env. 1358** Stud, **45**⅛ nut
R **599 Env. 1358** Stud, **738** roll, **7644** bushing
S **41-201002A**
T **1-225 Env. 1358**
U **1-224 Env. 1358**
V **800 Fte. 209 (10180)**
W 539 Fte. 200*
X **1-200807 Env. 1358**
Y **1-237 No. 3 Env. 1358**
Z **1-200263 No. 2**
AA **12008 No. 1 Style 13, 17**
AB **1-227 Env. 1358**
AC **1-226 Env. 1358**
AD **41-12025 No. 26**
AE **1-200216B No. 1 (1-200216C No. 1) 1-200216B No. 1 Env. 401C** Includes "B," "G," "AE"
AF **200342**
AG **8054¾**
AH **8054¾**
AI **8388**

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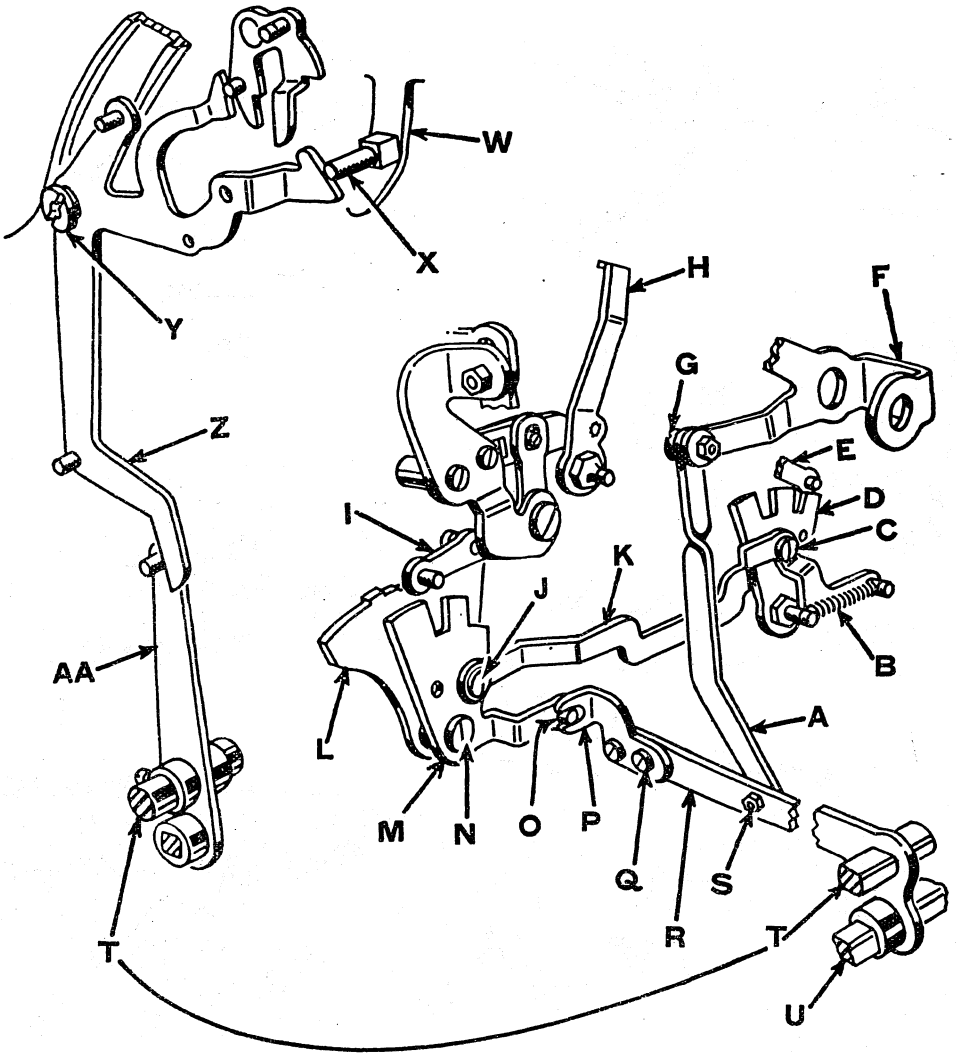
MULTIPLE SKIP—RETURN MECHANISM, NORMALIZED FROM TOTAL KEYS AND/OR CARRIAGE CONTROL, CLASSES 20 THRU 30 (Plate 45)

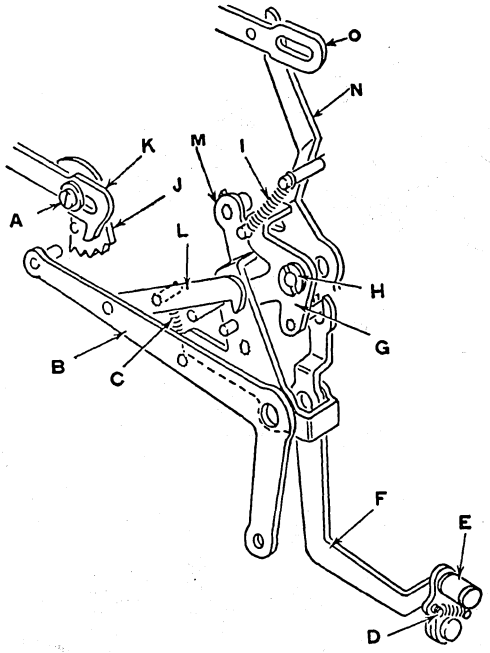


SYMBOLS (Plate 45)

A **267 Env. 1358** Link
B **10082½** Spring, connected to small spring stud 3450 and long hexagon spring stud
C **259½** Shoulder screw
46 Nut
D **1-264R Env. 1358** Specify "cut out" and machine number
E **1-12311¾R No. 1 (1-12311¾AR)** Punching includes studs and hubs
F **101 No. 3 Style 17 Env. 1410**
G **259½** Shoulder screw
46 Nut
H **1-12314½R&L (1-12314½AR&AL, 295)**
71614 Screw spring stud holding part to section
82809 Spring used on above item
I **1-12311¾L No. 1 (1-12311¾AL)** Punching includes studs and hub
J **259½** Shoulder screw
46 Nut
K **1-265 Env. 1358** Link
L **1-12312¼L No. 2** Specify position, "space cut out" and machine number, specify "AR" for right
M **1-264L Env. 1358** Specify "cut out" and machine number
N **8054¾** Screw
353 Env. 1358 Flanged collar
O **60508** Stud
P **266 Env. 1358 (266A Env. 1358, 8085A, 12046⅜, 203621)**
Q **106500** Screw (2 required)
R **1-268 Env. 1358** Arm includes hub and screw 72573 only
S **12355¼** Eccentric shoulder screw
46 Nut
T **12008 No. 1 Style 9, 11, 13 or 17**
U **12008 No. 2** Shaft
W **1-202225** Link assembly
X **202505A** Stud
10239 Roll, short
932⅛ Roll, long
7914½A Washer
Y **200342** Bushing
200597 Screw
Z **1-122 Fte. 207 No. 2 Env. 1339**
AA **1-224 Fte. 88 Env. 1359**

SEE EXPLANATION ON INSIDE OF FRONT COVER

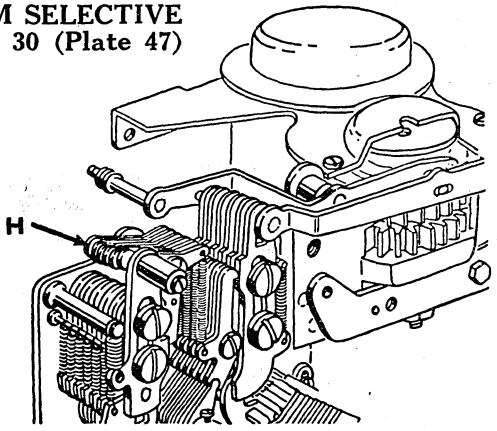
MULTIPLE SKIP—RETURN MECHANISM REPEAT MACHINE OPERATION NORMALIZING MECHANISM, CLASSES 20 THRU 30 (Plate 46)



SYMBOLS (Plate 46)

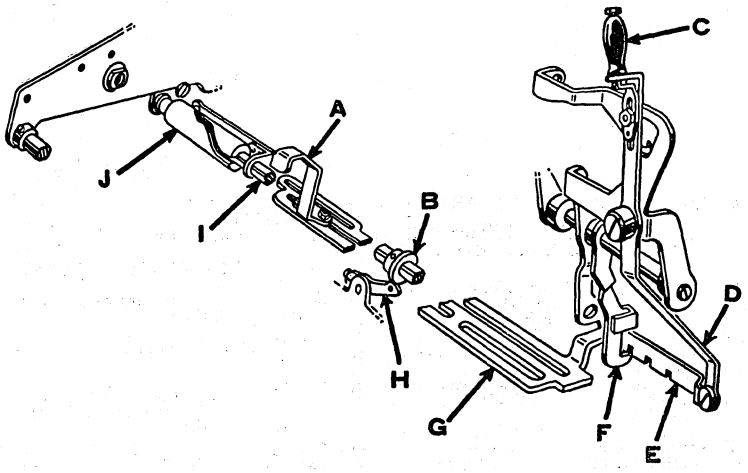
A **73659** Screw, **8436** collar
B **11-192 No. 2 Env. 1358 (1-200239½ No. 2)** Includes "L"
C **10780½**
D **9281½** Spring
E **1-109½ Fte. 200** Punching includes roll and screw, use screw **957½, Roll 307 Fte. 217**
F **1-109A Fte. 200 Env. 1358 (1-109 Fte. 200 No. 1, 108A Fte. 200, 12083½)**
G **1-200192½**
H **137½ Fte. 104** Bushing
1-72363 (72363, 7061⅛) Collar
I **12081½**
J **200195½ No. 2**
K **1-200190½**
L **200239¾**
M **1-200196½**
N **1-200186A Env. 1358 (1-200186B)**
O **1-200172 (1A-200172, 1-12024 No. 21A)**

MULTIPLE SKIP—RETURN RELEASE FROM SELECTIVE OPERATION CONTROL, CLASSES 20 THRU 30 (Plate 47)



SYMBOLS (Plate 47)

A **203292 (1-203293B, 203292B, 203510 ¾A [2 req.])**
B **1-203475** Collar includes screws 203515½
C 912A Fte. 203* Furnished with "D"
D **1-150C Fte. 203** Shift lever assembly
E **206A Fte. 203** Slide specify 2 or 3 selection
F **149A Fte. 203** Indexing lever for slide
G **155A Fte. 203 Style 12", 15" or 18"**
H **12312 No. 1 thru 6 (12312A No. 1 thru 6)**
I **203033 No. 1 Style 12, 15 or 18 (1-203033A No. 1 Style 12, 15 or 18, 79326)**
J **203912** Slotted collar



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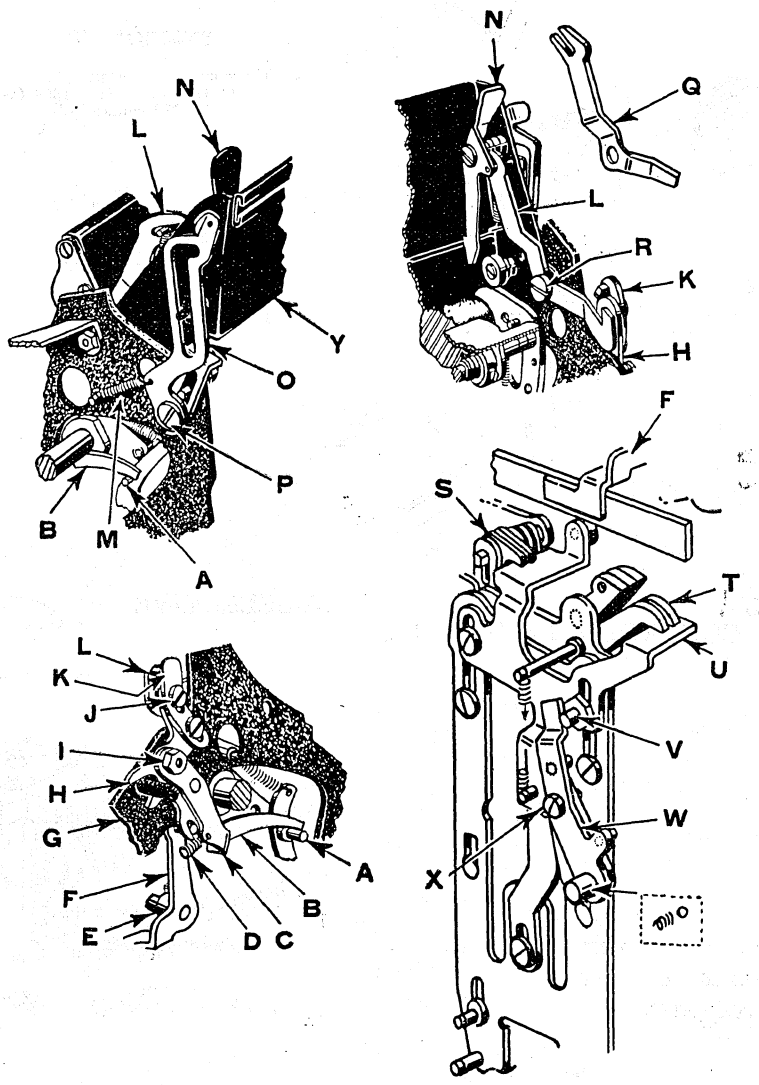
MULTIPLE SKIP—RETURN MECHANISM TO OPEN PRESSURE ROLLS CLASSES 20 THRU 30 (Plate 48)



SYMBOLS (Plate 48)

A **31-4A Fte. 213 No. 2 Style 12, 15, 18** for P. U. carriages
1B-203004A No. 2 Env. 1402 Style 12, 15, 18 Not P. U. carriages, uses spring 3883A

B **1-203110½ No. 6** For P. U. cge., to be indexed at all times
1-203110½ No. 5 For P. U. cge., not to be indexed at all times
1-100 Env. 1402 No. 2 Not P. U. cge., to be indexed at all times
1-100 Env. 1402 Not P. U. cge., not to be indexed at all times

C Part of B

D **3480½**

E Included in F

F **1-115 Env. 1402 Style 12, 15, 18**

G 21-203118DL*

H Included in B

I **106500** Screw, **3434** nut

J **952¾**

K **1-203109½ (1-203109½A, 203108½A No. 2)**

L **203108½ No. 1** Pressure rolls not indexed at all times

M **3480½**

N 203247AL* Included in Y

O **203102½**

P **203517½**

Q **203108½ No. 2 (203108½A No. 2, 1-203109½A)** Pressure rolls indexed at all times

R **2854⅞ (84618)**

S **12314⅝ Nos. 1 to 6**

T **12311⅝ Nos. 1 to 6**

U **1-12322** Use spring **283¼**

V **12358**

W **1-12322¼**

X **9053⅝** Screw, **46** nut

Y **1A-203247 Style 12 or 18 (1-203247A Style 12 or 15)**
1A-203247 Style 18 (1A-203247B No. 3 Style 18)

NOT SHOWN:

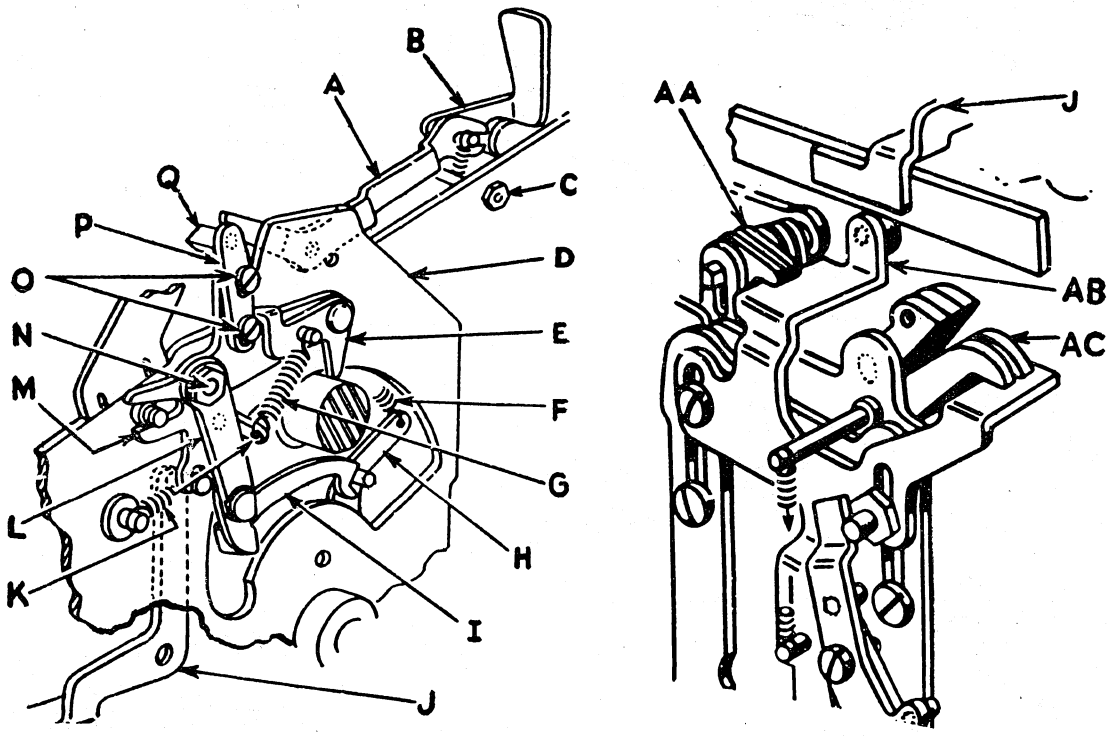
Ledger Pan 1-122A Fte. 213 Style 12, 15, 18 Env. 1402 for P. U. cge.

Ledger Pan 1-203122 Style 12, 15, 18 Env. 1402 if not P. U. cge., pan uses 3883A spring

Spring anchor 1-203107½R uses screw 302523

SEE EXPLANATION ON INSIDE OF FRONT COVER

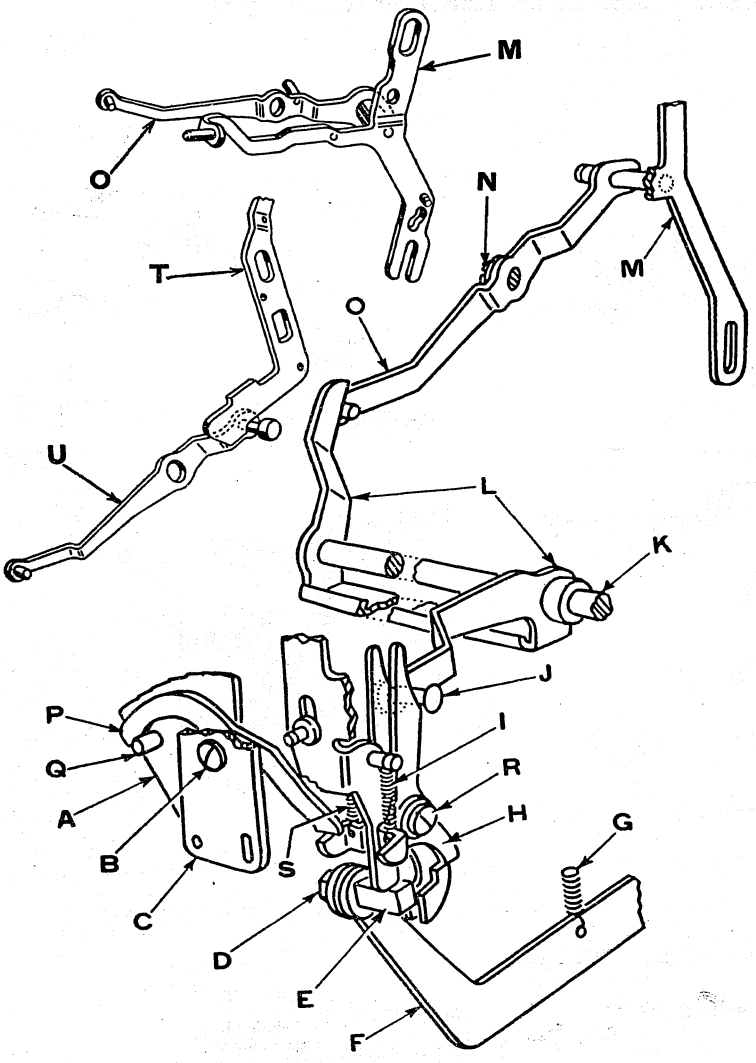
PRESSURE ROLL OPENING MECHANISM DISABLED, CARRIAGE CONTROLLED, CLASSES 20 THRU 30 (Plate 48-1)



SYMBOLS (Plate 48-1)

A **203108½A No. 2**
B **1A-203247B No. 1 Style 12, 15, 18** Use 203246B
C **46½ (46)** **200534½** Screw
D **1-203118DL No. 2 Env. 1402** Complate assembly 41-203006A Style 12, 15, 18 Env. 1402
E **1-134 Env. 1402** Use 7262½ rivet
F **3883A** Spring
G **10480¼**
H **31-4A Fte. 213 Style 12, 15, 18**
I **1-100 No. 6 Env. 1402**
J **11-115 Env. 1402 Style 12, 15, 18**
K **77801** Spring
L 1-100¼ Env. 1402* Included in I
M **1-100 No. 7 Env. 1402** Includes E
N **3434** Nut, 3455⅜ screw
O **106500**
P **1-203109½A**
Q 203521½* Included in P
AA **12314⅜A No. 1 thru 6** Specify stamping
AB **1-12322** Use 72803 spring
AC **12311⅝ No. 1 thru 6** Specify stamping

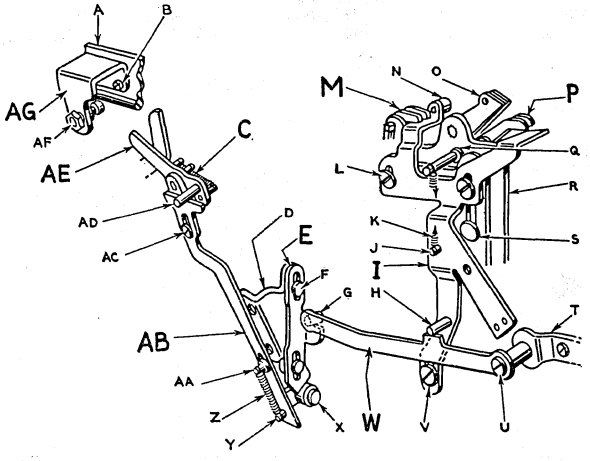
MULTIPLE SKIP—NORMALIZING KEY, CLASSES 20 THRU 30 (Plate 49)



SYMBOLS (Plate 49)

A **1-12312¼L No. 2**
B **8054¾**
C **1-12310**
D **72167½** Washer, **1097¾** lock washer, and **46** nut
E **200511½**
F **1-200263 No. 2** Specify machine No.
G **79822**
H **1-12321½** Specify machine number
I **82809**
J **312 Fte. 200** Roll
103515 Screw
7919½A Washer
46 Nut
K **1-200004 Style 17 No. 9** Specify machine number
L **200282¾** Specify machine No.
M **1-12215 No. 1** Shown on right
11-12215 No. 1 Shown on left
N **79603** Screw, **200350** collar
O **1-200280A**
P **1-157R&L Env. 1358** Specify machine number
Q **500 Fte. 201 (200525½)** Stud
301 Fte. 201 (200422) Collar
R **319 Env. 1358, 12331** and **8054¾** Specify machine number
S **806 Env. 1358 (283A)** Spring on 1-158R Env. 1358
T **1-12220 No. 2** Cge. normal key
U **1-200280 No. 2**

MULTIPLE SKIP—CARRIAGE OPENING FROM RETURN MECHANISM (Plate 50)

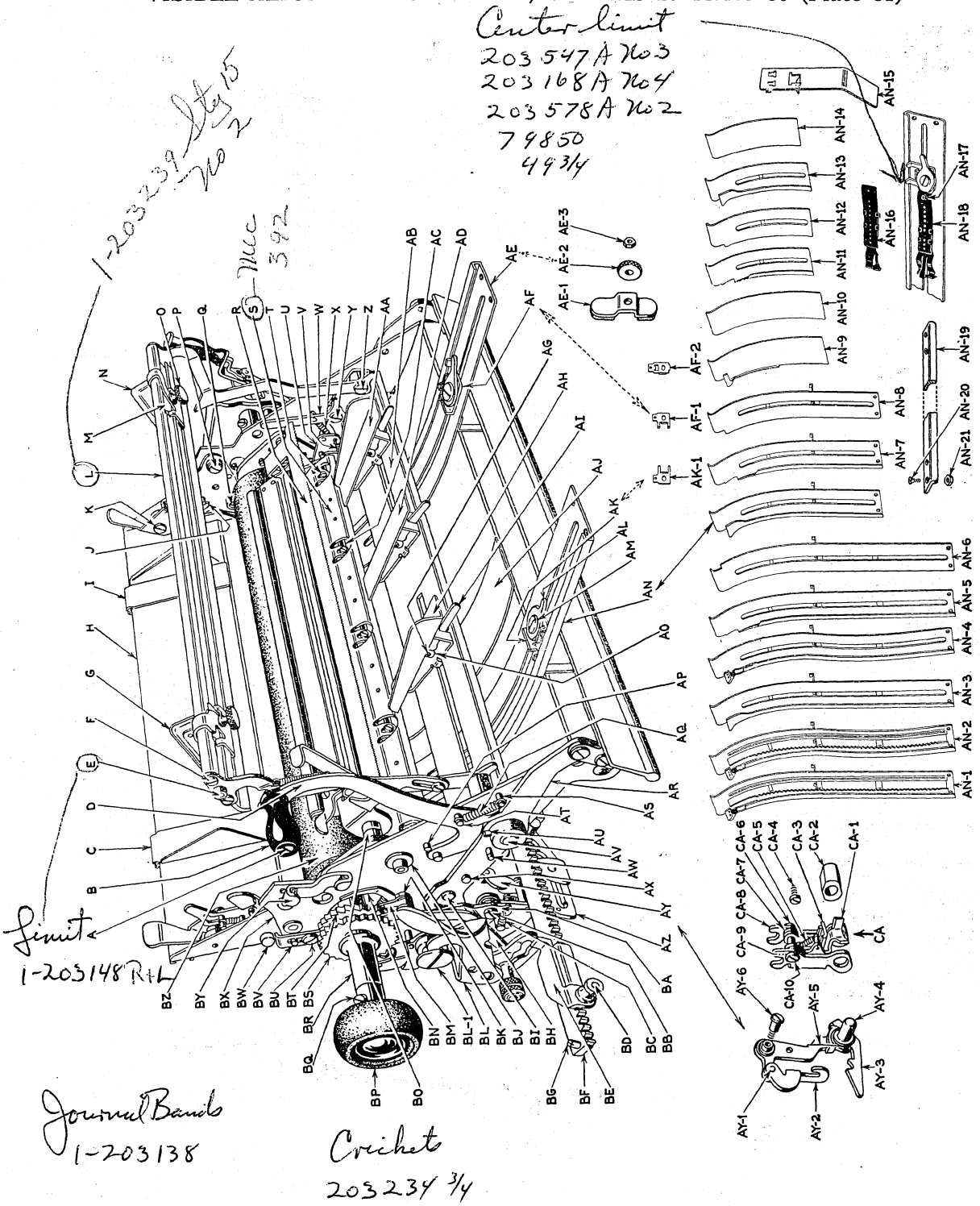


SYMBOLS (Plate 50)

A **21-203123D Style 12", 15" or 18" Specify Machine number,** rail assembly, includes punchings on each end only
B **2851⅞** Screw, 46 nut
C **10686½** Spring
D **1-203100½ (1A-203100½, 1-203105½A, 203522½A, 1-203262 No. 3)** Includes "E" and "F"
E *Included with "D"
F **53527** Shoulder stud
G **9253¼** Stud
H **9250⅛** Stud
I **1-12322** Assembly, includes "H," "J" and "O"
J **450¾** Spring stud
K **780½** Spring
L **3455⅜** Screw
M **12314⅜ No. 1 to 6**
N **953⅛** Stud
932⅝ Roll
O **12312 No. 1 thru 6 (12312A No. 1 thru 6)**
12380 Spring for above item
P **12311⅝ Nos. 1 to 6**
12381 Spring for above item
Q **99517 Env. 1402** Spring stud
R **1-116 Env. 1402** Side plate with studs and slides assembled
S **12052⅝** Shoulder stud
T **12315¼**
U **203522½ (1527 Fte. 214)**
V **12051⅞** Flat head shoulderless screw
W **1-203105½ (1A-203100½, 1-203105½A, 203522½A, 1-203262 No. 3)**
X **10751¾** Stud
75300A Roll
Y **3450** Spring stud
Z **73805** Spring
AA **1650¼** Shoulder spring stud
AB **21-203264 No. 2 (1A-203264 No. 2, 1A-203100½, 1-203105½A, 203522½A)**
AC **203617** Shoulder screw
AD **7264¼A** Stud furnished with "AE"
AE **1-203174 No. 2** Pawl assy., includes "AD" and parts attached
AF **1-203370** Stop assembly
203371 Nut
AG **203228** Punching fastened to rail with **2851⅞** screws

SEE EXPLANATION ON INSIDE OF FRONT COVER

VISIBLE ALIGNMENT CARRIAGE, CLASSES 20 THRU 30 (Plate 51)

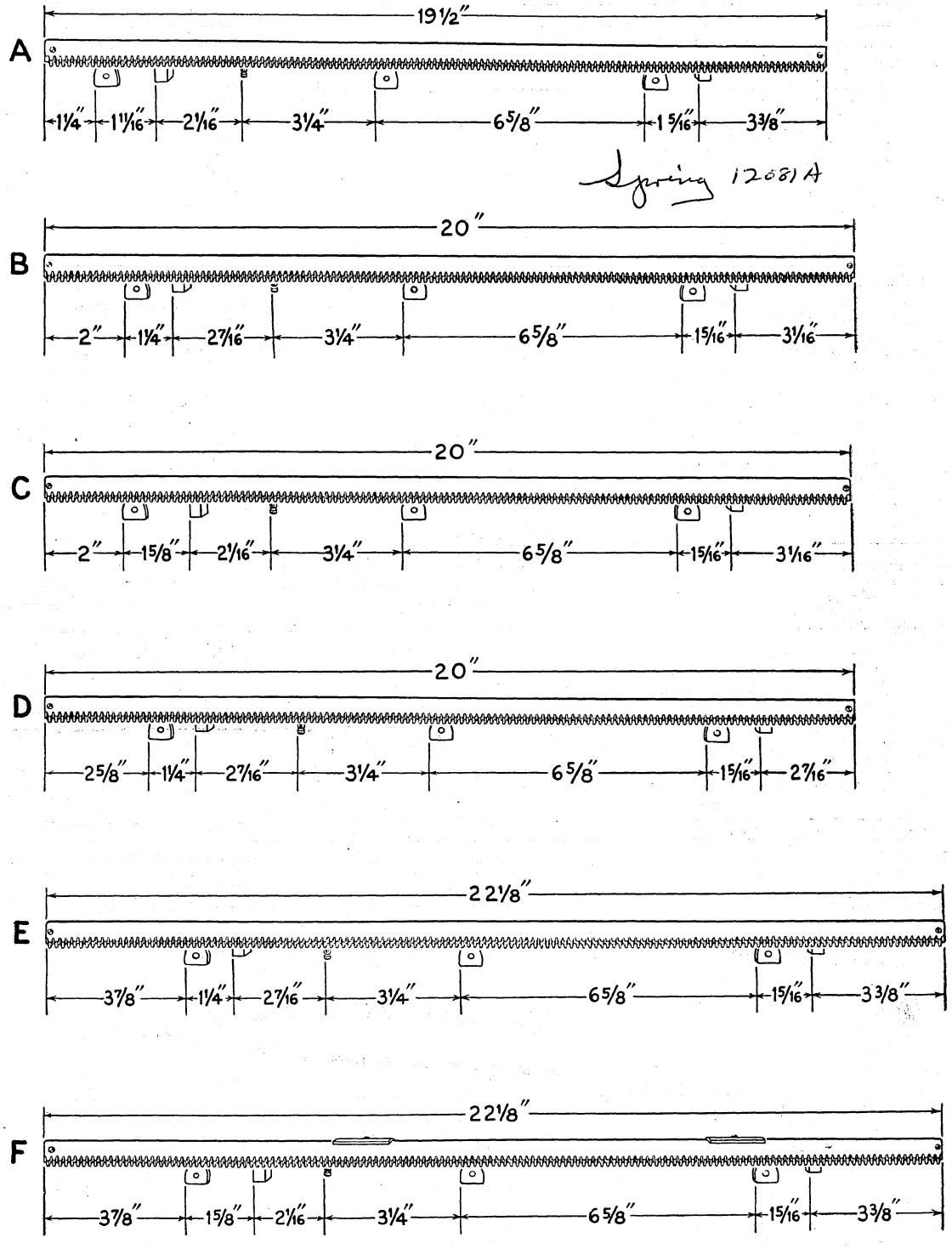


SYMBOLS (Plate 51)

A **73612**
B **4891A**
C **1-203114AR No. 7 (1-203114BR No. 7, 203479, 4557¼)** 203997A No. 3 billiard cloth—use cement code 7647-2
D **1-203127A** includes "A," "B," and studs
E **10739** Roll, 79635 stud
F **4952⅛** Screw (4 req.) 2 on each end
G **1-203237BR (1-203237CR)** use 203997 No. 4 billiard cloth—use cement code 7647-2
H **1-203110A No. 4 Style 12, 15 or 18 (2-203110D No. 4 Style 12, 15 or 18, 203246A, 203246½ No. 1, 506 Fte. 414, 952¾ [2 req.], 203398, 83802)** includes studs and hubs
1A-203110A No. 1 Style 12, 15 or 18 Aligning table with glass panel, specify machine number
I **1-203114AL No. 7 (1-203114BL No. 7, 203479, 4557¼)** 203997A No. 3 billiard cloth—use cement code 7647-2
J **1-203244**
K **203627** Screw
L **203239 Style 12", 15", 18"**
M **203237½** Block for screw "O" (2 req.)
N **1-203237BL (1-203237CL)** 203997 No. 4 billiard cloth—use cement code 7647-2
O **203635** (2 required)
P **203524 No. 2** Screw, 46 nut
Q **73612** Screw, 203472 No. 2 roll
R **1A-203200 Specify Style 3½", 6", 9", 12", 15", 18"** Use screw 203521A in hub
S **203135 No. 4 Specify Style 12", 15" or 18"**
T **74533** Screw
U **1-203191 No. 2**
V **7287 Style 5** Spring
W **1-203192 No. 2**
X **10686½** Spring
Y **203629A** Screw, 46¼ nut
Z **203625B** Screw, 46¼ nut
AA **1-203125L,** 203991 Small billiard cloth, 203992 large billiard cloth—use cement code 7647-2
AB **203124A Specify Style 12", 15", 18" 1-203124A Specify Style 12", 15", 18"** Includes "AA," "AD," "AG," "AH," "AL," "AO"
AC **203030 No. 2 Specify Style 12", 15", 18"** Shaft supporting punching 1-203194L No. 2 on left end and screw 203633 and 203194R No. 2 on right end using spring 10086
AD **1-203125** use 203991 small billiard cloth, 203992 large billiard cloth—use cement code 7647-2
AE **1-203230AL No. 3,** 203984 No. 2 billiard cloth—use cement code 7647-2
AE-1 **1-203142A (1-203142C)** 2897 billiard cloth—use cement code 7647-2
AE-2 **73376**
AE-3 **46¼**
AF **203168AL No. 2**
AF-1 **203168AL No. 3**
AF-2 **203168A No. 4**
AG **203525** Screw (3 required)
AH **1-203125R,** 203991 Small billiard cloth, 203992 large billiard cloth—use cement code 7647-2
AI **203132** (3 required)
AJ **1-203164,** 203993 Small billiard cloth, 203994 large billiard cloth—use cement code 7647-2
AK **203168AR No. 2**
AK-1 **203168AR No. 3**
AL **203184A No. 2** (2 required)
AM **203578A No. 2** Screw (2 required) **203547A No. 2** Shoulder nut (2 req.)
AN **1-203230AR or AL No. 3,** 203984 No. 2 billiard cloth (4 req.) use cement code 7647-2
AN-1 **1-203230AR or AL No. 1,** 203984 No. 1 billiard cloth (4 req.) use cement code 7647-2
AN-2 **1-203230AR or AL No. 9 (1-203230 AR or AL No. 1)** 203984 No. 1 billiard cloth (4 req.)use cement code 7647-2
AN-3 **1-203230AR or AL No. 4,** 203984 No. 2 billiard cloth (4 req.)—use cement code 7647-2
AN-4 **1-203230AR or AL No. 10 (1-203230 AR No. 4)** Specify AL for left, 203984 No. 2 billiard cloth (4 req.)—use cement 7647-2
AN-5 **1-203230AR or AL No. 7,** 203984 No. 2 billiard cloth (3 req.), 203984 No. 3 billiard cloth—use cement code 7647-2
AN-6 **1-203230A No. 7,** 203984 No. 2 billiard cloth (4 req.)—use cement code 7647-2
AN-7 **1-203230AR or AL No. 6,** 203984 No. 2 billiard cloth (3 req.), 203984 No. 3 billiard cloth—use cement code 7647-2
AN-8 **1-203230A No. 6,** 203984 No. 2 billiard cloth (4 req.)—use cement code 7647-2
AN-9 **1-203130AR or AL,** 203993 and 203994 billiard cloth—use cement code 7647-2
AN-10 **1-203164,** 203993 and 203994 billiard cloth—use cement code 7647-2
AN-11 **1-203230AR or AL No. 5,** 203984 No. 2 billiard cloth (3 req.), 203984 No. 3 billiard cloth—use cement code 7647-2
AN-12 **1-203230A No. 5,** 203984 No. 2 billiard cloth (4 req.)—use cement code 7647-2
AN-13 **1-203230AR or AL No. 2,** 203984 No. 2 billiard cloth (4 req.)—use cement code 7647-2
AN-14 **1-203164 No. 2** use 203993 No. 2 and 203994 billiard cloth—use cement code 7647-2
AN-15 **203125½ No. 1** formed strip for Types 20 and 30 carriage without statement limits or ledger chutes, with long journal sheets
AN-16 **1-203234 No. 3 (1-203234)**
AN-17 **252⅝** Screw **49¾** Nut
AN-18 **1-203234** Flexible limit stop
AN-19 **203283 Specify Length,** tie strip for ledger guides
AN-20 **2859⅞** Screw (4 required)
AN-21 **46** Nut (4 required)
AO **203526** Slotted post for "AG" (3 req.)
AP **69518** Stud
AQ **75814** Spring
AR 1-203107CR* included with shaft assembly "AV"
AS **10950½** Stud
AT **756** Stud
AU **59½** Pin
AV **1B-203005 Specify Style 12", 15", 18"** Includes right and left end plates, used on carriages to open on **forward** tabulation
11B-203005 Style 12", 15", 18" Used on carriages to open on **return** tab.
AW **71534** Stud
AX **203507**
AY **1-203189** complete assembly
AY-1 **203576 No. 2** Screw, 79333 No. 1 ecc., 69108 washer, 46 nut
AY-2 203190*
AY-3 203199*
AY-4 **120537⅛A** Stud
AY-5 **203816** Spring
AY-6 **203642** Screw
AZ **1-203260R** Refer to Plate 51-7
BA **11-2828¾R No. 1** Feed pawl
BB **7357½** Screw
BC **12083** Spring
BD **203564** Pin 203441 threaded washer, 12081¼ spring, 203455* hub
BE **1-203176R** includes "BD"
BF **See rack bar charts, Plate 51-1 thru 51-6**
BG **12055⅞**
BH **1-2822⅛** Link
BI **203500** Stud, 203401 roll
BJ **203408**
BK **46** Nut, 2858⅛ screw, 2820½ washer, 2843¾ collar
BL **1A-2826E** Lever held to shaft with pin 52
1-2803B Style 12, 15, 18 Shaft assembly includes lever
BL-1 **2857½C** Screw
BM **1-2822 No. 2** Pawl, use spring 2887½
BN **203113R** use screw 203539A
BO **203423 No. 3** Roll (.244" wide) use screw 74587 in right end of shaft
BP **1-2839½B**
BQ **2850⅛** Screw
BR **203424A**
BS 203449* Refer to "BZ"
BT 2828⅛A* Refer to "BZ"
BU **203569 (506 Fte. 209)**
BV **203183A** Punching, 7264 stud for punching
BW **203570AR** Stud, 203443 washer
BX 11-203118DR* Furnished with 11A-203006A Style 12", 15", 18"
BY **203269A** Punching, 203982 rubber (2 req.) 764¼ rivets (2 req.)
BZ **1-203998 Style 12, 15 or 18 (11-2800¼B Style H, K or 15 Specify Carbon, 1-2849D, 1-2839¼D, 2841⅛D, 2881B)** for machines not to close on machine operation use 2-223 Fte. 203 in place of 1-2849D
CA **1-203278** includes all parts CA-1 thru CA-10 except CA-2 and CA-4, this assy. is located on shaft between rack and outer carriage casting
CA-1 **1-203279**
CA-2 **203381A**
CA-3 **203280**
CA-4 **2850⅛**
CA-5 **3480½** Spring for "CA-1" **2887½** Spring for "CA-3"
CA-6 **46** Nut
CA-7 **629** Washer
CA-8 **203278**
CA-9 **428** Washer
CA-10 **203631** Screw

M.R.C. RACK BAR CHART (Plate 51-1)

Listed below are the various M.R.C. Rack Bars most commonly used. For other Rack Bars specify Style and Machine No.



SYMBOLS (Plate 51-1)

A 1-12017A Style 9H
B 1-12017 Style 11H
C 1-12017A Style 11H
D 1-12017 Style 13H
E 1-12017 Style 17H
F 1-12017 Style 13-13-34

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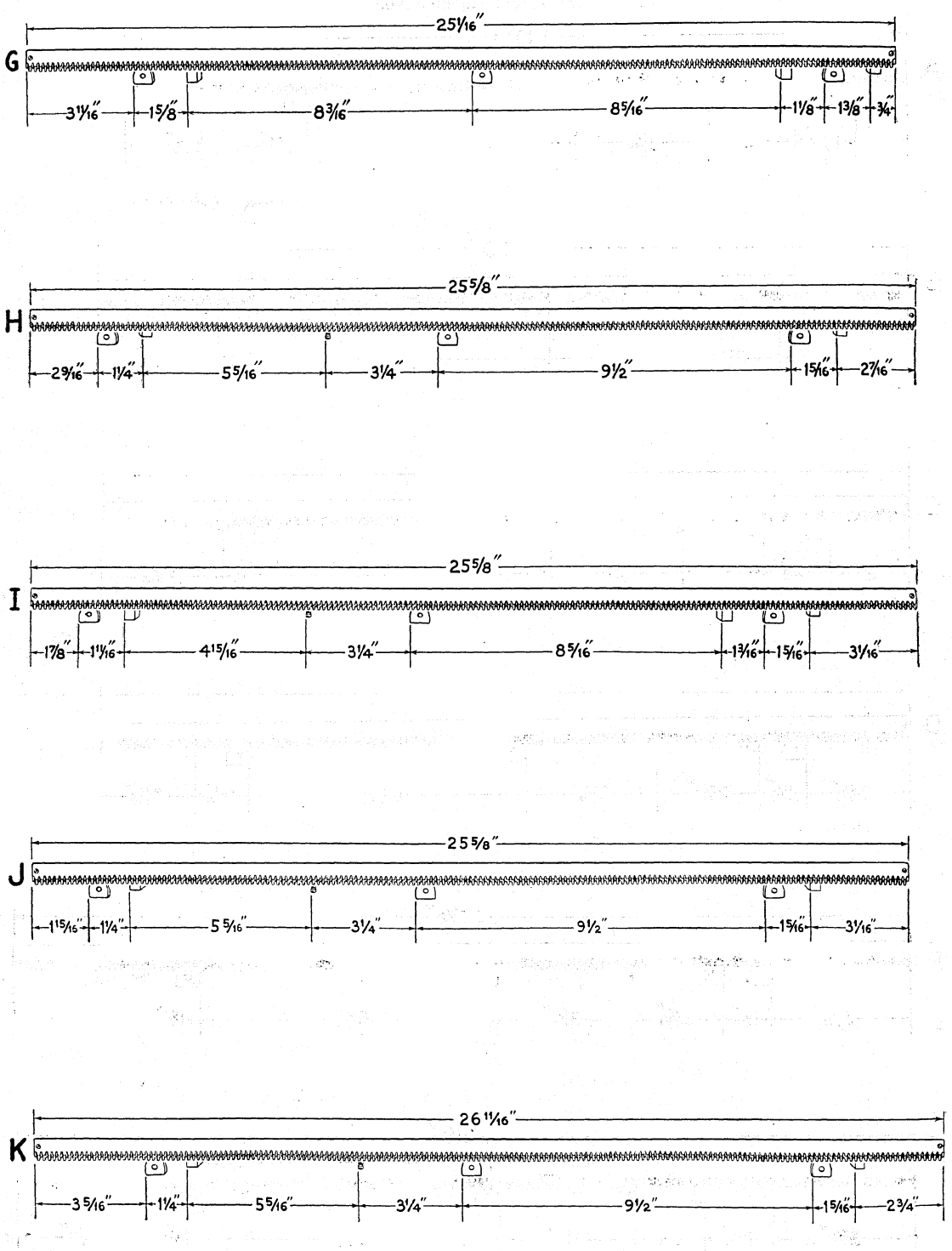
M.R.C. RACK BAR CHART (Plate 51-2)

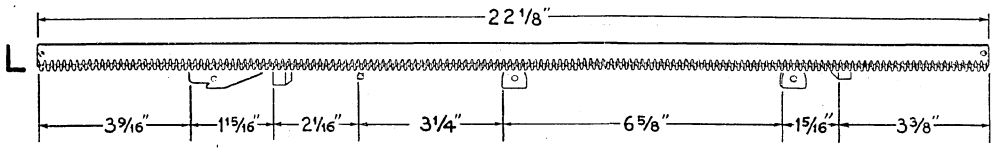


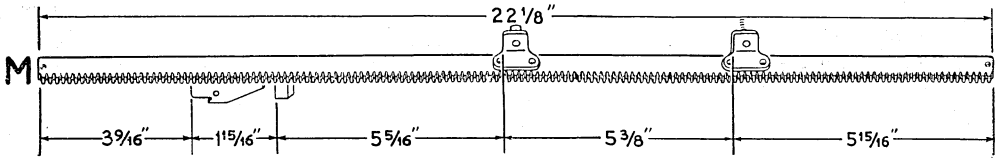
SYMBOLS (Plate 51-2)

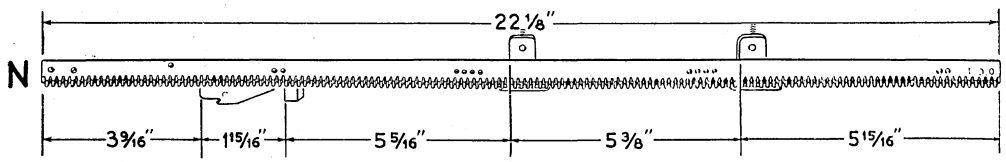
G 1-25½ Fte. 79
H 1-12017 Style 13K
I 1-12017A Style 11K
J 1-12017 Style 11K
K 1-12017 Style 17K

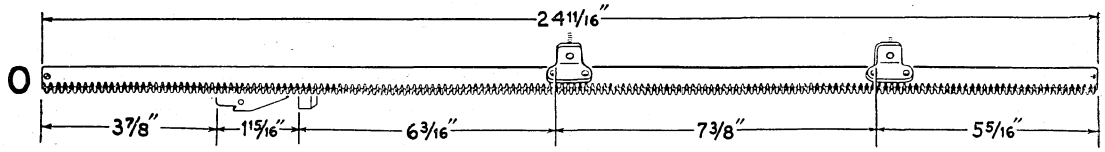
SEE EXPLANATION ON INSIDE OF FRONT COVER

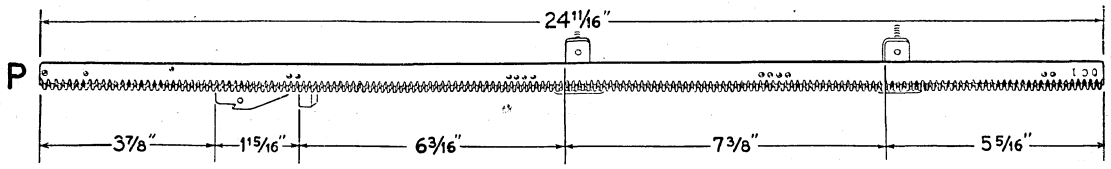
M.R.C. RACK BAR CHART (Plate 51-3)







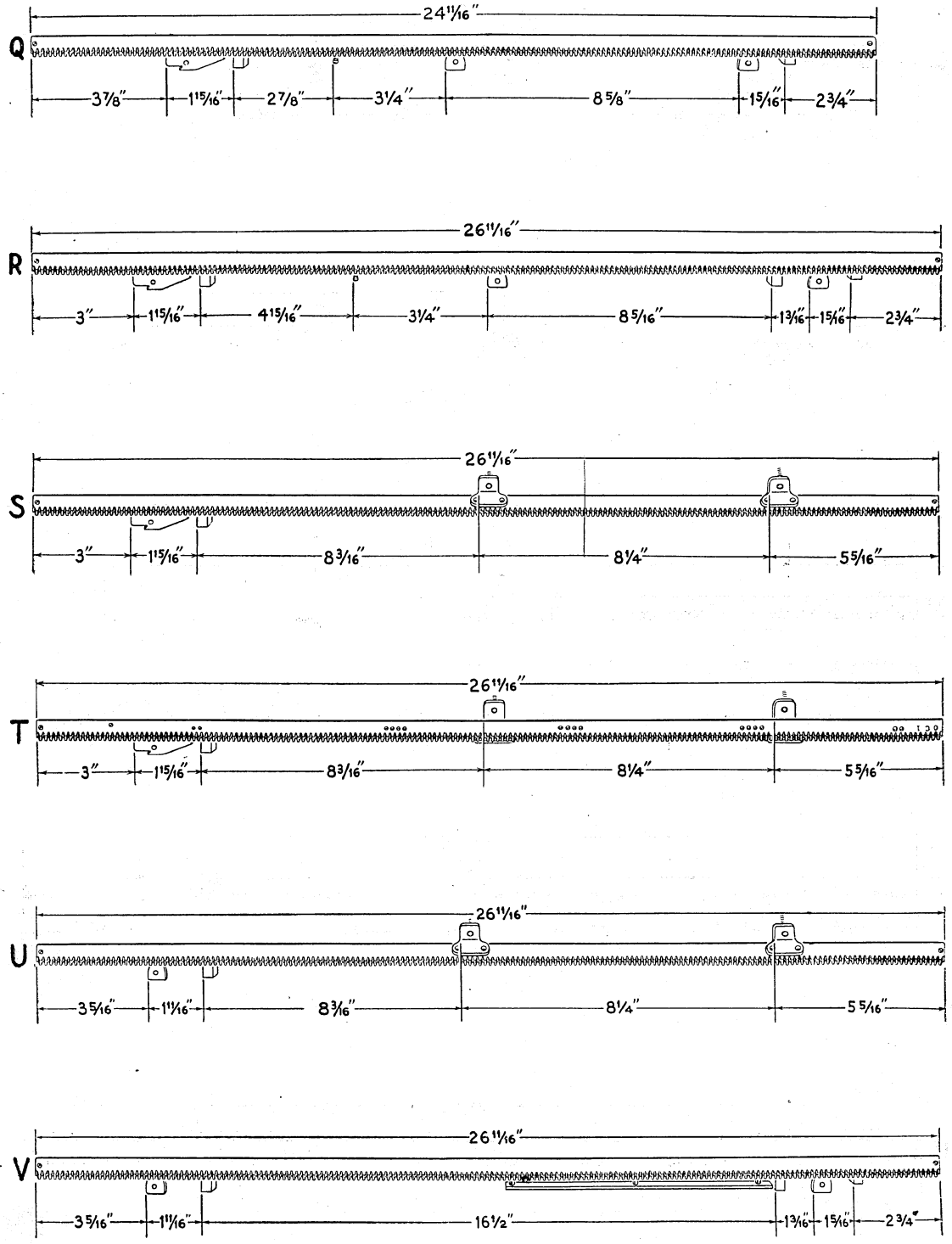




SYMBOLS (Plate 51-3)

L 1-12017A Style 17H
M 1-12017 Style 17 (12) No. 2
N 1-12017 No. 3 Style 12 (1-12017B No. 3 Style 12)
O 1-12017 Style 17 (15) No. 2
P 1-12017 No. 3 Style 15 (1-12017B No. 3 Style 15)

M.R.C. RACK BAR CHART (Plate 51-4)

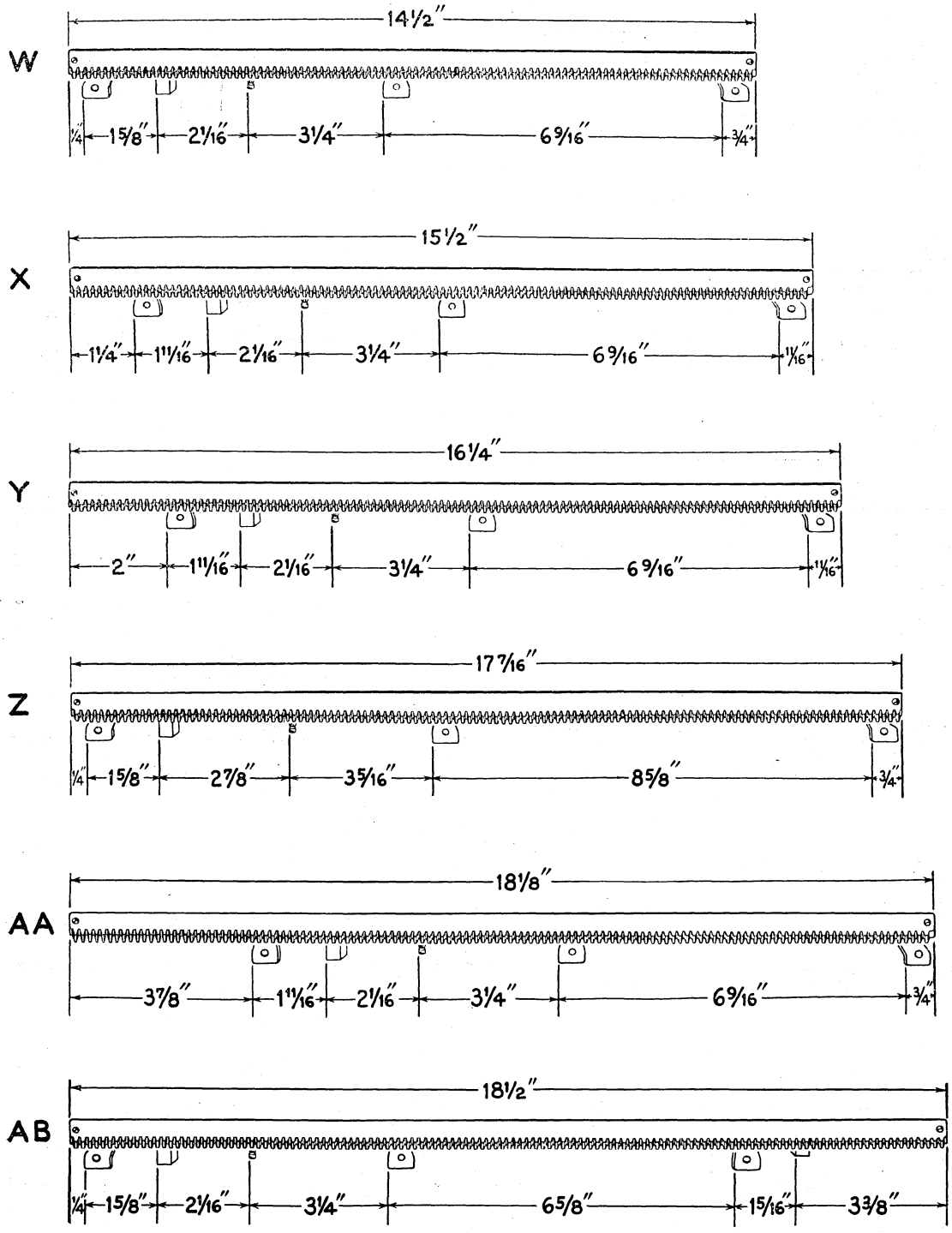


SYMBOLS (Plate 51-4)

Q 1-12017A Style 17 (15)
R 1-12017A Style 17K
S 1-12017 Style 17 (18) No. 2
T 1-12017 No. 3 Style 18 (1-12017B No. 3 Style 18)
U 1-12017B Style 17K Env. 1358
V 1-17 3/16A Style 17K Fte. 88

SEE EXPLANATION ON INSIDE OF FRONT COVER

M.R.C. RACK BAR CHART (Plate 51-5)



SYMBOLS (Plate 51-5)

W 1-17 Fte. 86 Style 17 (12) No. 1
X 1-17 Fte. 86 Style 9 (12) No. 3
Y 1-17 Fte. 86 Style 11 (12) No. 3
Z 1-17 Fte. 86 (15) No. 1
AA 1-17 Fte. 86 Style 17 (12) No. 3
AB 1-17 Fte. 86 Style 17 (12) No. 2

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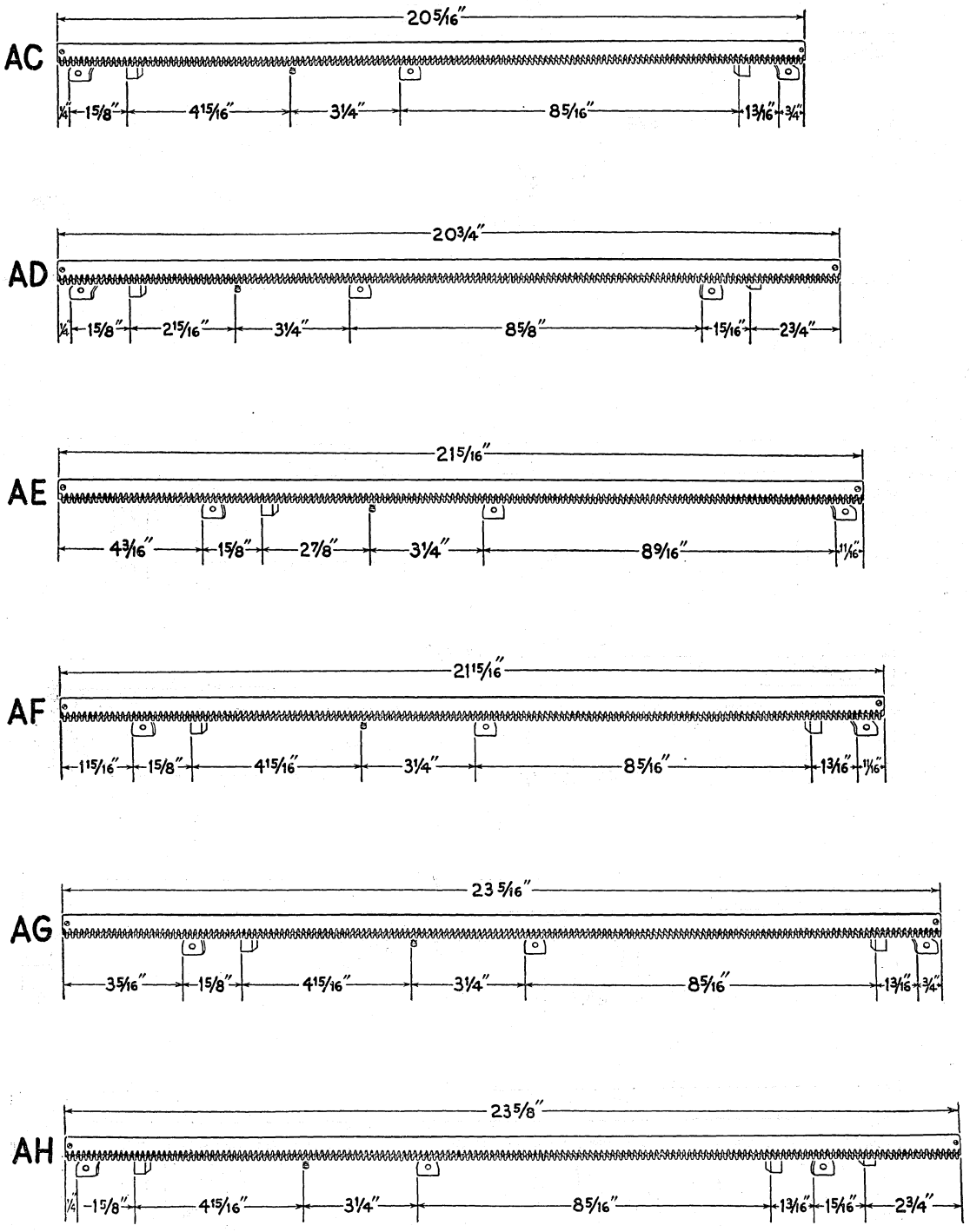
M.R.C. RACK BAR CHART (Plate 51-6)



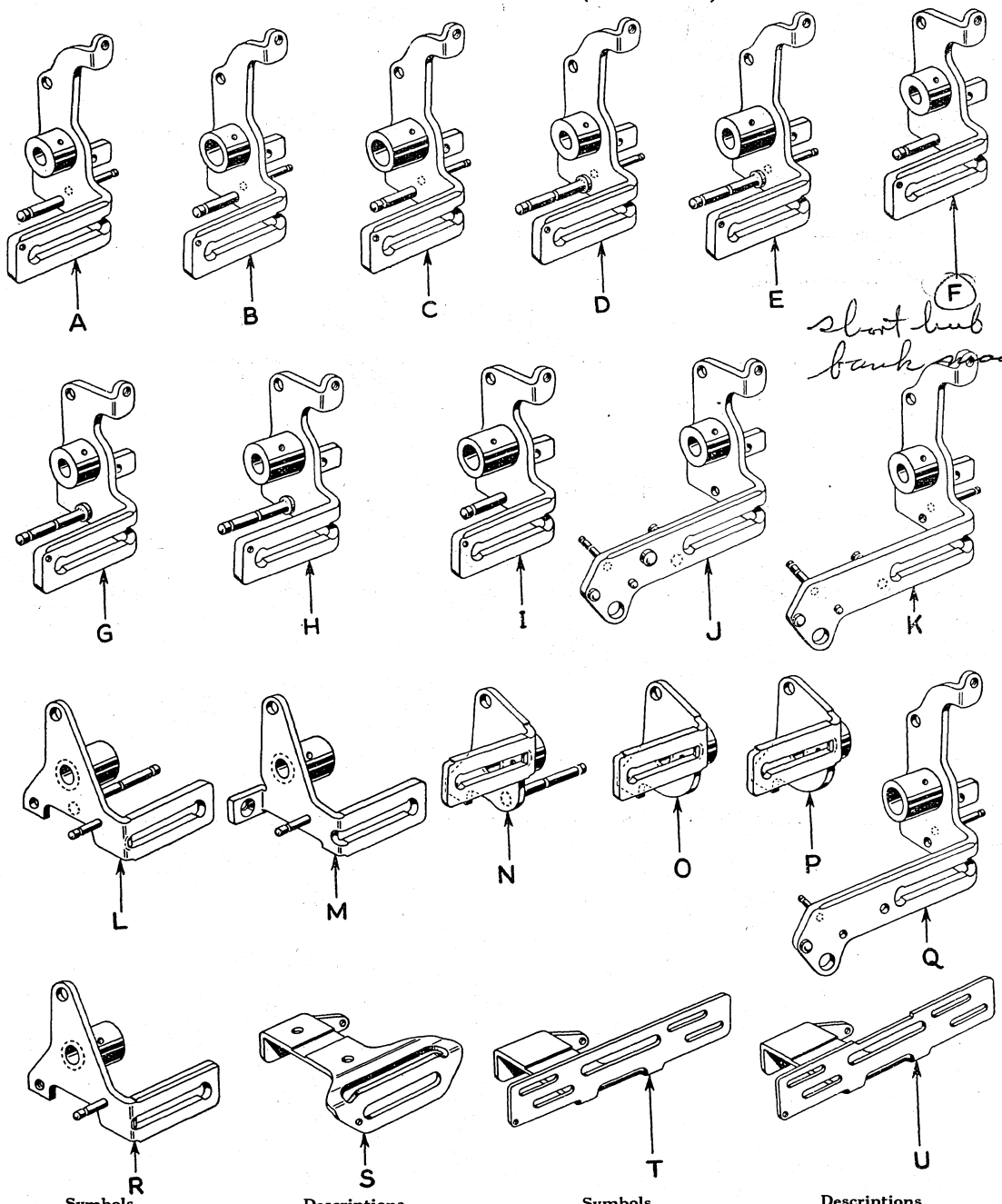
SYMBOLS (Plate 51-6)

AC 1-17 Fte. 86 Style 17 (18) No. 1
AD 1-17 Fte. 86 Style 17 (15) No. 2
AE 1-17 Fte. 86 (15) No. 3
AF 1-17 Fte. 86 Style 11 (18) No. 3
AG 1-17 Fte. 86 Style 17 (18) No. 3
AH 1-17 Fte. 86 Style 17 (18) No. 2

SEE EXPLANATION ON INSIDE OF FRONT COVER

A-1
Mec438

M.R.C. RACK BRACES (Plate 51-7)



	Symbols	Descriptions
A	**1A-120263/4AR**	Classes 1, 2, 6, 11 thru 16 later
B	**1A-263/4AR Fte. 88**	Classes 2, 6, 11 thru 16 Public Utility
C	**1-120263/4AR**	Classes 1, 2, 6 early
D	**1A-26R Fte. 86 No. 1**	Classes 1, 2, 6, 11 thru 16, 1″ Spacing on right
E	**1-26R Fte. 86 No. 1**	Classes 1, 2, 6, 11 thru 16, 1″ Spacing on right, early
F	**1A-203260R**	Classes 20 thru 30, Not Multiple Skip and Return
G	**1A-26R Fte. 86 No. 2**	Classes 20 thru 30, 1″ Spacing on right
H	**1-26R Fte. 86 No. 2**	Classes 20 thru 30, 1″ Spacing on right, early
I	**1-203260R**	Classes 20 thru 30, Manual Controlled Spacing Normalizer
J	**1A-218AR Fte. 203**	Classes 20 thru 30, Multiple Skip and Return, Space or Non-space
K	**1A-126BR Fte. 140**	Classes 1, 2, 6, 11 thru 16, Space or Non-space
L	**1-26L Fte. 86**	Classes 1, 2, 6, 11 thru 16, 20 thru 30, 1″ Spacing on left, S&N

	Symbols	Descriptions	
M	**1-203260L**	Classes 20 thru 30, Manual Controlled Spacing Normalizer	
N	**1-26L Fte. 86 No. 2**	Classes 20 thru 30, 1″ Spacing on left, Multiple Skip and Return	
O	**1-120263/4L No. 2**	Classes 20 thru 30, Multiple Skip and Return, stamped "2"	
P	**1-120263/4L No. 3**	Classes 20 thru 30, Platen Space from MRC Cge. Controlled, stamped "3"	
Q	**1-126BR Fte. 140**	Classes 11 thru 16, Variable Cge. Controlled, MRC Spacing Normalizer	
R	**1-120263/4CL**	Classes 1, 2, 6, 11 thru 16, 20 thru 26, Present construction	
S	**120267/8B**	Classes 1, 2, 6, 11 thru 16, 20 thru 30	Center brackets
T	**120267/8 No. 2**	Classes 20 thru 30, Multiple Skip and Return, stamped "2"	Center brackets
U	**120267/8 No. 3**	Classes 20 thru 30, Platen Space from MRC, stamped "3"	Center brackets

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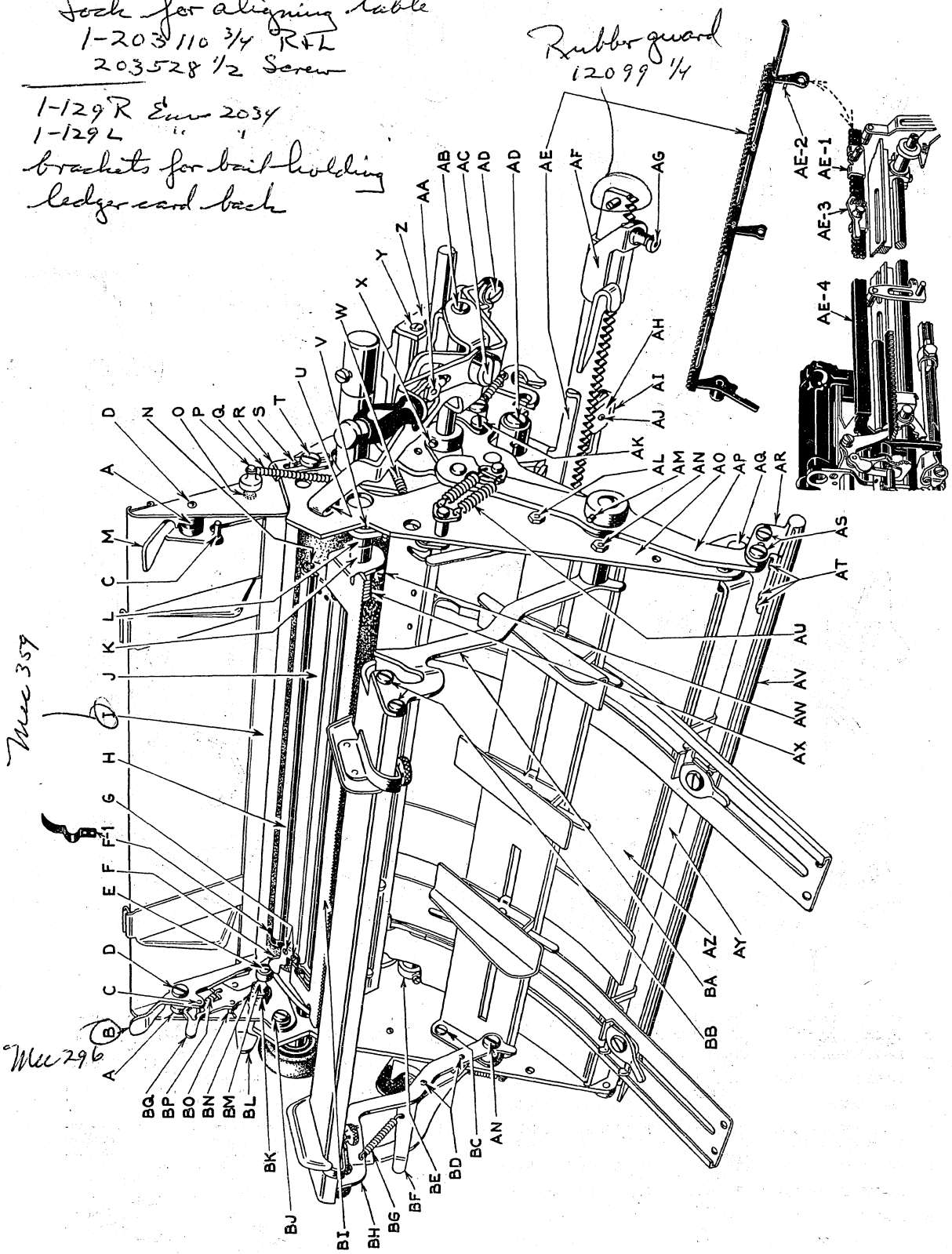
VISIBLE ALIGNMENT CARRIAGE, CLASSES 20 THRU 30 (Plate 52)

Lock for aligning table
1-203110 3/4 R+L
203528 1/2 Screw

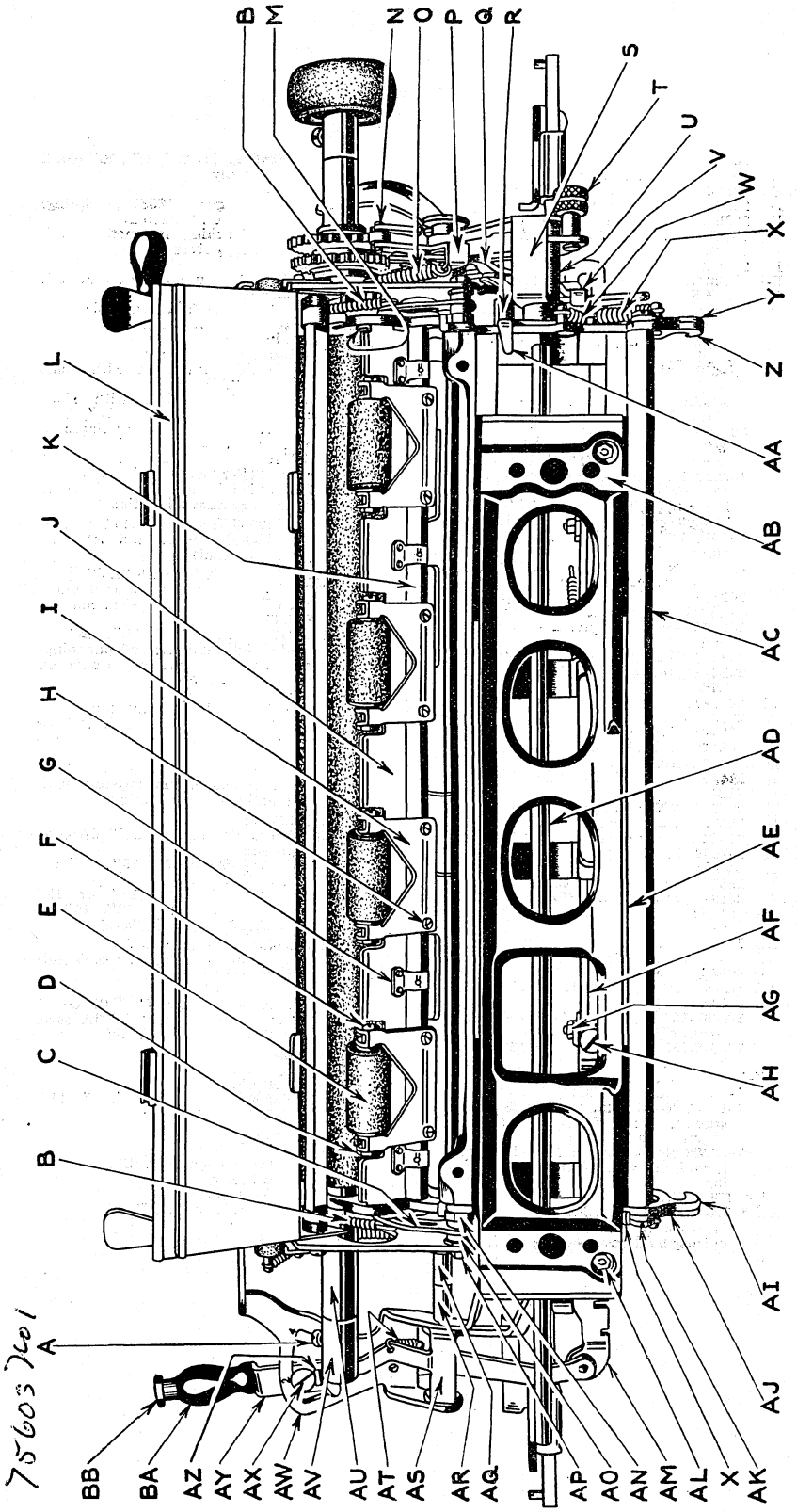
1-129R Env 2034
1-129L " "
brackets for bail holding ledger card back



SYMBOLS (Plate 52)

A 203372* Bushing
B 203247AR* included with "I"
C **203626** Stud (2 required)
D **203627** Screw (2 required)
E **203573 No. 2** Threaded stud (2 req.)
203472 No. 2 Roll (2 required)
73612 Screw (2 required)
F **203227½**
F-1 **203227A** Spring steel indicator
G **77515** Screws, 49¼ nut
H **203024 Style 3½", 6", 9", 12", 15", 18"** Roller
I **1A-203247A Style 12 (1-203247A Style 12)**
1A-203247A Style 15 (1-203247A Style 15)
1A-203247A Style 18 (1A-203247B No. 3 Style 18)
J **203205 Specify Style 3½", 6", 9", 12", 15" or 18" (1-203205A Specify Style 3½", 6", 9", 12", 15" or 18"**
1-203205 Specify Style 3½", 6", 9", 12", 15" or 18" (1-203205A Specify Style 3½", 6", 9", 12", 15" or 18"
K **1-203029 No. 2 Specify Style 12", 15", 18"** and width of cutter, included with "K"
203029 No. 2 Specify Style 12", 15", 18" Shaft only
L **203423A (203423 No. 5)** Approximately 3/32" wide
203423 No. 2 Approximately 5/32" wide
203423 No. 3 Approximately ¼" wide
203423 No. 4 Approximately 5/64" wide
M 203247AL* included with "I"
N **203543** Screw
O **203443** Washer
P **203570AL** Stud
Q **10080** Spring
R **203183A** (2 required)
S **7264**
T **203569 (506 Fte. 209)**
U **203524 No. 2** Screw, use nut 46
V **73564A** Screw in end of shaft "K"
W **1-203800 No. 6** Spring
X **64** Pin
Y **2852**1/16 Screw (4 required)
Z **2818A (4918R or L, 4952½)**
AA **551 Fte. 203** Screw, 200393 shoulder nut
AB **561 Fte. 203**
AC **3450**11/16 **Style 9** Screw
AD **8054¾** Screw
AE **1A-203166 Style 12 (11-203166 No. 3 Style 12)**
1A-203166 Style 15 (11-203166 No. 3 Style 15)
1A-203166 Style 18 (11-203166 No. 3 Style 18)
AE-1 **1-12023** use screw 12057¼
1-12023 No. 2 (1-12023)
1-12023 No. 3 Same as 1-12023 except stud for screw 12057¼ is near center of punching
1-12023 No. 4 Same as 1-12023 except is equipped with fin on top of punching
AE-2 **69510** Stud
AE-3 **1A-12023⅛ for MRC**
1A-12023⅛ No. 2 for Type 20 requiring hold down skip operation
AE-4 **1-203166 Styles 12", 15", 18" No. 2** Bail assembly
AF **1-203176L**
AG **203564** Plunger, 12081¼ spring, 203441 washer, 203455 hub
AH 1-12014* Punching fastened to rail with 12051⅛ rivets
AI **12026¼L**
AJ 12050⅛* Stud, use 47 nut and lock washer 1097⅞
AK **7357½** Screw, 1097/16 lock washer
AL **203629A** Screw, 46¼ nut
AM **59½** Pin
AN **203625B** Screw, 46¼ nut
AO 11-203118DL* furnished with shaft assembly "AQ"
AP 1-203107CL* furnished with shaft assy. **1B-203005 Style 12", 15", 18"** which is used on carriages to open on **forward** tabulation
11-203107CL* furnished with shaft assy. **11B-203005 Style 12", 15", 18"** which is used on carriages to open on **return** tabulation
AQ **11A-203006A Specify Style 12", 15", 18"** includes right and left end plates and shaft
AR 203196BL* included with "AV"
AS **2858¼A** Screws (2 req. on each end)
AT **205508** Rivets (4 req. on each end)
AU **1-203801A**
AV **1-203123D Style 12", 15", 18"** includes right and left end punchings and rivets, for carriage to open on **return** operation
1-203123D Style 23-17-40 or 42 machines Style 12", 15", 18"
11-203123D Style 12", 15", 18" for carriages to open on forward **tabulation**
21-203123D Style 12", 15", 18" for carriages to open on **forward** tabulation and **return** operation
AW **203521A** Screw
AX **203810AL** Spring, use 203810AR on right end
AY **1-203122½ Style 12", 15", 18"** use studs 203614
AZ **1-203122 Style 12", 15" or 18" (203122 No. 2 Style 12", 15" or 18", 203297R and L, 7562)**
BA **1-203248AL (1-203248BL)**
BB **4952**1/16 Screws (4 req., 2 on each end)
BC **4458¾** Screw
BD **203636 (200514½)**
BE **1-540** includes screw 550¾ (2 req.) 1 on each end of shaft 203003A Style 12", 203003 Style 15", 18"
BF **203249**
BG **10086**
BH **1-203248AR**
BI **1A-203200 Style 3½", 6", 9", 12", 15", 18"** Paper cutter
BJ **103502** Screw
BK **7919½A** Washer
BL **1-203245A** use spring 203814
BM **203624A** Screw
BN **72307** Eccentric
BO **8362¼** Stud for spring 75814
BP **44808** Spring
BQ **1-203246**

VISIBLE ALIGNMENT CARRIAGE, CLASSES 20 THRU 30 (Plate 53)



Bearing bushes
2818 '82 47
72309 1097 13/16
75603 Jc01

SYMBOLS (Plate 53)

A **2850⅛** Screw
B 203800 No. 7* assembled 1-203800 No. 6 includes extra spring and 20 No. 20 anchor
C **203287L No. 1** use R No. 1 for right side
D **49¼** Nut
E **1-703345**
F **703024** Shaft for pressure roll
G **203109A** Spring clip, use rivet 203508
H **7357½**
I **1-203121 No. 1** includes D, E, F
J **1-203108B Style 12″, 15″, 18″** Shield includes G
K **1B-203004A Style 12″, 15″, 18″** includes arms on each end with pins 52
L 203131A* Style 12″, 15″, 18″ included with complete aligning table, see Plate 51
M **10058⅞** Studs (2 req.)
N 2858 7/16A* Pin, 2841¾B* Roll, 2822⅜B* Flat punching, 2856 9/16A* Rivets — Included in P
O **2886⅞**
P **1-2816A No. 1** Detent includes N
Q **11-2828¾R No. 1** Feed pawl, use screw 7357½ and spring 12083
R **203518A** Hex. stud, use 12051⅞ screw, 45 nut, 1097¾ washer
S **1-2826E** included in complete shaft assembly, 1-2803B Style "H" or "K"
1-203226 included in shaft assembly 21-2803B Styles 12″, 15″, 18″
T **2847** use 2845½ threaded bushing, 2888 spring
U 1B-2816⅛* included in S, use pin 52
V 1-203258* included in shaft assembly 11-203008 Style 12″, 15″, 18″
W **2886¾** Spring for S
X **2881½**
Y **1-2823½ No. 2** Clip for control bar, use 84618 screw
Z **1-203117R** End plate
AA **2824⅝** use screw 4456½
AB **203665 Style 13, 12″ (2865C Style 13H, 4918R and L, 4952 1/16)**
2865C Style 13K use for Style 13 (15″) (18″)
2865C Style 17H use for Style 17 (12″)
2865C Style 17K use for Style 17 (15″) (18″)
AC **667 Fte. 213 Style 12, 18 No. 2**
667 Fte. 213 Style 15 No. 1
AD **1-203015 Style 15** used for 15″ only
1-2806½A Style H or K Held to shaft with 2851¾ screws; use spring 1-3383¼C Style H or K
AE **2824C Style H (2824 No. 2 Style 12, 2 req., 2837⅛ Specify Number, 20 req.)**
2824 No. 3 Style 18 (2824 No. 2 Style 18, 2 req., 2837⅛ Specify Number, 24 req.)
AF **155A Fte. 203 Style 12″, 15″, 18″** Punching on rectangular shaft 203013C Style 12″, 15″, 18″ use screw 2856 1/16C on left end of shaft
AG **2850 7/16A** Screw, 2820½ washer, 12044¼ shoulder nut, 46 nut
AH **535 Fte. 203** Screw, 46 nut
AI **1-203117L** End plate
AJ **1-2823¾ No. 2** Clip for control bar, use 2881½ spring
AK **2854⅞ (84618)** Screw
AL **2859 5/8A** Square headed screw, use 46 nut
AM **206A Fte. 203** (2 or 3 selection)
206B Fte. 203 Style 4 (4 selection)
AN **535B Fte. 213 (300153½, 47¼, 203287 R or L Specify Number, 328B Fte. 213, 2 req.)**
AO **328B Fte. 213** Roll, one used on each end
AP **47** Nut, 1097 11/16 lock washer, one used on each end
AQ **11A-203002 No. 1** Style 12″, 15″, 18″ for bank posting machines; **1A-203002 No. 1** Style 12″, 15″, 18″ Class 20 thru 30 — Includes shaft and right and left end plates
AR **561 Fte. 203** Long screw
AS **149A Fte. 203**
AT **83806B**
AU **48323/4** Sleeve
AV **1-911 Fte. 203** includes screw 2850⅛
AW **1-151C Fte. 203 Style 2 (2-151D Fte. 203 Style 3, 1-151 1/16 Fte. 203 No. 2, 573 Fte. 203, 4463, 12051⅞, 46, 535 Fte. 203)**
1-151C Fte. 203 Style 3 (2-151D Fte. 203 Style 3, 535 Fte. 203)
1-151C Fte. 203 Style 4 (2-151D Fte. 203 Style 3, 1-151 1/16 Fte. 203 No. 1, 535 Fte. 203, 573 Fte. 203, 4463, 12051⅞, 46)
AX **551 Fte. 203** Screw, 200393 shoulder nut
AY **1-150C Fte. 203** includes AZ, BA, BB
AZ 534B Fte. 203* included in AY
BA 912A Fte. 203* included in AY
BB 330A Fte. 203*, 331 Fte. 203* inside sleeve, 83⅛ Fte. 88* spring plunger, 1-533 Fte. 203*, furnished with AY

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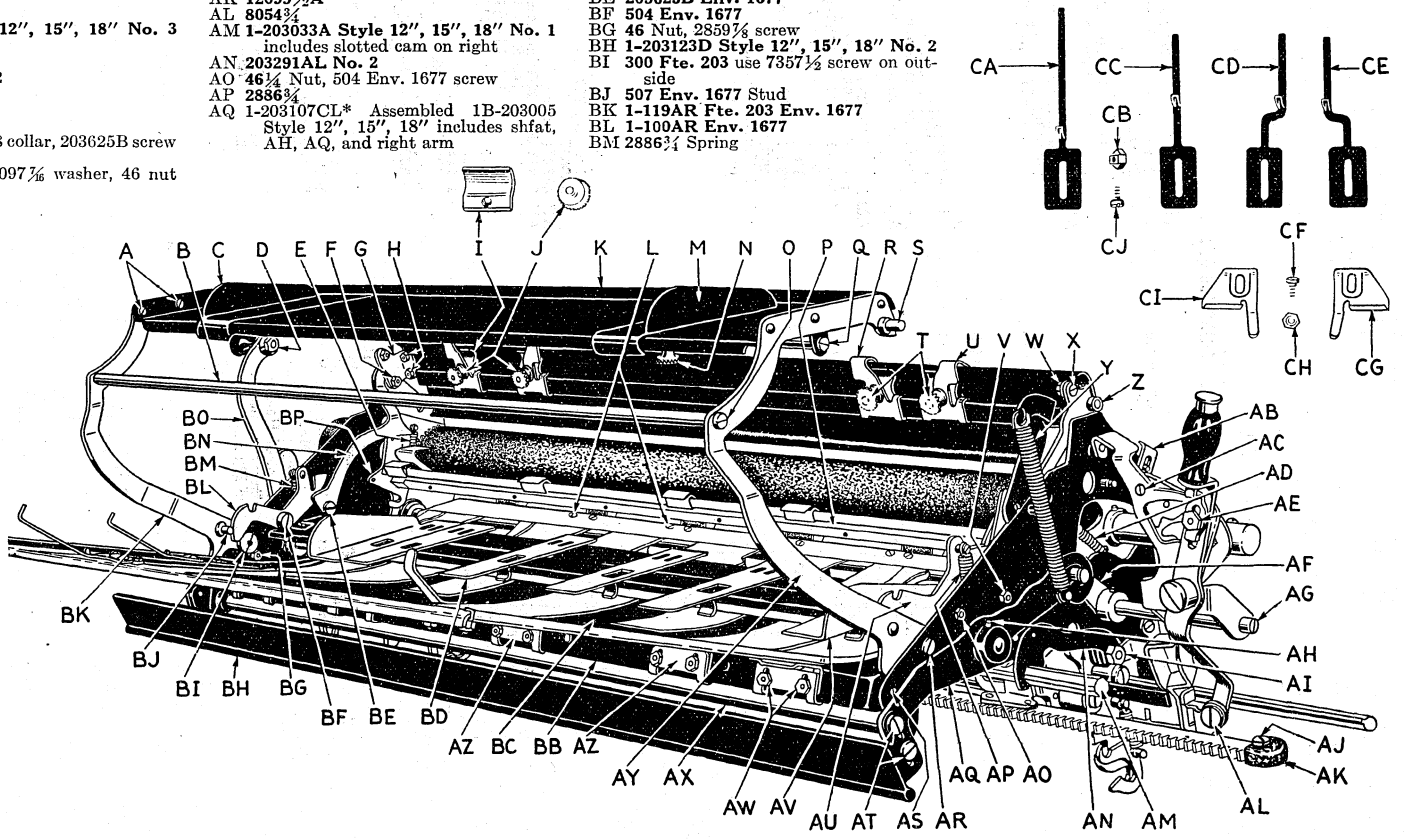
FORM MAGAZINE CARRIAGE WITH FORM ALIGNING INDICATOR BAIL (Plate 53-1)

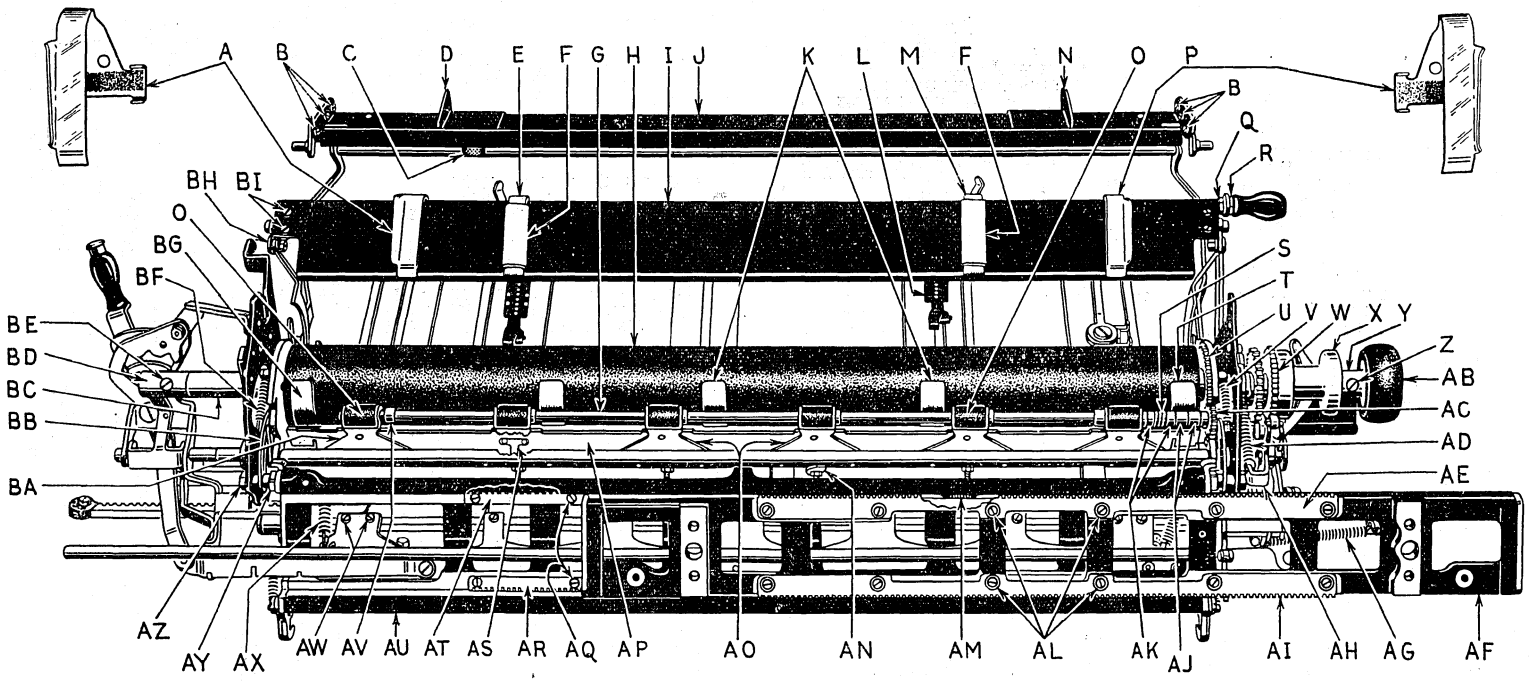
SYMBOLS (Plate 53-1)

A **952¾**
B **9 Fte. 203 Style 12″, 15″, 18″**
C **1-226¼R Fte. 203**
D **1-203485** Nut
E **705828**
F **46** Nut, 120517⁄8 screw
G **203248¼R No. 2** Bracket
H **46** Nut, 1097⁄16 lock washer, 120583⁄8 screw
I **203237½ No. 2**
J **203635**
K **111 Fte. 203 Style 18″**
L **203508 No. 3** use 1653½ screw on both ends
M **1-226¼L Fte. 203**
N **203635**
O **120513⁄8**
P **203030A Style 12″, 15″, 18″ No. 3** Shaft
Q **3256⁄16**
R **1-203237L No. 2**
S **503½ Fte. 203**
T **203635**
U **1-203237CL**
V **46¼** Nut, 103328 collar, 203625B screw
W **46**
X **2852⁄16** Screw, 1097⁄16 washer, 46 nut
Y **1-203824**
Z 10739* Roller
AB **203183A** use 506 Fte. 209 screw
AC **573 Fte. 203** Screw, 1097⁄16 lock washer, 46 nut
AD **1-203800 No. 6** includes 20 No. 20 anchor, 203800 No. 7 spring
AE **200393**
AF 1B-203100L* complete assembly 21-2B Fte. 213 Style 12″, 15″, 18″ includes shaft, side plates and AF
AG **561 Fte. 203**
AH **59½** Pin
AI **45** Nut, 1097⁄16 lock washer
AJ **100575⁄8**
AK **12099½A**
AL **8054¾**
AM **1-203033A Style 12″, 15″, 18″ No. 1** includes slotted cam on right
AN **203291AL No. 2**
AO **46¼** Nut, 504 Env. 1677 screw
AP **2886¾**
AQ 1-203107CL* Assembled 1B-203005 Style 12″, 15″, 18″ includes shfat, AH, AQ, and right arm
AR **7357½** Screw, use 300 Fte. 203 bushing on inside
AS **12055⁄16** Screw
AT **2858¼A**
AU **1-100AL Env. 1677**
AV **203125½L No. 2 (1-203125½AL No. 2)**
AW **46¼** Nut, 1097¾ lock washer
AX 203006A* Complete assembly 11A-203006A/ Style 12″, 15″, 18″ includes shaft and both side plates
AY **1-119AL Fte. 203 Env. 1677**
AZ **203187¼**
BB **1-203122½ Style 12″, 15″, 18″**
BC **203122 Style 12″, 15″, 18″ No. 2** Pan
BD **203125½ No. 2 (203125½A No. 2)**
BE **203625B Env. 1677**
BF **504 Env. 1677**
BG **46** Nut, 2859⅞ screw
BH **1-203123D Style 12″, 15″, 18″ No. 2**
BI **300 Fte. 203** use 7357½ screw on outside
BJ **507 Env. 1677** Stud
BK **1-119AR Fte. 203 Env. 1677**
BL **1-100AR Env. 1677**
BM 2886¾ Spring
BN **1A-203248AR Env. 1677**
BO **1-203127A** includes D
BP **203194CR** use 2818½ washer on outside
CA **184 Fte. 213 No. 11**
CB **327 Fte. 213**
CC **184 Fte. 213 No. 2**
CD **184R Fte. 213 No. 2**
CE **184L Fte. 213 No. 2**
CF **70512**
CG **184R Fte. 213 No. 10**
CH **49¼**
CI **184L Fte. 213 No. 10**
CJ **70512**



SEE EXPLANATION ON INSIDE OF FRONT COVER

FORM MAGAZINE CARRIAGE WITH FORM ALIGNING INDICATOR BAIL (Plate 53-2)



SYMBOLS (Plate 53-2)

A **1-203237CL**
B **952¾**
C **203635**
D **1-226¼L Fte. 203**
E **1-203237L No. 2** includes F
F **203908**
G **1-18A Fte. 213 Style 12″, 15″, 18″** includes AC
H **11A-203998 No. 2 Style 12″, 15″, 18″** Specify carbon, includes shaft, platen, pins and U, use 51 pin for gear on right and 63 pin on left of shaft
I **1-203239 Style 12″, 15″, 18″ No. 2**
J **111 Fte. 203 Style 18″** Table only, assembled table 1-111 Fte. 203 Style 18″ includes C, D, J, N and shaft
K **1-203272½ No. 1**
L **1-203234**
M **1-203237R No. 2** includes F
N **1-226¼R Fte. 203**
O **1-332 Fte. 213 No. 4** Rubber roll (6 req.)
P **1-203237CR**
Q **1-203485**
R **203561A** Tapped hexagon post
S **812 Fte. 213** Coil spring
T **1-203272½R No. 3**
U 11A-20338 No. 2* included in H
V **203800 No. 7** Assembled 1-203800 No. 6, includes extra spring and 20 No. 20 anchor
W **1-2849D**
X **2841⅛D**
Y **1-2839¼D** includes Z, AB, use 2881B coil spring
Z **2850⅛** Screw
AB **2896¼ No. 1** Rubber
AC 338A Fte. 213* Gear included in G, use 62½ pin
AD **2886⅞** Spring
AE **2824⅞ Style 13 (18″)**
AF **2865C Style 13K** Casting only
AG **53805 Style 13**
AH **1-2816A No. 1** Detent
AI **2824⅞ Style 13 (18″)**
AJ **203423 No. 3** Collar
AK **344 Fte. 213** Split collar
AL **2854⅝** Screw
AM **1-2824 Style 12″, 15″, 18″ No. 2** Geared bearing retainer
AN **191A Fte. 213** use 4952⅞A screw, 46 nut
AO **1-109R Fte. 213 No. 3** use 12058⅜ screws
AP **1-203108C Style 12″, 15″, 18″ No. 4** Platen shield includes AS
AQ **2854⅝**
AR **2824 Style 12″, 15″, 18″**
AS **203109 No. 2** Brace, use 203508 No. 3 screws
AT **2824¾ Style 12″, 15″, 18″**
AU **667 Fte. 213 Style 18″ No. 2** Casting only
AV **1A-339 Fte. 213** Collar includes 544 Fte. 213 screw
AW **2851¾**
AX **1-808 Fte. 213 Style 18″**
AY **535C Fte. 213** use 328B Fte. 213 collar
AZ **47¼** Nut, 1097⅞ washer
BA **1-109L Fte. 213 No. 3** (1 req.)
BB **203287 No. 4** Slotted arm
BC **4832¾**
BD **1-911 Fte. 203** includes BE
BE **2850⅛**
BF **203800 No. 7** Assembled 1-203800 No. 6 includes extra spring and 20 No. 20 anchor
BG **1-203272½L No. 3**
BH **12051⅞** Screw, 1097⅞ lock washer, 46 nut
BI **12058⅜** Screw, 1097⅞ lock washer, 46 nut

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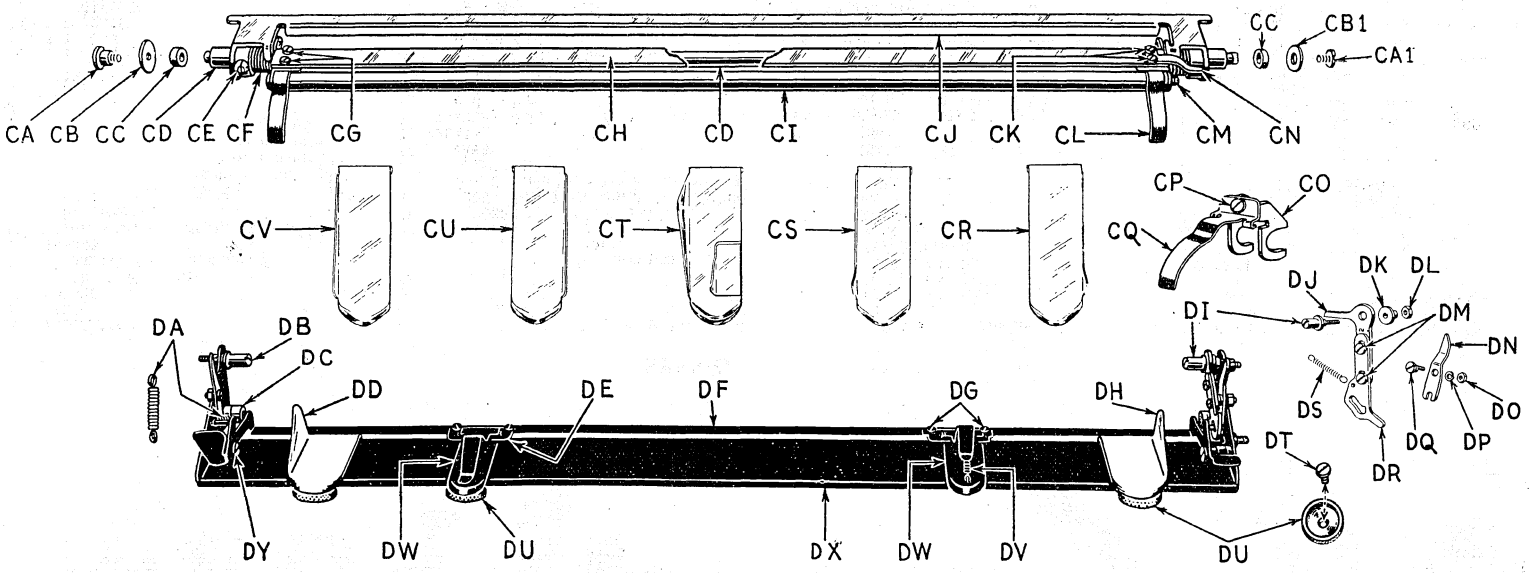
FORM MAGAZINE CARRIAGE WITH FORM ALIGNING INDICATOR BAIL (Plate 53-3)



SYMBOLS (Plate 53-3)

CA **73564A**
CA1 **74587**
CB **103176 Env. 1677** Large roller
CB1 **35 Fte. 69** Small roller
CC **203423 No. 2**
CD **203029 Style 12″, 15″, 18″ No. 2** Shaft only assembled shaft 1-203029 Style 12″, 15″, 18″ No. 2 includes CD, CE, CF, CH, CI, CJ, CK, CM, CN
CE **203521A** Screw
CF **203810AL No. 3** use AR No. 3 on right
CG **70512** Screw, 49¼ nut
CH **1-203205A Style 12″, 15″, 18″**
CI **203024 Style 12″, 15″, 18″**
CJ **1A-203200 Style 12″, 15″, 18″** Tear-off blade
CK **203502½** Screw, 49¼ nut
CL **203227A**
CM **203543** Small screw
CN **203227½**
CO **203227¾**
CP **545 Fte. 217**
CQ **203227 No. 2**
CR **1-203114BR No. 7 Env. 1834**
CS **1-203114BL No. 7 Env. 1834**
CT **11-203114BL&BR No. 7**
CU **1-203114BR No. 8**
CV **1-203114BL No. 8**

DA **75814**
DB **500 Env. 1677 No. 2**
DC **203472 No. 2** Roller, use 73612 screw
DD **1-203114BL No. 7**
DE **203114¾A** Bracket
DF **1-203247B No. 1 Style 12, 15 or 18 (1A-203247B No. 1 Style 12, 15 or 18, 203246B)** Specify machine style and number
DG **74502** Screws, 1097⅝ washer, 49¼ nut
DH **1-203114BR No. 7**
DI **500 Env. 1677 No. 3**
DJ **203246½ No. 2**
DK **203398**
DL **46**
DM **952¾**
DN **203110¾R&L**
DO **49**
DP **1097⅝**
DQ **203528½**
DR **203246A**
DS **83802**
DT **4557¼**
DU **203479**
DV **203819 No. 2**
DW **1-203114B No. 10**
DX **1-203110D Style 12″, 15″, 18″ No. 4** Specify style and machine number
DY **203627** Screw

SYMBOLS (Plate 53-4)

A **2896¼ No. 1** Rubber
B **1-2822⅛** Link
C **2858⅛** Screw, 2820½ washer, 2843¾ collar, 46 nut
D **506 Fte. 209**
E **203183A**
F **1-203800 No. 6** includes 20 No. 20 anchor, 203800 No. 7 spring
G **203637** Screw
H 11-203118DR* complete assembly 11A-203006A Style 12″, 15″, 18″ includes H, AN and shaft
I **1A-2826E** Lever only, use 52 pin, assembled 1-2803B Style 12″, 15″, 18″ includes shaft and I
J **1-203272½R No. 3** Guide
K **1A-203248AR Env. 1677**
L **73612** Screw
M **1-119AR Fte. 203 Env. 1677**
N **2809½ Style H or K**
O **2852⅛** Screw, 1097⅞ washer, 46 nut
P **12051⅜**
Q **1097¾** Washer
R **1-203127A** Assembled handle includes L
S **203635**
T **1-203272½ No. 1**
U **1-2819½A**
V **1-203272½L No. 3**
W 21-158L Fte. 213* Complete shaft assembly 21-2B Fte. 213 Style 12″, 15″, 18″
X **705828**
Y **7287 Style 10**
AB **952¾**
AC **9 Fte. 203 Style 12″, 15″, 18″**
AD **12058⅜** Screw, 1097⅞ lock washer, 46 nut
AE **46** Nut, 1097⅞ lock washer, 12051⅞ screw
AF **1-119AL Fte. 203 Env. 1677**
AG **203248¼R&L No. 2** Bracket
AH **1-203192 No. 2** use 10686½ spring
AI **1A-203248BL Env. 1677**
AJ **45** Nut, 1097⅞ lock washer
AK **203625B** Screw, 103328 shoulder collar, 46¼ nut
AL **1-100AL Env. 1677** use 504 Env. 1677 screw, 46¼ nut
AM **203125½L No. 2 (1-203125½AL No. 2)**
AN 11-203118DL* see H
AO **203125½ No. 2 (203125½A No. 2)**
AP **1-203230AL No. 13 (2-203230BL No. 13 or 12-203230BL No. 13, 203234¾)** Refer to Plate 53-5
AQ **49¾** Nut, 79580 screw
AR **203578A No. 2**

(Continued next page)

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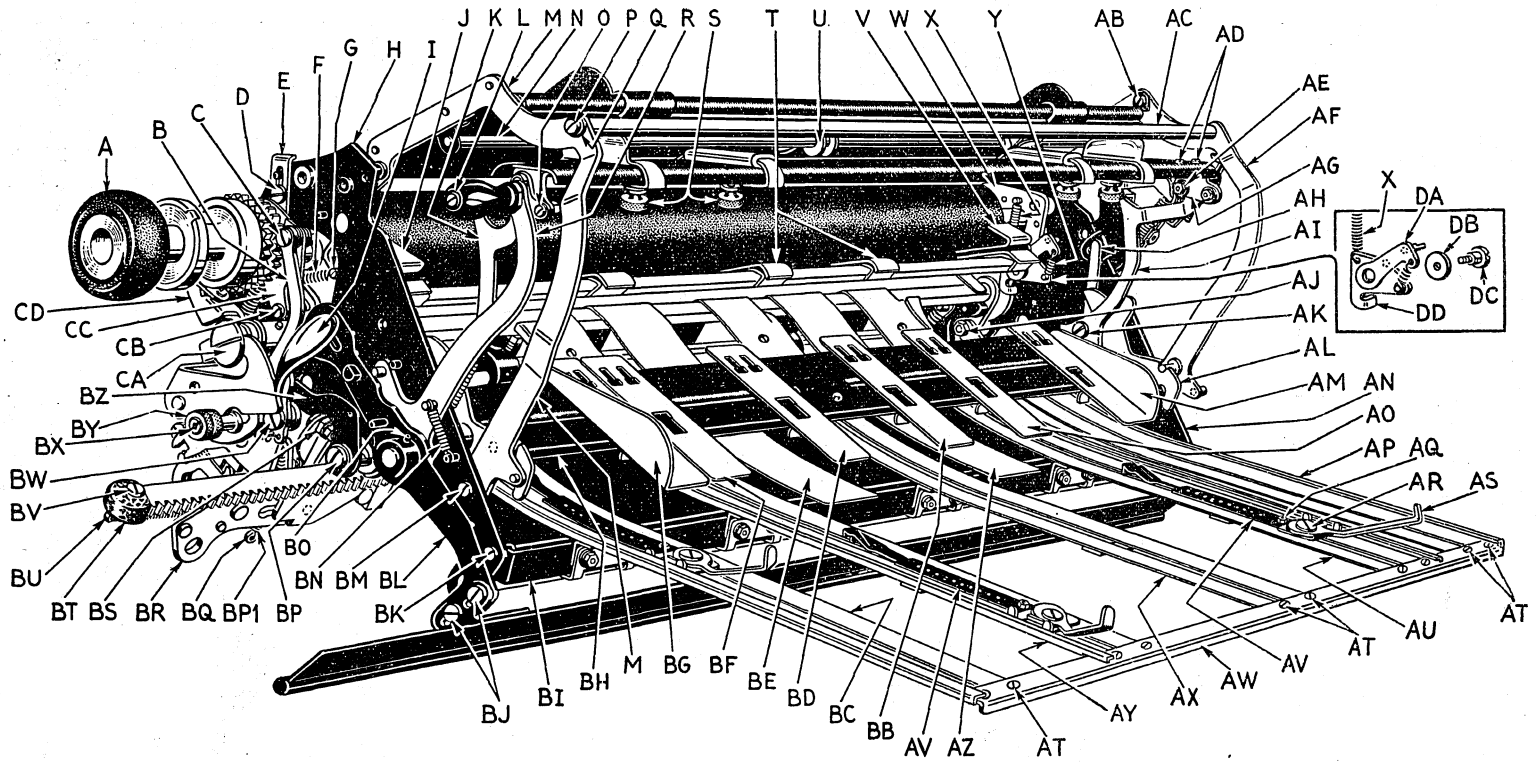
FORM MAGAZINE CARRIAGE WITH FORM ALIGNING INDICATOR BAIL (Plate 53-4)



SYMBOLS (Plate 53-4) Continued

AS **203184A No. 3**
AT **2859⅞** Screw, 1097⅞ washer, 46 nut
AU **1-203230AL No. 13 (2-203230BL No. 13, 12-203230BL No. 13, 203234¾)** Refer to Plate 53-5
AV **1-203234**
AW **203283** Specify length
AX **1-203230A No. 18 (1-203230B No. 18, 203234¾)**
AY **1-203230AR No. 13 (2-203230BR No. 13 or 12-203230BR No. 13, 203234¾)** Refer to Plate 53-5
AZ **1-203164 No. 3**
BB **203125½ No. 2 (203125½A No. 2)**
BC **1-203230AR No. 13 (2-203230BR No. 13 or 12-203230BR No. 13, 203234¾)** Refer to Plate 53-5
BD **203125½ No. 2 (203125½A No. 2)**
BE **1-203164 No. 3**
BF **203125½ No. 2 (203125½A No. 2)**
BG **203125½R No. 2 (1-203125½AR No. 2)**
BH **1-203124A Env. 1677 Style 12″, 15″, 18″** Table only
BI **1-203122½ Style 12″, 15″, 18″** Use small screw 12055½₆ on left
BJ **2858¼A**
BK **7062** use 12055½₆ on left
BL 1-203107CR* Assembled 1B-203005 Style 12″, 15″, 18″ includes BL, BO and left arm
BM **7357½** Screw, 300 Fte. 203 bushing on inside
BN **75814**
BO **59½** Pin
BP **8054¾** use 701327 collar on inside
BP1 **83832** Spring
BQ **11-203189** Assembled latch includes BS
BR **1A-218AR Fte. 203** Assembled bracket, refer to Plate 51-7
BS **79333 No. 1** Ecc., 69108 washer, 46 nut
BT **12099½A**
BU **203177A No. 2** Anchor
BV **73618** Screw, 1097¾ lock washer, 46 nut
BW **12051⅞** Screw
BX **2845½** Bushing, 2888 spring
BY **2847**
BZ **1-203291AR** use 957½ screw on inside
CA **2857½C**
CB **203539A** Screw, use 20518½ washer
CC **203113R**
CD **1-2816A No. 1**
DA **1-203191C**
DB **613½**
DC **73564A**
DD **1-203194CL**

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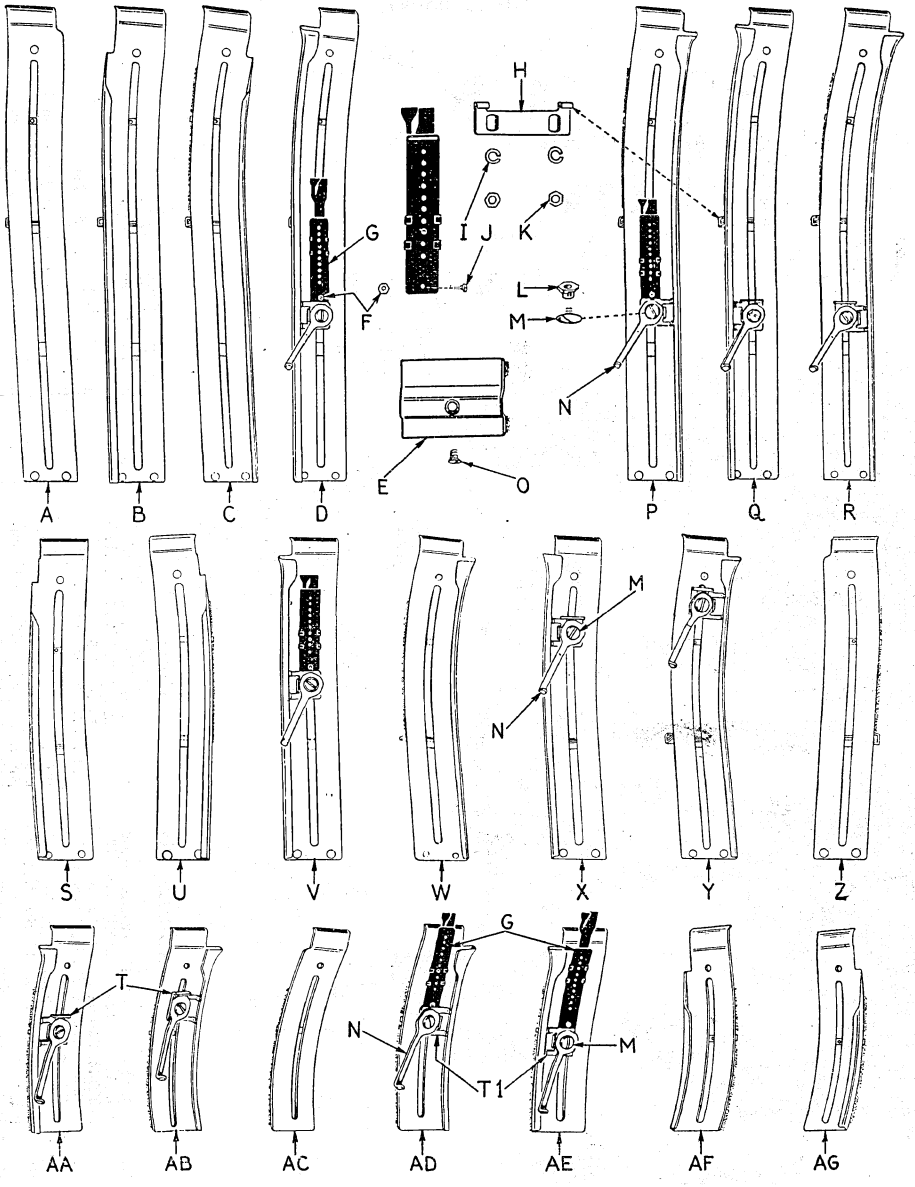
FORM CHUTES (Plate 53-5)



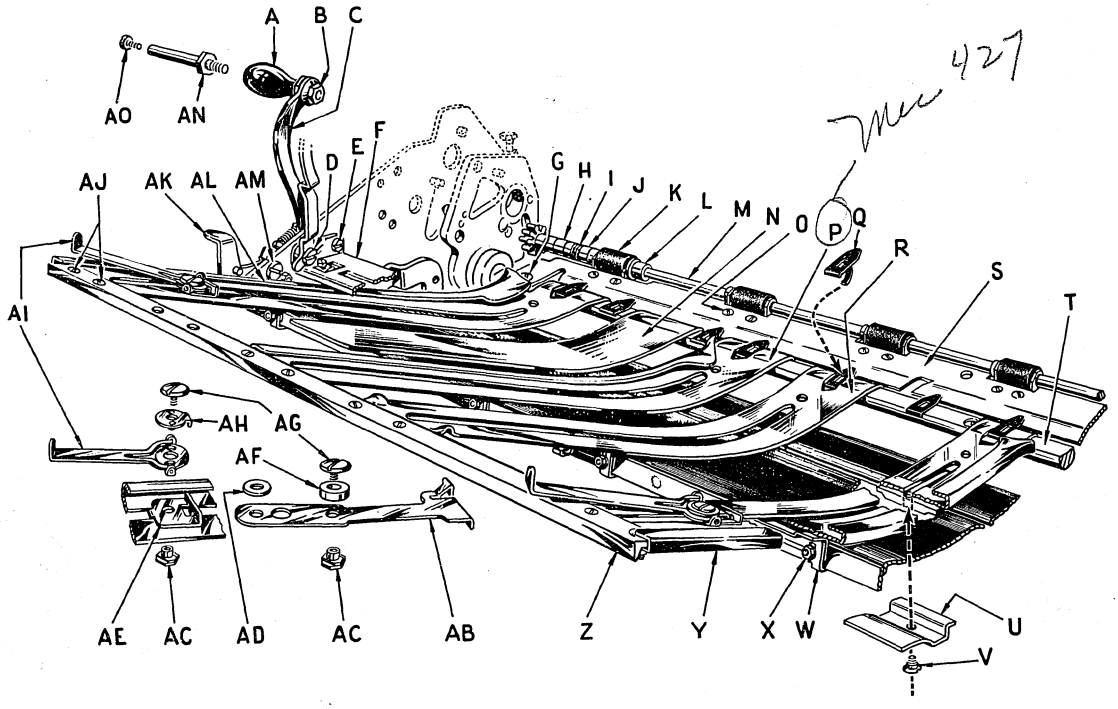
NOTE: 2-203230BR or BL Specify No. Equipment With Non-Flexible Limit Stop
12-203230BR or BL Specify No. Equipment With Flexible Limit Stop

SYMBOLS (Plate 53-5)

A 1-203230A No. 18 (1-203230B No. 18, 203234¾)
B 1-203230AR No. 18 (2-203230BR No. 18 or 12-203230BR No. 18, 203234¾)
C 1-203230AL No. 18 (2-203230BL No. 18 or 12-203230BL No. 18, 203234¾)
D 1-203230AR No. 13 (2-203230BR No. 13 or 12-203230BR No. 13, 203234¾)
E 1-203142C
F 49¾
G 1-203234
H 203187¼
I 1097¾ Lock washers
J 79580
K 46¼
L 203547A No. 3
M 203578A No. 2
N 203184A No. 3
203184A No. 2 Short arm
O 203657 (203657A)
P 1-203230AL No. 13 (2-203230BL No. 13 or 12-203230BL No. 13, 203234¾)
Q 1-203230AR No. 13 (2-203230BR No. 13 or 12-203230BR No. 13, 203234¾)
R 1-203230AL No. 13 (2-203230BL No. 13 or 12-203230BL No. 13, 203234¾)
S 1-203230AR No. 17 (2-203230BR No. 17 or 12-203230BR No. 17, 203234¾)
T 203168AR&AL No. 2
T1 203168AR&AL No. 3
U 1-203230AL No. 17 (2-203230BL No. 17 or 12-203230BL No. 17, 203234¾)
V 1-203230AR No. 15 (2-203230BR No. 15 or 12-203230BR No. 15, 203234¾)
W 1-203230AL No. 15 (2-203230BL No. 15 or 12-203230BL No. 15, 203234¾)
X 1-203230AR No. 15 (2-203230BR No. 15 or 12-203230BR No. 15, 203234¾)
Y 1-203230AL No. 15 (2-203230BL No. 15 or 12-203230BL No. 15, 203234¾)
Z 1-203230A No. 17 (1-203230B No. 17, 203234¾)
AA 1-203230AR No. 14 (2-203230BR No. 14 or 12-203230BR No. 14, 203234¾)
AB 1-203230AL No. 14 (2-203230BL No. 14 or 12-203230BL No. 14, 203234¾)
AC 1-203230A No. 16 (1-203230B No. 16, 203234¾)
AD 1-203230AL No. 14 (2-203230BL No. 14 or 12-203230BL No. 14, 203234¾)
AE 1-203230AR No. 14 (2-203230BR No. 14 or 12-203230BR No. 14, 203234¾)
AF 1-203230AR No. 16 (2-203230BR No. 16 or 12-203230BL No. 16, 203234¾)
AG 1-203230AL No. 16 (2-203230BR No. 16 or 12-203230BL No. 16, 203234¾)

SEE EXPLANATION ON INSIDE OF FRONT COVER

FORM CHUTE STOPS AND LIMITS (Plate 53-6)

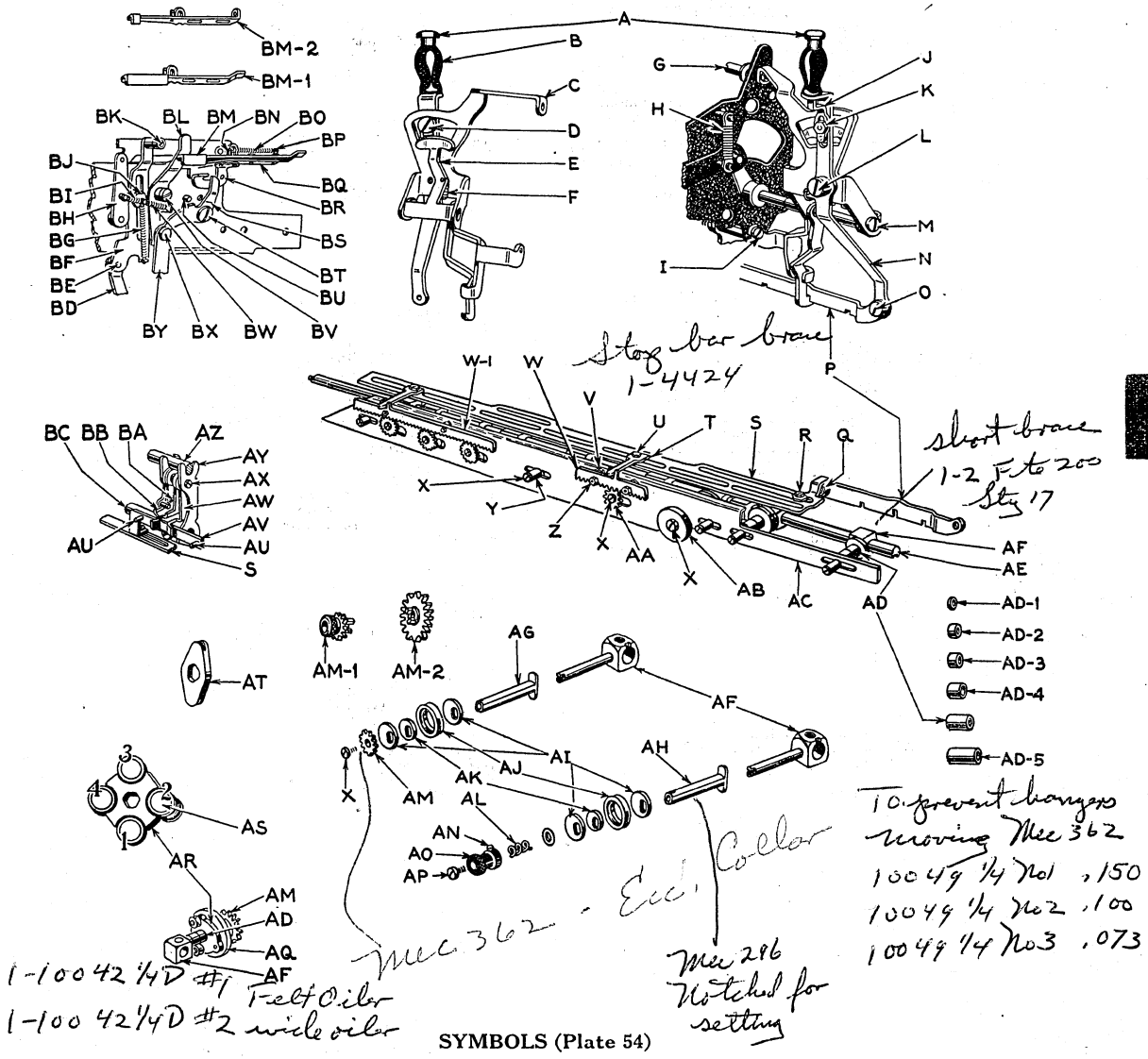


SYMBOLS

A **4891A**
B **1-203485**
C **1-203127A** includes A, B, AN, AO
D **203625 No. 3** screw
E **952¾**
F **203124A Styles 12, 15, 18** black
203124 No. 2 Styles 15, 18 brown
G **1653½** screw
H **203423 No. 3** collar
I **812 Fte. 213** spring
J **344 Fte. 213** collar
K **1-332 Fte. 213 No. 4**
L **1A-339 Fte. 213** includes 570A Fte. 203 screw
M **1-18A Fte. 213 Styles 12, 15, 18** includes 338A Fte. 213 gear, use 62½ pin
N **1-203164 No. 3**
O **203508 No. 3** screw
P **1-203230BR No. 21**
Q **203234¾**
R **1-203230B No. 17**
S **203108C No. 5 Style 15**
T **41-2B Fte. 213 Style 15**
U **1-203142C**
V **203657A**
W **203187¼**
X **46¼** use 1097¾ lock washer
Y **1-203230BL No. 15**
Z **203283 No. 7** for 2317C45 machine with standard forms
203283 Blank submit machine number and style with forms and layout
AB **203234R or L**
AC **203547A No. 3**
AD **428**
AE **203168B No. 4**
AF **203347½**
AG **203578A No. 2**
AH **203234½**
AI **1-203184B No. 3**
AJ **2859⅞** use 46 nut and 1097⅞ lock washer
AK **1-203296R or L**
AL **1-203230BR No. 15** guide
AM **10056** screw
AN **203561A**
AO **73612**

Mr M R Lovejoy
Buffalo N Y Branch 10-5

SELECTIVE OPERATION CONTROL FEATURE TWO, THREE, OR FOUR POSITION (Plate 54)



SYMBOLS (Plate 54)

A 330A Fte. 203* Inside sleeve 331 Fte. 203, spring 83⅛ Fte. 88

B 912A Fte. 203*

C **1-151C Fte. 203 Style 2 (2-151D Fte. 203 Style 3, 535 Fte. 203, 1-151⅛ Fte. 203 Style 2, 573 Fte. 203, 12051⅞, 4463, 46)** For 2 way roll position Type 20 thru 30 and automatic bill ejector
1-151C Fte. 203 Style 3 (2-151D Fte. 203 Style 3, 535 Fte. 203) For 3 way roll position Type 20 thru 30
1-151C Fte. 203 Style 4 (2-151D Fte. 203 Style 3, 535 Fte. 203, 1-151⅛ Fte. 203 Style 1, 573 Fte. 203, 12051⅞, 4463, 46) For 4 way roll position Type 20 thru 30
1-151½ Fte. 203 Style 3 for 3 way roll position Type 20 thru 30 automatic bill ejector carriages
2-151½ Fte. 203 Style 3 complete assembly for 3 way roll position Type 20 thru 30 automatic bill ejector carriages

D **551 Fte. 203** Screw

E **149A Fte. 203**

F **75814** Spring

G **203524A** Screw stud as shown, use sleeve 203421 and 46 nut, when required use shoulder screw 203524 No. 2 and 46 nut

H **1-203801 (1-203801A)**

I **7357½** Screw, 1097⅞ lock washer

J 1-533 Fte. 203* furnished with "N"

K **200393** Shoulder nut

L **3450⅛ Style 9** Screw

M **561 Fte. 203** Screw

N **1-150C Fte. 203** includes "A," "B" and "J"

O **8054¾** Screw

P **206A Fte. 203 2 or 3 Selection**
206B Fte. 203 Style 4 (4 selection)

Q **535 Fte. 203** Screw, 46 nut

R **2850⅜A** Screw, 46 nut, 12044⅞ shoulder screw

S **155A Fte. 203 Specify Style 12", 15", 18"** Punching

T **12020⅞A (1-12020⅞B)**

U **12051⅞** Screw, 12046⅜ shoulder screw, one or more required

V **12063⅞** Eccentric screw stud
506 Fte. 209 Screw

W **12021⅝ No. 1**

W-1 **12021⅝ No. 2**

X **7357½** Screw, one or more used

Y **10044⅛A** Collar, one or more required

Z **46** Nut, one or more required

AA **10042⅜**

AB **4443¼A** on hanger 4445¼A

AC **61200A Specify machine number** and submit form—price furnished with material

AD **10044⅛ No. 2**

AD-1 **10044⅛ No. 5**

AD-2 **10044⅛ No. 4**

AD-3 **10044⅛ No. 1**

AD-4 **10044⅛ No. 6**

AD-5 **10044⅛ No. 3**

AE **3203¾B Style 12" or 18"**

AF **10045⅞ No. 1** (1.726" long) for Classes 1, 2, 6, 11-16 const. with combination bars or selective operation control fte.

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SYMBOLS (Plate 54) Continued

10045⅞ No. 2 (1.660″ long) for Classes 1, 2, 6, 11-26, reversible control roll const., manual
10045⅞ No. 3 (1.596″ long) for Classes 1, 2, 6, 11-16, 20-26, SACT const.
10045⅞ No. 5 (1.321″ long) for Style 23 13 03 bank posting machine
10045⅞ No. 8 (1.596″ long) for Classes 1, 2, 6, 11-30 with adding and printing mechanism C.F. non-clear motor bar lock, auto. reg. total indexing lever
10045⅞ No. 9 (block only without stud) for Classes 1, 2, 6, 11-26, Class 30, controlled from skids on carriage when skids are used on hangers without control rolls
1-10045⅞B No. 10 (1.440″ long) Classes 1, 2, 6, 11-26 and Class 30, for two position adjustable control roll, manually operated by knurled knob

AG **10042¼B No. 2** (1.104″ long) narrow flange slotted end
10042¼C No. 1 (1.246″ long) round flange with 2 slots
10042¼B No. 3 (.034″ long) round flange without holes
10042¼B No. 4 (1.103″ long) round flange without holes, slotted end
10042¼C No. 5 (1.110″ long) round flange with 3 slots
10042¼B No. 6 (1.130″ long) without flange

AH **10042¼B No. 1** (1.145″ long)
AI **10025⅜ Specify number** (.008″ thick)
AJ **10043⅝A** All numbers, 3 way adjustable rolls, specify combination
AK **10025⅛** Specify number (.083″ thick)
AL **10081¾** Spring
AM **10042⅜**
AM-1 **10042⅜ No. 2**
AM-2 **10042⅜ No. 3**
10042⅜A No. 4 Same as No. 3 except has small hub on opposite side
AN **10051⅜** Screw
AO **10039½ (10039½A)**
AP **10051⅞**
AQ **10043¼A No. 5 (83443 No. 1)**
10043¼A No. 7, 8, 9, 10, 11, 12 or 13
10043⅜ No. 8, 9 or 10
AR **1-10026⅛A No. 1** Equipped with 5 rollers
1-10026⅛A No. 2 Equipped with 6 rollers
11-10026⅛A No. 2 Equipped with 1 roller
AS **10043⅝** Small rollers, 1 or more required
10058⅝ No. 1 Short rivet studs
10058⅝ No. 2 Long rivet studs
10033⅜ Collars for rivet studs
3628 Small washer
AT **10026⅛A No. 4**
AU **12050⅜** Stud
AV **1-12020⅜** Specify machine style and number, use 7153¼ screws
AW **1-203279** Use spring 2887½
AX **203631** Screw, 46¼ nut
AY **203278** Punching
1-203278 Assembly, includes "AW," "AX," "AY," "BA," "BB"
AZ **203003A Style 12″**
203003 Style 15″, 18″
BA **3480½** Spring
BB **203280** Punching
BC **11-203008 Style 12″, 15″, 18″** Shaft assembly, includes punching on end
BD 12027¾A* Styles 11, 13, 17 "furnished with BF"
BE **351½** Rivet
BF **1A-12013⅛ Style 11**
1A-12013⅛ Style 13 (1-12013 No. 3, 12027¾ No. 2 Style 13, 259½, 1097¾, 46)
1-12013⅛A Style 17 (1-12013 No. 3, 12027¾ No. 2 Style 17, 259½, 1097¾, 46)
BG **3489** Spring
BH **1A-12012**
BI **7287 Style 5**
BJ **12058¾** Spring screw stud
12046½ Shoulder nut
BK **200352** Roll, 73611 screw, 12059* stud
BL **1-12011⅛A**
BM **1-12014⅜ No. 1**
BM-1 **1-12014⅜ No. 2**
BM-2 **1-12014⅜ No. 3**
BN **12058⅛** Stud
BO **105502** Screw
BP **12062⅞** Spring screw stud
75817 Spring used with "BP"
BQ **1-12014¼ No. 2**
BR 1-12018¾* included with "BQ", use rivets 12064⅝
BS 12018⅛* (12018⅛A*)
BT **12062⅝** Screw
BU **12053⅜₀A**
BV **2850⅜** Screw
BW **10180** Spring
BX **351½** Rivet
BY **1-12018⅜₆A** includes "BS"

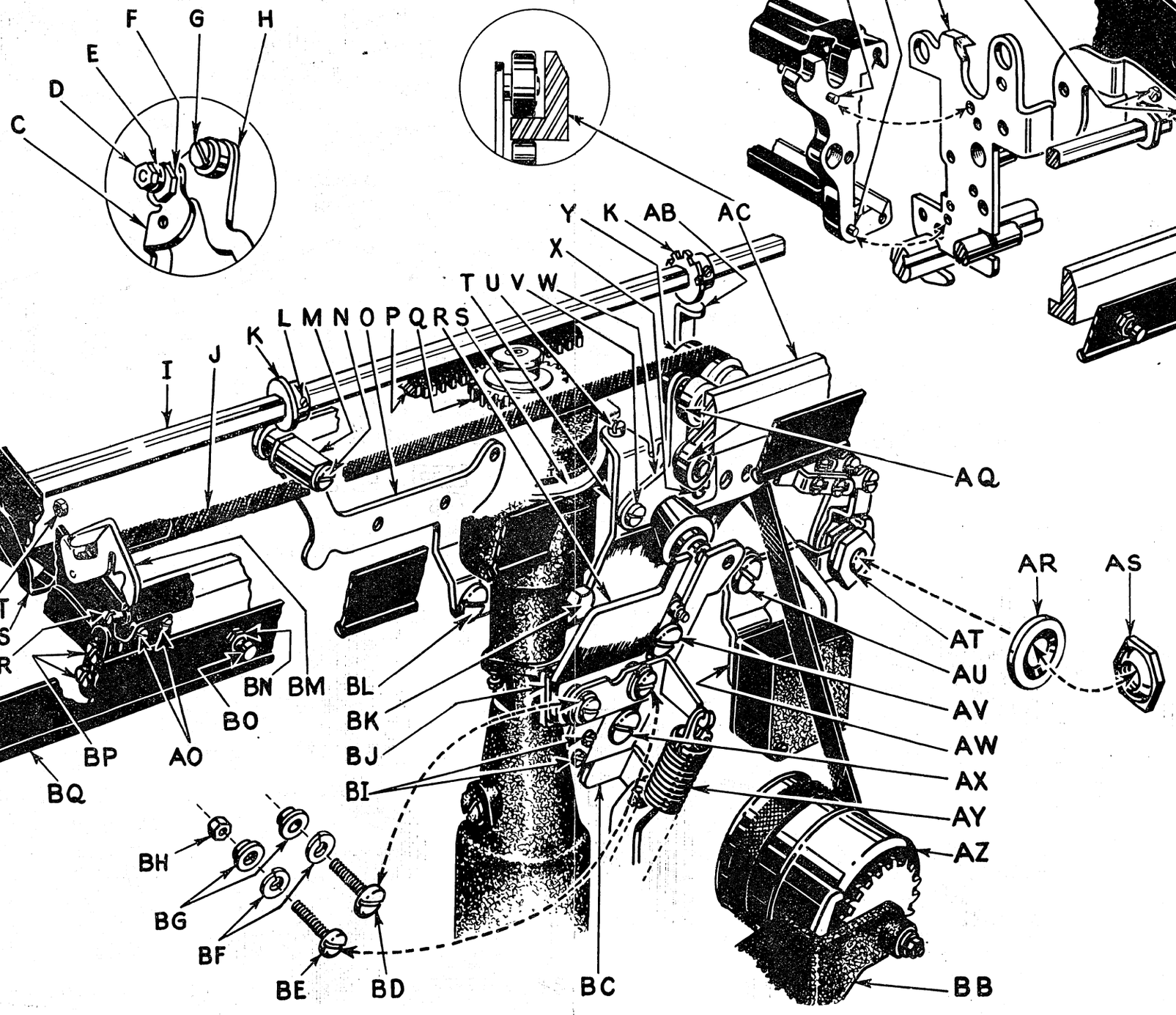
CARRIAGE, AND MULTIPLE SKIP AND RETURN UNIT, IMPROVED
CLASSES 20 THRU 30 (Plate 54-2)

(Plate 54-1 is in "Carriage" Instruction Book only)

Insured closing Mar 474

SYMBOLS (Plate 54-2)

A **89¼ Fte. 88** Spring
B **203307 Washer**
C **203190**
D **46**
E **69108 Washer**
F **79333 No. 1**
G **203642**
H **11-203189** includes C, D, E, F
I **1-203033A No. 3 Specify 12, 15, 18,** includes BW
J **203902 No. 3 Specify 12, 15, 18**
K **1-203475** Submit operation sheets and machine number
L **203515½**
M 123307⅛* included in O
N **8450¾**
O **1-12317¼A** includes M
P **1-12017B No. 2 Specify 12, 15, 18**
Q **12041B**
R **203170A No. 2**
S **1-12010½C** Governor
T **1-203185B** Includes Y
U **1050⅛**
V **76555** Screw, 47 nut
W **1-203185½B** includes AQ
X **203547½** Eccentric screw, 47 nut
Y 203303B* Included in T
AB **12315½L No. 1**
AC **203006B Specify 12, 15, 18**
AD **667 Fte. 213 No. 2 Specify 12, 18**
667 Fte. 213 No. 1 15
667 Fte. 213 No. 4, 15 gray



AE **525 Fte. 213**
AF **2860⅜**
AG **1-117L Fte. 213 No. 2**
AH **203558½**, 1097¾ lock washer
AI **203509A** Rivet
AJ **203118¾** included in AL
AK **1-203824**
AL **1-203118EL**
AM **10056**
AN **1-203296L**
AO **10056¾**
AP **203658**
AQ 1-201999* included in W
AR **12315⅝**
AS **12345**
AT **12001⅛A No. 2** Post
AU **12051⅞**
AV **203553 No. 2**
AW **1-12315¼B**
AX **203552, 203433** Collar
AY **1-805 Fte. 213 No. 1** for type 20 bank posting machine
1-805 Fte. 213 No. 3 for bill ejector carriage
1-805 Fte. 213 No. 4 for passbook or heavy forms
AZ **2-3323½A No. 6**
12-3323½A No. 6 for heavy duty
BB **1-3323½A No. 6** included in AZ
BC **1-203169B**
BD **554 Fte. 203**
BE **203541**
BF **1097¼**
BG **203429A**
BH **194**
BI **8451**
BJ **203157A** Shim
BK **12053¾**
BL **12359⅛**
BM **1-203296R**
BN **1-203370, 203371** Nut
BO **203593B** Plain
203593B Specify Nos. 1 thru 8 or 10
BP **2858¼A**
BQ **1-203123D No. 2 Specify 12, 15, 18**
11-203123D No. 2, 15, 18 gray
BR **203526½**, **1097¾** Lock washer, 46 nut
BS **203118¼**
BT **46**
BU **1-203118ER**
BV **2859⅞**
BW **203477A** Use 203550¼ screw to block positions not used

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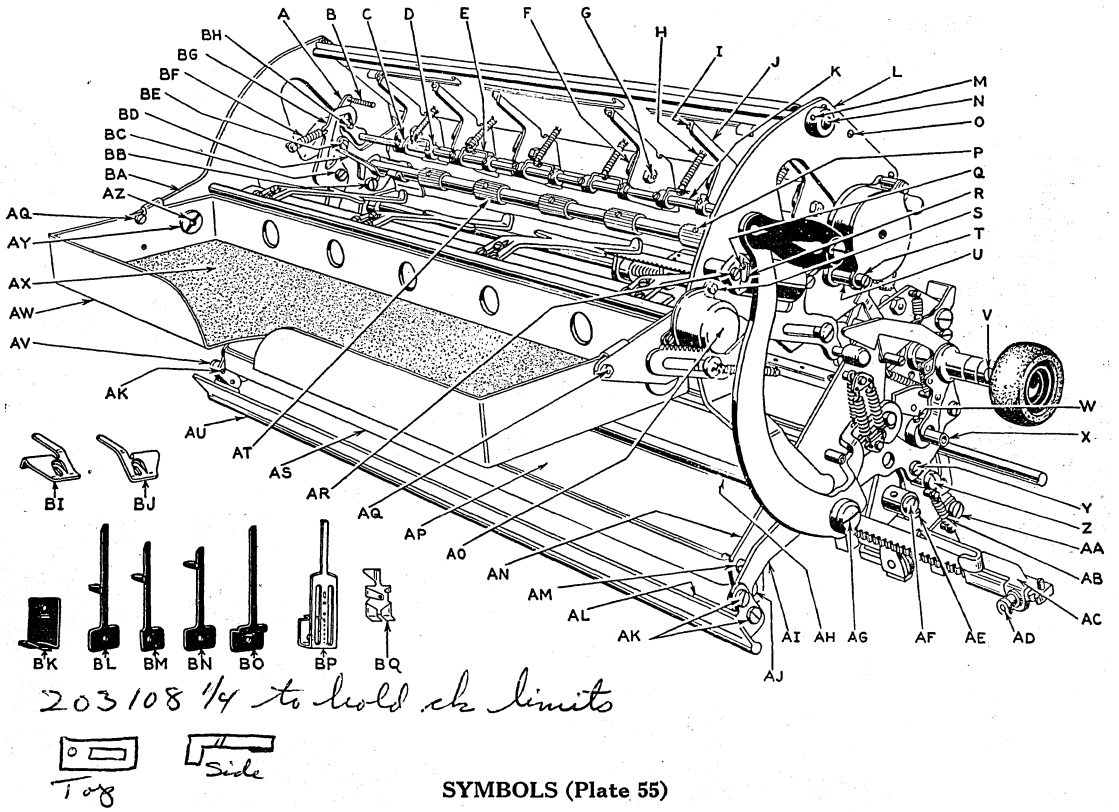
BILL EJECTOR CARRIAGE, AUTOMATIC, HIGH PRINTING LINE CONSTRUCTION (Plate 55)



SYMBOLS (Plate 55)

A **1-116R Fte. 213 No. 2**
B **10983** Spring
C **1-123 Fte. 213** Arm with hub, includes screw 75618
D **1-74308** Collar, includes screw 12055 5/16
E **1-161 Fte. 213 No. 2** includes pressure roll
F **163½ Fte. 213 No. 2**
G **72617** Screw, 47 nut
H **10983** Spring
I **2859⅞** Screws, 46 nuts
J **163A Fte. 213 No. 3**
K **1-1 Fte. 213** Shaft assy., includes only punching on right end, use screw 73612 and washer 216⅛ on right end
L 1-119L Fte. 213 No. 2* furnished with assembly 2A-10 Fte. 213 No. 2
M **51** Pin
N 7 Fte. 213* Shaft furnished with assembly 2A-10 Fte. 213 No. 2
O **952¾** Screw (6 required)
P **527 Fte. 213** Screw
Q **252⅝** Screw
R **190 Fte. 213**
S **4463** Screw (2 required)
T **522 Fte. 213** Screw, 325 fte. 213 collar
U **317 Fte. 213**
V **2850¼** Screw
W **64** Pin
X **1A-2A Fte. 213 Specify Style 18"** includes end plates and arms attached on each end
Y **7357½** Screw
1097¾ Lock washer
203518A Hexagon stud
45 Nut
Z **7356¾** Screw

AA **2854⅞** Screw
AB **2881½**
AC **1-203176L** includes "AD"
AD **203564** Plunger, 203441 washer, 12081¼ spring

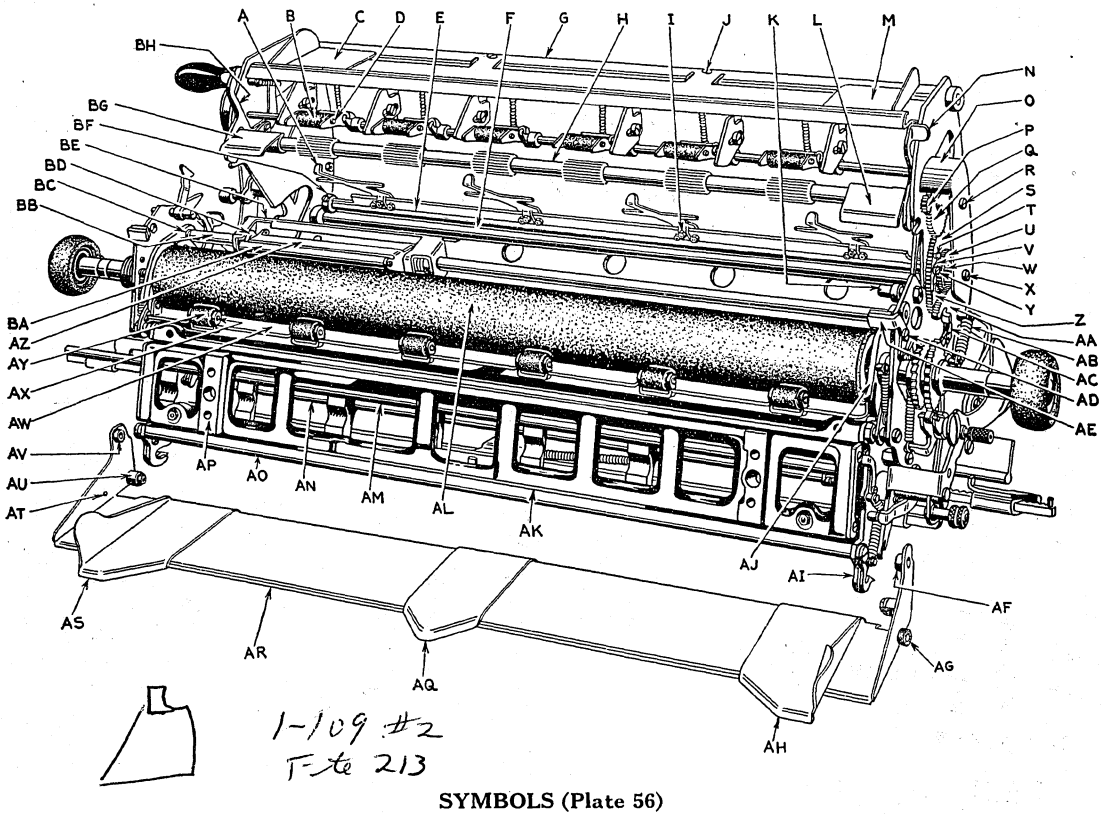
AE **2855 1/16B (200535½)** Screw
AF **8054¾** Screw
AG **520 Fte. 213** Screw, 10021½A space washer
AH **1-5 Fte. 213** includes end plates on each end, use pins 59½
AI 1-107L Fte. 213* furnished with shaft assembly "AH"
AJ **1A-6 Fte. 213** includes end plates on each end of shaft, use pins 52
AK **2858¼A** Screw (2 req. on each end)
AL 203196BL* furnished with "AU," use rivets 205508
AM **7062** Screw (1 req. on each end)
AN 1-118AL Fte. 213* furnished with shaft assembly "AJ"
AO **115 Fte. 213**
AP **1-122A Fte. 213 Specify Style 12, 15 or 18, 203122 No. 2 Specify Style 12, 15 or 18, 203297R and L, 7562**
AQ **529 Fte. 213** Screw, 46¼ nut
AR **7357½** Screw, 45 nut, 539A Fte. 213 threaded stud
AS **1-203122½ Specify Style 18"**
AT **1-302 Fte. 213 (1-302A Fte. 213)** includes P
AU **11-203123D Specify Style 18"**
AV 203196BR* furnished with "AU," use rivets 205508
AW **1-124B Fte. 213** includes cloth
AX **905A Fte. 213** Billiard cloth, use cement code 7647-2
AY **331A Fte. 213** Bushing (2 required)
166 Fte. 213 Washer (2 required)
AZ **950⅝** Screw (1 required)
103649 Screw (1 req.) used on left end

BA 1-119R Fte. 213 No. 2* furnished with assembly 2A-10 Fte. 213 No. 2
BB **510A Fte. 213** Stud, 47 nut
BC **103542A** Screw
BD **167R Fte. 213 No. 2 (167 Fte. 213 No. C)**

BE **73611** Screw on collar 334 Fte. 213
BF **2881½** Spring, 71534 stud
BG **1-162 Fte. 213 No. 2**
BH **12051⅛A** Stud
BI **184L Fte. 213 No. 10** for Type 20 with ledger and check stops, stationary stops, use screw 70512 and nut 49¼
BJ **184R Fte. 213 No. 10** Same description as above item
BK **184 Fte. 213 No. 4** for Type 20 automatic bill ejector carriage, printing line 2 5/16" to 3" from bottom of bill, use screw 70512 and shoulder nut 327 Fte. 213, adjustable bill stops
BL **184 Fte. 213 No. 11** for Type 20 bill magazine or auto., bill ejector carriage, use screw 70512 and nut 327 Fte. 213, adjustable bill stops
BM **184 Fte. 213 No. 2** for Type 20 automatic bill ejector carriage, printing line 1 3/16" to 1¾" from bottom of bill, adjustable bill stops
BN **184 Fte. 213 No. 1** Same description as above item except printing line is 1" to 1¼" from bottom of bill, adjustable bill stops
BO **184 Fte. 213 No. 3** Same description as "BM" except printing line is 1 11/16" to 2⅜" from bottom of bill, adjustable bill stops
BP **184½ Fte. 213 No. 1, 2, 3 or 4 Specify printing line and machine number.** Note—Printing line is from bottom of form to bottom of print, "BP" and "BQ" are furnished together, bill stop retainers
BQ **184 Fte. 213 No. 6, 7, 8 or 9 Specify printing line and machine number.** Note—Printing line is from bottom of form to bottom of print, "BP" and "BQ" are furnished together, adjustable bill stops

SEE EXPLANATION ON INSIDE OF FRONT COVER

BILL EJECTOR CARRIAGE, (AUTOMATIC) HIGH PRINTING LINE CONSTRUCTION (Plate 56)



SYMBOLS (Plate 56)

A **156A Fte. 213** Finger for shallow ticket box

B **1-509 Fte. 213** included with "E" plate No. 55

C **1-130L Fte. 213** Billiard cloth 910 Fte. 213, spot weld upper right corner
11-130L Fte. 213 Spot weld upper left corner

D 509 Fte. 213* furnished with "B"

E **1-9 Fte. 213** includes gear 309 Fte. 213* on left end and pin 52, specify location and number of fingers "A" to be used, collar "BF" furnished sep.

F **1-10 Fte. 213 No. 2 (2A-10 Fte. 213 No. 2)** includes end plates, shafts (2), screws "J" and bill magazine "G" for paper guides

G **111 Fte. 213** Bill magazine fastened to end plates with 952¾ screws

H **15A Fte. 213**

I **950** \⅝ Screws, 1097¾ lock washers, 46 nuts

J **528 Fte. 213** Screw

K **510A Fte. 213** Screw stud, 47 nut

L **167R Fte. 213 No. 2 (167 Fte. 213 No. 6)** Screw 73611 on collar 334 Fte. 213

M **1-130R Fte. 213** Billiard cloth 910 Fte. 213, spot weld upper left corner
11-130R Fte. 213 Spot weld upper right corner

N **1-116R Fte. 213 No. 2** on screw 73611 and collar 334 Fte. 213

O **1-114 Fte. 213 No. 2**

P **310A Fte. 213 No. 3** use 536 Fte. 213 screw

Q **105 Fte. 213 No. 1**

R **756⅛** Screw

S **1-102 Fte. 213** includes "T" and "Z"

T **526 Fte. 213** Stud

U **1-103 Fte. 213** Comb, ratchet and gear includes "W"

V **802 Fte. 213** Spring

W 311 Fte. 213*

X **72567** Screw

Y **76558** Screw for "V"

Z **101 Fte. 213** Pawl fastened to gear with 506 Fte. 213 rivet

AA **1-100 Fte. 213**

AB **1-803 Fte. 213** Spring—light
1-803 Fte. 213 No. 2 (1-807 Fte. 217) Spring—heavy
1-803 Fte. 213 No. 3 Spring for heavy post card bills

AC **1-136 Fte. 213** equipped with stud 950⅛ for spring 801 Fte. 213, use screw 515 Fte. 213

AD **7357½** Screws (2 required)

AE **1-235R Fte. 203** Parts on right end of carriage not symbolized, will be found on Plates 51 and 53

AF 308 Fte. 213*

AG **203570AR** Stud, 203443 washer

AH **1-125R Fte. 213 (1A-125R Fte. 213, 203479, 4557¼)** 911 Fte. 213 Billiard cloth, use cement code 7647-2

AI **1-117R Fte. 213** End plate

AJ 1-158R Fte. 213*

AK **2824B Style K (2824 Style 18 No. 2, 2 req., 2837⅛ Specify Number, 24 req.)** Punching for roller bearings

AL **11-2800¼B Style K Specify carbon,** includes ratchets, platen and shaft, pin 63 on left end and pin 203560 on right end

AM **1-2806½A Style 18 (1-2806½ Style K No. 2)** Shaft on assembly 1-2803B Style 18, fastened to shaft with screws 2851¾

AN **1-203008 Style 18″** Shaft assembly with arm on right end contacting with carriage release lever

AO **667 Fte. 213 Style 18″ No. 2** for selective operation control feature

AP **2865CK (2865C Specify Style 7, 9, 11, 13, 15, 17 H or K)**

AQ **1-126 Fte. 213 (1A-126 Fte. 213, 203479, 4557¼)** 911 Fte. 213 Billiard cloth, use cement code 7647-2

AR **1-110 Fte. 213** includes "AF," "AG," "AR," "AT," "AU," "AV"

AS **1-125L Fte. 213 (1A-125L Fte. 213, 203479, 4557¼)** 911 Fte. 213 Billiard cloth, use cement code 7647-2

AT **203570AL** Spring stud, 203443 washer, use spring 10080

AU **203573B** Shoulder stud, 10034 roll, 2820½ washer, 46¼ nut (2 each required)

AV 307 Fte. 213*

AW **108 Fte. 213 No. 1 Style 12, 15 or 18 Blank,** for Type 20 carriage with bill magazine and bill stops
108 Fte. 213 No. 3 Style 12, 15 or 18 for Type 20 carriage with geared pressure rolls
108 Fte. 213 No. 4 Style 12, 15 or 18 for Type 20 carriage with bill ejector or geared pressure rolls
} Submit Forms When Ordering These Parts

AX **1-109 Fte. 213 No. 2** Bracket includes "AY," secured to shaft with screws 7062
21-4A Fte. 213 Style 18″ Shaft assembly, includes arms pinned to ends with pins 52 and "AX"

AY **1-332 Fte. 213** Pressure roll

AZ **203205 Style 3½ (1-203205A Style 3½)** use 203807A spring

BA **203024 Style 3½** use screw 203543

BB **11 Fte. 213** Shaft, use screw 74587 and roll 12038⅛ on right end

BC **73564A** Screw, 203422A collar

BD **203521A** Screw in collar

BE **1-148 Fte. 213 Style 18**

BF **542½** Collar, 7502 screw

BG **167L Fte. 213 No. 2 (167 Fte. 213 No. 6)** use screw 73611

BH **1-116L Fte. 213 No. 2** on screw 73611 and collar 334 Fte. 213

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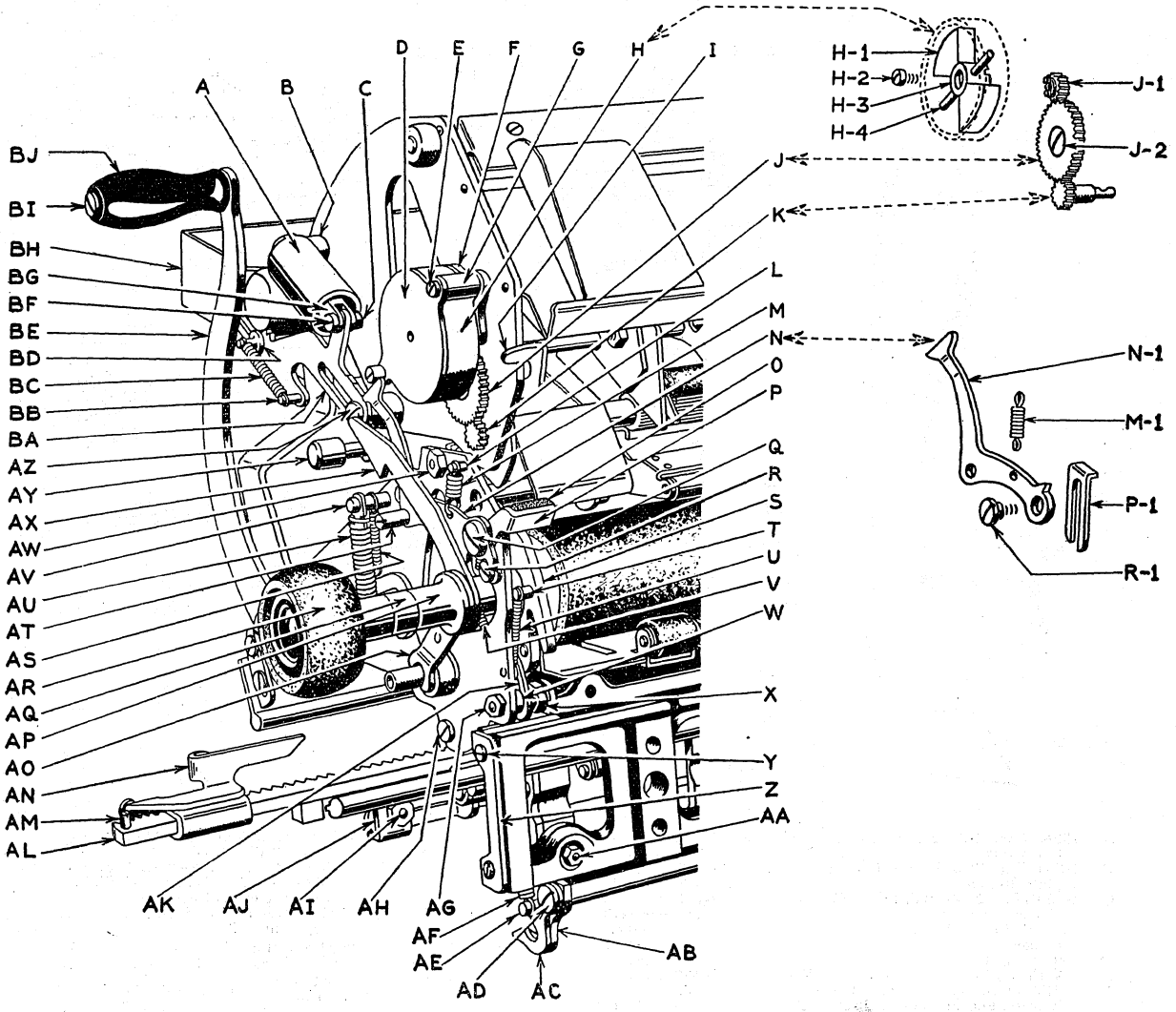
BILL EJECTOR CARRIAGE, (AUTOMATIC) HIGH PRINTING LINE CONSTRUCTION (Plate 57)



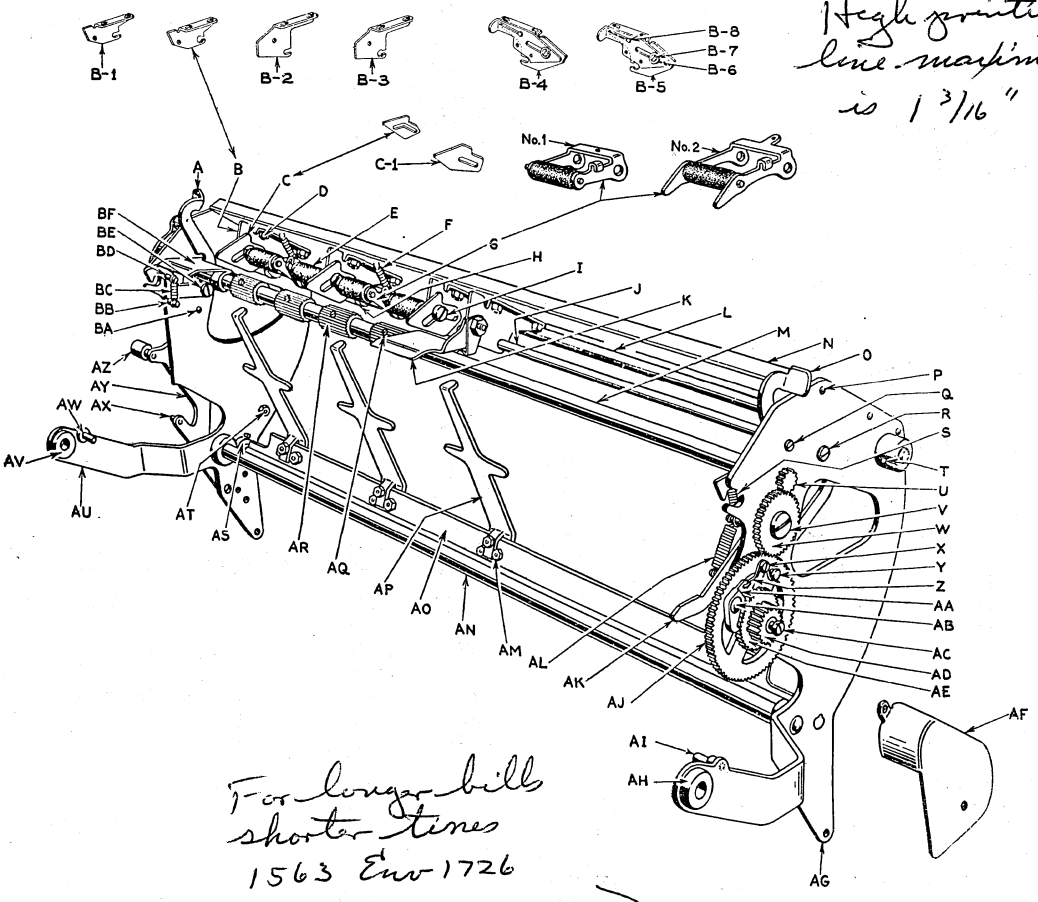
SYMBOLS (Plate 57)

A **1-336 Fte. 213**
B **539A Fte. 213** Threaded stud, 7357½ screw, 45 nut
C **540 Fte. 213** Screw, 46 nut
D **113 Fte. 213**
E **519 Fte. 213**
F **112 Fte. 213**
G **317 Fte. 213**
H **314 Fte. 213 No. 2**
H-1 **900 Fte. 213** Fiber (2 or more required)
H-2 **70512**
H-3 **1-313 Fte. 213 No. 2** includes four "H-4." Spider for high printing line const.
1-313 Fte. 213 No. 1 Spider for low printing line const.
H-4 **50** (four required)
I **1-116L Fte. 213 No. 2** on screw 73611 and collar 334 Fte. 213
J **105 Fte. 213 No. 2**
J-1 **310 Fte. 213 No. 1**
J-2 **10056**
K **310A Fte. 213 No. 2** use screw 536 Fte. 213
L **69510** Spring stud
M **7287 Style 5** Spring
M-1 **809 Fte. 213**
N **134 Fte. 213**
N-1 **134A Fte. 213**
O **914 Fte. 203** use 4458¾ screw
P **1-235L Fte. 203**
P-1 **203183A**
Q **10960½** Screw
R **7357½** Screw, 2820½ washer
R-1 **73568**
S 1-158L Fte. 213*
T **203502**
U **203800 No. 7** part of "V"
V **1-203800 No. 6** includes "U"
W **328B Fte. 213** Collar
X **535C Fte. 213**
Y **2852 1/16**
Z **2818A (4918R or L, 4952 1/16)**
AA **2859 5/8A** Square head screw, 46 nut
AB **1-117L Fte. 213**
AC **1-2823¾ No. 2**
AD **2854⅞ (84618)**
AE **2852 5/16**
AF **2881½** Spring
AG **47¼** Nut and 1097 7/16 lock washer
AH **7357½** Screw, 1097¾ lock washer, 203518A Hexagon stud, use 45 nut
AI 12050⅛* Stud, 47 nut, 1097⅞ lock washer
AJ **12026¼L**
AK **203287L No. 1** Specify "R" for right
AL **See Rack Bar Charts, Plates 51-1 thru 51-6**
AM **12055 1/16** Screw
AN **1-203176L**
AO 1-132 Fte. 213* included with "AX"
AP 320 Fte. 213* included with "AX"
AQ **318 Fte. 213**
AR **1-2839½B**
AS **75814**
AT **513 Fte. 213** Eccentric screw, 46¼ nut
AU **1-203801A**
AV **203509 (12354⅞)**
AW **47** Nut
511A Fte. 213 No. 1 Screw stud for automatic bill ejector carriage
511A Fte. 213 No. 2 Screw stud for automatic bill ejector carriage with selective operation control feature
AX **1-320 Fte. 213** includes "AO" and "AP"
AY **508 Fte. 213**
AZ **8054¾** Screw
BA **1-149A Fte. 213** includes "AY" and "BB"
BB **450 5/8**
BC **84803A** Spring used with governor "H." Note—Use spring 780½ when not equipped with governor
BD **512 Fte. 213**
BE **1-138 Fte. 213** includes "BI" and "BJ"
BF **540 Fte. 213** Screw
BG **335 Fte. 213** Fork
BH **1-124B Fte. 213** for automatic bill ejector carriage
BI **7356¾** Screw
BJ **7392A**

SEE EXPLANATION ON INSIDE OF FRONT COVER

BILL MAGAZINE AND EJECTOR FOR AUTOMATIC BILL EJECTOR CARRIAGE, LOW PRINTING LINE CONSTRUCTION 2A-10, FTE. 213 No. 1 FOR HIGH PRINTING LINE CONSTRUCTION 2A-10 FTE. 213 No. 2 (Plate 58)

High printing line maximum is 1 3/16"



For longer bill shorter times
1563 Env 1726

A **1-116L Fte. 213 No. 1**
B **163A Fte. 213 No. 2**
B-1 **163A Fte. 213 No. 1**
B-2 **163A Fte. 213 No. 3** for high printing line const.
B-3 **163A Fte. 213 No. 4** for high printing line const.
B-4 **1-163A Fte. 213 No. 5** for high printing line const.
1-163A Fte. 213 No. 7 for low printing line const.
B-5 **1-163A Fte. 213 No. 6** for high printing line const.
B-6 **170 Fte. 213** Spring washer
B-7 **71506** Screw
B-8 **538 Fte. 213** Stud
C **163½ Fte. 213 No. 1**
C-1 **163½ Fte. 213 No. 2** for high printing line const.
D **2859⅛** Screw, 46 nut
E **1-509 Fte. 213**
F **10983**
G **1-161 Fte. 213 No. 1** includes "E" for automatic bill ejector carriage, low printing line const.
1-161 Fte. 213 No. 2 includes "E" for automatic bill ejector carriage, high printing line const.
H **1-8345** Collar, includes screw 8359
I **72617** Screw, 47 nut
J **1-1 Fte. 213** Shaft assembly, includes punching on right end
K **167R or L Fte. 213 No. 3 (167 Fte. 213 No. 5)** for low printing line const.
167R or L Fte. 213 No. 4 (167 Fte. 213 No. 6) for high printing line const.

SYMBOLS (Plate 58)

L 7 Fte. 213* Shaft furnished with assembly 2A-10 Fte. 213 No. 1, refer to "AN"
M **15A Fte. 213**
N **111 Fte. 213** Magazine for carrying paper guides, used bevel head screw 528 Fte. 213
O **1-116R Fte. 213 No. 1** use screw 74529, part is equipped with stud 1360½
P **952¾** Screw (6 required)
Q **4458¾** Screw
R **73612** Screw, 216⅛ washer for shaft "J"
S **7787** Spring for "O"
T **51** Pin (2 required)
U **310A Fte. 213 No. 3** use 536 Fte. 213 screw
V **10056** Screw
W **105 Fte. 213 No. 1**
X **76558** Screw
Y **526 Fte. 213**
Z **802 Fte. 213** Spring
AA **101 Fte. 213**
AB **506 Fte. 213** Rivet
AC **72567** Screw
AD 311 Fte. 213* part of "AE"
AE **1-103 Fte. 213** includes "AD"
AF **1-114 Fte. 213 No. 1**
AG 1-119R Fte. 213 No. 1* furnished with "AN"
AH 304 Fte. 213*
AI **503 Fte. 213**
AJ **1-102 Fte. 213** includes "Y," "AA," "AB"
AK **1-162 Fte. 213 No. 1 (1-162 Fte. 213 No. 3)** use 108504 screw
AL **84815 (12080⅜)**
AM **950⅝** Screw, 1097¾ lock washer, 46 nut
AN 10 Fte. 213* assembled 2A-10 Fte. 213 No. 1 includes "L," "N," "P," "AG," "AH," "AI," "AN," "AU," "AV," "AW" complete bill magazine and ejector for low printing line construction. 2A-10 Fte. 213 No. 2 same description as No. 1 except is for high printing line
AO **1-9 Fte. 213** Shaft, assembled with gear on left end
AP **156B Fte. 213 (156C Fte. 213)**
AQ **527 Fte. 213**
AR **1-302 Fte. 213 (1-302A Fte. 213)** includes "AQ"
AS **542½** Collar, 7562 screw
AT **7357½** Screw, 45 nut, 539A Fte. 213 threaded stud
AU 1-119L Fte. 213 No. 1* furnished with "AN"
AV 324 Fte. 213*
AW **502 Fte. 213**
AX **450⅝**
AY **1-149A Fte. 213** Slide, includes studs attached
AZ **508 Fte. 213**
BA **522 Fte. 213** Long screw supports, long roll 317 Fte. 213 and short roll 325 Fte. 213
BB **76518** Stud
BC **7787** Spring
BD **1360½** Stud
BE **74529** Screw
BF **167L Fte. 213 No. 1 (167 Fte. 213 No. 5)**

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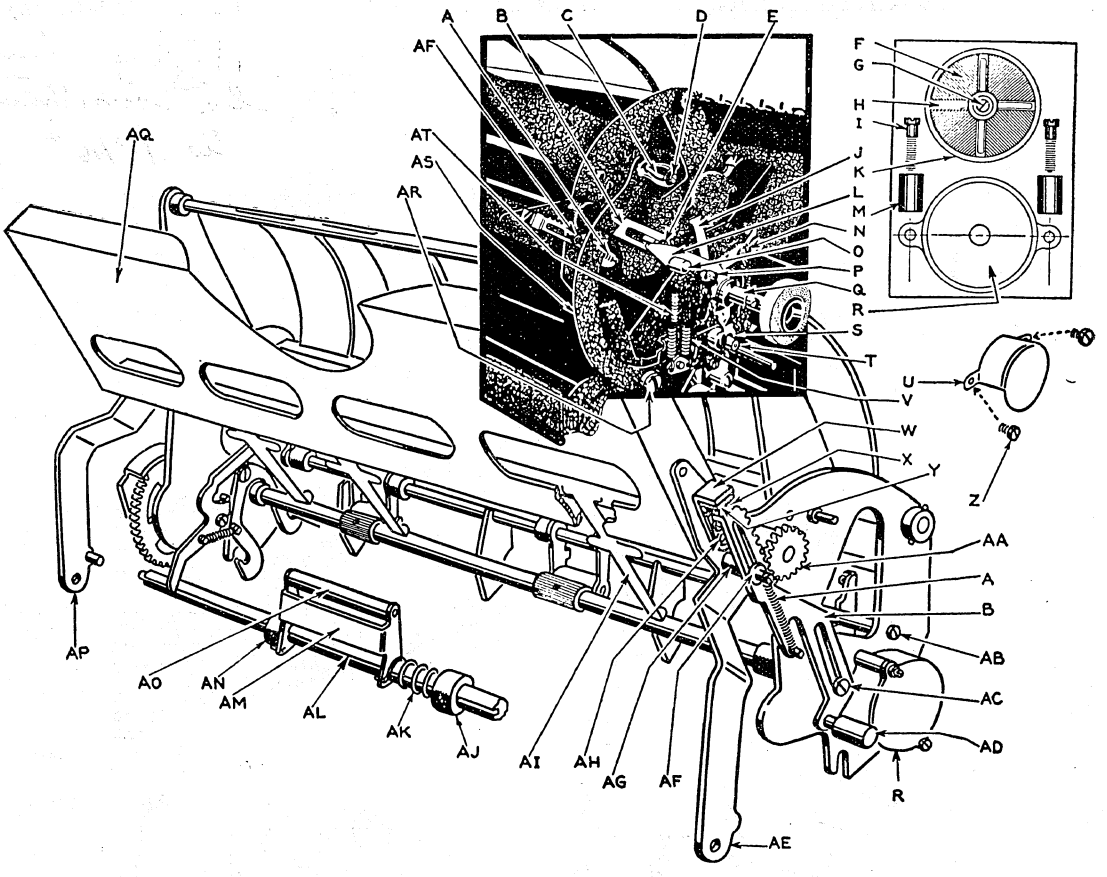
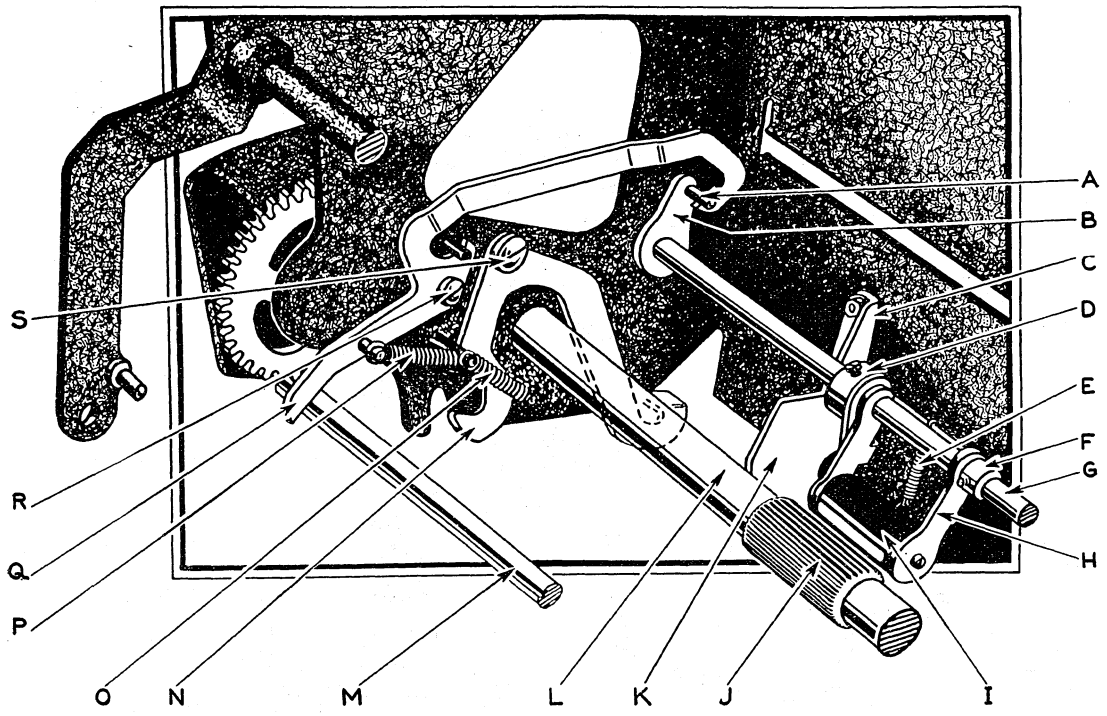
BILL EJECTOR CARRIAGE—AUTOMATIC (Plate 59)



SYMBOLS (Plate 59)

A **84803A** Spring
B **1-149 Fte. 213** Specify machine number
C **7392A** Hard roller
D **7356¾** Screw
E **8054¾** Screw
F **900 Fte. 213** Fiber (4 required)
G **519 Fte. 213** Screw for low printing line const.
70512 Screw for high printing line const.
H **1-313 Fte. 213 No. 1** for low printing line const., specify machine number
1-313 Fte. 213 No. 2 for high printing line const.
I **522 Fte. 213** Screw, use collar 325 Fte. 213
J **134 Fte. 213** Specify machine number. Use spring 7287 Style 5. Use spring 809 Fte. 213 on later const.
K **314 Fte. 213 No. 1** For low printing line const.
314 Fte. 213 No. 2 For high printing line const.
L 1-133 Fte. 213* Use spring 10180 included with "S"
M **317 Fte. 213** Collar (2 required)
N **10960½** Screw
73568 Screw used on later const.
O **508 Fte. 213** Stud
P **513 Fte. 213** Eccentric stud. Use nut 46¼
Q **319 Fte. 213** Space collar, 5/16" long
318 Fte. 213 Space collar, ½" long
R **113 Fte. 213**
S 1-132 Fte. 213*
1-320 Fte. 213 includes "L" and "S"
T **1-2 Fte. 213** Shaft assembled, specify machine number
U **115 Fte. 213**
V **1-203801A** Double spring assembly
W **120 Fte. 213** Bracket
121 Fte. 213 Small bracket with corrugated edge
X **901 Fte. 213** Felt pad held to "B" with wire spring 800 Fte. 213
Y **902 Fte. 213** Felt pad held in position by punching 121 Fte. 213, see "W"
Z **4458¾** Screw (2 required)
AA 309 Fte. 213* Included with shaft assembly 1-9 Fte. 213. Use pin 52. Use collar 1-7140¾ and screw 550¾
AB **73612** Screw for shaft
AC **8054¾** Screw
AD **508 Fte. 213** Stud
AE 1-119L Fte. 213 No. 1* Included with assembly 2A-10 Fte. 213 No. 1 low printing line construction
1-119L Fte. 213 No. 2* Included with assembly 2A-10 Fte. 213 No. 2 high printing line construction
AF **512 Fte. 213** Spring stud
AG **501 Fte. 213** Threaded stud
AH **7357½** Screws
AI **156 Fte. 213 (156A Fte. 213)** Use 950⅝ screw, 46 nut, 1097¾ lock washer, 3 each req.
AJ **1-203470L** Use screw 73600
AK **203807A** Spring
AL **11 Fte. 213** Shaft
AM **1-203205 Style 3½, 6, 9, 12, 15 or 18 (1-203205A Specify Style 3½, 6, 9, 12, 15 or 18)**
AN **1-203470R** Collar, includes screw 73600
AO **203024 Specify Style 3½, 6, 9, 12, 15 or 18** use 203543 screw
AP 1-119R Fte. 213 No. 1* Included with assembly 2A-10 Fte. 213 No. 1 low printing line construction
1-119R Fte. 213 No. 2* Included with assembly 2A-10 Fte. 213 No. 2 high printing line construction
AQ **1-124B Fte. 213** Specify machine number, fastened to end plates with screws 7062 (3 required) and screw 7562 (1 required)
AR **520 Fte. 213** Screw
AS **1-138 Fte. 213** Includes "C." "D"
AT **75814** Spring

BILL EJECTOR CARRIAGE—AUTOMATIC (Plate 60)



SYMBOLS (Plate 60)

A **12051½A** Stud included with punching "B"
B 1-106 Fte. 213* included with "G"
C **163A Fte. 213 Specify number,** refer to Plate 7 under letter "B" to "B-5" inclusive, for detail information
D **1-123 Fte. 213** includes screw 75618
E **3688** Spring for "H" No. 1
10983 Spring for "H" No. 2
F **1-8345** Hub, use screw 8359
G **1-1 Fte. 213** includes "B"
H **1-161 Fte. 213 No. 1** for low printing line const., includes "I"
1-161 Fte. 213 No. 2 for high printing line const., includes "I"
I **1-509 Fte. 213** Rubber roll
J **1-302 Fte. 213** includes screw 527 Fte. 213
K **163½ Fte. 213 Specify number,** refer to Plate 58 under "C" and "C-1" for detail information
L **15A Fte. 213**
M **11 Fte. 213**
N **1-116R Fte. 213 No. 1** for low printing line const., specify "L" when used on left side
1-116R Fte. 213 No. 2 for high printing line const., specify "L" when used on left side
O **7787** Spring for "N" No. 1
10983 Spring for "N" No. 2
P **84815 (12080⅜)** Spring, for "Q" No. 1
2881½ Spring, for "Q" No. 2
Q **1-162 Fte. 213 No. 1** for low printing line const.
1-162 Fte. 213 No. 2 for high printing line const.
R **108504** Screw
S **74529** Screw

SYMBOLS (Plate 61)

A **1-100 Fte. 213**
B **1-803 Fte. 213** for Type 20 automatic bill ejector carriage
1-803 Fte. 213 No. 2 (1-807 Fte. 217) for Type 20 and 30 automatic bill ejector carriage with direct bill ejector or heavy form ejection
1-803 Fte. 213 No. 3 for Type 20 automatic bill ejector carriage with heavy post card bills
C **801 Fte. 213** Spring
D 1-107R Fte. 213* Arm on right side of shaft assembly
E **516 Fte. 213** Screw
1-5 Fte. 213 Shaft assembly, includes arm "D" on right end and a similar arm on left end, use pins 59½
F **71509** Stud
G **1-136 Fte. 213** includes small stud 950⅛
H **533 Fte. 213** Stud
I **72567** Screw
J **1-114 Fte. 213 No. 1** Cover, with tapered end as shown
1-114 Fte. 213 No. 2 Cover, similar to part as shown except end is round instead of tapered
K **4458¾** Screw
L **1-130R Fte. 213** Right paper guide
1-130L Fte. 213 Left paper guide used on left end of carriage
M **157 Fte. 213**
N **101 Fte. 213** Pawl
O **802 Fte. 213** Spring
P **76558** Screw
Q **526** Fte. 213 Stud
R 311 Fte. 213* included with "U"
S **515 Fte. 213** Screw
T **1-103 Fte. 213** includes "R"
U **1-102 Fte. 213** includes "N," "V," "Q"
V **506 Fte. 213** Rivet stud
W **105 Fte. 213 No. 1**
X **10056** Screw
Y **521 Fte. 213** Screw
70512 Screw, used when above is not required
Z **310 Fte. 213 No. 1** for low printing line
310A Fte. 213 No. 2 for high printing line
AA **756⅛** Screw

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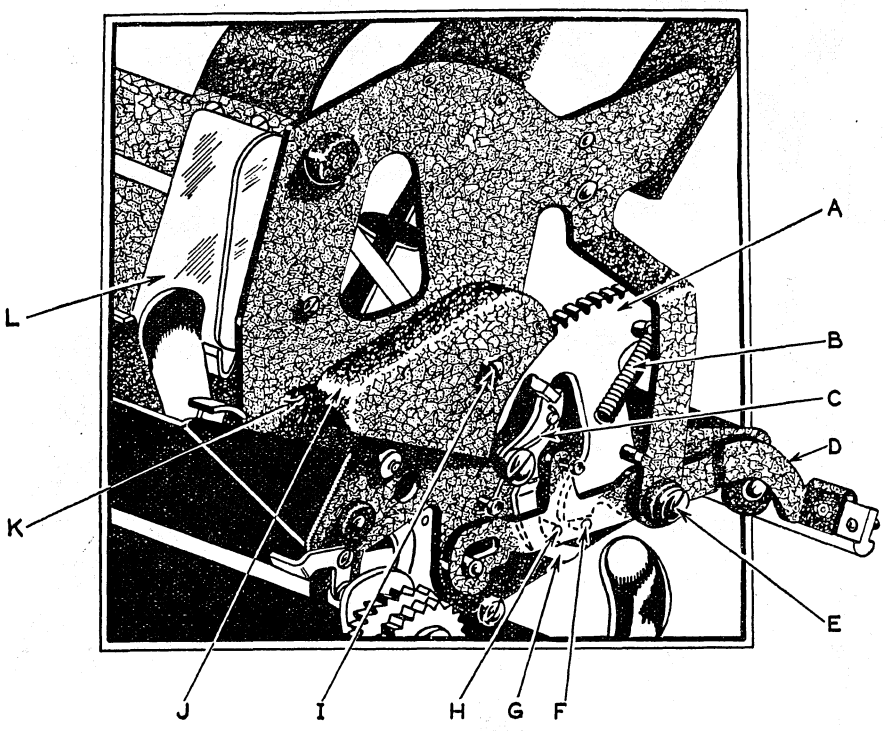
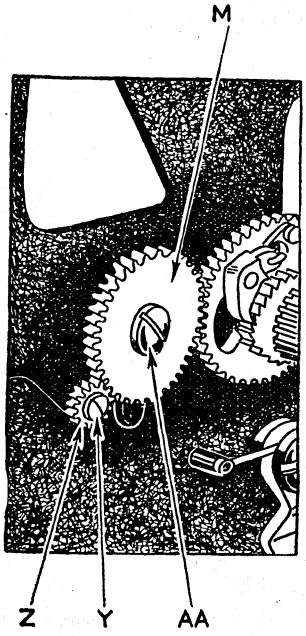
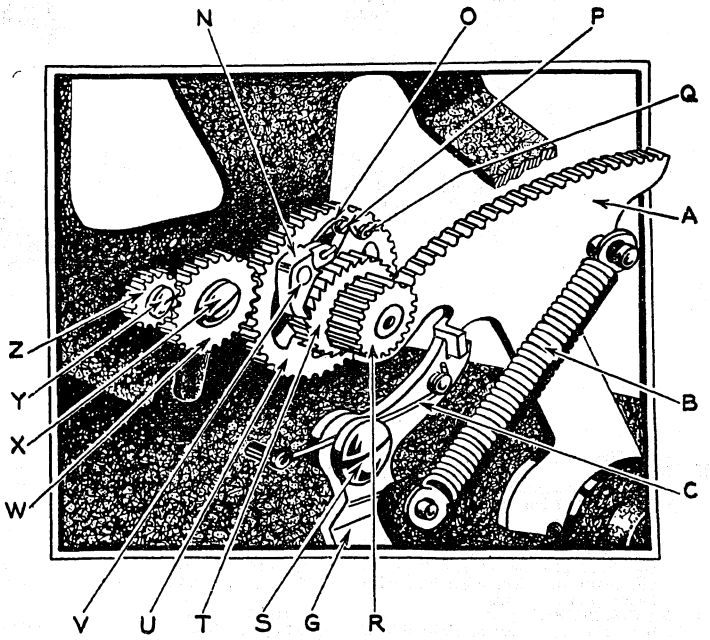
BILL EJECTOR CARRIAGE—AUTOMATIC (Plate 61)

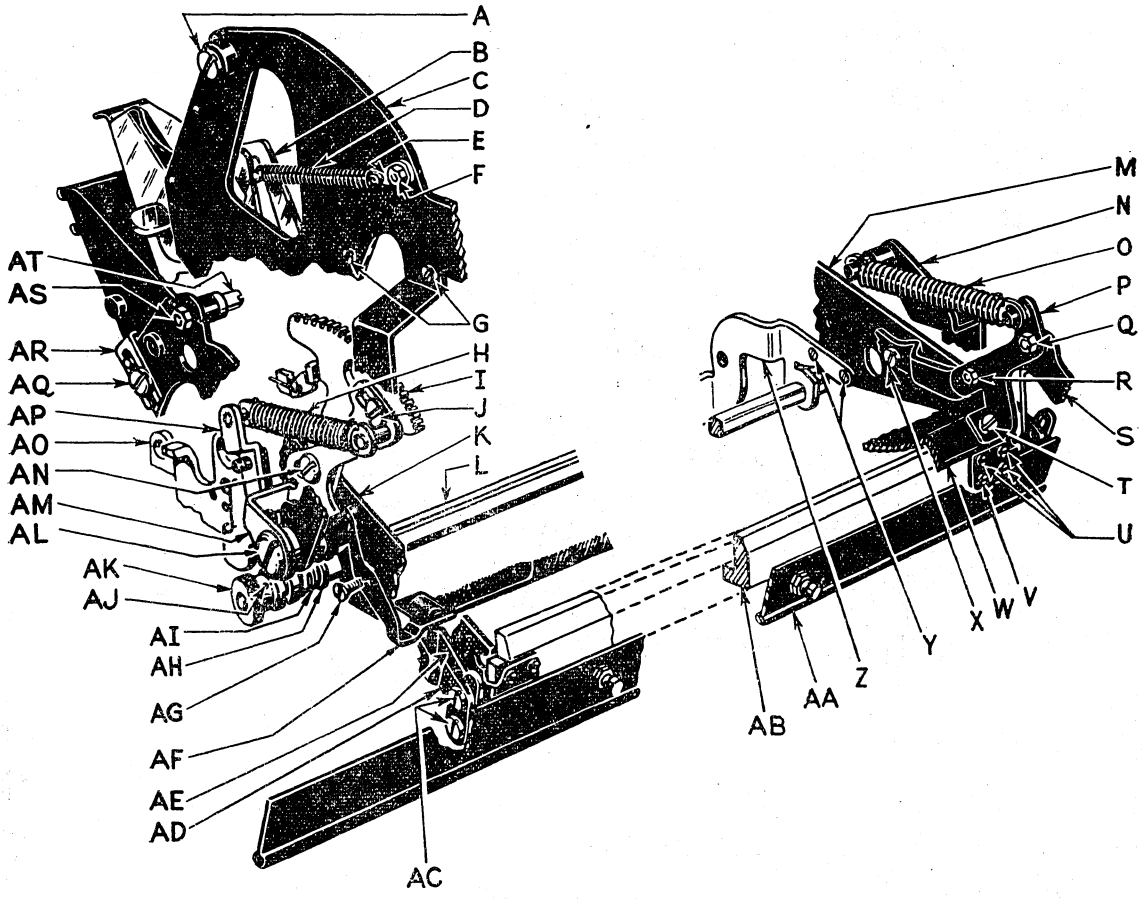
Symbols for Plate 61 are on preceding page







BILL EJECTOR CARRIAGE, IMPROVED, CLASSES 20 THRU 30
(Plate 61-1)



SYMBOLS (Plate 61-1)

A **8054¾**
B **1-162 Fte. 213 No. 2** for high printing line
1-162 Fte. 213 No. 3 for low printing line
C **1-119R No. 1 Fte. 213** for high printing line
1-119R No. 2 Fte. 213 for low printing line
D **810 Fte. 213** for light forms
12081A for heavy forms
E **11-20 No. 89** for light forms
20 No. 95 for heavy forms
F **46** Nut, 4454A screw
G **103649** Screw, 1097⅞ lock washer
H **1-811 Fte. 312 No. 3**
I **1-100 Fte. 213**
J **3455⅜** Screw, 46 nut
K **1-118BR Fte. 213**
L **1-203033A No. 3 Specify 12, 15, 18**
M **1-118BL Fte. 213**
N **1-192L Fte. 213**
O **1-10081¼** for light forms
1-814 Fte. 213 for heavy forms
P **1-20 No. 137L**
Q **47** Nut, 538 Fte. 200 screw
R **46** Nut, 10057⅝ screw
S **1-146L Fte. 213**
T **7357½**
U **10056¾**
V **203658**
W **1-203122½ Specify 12, 15, 18**
11-203122½ Specify 15, 18 gray
X **2854⅜** Screw
Y **203558½**
Z **1-117L Fte. 213 No. 2**
AA **1-203123D No. 2 Specify 12, 15, 18**
11-203123D No. 2, 15, 18 gray
AB **203006B Specify 12, 15, 18**
AC **528 Fte. 216**
AD **1-192R Fte. 213**
AE **1-5 Fte. 213**
AF **203118¼**
AG **2859⅞** Screw, 46 nut
AH **203307** Washer
AI **89¼ Fte. 88** Spring
AJ **82501** Pin
AK **203477A** Use 203550½ screw to block positions not used
AL **516A Fte. 213**
AM **1-175A Fte. 213**
AN **8054¾**
AO **1-117R Fte. 213 No. 2**
AP **1-111 Env. 3092** use 709558 screw, 76120 washer, 46 nut
AQ **506 Fte. 209**
AR **203183A**
AS **47** Nut
AT **510A Fte. 213** right side
511A Fte. 213 No. 1 left side
511A Fte. 213 No. 2 left side with S. O. C. L.

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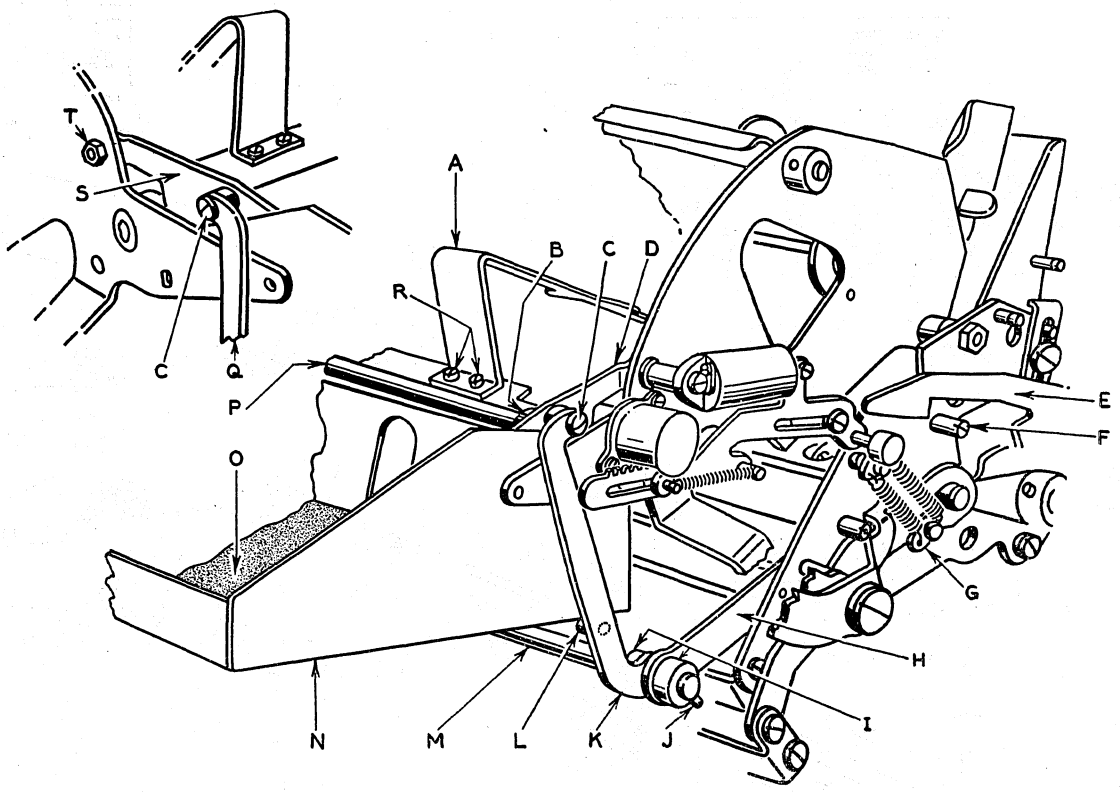
DEEP TICKET BOX FOR BILL EJECTOR CARRIAGE (Plate 62)

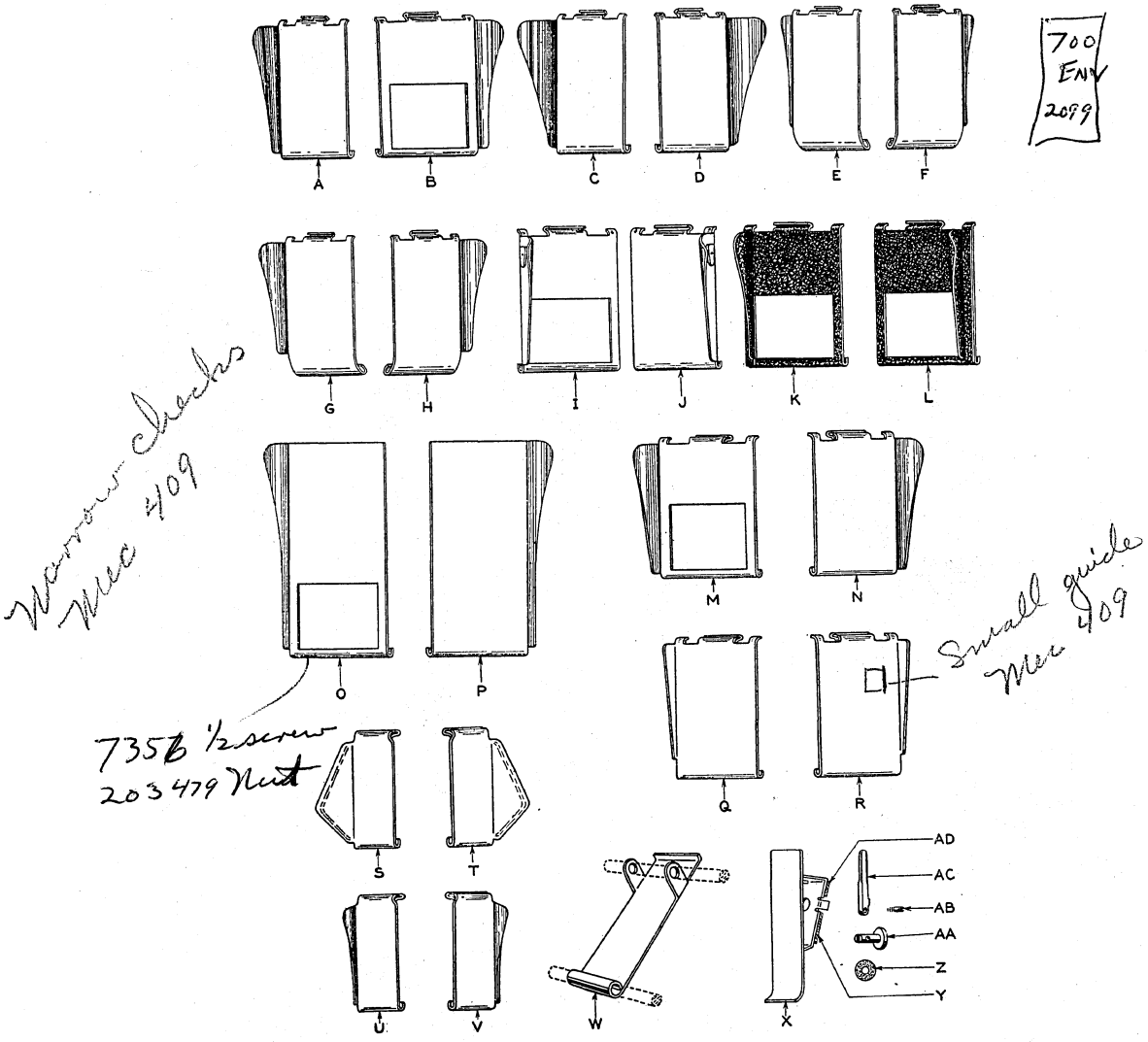


SYMBOLS (Plate 62)

A **156B Fte. 213 (156C Fte. 213)** Fingers (one or more required)
B **1-7140¾** Collar, includes screw 550¾ used on shaft "P"
C **120517/8** Screw
D **1-124⅛L Fte. 213** Punching fastened to tray with rivets 545 Fte. 213
E **1-320 Fte. 213** Arm
F **513 Fte. 213** Eccentric screw
46¼ Nut
G **1-203801A** Double spring assembly
H **1-146L Fte. 213** Arm supporting shaft
I **1-540** Collar, includes screw 550¾
200162½ Washer
J **550¾** Screw
K **1-124¼L Fte. 213 (1-124¼AL Fte. 213)**
L **547 Fte. 213** Stud
M **13 Fte. 213** Shaft
N **1-124C Fte. 213** Deep ticket box
O **905B Fte. 213** Billiard cloth, use cement code 7647-2
P **1-9 Fte. 213** Bail for fingers
Q **1-124¼R Fte. 213 (1-124¼AR Fte. 213)**
R **950⅝** Screw
1097¾ Lock washer
46 Nut
S **1-124⅛R Fte. 213** Punching fastened to tray with rivets 545 Fte. 213
T **4454A** Shoulder screw
45¼ Nut
1097$\frac{7}{16}$ Washer

CARRIAGE PAPER GUIDES (Plate 64)

(Plate 63 is in "Carriages" Instruction Book only)



SYMBOLS (Plate 64)

(For all billiard cloth use cement code 7647-2)

A **1-180R Fte. 203 No. 1** Bill guide, Class 20, use billiard cloth 203997B

B **1-180L Fte. 203 No. 1** Bill guide, Class 20, use billiard cloth 203985B

C **1-180R Fte. 203 No. 2** Ledger guides, telephone billing machine, Class 20, use billiard cloth 203997B

D **1-180L Fte. 203 No. 2** Ledger guides, telephone billing machine, Class 20, use billiard cloth 203997B

E **1-180R Fte. 203 No. 3** Ledger guides, public utility, Class 20-26, use billiard cloth 203997B

F **1-180L Fte. 203 No. 3** Ledger guides, public utility, Class 20-26, use billiard cloth 203997B

G **1-180R Fte. 203 No. 4** Bill guides, Class 20-26, use billiard cloth 203997B

H **1-180L Fte. 203 No. 4** Bill guides, Class 20-30, use billiard cloth 203997B

I **1-238R Fte. 203** Ledger guide, Class 20, use billiard cloth 203985B

J **1-238L Fte. 203** Ledger guide, Class 20, use billiard cloth 203997B

K **1-187R Fte. 203** Ledger guide, Class 20, use billiard cloth 203985B

L **1-187L Fte. 203** Ledger guide, Class 20, use billiard cloth 203985B

M **1-203114AR No. 1** Paper guides for swinging table, Class 20-26, use billiard cloth 203985B

N **1-203114AL No. 1** Paper guides for swinging table, Class 20-26, use billiard cloth 203997B

O **1-225R Fte. 203** Ledger guide, Class 20, use billiard cloth 203985B

P **1-225L Fte. 203** Ledger guide, Class 20, use billiard cloth 203997B

Q **1-203114AR No. 2** Paper guides on swinging table, Class 20-26, use billiard cloth 203997B

R **1-203114AL No. 2** Paper guides on swinging table, Class 20-26, use billiard cloth 203997B

S **1-203114AR No. 7 (1-203114BR No. 7, 203479, 4557¼)** Ledger guide for full visible alignment carriage, Class 20 thru 30, use billiard cloth 203997A No. 3

T **1-203114AL No. 7 (1-203114BR No. 7, 203479, 4557¼)** Ledger guide for full visible alignment carriage, Class 20 thru 30, use billiard cloth 203997A No. 3

U **1-203114AR No. 8 (1-203114BR No. 8, 203479, 4557¼)** Ledger guide for full visible alignment carriage, Class 20 thru 30, use billiard cloth 203997A No. 3

V **1-203114AL No. 8 (1-203114BL No. 8, 203479, 4557¼)** Ledger guide for full visible alignment carriage, Class 20 thru 30, use billiard cloth 203997A No. 3

W **130 Fte. 203** Ledger sheet guide for continuous journal device, Class 20-26 for ledger sheets exceeding 12" in length

X **1-192 Fte. 203** Ledger guide, Class 20, includes parts attached only

Y **203992** Billiard cloth

Z **203900** Leather washer

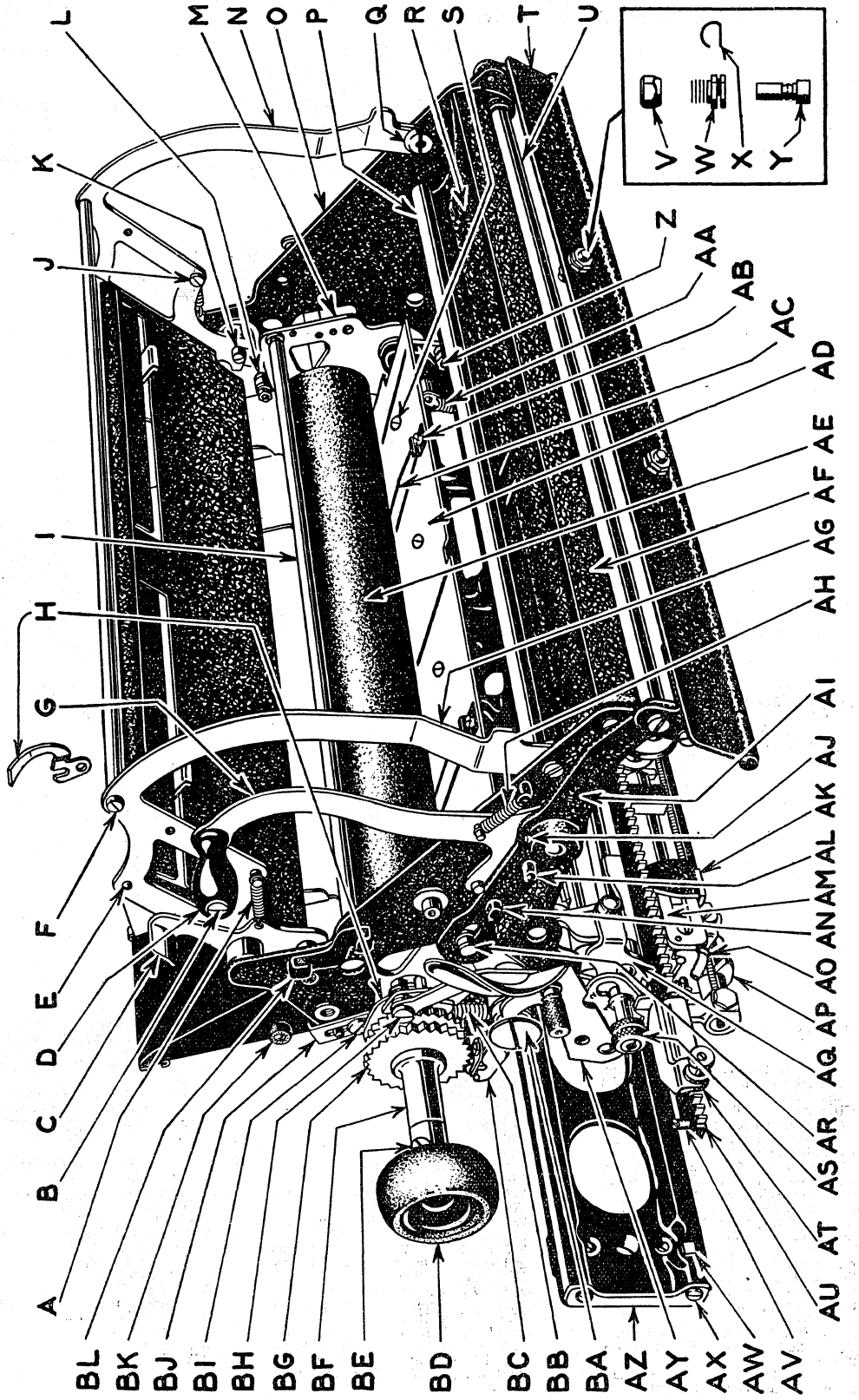
AA **203526** Slotted stud

AB **203525** Screw

AC **203132** Lever

AD **203991** Billiard cloth

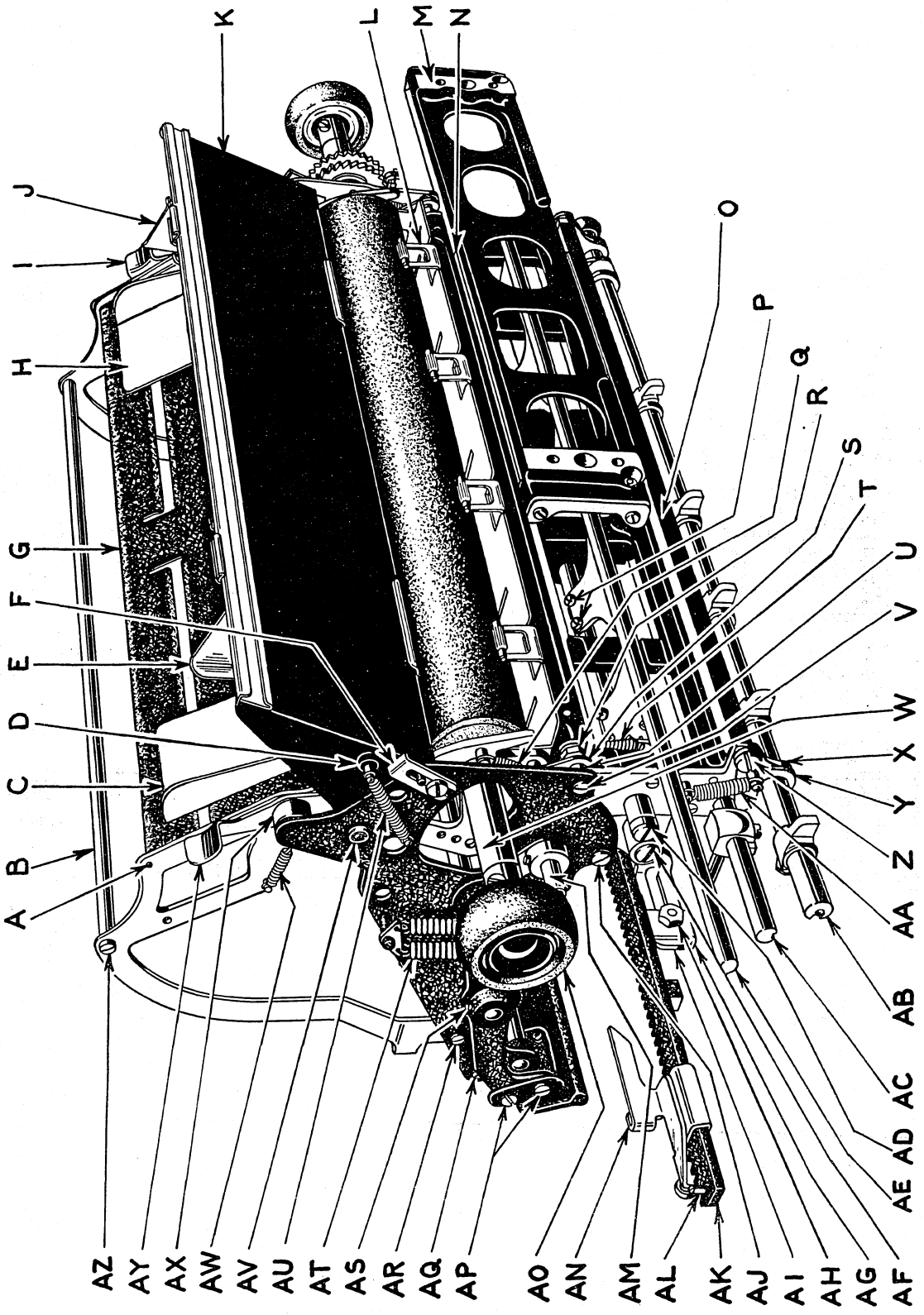
TELEPHONE BILLING MACHINE CARRIAGE (Plate 65)



SYMBOLS (Plate 65)

A **75814** Spring
B **73612** Screw
C **120R Fte. 203** Release lever 503 Fte. 203, large stud
D **4891A** Rubber grip
E **4458¾** Screw (3 req. on left side and 3 on right)
F **12051⅜** Screw
G **1-203127A** Operating lever
H **203113R** Punching, 203539A screw for punching and washer 20518½
I **203029A Specify Style 12, 15, 18 (-203029 No. 2 Specify Style 12, 15, 18, 950¾, 203423 No. 2)**
J **501 Fte. 203** Screw for spring (2 req., one for right and left)
K **203524A** Screw, 203421 collar
L **46¼** Nut, 2820½ washer, 10034 roller, 203573B stud
M **1A-2A Fte. 213 Style 12 (21A-2A Fte. 213 Style 12, 203029 Style 12 No. 2 or 1-203029 Style 12 No. 2, 950¾, 203423 No. 2)**
1A-2A Fte. 213 Style 15 (21A-2A Fte. 213 Style 15, 203029 Style 15 No. 2 or 1-203029 Style 15 No. 2, 950¾, 203423 No. 2)
1A-2A Fte. 213 Style 18
} Includes shaft and end plates
N **1-119L Fte. 203** includes release lever 120L Fte. 203
O 1-203118DL* Left end plate, for right end plate, specify 1-203118DR* included with "U"
1B-203005 Specify Style 12 (1-203005 No. 4 Specify Style 12)
1B-203005 Specify Style 15 or 18—includes right and left end plate—refer to AI
Q **300 Fte. 203** Bushing, 7357½ screw
R **1-122A Fte. 213 Specify Style 12, 15 or 18 (203122 Specify Style 12, 15 or 18, 203297R and L, 7562, 2 req.)**
S **1653½** Screw (4 or more required)
T **11-203123D Specify Style 12", 15" or 18"** Rail for opening carriage on tabulation or return operation, motor driven carriage opening
U **1D-203006A Specify Style 12", 15" or 18"** includes end plates as specied under "O"
V **203371** Nut
W **203370** Threaded collar with groove for spring reception
X **203806B** Spring
Y **203593B (203593B Plain)**
Z **45** Nut, 7357½ screw, 203518A hexagon stud, 1097¾ lock washer, one each used on right and left side of carriage
AA **1-808 Fte. 213 Style 18** Spring, 525 Fte. 213 stud
AB **70512** Screw, 327 Fte. 213 nut
AC **184 Fte. 213 No. 2** Flexible bill stop
AD **108 Fte. 213 No. 1 Style 12 or 15 (108 Fte. 213 No. 1 Style 12 or 15 Blank)**
108 Fte. 213 Style 18 (108 Fte. 213 No. 1 Style 18 Blank)
AE **11-2800¼B Style H, K, 15** Specify number of carbon, includes platen, shaft and pins
AF **1-203122½ Specify Style 12", 15" or 18"** Stabilizing strip
AG **1-119R Fte. 203** includes "C" and stud 503 Fte. 203
AH **75814** Spring
AI 1-203107CR* Right end plate, 1-203107CL left end plate, refer to "P" for complete assembly
AJ **59½** Pin, one required on each end
AK **203159** Small punching
AL **71534** Spring stud
AM **1-203260R** Bracket, use 8451 screw—refer to Plate 51-7
AN **203507** Stud
AO **1-117R Fte. 213** End plate
AP **1-2823½ No. 2** Latch
AQ **1-203008 Style 12", 15", 18"** Shaft assy. includes end plate with stud 203538 and roll 302302
AR **203401** Roll, 203500 stud
AS **2847** Knurled knob, 2845½ threaded bushing, 2888 spring
AT **1-203176R** Punching assy., includes plunger 203564, spring 12081¼, washer on end of plunger 203441, hub 203455* and punching 203177*, for left side use 1-203176L
AU **See Rack Bar Charts, Plates 51-1 thru 51-6**
AV **12055⅞** Screw
AW **2859⅝A** Square head screw, 46 nut, one each required on each end
AX **2852⅛** Screw, two required on each end
AY **21-2803B Specify Style 12", 15", 18"** Carriage shift lever assembly, use spring 2886¾, knurled knob 73327, spring 73807 for knob, and lever 1A-203226
AZ **2818A (4918R or L, 4952⅛)**
BA **2857½C** Screw
BB **2886⅞** Spring
BC **1-2816A No. 1** Detent
BD **1-2839½B** Twirler
BE **2850⅛** Screw
BF **203424A** Sleeve
BG **1-203449 (11-2800¼B Style H, K or 15 Specify Carbon, 1-2839¼D, 2841⅛D, 2881B, 1-2849D)** for machines without carriage closing on machine operation, use 2-223 Fte. 203 in place of 1-2849D
BH **2858⅛** Screw, 2843¾ collars, 1-2822⅛ link, 1-2822 No. 2 pawl
BI **203569 (506 Fte. 209)**
BJ **203183A** Stop
BK **203570AR** Stud, 203443 washer
BL **203269A** Punching, 764¼ stud (2) 203982 rubber (2)

TELEPHONE BILLING MACHINE CARRIAGE (Plate 66)



SYMBOLS (Plate 66)

A **4458¾** Screw (3 req. on each end)
B **9 Fte. 203 Style 12″, 15″, 18″** Shaft
C **1-130L Fte. 213** Left paper guide
D **203570AL** Stud, 203443 washer
E **1-180L Fte. 203 No. 4** Left paper guide, refer to detail drawings shown on Plate 64
F **203183A** Stop, 506 Fte. 209 screw
G **16¼ Fte. 88 Sprcify Style 12″ or 18″** Bill magazine
111 Fte. 203 Style 15 use for Style 15″ Bill magazine
H **1-130R Fte. 213** Right paper guide
I **120R Fte. 203** Release lever, large stud 503 Fte. 203
J **1-180R Fte. 203 No. 4** Right paper guide, refer to detail drawings shown on Plate 64
K **1-110 Fte. 203 No. 2 Specify Style 12″, 15″ or 18″** Aligning table, refer to detail drawings shown on Plate 68
L **1-109 Fte. 213 No. 1** includes knurled roll. **Complete shaft assembly** includes "L," screws 7062, arms 1-104R and L Fte. 213, shaft 203004A* and pins 52, symbolized 21-4A Fte. 213, specify Style 12″, 15″ or 18″
M **2865C Style 17H**
2865C Style 13 or 17 K
203665 Style 13, 12″ (2865C Style 13H, 4918R and L, 4952⅛)
N **2824B Style 13 or 17 H**
2824B Style K (2824 Style 18 No. 2, 2 req., 2837⅛ bearings, specify number, 24 req.)
O **667 Fte. 213 No. 1 Specify Style 15″**
667 Fte. 213 No. 2 Specify Style 12″ or 18″ Outer casting
P **2851¾** Screw
Q **1-203800 No. 6** Spring
R **535C Fte. 213** Tapped hex. shoulder stud, one required on each end
S **203287L No. 1** Specify "R" for right, slotted arms on collar 328A Fte. 213, one used on each end
T **1-808 Fte. 213 Style 18″** Spring restoring bail
U **328B Fte. 213** Collars
V Refer to Plate 57, letters "W," "X," "AG," and "AK" for detail symbols replacing construction as shown
W **4832¾** Sleeve
X **1-117L Fte. 213** End plate on carriage casting
Y **1-2823¾ No. 2** Latch for stop bar
Z **2854⅞ (84618)** Screw securing Y to carriage end plate
AA **2881½** Spring
AB **2-2804¾ Style 12″, 15″, 18″** Submit forms
AC **1-3203¾B Specify Style 12″, 15″ or 18″** Submit forms
AD **7356¾** Screw in shaft supporting feed bail
AE **1-2806½A Style H**
1-2806½A Style K (1-2806½ Style K No. 2)
1-203015 Style 15
AF **8054¾** Screw in end of shaft assembly
AG **12026¼L** Punching
AH **47** Nut, 1097¼ lock washer
AI **1-12026¾CL** Bracket for AG—refer to Plate 51-7
AJ **7357½** Screw, 203518A hexagon stud, 45 nut, 1097¼ lock washer
AK **See Rack Bar Charts, Plates 51-1 thru 51-6**
AL **12055⅞** Screw
AM **1A-2A Fte. 213 Style 12 or 15 (21A-2A Fte. 213 Style 12 or 15, 203029 No. 2 Style 12 or 15 or 1-203029 No. 2 Style 12 or 15, 950¾, 203423 No. 2)** Inner carriage frame assembly, includes arms on each end equipped with roll and stud and end plates supporting platen
1A-2A Fte. 213 Style 18
AN **1-203176L** Punching assembly, includes plunger 203564, spr. 12081¼, washer 203441, hub 203455* and punchings 203177* and 203176L*
AO **1-2839½B** Twirler
AP **2858¼A** Screws
AQ **7062** Screws, one req. on each end
AR **7357½** Screw, 300 Fte. 203 threaded bushing
AS **59½** Pin
AT **1-203801A** Spring
AU **10080** Spring
AV **203524A** Long head flanged screw, 203421 flanged bushing
AW **75814** Spring, one required on right and left side
AX **503 Fte. 203** Large stud for "AY"
AY **120L Fte. 203** Release lever
AZ **12051⅜** Screw

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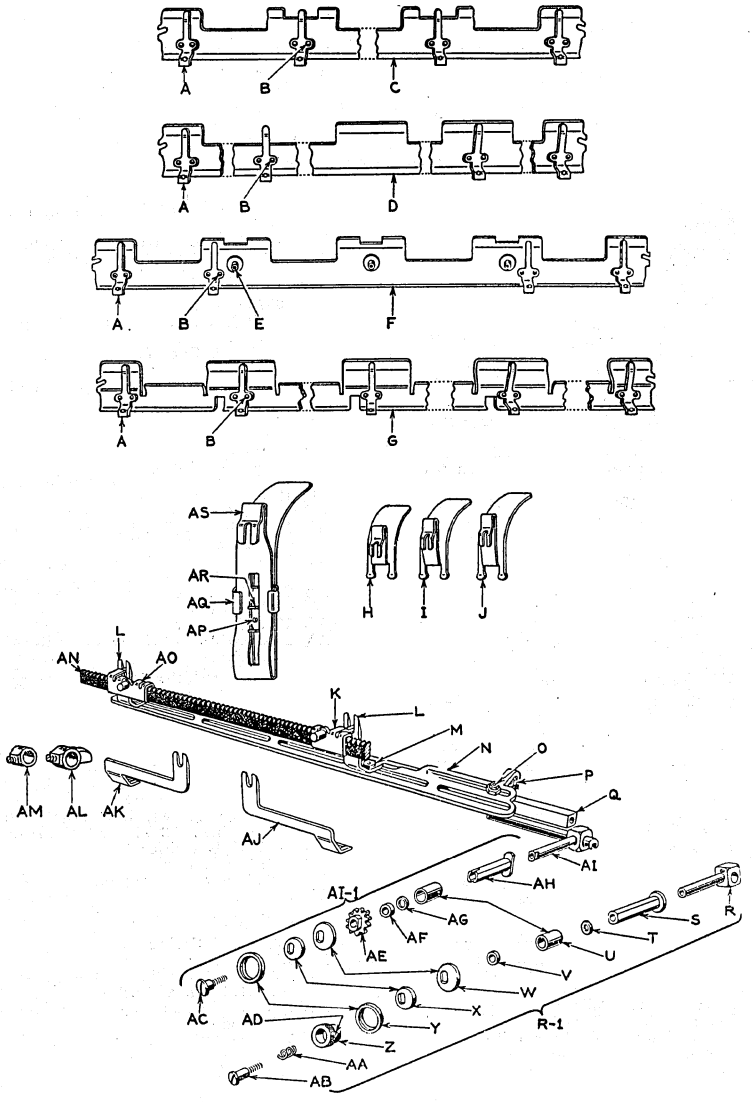
CARRIAGE PLATEN SHIELDS, ADJUSTABLE BILL STOPS, SKIP STOP KNOCKERS, HANGERS, AND RACK FOR CLASS 20 PUBLIC UTILITIES AND TELEPHONE BILLING MACHINE (Plate 67)

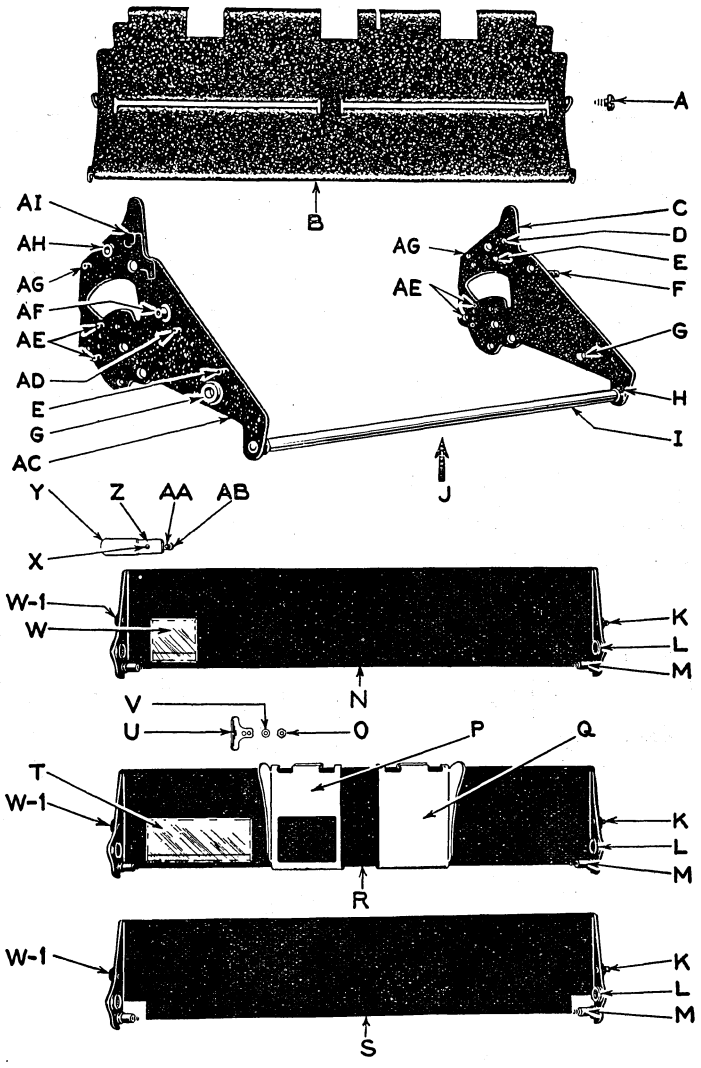


SYMBOLS (Plate 67)

A **203109** (4 or more required)
B **203508** Rivets (one or more required)
D **1-108 Fte. 203 No. 2 Style 15** for Type 20
E 515 Fte. 203* use 74587 screw
F **1-108 Fte. 203 No. 4 Style 12″** only for Type 20 public utility
G **1-108 Fte. 203 No. 5 Style 18** for Type 20 telephone billing machine
H **124 Fte. 203 No. 1** Type 20 public utility adjustable bill stop
I **124 Fte. 203 No. 2** same description as No. 1
J **124 Fte. 203 No. 3** same description as No. 1
K **1-159 Fte. 203** includes stud 508A Fte. 203*
L **165A Fte. 203**
M **12046⅜** Shoulder nut, use 12051⅞ screw
N **155A Fte. 203 Style 12″, 15″, 18″**
O **2850⅜A** Screw, 46 nut, 12044⅞ shoulder nut
P **535 Fte. 203** Screw, 46 nut
Q **8 Fte. 203 No. 2 Specify Style 12″, 15″ or 18″ (203013C Specify Style 12″, 15″ or 18″)**
R **1-10045⅞ No. 19**
R-1 **11A-445 Fte. 203 (11B-445 Fte. 203)** Complete assembly includes "R" thru "AB" and including "AD"
S **342A Fte. 203**
T **351 Fte. 203**
U **10044⅛ No. 3**
V **10044⅛ No. 1**
W **10025⅜ No. 23** Specify if for other number
X **10025⅛ No. 2** Specify if for other number
Y **301A Fte. 203 (301B Fte. 203)**
Z **303A Fte. 203**
AA **802 Fte. 203**
AB **504 Fte. 203 No. 1**
AC **504 Fte. 203 No. 2**
AD **570 Fte. 203** Screw
AE **334A Fte. 203**
AF **10042⅛**
AG **10044⅛ No. 5**
AH **10042¼B No. 2**
AI **10045⅞ No. 2** use screw 4462¼ for holding part to shaft
AI-1 **1A-445 Fte. 203** Complete assembly includes "AC," "Y," "X," "W," "AE," "AF," "AG," "U," "AH," "AI"
AJ **165 Fte. 203 No. 2** Brace used on Classes 1, 2, 6, 11-16 const. for selective operation control feature. Use screw 12051⅞ and shoulder nut 12046⅜
AK **165L Fte. 203 No. 2** same description as "AJ"
AL **1-920 Fte. 203 Specify number** use screw 536 Fte. 203 No. 2 for rotary stop bar, Classes 2, 6, 11-16
AM **1-921 Fte. 203** same description as "AL" except "specify number" is unnecessary
AN **1A-203166 Specify Style 12, 15 or 18 (11-203166 No. 3 Style 12, 15 or 18)** Specify machine number
AO **1-159 Fte. 203 No. 2** includes stud 508A Fte. 203*
AP **10056** Screw
AQ **186 Fte. 203**
AR **185 Fte. 203**
AS **1-184 Fte. 203** includes "AP," "AQ," "AR"

SEE EXPLANATION ON INSIDE OF FRONT COVER

CARRIAGE PAPER AND ALIGNING TABLES, OUTER CARRIAGE FRAME ASSEMBLY (Plate 68)



SYMBOLS (Plate 68)

A **4458¾** Screw (4 required)

B **1-125 Fte. 203 Specify Style 12, 15 or 18 (203122 No. 2 Style 12, 15 or 18, 203297R&L, 7562)** Paper table for Class 20 public utility carriage with adjustable bill stops

C 1-203118DL*

D 203412 No. 1* Threaded bushing

E **10950½** Spring stud, use spring 8084A

F **203509 (12354⅞)** Spring stud—use spring 1-203801A

G **203409B** Bushing

H **52** Pin

I 203006A* Style 12″, 15″, 18″

J **1A-6 Fte. 203 No. 5 Style 12″, 15″, 18″** Outer carriage frame assembly for Class 20-26 with space or non-space from MRC

K **203570AL** Spring stud, use spring 10080
203443 Washer

L 4499* Ball bearings, same parts used on right and left side
203406* Cup, same parts used on right and left side
4433¼* Retaining ring, same part used on right and left side

M **203573B** Stud, use 10034 roll, 2820½ washer, 46¼ nut (2 each required, one on each end)

N **1A-110 Fte. 203 No. 3 Style 12″, 15″ 18″** Aligning table for Class 20-26 with carriage opening on last right-hand position

O **49¾** Nut (2 required)

P **1-203114AR No. 1,** 203985B billiard cloth, use cement code 7647-2

Q **1-203114AL No. 1,** 203997B billiard cloth, use cement code 7647-2

R **1A-110 Fte. 203 No. 1 Style 12″, 15″ 18″** Aligning table Class 20-30, includes parts attached and "O," "U," "V"

S **1-110 Fte. 203 No. 2 Style 12″, 15″, 18″** Aligning table for Class 20-30, bill magazine carriage

T **906 Fte. 203** Glass

U **203206A** Clamp (2 required)

V **75210** Washer (2 required)

W **203906 No. 3** Glass, refer to "O," "U," "V" for associate parts

W-1 **203570AR** Stud
203443 Washer

X **527 Fte. 203 (203572½)** Stud

Y **1-198 Fte. 203** includes "X," "Z," "AA," "AB"

Z 197 Fte. 203*

AA **528 Fte. 203** Stud

AB 196 Fte. 203*

AC 1-203118DR*

AD **69518** Stud

AE **8853⅜** Stud

AF **203408** Threaded bushing, use screw 8054¾

AG **7264** Stud

AH 203410* Threaded bushing, use screw 203520

AI **203269A** Punching
764¼ Rivet
203982 Rubber (2 required)

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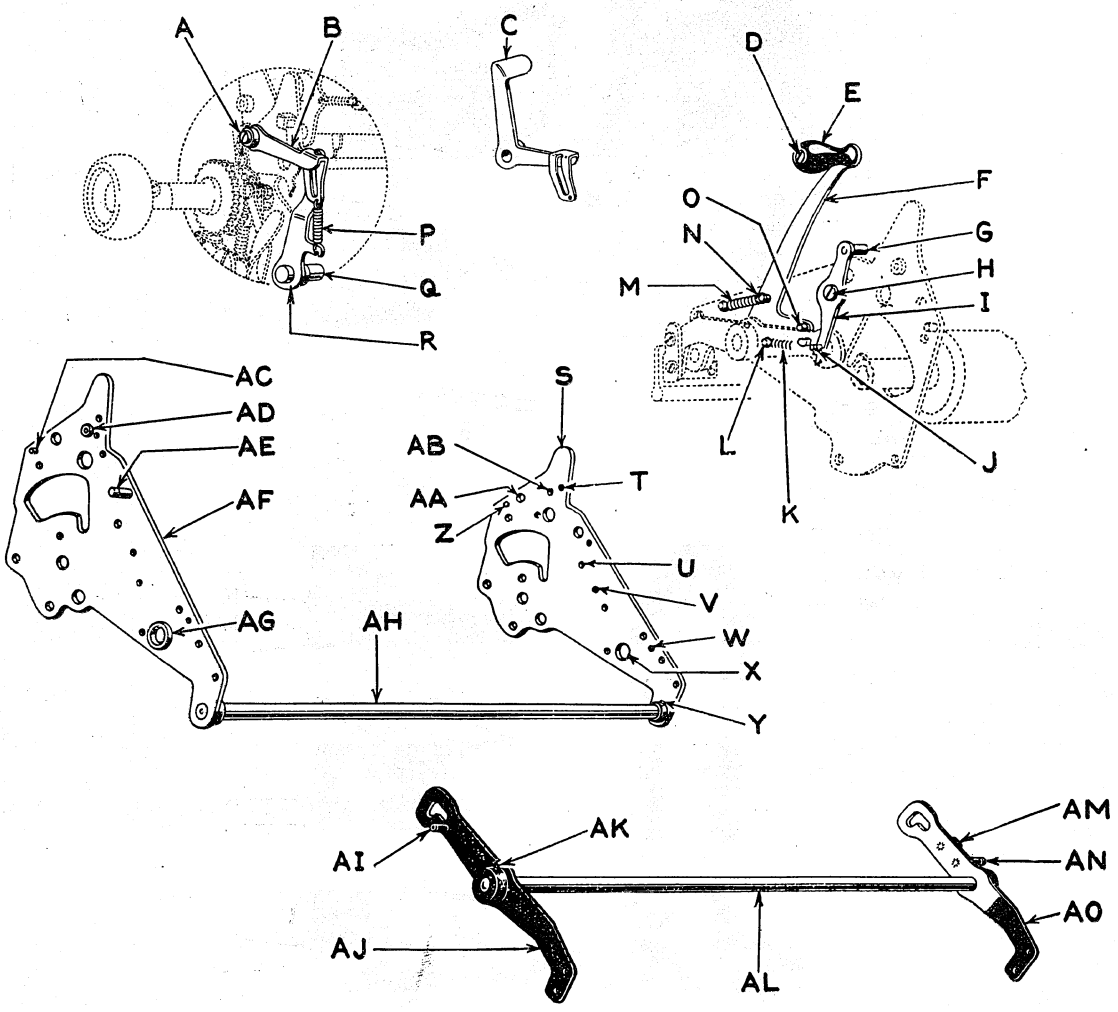
CARRIAGE PARTS SPECIAL TO LEFT-HAND PLATEN RELEASE
(Plate 69)



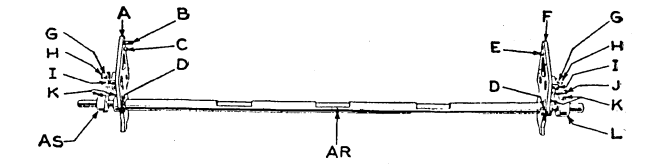
SYMBOLS (Plate 69)

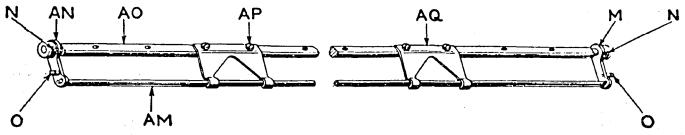
A **203520** Screw
B **1-116 Fte. 203 No. 1**
C **1-116L Fte. 203,** use screw 203520 and spring 480¼
D **73612** Screw
E **4891A**
F **1-127L Fte. 203** Complete lever
G **203511** Stud
H **8054¾** Screw
I **1-121 Fte. 203**
J **3450** Stud
K **71805** Spring
L **203506** Spring stud
M **75814** Spring
N **756** Spring stud
O **69518** Stud
P **480¼** Spring
Q **21-203003A Style 12″**
21-203003 Style 15″, 18″
Above assemblies includes shaft, end plates and pins 52
R 1-203129BR* use pin 52
S 1-118AL Fte. 203 No. 2*
T **12054** Stud
U **203408** Threaded bushing
V **953⅜** Stud
W **10950½** Spring stud
X **203409B** Bushing
Y **52** Pin (2 required)
Z **7264** Stud

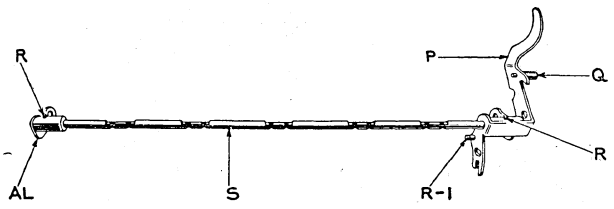
AA 203410* Threaded bushing
AB 203412 No. 1* Threaded bushing
AC **7264** Stud
AD 203412 No. 1* Threaded bushing
AE **203509 (12354⅞)**
AF 1-118AR Fte. 203 No. 2*
AG **203409B** Bushing
AH **11A-6 Fte. 203 Style 12** only, includes shaft, end plate and pins
AI **203506** Spring stud
AJ 1-107AR Fte. 203*
AK **59½** Pin (2 required)
AL **1A-5 Fte. 203 Style 12″, 15″, 18″** includes shaft, end plates and pins
AM **203507** Stud
AN **71534** Spring stud
AO 1-107AL Fte. 203*

SEE EXPLANATION ON INSIDE OF FRONT COVER

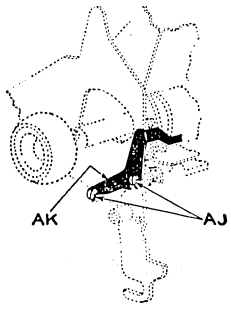
CARRIAGE SHAFTS, PRESSURE ROLL ASSEMBLIES, STOP BAR AND PASSBOOK GUIDES (Plate 70)

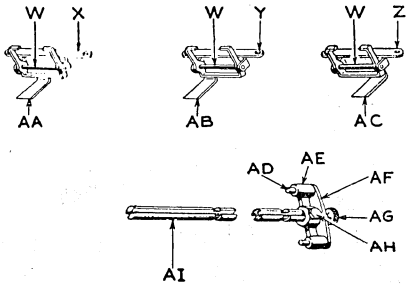






1-203995
for 231302





SYMBOLS (Plate 70)

A 1-203102AL*
B **3464¼** Spring stud
C **203504** Stud
D **203501 (10058⅞)**
E **203592A** Stud
F 1-203102AR*
G **203401** Roll
H **203500** Stud
I **203502** Spring stud
J **203503** Spring stud
K **64** Pin
L 1A-203100R*
M 1-205R Fte. 203*
N **52** Pin
O **2852⅜₆** Spring stud
P **1-203226**
Q **73327** Knurled knob, 73807 spring
R **52** Pin
R-1 **2863½** Spring stud
S **1-7 Fte. 203 No. 2 Styles 12″, 15″ or 18″ (21-4903¼D Style 12″, 15″ or 18″)** Shaft assembly for Class 20-26 S&N carriage
T **1-315 Fte. 203** used with "AO"
U **1-316 Fte. 203** used with "AO"
V **2-321 Fte. 203** used with "AO"
W 525 Fte. 203*
X **1B-103 Fte. 203** includes "W," "AA," pressure roll release bracket for Class 20-26 telephone billing machine, use screws 7357½
Y **1B-103L Fte. 203** same description as "X"
AA 104B Fte. 203* furnished with "X"
AB 104BL Fte. 203* furnished with "Y"
AC 104BR Fte. 203*
AD 568 Fte. 203* Pin (2 required)
2881¼ Spring (2 required)
243 Fte. 203 Washer (2 required)
AE **1-909 Fte. 203** includes "AD," "AF," "AG," "AH"
AF **1-244 Fte. 203** furnished with "AE"
AG 567 Fte. 203* furnished with "AF"
AH **2862⅝** Screw
AI **1-23 Fte. 203 Styles 12″, 15″, 18″ 2-23 Fte. 203 Styles 12″, 15″, 18″** complete assembly rotating stop bar for Classes 6, 11 thru 30 machines
AJ **7357½** Screw, 1097¾ lock washer
AK **190L Fte. 203,** Specify 190R Fte. 203 when used on right side, bracket for Type 20 passbook const.
AL 1B-4916⅛*
AM **203000 Style 12″, 15″, 18″** not included with "AO," order as separate item
AN 1-205L Fte. 203*
AO **1-24 Fte. 203 Style 18″** Special pressure roll assembly for Type 20 carriage whenever the last printing line is 7/16″ from forms edge, specify machine number
AP **7562** Screw, one or more required
AQ **203121B,** one or more required, not included with "AO," order as separate item
AR **1A-22 Fte. 203 Specify Style 12 or 18** includes all parts attached
AS 1B-203100L*

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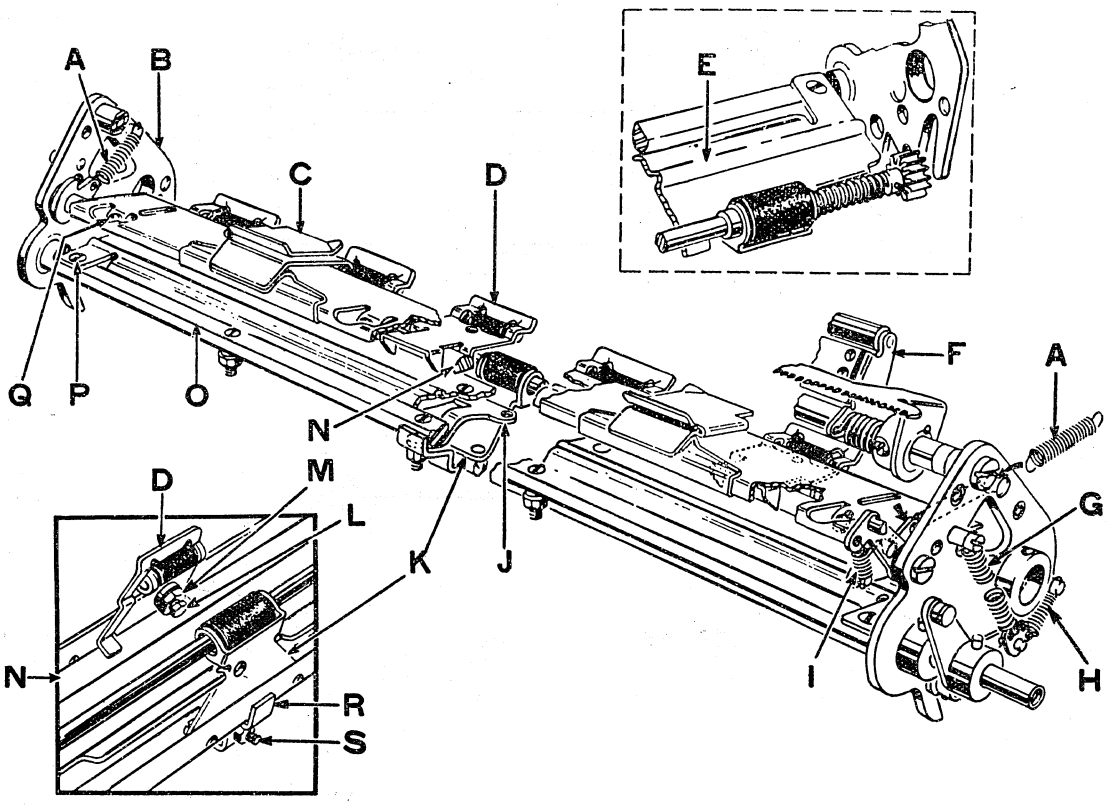
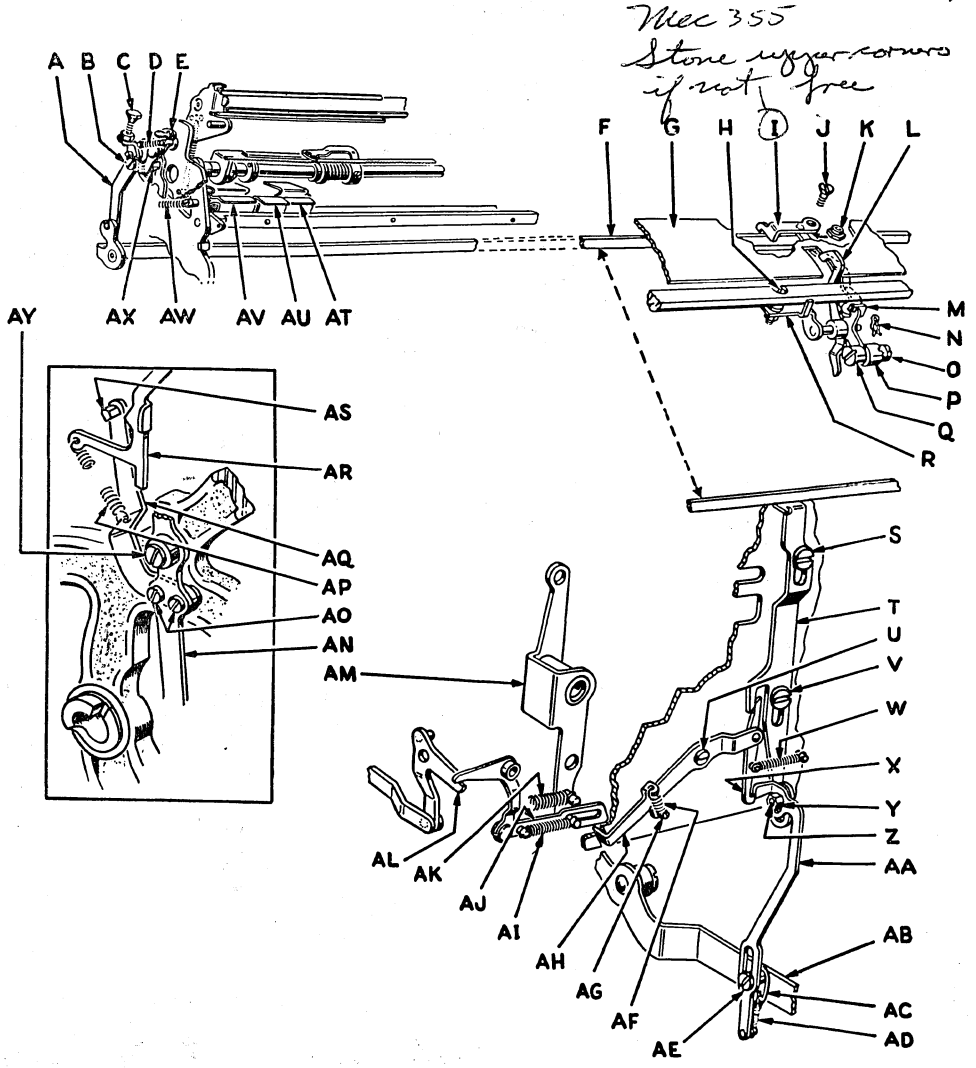
ADJUSTABLE JOURNAL PRESSURE ROLLS, JOURNAL GUIDES AND STANDARD LEDGER PLATE, CLASSES 20 THRU 30 (Plate 70-1)



SYMBOLS (Plate 70-1)

A **705828**
B 21-158L Fte. 213* included in O
C **1A-172R&L Fte. 213**
D **1-203121A No. 2** includes 1-203995 No. 2 pressure roll, 203032A pin
E **203108C Style 12, 15, 18 No. 1**
F **1-203205A Specify Style 3½, 6″, 9″, 12″, 15″, 18″**
G **1-203800 No. 6** includes H
H **203800 No. 7**
I **7287 Style 10** Spring
J **203109B** use 203508 No. 3 screw
K **1-109R&L Fte. 213 No. 3** use 12058⅜ screws
L **203656**
M **46¼** Nut
N **21-4A Fte. 213 Style 12, 15, 18** Shaft
O **21-2B Fte .213 Style 12, 15, 18**
P **1653½** Screw
Q **74533**
R **191A Fte. 213**
S **4952⅞A** Screw, 46 nut

LEDGER END LOCK (WITH DISABLING MECHANISM) (Plate 71-1)



SYMBOLS (Plate 71-1)

A **1-203298**
B **99539A**
C **1-203497**
D **480B**
E 1-203299* included in A
F **203299½ Style 15**
G **203108C Style 15 No. 5**
H **203508½** screw, use 46 nut
I **1-203298½** includes M
J **203508 No. 3**
K **12046⅜**
L **1-203295½**
M 203297½* included in I
N **21 No. 15**
O **71517** screw, use 203423 No. 4 collar
P **73378** round nut
Q **70521**
R **1-203296½**
S **8054¾**
T **200285¼**
U **76580**
V **79615**
W **480¼**
X 200279½* included in AH
Y **46**
Z **71605**

AA **1-200285½**
AB **1-201134A No. 2**
AC **20 No. 73**
AD **7787**
AE **12051⅝ No. 5**
AF **10785½**
AG **3464½** spring anchor screw, use 103181 washer
AH **1-200280½** includes X
AI **10788**
AJ **1-10026¼ No. 2**
AK **10788**
AL **1-10025¾ No. 2**
AM **11-10027½ Style 17**
AN **1-201156**
AO **7356½**
AP **82809**
AQ **1-201155** includes AS
AR **1-201153**
AS **201564** stud
AT **1-203272½L No. 7**
AU **1-203272½ No. 7**
AV **1-203272½R No. 7**
AW **1-203800 No. 6**
AX 203546½* stud
AY **203629A**

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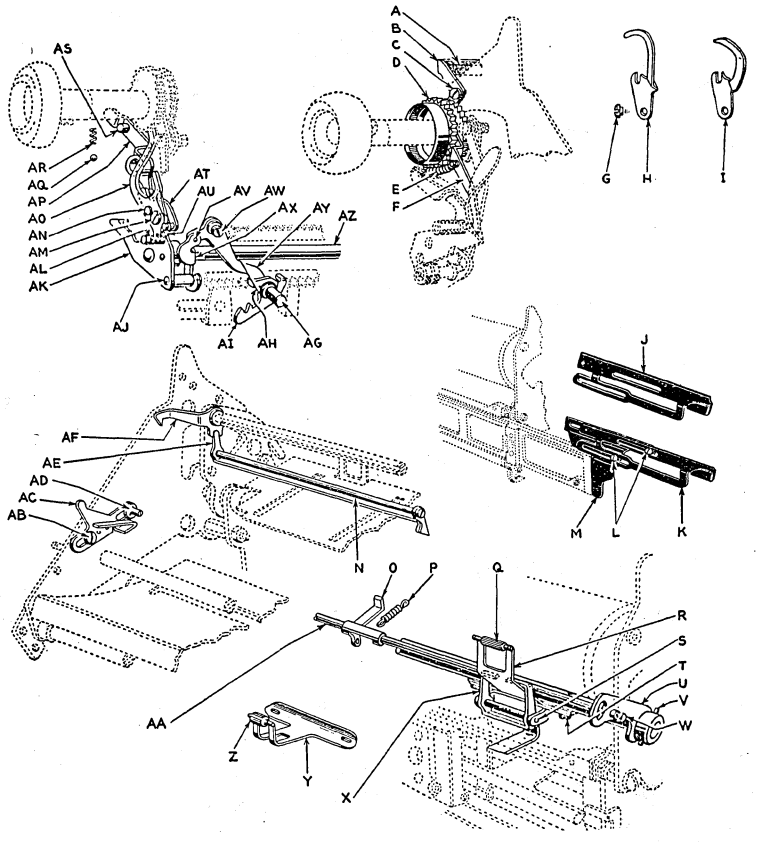
VARIABLE LINE SPACER, SPECIAL LEFT FEED PAWL, EXTENDED LINE FINDER AND JOURNAL SHEET LOCK (Plate 71)



SYMBOLS (Plate 71)

A **914 Fte. 203** Rubber, use cement code 7647-2

B **1-235R Fte. 203** Bracket acting as limit stop, includes "A," specify 1-235L Fte. 203 when used on left side

C **7357½** Screw
2820½ Washer

D **2-223 Fte. 203** Assembled gear, includes "F"

E **480¼** Spring

F 1-223 Fte. 203* included with "D"

G **203539A** Screw
20518½ Washer

H **14½AR Fte. 86 No. 2** specify AL when required for left side, cam used on Classes 20 thru 30 SACT carriages with one-inch platen spacing on right to prevent platen feed with carriage out of printing position

I **203113R** specify L when used on left side
203539A Screw used to hold cam in place
20518½ Washer

J **1-241R Fte. 203 No. 2** line finder on right to show previous printing line or ⅛ above actual printing line for Classes 20 thru 26
74587 Screws used for holding line finder in place

K **1-241R Fte. 203 No. 1** extended line finder to denote actual printing line for Type 20 carriages

L **74587** Screw

M **1-240R Fte. 203** Bracket
12051⅜ Screws holding bracket to casting

N **542A Fte. 203** Shaft for wide journal lock on right end. Classes 20-26

P **44805** Spring

Q 332 Fte. 213 No. 2* Corrugated roll
53¼A Fte. 88* Pin

R **1-109 Fte. 203 No. 2** Auxiliary pressure roll, includes roll and pin

S 525 Fte. 203* Shaft

T **7357½** Screws

U 1-205L Fte. 203* Arm furnished with assembly

V **52** Pin

W **2852⅜** Stud
203800 No. 5 Spring for stud

Y **1-109 Fte. 203 No. 1** Auxiliary pressure roll
74502 Screws for above item

Z 36A Fte. 88* Corrugated roll
53¼A Fte. 88* Pin

AA **1-24 Fte. 203 Specify style and machine number.** Shaft assembly includes arms on each end

AB **203527** Screw

AC **203134AR** Latch
203144 Spring clip held in place by "AV"

AD **203529** Screw stud

AE **1-221AR Fte. 203** Link for wide journal lock, Classes 20-26

AF **203136R** Hook

AG 12053⅞A* Stud

AH **203816** Spring

AI **1-146 Fte. 203** assembly includes "AG," "AH," "AY," "AX," "AV," toggle feed mechanism for Classes 20-26 with variable carriage controlled MRC spacing normalizer

AJ **12054⅛ (12054⅞Z, 103354, 1097¾)**

AK 1-203258* furnished with "AZ"

AL **12083** Spring
12063½ (4962½) Stud

AM **7357½** Screw

AN **505 Fte. 203** Stud

AO **1-142R Fte. 203** Specify L for left end includes "AN" and "AT," feed pawl for Classes 20-26 with S&N carriage specifying feed or non-feed from MRC
11-2828¾L No. 1 special left feed pawl used with S&N carriage specifying MRC feed on both sides, Classes 20-26

AQ **3298** Steel ball

AR **82 Fte. 98** Spring

AT **1-143R Fte. 203** includes spring stud 69509

AU **4487** Spring

AV **203576 (74595)** Shoulder stud
203576 No. 2 Screw, 79333 No. 1 eccentric, 69108 washer, 46 nut

AW **203642** Screw

AX 203190* Punching

AY 203189* included with "AI"

AZ **1-18 Fte. 203 Style 12", 15", 18"** Shaft assembly includes punchings only fastened to shaft, for Classes 20-26 machines with S&N carriage specifying MRC feed on both sides

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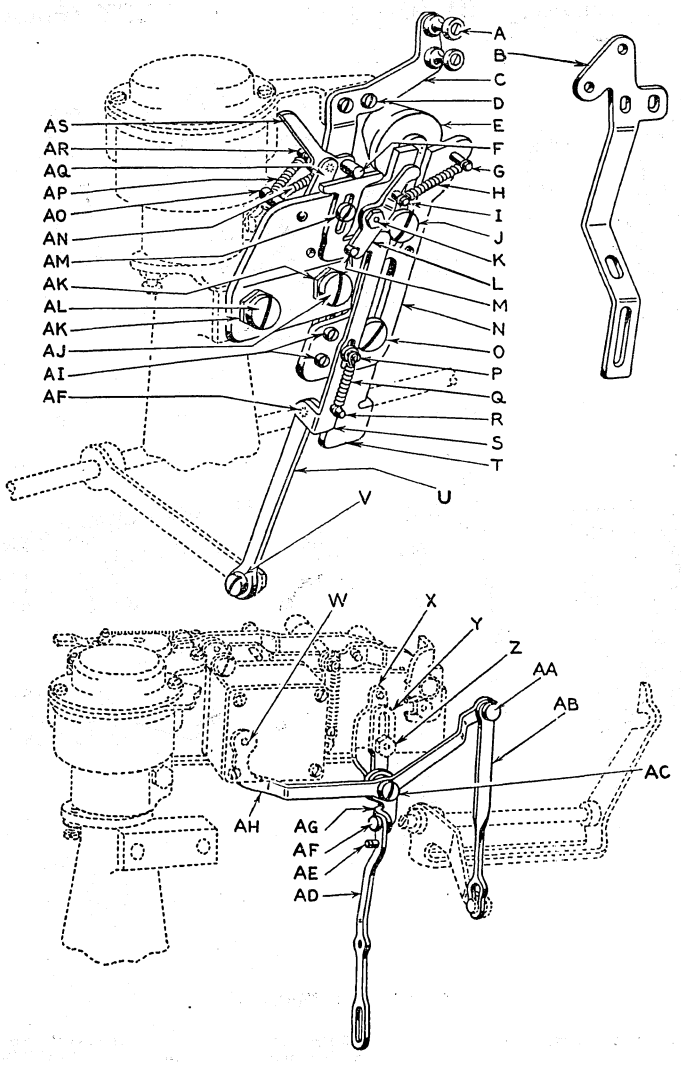
CARRIAGE OPENING MECHANISM AND CARRIAGE RETURN BAR (Plate 72)



SYMBOLS (Plate 72)

The illustration shown at top of page is for "Opening Mechanism to open on tabulation indexed by motor bar, total or subtotal keys, for long spaces between carriage stops at carriage opening point." Lower illustration is for "Carriage return bar in conjunction with carriage return key, Class 20-30."

A **203466** Roll (2 required)
203589 Screw (2 required)
47 Nut (2 required)

B **239 Fte. 203 (203185 No. 2)** Brace, use screws 73610, 2 required, for top connections, 1097⅞ lock washers and nuts 47, for bottom connections, use screws 72567, 2 required, 1097¾ lock washers and nuts 46

C **195 Fte. 203 (203185 No. 3)** Brace

D **73610** Screws (2 req.) use 1097⅞ lock washers and nuts **47**

E 203435 No. 2* Roll
203554A No. 2* Rivet stud
4499* Ball bearings (22 required)
4433¼* Roll bearing retainer (2 req.)

F **7264¼A** Stud

G **3464¼** Stud

H **3280⅛** Spring

I **3450** Stud

J **203553 No. 2** Screw
1097⅞ Lock washer
47 Nut

K **203594A** Screw
345A Fte. 203 Shoulder nut
344 Fte. 203 Collar

L **1-263 Fte. 203** Latch

M **1363½** Stud

N **1-270A Ftc. 203 (203170A No. 2, 572 Ftc. 203)**

O **203552** Screw
203433 Collar
47 Nut
1097⅞ Lock washer

P **1650¼** Spring stud

Q **73805** Spring

R **3450** Spring stud

S **1-264 Fte. 203 (1-203264 No. 2)** includes "M," "R," "U," "AI"

T **1-203169 No. 4 or 6** includes "E"

U **203261** Link

V **259½** Screw
46 Nut

W **526 Fte. 203** Screw used as shown in illustration, use screw 12062⅝ and bushing 12037¾ when link "AH" is used with large hole (5/16")

X **11-12013¼ Style 17**

Y **12027⅞ Style 17**

Z **12051¼** Screw
12046½ Shoulder nut

AA **12050¾** Shoulder stud

AB **12027⅝ Style 17** Link

AC **12059⅜** Screw
3612½ Collar
3434 Shoulder nut

AD **203162 No. 2** Link included with "AG"

AE **60530** Spring stud
76808 Spring

AF **351½** Shoulder stud

AG **1-203161 No. 2** includes "AD," "AE," "AF"

AH **1-193 Fte. 203 Style 17** includes "AA," "AB"
11-193 Fte. 203 Style 17 same as 1-193 except hole for screw "W" is 5/16" diameter, refer to "W" for details

AI **72567** Screws
1097¾ Lock washer
46 Nut

AJ **203541** Screw
1097¼ Lock washer
3645 Nut
203429 Shoulder nut eccentric

AK **203429** Shoulder nut eccentric
1097¼ Lock washer

AL **12063¼** Screw

AM **203617** Screw

AN **10686½** Spring

AO **203619** Spring stud

AP **3280⅛** Spring

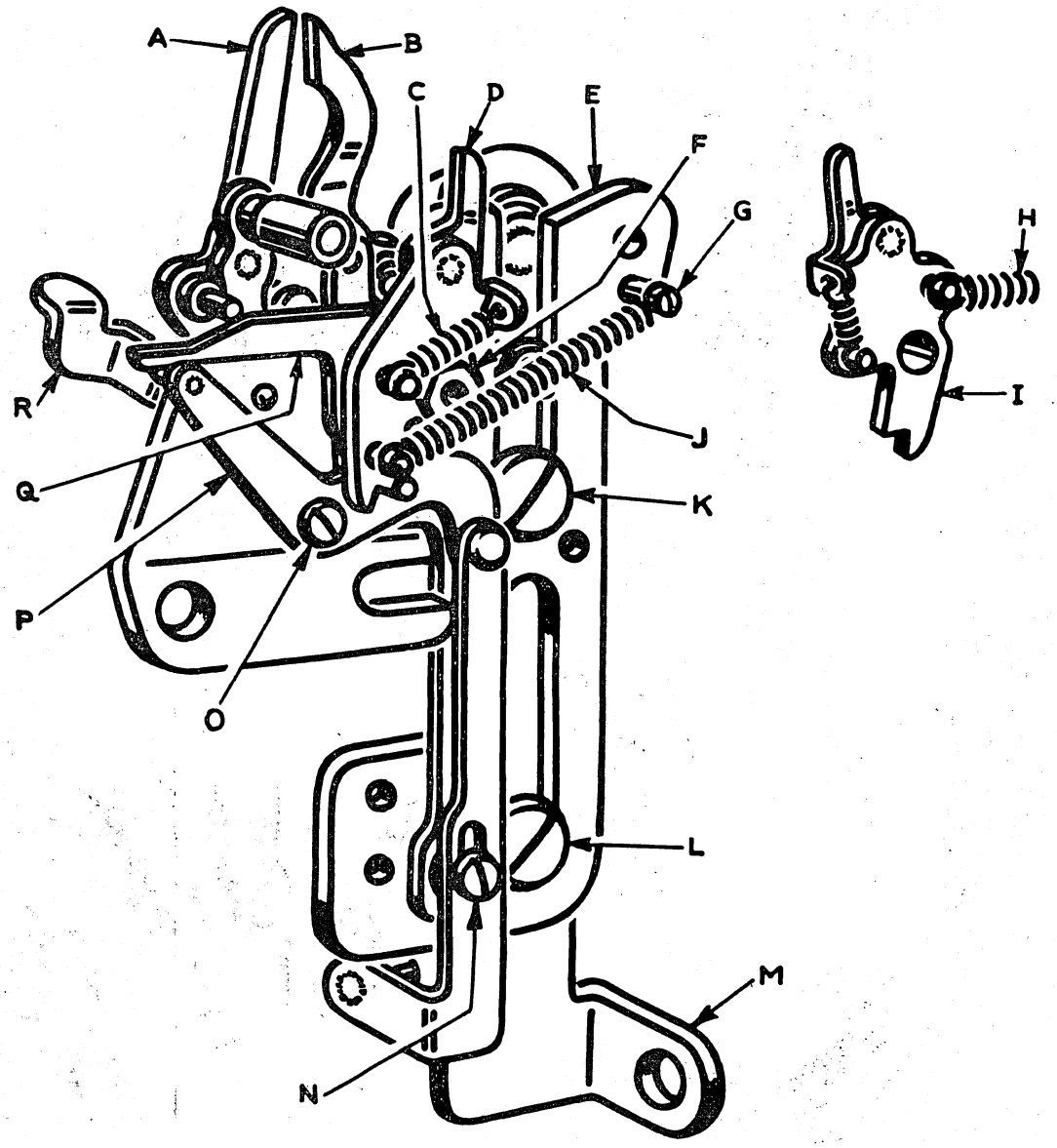
AQ 203173 No. 2*

AR **203612** Spring stud

AS **1-203174 No. 2** includes "AQ," "AR," "F" and lower punching

SEE EXPLANATION ON INSIDE OF FRONT COVER

CARRIAGE NON-OPENING FROM MOTOR BARS (Plate 73-1)



SYMBOLS (Plate 73-1)

A **11A-203174 No. 4**
B **11-203174A No. 2**
C **7781A**
D **1-100AL No. 3 Env. 1364**
E **203170A No. 2**
F **501A Env. 1364** nut, use 203595B screw stud
G **572 Ftc. 203**
H **3282 Env. 1364**
I **1-100A No. 3 Env. 1364**
J **10782 Env. 1364**
K **203553 No. 2** screw, use 1097⅞ washer and 47 nut
L **203552** screw, use 203433 collar, 1097⅞ washer and 47 nut
M **1-203169B**
N **79505** screw, use 108328 collar
O **79505** screw, use 8436 collar
P **1-203264½**
Q **203264 No. 3** use 203617 screw
R **1-203236 No. 2**

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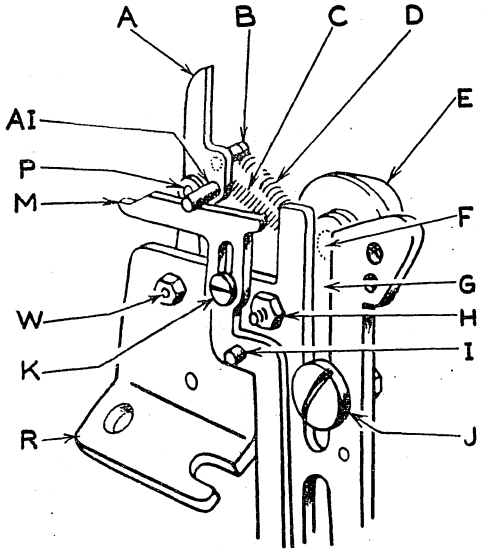
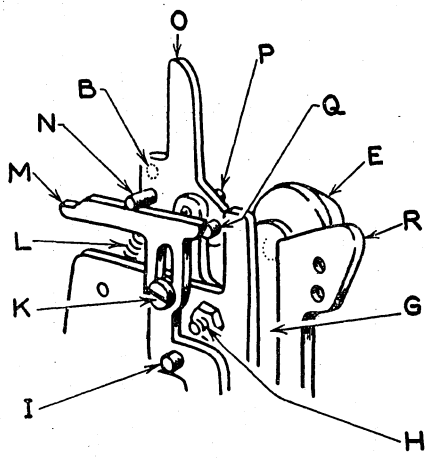
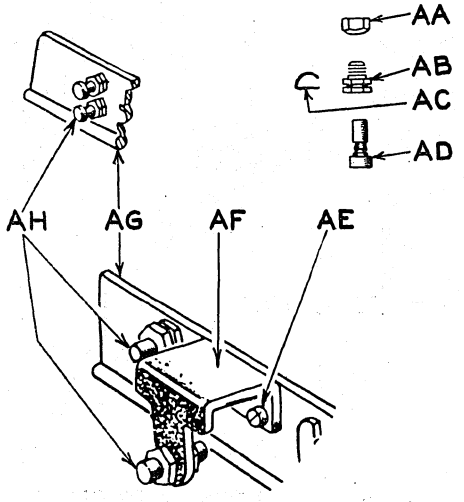
CARRIAGE OPENING MECHANISMS (Plate 73)

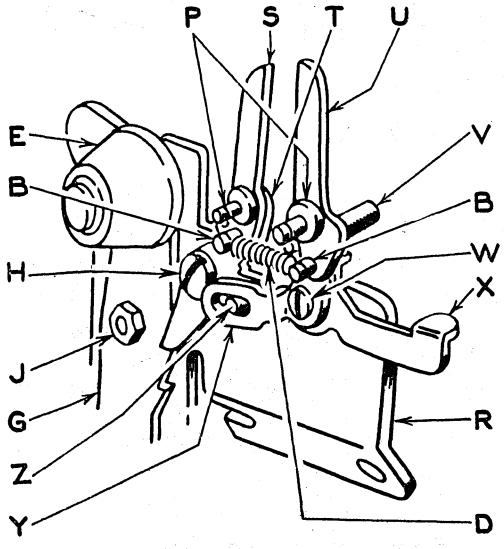


NON-OPENING ON RETURN FROM TOTAL KEYS, UPPER OR LOWER BARS.



NON-OPENING ON TABULATION FROM TOTAL KEYS, UPPER AND LOWER BARS.





OPENED ON TABULATION AND ON RETURN

SYMBOLS (Plate 73)

A **1-203174 No. 5** includes lower link
B **2852⅜** Spring stud
C **3280⅛** Spring
D **10686½** Spring
E 203435 No. 2* Roller
4433¼* Ball bearing retainer (2 req.)
4499* Ball bearings (22 required)
F **203554A No. 2** Stud for roller "E"
G **1-203169 No. 4, No. 6**
1-203169 No. 7 (1-203169A) includes E
H **203594A** Screw, 47 nut
I **1363½** Stud
J **203553 No. 2** Screw, 1097⅞ lock washer, 47 nut
K **203617** Screw
L **10686½** Spring
M **1-203264 No. 2** includes link 203261 and rivet 351½, spring stud 3450 for spring 73805
N **750¾ No. 2** Stud
O **1-203174 No. 3** includes lower link 203173 No. 2*
P **203612** Spring stud, use spring 3280⅛
Q **3959** Stud
R **203170A No. 2**
11-203174 No. 2 includes "P," "T," "B"
T 1-203173 No. 3*
U **1-203174 No. 4** includes "P," "V," "B," "Y"
V **203511** Stud
W **203587** Screw, 46 nut, 3237¾ bushing, 203285 washer
X **1-203236 No. 2** includes stud 264¾
Y 203273 No. 2* included with "U"
Z **203586** Stud
AA **203371** Nut
AB **203370** Threaded bushing
AC **203806B** Spring
AD **203593B (203593B Plain)** Plunger
AE **2851⅞** Screw, 46 nut
AF **203228**
AG **11-203123D Style 12, 15, 18** Type 20 carriage to open on forward tabulation, submit forms
21-203123D Style 12, 15, 18 Type 20 and 30 carriage to open on forward tabulation and return operation, submit forms
AH **1-203370** includes "AB," "AC," "AD"
AI **9250⅛** Stud

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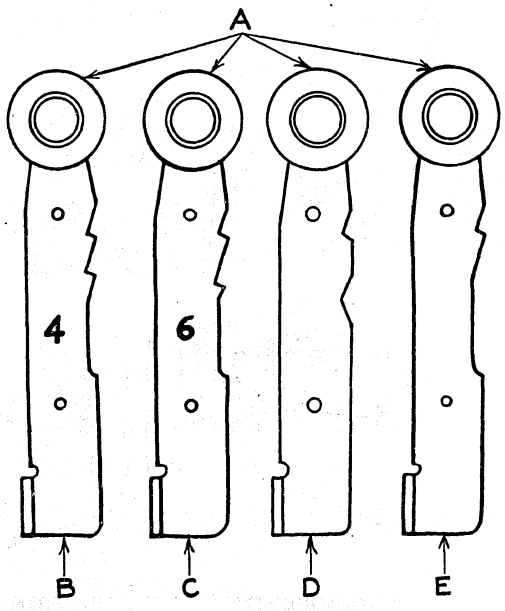
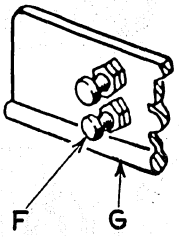
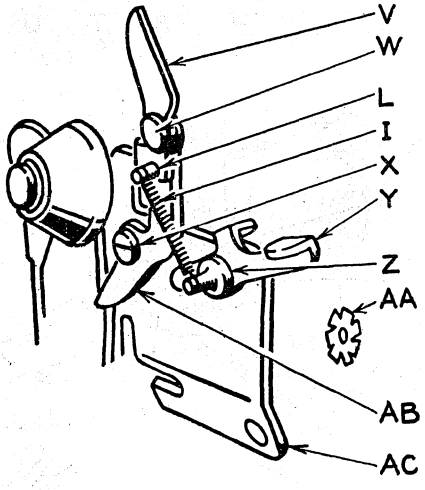
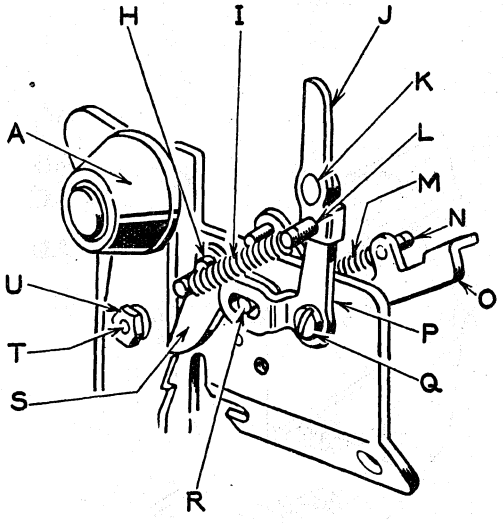
CARRIAGE OPENING MECHANISM (Plate 74)







CARRIAGE TO OPEN AND CLOSE BY MACHINE OPERATION, ALSO OPENS ON TABULATION



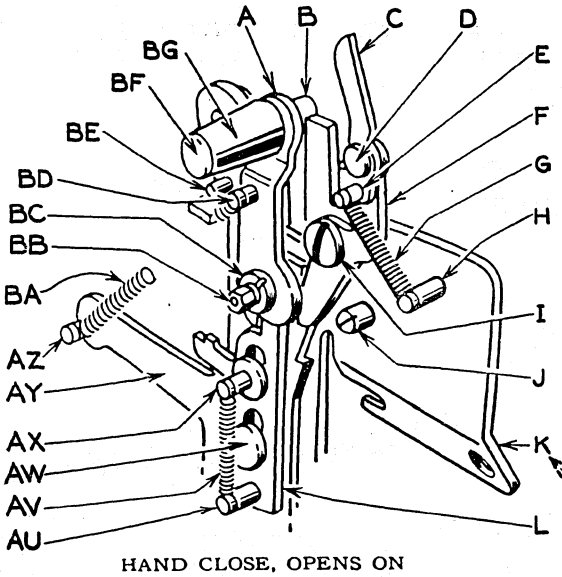
CARRIAGE TO OPEN AND CLOSE BY MACHINE OPERATION, ALSO OPENS ON RETURN

SYMBOLS (Plate 74)

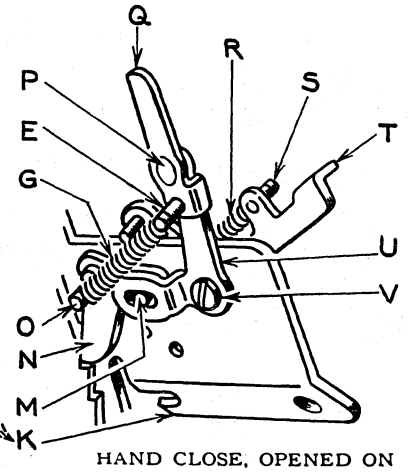
A 203435 No. 2* Roller
4433¼* Ball bearing retainer (2 req.)
4499* Ball bearings (22 required)
203554A No. 2 Stud for roller
B **1-203169 No. 4** includes "A"
C **1-203169 No. 6** includes "A"
D **1-203169 No. 7 (1-203169A)** includes "A"
E **1-203169 No. 3** includes A
F **1-203370** (2 required)
G **11-203123D Style 12, 15, 18** Type 20 carriage to open on forward tabulation, submit forms
21-203123D Style 12, 15, 18 Type 20 and 30 carriage to open on forward tabulation and return operation, submit forms
H **203595A (203595B)** Spring stud, use 47 nut
I **480B** Spring
J **1-203174L No. 1** included with "P"
K **253**$\frac{3}{16}$ Rivet
L **7253**$\frac{5}{8}$ Spring stud
M **3281**½ Spring
N **3450** Spring stud
O **1-203236** includes "N"
P **1-203273** includes "J," "K," "L"
Q **203587** Screw, 12046$\frac{3}{16}$ nut
R **203586** Stud
S **1-203198** includes "R"
T **203553 No. 2** Screw
U **47** Nut, 1097$\frac{7}{8}$ lock washer
V **1-203174R No. 1** included with "AB"
W **203599** Rivet
X **203594A** Screw
Y **265 Fte. 203**
Z **564 Fte. 203 (702595)**
AA **709146** Lock washer
AB **1-203173 No. 1** includes "V," "W," "L"
AC **203170A No. 2**

SEE EXPLANATION ON INSIDE OF FRONT COVER

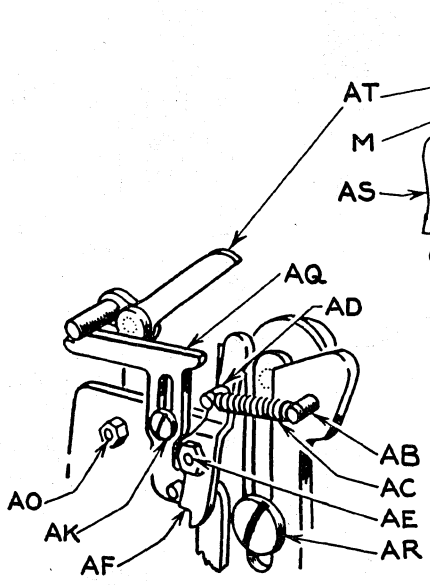
CARRIAGE OPENING MECHANISM
(Plate 75)



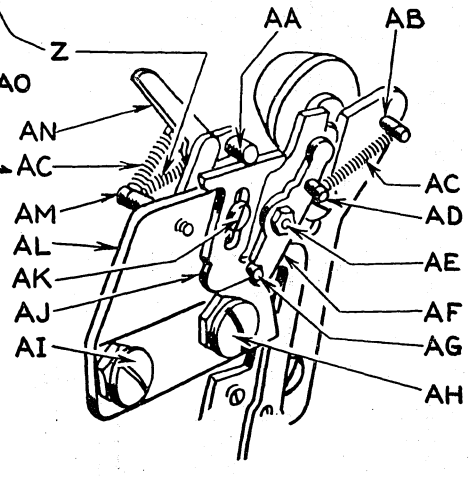
HAND CLOSE, OPENS ON TABULATION



HAND CLOSE, OPENED ON RETURN



INDEXED BY TOTAL KEY, OPENED ON RETURN



INDEXED BY TOTAL KEY, OPENED ON TABULATION

SYMBOLS (Plate 75)

A **1-203172 No. 1** includes "B," "BD," "BF," "BG"
B 203434 No. 1* Small collar
C **1-203174R No. 1** included with "F"
D **203599** Rivet
E **7253⅝** Stud
F **1-203173 No. 1** includes "C," "D," "E"
G **480B** Spring
H **203619** Spring stud
I **203594A** Screw
J **4462** Screw
K **203170A No. 2**
L **1-203171** includes "AU"
M **203586** Stud
N **1-203198**
O **203595A (203595B)** Spring stud
P **253⅛** Rivet stud
Q **1-203174L No. 1** included with "U"
R **3281½** Spring
S **3450** Stud
T **1-203236**
U **1-203273** includes "E," "P," "Q"
V **203587** Screw, 12046⅜ nut
W **203612** Spring stud
X **203511** Stud
Y **2852⅜** Stud
Z **10686½** Spring
AA **7264¼A** Stud
AB **3464¼** Stud
AC **3280⅛** Spring
AD **3450** Stud
AE **203595A (203595B)** Screw stud, 344 Fte. 203 collar, 345A Fte. 203 nut
AF **1-263 Fte. 203** includes "AD"
AG **1363½** Stud
AH **203541** Screw, 1097¼ lock washer, 3645 nut, 203429 shoulder nut, eccentric
AI **12063¼** Screw, 203429 shoulder nut, eccentric, use 1097¼ lock washer
AJ **1-264 Fte. 203 (1-203264 No. 2)** includes studs and link attached, not shown
AK **203617** Screw
AL **1-270A Fte. 203 (203170A No. 2, 572 Fte. 203)**
AM **203619** Spring stud
AN **1-203174 No. 2** includes studs and punching attached
AO **203587** Screw, 3237¾ bushing, 46 nut
AP 203273 No. 2* included with "AT"
AQ **1-203264 No. 2** includes studs and punching attached
AR **203553 No. 2** Screw, 1097⅞ lock washer, 47 nut
AS **1-203198** includes "M"
AT **1-203174 No. 4** includes "W," "X," "Y," "AP"
AU **69510** Stud
AV **75814**
AW **203550 (201535)** Rivet
AX **203551** Rivet stud
AY **1-203169 No. 2 or 5** includes "AU," "AW," "AX," "L," "AZ"
AZ **203549 (79614)** Stud
BA **75804 No. 2** Spring
BB **203553** Screw, 46 nut, 203436 No. 1 bushing, 1097¾ lock washer
BC **203436 No. 1** Bushing, 1097¾ lock washer
BD **69510** Stud
BE **203618A** Screw
BF 203554 No. 1* Stud for roll
BG 203435 No. 1* Roll

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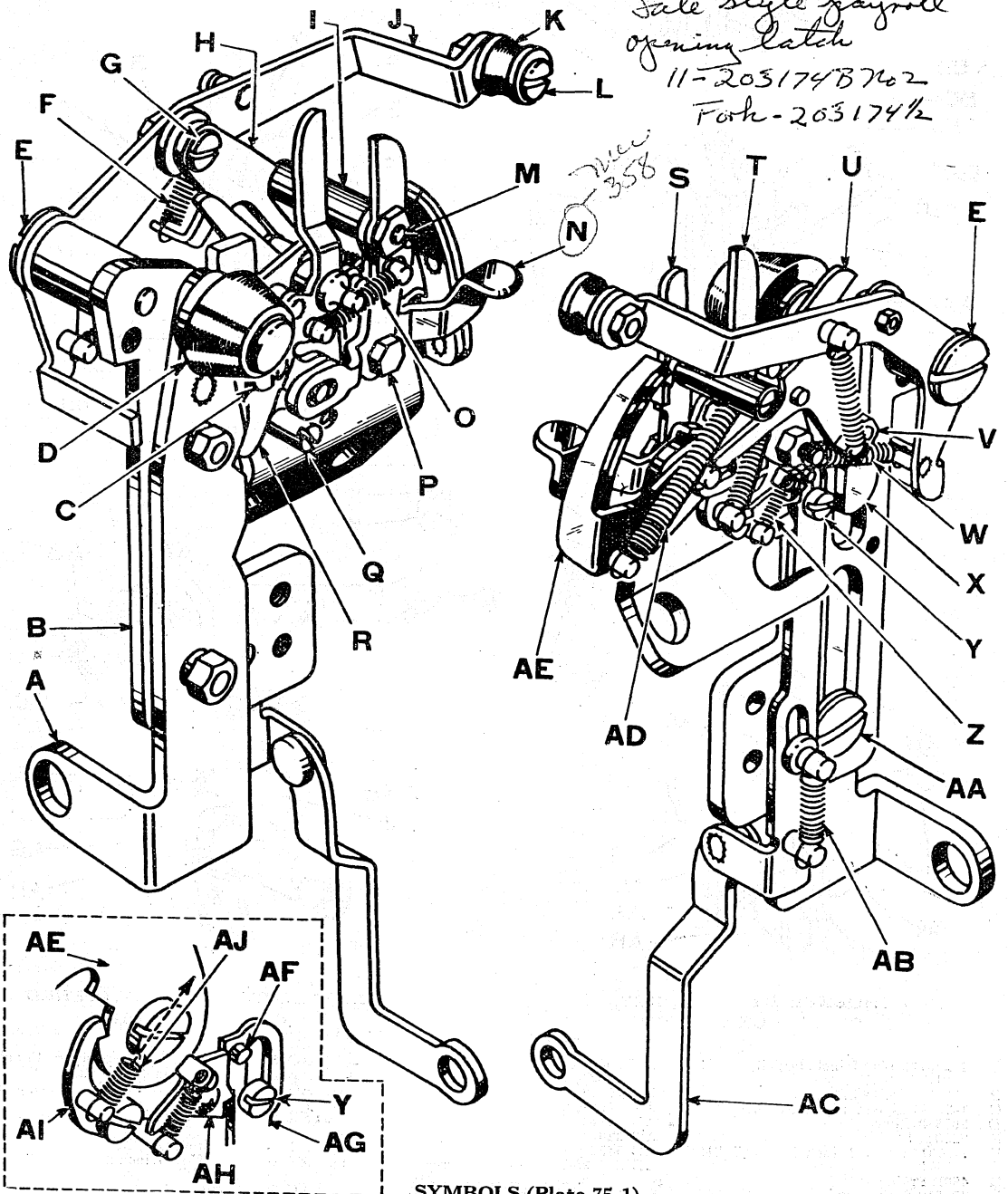
CARRIAGE OPENING FROM TOTAL KEYS AND BARS WITHOUT TABULATION, INCLUDING MANUAL CONTROL, CLASSES 11 THRU 16 AND 20 THRU 30 (Plate 75-1)

Late style payroll opening latch 11-203174B No 2 Fork-203174½

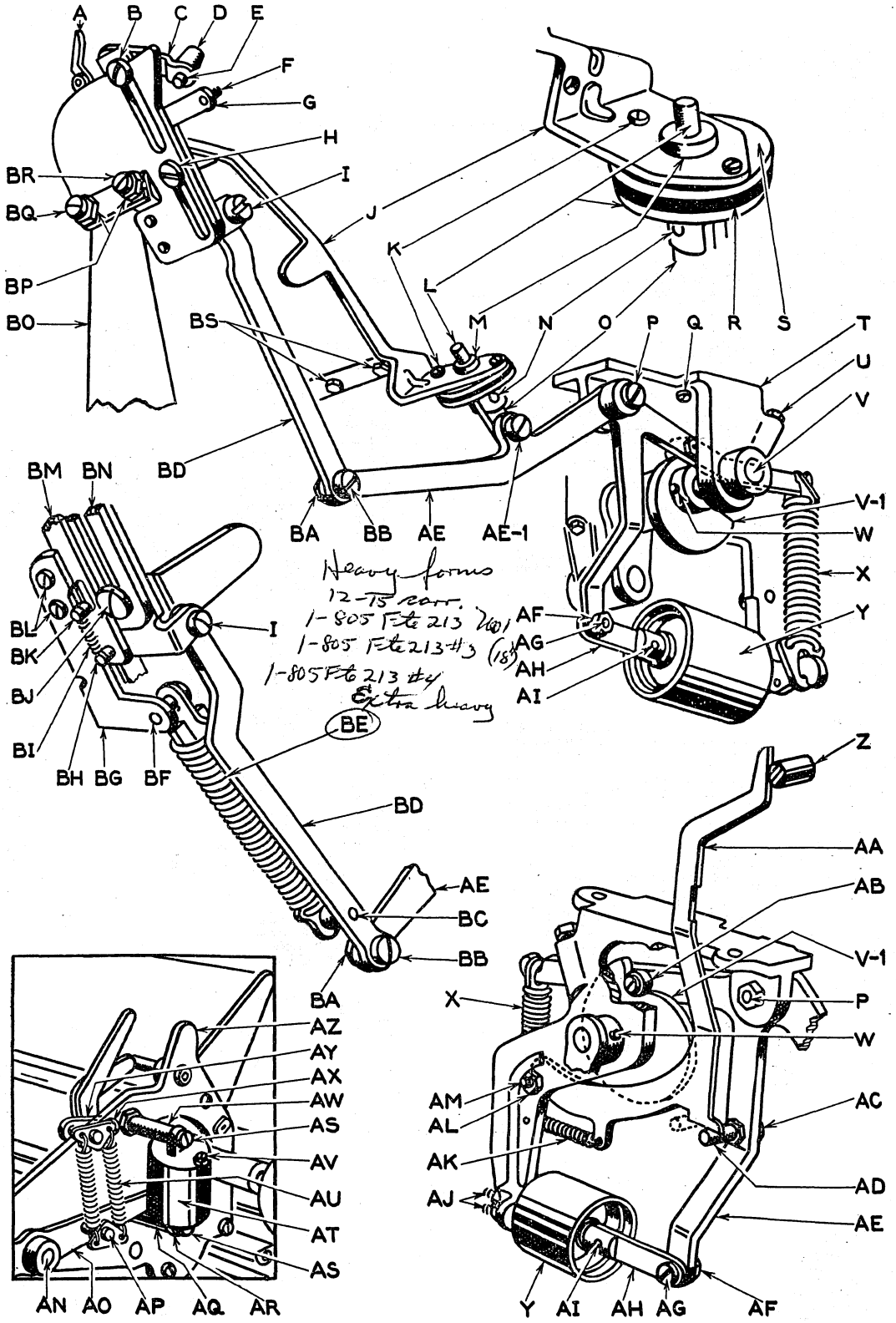


SYMBOLS (Plate 75-1)

A **1-203169A**
B **203170A No. 2**
C **203594A** Screw, 47 nut
D 203435 No. 2* included in A
E **203643B**
F **79810**
G **3960** Screw, 46 nut
H **1-203289B**
I **203395B**
J **1-203288B**
K **203396**
L **203642** Screw, 47 nut
M **74597** Screw, 12046⅝ nut
N **1-203236 No. 2**
O **480B**
P **203587** Screw, 203295 washer, 3237 bushing, 46 nut
Q **4462**
R 1-203173 No. 2* included in T
S **1-203174 No. 5**
T **11-203174 No. 2**
U **203265A**
V **203471A** Nut, 203594A screw
W **10086** Spring
X **203553 No. 3** Screw, 1097⅞ washer, 47 nut
Y **203505½**
Z **72805 (72820)**
AA **203552** Screw, 203433 collar, 1097⅞ lock washer, 47 nut
AB **4489 (83800A)**
AC 203261 No. 3* included in AG
AD **10080**
AE **1-203268C**
AF 253½* included in AG
AG **1-203262A** use in machines without multiple skip
11-203262 Shown, use with multiple skip
AH 203266A* included in AI
AI **1-203263B**
AJ **10686½** Spring

SEE EXPLANATION ON INSIDE OF FRONT COVER

CARRIAGE OPENING AND CLOSING ACTUATING MECHANISM (Plate 76)

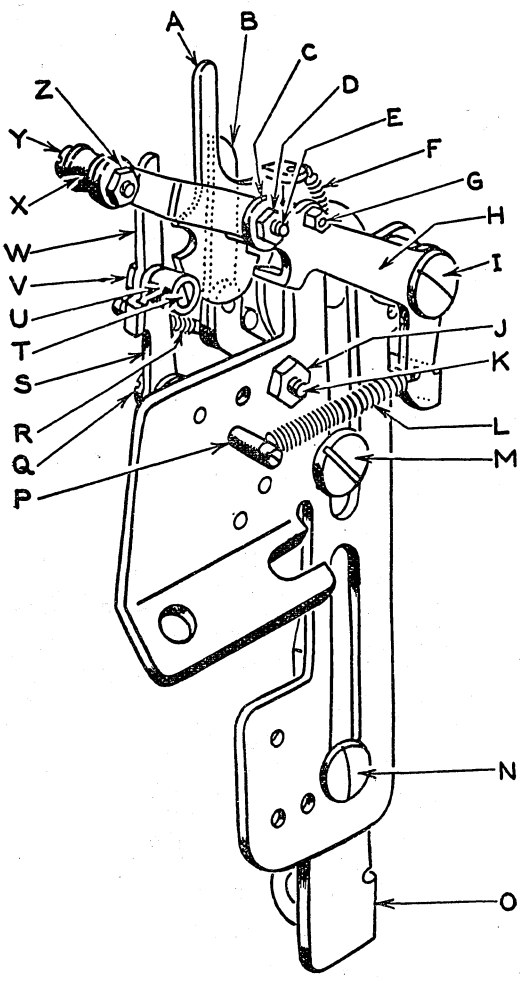


SYMBOLS (Plate 76)

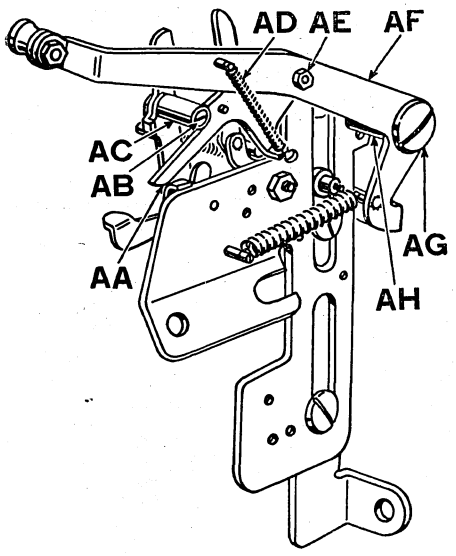
A **1-203173 No. 1** includes rivet and punching attached
B **203553** Screw, 203436 No. 1 bushing, 1097⅜ lock washer, 46 nut
C **1-203172 No. 1** includes "D"
D 203435 No. 1* Roll
203554 No. 1* Stud
E 203434 No. 1* Small collar
F **203549 (79614)** Stud
G **1-203169 No. 2 or 5**
H **203552** Screw, 203433 collar, **47** nut, 1097⅞ lock washer
I **201502** Screw, **47** nut, 1097⅞ lock washer
J **1-203181B** includes "K," "M," "S"
K **7562** Screw (2 required)
L **1-201446** includes "N," "O"
M 10033* Hub included with "J"
N 10060⅛* Pin
O 10020⅜* included with "L"
P **201515 (7153B)** Screw
201504B Threaded post for screw
393 Nut
Q **200558** Screw 55/64" long
4151½ (200558 No. 2) Screw 1 21/64" long
R **201990** Rubber
S **201127 (203181½)** Metal disk included with"J"
T **1-201665 No. 2 (21-201665 No. 4)** Casting includes shaft and pins, for Type 20 carriage opening on tabulation with register total indexing lever, carriage controlled
2-201665 No. 2 Style 17 (22-201665 No. 4 Style 17) Same as above item except is complete casting assembly with air cylinder and levers
11A-201665 (21-201665 No. 4) Casting includes shaft and pins, for Type 20 carriage opening on tabulation
12B-201665 (22-201665 No. 4 Style 13 or 17) Same description as above item except is completely assembled casting with air cylinders and levers
22B-201665 Style 13 or 17 (22-201665 No. 4 Style 13 or 17) Completely assembled casting with air cylinder and levers for carriage opening on tabulation and balance forward operation
U **3650⅛** Screw
1-201889 Spring and pin assembled
V **1-201002A** Shaft assembly, furnished with "T"
V-1 1-201104A* included with "V"
W **56½** Pins used in shaft assembly
X **1-201801** Spring assembly
Y **1-201448** includes "AI," "AH"
Z **101B Style 13 or 15** Small shaft for large base springs
AA **201113 Style 13 or 17**
AB **201303B** Roll
1-201503C (1-200564½) Screw
1097⅞ Lock washer
47 Nut
AC **3645** Nut, 1097¼ lock washer
AD **201513** Eccentric screw stud
AE **1A-201107B (1-201107C)** includes hub
AE-1 **201505A** Screw with eccentric collar, 47 nut, 1097⅞ lock washer
AF **45** Nut, 1097¼ lock washer
AG **201511** Screw
AH 1-201126* furnished with "Y"
AI 10060⅛* Pin
AJ **393** Nut, 10021¾ washer
AK **9180 (681⅛)**
AL **3645** Nut, 721 washer
AM **201514B** Hexagon headed screw use 201314 bushing
AN **11B-203005 Styles 12, 15, 18** includes shaft and "AO" also corresponding punching on left end
AO 11-203107CL* furnished with "AN"
AP **203506** Spring stud
AQ **203605** Stud
AR 203448* Plunger furnished with "AT"
AS **7357½** Screw
AT **1-203447** includes "AR," "AV"
AU **1-203801A** Double spring assembly
AV **74528** Screw, use nut 49¼
AW **203607** Stud, use nut 79351
AX **108623** Screw
AY **1-203118½** Plate includes stud **203509½**
AZ 1-203118DL* included with shaft assembly, 1D-203006A Style 12, 15, 18
BA **47** Nut
1097⅞ Lock washer
BB **201502** Screw with eccentric shoulder
BC **201517** Stud
BD **1-201106**
BE **1-805 Fte. 213 (145 Fte. 213 No. 3; 145½ Fte. 213; 1-805 Fte. 213 No. 3)**
BF **523 Fte. 213 (145 Fte. 213 No. 3; 145½ Fte. 213; 1-805 Fte. 213 No. 3)**
BG **1-145 Fte. 213 (145 Fte. 213 No. 3; 145½ Fte. 213; 1-805 Fte. 213 No. 3)** includes "BF"
BH **3450** Stud
BI **4489 (83800A)**
BJ **203552** Screw
203433 Collar
47 Nut
1097⅞ Lock washer
BK **1650¼** Stud
BL **8451** Screws
BM **1-203262**
BN **203170A No. 2**
BO **1-203668** Bottle casting
BP **203429** Eccentric shoulder nut, use 1097¼ lock washer
BQ **12063¼** Screw
BR **203541** Screw
1097¼ Lock washer
3645 Nut
BS **200560** Screws

CARRIAGE OPENING MECHANISM, MANUAL CONTROL (Plate 77)

EARLIER STYLE



LATER STYLE



SYMBOLS (Plate 77)

A **1-203289 No. 1** includes "E"
B **21-203174 No. 2** includes lower punching and studs
C **3820½** Washer
D **47** Nut
E 203641* Stud included with "A"
F **3280¼** Spring
G **203640** Screw stud, 47 nut
H **1-203288 (1-203288B, 1-203289B, 203643B, 74597, 203395B, 521 Fte. 428, 79810)**
I **203643** Screw, 47 nut
J **47** Nut
K **203595A (203595B)** Screw stud
L **8085A** Spring
M **203553 No. 2** Screw, 1097⅞ lock washer, 47 nut
N **203552** Screw, 203433 collar, 47 nut, 1097⅞ lock washer
O **1-203169 No. 7 (1-203169A)** includes bevel edge roller and stud
P **203621** Spring stud
Q **203587** Screw, 3237¾ bushing, 12046⅜ shoulder nut
R **3280⅛** Spring
S **203273 No. 3**
T **203644 No. 2** Screw
U **203395 No. 2** Roll
V **12046⅜** Shoulder nut
W **1-203174 No. 6** Carries spring stud 7253⅝
X **203396** Roller
Y **203642** Screw
Z **47** Nut

AA **1-203289B**
AB **203644B (74597)**
AC **203395B**
AD **79810**
AE **521 Fte. 428 (3960)** Screw, 46 nut
AF **1-203288B**
AG **203643B**
AH 203483* Collar
Other symbols same as earlier style

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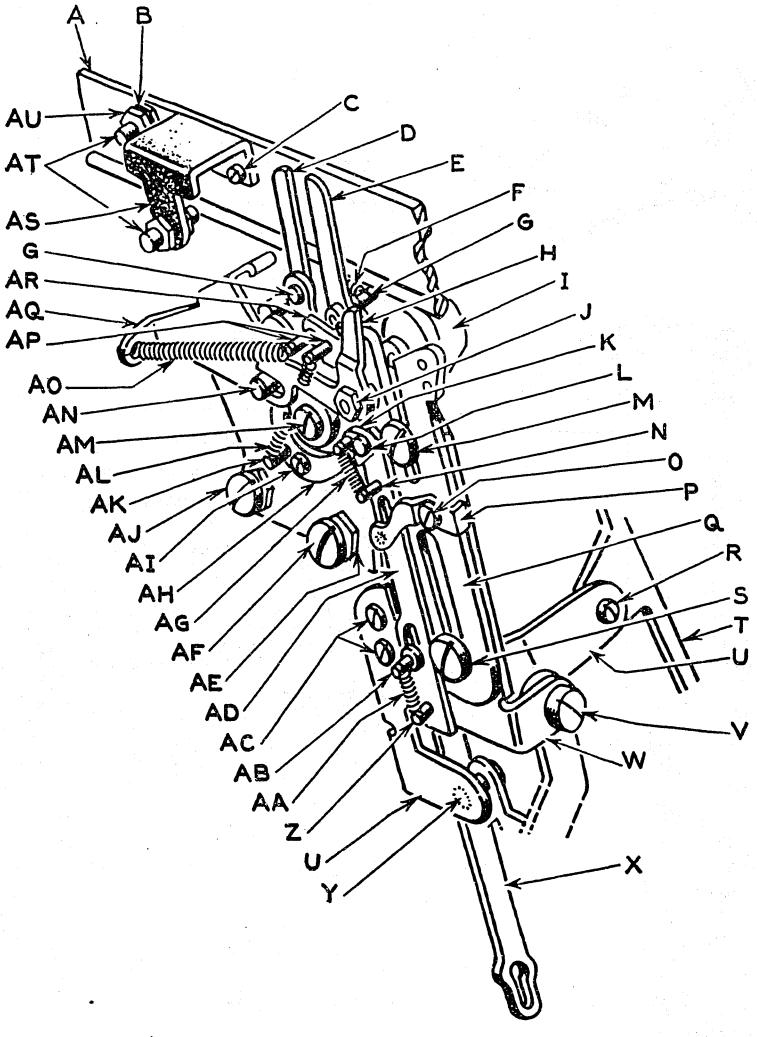
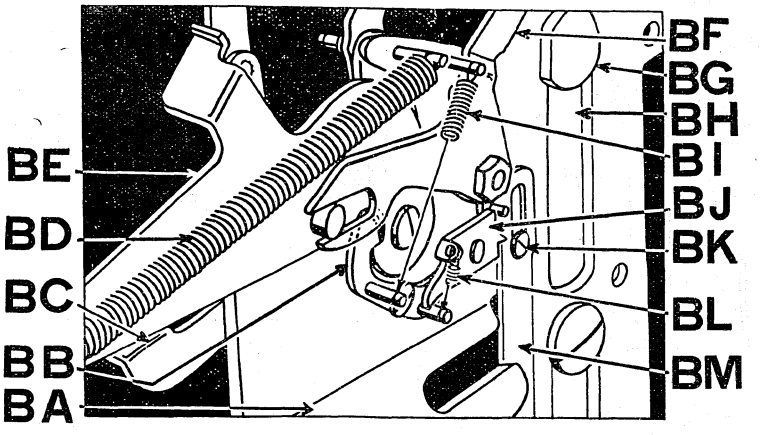
CARRIAGE OPENED FROM TOTAL KEYS AND RETURN BAR WITHOUT TABULATION (Plate 78)

EARLIER STYLE



LATER STYLE



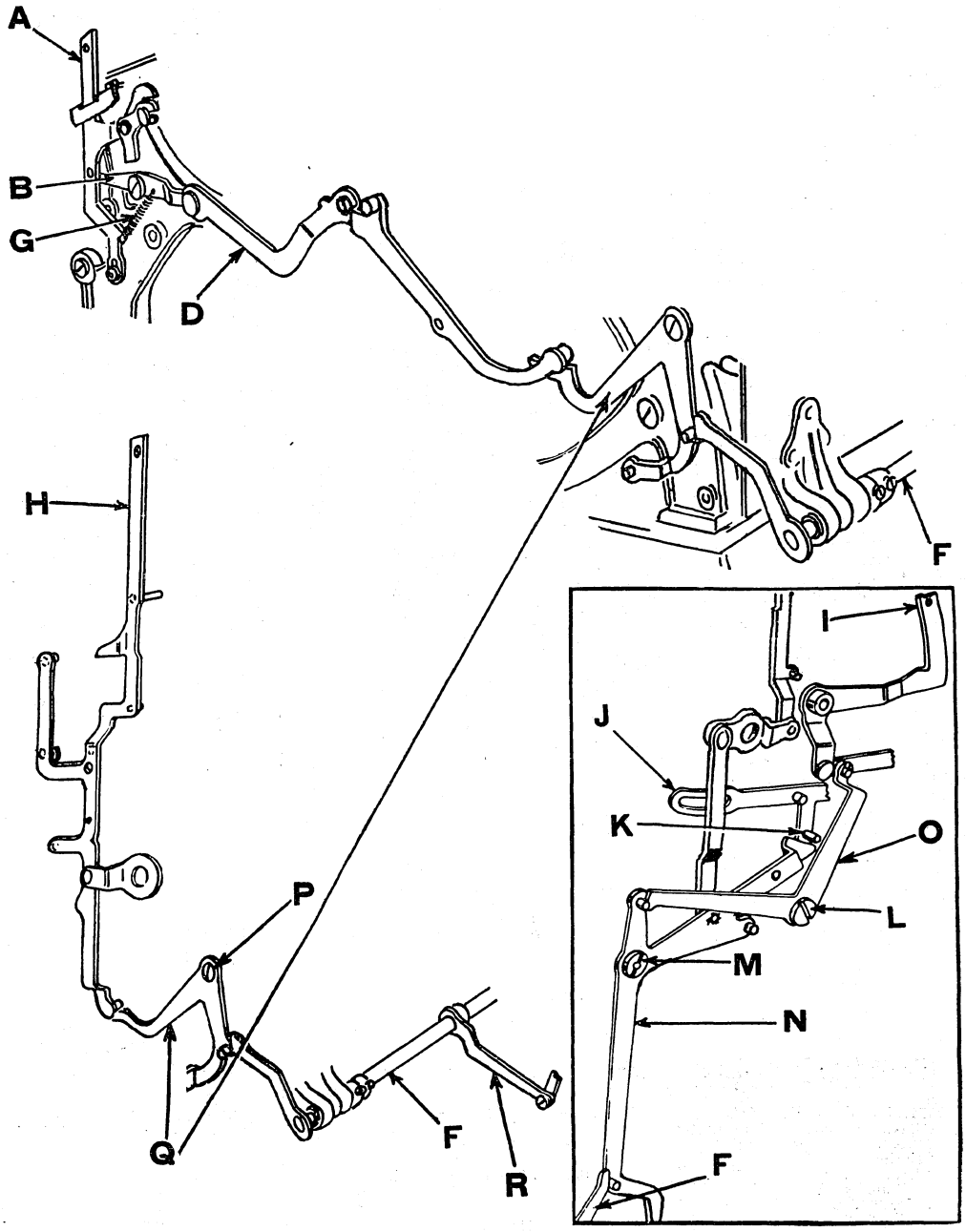
SYMBOLS (Plate 78)

A **11-203123D Style 12, 15, 18** Type 20 carriage to open on forward tabulation, submit forms
21-203123D Style 12, 15, 18 Type 20 and 30 carriages to open on forward tabulation and return operation submit forms
B **203806B** Spring
C **2851⅞** Screw, 46 nut
D **11-203174 No. 4**
E **21-203174 No. 2**
F **10686½** Spring
G **203612** Spring stud
H **203265**
I 203435 No. 2* Roller
4433¼* Ball bearing retainer (2 req.)
4499* Ball bearings (22 required)
203554A No. 2* Stud supporting roller
J **203471A** Nut
203594A Screw
K **1-203266** Latch includes stud 203615 included with "AD"
753½ No. 3 Rivet
M **203553 No. 2** Screw, 1097⅞ lock washer, 47 nut
N **75553** Spring stud
O **73607** Screw
P **1-203267**
Q **203170A No. 2**
R **72567** Screw, 46 nut
S **203552** Screw, 203433 collar, 47 nut, 1097⅞ lock washer
T **1-203181B** drill hole for "U" with a No. 36 drill
U **1-145 Fte. 213 (145 Fte. 213 No. 3, 145½ Fte. 213, 1-805 Fte. 213 No. 3)**
V **201502** Eccentric shoulder screw, 47 nut, 1097⅞ lock washer
W **1-203169 No. (4) (6)** includes "I"
1-203169 No. 7 (1-203169A) includes "I"
X **203261** included with and held to "AD" with rivet 351½
Y **523 Fte. 213 Stud (145 Fte. 213 No. 3, 145½ Fte. 213, 1-805 Fte. 213 No. 3)**
Z **3450** Stud
AA **4489 (83800A)** Spring
AB **1650¼** Spring stud
AC **8451** Screw
AD **1-203262** includes "K," "N," "X," "Z"
AE **203429** Eccentric shoulder nut, 1097¼ lock washer, 2 each required, one used with "AJ"
AF **203541** Screw, 1097¼ lock washer, 3645 nut
AG **72805 (72820)** Spring
AH **1-203263A**
AI **203617** Screw
AJ **12063¼** Screw
AK **3450** Spring stud
AL **10686½** Spring
AM **74529** Screw
AN **203620** Stud
AO **10984½ Style 11** Spring
AP **12059⅛** Studs
AQ **1-203268A (1-203268B)**
AR **1-203274B** Use screw 203594A and nut 3645
AS **203228**
AT **203593B (203593B Plain)**
AU **1-203370** includes "B" and "AT"

BA **203170A No. 2**
BB **1-203263B**
BC **1-203236 No. 2**
BD **10984½ Style 11**
BE **1-203268B**
BF **203265A**
BG **203553 No. 3**
BH **1-203169 No. 7 (1-203169A**
BI **10686½**
BJ 203266A*
BK **203505½**
BL **72805 (72820)**
BM **1-203262A**

SEE EXPLANATION ON INSIDE OF FRONT COVER

CARRIAGE OPENING, CONTROLLED FROM TOTAL KEYS AND OPERATING BARS (Plate 79)



SYMBOLS (Plate 79)

A **1-12021¼A**
B **1-200233**
D **1-103 Env. 401B**
F **1-200004 Style 13, 17 No. 2**
G **3682**
H **1A-200235**
I **1-202216 (1-62227)**
J **1-202225**
K **202505A** Stud, 932⅛ and 10239 rollers, 7914½A washer
L **4456½** Screw, 12031½ bushing
M **200342** Bushing, 200597 screw
N **1-200216B No. 1 (1-200216C No. 1)**
O **1-121 Fte. 207 (1-200217A No. 1)**
P **200548B** Post, 200348 washer, 3450½ Style 9 screw
Q **1-200239 Env. 401B**
R 1-200218* part of F

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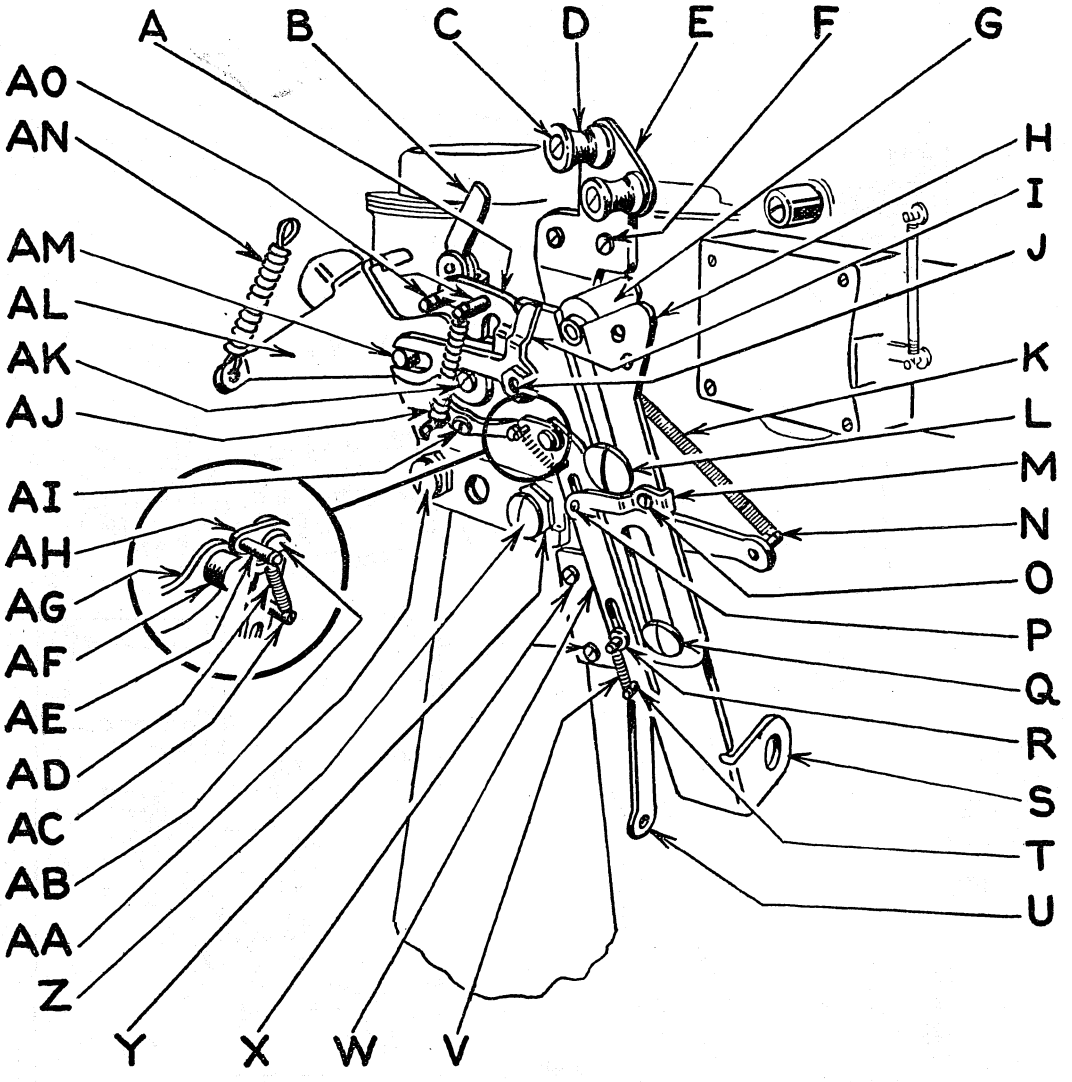
For Form 2960

CARRIAGE OPENING MECHANISM FROM TOTAL KEY WITHOUT CARRIAGE TABULATION (Plate 80)

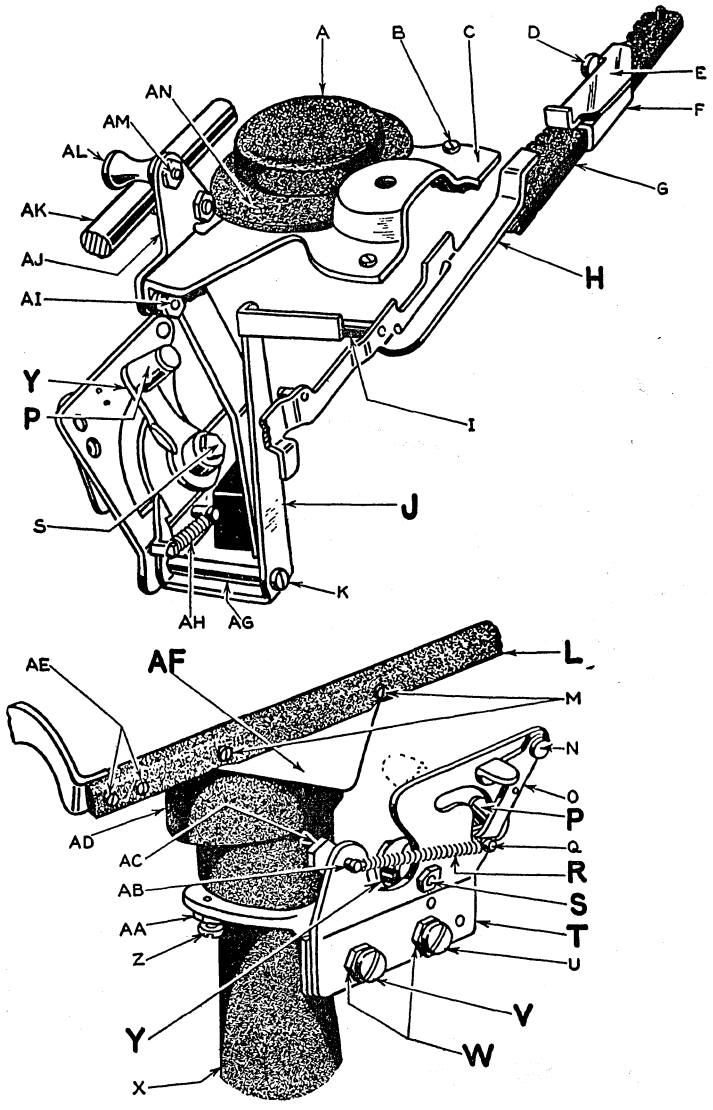


SYMBOLS (Plate 80)

A **1-203274B** includes studs "AO"
B **1-203174 No. 2** includes following parts:
203173 No. 2* Lower punching
2852⅜ Spring stud
203612 Rivet spring stud
7264¼A Round stud
203174 No. 2* Top punching
Use spring 3280⅛
C **203589** Screw (2 required)
47 Nut
D **203466** Roller (2 required)
E **203185 (203185 No. 1)**
F **73610** Screws (2 required)
G **1-203172 No. 1** Assembly—includes following parts:
203435 No. 1* Roller
203554 No. 1* Stud
203434 No. 1* Collar
69510 Spring stud
7555A Small round stud
H **203170A No. 2** Punching
I **203265** Punching
J **203471A** Shoulder nut
203594A Shoulder screw
K **75804 No. 2** Spring
L **203553 No. 2** Screw
1097⅛ Lock washer
46 Nut
203436 No. 1 Shoulder nut with slotted head
M **1-203267**
N **203549 (79614)** Stud
O **73607** Screw
P **89524** Stud
Q **203552** Screw
47 Nut
1097⅛ Lock washer
203433 Collar
R **1650¼** Spring stud, threaded
203609 Rivet stud
S **1-203169 No. 2** for Class 20 machine necessitating a partial opening for the pickup of old balance
1-203169 No. 5 Class 20 machine to open on tabulation, closed manually, with full and partial opening for actual printing line
T **3450** Stud
U **203261** Link, use rivet 351½, included with "W"
V **4489 (83800A)** Spring
W **1-203262** includes "U" and "AH"
X **8451** Screw (2 required)
Y **203429** Eccentric (2 required)
Z **203541** Screw, 1097¼ lock washer, 45 nut
AA **12063¼** Screw
AB **753½ No. 3** Rivet
AC **75553** Spring stud
AD **72805 (72820)** Spring
AE **203615** Spring stud
AF **253½** Round stud
AG **1-203263A**
AH **1-203266** included with "W"
AI **203617** Screw
AJ **10686½** Spring
AK **74529** Screw
AL **1-203268A (1-203268B)**
AM **203620** Stud
AN **10984½ Style 11** Spring
AO **12059⅛** Stud (2 required)

SEE EXPLANATION ON INSIDE OF FRONT COVER

CARRIAGE OPENING FROM CARRIAGE RETURN MOVEMENT CLOSED BY HAND (Plate 81)



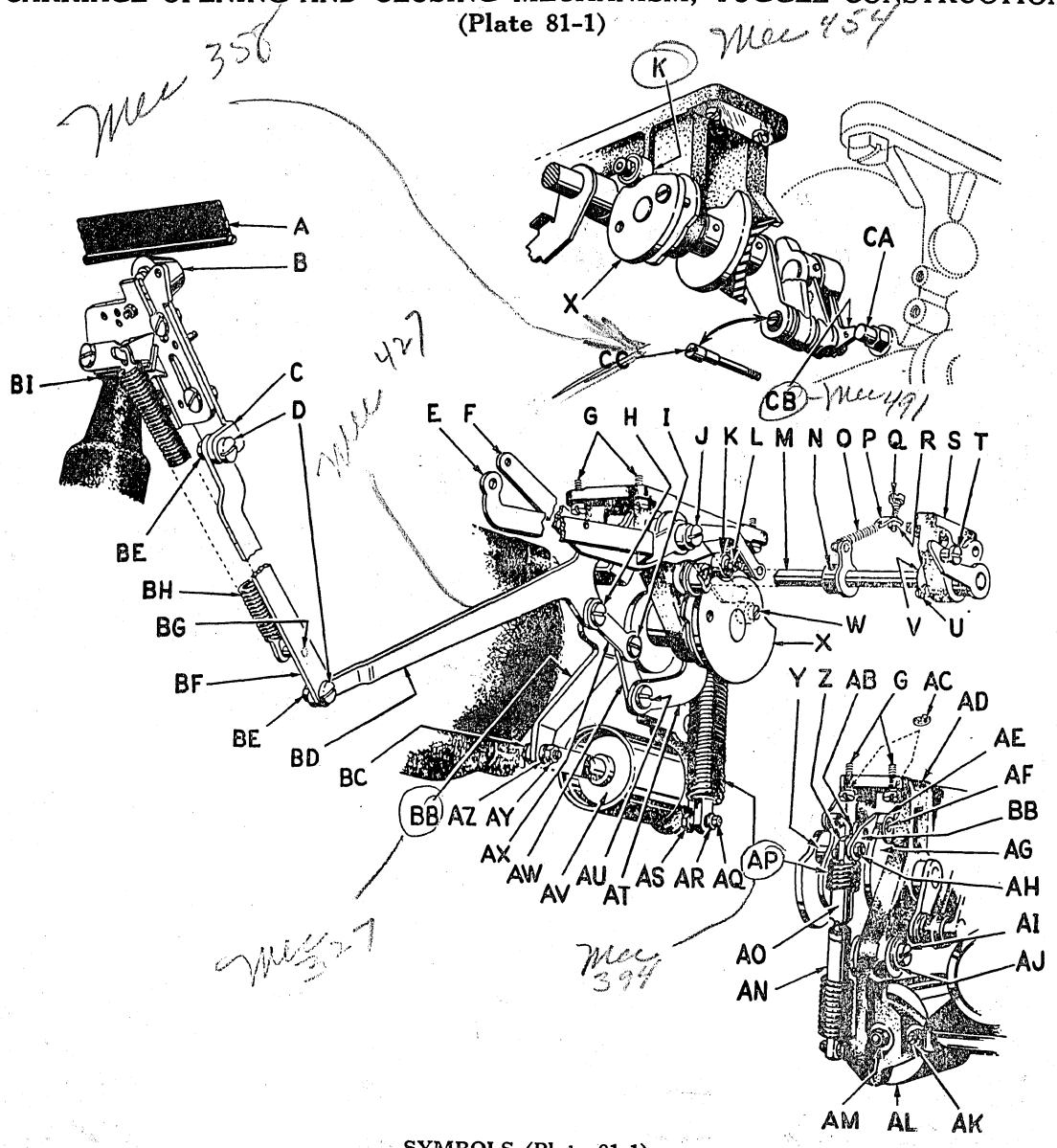
SYMBOLS (Plate 81)

A **12011**
B **12052**
C **1-12010½ No. 2 Style 12"**
(1-12010½B)
1-12010½ No. 2 Style 18"
(1-12010½B)
11-12010½ No. 2 Style 18"
(1-12010½B)
D **203564** stud
12081¼ spring
203441 threaded washer
E **1-203176R** includes "D" and "F"
F 203177*
G **See Rack Bar Charts, Plates 51-1 thru 51-6**
H **1-12014¼A** with early cge. return
11-12014¼A without early cge. return
I **12053⅝** stud
J **203153**
K **71517** screw
L **203123A Style 12, 15, 18** specify machine number
1-203123D Style 12, 15, 18 submit forms and machine number
M **203596 (702663)** screw, use 1097¾ lock washers and 45 nut, use with 203120A, see "AF"
103500 (702500½) screws, 47 nuts, used with 203120B, see "AF"
N **203584** rivet
O **1-203207**
P 203427A* roll, use stud 203534*
Q **203606** stud in "Y"
R **203812 (81 Fte. 69)**
S **203535A** hexagon head shoulder screw, use nut 47
T **1B-203154** includes "N," "O," "P," "Q," "S," "Y," "AB"
U **203541** screw, 3645 nut
V **12063¼** screw
W **203429** shoulder nut, 1097¼ lock washer
X **1-203668** includes "Z," "AA"
2-203668 complete assembled "bottle" without "unit plate"
Y **1-203155A** includes "P," "Q"
Z **75609** screw
AA **46** nut
AB **203506** spring stud
AC **12053¾** hexagon head screw
AD **1-12066¼A** casting on "X" for unit plate
AE **72567** screws used for replacements, later construction uses rivets 205508
AF **203120A** flat punching having slight bend and two small holes, refer to "M"
203120B flat punching having a corrugated surface through center and has one small screw hole and one elongated hole, refer to "M"
AG **203536** shaft
AH **4489 (83800A)**
AI **73595** screw, 47 nut, 1097⅛ lock washer (2 each required)
AJ **203156 No. 1**
AK 203006A* Style 12, 15, 18
AL **203466** roll
AM **203589** screw
203589 No. 2 eccentric screw for lower roll
47 nut
AN **12052** screw

Printed in U. S. America Revised 10-9-50 For Form 2960
Replaces Plates 81 and 81-1 Dated 1-4-49

CARRIAGE OPENING AND CLOSING MECHANISM, TOGGLE CONSTRUCTION

(Plate 81-1)



SYMBOLS (Plate 81-1)

A **1-203123D No. 2 Style 12, 15, 18** submit forms and machine number, complete assembly for carriage opening from lever without tabulation **1-203123D No. 2 Style 25 13 07**
B 203435 No. 2* included in C
C **1-203169B** includes B
D **201502** screw
E **1-201134A No. 2**
F **1-200263 No. 7**
G **200558**
H **3450 11/16 Style 9**
I **3450 11/16 Style 9**
J **2851 5/8** screw, 201504 No. 3 shaft, 1097 1/8 lock washer, 393 nut
K **1-201999** ball bearing roller
L **200557 1/2 (1-200006B Style 17)** screw, 47 1/4 nut, 1097 7/8 washer
M **1-200006A Style 17 (1-200006B Style 17)** includes N, S, U, V
N **63** pin
O **87800 No. 4**
P **20 No. 116** spring anchor
Q **79581**
R **46 1/4**
S **1-200665 1/2 (1-200006B Style 17)** includes 201334 bushing
T **200661 No. 2** screw, 46 nut
U **72573** screw
V **1-2840 7/8** collar, includes U
W **201547** screw
X 201147 1/2* included in AD
Y **201339** roller
Z **203553 No. 2 (203553 No. 3)** screw

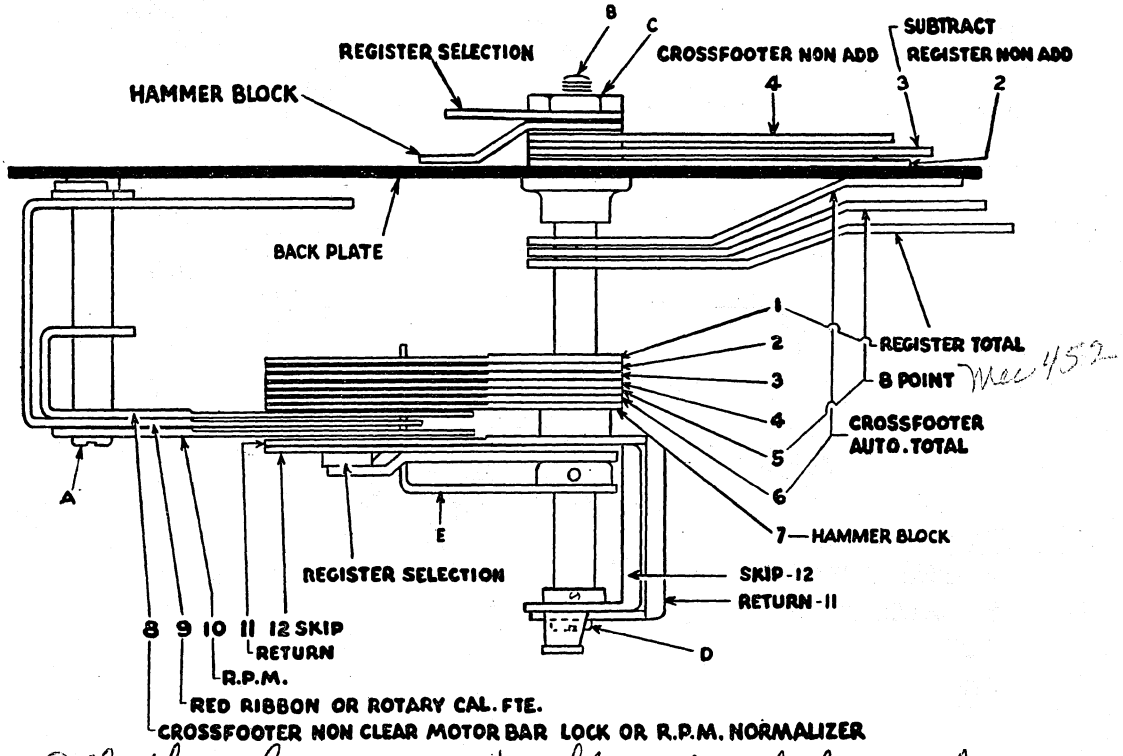
AB **3450 11/16 Style 9** screw
AC **1097 1/4** lock washer
AD **1-201665 No. 5** includes X, AG
AE **1-201999** ball bearing roller, 201351 washer
AF **201503 No. 2** screw, 1097 7/8 washer, 47 nut
AG 1-201104A* included in AD
AH **47** nut
AI **2851 5/8**
AJ **201105** washer
AK **201512** screw, 47 nut
AL 201447* included in AV
AM **393** nut, 10021 3/4 washer
AN 201555* see AP

AO 201555* see AP
AP **1-201801 No. 2** includes AN, AO
AQ **46** nut
AR **9028 1/2** washer
AS **201554** hexagon screw
AT **201109**
AU **3450 11/16 Style 9**
AV **1-201448** assembled air pot, includes AL
AW **1-201108**
AX **201109 1/2**
AY **45**
AZ **1097 1/4** lock washer

BB **1-201107 1/2** includes AE, AF
BC **201511** screw
BD **1-201107 No. 3**
BE **47** nut, 1097 7/8 washer
BF **1-201106**
BG **201517** stud
BH **1-805 Fte. 213 No. 1**
BI **203157A**
CA **3662 5/8**
CB **1-3612 1/4 No. 5**
CC **201501C**

SEE EXPLANATION ON INSIDE OF FRONT COVER

LEVERS ASSEMBLED ON BACK PLATE, ROLL CONTROLLED—THIN LEVER CONSTRUCTION (Plate 82)



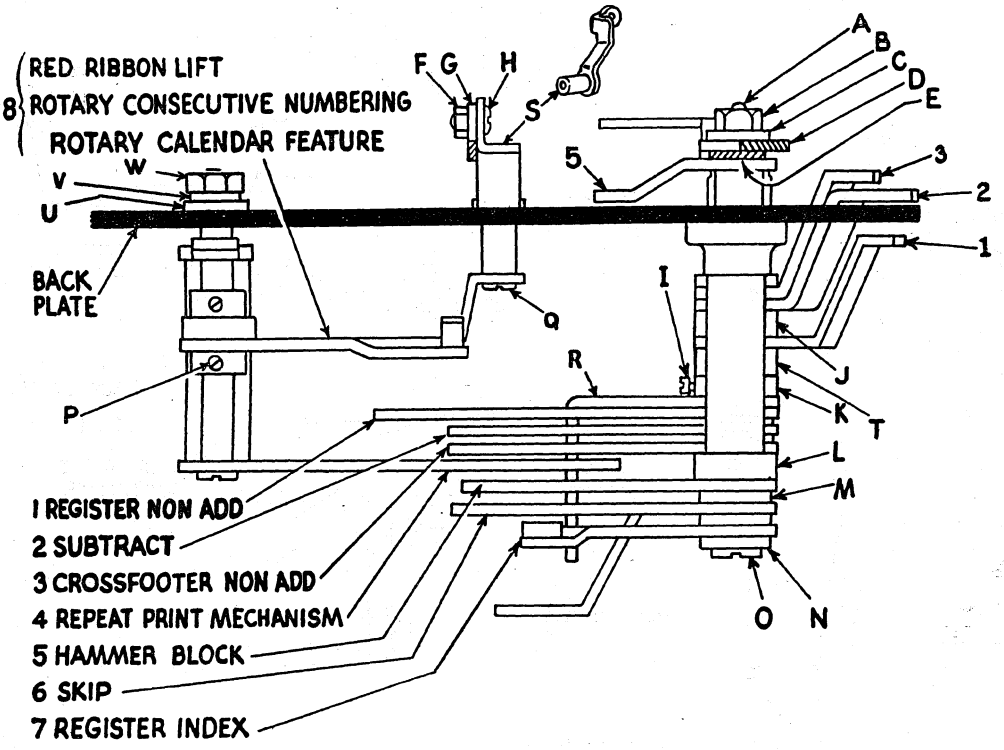
All thin lever 12110 #7 Sty 17 No fork on end
10027 5/8 - Forked

SYMBOLS (Plate 82)

The purpose of the thin lever construction is to provide roll control for all levers.

Lever Position Number	Symbol Number	Description
1	1-12110 Sty. 13 or 17 No. 1	Register Totals—Cge. Controlled
2	1-12110 Sty. 13 or 17 No. 3	Reg.—Non-add
3	1-12110 Sty. 13 or 17 No. 5	Subtract
4	12110 Sty. 13 No. 6 (12110 No. 28 Sty. 13) 12110 Sty. 17 No. 6	C.F.—Non-add
5	12110 Sty. 13 or 17 No. 7	8 Pt. Print. Control
6	12110 Sty. 13 or 17 No. 8	Cge. Cont.—C.F. Tots.
7	1-12110 No. 9	Hammer block
8	12110 No. 14 and 1-12110 Sty. 13 or 17 No. 1 and 1-1105 Fte. 209 No. 2 Sty. 13, 17	C.F. Non-clear Mtr. Bar Lock—without Skip Tab. Stop Blk.
8	101 No. 2 Env. 1410 Sty. 13, 17	C.F. Non-clear Mtr. Bar Lock—with Skip Tab. Stop Blk.
8	1-101 Sty. 13 or 17 Env. 1410	R.P.M. Norm.—without Skip Tab. Stop Block
8	101 No. 2 Sty. 13 or 17 Env. 1410	R.P.M. Norm.—with Skip Tab. Stop Blk.
9	1-200180 No. 1 Env. 1410	R.P.M. Norm.—with C.F. Non-clear Mtr. Bar Lock
9	200180 Env. 1410 (12110 No. 10)	Red Ribbon for Rotary Cal. Fte.
9	1-12110 No. 18	Skip Tab. Stop Block —Carriage Const.
10	1-12110 No. 16	R.P.M. without Skip Tab. Stop Block
10	1-12110 No. 17	R.P.M.—with Skip Tab. Stop Block
11	12110 Sty. 13 or 17 No. 22	Return Multiple Skip
	12110 Sty. 13 or 17 No. 23	Skip and Return
	1-12110 Sty. 13 or 17 No. 20	Skip, used only when Skip and Return Mech. is omitted
12	1-12110 No. 24	Reg. Sel.
A	2851⅝	Screw
B	12001⅛ No. 2 (12001⅛A No. 2, 1-12315¼B, 20945¾)	Threaded Shaft
C	393	Nut
D	2851⅝	Screw
E	1-101 Env. 1471	Arm held in position on Shaft with Screw 103649

LEVERS ASSEMBLED ON BACK PLATE, STANDARD ROLL CONTROLLED CLASSES 6, 11 THRU 16 (Plate 83)



SYMBOLS (Plate 83)

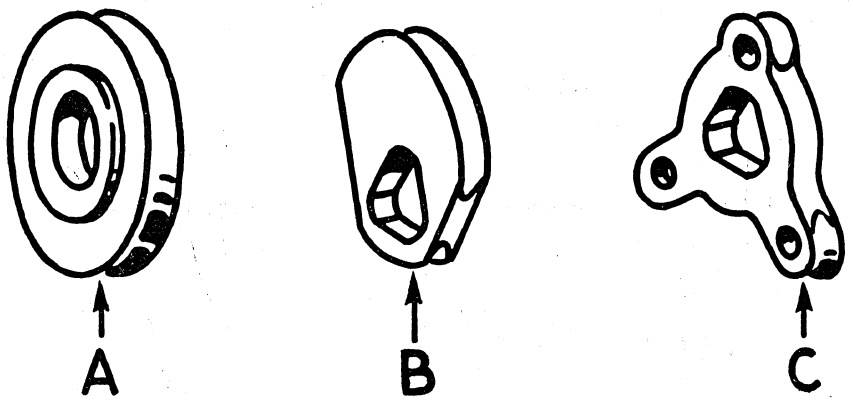
The standard lever construction has seven roll controlled levers and one (8) skid controlled lever. When required it is possible to replace C.F.N.A. (3) with two thin levers, repeat print normalizer pivoting on the right, its cam in line with 1 to 7 cams. The other thin lever C.F.N.A. pivoting in the same position as the standard lever which the thin lever replaces. Skip lever (6) can be replaced with two thin levers, skip tab stop block carriage controlled on the outside and C.F. total carriage controlled on the inside.

Lever Position Number	Symbol Number	Description
1	60127C Style 13, 17	Register Non-add
2	10012B Style 13, 17	Subtract
3	1-10027A Style 13, 17	C.F. Non-add
4	1-200170	Repeat print mech.
5	10012½	Hammer block
6	1-12028⅛A Style 13	Skip
6	1-12028⅛B Style 17	Skip
7	1-60129A	Reg. Indexing, 6 or less
7	1-60129A No. 10	Register Indexing, 10 reg. const.
8	1-200180 No. 2	Red ribbon lift
8	1-200180 No. 2	Rotary consecutive No.
8	1-200180 No. 2	Rotary Cal. Fte.
Thin 3	1-10027A Style 13, 17 Env. 705	C.F. Non-add
Thin 4	1-129 Fte. 137 No. 2 Env. 705	Repeat print normalizer
Thin 7	10027⅝ Sty. 13 No. 1	C.F. totals, Cge. Control replaces Skip No. 6
Thin 7	10027⅝ Sty. 17	C.F. totals, Cge. Control replaces Skip No. 6
Thin 8	1-130 Fte. 137 No. 5	Skip Tab. Stop block Cge. Control replaces Skip No. 6

A **60003**
B **393**
C **10021¾**
D **60128A Sty. 13, 17**
E **1-60129A or 1-60129 No. 10 (1-60129A No. 10, 1-60212A No. 10)** see item 7 for description
F **46**
G **1-110B Fte. 217 Style 13, 17**
H **259½**
I **550¾**
J **10046¾**
K **1-60212** for 6 reg. or less
1-60212 No. 10 (1-60129A No. 10, 1-60212A No. 10) for 10 reg. const.
L **10046¾**
M **10021½A**
N **12046⅞**
O **2851⅝**
P **1-2840⅞** (2 req.)
Q **8054¾**
R Part of K
S **1-111 Fte. 217 (1-111A Fte. 217)**
T **1-2840⅞**
U **10021¾**
V **1097⅛**
W **393**

SEE EXPLANATION ON INSIDE OF FRONT COVER

CONTROL ROLLS FOR THICK LEVER CONSTRUCTION, EXCEPT FOR REGISTER CONTROL LEVER (Plate 83-1)



Symbol	Stamped	Roll Nos. and/or Combinations Used on Control Charts
A Non-adjustable		
10043¼A No. 8		5
10043¼A No. 9		3
10043¼A No. 10		1
10043¼A No. 7	5½ (See Z, Plate 24, Acc. Inst. Bk)	
10043¼A No. 13	(See Par. 6, Plate 13-1, Prtg. Inst. Bk.)	
10043¼A No. 12	(Used on hanger preceding bank total)	
Note: For 2-way combination rolls, refer to Plate 83-3.		
B 3-Way Adjustable		
10043 1/16 No. 50	50	0–1–3
10043 1/16 No. 51	51	5–3–1
10043 1/16 No. 52	52	3–3–1
10043 1/16 No. 53	53	0–0–3
10043 1/16 No. 54	54	0–0–1
10043 1/16 No. 55	55	0–1–1
C 3-Way Adjustable, For Close Setups		
10042 3/16 No. 2	A2	0–0–5
10042 3/16 No. 4	A4	0–5–5
10042 3/16 No. 5	A5	0–5–3
10042 3/16 No. 7	A7	0–5–1
10042 3/16 No. 8	A8	0–3–3
10042 3/16 No. 9	A9	5–5–3
10042 3/16 No. 10	A10	0–1–3
10042 3/16 No. 11	A11	5–3–3
10042 3/16 No. 12	A12	5–5–1
10042 3/16 No. 13	A13	5–3–1
10042 3/16 No. 14	A14	0–1–1
10042 3/16 No. 15	A15	3–3–1
10042 3/16 No. 16	A16	5–1–1
10042 3/16 No. 17	A17	3–1–1
10042 3/16 No. 18	A18	0–0–3
10042 3/16 No. 19	A19	0–1–0

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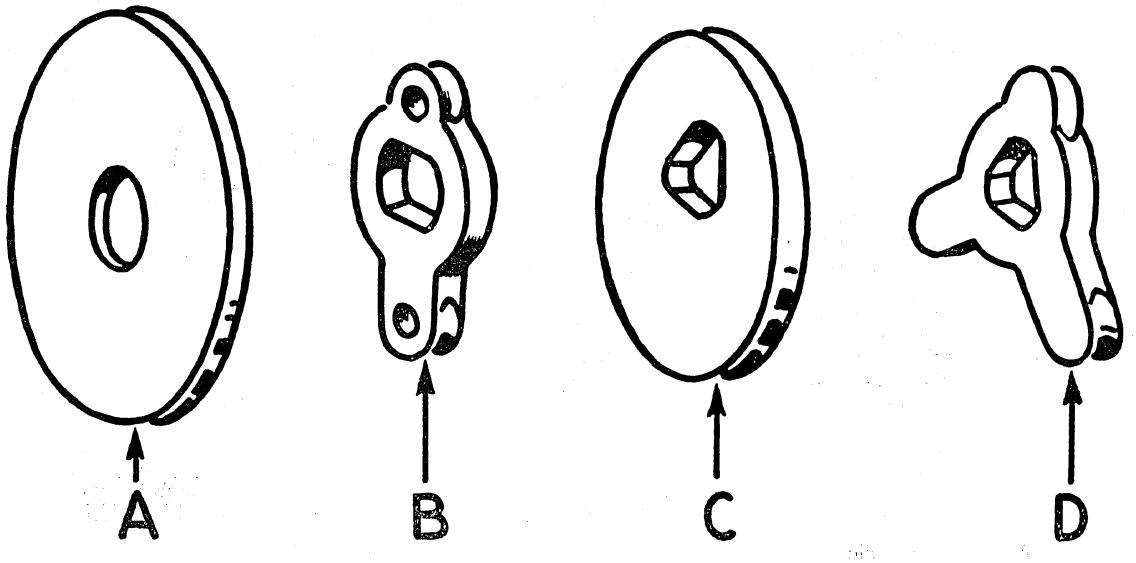
CONTROL ROLLS FOR THICK LEVER CONSTRUCTION, FOR REGISTER CONTROL LEVER (Plate 83-2)



Note: Register Control Levers Contained on Machines Manufactured prior to January 1, 1949, Require Oversize No. 1 Rolls of Either Regular or Combination Construction. (See Oversize No. 1 Rolls following Standard Roll Listings below.)

Symbol	Stamped	Roll Nos. and/or Combinations Used on Control Charts
A Non-adjustable		
10043 3/8 No. 8		5
10043 3/8 No. 9		3
10043 3/8A No. 10		1
B 2-Way Adjustable, For Close Setups		
10026 15/16 No. 7		0-1
10026 15/16 No. 8		0-3
10026 15/16 No. 9		0-5
10026 15/16 No. 18		5-3
C 3-Way Adjustable		
10043 7/8 No. 2	2	0-0-5
10043 7/8 No. 3	3	0-0-3
10043 7/8 No. 4	4	0-5-5
10043 7/8 No. 5	5	0-5-3
10043 7/8 No. 8	8	0-3-3
10043 7/8 No. 9	9	5-5-3
10043 7/8 No. 11	11	5-3-3
D 3-Way Adjustable, For Close Setups		
10042 9/16 No. 4	R4	0-0-5
10042 9/16 No. 5	R5	0-5-3
10042 9/16 No. 8	R8	0-3-3
10042 9/16 No. 9	R9	5-5-3
10042 9/16 No. 10	R10	0-3-1
10042 9/16 No. 11	R11	5-3-3
10042 9/16 No. 12	R12	5-5-1
10042 9/16 No. 13	R13	5-3-1
10042 9/16 No. 14	R14	0-1-1
10042 9/16 No. 15	R15	1-3-3
10042 9/16 No. 16	R16	5-1-1
10042 9/16 No. 18	R18	0-0-3
10042 9/16 No. 19	R19	0-0-1

(Continued)

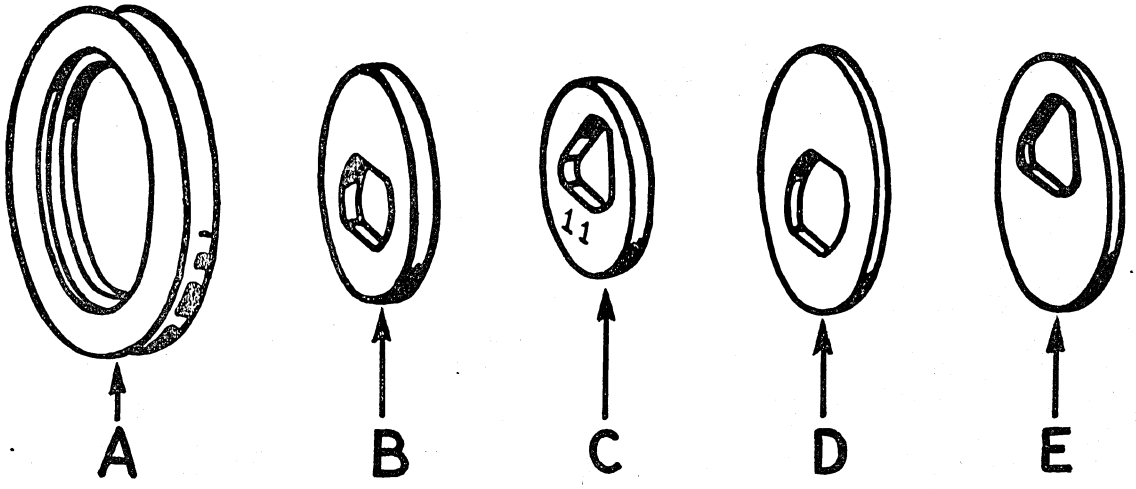
Oversize No. 1 Rolls for Machines Manufactured Prior to January 1, 1949

Symbol	Stamped	Roll Nos. and/or Combinations Used on Control Charts
A Non-adjustable		
10043⅜ No. 10		1

Note: For 2-Way Combination Rolls, refer to Plate 83-3, Register Rolls.

C 3-Way Adjustable		
10043⅞ No. 6	6	0–0–1
10043⅞ No. 7	7	0–5–1
10043⅞ No. 10	10	0–1–3
10043⅞ No. 12	12	5–5–1
10043⅞ No. 13	13	5–3–1
10043⅞ No. 14	14	0–1–1
10043⅞ No. 15	15	3–3–1
10043⅞ No. 16	16	5–1–1
10043⅞ No. 17	17	3–1–1

COMBINATION ROLLS CONSISTING OF RIM, CORE, AND RETAINER(S), FOR THICK LEVER CONSTRUCTION (Plate 83-3)



A 10043⅝A Nos. 2, 5, 9, 10, rim
10043⅝ Nos. 3, 7, 11 thru 22, rim
10044¾ Nos. 2, 3, 7, rim
B 10025⅛ Nos. 2, 3, 5, 7, 9, core
10025⅝ Nos. 2, 3, 7, core
C 10025⅛ Nos. 11 thru 22, core
D 10025⅜ Nos. 2, 3, 5, 7, 9, 10, 23, retainer
E 10025⅜ Nos. 11 thru 22, retainer

Consistency for Combination Rolls Except for Use with Register Control Lever

Combination	Rim	Core	Retainer(s)
2-Way Adjustable			
0–1	10043⅝A No. 2	10025⅛ No. 2	10025⅜ No. 23 (2 req.)
0–5	10043⅝ No. 3	10025⅛ No. 3	10025⅜ No. 10 (2 req.)
3–5	10043⅝A No. 5	10025⅛ No. 5	10025⅜ No. 5 (2 req.)
0–3	10043⅝ No. 7	10025⅛ No. 7	10025⅜ No. 7 (2 req.)
5–1	10043⅝A No. 9	10025⅛ No. 9	10025⅜ No. 9 (2 req.)
1–3	10043⅝A No. 10	10025⅛ No. 5	10025⅜ No. 5 (2 req.)

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3-Way Adjustable

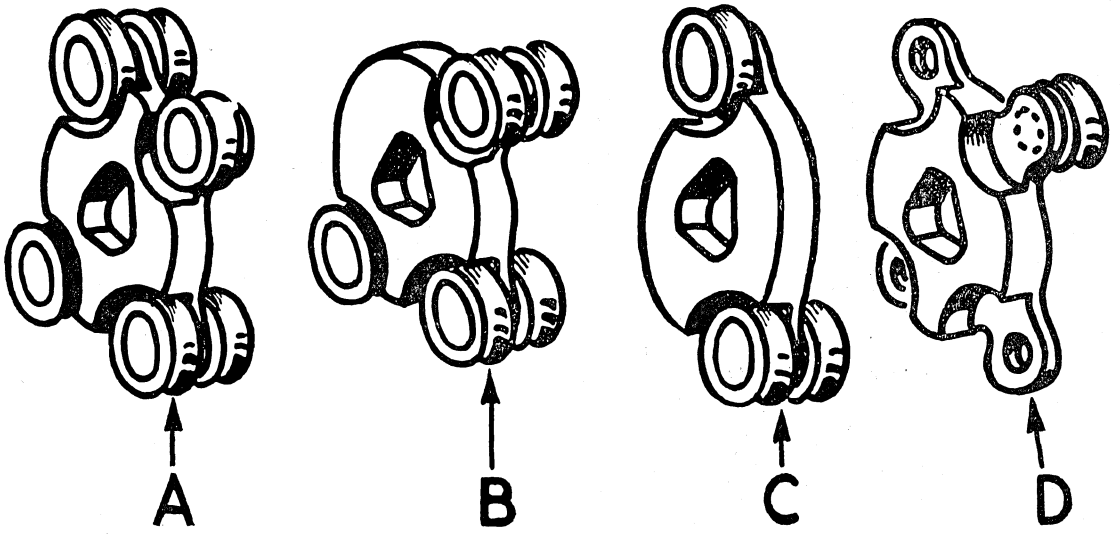
0–5–5	10043⅝ No. 11	10025⅛ No. 11	10025⅜ No. 11 (2 req.)
0–0–5	10043⅝ No. 12	10025⅛ No. 12	10025⅜ No. 12 (2 req.)
0–0–3	10043⅝ No. 13	10025⅛ No. 13	10025⅜ No. 13 (2 req.)
0–1–1	10043⅝ No. 14	10025⅛ No. 14	10025⅜ No. 14 (2 req.)
0–5–3	10043⅝ No. 15	10025⅛ No. 15	10025⅜ No. 15 (2 req.)
0–5–1	10043⅝ No. 16	10025⅛ No. 16	10025⅜ No. 16 (2 req.)
0–1–3	10043⅝ No. 17	10025⅛ No. 17	10025⅜ No. 17 (2 req.)
5–3–1	10043⅝ No. 18	10025⅛ No. 18	10025⅜ No. 18 (2 req.)
5–5–1	10043⅝ No. 19	10025⅛ No. 19	10025⅜ No. 19 (2 req.)
5–3–3	10043⅝ No. 19	10025⅛ No. 20	10025⅜ No. 20 (2 req.)
3–1–1	10043⅝ No. 20	10025⅛ No. 20	10025⅜ No. 20 (2 req.)
5–1–1	10043⅝ No. 21	10025⅛ No. 21	10025⅜ No. 21 (2 req.)
3–3–1	10043⅝ No. 21	10025⅛ No. 22	10025⅜ No. 22 (2 req.)
5–5–3	10043⅝ No. 22	10025⅛ No. 22	10025⅜ No. 22 (2 req.)

Consistency for Combination Rolls for Use with Register Control Lever

2-Way Adjustable

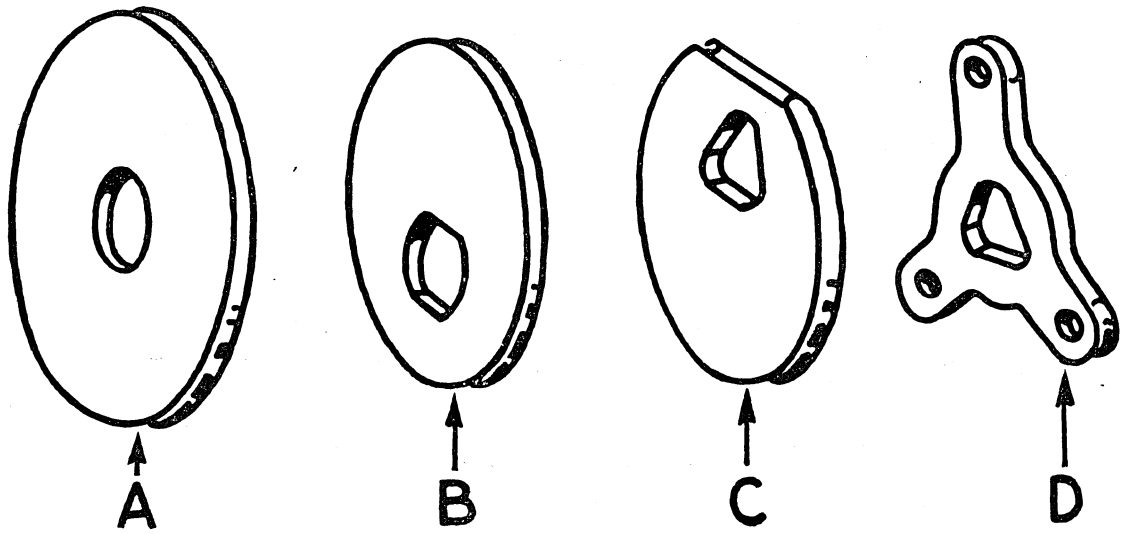
0–1	10044¾ No. 2	10025⅝ No. 2	10025⅜ No. 2
0–5	10044¾ No. 3	10025⅝ No. 3	10025⅜ No. 3
0–3	10044¾ No. 7	10025⅝ No. 7	10025⅜ No. 7

CONTROL ROLLS FOR AUTOMATIC CROSSFOOTER TOTALS—BANK POSTING MACHINES (Plate 83-4)



	Symbol	No. of Positions	Function
A	1-10026⅛A No. 2	4 Position	TOT., S. TOT., TOT., S. TOT.
B	1-10026⅛A No. 1	3 Position	S. TOT., TOT., S. TOT.
C	1-10026⅛ No. 7	2 Position	TOT., S. TOT.
D	11-10026⅛A No. 2	4 Position	C. F. N. A., C. F. A., C. F. A., C. F. A.

CONTROL ROLLS FOR THIN LEVER CONSTRUCTION, LEVERS 1 THRU 10
(Plate 83-5)



Note: Register Control Levers Contained on Machines Manufactured Prior to January 1, 1949, Require Oversize No. 1 Rolls of Either Regular or Combination Construction. (See Oversize No. 1 Rolls following Standard Roll Listings below.)

Symbol	Stamped	Roll Nos. and/or Combinations Used on Control Charts
A Non-adjustable		
10043 7/16 No. 1	B1	5
10043 7/16 No. 2	B2	3
10043 7/16 No. 3	B3	1
B 2-Way Adjustable		
10043 9/16 No. 1	B1	5–0
10043 9/16 No. 2	B2	3–5
10043 9/16 No. 3	B3	3–0
10043 9/16 No. 4	B4	1–5
10043 9/16 No. 5	B5	1–3
10043 9/16 No. 6	B6	1–0
10026 5/8 No. 1 Env. 1753		4–0
C 3-Way Adjustable		
10043 3/16 No. 2	B2	0–0–5
10043 3/16 No. 3	B3	0–0–3
10043 3/16 No. 4	B4	0–5–5
10043 3/16 No. 5	B5	0–5–3
10043 3/16 No. 6	B6	0–0–1
10043 3/16 No. 7	B7	0–5–1
10043 3/16 No. 8	B8	0–3–3
10043 3/16 No. 9	B9	5–5–3
10043 3/16 No. 10	B10	0–1–3
10043 3/16 No. 11	B11	5–3–3
10043 3/16 No. 12	B12	5–5–1
10043 3/16 No. 13	B13	5–3–1
10043 3/16 No. 14	B14	0–1–1
10043 3/16 No. 15	B15	3–3–1
10043 3/16 No. 16	B16	5–1–1
10043 3/16 No. 17	B17	3–1–1

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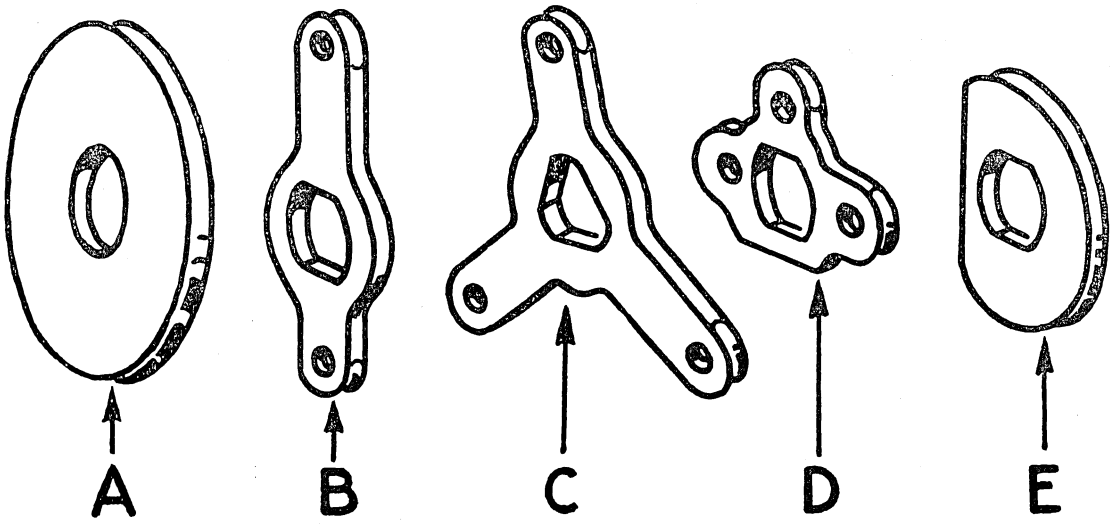
Symbol	Stamped	Roll Nos. and/or Combinations Used on Control Charts
D 3-Way Adjustable, For Close Setups		
10042 5/16 No. 2	B2	0–0–5
10042 5/16 No. 3	B3	0–0–3
10042 5/16 No. 4	B4	0–5–5
10042 5/16 No. 5	B5	0–5–3
10042 5/16 No. 6	B6	0–0–1
10042 5/16 No. 7	B7	0–5–1
10042 5/16 No. 8	B8	0–3–3
10042 5/16 No. 9	B9	5–5–3
10042 5/16 No. 10	B10	0–1–3
10042 5/16 No. 11	B11	5–3–3
10042 5/16 No. 12	B12	5–5–1
10042 5/16 No. 13	B13	5–3–1
10042 5/16 No. 14	B14	0–1–1
10042 5/16 No. 15	B15	3–3–1
10042 5/16 No. 16	B16	5–1–1
10042 5/16 No. 17	B17	3–1–1
10042 5/16 No. 18	B18	5–5–5
10042 5/16 No. 19	B19	3–3–3

Oversize No. 1 Rolls for Register Control Levers on Machines Manufactured Prior to January 1, 1949

A Non-adjustable		
10043 11/16 No. 3	C3	1
B 2-Way Adjustable		
10044 11/16 No. 6	C6	1–0
C 3-Way Adjustable		
10043 13/16 No. 6	C6	0–0–1
10043 13/16 No. 7	C7	0–5–1
10043 13/16 No. 10	C10	0–1–3
10043 13/16 No. 12	C12	5–5–1
10043 13/16 No. 13	C13	5–3–1
10043 13/16 No. 14	C14	0–1–1
10043 13/16 No. 15	C15	3–3–1
10043 13/16 No. 16	C16	5–1–1
10043 13/16 No. 17	C17	3–1–1
D 3-Way Adjustable, For Close Setups		
10042 7/16 No. 6	C6	0–0–1
10042 7/16 No. 7	C7	0–5–1
10042 7/16 No. 10	C10	0–1–3
10042 7/16 No. 12	C12	5–5–1
10042 7/16 No. 13	C13	5–3–1
10042 7/16 No. 14	C14	0–1–1
10042 7/16 No. 15	C15	3–3–1
10042 7/16 No. 16	C16	5–1–1
10042 7/16 No. 17	C17	3–1–1

INDEXING ROLLS FOR MULTIPLE SKIP AND RETURN MECHANISM
(Plate 83-6)



Used with New Style Levers (R1 and S1, Plate 37-2, Carriage Symbol List)

Symbol	Stamped	Roll Nos. and/or Combinations Used on Control Charts
A Non-adjustable		
10043 11/16 No. 3	C3	1
10044 3/16A No. 2	2A	2
10044 3/16A No. 3	3A	3
10044 3/16A No. 4	4A	4
10044 3/16A No. 5	5A	5
10044 3/16A No. 6	6A	6
B 2-Way Adjustable		
10026 5/8A No. 1		Specify Combination
C 3-Way Adjustable		
10026 5/8A No. 2		Specify Combination
D 4-Way Adjustable		
10026 5/8 No. 4	4A-4A-5A	0-4-4-6
10026 5/8 No. 5	6A-3A-5A	0-6-3-5
E 10043 9/16 No. 10	B10	0-5-5-5

Used with Old Style Levers (L and M, Plate 38, Carriage Symbol List)

A Regular Size, Non-adjustable		
10044 3/16 No. 1	1	1
10044 3/16 No. 2	2	2
10044 3/16 No. 3	3	3
10044 3/16 No. 4 Env. 1753	4	4
10044 3/16A No. 5	5A	5
10044 3/16 No. 6	6	6
A Oversize, Non-adjustable		
140 1/2 No. 1 Env. 1358	1S	1
10044 3/16 No. 7	2S	2
10044 3/16 No. 8	3S	3
10044 3/16 No. 9	4S	4
10044 3/16 No. 10	5S	5
10044 3/16 No. 11	6S	6

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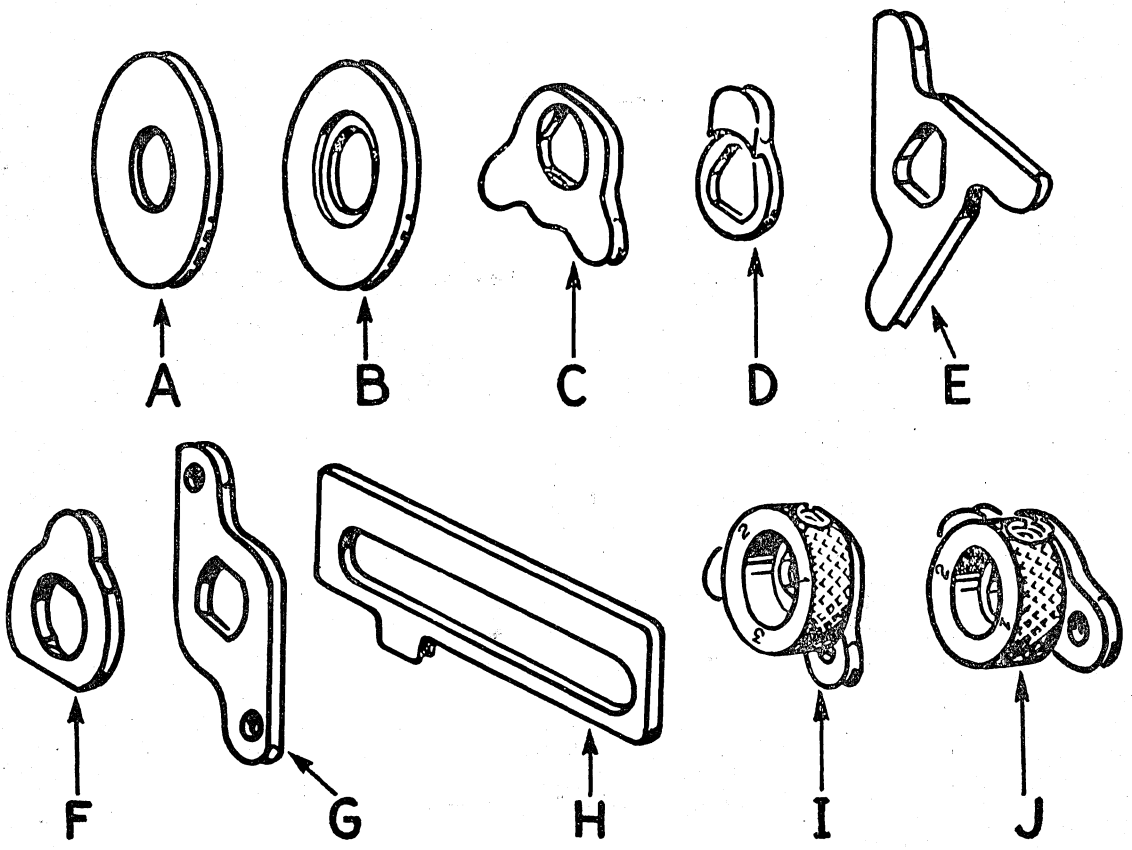
Symbol	Stamped	Roll Nos. and/or Combinations Used on Control Charts
B Oversize, 2-Way Adjustable		
	10026⅝A No. 1	5–0 or 5–5
	10026⅝ No. 1 Env. 1753	4–0
	10026⅝ No. 1	Specify Combination
C Oversize, 3-Way Adjustable		
	10026⅝A No. 2	5–0–0 or 5–5–0
	10026⅝ No. 2	Specify Combination

RETURN SHUT OFF CONTROLS—ROLL OR SKID (Plate 83-7)



A 10044⅝ stamped O, for return levers Nos. 1 thru 5

B 10044⅝ No. 6 stamped S, for return lever No. 6

C 10025⅞ No. 5, 3-way adjustable (active—inactive—inactive), for return levers Nos. 1 thru 5
10025⅞ No. 1, 3-way adjustable (active—active—inactive), for return levers Nos. 1 thru 5

D 10025⅞ No. 6, 3-way adjustable (active—inactive—inactive), for return lever No. 6

E 10025⅞ No. 2 for early or late shut off for return levers Nos. 1 thru 5

F 10026⅝A No. 3, 2-way adjustable (active—inactive), for return levers Nos. 1 thru 5

G 139 Env. 1358 Special No. 2, 2-way adjustable, for early or late shut off for return levers Nos. 1 thru 5

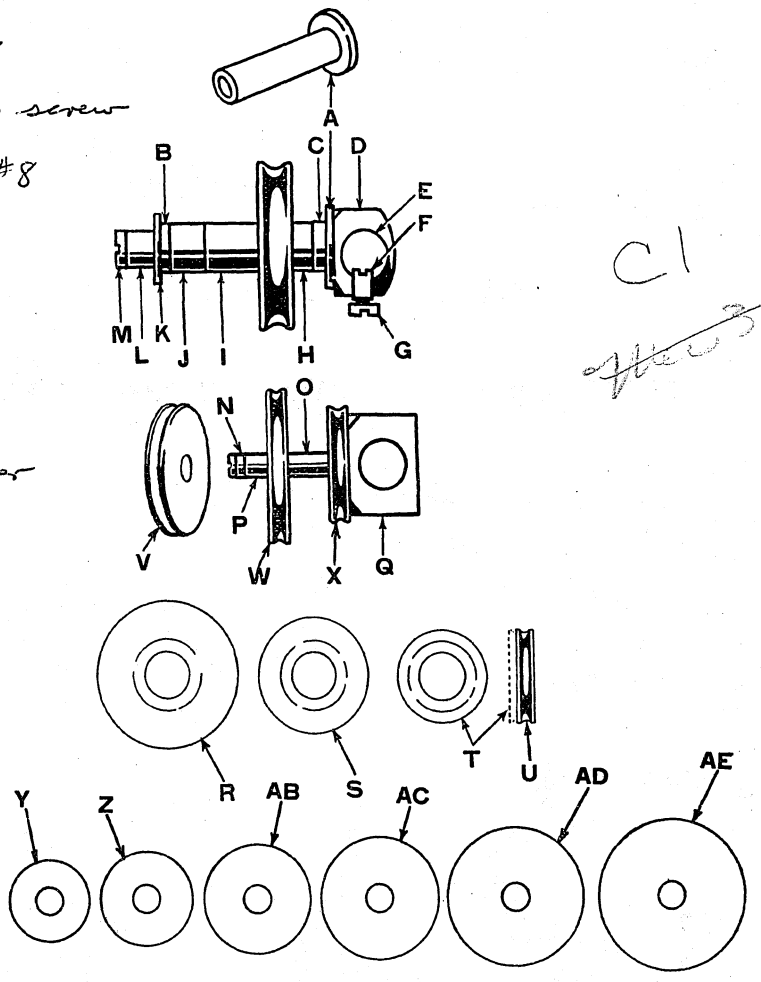
H 274 Env. 1358, shut off skid

I 1-10025⅞ No. 4, 3-way manual adjustable (active—active—inactive), for return levers Nos. 1 thru 4

J 1-10025⅞ No. 3, 2-way adjustable manual (active—inactive), for return levers Nos. 1 thru 4

CONTROL ROLLS, STANDARD (Plate 84)

Knob
10039 1/2 #7
570A Fte 203 screw
10042 1/4 E #8
Sleeve
Hanger
10045 7/8
#20
Long stud
Mon. turn over
post



C1
after 362

SYMBOLS (Plate 84)

A **10042¼B No. 3** Sleeve
B **10044⅛ No. 5** Spacer to fill in
C **10044/16 No. 4** Spacer to replace register roll
D **10045⅞ No. 1** Hanger for carriage return
10045⅞ No. 2 Hanger for shift
10045⅞ No. 3 Hanger—regular
10045⅞ No. 5 Hanger with short post
10045⅞ No. 10 (1-10045⅞B No. 10, 10042¼D No. 1 or 5) Hanger for manual shift
E **3203¾B Style 12, 15, 18** Shaft
F **2890¾** Non-skid
G **4462¼** Screw
H **10044⅛ No. 1** Spacer to replace one of rolls R, S or T
I **10044/16 No. 3** Spacer to replace three of rolls R, S or T
J **10044⅛ No. 2** Spacer to replace two of rolls R, S or T
K **428** Washer
L **10044⅛A** Collar
M **7357½** Screw
N **203423 No. 4** Collar
O **10044⅝** Spacer to replace two rolls
P **72512½** Spacer to replace one roll
Q **4445½A** Hanger, earliest style
R **10043¼A Bo. 10,** No. 1 roll
S **10043¼A No. 9,** No. 3 roll
T **10043⅜A No. 8,** No. 5 roll
U **10043⅜ No. 8** Register roll No. 5
10043⅜ No. 9 Register roll No. 3
10043⅜ No. 10 Register roll No. 1
V **4443A,** No. 3 roll
W **10043¾A,** No. 1 roll
X **10043¼A No. 5 (83443 No. 1)**
Y **10044⅜ No. 6**
Z **10044/16 No. 5 (10044/16A No. 5)**
AB **10044¾ No. 4 (10044¾ No. 4 Env. 1753)**
AC **10044¾ No. 3**
AD **10044⅝ No. 2**
AE **10044⅝ No. 1**

NOTE—When ordering Control Rolls, specify number stamped on roll and if for 1, 2 or 3 position

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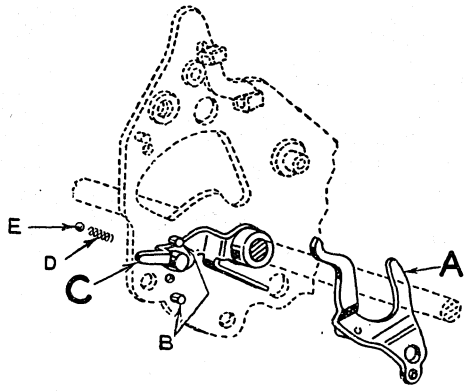
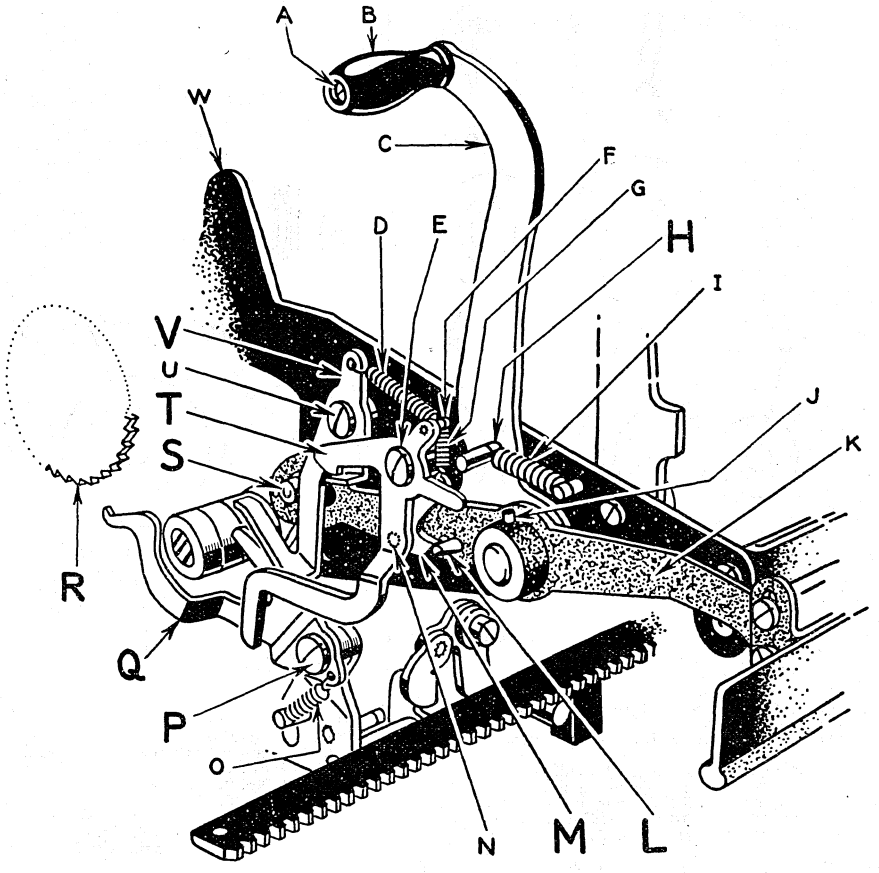
M.R.C. SPACE OR NON-SPACE, MANUAL CONTROL (Plate 85)



SYMBOLS (Plate 85)

A **1-142R Fte. 203 No. 1 Env. 1671** Feed pawl
B **8853⅜** Studs
C **1-144R Fte. 203 No. 1 Env. 1671** Detent for space and non-space mechanism
1-144L Fte. 203 No. 1 Env. 1671 Detent used on left end
D **4980A** Spring
E **3298** Ball bearing

M.R.C. NON-SPACE FROM PARTIAL CARRIAGE OPENING MECHANISM (Plate 86)

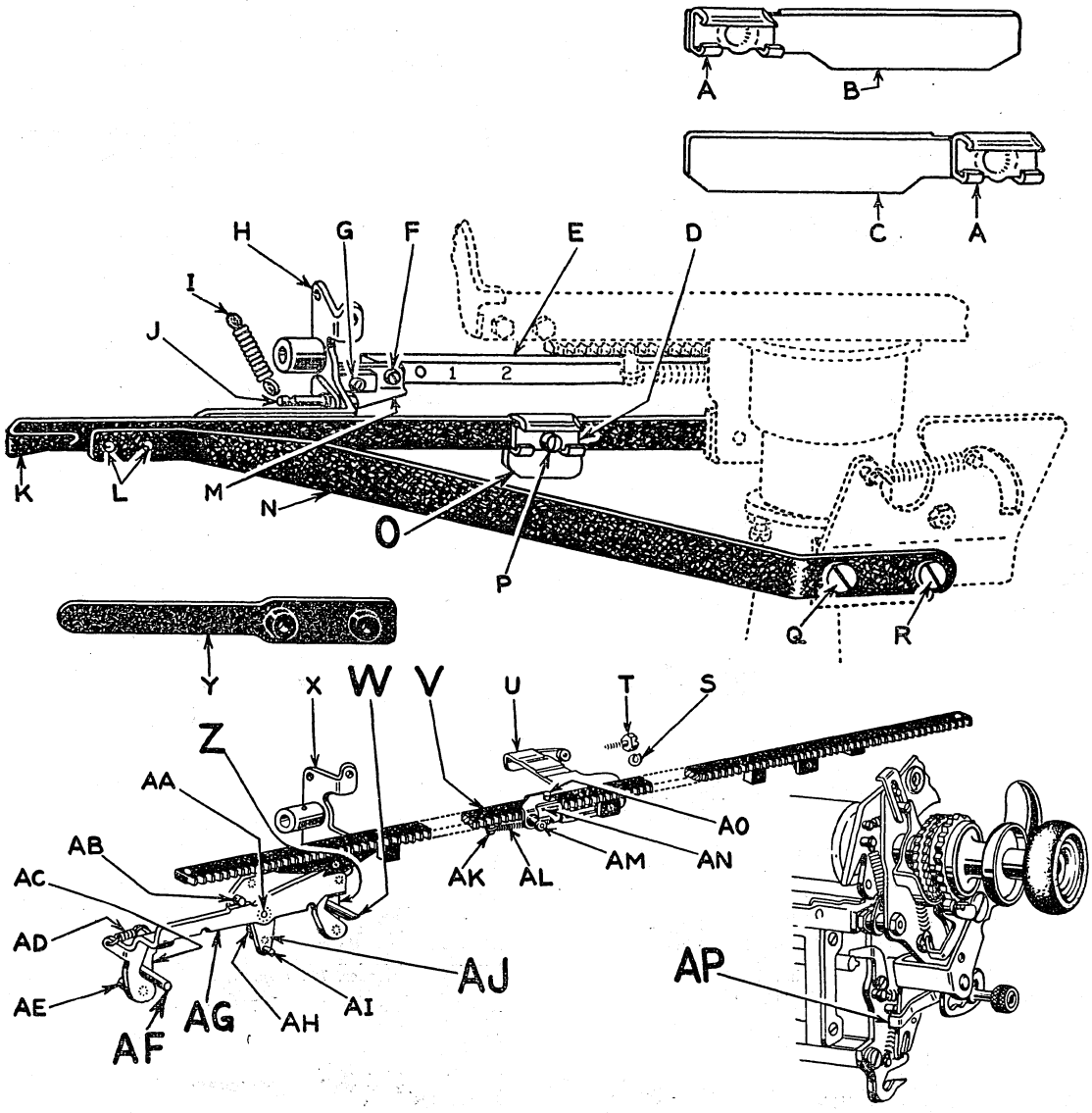


SYMBOLS (Plate 86)

A **73612** Screw
B **4891A** Rubber grip
C **1-203127A Env. 1819** Lever assembly
D **75818** Spring
E **75646** Screw
1097⅞₆ Lock washer
46 Nut
F **7259¼** Spring stud
G **3280⅛** Spring
H **99515 (705627)** Long spring stud
I **75814** Spring
J **59½** Pin
K 1-203107 CR Env. 1819* Arm
L **500 Env. 1819** Stud
M 102 Env. 1819* Punching fastened to "T"
N **72633** Shoulder stud
O **12083** Spring
P **12051⅞** Screw
Q **11-2828¾R No. 2** Spacing pawl
R **1-2849D** Ratchet wheel assembly
S **203500** Stud
203401 Roll
T **1-101 Env. 1819** Punching, includes "F," "M," and "N"
U **2855¾** Shoulder screw
V **1-100 Env. 1819** Punching
W **1D-203006A Env. 1819 Style 12", 15", 18"** Side frame assembly with shaft for NOT Visible Aligning Bail, Type 20
11A-203006A Env. 1819 Style 12", 15", 18" Side frame assembly with shaft for visible aligning bail, Type 20, same as above assembly except upper part indicated with "W" is milled off

SEE EXPLANATION ON INSIDE OF FRONT COVER

M.R.C. SPACE OR NON-SPACE (Plate 87)



SYMBOLS (Plate 87)

A 12023*
B **1-236A Fte. 203** used with "K"
C **1-236AL Fte. 203** used with "K"
D **1-169 Fte. 203** Retaining plate
E **8 Fte. 203 No. 2 Style 12, 15, 18 (203013C Style 12, 15, 18)** Shaft
F **79512** Screw
G **74532 (72614)** Screw
46 Nut
H **1-126BR Fte. 140** Bracket, refer to Plate 51-7
I **12083½** Spring
J **569 Fte. 203** Stud
46 Nut
K **1-231 Fte. 203 (231A Fte. 203)** Bracket, 203597 screws for fastening bracket to plate
L **3261B** Screw
M **246 Fte. 203** Bracket
N **234 Fte. 203** Brace
O **1-230 Fte. 203** Cam
P **7357½** Screw
Q **12063¼** Screw
R **203541** Screw
S **1097¾** Lock washer (2 required)
T **12054¾** Screw (2 required)
U **12026⅞B** Bracket, use screws 12054¾, lock washers 1097¾ and collars 16340. Refer to Plate 51-7
V **See Rack Bar Charts, Plates 51-1 thru 51-6**
W **547 Fte. 203** Stud
X **1-218AR Fte. 203** Plate
Y **1-237 Fte. 203** Arm
203597 Screws for fastening arm to plate
Z **1-226L Fte. 203** Latch includes stud "W"
AA **2851⅝** Screw
AB **12056⅞** Stud
AC **1-226R Fte. 203** Latch includes stud "AF"
AD **3486½** Spring
AE **650A** Shoulder stud
AF **548 Fte. 203** Stud
AG **1-227 Fte. 203** Assembly includes "W," "Z," "AC," "AE," "AF"
AH **10983** Spring
60530 Stud is used for spring
AI **3464⅞** Stud
AJ **1-228 Fte. 203** Latch
AK **12054⅜** Stud
AL **12081** Spring
AM **203441** Washer
12081¼ Spring
203564 Pin
AN **1-201R Fte. 203** Stop includes "AM and "AO"
AO **529 Fte. 203** Stud
AP 1-203258* Arm included with assembly 1-18 Fte. 203 Style 12", 15", 18" which consists of shaft and end plates

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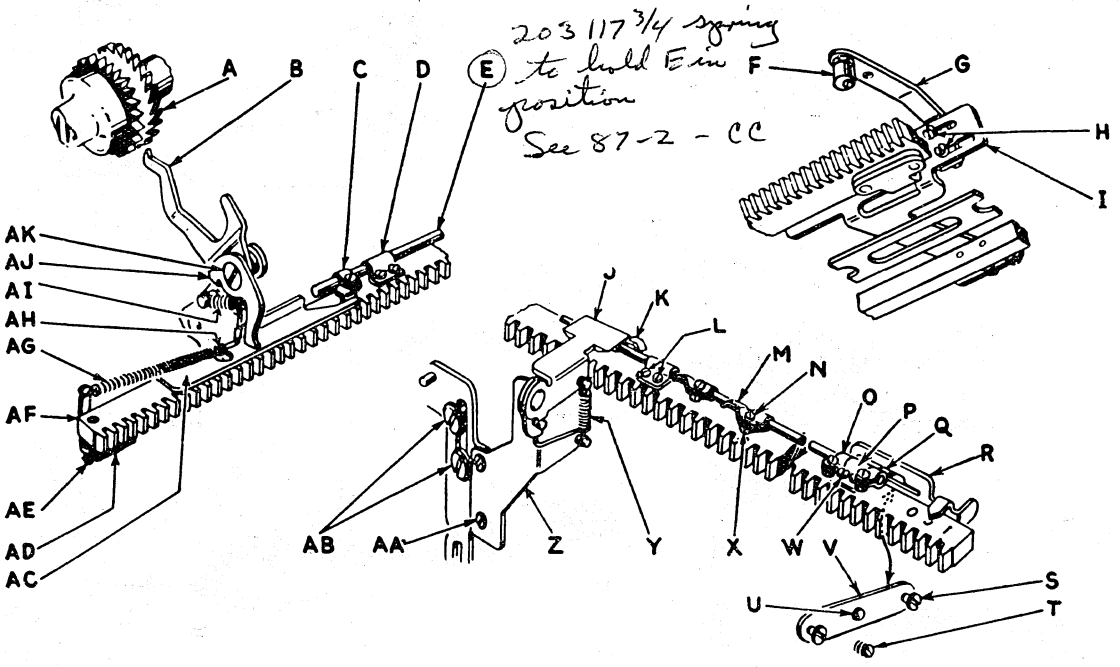
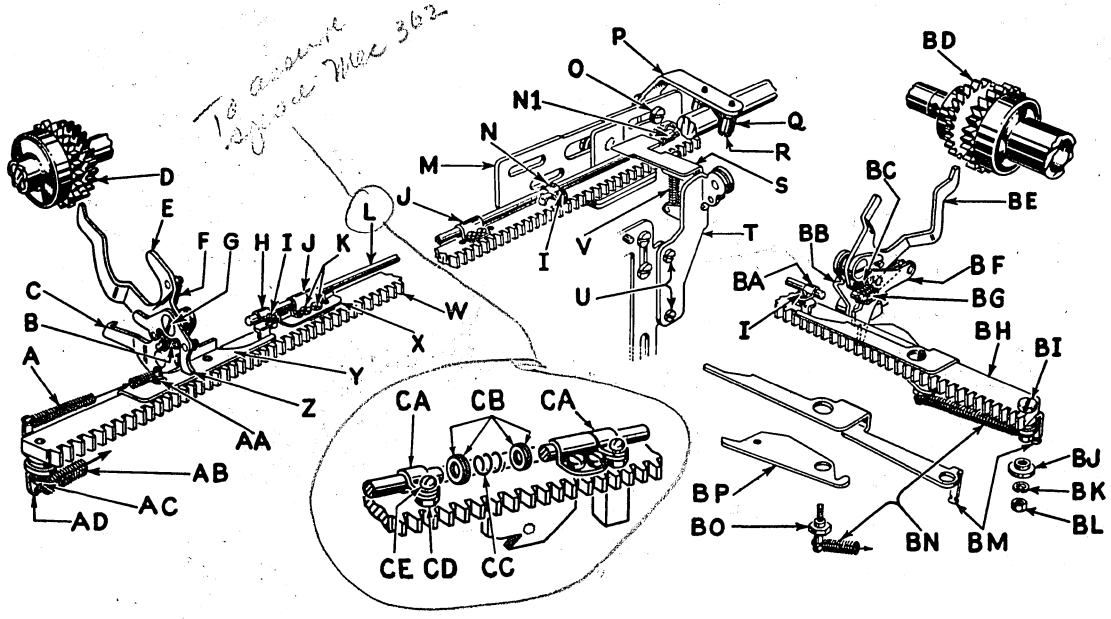
PLATEN SPACING FROM M.R.C.—MANUALLY ADJUSTED TO SPACE OR NON-SPACE—CONTROLLED FROM M.R.C. RACK (Plate 87-1)



SYMBOLS (Plate 87-1)

A **1-2849D**
B **1-2828¾AR No. 5**
C **203120½R (203120½AR and 203177½B)**
D **203117½**
E **203034 Style 12, 15, 18**
F **203480** Eccentric, use 73660 screw
G **203294**
H **79547** Screw, 46 nut
I **1-12026⅞ No. 3** Center Bracket; **1-12026¾L No. 3** Left Bracket — Refer to Plate 51-7
J 123107⅞* included in Z
K **203119½**
L **73548** Screws
M **203119½**
N **203539½** Screw
O **203119½**
P **203117½**
Q **203116½**
R **203113½L**
S **76528**
T **82 Fte. 98** Spring
U **3298** Ball bearing
V **203115½**
W **73548** Screw
X **49⅜**
Y **60801**
Z **1-12310¾**
AA **73612** use 824¼ washer
AB **80543¾**
AC **203177½A (203177½B and 203120½AR)** Slide
AD **785 Style 15** Spring
AE **203177A No. 2** Anchor, use 300359 space washer, 72567 screw, 1097¾ lock washer
AF **See Rack Bar Charts, Plates 51-1 thru 51-6**
AG **96801A Style 10**
AH **203534½** Screw
AI **800 Fte. 407** Spring
AJ **1-2828⅞**
AK **8851⅜**

FORM SPACE RIGHT OR LEFT SIDE FROM M.R.C., CARRIAGE CONTROLLED STYLE 2 (Plate 87-2)



SYMBOLS (Plate 87-2)

A **780¼**
B **75814**
C **11-203008A Style 12, 15, 18** shaft assembly
D **1-2849D**
E **1-2828¾AR No. 5** without form space ¼"
1-2828¾R No. 6 with form space ¼"
F **77881**
G **8851⅜**
H **203120½R** (203120½AR, 203177½C **No. 3, 2850⅝A, 59¼ Fte. 88, 46¼**)
I **203539½** screw, 49⅜ nut
J **203117½**
K **73548**
L **203034 Style 12, 15, 18**
M **12026⅞ No. 3**
N **203119½**
N1 Same as N
O **12051⅜**
P **203294**
Q **203480** eccentric
R **573 Fte. 203** screw
S 12310⅞* included in T
T **1-12310¾**
U **73612** screw, 824¼ washer
V **3480¾**
W **1-12017 No. 3 Style 12, 15, 18 (1-12017B No. 3 Style 12, 15, 18)**
X **203117¾ (60808, 79156 No. 1 4 Req.)**
Y **203177½A (203177½C No. 3, 203120 ½AR, 2850⅝A, 59¼ Fte. 88, 46¼)** without form space ¼"
203177½ No. 2 (203177½C No. 4, 2850⅝A, 46¼, 59¼ Fte. 88, 203120½AR) with form space ¼"
Z **2828⅞**
AA **203534½**
AB **785 Style 15**
AC **72567** screw
AD **203177A No. 2** spring clip
BA **107L Env. 1925 (203120½L)**
BB 11-145 Fte. 203 Env. 1925* assembled in 1-18A Fte. 203 Style 12, 15, 18 shaft
BC **12087A** spring
BD **1-4949C**
BE **1-4928⅝B Env. 1925**
BF **1-111 Env. 1925 (1-203177¼)**
BG **7285½A** spring
BH **1-12017A Style 18 No. 3 Env. 1925 (1-12017B Style 18 No. 3)**
BI **73618**
BJ **300359**
BK **1097¾**
BL **46**
BM **203177½L Env. 1925 (203177½L)**
BN **983**
BO **701518 (203562½)**
BP **112 Env. 1925 (203178½)** — 2 Req
CA **203119½ No. 3** 4 Req
CB **79156 No. 1** 4 Req
CC **60808** — 2 Req
CD **49⅜**
CE **203539½** 2 Req

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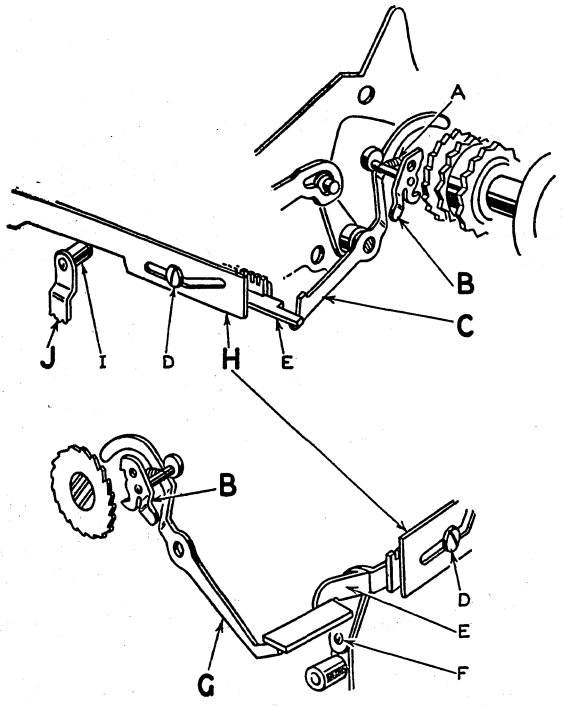
Replaces Previous Plate 87-2 Dated 1-4-49

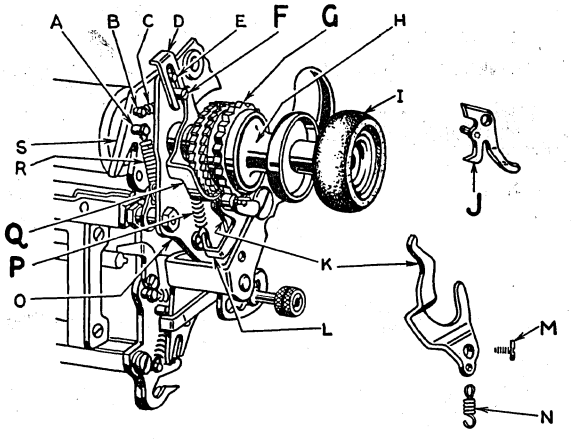
PLATEN SPACE OR NON-SPACE, SKID CONTROLLED (Plate 88)



SYMBOLS (Plate 88)

A **2887½** spring
B **1-2822**
C **1-100L Env. 509**
D **203504½ No. 1**
E **1-101 Env. 509 Special** specify machine number
F **84525** rivet
G **1-100R Env. 509**
H **203166½ No. 1, 2, 3, 4, 5, 6 or 7 Style 12", 15", 18"** specify style and position 1, 2, 3, etc., specify machine number
I **12036⅛** roll use 73611 screw
J **1-12013 No. 4** includes roll and stud

TRIPLE SPACING MECHANISM (Plate 89)

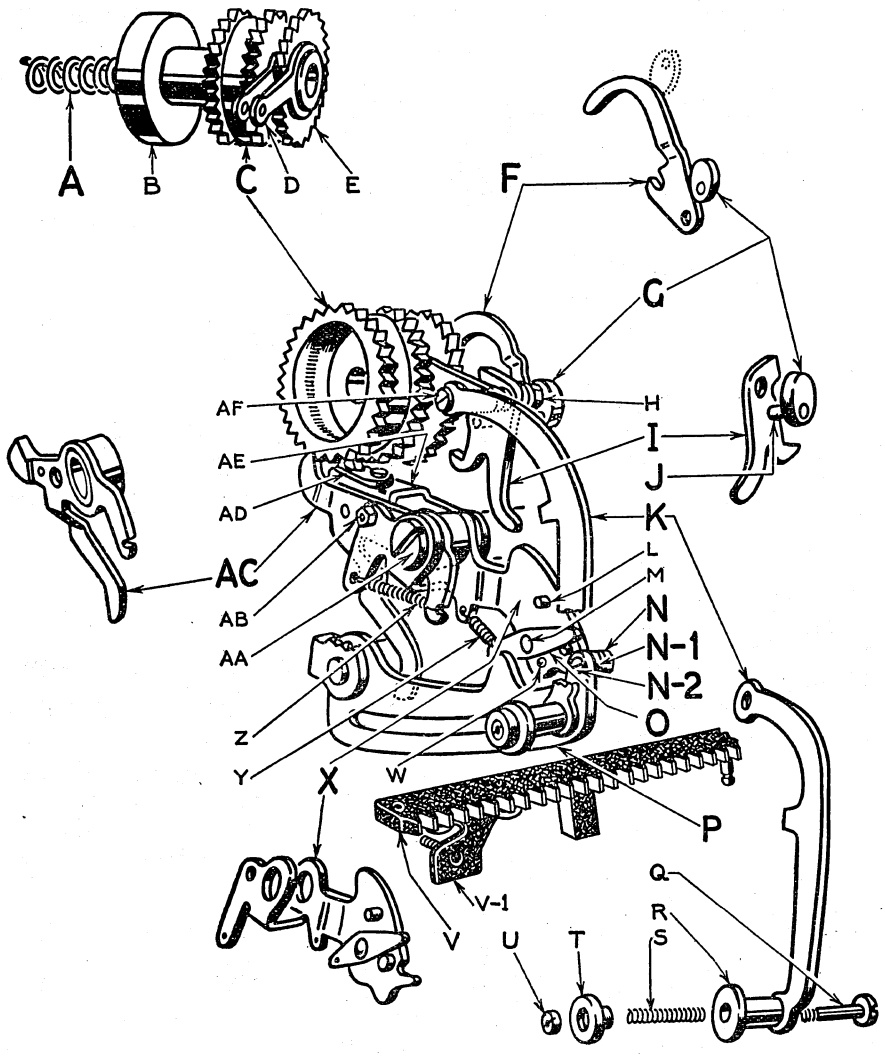


SYMBOLS (Plate 89)

A **203502** spring stud
B **350¼A** spring stud
C **79810** spring
D **203183A** slotted punching
E **7264** plain stud
F **4462** screw stud
G **1-4949C Env. 1671** gear assembly
H **2841⅛D** inside sliding clutch
I **1-2839¼D (21-2839¼D)** twirler use 2850⅛ screw
J **1-2822 Env. 1671** feed pawl, use spring 2887½
K **1-203193R Env. 1671 (1-142R No. 1 Fte. 203 Env. 1671)**
L **1-2816A No. 1 Env. 1671** detent assembly, use spring 2886¾
1-4916A No. 1 Env. 1671 detent assembly used on left end
M **7357½** screw
N **12083** spring
O **11A-203006A Style 12, 15 or 18** assembly consists of right and left end plates pinned to shaft for visible aligning bail const., specify machine number
1D-203006A Style 12, 15 or 18 same assembly as above item for non-visible aligning bail const., specify machine number
1A-6 Fte. 213 same assembly as above item for bill ejector mechanism, specify machine number
P **75814** spring
Q **203113 Env. 1671** punching contacting with stud "F" and connected to spring "P"
R **1-203800 No. 6** spring assembly
S 1-158R Fte. 213* end plate furnished with following items:
1A-2A Fte. 213 Style 12, 15 (21A-2A Fte. 213 Style 12, 15, 203029 No. 2 Style 12, 15 or 1-203029 No. 2 Style 12, 15, 950¾, 203423 No. 2) shaft and end plates assembled for bill ejector carriage, specify machine number
1A-2A Fte. 213 Style 18 shaft and end plates assembled for bill ejector carriage, specify machine number
1-203102AR* end plate furnished with following item:
1A-203002 No. 1 Style 12, 15 or 18 shaft and end plates assembled for standard Type 20 carriage, specify machine number

SEE EXPLANATION ON INSIDE OF FRONT COVER

ONE INCH SPACING MECHANISM (Plate 90)



SYMBOLS (Plate 90)

A **2881B** Spring
B **2841⅛D**
C **1-49½R Fte. 86** (28 teeth) includes "D" and "E"
D 2813½A*
E 2828⅛A*
F **14½AR Fte. 86 No. 2,** use 14½AL Fte. 86 No. 2 on left end, use screw 203539A
G 31 Fte. 86*
H **46** Nut
I **1-22R Fte. 86 No. 2,** includes "G" and "J," use 1-22L Fte. 86 No. 2 on left end, use spring 2887
J 61 Fte. 86* Stud
K **1-22½AR Fte. 86** use 1-22½AL Fte. 86 on left end
L **12053⅛** Stud
M **60 Fte. 86** Rivet stud
N **46¼** Nut
N-1 **40 Fte. 86** Roller
39 Fte. 86 Shoulder collar
N-2 **53 Fte. 86** Eccentric shoulder screw
O **18 Fte. 86** Punching
P **1-3 Fte. 86 No. 1 Styles 12", 15", 18"** Includes shaft assembly with shift lever, specify machine number and style
Q **54 Fte. 86**
R 33 Fte. 86*
S **282¾** Spring
T **57 Fte. 86 (505 Fte. 400)**
U **56 Fte. 86**
V **1-17 Fte. 86 Style 17 (12") (18") No. 1** see note below
1-17 Fte. 86 (15") or (24") No. 1 see note below
1-17 Fte. 86 Style 17 (12") (18") No. 2 see note below
1-17 Fte. 86 (15") or (24") No. 2 see note below
1-17 Fte. 86 Style 9 (12") No. 3 see note below
1-17 Fte. 86 Style 11, 17 (12") (18") No. 3 see note below
1-17 Fte. 86 (15") or (24") No. 3 see note below
Note—Above mentioned rack bars are for Class 1, 2, 6, 11-30 SACT carriage, MRC with 1-inch platen spacing as follows:
No. 1 used on S&N carriage with 1-inch platen spacing on both sides
No. 2 used on S&N or regular carriage with 1-inch platen spacing on right side only
No. 3 used on S&N carriage with 1-inch platen spacing on left side only
V-1 **1-17¼R Fte. 86** Bracket fastened to rack bar with rivet stud 12051⅛
1-17¼L Fte. 86 Bracket used on left end of rack bar
W **450⅝** Stud, use spring 10983
X **1-25R Fte. 86** includes "L," "M," "O," "V," "X," "AA," specify 1-25L Fte. 86 when used on left end
Y **9586** Spring
Z **2887** Spring
AA **2857½C** Screw, use screw 58 Fte. 86 No. 1 for left end
AB **75618** Screw, 46¼ nut
AC **1-23R Fte. 86** use 1-23L Fte. 86 for left end of carriage
AD 2841¾B* Roll contacting with ratchet wheel
2858⅞A* Pin for roll
2822⅜B* Punching holding pin in place
2856⅝A* Rivet holding punching to "AD"
AE **1-28R Fte. 86 No. 1** for carriages with 1 inch platen spacing for Classes 1, 2, 6, 11-16 SACT
1-28R Fte. 86 No. 2 for carriages with 1 inch platen spacing for Classes 20 thru 30 SACT
Specify 1-28L Fte. 86 No. 1 or 2 for similar parts used on left end
Above parts include "AC"
AF **55 Fte. 86** Screw

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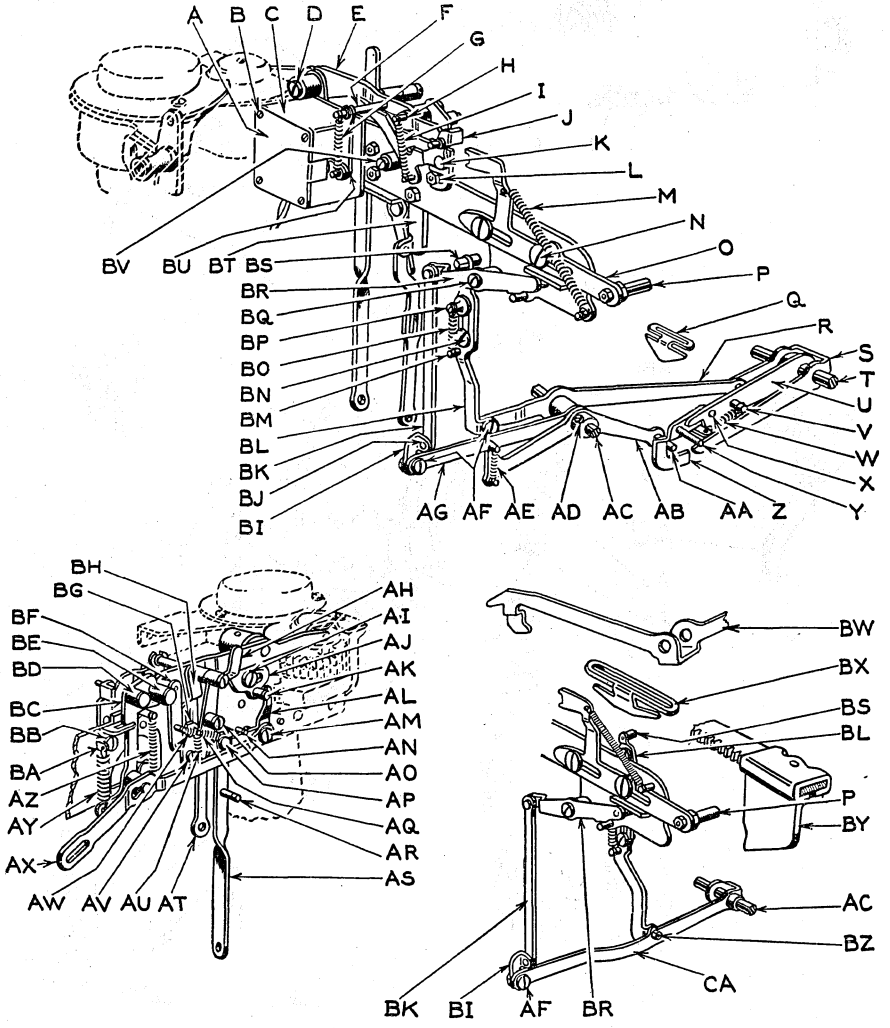
INTERMITTENT CARRIAGE RETURN FROM TOTAL KEY MECHANISM, WITH CARRIAGE CONTROLLED DISABLING MECHANISM (Plate 91)

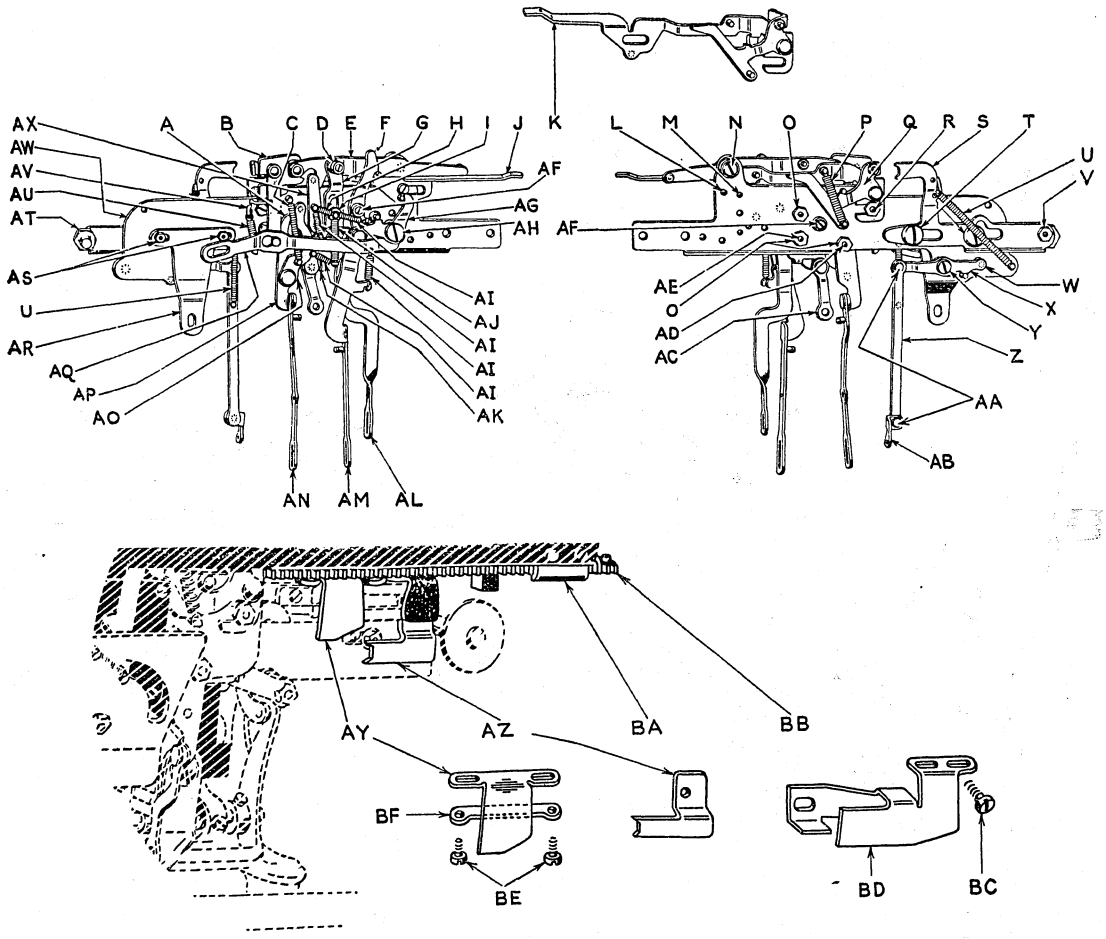


SYMBOLS (Plate 91)

A **12023⅛** Plate
B **7562** Screws (4 required)
C **1C-12092** Assembled switch box fastened to casting with screws 12055⅜, parts "A" and "B" not included, order separately
D **8054¾** Screw
E **1-12015A**
F **12063¾A** Stud
G **10082½** Spring
H **652⅛** Stud included with "AJ"
I **12080⅝** Spring
J **1-120 Fte. 201** use stud 545 Fte. 216
K **12052⅝** Rivet
L **12059½** Screw, 12046 shoulder nut
M **986** Spring
N **521 Fte. 201** Screw (2 required)
O **1-123 Fte. 201** includes "P"
P **516 Fte. 201** Stud, 47 nut, 1097¼ lock washer
Q **115B Fte. 209 No. 1 or 2**
R **1-12025 No. 33**
S **100 Env. 1352**
T **1B-1 Fte. 201 Style 13 or 17** Specify machine number
U 1-145 Fte. 201* furnished with "T"
V **3450** Stud
W **7480B** Spring
X **351½** Rivet
Y Stud for "Z" specify this plate number
Z 1-146 Fte. 201*
AA **12033⅝** Roll, 83522 stud
AB **1-12025A No. 32**
AC **12008 No. 1 Style 9, 11, 13 or 17**
AD **1-540** Collar, use screw 550¾
AE **84815 (12080⅝)** Spring
AF **8050½B** Screw, 46 nut
AG **1-12025A No. 31**
AH **1-12011½A**
AI **12057⅞** Screw
AJ **1-135A Fte. 201**
AK **500 Fte. 201 (200525½)** Stud and 200422 roll
AM **515 Fte. 201** Screw
AN **10950½** Stud
AO **2850⅜** Screw
AP **351½** Rivet
AQ **10180** Spring
AR **60530** Stud, use spring 75816
AT 12027¾A Style 17* Link fastened to "BH" by rivet 351½
AU **3489** Spring
AV **12060½** Screw
AW **7287 Style 5** Spring
AX **12022⅛A**
AY **10785½** Spring
AZ **986** Spring
BA **12013½** Latch
BB **12059½** Screw, 12046 shoulder nut
BC **1-12018½A (1-12018½ No. 3)** includes "BD"
BD **12062⅛** Stud, 12038⅛ roll
BE **12060¼** Stud, 12035 roll
BF **1A-12012** includes studs and hub
BG **12058¾** Screw stud, 12046½ nut
BH **1-12013 1/16A Style 17 (1-12013 No. 3, 12027¾ No. 2 Style 17, 259½, 1097¾ and 46)**
BI **133 Fte. 201** included with "BK"
BJ **7262½** Rivets used at top and bottom
BK **1-126 Fte. 201** includes "BI" and "BJ"
BL **1-104A Fte. 209 Env. 1352**
BM **1353¼** Stud
BN **9053⅝** Screw or 10056 screw
BO **16880** Spring
BP **7151⅛** Spring stud
BQ **73607** Screw
BR **1-125 Fte. 201** includes "BI," "BJ," "BK"
BT **1-203161** includes parts attached
BU **1B-12023¾B** Contact point assembly
BV **2850⅜** Screw
BW **60127C Style 17 Env. 1162**
BX **115B Fte. 209 No. 1** for adding and printing mechanism, carriage control **115B Fte. 209 No. 2** for crossfooter non-clear or register total indexing lever, carriage controlled
BY **140 Fte. 201** use screws 3361¼A
BZ **251⅜** Screw, 824¼ washer, 46 nut

SEE EXPLANATION ON INSIDE OF FRONT COVER

INTERMITTENT CARRIAGE RETURN INDEXED FROM TOTAL KEY, CARRIAGE CONTROLLED (Plate 92)



SYMBOLS (Plate 92)

A **12014½**
B **1-136 Fte. 201** Specify machine number. Note—12051¼ is screw in lower part fastening 1-136 Fte. 201 to plate
C **986** Spring
D **200352** Roll, 73611 screw
E **1-12015A**
F **1-11½B Fte. 130**
G **1-13½ Fte. 130 Style 13 or 17**
H **7287 Style 5** Spring
I **12058¾** Spring screw stud, 12046½ nut
J **1-135B Fte. 201**
K **1-135A Fte. 201**
L **522 Fte. 201** Screw for "J"
12057⅞ Screw for "K"
M **9050⅞** Screw
N **8054¾** Screw
O **12046½** Shoulder nut
P **12080⅜** Spring
Q **1-120 Fte. 201** included with "J," "K"
R **12059½** Screw
12046 Shoulder nut
S **1-123 Fte. 201** includes "V," "AT"
T **521 Fte. 201** Screw (2 required)
U **986** Spring
V **47** Nut, 1097¼ lock washer
W **301 Fte. 201 (200422)** Roll
500 Fte. 201 (200525½) Stud
X **1-125 Fte. 201** includes "W," "Z," "AA," "AB"
Y **73607** Screw
Z **1-126 Fte. 201** included with "X"
AA **7262½** Rivet
AB **133 Fte 201** included with "X"
AC 12027¾A Style 17* use rivets 351½
AD **12051¼** Screw
AE **51 Fte. 130 (9755½)** Screw
AF **2850⅜** Screw
AG **12018 1/16 (12018 1/16A)** included with "AM"
AH **12062⅝** Screw, collar under screw is 12037¾
AI **10180** Spring
AJ **3489** Spring
AK **1-19 Fte. 130** Pawl using spring "AI"
AL **1-16A Fte. 130 Style 13 or 17**
AM **1-12018 1/16A** includes "AG," use spring 283A on spring stud
AN **203162 No. 2** use 76808 spring on spring stud and rivet 351½ to fasten link, included with "AP"
AO **1-12013¼** included with "AP," use rivet 12050¼
AP **11A-203161** includes "AO" and "AN"
AQ **12022⅛A**
AS **46** Nut
AT **516 Fte. 201**
AU **10785½** Spring
AV **12013½** Latch
AW **1-110A Fte. 201** Plate
COMPLETE ASSEMBLED PLATE
2B-668 Fte. 201 Style 13 or 17 No. 1 for skip normalizing bar, specify machine number
COMPLETE ASSEMBLED MRC UNIT PLATE AND "BOTTLE" CASTING
For Classes 20 and 30 machines with selective Dr. and Cr., carriage return, selective column return, motor driven carriage throwback on tab. and intermittent carriage return mechanism.
2B-668 Fte. 201 Style 13 or 17 No. 2 specify machine number
AX **1A-12012**
AY **140 Fte. 201** use screws 3361¼A when "BF" is not used
AZ **139 Fte. 201**
BB **1-170 Fte. 201 Style 15, 17H, 17K or 231334**
BC **75602** Screw (2 required)
BD **140 Fte. 201 No. 2**
BE **103500**
BF **144 Fte. 201**

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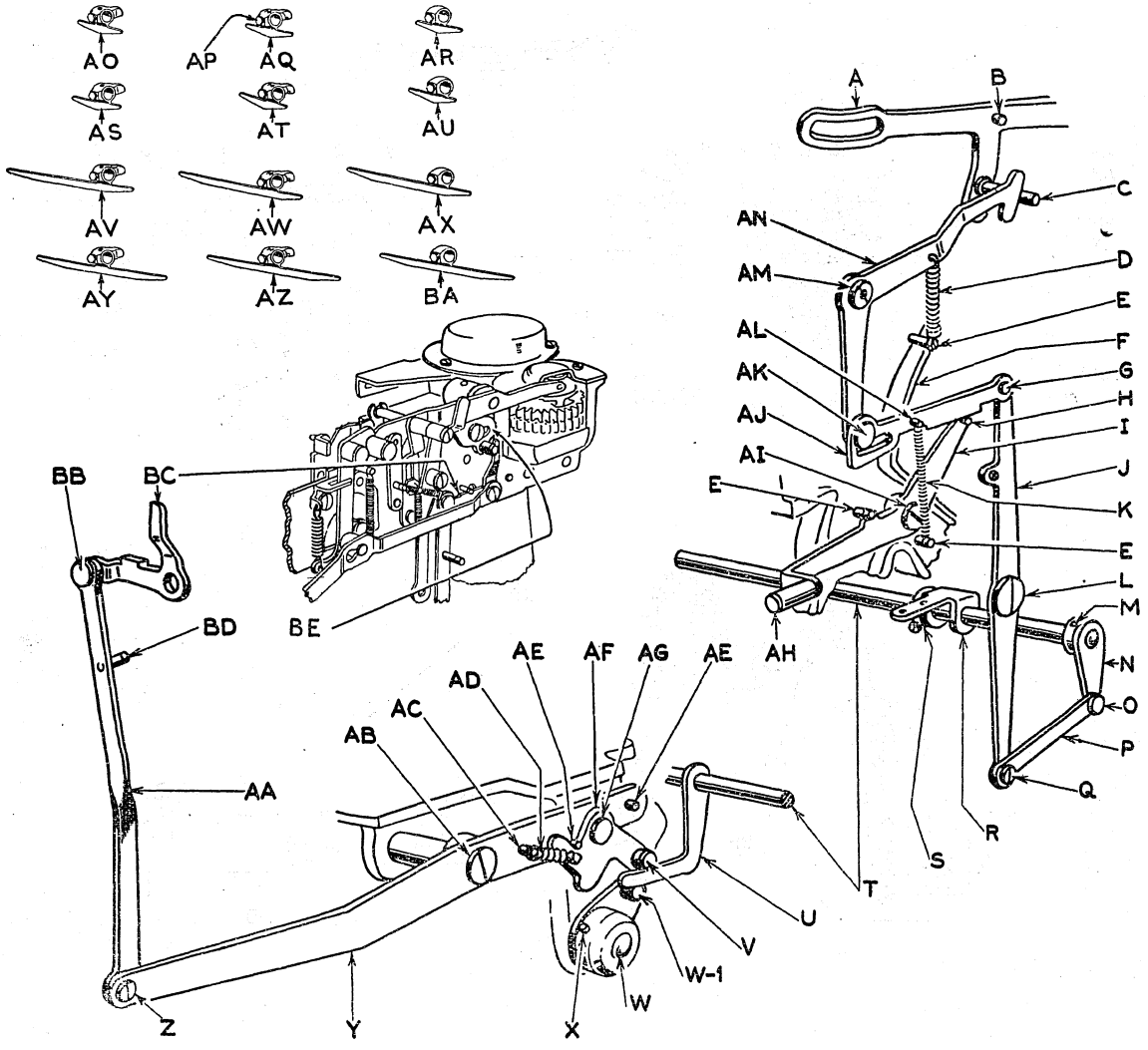
INTERMITTENT CARRIAGE RETURN FROM TOTAL KEY, SELECTIVE CLASSES 20 THRU 30 (Plate 93)



SYMBOLS (Plate 93)

A **1-202225**
B **253⅛** Stud
C **202505A** Stud
10239 Short roll
932⅛ Long roll
7914½A Washer
D **480¼** Spring
E **514 Fte. 201 (72608A)** Stud
F **666L Fte. 201** Side frame, specify "R" for right side
G **7262½** Rivet
H **3456⅝** Stud
K **10983** Spring
L **4454¼ Style 11** Screw to be used for replacements in the field prior to this date of issue. When new parts "AN" are replaced, use same screw and an additional washer 306A Fte. 200 No. 2
M **52**
N 105 Fte. 201* includes "O," "P," included with "T"
O **7262½** Rivet
P **104 Fte. 201**
Q **72582** Screw, 49 nut
R **22⅜ Fte. 104**
S **1-75332** Collar including screw 75618
T **1B-1 Fte. 201** Specify machine number
U 1-111 Fte. 201*
V **301 Fte. 201 (200422)** Roll
504 Fte. 201 Stud
W **1-201002A**
W-1 **7948** Roll
201516 Stud
X **56½** Pin
Y **1-107 Fte. 201** includes "AC," "AD," "AE," "AF," "AG," "V"
Z **251** Screw, 46 nut
AB **393** Hexagon nut
AC **10950½** Stud
AD **3486½** Spring
AE **7753¼** Stud
AF **1-106 Fte. 201** Pawl, spring stud is 69510
AG **9051⅞** Rivet
AH **312 Fte. 200** Roll
543 Fte. 200 Stud
AI **12053⅛** Screw
12029½ Washers
74245 Washers
AJ **1-102 Fte. 201** includes "AL," included with "AN"
AK **501 Fte. 201 (8450¾)** Rivet stud
AL **3464⅞** Stud
AM **200597** Screw
305 Fte. 201 Bushing
AN **1-101 Fte. 201** includes "G," "AJ," "AK," "AL"
AO **1-900 Fte. 207 No. 6**
AP **2862¼** Screws used in all stops
AQ **1-900 Fte. 207 No. 14**
AR **1-900 Fte. 207 No. 15**
AS **1-900R Fte. 207 No. 6** Specify "L" for left
AT **1-900R Fte. 207 No. 14** Specify "L" for left
AU **1-900R Fte. 207 No. 15** Specify "L" for left
AV **11-900R Fte. 207 No. 6** Specify "L" for left
AW **11-900R Fte. 207 No. 14** Specify "L" for left
AX **11-900R Fte. 207 No. 15** Specify "L" for left
AY **11-900 Fte. 207 No. 6**
AZ **11-900 Fte. 207 No. 14**
BA **11-900 Fte. 207 No. 15**
BB **351½** Rivet
BD **60530** Stud, use spring 75816
BE **1-135A Fte. 201**

SEE EXPLANATION ON INSIDE OF FRONT COVER

PAPER HOLDERS FOR ROLL PAPER (Plate 94)

SYMBOLS (Plate 94)

A **2-12010⅛ Style 3 $\frac{15}{32}$** Complete roll paper holder for Classes 1, 2 and 6 machines with split and normal platen for 6-inch paper

B **2-12010$\frac{5}{16}$ Style 13 or 17** Complete roll paper holder for Classes 2 and 6 MRC. Machines without split and normal carriage. Use Style 13 for Style 11

C **2-12010$\frac{5}{16}$ Style 6** Complete roll paper holder for Classes 1, 2, 6, 11 through 16. MRC const. with 6-inch left-hand split with toggle feed

D **2-11$\frac{15}{16}$ Fte. 88 Styles 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 10, 11** Complete roll paper holder for public utility machines

E **2-147 Fte. 213 Styles 3½, 6, 9, 12, 15, 18** Complete roll paper holder for Type 20 automatic bill ejector carriage

F **1-203203B Style 3½, 6, 9, 12** Complete roll paper holder for Type 20 carriage

1-203203B Style 15, 18 Complete roll paper holder for Type 20 carriage. Will accommodate roll paper widths 14¾" for Style 15, 17¾" for Style 18

11-203203B Style 15, 18 Complete roll paper holder for Type 20 carriage—full visible alignment; will accommodate roll paper widths 14⅝" for Style 15, 17⅝" for Style 18

1Z-203203B Style 15, 18 Complete roll paper holder for Type 20 carriage—not full visible alignment; will accommodate roll paper widths 15" for Style 15, 18" for Style 18

G **46** Nut

H **12001¼ Style 3 $\frac{15}{32}$"** Shaft

I **550¾** Screw

J **1-12010⅜ Style 13 or 17** includes "K," "L," "M," "N," use Style 13 for Styles 9 and 11

K **12016⅞**

L **8050¾** Shoulder rivet

M **3281½** Spring

N **10961½** Spring stud

O **12051⅜** Screws, 46 nut (2 each req.)

P **2861½** Knurled head screw
2862½ Plunger
2882½ Spring

Q **3½ Fte. 88 Styles 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 10, 11** use "G" on each end of shafts

R **1-12005¾ Style K** includes "P"

S **653¾** Screw

T **1-16 Fte. 88** includes "S"

U **3¼ Fte. 88 Styles 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 10, 11** use "G" on each end of shafts

V **1-11$\frac{15}{16}$L Fte. 88 (1-11$\frac{15}{16}$AL Fte. 88, 1-4B Fte. 88 Style 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 10 or 11)**

W **1-4A Fte. 88 Style 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 10 or 11 (1-4B Fte. 88 Style 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 10 or 11)** with milled end

1-4 Fte. 88 Style 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 10 or 11 (1-4B Fte. 88 Style 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 10 or 11 and 1A-11$\frac{15}{16}$R Fte. 88) with threaded end

X **203027 No. 3 Styles 3½, 6, 9, 12, 15, 18** used with assembly 1-203203B refer to "F"

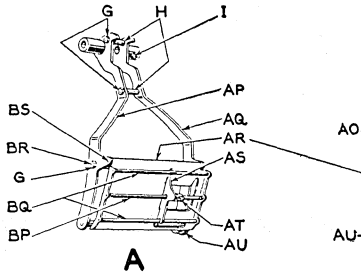
203027 No. 4 Style 15, 18 used with assembly 11-203203B refer to "F"

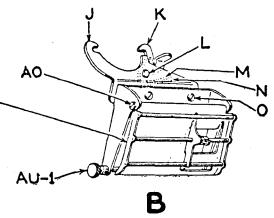
Y **203027 Styles 3½, 6, 9, 12, 15, 18** used with assembly 1-203203B, refer to "F"

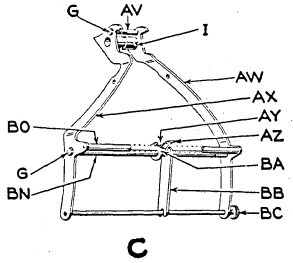
203027 No. 2 Styles 15, 18 used with assembly 11-203203B, refer to "F"

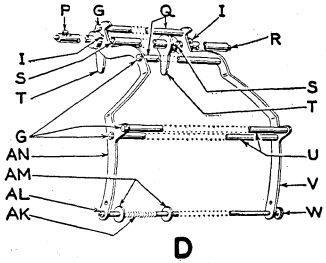
Z **203203B** (2 required)

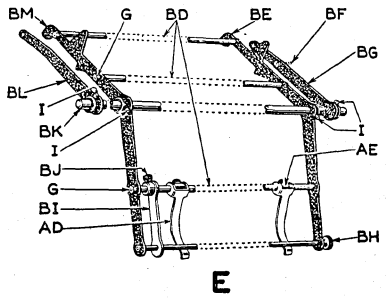
AA **203023A Styles 3½, 6, 9, 12, 15, 18** used with assembly 1-203203B, refer to "F"

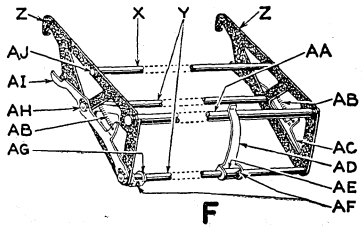












203023A No. 2 Styles 15, 18 used with assembly 11-203203B, refer to "F"

AB **75814** Spring (2 required)

AC **203204AL**

AD **203201** (one or more required)

AE **203460** Collar (one or more required) use spring 203808

AF **75618** Screw

AG **203202R**

AH **203446A** Shoulder nut (one or more required)
913⅜ Washer (one or more required)

AI **203204AR**

AJ **103514 No. 1 Style E** Hexagon head screw
1097⅞ Lock washer (one or more required)

AK **83⅛ Fte. 88** Spring

AL **8081A** Straight spring in hub

AM **721**

AN **1A-11$\frac{15}{16}$R Fte. 88** includes hubs and "AL"

1-11$\frac{15}{16}$R Fte. 88 (1A-11$\frac{15}{16}$R Fte. 88, 1-4B Fte. 88 Style 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 10 or 11)

AO **2850⅜** Screw (2 required)

AP **1-12010⅛R Style 3$\frac{15}{32}$** includes hub

AQ **1-12010⅛L Style 3$\frac{15}{32}$** includes hub

AR **1-2810⅛** includes "AS," "AT," "BP," "BQ"

AS **1-2812⅛** includes "AT"

AT **2813⅛** Lever
2852$\frac{5}{16}$ Pin
2880¼ Spring
2832¼* Hub

AU **1-12005 Style 3$\frac{15}{32}$**

AU-1 **1-2800 (1-83001 Style 12¼)**

AV **12001$\frac{5}{16}$ Style 6**

AW **1-12010$\frac{5}{16}$L Style 6 (1-12010$\frac{5}{16}$AR Style 6, 1-12010$\frac{5}{16}$AL Style 6, 12001$\frac{5}{16}$A Style 6)**

AX **1-12010$\frac{5}{16}$R Style 6 (1-12010$\frac{5}{16}$AR Style 6, 1-12010$\frac{5}{16}$AL Style 6, 12001$\frac{5}{16}$A Style 6)**

AY **12083** Spring

AZ **12013⅜ Style 6** included with "BB"

BA **256¼A (12062$\frac{5}{16}$)**

BB **1-12011¼ Style 6** includes "AY," "AZ," "BA"

BC **1-12005 Style 6**

BD **12 Fte. 213 Styles 3½, 6, 9, 12, 15, 18 (12A Fte. 213 Style 3½, 6, 9, 12, 15, 18 and 1-14B Fte. 213 Style 3½, 6, 9, 12, 15, 18)**

BE **1-147BL Fte. 213** includes hub and screw "I"

BF **7357½** Screw (4 required)

BG **1-146L Fte. 213** includes hub and screw

BH **1-14A Fte. 213 Style 3½, 6, 9, 12, 15, 18 (1-14B Fte. 213 Style 3½, 6, 9, 12, 15, 18 and 12A Fte. 213 Style 3½, 6, 9, 12, 15, 18)**

BI **1-155 Fte. 213** includes hub

BJ **203555** Knurled head screw (3 req.)

BK **13 Fte. 213** (19$\frac{15}{16}$" long)

BL **1-146R Fte. 213** includes hub and screw

BM **1-147BR Fte. 213** includes hub and screw

BN **12002½ Style 6**

BO **12002¼ Style 6**

BP **2801½**

BQ **2803½**

BR **12002½A Style 3$\frac{15}{32}$** Shaft between end plates

BS **12002¼A Style 3$\frac{15}{32}$** Shaft supporting paper guide

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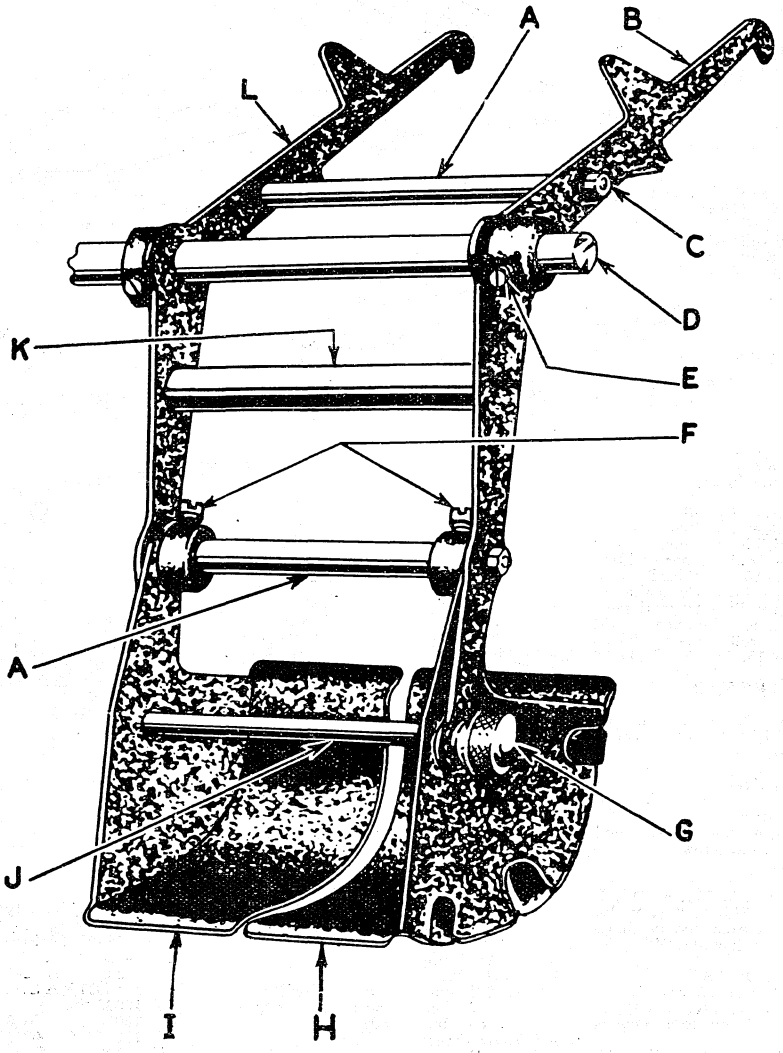
ROLL PAPER HOLDER FOR FORM EJECTOR CARRIAGE (Plate 94-1)



SYMBOLS (Plate 94-1)

2A-147 Fte. 213 Specify Style 12, 15, 18 Complete paper holder
A **12A Fte. 213** Specify length
B **1-147BL Fte. 213**
C **46** Nut, 1097/16 washer
D **13 Fte. 213** Specify length
E **550**¾ Screw
F **75618** Screw
G 2830¾*
H **1-155½AL Fte. 213**
I **1-155½AR Fte. 213**
J **1-14B Fte. 213** Specify length, includes "G"
K **1-912 Fte. 213** Specify length
L **1-147BR Fte. 213**

COMPLETE CARRIAGES

(Plate 95)

(Specify Style of Machine When Ordering Carriages)

The following are standard style carriages.

Symbol No.	Mach. Style	Description
31-2865C (12¼″)	9 to 17H	12¼″ Rear Feed Cge. without I. & E.
31-2865C (18″)	9 to 17K	18″ Rear Feed Cge. without I. & E.
31-2865C MRC (12¼″)	9 to 17H	12¼″ Rear Feed Cge. without I. & E.
31-2865C MRC (18″)	9 to 17K	18″ Rear Feed Cge. without I. & E.
31-4865C (12¼″)	9 to 17H	12¼″ Rear Feed Cge. with Right-hand I. & E.
31-4865C (18″)	9 to 17K	18″ Rear Feed Cge. with Right-hand I. & E.
31-4865C MRC (12¼″)	9 to 17H	12¼″ Rear Feed Cge. with Right-hand E. & I.
31-4865C MRC (18″)	9 to 17K	18″ Rear Feed Cge. with Right-hand I. & E.
2-203665 (12″)	13-17	12″ Front Feed Cge., Type 20
2-203665 (15″)	13-17	15″ Front Feed Cge., Type 20
2-203665 (18″)	13-17	18″ Front Feed Cge., Type 20
12-203665 (12″) (3¾″R) (3¾″L)	13-17	12″ Front Feed S. & N. Cge., 3¾″ Split, Right or Left, Type 20
12-203665 (12″) (5″R) (5″L)	13-17	12″ Front Feed S. & N. Cge., 5″ Split, Right or Left, Type20
12-203665 (12″) (6″)	13-17	12″ Front Feed S. & N. Cge., 6⅛″ Split, Type 20
12-203665 (15″) (3″R) (3″L)	13-17	15″ Front Feed, S. & N. Cge., 3″ Split, Right or Left, Type 20
12-203665 (15″) (5″R) (5″L)	13-17	15″ Front Feed S. & N. Cge., 5″ Split, Right or Left, Type 20
12-203665 (15″) (7½″)	13-17	15″ Front Feed S. & N. Cge., 7½″ Split, Type 20
12-203665 (18″) (3¾″R) (3¾″L)	13-17	18″ Front Feed S. & N. Cge., 3¾″ Split, Right or Left, Type 20
12-203665 (18″) (5″R) (5″L)	13-17	18″ Front Feed S. & N. Cge., 5″ Split, Right or Left, Type 20
12-203665 (18″) (6″R) (6″L)	13-17	18″ Front Feed S. & N. Cge., 6″ Split, Right or Left, Type 20
12-203665 (18″) (8″R) (8″L)	13-17	18″ Front Feed S. & N. Cge., 8″ Split, Right or Left, Type 20
22-203665 (12″)	13-17	12″ Front Feed Cge. with Full Visible Alignment and Selective Operation Control, Type 20
22-203665 (15″)	13-17	15″ Front Feed Cge. with Full Visible Alignment and Selective Operation Control, Type 20
22-203665 (18″)	13-17	18″ Front Feed Cge. with Full Visible Alignment and Selective Operation Control, Type 20
32-203665 (12″)	13-17	12″ Front Feed Cge. with Full Visible Alignment and Geared Pressure Rolls, Type 20
32-203665 (15″)	13-17	15″ Front Feed Cge. with Full Visible Alignment and Geared Pressure Rolls, Type 20
32-203665 (18″)	13-17	18″ Front Feed Cge. with Full Visible Alignment and Geared Pressure Rolls, Type 20
42-203665 (12″)	13-17	12″ Front Feed Cge., not Full Visible Alignment with Geared Pressure Rolls, Type 20
42-203665 (15″)	13-17	15″ Front Feed Cge., not Full Visible Alignment with Geared Pressure Rolls, Type 20
42-203665 (18″)	13-17	18″ Front Feed Cge., not Full Visible Alignment with Geared Pressure Rolls, Type 20
2-203665 No. 1 (12″)	13-17	12″ Front Feed Cge. with Full Visible Alignment and Improved Geared Pressure Rolls, Type 20
2-203665 No. 1 (15″)	13-17	15″ Front Feed Cge. with Full Visible Alignment and Improved Geared Pressure Rolls, Type 20
2-203665 No. 1 (18″)	13-17	18″ Front Feed Cge. with Full Visible Alignment and Improved Geared Pressure Rolls, Type 20
2-203665 No. 2 (12″)	13-17	12″ Front Feed Cge., not Full Visible Alignment with Improved Geared Pressure Rolls, Type 20
2-203665 No. 2 (15″)	13-17	15″ Front Feed Cge., not Full Visible Alignment with Improved Geared Pressure Rolls, Type 20
2-203665 No. 2 (18″)	13-17	18″ Front Feed Cge., not Full Visible Alignment with Improved Geared Pressure Rolls, Type 20
2-203665 No. 3 (18″)	17	18″ Front Feed Form Ejector Cge., Style 1, Type 20
2-203665 No. 5 (15″)	13	15″ Front Feed Cge. with Full Visible Alignment for Mach. Style 25 13 07
2A-665 Fte. 203 (12″)	13-17	12″ Front Feed Cge. with Bill Magazine, Type 20
2A-665 Fte. 203 (15″)	13-17	15″ Front Feed Cge. with Bill Magazine, Type 20
2A-665 Fte. 203 (18″)	13-17	18″ Front Feed Cge. with Bill Magazine, Type 20
12A-665 Fte. 203 (12″)	13-17	12″ Front Feed Cge. with Bill Magazine and New Style Bill Stops, Type 20, Telephone Billing
12A-665 Fte. 203 (15″)	13-17	15″ Front Feed Cge. with Bill Magazine and New Style Bill Stops, Type 20, Telephone Billing

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(Plate 95) Continued

Symbol No.	Mach. Style	Description
12A-665 Fte. 203 (18″)	13-17	18″ Front Feed Cge. with Bill Magazine and New Style Bill Stops, Type 20, Telephone Billing
32-665 Fte. 203 (12″)	13-17	12″ Front Feed Cge. with Full Visible Alignment and Fte. 213 Pressure Rolls, Type 20
32-665 Fte. 203 (15″)	13-17	15″ Front Feed Cge. with Full Visible Alignment and Fte. 213 Pressure Rolls, Type 20
32-665 Fte. 203 (18″)	13-17	18″ Front Feed Cge. with Full Visible Alignment and Fte. 213 Pressure Rolls, Type 20
2-665 Fte. 213 (18″)	13-17	18″ Front Feed Ejector Cge., Style 1, low printing line construction, Type 20
12-665 Fte. 213 (18″)	13-17	18″ Front Feed Ejector Cge., Style 1, high printing line construction, Type 20
22-665 Fte. 213 (18″)	13-17	18″ Front Feed Ejector Cge., Style 1, Type 20, Telephone Billing

COMPLETE STOP AND CONTROL BARS

(Plate 96)

(Specify Basic Symbol, Width and Set-up Specifications)

STOP BARS

Symbol No.	Width	Used On
2-2804¾	12″, 15″, 18″, 24″	Classes 1, 2, 6, 11-16, Type 20
ROTATING STOP BAR		
2-23 Fte. 203	12″, 15″, 18″	Double Set-up
CONTROL BARS		
1-3203¾B	12″, 18″, 24″	Classes 1, 2, 6, Not MRC
1-3203 (for A.C.T. or not VHB)	12″, 18″, 24″	Classes 1, 2, 6, not MRC
1-3203¾B MRC	12″, 15″, 18″, 24″	Classes 1, 2, 6, MRC and 11, 20, 21
11-3203¾B	12″, 18″, 24″	Classes 12-16, includes Register Skid
11-3203¾B	12″, 15″, 18″	Classes 22-30, includes Register Skid

COMPLETE ADJUSTABLE ROLLS

(Plate 97)

Classes 1, 2, 6, 11-16, 20-30

Symbol No.	Description
2-10045⅞B No. 10 Special	2-Way Adjustable Roll
12-10045⅞B No. 10 Special	3-Way Adjustable Roll
22-10045⅞B No. 10 Special	4-Way Adjustable Roll

SERIES H MACHINES

Classes 1, 2, 6, 11 thru 16 and 20 thru 30

KEYBOARD

Symbol List

January 5, 1949

*Issued*_____

*To*_____

*Of*_____

Property of and to be returned to

BURROUGHS ADDING
MACHINE COMPANY

DETROIT, MICHIGAN

Mr M R Lovejoy
Buffalo N Y Branch 10-5

Printed in U. S. America 1-5-49

Form 2961

WHERE DISCARDED SYMBOLS (NOT REQUIRED FOR REPAIRS) ARE REPLACED BY ACTIVE SYMBOLS, THE ACTIVE SYMBOLS ARE SHOWN IN PARENTHESES FOLLOWING THE DISCARDED SYMBOLS.

EXAMPLE: 1-8817¼ (3261B, 1-8801AZ STYLE 12 OR 20, 1-8817BR NO. 4, 8817½ZL, 8828¼C, 8828½B, 47¾, 49¼—2 PCS., 79543—2 PCS.)

SYMBOLS WHICH ARE NO LONGER AVAILABLE AND WHICH HAVE NOT BEEN REPLACED BY ACTIVE SYMBOLS HAVE BEEN REMOVED FROM THE VARIOUS PLATES.

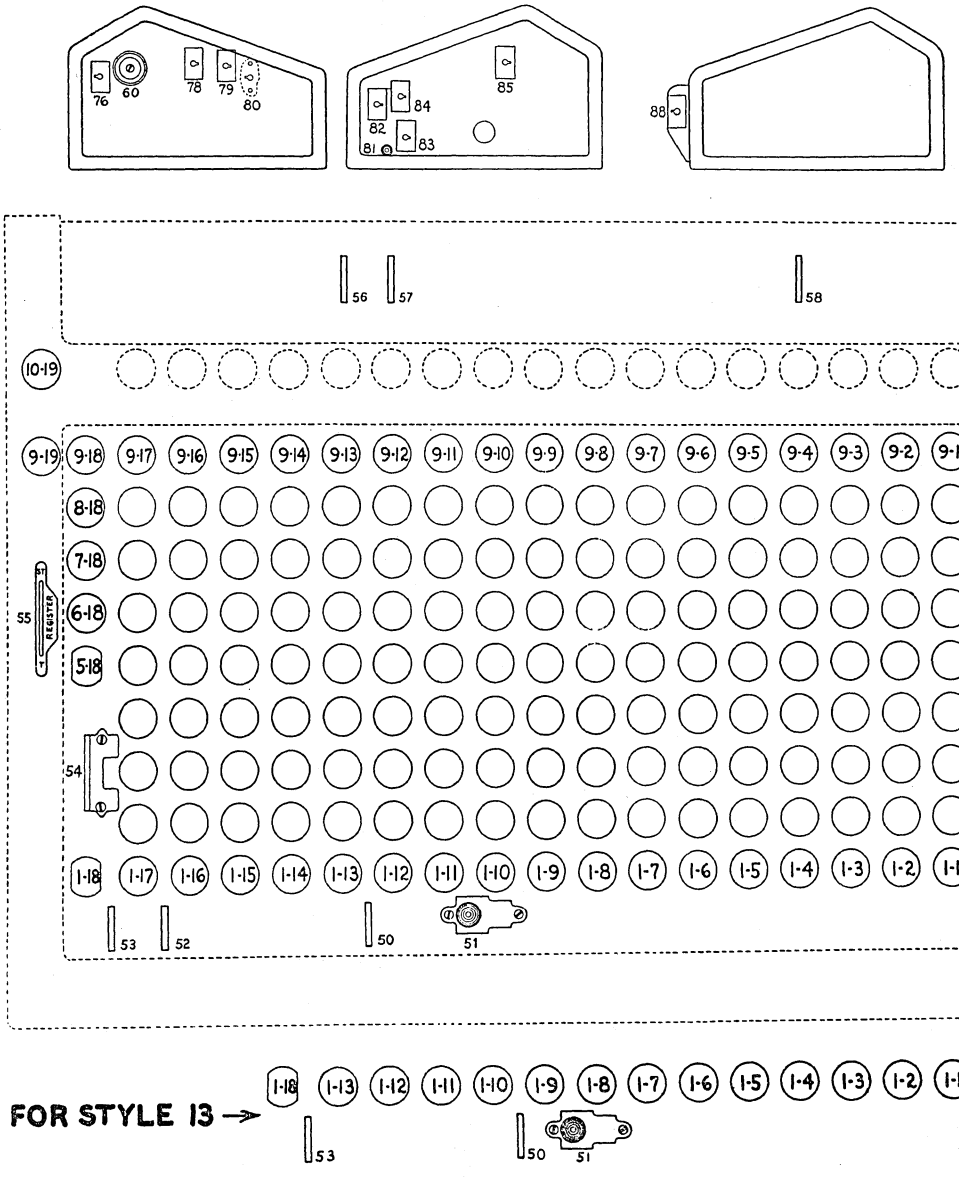
INDEX OF MECHANISMS

DESCRIPTION	Plate No.
Automatic Repeat Mechanism (Classes 20 thru 30)	13
Automatic Repeat Mechanism (Classes 11 thru 16)	14
Automatic Repeat Normalizing Key Non-cycle (Classes 11 thru 16)	15
Automatic Total Repeat Mechanism Normalized by Carriage Return (Bank Posting Machine)	21
Carriage Return Bar, Lower	62
Carriage Return Bar, Upper	61
Count and Normal Mechanism Indexed from Machine Operation	26
Counter Control Mechanism (Class 6)	11
Crossfooter Add Bar Carriage Controlled	36
Crossfooter Add—Register Non-add Bar (Uppermost)	37
Crossfooter Sub-total or Total Key to Total in Last Repeat Operation via Automatic Register Total Mechanism	38
Crossfooter Subtract Mechanism Indexed from Key	32
Crossfooter Total Key Sub-total in Crossfooter Add Position and Total in Crossfooter Non-add Position	34
Crossfooter Total With Keys on Keyboard Depressed (H-903 Machines)	33
Date Repeat Key Mechanism	7
Detent for Totaling Registers (Classes 11 thru 16)	45
Enforced Designation Mechanism Normalized by Total and Sub-total Keys, Carriage Controlled	27
Flexible Keyboard	28
Installing of Repair 1A-210AR-AL Env. 1242	63
Interlock to Block Depression of the Regular Bar Following Depression of Upper and Uppermost Bars	58
Interlock to Block Regular Motor Bar Following Depression of Upper or Lower Bars, Carriage Controlled	60
Interlock to Block Sub-total Key when Subtract Lever is in Subtract Position	35
Interlock to Prevent Depressing Regular Motor Bar Following Depression of Upper or Lower Bars	56
Interlock to Prevent Depressing Upper Bar Following Depression of Other Motor Bars	59
Keyboard Assembly (Classes 1 and 2)	2–3
Keyboard Assembly (Classes 6, 11 thru 16 and 20 thru 30)	4–5
Keyboard Interlocks	6
Keyboard Plates and Their Symbols	64
Keyboard Register Selection	47
Keyboard Register Selection Spring Assembly	48
Key Restoring Mechanism	7
Key to Normalize Register Shift Release and to Normalize Sub-total from Total Mechanism	52
Keys—Position (9-19) (10-19)	5–1

DESCRIPTION	Plate No.
Lock and Key Mechanisms to Prevent Totaling Registers and to Block Motor Bar and Total Keys	29
Lock-down Total Mechanism	10
Motor Bar Interlocks	56–57–58–59–60
Negative Total Lock Disabling Mechanism	31
Non-transfer to Crossfooter	39
Non-transfer to Register	39
Operation Control Keys, Control Levers, Locks and Motor Bars	Plate A
Partial Keyboard Repeat, Single, Carriage Controlled and Normalized from Upper Motor Bar (Classes 11 thru 16 and 20 thru 30)	24
Partial Keyboard Repeat, Duplex	25
Positive Counter Control (Class 2)	12
Register Shift from Skip Bar (Classes 12 thru 16)	51
Register Shift from Subtract Lever	49
Register Shift from Withdrawal Bar (Classes 12 thru 16)	50
Register Total from Register Total Indexing Lever	43
Register Total Indexing Mechanism	41
Register Total Indexing and Subtract Levers Locked During Machine Operation No. 2	53
Register Total Indexing Lever to Normalize Carriage Opening Mechanism	54
Register Total Key Interlock	42
Register Total Symbol Mechanism	9
Register Total to Add in Non-add Position	46
Register Transfer Controlled by Total Key (Classes 11 thru 16)	40
Repeat and Cycle Normalizing Key (Classes 11 thru 16)	16
Repeat Machine Operations Indexed from Total Keys and Lower and Upper Bars (Classes 20 thru 30)	22
Repeat of Machine Cycle, Carriage Controlled (Improved)	13–1
Repeat Print and Cycle Mechanism (Classes 2, 6, 11 thru 16)	20
Repeat Print Keyboard Lock	23
Repeat Print of Sub-totals (Classes 11 thru 16, Early Style)	17
Repeat Print of Sub-totals (Classes 11 thru 16 and 20 thru 30)	19
Repeat Timing Mechanism (Classes 11 thru 16)	18
Safeguard Keyboard and Motor Bar Lock Mechanism	30
Sector Guide Repair Parts	63–1
Single Stroke Total Interlock	44
Skip Tabulating Motor Bar Mechanism (Bank Posting Machine)	55
Uppermost Bar Blocked by Regular and Auxiliary Motor Bars, Released from Total Keys	57
214's Where Used	65

OPERATION CONTROL KEYS, CONTROL LEVERS, LOCKS, AND MOTOR BARS (PLATE A)

The various operation control keys, control levers, locks, and motor bars are referred to by the numerical designations shown in the following diagram:



O.C.K.'s, operation control keys are designated first by key position and then by column position; i. e., 1-0 (position 1 column 0) through 10-19 (position 10 column 19).

50 Series—designations assigned to control levers.

No. 60—designations assigned to the dials for setting the Rotary Calendar Feature, quick set.

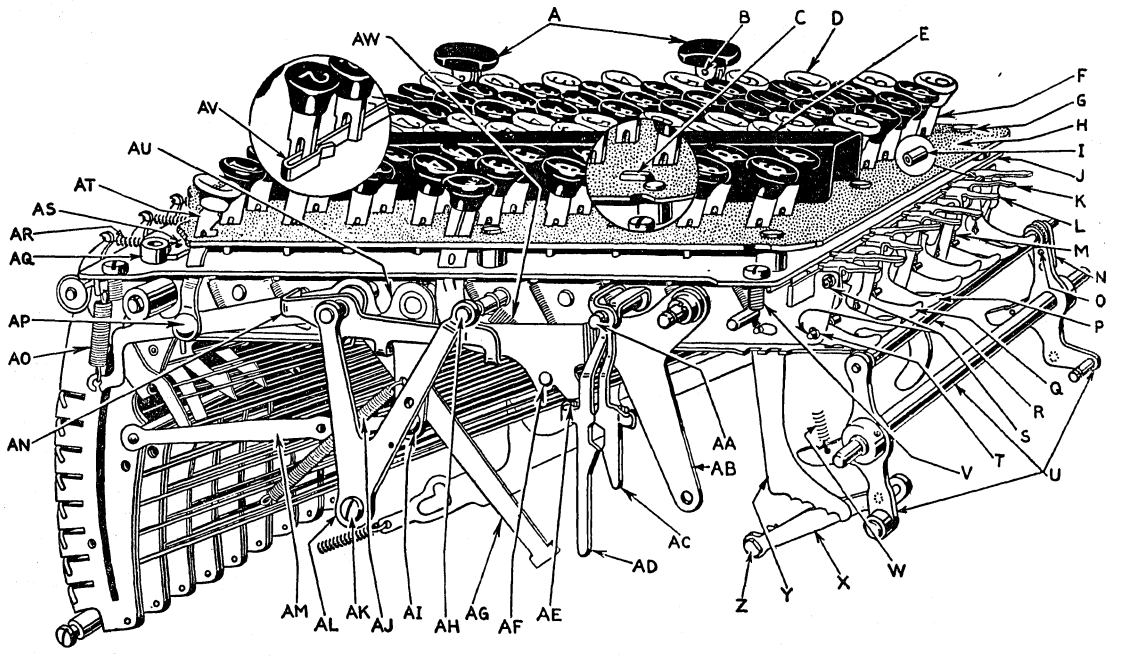
70 and 80 Series—designations assigned to locks requiring keys.

No. 81—designations assigned to the manual lock.

100 Series—designations assigned to motor bars.

KEYBOARD ASSEMBLY, CLASSES 1 AND 2 (Plate 2)

(Plate 1 in Keyboard Instruction Book only)



SYMBOLS (Plate 2)

A **1-293½** specify color
B **255¼**
C **221¾** Keyboard plug for keystem
221¼ Keyboard plug for result keys
D **291** specify color, numeral or characters
291½ Error, non-add, repeat, etc., for others specify characters
1-291 specify color, numeral or character, assembled keystem and button
E **296B No. 1** for 1 col. of keys
296B No. 2 for 2 col. of keys
296B No. 3 for 3 col. of keys
296B No. 7A for 3 col. of cal. fte. and 3 S.C.R. keys
296B No. 9A for 3 col. of cal. fte., 3 year dates and 4 S.C.R. keys
296B No. 10 for 3 col. of cal. fte., except 19 key
1-1310¾ for split, date, count and normal machines
F **221**
221 No. 3 for bridged keytops
221 No. 4 for bridged keytops—not to index 1-217AL&AR
221⅛ with notch
G **252**
H See Keyboard Plate reference chart, Plate 64
I **236A** spacing collar between 228CR & 228¼BL
236⅛ spacing collar
236⅛A spacing collar
J See Keyboard Plate reference chart, Plate 64
K **228¼BL**
L **228¼BR**
M **283A**
N **1-219¾B**
O **8064⅝** Screw
P **228CL**
Q **228CR**
R **1-202005 Blank Style 9, 11, 13, 15 or 17,** includes 10233* and 10240*
S **1-200¾ Style 9, 13, 15 or 17**
T **277**
U **1-207 Style 7, 9, 11 or 15**
1-207 Style 13 (21-202007 Style 13, 1-202005 Blank Style 13)
1-207 Style 17 (21-202007 Style 17, 1-202005 Blank Style 17)
V **7059**
W **4489 (83800A)** use 20 No. 73 anchor
X **226½A**
Y 1A-229½B* included with shaft 1B-206C Style 9
Z **251½** Screw, 46 nut
AA **1A-202¼ Style 7, 9, 11, 15**
1A-202¼ Style 13 (1A-10200 Style 13)
1A-202¼ Style 17 (1A-10200 Style 17)
1A-10200 Style 9, 11, 13, 17 use for Cl. 2 machines with date repeat or MRC
} Includes wire 279Z
AB **1A-227½** includes AF
AC **3614¾**
3614⅞ used on foot and inch machines
AD **3614½**
3614⅝ used on foot and inch machines
AE **10180**
AF **3856¼**
AG **1A-218A** includes AP, AT
AH **1-200½ Style 7, 9, 11, 13 or 17**
AI **263**
AJ **289**
AK **352⅞**
352⅞ No. 2 use with 1-215⅝ No. 2
AL **222⅞**
215⅝ for repeat print of sub-totals
1-215⅝ No. 2 for auto. totals, bank posting machine
1-215⅝ No. 3 (1C-215⅝ No. 3, 200233½A, 20 No. 114, 69809, 203423 No. 4) for mult. skip and return
AM **216AR**
AN **1418** Cl. 1-2
AO **3282**
AP **255A**
AQ **237**
AR **483**
AS **423 Style 9, 11, 13 or 17**
AT **215A**
AU 227AR* included in shaft assembly 21-204A Style 9, 11, 13 or 17
AV **273 Style 9, 11, 13 or 17**
AW **10085½**

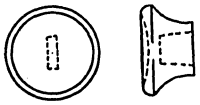
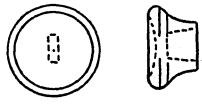
Comp. carr. for 301707
12A-202213 Sty 301707
$8.00 with increase

Non-tab key - Keyboard
wearing
7361/2 C1
46 1/4
205139 Z

KEYTOP COLOR COMBINATION CHART (PLATE 2-1)

This chart, consisting of actual size keytop outlines, symbol numbers, descriptions, and related color combinations, is designed to facilitate the ordering of keytops. Comparison with illustrations in the "Keytop Outline" column, and reference to the "Description," "Symbol No." and "Color Combination" columns will generally serve to identify the desired keytop. As indicated in the example below, orders for keytops should contain the complete Symbol Number, the Number, Character, or Figure, and the Color and Color Number. Should similar colors be available in the required symbol number, or should use of color names—such as, gray, tan or brown—leave some doubt as to the color number desired, the "Keytop Color Chart," Form 2902 (in front section of symbol binder) should be referred to for color identification from comparison with actual color reproductions.

Example:	Symbol No.	Figure	Color	Color No.
	291 Alphabet (9/32)	(B—9/32 high)	White	900

Keytop Outline	Symbol No.	Description	Color Combination	Color No.
	291 Abbreviations	EXP, NET, SER, etc.	Ivory letters on Brown White letters on Gray Brown letters on Ivory White letters on Red White letters on Blue White letters on Black Black letters on White	(108) (207) (301) (402) (700) (800) (900)
	291 Alphabet (5/32) 291 Alphabet (9/32)	A, B, C, etc. letters 5/32" high letters 9/32" high	Ivory letters on Brown White letters on Red White letters on Black Black letters on White	(108) (402) (800) (900)
	291 Complement 291 Fraction	$^{8}1$, $^{7}2$, $^{6}3$, etc. 1/12, 1/10, 1/8, etc.	Ivory figures on Brown White figures on Gray Brown figures on Ivory White figures on Red White figures on Black Black figures on White	(108) (207) (301) (402) (800) (900)
	291 Months	APR, MAY, JUN, etc.	Brown letters on Ivory White letters on Black	(301) (800)
	291 Number	1, 2, 3, 4, etc.	Ivory figures on Brown White figures on Gray Brown figures on Ivory White figures on Red White figures on Blue White figures on Black Black figures on White	(108) (207) (301) (402) (700) (800) (900)
	291 Percent	1%, 2%, 3%, etc.	Ivory figures on Brown White figures on Gray Brown figures on Ivory White figures on Black Black figures on White	(108) (207) (301) (800) (900)
	291 1/4	A or B Non-count	Brown letters on Ivory	(301)
	291 1/2	NON REG REG ADD, ADD, NA, etc.	Brown letters on Ivory White letters on Red White letters on Black Black letters on White	(301) (402) (800) (900)

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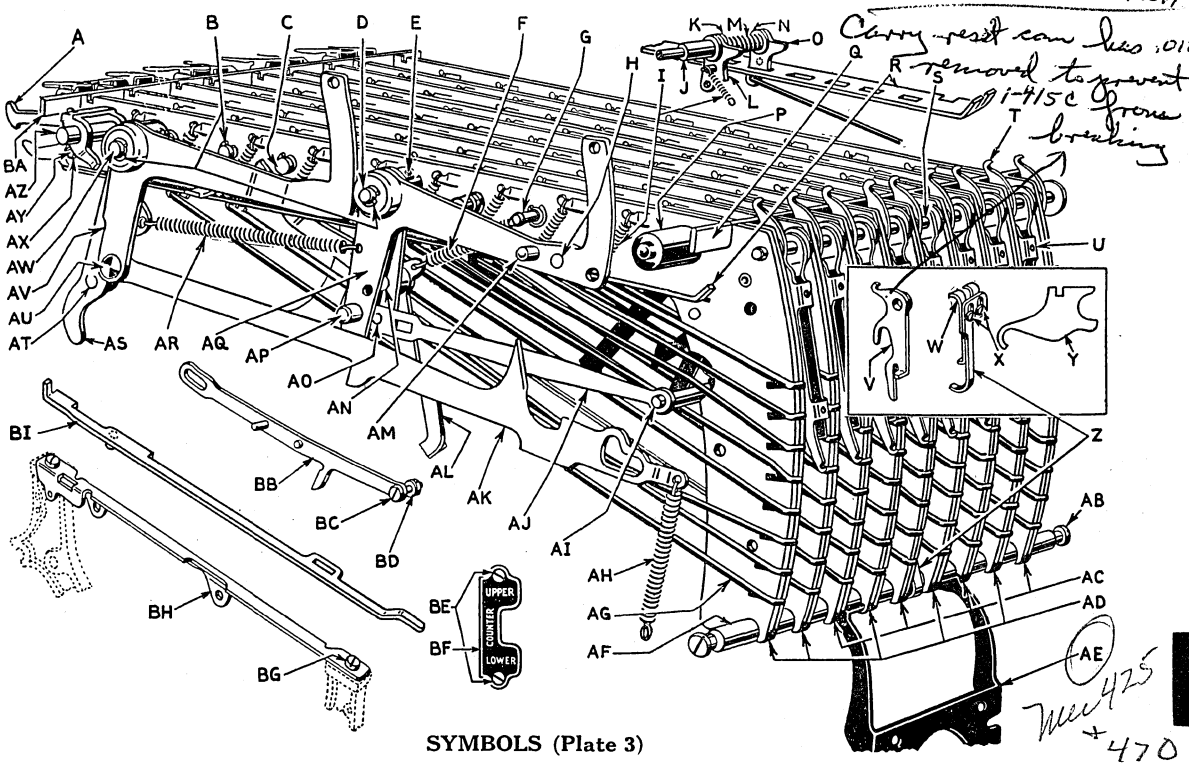
KEYBOARD ASSEMBLY, CLASSES 1 AND 2 (Plate 3)



SYMBOLS (Plate 3)

A **229¾B** use 4487 spring
B **279Z (21 No. 18)**
C **1-200 Style 7, 9, 11, 13, 15 or 17** includes 279 wire
D **21-204A Style 9, 11, 13 or 17** includes E, AJ, AL, AN and AO, Cl. 1 and 2
E **51**
F **986**
G **1-200⅝ Style 9, 11, 13 or 17**
H 261⅛* included in AQ
I **284**
J 235¼ space collar between 246 sleeves
235½ space collar between 210R&L
K **295** Brass washer for 1-217AR&AL
L **1-217AL**
11-217AL (21-217AL) for R.P.M.
1-217L No. 2 with reg. and/or crossfooter auto totals with keys on keyboard depressed
1-217L No. 3 for reg. and/or crossfooter auto totals with keys on keyboard depressed
1-10217L for date repeat and cal. fte.
M **282**
N **246** Shoulder sleeve for 1-217AR&AL
O **1-217AR**
1-217R No. 2 for reg. and/or crossfooter auto totals with keys depressed on keyboard
1-217R No. 3 for reg. and/or crossfooter auto totals with keys depressed on keyboard
1-217⅛A for cal. fte. and ⅛ fractions
11-217⅛A for cal. fte. and ⅛ fractions
1-10217R for Style 13 machine built in Style 17 base, for bal. and 19 nonlock down keys
P **201½ Style 9, 11, 13 or 17**
Q **225 Style 9, 11, 13 or 17**
R See 214 Reference chart, Plate 65
S **1-403 Style 7, 9, 11, 13, 15 or 17**
T **415D**
U **411B**
411 No. 2 Cl. 20 thru 30
W **1-419 (1-419 No. 1)** includes X and Z
X **75608**
Z **419¼**
AB **255⅛**
AC **1-210AR Pitch 8, 10, 12 or 16** specify column, pitch and machine number
1A-210AR Pitch 8, 10, 12 or 16 for column one, specify pitch and machine number
AD **1-210AL Pitch 8 (1A-210AL Pitch 8)**
1-210AL Pitch 10, 12 or 16 specify column, pitch and machine number
AE **223¼B Style 15**
223¼C use 1060½ screws
223¼ No. 2 (223¼ No. 2 Env. 1985) for Style 13 or 17 with more than 2 item counters, use 1060½ screws
AF **205 Style 7, 9, 11, 13, 15 or 17**
AG **270A No. 1 thru 8**
270A No. 8R for No. 8 key in extreme R and L columns
270A⅛ Fraction No. 1 thru 15 for cal. fte.
270A⅛ Fraction No. 1 thru 6 for ⅛ fractions
271¼R or L No. 1 thru 8 for Cl. 20 thru 30 machines with register and/or crossfooter totals with keys depressed on keyboard
1-271½ No. 1 thru 9 for keyboard selection of registers
1-271½ No. 10 (211½) for keyboard selection of registers
AH **288¾ (983)**
AI **209 Style 9, 11, 13, 15 or 17**
AJ **216⅞**
AK **216½B** included with AV
AL **1-202127** included with D
AM 253⅛* included in AQ
AN **253⅝**
AO **81515**
AP 260½* included in AQ
AQ **1A-227CL** includes H, AM, AP, Cl. 1
1A-227DL Cl. 2
AR **280¼**
AS 1-227¼BL*
AT **257½ Stud, 738 roll** included in AS
AU **263**
AV **1A-227¾L** includes AK, AU, Cl. 1
1B-227¾DL Cl. 2
AW **1A-206C Style 7, 9, 13, 15 or 17** for Cl. 1
11-206C Style 9, 11, 13, 15 or 17 for Cl. 2
AX **277**
AY **1-200¾ Style 9, 13, 15 or 17** includes 277 wire
AZ **201 Style 9, 11, 13 or 17**
BA **223 Style 9, 11, 13, 15 or 17** shown, similar tie strips under keyboard
224 Style 7, 9, 11, 13, 15 or 17 located in position 2 and 8
224⅜ **Style 9, 11 or 17** for double 1/12 fractions
1-224½ Style 9 or 15 for cal. fte. and fractional machines Cl. 2 and 6
BB **1-226¼** with cal. fte., Cl. 1
1A-226¼E without cal. fte., Cl. 1
1B-226¼D without cal. fte., Cl. 2
1-226⅜ with cal. fte., Cl. 2
1-3426⅛ with A.C.T., S.A.C.T. or shuttle carriage without cal. fte., Cl. 1, 2 or 6
1-3426½ with shuttle carriage, Cl. 2
1-3426⅜ with shuttle carriage and cal. fte., Cl. 2
1-11226¼A with progressive or diminishing table const.
1-12226⅛A with S.A.C.T. and T.N. machanism, without cal. fte., Cl. 1
1-12226¼A with M.R.C. and T.N. mechanism, Cl. 6
1-12226⅜A with cal. fte. and T.N. mechanism, Cl. 2
1-12226½A without cal. fte. and T.N. mechanism, Cl. 2
1-12226¾ with S.A.C.T., T.N. mechanism and cal. fte., Cl. 1
1-62125(1Z-62125, 200251A) with nontransfer of reg. totals or sub-totals to crossfooter, from regular subtotal key, Cl. 11 thru 16
1-202225 with carriage throwback or non-throwback from total key, Cl. 20 thru 30
21-202225 for Style 21 17 14 and 21 17 16
31-202225 for bank posting machines, with keyboard lock Env. 1938
1-34 Fte. 63 for gas billing machine
1-17 Fte. 113 for carriage controlled transfer mechanism, Cl. 2
1-119⅝ Fte. 104 No. 1 with single cycle total
1-119⅝ Fte. 104 No. 2 with cycle when auto total or sub-total are taken in same position
BC **251¼** Screw, 46 nut
BD **824**
BE **252⅝**
BF **229⅜** specify
229⅜A Mohave brown
BG **7059**
BH **212⅜**
BI **1-229⅝B**

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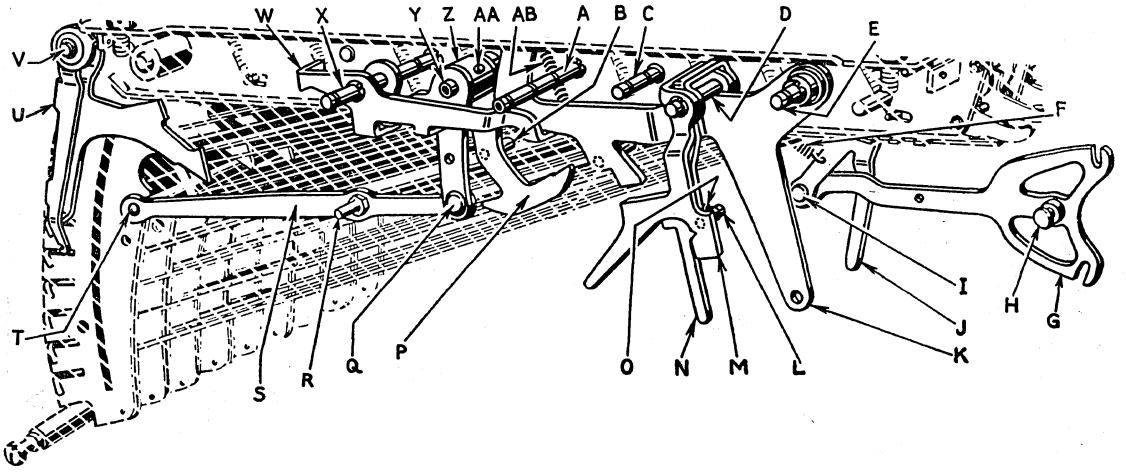
KEYBOARD ASSEMBLY, CLASSES 6, 11 THRU 16, 20 THRU 30 (Plate 4)



SYMBOLS (Plate 4)

A **1-200½ Style 7, 9, 11, 13 or 17** includes wire 21 No. 18
1-200½R (1A-200½R) used with auto totals bank posting machine

B **10259 Stud, 10239 roller, 7914½A washer**, included in P

C **1-62000 Style 13 or 17** includes wire 21 No. 18
1-62000 No. 2 Style 17 for Cl. 20 thru 30 auto totals bank posting machine with folio repeat key

D **1A-10200 Style 9, 11, 13 or 17** for Cl. 11 thru 16, 20 thru 30, also Cl. 2 and 6 machines with date repeat, and Cl. 2 with M.R.C., includes wire 21 No. 18
1-10200 No. 2 Style 13 or 17 for Cl. 20 thru 30, auto totals bank posting machines
1-10200 No. 3 Style 17 for Cl. 20 thru 30 auto totals bank posting machines with folio repeat key

E **1-62002 Style 13 or 17** includes J, for Cl. 11 thru 16, 13 or 17 col. and Cl. 20 thru 30, 17 col.
1-62002 No. 2 Style 17 use with totals and sub-totals, cgc. controlled for positive and negative bal.
11-206C Style 9, 11, 13, 15 or 17 for Cl. 2 and 6
1-202006 Style 13 includes J, for Cl. 20 thru 30, 13 cols. only
11-202006 Style 13 or 17 use where symbol is obtained from reg. N.A. key

F **280¾**

G **1-202110**
1-228⅞ Cl. 2

H **253⅜** included in G

I **263**

J 1-62229* specify style, included in E
1-229¼* specify style, for Cl. 2-6, included in shaft assembly 11-206C Style 9, 11, 13, 15 or 17

K **1A-227½**

L **10159¼**

M **1-10114¾** includes L
1-10114¾ No. 2 use for high speed machines
1-201124A No. 2 use for R.P.M. and cycle

N **3614½**

O **7286½**

P **1-10218½** includes B
1-10218½ No. 2 use with old and new bal.
1-218½B* included in shaft assembly 1-208½D Style 9, 11, 13, 15 or 17

Q **263**

R **256¾ Screw stud, 1097¾ washer, 46 nut**

S **216AR**

T **209 Style 9, 11, 13, 15 or 17**

U **10411** Cl. 6, 11 thru 16
10411 No. 2 Cl. 20 thru 30
411 No. 2 used in other cols.—Cl. 20 thru 30
411 No. 3 located between 8th and 9th cols., Cl. 20 thru 30 with crossfooter totals and sub-totals for positive and negative bal.
411 No. 4 located between 8th and 9th cols. with permanent split between cols. 7-8, Cl. 20 thru 30 with crossfooter totals and sub-totals for positive and negative bal.

V **1-64001 Style 13 or 17**
1-64001 No. 2 Style 13 (64001 No. 2 Style 13, 470)
1-64001 No. 2 Style 17 (64001 No. 2 Style 17, 470)

W **10227⅛**

X **1A-10208½ Style 9, 11, 13 or 17**

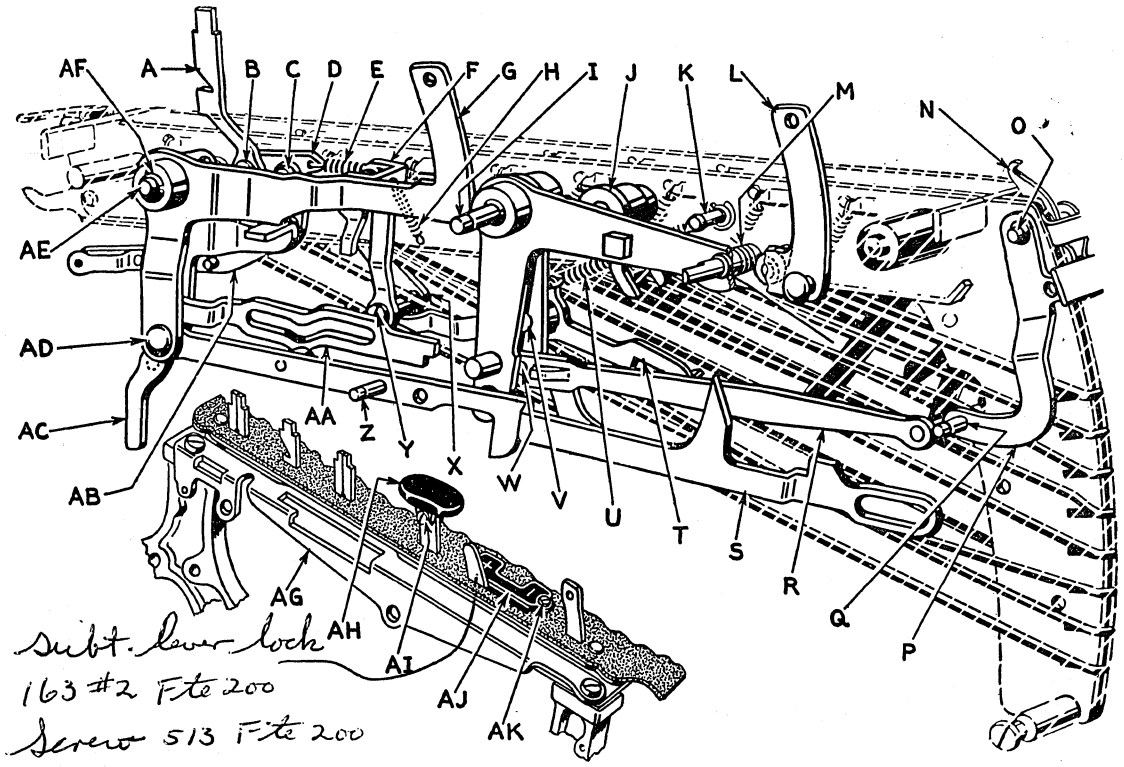
Y **21-204A Style 9, 11, 13 or 17** specify machine number, for Cl. 6, 11 thru 16 without R.P.M., includes Z, AA
1B-204A Style 9, 11, 13, 15 or 17 specify machine number, for Cl. 20 thru 30 machines and Cl. 6, 11 thru 16 with R.P.M.

Z 1-227R No. 2* included with Y

AA **51**

AB **10085½**
9180 (681⅛) for R.P.M. and cycle

KEYBOARD ASSEMBLY, CLASSES 6, 11 THRU 16, 20 THRU 30 (Plate 5)



SYMBOLS (Plate 5)

A **10221L** included in assembly D
10221R Keystem used on right side, complete assembly 11-10219R

B **263**

C **1A-10200 Style 9, 11, 13 or 17** Shaft with wire 21 No. 18

D **1A-10219L** assembly, includes A, B, E, AB
1-10219L No. 2 same assembly as above except without part A and is used when S.C.R. keys only are to release numeral keys
1-10219R (11-10219R) assembly on right side of machine for folio repeat mechanism, use shaft 1-10201 Style 17

E **10281**

F **62106**

G **1-62227** includes S and AD
1B-227¾DL Cl. 2, 6
1-16¼ Fte. 132 use when tally roll is indexed by total key
1A-13¼ Fte. 104 used for R.P. of sub-totals

H **3283**

I **21-204A Style 9, 11, 13 or 17** specify machine number, includes R, T, V, W, for Cl. 6, 11 thru 16 without R.P.M.
1B-204A Style 9, 11, 13, 15 or 17 specify machine number, for Cl. 20 thru 30 machines and Cl. 6, 11 thru 16 with R.P.M.

J 1-218¼* included in shaft assembly 1A-10208½ Style 9, 11, 13 or 17

K **1-200⅝ Style 9, 11, 13 or 17** includes wire 21 No. 18
1-200⅝ No. 2 for R.P.M. and bank posting machines

L **1-62127**
1A-227DL Cl. 2
1-10227 Cl. 6
1-15¾ Fte. 132 use when tally roll is indexed by total key
1-128⅜ Fte. 104 for cycle machines
1-19¼ Fte. 132 for cycle machines when tally roll is indexed by total key

M **285½B** Torsion spring

N **10415¾ No. 1**
10415¾ No. 2
10415¾ No. 3
10415¾ No. 4
For hold down key construction specify key position

O **1-64001 Style 13, 17, wire 470**

P **1-64102 No. 3** use for split between 10th and 11th cols. on 13 col. mach. and 14th and 15th cols. on 17 col. mach.
1-64102 No. 4 use for split between 9th and 10th cols. on 13 col. mach. and 13th and 14th cols. on 17 col. mach.
1-64102A No. 5 use for split between 8th and 9th cols. on 13 col. mach. and 12th and 13th cols. on 17 col. mach.
1-64102A No. 6 use for split between 7th and 8th cols. on 13 col. mach. and 11th and 12th cols. on 17 col. mach.
1-64102A No. 7 use for split between 6th and 7th cols. on 13 col. mach. and 10th and 11th cols. on 17 col. mach.
1-64102A No. 8 use for split between 5th and 6th cols. on 13 col. mach. and 9th and 10th cols. on 17 col. mach.
1-64102A No. 9 use for split between 4th and 5th cols. on 13 col. mach. and 8th and 9th cols. on 17 col. mach.
1-64102A No. 10 use for split between 3rd and 4th cols. on 13 col. mach. and 7th and 8th cols. on 17 col. mach.
1-64102A No. 11 use for split between 2nd and 3rd cols. on 13 col. mach. and 6th and 7th cols. on 17 col. mach.
1-64102A No. 12 use for split between 1st and 2nd cols. on 13 col. mach. and 5th and 6th cols. on 17 col. mach.

Q **64500** use 8382 spring for P, No. 3 and 4, 7781A spring for P, No. 5 thru 12

R **216⅞**

S **1-62216** included with G
1-216⅝ Cl. 6

T **1-202127** included with I

U **986**

V **253⅝**

W **81515**

X **1-62101**

Y **252⅝**

Z **1353¼** included in S

AA **62100** included with AE assembly
202109 included with AE assembly, use when symbol is obtained from reg. N.A. key

AB **1-10211½** included with D

AC 1-62226* included with AE
1-227¼* Cl. 6

AD **263**

AE **1-62002 Style 13 or 17** includes AA and AC. Cl. 11 thru 16, 13 or 17 cols. and Cl. 20 thru 30, 17 cols.
1-62002 No. 2 Style 17 use with totals and sub-totals, cge. controlled for positive and negative bal.
11-206C Style 9, 11, 13, 15 or 17 Cl. 2, 6
1-202006 Style 13 Cl. 20 thru 30, 13 cols. only
11-202006 Style 13 or 17 Cl. 20 thru 30, use where symbol is obtained from reg. N.A. key

AF **279Z (21 No. 18)**

AG **1-62215**

AH **1-293½** specify color

AI **255¼**

AJ **10229⅜A** Cl. 6, 11 thru 16, 20 thru 30
10229⅜A No. 2 use with H903 construction

AK **252⅝**

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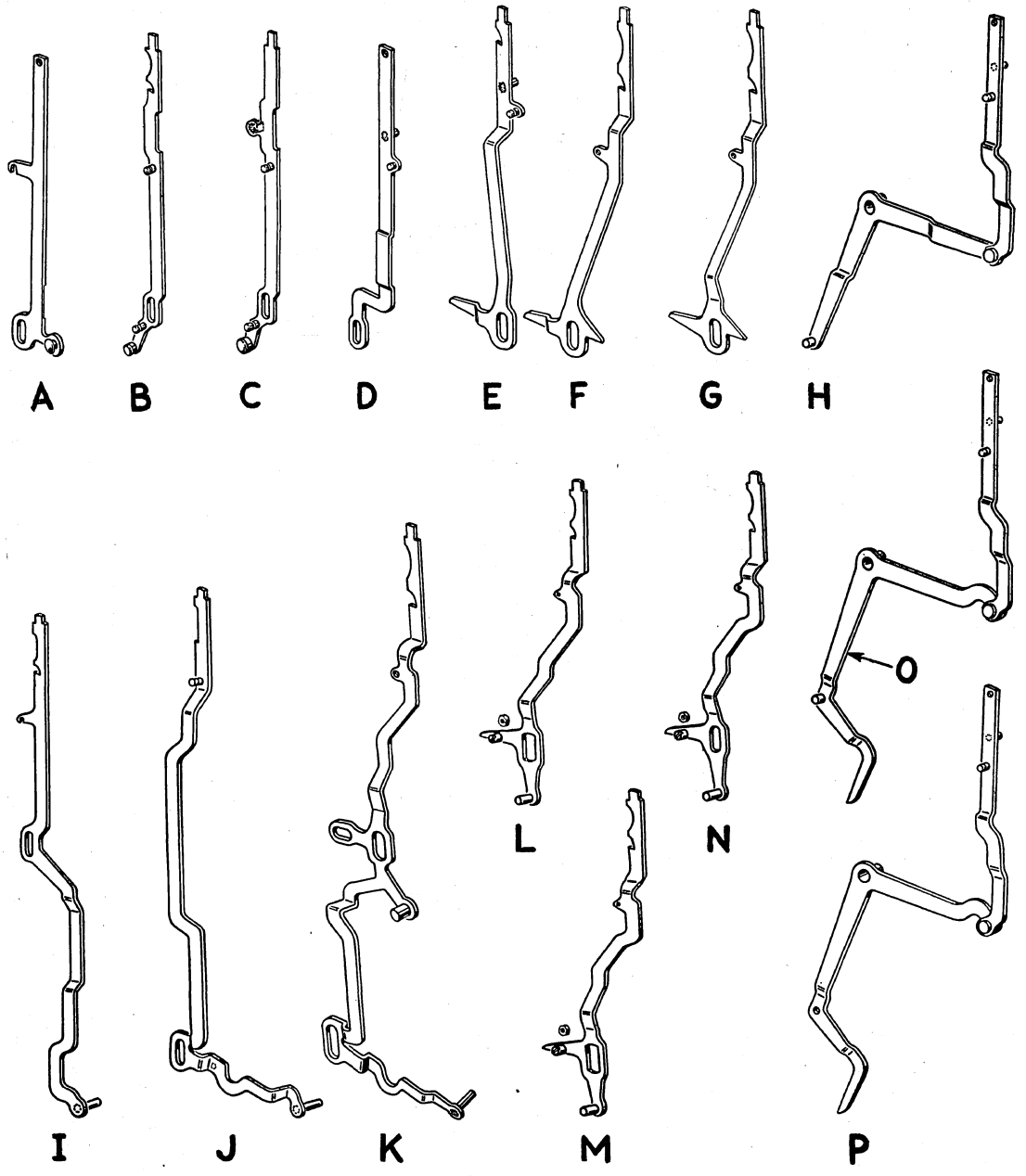
For Form 2961

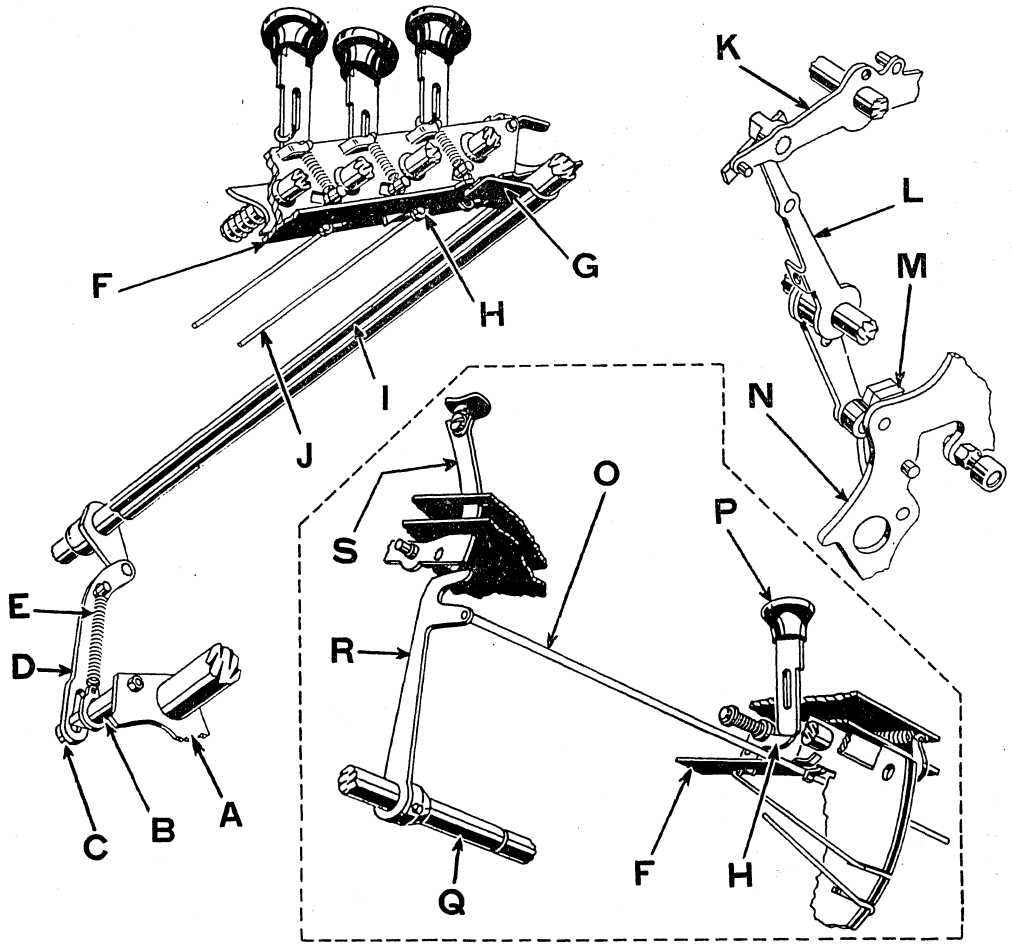
KEYS—POSITION (9-19) (10-19) (Plate 5-1)



SYMBOLS (Plate 5-1)

	Symbols	Position	Description
A	**1-12021½**	9-19	Carriage return key, Cl. 1, 2, 6, 11-16
B	**1-118 Fte. 219**	9-19	Disabling key for automatic count, latch down construction
C	**1-118 Fte. 219 No. 2**	9-19	Disabling key for automatic count, lock down construction, Styles 23 17 41-45
D	**1-104 No. 2 Env. 401C**	9-19	Carriage opening key via shaft under base with carriage opening from total and sub-total keys, used with 1-200216C No. 1
E	**1-200143½ No. 4**	10-19	Same function as F
F	**200143½ No. 3**	9-19	Disabling key for carriage return from sub-total key via shaft under base or thru hinges, without 903
G	**222 Fte. 214**	9-19	Disabling key for crossfooter sub-total from total key in non-add C. F. position carriage controlled without 903
H	**1A-22¾ Fte. 129**	10-19	Carriage opening key via shaft thru hinges without carriage opening from total or sub-total keys without 903
I	**1-106 Env. 280G**	10-19	Disabling key for register shift release from register total indexing lever without 903, without 1410 lever construction
J	**1-106 No. 5 Env. 280G**	10-19	Same function as I, except with or without 903, with 1410 lever construction
K	**1-200143½ No. 5**	9-19	Disabling key for register shift release mechanism with 903 and/or 1429
L	**1-200143½ No. 2**	9-19	Disabling key for crossfooter and/or reg. totals and sub-totals, carriage controlled
M	**1-200143½ No. 2 Env. 1370**	9-19	Same function as G, except with 903, with 1429
N	**1-200143½ Env. 1370**	9-19	Same function as G, except with 903, without 1429
O	**1-22¾ Fte. 129 No. 2**	10-19	Same function as H, except via shaft under base, with 903
P	**1-22¾ Fte. 129 No. 2 Env. 2034**	10-19	Carriage opening key via shaft under base and auxiliary control for mult. skip and return from C. F. total and sub-total keys

KEYBOARD INTERLOCKS (Plate 6)

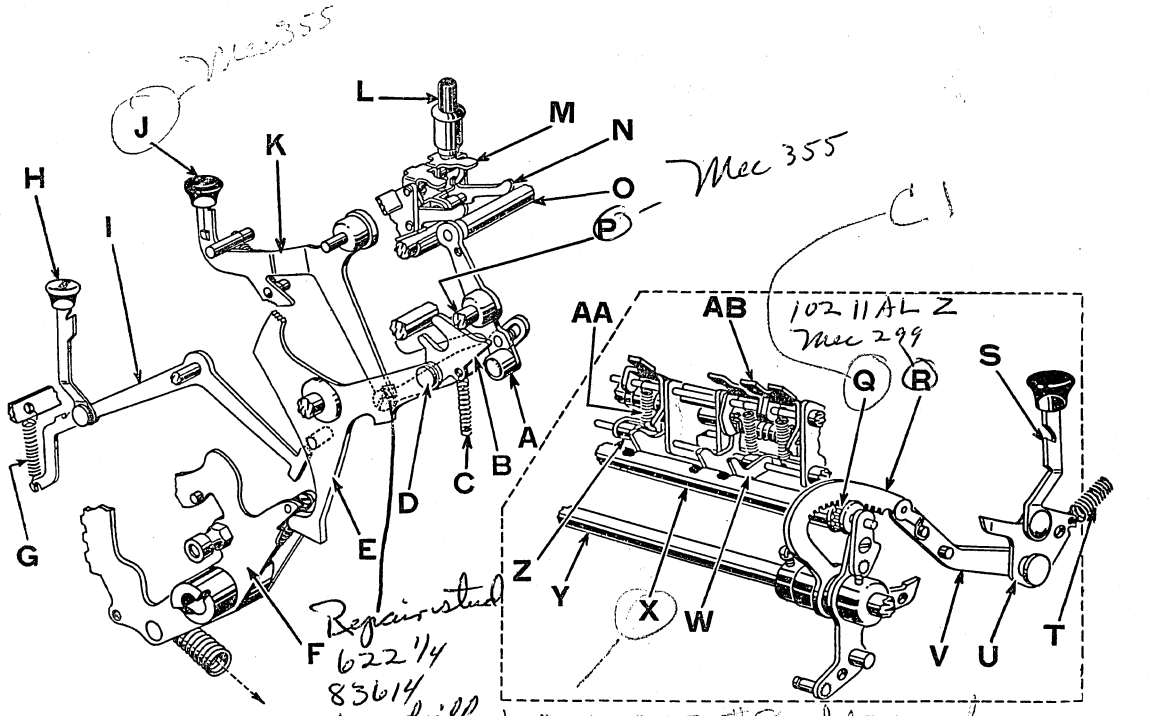


SYMBOLS (Plate 6)

A	**1-613L***
B	**250¼A Screw, 46 nut**
C	**259⅝** Screw
D	1-220¼* part of assembly I
E	**283¼ (72806)** Spring, 20 No. 36 anchor
F	**214 No. 1** specify style, see reference chart, Plate 65 for other styles
G	220B* part of assembly I
H	**1-217AR or AL,** see Plate 3 for other styles
I	**1A-202½B Style 9, 11, 13 or 17** specify machine number **1-202003 Style 9, 13, 15 or 17** with R.P.M. **21-202003 Style 13 or 17** with auto reg. and/or crossfooter totals with keys depressed on keyboard
J	**270A Nos. 1 thru 8,** see Plate 3 for other styles
K	**1-3612B**
L	1415A*
M	315A* part of assembly N
N	**2B-311⅛** Cl. 1-2-6 **12B-311⅛** Cl. 11 thru 16 and Cl. 20 thru 30, not auto bank totals **22B-311⅛** for auto bank totals
O	**402B Style 7, 9, 11, 13, 15 or 17**
P	**291** specify color, numeral or character
Q	**1-400A Style 9, 11, 13, 15 or 17** specify machine number, Cl. 1 **1-401 Style 9, 11, 13, 15 or 17** specify machine number **1-204000 Style 13 or 17** specify machine number, used when negative total lock is located between columns 8 and 9 **21-204000 Style 17** specify machine number, used when negative total lock is located between columns 9 and 10 **31-204000 Style 17** specify machine number, used when negative total lock is located between columns 6 and 7
R	1-424AL* part of assembly Q
S	**1A-227CL**

Complete assembly, except shaft O not included

KEY RESTORING MECHANISM AND DATE REPEAT KEY MECHANISM (Plate 7)



SYMBOLS (Plate 7)

A **232½** Roller, 262 stud included in P

B **623B, 629 washer, 652 rivet**
- **623 No. 2 Long** — Use 6323/4 Flanged collar, 428 washer, 1-652A No. 2 shoulder stud, 1-688 No. 2 spring
- **623 No. 3 Short** — Use 6323/4 Flanged collar, 428 washer, 1-652A No. 2 shoulder stud, 1-688 No. 2 spring

C **688** Regular
1-688 No. 2 used with 623 No. 2 and No. 3

D **652** Regular
652 No. 3 stud in 21-622¼A
1-652A No. 2 shoulder stud in 1-622¼ No. 2
1-652 No. 4 shoulder stud in 21-622¼ No. 2
1-652 No. 5 shoulder stud in 31-622¼ No. 2

E **1-622¼A** includes B, D
11-622¼A includes B, D; used with R.P.M.
21-622¼A includes B, D; used with partial keyboard repeat, cge. controlled
1-622¼ No. 2 includes B, D; used with auto totals, bank posting machine
11-622¼ No. 2 includes B, D; used with repeat print normalizing cge. controlled bar
21-622¼ No. 2 includes B, D; used with partial keyboard repeat, cge. controlled, index from auxiliary motor bar
31-622¼ No. 2 includes B, D; used with partial keyboard repeat, cge. controlled with repeat indexed from auxiliary motor bar, and with keyboard set-up released during repeat operation

F **2B-311⅛** see Plate 6 for other styles

G **3282**

H **291½ Repeat,** white body

I **1A-218A**

J **291½ Error,** red body

K **1A-227½**

L **200900** Keytop, 200510 stem, 200801 spring, 1026 washer, 200303B cylinder — Complete assembly 1-200303B use lock nut 22 No. 2

M **228¼BR or BL**

N **228CR or CL**

O **1-202005 Style 9, 11, 13, 15 or 17, Blank**—other styles listed below under X

P **1-207 Style 7, 9, 11 or 15**
1-207 Style 13 (21-202007 Style 13, 1-202005 Style 13 Blank)
1-207 Style 17 (21-202007 Style 17, 1-202005 Style 17 Blank) complete assembly includes A, O—other styles listed below under Y

Q 10233* Ratchet, part of O

R **1-10211AL**

S **10221L**

T **10281**

U **1A-10219L** assembly, includes S, V

V **1-10211½**

W **228⅛A** used in cal. ftc.
228 5/16A used in cal. ftc.
228⅜BR or AL

X NOTE: For all X symbols specify machine style and number, and submit forms for styles not listed
1-202005 Style 9, 11, 13, 15 or 17 Blank without slots
1-202005 No. 1 Style 9, 11, 13, 15 or 17 Date repeat key controlled, 2 slots
1-202005 No. 2 Style 9, 11, 13, 15 or 17 Date repeat key controlled, not cal. fte., 3 slots
1-202005 No. 3 Style 9, 11, 13, 15 or 17 Date repeat key controlled, cal. fte., 3 slots
1-202005 No. 4 Date repeat key controlled cal. fte. with folio repeat key split shaft, 3 slots
1-202005 No. 5 Style 17 use for Styles 23 17 40 and 23 17 42 with R.P.M., 4 slots
1-202005 No. 6 Style 13 use for Style 13 built in Style 17 base, with date repeat key controlling col. 11-12-13 cal. fte., Cl. 20 thru 30, 3 slots
1-202005 No. 7 Style 13 use for Style 13 built in Style 17 base, with date repeat key controlling col. 10-11-12-13 cal. fte., Cl. 20 thru 30, 4 slots
1-10202¼ Style 13 cal. fte. with 10th col. controlled, 4 slots
1-10202⅛ Style 17 Folio repeat key controlling 3 cols., 3 slots
1-10202⅜ Style 17 Folio repeat key controlling 4 cols., 4 slots
1-202002R Style 17 4 Bank Folio repeat key controlling 4 cols. Cl. 20 thru 30, 4 slots
1-202002R No. 2 Style 17 3 Bank Partial keyboard repeat, date repeat controlling 3 cols., 3 slots
1-202002R No. 2 Style 17 4 Bank Partial keyboard repeat, date repeat controlling 4 cols. Cl. 20 thru 30, 4 slots
1-202002L Style 17 4 Bank Date repeat key controlled, not cal. fte., with repeat key, 4 slots

Y Complete assembly, except slotted shaft X not included
NOTE: For all Y specify machine style and number and submit forms for styles not listed
1B-10207 Style 9 or 11 with date repeat key, Cl. 1, 2. 6, 11 thru 16
1-202007 Style 13 or 17 without folio repeat key, used with early crossfeed ribbon, Cl. 20 thru 30
11-202007 Style 17 3 Bank with folio and date repeat key, used with early crossfeed ribbon, Cl. 20 thru 30, 3 slots
11-202007 Style 17 4 Bank with folio and date repeat key, used with early crossfeed ribbon, Cl. 20 thru 30, 4 slots
21-202007 Style 13 or 17 without folio repeat key, Cl. 11 thru 16, 20 thru 30
21-202007 Style 17 3 Bank with folio and date repeat key, Cl. 11 thru 16, 20 thru 30, 3 slots
21-202007 Style 17 4 Bank with folio and date repeat key, Cl. 11 thru 16, 20 thru 30, 4 slots
31-202007 Style 17 Folio repeat key controls both date and folio section, Cl. 11 thru 16, 20 thru 30

Z **249¼A**

AA **283A**

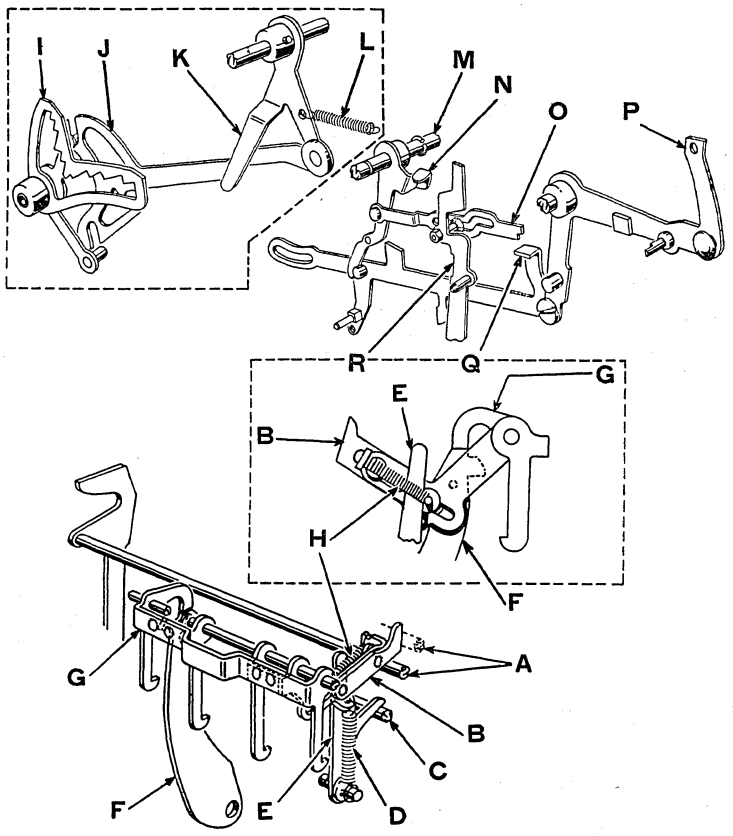
AB **228 5/16** used in cal. ftc.

REGISTER TOTAL SYMBOL MECHANISM, CLASSES 11 THRU 16 AND 21 THRU 30 (Plate 9)

(Plate 8 in Keyboard Instruction Book only)

SYMBOLS (Plate 9)

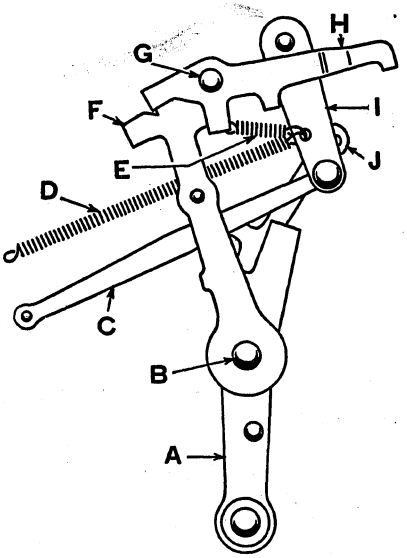
A **402B Style 7, 9, 11, 13, 15 or 17**
B 20413* part of G
C **209 Style 9, 11, 13, 15 or 17**
D **680**
E **1-204102 (1A-204102)** early style
1A-204102 use with bail G, later style
1-204102 No. 2 early style
1A-204102 No. 2 use with keyboard selection of reg. and bail G, later style
1-204102 No. 3 early style
1A-204102 No. 3 (1-204102A No. 3, 1-204130A) use with code H903 and bail G, later style
F **66106 Pitch 12 or 16,** blank sector, specify col.
G **1-204100 (1-204100B, 1A-204102, 680 3480½, 225 Style 13 or 17)** early style
1-204100B later style
11-204100B (1-204100C) used with large dia. 1-64001 Style 17 shaft
H **3480½**
I **1-710¾A** Cl. 2-6
1-67111 Cl. 11 thru 16, 20 thru 30
11-67111 used for closed acct. ftc., specify symbol printing control, Cl. 11 thru 16, 20 thru 30
21-67111 used when reg. non-add is to print same symbol as reg. sub-total, Cl. 11 thru 16, 20 thru 30
J **1-202110**
K 1-62229* specify style, included in assembly M
L **280¾**
M **1-62002 Style 13 or 17** includes K, N, O
N 1-62226* included in assembly M
O **62100** included in assembly M
P **1-62127**
Q **1-62125 (1Z-62125, 200251A)** see Plate 3 for other styles
R **1A-60100** specify machine number
11-60100 used with auto totals, bank posting machine
21-60100 used with repeat of machine operation, total and sub-total key indexed, cge. controlled or lock for reg. total indexing lever
41-60100 used with C. F. totals and sub-totals, cge. controlled for positive and negative bal.
1-60100 No. 3 used with reg. and auto C.F. totals, with keys depressed on keyboard



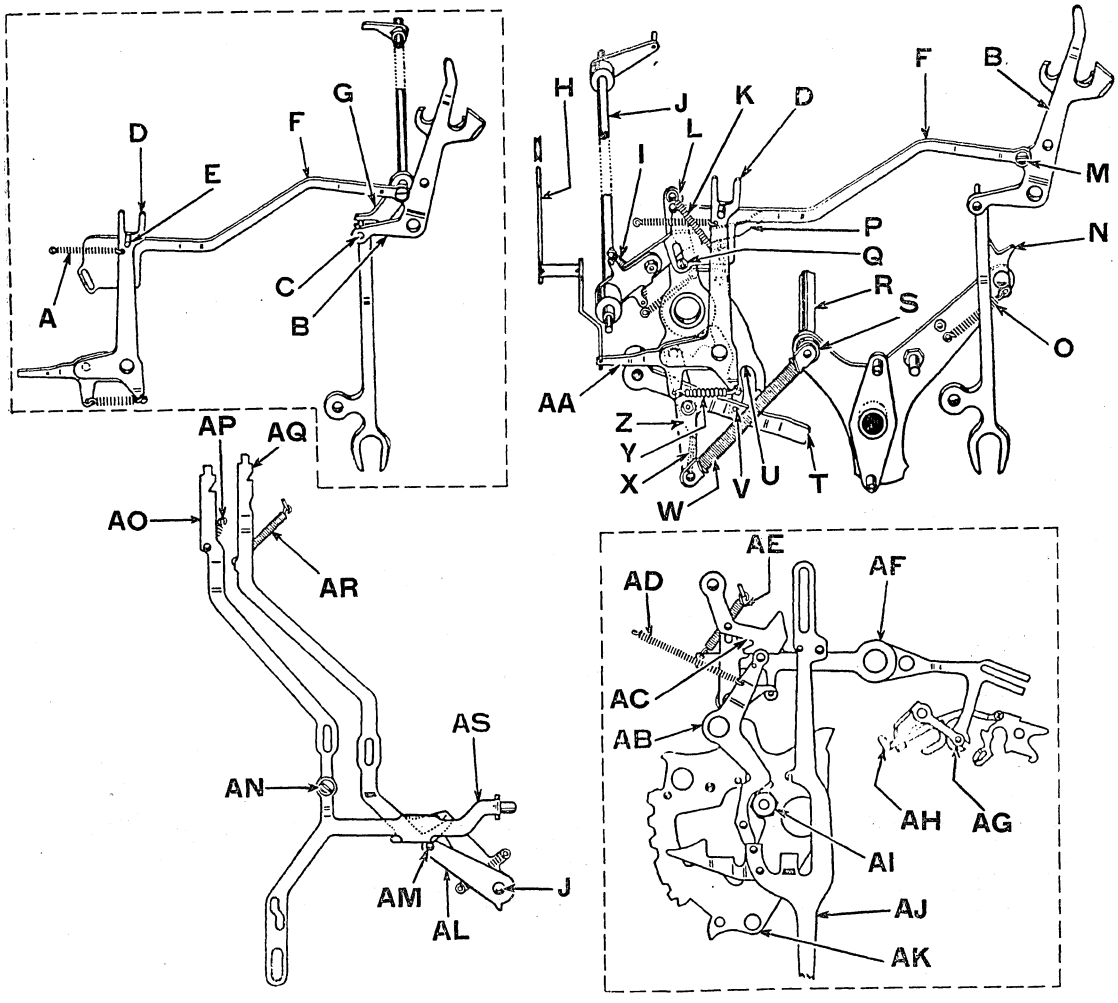
LOCK DOWN TOTAL MECHANISM (Plate 10)

SYMBOLS (Plate 10)

A Included in B
B **1A-10500¼ Style 9, 11, 13 or 17**
C Included in I
D **289**
E **3981**
F Included in B
G **1A-10208½ Style 9, 11, 13 or 17**
H Included in G
I **21-204A Style 9, 11, 13 or 17**
J Included in B



COUNTER CONTROL MECHANISM, CLASS 6 (Plate 11)



SYMBOLS (Plate 11)

A **10080**
B **1-10010¼B** includes fork 10019*
C **931⅞ Roll, 10055¼A stud**
D **1-10011A**
E **350⅜**
F **1-10016A**
G **1-10601¼ Style 13, 17**
H **10027A Style 11, 13 or 17**
I **10089**
J **1A-10000 Style 9, 11, 13 or 17**
K **10082½** for Cl. 20-30
7283¼ for Cl. 6, 11-16
L **1-10022¾** uses bushing 10051¾, screw 3457, washer 10015¾, collar 10036½
M **10056**
N **1-821B**
O **1-883½A (1-84804)**
P **1-200169**
Q **3960**
R **10853A Style 11, 13, 15 or 17,** use 46 nut
S **10830,** 300362, 838½ Style 13 collars, 834½ washer, for early style
T **1-10022¼,** includes X and Z
U **1-10013½**
V Included in T
W **1-10081¼**
X **10085**
Y **10088A**
Z **1-10024¼** uses 3455 screw, 45 nut
AA Included in D
AB **1-323½A**
AC **1-10218½**
AD **983**
AE **681**
AF **1-10614¾ Style 13 or 17 (11-614¾A Style 13 or 17, 1-711¾ No. 2)**
AG **1-711¾A**
AH **1-717 No. 3**
AI **1-3662¼ Bushing, 45 nut**
AJ **1-3627 No. 1**
AK **2B-311⅛**
AL Included in J
AM 750¼ **No. 2**
AN **259½ Screw, 46 nut**
AO **3420** uses 3458 screw, 629 washer, 46 nut
AP **3281½**
AQ **3410⅛** uses 3455¼ screw, 613½ washer, 46 nut
AR **3281½**
AS **1-12215 Style 9-17 No. 2**

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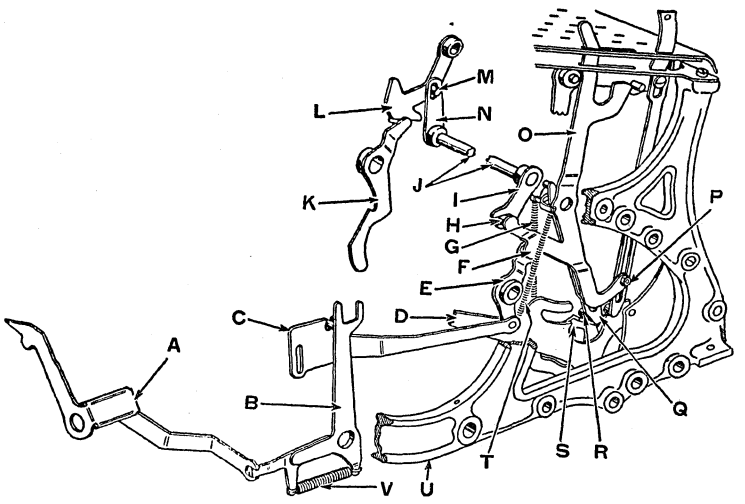
For Form 2961

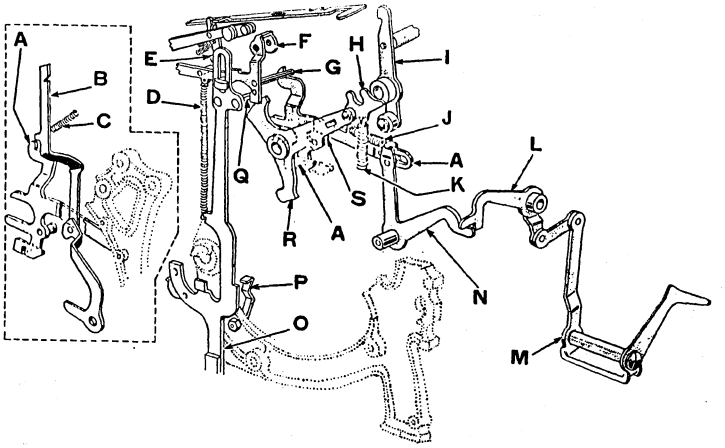
POSITIVE COUNTER CONTROL, CLASS 2 (Plate 12)



SYMBOLS (Plate 12)

A 3327⅛ Style 13 (10012B Style 13)
3327⅛ Style 17 (10012B Style 17)
B 1-1011 5/16 Style 13 or 17
C 1-1016⅛
D 914⅝
E 1-1022⅞ included in C
F 1031¼ (10739)
G 986
H 649½
I Included in J
J 1-601¼ Style 13 or 17 (includes I&N)
K 1-323½ (1-323½A, 334¼A)
L 1-218⅛
M 649½
N Included in J
O 1-1010 1/16
P 1052⅞ Screw, 46 nut
Q 1-1010⅞
R 1033
S 1-914⅞
T 7283¼
U 11-1066D Style 13 or 17
V 1088

AUTOMATIC REPEAT MECHANISM, CLASSES 20 THRU 30 (Plate 13)

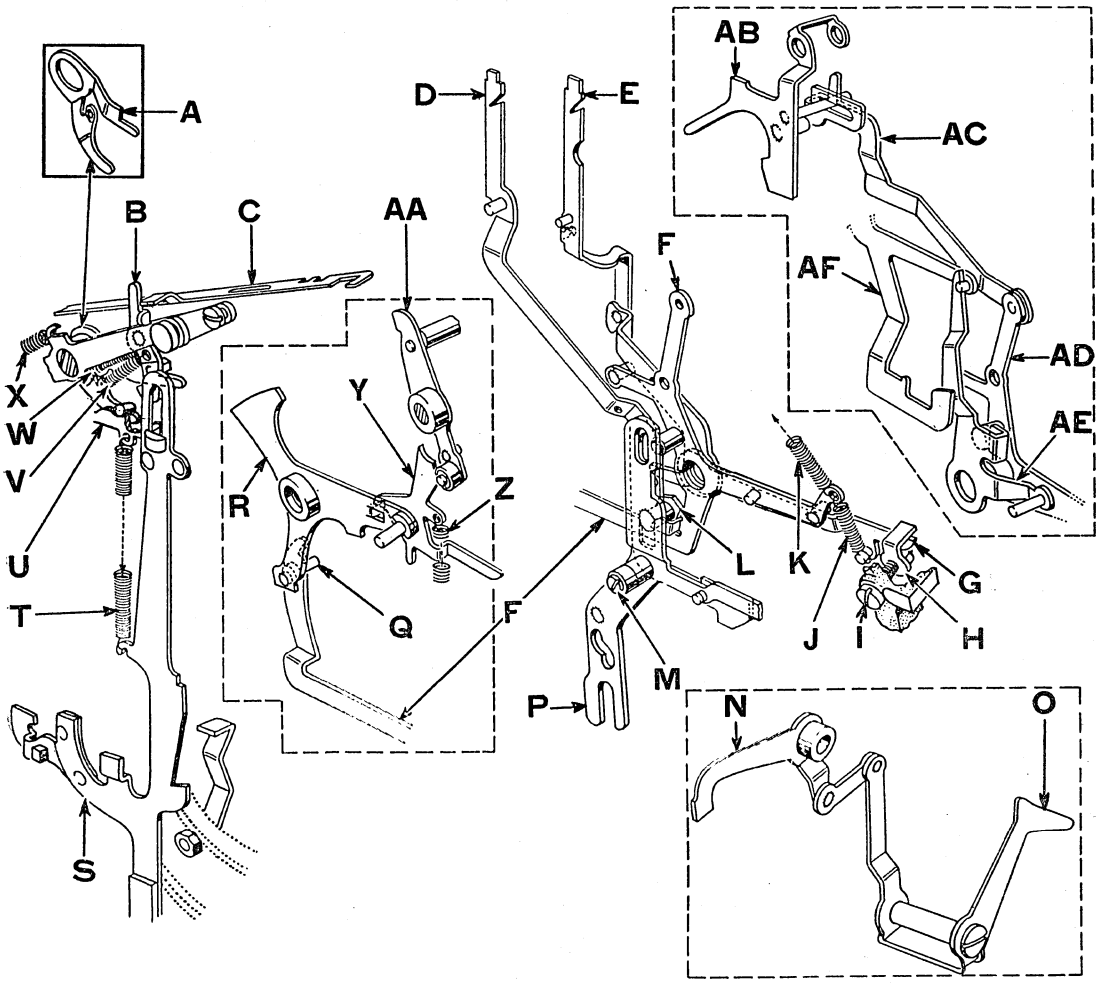


SYMBOLS (Plate 13)

A 1-200173 (1-200173A No. 1, 1-12024 No. 21A)
B 1-200174 (1-200230 No. 1)
C 75804 No. 2
D 3682
E 1-201122
F 1-201124
G 201510
H 623B
I 1-202119R
J 10080
K 10686½
L 1-200171 Style 13, 17
M 1-200170
N 200172 (1A-200172, 1-12024 No. 21A)
O 11B-3827
P 10025¾ (1-10025¾A, 10057¼B)
Q 3652⅛
R 11-622¼A
S 659¾ (659¾A)

SEE EXPLANATION ON INSIDE OF FRONT COVER

REPEAT OF MACHINE CYCLE, CARRIAGE CONTROLLED (IMPROVED)
(Plate 13-1)



SYMBOLS (Plate 13-1)

A **1-201125A**
B **1-201122** included in 1-201121A
C **1-202233 No. 2** use 480¼ spring, 308519 and 202504 studs
D **1-12220 No. 1**
E **1-200230 No. 1**
F **1-200172 No. 1**
G **1-200172¼**
H **200172½**
I **200548½**
J **681⅛**
K **10786**
L **12046⅜** use 12059½ screw, 3237¾ flanged collar, 824¼ washer
NOTE: On Commercial Machines 83348½ and 203401 replaces 12046⅜
M **75615** Screw, 12031⅞, 12055⅛ collars
N **1-200171 Style 13, 17**
O **1-200170**
P **11-12215 No. 1**
Q **653⅞**
R **1-622¼ No. 3** includes Q, Y
S **21-3627 No. 1**
T **3682**
U **1A-201123**
V **489**
W **73829**
X **7283A Style 10**
Y **623 No. 4** use 1-652 No. 4 stud, 622⅛ No. 2 and 632¾ washers
Z **483**
AA See Plate 7, letter Y, for assembly
AB **1-201124A No. 2** use 7286½ spring
AC **200173B** use 74587 screw
AD **1-200172 No. 2**
AE **1-200266A No. 2** (**1-200266B, 3283**) **1-200266A No. 3** Repeat print indexed from motor bars and **11-200266A No. 2** carriage controlled
AF **1-200276A No. 4**

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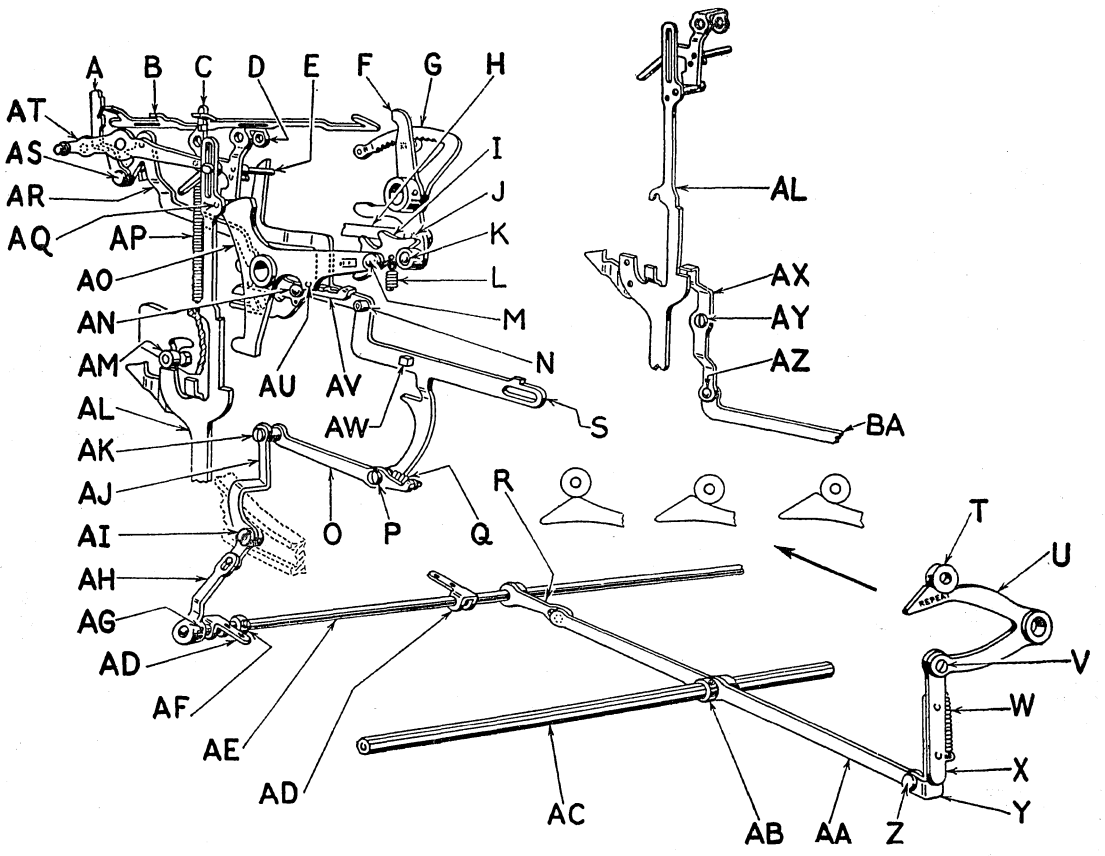
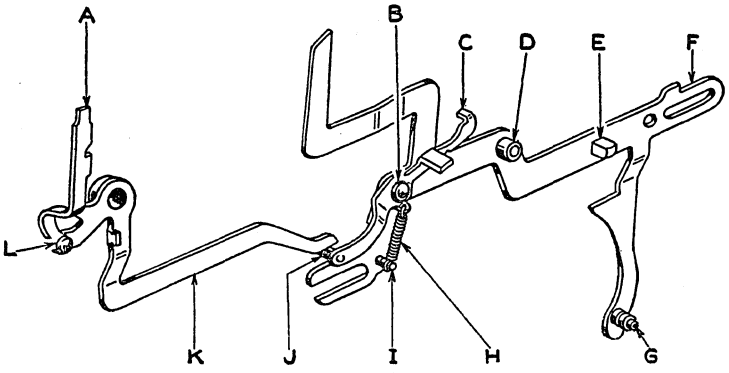
AUTOMATIC REPEAT MECHANISM, FTE. 104, CLASSES 11 THRU 16 (Plate 14)



SYMBOLS (Plate 14)

A **215A**
B **1-124 Fte. 104**
C **1A-201121 (1-201121A, 1A-201123)**
D **1-201124**
E **201510**
F **51A-10207 Style 17 (21-202007 Style 17 3 Bank)** specify machine number
G **1-10211¾R (21-202007 Style 17 3 or 4 Bank, 1-10202⅛ Style 17)**
H **10226½**
I **623B**
J **256** Rivet, 295 washer
K **232½** Roll, 262 stud
L **688**
M **652**
N **932⅝** Roll, 953⅛ stud
O **1-13 Fte. 104**
P **4857½** Screw, 50¾ Fte. 104 stud
Q **82 Fte. 104**
R 1-107⅛ Fte. 104*
S **2-11⅜ Fte. 104** includes N, AW, AV, AN
T **10043¼A No. 6, 7, 8, 9, 10, 11 or 12 10043¼A No. 5 (83443 No. 1)**
U **1-12⅞ Fte. 104 No. 2**
V **251** Screw, 46 nut
W **2886¾**
X **1-12025⅝** includes Y
Y 12025⅞*
Z **8050¾**
AA **1-12025 No. 8** includes Z, Y, X, hub in center and stud 3655¼A in front end, old style part used with round shaft is 1-10⅜ Fte. 104
AB **1-540** Collar with screw 550¾, use collar 1-75332 with screw 75618 on round shaft
AC **12008 No. 1 Style 9, 11, 13 or 17** Octagon shaft; old style round shaft is 1-1½ Fte. 104 Style 11, 13, 15 or 17
AD **22⅜ Fte. 104**
AE **1-1 Fte. 104 Style 13 or 17** includes R, AD, AF, AG, AH
AF **1-75332** use screw 75618
AG **52**
AH 1-10¾ Fte. 104*
AI **12031½** Bushing, 3458 stud holds bushing to side frame 1-166R Fte. 104
AJ **1-11⅛ Fte. 104** with long stud it is 1-11⅛ Fte. 104 No. 2
AK **2850¾ (2855⅝)**
AL **11-3627 No. 1**
AM **3649**
AN **351½**
AO **11-622¼A** includes I, M, AU
AP **3682**
AQ **3652⅛**
AR **1-20 Fte. 104** includes AS, A
AS **255A**
AT **1-201123 (1-201121A, 1A-201123)**
AU **659¾A**
AV **1-12⅝ Fte. 104** use spring 80¼ Fte. 104
AW **54¾ Fte. 104**
AX **1A-10025¾ (1-10025¾A, 10057¼B)**
AY **10057¼A**
AZ **7050⅛**
BA **10025½**

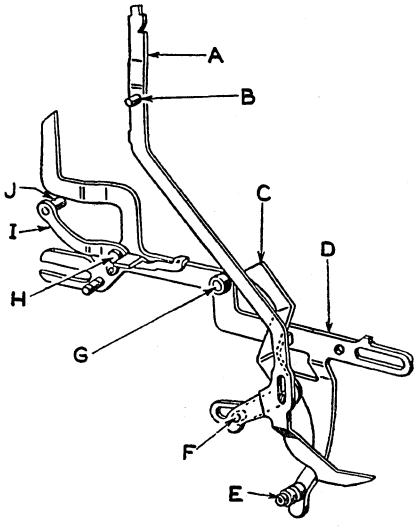
AUTOMATIC REPEAT NORMALIZING KEY (NON-CYCLE) CLASSES 11 THRU 16 (Plate 15)



SYMBOLS (Plate 15)

A 20¼ **Fte. 104 (202237 No. 2)** included with K
B **351½**
C **1-12⅝ Fte. 104**
D **953⅛** Stud, 932⅝ roll
E **54¾ Fte. 104**
F **2-11¾ Fte. 104** includes all parts except A, H, K, L
G **50¾ Fte. 104** use 4857½ screw
H **80¼ Fte. 104**
I **54⅜ Fte. 104**
J **200587**
K **1-20⅛ Fte. 104** includes A, L
L **263**

CYCLE NORMALIZING KEY, CLASSES 11 THRU 16 (Plate 16)



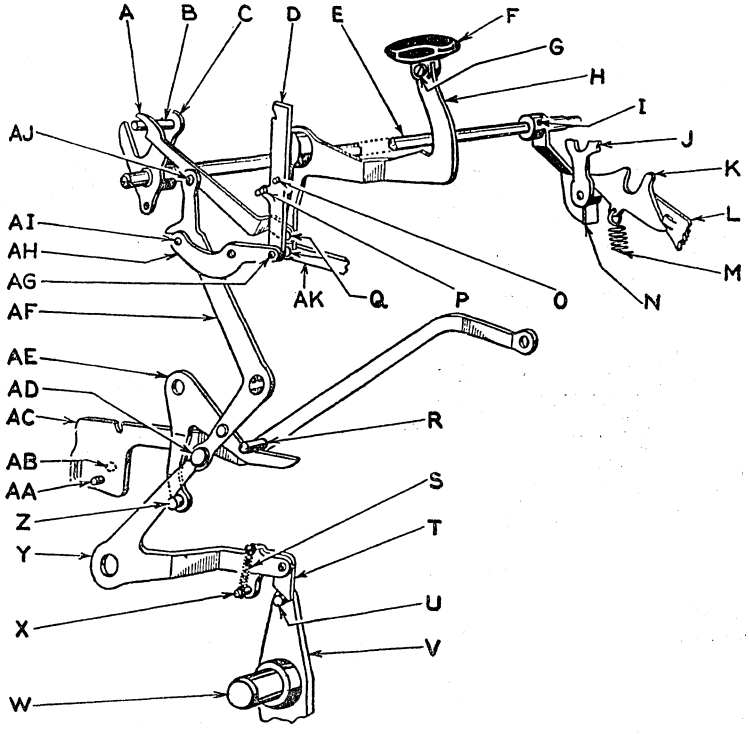
SYMBOLS (Plate 16)

A **1-16¼ Fte. 104** includes B, F
B **3464⅞**
C **16⅜ Fte. 104** on screw 251⅜
D **2-11¾ Fte. 104**
E **50¾ Fte. 104**
F **53A Fte. 104 (12358½)**
G, H, I, J* included in D

SYMBOLS (Plate 17)

A **13½ Fte. 104**
B **12052⅝**
C 1-13⅝ Fte. 104*
D **1-13⅞ Fte. 104** included with AII
E **1-2 Fte. 104 Style 17** includes parts attached
F **1-293½** specify color
G **255¼**
H **1A-13¼ Fte. 104** specify machine No., includes Q, AK, A, used in machines above A22066
1-13¼ Fte. 104 specify machine No., is same except AK is equipped with formed car on front end, early style
I **51**
J 1-10219½R*
K **623B**
L **1-17¼ Fte. 79**
M **688**
N 1-13¾ Fte. 104*
O **264¾**
P **12057¾** use spring 7283¼
Q **351½**
R **253⅛**
S **480B**
T **14⅝ Fte. 104** use rivet 351½
U **68502** short, **68503A No. 1** long **68503AY No. 2** longest, for brace 68119Z
V 1-68112 No. 2*(11-68000 Style 13 or 17)
W 800 Style 13, 17*
X **3450**
Y **1-14½ Fte. 104** fastened to side frame by screw 51⅛ Fte. 104 and bushing 10051¾
Z **10850**
AA **2852⅝** use spring 7283¼
AB **1052⅝** Stud, 1033 roll
AC **1-14⅞ Fte. 104** use screw 10056 in front end and screw 3960, washer 629 and nut 46 in slot at rear
AD **83502**
AE **1-14¾ Fte. 104** use 12055¼ No. 2 screw
AF **1-14⅛ Fte. 104** on 30½ Fte. 104 bushing and screw 1051½A
AG **7262½**
AH **1-14 Fte. 104** includes D on hex. 51¾ Fte. 104 and screw 2850⅜
AI **252⅛**
AJ **257½**
AK **1-13⅛A Fte. 104** refer to H

REPEAT PRINT OF SUB-TOTALS (EARLY STYLE) CLASSES 11 THRU 16 (Plate 17)



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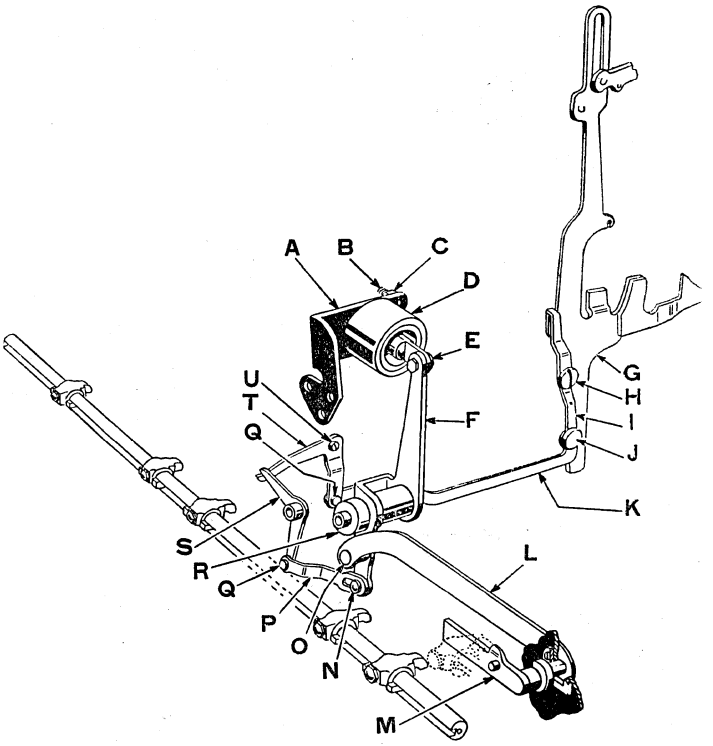
REPEAT TIMING MECHANISM, CLASSES 11 THRU 16 (Plate 18)

SYMBOLS (Plate 18)

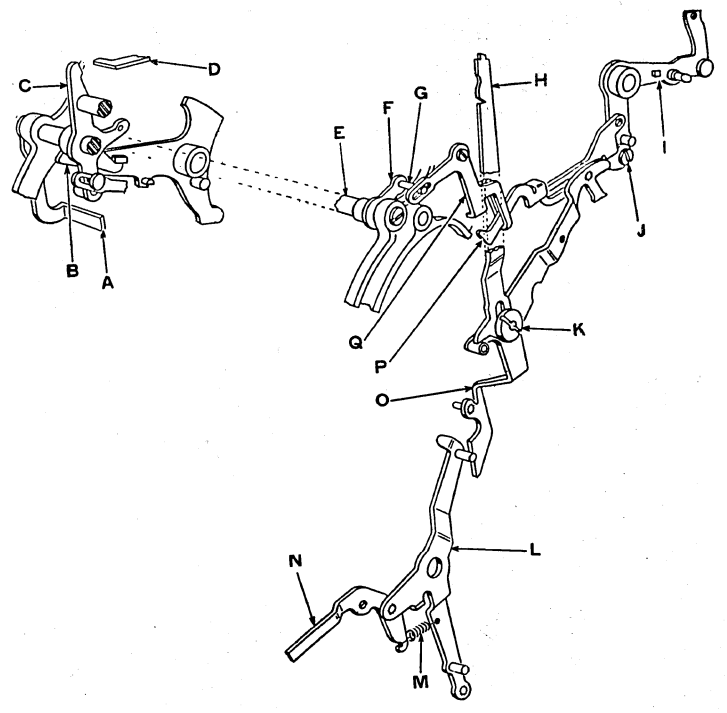
A **10016¼ Style 9 or 17** use 10050¼ rivets
B **10056¼**
C **47**
D **1-10048¼** consists of cylinder and plunger
E **10054¼** Screw, 47 nut
F **1-27½A Fte. 104 Style 17** includes N, P, Q, S, use spring 10085½
G **11-3627 No. 1**
H **10057¼A** Screw, 46 nut
I **1-10025¾A** includes J, K, Q, T, U
J **7050⅞**
K **10025½**
L **1-11¼ Fte. 104 Style 17**
M **1A-10023½ (1AZ-10023½, 1-12014⅞ No. 2, 12044¾B, 12059⅛A, 10788)** use 45 nut, 1097¼ lock washer, 10042½ bushing
N **3255½**
O 10044½* use 8054¾ screw
P **1-11½ Fte. 104 Style 11 or 17** includes Q, S
Q **16655**
R 54½ Fte. 104* (12054$\frac{15}{16}$*) used in back plate 1-12½A Fte. 104, use screw 8054¾
S 10026¼* supported by 10454 screw
T **10025¼** use spring 77881
U **10058¾**



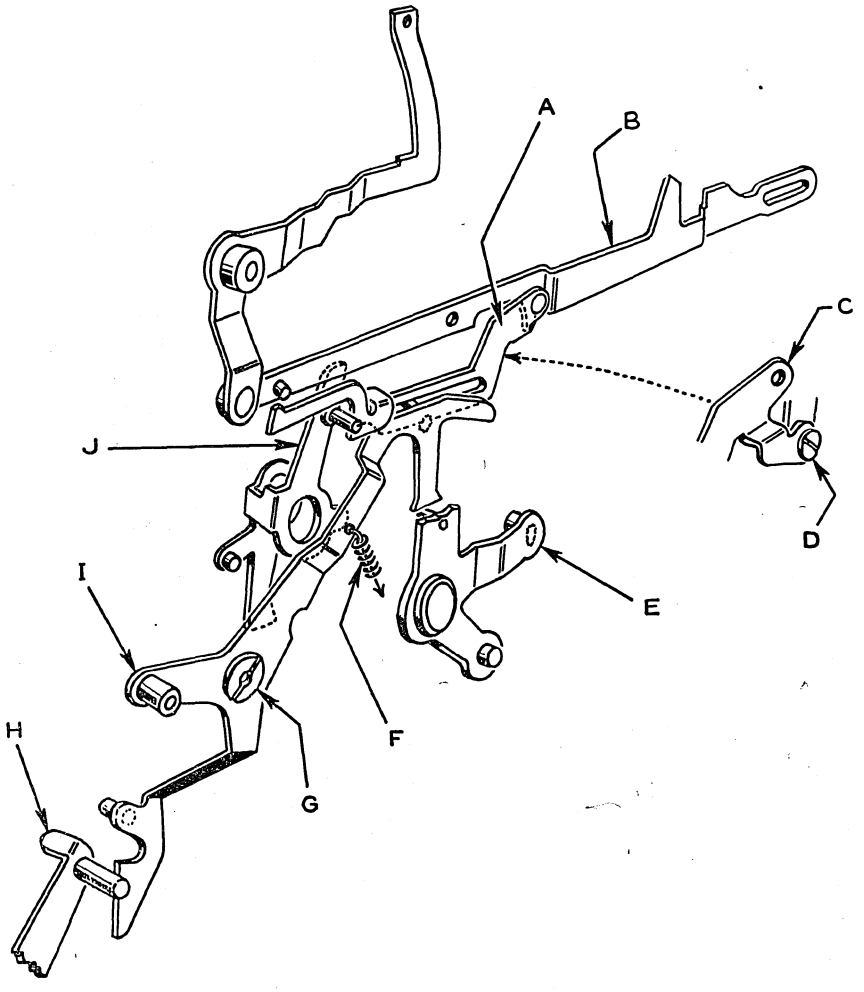
REPEAT PRINT OF SUB-TOTALS, CLASSES 11 THRU 16 AND 20 THRU 30 (Plate 19)

SYMBOLS (Plate 19)

A **1-12024¾ No. 2 (1-12020¾ No. 2)**
B **623B**
C **1-10219½R***
D **1-202233 (1-202233 No. 2)**
E **11-12007 Style 11, 13 or 17 No. 1**
F **1-12024 No. 18 (1-12024 No. 18A)**
G **12052$\frac{3}{16}$**
H **222 Fte. 214**
I **1-62127**
J **251⅜ No. 3**
K **30 Fte. 132 Bushing, 3455¼ screw**
L **1-60106C**
M **2886½** included in L
N 60122* included in L
O **1-220A Fte. 214 No. 1** uses 2887½ spring
P **208A Fte. 214 No. 1**
Q **1-207 Fte. 214**



TOTAL OR SUB-TOTAL KEY TO CLEAR THE CROSSFOOTER IN THE LAST POSITION ONLY OF A REPEAT TOTAL OPERATION—CARRIAGE CONTROLLED (Plate 19-1)

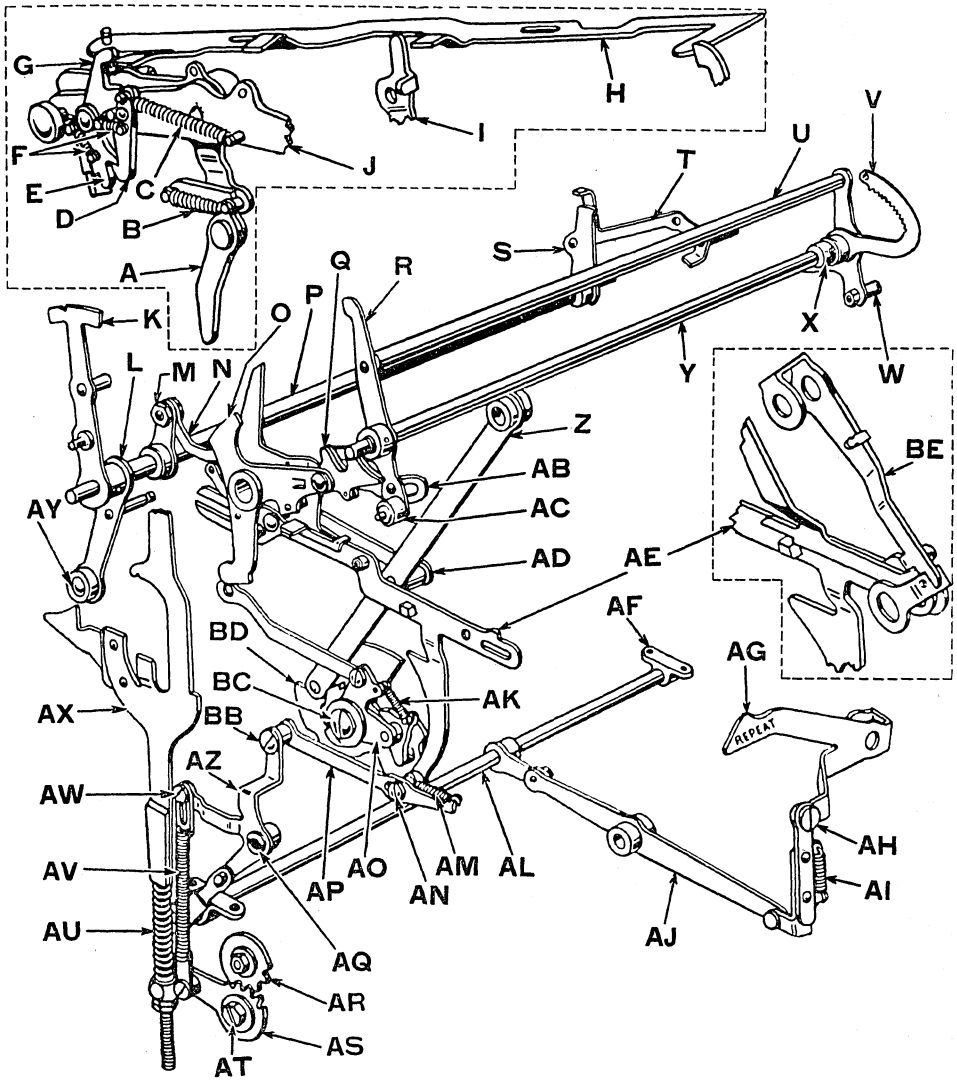


SYMBOLS (Plate 19-1)

A	Included in B
B	**1A-228 Fte. 214 No. 2**
C	**208A Fte. 214 No. 1**
D	**251⅜ No. 3**
E	**21-60100**
F	**2887½**
G	**30 Fte. 132, 3455¼ screw**
H	**1-60106C**
I	**1-220A Fte. 214 No. 1**
J	**11A-3429⅛A**

Printed in U. S. America 12-12-52

REPEAT PRINT AND CYCLE MECHANISM, CLASSES 2, 6, 11 THRU 16 (Plate 20)



SYMBOLS (Plate 20)

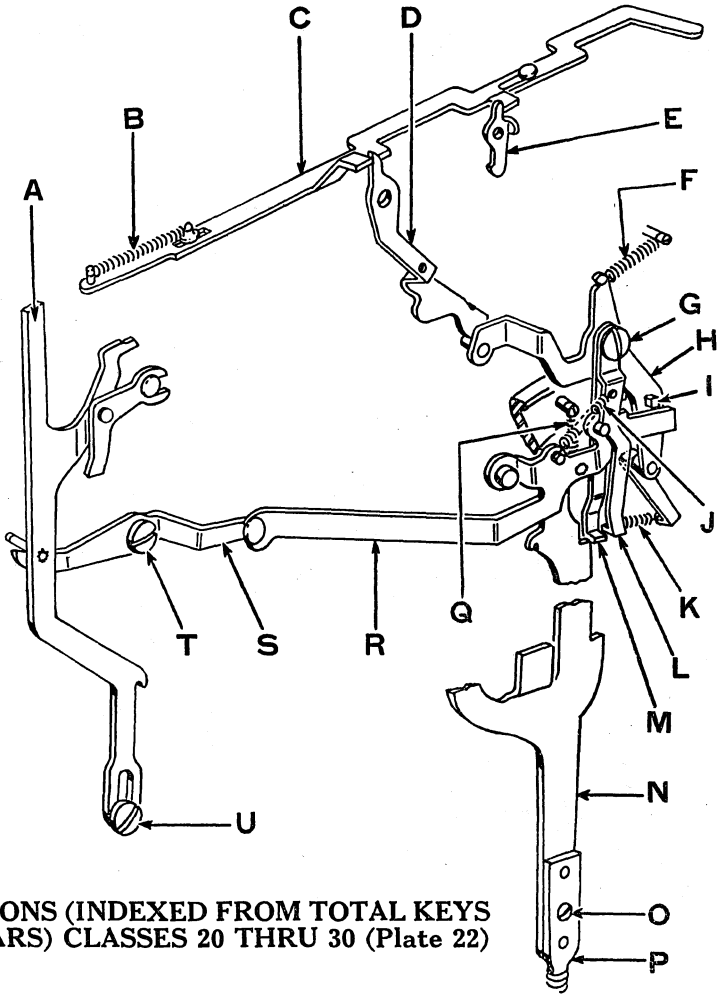
A **1-122¾ Fte. 104**
B **180⅛ Fte. 104**
C **10480¼**
D 1-122⅝ Fte. 104* included in G
E **1-123⅛ Fte. 104**
F **62880 (89801)**
G **2-122½ Fte. 104** includes D
H **1-124 Fte. 104**
I **1-19¼ Fte. 104 (1-201122)**
J **2-122⅜ Fte. 104** includes A, B, C, D, E, F, G
K 1-124⅝ Fte. 104*
L Included in P
M **162⅜ Fte. 104 (550A Fte. 200)** Screw, 47 nut
N **126⅜ Fte. 104**
O **1-124⅛ Fte. 104 (1-622¼ No. 2)**
P **1-105¼ Fte. 104 Style 13 or 17**
Q **124⅜ Fte. 104 and 124¼ Fte. 104**
R Included in Y
S Included in T
T **2-115 Fte. 104**
U **1-10202A Style 11 (1-202005 Blank Style 11)**
1-10202A Style 13 (1-202005 Blank Style 13)
1-10202A Style 17 (1-202005 Blank Style 17)
V **1-10211AL**
W **7355¼A** Screw, 46 nut
X **1-7140¼**
Y **1-107½ Fte. 104 Style 11 (1-107½ No. 1 Fte. 104 Style 11)**
1-107½ Fte. 104 Style 13 (21-202007 Style 13)
1-107½ Fte. 104 Style 17 (21-202007 Style 17)
Z **1-128⅝ Fte. 104**
AB **10226½**
AC **132½ Fte. 104 (202400A, 202503A)**
AD **10056**
AE **2-120⅜ Fte. 104 (1-120⅜ Fte. 104)** with cycle
2-11¾ Fte. 104 without cycle
AF Included in AL
AH **12059⅞ Screw, 46 nut**
AI **2886¾**
AJ **1-10⅜ Fte. 104**
AK **7480B**
AL **1-1 Fte. 104 Style 13, 17**
AM **82 Fte. 104**
AN **2850⅜**
AO **1-129⅜ Fte. 104**
AP **1-13 Fte. 104**
AQ **12031½**
AR **3616B**
AS **11B-3615C**
AT **3660¾ Hex., 3634¼A bushing**
AU **3684A**
AV **1-186 Fte. 104 (1-201800)**
AW **2857⅞ (4857½)**
AX **1-3627 No. 1**
AY **1435 Roll, 1455 stud**
AZ **1-118½ Ftc. 104**
BB **2850¾ (2855⅝)**
BC **160⅝ Ftc. 104 (7153B)** Screw **160¾ Ftc. 104** Washer
BD **1-126⅝ Ftc. 104**
BE **125¼ Ftc. 104**

Printed in U. S. America 1-5-49 For Form 2961

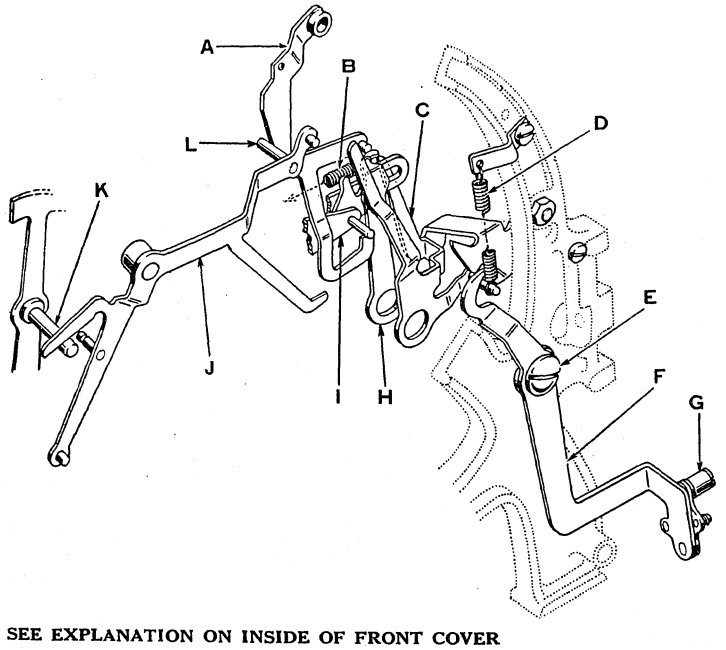
AUTOMATIC TOTAL REPEAT MECHANISM NORMALIZED BY CARRIAGE RETURN (BANK POSTING MACHINE) (Plate 21)

SYMBOLS (Plate 21)

A **1-12021¼ No. 2** early style
1-12021¼A later
B **480¼**
C **1-202233 No. 2**
D **202234**
E **1-201122**
F **2887**
G **200505 No. 3** for early Style H
12051⅛ No. 4 for later Style H
H **1-12024⅝ No. 3** early style
1-12024⅝A No. 3 later
I **527 Fte. 200** Triangular stud
302518 Square stud
J **10180**
K **72807 No. 1**
L **200244 No. 4**
M **11-200244A No. 1**
N **1-3627 No. 1**
O **3651⅜**
P **3651½**
Q **7287 Style 5**
R **1-200144 No. 2**
S **1-200233 No. 2**
T **12051⅛**
U **200517B**



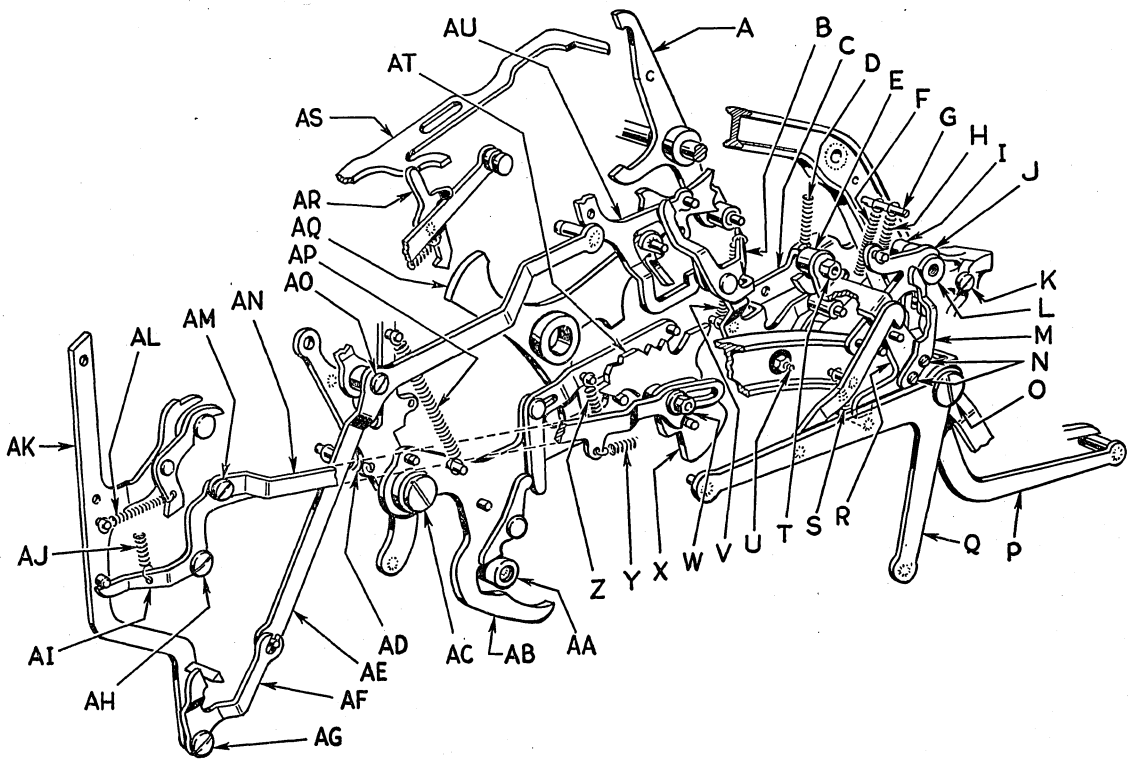
REPEAT MACHINE OPERATIONS (INDEXED FROM TOTAL KEYS AND LOWER AND UPPER BARS) CLASSES 20 THRU 30 (Plate 22)



SYMBOLS (Plate 22)

A **1-200276A No. 1 (1-200276A No. 3)** used with auto bank totals or repeat print from upper bar
1-200276A No. 4 used with repeat print from upper, uppermost or lower bar
B **10080**
C **13⅝ Fte. 103 (20 No. 114)** use 7562 screw
D **480¼**
E **564 Env. 1358**
F **1-109A Fte. 200 No. 3 Env. 1358**
G **307 Fte. 217 Roller, 957½ screw**
H **1-200266A** used with auto totals, bank posting machine
1-200266 No. 2 used with repeat print indexed from auxiliary motor bar or total key
1-200266 No. 3 used with repeat print indexed by upper or uppermost motor bar and normalized by cam combined with repeat cam
I **11-622¼A** see Plate 7 letter E for other styles
J **1-235 Env. 1358**
K **205533 No. 3**
L **3850⅝** included with J

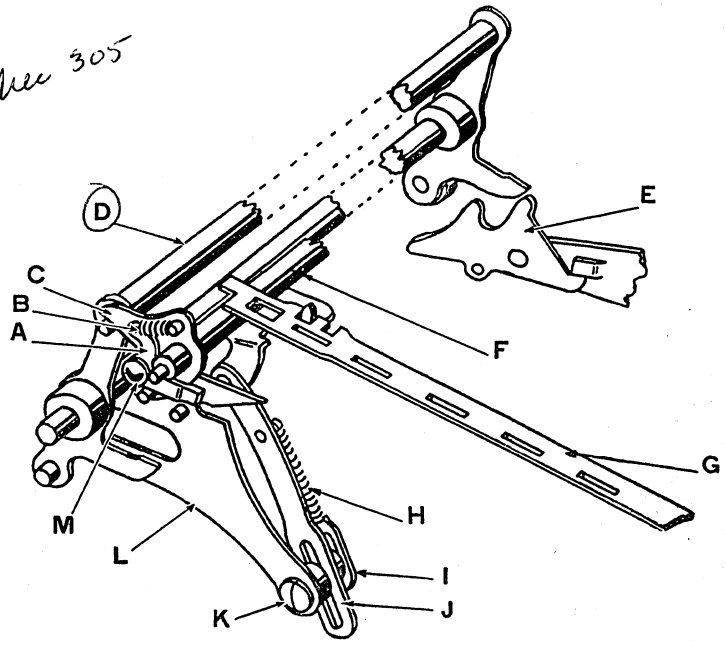
REPEAT OF MACHINE OPERATION INDEXED FROM THE LOWER BAR OR DISABLED FROM THE LOWER BAR, CARRIAGE CONTROLLED (Plate 22-1)



SYMBOLS (Plate 22-1)

A	**21-202007 Style 17**
B	**1-200266B**
C	**1-200186 No. 3**
D	**10080**
E	**75300A** roller, 201562 screw
F	**780⅜**
G	**200501½**
H	**12081½** spring
I	**72363** spacer
J	**1-200192½A**
K	**200548½**
L	**137½ Fte. 104**
M	**200196¼**
N	**74533**
O	**3450 11/16**
P	**1-109 Fte. 200 No. 5**
Q	**1-200239½ No. 2**
R	**1A-200196½**
S	**10780½** spring
T	**46,** 1097¾ lock washer
U	**200537½,** 46 nut
V	**3282** spring
W	**46,** 8436 bushing
X	**1-200195½ No. 2**
Y	**7283¼**
Z	**83800A**
AA	**1-3662¼ No. 3**
AB	**1-200270 No. 3**
AC	**352¾ No. 2**
AD	**2881¼**
AE	**1-235 Env. 1358** trim
AF	**200276¼**
AG	**200517 No. 3**
AH	**12051 1/16A No. 4**
AI	**1-200191½A**
AJ	**75804 No. 1**
AK	**11A-12021¼ No. 3**
AL	**77801**
AM	**200621**
AN	**1-200190½**
AO	**79593**
AP	**12081A**
AQ	**1-622¼ No. 3**
AR	**1-201121A**
AS	**1-202233 No. 2**
AT	**1-200195½ No. 1**
AU	**1-200276 No. 5**

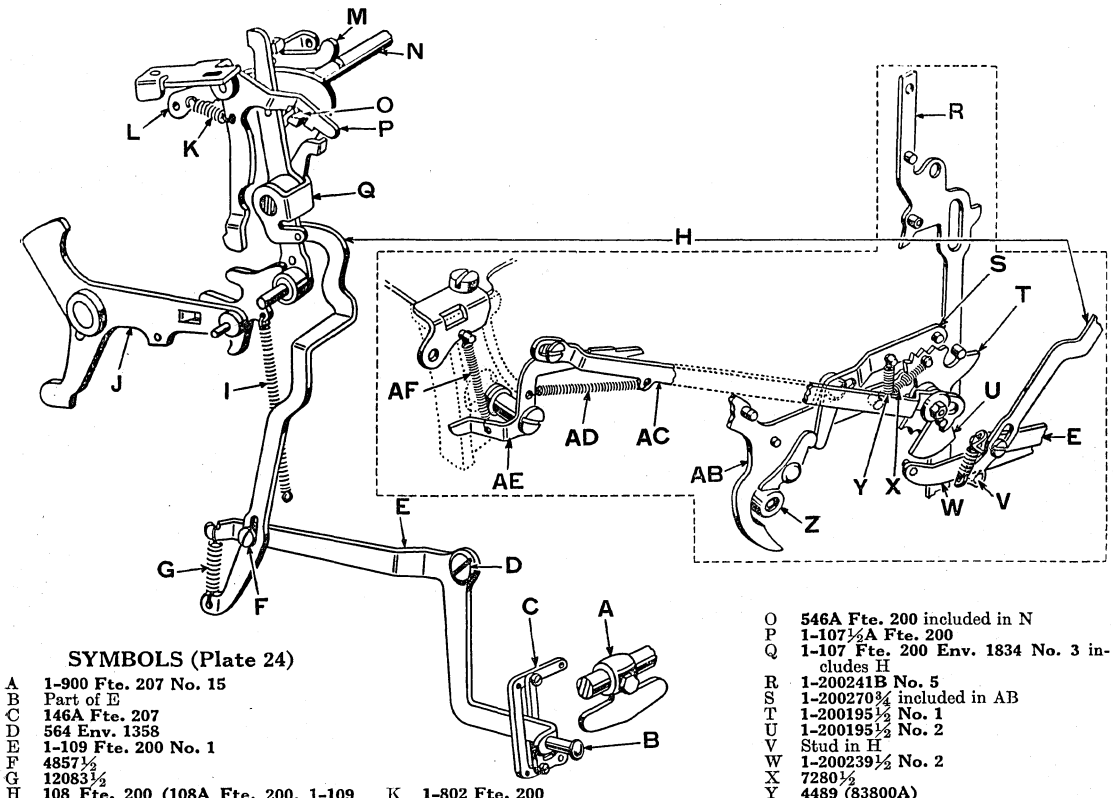
REPEAT PRINT KEYBOARD LOCK (Plate 23)



SYMBOLS (Plate 23)

A 202231 (202231 Env. 1726)
B 3984 (12085½)
C 1-202232 (1-202003 Style 9, 13 or 17 specify machine No.)
D 1-202005 No. 1 Style 13 or 17 specify machine No.
E 623B
F 1-202003 Style 9, 13 or 17 includes C and J, specify machine No.
G 214 No. 1 specify style, see chart, Plate 65 for other styles
H 283¼ (72806)
I 225½ (20 No. 36)
J 1-202230
K 259⅝
L 1-29¼ Fte. 88 No. 1
M 709607

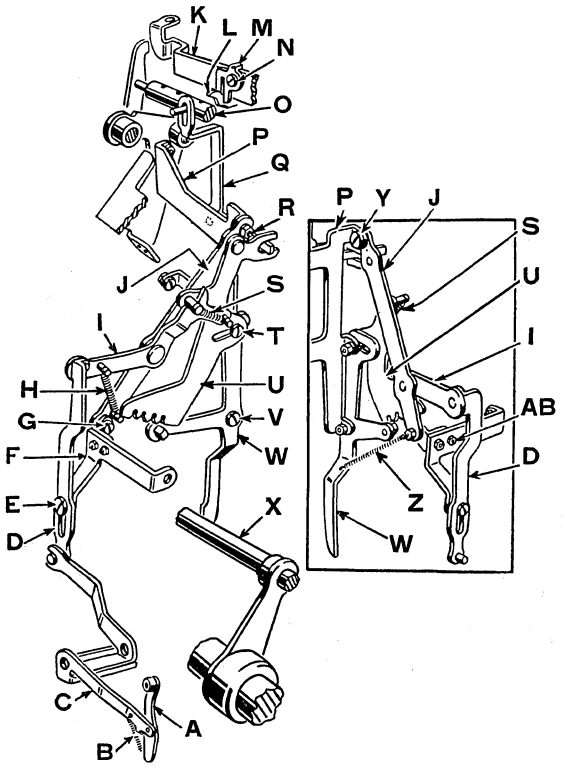
PARTIAL KEYBOARD REPEAT (SINGLE), CARRIAGE CONTROLLED, NORMALIZED FROM UPPER MOTOR BAR (Plate 24)



SYMBOLS (Plate 24)

A 1-900 Fte. 207 No. 15
B Part of E
C 146A Fte. 207
D 564 Env. 1358
E 1-109 Fte. 200 No. 1
F 4857½
G 12083½
H 108 Fte. 200 (108A Fte. 200, 1-109 Fte. 200 No. 1, 4857½, 12083½) at top
108 Fte. 200 Env. 1726 No. 2 (108A Fte. 200) at bottom
I 10686½
J 1-622¼ No. 2
K 1-802 Fte. 200
L 1-118½R Fte. 200
M 228CR&CL
N 200¾ (1-2 Fte. 200 Style 17) specify style and machine number, used for machines without date repeat, see Plate 7 for other styles
O 546A Fte. 200 included in N
P 1-107½A Fte. 200
Q 1-107 Fte. 200 Env. 1834 No. 3 includes H
R 1-200241B No. 5
S 1-200270¾ included in AB
T 1-200195½ No. 1
U 1-200195½ No. 2
V Stud in H
W 1-200239½ No. 2
X 7280½
Y 4489 (83800A)
Z 1-3662¼
AB 1-200270 No. 3
AC 1-200190½
AD 780½
AE 1-200191½
AF 75804 No. 1

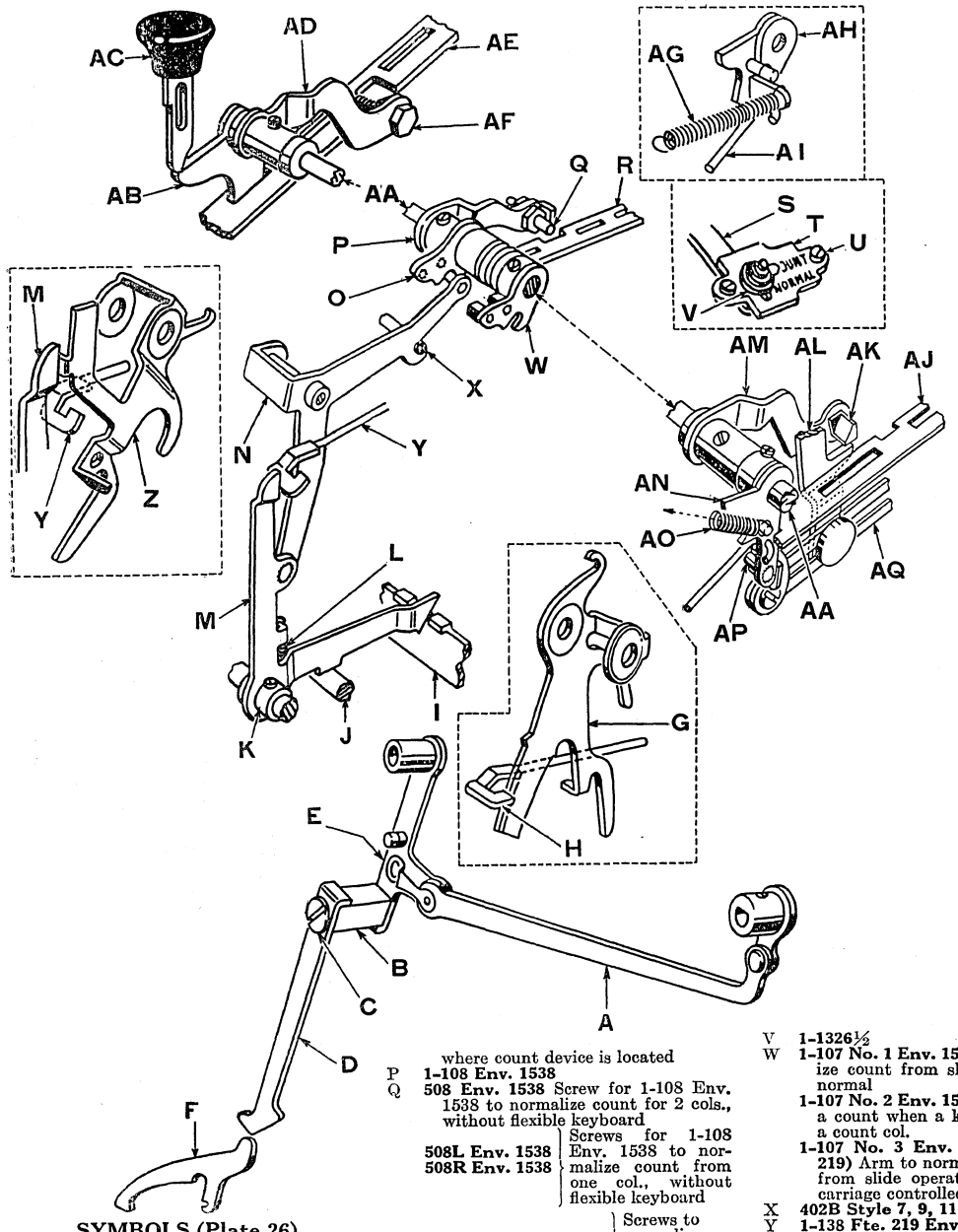
DUPLEX PARTIAL KEYBOARD REPEAT MECHANISM (Plate 25)



SYMBOLS (Plate 25)

A Included in C
B **71805**
C **1-127 Fte. 202 Env. 144** specify machine number
D Included in J
E **4456½ Screw, 46 nut, 1097¾ washer**
F **126 Fte. 202 Env. 144**
G **73612 Screw, 46 nut, 1097¾ washer**
H **7283A Style 10**
I Included in J
J **1-120 Fte. 202 Env. 144** includes D, I and U
L **228⅝BR and BL**
N **74587**
O **1-900 Fte. 202 No. 3 Env. 144** specify machine No., for 3 Fte. 202 Env. 144 specify machine No.
Q Included in P
R **4456½ Screw, 46 nut**
S **72588 (12356⅝)**
T **10751¼ (3960)** Screw, 46 nut
U Included in J
V **12051¼ Screw, 46 nut**
X **101 Style 9**
Y **4456½ Screw, 46 nut, 1097¾ washer**
Z **16880**
AB **12058⅜ Screws, 46 nuts**

COUNT AND NORMAL MECHANISMS INDEXED FROM MACHINE OPERATION (Plate 26)



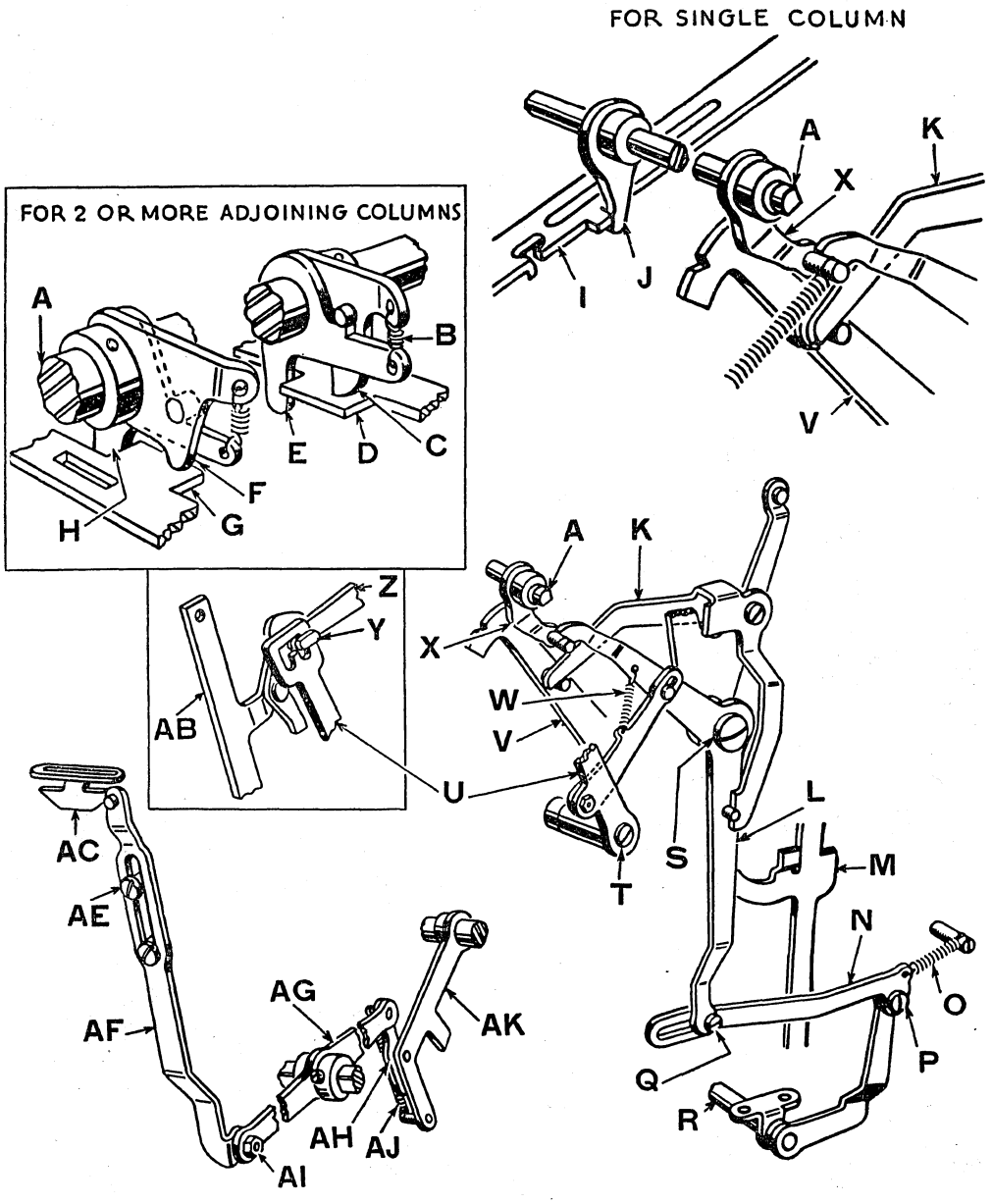
SYMBOLS (Plate 26)

A **1-111 Env. 1538**
B **308 No. 4 Env. 1538**
C **60550 Screw, 46 nut**
D **110 No. 2 Env. 1538** or **110 Env. 1538** if other than No. 4 block (B) is used
E **1-109 No. 2 Env. 1538** or **1-109 Env. 1538** if other than No. 4 block (B) is used
F **28 Fte. 5**
G **108 Fte. 219**
H **1-138 Fte. 219 Env. 1538 (1-138A Fte. 219)**
I **617A Style 9, 11, 13, 15 or 17**
J **205 Style 7, 9, 11, 13 or 17**
K **1-540** includes screw 550¾
L **12083½** Spring, 20 No. 73 anchor
M **1-100 Env. 1538**
1-100 Env. 1538 No. 2 (1-154 Fte. 219) for permanent split
N **1-101A Env. 1538 (1-155 Fte. 219)**
O **1-107 Env. 1538** Arm to operate on count device in cols. other than where count device is located
P **1-108 Env. 1538**
Q **508 Env. 1538** Screw for 1-108 Env. 1538 to normalize count for 2 cols., without flexible keyboard
508L Env. 1538, **508R Env. 1538** — Screws for 1-108 Env. 1538 to normalize count from one col., without flexible keyboard
508L Env. 1538, **508 No. 2R Env. 1538** — Screws to normalize count from one col., with flexible keyboard
508 No. 2 Env. 1538 Screw for 1-108 Env. 1538 to normalize count in 2 cols., with flexible keyboard
R **214 No. 1 Env. 1538** used in odd col. except when first col. of the count device is an odd col., regular
214R No. 1 Env. 1538 (214 No. 2) used in even col., regular
214 No. 2 Env. 1538 (214 No. 103) used when first col. of count device is in odd col.
214AL No. 5 Env. 1538 Flexible keyboard
214R No. 5 Env. 1538 Flexible keyboard
S **1-105A Env. 1538** Slide
T **1329¼**
U **252⅝**
V **1-1326½**
W **1-107 No. 1 Env. 1538** Arm to normalize count from slide of date count normal
1-107 No. 2 Env. 1538 Arm to prevent a count when a key is depressed in a count col.
1-107 No. 3 Env. 1538 (1-156 Fte. 219) Arm to normalize count device from slide operated by beehive or carriage controlled slide
X **402B Style 7, 9, 11, 13, 15, 17**
Y **1-138 Fte. 219 Env. 1538 (1-138A Fte. 219)**
% **115 Fte. 206 No. 8 Env. 1538** specify machine No.
AA **1 No. 7 Style 17 Env. 1098**
AB **217 (1-217AR&AL, 246)**
AC **1-291** specify button
AD **1-108 Env. 1538 No. 2**
AE **214 Env. 1538** specify machine No.
AF **509 Env. 1538** included in AD
AG **802 Fte. 219**
AH **217A Env. 1538** Flexible keyboard
AI **1-138 Fte. 219 Env. 1538 No. 2 (11-138A Fte. 219)** Flexible keyboard
AJ **214 No. 94** specify machine No.
AK Included in AM
AL **11-113 Env. 1538** complete normalizer assembly; includes AQ
AM **1-108 Env. 1538 No. 2**
AN **1-125R or L Fte. 207 No. 1**
AO 284
AP Stud in AN
AQ Included in AL

SEE EXPLANATION ON INSIDE OF FRONT COVER

Printed in U. S. America 1-5-40

ENFORCED DESIGNATION MECHANISM NORMALIZED BY TOTAL AND SUB-TOTAL KEYS—CARRIAGE CONTROLLED (Plate 27)

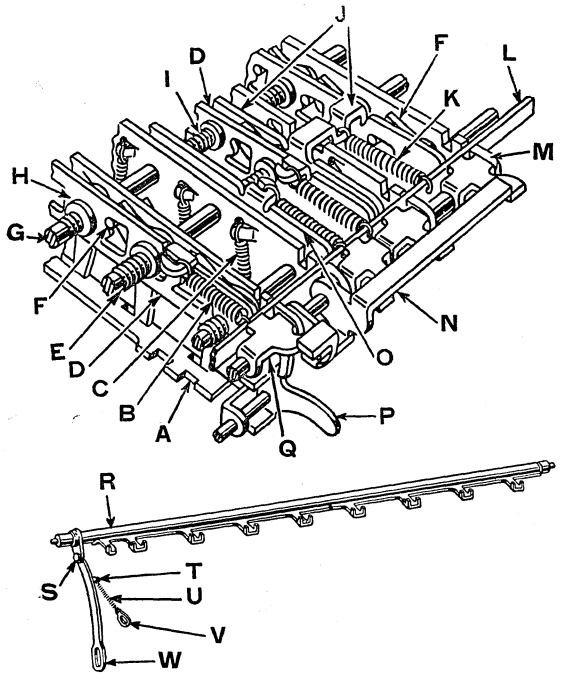


SYMBOLS (Plate 27)

A 1 No. 2 Env. 1163
B 800 Env. 1163
C 1-106R Env. 1163
D 214L No. 29
E 108 Env. 1163
F 1-106L Env. 1163
G 214R No. 29
H 11-108 Env. 1163
I 214R No. 31
J 220⅝
K 1-115 Env. 1163 Special specify machine number, uses 3455⅝ screw, 303 Fte. 201 bushing
L 1-104½ Env. 1163
1-104½ Env. 1163 No. 2 for mult. skip-return
M 21A-3627 No. 1
N 103 Fte. 209 Env. 1163
O 480¼
P 506 Fte. 209
Q 9259⅝
R 1A-4 Fte. 209 Style 17 (1B-4 Fte. 209 Style 17, 1A-12025 No. 9 60804A)
1B-4 Fte. 209 Style 13
S 503 Env. 1163 Screw, 79325 collar
T 503½ Env. 1163 Screw, 237 collar
U 1-112½ Env. 1163
1-112½ Env. 1163 No. 2 for mult. skip-return
1-112½ Env. 1163 No. 3 for bank totals machine
V 1A-10500¼ Style 13 or 17 Env. 1163
W 7480B
X 1-113 Env. 1163
Y 3657¼B Env. 1163
Z 1-201123 Env. 1163
AB 1-12021¼ No. 2
AC 115A Fte. 209 Env. 1163
AE 8054¾
AF 1-104B Fte. 209
AG 1-12025 No. 9 includes AH
AH Included in AG
AI 251 Screw, 46 nut
AJ 4489 (83800A)
AK 1-114A Fte. 209 (1B-4 Fte. 209 Style 17, 1A-12025 No. 9, 60804A)

SEE EXPLANATION ON INSIDE OF FRONT COVER

FLEXIBLE KEYBOARD (Plate 28)



SYMBOLS (Plate 28)

A **214R&L No. 4** specify machine No., used in non-add cols.
214R&L No. 5 specify machine No., used in adding cols.
214R&L No. 6 specify machine No., specify extra repeat key, partial keyboard repeat, or folio to add
214 No. 47 (214 No. 42) specify machine No., with 1/12 fraction, fractions to add
1-214 No. 57 specify machine No., used with 15 characters
1-214 No. 68 specify machine No., used with 15 characters placed in odd cols.
1-214 No. 73 specify machine No., used in calendar feature for months
1-214 No. 86 specify machine No., used in date col.
1-214 No. 87 specify machine No., used when dates, characters or numerals are to list 1 to 4 incl.
1-214 No. 98 specify machine No., used with calendar feature keys 1 and 2 hold down in last col., keys 1-2-3-4 lock down in next col.
214 No. 99 (211½) specify machine No., used in tens of shillings col.

B **480¼**

C **284** Flexible

D **214¾AR** Right locking strip for 217 L's

E **282¾**

F **11-217R or L No. 5** used in cols. requring characters, has long stud
31-217R or L No. 5 used in No. 9 key position, has short stud
1-217R or L No. 5 used in regular flexible cols., has shortest stud, to clear 214¾AR
1-217R or L No. 6 used in last month position in calendar fte., short slot in 214

G **1-200 Style 7, 9, 11, 13, 15 or 17**

H **295 Brass washer, 246 sleeve, 233¼A collars** used for double locking slides J, or 633¼ collars for D or O

I **282¾**

J **214¾ No. 3** for 1-217R No. 5 keylevers placed between 1-210AL pitch 16 and 11-210AL pitch 10 in extreme left of 200 section, width of span .710
214¾ No. 4 for 1-217L No. 5 keylevers placed in between 1-210AL pitch 16 and 1-210AR pitch 10 in 16 pitch column, width of span .545
214¾ No. 5 used in calendar feature or pitch 16 charactrs, in odd column except last column, width of span .875

K **480¼**

L **223¾ Style 7, 11, 13, 15 or 17**

M **1-210AL Pitch 16**
11-210AL Pitch 10 cut out for 214¾ No. 3 and No. 5

N **228 No. 2 (228A No. 2)** specify machine number

O **214¾AL** left locking strip for 217 R's
1-214¾L No. 2 locking strip for 11-217R No. 5, used in col. to right of 16 pitch

P **228¾AR or AL** for releasing 214¼R or L No. 5 thru rocker shaft assembly
228¾AR or AL No. 2 (228⅜AR or AL No. 5) for releasing 214's in calendar feature columns
228⅜AR or AL No. 3 used in columns where keys are to restore only by key in same column or selective column release key, not actuated by rocker shaft assembly

Q **228¼BR**

R **11B-202½B Style 7, 9, 11, 13, 15 or 17** specify flexible keyboard columns, assembly for locking 214's for machines without repeat print mechanism, includes S, T, W
11-202003 Style 13 or 17 specify flexible keyboard columns for machines

S **256¼A (12062⅝)**

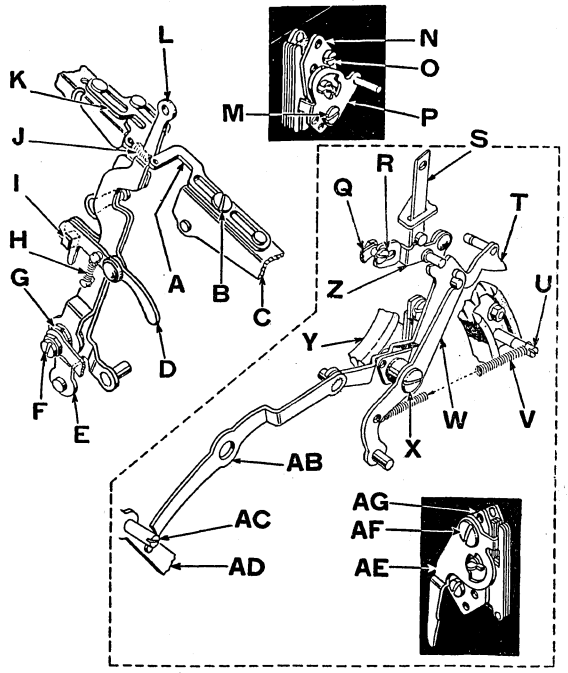
T **3450**

U **283¼ (72806)**

V **225½ (20 No. 36)**

W **1-220¼**

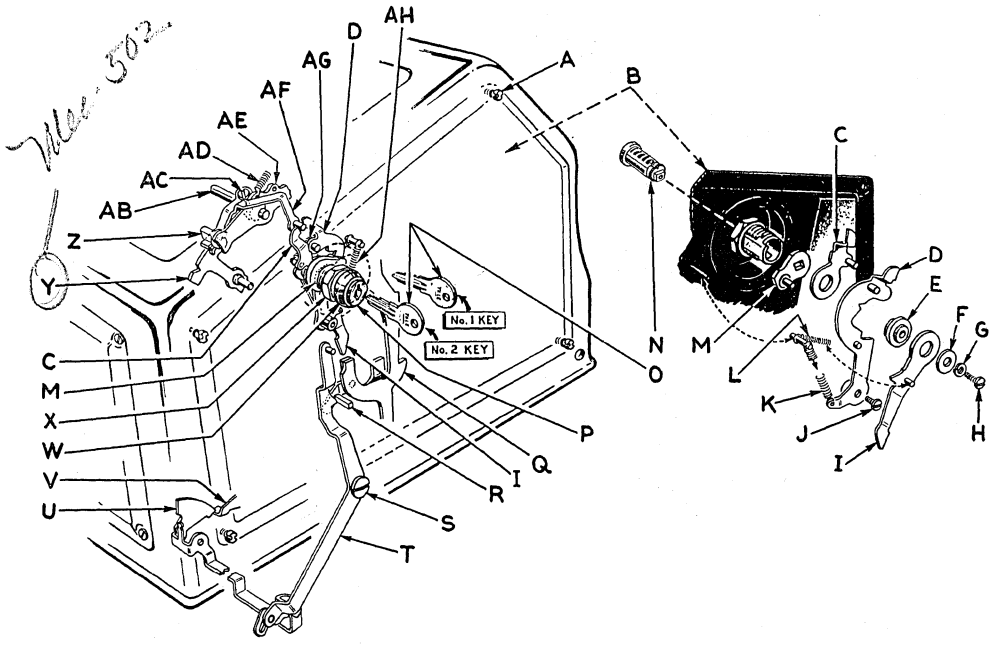
LOCK AND KEY MECHANISMS TO PREVENT TOTALING REGISTERS AND TO BLOCK MOTOR BAR AND TOTAL KEYS (Plate 29)



SYMBOLS (Plate 29)

A **105 Env. 1728** included in C
B **53522 (83630)**
C **1-62215A No. 3 Env. 1728** includes A, B, K
D **1-100 No. 2 Env. 1728** included in L
E **31-60100 Env. 1728**
F **73207 Eccentric nut, 12051⅜ screw**
G **60557 Env. 1728**
H **4487**
I **302518** included in E
J **7781A**
K **104 Env. 1728** included in C
L **1-101 Env. 1728** includes D
M **15520**
N **2-115L Fte. 200 Style 1 Env. 1728** left case panel with lock and key complete to prevent totaling registers, specify machine number
O **75608**
P **1-169 Fte. 200 No. 2 Env. 1728** for registers
1-169 Fte. 200 Env. 1728 for folio repeat
Q **1A-201121 (1-201121A, 1A-201123)**
R **12062¼A**
S Motor bar
T **1-1170 Fte. 214** uses spring 10686½
U **200501½**
V **1086**
W **11-171 Fte. 200**
X **1527 Fte. 214**
Z **1-200242 No. 1**
AB **1-200158**
AC **205533 No. 2 (552 Fte. 209)** Screw, 46 nut
AD **11-205117**
AE **169A Fte. 200 No. 1**
AF **15520**
AG **2-115AR Fte. 200 Style 1** right case panel with lock and key complete to block motor bar and total keys, specify machine number

LOCK TO PREVENT MACHINE OPERATION—POSITION 89
(For Wide Base Machines) (Plate 29-1)



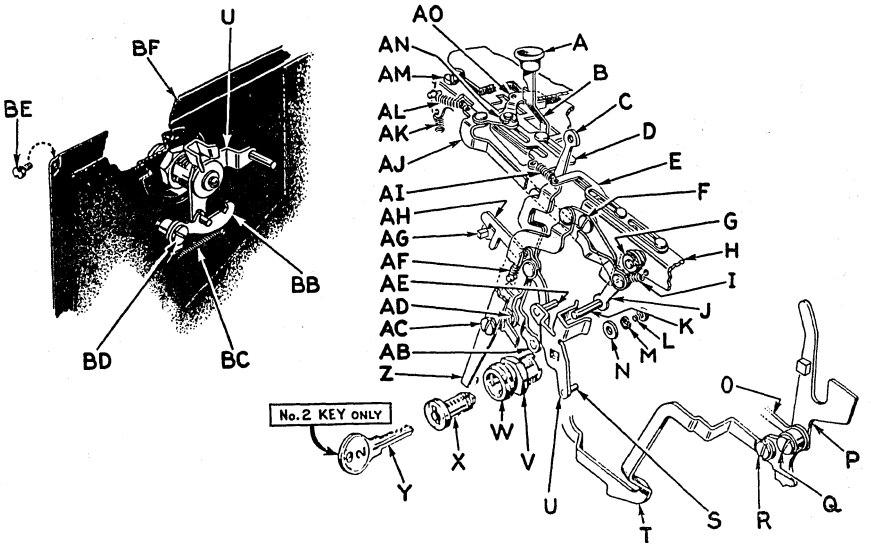
SYMBOLS (Plate 29-1)

A **501 Env. 3236**
B **1A-200115R Env. 3236**
C **1-101 Env. 3236**
D **1-100 Env. 3236**
E **302 Env. 3236**
F **3820½**
G **1097⅞**
H **506 Env. 3236**
I **1-102 Env. 3236**
J **10750⅝ Style 9**
K **7385**
L **76808**
M **1-110 Env. 3236**
N Part of P
O **90⅝ Specify Key Number**
P **90½ Specify Key Number** complete assembled lock includes F, G, H, N W, X
Q **21C-3627 No. 1** includes
R 203518½* included in Q
S **511 Env. 3236**
T **1-112 Env. 3236 No. 3**
U **69126½ P. 10 No. 10 Env. 3236** columns 5, 6, 7, 8, 9, 10, 11, 12
V **1-69109 No. 10**
W Cylinder included in P
X Lock nut included in P
Y 11-205117*
Z 201508 Env. 3236* included in AE
AB **1-10208½ Style 17 Env. 3236**
AC **505 Env. 3236**
AD **10788**
AE **1-201123 Env. 3236** includes Z
AF **1-104 Env. 3236**
AG **77879** spring
AH **7385**

Mr M R Lovejoy
Buffalo N Y Branch 10-5

Printed in U. S. America 11-7-49

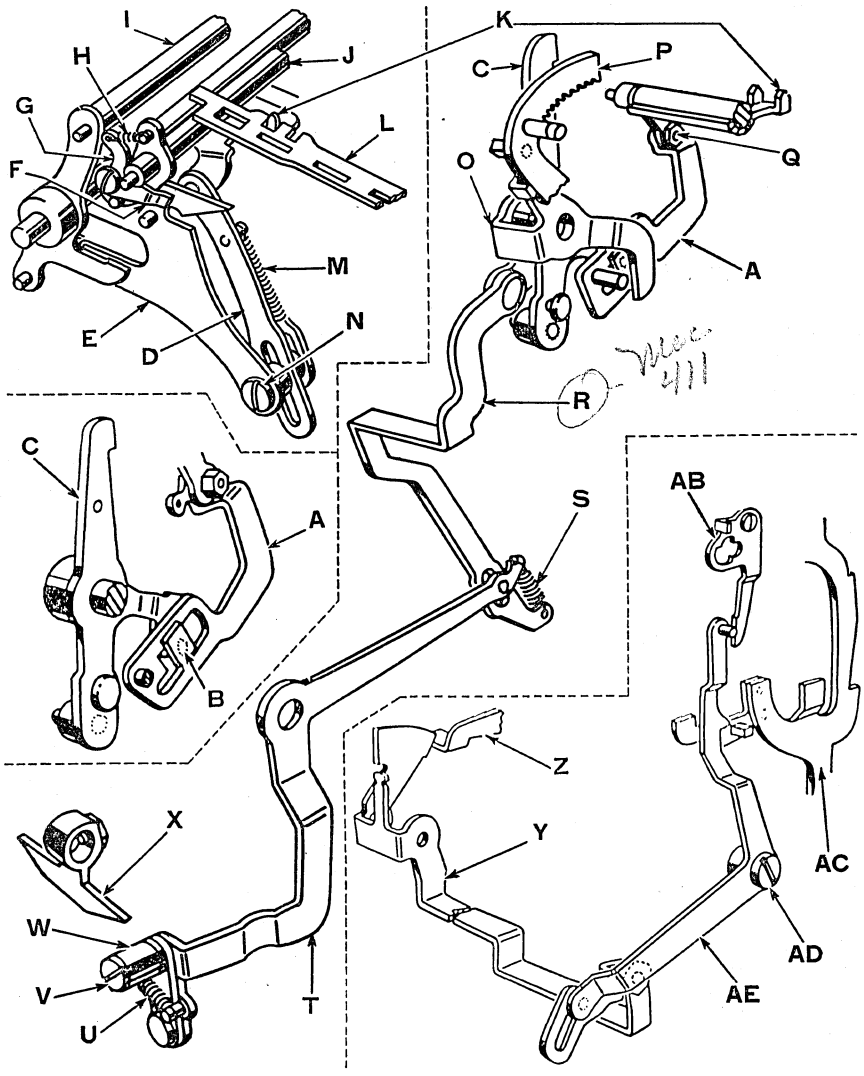
LOCK WITH KEYS, POSITION 90, TO PREVENT MANUAL REGISTER TOTALS AND/OR DEPRESSION OF THE DATE NORMAL KEY
(For Wide Base Machines) (Plate 29-2)



SYMBOLS (Plate 29-2)

A **291⅛ Specify Character and Color**
B 10221L* included in 1A-10219L
C **1-111 Env. 3236** includes AH
D 104 Env. 1728* included in H
E 105 Env. 1728* included in H
F **10056**
G **21 No. 2**
H **1-62215A No. 3 Env. 3236** includes D, E
I **87801A** spring
J 1-108 Env. 3236* included in AJ
K 507 Env. 3236* included in J
L Screw, included in X
M **1097⅛**
N **3820½**
O **1-60118 No. 1**
P **12A-60110A**
Q **60514 No. 2**
R **10056**
S 509 Env. 3236* included in U
T **10016 No. 2 Env. 3236**
U **1-109 Env. 3236** includes S, AE
V Lock nut included in X
W Cylinder included in X
X **90½ Specify Key Number**—complete assembled lock, includes L, M, N, V, W
Y **90⅝ Specify Key Number**
Z **1-60153 Env. 3236**
AB **31-60100 Env. 3236** includes AG
AC **12059⅛A** screw, use 60356 spacer and 200489 eccentric
AD **60557 Env. 3236** tapped shoulder screw
AE 548 Fte. 203* included in U
AF **4487** spring
AG 302518* included in AB
AH 1-111½ Env. 3236* included in C
AI **7781A**
AJ **1-107 Env. 3236** includes J, K, AO
AK **300812**
AL **3282**
AM **7059**
AN **21 No. 2** clip
AO 106 Env. 3236* included in AJ
BB **1-103 Env. 3236**
BC **10080**
BD **10750⅝ Style 9**
BE **501 Env. 3236**
BF **1A-200115L Env. 3236**
1A-200115L No. 2 Env. 3236 for quickset rotary date

SAFEGUARD KEYBOARD AND MOTOR BAR LOCK MECHANISM (Plate 30)



SYMBOLS (Plate 30)

A **1-103 Env. 1726** uses spring 1685 No. 2
B Stud in C
C **1-118R Fte. 200 Env. 1726**
D **1-202230**
E **1-62220 No. 2 (1-62220 No. 1)**
F **202231 (202231 Env. 1726)**
G **1-200191½ Env. 1726**
H **3984 (12085½)**
I **1-202005** all styles, specify machine number
J **21-202003 Style 13 or 17 Env. 1726** includes D, F, G, H, K, used when non-adding in 1st col.
21-202003 Style 13 or 17 No. 2 Env. 1726 used when adding in 1st col.
K **1-105 Env. 1726**
L **214 No. 43** uses spring 983
M **283¼ (72806)** Spring, 20 No. 36 anchor
N **259⅝ Screw, 250¼A bushing, 46 nut**
O **1-107 Fte. 200 Env. 1726**
P **1-118½R Fte. 200** included in 21-7 Fte. 200 Style 13 or 17 Env. 1726 which also includes C, O, R
R **108 Fte. 200 Env. 1726 No. 2 (108A Fte. 200)**
S **9281½ (87801A)**
T **1-109A Fte. 200 Env. 1726 (1-109 Fte. 200 No. 1)**
U **9281½ (87801A)**
V **957¼** included in T
W **307 Fte. 217** included in T
X **1-900 Fte. 207** specify machine No.
Y **69126½ P. 10 No. 10 Env. 1726** specify col. and machine number
Z **1-69109 No. 10** Carry pawl
AB **169A Fte. 200 No. 1**
AC **21-3627 No. 1 Env. 1726**
AD **502 Env. 1726**
AE **1-102 Env. 1726 No. 2 (1-102 No. 3 Env. 1726)**

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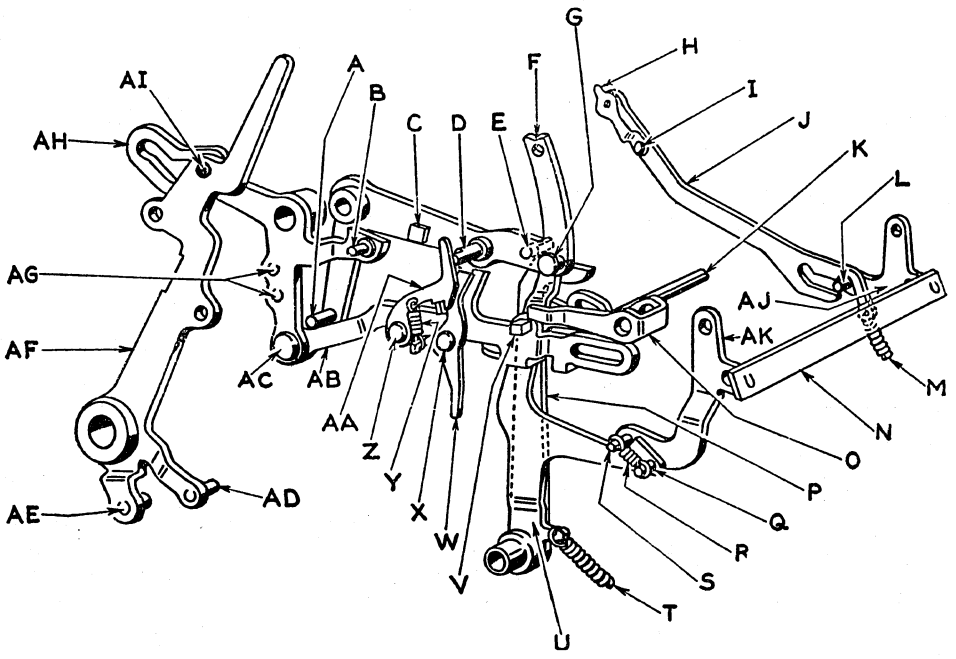
NEGATIVE TOTAL LOCK DISABLING MECHANISM, CLASSES 6, 11 THRU 16 AND 20 THRU 30 (Plate 31)



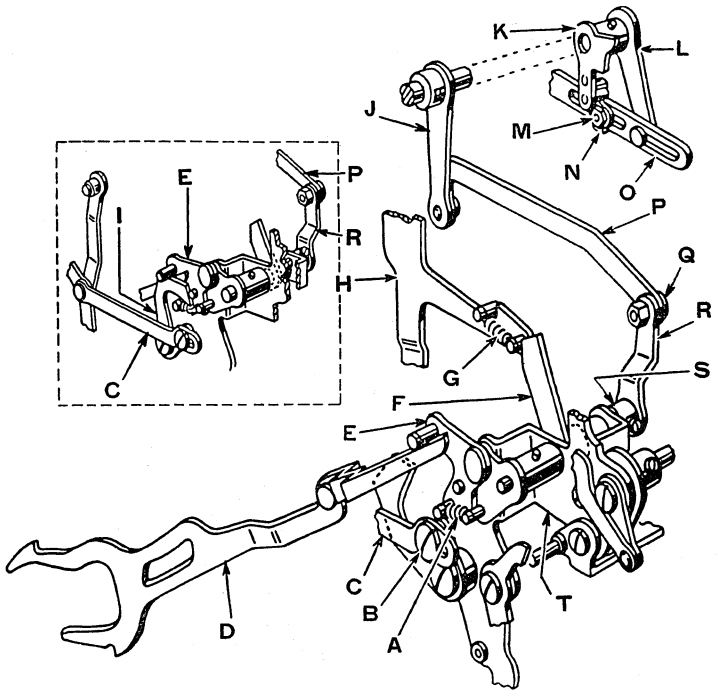
SYMBOLS (Plate 31)

A 251⅝
B **62500**
C **10250**
D **62511 (62511A)**
E **261⅛**
F **1-62127** includes all studs
G **83502**
H 10213¾*, 10255* stud
I 10254*
J **1-10214A**
K **402B Style 7, 9, 11, 13, 15 or 17**
L 10455* Stud in 1-10411AL
M 3280⅛
N **1-64102 No. 3** use for split between 10th and 11th cols. on 13 col. mach. and 14th and 15th cols. on 17 col. mach.
1-64102 No. 4 use for split between 9th and 10th cols. on 13 col. mach. and 13th and 14th cols. on 17 col. mach.
1-64102A No. 5 use for split between 8th and 9th cols. on 13 col. mach. and 12th and 13th cols. on 17 col. mach.
1-64102A No. 6 use for split between 7th and 8th cols. on 13 col. mach. and 11th and 12th cols. on 17 col. mach.
1-64102A No. 7 use for split between 6th and 7th cols. on 13 col. mach. and 10th and 11th col. 17 col. mach.
1-64102A No. 8 use for split between 5th and 6th cols. on 13 col. mach. and 9th and 10th cols. on 17 col. mach.
1-64102A No. 9 use for split between 4th and 5th cols. on 13 col. mach. and 8th and 9th cols. on 17 col. mach.
1-64102A No. 10 use for split between 3rd and 4th cols. on 13 col. mach. and 7th and 8th cols. on 17 col. mach.
1-64102A No. 11 use for split between 2nd and 3rd col. on 13 mach. and 6th and 7th cols. on 17 col. mach.
1-64102A No. 12 use for split between 1st and 2nd cols. on 13 col. mach. and 5th and 6th cols. on 17 col. mach.
O **64101A,** 64301A Hex. bushing, 72614 screw
46 Nut, 64302 collar
P 1-424AL* included with assembly 1-400A Style 9, 11, 13 or 17, see Plate 6, letter Q
Q **7259¼** Stud included in U
R **7781A** use for letter N No. 5 thru 12
8382 for letter N No. 3 and No. 4
S **64500**
T **7480B**
U **1-64100**
V **62511**
W **62107**
X **62509**
Y **62880 (89801)**
Z **62508**
AA **62105**
AB 62103*, 11A-62103 complete assy., includes B, V, W, X, Y, Z, AA, AC, AG, AH
AC **62506**
AD **10850**
AE **204509**
AF **1A-60100** specify machine No., includes AD, AE, AI
AG **7253⅝**
AH **1-62102** included with AB
AI **7948 Roll, 10751¾ stud**
AJ 1-64103R* included with N
AK 1-64103L* included with N

CROSSFOOTER SUBTRACT MECHANISM INDEXED FROM KEY CLASSES 20 THRU 30 (Plate 32)

SYMBOLS (Plate 32)

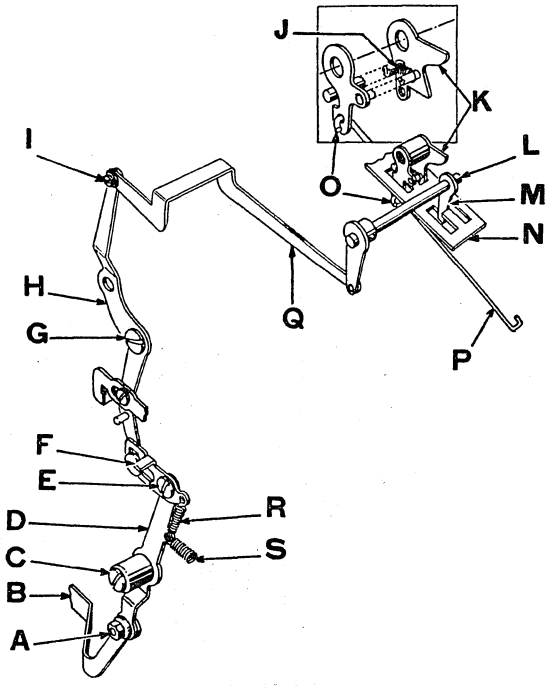
A **7286½**
B **10056**
C **200120½ Env. 392C** included with 1-200121½ Env. 392C
D **1-102 Fte. 210 Env. 392C**
E 1-119 Env. 392C* included with 1-3L Fte. 206 Env. 392C
F **1-118 Env. 392C**
G **7480B**
H **1-64100**
I **1-117 Env. 392C**
J **1-160 Fte. 216 Env. 392C** included in assembly 1-200⅝ Env. 392C
K **1-125R or L Fte. 207 No. 1** Long screw 511 Fte. 207
L **1-160 Fte. 216 Env. 392C** included in assembly 1-200⅝ Env. 392C
M **75621 Screw, 1097⅜₆ washer, 49 nut**
N **49 Nut**
O 158 Fte. 216* included in assembly 1-200⅝ Env. 392C
P **120 Env. 392C** use 12060½ screw and 46 nut on both ends
Q **12060½ Screw, 46 nut**
R **1-122 Env. 392C**
S 64306* included with R
T **21-150L Fte. 216 No. 2 Env. 392C**



CROSSFOOTER TOTAL WITH KEYS ON KEYBOARD DEPRESSED, CLASSES 21 THRU 30 (H903) (Plate 33)

SYMBOLS (Plate 33)

A **3826½ Washer, 46 nut**
B **1A-200176½**
C **200658 (200658A)**
D **1-200178½A (1-200178½B)**
E **200656**
F **200126½B** included in H
G **200619**
H **1A-200125½A**
I **104380 Eccentric, 75615 screw**
J **287**
K **1-217R&L No. 2**
L **200 Style 17 No. 2**
M **220⅝**
N **214⅝**
O **1-217R&L No. 3**
P **271¼L Numbers 1 to 8 inclusive** for even columns
271¼R Numbers 1 to 8 inclusive for odd columns
Q **1-221⅜ (21-221⅜)** for C.F. totals
11-221⅜ for reg. totals
R **182⅝ Fte. 104**
S **87800 No. 3**



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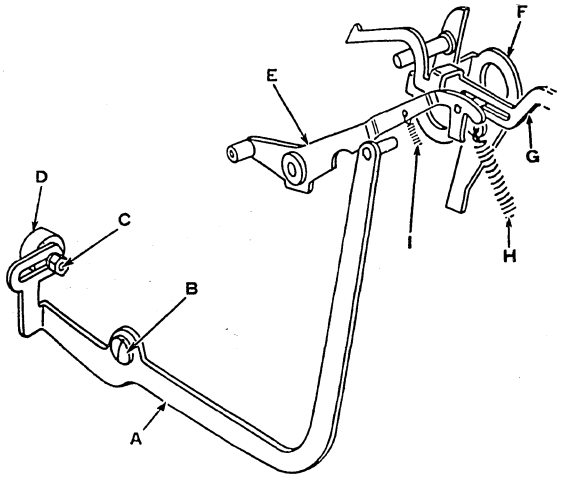
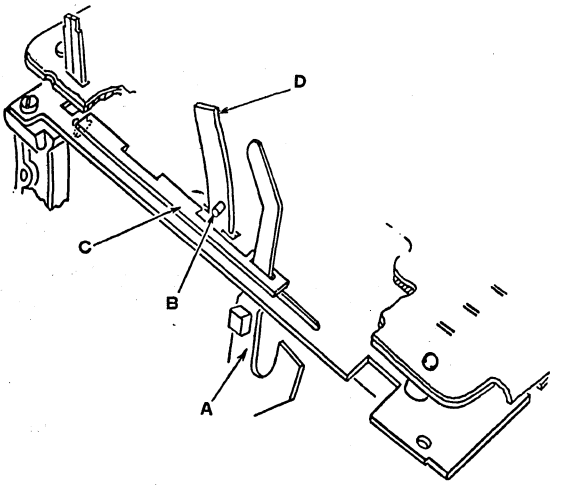
C. F. TOTAL KEY SUB-TOTAL IN C. F. A. POSITION AND TOTAL IN C. F. N. A. POSITION, CLASSES 21 THRU 30 (Plate 34)



SYMBOLS (Plate 34)

A 1-220A Fte. 214 No. 4 Env. 1826
B 506 Fte. 206
C 56 Fte. 103, 46 nut
D 33 Fte. 103
E 1-220A Fte. 214 No. 1
F 11A-3429⅛A (1-3429⅛AZ, 957½, 1-3429⅛Z)
G 208A Fte. 214 No. 2
H 10983
I 2887½

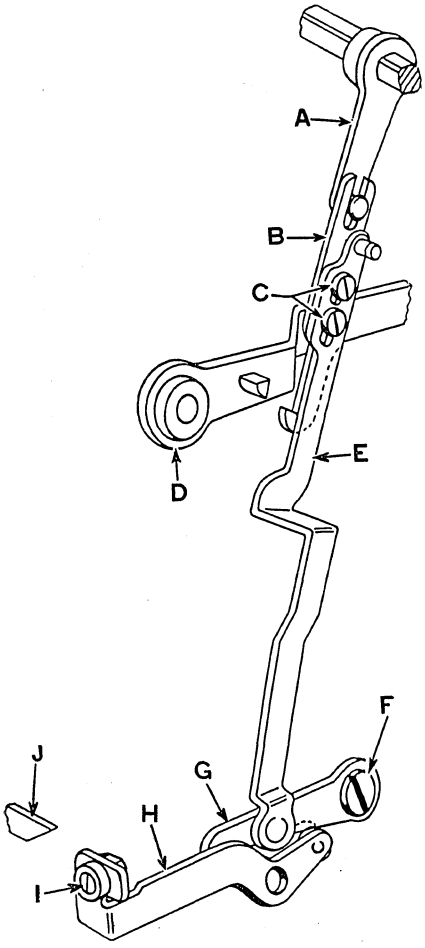
INTERLOCK TO BLOCK SUB-TOTAL KEY WHEN SUBTRACT LEVER IS IN SUBTRACT POSITION, CLASSES 11 THRU 16 AND 20 THRU 30 (Plate 35)



SYMBOLS (Plate 35)

A 2-60110A
B 12051½A
C 213 Fte. 214
D 1-228 Fte. 214

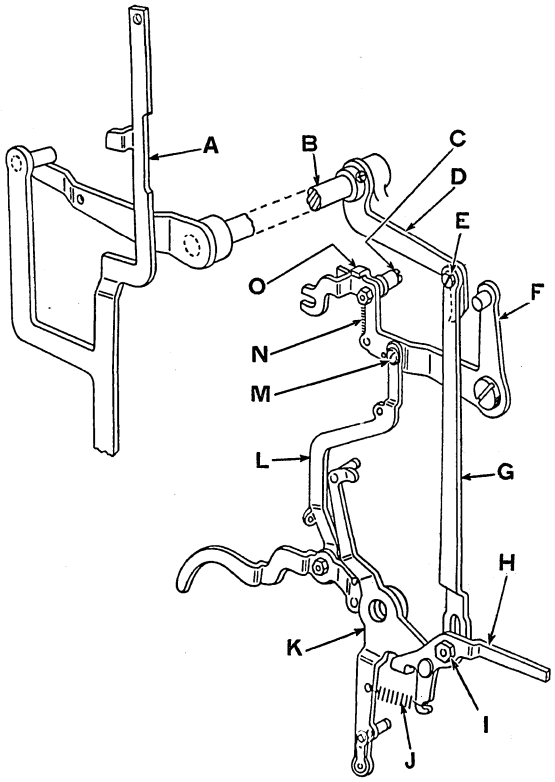
CROSSFOOTER ADD BAR (UPPER OR UPPERMOST) (Plate 36)



SYMBOLS (Plate 36)

A **1-102 No. 2 Env. 692**
B **101A Env. 692 No. 2**
C **10058¾, 1097¾ lock washer, 46 nut**
D **1-216 Fte. 200 No. 1 (11-216 Fte. 200 No. 3 Specify Machine Number)**
E **1-100A Env. 692** includes G
F **54¾A Fte. 103**
G **1-11½ Fte. 103 No. 2 Env. 692**
H **1-23 Fte. 103** includes I
I **33 Fte. 103 Roller, 56 Fte. 103 screw**
J **115B No. 2 Fte. 209**

CROSSFOOTER ADD-REGISTER NON-ADD BAR (UPPERMOST) (Plate 37)



SYMBOLS (Plate 37)

A **1A-200235**
B **1-12007 Style 13 No. 1 (1-12007 Style 13 No. 4, 1-540)**
1-12007 Style 17 No. 1 (1-12007 Style 17 No. 4, 1-540)
C **74502 Screw, 60340 collar, 60540 screw stud, 629 washer, 46 nut**
D **1-12024 No. 16A** later style
E **259½**
F **1-216 Fte. 200 No. 1 (11-216 Fte. 200 No. 3)** includes C, N, O
G **214 Fte. 200** later style
H **60122**
I **72582 Screw, 49¼ nut**
J **2886½**
K **1-60106C** includes H, J
L **200224 No. 1**
M **10761¼ Screw, 46 nut**
N **284**
O **3322½**

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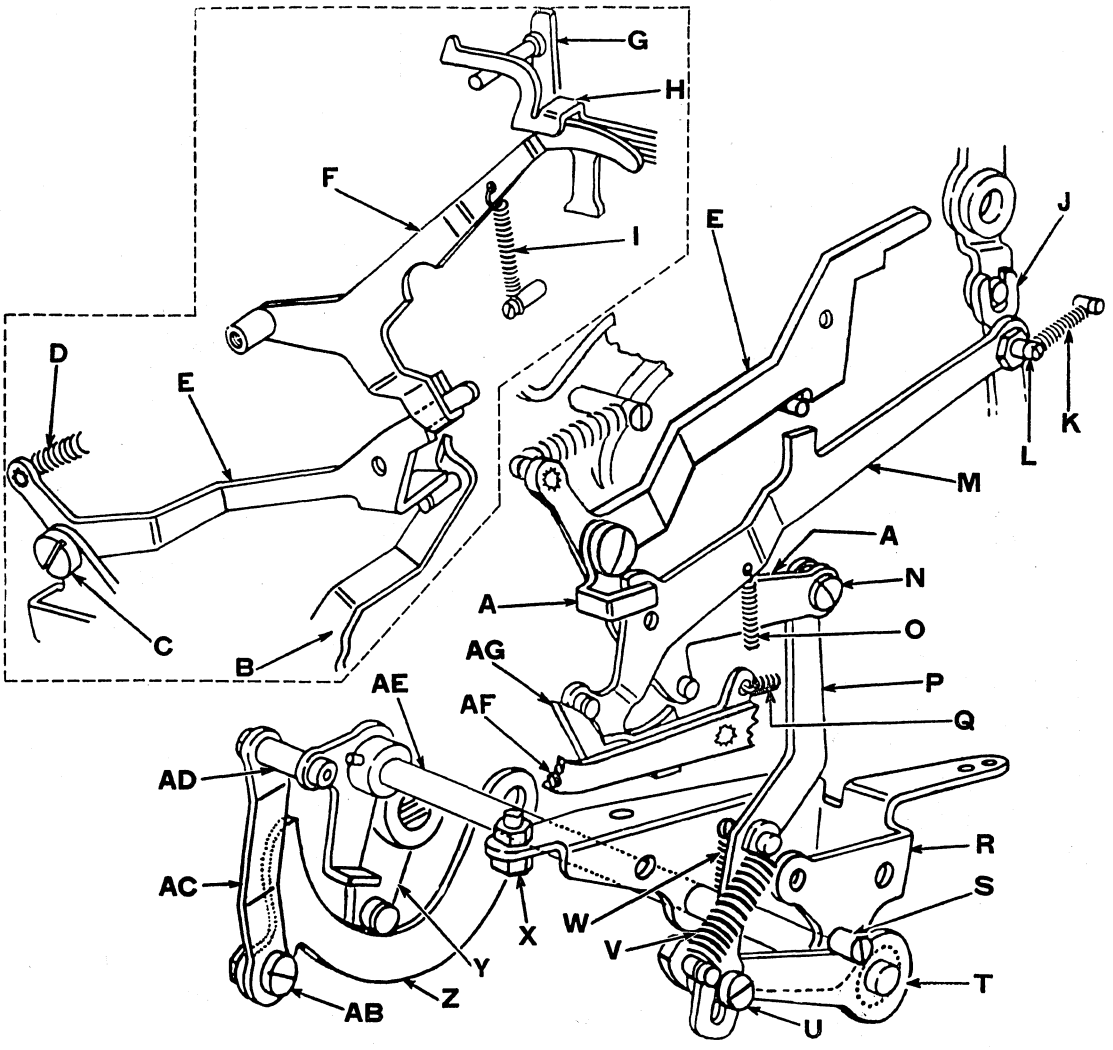
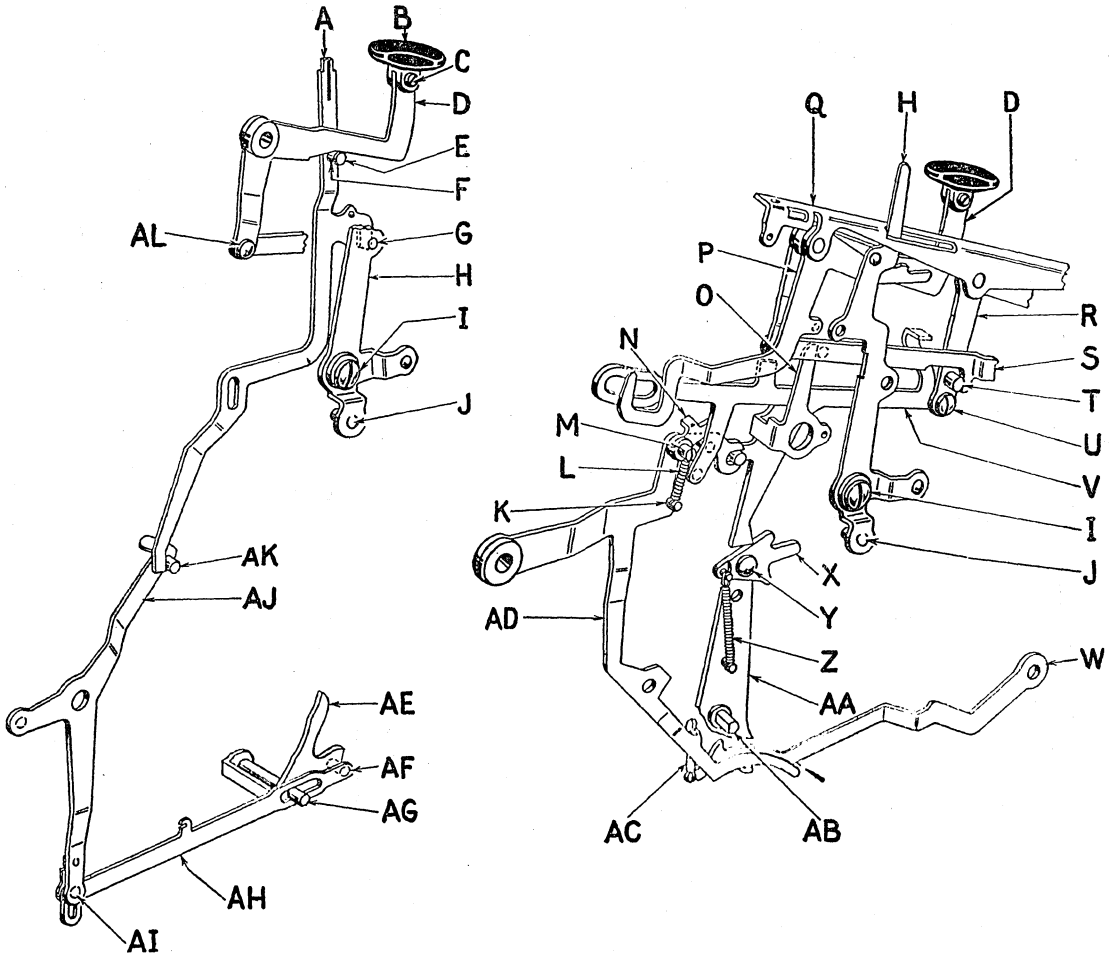
C. F. SUB-TOTAL OR TOTAL KEY TO TOTAL IN LAST REPEAT OPERATION VIA AUTOMATIC REGISTER TOTAL MECHANISM—CARRIAGE CONTROLLED, CLASSES 21 THRU 30 (Plate 38)



SYMBOLS (Plate 38)

A 11-200158½A (1-200158½B, 1-200161½)
11-200158½ Env. 1429 for H903 machines
B 1-122 Env. 240F
C 8460½ Screw, 3434 nut
D 986
E 1-123 Env. 1834
F 1-220A Fte. 214 No. 2 Env. 1834
G 11A-3429⅛A (1-3429⅛AZ, 957½, 1-3429⅛Z)
H 1-208A Fte. 214 No. 1 (208A Fte. 214 No. 1, 1-220A Fte. 214 No. 2, 1062½)
I 10086
J 11-60101 No. 2
K 4489 (83800A)
L 200647 No. 2 Screw, 200427 eccentric
M 1-200161½
N 10056
O 8084A
P 1-200182½ (1-200182½A)
Q 7287 Style 5
R 169 Fte. 216 No. 2
S 200664A Eccentric
T 1-200179½ or 1-200179½Z
U 83508 No. 2 Screw stud, 200399 nut
V 1-200816A (1-88800B)
W 1-200816A (1-88800B)
X 3645
Y 21-201002A (1A-201002A)
Z 1-201130
AB 8050½B Screw, 46 nut
AC 201131
AD 200659 No. 1
AE 1A-200006 Style 17
AF 1-200159½ No. 2 for skid control
1-200159½ for roll control
AG Included in AF

NON-TRANSFER TO REGISTER, NON-TRANSFER TO CROSSFOOTER, CLASSES 11 THRU 16 AND 21 THRU 30 (Plate 39)



SYMBOLS (Plate 39)

A **11-62221 No. 2** for Cl. 11 thru 16, 21 thru 30 on machines requiring non-add from sub-total
1-62221 No. 2 for Cl. 11 thru 16, 21 thru 26 on machines requiring shift from normal to 3rd position
1-62221 No. 3 for Cl. 11 thru 16, 21 thru 30, register non-add
21-62221 No. 2 for Cl. 11 thru 16, 21 thru 30 on machines without register add or non-add key and requiring register non-add from sub-total key
1-62221A No. 4 for Cl. 11 thru 16, 21 thru 30 for machines requiring sub-total sign to print from register non-add key
11-62221A No. 4 for Cl. 11 thru 16, 21 thru 30 on machines requiring symbol sector to print symbol next to last position from register non-add key
1-62221 No. 5 for Cl. 11 thru 16, 21 thru 30 on machines for non-adding register and having projection for indexing symbol sector to print crossfooter non-add symbol
NOTE—Use screw stud 60517 and nut 46 to fasten above parts to side frame. Use spring 681⅛.

B **1-293½** Specify color

C **255¼**
D **1-62227**
E **62510** Stud } Included in H
F **62300** Roll }
G **3257⅛**
H **1A-60100** Cl. 11 thru 16, 20 thru 30 specify machine number, see Plate 9 letter R for other styles
I **60506**
J **204509**
K **3454¾**
L **284**
M **60540 Screw stud, 629 washer, 46 nut, 60340 collar, 74502 screw**
N **3322½**
O **1-3429⅛A (1-3429⅛AZ, 957½, 1-3429⅛Z)**
P **1-62109**
Q **1-62215**
R **1-62127** includes all studs
S **1-62216**
T **251⅝*** included in R
U **251⅜**
V **1-62125 (1Z-62125, 200251A)**
W **10920¼B** use **10960½** screw and 10960 hub
X **1-821B**
Y **7550½**
Z **1-883½A (1-84804)**

AA 1-68113* included with complete section, specify as follows:
1B-68000 Style 17 (11-68000 Style 17, 1-69117B No. 2 or 3) specify machine No.
1C-68000 Style 13 (11-68000 Style 13, 1-69117B No. 2 or 3) specify machine No.
AB **10856½A Stud, 10856¼ bushing, 46 nut**
AC **7480B**
AD **11-60126A** later style
11-60126A for Style 23 13 03, 23 17 41 with reg. total indexing lever to operate skip mech.
1-60126 No. 2 used with totals and sub-totals, cge. controlled for pos. and neg. bal.
AE **60109 No. 1**
AF 72526*
AG **60001** Shaft
AH **1-60107A**
AI 10257* Stud, 10213¾* clip, 10254½* stud
AJ **1-60106A Style 13** specify machine No.
AK 12033⅝* Roll, 12063⅝* stud included in AJ
AL **263**

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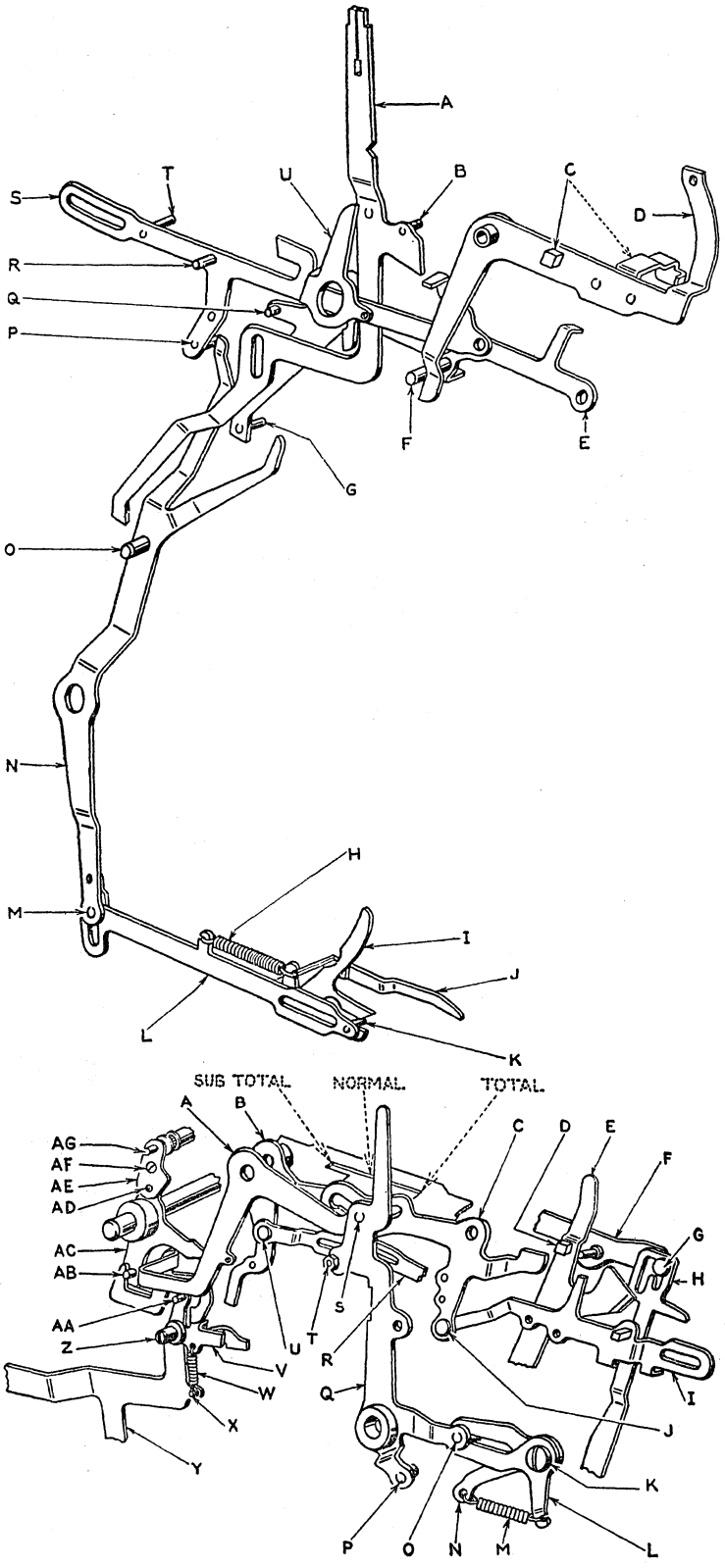
REGISTER TRANSFER CONTROLLED BY TOTAL KEY (Plate 40)



SYMBOLS (Plate 40)

A **1-62221 No. 2** specify machine No. for Cl. 11 thru 16 and 20 thru 30
B **3450 Stud, use 681⅛ spring**
C 154¼ Fte. 104* Stud, 128⅛ Fte. 104* extension
D **1-128½ Fte. 104** includes C
E **1416B** included in assembly 2-115 Fte. 104 use rivet 9051 7/16
F **504 Fte. 204, 46¼ nut**
G **1358½ Style 9**
H **10983**
I **60109 No. 1**
J **60108**
K 72526*
L **1-60107A** includes K
M 10257* Stud, 10213¾* spring clip, 10254½* stud
N **1-113 Fte. 104** early style, includes M, O
1-60106C later style
O **12033⅝ Roll, 12063⅝ stud**
P **3456⅝**
Q **3450⅛**
R **253⅛**
S **1-62126 (1-62126Z, 200251A**
T **750¾ No. 2**
U **1-123 Fte. 104**

REGISTER TOTAL INDEXING MECHANISM (Plate 41)

SYMBOLS (Plate 41)

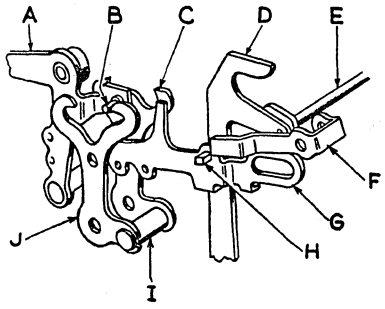
A **1-62104** use 780 spring
B 1-62226* furnished with 1-62002 Style 13 or 17, specify machine No.
C **1-62102** included with I
D **7061⅜**
E **2-60110A**
F **1-62127**
G **83502**
H **1-69111**
I **1A-62103 (11A-62103)** includes C and J
11A-62103 used without reg. shift release from reg. total indexing lever
21A-62103 used with C.F. totals and sub-totals, cge. controlled for pos. and neg. bal.
31A-62103 used with C.F. totals and sub-totals, cge. controlled for pos. and neg. bal. without reg. shift release from reg. total indexing lever
41A-62103 used with reg. totals indexing lever, cge. controlled
51A-62103 used with reg. total indexing lever cge. controlled without reg. shift release from reg. total indexing lever
J **62506**
K **60509**
L **60102**
M **60800**
N **60103**
O **10850**
P **204509**
Q **1A-60100** specify machine No., see Plate 9 letter R for other styles
R **62100** included in B
S **7948 Roll, 10751¾ stud**
T **60502 No. 1 Screw, 46 nut**
U **62502**
V **1-60113**
W **284**
X **3454¾**
Y **21-60126**
Z **10059¾** Screw, 46 nut, 629 washer
AA **1056** ⅛
AB **82502**
AC 1-219L No. 2*
AD **250⅜**
AE **1-219¾A**
AF **8064⅝**
AG **1-202005** specify style and machine No., see Plate 7 letter X for other styles

SEE EXPLANATION ON INSIDE OF FRONT COVER

REGISTER TOTAL KEY INTERLOCK (Plate 42)

SYMBOLS (Plate 42)

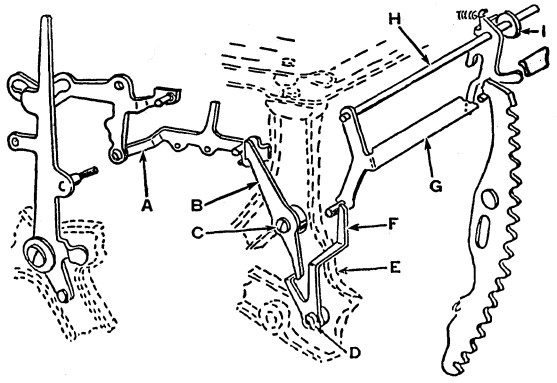
A **1-62102** included with G
B **62500** Stud, part of A
C **1-60105**
D 1-424AL*
E **402B Style 7, 9, 11, 13, 15 or 17**
F **64101A** on bushing 64301, held to side frame by 74532 and collar 64302
G 62103*
H **62511 (62511A)**
I 60513* Part of C
J **60104**



REGISTER TOTAL FROM REGISTER TOTAL INDEXING LEVER (Plate 43)

SYMBOLS (Plate 43)

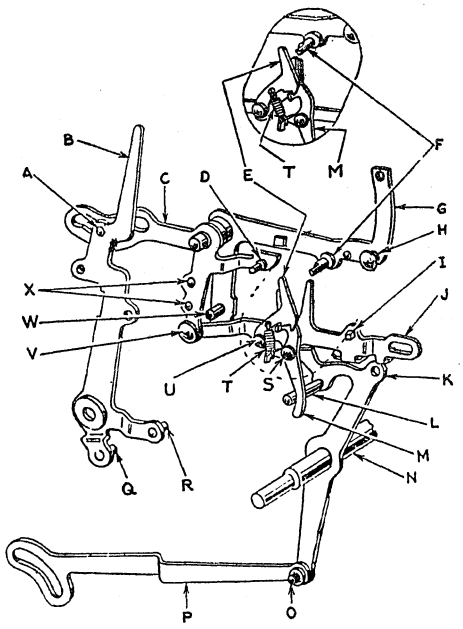
A **1A-62103 (11A-62103)**
B **1-17⅝ Fte. 124**
C **12059/16 Screw, 46 nut**
D **33 Fte. 124**
E **66L Fte. 124 No. 1**
F **1-17½ Fte. 124**
G **1-17¼B Fte. 124 Style 13 or 17**
H **1 Fte. 124 Style 13 or 17**
I **21½ Fte. 124**



SINGLE STROKE TOTAL INTERLOCK (Plate 44)

SYMBOLS (Plate 44)

A **7948 Roll, 10751¾ stud,** included in B
B **1A-60100** specify machine number, includes A, R, Q, see Plate 9 letter R for other styles
C **1-62102** included with J
D **62500**
E **62105** included with J
F **62507**
G **1-62127** includes all studs
H **83502**
I **62511 (62511A)**
J 11A-62103 includes C, E, I, M, S, T, U, V, X, see Plate 41 for other styles
K 1-69158* included with N
L **69522** included in K
M **62107** included in J
N **1-69024 Styke 13 or 17** specify machine No., includes K, L, O, P
O **10959½, Spring 984**
P **11-922BL** included with N
Q **204509**
R **10850**
S **62509**
T **62880 (89801)**
U **62508**
V **62506**
W **251⅝**
X **7253⅝***



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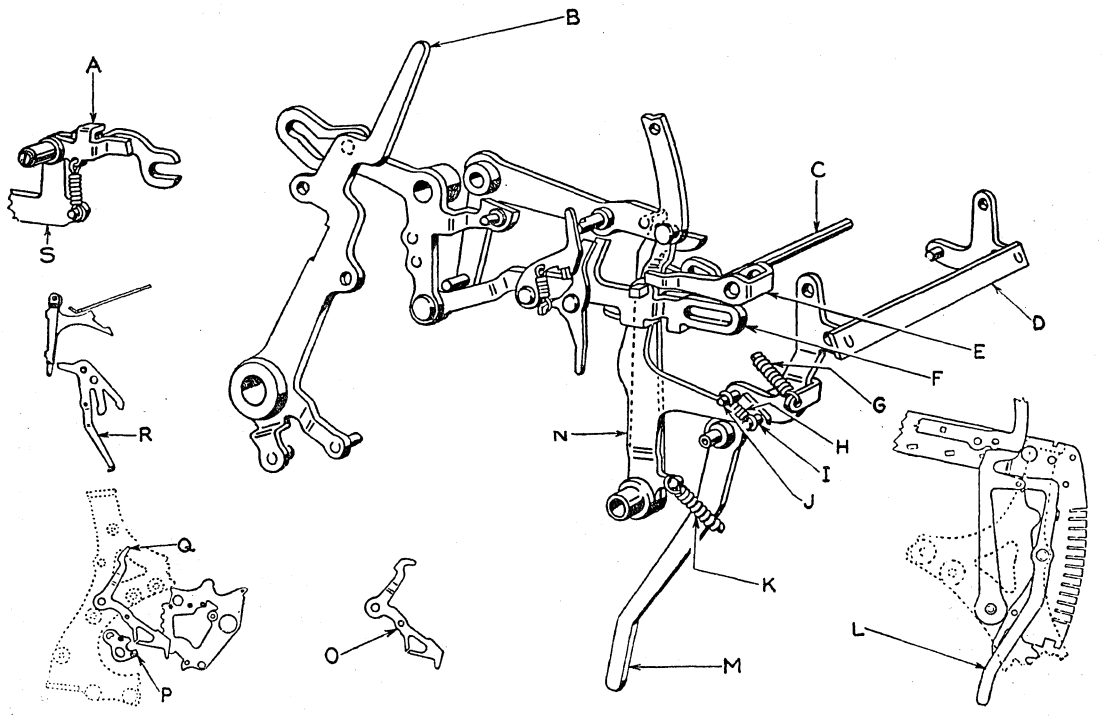
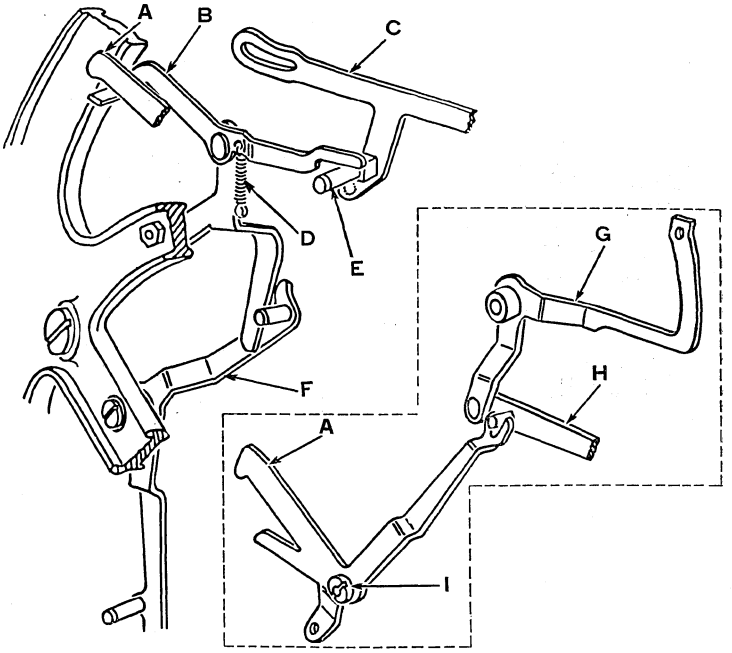
DETENT FOR TOTALING REGISTERS (Plate 45)



SYMBOLS (Plate 45)

A **3322½, Spring 284**
B **1A-60100** specify machine No., see Plate 9 letter R for other styles
C **402B Style 7, 9, 11, 13, 15 or 17**
D **1-64102A** see Plate 31 letter N for other styles
E **64101A, Hex. bushing 64301A, screw 72614, 46 nut, collar 64302**
F **11A-62103** see Plate 41 letter I for other styles
G **7683**
H **7781A** use for letter D No. 5 thru 12 **8382** use for letter D No. 3 and 4
I **7259¼** included in N
J **64500** included in D
K **7480B**
L **1-10410**
M **1-64110**
N **1-64100**
O **1-200138B (1-200138C No. 2)**
P **1-10912**
Q **1-200138Z (1-200138C No. 2, 200517B, 200357A, 1-200139)**
R **1-10413R**
S **1-60126A (11-60126A)** see Plate 39 letter AD for other styles

REGISTER TOTAL TO ADD IN NON-ADD POSITION (Plate 46)



SYMBOLS (Plate 46)

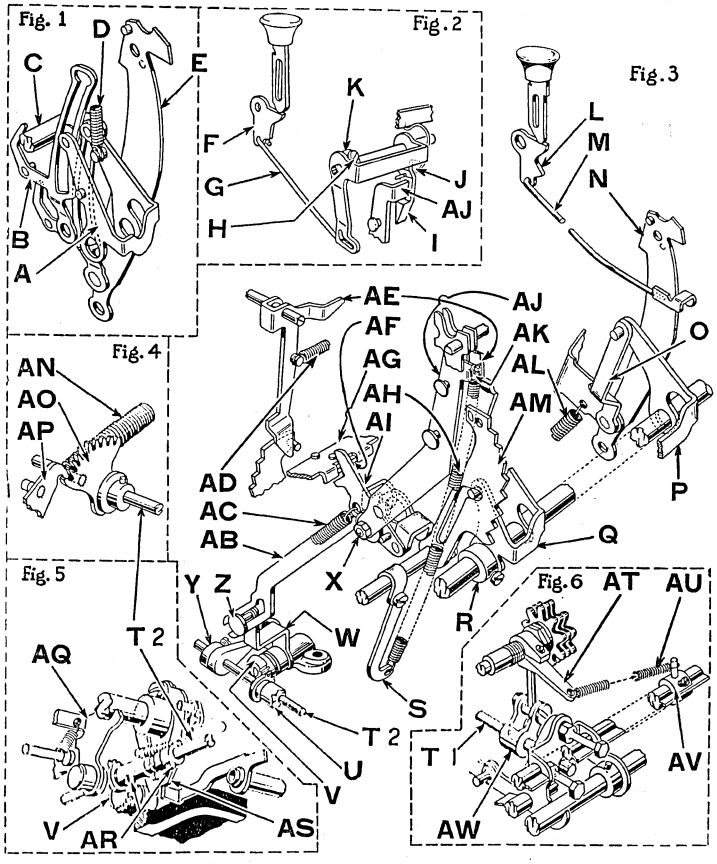
A **1-200217A No. 1**
B **1-200 Fte. 200**
C **1-202225** includes E
D **79810**
E **7914½A Washer, 932⅛ roll, 10239 roll, 202505A stud**
F **1-60106C**
G **1-202216 (1-62227)**
H Included with G
I **306 Fte. 207**

SEE EXPLANATION ON INSIDE OF FRONT COVER

KEYBOARD SELECTION OF REGISTER, CLASSES 12 THRU 16 AND 20 THRU 30 (Plate 47)

SYMBOLS (Plate 47)

A **1-101A Fte. 202 Env. 1172 No. 2** includes B, specify col.
B 1-101B No. 2 Env. 1172*
C 400A Style 13 or 17*
D **685A (9087)**
E **1-110AL Fte. 202 P. 16 Env. 1172**
F **11-217⅛A**
G **700 Env. 1331**
H **75660**
I **1-100A Env. 1331 (1-102 Env. 1331)**
J **800 Env. 1331 (1-102 Env. 1331)**
K **89320 Style 10 (64307)**
L **1-217AR or AL**
M **1-271½ Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9**
1-271½ No. 10 (211½)
N **1-110AR Fte. 202 P. 16** use in odd No. col.
1-110AL Fte. 202 P. 16 use in even No. col.
O 1-102 Fte. 202 No. 2* use for 9 characters, included in P and Q
1-102 Fte. 202 No. 3* use for 10 characters, included in P and Q
P **1-101A Fte. 202 Style 13 or 17** Keyboard selection of reg. in col. 1, 9 char., Cl. 12 thru 16, 22 thru 30
21-101A Fte. 202 Style 13 or 17 Keyboard selection of reg. in col. 1, 10 char., Cl. 30
Q **1-101 Fte. 202** early style, specify col.
1-101A Fte. 202 No. 2 Keyboard selection of reg. in col. 12, 9 char., Cl. 12 thru 16, 22 thru 30
1-101A Fte. 202 No. 3 Keyboard selection of reg. in col. 13, 9 char., Cl. 12 thru 16, 22 thru 30
1-101A Fte. 202 No. 4 Keyboard selection of reg. in col. 14, 9 char., Cl. 12 thru 16, 22 thru 30
11-101A Fte. 202 No. 3 Keyboard selection of reg. in col. 13, 10 char., Cl. 27 thru 30
11-101A Fte. 202 No. 4 Keyboard selection of reg. in col. 14, 10 char., Cl. 30
1-101A Fte. 202 No. 5 Keyboard selection of reg. in col. 8, Style 13 machine built on Style 17 base, Cl. 22 thru 30
11-101A Fte. 202 No. 5 Keyboard selection of reg. in col. 9, Style 13 machine built on Style 17 base, Cl. 22 thru 30
21-101A Fte. 202 No. 5 Keyboard selection of reg. in col. 9, 10 char., Style 13 machine built on Style 17 base, Cl. 30
31-101A Fte. 202 No. 5 Keyboard selection of reg. in col. 10, 10 char., with item counter, Style 13 machine built on Style 17 base, Cl. 30
41-101A Fte. 202 No. 5 Keyboard selection of reg. in col. 10 with item counter, Style 13 machine built on Style 17 base, Cl. 22 thru 30
1-101½ Fte. 202 No. 5 Keyboard selection of reg. in col. 11 on Style 13 machine, 9 char., Cl. 11 thru 16, 22 thru 30
1-101½ Fte. 202 No. 5 Keyboard selection of reg. in col. 15 on Style 17 machine, 9 char., Cl. 11 thru 16, 22 thru 30
11-101½ Fte. 202 No. 5 Keyboard selection of reg. in col. 11 on Style 13 machine, 10 char., Cl. 27 thru 30
11-101½ Fte. 202 No. 5 Keyboard selection of reg. in col. 15 on Style 17 machine, 10 char., Cl. 27 thru 30



R **1-540 Collar, 550¾ screw**
S **142 Fte. 202** use screw 79512
T1 **1-69015A No. 2 (1A-69015D No. 2, 1-69114BL No. 2, 7356½)** includes AW
T2 **11-60002 No. 6 Style 13 or 17** includes AO
U **312 Fte. 202 No. 1**
V **311 Fte. 202 No. 1 Gear, 514 Fte. 202 No. 1 screw, 1097⅞ washer, 47 nut**
W **2-143 Fte. 202 No. 1** includes V, Z
X 12059⅞ **Screw, 46 nut**
Y **1-71321** use 75660 screw
Z **515 Fte. 202 No. 1**
AB **1-100A Fte. 202** early style
1-100A Fte. 202 No. 10
AC **804A Fte. 202 (804 Fte. 202 No. 2)**
AD **480¼**
AE **1-139 Fte. 202**
1-139 Fte. 202 No. 2 use with large shaft
AF 141 Fte. 202*
AG **1-140 Fte. 202 Style 17** includes AF
AH **1-806A Fte. 202** includes AK
AI **1-105B Fte. 202 No. 1 (1-105B Fte. 202, No. 2)** used for 9 and 10 char.
AJ **1-135½A Fte. 202 No. 1** part of 2-135½A Fte. 202 No. 1
AK **20 No. 12** Eyelet on spring AH
AL **4487**
AM **1-137 Fte. 202** early style, Cl. 12 thru 16, 22 thru 26
1-137A Fte. 202 Cl. 12 thru 16, 22 thru 26
1-137 Fte. 202 No. 10 Cl. 30
AN **60802A Style 13 or 17**
AO **1-60140 No. 6** use pin 54¼
AP **1A-60137B No. 1**
AQ 1-69132* included in assembly 1A-69002 Style 13 or 17, specify machine No.
AR **75618**
AS **1-69123**
AT **1-69340A (1A-69340A, 1-69015A No. 1, 1-71321, 1-69015D No. 1, 1-69114¼A)**
AU **60802 Style 17 No. 3**
AV **1-69333 (1-69333A)** Collar, 69558 screw, 504 Fte. 214 screw stud
AW 69560* included with T1

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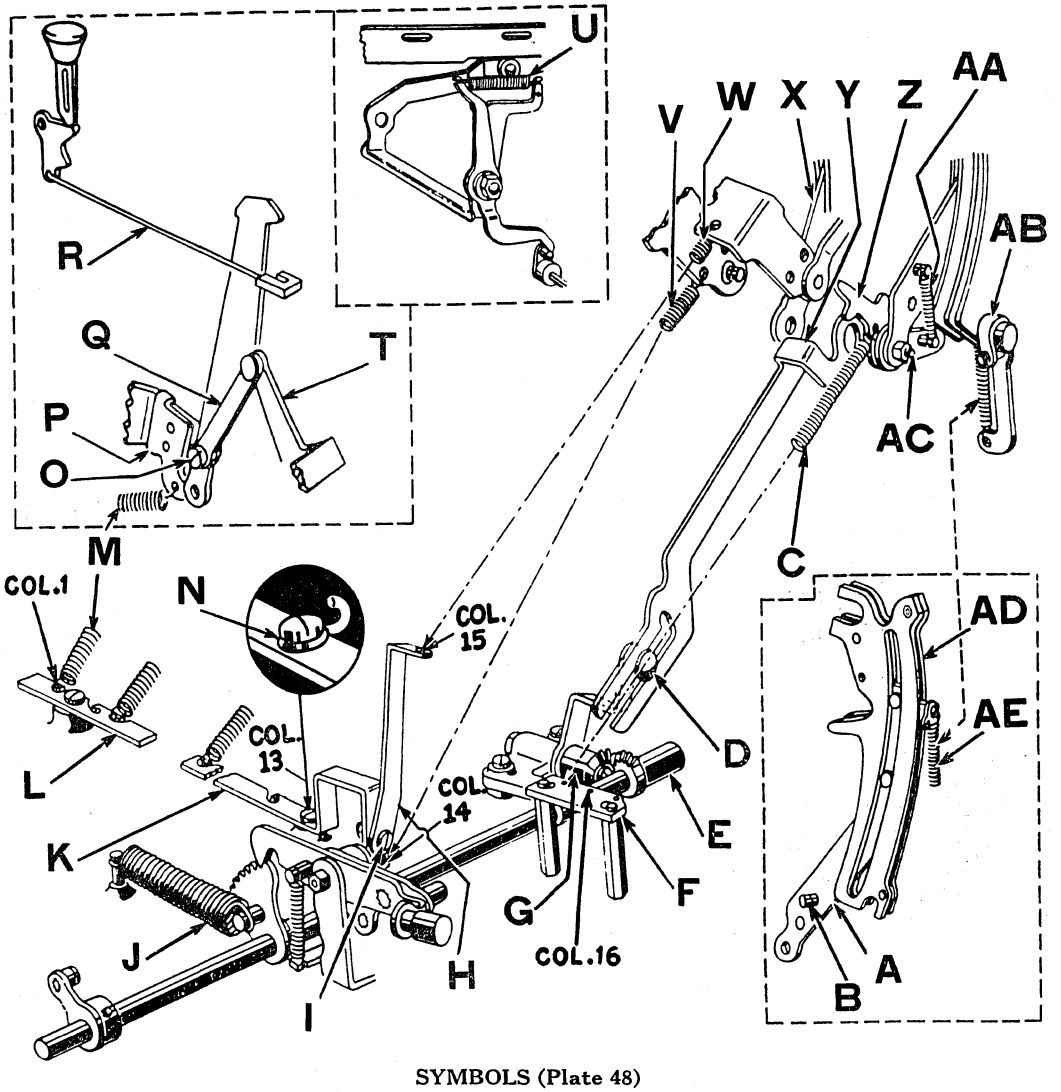
KEYBOARD REGISTER SELECTION SPRING ASSEMBLY, CLASSES 12 THRU 16 AND 22 THRU 30 (Plate 48)



SYMBOLS (Plate 48)

A **1-135½A Fte. 202 No. 1**

B **69509**

C **804 Fte. 202 Style 13 (82810 No. 2)** used on machine with item counters and 14 cols. adding capacity
804A Fte. 202 (804 Fte. 202 No. 2) used on machines without item counters and 14 cols. adding capacity
804A Fte. 202 (804 Fte. 202 No. 2) used for keyboard selection in the 15 col., 2 req.
4484 Style 15 used in conjunction with springs 84817 or 804 Fte. 202 No. 2
685A (9087) used on machines with selection from short tabulation
805 Fte. 202 used on special 611 in col. 15, symbol 1-135 Fte. 202 Style 13 or 17 P. 10 No. 2 when keyboard selection is in col. 14

D **515 Fte. 202 No. 1 or No. 2**

E **312 Fte. 202 No. 1** Cl. 12 thru 26
No. 2 Cl. 27 thru 30
No. 3 Cl. 22 thru 26, 14 digit capacity
No. 4 Cl. 27 thru 30, 14 digit capacity

F **66116L No. 1**

G **2-143 Fte. 202 No. 1** Cl. 12 thru 16, 22 thru 26, without item counters
2-143 Fte. 202 No. 2 Cl. 27 thru 30, with or without item counters
1-217 Fte. 216 Cl. 12 thru 16, 22 thru 26, with item counters

H **138A Fte. 202**

I **71553, 46** Nut

J **60802A Style 13** Ivory, Cl. 27 thru 30
60802 No. 2 Style 17 alloy finish, Cl. 27 thru 30 without rotary
60802 No. 2 Style 17 alloy finish, Cl. 27 thru 30 with rotary on left
60802A Style 13 Ivory, Cl. 12 thru 16, 22 thru 26
60802A Style 17 Black, Cl. 12 thru 16, 22 thru 26, without rotary on left
60802 No. 2 Style 17 alloy finish, Cl. 12 thru 16, 22 thru 26, with rotary on left
60802 Style 17 No. 3 alloy finish, Cl. 30, 14 digits in reg. with or without rotary
NOTE: Above springs are colored on one end for identification purposes.

K **144 Fte. 202 Style 13 or 17**

L **66116AR**

M **4484 Style 15** used when keyboard selection is in cols. 1, 13, 14, 16

N **10070 (20 No. 97)**

O **74527** use 52A Fte. 127 nut for Cl. 12 thru 16, 309A Fte. 202 for Cl. 22 thru 26 when in col. 1; Cl. 27 thru 30 all cols.

P **111 Fte. 202**

Q **1-102 Fte. 202 No. 2** for 9 characters
1-101A Fte. 202 No. 2, No. 3, No. 4
1-101½ Fte. 202 No. 5
1-102 Fte. 202 No. 3 for 10 characters
Use 309A Fte. 202 nut included in 11-101A Fte. 202 No. 3 and No. 4 11-101½A Fte. 202 No. 5

R **1-271½ No. 1, 2, 3, 4, 5, 6, 7, 8, 9**
1-271½ No. 10 (211½)

T **1-101A Fte. 202 Style 13 or 17** K.B. sel. col. 1, Cl. 12 thru 16, 22 thru 30, 9 character
See Plate 47 letter P or Q for other styles

U **60803 Style 13 (1-60128A Style 13, 60803A Style 13, 60802Z Style 13)**
60803 Style 17 (1-60128A Style 17, 60143Z Style 17, 60803A Style 13, 60802Z Style 17)

V **4484 Style 15**

W **804A Fte. 202 (804 Fte. 202 No. 2) or 805 Fte. 202**

X **1-110AR Fte. 202 P. 16**
1-110AL Fte. 202 P. 16

Y **1-100A Fte. 202 No. 10**

Z **1-105B Fte. 202 No. 2**

AA **3282**

AB **142 Fte. 202**

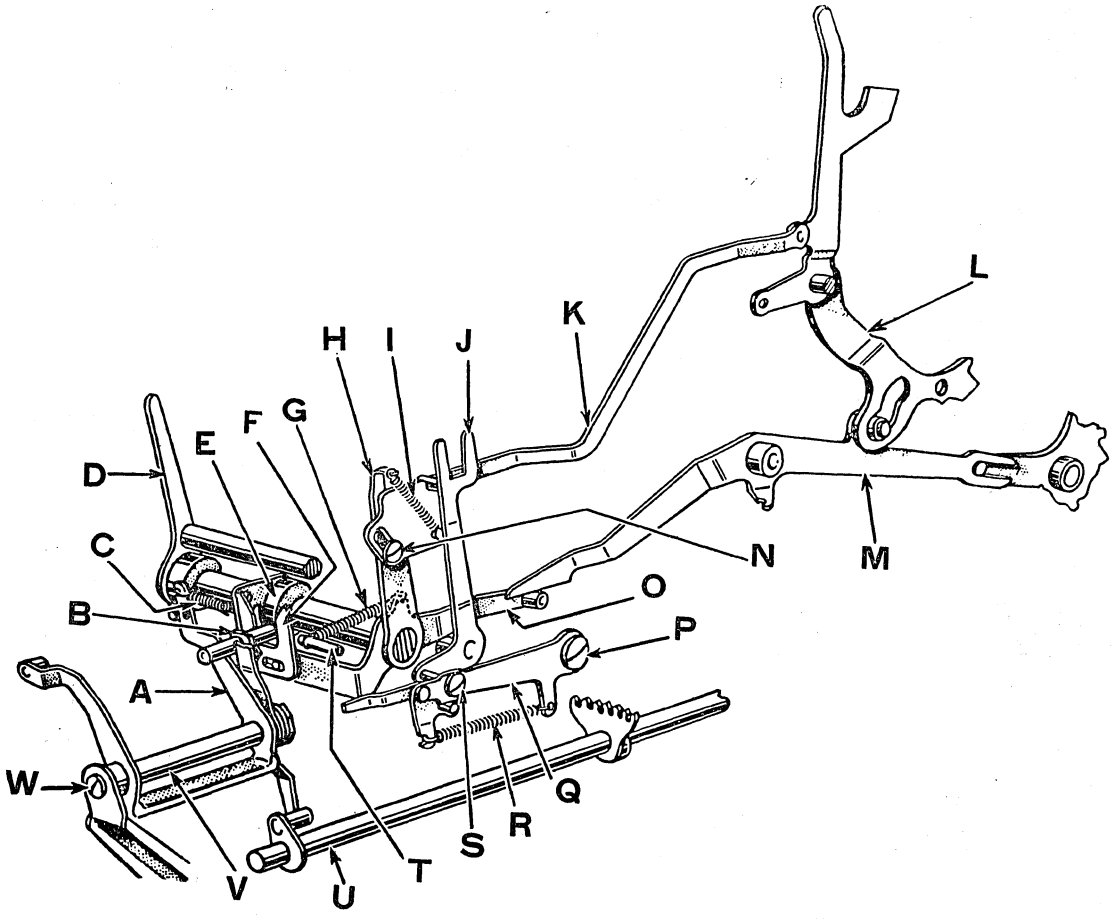
AC **12059⅝**

AD **2-135½A Fte. 202 No. 1**

AE **1-806A Fte. 202**

SEE EXPLANATION ON INSIDE OF FRONT COVER

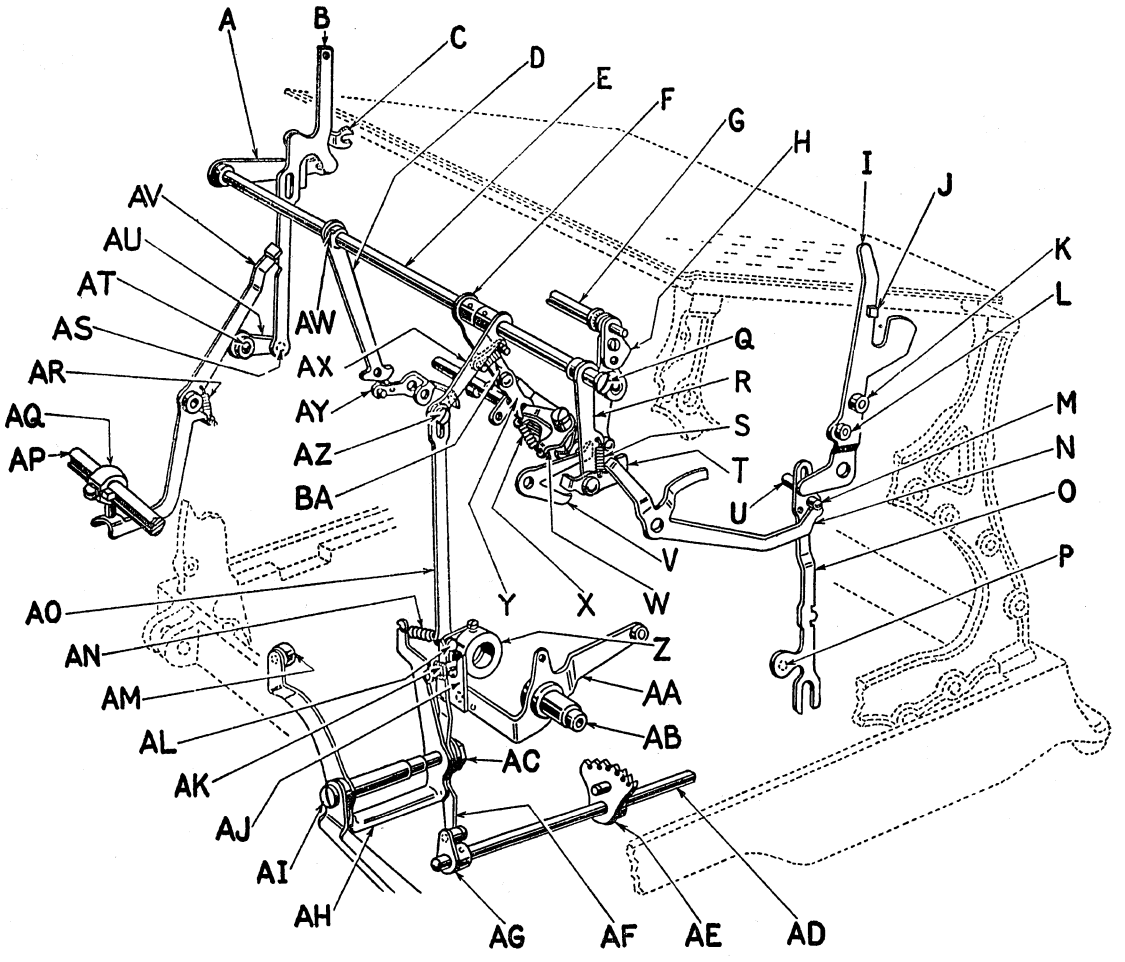
REGISTER SHIFT FROM SUBTRACT LEVER, CLASSES 12 THRU 16 AND 22 THRU 30 (Plate 49)



SYMBOLS (Plate 49)

A **1-60129A** use 1-60129A No. 10 for Cl. 27 thru 30
B **1-200182**
C **60803A Style 13**
60803 Style 13 (1-60128A Style 13, 60803A Style 13, 60802Z Style 13)
60803 Style 17 (1-60128A Style 17, 60143Z Style 17, 60803A Style 13, 60802Z Style 17)
60803 No. 10 for Cl. 27 thru 30
D **1-205122 Style 13 or 17 No. 2**
E **1-205308**
F **200184A** use 200184 No. 10 for Cl. 27 thru 30
G **3283**
H **1-200185** uses 200537 bushing, 3457 screw
I **7283¼** for Cl. 12-16
10082½ for Cl. 22-30
J **1-4415 Style 11** for Style 13
1-10011 (1-10011A) for Style 17
K **1-10016A**
L **2-60110A**
12A-60110A for II903 machines
M **1-200229 No. 2**
N **3960 Screw, 629 washer, 46 nut**
O **1-200168A No. 1 Style 13 or 17 (1-200168 No. 3 Style 13 or 17, 200184A)** early style
1-200168 No. 3 Style 13 or 17 late style
P **10056**
Q **1-4424¼ Style 13 No. 2** used only on Style 13
R **4485 Style 11**
S **957½**
T **200584 (705506A)**
U See Plate 28-1 accumulation symbol list
V **60003 Shaft, 393 nut, 10021¾ washer**
W **2851⅝**

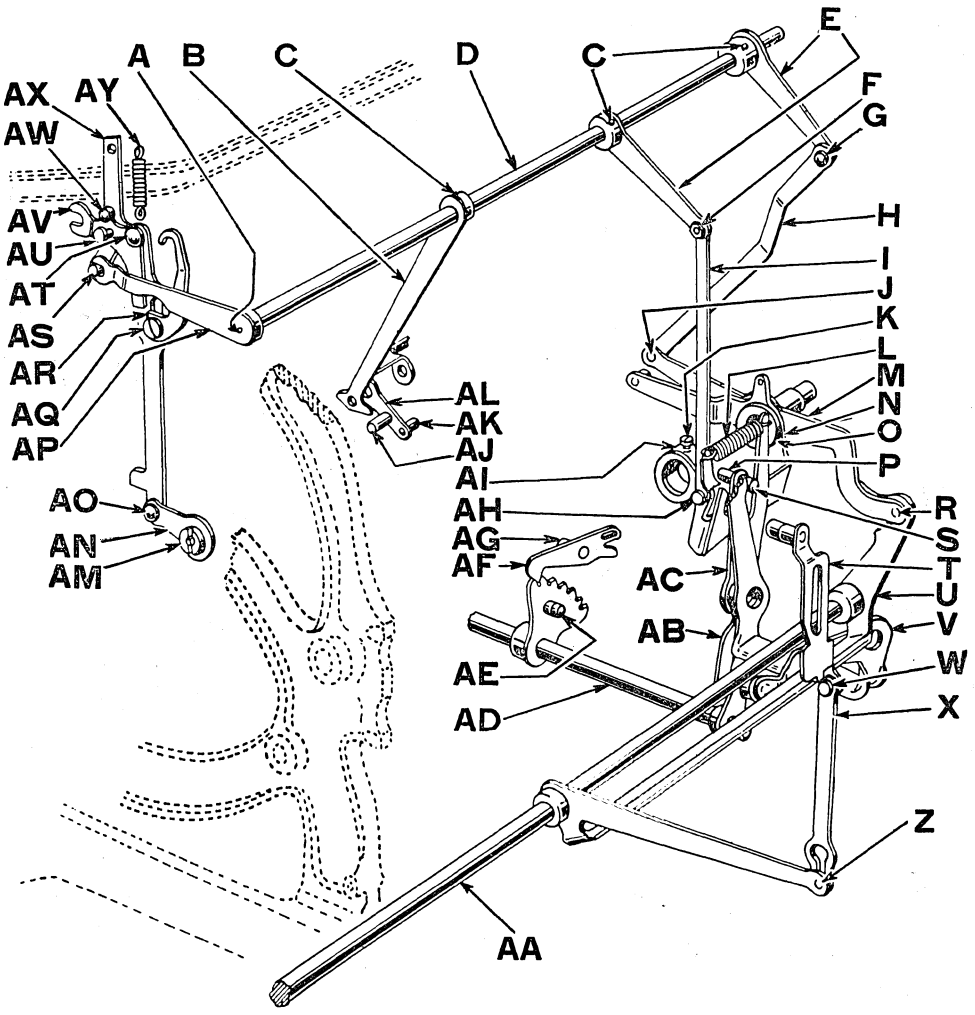
REGISTER SHIFT FROM WITHDRAWAL BAR, CLASSES 12 THRU 16 (Plate 50)



SYMBOLS (Plate 50)

A 1-12020¾* included with E
B **1A-12021⅛** early style
11-200241B No. 2 later style, specify machine No., includes C, AS, AU
C **1-12022¼A (1-200242 No. 1)**
D 1-12024 No. 25* included with E
E **1-7⅛ Fte. 99 Style 13 or 17,** specify machine No. and this plate No., includes A, D, F, T, Y, BA, AX, AW
F 2-12⅜ Fte. 99* includes Y, rivet 351½, spring stud 1353¼ and 3450
G **1-202005** specify machine No. and submit form
H **1-219¾A,** use screw 80645⅝
I **60110 (1-60110A)** included with O
J **7061⅜**
K **60303** use 200377 No. 1, 705603 No. 2
L **10041** use 10056 screw
N **1-13¼B Fte. 124** use screw stud 154 Fte. 104, screw 10056 and nut 46
O 19⅝A Fte. 99* assembled 11-19⅝A Fte. 99 includes I, J, K, L, O, P, U
P **10050**
Q **3455⅜**
S **10686½**
T **12025⅛** use rivet 351½
U **10055¼A Stud, 931⅞ roll, 7914½A washer**
V **1-19⅞ Fte. 99** use 8452½ screw, 46 nut
X **7286½**
Y **1-12½A Fte. 99** use 351½ rivet
Z **1-205308** use 205509 screw
AA **1-60168 Style 13 or 17** included with AO
AB **200537** use 3457 screw
AC **393 Nut, 10021¾ washer, 60003 shaft**
AD See Plate 28-1 accumulation symbol list
AE 1-60140 No. 6* use pin 54¼
AF **1-60128A Style 13 or 17** for Cl. 12 thru 16, 22 thru 30
AG 1-60141* use pin 55
AH **1-60129A**
1-60129A No. 10 for Cl. 30
AI **2851⅝**
AJ **200184A** use hex. head screw 200553
AK **1-200182**
AL **650A** Rivet, use 259½ screw and 46 nut when required
AM **60315A, 650A Stud**
AN **60803A Style 13**
AO **1-15A Fte. 121 No. 1** Style 17, includes AA, for Cl. 12 thru 16 with reg. shift mechanism
1-15A Fte. 121 No. 2 Style 17, includes AA, for Cl. 22 thru 26 with reg. shift mechanism
AP **1-2804C Style H or K**
AQ **1-2893A No. 15** use 2862¼ screw and 4490¾
AR **7286½**
AS **7262½**
AT **12031½ Bushing, 3458 screw**
AU **12017¼A**
AW **52 Pins**
AX 1-12024 No. 1* included with E
AY **1-12¼A Fte. 99**
AZ **3960 Screw, 46 nut**
BA **2886½**

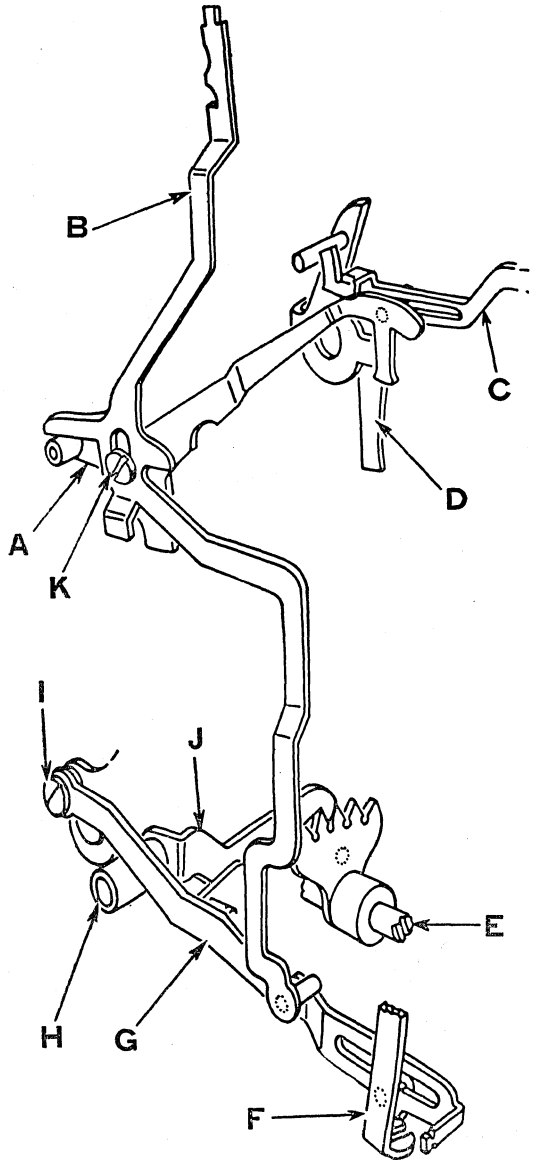
REGISTER SHIFT FROM SKIP BAR, CLASSES 12 THRU 16 (Plate 51)



SYMBOLS (Plate 51)

A **3451⅞** Dowel pin
B 1-12024 No. 25* included with D
C **52**
D **1-7⅛ Fte. 99 Style 13 or 17** specify machine No. and this plate, includes B, E, AP
E 1-12024 No. 1* included in D
F **46 Nut, 3960 screw**
G **3960 Screw, 46 nut**
H 12019⅜*
I **1-15A Fte. 121 No. 1 Style 13, 17,** includes N, for Cl. 12 thru 16 with reg. shift mechanism
1-15A Fte. 121 No. 2 Style 13, 17, includes N, for Cl. 22 thru 26 with reg. shift mechanism
1-15A Fte. 121 Style 17 No. 1 use with late style C. F. ribbon construction, and reg. shift bar, use 203587 screw and 40 nut
J 16355* Rivet
K **205509**
L **60803 No. 10** for Cl. 27 thru 30, copper plated
60803 Style 17 No. 3 for Cl. 27 thru 30, without rotary, yellow
60803 Style 17 No. 4 for Cl. 27 thru 30, with rotary on left, green
60803A Style 13 for Cl. 12 thru 16, 22 thru 26, blue
60803A Style 13 for Cl. 12 thru 16, 22 thru 26, without rotary on left, blue
60803 Style 17 No. 2 for Cl. 12 thru 16, 22 thru 26, with rotary on left, red
60803 Style 17 No. 4 for Cl. 30, 14 digits in reg., with rotary, yellow
60803 Style 17 No. 3 for Cl. 30, 14 digits in reg., without rotary, yellow
NOTE: Above springs are colored on one end for identification purposes.
M **1-12018⅛A** includes H, J, R
N **1-60168 Style 13 or 17** included in I
O **200537** Bushing, use 3457 screw
P **200319**
R **12041⅛ Roll, 12052⅛** stud
S **200320 Roll, 200549** stud
T **1-12013 (12013 No. 3, 12028½ No. 2, 259½, 1097¾, 46)** includes W, X; 12059* and 12036⅛ rolls, 73011 screw
U **1-12010¼A Style 13, 17**
V **1-60129A** use 60315A roll, 650A stud
1-60129A No. 10 for Cl. 30
W **351½** Rivet
X **12028½ (12028½ No. 2)**
Z **12061½**
AA **12001½ Style 13, 17**
AB **1-60128 No. 10** use for Style 17, Cl. 27 thru 30
1-60128 Style 13 No. 10 use for Style 13, Cl. 27 thru 30
1-60128A Style 13 or 17 for Cl. 12 thru 16, 22 thru 30
AC **1-200182**
AD See Plate 28-1 accumulation symbol list
AE 60537*
AF **1-60137A** see Plate 28-1 Accumulation Symbol List
AG 9053⅛*
AH **650A** use 259½ screw and 46 nut when required
AI **1-205308** use 205509 screw
AJ 350⅜*
AK 760¼*
AL **1-12¼A Fte. 99** includes AJ, AK
AM **12031½** Bushing for screw stud 3458
AN 12017¼A*
AO 7262½*
AP 1-12020¾* included in D
AQ **200550A** Screw, 200423 roll
AR **200347A**
AS 12062¾*
AT 7262½*
AU 200587 No. 2*
AV **1-200242 No. 1** includes AU
AW 264¾*
AX **1A-12021⅛** early style
11-200241B No. 2 later style, specify machine No., includes AN, AO, AS, AT, AV, AW
AY **7286½**

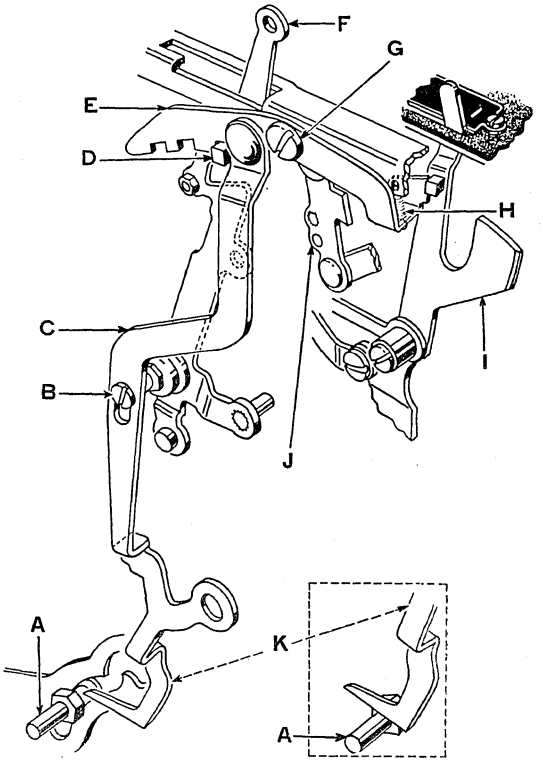
KEY TO NORMALIZE REGISTER SHIFT RELEASE AND TO NORMALIZE SUB-TOTAL FROM TOTAL MECHANISM, CLASSES 22 THRU 30 (Plate 52)



SYMBOLS (Plate 52)

A **1-220A Fte. 214 No. 1**
B **1-106 Env. 280 G**
C **1-208A Fte. 214 No. 1 (208A Fte. 214 No. 1, 1-220A Fte. 214 No. 2, 1062½)**
D **11A-3429⅛A (1-3429⅛AZ, 957½, 1-3429⅛Z)**
E See Plate 28-1 accumulation symbol list
F **1-105 Env. 280 G** includes G
G **109 Env. 280 G** included in F
H **89332 (32½ Fte. 132)** Roll, 60531 stud
I **60505 (9656, 200380 No. 1)**
J **1A-60137B No. 2**
K **60352 Bushing, 10056 and 60517** screws

REGISTER TOTAL INDEXING AND SUBTRACT LEVERS LOCKED DURING MACHINE OPERATION NO. 2, CLASSES 21 THRU 30 (Plate 53)

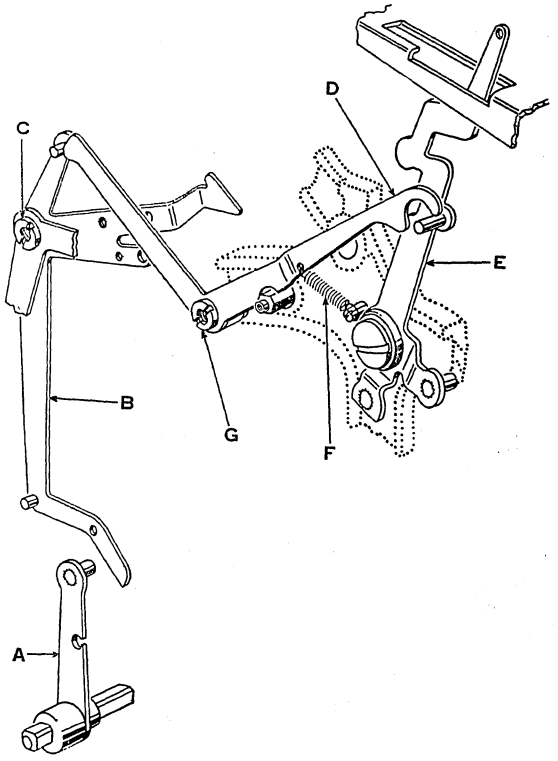


SYMBOLS (Plate 53)

A **68503A No. 2**
B **73618 Screw, 60356 collar**
C Included in E
D 60567*
E **1-60153A** specify machine number
F **41-60100**
G **10751¼ (3960)** Screw, 824¼ washer
H **3486½**
I **12A-60110A**
J **1-62102**
K **1-200140½ (1-200140½ No. 2)**

SEE EXPLANATION ON INSIDE OF FRONT COVER

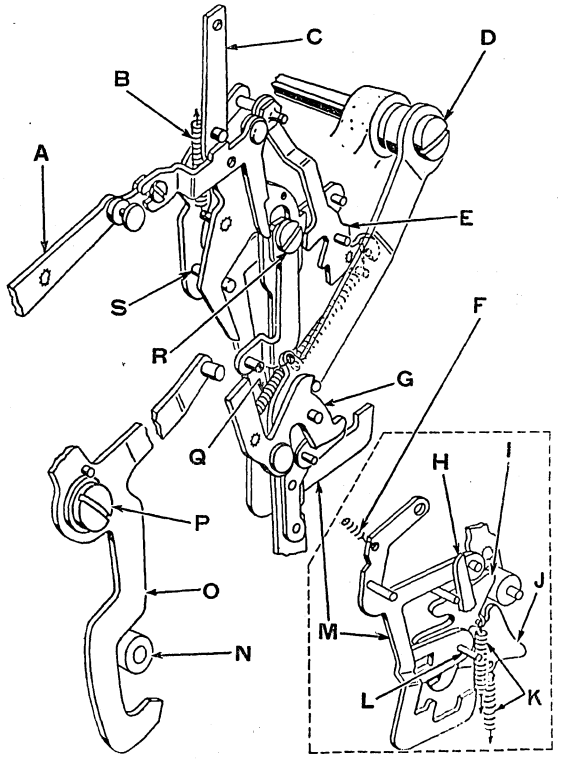
REGISTER TOTAL INDEXING LEVER TO NORMALIZE CARRIAGE OPENING MECHANISM, CLASSES 11 THRU 16 AND 21 THRU 30 (Plate 54)



SYMBOLS (Plate 54)

A **1-12025 No. 26**
B **1-200216B No. 1 (1-200216C No. 1)** specify machine No.
C **200342 Bushing, 200597 screw**
D **1-200217 No. 3**
E **21-60100** specify machine No.
F **16880**
G **12031½**

SKIP TABULATING MOTOR BAR MECHANISM (BANK POSTING MACHINE) (Plate 55)



SYMBOLS (Plate 55)

A **1-12013⅞, 84534 Screw, 1097¾ washer, 49¼ nut**
B **72804**
C **1-200241B No. 2**
D **2855⅜**
E **1-200238B No. 2, 200591B No. 2 Hex screw**
F **83800A**
G 1-12028⅞* included in 1-12024 No. 29
H 200266* see Plate 22, letter H_5 for other styles
I **623 No. 2** long
J **623 No. 3** short
K **1-688 No. 2**
L **1-652A No. 2** use 632¾ flanged collar, 428 washer
M **1-200276A No. 1 (1-200276A No. 3)**
N 3649 No. 2* included in 1-3662¼ No. 2, use 45 nut
O **1-200270**
P **352⅜** Short shoulder screw, 352⅞ No. 2 long screw
Q **10783**
R **200550A**
S **3850⅝**

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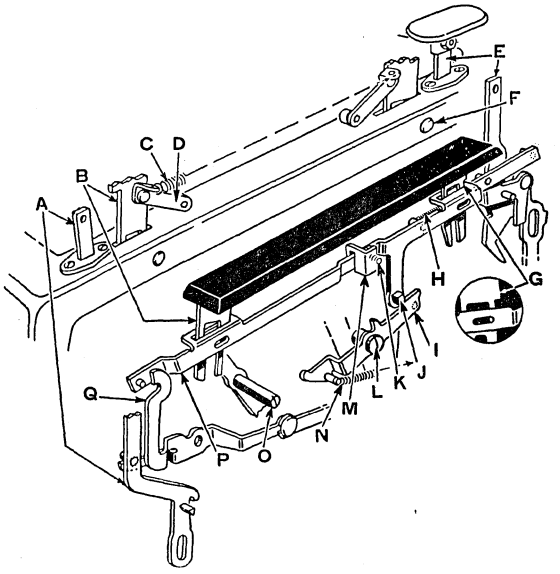
INTERLOCK TO PREVENT DEPRESSING REGULAR MOTOR-BAR FOLLOWING DEPRESSION OF UPPER OR LOWER BARS (Plate 56)

SYMBOLS (Plate 56)

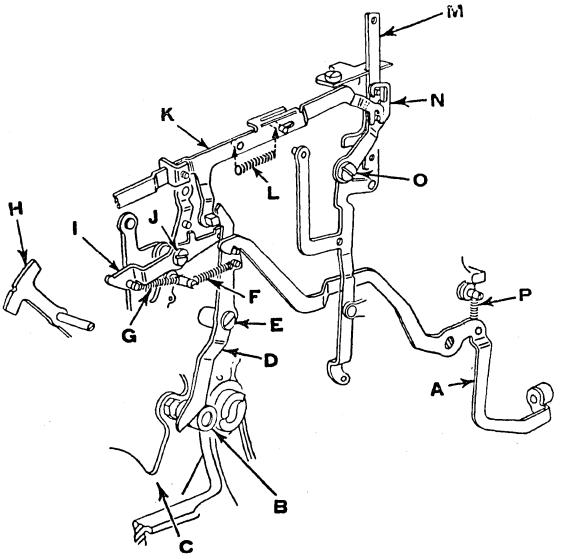
A	**1-12021¼A No. 2 Env. 1457**
B	**1-3625 Env. 1457** includes C, D, G
C	**16380**
D	**1-104 No. 2 Env. 1457**
E	**1-200241B No. 2 Env. 1457**
F	**1053A**
G	Included in B
H	**7480B**
I	**1-101 Env. 1457**
J	**201507**
K	**1053⅛**
L	**2861¼**
M	**103 Env. 1457**
N	**10086**
O	**205533 No. 3, 46 nut**
P	**1-100 Env. 1457** includes J
Q	**1-200233 Env. 1457**



UPPERMOST BAR BLOCKED BY REGULAR AND AUXILIARY MOTOR BARS RELEASED FROM TOTAL KEYS—CARRIAGE CONTROLLED (Plate 57)

SYMBOLS (Plate 57)

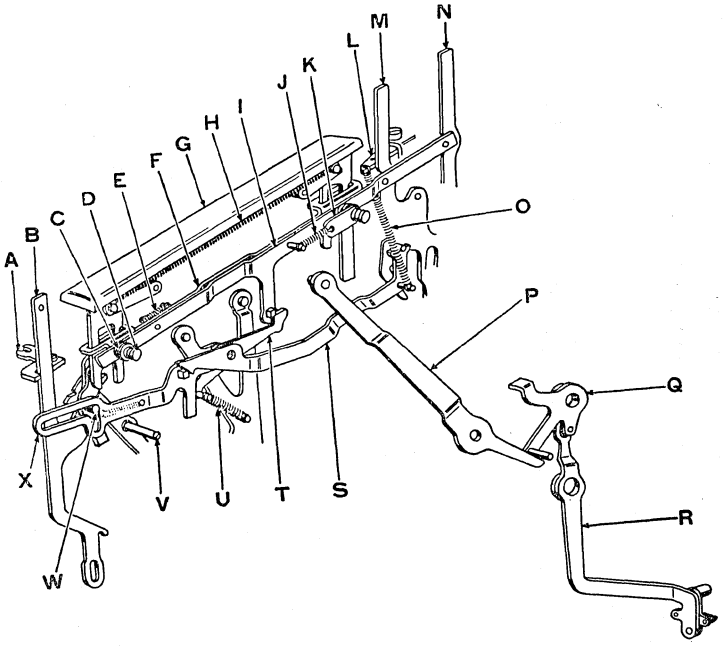
A	**1-106 Env. 1457**
B	**1-3662¼ No. 2, 45 nut**
C	1B-311⅛*
D	**1-105 Env. 1457**
E	**9251⅜**
F	**12083½**
G	**10086**
H	11-205117*
I	**1-101 No. 2 Env. 1457**
J	**2861¼**
K	**1-100 No. 2 Env. 1457**
L	**10086**
M	**1-200235 No. 2 Env. 1457**
N	**1-102 Env. 1457**
O	**200550 Env. 1457**
P	**7480B**



INTERLOCK TO BLOCK DEPRESSION OF THE REGULAR BAR FOLLOWING DEPRESSION OF UPPER AND UPPERMOST BARS, RELEASED FROM THE TOTAL KEY, DISABLED FROM CARRIAGE CONTROL, LOWER BAR LOCKED FROM TOTAL KEY AND RELEASED FROM UPPER BAR (Plate 58)

SYMBOLS (Plate 58)

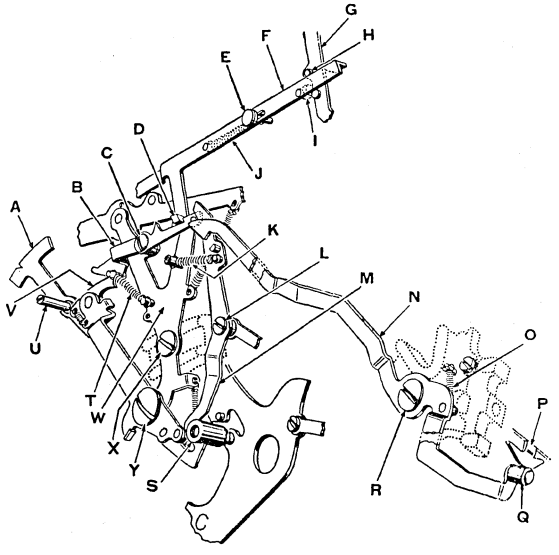
A **12018⅞ No. 2 Env. 1457**
B **1-12021¼A Env. 1457**
C **3819⅛** Washers
D **3656¼ Env. 1457**
E **10086**
F **113 Env. 1457**
G **1-3625 Env. 1457**
H **16380**
I **100 No. 3 Env. 1457** complete slide **1-100 No. 3 Env. 1457**
J **10086**
K **72159**
L **200245 No. 2**
M **1-200241B No. 2 Env. 1457**
N **1-200235 No. 3 Env. 1457**
O **10085**
P **1-112 Env. 1457**
Q **1-200192½**
R **1-109A Fte. 200 No. 2 Env. 1358**
S **1-115 Env. 1457 No. 3**
T **1-101 No. 3 Env. 1457**
U **10086**
V **205533 No. 3**
W **304 Env. 1457**
X **1-116 Env. 1457**



INTERLOCK TO PREVENT DEPRESSING UPPER BAR FOLLOWING DEPRESSION OF REGULAR, UPPERMOST AND LOWER BARS (Plate 59)

SYMBOLS (Plate 59)

A **11-205117**
B **1-101 No. 2 Env. 1457**
C **12059⅜**
D **201507**
E **3656¼ Env. 1457**
F **1-100 No. 4 Env. 1457** includes D
G **11-200241B No. 2 Env. 1457** includes H
H **1363½**
I **502 Env. 1457** included in **1-100 No. 4 Env. 1457**
J **10086**
K **12083½**
L **9251⅜**
M **1-105 Env. 1457**
N **1-106 Env. 1457**
O **7480B**
P **115B Fte. 209 No. 1** Short **No. 2** Long
Q **42¾ Fte. 88**
R **3450¹¹⁄₁₆ Style 9**
S **1-3662¼ No. 2**
T **10086**
U **205533 No. 3**
V **1-215⅝** use for repeat print of sub-totals
1-215⅝ No. 2 use for auto totals, bank posting machines, multiple skip and return
W **1-215¹¹⁄₁₆** use for repeat print of sub-totals
1-215¹¹⁄₁₆ No. 2 use for auto totals, bank posting machines
1-215¹¹⁄₁₆ No. 3 (1C-215¹¹⁄₁₆ No. 3, 200233½A, 20 No. 114, 69809, 203423 No. 4) use for multiple skip and return
X **352⅞**
352⅞ No. 2
Y **256⅝** Screw, **1097¾** washer, 46 nut



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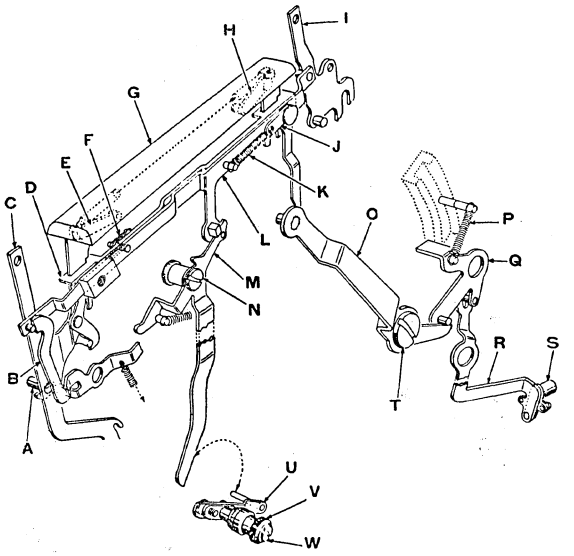
INTERLOCK TO BLOCK REGULAR MOTOR BAR FOLLOWING DEPRESSION OF EITHER UPPER OR LOWER MOTOR BARS—CARRIAGE CONTROLLED (Plate 60)

SYMBOLS (Plate 60)

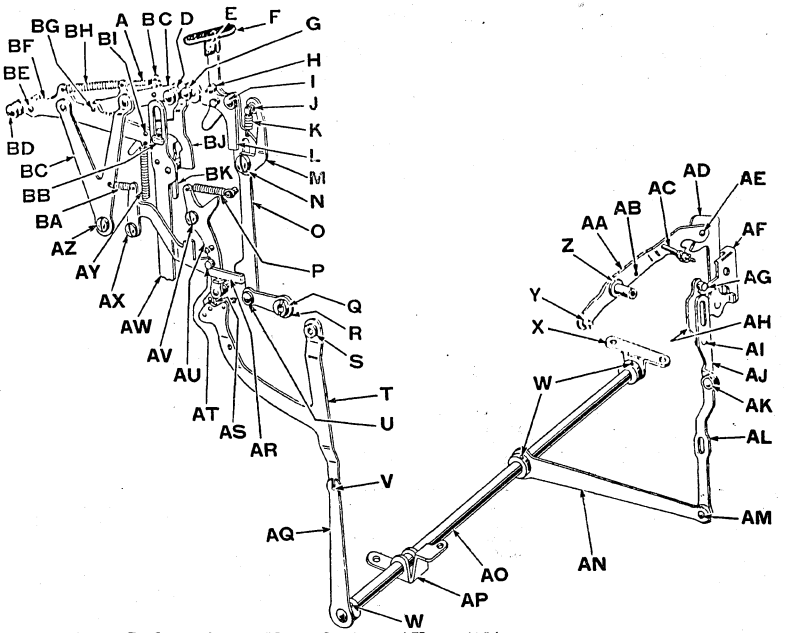
A **84577 (200550½)** included in C
B **1-200233 Env. 1457 No. 2**
C **1-12021¼A No. 2 Env. 1457**
D 113 No. 3 Env. 1457*
E Included in 1-3625 Env. 1457
F **10086**
G **1-3625 Env. 1457**
H Included in 1-3625 Env. 1457
I **1-200241B No. 2 Env. 1457**
J **72159**
K **10086**
L **1-100 No. 3 Env. 1457** includes L
M **1-101 No. 3 Env. 1457**
N **2861¼**
O **1-112 Env. 1457**
P **12081½**
Q **1-110 Env. 1457**
R **1-109A Fte. 200 No. 2 Env. 1358**
S **307 Fte. 217**
T **9264¼ (305 Fte. 205)**
U **1-138 Fte. 209**
V **305 Fte. 209**
W **74587**



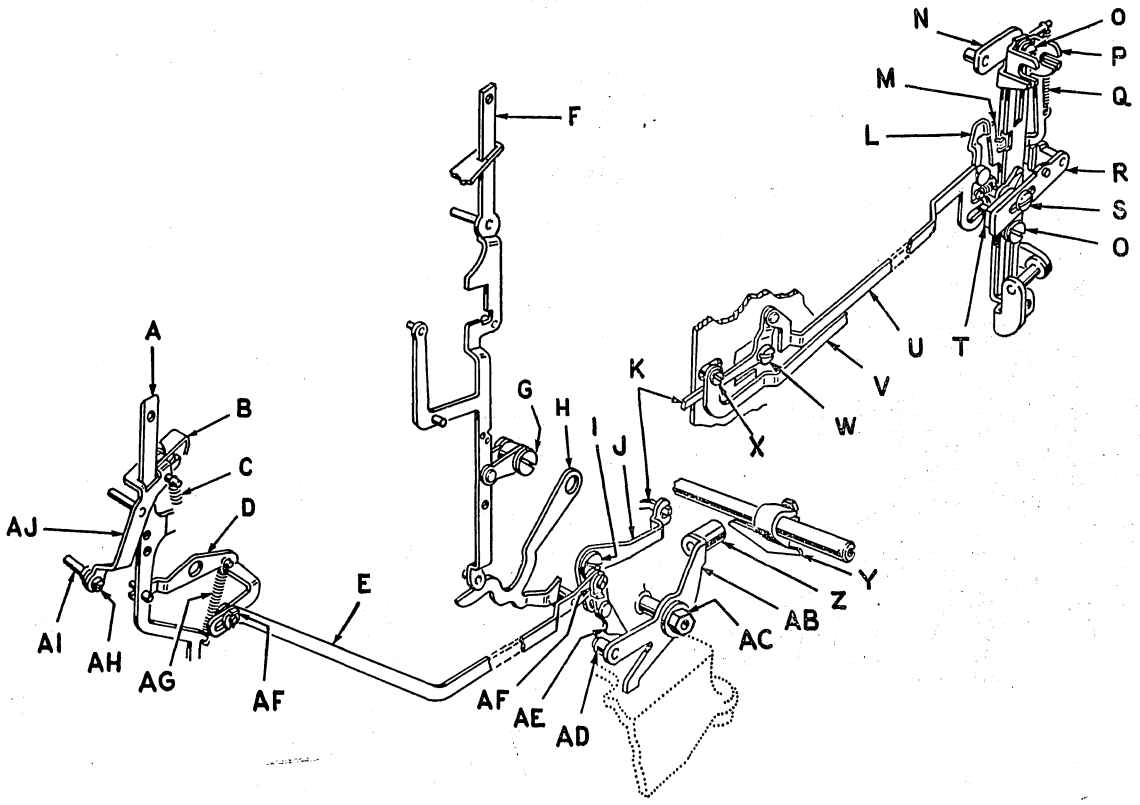
CARRIAGE RETURN BAR (UPPER), CLASSES 11 THRU 16 AND 20 THRU 30 (Plate 61)

SYMBOLS (Plate 61)

A **10180**
B **10111**
C **1-12013⅞** includes A, B, D, G
D **3658¼**
E **12051⅜ Screw, 46 nut**
F **1-12016¼B** specify color and description
G **12062¼A Screw, 1097¾ lock washer, 49¼ nut**
H **264¾**
I **7262½**
J **12058½A**
K **3486½**
L **1-200242 No. 1**
M **12019⅞ (200347A, 200550A)**
N **3661B Screw, 200423 roll**
O **1A-12021⅛** includes H, I, L, R, U
P **2887**
Q **12031½ Bushing, 3458 screw**
R **12017¼A**
S **12031½ Bushing, 3455¼ screw**
T **1A-12027⅝** includes V, AS
U **7262½**
V **750¾ No. 1**
W **51**
X **200125L** use 200527 screws and 200312 nuts
Y **12054**
Z **12064A** use screw 8054¾
AA **1-12015A** specify machine No.
AB **12064⅜**
AC **12063¾A** use 10082½ spring
AD **1-12018½ No. 3** specify machine No.
AE **12060¼ Stud, 12035 roll**
AF **12013½** use 12059½ screw, 12046 nut, 83800A spring
AG **12052¾**
AH **1-12013¼** part of AJ, use spring 83800A
AI **12050¼**
AJ **1-203161** includes AG, AH, AI, AK, AL
AK **351½**
AL **203162** included with AJ
AM **8050½ Screw, 46 nut**
AN 1-200124*
AO **1-12000 Style 9 (12008 Style 9 No. 1, 1-12022R, 12022L, 1-12025 No. 3, 1-12025 No. 30, 1-540, 2 req.)**
1-12000 Style 11 (12008 No. 2, 1-12022R, 12022L, 1-12025 No. 3, 1-12025 No. 6, 1-540, 2 req.)
1-12000 Style 13 (12008 No. 1 Style 13, 1-12025 No. 6, 1-12025 No. 3, 1-12022R, 12022L, 1-540, 2 req.)
1-12000 Style 15 (12008 Style 13 No. 1, 1-12025 No. 3, 12025 No. 6, 1-12022R, 12022L, 1-540, 2 req.)
1-12000 Style 17 (12008 Style 17 No. 1, 1-12022R, 12022L, 1-12025 No. 3, 1-12025 No. 6, 1-540, 2 req.)
AP **1-200125R**
1-12022R No. 2
AQ 1-12024⅝*
AR **12022⅞**
AS **1-12022⅝A** use rivet 53539, 489 spring
AT **750¾ No. 1**
AU For kinds see Plate 62, letter BC
AV **12051⅝**
AW **11-3627 No. 1**
AX **12051⅞**
AY **3682**
AZ **352⅞**
BA **681**
BB **3653¼C**
BC **222**
BD **3657¼B**
BE **3655½A**
BF **1-3612B**
BG **3655¼A**
BH **3683**
BI **3257½**
BJ **1-10114¾** use spring 7286½
BK **3614½**



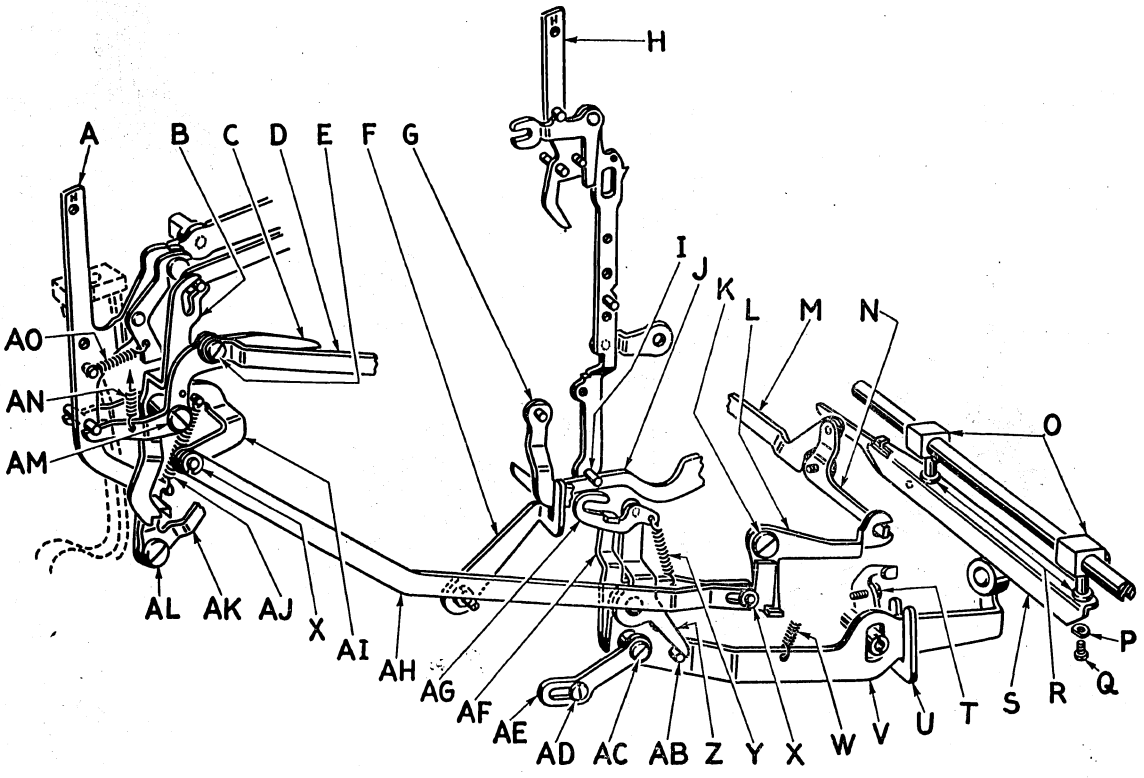
FORM SPACING—INDEXED FROM AUXILIARY MOTOR BARS—CARRIAGE CONTROLLED (Plate 60-1)



SYMBOLS (Plate 60-1)

A	**1A-12021¼ No. 3**
B	**20 No. 126**
C	**75804 No. 1**
D	**1-200233 No. 4** use 12051⅜₆A No. 4 screw when multiple skip and return is indexed from total keys or auxiliary motor bars, use 12051⅜₆ screw when multiple skip and return is not indexed from total keys or auxiliary motor bars
E	**1-200103½**
F	**1-200235 No. 3**
G	**200552½**
H	**1-200101½**
I	**200574½** use 9028½ washer
J	**1-200104½** includes AE
K	12019⅞₆* included in U
L	**1-250 Fte. 200**
M	**200104A**
N	**1-12010⅞ No. 2 Style 17**
O	**3455⅝**
P	**12010⅛₆**
Q	**3280⅛**
R	**1-10023½A**
S	**12059⅛A**
T	**12044¾B**
U	**1-12019¾ No. 2** includes K
V	**12019¾B Style 17**
W	**12060⅛₆**
X	**7357½**
Y	**1-900L Fte. 207 No. 6**
Z	200444* included in AB
AB	**1-200100½** includes Z and AD
AC	**200598 No. 4**
AD	200446* included in AB
AE	200102½* included in J
AF	**21 No. 7**
AG	**9086**
AH	**70528**
AI	**1-204004 Style 17**
AJ	**1-12018⅞A No. 3**

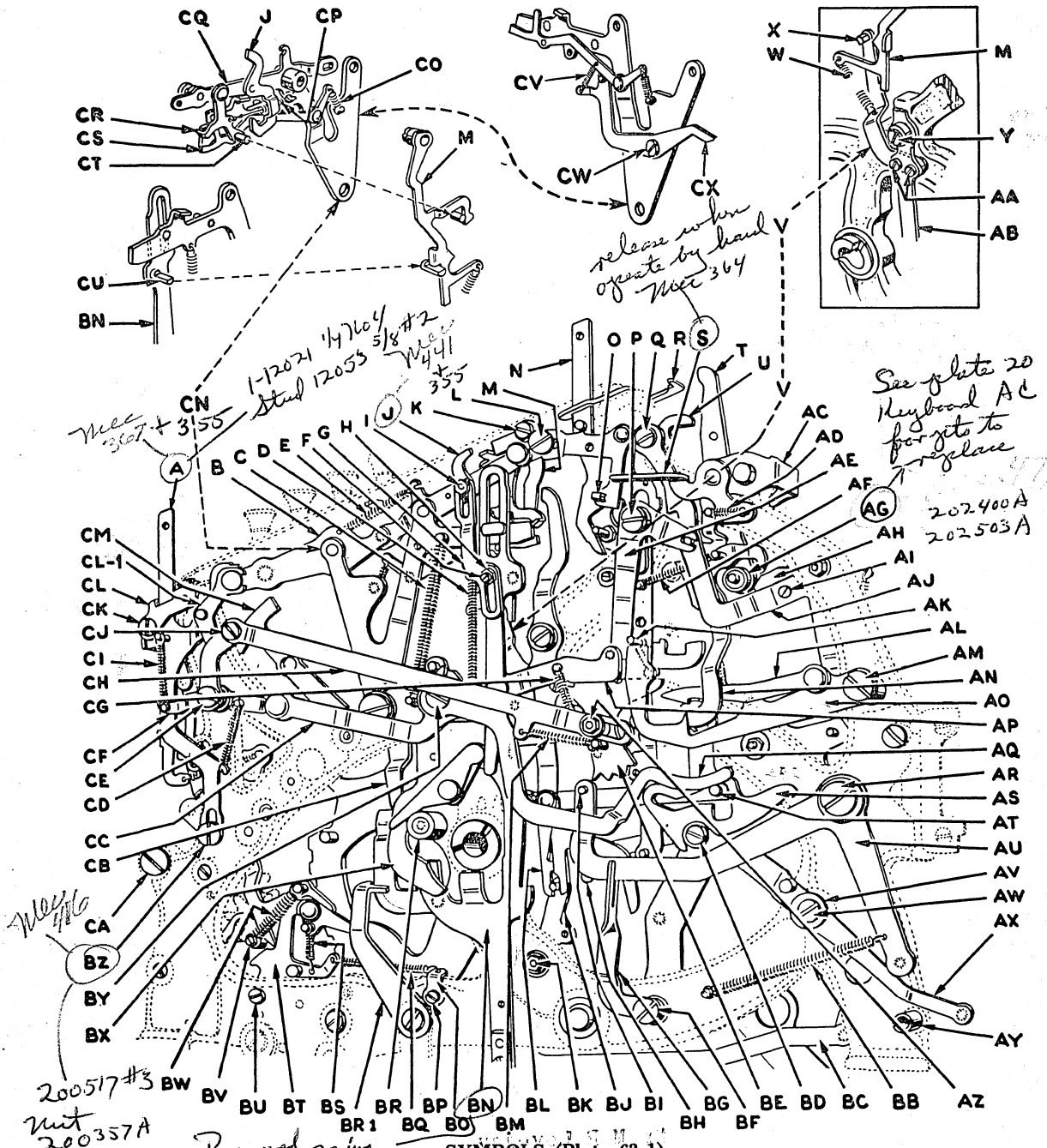
FORM SPACING—INDEXED FROM THE LOWER (101) MOTOR BAR, CARRIAGE CONTROLLED, DISABLED FROM THE UPPER (103) MOTOR BAR (Plate 60-2)



SYMBOLS (Plate 60-2)

A **11A-12021 1/4 No. 3**
B **1-200194 1/2 No. 1**
C **1-200191 1/2A**
D **11-200190 1/2**
E **200621** screw
F **1-200227 1/2 No. 2** use 200304 1/2 bushing
G **11-200239 1/2 No. 4**
H **21-200241B No. 5**
I 200587* included in H
J **1-200239 No. 2**
K 200503 1/4 use 9028 1/2 washer
L 200233 1/8
M **1-12019 3/4 No. 2**
N 120197/16* included in M, use 12060 1/16 screw
O **10045 7/8 No. 9** use 2890 3/4
P **131 Fte. 209** washer
Q **514 Fte. 209**
R **512A Fte. 209 No. 1**
S **1-115 Fte. 209 No. 9**
T **952 3/4** screw
U **200228 1/2 No. 3**
V **1-200153 1/4**
W **1084**
X **21 No. 7** clip
Y **8082A**
Z 200154 3/4* included in V
AB 1362 1/2* included in V
AC **84632**
AD **9259 5/8**
AE **1-217 Fte. 209 No. 2**
AF **1-200234 3/4**
AG 200154 1/4* included in V
AH 200233 1/4
AI **1-200233 No. 4**
AJ **9086** spring
AK **200276 1/4**
AL **200517 No. 3**
AM **12051 1/16A No. 4**
AN **75804 No. 1** spring
AO **77801** spring

MOTOR BARS—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES
(Plate 62-1)



SYMBOLS (Plate 62-1)

A **1-12021¼ No. 4**
B **1-201123 No. 2**
C **12081A**
D **86800B**
E **10788**
F **74502** screw
G **201152**
H **62303** eccentric
I **58310** shoulder nut
J 201122½* included in CQ
K **201562**
L **12353¾** screw, use 1097⅝ washer and 49¼ nut
M **1-201153**
N **1A-200241C No. 2** includes O
O 200570½* included in N
P **200550 No. 2,** use 401113 washer
Q **200591B No. 4** screw, use 76120 washer and 9945 nut
R **1-202233 No. 3** use 480¼ spring
S 1-200283½* included in AC
T 1-202119R* included in 21-202007 Style 17
U **1-200276A No. 8**
V **1-201155** includes X
W **82809**
X 66507* included in V
Y **203629A**
AA **7356½**

(OVER)

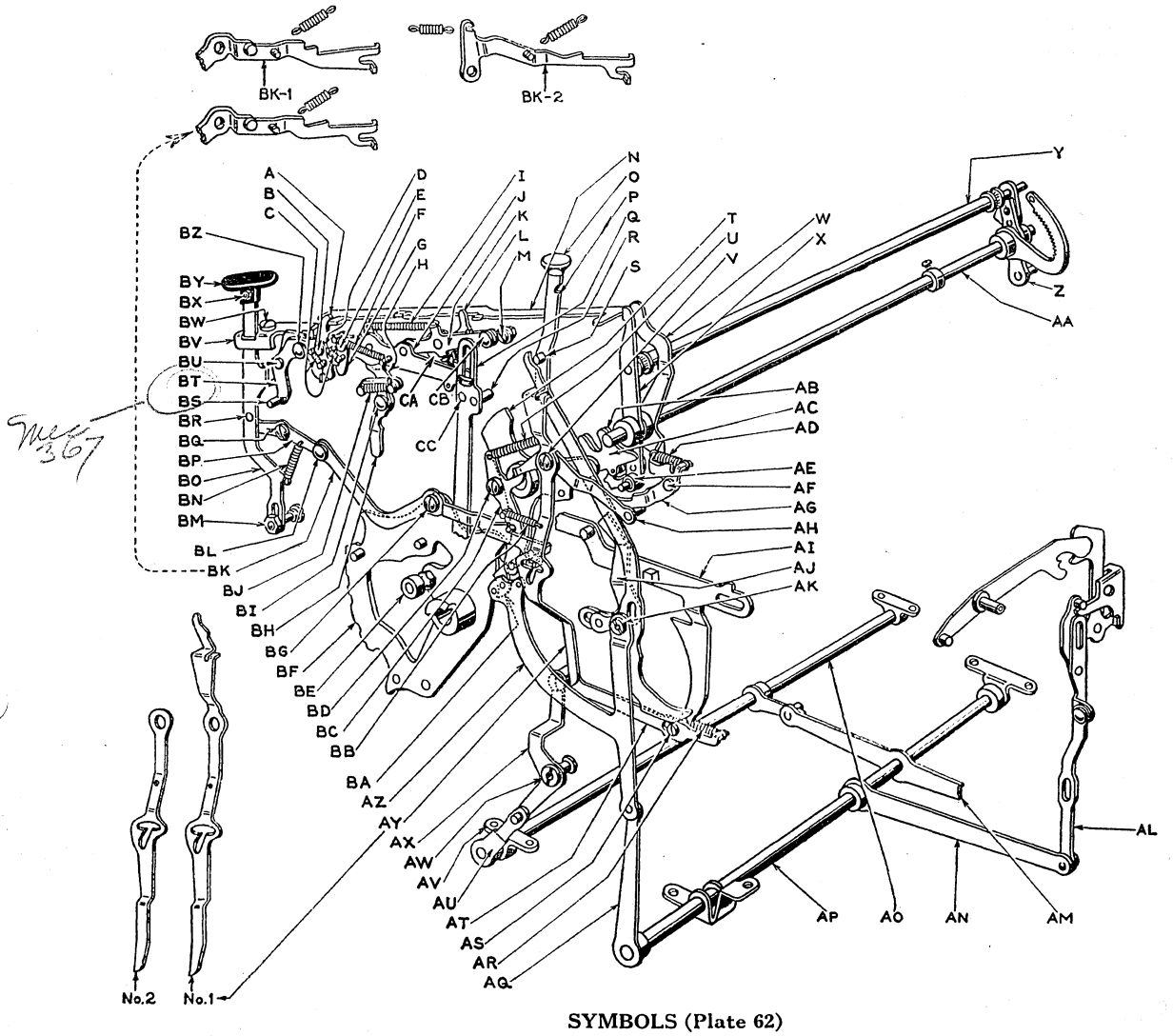
Printed in U. S. America Revised 9-27-50 For Form 2961
Replaces Previous Plate 62-1 Dated 4-17-50

SYMBOLS (Plate 62-1)—Continued

AB **1-201156** includes BL
AC **1-200281½** includes S
AD **489** spring
AE **1-200283⅜**
AF **483**
AG 202400A* included in T
AH **200282¼**
AI **12052** screw, use 76302 No. 5 spacer and 46 nut
AJ **1-200283¼A**
AK 200569½* included in N
AL 200236¾* included in AO
AM **200607½** use 45 nut
AN **1-200238B No. 6**
AO **1-200236¼** includes AL
AP **1-200270¾ No. 2,** use 650A rivet
AQ **1-200144 No. 11**
AR **3450⅞ Style 9**
AS **12024¾B No. 5**
AT 709556* included in 41-12016⅛
AU **1-200239½ No. 5** includes BI
AV **200350**
AW **79603**
AX **1-200280A**
AY **200598 No. 3**
AZ **46** nut, use 8436 shoulder collar
BB **3682**
BC 10025½* included in BJ
BD **75615** screw, use 12031⅞ roller
BE **1-200195½ No. 3**
BF **12051⅞** use 12031½ threaded bushing
BG **200227½**
BH 200586½* included in 1-200284
BI 264¾* included in AU
BJ **1-10025¾ No. 2** includes BC
BK **10057¼B** screw, use 7919½A washer and 46 nut
BL 201154* included in AB
BM **7283¼**
BN **1-3627 No. 3** includes CU
BO **20 No. 96**
BP **75602** screw, use 62300 collar
BQ **51802**
BR **1-3662¼ No. 3** use 45 and 45⅛ nuts
BR1 **3626½,** use 69551 No. 2 screw
BS **87801A** spring
BT **1-200231½**
BU **2854⅜,** 1097¾ lock washer, use 2820½ washer, 200339½ eccentric
BV **69557 No. 2**
BW **69805A No. 1**
BX **1-200270 No. 4** includes AP
BY **200527½A No. 2** screw
BZ **200517B** use 200357A nut
CA **103654**
CB **1-200278½**
CC **1-200144 No. 10**
CD **480¼**
CE **12051⅜6A No. 4** screw, use 3612½ washer
CF **1-200191½ No. 2**
CG **8082A**
CH **1-200190½**
CI **480¼**
CJ **200621** use 46 nut
CK **8054¾**
CL **12018⅞ No. 3**
CL1 **12017⅛ No. 3** use 753½ No. 3 rivet
CM 11-205117* included in 21-205002 Style 17
CN **1-215⅝6 No. 4** includes CS
CO **489** spring
CP **89800 (705811)** spring
CQ **1-201121 No. 3** includes J, CR
CR 201121½* included in CQ
CS 215⅞6* included in CN
CT 72611* included in CR
CU 3652⅛ No. 3* included in BN
CV **3286½**
CW **207503** use 46¼ nut
CX **1-215⅝6**

Mr M R Lovejoy
Buffalo N Y Branch 10-5

CARRIAGE RETURN BAR (LOWER), CLASSES 11 THRU 16 AND 21 THRU 30 (Plate 62)



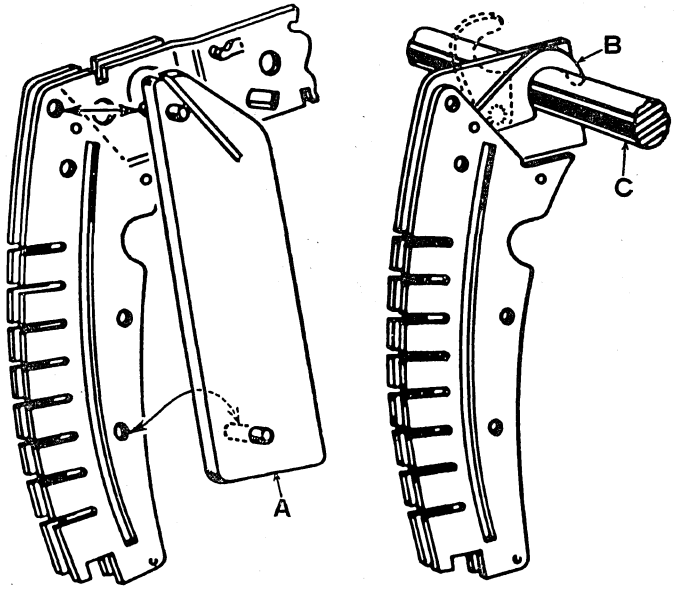
SYMBOLS (Plate 62)

A **2-122½ Fte. 104** includes E, G
B **164¼ Fte. 104**
C **62880 (89801)**
D **1-123⅛ Fte. 104**
E **164¾ Fte. 104**
F **10480¼**
G **1-122⅝ Fte. 104**
H 1-122⅞ Fte. 104* included with J
I **7283A Style 10**
J **2-122⅜ Fte. 104** consists of A thru J except I and includes BH, BI, BJ
K **1A-201121 (1-201121A, 1A-201123)** includes L, M, CA, CB and springs
L **1-201122** use rivet 351½, short spring 489, long spring 7681¼
M **12062¼A** Screw, 1097¾ lock washer, 49¼ nut
N **1-124 Fte. 104** furnished with keyboard plate 1-112⅛ Fte. 104, specify machine number, use rivet 263 and spring stud rivet 202504 for spring 480¼
O **291** specify color and character
P **1-16¼ Fte. 104** use spring 3281½
Q **11-3627 No. 1**
R **3652⅛**
S **3464⅞**
T **1-622¼ No. 2** includes AB, AC
U **2887** used on all excet use 72803 for 11-12024⅝₁₆A No. 1, 7787 for 11-12024⅝₁₆A No. 1, and 21-12024⅝₁₆A No. 2
V **160¾ Fte. 90**
W **1-124¼ Fte. 90** includes AF, AG
X 1-202119R* included with AA
Y **1-202005 No. 1 Styles 9, 11, 13, 15 and 17** specify machine number, submit form
Z 1-219L No. 2* includes **1-219¾B** and 8064⅝
AA **1-107½ Fte. 104 No. 1 Styles 11 and 15**
1-107½ Fte. 104 No. 1 Style 13 (21-202007 Style 13)
1-107½ Fte. 104 No. 1 Style 17 (21-202007 Style 17) specify machine No., includes X, Y, Z, AE, segment 1-10211AL, and collar 1-7140¼
AB **124¼ Fte. 104** short, use rivet 161½ Fte. 104, washer 629, collar 8436, spring 10686½, 2 req.
AC **124⅜ Fte. 104** long, use rivet 161½ Fte. 104, washer 629, collar 8436, spring 10686½, 2 req.
AD **489**
AE **202400A** Roll, 202503A stud
AF **351½**
AG **124⅜ Fte. 90** included with W
AH **1-125¾ Fte. 90** includes 1637 roll, 1657 stud
AI **2-11¾ Fte. 104**
AJ **16⅜ Fte. 104** use 251⅜ screw
AK **12031½ Bushing, 3455¼ screw**
AL **203162** included in AJ
AM **1-12025 No. 8**
AN **1-200124**
AO **1-1 Fte. 104 Style 13 or 17**
AP **1-12000 Style 9 (12008 No. 2, 1-12022R, 12022L, 1-12025 No. 3, 1-12025 No. 6, 1-540, 2 req.)**
1-12000 Style 11 (12008 No. 2, 1-12022R, 12022L, 1-12025 No. 3, 1-12025 No. 6, 1-540, 2 req.)
1-12000 Style 13 (12008 No. 1 Style 13, 1-12025 No. 6, 1-12025 No. 3, 1-12022R, 12022L, 1-540, 2 req.)
1-12000 Style 15 (12008 Style 13 No. 1, 1-12025 No. 3, 12025 No. 6, 1-12022R, 12022L, 1-540, 2 req.)
1-12000 Style 17 (12008 Style 17 No. 1, 1-12022R, 12022L, 1-12025 No. 3, 1-12025 No. 6, 1-540, 2 req.)
AQ Included in AO
AR **82 Fte. 104**
AS **4857½ Screw, 50¾ Fte. 104 stud**
AT **1-13 Fte. 104**
AU Included in AO
AV **22⅝ Fte. 104**
AW **12031½ Bushing,** 3458 screw holds bushing to side frame
AX **1-11⅛ Fte. 104**
1-11⅛ Fte. 104 No. 2 with long stud
AY **16⅞ Fte. 104** earliest style
16⅝ Fte. 104 No. 1 for Cl. 2, 6, 11 thru 16 with return bar, lower

SYMBOLS (Plate 62) Continued

AZ **1A-12027 5/16**
BA **1-12022 5/16A**
BB **63800**
BC **1-12024 5/16** Shuttle posting bar const.
11-12024 5/16 early style, Cl. 20 thru 30, with combination vertical space and carriage return bar, with repeat of machine operation carriage controlled
1-12024 5/16 No. 2 early style, Cl. 20 thru 30, early carriage return with combination vertical space and carriage return bar
1-12024 5/16 No. 3 early style, Cl. 20 thru 30, automatic total, bank posting
1-12024 5/16A No. 1 Cl. 1, 2, 6, 11 thru 16, with carriage return bar
11-12024 5/16A No. 1 Cl. 20 thru 30, combination vertical space and carriage return bar in connection with repeat print mechanism
31-12024 5/16A No. 1 (11-12024 5/16A No. 1) Cl. 1, 2, 6, 11-16, carriage return bar in connection with repeat of machine operation
1-12024 5/16A No. 2 (11-12024 5/16A No. 1) Cl. 20 thru 30, early carriage return with combination vertical space and carriage return bar, top part removed, use 72803 spring
11-12024 5/16A No. 2 (11-12024 5/16A No. 1) Cl. 1, 2, 6, 11 thru 16, carriage return bar in connection with repeat of machine operation top part removed, use spring 7787
21-12024 5/16A No. 2 Cl. 1, 2, 6, 11 thru 16, carriage return bar, top part removed, use spring 7787
1-12024 5/16A No. 3 Cl. 20 thru 30, automatic total bank posting
BD **12051 5/16** used with BC, 1- and 11-12024 5/16 and 1-12024 5/16 No. 2, use screw 200505 No. 3 for 1-12024 5/16 No. 3, use screw 12051 5/16 No. 1 for 1-, 11-12024 5/16A No. 1 and for 21-12024 5/16A No. 2, use screw 12051 5/16 No. 4 for 1-12024 5/16A No. 3
BE **1-3662 1/4,** Nut 45
BF **12B-311 1/8**
BG **2854 7/8 (84618)** for 1-12015 1/16 No. 3 **12051 7/16A** Screw for 1-12015 1/16 No. 4 **12051 7/16 No. 2** for 1-12015 1/16 No. 3
BH **1-122 3/4 Fte. 104** included with J
BI **351 1/2**
BJ **180 1/8 Fte. 104**
BK **1-12015 1/16A (1-12015 1/16 No. 3)** Cl. 2, 6, 11 thru 26, lower bar const., use spring 72803
BK-1 **1-12015 1/16 No. 3** Cl. 2, 6, 11 thru 26, upper bar const., use spring 480 1/4 on spring stud and spring 681 on end
BK-2 **1-12015 1/16 No. 2 (1-12015 1/16 No. 4)** Cl. 20 thru 30, early carriage return with combination vertical space and carriage return bar, use spring 72803
BL **12050 1/4**
BM **200517 No. 2** Screw, 46 nut
BN **3683**
BO **1-12021 1/4A** includes BR, BT, BU
BP **1-200233** includes BL
BQ **12051 5/16**
BR **264 3/4**
BS **12053 5/8** Screw stud on hexagon **12053 3/8** for springs 3282 and 82814
BT **12017 1/8**
BU **753 1/2 No. 3**
BV **12018 7/8**
BW **7059**
BX **12051 3/8** Screw, 46 nut
BY **1-12016 1/4B** specify color and description
BZ **3657 1/4B**
CA **1-201125A** included with K
CB **3658 1/4**
CC **3653 1/8 (709598)**

INSTALLING REPAIR 1A-210AR&AL ENV. 1242 (SPECIFY PITCH), CLASSES 1, 2, 6, 11 THRU 16 AND 20 THRU 30 (Plate 63)



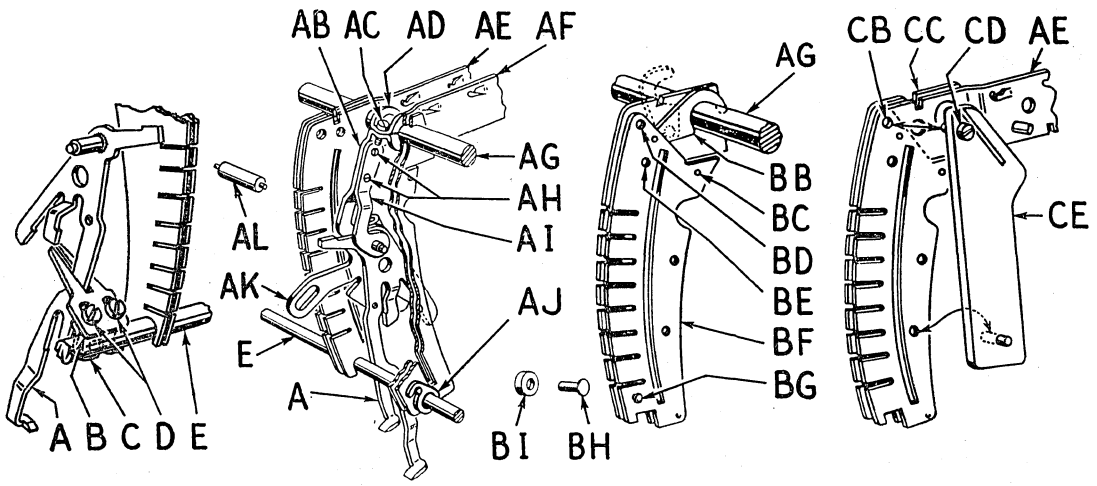
SYMBOLS (Plate 63)

A **Kit Env. 1242**
B **1A-210AR or AL Env. 1242** specify pitch
C **201 1/2 Styles 9, 11, 13 and 17**
NOTE: Order A and B only as needed. Specify machine No. and column. Return jig to Home Office.

SYMBOLS (Plate 63-1)

A **1-10413A**
B **419 1/16Z**
C **419 No. 1** Brace
D **952 3/4**
E **205 Styles 9, 13, 17**
AB **1-10413 1/2Z** includes AC, AD, AH, AI
AC **2851 3/4** 2 required
AD **10413 1/4Z**
AE **1-210BL Pitch 8-10-12-16 No. 1** specify pitch and column
AF **1-210BR Pitch 8-10-12-16 No. 1** specify pitch and column
AG **201 1/2 Styles 9, 13, 17**
AH **10458Z** Screw, use 49 1/4 nut
AI **10413 3/4Z**
AJ **222 1/4B**
AK **204109**
AL **460 1/8Z**
BB 100 Env. 1242* included in BF
BC Description
BD Description
BE Description
BF **1-210AR and AL Env. 1242** specify pitch—has small hole BD
1-210AR and AL Env. 1242 No. 2 specify pitch—has small hole BD with stud at BG
1-210BR and BL Env. 1242 specify pitch—has large hole BD with stud at BC
1-210BR and BL Env. 1242 No. 2 specify pitch—has large hole BD with studs at BC and BG
BG Description
BH **258 No. 2**
BI **16340**
CB Description
CC Description
CD **350 7/8** Screw
CE **Kit 1A Env. 1242** includes CD

SECTOR GUIDE REPAIR PARTS—SERIES H MACHINES (Plate 63-1)



Auxiliary Carry Pawl Guide B—For use in maintaining lateral alignment of the carry pawl Foot with the adding wheel cam when the bearing on one side of a carry pawl becomes worn.

To install guide B: (1) fasten the guide to shaft E with clamp C; (2) align the guide to permit free movement of the carry pawl and to prevent the carry pawl from limiting in the bottom of the slot of the guide.

Carry Pawl Brace AB—For use in providing replacement bearing surfaces for the carry paw lshould both bearings become worn.

To install brace AB : (1) remove the keyboard; (2) lock shaft AG against rotation by installing brace AB in a space between non-add columns, using shaft AL in place of a carry pawl; (3) remove the affected carry pawl and to it assemble brace AB; (4) replace the carry pawl in the machine, using clamp AD to anchor brace AB to shaft AG; (5) align the brace for free movement of the carry pawl with its springs unhooked; (6) replace the keyboard and check the carry pawl for free action.

Repair Sector Guide BF—To replace badly worn or broken sector guides.

To install guide BF: (1) remove the keyboard; (2) remove carry pawls A and the adding rack latches and the carry pawl latches (N and C, repsectively, Plate 3, Accumulation Instruction Book) from each side of the affected sector guide; (3) remove the adding rack; (4) remove the index wires from the slots in the sector guides, leaving them attached to the keyboard lock strip; (5) place jig CE as a template for the hack saw and cut guide AE—(screw CD may be reversed to use either its head or its shank as a guide in hole CB, depending on the size of hole CB); (6) break off the remaining portion of guide CC and remove the original guide; (7) place repair sector guide BF and secure with hook BB, which should fit tightly over shaft AG—(when the repair sector guide is used in a column where a carry does not occur, washer BI is placed between the plates in line with hole BE, and rivet BH is inserted through hole BE and riveted); (8) reassemble and assure free action of parts.

Mee 420 – Billiard Cloth strips
200 992 No1 1092 1/2 No1 + No2
200 992 No2 Kit 164 1/4 cement

KEYBOARD PLATES AND THEIR SYMBOLS (Plate 64)

1-213B Styles 7, 9, 11, 13, 15 or 17 specify machine number. UPPER KEYBOARD PLATE with cloth, Cl. 1 machine

1-213C Styles 7, 9, 11, 13, 15 or 17 specify machine number. UPPER KEYBOARD PLATE with cloth, Cl. 2 machine

1-213D Styles 7, 9, 11, 13, 15 or 17 specify machine number. UPPER KEYBOARD PLATE with cloth. Cl. 1 machine split and normal

1-213E Styles 7, 9, 11, 13, 15 or 17 specify machine number. UPPER KEYBOARD PLATE with cloth. Cl. 2 machine split and normal

1-3413 Styles 7, 9, 11, 13, 15 or 17 specify machine number. UPPER KEYBOARD PLATE with cloth. Cl. 1, 2, 6 shuttle carriage const.

1-62213 Styles 13 or 17 specify machine number. UPPER KEYBOARD PLATE with cloth. Cl. 11 thru 30 machines

11-62213 Style 13 specify machine number. UPPER KEYBOARD PLATE with cloth. For Style 13 machine built in style 17 base and case. Cl. 20 thru 30

1-10213A Style 9, 11, 15 specify machine number. UPPER KEYBOARD PLATE with cloth. Cl. 6 machine

1-127 Fte. 207 No. 3 or 4 Styles 13 or 17 specify machine number. LOWER KEYBOARD PLATE. For Cl. 1, 6, 11 thru 16, 20 thru 26 with 8 point printing control, viz.:
No. 3 from keyboard lever with repeat print mechanism
No. 4 from keyboard button to release automatically upon machine operation with repeat print mechanism

1-128 Fte. 207 No. 1 and No. 2 Styles 13 or 17 specify machine number. UPPER KEYBOARD PLATE with cloth, viz.;
No. 1 from keyboard lever
No. 2 from keyboard button. For Cl. 2, 6, 11 thru 16, 20 thru 26 with 8 point printing control

1-128 Fte. 207 Style 13 No. 5 specify machine number. UPPER KEYBOARD PLATE with cloth. For Cl. 20 thru 30 Style 13 machines built in Style 17 base and case, with 8 point printing control from keyboard button

1-128 Fte. 207 Style 13 No. 6 specify machine number. Same description as above item except is for "KEYBOARD LEVER." Lever to restore automatically when mchine is operated

1-112 Fte. 219 Style 17 specify machine number. Lower keyboard plate for Styles 23 17 40 and 23 17 42 carriage controlled automatic count device

11-112 Fte. 219 Style 17 specify machine number. Lower keyboard plate for Styes 23 17 40 and 23 17 42. For machines when automatic count is required in 10th col.

21-112 Fte. 219 Style 17 specify machine number. Lower keyboard plate for Cl. 20 thru 30 machines with automatic count and automatic total

12-112 Fte. 219 Style 17 specify machine number. Same as 2-112 Fte. 219 Style 17 except automatic count is in 9th or 10th col.

214's—WHERE USED (Plate 65)

Symbol	Class	Description
214 No. 1	All	Used in regular adding columns
214 No. 2	All	Date or folio column
214 No. 3	All	Dates or folio to add, also used with partial keyboard repeat
214R No. 4	All	Flexible keyboard in a non-add column
214L No. 4	All	Flexible keyboard in a non-add column
214R No. 5	All	Flexible keyboard in an adding column
214L No. 5	All	Flexible keyboard in an adding column
214R No. 6	All	Flexible keyboard, specifying extra repeat key, partial keyboard repeat, or folio to add
214L No. 6	All	Flexible keyboard, specifying extra repeat key, partial keyboard repeat, or folio to add
214 No. 7	All	Used in a character or year date column with one hold down key
214 No. 8	All	Character or year date column with two hold down keys
214 No. 9	All	Character or year date column with three hold down keys
214 No. 10	All	Character or year date column with four hold down keys
214 No. 11	All	Character or year date column with five hold down keys
214 No. 12	All	Character or year date column with six hold down keys
214 No. 13	All	Character or year date column with seven hold down keys
214 No. 14	All	Character or year date column with eight hold down keys
214 No. 15	All	Adding column 9th on Style 13 and 13th on Style 17 machines with eight point printing control. Keyboard lever to restore on machine operation
214 No. 16	11-30	Carriage controlled register totals with keys depressed in keyboard
214 No. 17	11-30	Carriage controlled automatic crossfooter totals with keys depressed in keyboard, used in even cols.
214 No. 18	All	Double automatic keyboard count from depression of keys, right or left section
214 No. 19	11-30	Automatic count in 12th col. controlled from 14th col., not carriage controlled
214 No. 21	All	In a non-add column, 9th on Style 13 and 13th on Style 17, machines with eight point printing control keyboard lever to restore on machine operation
214 No. 22	21-30	Use when register add or non-add is indexed by the 7th, 8th, or 9th key in a non-add column
214 No. 23	All	Use when count comes in even cols.
214 No. 24	All	Use when count comes in even cols., partial keyboard repeat
214 No. 25	2-6, 11-30	For safeguard symbol printing device, keyboard control
214 No. 26	All	Use with front panel item counter, partial keyboard repeat controlled from a key in an adding column
214 No. 27	All	Use with front item counter, controlled from a key in a non-add column
214 No. 28	All	Use with front panel item counter controlled from a key in an adding column
214R No. 29	11-30	Enforced designation from a character key in odd columns, non-add
214L No. 29	11-30	Enforced designation from a character key in even columns, non-add
214R No. 30	11-30	Machine operation from a character key in place of motor bar
214L No. 30	11-30	Machine operation from a character key in place of motor bar
214R No. 31	11-30	Enforced designation from an adding col.
214L No. 31	11-30	Enforced designation from an adding col.
214 No. 32 (211½)	All	Tens of shillings column
214 No. 33 (211½)	All	Tens of shillings column, partial keyboard repeat
214 No. 34	All	Farthing column, or when a pence or 1/12th fraction is in center of machine and list 1 to 7 is required in the column to right
214 No. 35	All	Farthing column or when a pence or 1/12th fraction is in center of machine and list 1 to 7 is required in the column to right, partial keyboard repeat
214 No. 36	All	17th column, list 1 to 6 inclusive with characters listing 1 to 12 inclusive in column to right
214 No. 37	All	17th column list 1 to 5 inclusive with characters listing 1 to 13 inclusive in column to right
214 No. 38	1-2	For Style 17 in center of machines for triple English, tens of shillings column when the £'s are listed from 1 to 9 inclusive to the right of pence column
214 No. 39	All	When characters or numerals are list 1 to 8 inclusive and total nine
214R No. 40	All	Non-add column characters or numerals list 1 to 8 inclusive, column to left list 1 to 10 inclusive
214L No. 40	All	Non-add column characters or numerals list 1 to 8 inclusive, column to right list 1 to 10 inclusive
214 No. 41	All	For pence column or 1/12th fraction other than first column, partial keyboard repeat
214R No. 42	All	For pence column or 1/12th fraction other than first column
214L No. 42	1-2	For Style 17 in center of machine for triple English when £'s are listed from 1 to 9 inclusive to the right of the pence column
214 No. 43	All	For partial keyboard repeat, pence column or 1/12th fraction, used in first column
214 No. 44	All	For pence column or 1/12th fraction when used in first column
214 No. 45	2	Repeat print construction, pence column or 1/12th fraction, in first column
214 No. 46	1-2	For Style 17 in center of machine for triple English units of shillings column when the £'s are listed from 1 to 9 inclusive to right of pence column
214 No. 47 (214R No. 42)	All	Flexible keyboard with 1/12th fraction, fractions to add
214R No. 48	All	When 10 characters or numerals are required, non-add column list 1 to 8 inclusive in column to right
214L No. 48	All	When 10 characters or numerals are required, non-add column list 1 to 8 inclusive in column to left
214 No. 49	11-30	When all keys in column index register add or non-add mechanism
214 No. 50 & 1-	All	When calendar feature or characters are to add, without date repeat key
214 No. 51 & 1-	All	For months column in calendar fte., date repeat key construction
214 No. 52 & 1-	All	When 15 characters are required
214 No. 53 & 1-	All	For characters when more than nine are required, list 1 to 4 inclusive in column to right
214 No. 54 & 1-	All	For characters when more than nine are required, list 1 to 5 inclusive in column to right
214 No. 55 & 1-	All	For characters when more than nine are required, list 1 to 6 inclusive in column to right
214 No. 56 & 1-	All	For characters when more than nine are required, list 1 to 7 inclusive in column to right
214 No. 57 & 1-	All	Flexible keyboard when 15 characters are required
214 No. 58 & 1-	All	Flexible keyboard when more than nine characters are required and characters or numerals in column to right are list 1 to 4 inclusive
214 No. 59 & 1-	All	Flexible keyboard when more than nine characters are required and characters or numerals in column to right are list 1 to 5 inclusive
214 No. 60 & 1-	All	Flexible keyboard when more than nine characters are required and characters or numerals in column to right are list 1 to 6 inclusive
214 No. 61 & 1-	All	Flexible keyboard when more than nine characters are required and characters or numerals in column to right are list 1 to 7 inclusive
214 No. 62 & 1-	All	Flexible keyboard when more than nine characters are required and characters or numerals in column to right are list 1 to 8 inclusive
214 No. 63 & 1-	All	Flexible keyboard when more than 9 characters are required and characters or numerals in column to right are list 1 to 8 inclusive, used in odd col.
214 No. 64 & 1-	All	Flexible keyboard when more than 9 characters are required and characters or numerals in column to right list 1 to 7 inclusive, used in odd column
214 No. 65 & 1-	All	Flexible keyboard when more than 9 characters are required and characters or numerals in column to right list 1 to 6 inclusive, used in odd column
214 No. 66 & 1-	All	Flexible keyboard construction, when more than 9 characters are required and characters or numerals in column to the right are list 1 to 5 inclusive, used in odd columns
214 No. 67 & 1-	All	Flexible keyboard, when more than 9 characters are required and characters or numerals in column to right are list 1 to 4 inclusive, used in odd columns
214 No. 68 & 1-	All	Flexible keyboard specifying 15 characters, used in odd columns
214 No. 69	All	For characters to list 1 to 12 inclusive, column to right list 1 to 15 inclusive
214 No. 70 & 1-	All	For characters to list 1 to 15 inclusive, column to left list 1 to 12 inclusive
214 No. 71 & 1-	All	When characters are to list 1 to 12 inclusive, column to left list 1 to 6 inclusive
214 No. 72 & 1-	All	When characters are to list 1 to 13 inclusive, column to left list 1 to 5 inclusive
214 No. 73 & 1-	All	Flexible keyboard used in calendar feature for months

SEE EXPLANATION ON INSIDE OF FRONT COVER

214's—WHERE USED (Plate 65) Continued

Symbol	Class	Description
214 No. 74 & 1-	All	Flexible keyboard, used in calendar feature, France, one hold down key
214 No. 75 & 1-	All	Used in calendar fte. for France
214 No. 76 & 1-	All	For date column in calendar feature
214 No. 77 & 1-	All	When dates, characters, or numerals are to list 1 to 4 inclusive
214 No. 78 & 1-	All	When dates, characters, or numerals are to list 1 to 5 inclusive
214 No. 79 & 1-	All	When dates, characters, or numerals are to list 1 to 6 inclusive
214 No. 80 & 1-	All	When dates, characters, or numerals are to list 1 to 7 inclusive
214 No. 81 & 1-	All	When dates, characters or numerals are to list 1 to 3 inclusive and total nine
214 No. 82 & 1-	All	When dates, characters or numerals are to list 1 to 4 inclusive and total nine
214 No. 83 & 1-	All	When dates, characters or numerals are to list 1 to 5 inclusive and total nine
214 No. 84 & 1-	All	When dates, characters or numerals are to list 1 to 6 inclusive and total nine
214 No. 85 & 1-	All	When dates, characters or numerals are to list 1 to 7 inclusive and total nine
214 No. 86 & 1-	All	Flexible keyboard, used in date column
214 No. 87 & 1-	All	Flexible keyboard, when dates, characters or numerals are to list 1 to 4 inclusive
214 No. 88 & 1-	All	Flexible keyboard, when dates, characters or numerals are to list 1 to 5 inclusive
214 No. 89 & 1-	All	Flexible keyboard, when dates, characters or numerals are to list 1 to 6 inclusive
214 No. 90 & 1-	All	Flexible keyboard, when dates, characters or numerals are to list 1 to 7 inclusive
214 No. 91 & 1-	6, 11-30	For date column in calendar feature when placed to the left of 1-10216A
214 No. 92	All	Characters 15 to list in 13th and 14th columns
214 No. 93	All	Characters to list in 7-8-9 key position, working in conjunction with 214 No. 92
214 No. 94	Class 30	Keyboard selection of registers in column 1, ten key selection
214 No. 95	All	Characters to list 1 to 3 inclusive in last column
214 No. 96 & 1-	20-30	Characters in 14th and 15th columns and requiring crossfooter total operation with amount in keyboard
214 No. 97 & 1-	1-2-6 11-16 20-30	Calendar feature when numerals in column 16 are list 1 to 4 inclusive and No. 1 and No. 2 key positions in column 17 are hold down keys
214 No. 98 & 1-	1-2-6 11-16 20-30	Flexible keyboard with calendar feature keys 1 and 2 hold down in last column, keys 1-2-3-4 lock down in next column
214 No. 99 (211½)	1-2-6 11-16 20-30	Flexible keyboard, Sterling, in tens of shillings column
214 No. 100	20-30	Crossfooter totals with keys depressed in keyboard located in 8th column, list six total nine, in conjunction with flexible construction in columns to left including 7-8-9 keys in col. 8, used with 1-214 No. 65
214 No. 101	11-16 20-30	Non-add locking strip in calendar feature where 204101AR is located

SERIES H MACHINES

Classes 1, 2, 6, 11 thru 16 and 20 thru 30

PRINTING

Symbol List

January 10, 1949

*Issued*_____

*To*_____

*Of*_____

Property of and to be returned to

BURROUGHS ADDING
MACHINE COMPANY

DETROIT 32, MICHIGAN

Printed in U. S. America 1-10-49

Form 2962

WHERE DISCARDED SYMBOLS (NOT REQUIRED FOR REPAIRS) ARE REPLACED BY ACTIVE SYMBOLS, THE ACTIVE SYMBOLS ARE SHOWN IN PARENTHESES FOLLOWING THE DISCARDED SYMBOLS.

EXAMPLE: 1-8817¼ (3261B, 1-8801AZ STYLE 12 OR 20, 1-8817BR NO. 4, 8817½ZL, 8828¼C, 8828½B, 47¾, 49¼—2 PCS., 79543—2 PCS.)

SYMBOLS WHICH ARE NO LONGER AVAILABLE AND WHICH HAVE NOT BEEN REPLACED BY ACTIVE SYMBOLS HAVE BEEN REMOVED FROM THE VARIOUS PLATES.

INDEX OF MECHANISMS

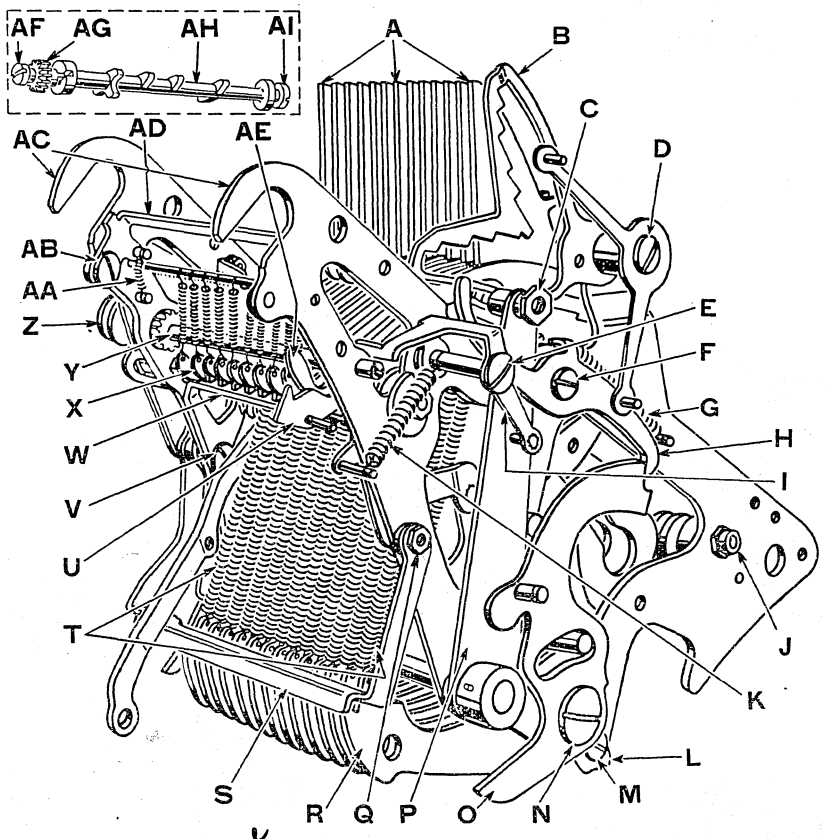
DESCRIPTION	Plate No.
Case Shutter	48
Cipher Cut-Out Mechanism	5
Closed Account Symbol and Consecutive Number Not to Print During Spacing Stroke (H903 Machines)	11
Couplers—Symbols and Where Used	54
Crossfeed Ribbon, Feature 69 (Style 2 09 09 Tally Roll)	45
Crossfeed Ribbon Mechanism (Class 20) (Early Style)	39
Crossfeed Ribbon Mechanism (Improved)	38–1
Crossfeed Ribbon Mechanism (Class 20) (Later Style)	38
Crossfooter Detent	28
Crossfooter Detent for Single Operation Multiple Print Machine—Improved	28–1
Delayed Cipher Printing Mechanism	5
Double Bail Printing Control	6
Driver Assembly	24
Eight Point Printing Control, Carriage and Keyboard Lever Controlled, Lever Restores at Each Machine Operation	14
Eight Point Printing Control From Carriage Controlled Total and Sub-total Mechanism (H903 Machines)	15
Eight Point Printing Control From Character Keys	20
Eight Point Printing Control From Keyboard Button	18
Eight Point Printing Control—Indexed and Disabled From Various Sources and Shifted Thru Machine Operation—In Conjunction with the Count Mechanism (Class 20 Bank Machines)	13–1
Eight Point Printing Control Shifted from Register Total Indexing Lever and C.F.N.A. Key	19
Eight Point Printing Control from Total Key Disabled by Keyboard Button	17
Eight Point Printing Control from Total and Subtotal Keys, Carriage Controlled	16
Eight Point Printing Control from Upper and Lower Motor Bars	21
Eight Point Printing Control Indexed from all Sources—Actuated by Machine Operation	13
Hammer Assembly, Right	3
Hammer Assembly, Left	4
Hammer Chart	6–2
Hammer Release and Driver Resetting Control	23
Items to Print in Red, Carriage Controlled (Early Style)	42
Items to Print in Red, Subtract Lever Controlled (Early Style)	42
Items to Print in Red, Carriage Controlled (for Later Ribbon Mechanism)	41
Items to Print in Red—Manual Control	40
Items to Print in Red, Subtract Lever Controlled (Later)	43
Mechanism to Prevent Minus Symbol Printing with Added Amounts and Insure Printing with Subtracted Amounts (Bank Posting Machines)	12
Printing Control Camshaft Rotated from Upper or Uppermost Bar	22
Printing Control Indexed from Carriage and Machine Operation	6–1
Printing Control for Symbol Type (Later)	8–2
Printing Control from Character and Total Keys	26
Printing Control—Roll and Skid Controlled	25
Rapid Ribbon Change Device	49
Ribbon Mechanism, Vertical	46
Ribbon Shutter Mechanism	47
Rotary Calendar Feature Carriage Controlled	33
Rotary Calendar Feature Quick Set	36
Rotary Consecutive Numbering Device Controls	35
Rotary Consecutive Numbering Device, Carriage Controlled	34
Safeguard Latches for Series H Machines Equipped with Multiple Print Mechanism	23–2
Safeguard Symbol Printing Control	31
Safeguard Symbol Printing Mechanism Disabled by Register Total Indexing Lever	32
Safeguard Symbol Printing Mechanism, Style 2	31–1
Safeguard Symbol Printing Mechanism Listing and Totaling	29
Safeguard Symbol Printing Mechanism (Totaling)	30
Single Bail Printing Control (Early Style) (4 Pt. and 8 Pt.)	7
Single Operation Multiple Print (Improved) Indexed and Disabled from Control Rolls	27–1
Single Operation Multiple Print Hammer Release and Diver Resetting Control (Improved)	23–1
Single Operation Multiple Print Printing Controls (Improved)	25–1
Single Stroke Multiple Print	23 thru 28
Single Stroke Multiple Print Disabled by Carriage Normal Key and Also by Spring	27
Symbol Indexing Controls	8
Symbols Print Only with Amounts in Conjunction with Closed Account Feature (Classes 20 thru 30)	8–1
Symbol Type Printing Control	10
Totals to Print in Red with Subtract Lever in Subtract Position (Early and Later Styles Ribbon Mechanisms)	44
Type Centers, 1/8	50–1
Type Mechanism	50
Unlimited Split Mechanism	37

Printed in U. S. America 1-10-49

To Remove Complete Section Mec. 300

HAMMER ASSEMBLY, RIGHT (Plate 3)

(Plates 1 and 2 in Printing Instruction Book only)



To Change Mec 300

SYMBOLS (Plate 3)

A See Chart Plate 6-2

B **1-710¾A** Cl. 2, 6
1-67111 Cl. 6, 11 thru 16, 20 thru 30
11-67111 used with closed acct. fte., specify printing control, Cl. 11 thru 16, 20 thru 30
21-67111 used when reg. non-add is to print same symbol as register sub-total, Cl. 11 thru 16, 21 thru 30

C **731¾**

D **8054¾**

E **8054¾**

F **750**

G **7283¼**

H **1-714A**

I **1-711¾A** Cl. 2
1-10711⅝ Cl. 6, 11 thru 16, 20 thru 30
1-10711⅝A No. 3 used for bank posting machines

J **731A**

K **681⅛**

L **710⅛R**

M **756½A**

N **759** use 759⅛ screw for 1-713⅛R Style 17

O **1-713AR Style 9,** Spring 1-783C
1-713⅛R Style 17 used on machines with tally roll

P 1-711AR* Part of 1-67004 Style 13-17, Cl. 6, 11 thru 16, 20 thru 30, part of 1-3903 specify style, Cl. 1, 2

Q **10746½** Nut, 10746¾ washer, 3961A screw, use screw 7357½ for Cl. 2

R **1-716D** used with late Style 1-702B Style 7, 9, 11, 13, 15, 17 assembly, 710⅛R&L brackets, 707A No. 2 Style 7, 15 or 707B No. 2 Style 9, 11, 13, 17 shaft
1-716C used with 710⅛R&L brackets, 707A No. 2 Style 7, 15 or 707B No. 2 Style 9, 11, 13, 17 shaft
1-716A (1-716Z, 780¼) Early
1-716B (1-716Z, 780¼) Early

S **1-10718C Style 13, 15, 17** Early style
10718D No. 2 Style 13, 17 Later style, specify machine number and submit forms. See Plate 4 for other styles

T **780¼** see Plate 5 for inside springs

U **1-729⅜ No. 7** included in 1-717 No. 8, See Plate 54 for other styles

V **10754¼** Screw, 10735⅞ spacing collar, 45 nut

W **1-10727½** Styles 11, 13, 15, 17

X **51-717 No. 6** see Plate 54 for other styles

Y **10701B No. 1 Style 13, 17** (No. 1 is used for 8 point construction) | Specify machine number and submit forms
10701B No. 2 Style 13, 17 (No. 2 is used for 4 point construction) | Specify machine number and submit forms
10701B No. 2 Style 23 13 03 (4 point construction)
10701C No. 1 Style 23 13 03 (8 point construction)
10701B No. 1 Style 23 17 41 Early style 8 point
10701C No. 1 Style 23 17 41 Later style 8 point
10701B No. 2 Style 23 13 02 (4 point)
10701B No. 2 Style 23 17 40 (4 point)
10701B No. 2 Style 23 17 42 (4 point)

Z **10736⅜** used for camshaft with tapped end, screw 72614
10736⅜A used for camshaft with threaded end, 47¼ nuts

AA **10784** use spring 283A for Style 17

AB **7559½, 46¼** Nut

AC **1-710R&L No. 1** used for machines with variable hammerblock, Cl. 1, 2, 6, 11 thru 16, 20 thru 30
1-710R&L used for machines without V. H. B., Cl. 1
1-710CR&AL used for machines without V. H. B., Cl. 2
1-710CR&CL Early style, used for machines without V. H. B., Cl. 2
1-710CR&AL used for S&N, DCN, or DSN construction, Cl. 1 and 2
1-710AL Early style, used for S&N, DCN, or DSN construction, Cl. 1 and 2
1-3910½R&L used for unlimited split, Cl. 2, 6
1-3910R&L used for unlimited split, Cl. 1
11-710L No. 1 used for machines with S&N and V. H. B. construction
1A-10710L used with early style V. H. B., Cl. 6
1-3910½R used with early style V. H. B., Cl. 6
1-10710R Style 17 used with tally roll and wide ribbon

AD **1-3912½ Styles 11, 13, 17**

AE **710¼ No. 4** included in 21-717 No. 11. See Plate 54 for other styles

AF **10751½**

AG **10740A**

AH **10701¾ Style 11, 13, 15, 17** Specify machines number and submit forms

AI **10754½ (7354¾)**

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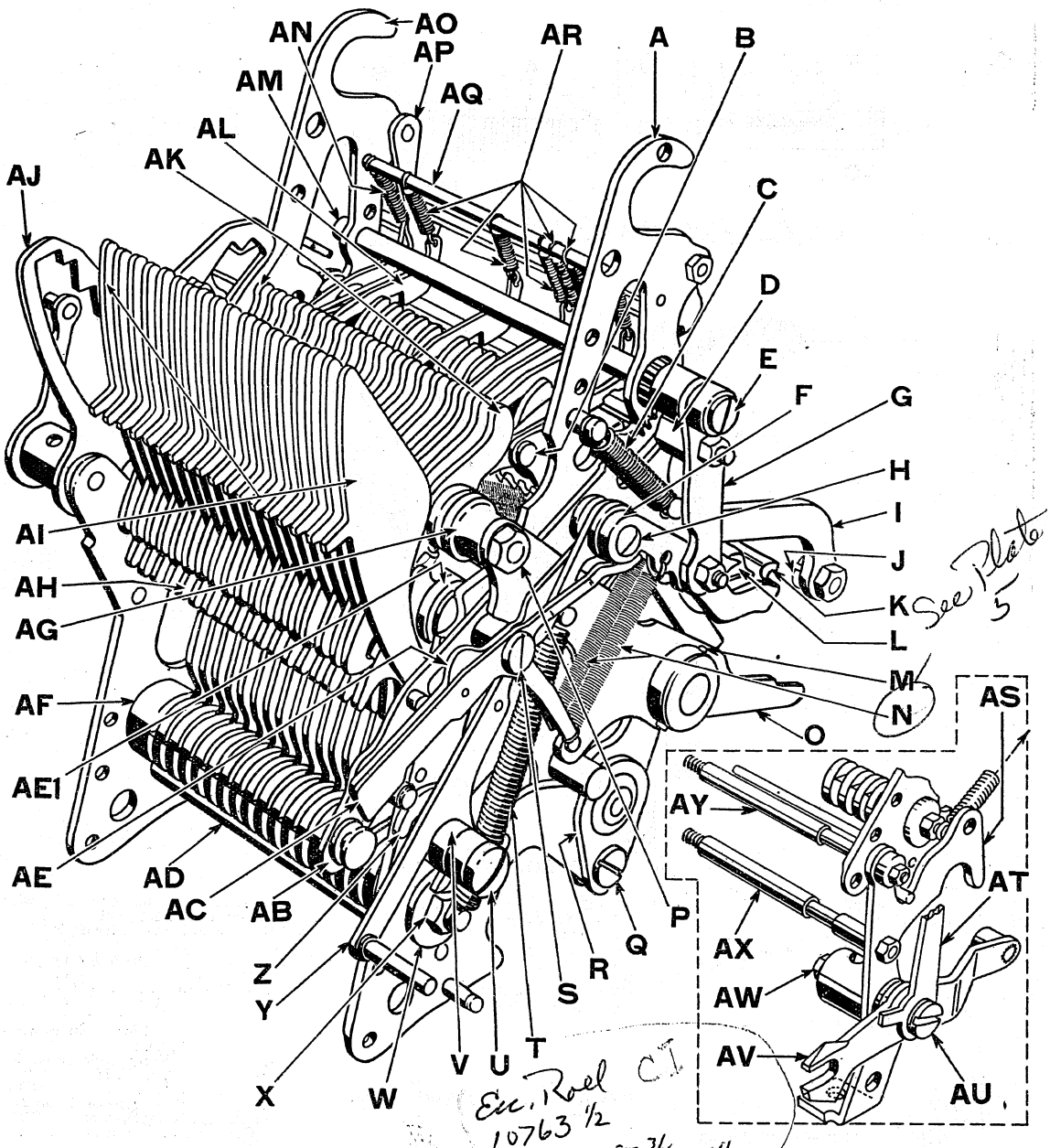
To Change Mec 300

HAMMER ASSEMBLY, LEFT (Plate 4)



SYMBOLS (Plate 4)

A **1-710L No. 1**

B **753½ No. 3**

C **10780**

D **10750¼A, 46** Nut

E **7357½, 749** Collar

F **10735⅛**

G **10712⅜**

H **10750⅜** Screw 10750⅜ Style 9 used for Style 9, 11 machines

I 729B* included with 1-702B Styles 7, 9, 11, 13, 15, 17. Use 21-702B Style 17 for tally roll

J **251⅜, 46** Nut, use 855 screw for early style arm with hub

K See note top of next page
10718D No. 2 Style 13, 17 Specify machine No. and submit forms. Used for single or double bail variable hammerblock construction, 4 or 8 point, Cl. 1, 2, 6, 11 thru 16, 20 thru 30
10718D No. 2 Style 23 13 03 use for 4 or 8 point hammerblock construction
10718D No. 2 Style 21 17 14 also used for Styles 21 17 16
10718D No. 2 Style 23 17 40 (10718D No. 4 Style 17) also used for Style 23 17 42
10718D No. 2 Style 23 17 41 used for 8 point hammerblock construction

L See note top of next page
1-10718D No. 3 Style 13, 17 used for double variable hammerblock construction, 4 or 8 point, Cl. 1, 2, 6, 11 thru 16, 20 thru 30)
1-10718D No. 3 Style 23 13 03 use for 8 point double bail hammerblock construction
1-10718D No. 3 Style 21 17 14 also used for Style 21 17 16
1-10718D No. 3 Style 23 17 41 used for 8 point hammerblock construction
10718DZ No. 2 Style 13, 17 used with 4 or 8 point hammerblock construction

Symbols continued on next page

SEE EXPLANATION ON INSIDE OF FRONT COVER

SYMBOLS (Plate 4—Continued)

NOTE: VARIABLE HAMMERBLOCK BAILS, STYLES 13 and 17 Cl. 6, 11 thru 16, 20 thru 30

The later bails, all styles and numbers are re-enforced to prevent breakage at the formings and of changed outline to eliminate the possibility of the 1-716D's striking bails when not blocked.

1-10718C Styles 13, 17 are replaced by 10718D No. 2 Styles 13, 17. When replacing 1-10718C Styles 13, 17 in the Field, the following parts are required:
10718DZ No. 2 Styles 13, 17
1-10712¾CZ No. 1
1-10719B Style 13 No. 2
10735⅞
10746½
10746¾

EXCEPTION: If forms submitted, 10718D No. 2 Styles 13, 17 and 10712¾C No. 1, cut to form, are furnished in place of 10718DZ No. 2 Styles 13, 17 and 1-10712¾CZ No. 1.

To replace 1-10718C Style 23 13 03, use:
10718D No. 2 Style 23 13 03
1-10719B Style 13 No. 2
10712¾C Style 23 13 03
10735⅞
10746½
10746¾

To replace 1-10718C Style 23 17 40, use:
10718D No. 2 Style 23 17 40
10712¾C Style 23 17 40
1-10719B Style 13 No. 2
10735⅞
10746½
10746¾

Following are the double bails which require no additional parts:
To replace 10718C No. 2 Style 23 17 41 use 10718D No. 2 Style 23 17 41
To replace 1-10718C No. 3 Style 23 17 41 use 1-10718D No. 3 Style 23 17 41
To replace 1-10718C No. 3 Style 13, 17 use 1-10718D No. 3 Style 13, 17
To replace 10718C No. 2 Style 13, 17 use 10718DZ No. 2 Style 13, 17, or 10718D No. 2 Style 13, 17 cut to form if forms are submitted

To replace 1-10718CZ Style 13, 17, use:
10718DZ No. 2 Style 13, 17
1-10712¾CZ No. 1
1-10719B Style 13 No. 2
10735⅝
10746½
10746¾

M **59½** Pin
N **10786**
O 1-10711 Style 13* included with 1-67004 Style 13, 17, Cl. 6, 11 thru 16, 20 thru 30
1-711L Style 9*, 15* included with 1-3903 Style 9, 11, 13, 17, Cl. 1-2
P **45**
Q **756½A**
R **710½L**
S **10750⅝** used with single bail, use 7354¾ and 428 washer for double bail
T **785 No. 15** use for Style 17 machines
785 No. 9 use for other styles
U **204502**
V **10735½,** Outside collar 10735⅝ No. 2
W **721**
X **45**
Y **1-10719B Style 13** Early style, use for Style 9, 11, 13, 15, 17, Cl. 1, 2, 6, 11 thru 16, 20 thru 30 with variable hammerblock
1-10719B No. 2 Style 13, Later style, used with parts K&L hammberblock bails
1-10719B Style 9
1-10719B Style 11 (10718C Style 11, 11-10719B Style 13, 10735½, 10750⅜) for regular Cl. 1, 2 machines
11-10719B Style 13 use for Style 13, 17, regular Cl. 1 and 2 machines
Z **1-10721D**
AB **1-10720 No. 1** Present style for single or double bail construction
1-10720C (1-10720 No. 1, 10711¾B) Early style, single bail construction
11-10720C (1-10720 No. 1, 10711¾B) Early style, double bail construction
AC See "Variable Hammerblock Bails" under letter L
10712¾B No. 2 used with 4 or 8 point printing control, double bail construction, specify machine number and submit forms
10712¾B Early style, used with 4 or 8 point printing control single bail construction, specify machine number and submit forms
10712¾C No. 1 Later style, used with 4 or 8 point printing control single bail construction, specify machine number and submit forms
10712¾B Style 23 13 03 Early style, 4 point single bail construction
10712¾C Style 23 13 03 Present style, 4 point single bail construction
1-10712¾D No. 2 Style 23 13 03 used for 8 point double bail construction
10712¾B No. 2 Style 21 17 14 also used for Style 21 17 16, 4 point double bail construction
10712¾B Style 23 17 40 Early style, also used for Style 21 17 42, 4 point single bail construction
10712¾C Style 23 17 40 Present style
1-10712¾B No. 2 Style 23 17 41, 8 point double bail construction
AD **707A Style 7, 9, 11, 13, 15, 17**
AE See "Variable Hammerblock Bails" under letter L
10712¾B No. 3 used with 4 or 8 point printing control, double bail construction, specify machine number and submit forms
1-10712¾D No. 3 Style 23 13 03 (1-10712¾D No. 3) used for 8 point double bail construction
10712¾B No. 3 Style 21 17 41 also used for Style 21 17 16, 4 point double bail construction
1-10712¾B No. 3 Style 23 17 41, 8 point double bail construction
AE1 **700A Styles 7, 9, 11, 13, 15**
700B Style 17 used for Style 17
AF **701C Styles 9, 11, 13, 15, 17**
AG **67004 Style 13, 17** Cl. 6, 11 thru 16, 20 thru 30
3904 Styles 9, 11, 15
3904 Style 13, 17 (67004 Style 13, 17) Cl. 1 and 2 regular, also used for Cl. 1, 2, 6 unlimited split or S&N machines
704B Style 9 (3904 Style 9) used for Style 9, Cl. 1 and 2
AH **717 No. 1 (717 No. 3)** see Plate 54 for other styles
1-717 No. 8 used in symbol sector, Cl. 6, 11 thru 16, 20 thru 30
AI See Chart Plate 6-2
AJ **1-67111** see Plate 3 for other styles
AK Positions of 718 for Style 17 machines, high speed
718 No. 4 used in symbol sector, No. 4, 9 and 13th position
718 No. 5 used in No. 3, 8 and 12th position
718 No. 6 used in No. 2, 7, 11 and 16th position
718 No. 7 used in No. 1, 6, 10 and 15th position
718 No. 8 used in No. 5 position
718⅛ used in No. 14 and 17 positions
1-28 Fte. 5 used for date, count and normal
Positions of 718 for Style 13 machines, high speed
718 No. 4 used in symbol sector
718 No. 5 used in No. 3 and 7th position
718 No. 6 used in No. 2, 6 and 12th position
718 No. 7 used in No. 1, 5, 9, 11 position
718 No. 8 used in No. 4 position
718⅛ used in No. 10 and 13th position
AL **11-17 No. 7**
AM **10701B No. 2 Style 13, 17** Specify machine number or submit forms, see Plate 3 for other styles
AN **10686½**
AO **1-710R No. 1**
AP **1-3912½ Style 11, 13, 17**
AQ **708A Style 7, 9, 13, 15, 17**
708A Style 11 (89026)
708½ Style 7, 9, 11, 13, 15, 17 Shaft over top of 1-717's
AR **10780½** used for 4 point hammer construction
789 used for 8 point hammer construction
AS **1-207126 Style 13, 17** used for Cl. 20 thru 30
1-726L Style 9, 11, 13, 15, 17 used for Cl. 1, 2, 6, 11 thru 16
726R Style 9 used on right, for Styles 7, 9, 11, 13
726R Style 17 used on right, for Styles 15, 17
AT **10711¾A (10711¾B, 1-10720 No. 1) 10711¾B** Later
AU **256⅝, 10730** Collar, 72167½ washer
AV **1-10727 Style 17** used for Style 17, Cl. 6, 11 thru 16, 20 thru 30 with MRC
1-4427 Style 13 used for Style 13, Cl. 1, 2, 6, 11 thru 16, 20 thru 30 with MRC, use screw 4464 Style 13, 393 nut
1-4427 Style 11 used for Style 11, Cl. 1, 2, 6, 11 thru 16 with MRC, use screw 4464 Style 11, 393 nut
1-44127 Style 9 used for 20909 machines
1-3427 Style 9 used for Style 9 with shuttle or ACT carriages, Cl. 1, 2, use 764A Style 9 bolt and 393 nut
1-3427 Style 17 used for Styles 11, 13, 15, 17 with shuttle or ACT carriage, Cl. 1, 2, use 764A Style 17 bolt, 393 nut
1-727A Style 9 or K used on Style 9, regular Cl. 1, 2, use 764A Style 9 bolt, 393 nut
1-727A Style 17 or K used on Styles 11, 13, 15, regular Cl. 1, 2, use 764A Style 17 bolt, 393 nut
AW **45, 3612½** Washer
AX **709¾ Styles 9, 11, 13, 17**
AY **709½C Styles 9, 11, 13, 15, 17**

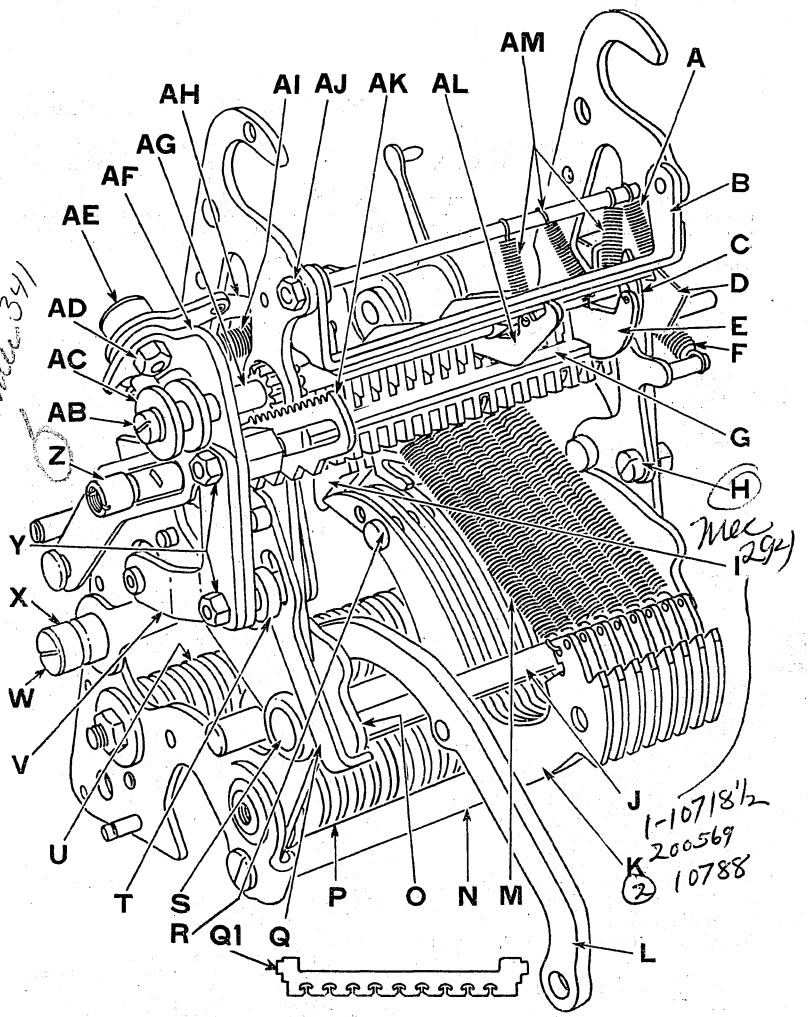
DELAYED CIPHER PRINTING AND CIPHER CUT-OUT MECHANISM (Plate 5)

SYMBOLS (Plate 5)

A **10686½**
B **1-3912½ Style 11, 13, 17**
C **710¼ No. 4** included in 21-717 No. 11, see Plate 54 for other styles
D **1-729⅜ No. 7** included in 1-717 No. 8
E **11-717 No. 7,** see Plate 54 for other styles
F **681⅛**
G **3906 Style 11, 13, 17,** Cl. 2, 6, 11 thru 16, 20 thru 30, also used for unlimited split machines and DCN
3906 Style 9 No. 3 used for extended totals unlimited split construction
3906 No. 2 Styles 9, 15, 17 specify machine number, used for S&N machines V.H.B. construction, Cl. 6, 11 thru 16, 20 thru 30
3906 Style 17 No. 3 used for 8 point V.H.B. construction, with combination block and delayed coupler in symbol column
706B Style 7, 9, Cl. 1
H **3961A,** 10746¾ Washer, 10746½ nut, use screw 7357½ for Cl. 2
I **91A-717 No. 3** see Plate 54 for other styles
J 709B* included in assembly 1-702B Style 7, 9, 11, 13, 15, 17 included in 1B-702A Style 7, 9, 11, 13, 15, 17, early
K **1-716D** see Plate 3 for other styles
L 729B* (729 No. 2*) included in assembly 1-702B Style 7, 9, 11, 13, 15, 17, use 21-702B Style 17 for tally roll, wide ribbon construction 21A-702A Style 17, early style
729A* included in assembly 1B-702A Style 7, 9, 11, 13, 15, 17, early
M Springs listed as M are inside springs hooked from 725½ strip to 1-716D's
Springs used in **month** col. with type .070″ or .100″ high, with or without tally roll:
780⅝ used with type .100″ high, Cl. 1, 2, 6, 11 thru 16, 20 thru 30
780⅝ used with type .070″ high, Cl. 20 thru 30
780½ used with type .070″ high, Cl. 1, 2, 6, 11 thru 16, also for machines with tally roll and crossfeed ribbon; or where 5 carbon copies are required or with type .130″ high
Springs used in **date** col. with type .070″ or .100″ high, with or without tally roll
74809 No. 2 used with type .100″ high, Cl. 1, 2, 6, 11 thru 16, 20 thru 30
76808 used with type .070″ high, Cl. 1, 2, 6, 11 thru 16
74809 No. 2 (986) used with type .070″ high, Cl. 20 thru 30
780⅜ used with type .070″ or .100″ high, for machine with tally roll and crossfooter ribbon; or where 5 carbon copies are required, or with type .130″ high
Springs used in **character** cols. with type .070″ or .100″ high, with or without tally roll

780½ used with type .100″ high, for 1 or 2 letters	Cl. 1, 2, 6, 11 thru 16, 20 thru 30
780⅝ used with type .100″ high, for 3 letters	
780⅜ used with type .070″ high, for 1 or 2 letters	
780½ used with type .070″ high, for 3 letters	

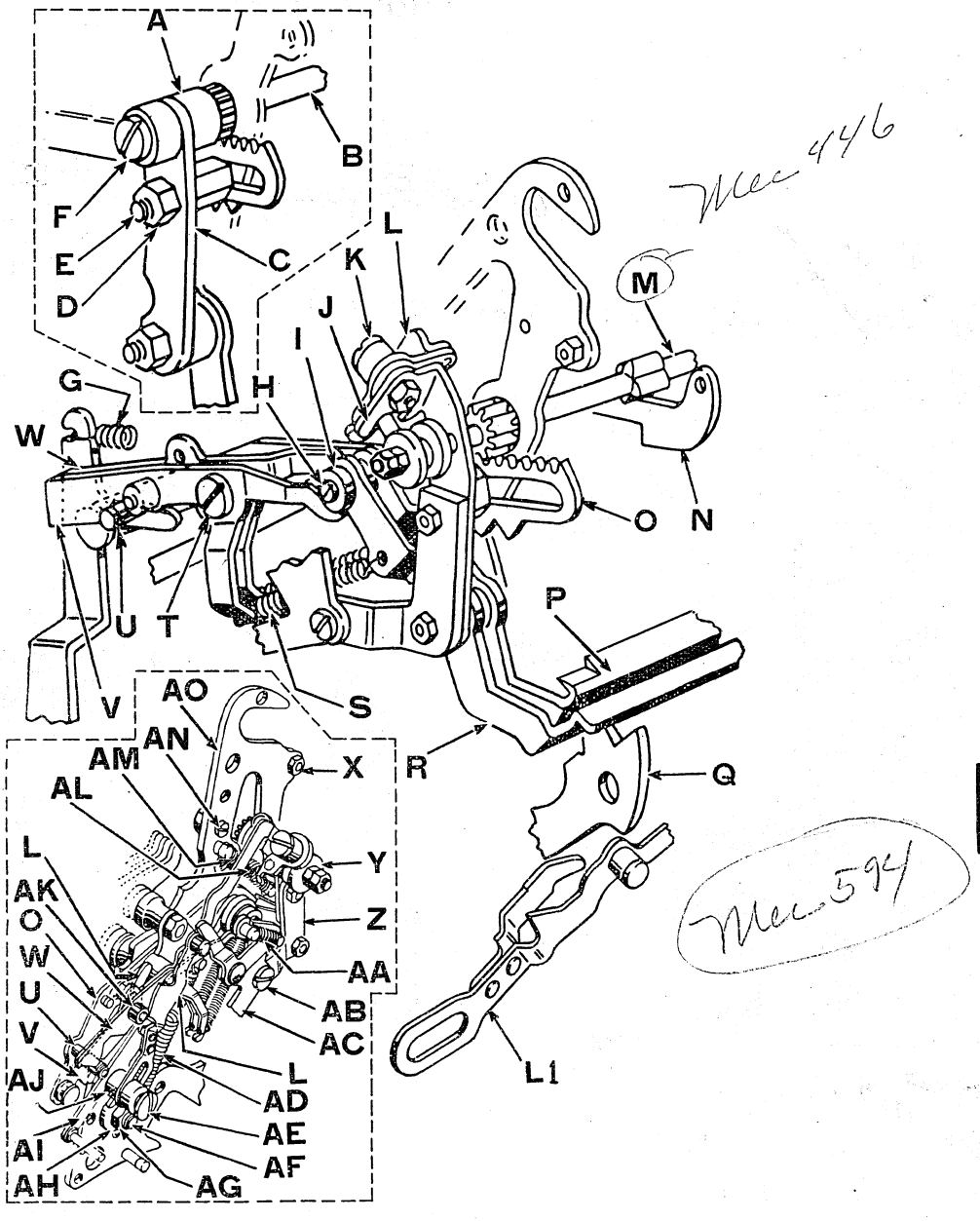
Springs used in **folio** section with type .070″ or .100″ high, with or without tally roll
76808 used with type .070″ high, Cl. 1, 2, 6, 11 thru 16
76808 used with italic type
74809 No. 2 used with type .100″ high, Cl. 1, 2, 6, 11 thru 16, 20 thru 30
780⅜ used with type .070″ or .100″ high, for machine with tally roll and crossfeed ribbon; or where 5 carbon copies are required, or with type .130″ high
Springs used in **amounts** section, with or without tally roll
74809 No. 2 used with type .100″ high, Cl. 6, 11 thru 16, 20 thru 30
780⅜ use for machines with tally roll and crossfeed ribbon or where 5 carbon copies are required, or with .130″ type



76808 used on standard Cl. 1 and 2 without tally roll
Springs used in **symbol** sector, with or without tally roll
76808 used with one letter type, Cl. 1, 2, 6, 11 thru 16
74809 No. 2 used with two letter type, Cl. 1, 2, 6, 11 thru 16
74809 No. 2 used with three letter type, Cl. 1, 2, 6, 11 thru 16
780⅜ used with one and two letter type, Cl. 20 thru 30
780½ used with three letter type, Cl. 20 thru 30
780⅜ used with one and two letter type, for machines with tally roll, and crossfeed ribbon, or where 5 carbon copies are required, or with type .130″ high
780½ used with three letter type, for machines with tally roll and crossfeed ribbon, or when 5 carbon copies are required, or with type .130″ high
N **707A No. 2 Style 7**
707A No. 2 Style 9 (707B No. 2 Style 9)
707A No. 2 Style 11 (707B No. 2 Style 11)
707A No. 2 Style 13 (707B No. 2 Style 13)
707A No. 2 Style 15
707A No. 2 Style 17 (707B No. 2 Style 17)
O 1B-712L* complete assembly 1-702B Style 7, 9, 11, 13, 15, 17
P 702B* included in assembly 1-702B Style 7, 9, 11, 13, 15, 17, use 724 washers for end of shaft
702A* included in assembly 1B-702A Style 7, 9, 11, 13, 15, 17, early
Q **1-10721D**
Q1 **725½ Style 9, 11, 13, 17**
R **741A** Roll, 753A stud shown; use 9059⅜ stud, 306305 roll in 1-716Z and 1-716C
S **1-67004 Style 13, 17,** Cl. 6, 11 thru 16, 20 thru 30
1-3903 Style 9, 11, 13, 17, Cl. 1, 2, also used for Cl. 1, 2, 6 unlimited split, S&N or DCN machines
T **10735⅞**
U **701C Style 9, 11, 13, 15, 17**
V **1-160 Fte. 207**
W **204502**
X **10735½**
Y **46**
Z **10752½A**
AB **72614**
AC **10736⅜**
AD **46**
AE **12059⁹⁄₁₆**
AF **10712½A**
AG **10701B No. 1 Style 13, 17** Specify machine number and submit forms
AH **10712⅝A** Spring anchor, 255¼ screw, 46 nut
AI **10781½**
AJ **46¼, 7559½** Screw
AK **1-10720 No. 1**
AL **729⅜ No. 15A** included in 91A-717 No. 3
AM **10780½** used for 4 point hammer construction
789 used for 8 point hammer construction

SEE EXPLANATION ON INSIDE OF FRONT COVER

DOUBLE BAIL PRINTING CONTROL (Plate 6)



SYMBOLS (Plate 6)

A **10735¾**
B **10701B No. 2 Style 13, 17** Submit forms
C **10712⅜**
D **46**
E **10750¼A**
F **7357½** Screw, 749 collar
G **10788**
H **10750⅜**
I **10735⅛**
J **10712½A**
K **12059⅜**
L **1-156½ Fte. 207 No. 4**
L1 **1-156½ Fte. 207 No. 2**
M **10701B No. 1 Style 13, 17** Submit forms and machine number
N **31-717 No. 3** Submit forms and machine number, see Plate 54 for other styles
O **11-10720C (1-10720 No. 1, 10711¾B)**
P **1-10718C No. 3 Style 13, 17 (1-10718D No. 3 Style 13, 17)** Submit forms and machine number
Q **1-716D**
R **10718C No. 2 Style 13, 17 (10718DZ No. 2 Style 13, 17)** Submit forms and machine number
S **10786**
T **7354¾** Screw, 428 washer
U **10750⅝** Stud, 12033⅝ roll, 7247 collar
V **10712¾B No. 2** Submit forms and machine number
W **10712¾B No. 3** Submit forms and machine number
X **955⅝** Screw, 46¼ nut for bail 1-3912½ Style 11, 13, 17
Y **10736⅜A** Collar, 47¼ nuts
Z **1-160 Fte. 207**
AA **12083**
AB **3960**
AC **1-157 Fte. 207 No. 1, 2 or 3** Specify machine number
AD **785 Style 7, 9, 11, 15, 17**
AE **204502**
AF **701C Style 9, 11, 15, 17**
AG **731A** Bushing, 45 nut
AH **721**
AI **1-10719B No. 2 Style 13**
AJ **10735½**
AK **10738** Roll, 10755¼ stud
AL **10781¼**
AM **10780**
AN **73611** Screw, 45 nut, 10712⅜A anchor for AL
AO **1A-10710L**

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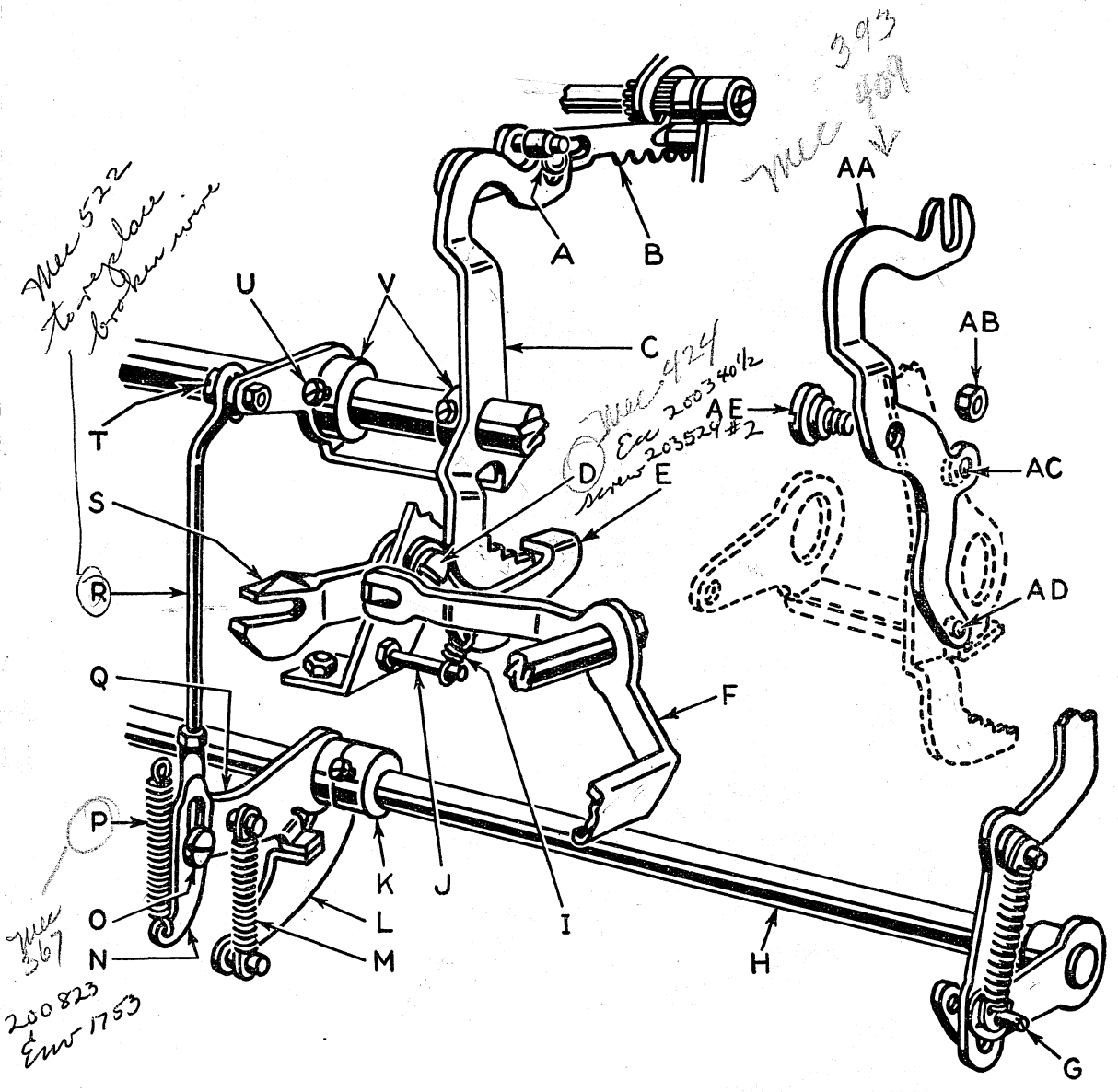
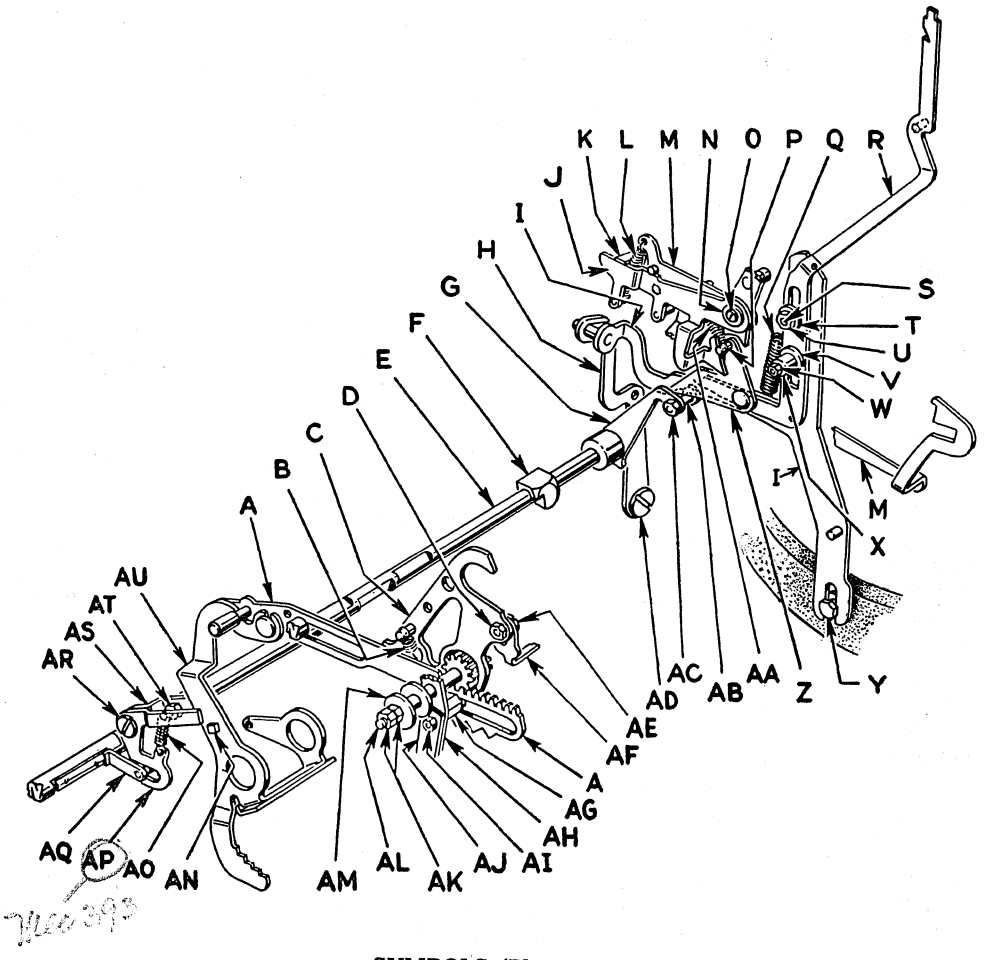
PRINTING CONTROL INDEXED FROM CARRIAGE AND MACHINE OPERATION (Plate 6-1)



SYMBOLS (Plate 6-1)

A 200622A* included in B
B **21-10720 No. 1**
C **1-200237½**
D **256⅝** use 10730 shoulder collar, 72167½ washer
E **200240½**
F **1-12110 No. 9**
G **200661A**
H **1-200006 Style 17 No. 2** includes L
I **12083** spring
J **702572**
K **1-540** use screw 550¾
L 1-200238½* included in H
M **1-803A Fte. 217 (1-200826)**
N **200236½**
O **76575**
P **10280½**
Q **1-200242½**
R **200700**
S **1-10727 Style 17**
T **200544½** use 46 nut
U **550¾**
V **1-205312** includes U
AA **1-200237½Z** includes AC, AD
AB **46**
AC 7563½*
AD 9164*
AE **200537¼Z**

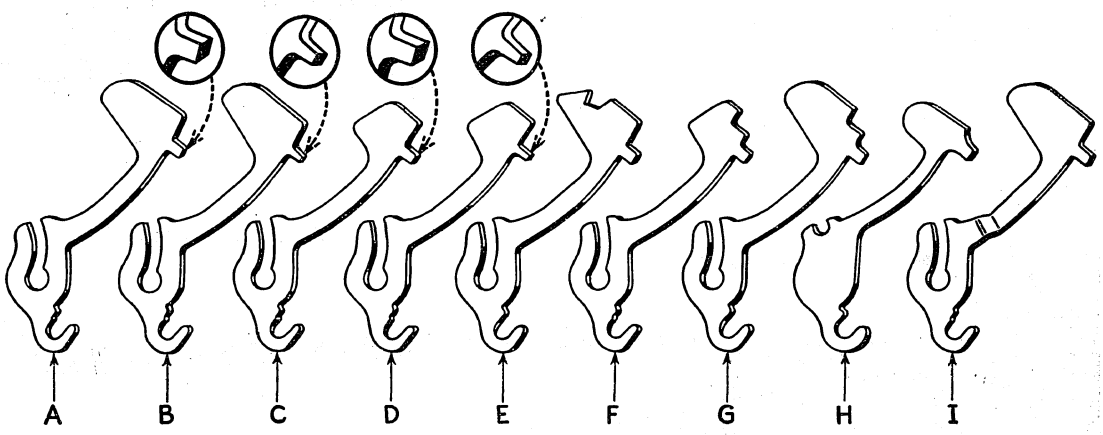
PRINTING CONTROL SELECTED FROM NON-TAB KEY (8-0), DISABLED BY REPEAT ROLL (Plate 6-3)



SYMBOLS (Plate 6-3)

A **21-10720 No. 1**
B **10780** spring
C **1-710L No. 2**
D **46¼**
E **1-200000A Style 17 No. 3** includes F, G, AQ
F **3450¼ No. 2**
G 1-200296* included in E
H **1-4419¼**
I **11-12215 No. 1**
J **1A-200172¼ No. 2**
K **200172½** clip
L **480¼**
M **1-200172 No. 3**
N **200458** sleeve
O **200537½** screw, use 2820½ washer and 46 nut
P 12250½* included in Z
Q **986**
R **1-12220 No. 5** includes Z
S **12050⅝ No. 3** screw
T **12233¼**
U **45⅛**
V **3237¾** washer
W **12239** nut, use 12059½ screw
X **738** roller
Y **12053⅛** screw, use 108385 washer and 12031½ nut
Z 1-12220½* included in R
AA **3489** spring
AB **9752½** screw
AC **46** nut, use 1097⅞ washer
AD **4454A** use 3220½ washer and 46 nut
AE **7559½** screw
AF **1-3912½ Style 17**
AG **10750¼A** screw post
AH **10712½A**
AI **46**
AJ **1-160 Fte. 207**
AK **47¼**
AL **10701 No. 1 Style 30 17 07** standard or option No. 1 or 3
10701Z No. 1A Style 30 17 07 stamped "7A," for option No. 2
10701Z No. 1B Style 30 17 07 stamped "7B," for option No. 4, 6, or 12
10701Z No. 1C Style 30 17 07 stamped "7C," for option No. 9
10701Z No. 1D Style 30 17 07 stamped "7D," for option No. 10
10701Z No. 1E Style 30 17 07 stamped "7E," for option No. 5, 7, or 13
10701Z No. 1F Style 30 17 07 stamped "7F," for option No. 8, 14, or 15
10701Z No. 1G Style 30 17 07 stamped "7G," for option No. 11
AM **10736⅜A**
AN 709538* included in AU
AO **806 Fte. 217** spring
AP **207104**
AQ 1-200295* included in E
AR **259½** use 46 nut
AS **207103** use 957½ screw
AT **46** nut, use 207504 screw
AU **1-200237½** includes AN

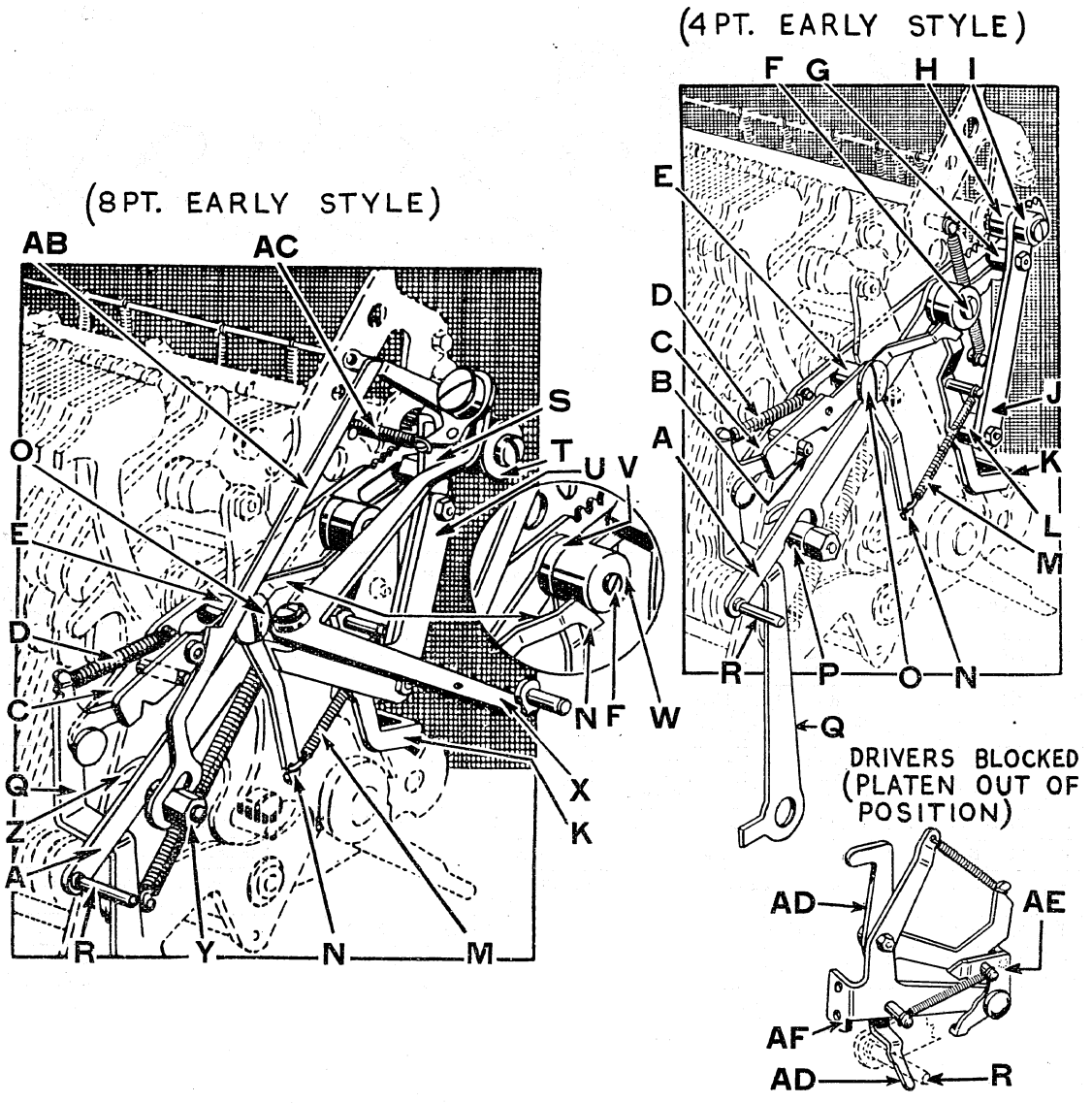
HAMMER CHART (Plate 6-2)



SYMBOLS (Plate 6-2)

	SYMBOL NO.	DESCRIPTION OF USE
A	**715B No. 1**	Standard hammer for use with 10 pitch sectors in Classes 1, 2, 6, 11-16 and 20-30 machines, except as indicated in C, E, F, G, and H, below.
B	**715 1/16B No. 1**	Standard hammer for use with 16 pitch sectors in Classes 1, 2, 6, 11-16 and 20-30 machines, except as indicated in D and I, below.
C	**715B No. 4**	Used with 10 pitch sectors in Classes 1 and 2 machines with Unlimited Split Mechanism. Also used with 10 pitch sectors including one or two letter character type, in Classes 20-30 machines with the Single Stroke Multiple Print Feature.
D	**715 1/16B No. 4**	Used with 16 pitch sectors in Classes 1 and 2 machines with Unlimited Split Mechanism. Also used with 16 pitch sectors with one or two letter character type, in Classe 20-30 machines with the Single Stroke Multiple Print Feature.
E	**715B No. 7**	Used in symbol col. Classes 20-30 machines with symbol printing only with amounts.
F	**715B No. 8**	Used in Classes 1 and 2 machines with Unlimited Split Mechanism and LSD or LSD & F Feature.
G	**715B No. 5**	Used in the tens of shillings column in Classes 1, 2, 6, 11-16 and 20-30 machines of S & N construction, and equipped with LSD or LSD & F Feature.
H	**715 No. 2**	Used to create a permanent hammerblock in a single column in Classes 1, 2, 6, 11-16 and 20-30 machines.
I	**715 1/16BL No. 1**	Used with an offset 16 pitch sector in the extreme left column of Classes 1, 2, 6 and 11-16 machines.

SINGLE BAIL PRINTING CONTROL, 4 AND 8 POINT (Plate 7)

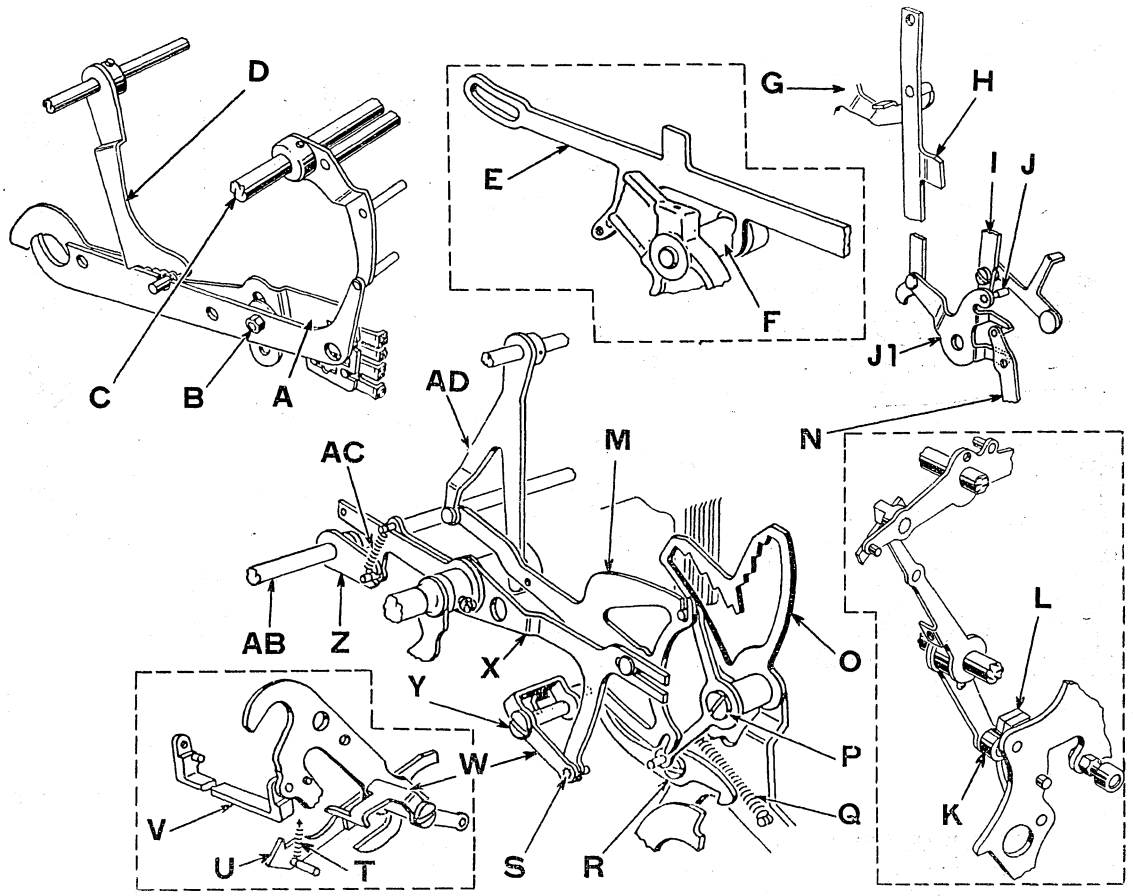


SYMBOLS (Plate 7)

A **1-10719B Style 13**
B **3433½**
C **1-10720C (1-10720 No. 1, 10711¾B)**
D **10788** Top spring
986 Lower spring—not shown
E **10752½A**
F **10750⅜**
G **10750¼A**
H **10735¾**
I **749**
J **10712⅜**
K **1-10718C Style 13, 17** Submit forms and machine number
L **10735⅝**
M **10786**
N **10712¾B** Submit forms and machine number
O **10750⅝₆**
P **10735½** Roll
Q **10711¾A (1-10720 No. 1, 10711¾B)**
R **99551 No. 3 (84613)**
S **10712½A**
T **10736⅝**, uses screw 72614
U **1-10712⅞₆**
V **10735A Style 13**
W **10735⅛**
X **1-10712⅝₆ Style 13, 17**
Y **10750¾**
Z **1-10721D**

AB **1-156 Fte. 207 Nos. 2 and 4** Submit forms and machine number
AC **10781½**
AD **10712¼A** part of AF
AE **1A-10714A Style 11** part of AF
AF **11A-10713A Style 11**

SYMBOL INDEXING CONTROLS (Plate 8)



SYMBOLS (Plate 8)

A **2-612D** Early style
B **46** Nut
C **2F-503 Style 9 (1B-503 Style 9)**
2F-503 Style 11
2F-503 Style 13 (1B-503 Style 13)
2F-503 Style 17 (1B-503 Style 17)
} Specify Machine No.
Use 2AZ-503 for machine with old Style 600A or 600½ grooved shaft
D 1A-229½B* included in assembly 1B-206C Style 9
E **1-12226¼A** for other styles see keyboard book, Plate 3
F 600A* Style 13, 17
G 1-227¼CL* included in assembly 11-206C Style 9, 11, 13, 15, 17
H **1-1010⅝B**
I **1B-227¾DL**
J **1053⅜**
J1 1-1010½* included in H
K 1435* included in 1-1415A
L 315A* included in 2B-311⅛
M **1-2287⁄8** use 263 rivet
N **1-1010⅞**
O **1-710¾A** see Plate 3 letter B for other styles
P **8054¾**
Q **7283¼**
R **750**
S 760¼* included in W
T **10686½**
U **1-717 No. 8** see Plate 54 for other styles
V **1-3912½** Style 11, 13, 17
W **1-10711⅝** see Plate 3 letter I for other styles
X **1-10614¾ Style 9 (11-614¾A Style 9, 1-711¾ No. 2)**
1-10614¾ Style 13 (11-614¾A Style 13, 1-711¾ No. 2)
1-10614¾ Style 15
1-10614¾ Style 17 (11-614¾A Style 17, 1-711¾ No. 2)
Y **8054¾**
Z 1-10612* included in AB
AB **1-10601¼** Style 9, 11, 13, 15, 17
AC **681**
AD 1-2291¼* Specify style, included in shaft assembly 11-206C Style 9, 11, 13, 15, 17

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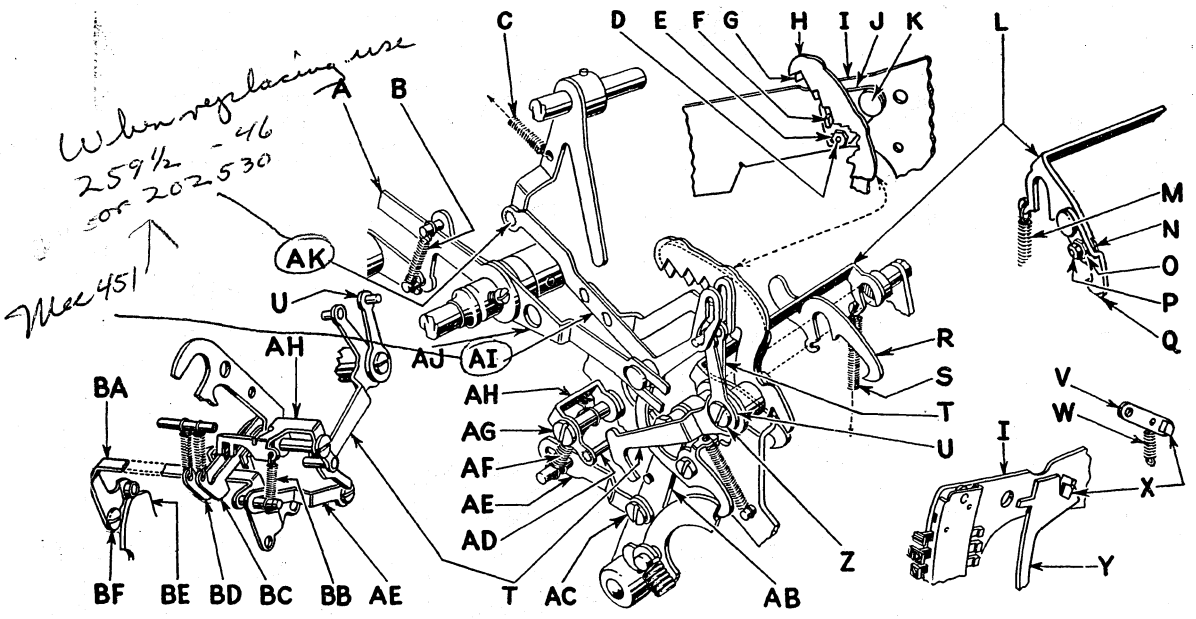
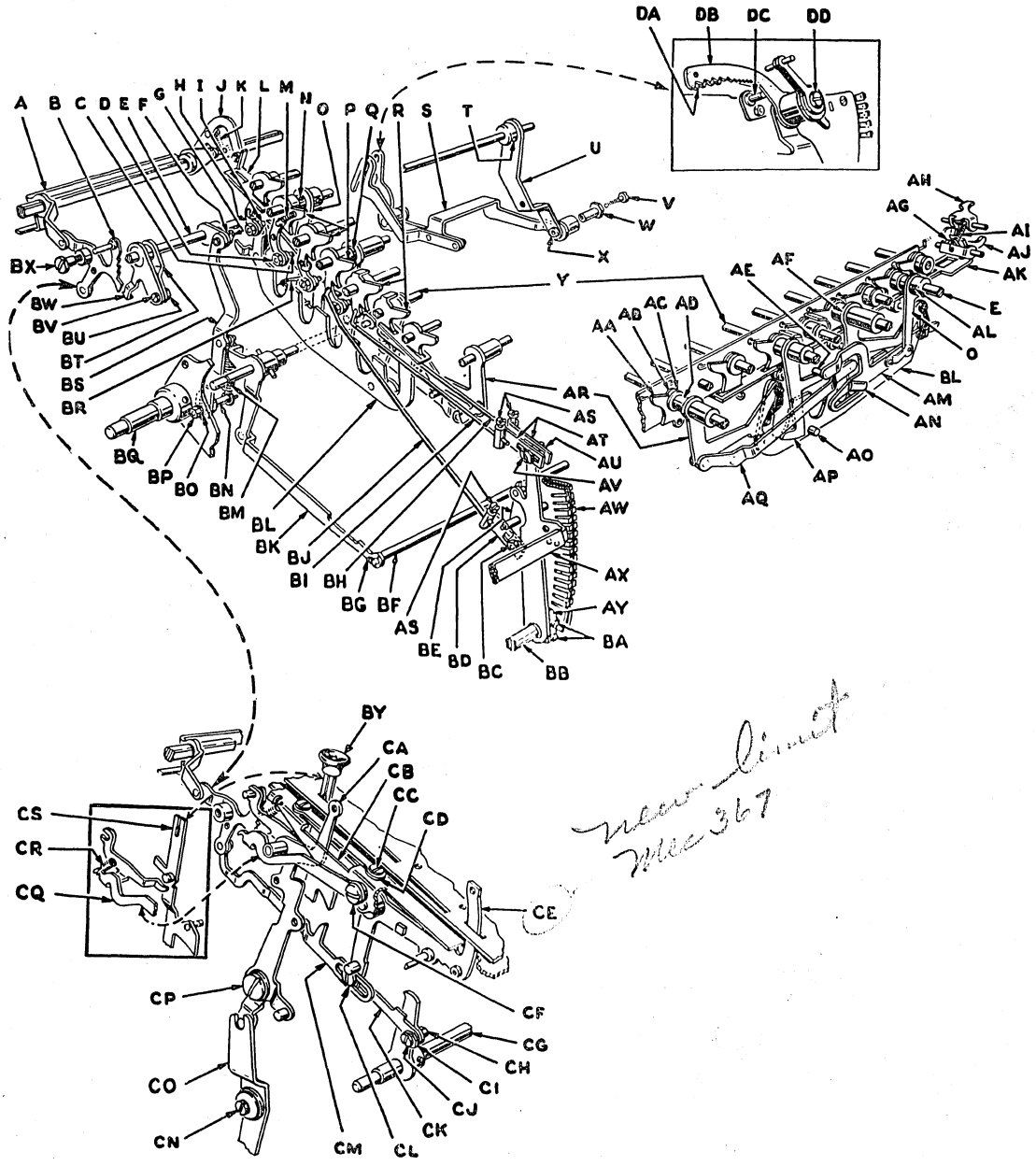
SYMBOLS PRINT ONLY WITH AMOUNTS IN CONJUNCTION WITH CLOSED ACCOUNT FEATURE CLASSES 20 THRU 30 (Plate 8-1)



SYMBOLS (Plate 8-1)

A 1-10614¼ Style 9* included in AJ
B **681**
C **280¾**
D **66508** Screw
E **66301** Nut
F 66501A No. 2* Stud, included in J
G 710¾ No. 3* included in H
H **2-710¾ No. 2**
I **2-66112 No. 2** includes D, E, J, K, V
J **1-66112¼**
K **511 Fte. 202** Rivet
L **1-718⅜ Style 17**
M **2887½**
N **755½** Screw
O **735½** Eccentric
P **49¾** Nut
Q **718⅝*** included in L
R **718 No. 14 thru No. 18** for P. 10 add cols.
718 No. 24 thru 28 for P. 10 non-add cols.
718½ No. 3 for P. 12 cols.
718 1/16 No. 3 for P. 16 non-add cols.
718 1/16 No. 4 for K.B. sel. col.
S **79810**
T 711¼ No. 2 included in H
U 711¼ No. 3* included in H
V **1-66113**
W **205801**
X 66507* included in V
Y **715B No. 7** see chart Plate 6-2 for other styles
Z **8054¾**
AB **21-67004 Style 17**
AC **3259⅛A** without rotary on right
9053⅝ with rotary on right
AD 750¾ No. 2* included in AH
AE **712⅜**
AF **681⅛**
AG **7357½**
AH **1-711¾ No. 4**
AI **1-202110 No. 2**
AJ **11-614⅜A Style 13, 17**
AK **263** Rivet
BA **1-10727½ Style 13, 17**
BB **3688**
BC **21-717 No. 11 Env. 1926**
BD **11-717 No. 7,** 729⅜ No. 20 replaces 729⅜ No. 5
BE **31-702B Style 17**
BF **10754¼**

SYMBOL INDEXING CONTROLS—FOR BANK POSTING MACHINES
(Plate 8-3)*



(OVER)

*(Plate 8-2 on succeeding sheet)

SYMBOLS (Plate 8-3)

A **1-202159** includes J
B **1-200296¾**
C **256⅛** screw
D **46¼**
E **11-62002 Style 17** includes O, T, U, BT
F **203495** eccentric
G **104506** screw
H **1-217L No. 8**
I **256⅜** screw
J 1-202160* included in A
K **44810** spring
L **214 No. 106**
M **284 No. 2**
N **1-89325** collar, use 79566 screw
O 1-62130* included in E
P **1-217L No. 7**
Q **295** brass washer
R **1-217L No. 9**
S **1-202110A No. 2**
T **52** pin
U 1-62229 No. 2* included in E
V **73659**
W **202313** eccentric bushing
X 108332* included in U
Y **51-204A Style 17** includes AP, BK

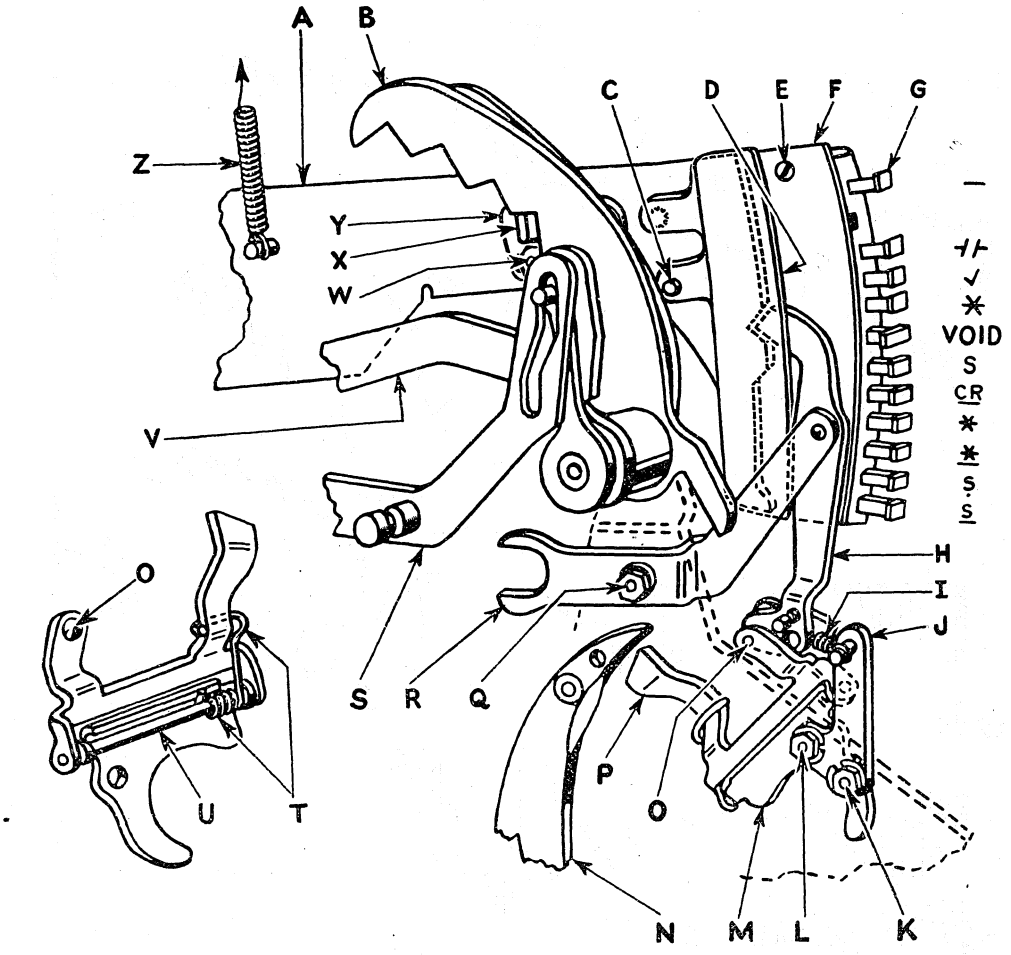
AA **1-217AL**
AB **295** brass washer
AC **246** shoulder washer
AD **74330A** collar
AE **62501** stud
AF **1-202143** includes AN
AG **249¾** roller
AH **228¼BR**
AI **283A** spring
AJ **1-228CR** includes AI
AK **214 No. 106**
AL **8050⅜** pin
AM **1-202141** includes AE
AN **202515**
AO **62501**
AP **1-227⅜**
AQ **1-202142**
AR **1-202144**
AS **550¾**
AT **202147**
AU **76528** screw
AV **702320** shoulder nut
AW **1-210BL P. 16 No. 1**
AX **1-200914**
AY **1-200396A No. 1** includes BA

BA **709519** screw
BB **205 Style 17 No. 2**
BC **49** nut, use 76528 screw
BD **202147**
BE **1-202146**
BF **209 Style 17**
BG **21 No. 15** clip
BH **202700 No. 1**
BI **202700 No. 2**
BJ **202700 No. 3**
BK **216⅞ No. 2** use rivets 103648
BL **1-202163** includes AO
BM **69800 No. 1**
BN **202518** post
BO **1097¾** lock washer
BP **46**
BQ **31-600⅝ Style 17**
BR **202800** spring
BS **1-62114**
BT 1-62113* included in E
BU **62340** eccentric
BV **74502**
BW **1-62115**
BX **200611½**
BY **291½** (REG / NA) brown inlay, ivory body

CA **1-60100 No. 5**
CB **1-62215 No. 2**
CC **73612**
CD **60100½**
CE **1-62127**
CF **10056**
CG **21-205002 Style 17**
CH **46**
CI **203495** eccentric
CJ **4456½**
CK **1416 No. 3**
CL **200610½** screw, use 200441 nut
CM **200296¼**
CN **705603 No. 2**
CO **1-60101A No. 3**
CP **60506**
CQ **60165**
CR **10686½**
CS **1-62221A No. 6**

DA 710¾ No. 7* included in DB
DB **2-710¾ No. 6** includes DA
DC **66501A No. 3** stud
DD **8054¾**

PRINTING CONTROL FOR SYMBOL TYPE—LATER (Plate 8-2)



SYMBOLS (Plate 8-2)

A **1-66112A No. 2 (1-66112 No. 2)**
B **12-710¾ No. 5**
C **545 Fte. 217**
D **1-67112B Env. 1926** Specify position
E **652⅞**
F **1-611⅛B P. 12**
G **618A No. 50** Specify character
H 1-67113¼ Env. 1926* included in R
I **8381**
J **1-101 Env. 1926**
K **75602** Screw, 1097⅞ lock washer, 46¼ nut
L **950⅝** Screw, 1097⅞ lock washer, 46¼ nut
M **1-67113**
N **1-716 No. 3**
O 67500* included in M
P 67114* included in M
Q **7062** Screw, 1097⅞ lock washer, 46¼ nut
R **1-67113½ Env. 1926**
S **1-202110 No. 2**
T 67800* included in M
U 67005* included in M
V **202110 No. 3** included in S
W **66301** Shoulder nut, 66508 eccentric screw
X 66501A No. 3* included in Y
Y **1-66112¼**
Z **60804A** used without safeguard mechanism
66800 Env. 1926 used with safeguard mechanism

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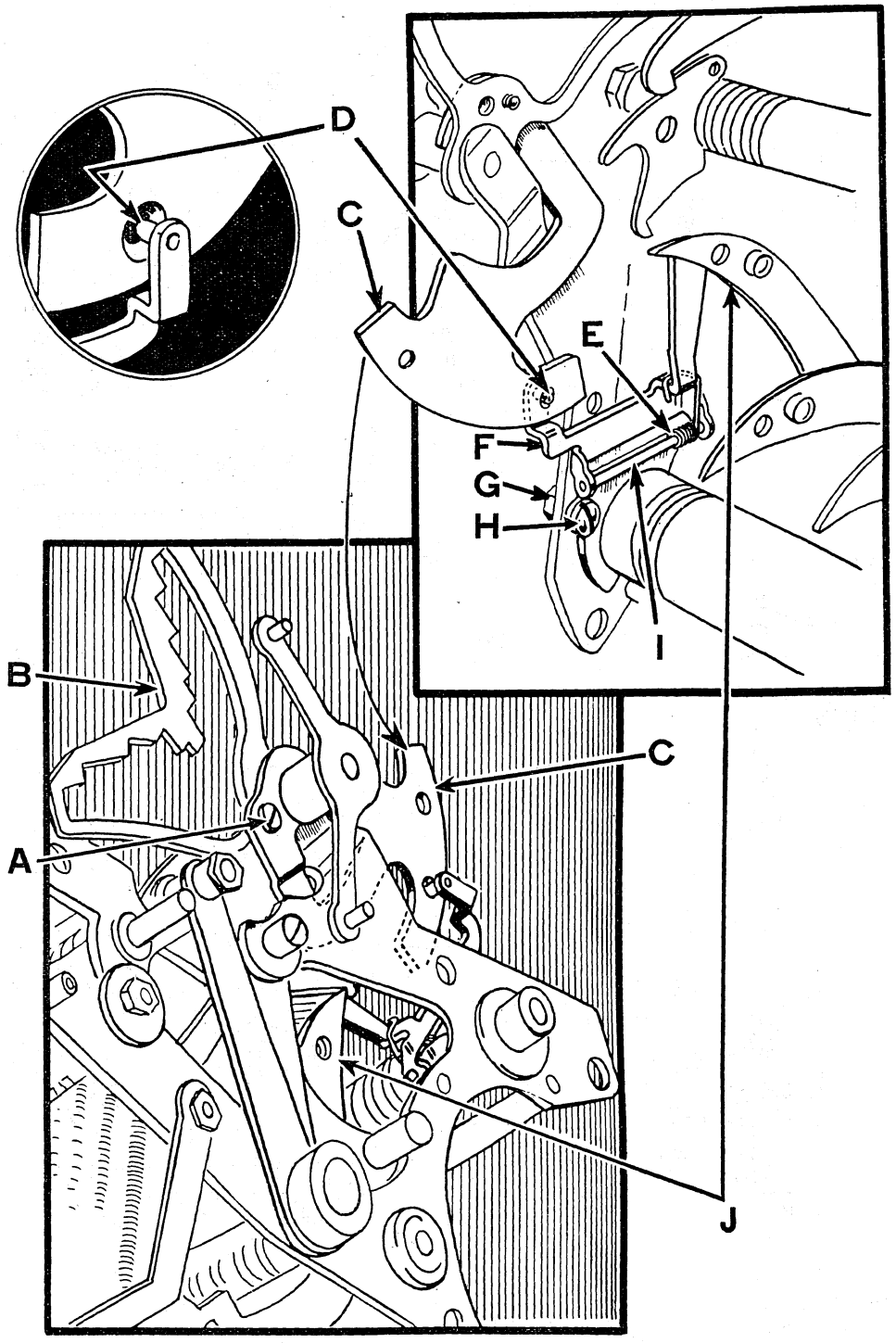
SYMBOL TYPE PRINTING CONTROL (Plate 10)

(Plate 9 in Printing Instruction Book only)

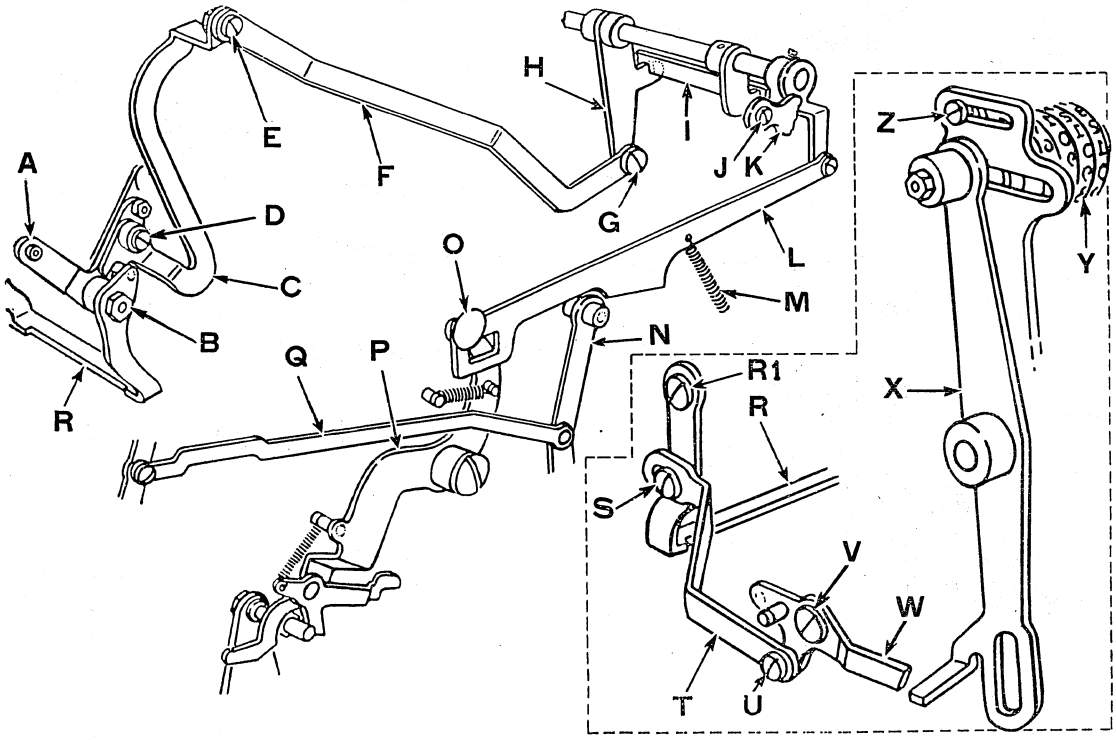


SYMBOLS (Plate 10)

A	**73514**	F	**1-67113**
B	**11-67111**	G	**46**
C	**67112** (**67112 P. 12**) Specify pitch	H	**12055⅝**
D	**67500** included in F	I	**67005** included in F
E	**67800** included in F	J	**1-716D or Z**

SEE EXPLANATION ON INSIDE OF FRONT COVER

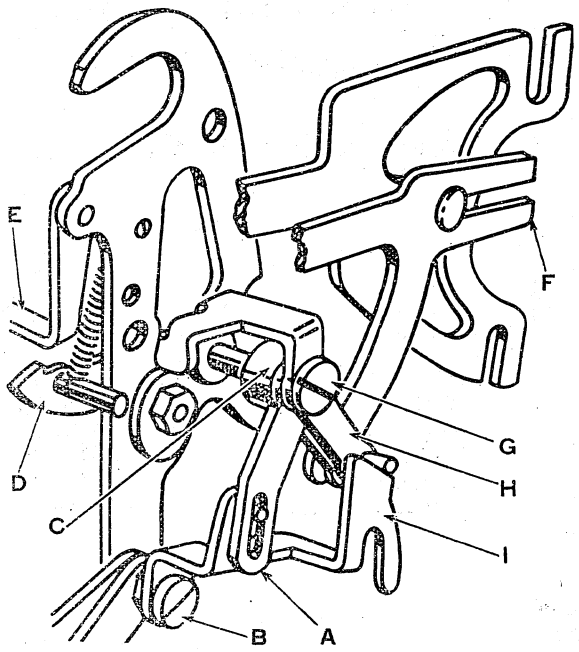
CLOSED ACCOUNT SYMBOL AND CONSECUTIVE NUMBER NOT TO PRINT DURING SPACING STROKE, H903 MACHINES (Plate 11)



SYMBOLS (Plate 11)

A 1-160 Fte. 207 Env. 903
B 10746¼ Env. 903
C 1-147 Env. 903 Style 13, 17
D 532 Env. 903
E 7559½
F 1-148 Env. 903 Style 13, 17
G 7559½
H 146 Env. 903
I 1-64001 Style 13, 17 No. 3
J 519 Fte. 213
K 200129½
L 1-200122½ (11B-200122½, 200380 No. 1, 200198¾, 200465½A, 200625A)
M 983
N 1-200121½ (1-200121½ No. 2)
O 200617
P Part of L
Q Part of N
R 1-10718C No. 2 Style 13, 17 Env. 903
R1 4863
S 975
T 151 Env. 903
U 9755
V 522 Fte. 217
W 1-128A Fte. 217 Env. 903 (1-128A Fte. 217)
X 1-101B Fte. 217
Y 1-132 Fte. 217 (2-132 Fte. 217)
Z] 501 Fte. 217

MECHANISM TO PREVENT MINUS SYMBOL PRINTING WITH ADDED AMOUNTS AND INSURE PRINTING WITH SUBTRACTED AMOUNTS, BANK POSTING MACHINES (Plate 12)



SYMBOLS (Plate 12)

A 1-207102
B 3259⅛A
C 1-74326
D 1-729⅜ No. 14
E 1-10727½
F 1-10614¾ Styles 13, 17 (11-614¾A Styles 13, 17; 1-711¾ No. 2)
G 8054¾
H 1-10711⅝A No. 3 for symbol block coupler
1-10711⅝A No. 4 for symbol coupler
I 1-207101

If necessary to install on earlier Bank Posting Machines, parts A, B, C, G, H and I are required.

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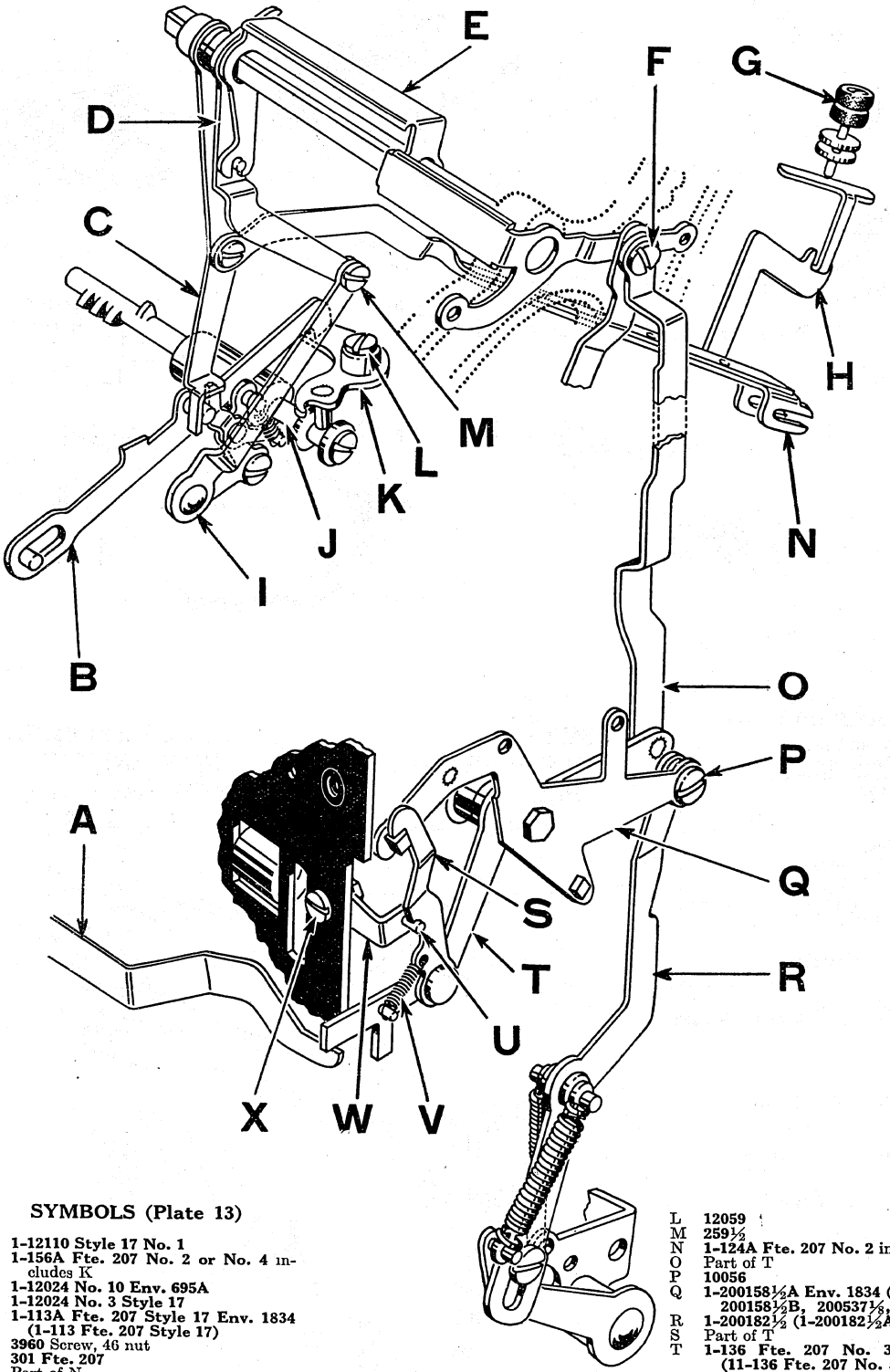
EIGHT POINT PRINTING CONTROL—INDEXED FROM ALL SOURCES—ACTUATED BY MACHINE OPERATION (Plate 13)

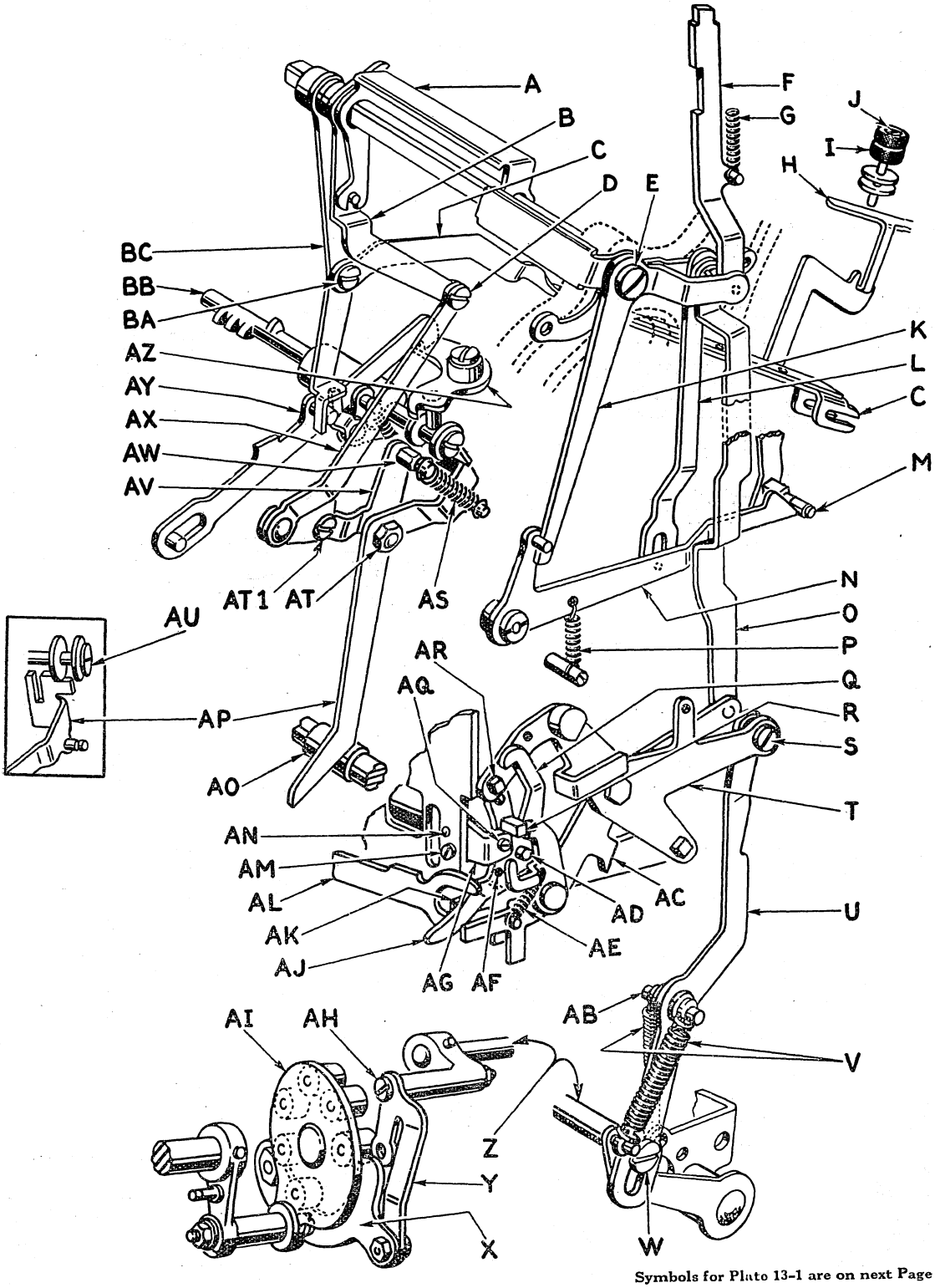


SYMBOLS (Plate 13)

A **1-12110 Style 17 No. 1**
B **1-156A Fte. 207 No. 2 or No. 4** includes K
C **1-12024 No. 10 Env. 695A**
D **1-12024 No. 3 Style 17**
E **1-113A Fte. 207 Style 17 Env. 1834 (1-113 Fte. 207 Style 17)**
F **3960** Screw, 46 nut
G **301 Fte. 207**
H Part of N
I **1-157 No. 1 or No. 2 Fte. 207**
J Camshaft—submit machine number and forms
K Part of B
L **12059**
M **259½**
N **1-124A Fte. 207 No. 2** includes H
O Part of T
P **10056**
Q **1-200158½A Env. 1834 (11-200158½B, 200537⅛, 200136½A)**
R **1-200182½ (1-200182½A)**
S Part of T
T **1-136 Fte. 207 No. 3 Env. 1834 (11-136 Fte. 207 No. 5)** includes O and S)
U **521 Env. 1834**
V **283A**
W **1-164 Env. 1834**
X **522 Env. 1834**

SEE EXPLANATION ON INSIDE OF FRONT COVER

EIGHT POINT PRINTING CONTROL—INDEXED AND DISABLED FROM VARIOUS SOURCES AND SHIFTED THRU MACHINE OPERATION—IN CONJUNCTION WITH THE COUNT MECHANISM, BANK MACHINES (Plate 13-1)

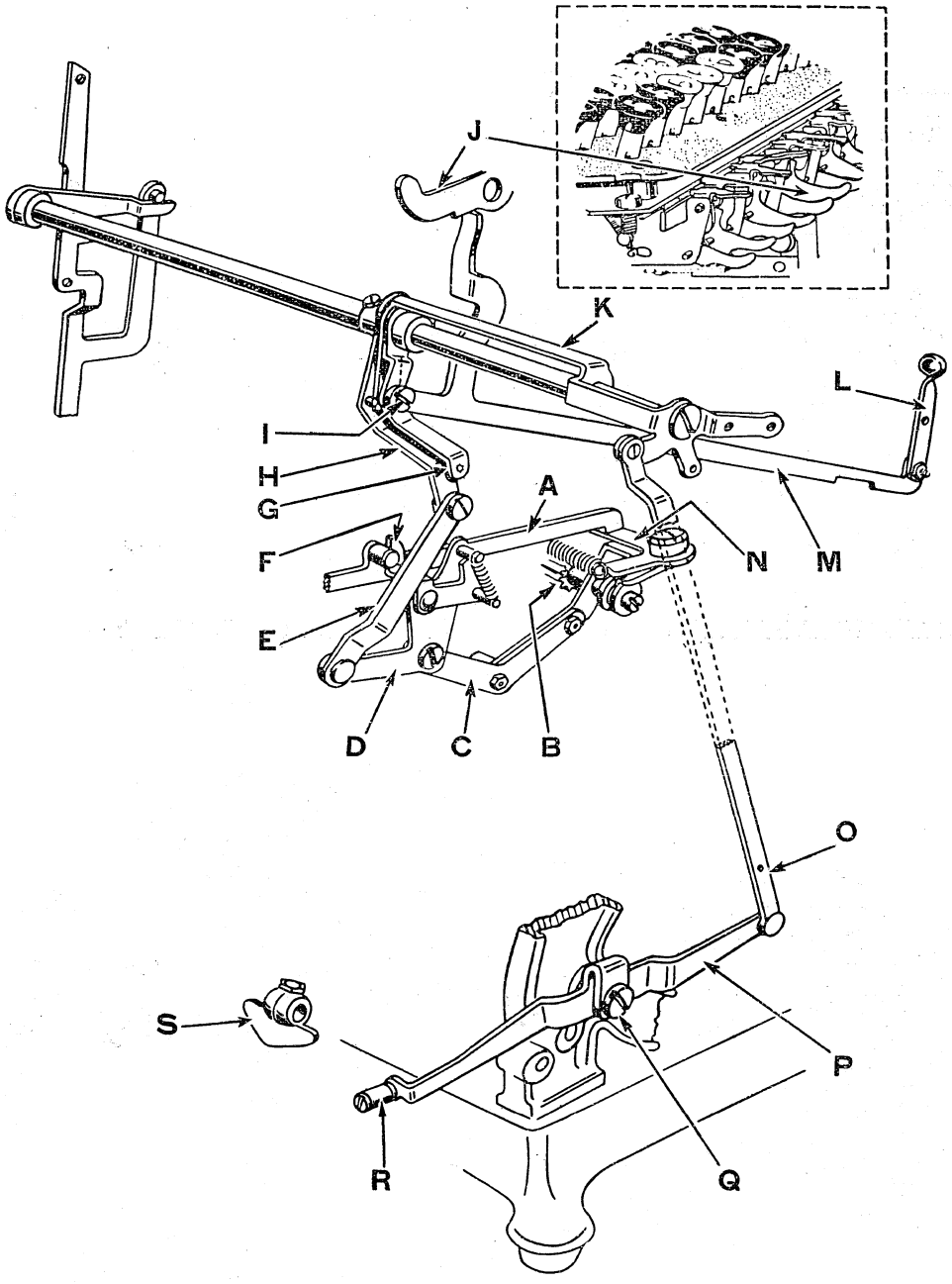


Symbols for Plate 13-1 are on next Page

SYMBOLS (Plate 13-1)

A **1-113B Fte. 207 Style 17**
B **1-12024 Style 17 No. 3**
C **1-124A Fte. 207 No. 2**
D **251⅜**
E **505 Fte. 207 No. 2**
F 1-200255 Env. 903* included in K
G **10180**
H **126 Fte. 207**
I **301 Fte. 207**
J **304 Fte. 207** Bushing
K **1-200254 Env. 903**
L 123 Fte. 207* included in N
M 7914½A* included in 1-202225
N **1-122A Fte. 207**
O **120 Fte. 207 No. 4** included in AC
P **480B**
Q 186 Fte. 207 No. 2* included in AC
R 108591* included in AJ
S **8054¾**
T **11-200158½B**
U **1-200182½A**
V **1-200816A**
W **83508 No. 2**
X **1-201130A**
Y **201131B**
Z **1B-200006 Style 17**
AB 200660A* included in U
AC **11-136 Fte. 207 No. 5**
AD 8351¼* included in AJ
AE **7286½**
AF 309517* included in AJ
AG **184 Fte. 207 No. 1**
AH **200659B** Screw, 1097⅞ lock washer, 47 nut
AI 1-201105B* included in 51-201002A
AJ **1-185 Fte. 207**
AK **11-11½A Fte. 103**
AL **11-27⅜A Fte. 99 Style 17 No. 2**
AM **531 Fte. 207**
AN **952¾**
AO **838¼ Style 17** Collar, 10853A Style 17 shaft
AP **1-10721½**
AQ **75602** Screw, 75346 nut
AR 302518* included in T
AS **69802**
AT **3434**
AT1 **4857½**
AU **72614**
AV **1-160 Fte. 207**
AW **10738½**
AX **1-157 Fte. 207 No. 1**
AY **1-156A Fte. 207 No. 2 or 4**
AZ 10712⅞* included in AY
BA **259½**
BB **10701B No. 1 Style 13, 17** sumbit machine number and forms
BC **1-12024 No. 10 Env. 695A**

EIGHT POINT PRINTING CONTROL, CARRIAGE AND KEYBOARD LEVER CONTROLLED; LEVER RESTORES AT EACH MACHINE OPERATION (Plate 14)



SYMBOLS (Plate 14)

A **1-156A Fte. 207 No. 2** includes N
B **10701B No. 1 Style 13, 17** submit forms and machine number
C **160 Fte. 207**
D **1-157 Fte. 207 No. 1** includes E, F
E 159 Fte. 207 No. 1*
F 1-158 Fte. 207* (1-157 Fte. 207 No. 1)
G **1-12024 No. 8**
H **1-12024 No. 5**
I **8054¾**
J **165R or L Fte. 207**
K **1-113A Fte. 207 Style 13**
1-113A Fte. 207 Style 17 (1-113B Fte. 207 Style 17)
L Included in M
M **1-133A Fte. 207**
N 10712⅞A*
O Included in P
P **1-119B Fte. 207** includes O
Q **3960** Screw, 46 nut
R **307 Fte. 217**
S **1-900 Fte. 207 No. 6, No. 14 or No. 15**

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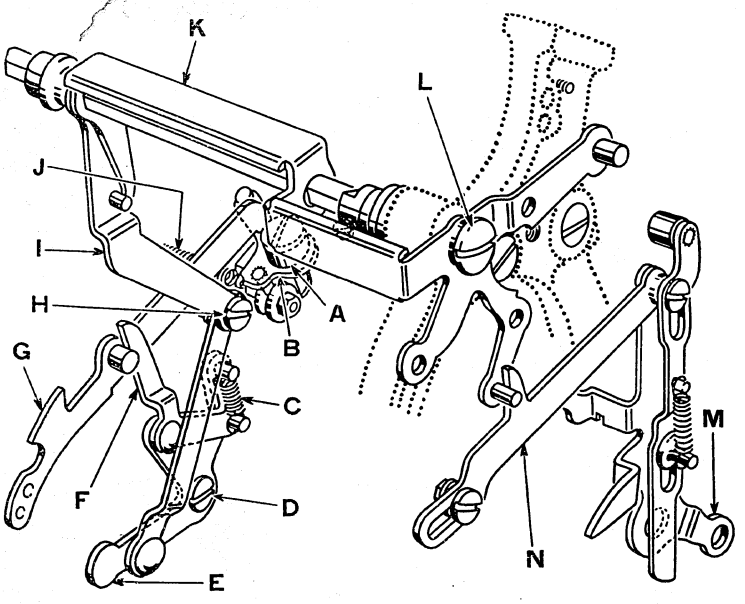
8 POINT PRINTING CONTROL FROM CARRIAGE CONTROLLED TOTAL AND SUB-TOTAL MECHANISM, H903 MACHINES (Plate 15)

SYMBOLS (Plate 15)

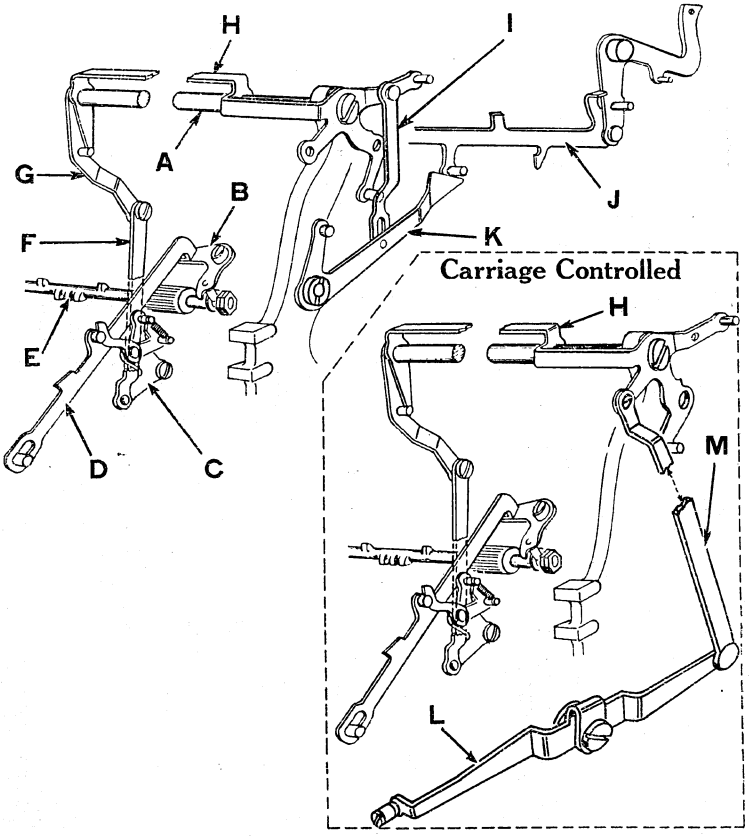
A **10750⅛**
B Included in G
C **12083**
D **4857½**
E **1-157 Fte. 207 Nos. 1 or 2** Specify machine number
F Included in E
G **1-156A Fte. 207 No. 4**
H **3960** Screw, 46 nut
I **1-12024 Style 17 No. 3**
J **10781½**
K **1-113A Fte. 207 Style 17 (1-113B Fte. 207 Style 17)**
L **505 Fte. 207**
M Included in N
N **11-200138½**



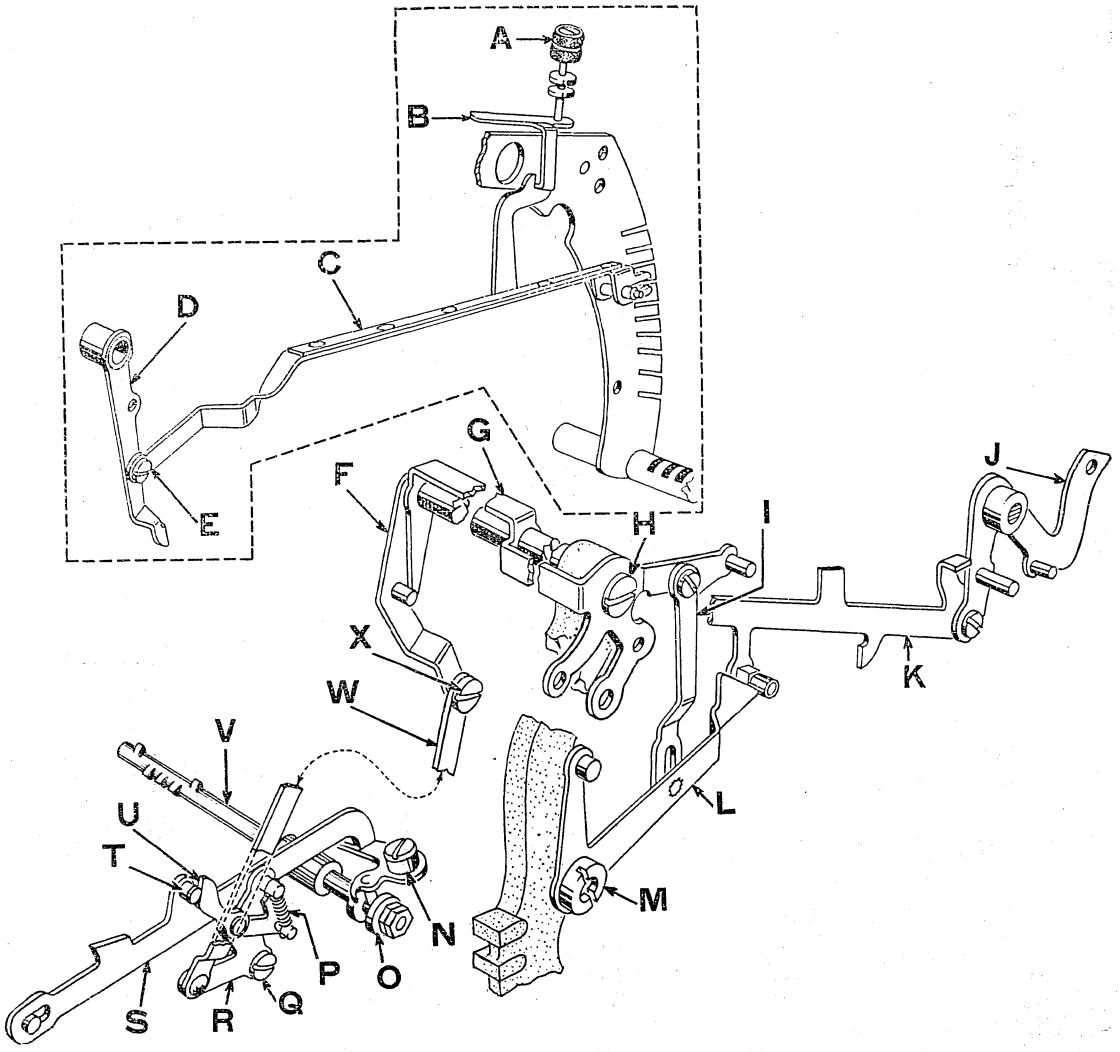
EIGHT POINT PRINTING CONTROL FROM SUB-TOTAL AND TOTAL KEY (Plate 16)

SYMBOLS (Plate 16)

A **1-12007 No. 1 Style 13 (1-12007 Style 13 No. 4, 1-540)**
1-12007 No. 1 Style 17 (1-12007 Style 17 No. 4, 1-540)
B Part of D
C **1-157 No. 1 or No. 2 Fte. 207** includes F, uses spring 12083
D **1-156A Fte. 207 No. 2 or No. 4** includes B
E **10701B No. 1 Style 13, 17** Submit forms and machine number, uses 10736¾A collar and 47¼ nut
F Included in C
G **1-12024 Style 17 No. 3**
H **1-113A Fte. 207 Style 13**
1-113A Fte. 207 Style 17 (1-113B Fte. 207 Style 17)
I **123 Fte. 207** included in K
J **1-202225**
K **1-122 Fte. 207 (1-122A Fte. 207)** includes I
L **1-119B Fte. 207**
M **120A Fte. 207**



EIGHT POINT PRINTING CONTROL FROM TOTAL KEY DISABLED BY KEYBOARD BUTTON (Plate 17)



SYMBOLS (Plate 17)

A **301 Fte. 207**
B **126 Fte. 207**
C **1-124A Fte. 207 No. 2**
D **1-12024 No. 10**
E **75632 (9053⅝)** Screw **46** Nut
F **1-12024 No. 5**
G **1-113A Fte. 207 Style 13** **1-113A Fte. 207 Style 17 (1-113B Fte. 207 Style 17)**
H **505 Fte. 207**
I Included in L
J Total key
K **1-202225**
L **1-122 Fte. 207 (1-122A Fte. 207)**
M **200342**
N **12059⅝**
O **10736⅜A** Collar and two 47¼ nuts for later style, tapped early style camshaft uses screw 72614 and collar 10736⅜
P **12083½**
Q **4857½**
R **1-157 Fte. 207 No. 1** includes W and U
S **1-156A Fte. 207 No. 2**
T Included in S
U Included in R
V **10701B No. 1 Style 13, 17** Submit forms and machine number
W Included in R
X **251⅜** Screw, 2820½ washer, 46 nut

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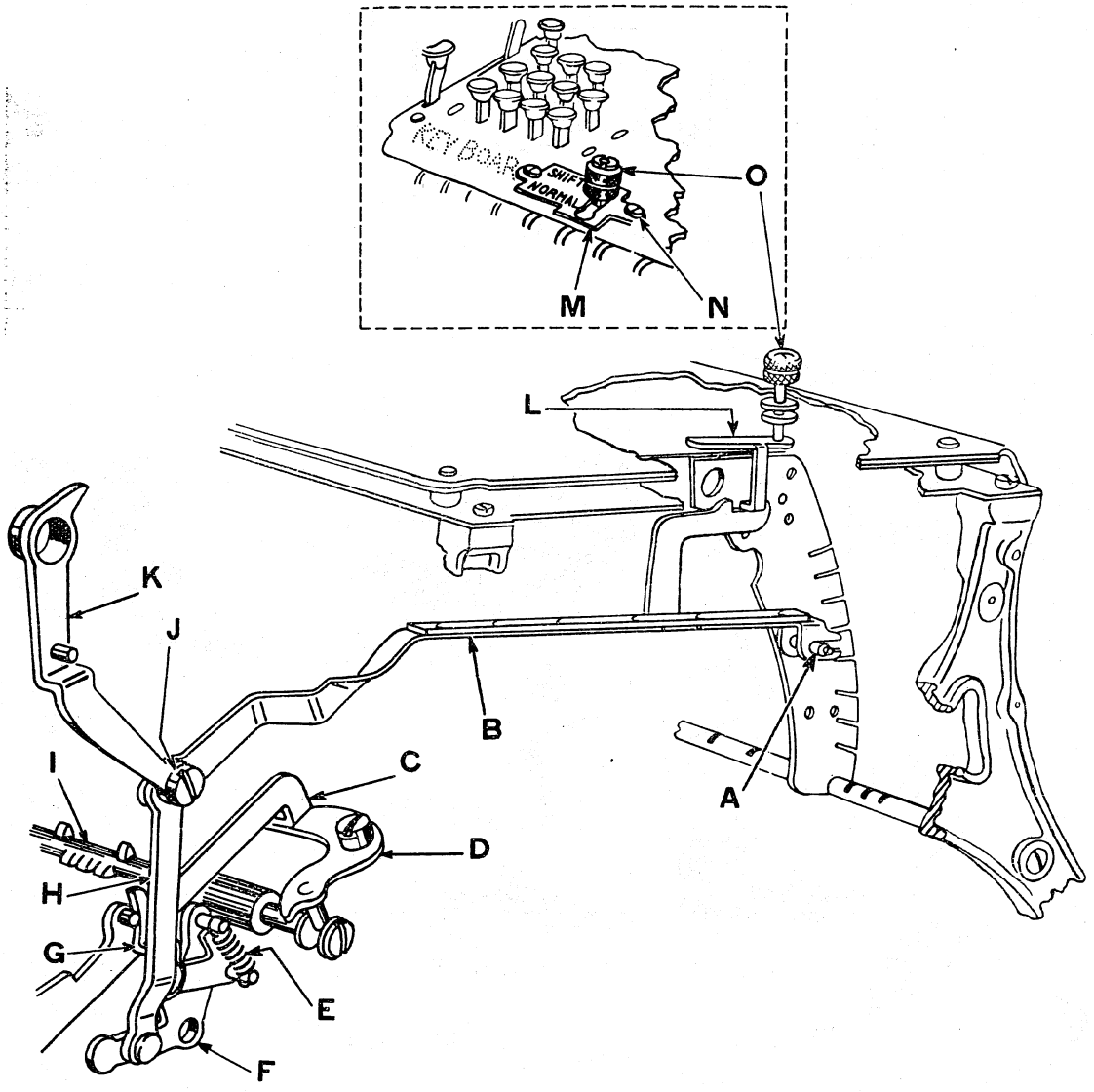
EIGHT POINT PRINTING CONTROL FROM KEYBOARD BUTTON (Plate 18)



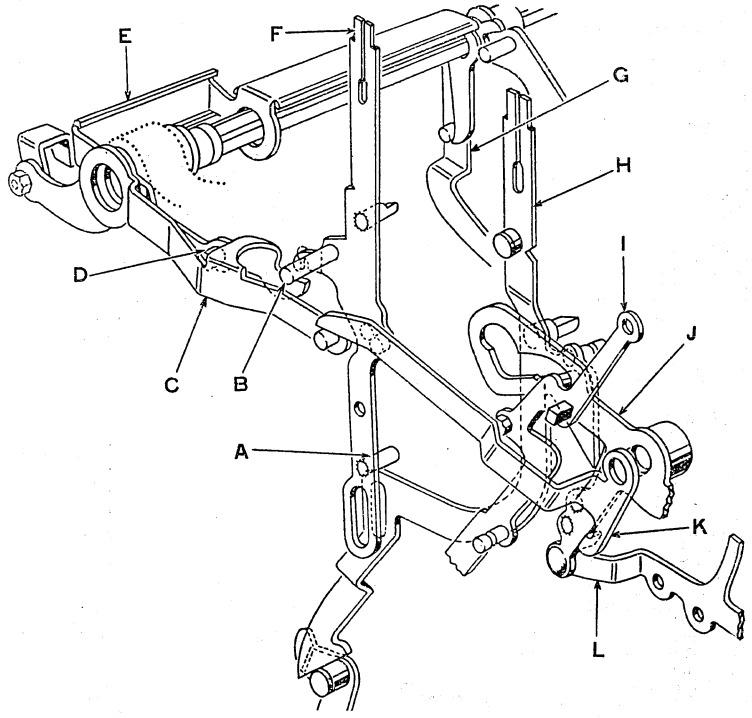
SYMBOLS (Plate 18)

A **506 Fte. 207**
B **1-124A Fte. 207 No. 2**
C **1-156A Fte. 207 No. 2** includes D
D 10712⅞A*
E **12083½**
F **1-157 Fte. 207 No. 1** includes H and G
G 1-158 Fte. 207* (1-157 Fte. 207 No. 1)
H 159 Fte. 207 No. 1*
I **10701B No. 1 Style 13, 17** Submit forms and machine number
J **251⅜**
K **1-12024 Style 17 No. 3**
L **126 Fte. 207**
M **129A Fte. 207 No. 1**
N **252⅝**
O **301 Fte. 207**

EIGHT POINT PRINTING CONTROL SHIFTED FROM REGISTER TOTAL INDEXING LEVER AND C.F.N.A. KEY (Plate 19)

SYMBOLS (Plate 19)

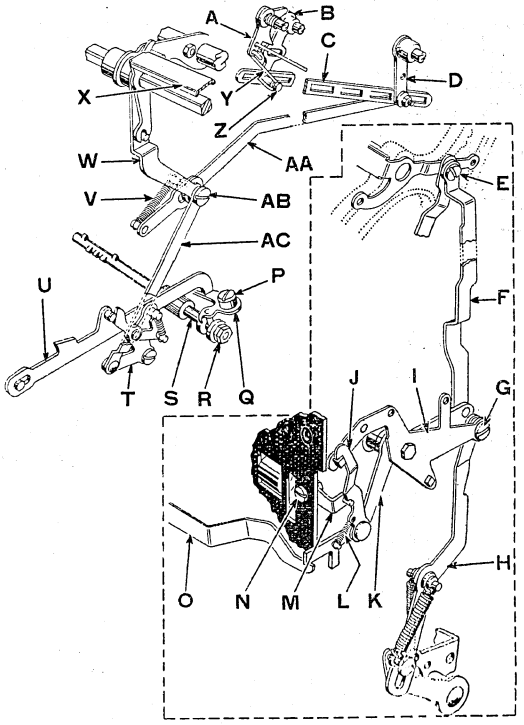
A Included in F
B Included in F
C **1-100 No. 3 Env. 1759** includes D
D Included in C
E **1-113A Fte. 207 Style 13**
1-113A Fte. 207 Style 17 (1-113B Style 17 Fte. 207)
F **1-62222 Env. 488**
G **1-12024 Style 17 No. 3**
H **1-62221 No. 3** Specify machine number
I **41-60100**
J 1-62102 includes L
K **1-101B Env. 1759 (1-118½ Fte. 207)**
L Included in J



EIGHT POINT PRINTING CONTROL FROM CHARACTER KEYS (Plate 20)

SYMBOLS (Plate 20)

A **1-125R or L Fte. 207 No. 1,** No. 2 for flex. keyboard
B 1-159 Fte. 216 Env. 1340* included in C
C **11-100A Env. 1340 (11-100A No. 2 Env. 1340)** for col. 10, includes B, D, AA
11-100 No. 4 Env. 1340 for col. 13
11-100 No. 2 Env. 1340 for any col. except 10 or 13
D Included in C
E **3960** Screw, 46 nut
F Part of K
G **10056**
H **1-200182½ (1-200182½A)**
I **1-200158½A Env. 1834 (1-200158½B Env. 1834, 200537⅛, 200136½)**
J Part of K
K **1-136 Fte. 207 No. 3 Env. 1834 (11-136 Fte. 207 No. 5)** includes F and J
L **283A**
M **1-164 Env. 1834**
N **522 Env. 1834** Screw, 46 nut
O **1-12110 Style 17 No. 1**
P **12059⅛**
Q Included in U
R **47¼** Nuts, 10736⅜A collar
S **10701B No. 1** Submit forms and machine number
T Included in AC
U **1-156A Fte. 207 No. 2** includes Q
V **10085**
W **1-12024 Style 17 No. 3**
X **1-113A Fte. 207 Style 17 Env. 1834**
Y **700A Fte. 216**
Z **547 Fte. 216**
AA 1-160 Fte. 216 Env. 1340* included in C
AB **251⅜** Screw, 8436 shoulder nut
AC **1-157 No. 1 Fte. 207** uses spring 12083½



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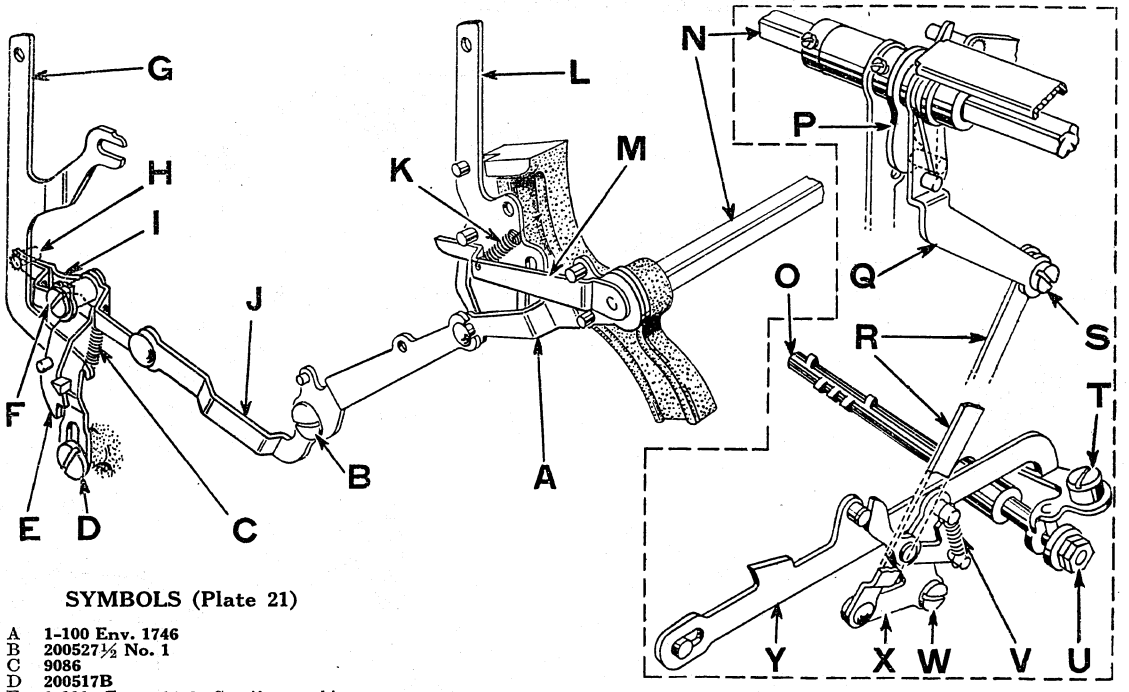
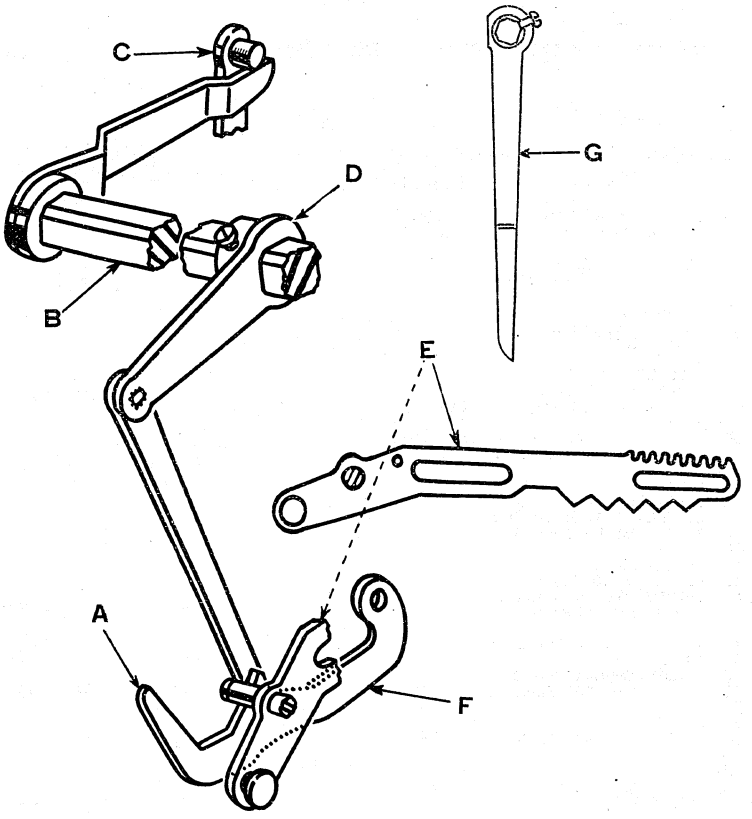
8 POINT PRINTING CONTROL FROM UPPER AND LOWER MOTOR BARS (Plate 21)



SYMBOLS (Plate 21)

A **1-100 Env. 1746**
B **200527½ No. 1**
C **9086**
D **200517B**
E **1-101 Env. 1423** Specify machine number
F **1527 Fte. 214 or 12051 7/16A**
G **1-12021¼A Env. 1423 (1-12021¼ No. 3)**
H Included in G
I **1-200233 No. 3**
J **1-200144 No. 8**
K **10086**
L **11-200241B No. 2**
M 1-12020¾ No. 1* (1-12007 Style 13, 17 No. 4, 1-540)
N **1-12007 Style 13, 17 No. 1 (1-12007 Style 13, 17 No. 4, 1-540)**
O **10701B No. 1 Style 13, 17** Submit forms and machine number
P **1-12024 No. 9**
Q **1-12024 Style 17 No. 3**
R Included in X
S **251⅜** Screw, 2820½ washer, 46 nut
T **12059 9/16**
U **47¼** Nut, 10736⅜A collar
V **12083½**
W **4857½**
X **1-157 Fte. 207 No. 3** Specify machine number
Y **1-156A Fte. 207 No. 2**

PRINTING CONTROL CAMSHAFT ROTATED FROM UPPER OR UPPERMOST BAR (Plate 22)



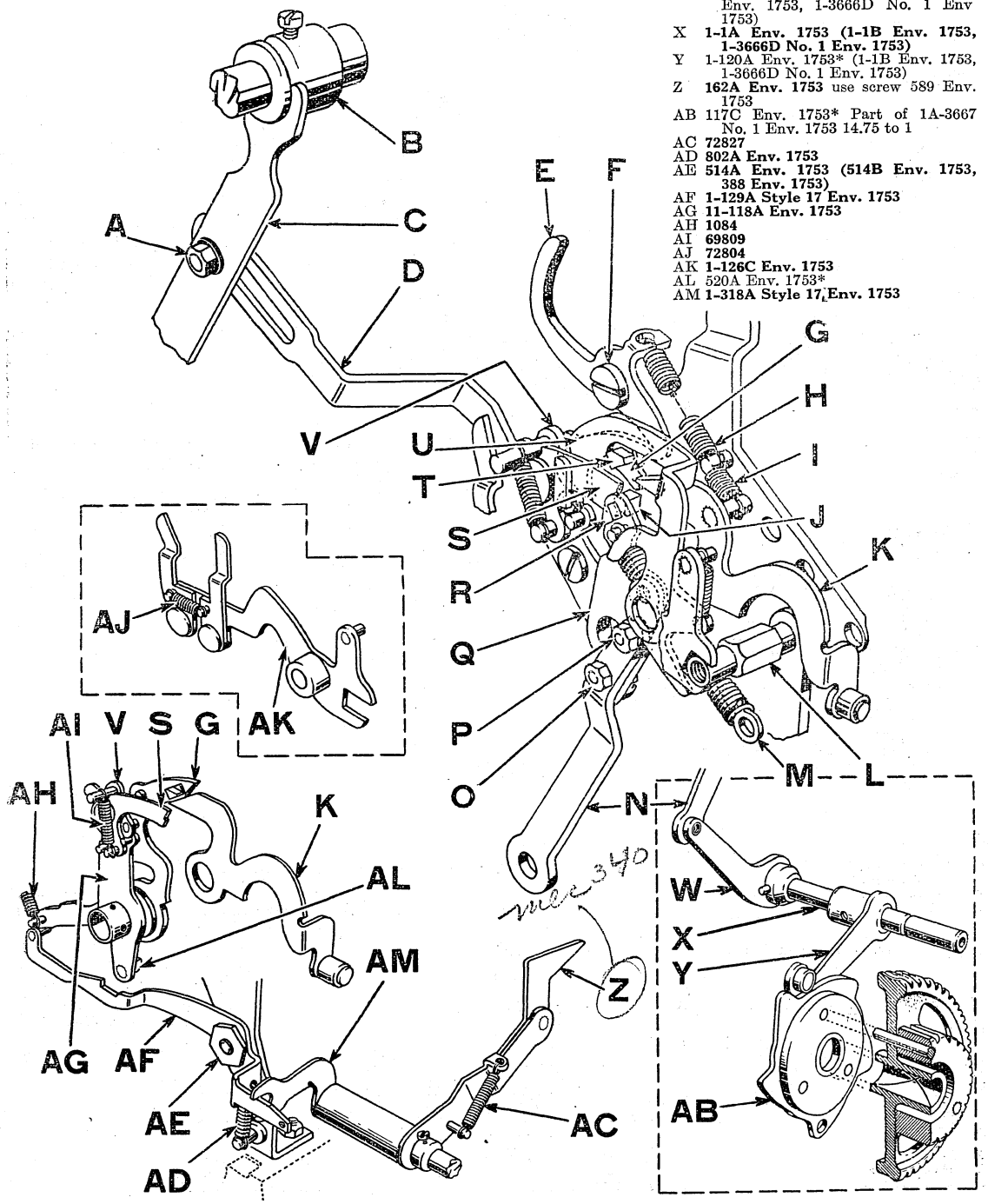
SYMBOLS (Plate 22)

A Included in F*
B **1-12007 Style 13, 17 No. 1 (1-12007 Style 13, 17 No. 4, 1-540)**
C Motor bar
D 1-103 Env. 1165* included in F
E **11-10720 No. 1 Env. 1165** used with F, 1-10720 No. 1 used with G
F **1-102 Env. 1165** used with roll combinations 0-5 or 1-3
G **1-12024 No. 22** used in place of D & F in other roll combinations

HAMMER RELEASE AND DRIVER RESETTING CONTROL, SINGLE STROKE MULTIPLE PRINT (Plate 23)

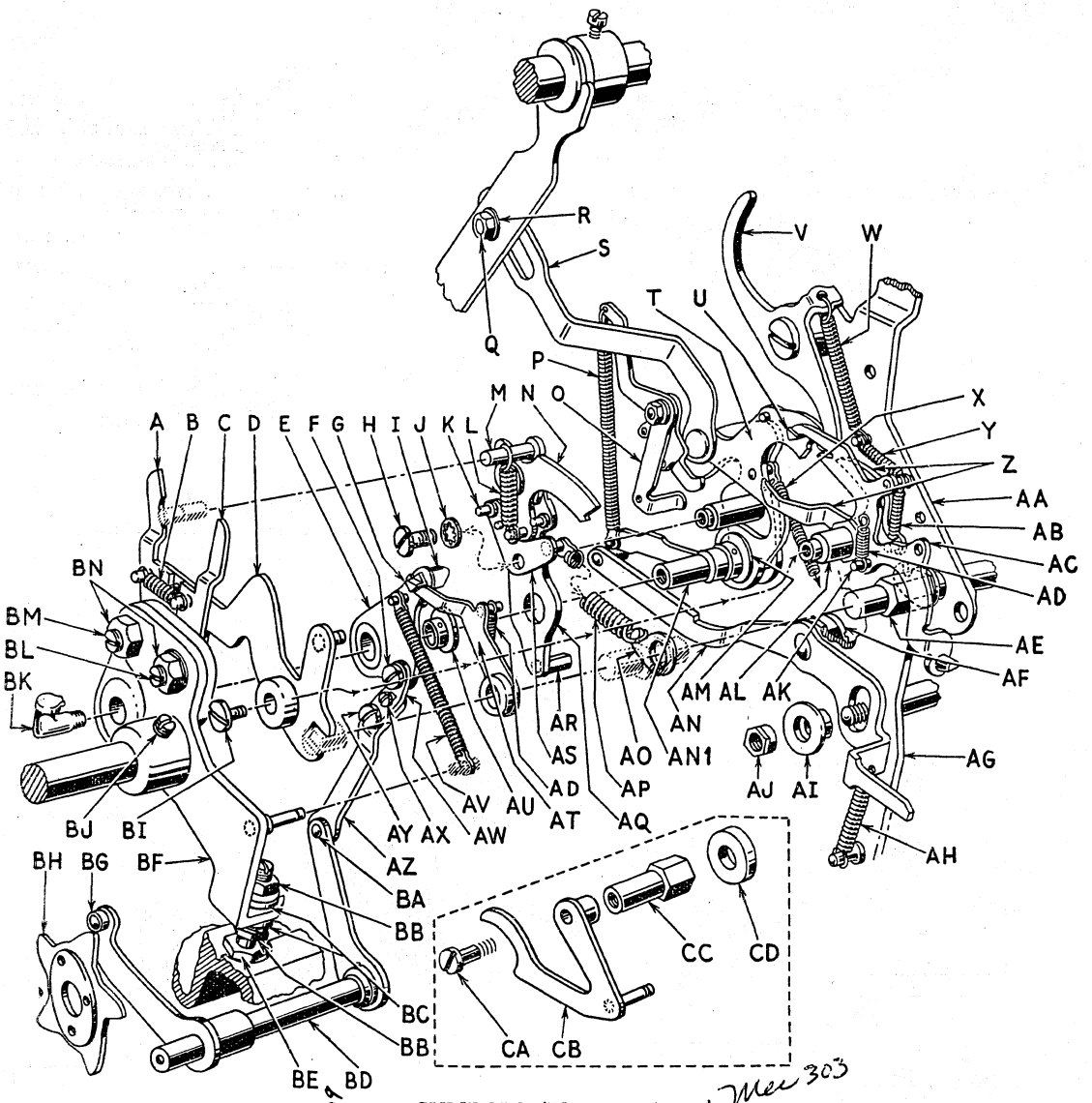
SYMBOLS (Plate 23)

A **46** Nut, 60523 No. 3 eccentric screw, 1097¾ washer
B **1-649**⅜, Screw 653¾
C **617½A Env. 1753**
D **138A Style 17 Env. 1753**
E **1-714A**
F **750**
G **1-713BR Env. 1753** includes D, T
H **7283¼**
I **9088 (7285½A)**
J 322A Env. 1753* (1-22A Env. 1753)
K **1-109B No. 2 Env. 1753 (1-109E No. 2 Env. 1753, 1-201B Env. 1753, 401 Env. 1753, 400Z Env. 1753, 1-134C Env. 1753, 513B Env. 1753, 526B Env. 1753, 7286½, 7285½A)**
L **513A Env. 1753**
M **1-803B Env. 1753**
N **132 Env. 1753 (132A Env. 1753)**
O **557 Env. 1753 (557A Env. 1753)** Eccentric screw, 1097$\frac{15}{16}$ washer, 47¾ nut
P **59½ Fte. 64 (103500)** Screw 47¾ Nut
Q **1-122A Env. 1753**
R 527A Env. 1753* (1-122A Env. 1753)
S 1-119A Env. 1753* included in assembly AG
T 529A Env. 1753*
U **1-134A Env. 1753 (1-109E No. 2 Env. 1753, 1-201B Env. 1753, 401 Env. 1753, 1-134C Env. 1753, 513B Env. 1753, 526B Env. 1753, 7286½, 7285½A)**
V 1-116A Env. 1753* included in assembly AG
W 1-121A Env. 1753 Style 17* (1-1B Env. 1753, 1-3666D No. 1 Env 1753)
X **1-1A Env. 1753 (1-1B Env. 1753, 1-3666D No. 1 Env. 1753)**
Y 1-120A Env. 1753* (1-1B Env. 1753, 1-3666D No. 1 Env. 1753)
Z **162A Env. 1753** use screw 589 Env. 1753
AB 117C Env. 1753* Part of 1A-3667 No. 1 Env. 1753 14.75 to 1
AC **72827**
AD **802A Env. 1753**
AE **514A Env. 1753 (514B Env. 1753, 388 Env. 1753)**
AF **1-129A Style 17 Env. 1753**
AG **11-118A Env. 1753**
AH **1084**
AI **69809**
AJ **72804**
AK **1-126C Env. 1753**
AL 520A Env. 1753*
AM **1-318A Style 17 Env. 1753**



Printed in U. S. America 1-10-49

SINGLE OPERATION MULTIPLE PRINT HAMMER RELEASE AND DRIVER RESETTING CONTROL—IMPROVED (Plate 23-1)

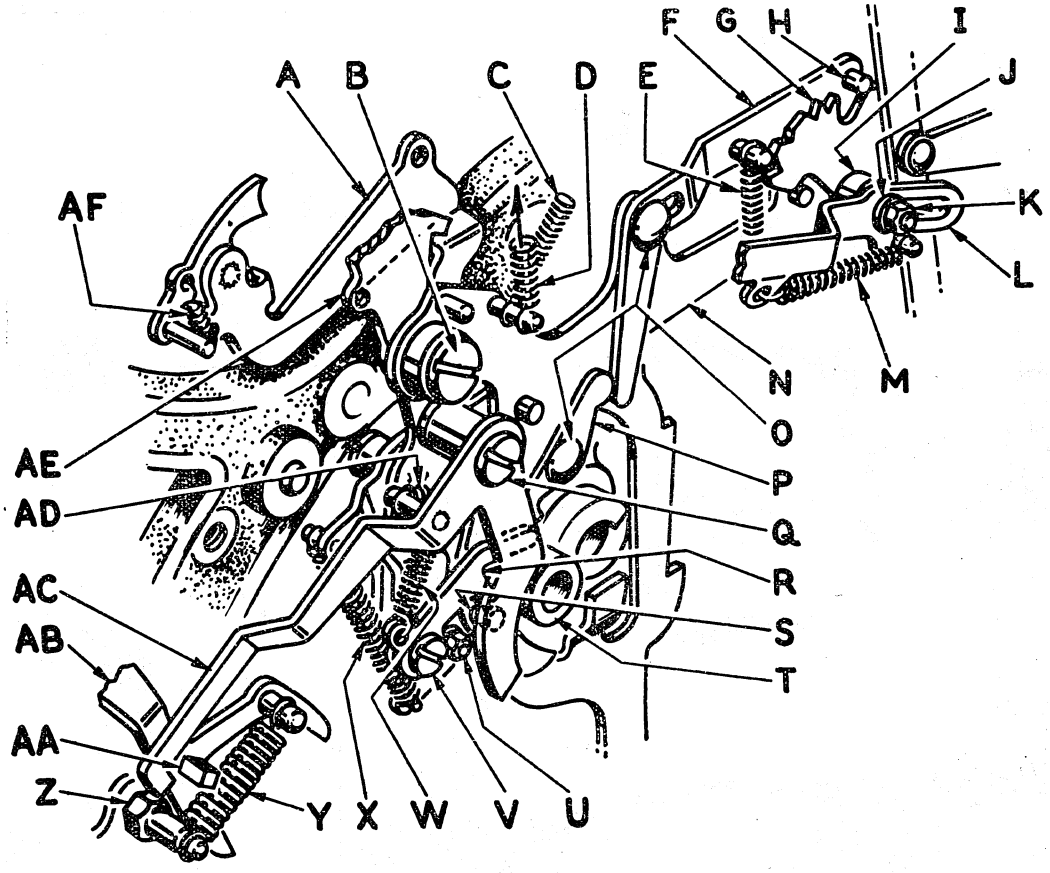


SYMBOLS (Plate 23-1)

A 1-126½ Env. 1753* included in D
B **72804**
C 1-126¾ Env. 1753* included in D
D **1-126C Env. 1753** includes A, C
E **1-122A Env. 1753** includes G, I
F **8054¾**
G 527D Env. 1753* included in E
H **79603**
122½ Env. 1753* included in E
1097⅜
K 591 Env. 1753* included in AS
L **69809**
M 512A Env. 1753* included in AQ
N 1-119A Env. 1753* included in AQ
O **200 Env. 1753**
P **1-811 Env. 1753**
Q **60523 No. 3** Ecc. screw
R **1097¾** Lock washer, 46 nut
S 138A Style 17 Env. 1753* included in T
T **1-713BR Env. 1753** includes S, U
U 588 Env. 1753*
V **1-714A**
W **7283¼**
X **1-812 Env. 1753** Spring
Y **9088 (7285½A)**
Z **1-201A Env. 1753 (1-201B Env. 1753, 1-109E No. 2 Env. 1753, 401 Env. 1753)**
AA **1-710AR No. 1 Env. 1753** Side frame
AB **10983**
AC **1-109D No. 2 Env. 1753 (1-201B Env. 1753, 1-109E No. 2 Env. 1753, 401 Env. 1753)**
AD **7286½**
AE **513B Env. 1753**
AF **8054¾** Screw
AG **1-726R Style 17 Env. 1753** Brace
AH **108805**
AI **514B Env. 1753**
AJ **388 Env. 1753**
AK 12357½* included in AC
AL **526B Env. 1753** Bushing
AM **352½ No. 4 Env. 1753** Bushing
AN **1-129B Style 17 Env. 1753**
AN1 **1-702D Style 17 Env. 1753** Assembled shaft
AO **193 Env. 1753** Spring anchor
AP **1-804½ Env. 1753**
AQ **11-118A Env. 1753** includes M, N, AR
AR 520A Env. 1753*
AS **1-194 No. 2 Env. 1753** includes K
AT **1-134C Env. 1753**
AU **352½ No. 5 Env. 1753** Bushing
AV **1-803B Env. 1753**
AW **164A No. 2 Env. 1753** Small link
AX **103500**
AY **557A Env. 1753** use 301 Fte. 141 nuts
AZ **132B Env. 1753**
BA **8054¾** Screw
BB **10762 Style 17**
BC **12018** Washer
BD **1-1A Style 17 Env. 1753 (1-1B Env. 1753, 1-3666D No. 1 Env. 1753)**
BE **544A Env. 1753**
BF **1-157A Env. 1753**
BG **317A Env. 1753** Roller, 516B Env. 1753 stud
BH **1-3667 No. 2 Env. 1753** Gear assembly
BI **8054¾**
BJ **4657 (4657 Env. 1753)**
BK **900 Env. 1753**
BL **560 Env. 1753** Ecc.
BM **562 Env. 1753**
BN **393** Nut, 1097⅛ lock washer
CA **72614**
CB **1-157Z Env. 1753**
CC **513BZ Env. 1753**
CD **400Z Env. 1753**

SEE EXPLANATION ON INSIDE OF FRONT COVER

SAFEGUARD LATCHES FOR SERIES H MACHINES EQUIPPED WITH MULTIPLE PRINT MECHANISM (Plate 23-2)



SYMBOLS (Plate 23-2)

A **1-215⅝ No. 3**
B **352⅜ No. 2**
C **7283A Style 10**
D **785 Style 15**
E **83800A**
F **1-200270¾**
G **1-200195½ No. 1** Specify cutout—per factory order
H **264¾**
I **200418** Collar
J **8436** Washer
K **46**
L **1-200190½**
M **7283¼**
N **1-200270 No. 3 Env. 2034** includes F, H, O, P, S
O **650A**
P **200270¼**
Q **8054¾**
R **127 Env. 2034**
S 517 Env. 2034* Stud, included in N
T **1-3662¼ No. 3 Env. 1753**
U **46** Nut, 1097¾ washer, 253⅛ No. 2 screw
V **12355¼**, 46 Nut, 1097¾ washer
W **8082A**
X **483** use 20 No. 71 wire
Y **69805A No. 1**
Z **69557 No. 2**

AA **60556 (9160)**
AB **1-200139A No. 2 Env. 1753**
AC **1-297 Env. 1753**
AD **7286½** Spring
AE **215⅛ No. 3 Env. 2034** Brace only, 1-215⅛ No. 3 Env. 2034 assembled brace includes A
AF **709803** Spring

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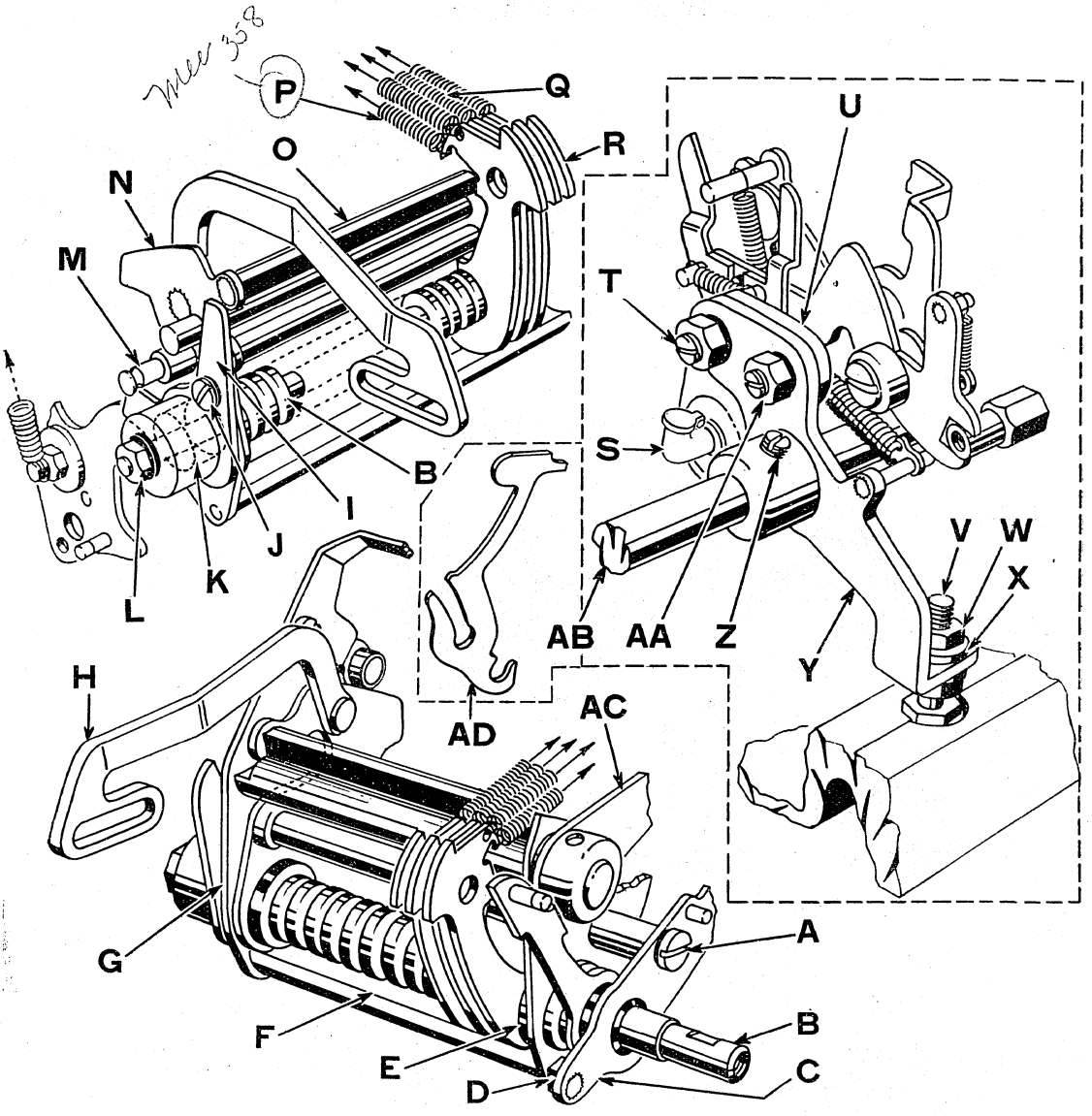
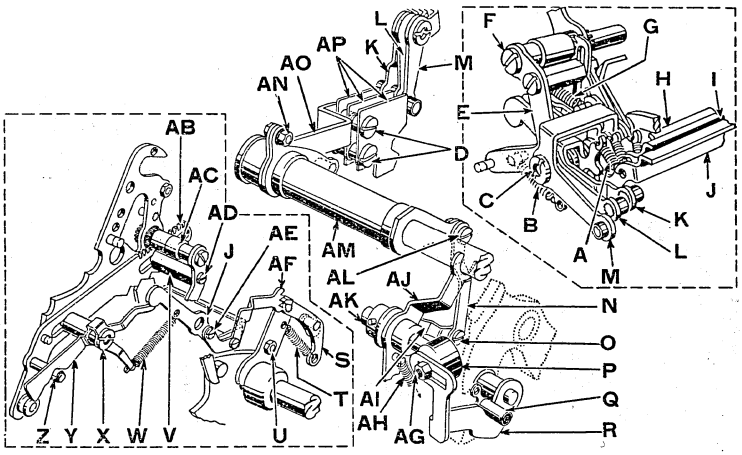
DRIVER ASSEMBLY, SINGLE STROKE MULTIPLE PRINT (Plate 24)



SYMBOLS (Plate 24)

A **548 Fte. 216 (79603)** Screw 1097⅜ Washer
B **1-702D Style 17 Env. 1753**
C **11-118A Env. 1753**
D **1-713BR Env. 1753**
E **1-12¼AR Fte. 124 Env. 1753** included in B
F **707B No. 2 Style 17 Env. 1753**
G **1-710AL No. 1 Env. 1753**
H 729C Env. 1753* (729D Env. 1753*, 755D Env. 1753*) included in B
I **710½AL No. 1 Env. 1753**
J **7356½** Screw, 1097 7/16 washer
K **353 Env. 1753**
L **563 Env. 1753**
M **751AL Env. 1753**
N **1-12¼AL Fte. 124 Env. 1753** included in B
O **709C Style 17 Env. 1753**
780½ for two letter type, 2 req.
780⅝ for three letter type, 1 req.
74809 No. 2 (986) Regular, 15 req.
Q **780¼**, 18 req.
R **1-716D**
S **900 Env. 1753**
T **560 Env. 1753** Screw, 393 nut
U **1-157½ Env. 1753**
V **544A Env. 1753**
W **10762 Style 17**, 2 req.
X **12018**, 2 req.
Y **1-157A Env. 1753**
Z **4657 Env. 1753**
AA **562 Env. 1753** Screw, 1097 7/16 washer
AB **1A-205001A Style 17 Env. 1753 (1A-205001A Style 17 No. 3 Env. 1753)**
AC **1A-67004 Style 17 Env. 1753**
AD **715/16B No. 4**

PRINTING CONTROL—ROLL AND SKID CONTROLLED, SINGLE STROKE MULTIPLE PRINT (Plate 25)



SYMBOLS (Plate 25)

A **7787** Outside spring
108802 Inside spring
83 Fte. 104 (87801A) Middle spring
B **785 Style 15**
C **359½ Env. 1753, 360 Env. 1753 Thin Collar, 361 Env. 1753 Thin Collar, 362 Env. 1753 Thick Collar, 10735⅞ Env. 1753 Combination Collar, 10754¼A Env. 1753 Long Screw**
D **3455⅜** Screw, **357¾** Env. 1753 collar
E **1-176 Env. 1753**
F **530 Env. 1753**
G **10785**
H **1A-10718D No. 3 Style 17 Env. 1753** Top bail
I **1-10718E No. 2 Style 17 Env. 1753** Center bail
J **133A Env. 1753 Style 17** Lower bail
K **1-177 Env. 1753** Control for lower bail
L **1-177 No. 2 Env. 1753** Control for center bail
M **1-177 No. 3 Env. 1753** Control for top bail
N **180 Env. 1753**
O **709607**
P **365 Env. 1753 (200396½)**
Q **200598 Env. 903 (200598),** 200229½ Anchor, 47 nut
R **1-175 Env. 1753**
S **1-184 Env. 1753 (1-184A Env. 1753)**
T **10983**
U **251⅜ Env. 1753 (251⅜A Env. 1753, 1097⅞, 613½, 45¼)**
V **10750¼A No. 2 Env. 1753**
W **10786**
X **538A Env. 1753**
Y **10712¾A Env. 1753** Specify control; normal, No. 1, No. 3 or No. 5 position
Z Part of AB
AB **1-10720 No. 1**
AC **749** Short collar, 10735¾ long collar
AD **2854⅜**
AE **74533**
AF **186 Env. 1753,** 186 No. 2 Env. 1753, 186 No. 3 Env. 1753
AG **572 Env. 1753 (200596½, 200396½)**
AH **94808 (16880)**
AI **1-183 Env. 1753**
AJ **1-174 Env. 1753 (1-174A Env. 1753, 73607, 200146⅜)**
AK **1-2 Env. 1753 (1-2 No. 2 Env. 1753)** includes R and AI
AL **200621** Eccentric screw, 46 nut
AM **1-366 Env. 1753**
AN **47¾** Nut, 599 Env. 1753 Screw
AO **1-364 Env. 1753**
AP **178 Env. 1753** Specify control; normal No. 1, No. 3 or No. 5 position

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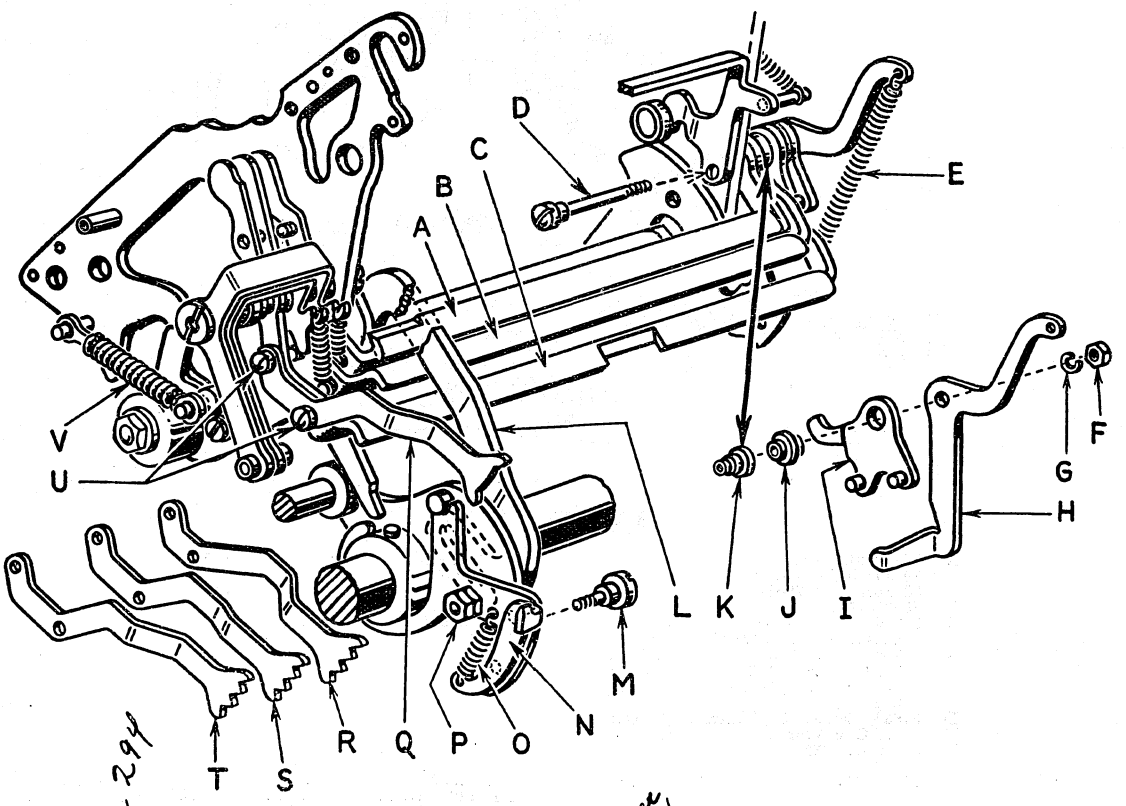
SINGLE OPERATION MULTIPLE PRINT PRINTING CONTROLS—IMPROVED
(Plate 25-1)



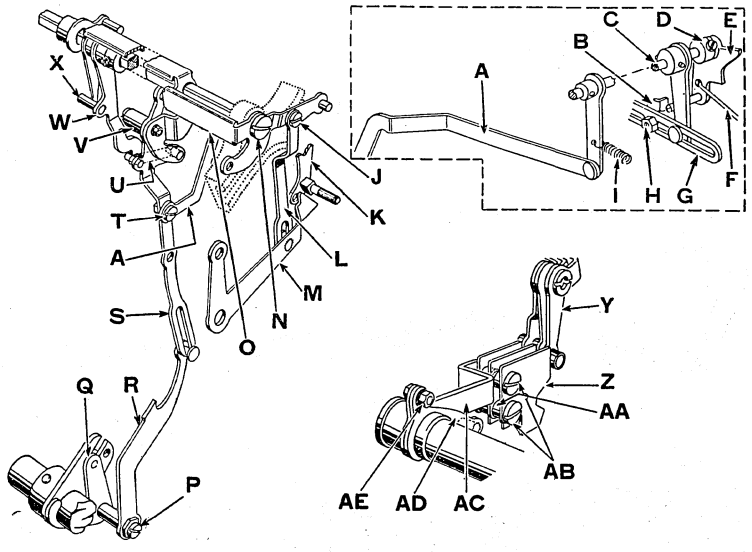
Mec 294

Mec 314

SYMBOLS (Plate 25-1)

A	**1A-10718D No. 3 Style 17 Env. 1753**
B	**1-10718E No. 2 Style 17 Env. 1753**
C	**133A Style 17 Env. 1753**
D	**583 Env. 1753**
E	**1-811 Env. 1753**
F	**46**
G	**1097¾**
H	**200 Env. 1753**
I	**1-119½A Env. 1753**
J	**327½ Env. 1753**
K	**10746½ Env. 1753**
L	729D Env. 1753* included in assembly 1-702D Style 17 Env. 1753
M	**251⅜ Env. 1753 (251⅜A Env. 1753, 1097⅞, 613½, 45¼)**
N	**1-184A Env. 1753** Bracket
O	**10983**
P	**45¼**
Q	**186 No. 3 Env. 1753** Trim as required
R	**186 No. 2 Env. 1753**
S	**186 Env. 1753**
T	**186 No. 3 Env. 1753**
U	**74502** Screw, 1097⅝ washer
V	**1-804A Env. 1753**

PRINTING CONTROL FROM CHARACTER AND TOTAL KEYS, SINGLE STROKE MULTIPLE PRINT (Plate 26)



SYMBOLS (Plate 26)

A **1-113 No. 3 Env. 1135** included in assembly 11-100 No. 5 or No. 6 Env. 1340
B **205 Fte. 216**
C **200⅝ Style 17** included in assembly 11-100 No. 5 or No. 6 Env. 1340
D **1-8345**
E **1-125R or L Fte. 207 No. 1** Long screw 511 Fte. 207
F **270A No. 1 thru 8,** see Plate 3 keyboard symbol list for other styles
G 1-160 Fte. 216 Env. 1340* included in assembly 11-100 No. 5 or No. 6 Env. 1340
H **75621** Screw, 1097⅝ washer, 49 nut
I **9280¾**
J **7262½**
K **1-202225**
L **123 Fte. 207**
M **1-122 Fte. 207 (1-122A Fte. 207)** includes link L
N **505 Fte. 207 No. 2**
O **1-113A Fte. 207 Style 13**
1-113A Fte. 207 Style 17 (1-113B Fte. 207 Style 17)
P **2854⅝** Screw, 209302 eccentric nut
Q **1-171 Env. 1753,** Screw 3450⅛ Style 9, 510½ washer
R **1-172A Env. 1753**
S **11-115 Env. 1135**
T **200621** Eccentric, 46 nut
U **69808**
V **503 No. 2 Env. 1135,** 75646 Screw
W **1-115½ Env. 1135** includes X
X 750¾ No. 2*
Y **1-177 No. 3 Env. 1753**
Z **178 Env. 1753** Specify control; normal, No. 1, No. 3 or No. 5 position
AA **357¾ Env. 1753**
AB **3455⅜**
AC **1-364 Env. 1753**
AD **182 Env. 1753** included with AC
AE **47¾ Nut, 599 Env. 1753**

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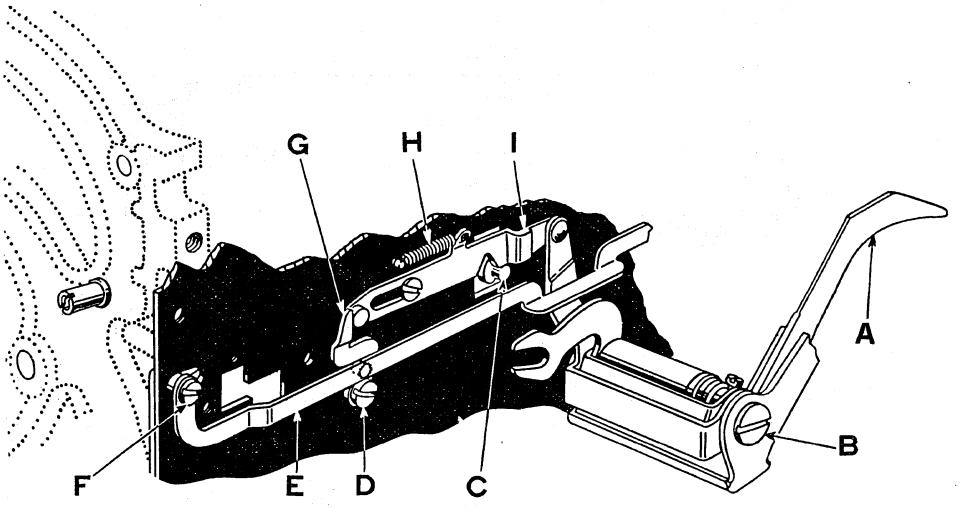
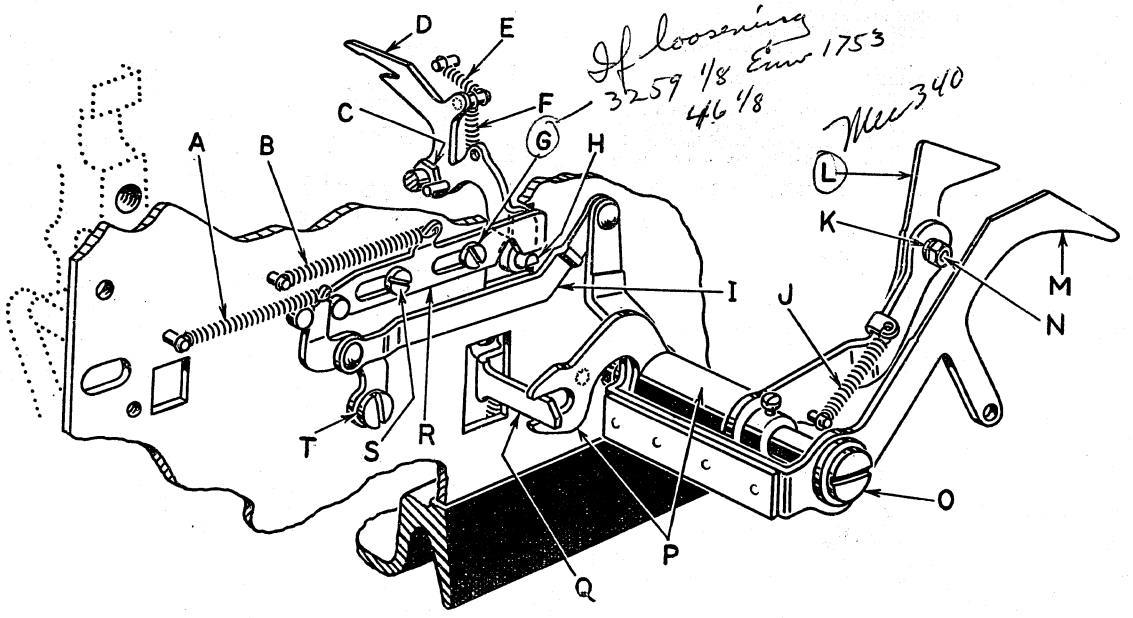
SINGLE STROKE MULTIPLE PRINT DISABLED BY CARRIAGE NORMAL KEY AND ALSO BY SPRING (Plate 27)



SYMBOLS (Plate 27)

A **1-12110 No. 14 Env. 1753**
B **572 Env. 1753 (200596½, 200396½)**
C **321½ Env. 1753 (1-109E No. 2 Env. 1753, 1-201B Env. 1753, 401 Env. 1753, 1-134C Env. 1753, 513B Env. 1753, 526B Env. 1753, 7286½, 7285½A)**
D **3259⅛A**
E **1-12019¾B Style 17 Env. 1753**
F **957½**
G **168¼ Env. 1753**
H **283A**
I Included in A

SINGLE OPERATION MULTIPLE PRINT, IMPROVED, INDEXED AND DISABLED FROM CONTROL ROLLS (Plate 27-1)

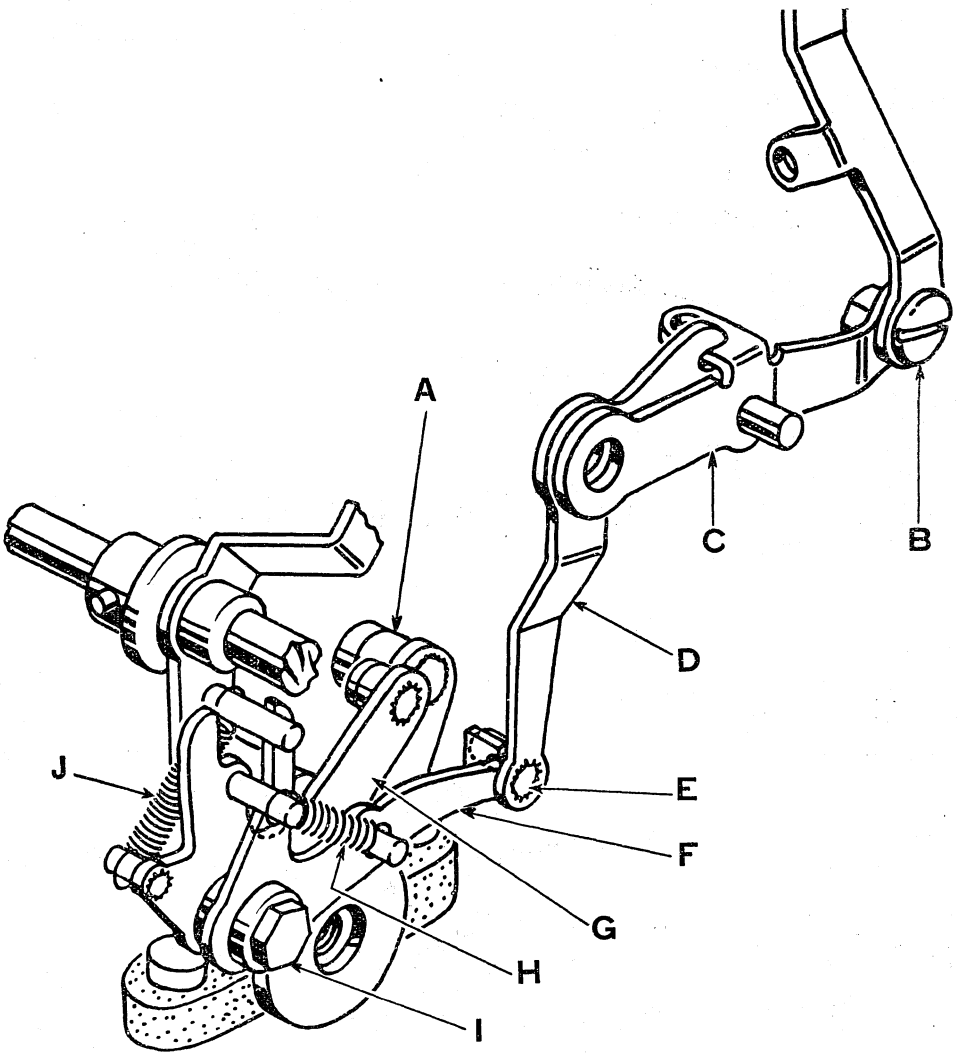


SYMBOLS (Plate 27-1)

A **84819**
B **84819**
C **526B Env. 1753** Bushing
D **1-109D No. 2 Env. 1753 (1-109E No. 2 Env. 1753, 1-201B Env. 1753, 401 Env. 1753)** includes H
E **9088 (7285½A)**
F **10983**
G **3259⅛A** use 3227½ washer
H 579 Env. 1753* included in D
I 168¾ Env. 1753* included in M
J **72827**
K **1097¾** Washer, 46 nut
L **162C Env. 1753**
M **1-12110A No. 10 Env. 1753** Located in position 9
1-12110A No. 14 Env. 1753 Located in position 8
N **589 Env. 1753** Ecc. screw
O **103654**
P **1-318A Style 17 Env. 1753**
Q **1-129B Style 17 Env. 1753**
R **1-168½A Env. 1753**
S **3259⅛A** use 3227½ washer
T **3259⅛A** use 3220½ washer

SEE EXPLANATION ON INSIDE OF FRONT COVER

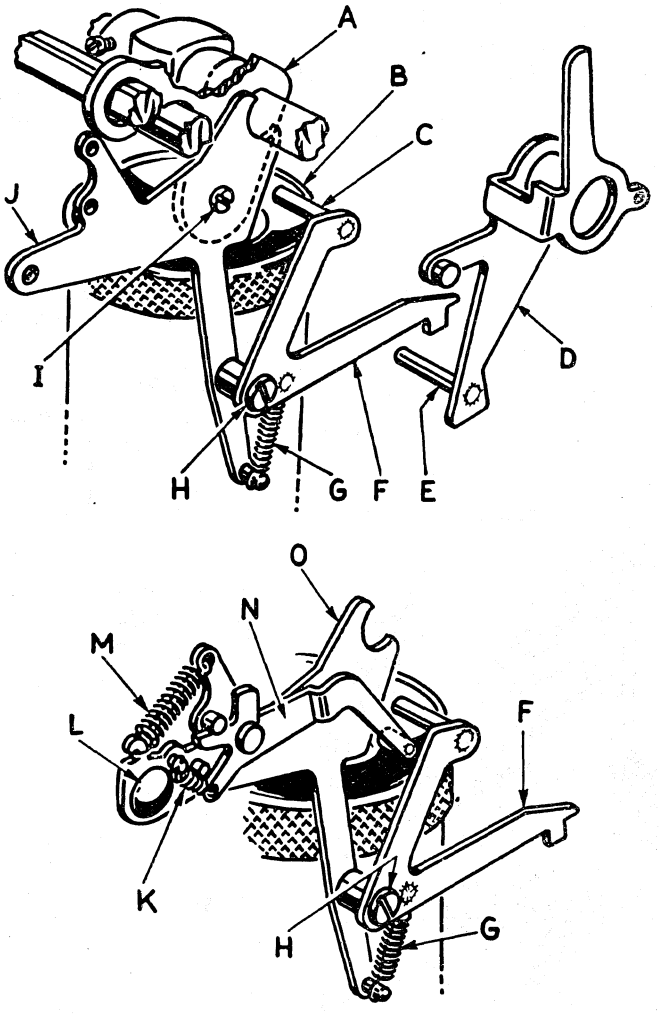
CROSSFOOTER DETENT, SINGLE STROKE MULTIPLE PRINT (Plate 28)



SYMBOLS (Plate 28)

A	**2A–60000 Style 17 or 2–60000 Style 13** Specify machine number	E	**575 Env. 1753**
B	**259½** Screw, 46 nut	F	**1–170B Env. 1753**
C	**1–60121 No. 2**	G	**1–170¼ Env. 1753**
D	**1–190 Env. 1753** includes E, use shoulder nut 60343 Env. 1753	H	**75818**
		I	**305502**
		J	**824 Env. 1753**

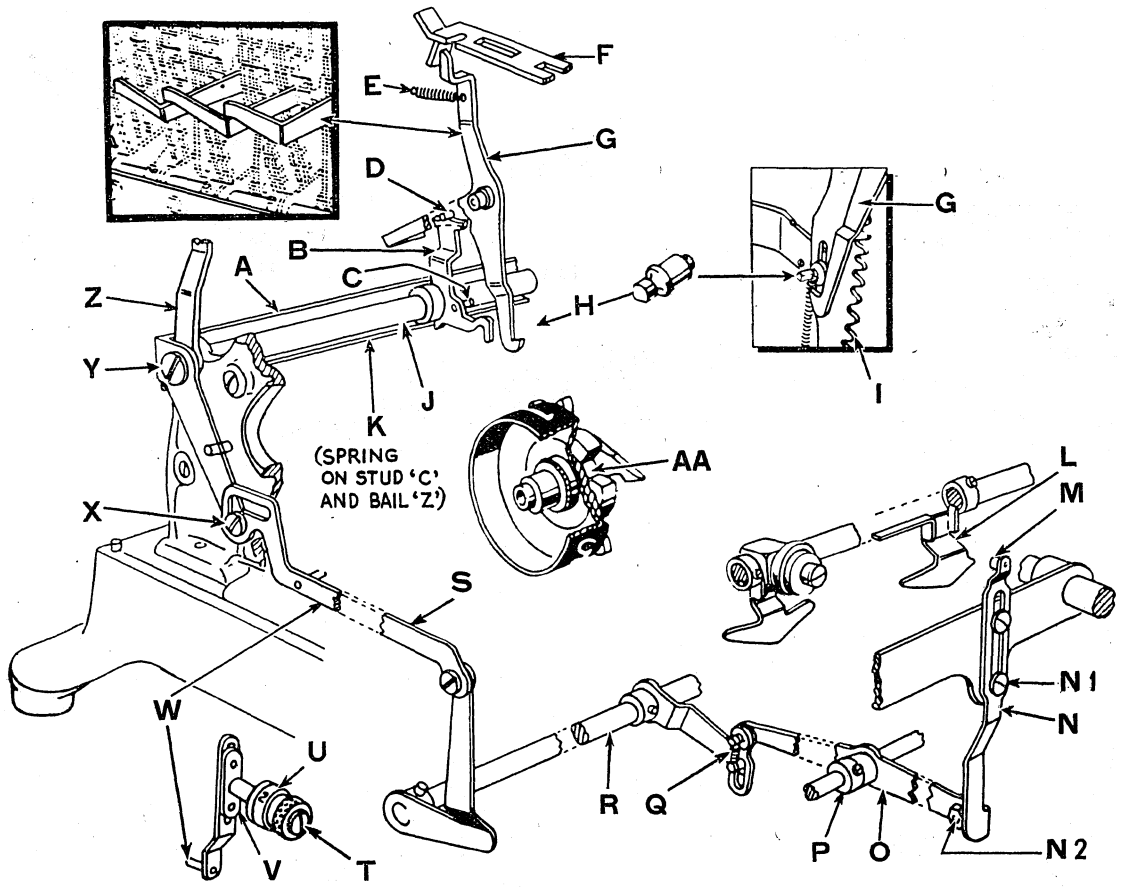
CROSSFOOTER DETENT FOR SINGLE OPERATION MULTIPLE PRINT MACHINES—IMPROVED (Plate 28-1)



SYMBOLS (Plate 28-1)

A **1-205100 No. 2**
B **2B-847A Styles 25, 44, 47, 50, 57, 66** Dashpot, See Plate 1 Power Symbol List
C 598 Env. 1753* included in F
D **1-3429⅛A Env. 1753** includes E
E **760⅛**
F **1-294 Env. 1753**
G **480¼**
H **9052½**
I **7562**
J 1-200183½ Env. 1753* included in O
K **72820** Spring
L 200546½* included in O
M **72834**
N 1-200184¼* included in O
O **11-200183½ Env. 1753** includes J, K, L, M, N

SAFEGUARD SYMBOL PRINTING MECHANISM, LISTING AND TOTALING
(Plate 29)



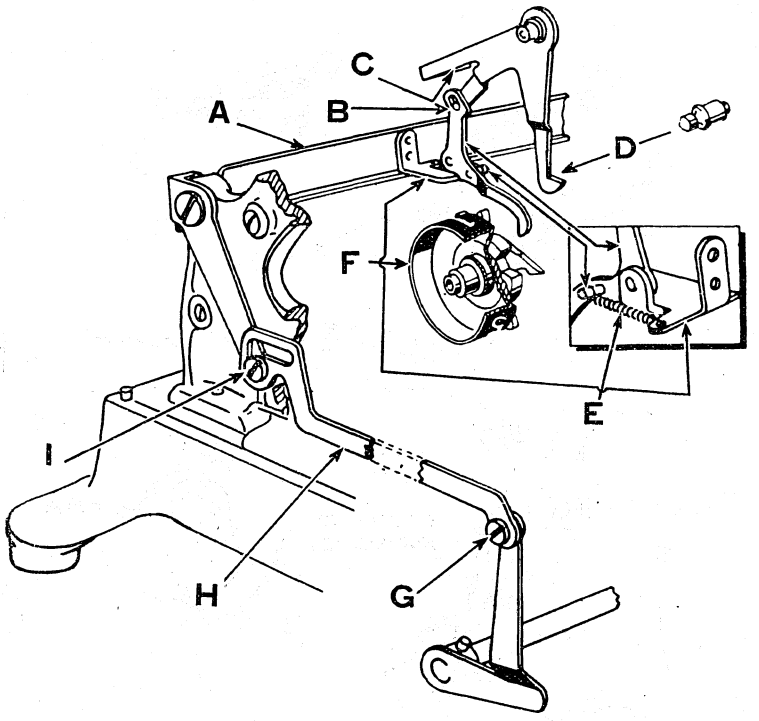
SYMBOLS (Plate 29)

A **105A Style 17 Env. 508**
B **1-100A Env. 508**
C 7253⅝*
D Included in G
E **72830**
F **214 No. 25**
G **1-104B Env. 508**
H **1501AR or AL Fte. 209** Stud, 633¼ sleeve
I **1-610R No. 28 (1-610R No. 29)** for 1st col., Cl. 20 thru 26
11- or 21-610R No. 28 for other cols., Cl. 20 thru 26
1-610R No. 29 for Cl. 27 thru 30
J **1-204003 Style 13, 17**
K **108806**
L **115B Fte. 209 Nos. 1, 2, 3 or 4** Specify machine number
M **304A Fte. 209** Roller, 308513 stud, included in N
N **1-104B Fte. 209** without multiple skip return
1-104 Fte. 209 No. 2 with multiple skip return
N1 8054¾
N2 **520 Fte. 209 (251)** Screw, 46 nut
O **1-12025 Style 13 No. 9** on Style 13
1-12025 No. 9 on Style 17
P **1-540** Collar includes 550¾ screw
Q **77880 No. 4** for single lock
77880 No. 5 for double motor bar lock
R **1A-4 Fte. 209 Style 13 (1B-4 Fte. 209 Style 13, 1-12025 No. 9 Style 13)**
1A-4 Fte. 209 Style 17 (1B-4 Fte. 209 Style 17, 1A-12025 No. 9, 60804A)
S **1103 Fte. 209**
T **74587**
U **1-306 Fte. 209** Disc, 305 Fte. 209 knob, 10081¾ spring
V **1-137 Fte. 209**
W **1-138 Fte. 209**
X **3960**
Y **4454A** Screw, 72167½ spacer
Z **1-103B Style 17 Env. 508** Specify machine number
AA **31-990 P. 10 No. 1**

SAFEGUARD SYMBOL PRINTING MECHANISM, TOTALING (Plate 30)

SYMBOLS (Plate 30)

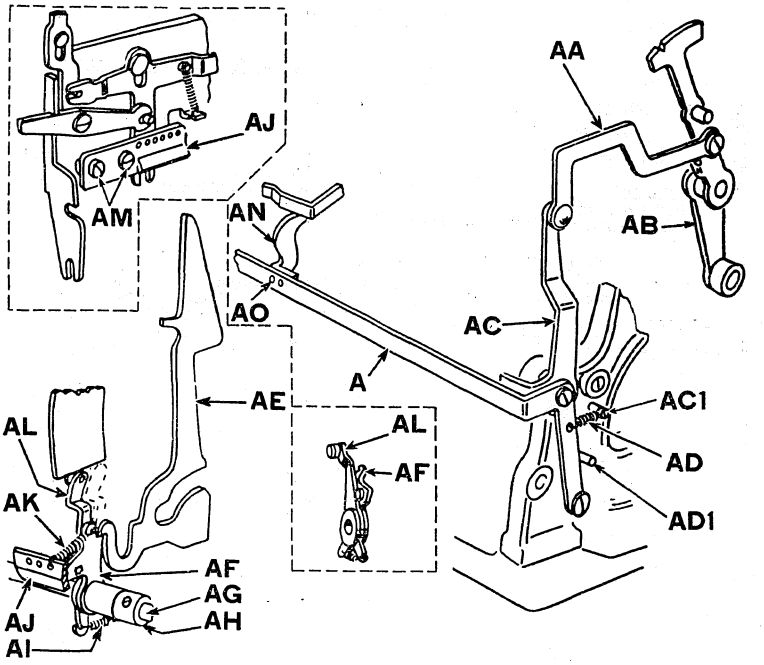
A **1-1102 Fte. 209 Style 13, 17**
B **1-1101 Fte. 209**
C **1-1107 Fte. 209 No. 1**
D **1501AR or AL Fte. 209** Stud, 633¼ sleeve
E **10180**
F **31-990 P. 10 No. 1**
G **506 Fte. 209**
H **1103 Fte. 209**
I **3960**



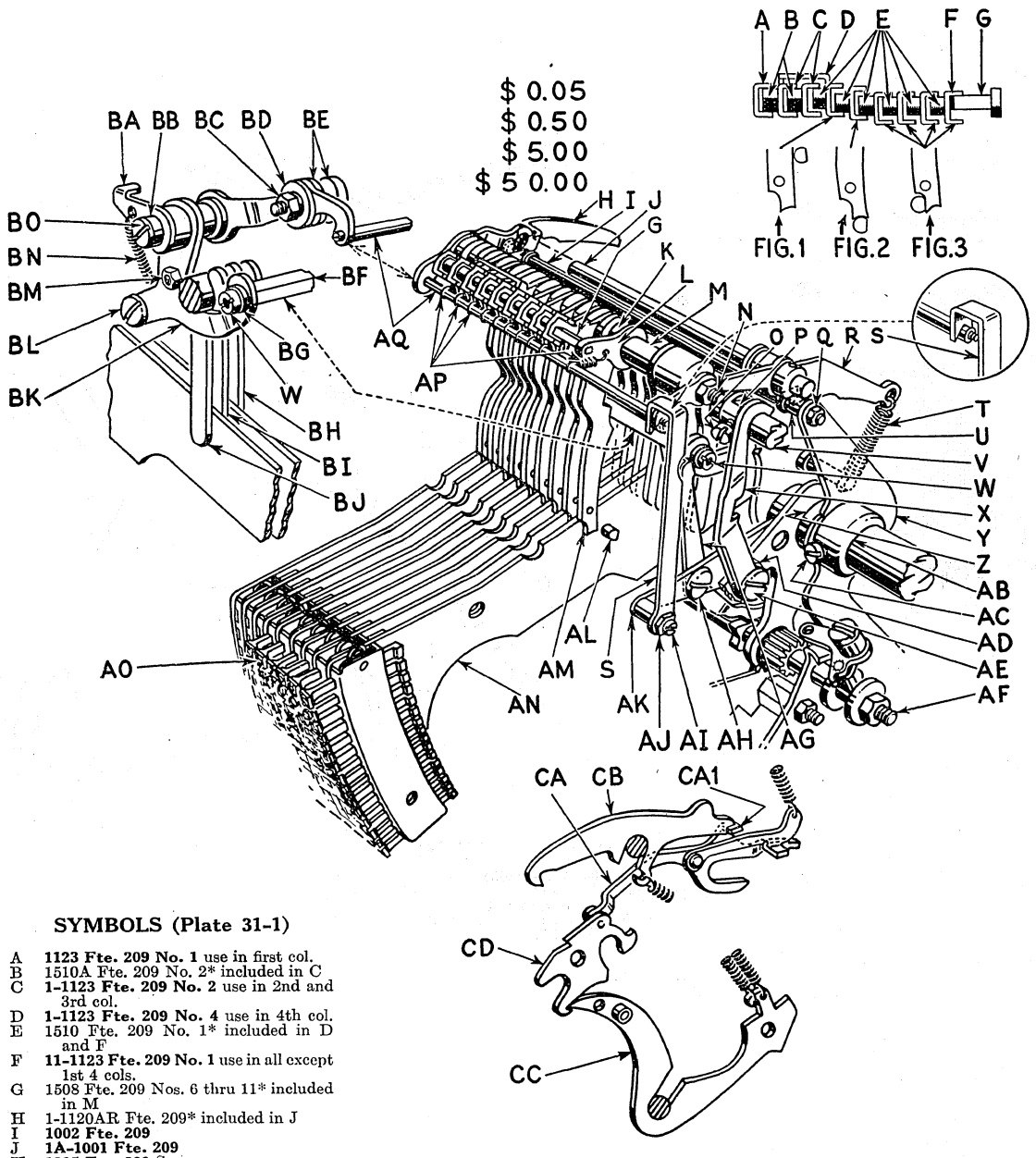
SAFEGUARD SYMBOL PRINTING CONTROL (Plate 31)

SYMBOLS (Plate 31)

A **105A Style 17 Env. 508**
AA **101 Env. 508** included in AC
AB **1-205002 Style 17 Env. 508**
AC1 **1062½**
AD **4489 (83800A)**
AD1 **3350⅜**
AE **110A Env. 508**
AG **207013 Style 17**
AH **542½** Collar, 7562 screw
AI **800 Env. 508**
AK **801 Env. 508**
AM **2851⅞** Screws, 303 Env. 508 collars
AN **107A Env. 508**
AO **4458¾**



SAFEGUARD SYMBOL PRINTING MECHANISM STYLE 2 (Plate 31-1)



SYMBOLS (Plate 31-1)

A **1123 Fte. 209 No. 1** use in first col.
B 1510A Fte. 209 No. 2* included in C
C **1-1123 Fte. 209 No. 2** use in 2nd and 3rd col.
D **1-1123 Fte. 209 No. 4** use in 4th col.
E 1510 Fte. 209 No. 1* included in D and F
F **11-1123 Fte. 209 No. 1** use in all except 1st 4 cols.
G 1508 Fte. 209 Nos. 6 thru 11* included in M
H 1-1120AR Fte. 209* included in J
I **1002 Fte. 209**
J **1A-1001 Fte. 209**
K **1315 Fte. 209** Spacer
L **1-1118 Fte. 209 Nos. 6 thru 11**
M **1310 Fte. 209**
N **1004 Fte. 209** Shaft, 47 nut
O **654⅞** Screw
P **1-644⅛ No. 3** includes O
Q **47¼**
R 1-1120AL Fte. 209* included in J
S **1125 Fte. 209**
T **709812**
U **1316 Fte. 209** Collar, 2 req.
V **1-602 Style 17** Shaft assembly without reg. total and/or sub. total, carriage controlled
21-205000 Style 17 (31-205000 Style 17) Shaft assembly with reg. total and/or sub. total, carriage controlled
W **1318 Fte. 209** Threaded collar, 75210 washer
X **1121L Fte. 209**
Y **617½ No. 2**
Z **1308 Fte. 209** Collar

AB **1307 Fte. 209** Set collar
AC **653¾** Screw
AD **1312 Fte. 209** Eccentric
AE **1507 Fte. 209** with rotary
1511 Fte. 209 without rotary
AF **10701B No. 1 Style 17** Specify machine No.
AG **1-1117A Fte. 209**
AH **702655**
AI **79505**
AJ **209302**
AK **1-207100AL No. 2**
AL **654¾** included in AN
AM **11-1123 Fte. 209 No. 1**
AN **21-611F No. 7R, 8R,** for col. 1, 2
1-611G No. 2 Specify offset for all other safeguard col.
AO **618A** Specify number, included in AN
AP **9586,** 10 req.
AQ **1003 Fte. 209**
BA **20 No. 107**

BB **79326** Collar
BC **47** Nut, 1097⅞ lock washer
BD **1313 Fte. 209** Spacer
BE **1314 Fte. 209** Spacer, 11 req.
BF **1005 Fte. 209**
BG **75210** Washer
BH **625 No. 2 (.111, .113)** 16 req.
BI **625⅝ No. 2**
BJ **625R No. 2,** 625L No. 2 for left side
BK **1-1124R Fte. 209**
BL **103522A** Screw, shown
8054¾ Screw, use on 1-1124L Fte. 209, not shown
BM **45**
BN **77879**
BO **103519** Screw
CA **710¼ No. 17** included in CD
CB **718 No. 34 thru 38**
CC **1-716 No. 3**
CD **191-717 No. 6** Complete assembled coupler, see Plate 54 for other styles

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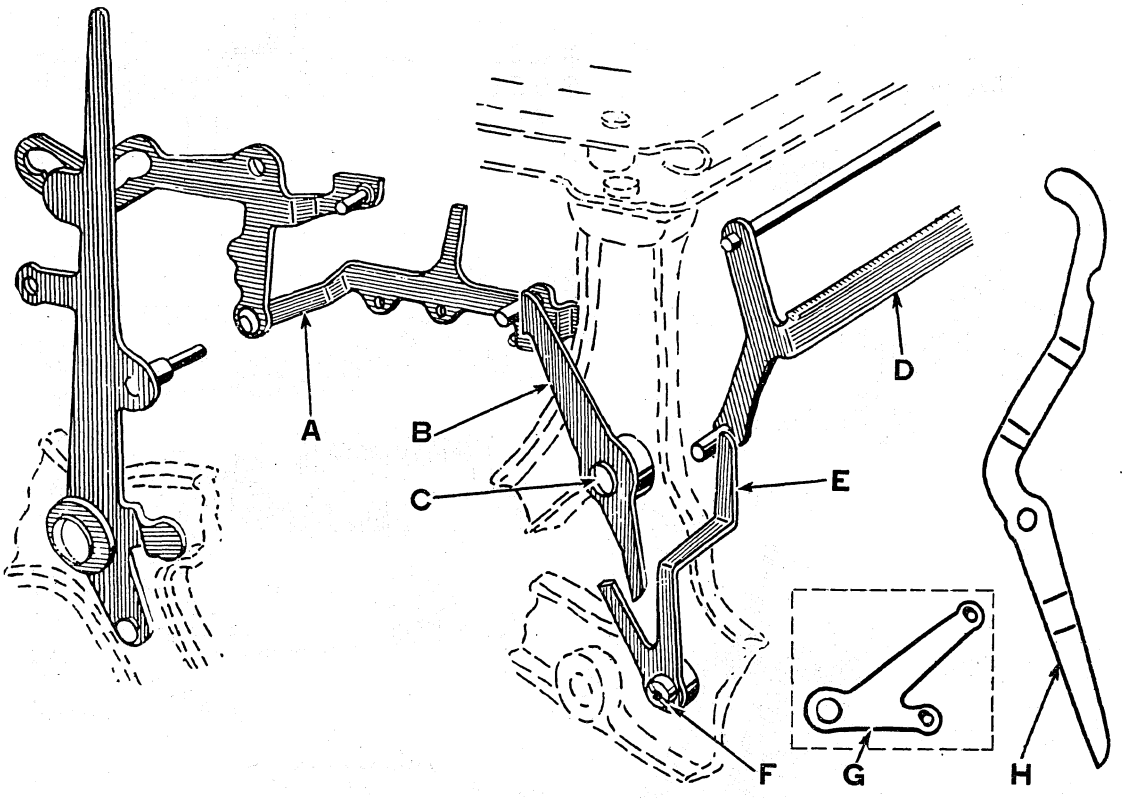
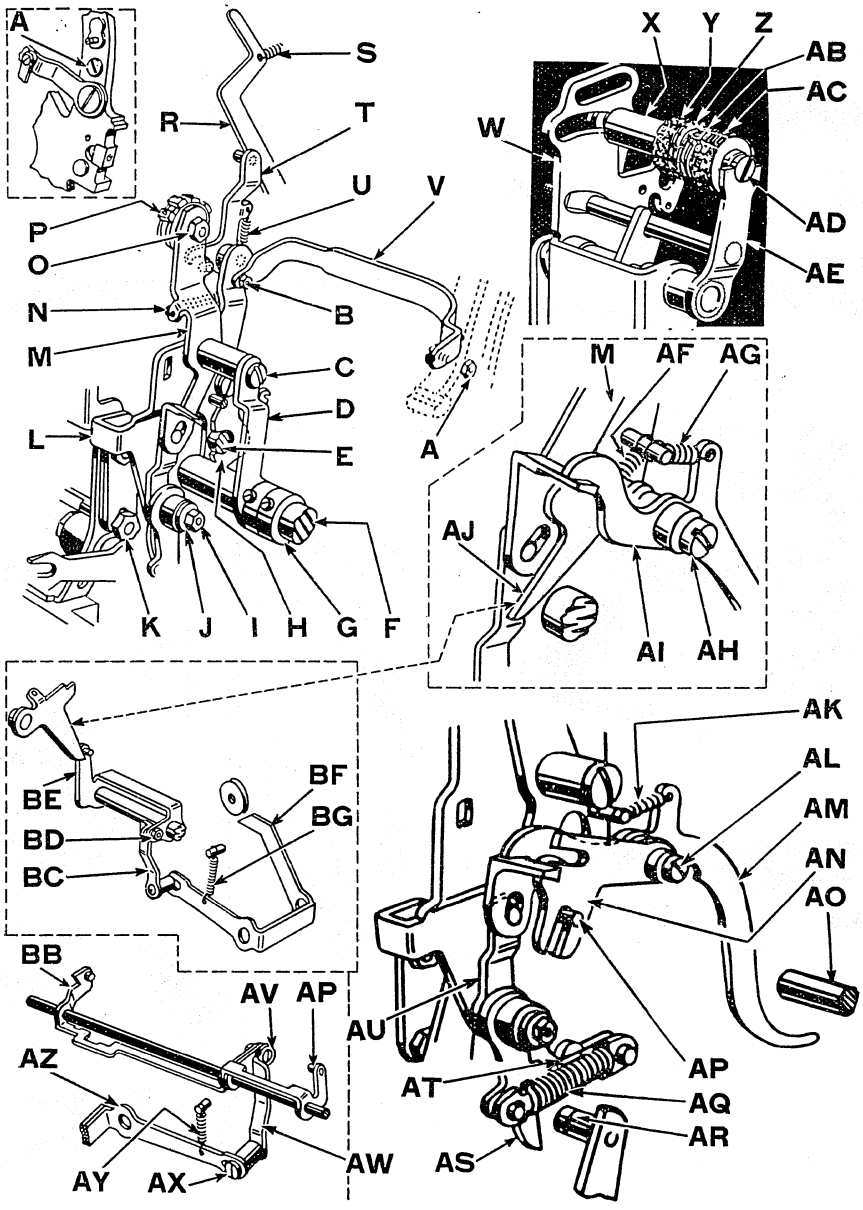
SAFEGUARD SYMBOL PRINTING MECHANISM DISABLED BY REGISTER TOTAL INDEXING LEVER (Plate 32)



SYMBOLS (Plate 32)

A **1A-62103 (11A-62103)**
B **1-17⅝ Fte. 124**
C **12059⅜ Screw, 46 nut**
D **1-17¼B Fte. 124 Style 13, 17**
E **1-17½ Fte. 124**
F **33 Fte. 124**
G **1-60150A**
H **60151**

ROTARY CALENDAR FEATURE, CARRIAGE CONTROLLED (Plate 33)



SYMBOLS (Plate 33)

A **73618, 46** Nut
B **530 Fte. 217, 46** Nut
C **2855⅜**
D **1-147 Fte. 217**
E **205003 Style 17**
F **1-205001A Style 13, 17**
G **1-205308**
H **169 Fte. 217 No. 1** without ribbon shift from subtract
169 Fte. 217 No. 2 with ribbon shift from subtract
I **46**
J **824¼** Collar, 1097¾ washer
K **709¾ Style 13, 17**
L **1-100 Fte. 217 No. 2**
M **1-101 Fte. 217 No. 2**
N **10080**
O **45** Nut, 1097¼ washer
P **1-2B Fte. 217 No. 3** wheels unit complete
R **128 Fte. 205 Env. 695A No. 2**
S **283A**
T **1-149 Fte. 217**
U **203803 (480¼)**
V **148 Fte. 217**
W **1-100 Fte. 217 No. 3**
X **305 Fte. 217 No. 2**
Y **21-75311 No. 2 (31-75311A No. 2)** Years
Z **11-75311 No. 2 (11-75311A No. 2)** Units of days
AB **1-75311 No. 2 (1-75311A No. 2)** Tens of days
AC **1-75311 No. 1 (1-75311A No. 1)** Months
AD **2B Fte. 217 No. 4**
1-2B Fte. 217 No. 4 Wheels unit complete
AE **1-101½ Fte. 217**
AF **44805**
AG **806 Fte. 217**
AH **73607** Screw, 72512½ collar
AI **1-163 Fte. 217**
AJ **1-165 Fte. 217**
AK **806 Fte. 217**
AL **73607** Screw, 72512½ collar
AM **1-162 Fte. 217**
AN **1-100 Env. 1396 (1-151 Fte. 217 No. 1)** Specify machine number
1-151 Fte. 217 No. 1, 2 or 3 Specify machine number
AO Dashpot shaft
AP **Stud in 1-110 Fte. 217 Style 17 No. 2**
AQ **1-801 Env. 695A**
AR **12035** Roller, 12060¼ stud
AS **1-102½ Fte. 217 No. 1**
AT **547 Fte. 217, 46** Nut
AU **1-156 Fte. 217**
AV **259½** Screw, 46 nut
AW **1-111 Fte. 217 (1-111A Fte. 217)**
AX **8054¾**
AY **10086**
AZ **200180A**
BB **1-110B Fte. 217 Style 17 Env. 1396 or 1-110 Fte. 217 Style 17 No. 1**
BC **1-111 Fte. 217 (1-111A Fte. 217)**
BD **259½** Screw, 46 nut
BE **1-110 Fte. 217 Style 17 No. 2**
BF **200180A**
BG **10086**

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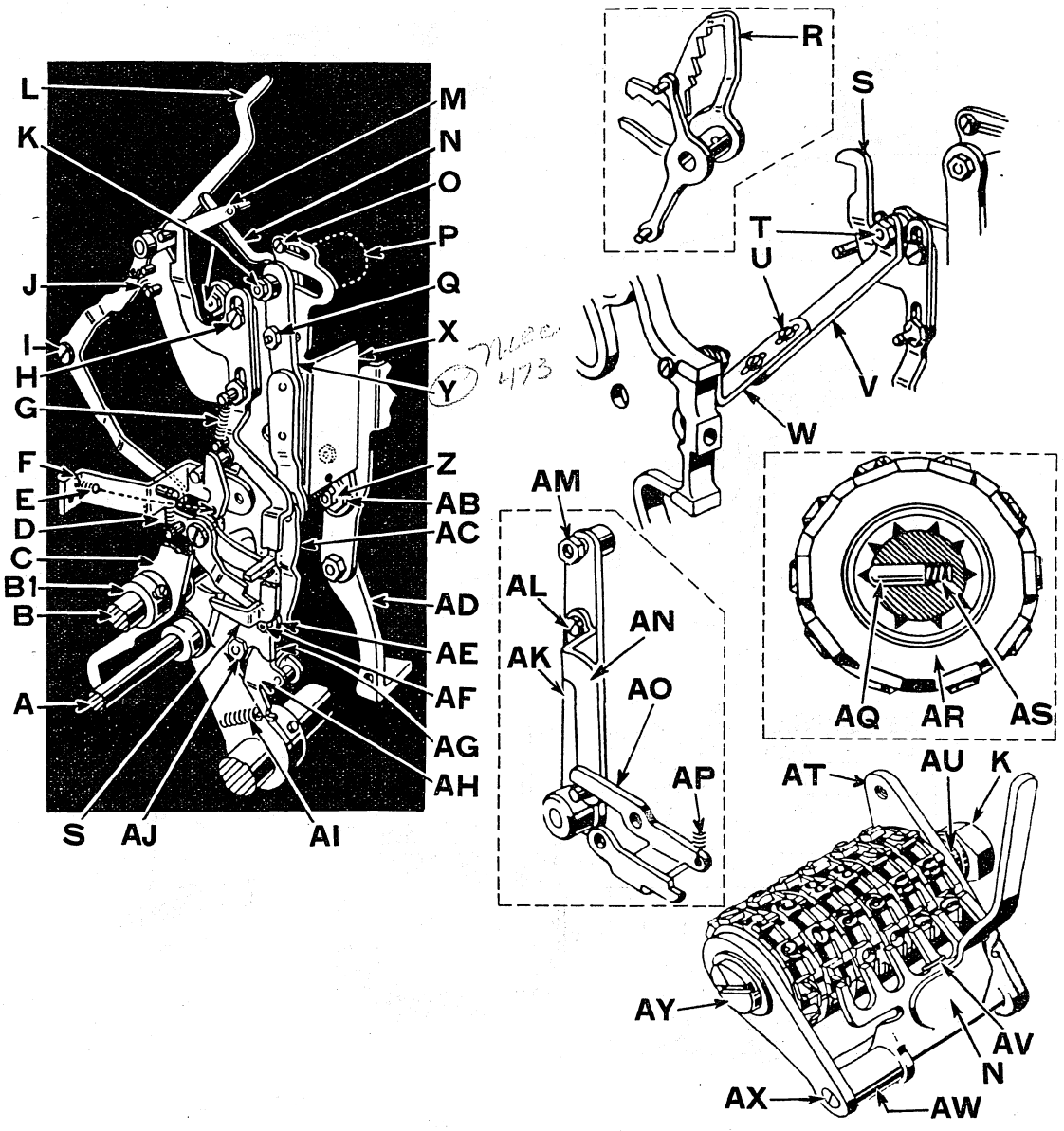
ROTARY CONSECUTIVE NUMBERING DEVICE, CARRIAGE CONTROLLED
(Plate 34)



A **60004 Style 13, 17**
B **1-5A Fte. 217 Style 17**
B1 **1-205308**
C **1-146A Fte. 217 Style 17**
D **1-128A Fte. 217 Env. 925 (1-128A Fte. 217)** use 12083 spring
E **780½**
F **1-121B Fte. 217**
G **3981**
H **12060½**
I **950¾**
J **7480B**
K **45**
L **1-119A Fte. 217**
M 1-152 Fte. 217* included in 1-100 Fte. 217 No. 3
N 136 Fte. 217* included in AV
O **501 Fte. 217**
P **1-2B Fte. 217 No. 1** Wheels unit complete
Q **47**
R **31-67111** Regular

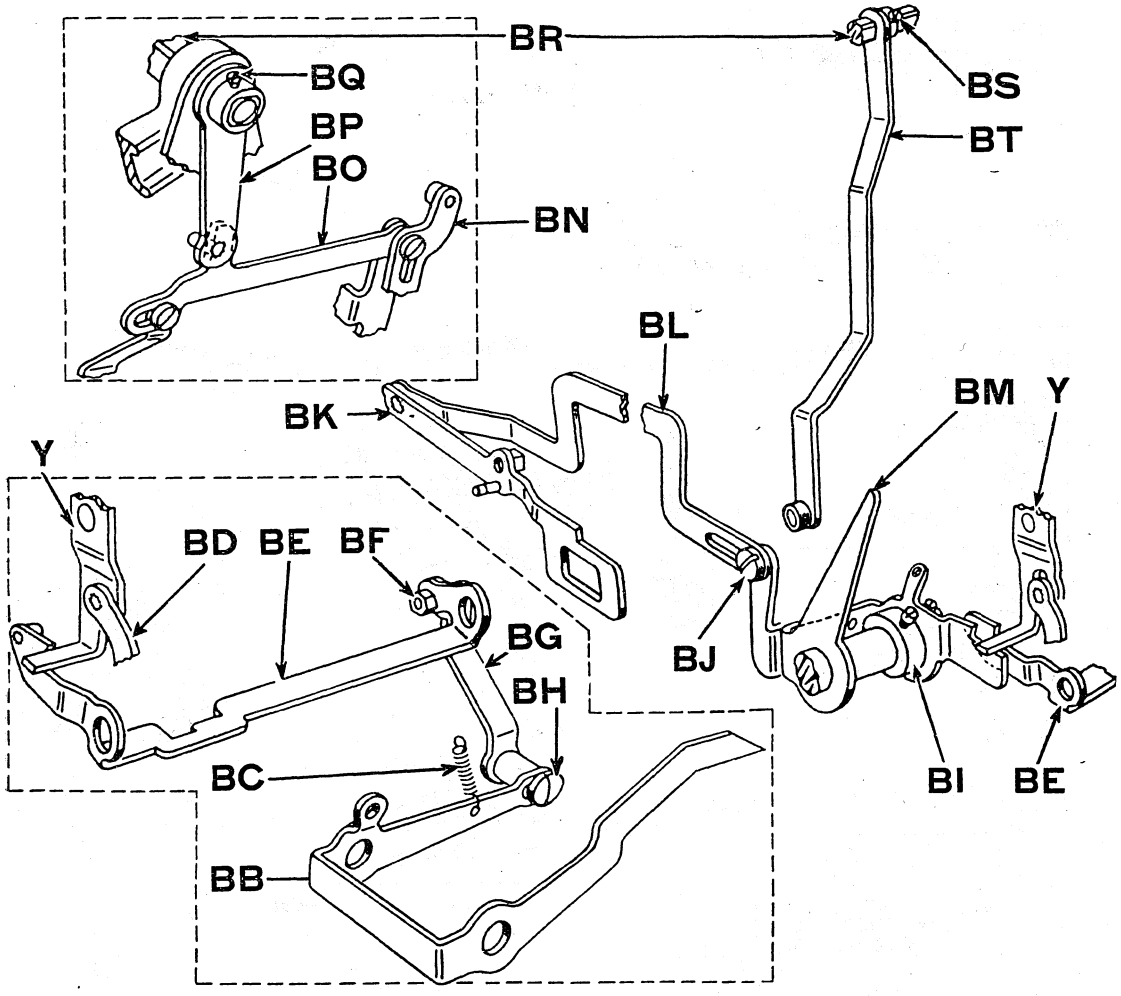
SYMBOLS (Plate 34)

41-67111 for closed account feature specifying symbol printing control
51-67111 for register non-add key to print same as register sub-total

S **1-105A Fte. 217 Env. 1396**
T **45**
U **75602 and 46** Nut
V **108 Env. 1396** for Style 13
121½ Fte. 217 Style 17
W **108 Style 13 Env. 1396**
121¾ Fte. 217
X **1-100 Fte. 217 No. 3**
Y **107½ Fte. 217** Upper segment
Y1 **1-101 Fte. 217 No. 3** Lower segment
Z **3 Fte. 69 Style 17** Screw, 45 nut
AB **3415¼**
AC **1-102A Fte. 217**
AD **726R Style 17**
AE **500A Fte. 217**
AF **3826½** Washer, 46 nut
AG **1-803 Fte. 213 No. 2**
AH **1-103A Fte. 217 Style 13, 17 Env. 925**
AI **1-803A Fte. 217 (1-200826)**
AJ **46 Nut, 533 Fte. 217 Eccentric**
AK **21-67004 Style 17, 1-104½ Fte. 217 No. 2**
AL **73612**
AM **731¾**
AN **1-104½ Fte. 217**
AO **104A Fte. 217**
AP **3688**
AQ **511 Fte. 217**
AR **314 Fte. 217 (86311 No. 2)**
AS **800 Fte. 217**
AT **130B Fte. 217 (130C Fte. 217, 516B Fte. 217, 351 Fte. 217, 21 No. 7)**
AU **1097¼**
AV **1-138A Fte. 217**
AW **331 Fte. 217**
AX **516A Fte. 217**
AY **2B Fte. 217 No. 1**

SEE EXPLANATION ON INSIDE OF FRONT COVER

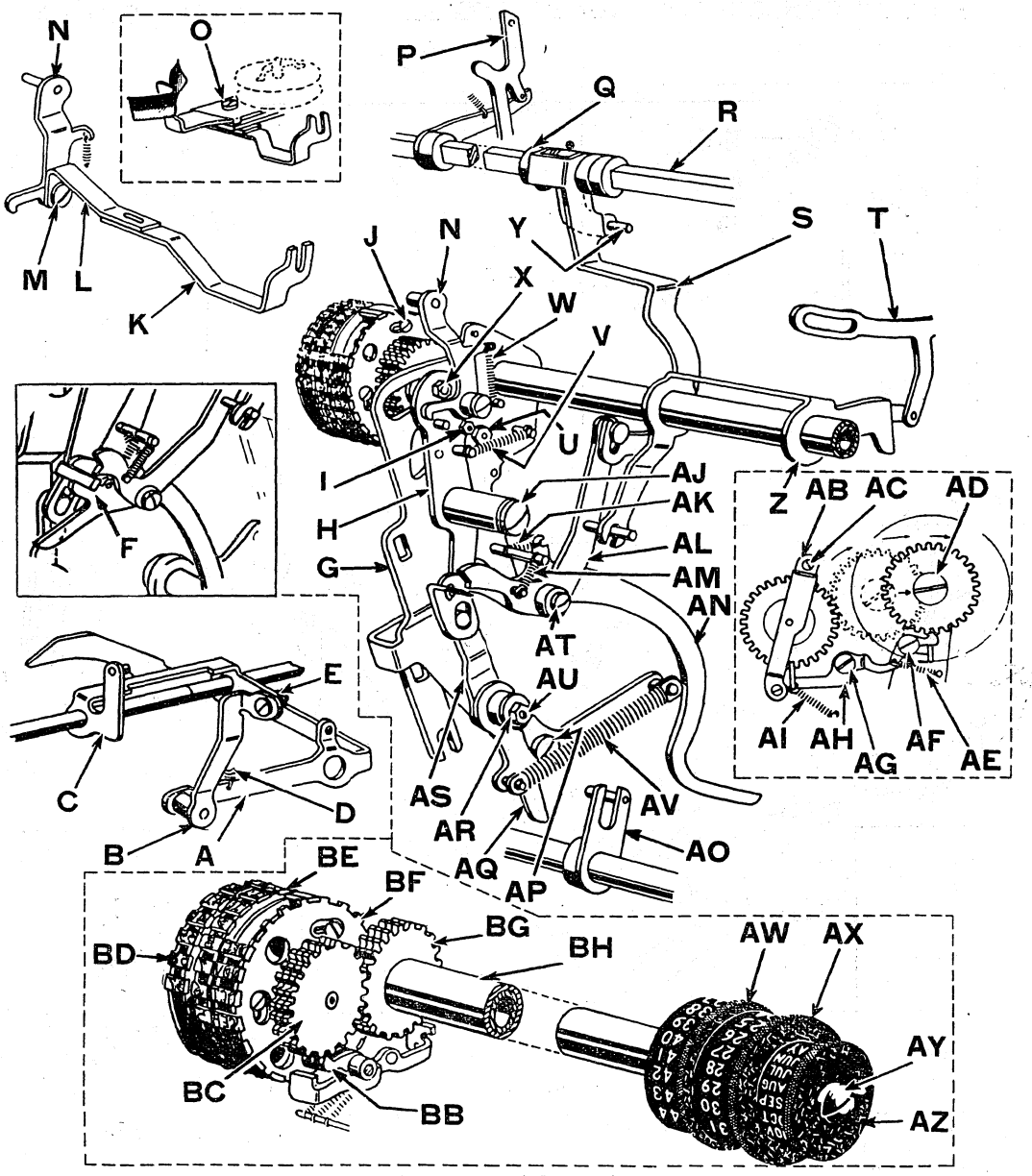
ROTARY CONSECUTIVE NUMBERING DEVICE CONTROLS (Plate 35)



SYMBOLS (Plate 35)

Y **1-101 Fte. 217 No. 3**
BB **12110 No. 10**
BC **10086**
BD Included in Y
BE **1-110A No. 2 Style 17 Fte. 217**
BF **259½** Screw, 46 nut
BG **1-111 Fte. 217 (1-111A Fte. 217)**
BH **8054¾**
BI **1-304 Fte. 217**
BJ **259½**
BK **1A-116 Env. 427F**
BL Included in BK
BM **1-106A Fte. 217 Style 17** Specify machine number
BN **1-200152½**
BO **11-200138½**
BP **1-12024 No. 31**
BQ **72573**
BR **1-12007 Style 17 No. 1 (1-12007 No. Style 17, 1-540)**
BS **72573**
BT **1-12024 Style 17 No. 32A**

ROTARY CALENDAR FEATURE, QUICK SET (Plate 36)

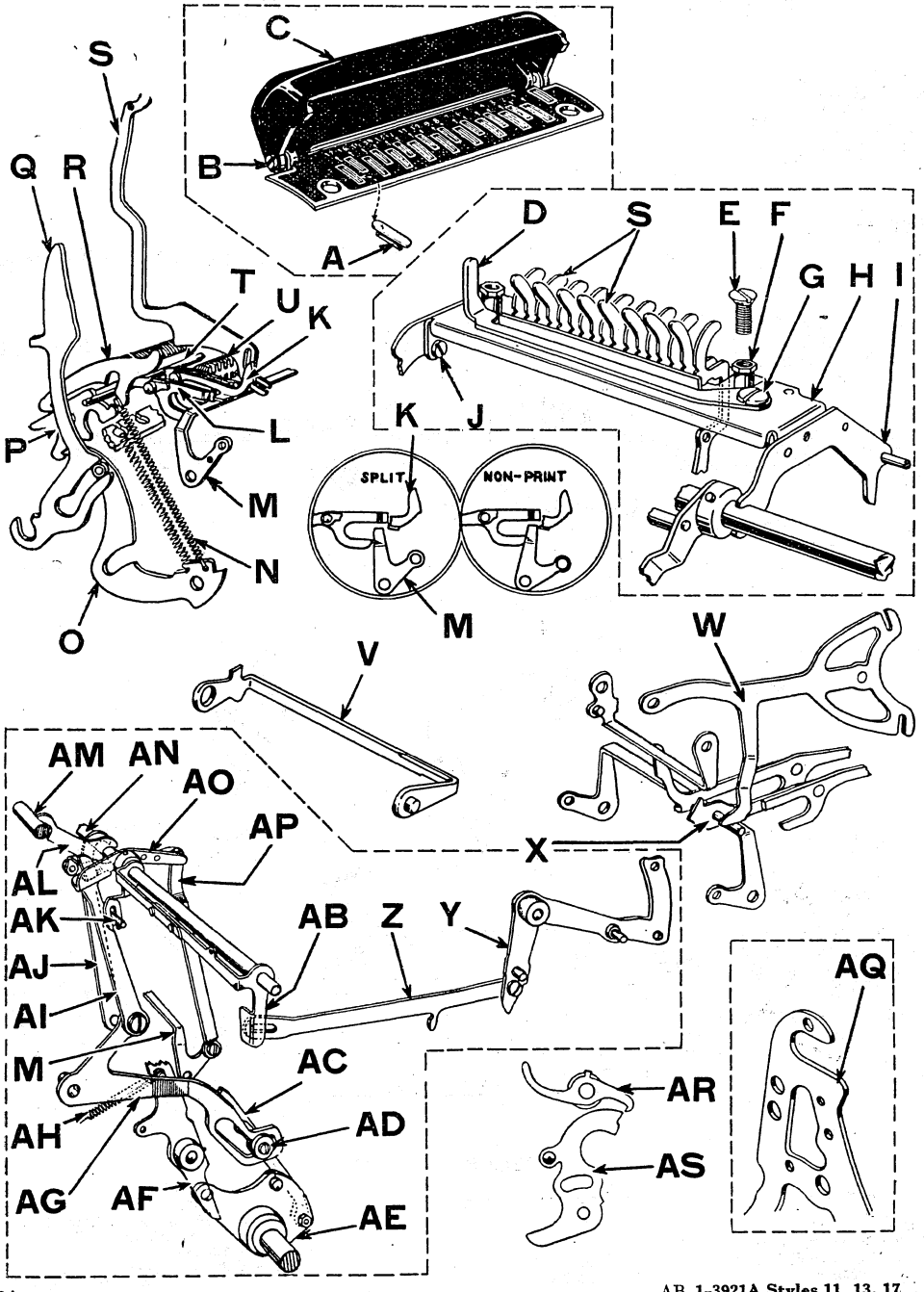


SYMBOLS (Plate 36)

A **12110 No. 10 or 12110 No. 12** used with skip tab stop block
B **1-111 Fte. 217 (1-111A Fte. 217)**
C **1-110 Fte. 217 Style 17 No. 2**
D **10086**
E **259½** Screw, 46 nut
F **1-165 Fte. 217**
1-128 No. 2 Env. 695A
G **1-100 Fte. 217 No. 4**
11-100A Env. 695A
H **1-101 Fte. 217 No. 4**
I **46,** 1097¾, 160 Fte. 217, 541 Fte. 217, 540 Fte. 216
J **545 Fte. 217**
K **168 Fte. 217**
L **167 Fte. 217**
M **8054¾**
N **1-166 Fte. 217**
O **548 Fte. 217 (1511 Fte. 209)**
P Motor bar, upper
Q **1-540**
R **1-12007 Stylo 13 No. 1 (1-12007 Style 13 No. 4, 1-540)**
1-12007 Stylo 17 No. 1 (1-12007 Style 17 No. 4, 1-540)
S **12024 No. 11**
T **1-202225**, **11-202225**, **(21-202225)** Used with C.F. totals and sub-totals, cge. controlled for positive and negative balances
U **44504** Screw, 104310 nut
V **75819**
W **480¼**
X **536 Fte. 217** Screw, 47 nut, 1097⅛ washer
Y **1-12024 No. 9**
Z **130 Env. 695A**
AB **157 Fte. 217**
AC **952¾**
AD **536 Fte. 217**
AE **805 Fte. 217**
AF **514 Env. 695A (540 Fte. 216)**
AG **44504**
AH **159 Fte. 217**
AI **489**
AJ **2855⅜**
AK **806 Fte. 217**
AL **1-163 Fte. 217** used when printing is disabled from total or auxiliary bar
1-122 No. 2 Env. 695A used when printing from total or auxiliary bar
AM **44805**
AN **1-162 Fte. 217**
AO Part of 52-60000 Style 17*
AP **547 Fte. 217, 46** Nut
AQ **1-102½ Fte. 217 No. 2**
AR **824¼**
AS **1-156 Fte. 217**
AT **73607** Screw, 72512½ collar
AU **46** Nut, 1097¾ washer
AV **1-801 Env. 695A**
AW **1-335 Fte. 217 No. 3**
AX **1-335 Fte. 217 No. 2**
AY **535 Fte. 217 No. 2**
AZ **1-335 Fte. 217 No. 1**
BB **158 Fte. 217 No. 1**
158 Fte. 217 No. 2
158 Fte. 217 No. 3
BC **338 Fte. 217 No. 1** Years
338 Fte. 217 No. 2 Dates
338 Fte. 217 No. 3 Months
BD **1-340 Fte. 217 No. 1** Years
BE **1-340 Fte. 217 No. 2** Dates
BF **1-340 Fte. 217 No. 4** Months
BG Part of BH
BH **1-7 Fte. 217 No. 3** Year tube
1-7 Fte. 217 No. 2 Dates tube
1-7 Fte. 217 No. 1 Months tube

SEE EXPLANATION ON INSIDE OF FRONT COVER

UNLIMITED SPLIT MECHANISM (Plate 37)



A **3929¾**
B **3954¼**
C **3990 Styles 11, 13, 17**
D **3928A Styles 9, 11, 17**
E **3952½**
F 3936A* and 3936½ Bushings
G **3960** Screw, 46 nut
H **1-3920A Styles 9, 11, 13, 15, 17** includes D, F, G, I
I **3912**
J **952¾**
K **1-729¾ No. 6** included in L
L **710¼ No. 7** Complete assembly 11-717 No. 6, includes K, P
M **3927 Styles 11, 13, 15, 17**
N **780¼**
O **1-716Z**
P **1-717 No. 6** included in L, see Plate 54 for other styles

SYMBOLS (Plate 37)

Q **715A (715B No. 1)** Early style
715 No. 4 (715B No. 4) Late style
R Refer to AK, Plate 4, for symbols
S **3915½** Four front controlling strips
3915½L One extreme left controlling strip, front
3916½ Four rear controlling strips
3916½L Extreme left rear controlling strip in SKS
T **708½ Styles 7, 9, 11, 13, 15, 17**
U **3906 Styles 9, 11, 13, 17**
V **1-3912½ Styles 11, 13, 17**
W **1-3928⅞**
X **1-729⅛ No. 7**
Y **1A-227DL**
Z **1B-226¼D**

AB **1-3921A Styles 11, 13, 17**
AC 1-729* Early style
729B (729 No. 2) Later
AD **3930A** Roller, 3952A screw
AE 1A-823 Style 9, 17*
AF 1-711L Style 9, 15*
AG **1-3913B**
AH **785 Style 9, 15**
AI **1-3920½** uses screw 2853¾
AJ **1-3919½ Style 15** includes AL
AK **3956**
AL **3919¼ Style 15** included in AJ
AM 503*
AN **1-3902A Styles 7, 9, 11, 13, 15, 17**
AO 3923L*
AP **3911½AL or AR**
AQ **1-3910R or L**
AR **1-714A**
AS **1-713AR Style 9**

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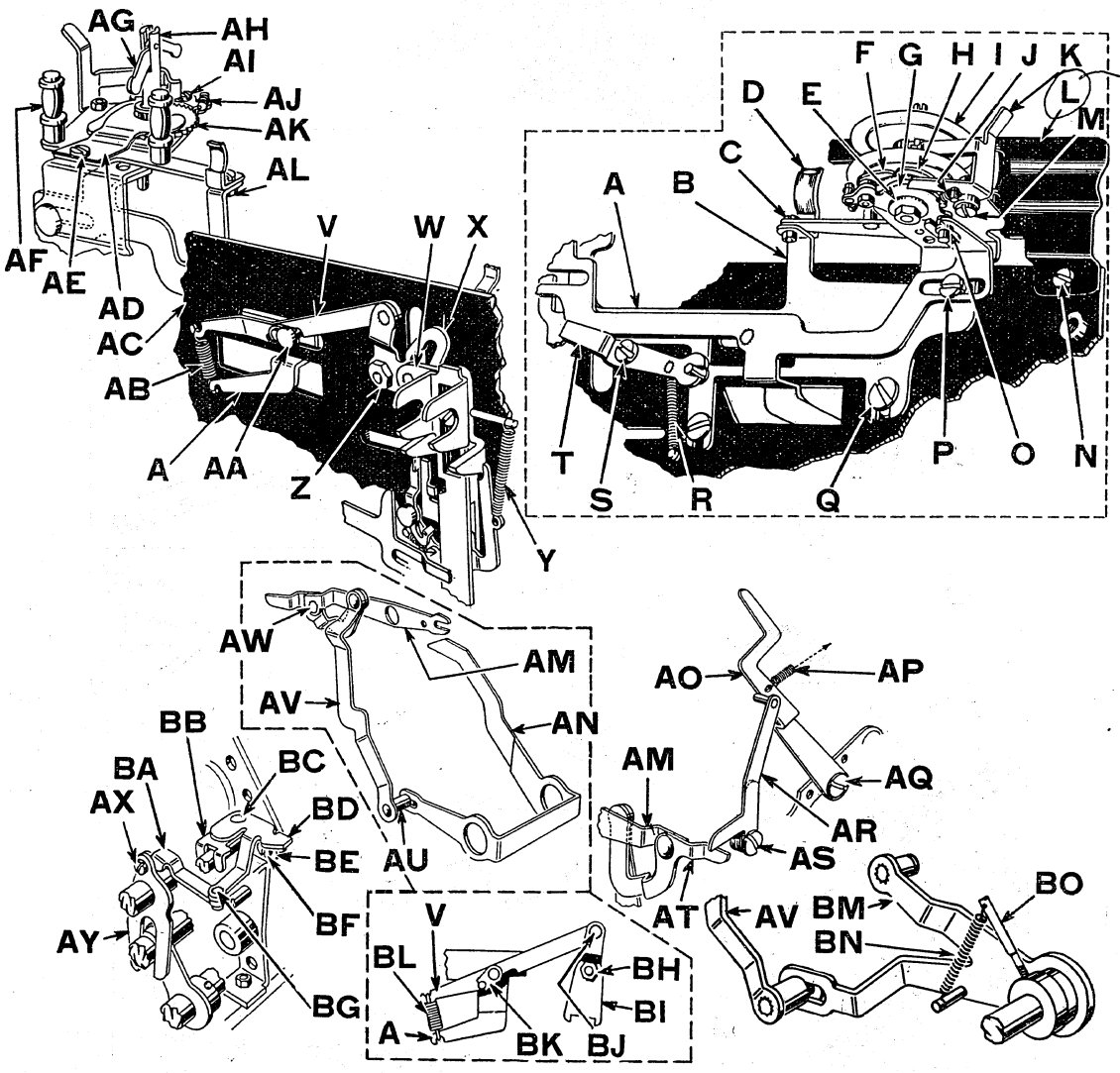
CROSSFEED RIBBON MECHANISM CLASS 20—LATER STYLE (Plate 38)



SYMBOLS (Plate 38)

A **1-205109 No. 2 Style 13, 17**
B **1-205118 Style 13, 17 No. 2**
C **75602** Screw and 46 nut
D **1-205102R Style 13, 17 No. 2** includes 205517 No. 2 stud, 205307A roller and 1026 washer
E **7521½** Washer
F **9515½A**
G **1-205137R**
H **9515¾R (9515¾A, 9551)**
I **1-205126** Spool only
J **44808**
K **1-205138R (1-205138AR)**
L **200122 No. 2 Style 13, 12″ or 18″**
200122 No. 2 Style 17, 12″ or 18″
M **72647 (200565½)** 46 Nut
N **2850⅜**
O **9546**
P **9052½**
Q **8054¾**
R **79813 No. 2**
S **205529A**
T **1-205121 No. 2**
V **1-205112 No. 2**
W **1-12010⅞ Style 13, 17 No. 2**
X **1-205113A No. 2**
Y **3280⅛**
Z **104310**

AA **205526** included in A
AB **3883A**
AC **1-12012½ Style 13, 17 No. 21A** Specify machine number
AD **205104 No. 2**
AE **7356½**
AF **205307A** included in B
AG **205105** included in AH
AH **1-205501 No. 2**
AI **79565**
AJ **9586**
AK **1A-9516R**
AL **46** Nut, 75602 screw
AM **205127 No. 2 Env. 1609**
AN **200180A**
AO **128 Fte. 205**
AP **384A**
AQ **509 Fte. 205**
AR **1-130 Fte. 205**
AS **3960**
AT **103 Env. 1609**

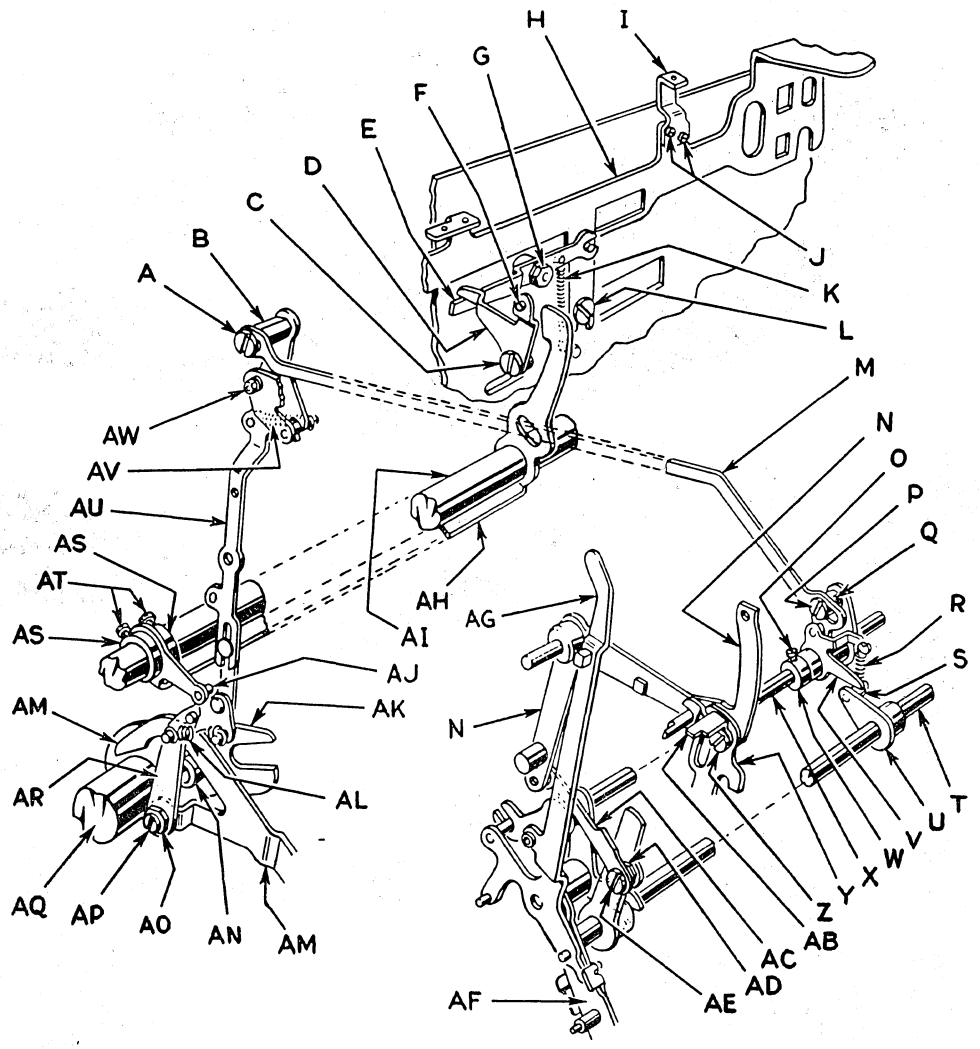
AU **200538**
AV **1-200208 Env. 1609 No. 2** includes AM, AT and AW
AW **7262½**
AX **205522** Screw, 46¼ nut
AY **1-205133** includes BD, BB, BC, BA, BG, AX
1Z-205133 includes 1097¾ washer, 205522 screw, 46 nut

BA **205134**
BB **205136**
BC **81515**
BD **205135**
BE 710* see list, Plate 3
BF **950⅝**
BG **205523**
BH **205317** Eccentric
BI **1-205113 No. 2**
BJ **205528**
BK **205114 No. 2** included in V
BL **3883A**
BM **1-200180 No. 2**
BN **72826**
BO **1-200369**

SEE EXPLANATION ON INSIDE OF FRONT COVER

4 -- 200122 (12") Qty 17 #3
guide for 301707

RIBBON SHIFT, CONTROLLED THROUGH THE COUNTER CONTROL LEVER AND THE TOTAL KEYS (Plate 38-2)



SYMBOLS (Plate 38-2)

A **8054¾**
B **205544** post, use 1097¾ washer and 46 nut
C **204502**
D **1-205124 No. 6** includes F
E **1-205121 No. 2**
F 264¾* included in D
G **104310** nut, 2 required, use 205529Å screw
H **1-205118 Style 17 No. 8**
I **205118¼**
J **74533**
K **7283A Style 10**
L **8054¾**
M **205144**
N **1-62127**
O **7562**
P **100564**
Q 200300* included in 1-10617½
R **10085**
S 72502¾* included in U
T **21-205002 Style 17** includes U
U 1-205145* included in T
V 1-10617* included in X
W **542½**
X **11-10601¼ Style 17** includes Q, V, W
Y **1-69111 No. 2**
Z **9052½**

AB **69111¼**
AC **1416 No. 3**
AD **203495** eccentric
AE **4456½** screw, use 1097¾ washer and 46 nut
AF **1-60161**
AG **1-60110 No. 2**
AH **1-205122 No. 4** includes AJ
AI **1-205001A Style 17**
AJ 3464⅞* included in AH
AK 1-117A Style 15* included in AQ
AL **108804 No. 3**
AM **1-205149**
AN **12038⅛** roller, use 3454⅝ stud
AO **209302** eccentric
AP **2854⅜**
AQ **42A-60000 Style 17** includes AK
AR **1-205147** includes AL
AS **1-205312** includes AT
AT **550¾**
AU **1-205146**
AV **10686½** spring
AW **46** nut, use 1097¾ washer and 12059⅜ screw

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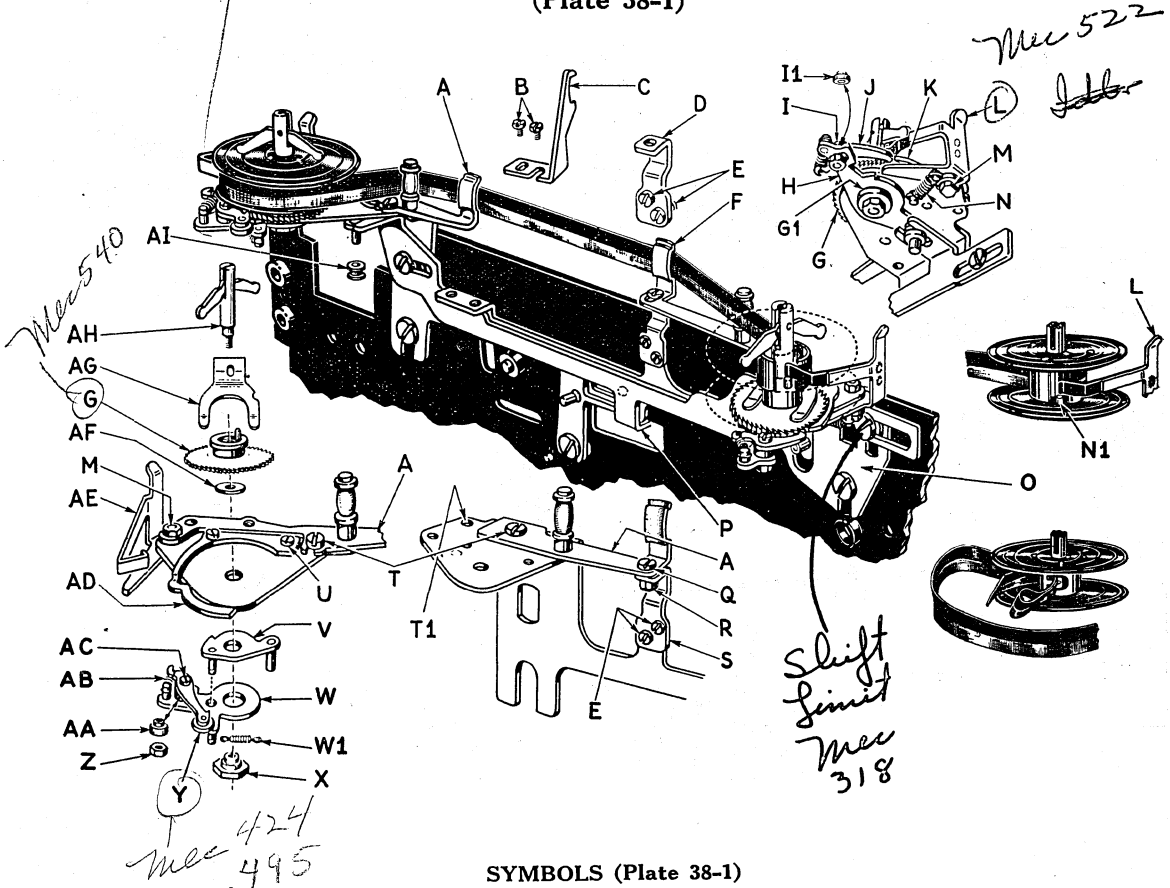
CROSSFEED RIBBON MECHANISM—IMPROVED CLASSES 20 THRU 30
(Plate 38-1)



SYMBOLS (Plate 38-1)

NOTE: See text for parts necessary to install this mechanism.

A **1-205102L Style 17 No. 6** without rotary
1-205102L Style 17 No. 7 with rotary on left
1-205102L Style 17 No. 2 with rotary on right, early style as shown in lower center illustration
1-205102AL Style 13 No. 2 for Style 13, also for Style 17 with rotary on left, equipped with early style slide "O"

B **952¾** with rotary on left
C **205118½AL No. 2** with rotary on left
205118½AR No. 1 with rotary on right
D **205118¼** for Style 17
E **74533** for Style 17
F **1-205102R Style 17 No. 2** for Style 17
1-205102R Style 13 No. 2 for Style 13
205102R No. 3 with rotary on right
G **1A-9516L,** 2 req.
G1 **9547** New style, bushing
H **1-205137R**
I **79565** Screw, 49¼ nut
I1 **9548**
J **9515½A**
K **205115¾R**
L **1-205138AR**
M **205537,** 2 req.
N **89801**
N1 Description only
O **1-205118 Style 17 No. 7**
1A-205118 Style 13 No. 2
P **1-205109 Style 17 No. 3**
1-205109 Style 13 No. 3 (1-205109 No. 2 Style 13)
Q **75602**
R **46**
S **100L Env. 3092** with rotary on right, early style
T **7356½**
T1 Description only
U **9551,** 2 req.
V **1-205137AL**
W **1-205137½**
W1 **12085½**
X **205447**
Y **1-205115½**
Z **49¼**
AA **205448** Collar
AB **9586** Spring
AC **73562**
AD **205115¾**
AE **1-205138AL**
AF **7521½**
AG **205104 No. 3**
AH **1-205501 No. 2**
AI **9546**

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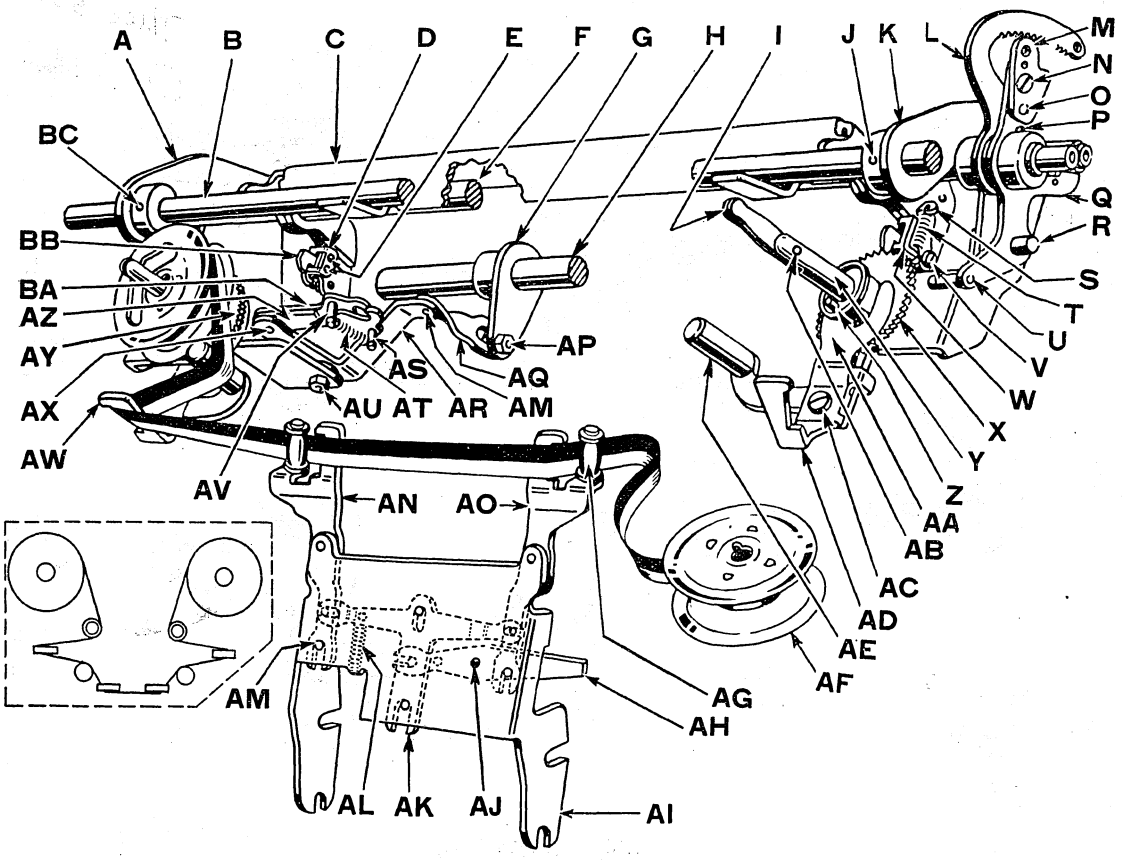
RIBBON MECHANISM, CROSSFEED—EARLY STYLE CLASS 20 (Plate 39)



SYMBOLS (Plate 39)

A **1-205100AR*** included with B

B **1-205000 Style 13, 17** includes right and left arms pinned to shaft, two free arms and two collars with screws 7159 and one long collar with screw 550¾, for Cl. 20 thru 26
11-205000 Style 17 for Cl. 21 thru 30 with motor operated register total indexing lever, carriage controlled

C **1-205109A Style 13, 17** includes D, S, W and BB

D **205111R**

E **205508**

F NOTE: Specify style and machine number or submit forms for styles not listed.
1-202007 Style 13, 17 without folio repeat key, used with early crossfeed ribbon, Cl. 20 thru 30
11-202007 Style 17 3 Bank with folio and date repeat key, used with early crossfeed ribbon, Cl. 20 thru 30, 3 slots
11-202007 Style 17 4 Bank with folio and date repeat key, used with early crossfeed ribbon, Cl. 20 thru 30, 4 slots
21-202007 Style 13, 17 without folio repeat key, Cl. 11 thru 16, 20 thru 30
21-202007 Style 17 3 Bank with folio and date repeat key, Cl. 11 thru 16, 20 thru 30, 3 slots
21-202007 Style 17 4 Bank with folio and date repeat key, Cl. 11 thru 16, 20 thru 30, 4 slots
31-202007 Style 17 Folio repeat key controls both date and folio section, Cl. 11 thru 16, 20 thru 30

G 1-206100* included in H

H **1-206000 Style 13, 17** includes arms pinned to shaft, Cl. 21 thru 30
11-206000 Style 13, 17 for Cl. 21 thru 30 with item counters to count items added in register

I **205105**

J **63**

K 1-205100AL* included with B

L **1-10211AL** included with F

M **1-219¾B**

N **8064⅛**

O 250⅜*

P **59 (59¼)**

Q 1-219L No. 2* furnished with F

R **82502**

S **205110L**

T **44808**

U **250⅛** use spring 12085½

V **205504A**

W **205111L**

X **1A-9516L**

Y **1-205501B** includes 205502 pin, 205800 spring, 7521½ washer, 47 nut

Z **9555½**

AA **205104A**

AB **205511**

AC **7357½** for left side
73618 for right side

AD **1-205102AL** includes AE

AE **205517** Stud
205309 Roller

AF **1-205126** Spool only

AG **205516A** Post
205307A Roller

AH **1-205121 No. 2**

AI **1-205118A Style 13, 17** includes AG, AH, AJ, AK, AL, AM, AN, AO

AJ **8054¾**

AK **1-205120 Style 13, 17**

AL **75814** for Style 13
7285½A for Style 17

AM **263**

AN **1A-205119BR** includes AG

AO **1A-205119BL** includes AG

AP **3960** Screw, 46 nut

AQ **205113**

AR **1A-205112** includes AQ, AM, AS, AT, AV, AX, AZ and BA

AS **7259¼**

AT **205802 (83832)**

AU **205510** Screw, 47 nut

AV **8362¼**

AW **1-205102AR**

AX **205505 (300646)**

AY **1A-9516R**

AZ **1-205114BL**

BA **1-205114BR**

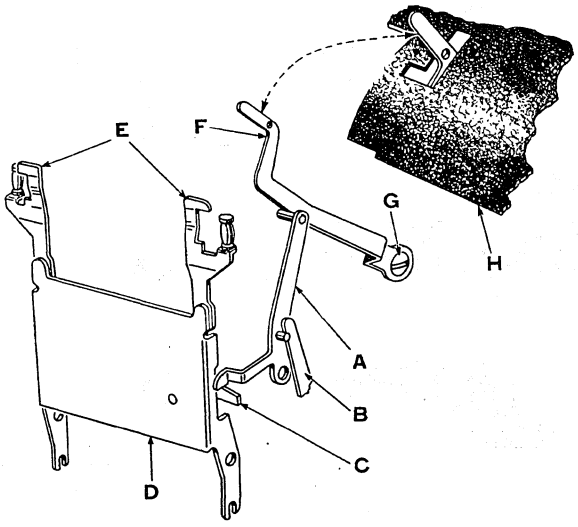
BB **205110R**

BC **63**

ITEMS TO PRINT IN RED, MANUAL CONTROL (Plate 40)

SYMBOLS (Plate 40)

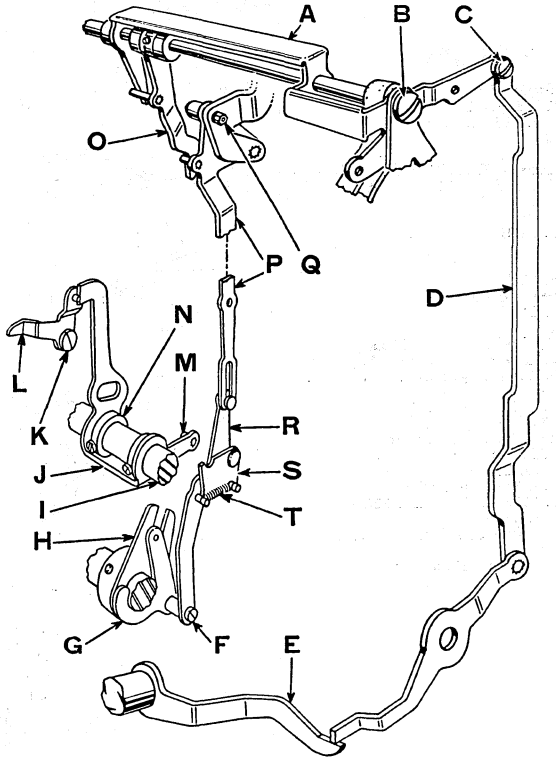
A **1-130 Fte. 205**
B **1-205122 Style 13, 17 No. 2**
C **1-205121 No. 2**
D **1-205118 Style 13, 17 (1-205118A Style 13, 17)** includes C, E
E **1A-205119BR&BL**
F **128 Fte. 205**
G **950¾**
H **1-132 Fte. 205 Style 13, 17**



ITEMS TO PRINT IN RED, CARRIAGE CONTROLLED, FOR LATE STYLE RIBBON MECHANISM (Plate 41)

SYMBOLS (Plate 41)

A **1-113A Style 13 Fte. 207**
1-113A Style 17 Fte. 207 (1-113B Style 17 Fte. 207)
B **505 Fte. 207 No. 2**
C **3960** Screw, 46 nut
D **1-136 Fte. 207 No. 2** Specify machine number
E **1-12110 Style 17 No. 1**
F **120517/8** Screw, 504 No. 2 Env. 1135
G **1-103 No. 2 Env. 1135**
H 1-117A Style 15*
I **1-205001A Style 13, 17**
J **1-111 Env. 1135** for Style 17
1-111 Style 13 Env. 1135 for Style 13
K **204502**
L **1-114 Style 13 Env. 1135** used for Style 13
1-114 No. 2 Env. 1135 used for Style 17
M **750¾ No. 1**
N **1-205312**
O **1-115½ Env. 1135**
P **11-115 Env. 1135**
Q **75646, 46** Nut
R **1-116 Env. 1135**
S **1-109 Env. 1135** part of R
T **800 Env. 1135 (1-116 Env. 1135)**



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ITEMS TO PRINT IN RED, CARRIAGE CONTROLLED, EARLY STYLE (Plate 42)

SYMBOLS (Plate 42)

A **200180A**—early style; 1-200180 No. 2 later
B 61200A Blank*, submit forms and machine number
C **205121 No. 2 (1-205121 No. 2)**
D **1-200208** for early style ribbon mechanism
1-200208 No. 2 for later mechanism
E **1A-205119BL**
F **1-205124 No. 2**
G **8054¾**
H **1-200168A Style 13 No. 2 (1-200168 No. 3 Style 13, 200184A)**
1-200168A Style 17 No. 2 (1-200168 No. 3 Style 17, 200184A)
I **1-200229 No. 2**
J **1-10022 (1-60120)** Early
1A-10022 Later
K **1-60110 (2-60110A)** Early
1-60110A Later
12-60110 (12A-60110A, 10016 No. 2, 1-200146½A No. 2, 200501½, 1-13¼ Fte. 124 No. 2, 780½, 3880½, 11-114⅝ Fte. 104 No. 2 Style 17 for H903 machines, specify machine number

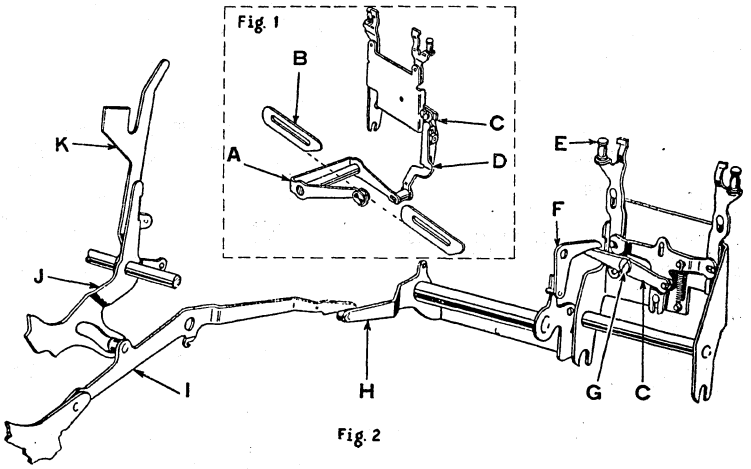
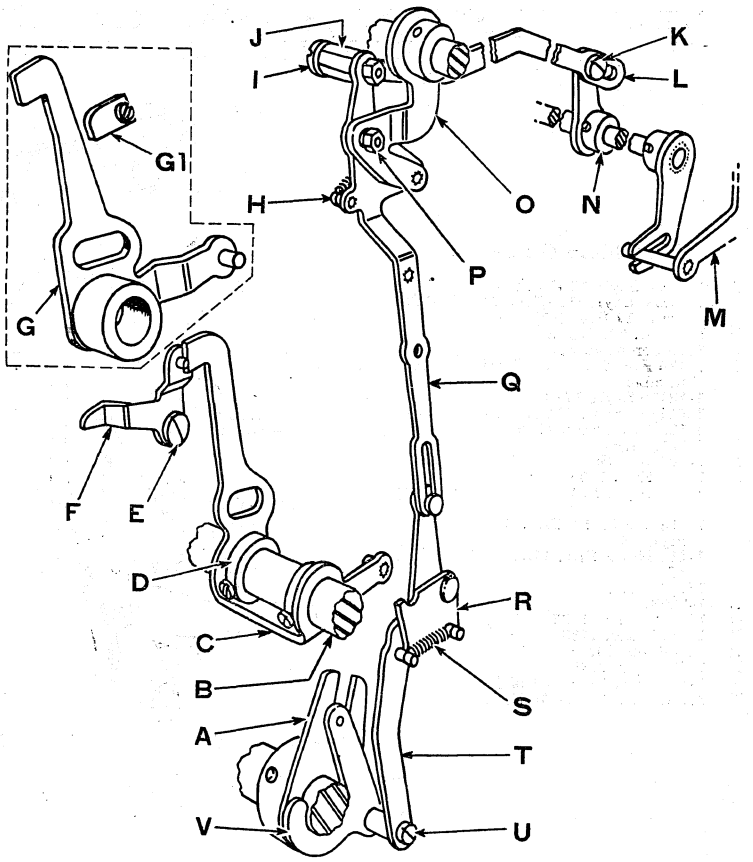


Fig. 2

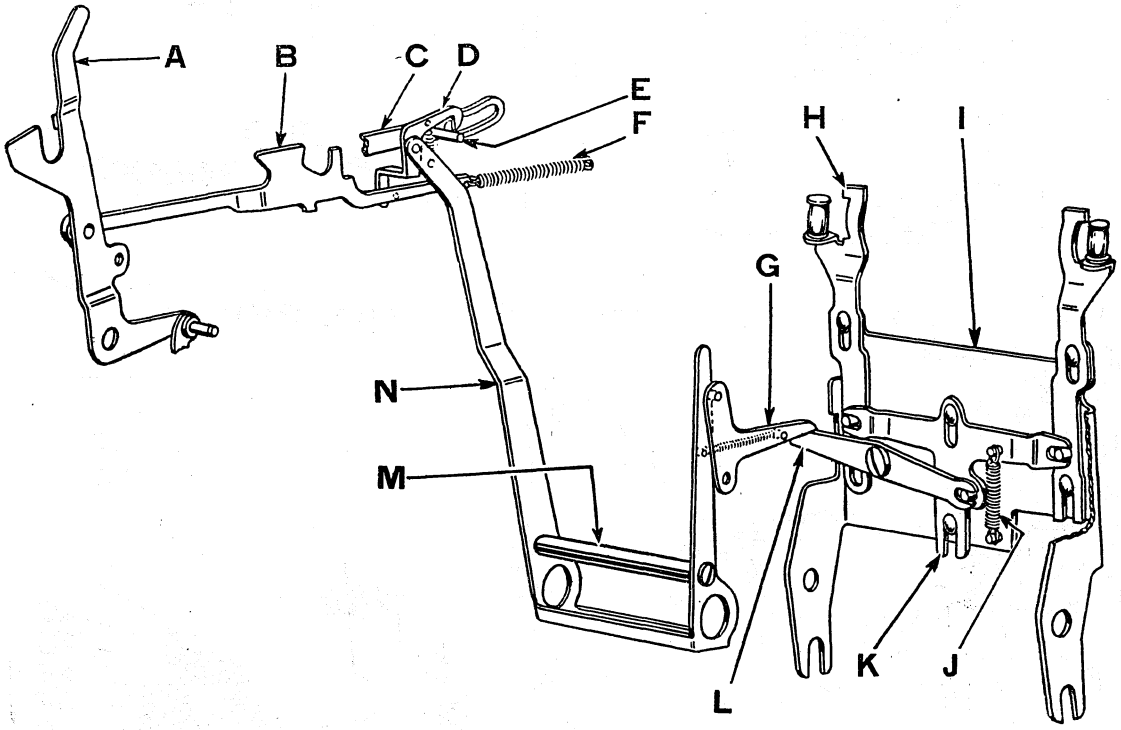
ITEMS TO PRINT IN RED, SUBTRACT LEVER CONTROLLED, LATER (Plate 43)

SYMBOLS (Plate 43)

A 1-117A Style 15*
B **1-205001A Style 13, 17**
C **1-111 Env. 1135** for Style 17
D **1-205312**
E **204502**
F **1-114 Style 13 Env. 1135** for Style 13
1-114 No. 2 Env. 1135 for Style 17
G **1-111 Style 13 Env. 1135** used instead of C on Style 13
G1 **119 Env. 1135** Limit for G
H **480¼**
I **3960**
J **503 Env. 1135**
K **3960** Screw, 46 nut
L **117 Env. 1135**
M **2-60110A**
N **1-10601¼ Style 13 Env. 1135**
1A-10601¼ Style 17 Env. 1135 (1A-10601¼ Style 17 No. 3 Env. 1135)
O **1-112 No. 2 Env. 1135 (31-205000 Style 17)** for Style 17
1-112 Style 13 Env. 1135 for Style 13
P **46** Nut, 75646 screw
Q **11-115 Env. 1135**
R **1-109 Env. 1135** Part of T
S **800 Env. 1135 (1-116 Env. 1135)**
T **1-116 Env. 1135**
U **12051⅞** Screw, 504 No. 2 Env. 1135 bushing
V **1-103 No. 2 Env. 1135**



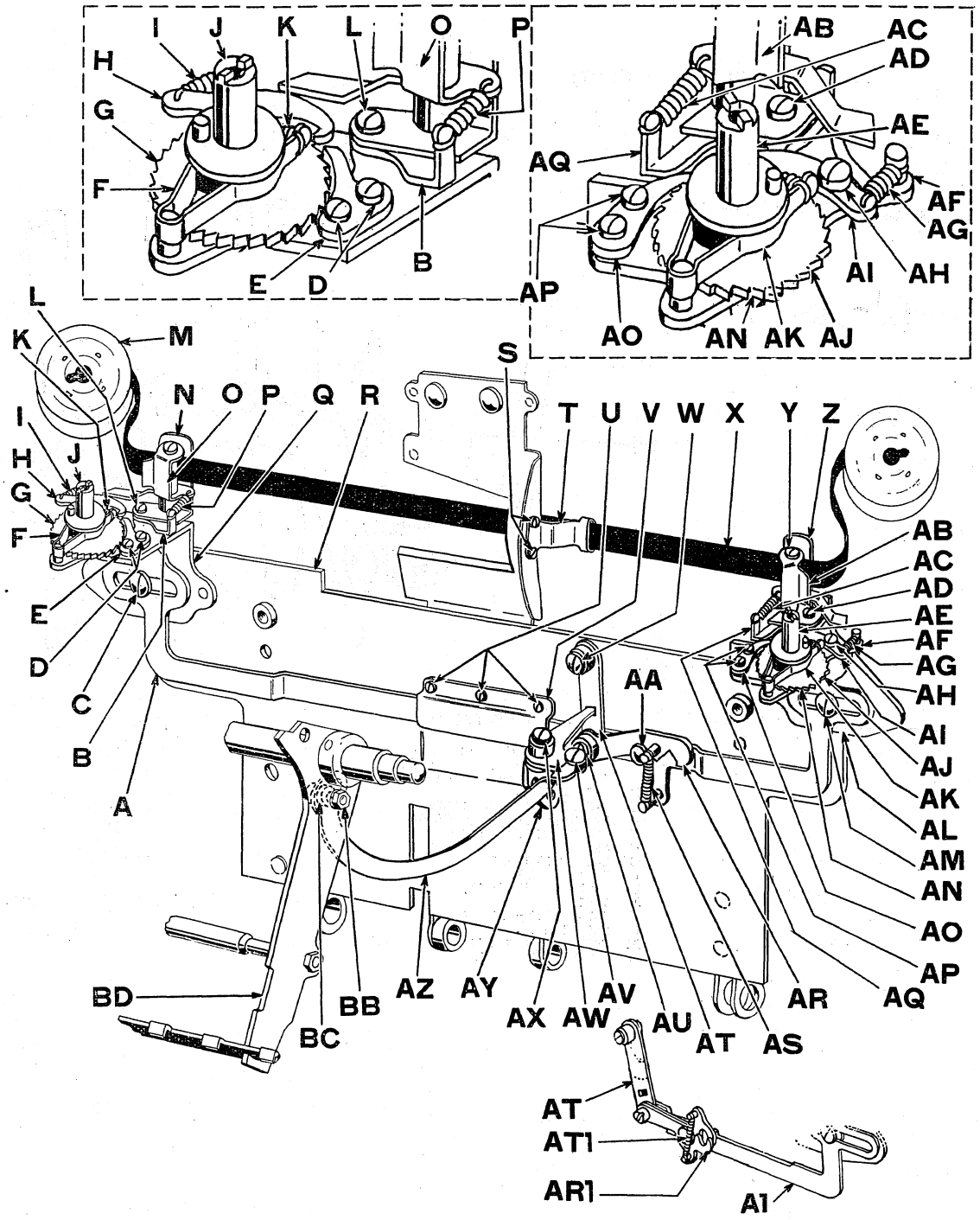
TOTALS TO PRINT IN RED WITH SUBTRACT LEVER IN SUBTRACT POSITION, EARLY AND LATER STYLES RIBBON MECHANISMS (Plate 44)



SYMBOLS (Plate 44)

A	**1-60110 (2-60110A)** Early style **1-60110A** Later	Specify Machine Number
B	**1-60118 No. 1**	
C	**1-62125 (1Z-62125, 200251A)**	
D	**1-205123** uses spring 205801	
E	**10053¾ (750¾ No. 2)**	
F	**680**	
G	**1-205124A No. 1**	
H	**1A-205119BL**	
I	**1-205118A Style 13, 17**	
J	**75814**	
K	**1-205120 Style 13, 17**	
L	**205121 No. 2**	
M	**205003 Style 13, 17**	
N	**1-205122 Style 13, 17 No. 2**	

CROSSFEED RIBBON, FEATURE 69 (Plate 45)

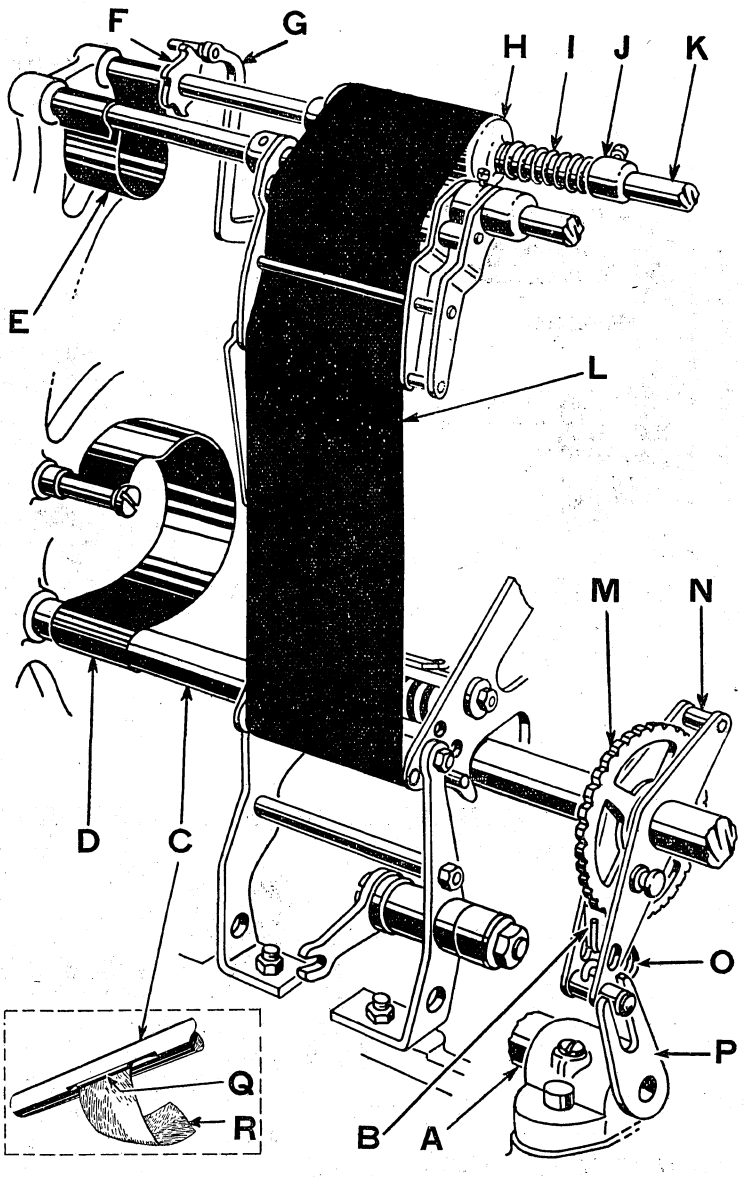


Symbols for Plate 45 are on next Page

RIBBON MECHANISM, VERTICAL (Plate 46)

SYMBOLS (Plate 45)

A **1-10¼A Fte. 69 Style 9, 11, 13, 17 (1-10¼B Fte. 69 Style 9, 11, 13, 17, 38 Fte. 69, 1-205114BR, 3281½)** Early
A1 **1-10¼B Fte. 69 Style 9, 11, 13, 17** Later
B **18L Fte. 69**
C **3259⅛A**
D **7562**
E **11½ Fte. 69**
F **10¾ Fte. 69**
G **1A-9516L**
H **12¼ Fte. 69**
I **9586**
J **9558A No. 1**
K **10784**
L **7562**
M **1-7518¾**
N **15½L Fte. 69**
O **17L Fte. 69**
P **44808**
Q **1-16L Fte. 69**
R **1-12012½ No. 5 Style 9, 11, 13**
S **58 Fte. 69**
T **16¾ Fte. 69 Style 9**
U **58 Fte. 69**
V **12¾ Fte. 69 Style 9, 11, 13, 17**
W **8054¾**
X RIBBON: See—Business Machines Supplies, Price List
Y **2857⅞**
Z **15½R Fte. 69**
AA **54¼B Fte. 69** Stud, **32½A** Fte. 69 roll, stud **9051⅞₆*** for later style link A
AB **17R Fte. 69**
AC **44808**
AD **7562**
AE **9558A No. 1**
AF **1-12½R Fte. 69**
AG **9586**
AH **2857⅞**
AI **12¼ Fte. 69**
AJ **1A-9516R**
AK **10¾ Fte. 69**
AL **1-16R Fte. 69**
AM **3259⅛A**
AN **34 Fte. 69** Shoulder nut
AO **11½ Fte. 69**
AP **7562**
AQ **18R Fte. 69**
AR **1-13¼A Fte. 69** Early style
AR1 **1-205114BR&BL** Later
AS **3281½**
AT **1-13 Fte. 69**
AT1 **3281½**
AU **4857½**
AV **200621** Eccentric
AW **1-13½ Fte. 69** included in AZ
1-13½ Fte. 69 Style 9 for S.A.C.T.
AX **54 Fte. 69, 45** Nut
AY **13¾ Fte. 69**
AZ **11¾ Fte. 69 Style 9**
11¾ Fte. 69 Style 9 No. 2* for S.A.C.T., included in AW
BB **46**
BC **56¼ Fte. 69 Style 9, 13, 15, 17**
56¼A Fte. 69 Style 17
56¼ Fte. 69 Style 9 No. 2
BD **1-600½ Style 9, 11, 13** Cl. 1
11-600⅝ Style 9 for Cl. 2



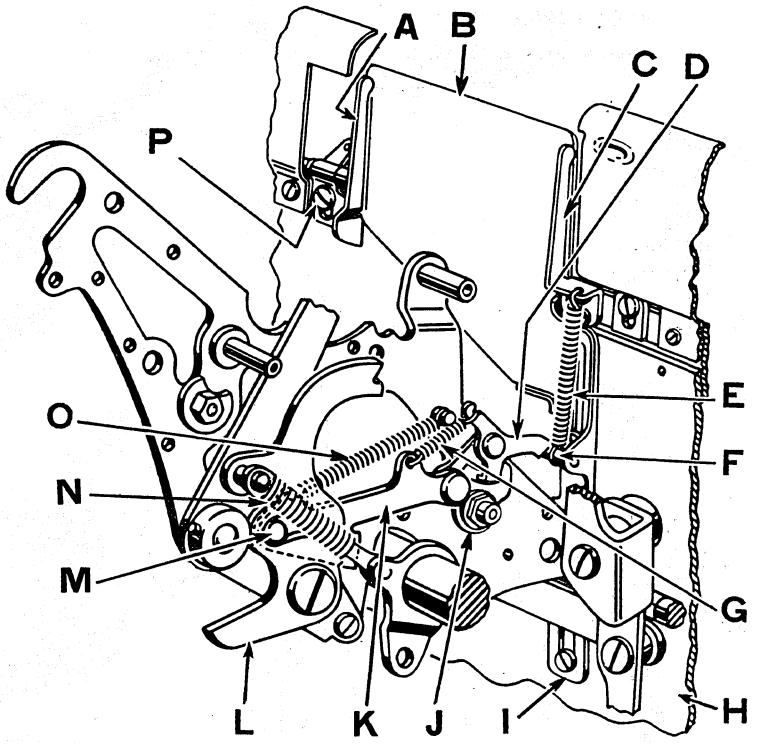
SYMBOLS (Plate 46)

A 100A*
B **523**
C **1-501A Style 7, 9, 11, 13, 15, 17** includes M, N
D **518**
E **518½**
F 524*
G **1-619A**
H **568A Style 7, 9, 11, 13, 15, 17**
568¼ Style 17 for Class 6, Style 17 tally roll
510½ Washer
I **580**
J **1-540** includes screw **550¾**
K **1-500A Style 9, 11, 13, 15, 17** includes H, I, J and notched wheel for ribbon feed
11-500A Style 17 for Class 6 tally roll
L RIBBON: See—Business Machines Supplies, Price List
M 1-516A* includes 549
N **562** included in 1-511
O **581**
P 117A*
Q **525**
R **592A**

RIBBON SHUTTER MECHANISM CLASSES 6, 11 THRU 16 (Plate 47)

SYMBOLS (Plate 47)

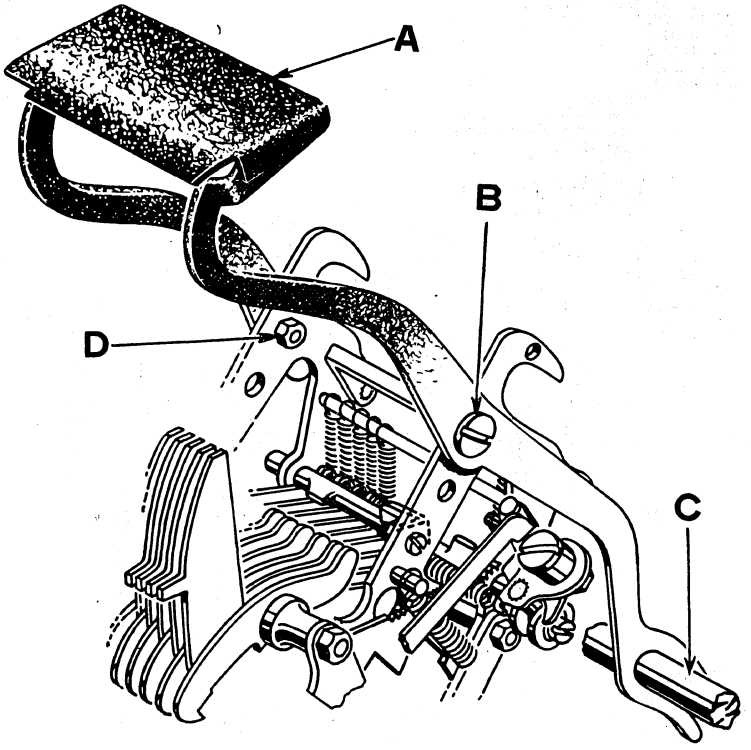
A **2812⅞L or 1-2812⅞L Style 17**
B **1-2820¾ Style 11, 13, 15, 17**
C **2812⅞R** uses 2853¼ screw
D 712¾*
E **2887¾A**
F **2863¾** included in B
G **10686½**
H Back plate
I **2853⅝**
J 712½*
K **1-712⅝** includes D, G, J, O, use washer 1028 Style 15 and 730 collar
L **1-713AR Style 9**
M 751* on 1-712R*
N **1-783C**
O **787 (1080⅛)**
P **2857⅞ (4857½)**



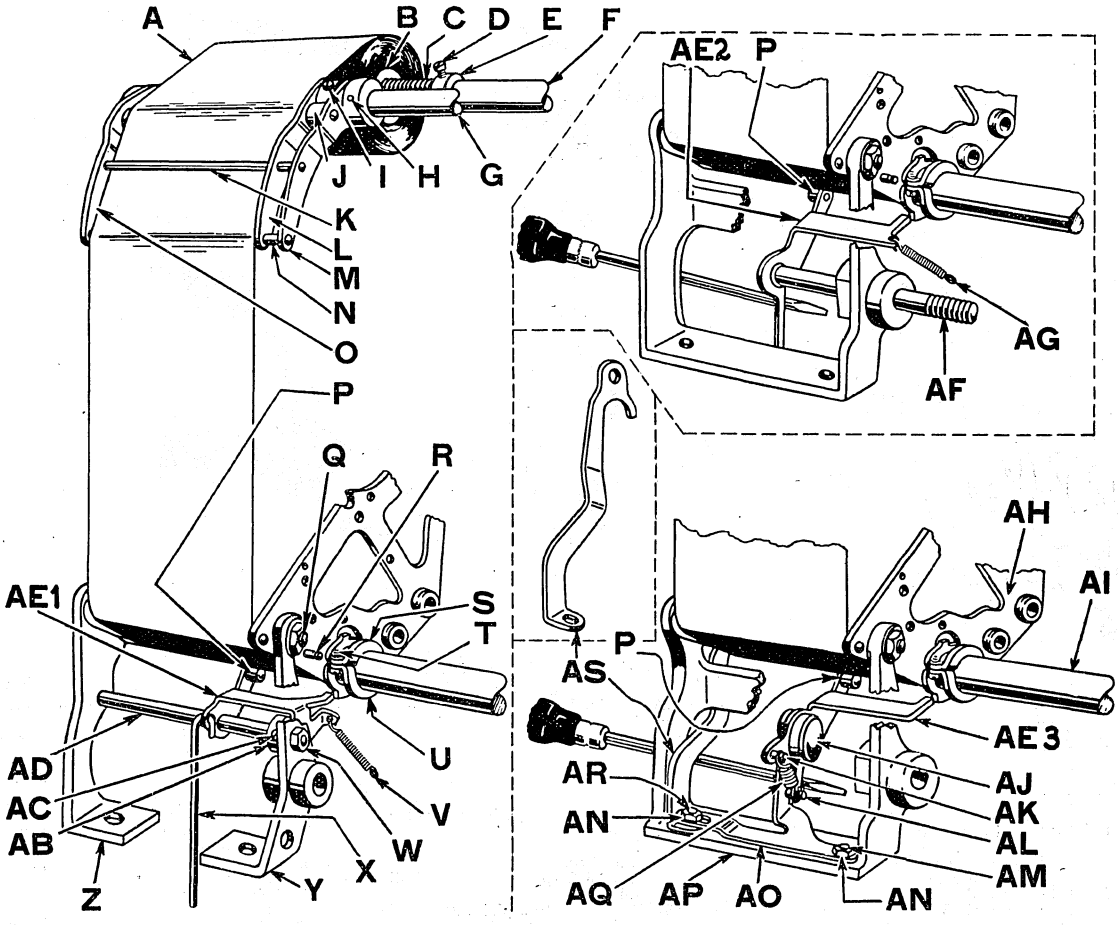
CASE SHUTTER, CLASSES 20 THRU 30 (Plate 48)

SYMBOLS (Plate 48)

A **1-205107 Style 13, 17**
B **12051¼**
C **601 Style 7, 9, 11, 13, 15, 17**
D **46**



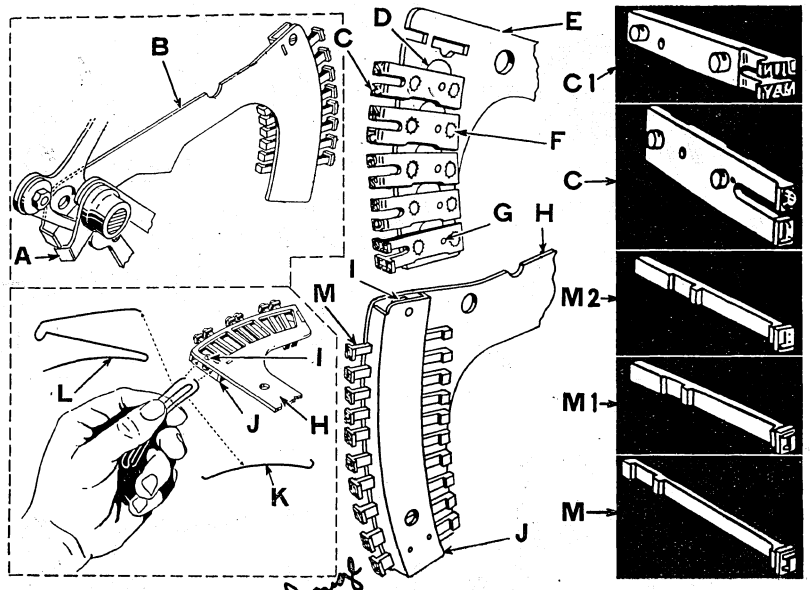
RAPID RIBBON CHANGE DEVICE (Plate 49)



SYMBOLS (Plate 49)

A RIBBON: See—Business Machine Supplies, Price List
B **568A Style 9, 11, 13, 15**
568¼ Style 17 for Cl. 6 Style 17, tally roll
510½ Washer
C **580**
D **550¾**
E **1-540** includes D
F **1-500A Style 9, 11, 13, 15 or 17** includes B, C, D, E, notched wheel for ribbon feed
11-500A Style 17 for Cl. 6 tally roll
G **2F-503 Style 9, 13, 17 (1B-503 Style 9, 13, 17)** Complete ribbon guide assembly includes G thru O
2F-503 Style 11
2F-503 Style 9, 13 LSD (1B-503 Style 9, 13)
2AZ-503 Style 9, 11, 13, 15 used with type bar designed to eliminate breaking of lugs that separate type
12C-503 Style 9, 11, 13, 17 used with single piece type
H **59 (59¼)**
I **550¾**
J **504A Style 7, 9, 11, 13, 17**
K **502½A Style 7, 9, 11, 13, 17**
L **1A-510¼**
M 1A-510L*
N **502A Style 7, 9, 11, 13, 17**
O 1A-510R*
P **3433¼A,** 563 Stud
Q **709½C Style 9, 11, 13, 15, 17,** 3612½ washer, 45 nut
R **761½**
S **522¼**
T **2851¾**
U **522¾**
V **7480B**
W **45**
X **571**
Y **1-726L Style 9, 11, 13, 15, 17**
Z **726R Style 9, 17**
AB **542½**
AC **7562**
AD **709¾ Style 9, 11, 13, 17**
AE1 **1-522⅛ Style 9, 17**
AE2 **1-522⅜Z Style 15, 17**
AE3 522Z* included with AO
AF **764Z Style 17** without hammerblock
10764Z Style 17 with hammerblock
AG **16880**
AH **1-710L**
AI **1-501A Style 7, 9, 11, 13, 15, 17** Specify machine number
AJ **556Z**
AK **450¾**
AL **10961½**
AM **10060¾A** Screw
AN **1028 Style 15** Washer, 45 nut
AO **1-522½Z Style 11, 13, 17** includes P, AE3, AJ, AK, AL
AP 765C* not furnished, use following parts for replacements:
709¾ Style 9, 17
726R Style 9, 11, 13, 15, 17
1-726L Style 9, 11, 13, 15, 17
45 Nut, 2 required
AQ **2887½**
AR **1055⅜H**
AS **520A Style 13, 17**

TYPE MECHANISM (Plate 50)



611 1/8 P. 16 Slide to hold type in

To change mes 350

SYMBOLS (Plate 50)

A **1-613¾ Style 9** for Style 9, 11, 15 Class 2
1-613¾ Style 13

B **1-66112A** Symbol sector, see AF Plate 1, Accumulation Symbol List, for other styles

C **1-618C** Specify character, pitch, height and offset

C1 **1-618B P. 16** Height .070, specify offset and character
Use type chart Form 2836 when ordering any special type

D **682C** for 1-618C
682B for 1-618B P. 16
682BZ for oversize studs 657BZ

E 611B* or 611C* Early styles, for worn sector slots use oversize studs 657BZ or magazine 1-611⅛Z Pitch 8, 10, 12
EXCEPTION: Sector 611B* 16 Pitch which cannot use the magazine, would require replacement by later sector 1Z-611F No. 0, 1R or 1L thru 8R or 8L. Complete sector 2Z-611F No. 0, 1R or 1L thru 8R or 8L

F **50 Fte. 124** Except for P. 16
657⅛ for 1-618B P. 16

G **654⅛ or 654⅛Z**

H **11-611F No. 8R Style 17** H903 machines for inertia lock
11-109 Fte. 202 No. 6R Pitch 10, 16 H903 machines for inertia lock, with type
For other sectors refer to AF Plate 1, Accumulation Symbol List

I **652⅞**

J **1-611⅛B P. 8, 10, 12, 16**
1-611⅛ P. 10 No. 2
1-611⅛Z P. 8, 10, 12

K **687¼Y** used with 687½Z
687¼Z used with 687½B
687¼ No. 2 for safeguard symbol

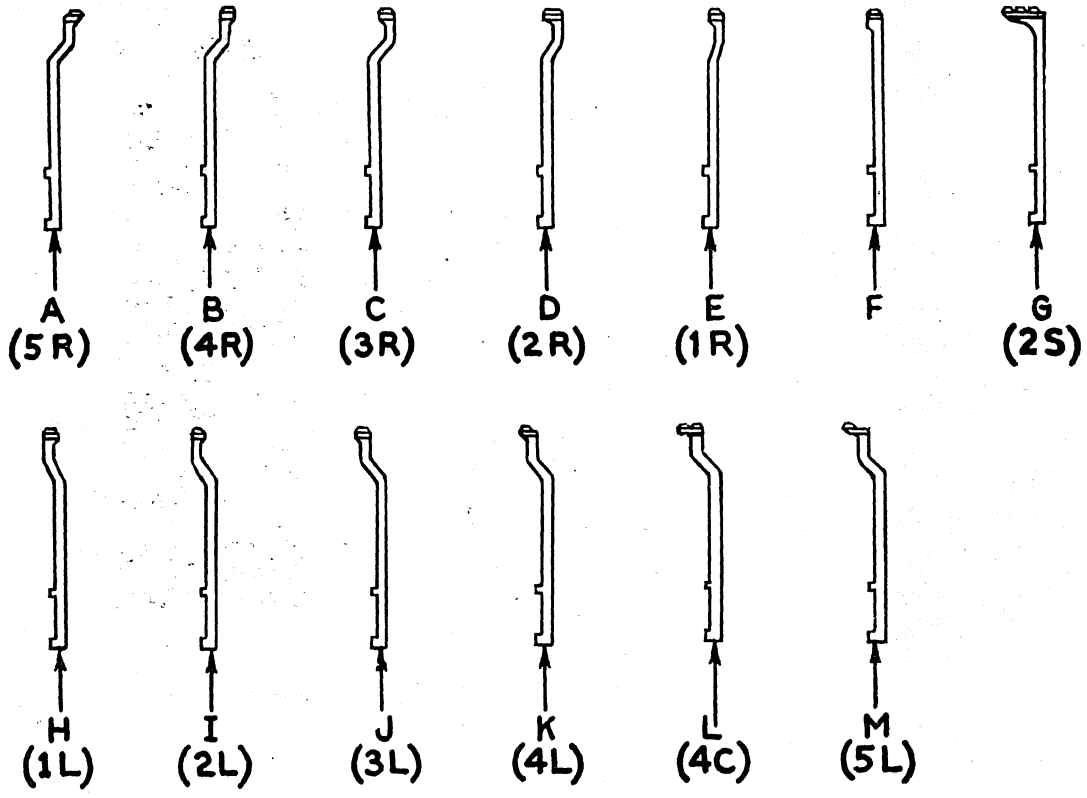
L **687½C**
687½Z used with 1-611⅛Z
687½ No. 2 for safeguard symbol
687½B for single piece 618 P. 16

M2 **618D** P. 16 earliest; specify character, height and offset

M1 **618 P. 16** Early; specify character, height and offset

M **618A Special** Specify character, pitch, height and offset, use Form 2836
618A No. 1 0 to 9 plain, .070 central
618A No. 1R 0 to 9 plain, .070 offset right
618A No. 1L 0 to 9 plain, .070 offset left
618A No. 2 .0 to .9 period prints left, .070 central
618A No. 3 0, to 9, comma prints right, .070 central
618A No. 10 0 to 9 plain, .080 italic central
618A No. 10R 0 to 9 plain, .080 italic offset right
618A No. 10L 0 to 9 plain, .080 italic offset left
618A No. 11 .0 to .9 period prints left, .080 italic central
618A No. 12 0, to 9, comma prints right, .080 italic central
618A No. 13 0 to 9 plain, .085 central
618A No. 13R 0 to 9 plain, .085 offset right
618A No. 13L 0 to 9 plain, .085 offset left
618A No. 14 .0 to .9 period prints left, .085 central
618A No. 15 0, to 9, comma prints right, .085 central
618A No. 16 0 to 9 plain, .100 central
618A No. 16R 0 to 9 plain, .100 offset right
618A No. 16L 0 to 9 plain, .100 offset left
618A No. 16½R 0 to 9 plain, .100 sterling offset, LSD
618A No. 17 .0 to .9 period prints left, .100 central
618A No. 17½ .0 to .9 period prints left, .100 sterling offset, LSD
618A No. 18 0, to 9, comma prints right, .100 central
618A No. 18½ 0, to 9, comma prints right, .100 sterling offset, LSD
618A No. 19 0. to 9. period prints right, .100 central
618A No. 19½ 0 to 11 plain, .100 central, LSDF
618A No. 20 ,0 to ,9 comma prints left, .100 central
618A No. 20¼A ¼, ½, ¾ plain fractions, .146 offset right
618A No. 21A ⅛ fractions, .146 central
618A No. 22 0 to 9 plain, .130 central
618A No. 23 .0 to .9 period prints left, .130 central
618A No. 24 0, to 9, comma prints right, .130 central
618A No. 25 0, to 9, comma prints right, .100 offset right
618A No. 26 0: to 9: colon prints right, .100 central
618A No. 28 0 to 15 plain, .070 central
618A No. 30 A to Z alphabet, .100 central
618A No. 30½ £ sterling sign, .100 central
618A No. 31 2 letter standard character, .070 central
618A No. 32 2 letter standard character, .100 central
618A No. 33R 3 letter standard character, .070 offset right
618A No. 33AL 3 letter standard character, .070 offset left
618A No. 34R 3 letter standard character, .100 offset right
618A No. 34L 3 letter standard character, .100 offset left
618A No. 50 standard symbol characters, .070 & .100 central
618A No. 50R CR, .070 offset right
618A No. 50½ standard sterling symbol characters, .070 & .100 offset, LSD
618A No. 51 1 form collating type symbol sector, .070 & .100 central collating No. 1
618A No. 52 2 form collating type symbol sector, .070 & .100 central collating No. 2
618A No. 53 1 form collating type symbol sector narrow, .070 & .100 central collating No. 1
618A No. 54 2 form collating type symbol sector narrow, .070 & .100 central collating No. 2

1/8 TYPE CENTERS (Plate 50-1)



SYMBOLS (Plate 50-1)

A	618A No. 55-5R	plain		
	No. 57-5R	comma right		
B	618A No. 55-4R	plain		
	No. 57-4R	comma right		
	No. 58-4R	period left		
	No. 60-4R	italic plain		
C	618A No. 55-3R	plain		
	No. 56-3R	period right		
	No. 57-3R	comma right		
	No. 58-3R	period left		
	No. 61-3R	italic period left		
D	618A No. 55-2R	plain		
	No. 57-2R	comma right	0 thru 9	
	No. 58-2R	period left		
	No. 59-2R	comma left		
	No. 60-2R	italic plain		
E	618A No. 55-1R	plain		
	No. 56-1R	period right		
	No. 57-1R	comma right		
	No. 58-1R	period left		
	No. 60-1R	italic plain		
F	618A No. 55-0	plain		
	No. 56-0	period right		
	No. 57-0	comma right		
	No. 58-0	period left		
	No. 60-0	italic plain		
G	618A No. 62-2	specify symbol		
H	618A No. 55-1L	plain		
	No. 57-1L	comma right		
	No. 58-1L	period left		
I	618A No. 55-2L	plain		
	No. 56-2L	period right		
	No. 57-2L	comma right		
	No. 58-2L	period left	0 thru 9	
J	618A No. 55-3L	plain		
	No. 58-3L	period left		
K	618A No. 55-4L	plain		
	No. 58-4L	period left		
	No. 59-4L	comma left		
L	618A No. 63-2	specify character		
M	618A No. 55-5L	plain	0 thru 9	

COUPLERS—SYMBOLS AND WHERE USED (Plate 54)

(Plates 51, 52, and 53 are in Instruction Book only)

Listed below are the positions of 717 couplers for styles of machines most commonly used. **For other couplers submit forms and machine number.**

USED FOR REGULAR CL. 1:

717 No. 2 (717 No. 4) Used in symbol and Col. 1:
717 No. 1 (717 No. 3) Used in all other cols.

USED FOR REGULAR CL. 2:

21-717 No. 6 Used in symbol col.
31-717 No. 4 Used in Col. 1
717 No. 1 (717 No. 3) Used in all other cols.

USED FOR UNLIMITED SPLIT:

1-717 No. 6 Used in symbol col.
11-717 No. 6 Used in all other cols.

USED FOR DCN OR S&N CL. 1:

717 No. 2 (717 No. 4) Used in symbol and Col. 1
717 No. 1 (717 No. 3) Used in all other cols. except where split is located, then use 1-717 No. 3 and 31-717 No. 4

USED FOR DCN OR S&N CL. 2:

21-717 No. 6 Used in symbol col.
31-717 No. 4 Used in Col. 1
717 No. 1 (717 No. 3) Used in all other cols. except where split is located, then use 1-717 No. 3 and 31-717 No. 4

USED FOR STYLES 6 13 02, 13 13 02, 23 13 02, 21 13 54:

1-717 No. 8 Used in symbol col.
21-717 No. 11 Col. 1
11-717 No. 7 Col. 2
717 No. 1 (717 No. 3) Cols. 3, 4, 5, 6, 7, 8
31-717 No. 3 Col. 9
81-717 No. 4 Col. 10
717 No. 2 (717 No. 4) Col. 11
21-717 No. 3 Col. 12
61-717 No. 4 Col. 13

USED FOR STYLE 23 13 03, 8 POINT CONSTRUCTION:

1-717 No. 8 Used in symbol col.
21-717 No. 11 Col. 1
51-717 No. 7 Col. 2
31-717 No. 6 Col. 3
71-717 No. 6 Col. 4
31-717 No. 6 Cols. 5, 6, 7, 8
31-717 No. 4 Col. 9
81-717 No. 4 Col. 10
717 No. 2 (717 No. 4) Col. 11
21-717 No. 3 Col. 12
61-717 No. 4 Col. 13

NOTE: For 4 point construction, all columns are the same except:
Replace Col. 2 with 41-717 No. 7
Replace Col. 4 with 31-717 No. 6
Replace Col. 9 with 51-717 No. 6

USED FOR STYLE 21 17 14, 11 17 14, 6 17 14:

1-717 No. 8 Used in symbol col.
21-717 No. 11 Col. 1
11-717 No. 7 Col. 2
717 No. 1 (717 No. 3) Cols. 3, 4, 5, 6, 7
31-717 No. 3 Col. 8
717 No. 2 (717 No. 4) Col. 9
717 No. 1 (717 No. 3) Cols. 10, 11, 12
31-717 No. 3 Col. 13
81-717 No. 4 Col. 14
717 No. 2 (717 No. 4) Col. 15
21-717 No. 3 Col. 16
61-717 No. 4 Col. 17

NOTE: Also used for style 21 17 16, 11 17 16, 6 17 16 except:
Replace Col. 12 with 31-717 No. 3
Replace Col. 13 with 717 No. 2 (717 No. 4)
Replace Col. 14 with 81-717 No. 4

USED FOR STYLE 23 17 41, 8 POINT CONSTRUCTION:

1-717 No. 4 Used in symbol col.
31-717 No. 11 Col. 1
51-717 No. 7 Col. 2
31-717 No. 6 Col. 3
71-717 No. 6 Col. 4
31-717 No. 6 Col. 5
71-717 No. 6 Col. 6
31-717 No. 6 Col. 7
71-717 No. 6 Col. 8
31-717 No. 6 Col. 9
31-717 No. 4 Col. 10
717 No. 2 (717 No. 4) Col. 11
21-717 No. 3 Col. 12
11-717 No. 3 Col. 13
81-717 No. 4 Col. 14
717 No. 2 (717 No. 4) Col. 15
21-717 No. 3 Col. 16
61-717 No. 4 Col. 17

NOTE: For 4 point construction all columns are the same except:
Replace Col. 2 with 21-717 No. 7
Replace Cols. 4, 6, 8 with 31-717 No. 6

USED FOR STYLE 23 17 42:

1-717 No. 8 Used in symbol col.
21-717 No. 11 Col. 1
21-717 No. 7 Col. 2
61-717 No. 6 Col. 3
31-717 No. 6 Cols. 4, 5, 6, 7, 8
51-717 No. 6 Col. 9
81-717 No. 4 Col. 10
717 No. 2 (717 No. 4) Col. 11
717 No. 1 (717 No. 3) Col. 12
31-717 No. 3 Col. 13
81-717 No. 4 Col. 14
717 No. 2 (717 No. 4) Col. 15
21-717 No. 3 Col. 16
61-717 No. 4 Col. 17

SERIES H MACHINES

Classes 1, 2, 6, 11 thru 16 and 20 thru 30

ACCUMULATION

Symbol List

February 1, 1949

*Issued*_____

*To*_____

*Of*_____

Property of and to be returned to

BURROUGHS ADDING
MACHINE COMPANY
DETROIT 32, MICHIGAN

Mr M R Lovejoy
Buffalo N Y Branch 10-5

ACCUM.

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WHERE DISCARDED SYMBOLS (NOT REQUIRED FOR REPAIRS) ARE REPLACED BY ACTIVE SYMBOLS, THE ACTIVE SYMBOLS ARE SHOWN IN PARENTHESES FOLLOWING THE DISCARDED SYMBOLS.

EXAMPLE: 1-8817¼ (3261B, 1-8801AZ STYLE 12 OR 20, 1-8817BR NO. 4, 8817½ZL, 8828¼C, 8828½B, 47¾, 49¼—2 PCS., 79543—2 PCS.)

SYMBOLS WHICH ARE NO LONGER AVAILABLE AND WHICH HAVE NOT BEEN REPLACED BY ACTIVE SYMBOLS HAVE BEEN REMOVED FROM THE VARIOUS PLATES.

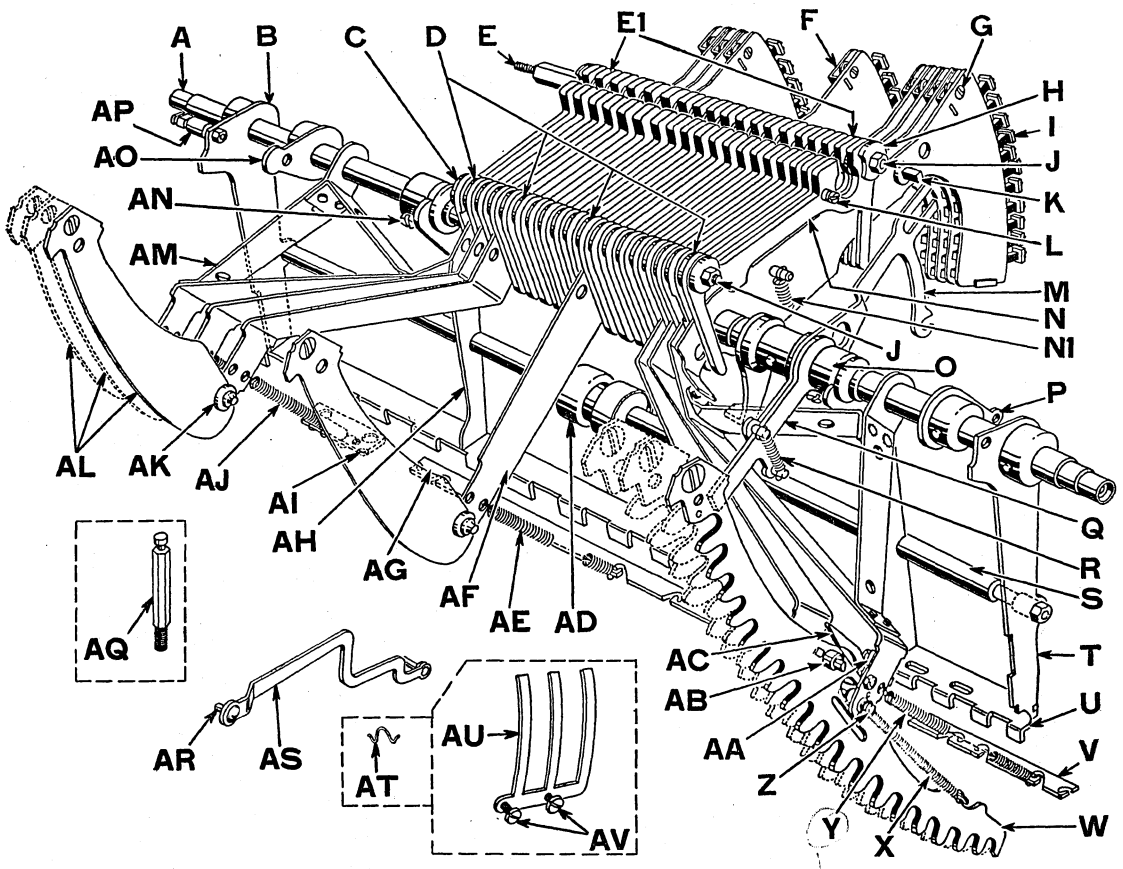
INDEX OF MECHANISMS

DESCRIPTION	Plate No.
Accumulator Meshing Controls and Adjustments	2
Adding and Printing, Carriage and Register Total Indexing Lever Controlled (Classes 21 thru 30 with H903 Mechanism)	89
Adding and Printing, Carriage Controlled—for early H903 machines	90
Add-Subtract Lever, Class 6	18
Automatic Balance Column Indexing Mechanism	37
Automatic Crossfooter Total and Sub-total Mechanism, Carriage Controlled—Bank Posting Machines	67
Automatic One, Extra	15
Automatic One for Register Selection (Col. 1)	15
Automatic One Mechanisms	14
Booster for Meshing Crossfooter in Non-add Positions, Classes 20 thru 30	60
Brace for Stud 68503A (Classes 21 thru 30 with H903 Mechanism)	91
Carriage and Crossfooter Controls (Classes 21 thru 30 with H903 Mechanism)	74
Carry Rack Resetting Mechanism	34
Carry Timing and Negative Total Lock Mechanisms to Control Release of Automatic Total Mechanism—Bank Posting Machines	65
Carry Timing Mechanism, Airpot Controlled, for Totals, Classes 21 thru 30	63
Carry Timing Mechanism, Escapement Arm Controlled—Bank Posting Machines	64
Carry Timing Mechanism for Automatic One (Bank Posting Machine)	66
Compulsory Spacing Stroke, Class 2	5
Counter Control, Class 2 Shuttle Carriage	9
Counter Shift Mechanism, Class 6	18
Count and Normal Indexed from Keyboard Carriage Controlled	69
Counters-Dial, Advanced from Carriage Openings	95
Counters-Dial, Advanced from Carriage Returns	94
Counters-Dial, Advanced from Selected Key	96
Counters-Dial, Advanced from Total and Sub-total, Carriage Controlled	97
Counters-Dial, Control Mechanisms (Classes 20 thru 30, Style 17)	93
Counters-Dial, Counts Items Added in Registers	98
Counters-Dial, Cover and Lock Mechanism	100
Counters-Dial, Operation Delayed Until Registers are Meshed	99
Credit Balance Indexing Mechanism, (Classes 21 thru 30 with H903 Mechanism)	79
Crossfooter Mechanism, Class 6	16
Crossfooter Add from Lower Bar	70
Crossfooter Add—Register Non-add from Upper Bar	71
Crossfooter Mechanism (Classes 11 thru 16, 20 thru 30)	43
Crossfooter Meshing Pawl Disabled by Safeguard Symbol Mechanism (Classes 21 thru 30 with H903 Mechanism)	87
Crossfooter Non-clear Motor Bar Lock Disabled by Lower Bar and Key, Classes 20 thru 30	61
Crossfooter Non-clear Motor Bar Lock, Later, Carriage Controlled—for Consumption Column	58
Crossfooter Non-clear Motor Bar Lock No. 1, Early, Carriage Controlled	56
Crossfooter Non-clear Motor Bar Lock No. 2, Airpot and Carriage Controlled	57
Crossfooter Non-clear Motor Bar Lock with Carriage Open in Conjunction with Crossfooter Non-clear Lock, Carriage Controlled—for Consumption and Amount Columns	59
Crossfooter Non-clear Total Key Lock, Add and Subtract Positions, Airpot and Carriage Controlled	62
Crossfooter Simultaneous Addition and Subtraction with Automatic Count, Carriage Controlled	42
Crossfooter Total and Sub-total, Carriage Controlled, Indexed from Carriage and Drive to Secure Easy Tabulation (Classes 21 thru 30 with H903 Mechanism)	82
Crossfooter Total and Sub-total Mechanism—Positive and Negative—Carriage Controlled, Improved, Style No. 2 with H903	74–3–4
Crossfooter Totals, Carriage Controlled Indexing Detent	74–1
Crossfooter Total Control Mechanism (Classes 21 thru 30)	45
Crossfooter Totals with Keys on Keyboard Depressed, Improved, Classes 21 thru 30 with H903	74–2
Detent to Hold Crossfooter in Mesh until Return Stroke is Completed (Classes 21 thru 30 with H903 Mechanism)	86
Floating Bearings for Register Indexing Assemblies	30
Inertia Latches, Classes 21 thru 30	44
Interlock to Prevent Depression of Keys on Keyboard During an Operation Before Taking Automatic Crossfooter Totals, Carriage Controlled (Classes 22 thru 30 with H903 Mechanism)	88
Key to Release Repeat Latch—Bank Posting Machines	68
Lock to Prevent Machine Operation Crossfooter Non-clear, Carriage Controlled. Disabled from Total, Sub-total or Motor Bars	58–2
Mechanism to Delay Clutch Release for Carriage Controlled Total Operation (Classes 21 thru 30 with H903 Mechanism)	92
Motor Bar Release Mechanism for Overdraft Operation—Bank Posting Machines	68–1
Negative Total Lock Mechanism	11
Non-add Control, Crossfooter and Register, Later	39
Non-add—Non-print, Carriage Controlled	40
Non-add—Non-print, Key Controlled	41
Reflector and Light for Reading Accumulator Dials	72
Register Add and Non-add Control Cams	28–2
Register Aligning Detent—Early	28
Register Assembly, Ten Construction	29
Register Control Mechanism to Provide Sufficient Time for Register to Position Correctly	49
Register Detents and Register Control Shafts	28–1
Register Detent Release Mechanism, Improved Style	27–2
Register Meshing Control	21
Register Non-add Controlled by Total Key	53
Register Non-add from Subtract Mechanism	52
Register Section Braces, Ten Register Construction	48
Register Shift, Airpot Controlled Mechanism	27–1
Register Shift from Subtract Mechanism, Bar and Carriage Controlled (Classes 22 thru 30)	51

INDEX OF MECHANISMS (Continued)

DESCRIPTION	Plate No.
Register Shifting Mechanism	27
Register Shift Release Mechanism with Disabling Key (Classes 22 thru 30)	50
Register Total Indexing Lever	20
Register Total Indexing Linkage, Carriage Controlled—Early	38
Register Total Indexing Lever, Indexed by Carriage and Shifted by Drive Mechanism (Classes 21 thru 30 with H903 Mechanism)	81
Register Total Indexing Lever and Machine Operation to Disable Crossfooter and Register Total and Sub-total Mechanism, Carriage Controlled (Classes 21 thru 30 with H903 Mechanism)	83
Register to Total and Sub-total from Register Total Indexing Lever (Classes 21 thru 30 with H903 Mechanism)	80
Register Total and Sector Bar Lock from Register Total Indexing Lever (Classes 21 thru 30)	54
Repair Plate for 611 Adding Sectors	1–1
Reverse Pull-in and Carry Pawl Resetting Mechanisms (Classes 21 thru 30 with H903 Mechanism)	85
Sector Assembly	1
Sector Bar Lock, Early	55
Sector Bar Lock—Early—and Other Controls Actuated from Main (100) Section (Classes 21 thru 30 with H903 Mechanism)	76
Sector Bar Lock, Improved	55–1
Sector Bar Lock Mechanism and Primary Operating Section to Release Adding Racks (Classes 21 thru 30 with H903 Mechanism)	77
Single Stroke Totaling Mechanism (Classes 20 thru 30)	46
Spacing Stroke Controlled from Subtract Shift Mechanism (Classes 21 thru 30 with H903 Mechanism)	75
Spacing Stroke Mechanism—Improved, Classes 21 thru 30 with H903	74–5
Subtract Control Indexed from Carriage	19
Subtract Mechanism Jointly Indexed from Subtract Lever, Credit Balance, Uppermost Bar, Carriage and Machine Operation (Classes 21 thru 30 with H903 Mechanism)	78
Sub-transfer Total Mechanism, Class 2	7
Timing Mechanism to Delay Motor Bar Release	58–1
Total Lock Detent, Class 6	17
Total Symbol, Ribbon Shift, Non-add and Repeat Release Mechanism (Classes 21 thru 30 with H903 Mechanism)	84
Transfer Mechanism, Carriage Controlled, Class 2	8
Transfer Total Mechanism, Class 2	6
Upper and Lower Counter Mechanisms, Class 2	4
Wiring Diagram for Reflector Lamps	73

SECTOR ASSEMBLY (Plate 1)



SYMBOLS (Plate 1)

A 206000* included in 1-206000 Style 13, 17, specify machine No., Cl. 20 thru 30
206000* included in 11-206000 Style 13, 17, specify machine No., used for machines with item counters, Cl. 20 thru 30
206000* included in 11-600⅝ Style 13, 17, specify machine No., Cl. 2, 6, 11 thru 16 and Cl. 2 shuttle posting machine
600⅝* included in 11-600⅝ Style 9, 11, specify machine No., Cl. 2, 6, 11 thru 16 and Cl. 2 shuttle posting machine
600A Style 7* (600½ Style 7*) included in 1A-600A Style 7, early style, specify machine No., Cl. 1, 2, 6, 11 thru 26

B 1-613L* included in A

C **721**

D **626** Washers, specify size:
Stamped: No. 1 (.041)
No. 2 (.042)
No. 3 (.043)
No. 4 (.044)
No. 5 (.045)
No. 6 (.046)

E **206502 No. 2 Style 13, 17**

E1 **625** Size (.111) (.113)

F **1-611⅛B P. 8, 10,** see printing book, Plate 50 for other styles

G **652⅞**

H **625⅜**

I **618A** Specify numeral, character, pitch, height and offset, see Plate 50 in "Printing" Book for other type

J **605 Style 13** use 45 nuts, Cl. 1
605½ Style 9, 11, 13, 15, 17 use 45 nuts, Cl. 2, 6, 11 thru 30

K **651⅜** Cl. 2-6
66501 No. 2 Cl. 11-30

L **655¼**

M **1-10614¾ Style 9, 13, 17 (11-614¾A Style 9, 13, 17; 1-711¾ No. 2)** for Cl. 6, 11 thru 30.
2-614¾ Style 9, 11, 13, 17 (1-614¾A Style 9, 11, 13, 17; 1-711¾ No. 1) for Cl. 2

N **625AR or AL** use 655⅛ screw in AL

N1 **3489** used with high speed machines
681⅛ used with low speed machines

O **1-649¾** includes 12055⅝ screw, use for Styles 7, 9, 11, 13, 15
1-649⅞ includes 653¾ screw, use for Style 17
1-649⅜ No. 2 used on machines with S&N construction

P 1-206100* included in A

Q 1-10614¼*
1-10614¾ Style 9, 13, 17 (11-614¾A Style 9, 13, 17; 1-711¾ No. 2) complete assembly, Cl. 6, 11 thru 30

R **681**

S **601 Style 7, 9, 11, 13, 15, 17** use 45 nuts

T 1-613R* included in A

U **617A Style 9, 11, 13, 15 or 17**
617Z Style 7, 9, 11, 15, 17 used for field replacement
1-140 Fte. 202 Style 17 used with keyboard selection of registers

V **66116AR** Cl. 11 thru 30
10616½R used on machines with increased speed, Cl. 2, 6

W SEE LIST OF ADDING RACKS

X **680**

Symbols continued on Next Page

61885 #5

SYMBOLS (Plate 1)—Continued

Y **66885** Shown below are sector, 611, springs used in other columns; all style machines of high speed construction

Springs used for regular machines without shuttle or A.C.T. carriage, Class 2

66885
- Used in cols. 1 thru 9, Style 9
- Used in cols. 1 thru 11, Style 11
- Used in cols. 1 thru 13, Style 13
- Used in col. 1, 5 thru 17—use 66885 No. 3 in cols. 2, 3 and 4, Style 17

Springs used for Class 6 machines:

66885
- Used in cols. 1 thru 9, Style 9
- Used in cols. 1 thru 11, Style 11
- Used in cols. 1 thru 10—use 66886 in cols. 11, 12, 13, Style 13
- Used in cols. 1, 5 thru 14—use 66885 No. 3 in cols. 2, 3, 4 and 66886 in cols. 15, 16, 17, Style 17

Springs used for Cl. 11 thru 16, 20 thru 30 machines:

66885
- Used in cols. 1 thru 10—use 66886 in cols. 11, 12, 13. Style 13
- Used in col. 1, 5 thru 14—use 66885 No. 3 in cols. 2, 3, 4 and 66886 in cols. 15, 16, 17, Style 17

Springs on sectors, 611, used on low speed construction: Class 1 and 2

685A (9087)
- Used in cols. 1, 3, 4, 6 thru 9—use 686A in cols. 2 and 5, Style 9
- Used in cols. 1, 3, 4, 5, 7 thru 11—use 686A in cols. 2 and 6, Style 11
- Used in cols. 1, 3, 4, 5, 6, 8 thru 13—use 686A in cols. 2 and 7, Style 13
- Used in cols. 1, 3 thru 8, 10 thru 17—use 686A in cols. 2 and 9, Style 17

Class 6

685A (9087)
- Used in cols. 1, 3, 4, 6 thru 9—use 686A in cols. 2 and 5, Style 9
- Used in cols. 1, 3, 4, 5, 7 thru 11—use 686A in cols. 2 and 6, Style 11
- Used in cols. 1, 3, 4, 5, 6, 8 thru 13—use 686A in cols. 2 and 7, Style 13
- Used in cols. 1, 3 thru 8, 10 thru 17—use 686A in cols. 2 and 9, Style 17

Classes 11 thru 16

685A (9087)
- Used in cols. 1, 3, 4, 5, 6, 7, 8, 9, 10—use 686A in cols. 2 and 7 and 66886 in cols. 11, 12, 13, Style 13
- Used in cols. 1, 3 thru 8, 10 thru 14—use 686A in cols. 2 and 9 and 66886 in cols. 15, 16, 17, Style 17

NOTE: On machines with register selection, spring 805 Ftc. 202 replaces spring in right-hand calendar feature column and 4484 Style 15 replaces regular spring for column which selects register.

Z **655B** Stud, 633¼ collar
655CZ Screw stud, 633¼CZ threaded collar, for field replacement

AA **617¾A** use stud 653⅛
617¾ No. 2 for field replacement, use 4458¾ screw; on machines with inertia locks, use screw 79505

AB 206300* Roller, 651 No. 1* included in W

AC **66117AR** use screw 79505, 47¼ nut in 1st column, 79548 screw, 46 nut in other columns and 66505 in negative total lock column; collar 66300 No. 2, lock washer 1097¾, spring 680 and thin washer 77133, see inertia latches, Plate 44

AD **1-632C**

AE **66885**

AF NOTE: 2Z-611F No. 0, 1R or 1L thru 8R or 8L is used for field replacement, specify pitch, column and machine number, includes adding rack and type, specify pitch, height, numeral or characters.
1Z-611F No. 0, 1R or 1L thru 8R or 8L without adding rack or type
Listed below is the arrangement of sectors in different style machines:

Sector used in symbol col.:

1-612D used with 2 prong type, Cl. 1
1-611¼ No. 2 without type, Cl. 2, 6
2-611¼ No. 2 complete with type, Cl. 2, 6
1-66112A without type, Cl. 11 thru 30
2-66112A complete with type, Cl. 11 thru 30
66112Z P. 10 without type, use for field replacement
1-611F No. 2 (1-611G No. 2 P. 10, 1-716E) use for safeguard printing, specify pitch, machine number and column

Arrangement for Style 9, Cl. 1, 2, 6:

2Z-611F
- 4R used in col. 1
- 3R used in col. 2
- 2R used in col. 3
- 1R used in col. 4
- 0 used in col. 5
- 1L used in col. 6
- 2L used in col. 7
- 3L used in col. 8
- 4L used in col. 9

Arrangement for Style 11, Cl. 1, 2, 6:

2Z-611F
- 5R used in col. 1
- 4R used in col. 2
- 3R used in col. 3
- 2R used in col. 4
- 1R used in col. 5
- 0 used in col. 6
- 1L used in col. 7
- 2L used in col. 8
- 3L used in col. 9
- 4L used in col. 10
- 5L used in col. 11

Arrangement for Style 13, Cl. 1, 2, 6, 11 thru 30:

2Z-611F
- 6R used in col. 1
- 5R used in col. 2
- 4R used in col. 3
- 3R used in col. 4
- 2R used in col. 5
- 1R used in col. 6
- 0 used in col. 7
- 1L used in col. 8
- 2L used in col. 9
- 3L used in col. 10
- 4L used in col. 11
- 5L used in col. 12
- 6L used in col. 13

Arrangement for Style 15, Cl. 1, 2, 6:

2Z-611F
- 7R used in col. 1
- 6R used in col. 2
- 5R used in col. 3
- 4R used in col. 4
- 3R used in col. 5
- 2R used in col. 6
- 1R used in col. 7
- 0 used in col. 8
- 1L used in col. 9
- 2L used in col. 10
- 3L used in col. 11
- 4L used in col. 12
- 5L used in col. 13
- 6L used in col. 14
- 7L used in col. 15

Arrangement for Style 17, Cl. 1, 2, 6, 11 thru 30:

2Z-611F
- 8R used in col. 1
- 7R used in col. 2
- 6R used in col. 3
- 5R used in col. 4
- 4R used in col. 5
- 3R used in col. 6
- 2R used in col. 7
- 1R used in col. 8
- 0 used in col. 9
- 1L used in col. 10
- 2L used in col. 11
- 3L used in col. 12
- 4L used in col. 13
- 5L used in col. 14
- 6L used in col. 15
- 7L used in col. 16
- 8L used in col. 17

AG **66116L No. 2 Style 13, 17** Cl. 11 thru 30—use screws 7062
10616½L Style 11, 13, 17 used on machines with increased speed, use 10047¼ collar, 10056⅛ screw, 45 nut, Cl. 2 & 6
616A Style 7, 9, 13, 15, 17 used on machines without increased speed, use 1064A post, Cl. 1, 2 & 6
144 Ftc. 202 Style 13, 17 used for keyboard selection of registers

AH **617½**
617½Z Early style, used for Styles 15 and 17 only

AI **66116L No. 1**

AJ **66886**

AK **655B** Stud, 633¼ collar

AL **66106 Pitch 16** see list

AM **1Z-611F No. 8L** see other sectors under letter AF

AN **653¾**

AO 1-206100 No. 2* included in A

AP **250¼A, 46** Nut

AQ **1064A**

AR **650A** Stud

AS **1-619A**

AT **670**

AU **613⅛**

AV **73611, 46** Nut

SEE EXPLANATION ON INSIDE OF FRONT COVER

Symbols continued on Next Page

SYMBOLS (Plate 1)—Continued

(W) NOTE: Listed below are adding racks, 610's, used in Classes 1, 2, 6, 11 thru 16, 20 thru 30 machines and stamped with small figures for identification. For adding racks not listed, specify machine number, column and pitch.

ADDING RACKS USED ON CLASS 1 MACHINES:

Symbol	Pitch	Stamping	
1-610 No. 1	8	1-1	Used in col. 1, also used in other cols. where no carry is required
11-610 No. 1	8	11-1	Used in other cols. except col. 1
21-610R No. 25	10	21R-25	Used in col. 1 regular machine and where required for permanent split, also used in folio and date cols.
1-610 No. 25	10	1-25	Used in other cols. except 1st and last or non-add cols.
21-610L No. 25	10	21L-25	Used in last left col.
11-610 No. 25	10	11-25	Used on machines with variable split or extended totals
1-610ZR No. 26	10	1ZR-26	Used in col. 1 regular machine and where required for permanent split, also used in folio and date cols.
1-610Z No. 26	10	1Z-26	Used in other cols. except 1st and last or non-add cols.
1-610ZL No. 26	10	1ZL-26	Used in last left col.
21-610 No. 50	12	21-50	Used in col. 1, also used in other cols. where no carry is required
1-610 No. 50	12	1-50	Used in other cols. except col. 1
1-610 No. 77	16	1-77	Used in months or character cols.

Early style, used for machines equipped with short 210 slots

ADDING RACKS USED ON CLASS 2 MACHINES:

1-610 No. 1	8	1-1	Used on col. 1, also used in other cols. where no carry is required
11-610 No. 1	8	11-1	Used in other cols. except col. 1 or non-add cols.
21-610R No. 25	10	21R-25	Used in col. 1, also used in folio and date cols.
1-610 No. 25	10	1-25	Used in other cols. except col. 1 or non-add cols.
41-610 No. 25	10	41-25	Used on machines with sub-transfer total fte.
1-610ZR No. 26	10	1ZR-26	Used in 1st col., also used in folio or date cols.
1-610Z No. 26	10	1Z-26	Used in other cols. except col. 1 or non-add cols.
21-610 No. 50	12	21-50	Used in col. 1, also used in other cols. where no carry is required
1-610 No. 50	12	1-50	Used in other cols. except col. 1
11-610 No. 50	12	11-50	Used on machines with sub-transfer total fte.
1-610 No. 77	16	1-77	Used in months or character cols.

Early style, used for machines equipped with short 210 slots

ADDING RACKS USED ON CLASS 6 MACHINES:

1-610R No. 2	8	1R-2	Used in 1st col. only
1-610 No. 2	8	1-2	Used in other cols. except col. 1 or non-add cols.
31-610R No. 25	10	31R-25	Used in 1st col. only
1-610 No. 25	10	1-25	Used in other cols. except col. 1 or non-add cols.
11-610ZR No. 26	10	11ZR-26	Used in 1st col. only
1-610Z No. 26	10	1Z-26	Used in other cols. except col. 1 or non-add cols.
1-610ZR No. 26	10	1ZR-26	Used in date and folio cols.
1-610 No. 30	10	1-30	Used in col. where extra automatic one is located
1-610R No. 52	12	1R-52	Used in 1st col. only
1-610 No. 52	12	1-52	Used in other cols. except col. 1 or non-add cols.
1-610 No. 77	16	1-77	Used in months or character cols.

Early style, used for machines equipped with short 210 slots

ADDING RACKS USED ON CLASSES 11 THRU 16 MACHINES:

11-610R No. 3	8	11R-3	Used in 1st col. only
1-610R No. 3	8	1R-3	Used in other cols. except col. 1 or non-add cols.
11-610R No. 28	10	11R-28	Used in 1st col. only
1-610R No. 29	10	1R-29	Used in other cols. except col. 1 or non-add col.
1-610L No. 29	10	1L-29	
1-610R No. 31 (1-610R No. 32)	10		Used in cols. where extra automatic one is located
1-610L No. 31 (1-610L No. 32)	10		
66106 No. 1	10		Blank sector, used in folio and date cols.
66106 No. 2	10		Blank sector, used in 14th col. on machines having 14 cols. of adding
135 Fte. 202 No. 2	10		Blank sector, located in 11th col. Style 13 or 15th col. Style 17 on machines with keyboard selection of registers in col. 1, Cl. 12 thru 16
11-610R No. 53	12	11R-53	Used in 1st col. only
1-610R No. 53	12	1R-53	Used in other cols. except col. 1 or non-add cols.
1-610L No. 53	12	1L-53	
1-610R No. 54	12	1R-54	Used in cols. where extra automatic one is located
1-610L No. 54	12	1L-54	
66106	12		Blank sector, used in months or character cols.
66106	16		Blank sector, used in months or character cols.
1-110AL Fte. 202	16		Used in even cols. on machines with keyboard selection of registers, Cl. 12 thru 16
1-110AR Fte. 202	16		Used in uneven cols. on machines with keyboard selection of registers, Cl. 12 thru 16

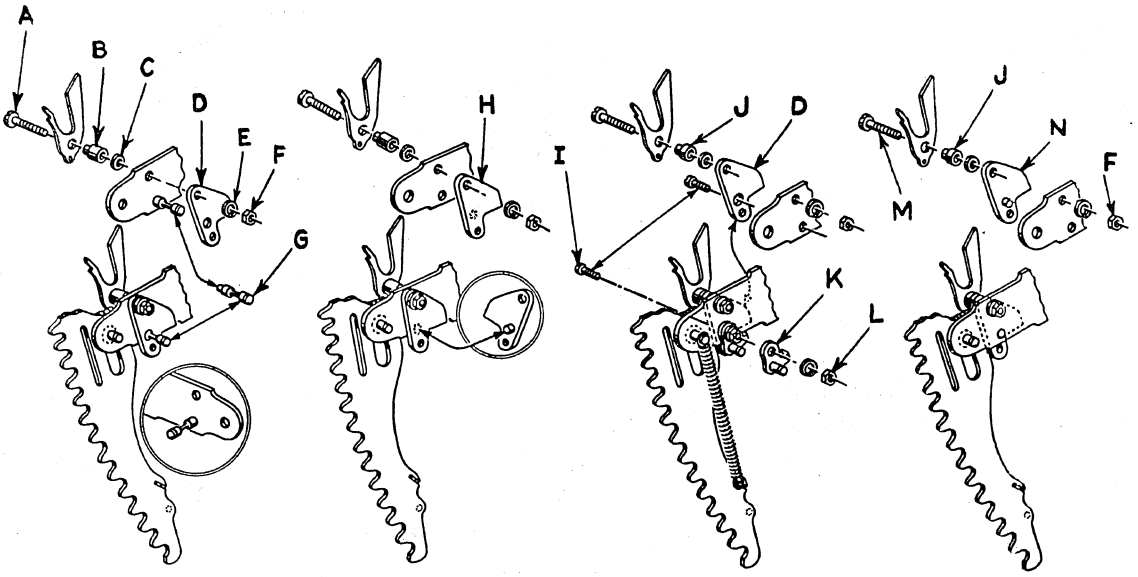
ADDING RACKS USED ON CLASSES 20 THRU 30 MACHINES:

1-610R No. 3	8	1R-3	Used in all cols. except non-add cols., Cl. 20 thru 26
1-610R No. 4	8	1R-4	Used in cols. where extra automatic one is located, Cl. 20 thru 26
1-610L No. 4	8	1L-4	
21-610R No. 3	8	21R-3	For H903 construction, used in all cols. except non-add cols.
1-610R No. 29	10	1R-29	Used in all cols. except non-add or auto count cols.
1-610L No. 29	10	1L-29	
11-610R No. 29 (1-610R No. 29)	10		For H903 construction, used in all cols. except non-add or auto. count cols.
11-610L No. 29 (1-610L No. 29)	10		
21-610R No. 29	10	21R-29	Used in automatic count cols.
21-610L No. 29	10	21L-29	
11-610R No. 31 (1-610R No. 32)	10		Used in cols. where extra automatic one is located, Cl. 20 thru 26
11-610L No. 31 (1-610L No. 32)	10		
1-610R No. 32	10	1R-32	Used in col. where extra automatic one is located, Cl. 27 thru 30
1-610L No. 32	10	1L-32	
66106 No. 1	10		Blank sector, used in folio and date cols.
66106 No. 2	10		Blank sector, used in 14th col. on machines having 14 cols. of adding
135 Fte. 202 No. 2	10		Blank sector, located in 11th col. Style 13 or 15th col. Style 17 on machines with keyboard selection of registers in col. 1, Cl. 22 thru 30
1A-206110R	10		For field replacement, adding rack without lower tooth ground off and used with early style detent bail 69005A Style 13 or 17, Cl. 21 thru 26
1A-206110L	10		
1-610R No. 53	12	1R-53	Used in all cols. except non-add cols.
1-610L No. 53	12	1L-53	
21-610R No. 53 (1-610R No. 53)	12		For H903 construction, used in all cols. except non-add cols.
21-610L No. 53 (1-610L No. 53)	12		
1-610R No. 54	12	1R-54	Used in cols. where extra automatic one is located
1-610L No. 54	12	1L-54	
66106	12		Blank sector, used in months or character cols.
1A-206110R	12		For field replacement, adding rack without lower tooth ground off and used with early style detent bail 69005A Style 13 or 17, Cl. 21 thru 26
1A-206110L	12		
66106	16		Blank sector, used in months or character cols.
1-110AL Fte. 202	16		Used in even cols. on machines with keyboard selection of registers, Cl. 22 thru 30
1-110AR Fte. 202	16		Used in uneven cols. on machines with keyboard selection of registers, Cl. 22 thru 30

REPAIR PLATES FOR 611 ADDING SECTORS (Plate 1-1)

(For use when wear occurs at point of contact with restoring bail 617A)

In machines equipped with inertia latches, the repair plates are to be installed in the columns indicated as illustrated.



Repair Plate D Columns 4, 5, 11, 17	Repair Plate H Columns 3, 6, 7, 9, 10, 12, 13, 14, 16	Repair Plate D Column 2	Repair Plate N Column 1

In column eight, plate N is to be assembled to the left of the 611 sector, replacing wide collar B with narrow collar J. In earlier styles of machines, stud 66506 is to be replaced with stud G.

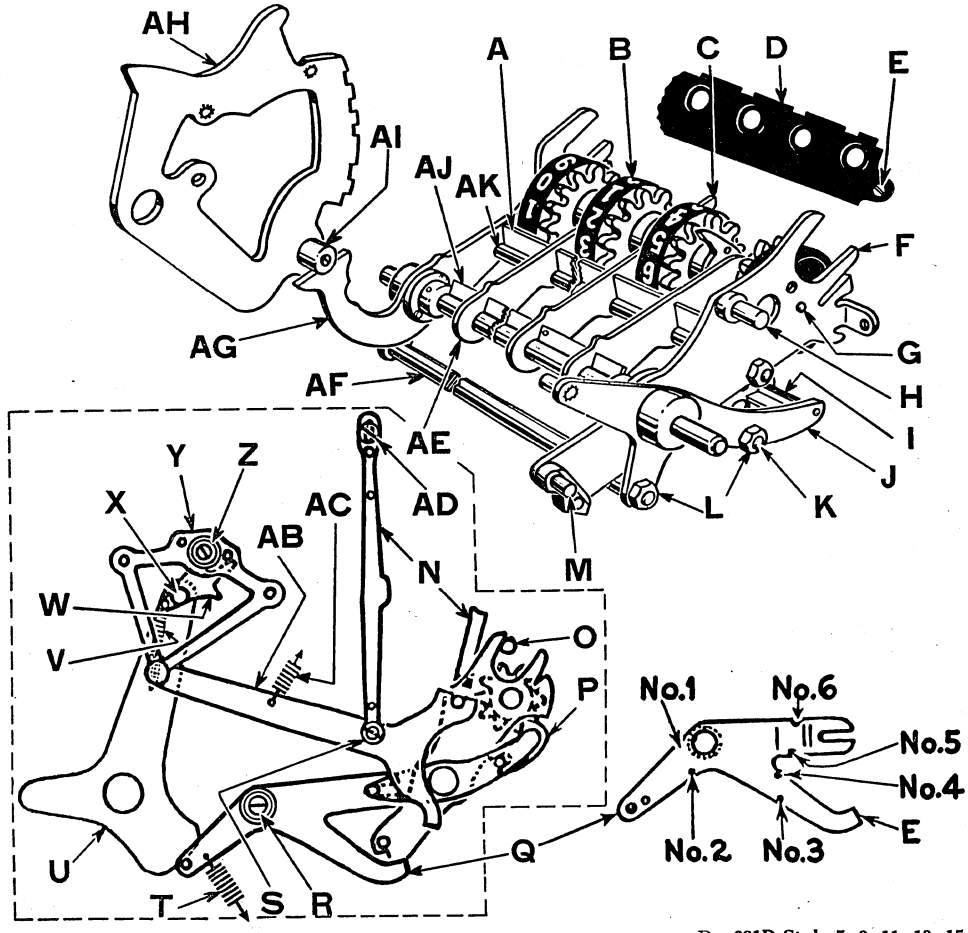
In column fifteen, plate D is to be assembled to the left of the 611 sector and if necessary, the stud is to be replaced as in column eight.

In machines or columns not equipped with inertia latches, screw 308526 is to be used to assemble the repair plates to the sectors.

SYMBOLS (Plate 1-1)

A	79548
B	66300 No. 1
C	77133
D	617¾Z No. 3
E	1097¾ Lock washer
F	46¼
G	66502A
H	1-617¾ZR No. 4
I	657¾Z
J	66300 No. 2
K	1-66117½
L	46
M	79505
N	1-617¾ZL No. 4

ACCUMULATOR MESHING CONTROLS AND ADJUSTMENTS (Plate 2)



2A-900 Style 9, 11, 15 complete assembled section, specify machine number

1A-900 Style 7, 9, 13, 15, 17 assembled frame, without dial wheels and detents, specify machine number

B **1-990 P. 10 No. 1**

REFERENCE LIST OF OTHER DIAL WHEELS

Class 1

1-990 P. 10 No. 1 used in all columns except the last
1-990L P. 10 No. 1 used in last column
1-990 P. 12 No. 1 for 1/12 fraction
1-990P. 16 No. 1 for 1/16 fraction
1-990 P. 60 No. 1 for hrs. and min. or lbs. and bu.
1-990 P. 62 No. 1 for hrs. and min. or lbs. and bu.
1-990 P. ⅛ No. 1 for ⅛ fraction

Class 2

11-990 P. 10 No. 1 used in all columns
11-990 P. 12 No. 1 for 1/12 fraction
11-990 P. 16 No. 1 for 1/16 fraction
11-990 P. 60 No. 1 for hrs. and min. or lbs. and bu.
11-990 P. 62 No. 1 for hrs. and min. or lbs. and bu.
11-990 P. ⅛ No. 1 for ⅛ fraction

Class 6, 11 thru 16, 20 thru 30

21-990 P. 10 No. 1 used in all columns except the 1st
1-990R P. 10 No. 1 used in 1st column
31-990 P. 10 No. 1 with crossfooter non-clear motor bar lock
1-990 P. 10 No. 1 Reversed, with crossfooter non-clear motor bar lock and reversed figures
11-990R P. 10 No. 1 with crossfooter non-clear motor bar lock

SYMBOLS (Plate 2)

1-990 P. 10 No. 2 with reflector and light, negative amounts in add position
11-990 P. 10 No. 2 with reflector and light, negative amounts in subtract position
1-990R P. 10 No. 2 with reflector and light, negative amounts in add position
11-990R P. 10 No. 2 with reflector and light, negative amounts in subtract position
1-990 P. 10 No. 3 with reflector and light, positive amounts in add position
11-990 P. 10 No. 3 with reflector and light, positive amounts in subtract position
1-990R P. 10 No. 3 with reflector and light, positive amounts in add position
11-990R P. 10 No. 3 with reflector and light, positive amounts in subtract position
41-990 P. 12 No. 1 for 1/12 fraction with crossfooter non-clear motor bar lock
21-990R P. 12 No. 1 for 1/12 fraction with crossfooter non-clear motor bar lock

Class 6 Fractions

21-990 P. 12 No. 1 for 1/12 fraction
1-990R P. 12 No. 1 for 1/12 fraction
21-990 P. ⅛ No. 1 for ⅛ fraction
1-990R P. ⅛ No. 1 for ⅛ fraction

Class 11 thru 16, 20 thru 30 Fractions

31-990 P. 12 No. 1 for 1/12 fraction
11-990R P. 12 No. 1 for 1/12 fraction
31-990 P. ⅛ No. 1 for ⅛ fraction
11-990R P. ⅛ No. 1 for ⅛ fraction

D **921D Style 7, 9, 11, 13, 15, 17** Cl. 1
921½ Style 9, 11, 13, 15, 17 Cl. 2
10921½ Style 9, 11, 13, 15, 17 Cl. 6, 11 thru 16
E **952¾**
F 1-910DL* included in assembly 1A-900 Style 7, 9, 13, 15, 17
G **1-908 Style 9, 11, 13, 17** includes clip 914½, use screw 12055⅝
H **958D**
I **903¼D Style 7, 9, 11, 13, 17** use brace 922⅛
J **1-920¼AL**
K **905A Shaft Style 7, 15** complete detent assembly 1-905A, includes I, J, K, L
L **45** Nuts
M **959¼**
N **1-911**
O **205 Style 7, 9, 11, 13, 15, 17** Shaft
P **926D P. 10** specify pitch if other than style shown is required
Q **1-917B**
R **255⅛** Screw, 942 bushing
S **259½** Screw, 46 nut
T **982 Style 9 (200823)** use for Style 7, 9, 11
982 Style 15 use for Style 13, 15, 17
U 813A* included in 1A-800 Style 9, 11, 13, 15, 17 specify machine number
V **1-883½A (1-84804)**
W **1-821B**
X **7550½**
Y 1-913A* included in AB
Z **941A,** 1050¼ Screw
AB 914C* complete assembly 1-914C, includes Y
AC **983**
AD **251, 46** Nut
AG 1-910DR* included in assembly 1A-900 Style 7, 9, 13, 15, 17
AH **2B-311⅛**
AK **901D Style 9, 13**

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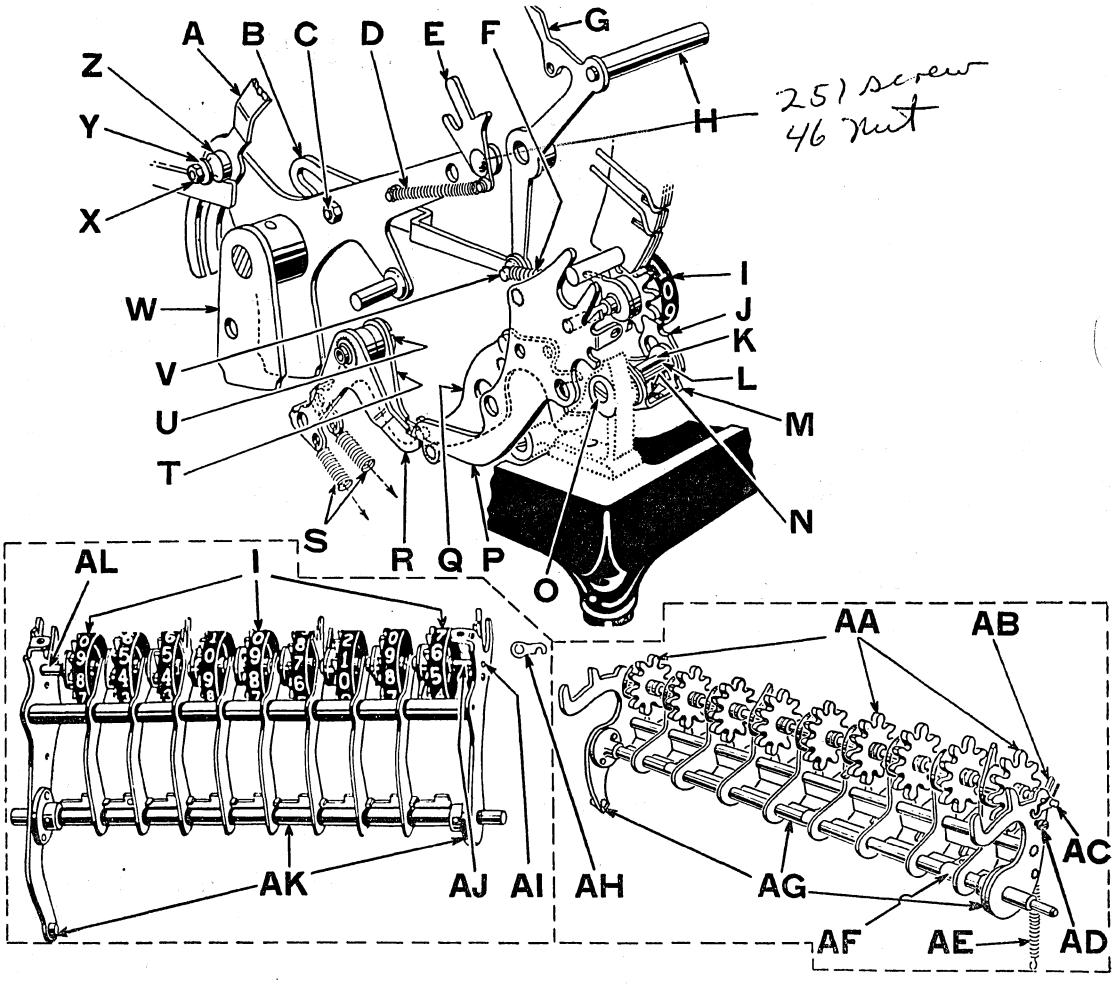
UPPER AND LOWER COUNTER MECHANISMS, CLASS 2 (Plate 4)

(Plate 3 in Instruction Book only)



SYMBOLS (Plate 4)

A 1-918⅛* included in 1-913B
B **918¼B**
C **856¼** Screw, 824¼ washer, 46 nut
D **1-883½A (1-84804)**
E **1-821B**
F **984**
G 11-922BL* included in assembly 11-904 Style 9, 11, 13, 17
H **902½A Style 7, 9, 11, 13, 15, 17**
I **11-990 P. 10 No. 1** see Plate 2 for other styles
J **926¼A P. 10, 926½A P. 10** Lower detent
K **909 Style 9, 11, 13, 17** Upper and lower shafts
L **927⅛ Style 9, 11, 13, 15, 17** Upper and lower strips
M **926¾** same on right side
N **988**
O **957⅜A** used on both sides
P 1-910⅛L* included in assembly 1B-900 Style 7, 9, 11, 13, 17
Q 1-910⅜L* included in assembly 1E-900 Style 9, 11, 13, 17
R **1-917⅛A**

1A-909 Style 9, 11, 13, 15, 17 complete assembled detent rack

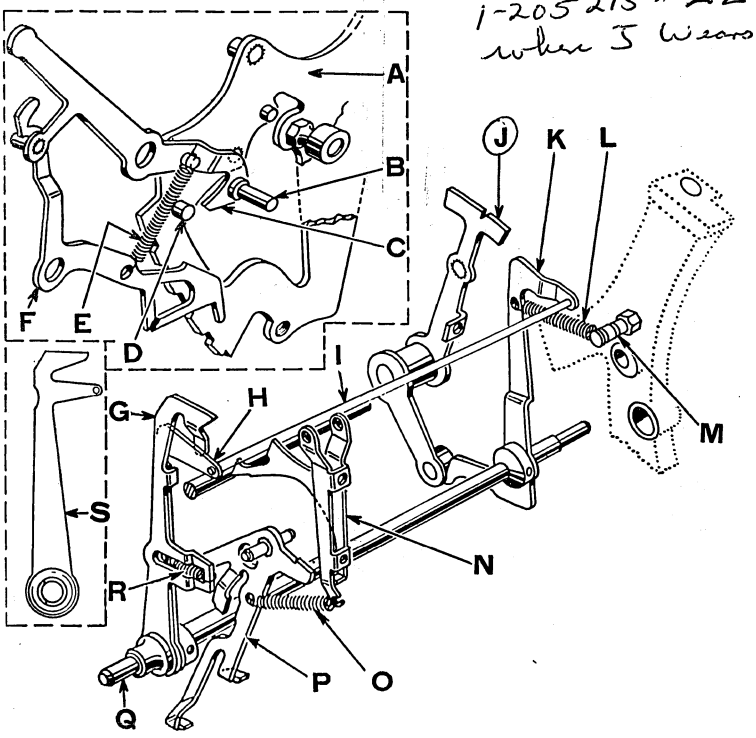
S **982½ Style 9 (72836)** use for Style 7, 9, 11, 13, 15
982½ Style 17 use for Style 17
T **1-917⅝A**
U **931⅛** use screw 255⅛
V **10959½**
W 813¼* included in assembly 11A-800 Style 9, 11, 13, 17
X **46** Nut, 3453B Style 9, 11, 13, 15, 17 Shaft
Y **7919½A**
Z **3432A**
AA **1E-916 P. 2, 8, 10, 16**
AB **916⅞A Style 9, 11, 13, 15, 17** Guide
AC **1-908 Style 9, 11, 13, 17** includes clip 914½
AD **12055⅝**
AE **984½ (289)**
AF **916⅜** Brace use 75608 screws
AG **1E-900 Style 9, 11, 13, 17** complete assembled section, specify machine number
AH **929⅛** use screw 950⅝, 46 nut
AI **908⅛ Style 9, 11, 13, 17**
AJ **932⅛** Collar
AK **1B-900 Style 7, 9, 11, 13, 17** complete assembled section, specify machine number
AL **931⅞**

COMPULSORY SPACING STROKE—COMPULSORY TOTAL KEY RELEASE MECHANISMS, CLASS 2 (Plate 5)

205533A #4Z
1-205215 #2Z
when S was

SYMBOLS (Plate 5)

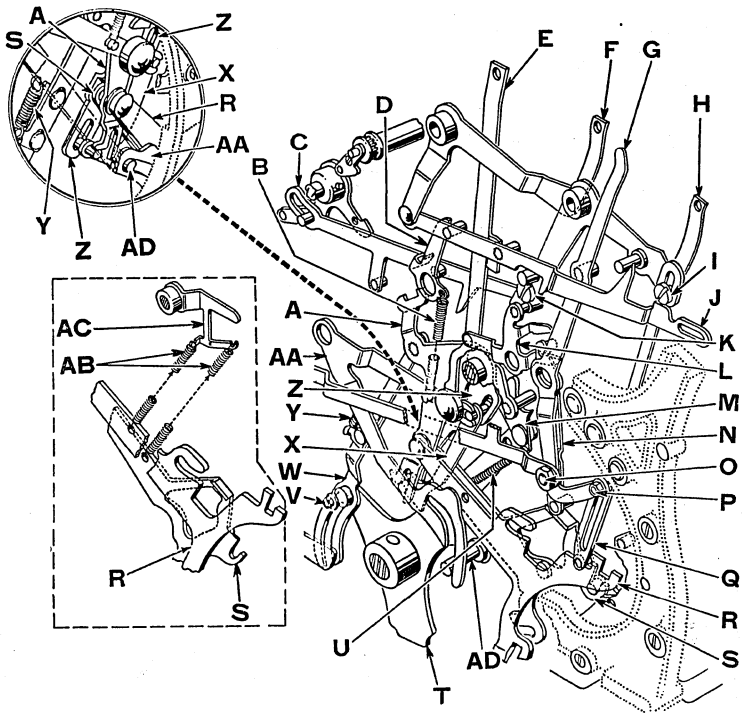
A **2B-311⅛**
B **1056⅝**
C **1-1012⅝**
D **355¼**
E **1084**
F **200138 No. 2 (1-200138C No. 2, 200517B, 200357A, 200384A)**
G **1-424¼**
H 1-424½L* included in Q
I **402B Style 7, 9, 11, 13, 15, 17**
J 1-1415A* included in 1-1400¼ Style 9, 11, 13, 17
K 1-424½R* included in Q
L **82814**
M **1053¼**
N **411B**
O **480¼**
P **1-413D**
Q **1-401 Style 9, 11, 13, 15, 17** includes G, H and K
R **489**
S 1-424AL*



TRANSFER TOTAL MECHANISM, CLASS 2 (Plate 6)

SYMBOLS (Plate 6)

A **1-913B** includes R, W
B **986**
C **1-3426⅛**
D **1-3429⅛A (1-3429⅛AZ, 1-3429⅛Z, 957½)**
E **1-1010⅝B** includes L, uses 7283A Style 10 spring
F **1B-227⅜DL** includes J
G **1-1010¼A**
H **1A-227DL**
I **251** Screw, 46 nut
J **1-216⅝** included in F
K **251⅜** Screw, 46 nut
L **1-1010½** included in E
M **1-821B** included in T
N **1-1010⅜** included in G
O **3434** Nut, 1052⅞ screw
P **259½** Screw, 46 nut
Q **1-911B**
R **914⅝** included in A
S **1-914⅞**
T 1-813E* included in 11A-800 Style 9, 11, 13, 15, 17
U **1-883½A (1-84804)**
V **3432A** Sleeve, 7919½A washer, 46 nut, 3453B Style 9, 11, 13, 15, 17, shaft
W 1-918½A* included in A
X **1-929¾** included in Z
Y **3882**
Z **1-913⅛** includes X
AA **1-1012⅛** uses 931⅛ bushing, 255⅛ screw
AB **986**
AC **1-1011⅛A** uses 255⅛ screw
AD **850⅞**



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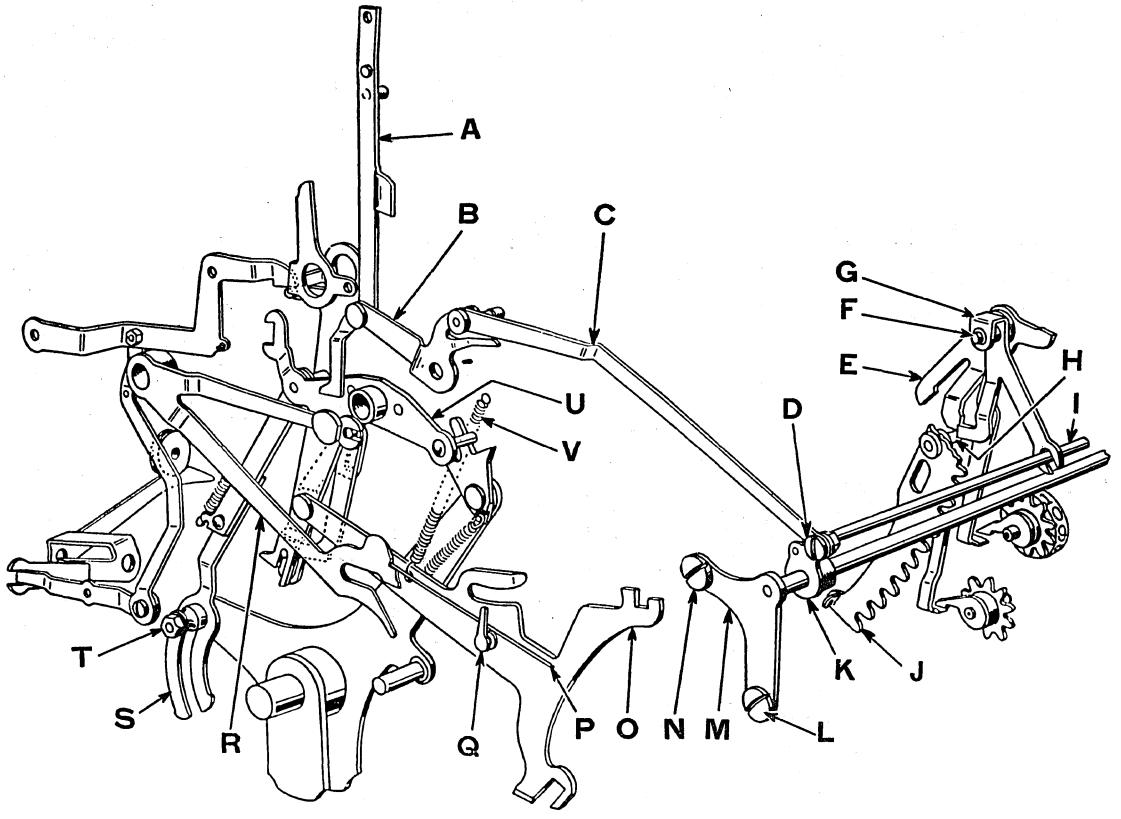
SUB-TRANSFER TOTAL MECHANISM, CLASS 2 (Plate 7)



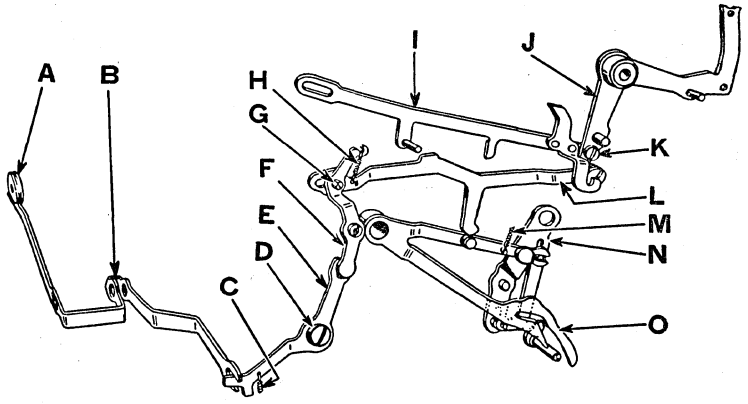
SYMBOLS (Plate 7)

A **1-1010⅝B** included in B
B **2-120 Fte. 31** includes A and C
C **122 Fte. 31**
D **1052⅞**
E **1-413D**
F **460A**
G **115½ Fte. 31**
H **651 No. 5**
I **102 Fte. 31 Styles 9, 11, 13, 17**
J **41-610R No. 25**
K **1-111 Fte. 31** on 1-101 Fte. 31 Style 15,17
L **51½ Fte. 123 (553 Fte. 216)**
M **29½A Fte. 99**
N **64 Fte. 99**
O **1-114⅝ Fte. 31** includes U and S
P **170 Fte. 31**
Q **151 Fte. 31** Stud, 114½ Fte. 31 latch
R **1-112½A Fte. 31**
S **1-918⅛A** included in O
T **3453B Style 9, 11, 13, 15, 17** Shaft, 46 nut, 7919½A washer, 3432A sleeve
U Included in O
V **986**

TRANSFER MECHANISM, CARRIAGE CONTROLLED, CLASS 2 (Plate 8)

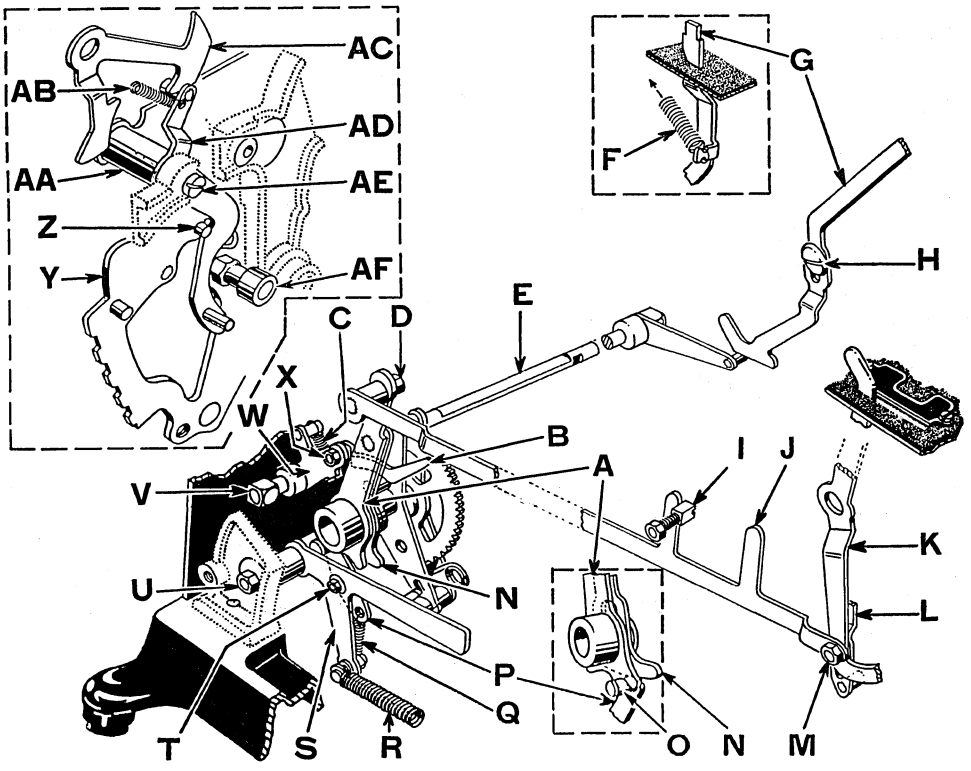
SYMBOLS (Plate 8)

A **No. 3 Roll**—see Plate 84 carriage symbol list
B **11-27⅜ Fte. 99 Style 13 No. 2**
11-27⅜A Fte. 99 Style 17 No. 2
C **100821½**
D **120531⅛**
E **1-13 Fte. 113**
F **1-14 Fte. 113**
G **259½**
H **489**
I **1-17 Fte. 113**
J **1A-227DL**
K **251¼**
L **20 Fte. 113**
M **986**
N **1-929¾**
O **1-22 Fte. 113**



SEE EXPLANATION ON INSIDE OF FRONT COVER

COUNTER CONTROL, CLASS 2 SHUTTLE CARRIAGE (Plate 9)

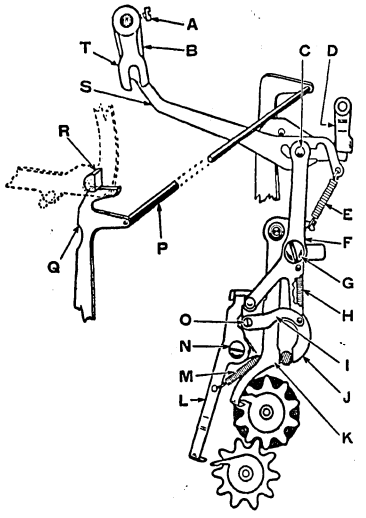


SYMBOLS (Plate 9)

A **1-3422¾** complete assembly 2-3422¾ includes J and N
B **1-3216½**
C **10089**
D **46** Nut, 2820½ washer
E **1-3400 Style 9, 11, 13, 15, 17** includes C, W, X
F **1385 Style 9**
G **3410⅛**
H **3455¼** Screw, 613½ washer, 46 nut
I **3464⅛** Screw, 46 nut
J **1-3421½A** included in A
K **1-1010¼A** includes L
L **1-1010⅜** included in K
M **1052⅞** Screw, 3434 nut
N **1-3424** included in A
O **3435¼** Roller, 3454⅝ stud
P **1-3424¼** included in S
Q **10085**
R **1-3481C**
S **1-3422¼A** includes P
T **251¼** Screw, 629 washer, 46 nut
U **3455** Screw, 45 nut
V **3450¼**
W **1-3215¾**
X **259½** Screw, 46 nut
Y **2B-311⅛**
Z **355¼**
AA **334¼A**
AB **983**
AC 1-218½B* included in assembly 1-208½D Style 9, 11, 13, 15, 17
AD **1-323½A**
AE **352⅞** Screw, 393 nut, 322 washer
AF **1-3662¼, 45** Nut

NEGATIVE TOTAL LOCK MECHANISM (Plate 11)

(Plate 10 in Instruction Book only)



SYMBOLS (Plate 11)

A **7562**
B **1-10216A**
C **10451A**
D **1-10411AL**
E **3280⅛**
F **1-10416A (21-10416A)**
G **10454**
H **7280½**
I **1-10417½A**
J **1-10415C**
K **1-10413AL** complete assembly 22-10413AL includes F, I, J, K, L
L **10414C**
M **10480¼**
N **10056**
O **252⅝**
P **402B Style 7, 9, 11, 13, 15, 17**
Q 1-424AL* included in 11-400A Style 13, 17
R **261⅛**
S **1-10214A**
T 1-218¼* included in 1A-10208½ Style 9, 11, 13, 17

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For Form 2963

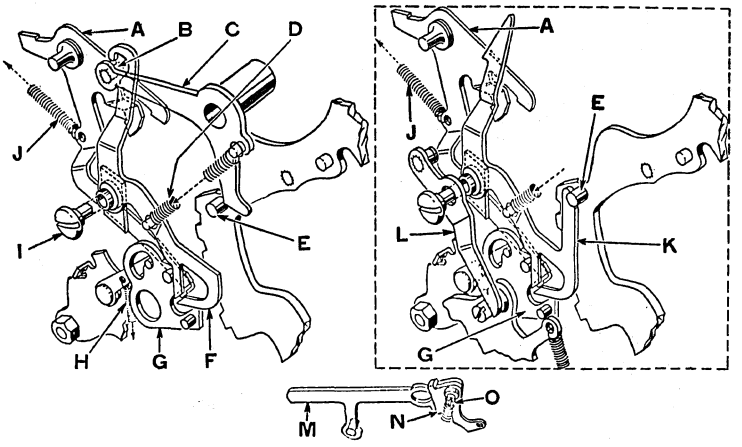
AUTOMATIC ONE MECHANISMS (Plate 14)

(Plates 12 and 13 in Instruction Book only)

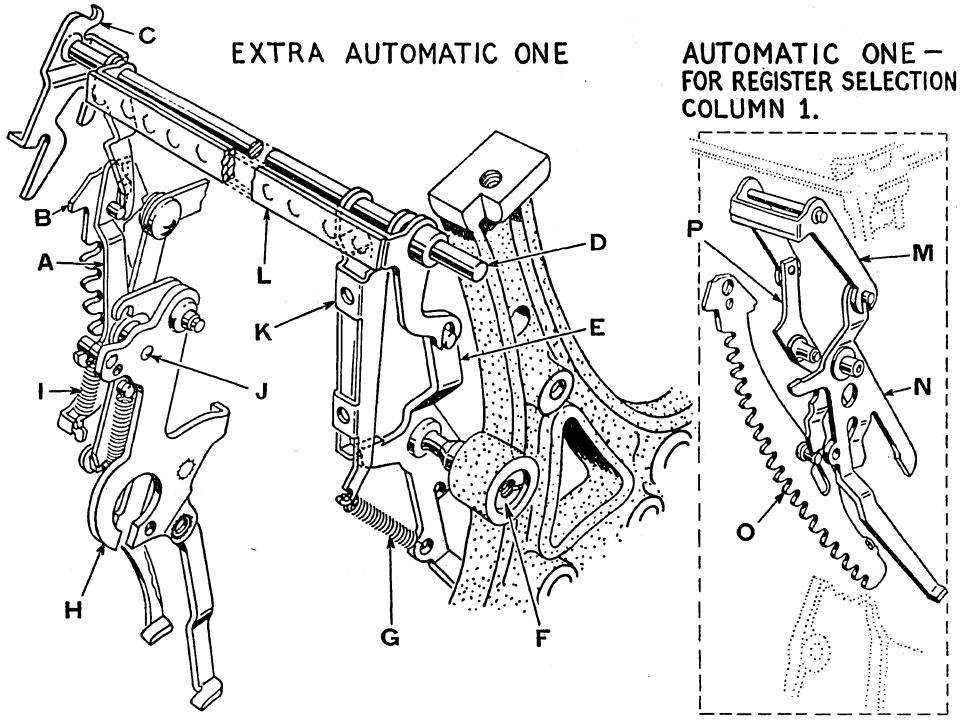
SYMBOLS (Plate 14)

A **1-10413R** for Cl. 11 thru 16
1-204113R for Cl. 20 thru 30
B **1056⅞** part of C
C **1-200231A**
D **1084**
E **63500** included in 12B-311⅛ or 22B-311⅛
F **1-200138C**
G **1-10912** uses 3455⅜ screw, 10955 bushing
H **284**
I **200517B** Screw, 200357A nut
J **480B**
K **1-200138B (1-200138C No. 2)** Early style
L **1-200139**
M **1-200231 (1-200231A, 1-200138C)**
N **200231AZ**
O **200523¼Z** Stud, 1097⅞ washer, to assemble, remove **652⅜** from 1-200231, drill hole with a No. 37 drill and tap to ⅛-44 thd., place 1097⅞ washer under head of 200523¼Z

NOTE: To avoid having to remove the side frame on the earlier mechanisms, field repair parts M, N and O are used instead of arm C.
Parts M, N and O require resetting arm F instead of arm K.



EXTRA AUTOMATIC ONE—AND AUTOMATIC ONE—FOR REGISTER SELECTION—COLUMN 1 (Plate 15)

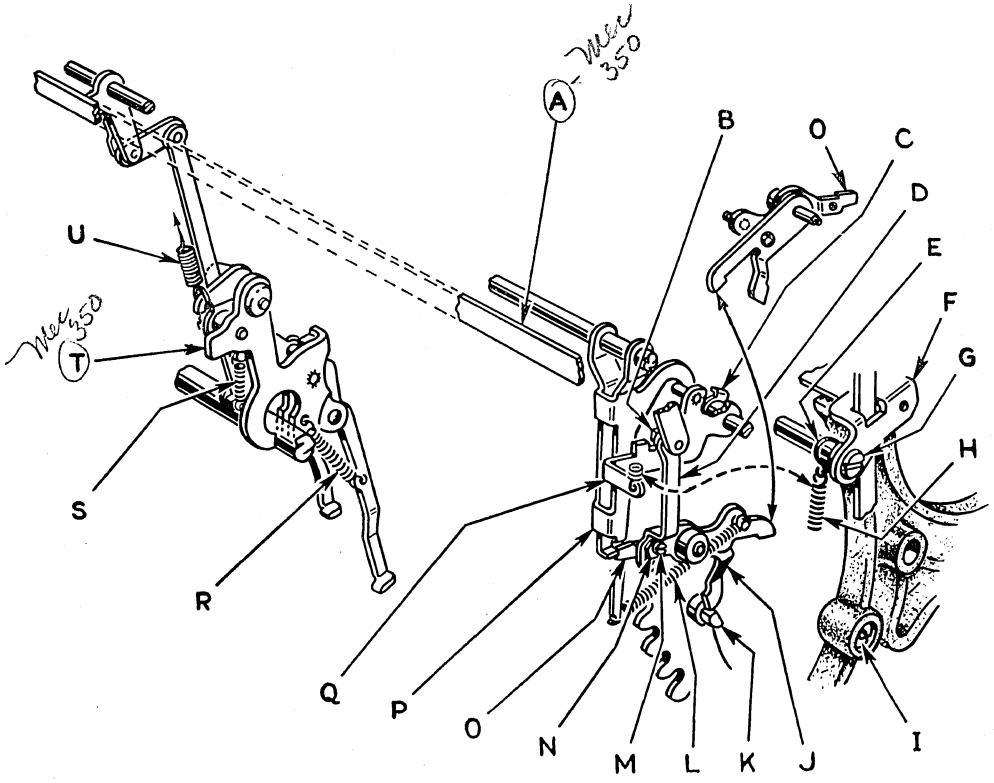


SYMBOLS (Plate 15)

A **1-26⅝ Fte. 99** included in H
B **1-610R or L No. 32,** see Plate 1 for other symbols
C **18⅛ Fte. 99**
D **1⅞ Fte. 99 Style 13, 17**
E **1-102 Fte. 204**
F **10059** Bearing, 10036 screw
G **480¼**
H **31-13 Fte. 99** includes A, I and J
I **8082A**
J **52⅜ Fte. 99 (8452½)**
K **10411 No. 2**
L **1-26⅞ Fte. 99 Nos. 4 thru 12** for 2 permanent splits, specify location
11-26⅞ Fte. 99 Nos. 4 thru 12 for one permanent split, specify location
M **101 Fte. 204**
N **1-102 Fte. 204**
O **610*** see kinds, Plate 1
P **1-100 Fte. 204 No. 2**

SEE EXPLANATION ON INSIDE OF FRONT COVER

AUTOMATIC ONE—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 15-1)



SYMBOLS (Plate 15-1)

A	**1-204140** includes B, D
B	**204527** stud
C	**21 No. 8** clip
D	**204138**
E	**20 No. 85**
G	**259⅝** screw, use 2820½ washer
H	**480B**
I	**10036** nut, use 10059 screw
J	**1-204113R No. 2**
K	651 No. 1* stud
L	**84819**
M	**74502** screw
N	**204319** eccentric
O	**1-204113½**
P	**411½R No. 3**
Q	**1-204147**
R	**10480¼**
S	**7280½**
T	**32-10413AL** includes R, S
U	**983**

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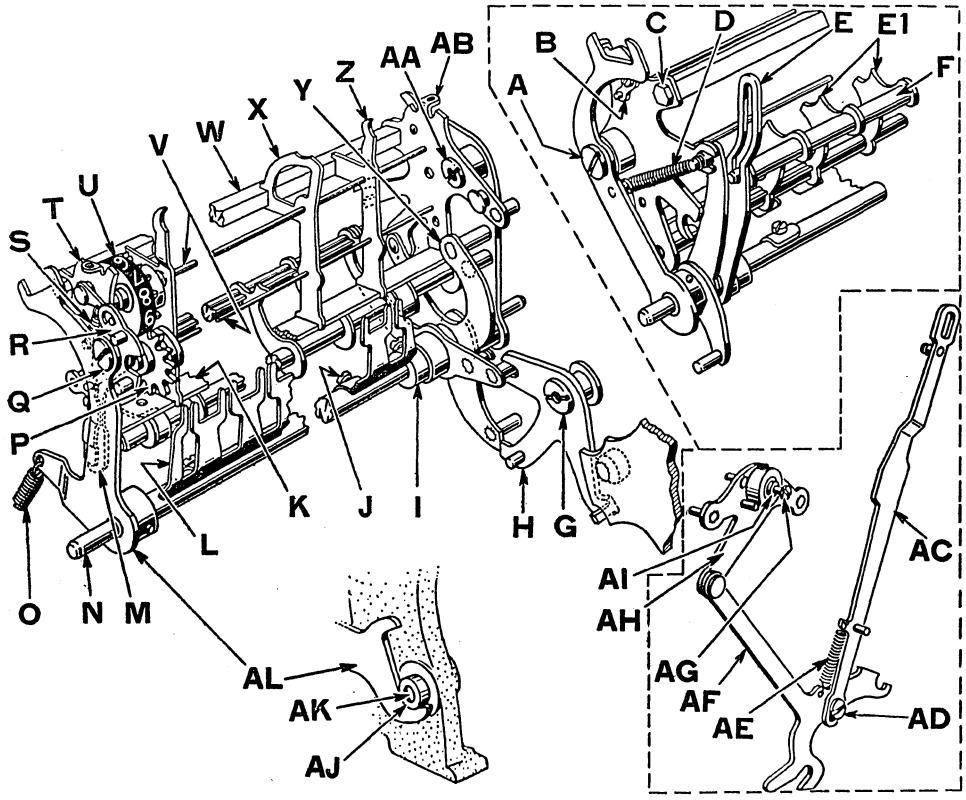
CROSSFOOTER MECHANISM, CLASS 6 (Plate 16)



TOTAL LOCK DETENT, CLASS 6 (Plate 17)

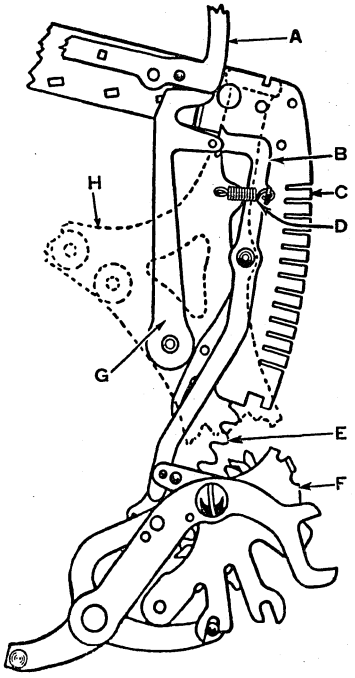
SYMBOLS (Plate 16)

2-10900 Style 11, 13, 15 complete assembled section; specify machine number

A **10960½**
B **929¼** use screw 12055⅝
C **10961¼A (203597)**
D **10980**
E **1-10915**
E1 10926½* P. 8, 10, 12 included in F
F **1-10905A Style 9, 11, 13, 15, 17**
1-10905A Style 11, 13, 15, 17 £.s.d, (1A-10905A Style 11, 13, 15, 17 £.s.d., 1-10916R P. 12, 1-990R P. 12 No. 1) complete assembled detent rack
G **931⅛** use screw 255⅛
H **1-10917⅛A** use spring 10982
I **1-7140¼** use screw 75602
J **2851¾**
K 10926⅛* Style 11, 13
L **10916⅞ Style 9, 11, 13, 15, 17**
M **10929¼** use 12055⅝ screw
N **1-10900 Style 9, 11, 13, 15, 17** includes E, I, Y and AL
O **10984½ Style 11, 13, 17**
P **1-10916R P. 10, 1-10916 P. 10** used in other columns
Q **3455⅜** use 10955 bushing
R **1-10912**
S **284**
T 1-10910⅜R*
U **1-990R P. 10 No. 1, 21-990 P. 10 No. 1** used in other columns, see Plate 2 for other styles
V **10908⅜ Style 9, 11, 13, 15, 17**
W 1-10926⅜B* Style 11, 13, 15 included in assembly 2Z-10926⅜B Style 11, 13, 15, frame without dial wheels and includes K, T, X, Z and AB
X 10915¼A*
Y 1-10914*
Z 10915½A*
AA **10960**
AB 1-10910⅜L*
AC **1-10911** use 251 screw and 46 nut in upper slot
AD **10056**
AE **10983**
AF 10914⅝* assembled 1-10914⅝
AG **255⅛**
AH 1-10913* included in AF
AI **10932⅜** Bushing
AJ **10037 (10037 No. 2)**
AK **1050⅛**
AL 10910⅜R&L* included in N

SYMBOLS (Plate 17)

A **1-10227**
B **1-10410**
C **1-210AL P. 8 (1A-210AL P. 8) 1-210AL P. 10, 12, 16**
D **3283**
E **1-610 No. 77**
F **1-10910⅜L**
G 1-424AL* included in 11-400A Style 13
H **1-10066L** specify machine number



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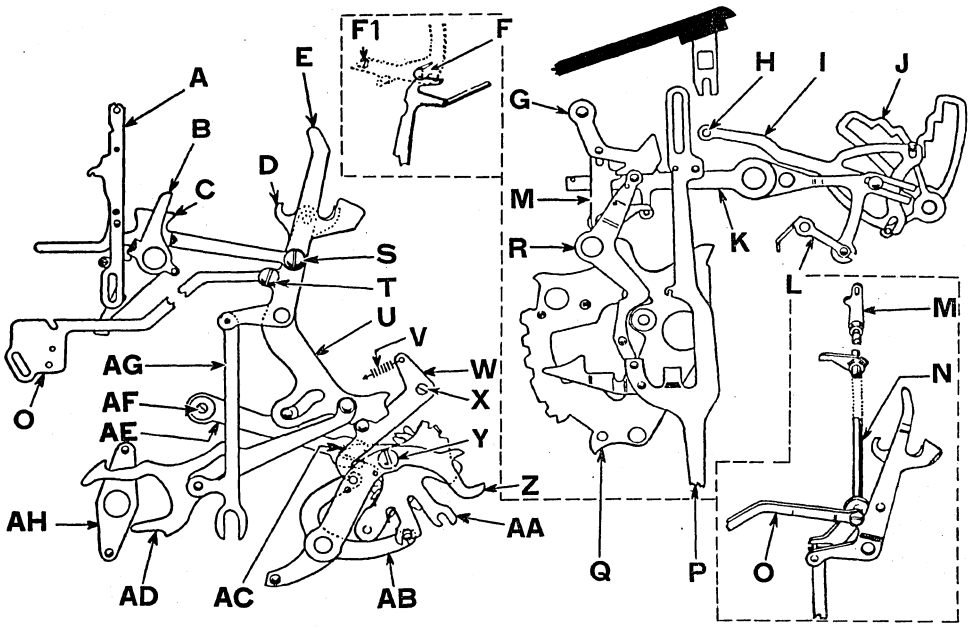
ADD-SUBTRACT LEVER AND COUNTER SHIFT MECHANISM, CLASS 6 (Plate 18)



A **1-10221½**
B **1-3429½ Style 9, 13, 17**
C **10018B**
D **1-10023**
E **1-10010¼B**
F **251⅞A** in 1-10227
F1 **10250** in 1-10227
G **1-10218½**
H **263**
I **1-2287⅛**
J **1-710¾A**
K **1-10614¾ Style 15** uses springs 681 and 10686½

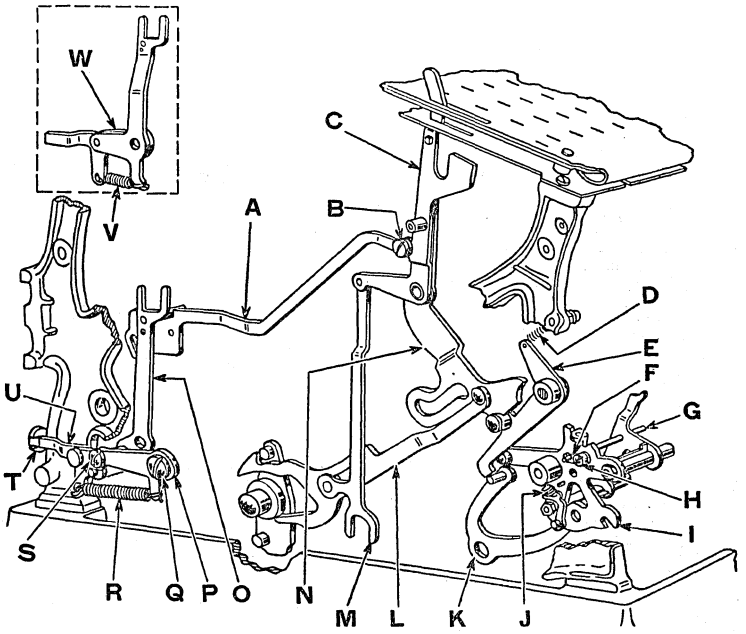
SYMBOLS (Plate 18)

L **1-711¾A**
M 1-10614* on N
N **1-10601¼ Style 9, 11, 13, 17**
O **1-10016A**
P **1-3627 No. 1**
Q **2B-311⅛**
R **1-323½A** uses spring 983
S **10056**
T **10056**
U 1A-10022* included in AD
V **3283**
W **1-10025**
X **10057** Screw, 46 nut
Y **10960½** Screw, 10960 bushing
Z 10910⅛L*
AA **1-10910⅜L**
AB **1-10914**
AC 10959* Stud
AD **1-10020 (1-60120)** includes U
AE **1-10026**
AF **255⅛** Screw, 10032 bushing
AG Included in E
AH 1-68112*

SUBTRACT CONTROL INDEXED FROM CARRIAGE (Plate 19)

SYMBOLS (Plate 19)

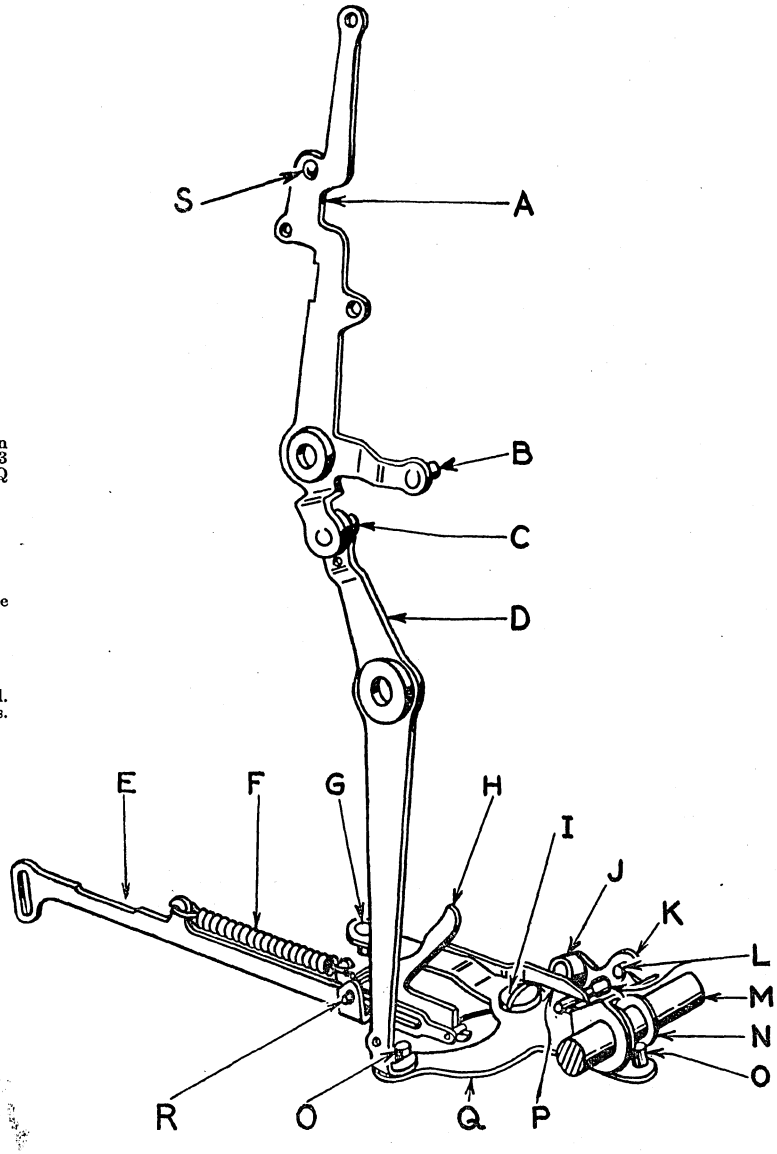
A **1-10016A**
B **10056**
C **2-60110A** includes M
D **3283**
E **1-10025** uses 10057 shoulder screw, 46 nut
F **929⅛**
G **10908⅜ Style 9, 11, 13, 15, 17**
H **12055⅜**
I **1-69211L**
J **1-69803**
K **1-69214**
L **1-60120**
M Included in C
N Included in L
O **1-4415 Style 11** use for Style 13, uses 10038¼ washer, 1055⅜ Style II screw
P **1-4424¼ Style 11**
1-4424¼ Style 13 No. 2
Q **10056**
R **4485 Style 11**
S **957½**
T **10012B Style 13, 17**
U Included in P
V **10088A**
W **1-10011A** use for Style 17



REGISTER TOTALING INDEXING LEVER, CLASSES 11 THRU 16 (Plate 20)

SYMBOLS (Plate 20)

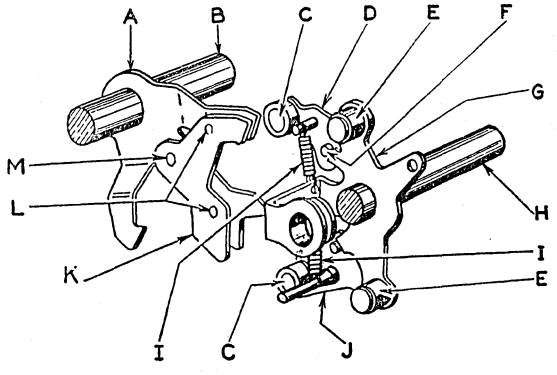
A **1A-60100** specify machine number
B Included in A
C Included in A
D **1-60101A**
1-60101 No. 2 for H903 construction
E **1-60107A** complete assembly 1A-60133 Nos. 1 thru 6 includes F, H, P, Q
F **60807**
G Included in Q
H **60109 No. 4** see Plate 28-2
I **69552**
J **69308** Roll, 69511 stud
K **1-69134L** includes J and L
L Included in K
M **1A-69002 Style 13, 17** specify machine number
N Included in M
O Included in Q
P **60108**
Q **1-60111 (1-60111A)**
1-60111 No. 2 (1-60111A) for 14 col. adding capacity on Style 17, 10 cols. adding capacity on Style 13
R **60001** Shaft, 470 ring
S **7948** Roll, 10751¾ stud



REGISTER MESHING CONTROL (Plate 21)

SYMBOLS (Plate 21)

A 1-68101* included in B
B **21-68000 Style 13 (11-68000 Style 13, 1-69117B No. 2 or 3)**
21-68000 Style 17 (11-68000 Style 17, 1-691117B No. 2 or 3) specify machine number
11-68000 Style 13, 17 used for H903 construction
41-68000 Style 13 used for machines with rotary consecutive numbering device and/or rotary cal. fto. right or left side, or quick set rotary
C **69308** Roll, 69511 stud
D **1-69134R** includes C, E, F
E **69312** Roll, 69506 stud
F **69518**
G 1-69132* included with H
H **1A-69002 Style 13, 17** Shaft assembly, specify machine number
I **69802**
J **1-69134L** includes 69517 stud, also E, C
K 68100* included in A
L **68501**
M **68500**



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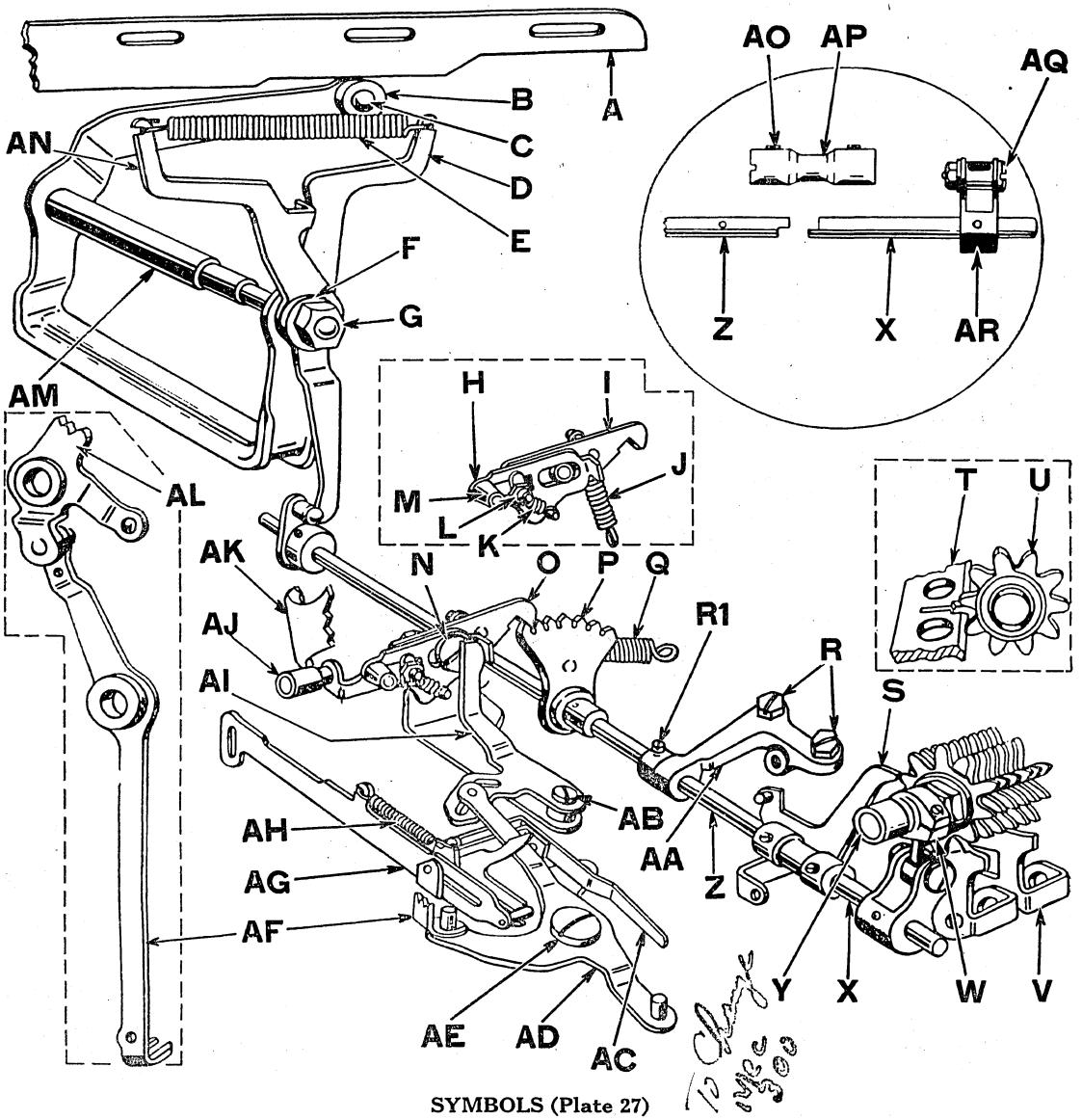
REGISTER SHIFTING MECHANISM, CARRIAGE SELECTION, CLASSES 12 THRU 16, 22 THRU 30 (Plate 27)

(Plates 22 to 26 inclusive in Instruction Book only)



SYMBOLS (Plate 27)

A **61200** specify machine style and number and submit form

B **60315A**

C **650A**

D **1-60129A** Classes 12 thru 16 and 22 thru 26
1-60129A No. 10 Classes 27 thru 30
1-60129 No. 2 used with 10 register construction if machine has rotary cal. fte. on left
1-60129A Style 13, 17 Env. 695A used on earlier 6 register construction with rotary on left

E **60803 No. 10** for Classes 27 thru 30, copper plated
60803 Style 17 No. 3 for Classes 27 thru 30, without rotary, yellow
60803 Style 17 No. 4 for Classes 27 thru 30, with rotary on left, green
60803A Style 13 for Classes 12 thru 16, 22 thru 26, blue
60803A Style 13 for Classes 12 thru 16, 22 thru 26, without rotary on left, blue
60803 Style 17 No. 2 for Classes 12 thru 16, 22 thru 26, with rotary on left, red
60803 Style 17 No. 4 for Class 30, 14 digits in register with rotary, yellow
60803 Style 17 No. 3 for Class 30, 14 digits in register without rotary, yellow

F **10021¾**

G **393**

H **1-60138B No. 2**

I **11B-60137B No. 1 (11B-60137B No. 2)** see Plate 28-1

J **60804A**

K **8381**

L **60529 No. 2** or
60529½Z, 60137½ Bushing, 46¼ nut

M Included in H

N **60552 No. 2** Screw, 46 nut

O **11B-60137B No. 2** see Plate 28-1

P 1-60140 No. 6* or No. 10* included in Z

Q **60802 Style 17 No. 2** Alloy finish, Classes 27 thru 30, without rotary
60802 Style 17 No. 2 Alloy finish, Classes 27 thru 30 with rotary on left
60802A Style 13 Ivory, Classes 12 thru 16, 22 thru 26, 27 thru 30
60802A Style 17 Black, Classes 12 thru 16, 22 thru 26 without rotary on left
60802 Style 17 No. 2 Alloy finish, Classes 12 thru 16, 22 thru 26 with rotary on left
60802 Style 17 No. 3 Alloy finish, Class 30, 14 digits in register with or without rotary

NOTE: Springs Q are colored on one end.

Symbols continued on Next Page

SYMBOLS (Plate 27)—Continued

R **3660¾**
R1 **1-60357** includes screw 75618
S **1-69118** specify pitch, for 6 register construction; see Plate 29 for 10 register construction
T **69135 Style 13, 17** specify machine number; see AV Plate 29 for other styles
U **69116A** specify pitch and 6 or 10 register construction
V **1-69122** specify pitch and 6 or 10 register construction
W **1A-69340A** includes screw 69558
X **1-69015B No. 1 (1-69015D No. 1, 1-69114¼A)** includes AQ and AR, for less than 10 digits Style 13, or less than 14 digits Style 17
1-69015A No. 2 includes AQ and AR, for Style 13 with 10 digits register capacity, or Style 17 with 14 digits register capacity
Y **1-69009 Style 13, 17 No. 2** for 10 digits register capacity in Style 13 and 14 digits in Style 17
1-69009 Style 13, 17 No. 4 for less than 10 digits in Style 13 and less than 14 digits in Style 17
Z **11-60002 Style 13, 17 No. 10** for 10 register construction with 10 digits register capacity in Style 13 or 14 digits in Style 17
1-60002 Style 13, 17 No. 10 for less than 10 digits Style 13, or less than 14 digits Style 17
AA **665½ Fte. 202** included in Z
AB **60551**
AC **60108**
AD **1-60111 (1-60111A)**
1-60111 No. 2 (1-60111A) for 14 col. adding capacity on Style 17, 10 cols. adding capacity on Style 13
AE **69552**
AF **1-60101A**
1-60101 No. 2 for H903 construction
AG **1-60107A** assembly 1A-60133, specify machine number; includes AG, AH, AC, AD, AE
AH **60807**
AI **1-60136B No. 2**
AJ Included in O
AK 68113A*
AL **1A-60100** specify machine number
AM **60003** uses screw 2850½ in end
AN **1-60128A Style 13, 17** Classes 12 thru 16 and 22 thru 26
1-60128 No. 10 for Style 17, 10 register construction
1-60128 Style 13 No. 10 for Style 13, 10 register construction
1-60128 No. 2 used with 10 register construction if machine has rotary cal. fte. on left
60128A Style 13, 17 Env. 695A used on earlier 6 register construction with rotary on left
AO **75618**
AP **60312**
AQ **69560** Screw, 9028½ washer, 47 nut all included in X
AR Included in X

REGISTER SHIFT, AIRPOT CONTROLLED MECHANISM (Plate 27-1)

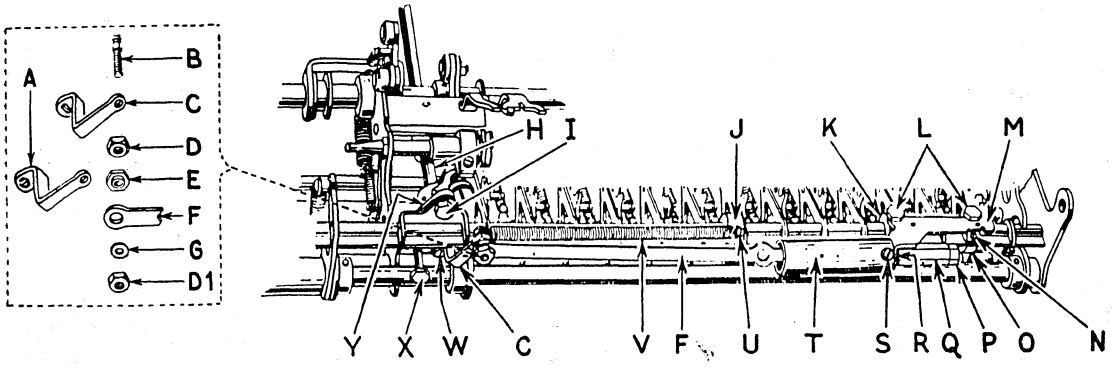


FIG. No. 1

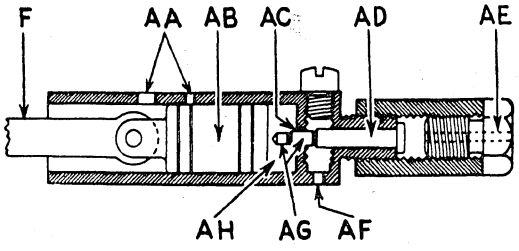


FIG. No. 2

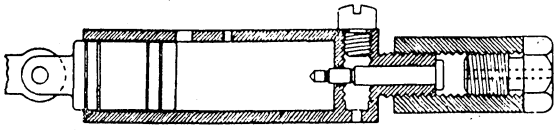


FIG. No. 3

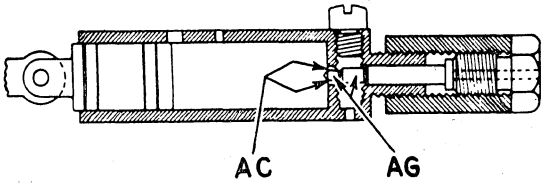
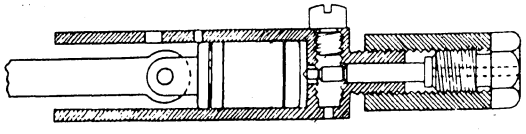


FIG. No. 4



SYMBOLS (Plate 27-1)

A **69114¼Z**
B **69543**
C **69114¼ No. 2** Arm only
D **104310**
D1 **46**
E **203446A**
F **1-69232**
G **629** Washer
H **1-69015D No. 1**
I **69534 No. 2**
J **1-69333A** includes U
K **1-69333½** Collar includes L, N
L **709540**
M **69233**
N **71519** Screw
O **1-69333½** Collar includes L, N
P **69542**
Q **69341**

Symbols continued on Next Page

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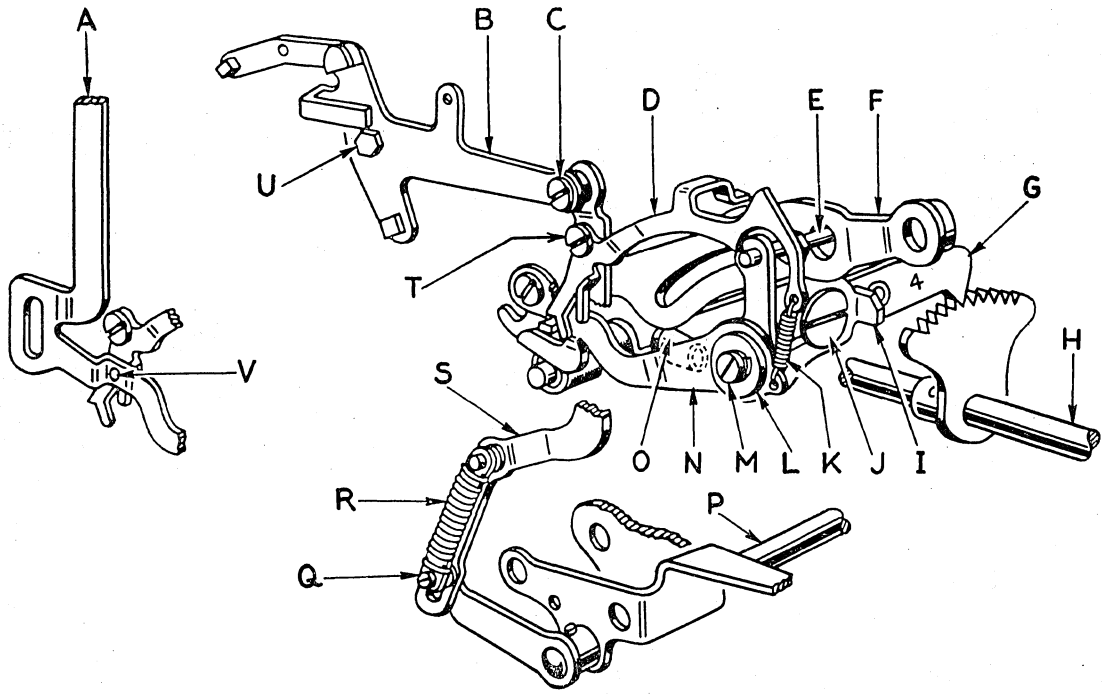
SYMBOLS (Plate 27-1)—Continued

R **1097⅝** Lock washer
S **73617**
T **69447** Dashpot only
* **1Z-69447** complete assembled dashpot includes A, B, C, D, D1, E, F, G, K, M, O, P, Q, R, S, T, AG
U **69562**
V **83814**
W **73611** Screw, 1097¾ lock washer
X **69534**
Y **69114½ No. 1** Bearing
AA Description
AB 103448* included in F
AC Description
AD **69541** Valve
AE Description
AF Description
AG Description
AH Description
1-806 Fte. 202 No. 2 Spring, not shown
*Parts required for field installation. See text, Plate 27-1, Accumulation Instruction Book

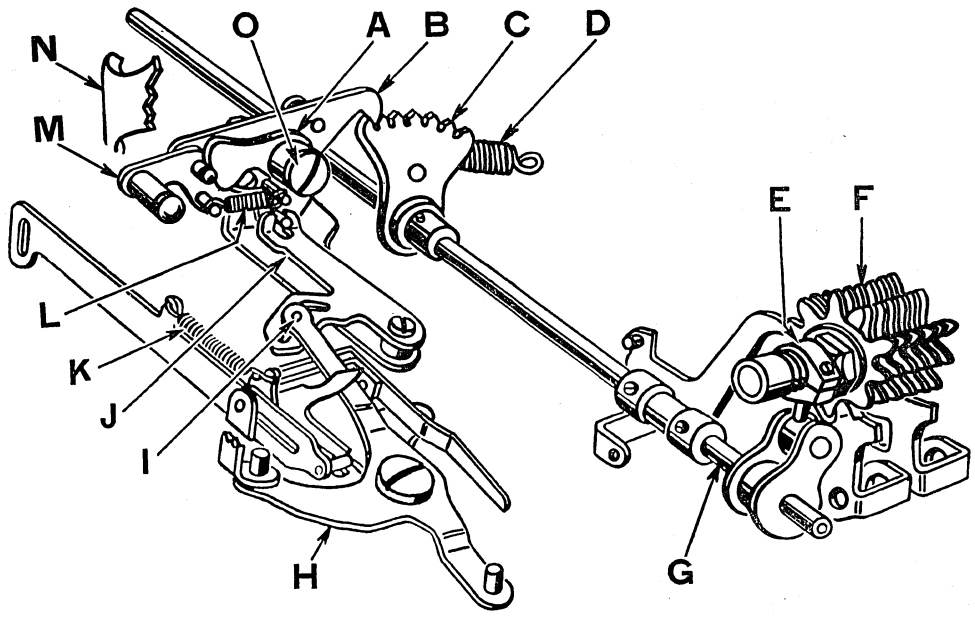
REGISTER DETENT RELEASE MECHANISM, IMPROVED STYLE (Plate 27-2)



SYMBOLS (Plate 27-2)

A **1-200143½ No. 5** Position 9-19
1-106 No. 5 Env. 280G Position 10-19
B **11-200158½B**
C **10056** Screw
D **200182¾**
E **68503A No. 2**
F **61-200162**
G **11B-60137B No. 2** see Plate 28-1
H **1A-60002 Style 17 No. 10**
I **1-60138B No. 2**
J **60552 No. 2**
K **82809**
L **200480** Shoulder bushing
M **73659** Screw, 1097¾ lock washer
N **1-200183¾**
O 60311 No. 2* included in I
P **1-200006 Style 17 No. 2**
Q **200661A**
R **1-200816A (1-88800B)**
S **1-200182½A**
T **200582½**
U **69554**
V 9252⅞* included in A

REGISTER ALIGNING DETENT (EARLY) (Plate 28)



SYMBOLS (Plate 28)

A **1-60139**
B **11A-60137B No. 1** see Plate 28-1
C 1-60140 No. 6* or No. 10*
D **60802A Style 13** see Plate 27 for other styles
E **1A-69340A** includes screw 69558
F **69116A P. 8, 10, 12** specify 6 or 10 register construction
G **1-69015 (1A-69340A, 1-69015A No. 1, 1-71321)** Early style with steel ball; for present style see X Plate 27
H **1-60111 (1-60111A)**
1-60111 No. 2 (1-60111A) for 14 col. adding capacity on Style 17, 10 cols. adding capacity on Style 13
I **60515**
J **1-60136A No. 2**
K **10983**
L **60805**
M **1-60138A No. 2** included in B
N 68113A*
O **60552** Screw, 46 nut

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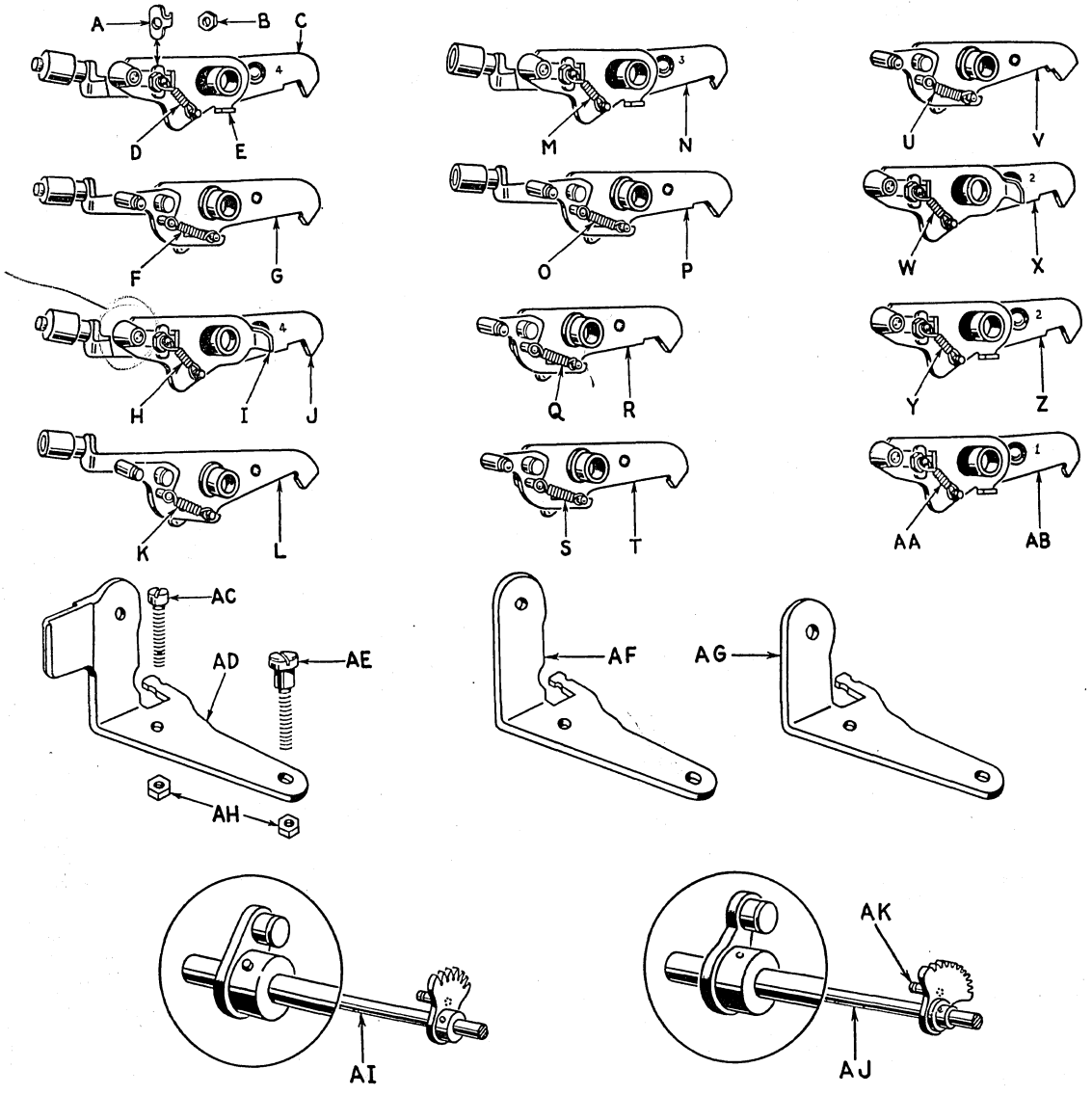
REGISTER DETENTS AND REGISTER CONTROL SHAFTS (Plate 28-1)



SYMBOLS (Plate 28-1)

NOTE: BECAUSE OF THE MANY SIMILAR REGISTER DETENTS IT WILL BE NECESSARY AT TIMES TO MAKE A COMPARISON OF THE DETENT WITH THE CHART, ALSO CHECK FOR THE CORRECT BRACKET AD, AF, AG.

A **60137½**
B **46¼**
C **11A-60137B No. 2** includes A, B, D, E, used with reg. shift release from reg. total indexing lever and bracket AD, 10 reg. const. Classes 22-30, see J and P
D **60805**
E **1-60138A No. 2** included in C
F **7286½**
G **1-60137 No. 2** used with reg. shift release from reg. total indexing lever and bracket AF, 6 reg. const.—Classes 12-16, 22-26, see L and N
H **8381**
I **1-60138B No. 2** included in J
*J **11B-60137B No. 2** used with reg. shift release from reg. total indexing lever and bracket AD, 10 reg. const.—Classes 22-30, see C and P
K **7286½**
L **1-200166** used with reg. shift release from reg. total indexing lever and bracket AG, 6 reg. const.—Classes 22-26, see G and N
M **60805**
N **1A-60137B No. 2** used with reg. shift release from reg. total indexing lever and bracket AD, 6 reg. const.—Classes 12-16, 22-26, see G and L
O **7286½**
P **11-60137 No. 2** used with reg. shift release from reg. total indexing lever and bracket AF, 10 reg. const.—Classes 22-30, see C and J
Q **7286½**
R **11-60137A** used with 10 reg. const. and bracket AF—Classes 22-30, see X and Z
S **7286½**
T **1-60137A** used with 6 reg. const. and bracket AF—Classes 12-16, see V and AB
U **7286½**
V **1-60137** used with 6 reg. const. and bracket AG—Classes 12-16, see T and AB

Symbols continued on Next Page

SEE EXPLANATION ON INSIDE OF FRONT COVER

SYMBOLS (Plate 28-1)—Continued

W **8381**
*X **11B-60137B No. 1 (11B-60137B No. 2)** used with 10 reg. const. and bracket AD—Classes 22-30, see R and Z
Y **60805**
Z **11A-60137B No. 1** used with 10 reg. const. and bracket AD —Classes 22-30, see R and X
AA **60805**
AB **1A-60137B No. 1** used with 6 reg. const and bracket AD—Classes 12-16, 22-26, see T and V
AC **74531**
*AD **60135B** used with detents C, J, N, X, Z, AB
AE **60551**
AF **60135A** used with detents G, P, R, T
AG **60135** used with detent L, V
AH **45¼**

6 Register Construction—Classes 12-16, 22-26

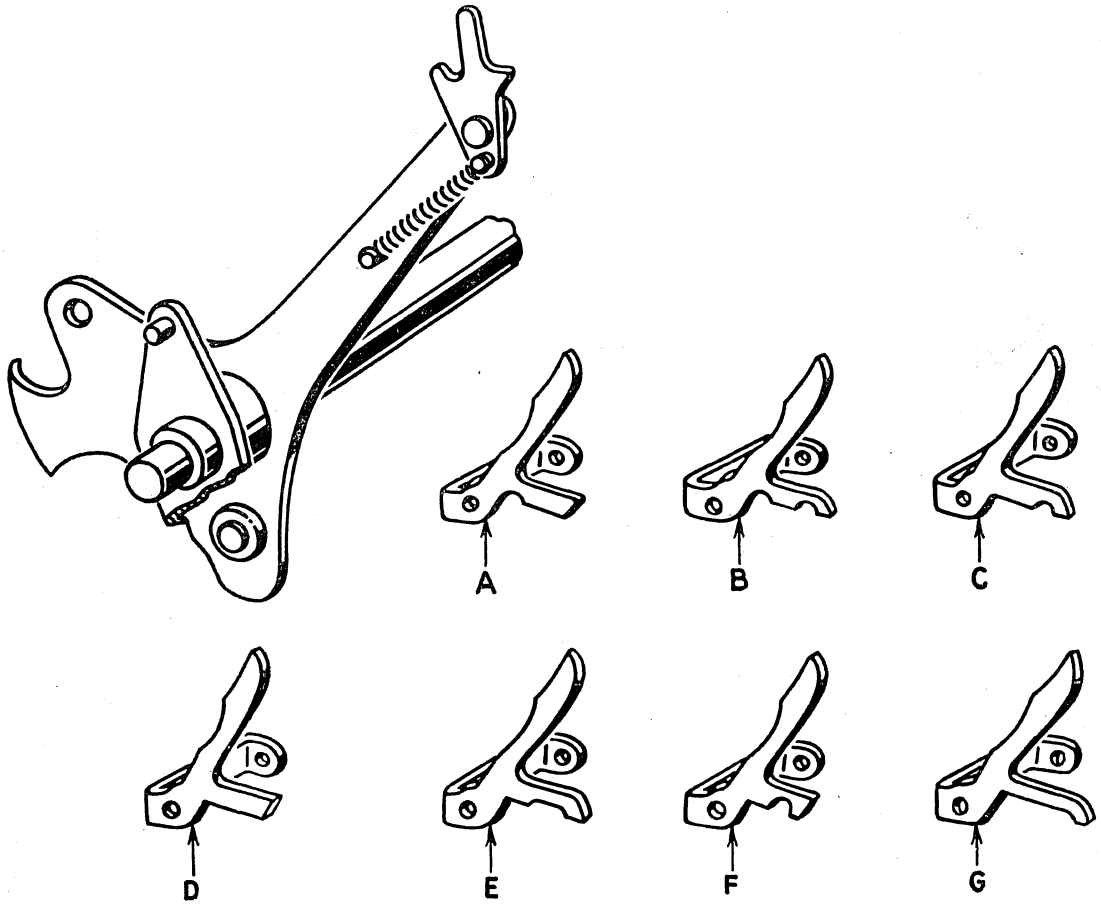
AI **11-60002 Style 17 No. 6** shown, Short shaft—used with 14 digit register capacity—Style 17 machines
11-60002 Style 13 No. 6 Short shaft—used with 10 digit register capacity—Style 13 machines
1A-60002 Style 13 No. 6 Long shaft—used with less than 10 digit register capacity—Style 13 machines
1-60002 Style 17 No. 6 Long shaft—used with less than 14 digit register capacity—Style 17 machines
Note: Dimension for short shaft 7¼"
Dimension for long shaft 7½"

10 Register Construction—Classes 22-30

AJ **11-60002 Style 17 No. 10** with stud AK; *__11A-60002 Style 17 No. 10__ without stud AK — Short shaft—used with 14 digit register capacity—Style 17 machines
11-60002 Style 13 No. 10 with stud AK; *__11A-60002 Style 13 No. 10__ without stud AK — Short shaft—used with 10 digit register capacity—Style 13 machines
*__1A-60002 Style 13 No. 10__ without stud AK; *__1A-60002 Style 17 No. 10__ without stud AK — Long shaft—used with less than 10 digit capacity—Style 13 or 17 machines
1-60002 Style 13 No. 10 with stud AK; **1-60002 Style 17 No. 10** with stud AK — Long shaft—used with less than 10 digit capacity—Style 13 or 17 machines
AK 60537*

*Standard construction

REGISTER ADD AND NON-ADD CONTROL CAMS (Plate 28-2)



SYMBOLS (Plate 28-2)

A **60109 No. 1**
B **60109 No. 2**
C **60109 No. 3**
D **60109 No. 4**
E **60109 No. 5**
F **60109 No. 6 (1A-60133 No. 6)**
G **60109 No. 7**

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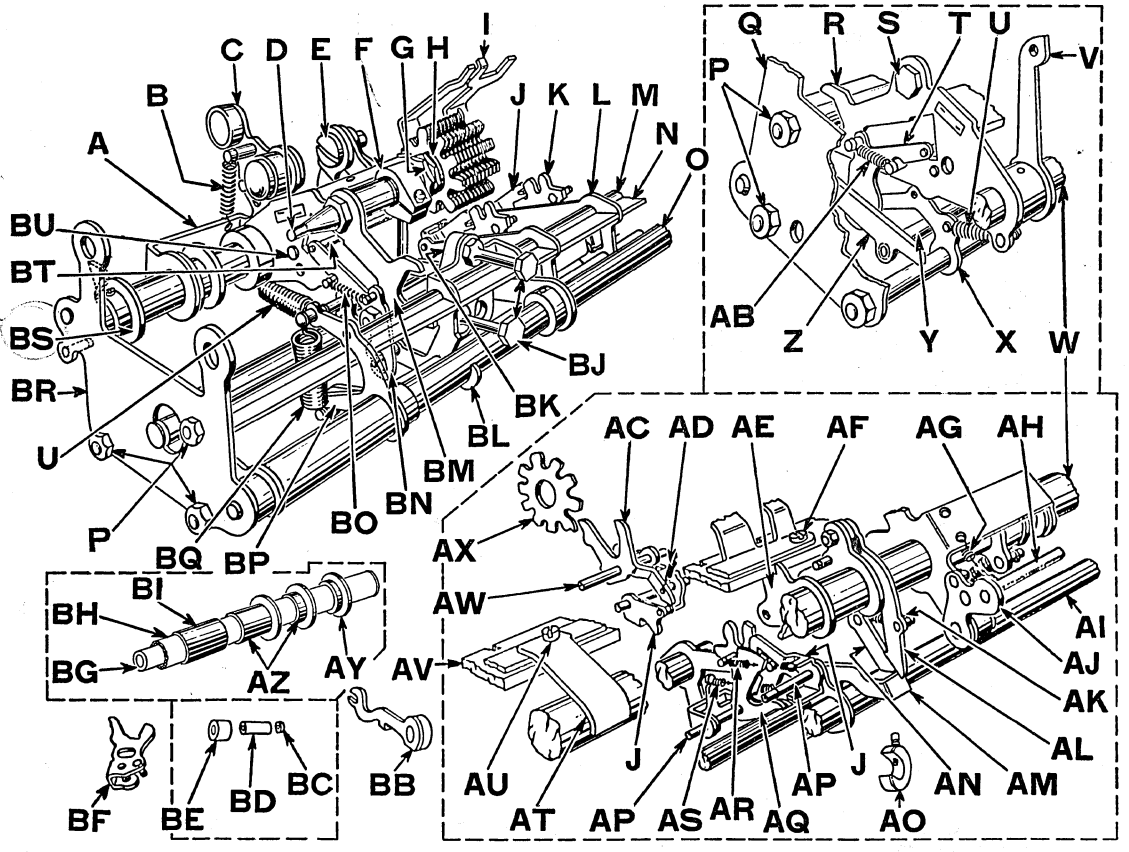
REGISTER ASSEMBLY, 10 CONSTRUCTION (Plate 29)



SYMBOLS (Plate 29)

NOTE: Where (†) appears in this and other register plates in this book it indicates that the symbol is for 6 register construction which was built for Classes 11 thru 16, 21 thru 26 machines prior to 1941, and such parts will still be furnished for the 6 or less register machines in the field.
Beginning in 1941 the 10 register construction which prior to 1941 was confined to Classes 27 thru 30 is now standard for all Classes from 21 to 30 inclusive. Parts used only in 10 register construction usually have "No. 10" at the end of symbol.

A **1-69132** includes C, AH and AJ

B **69802**

C **1-69134R**

D **69530 No. 1**
69530 No. 2 used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17

E **69550** Screw, 46 nut

F **1A-69340A** includes screw 69558 and pin 69523A
1A-69340 No. 2 used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17

G **69321 No. 2** Nut

H **69330 No. 2** Washer

I **69120C Style 13, 17 No. 1**
69120CR&CL Style 17 use for mach. with 14 digits in reg., Style 17
69120C Style 13 No. 2 use for mach. with 10 digits in reg., Style 13

J **1-69109 No. 10**
†69109A
1-69109 No. 3 1 req., used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17, Cl. 21 thru 30
†69109 No. 2 used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17

K **1-69122 P. 10 No. 10**
1-69122R P. 10 No. 10 used in 1st col.
1-69122 No. 3 1 req., used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17, Cl. 21 thru 30
†1-69122A
†1-69122AR used in 1st col.
†1-69122 No. 2 1 req., used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17

L **69115 No. 10**
69115½ No. 10 with upper projection, located in position 6th and 11th
11-69115 Located in 2nd position, has limit stud for carry rack 1-69122R
†69115
†1-69115 Located in 2nd position
} Included in M

M **69004 Style 13, 17**
1A-69004 Style 13, 17 No. 10
†11B-69004 Style 13, 17
†1A-69004 Style 13, 17 Cl. 11 and 21 only
} Partial assembly, specify style and mach. No., includes L, M, N, X, AI, BL

N **69154A Style 13, 17 No. 4**

O **1-69003 Style 13, 17** includes AM
31-69003 Style 13, 17 used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17

P **45⅝₆**

Q **1-69110R No. 10**
†1-69110AR (1-69110R No. 10)

R 1-69125R No. 10* included in W

S **69553**

T **1-69113R No. 10** use rivet 4450½
†1-69113AR use rivet 3255½

U **69807 No. 10**
†69807 Style 13, 17
†10982 used with 9 to 28 pinion

V 69127* included in R

W **1-69002 Style 13, 17 No. 10**
†11A-69002 Style 13, 17
†1A-69002 Style 13, 17 Cl. 11 and 21 only
} Partial assembly, specify style and mach. No., includes A, C, R, T, V, AE, AJ, AH, AV, BM, BN

X 1-69115R No. 10* included in M
†1-69115R*

Y **1-69011 Style 13, 17 No. 10** includes retaining wire 69771
69011 Style 13, 17 No. 3 used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17
1-69011A Style 13 (1-69011 No. 10 Style 13, 69771)
1-69011A Style 17 (1-69011 No. 10 Style 17, 69771)
69011 Style 13 No. 2 (69011 Style 13, 69771)
69011 Style 17 No. 2 (69011 Style 17, 69771)

Symbols continued on Next Page

SYMBOLS (Plate 29)—Continued

AB **7480B**
AC **69118 P. 10 No. 10** Early
69118A P. 10 No. 10
69118L No. 10 Early, used in last left col., use spring 71803
69118AL No. 10 used in last left col., use spring 71803
†**1-69118**
†**69118L**
†**1-69118L No. 2** 1 req., used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17
AD **283A**
AE 69173 No. 10* included in W
AF **7062**
AG **69802**
AH **69517**
AI Same as letter M
AJ **1-69134L** included in A
AK **69809**
AL **1-69123**
11-69123 used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17
AM 1-69121L* included in O
AN **1-69124**
AO **1-69333A** includes screw 69558
AP **69006 Style 13, 17**
69006 Style 13, 17 No. 4 for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17
AQ **69126½ P. 10 No. 10**
†**69126½ P. 8, 12**
69126½ No. 2 1 req., used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17
AR **69801**
69801 No. 2 used in 1st col., Cl. 20 thru 30
AS **51802** use 10783 in 14th col.
AT **69178**
AU **74523**
AV **69135 Style 13, 17 No. 10**
69135 Style 13, 17 No. 3 used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17
†**69131 Style 13**
†**69131A Style 17**
†**69135 Style 13, 17 No. 2** used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17
AW **69007 Style 13, 17** use wire retainer 470
69007 Style 13, 17 No. 3 used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17
AX **69116A P. 10 No. 10**
†**69116A P. 8, 10, 12**
AY **69304 No. 10** Bearing for AX
†**69304A** Bearing for AX
†**69304AR** Bearing for AX, used in extreme right end
AZ **69329** Specify No. 1—⅛" wide over all
No. 2—¼" wide over all
No. 3—⅜" wide over all
No. 4—½" wide over all
No. 5—⅝" wide over all
69329R No. 1 (69304AR) used on extreme right end
No. 2 Approx. length 11/64"
No. 3 Approx. length 19/64"
No. 4 Approx. length 27/64"
No. 5 Approx. length 35/64"
BB **1-69175 No. 10** use spring 69801 No. 2
BC **89306 16th** used with BB
BD **10941**
BE **304A Fte. 209**
BF **1-69119AL No. 3** used in last left col. for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17, use spring 69806
†**69119L No. 2** used in last left col. for machine, with 10 digits in reg., Style 13, 14 digits in reg., Style 17, use spring 69806
BG **69010 Style 13, 17**
69010 Style 13, 17 No. 2 used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17
BH **1-69009 Style 13, 17 No. 10** Cl. 22 thru 30
1-69009A Style 13, 17 No. 1 Cl. 11 and 21
1-69009 Style 13, 17 No. 4 used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17
1-69009 Style 13, 17 No. 2 Cl. 12 thru 16, 22 thru 26
1-69009 Style 13 (1-69009 Style 13 No. 1) } Cl. 11 and 21
1-69009 Style 17 (1-69009 Style 17 No. 1) }
1-69009 Style 13, 17 No. 3 used for mach. with 10 digits in reg., Style 13. 14 digits in reg., Style 17

NOTE: Listed below is complete register pinion assembly. Specify style and machine No., includes G, H, AX, AY. BG, BH.

2AZ-69009 Style 13, 17 } Thin pinion construction
No. 1 used for Cl. 11 and 21
No. 2 used for Cl. 12 and 22
No. 3 used for Cl. 13 and 23
No. 4 used for Cl. 14 and 24
No. 5 used for Cl. 15 and 25
No. 6 used for Cl. 16 and 26
No. 7 used for Cl. 27
No. 8 used for Cl. 28
No. 9 used for Cl. 29
No. 10 used for Cl. 30

12AZ-69009 Style 13, 17 } Used for machine with 10 digits in reg., Style 13, 14 digits in reg., Style 17. Thin pinion construction
No. 1 used for Cl. 11 and 21
No. 2 used for Cl. 12 and 22
No. 3 used for Cl. 13 and 23
No. 4 used for Cl. 14 and 24
No. 5 used for Cl. 15 and 25
No. 6 used for Cl. 16 and 26
No. 7 used for Cl. 27
No. 8 used for Cl. 28
No. 9 used for Cl. 29
No. 10 used for Cl. 30

†**2Z-69009 Style 13, 17** } Wide pinion construction
No. 1 used for Cl. 11 and 21
No. 2 used for Cl. 12 and 22
No. 3 used for Cl. 13 and 23
No. 4 used for Cl. 14 and 24
No. 5 used for Cl. 15 and 25
No. 6 used for Cl. 16 and 26

†**12Z-69009 Style 13, 17** } Used for machine with 10 digits in reg., Style 13, 14 digits in reg., Style 17. Wide pinion construction
No. 1 used for Cl. 11 and 21
No. 2 used for Cl. 12 and 22
No. 3 used for Cl. 13 and 23
No. 4 used for Cl. 14 and 24
No. 5 used for Cl. 15 and 25
No. 6 used for Cl. 16 and 26

BI **69307**
BJ **69534** Short
69534 No. 2 Long
BK **69114½ No. 1**
69114½ No. 2 used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17
BL 1-69114AL No. 1* included in assembly M
BM 1-69125L No. 10* included in W
BN **1-69113L No. 10**
11-69113L No. 10 used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17
†**1-69113AL**
BO **7480B**
BP **1-69101**
BQ **69800 No. 1** used for mach. with 9 cols. of adding or less
69800 No. 2 used for mach. with 10 cols. of adding or more
BR **1-69110AL**
BS 1-69102*
BT **69005 Style 13, 17 No. 10**
69005 Style 13, 17 No. 3 used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17, Cl. 21 thru 30
†**69005A Style 13, 17**
†**69005 Style 13, 17 No. 2** used for mach. with 10 digits in reg., Style 13, 14 digits in reg., Style 17, Cl. 21 thru 30
BU **1-69507A** includes retaining wire 279

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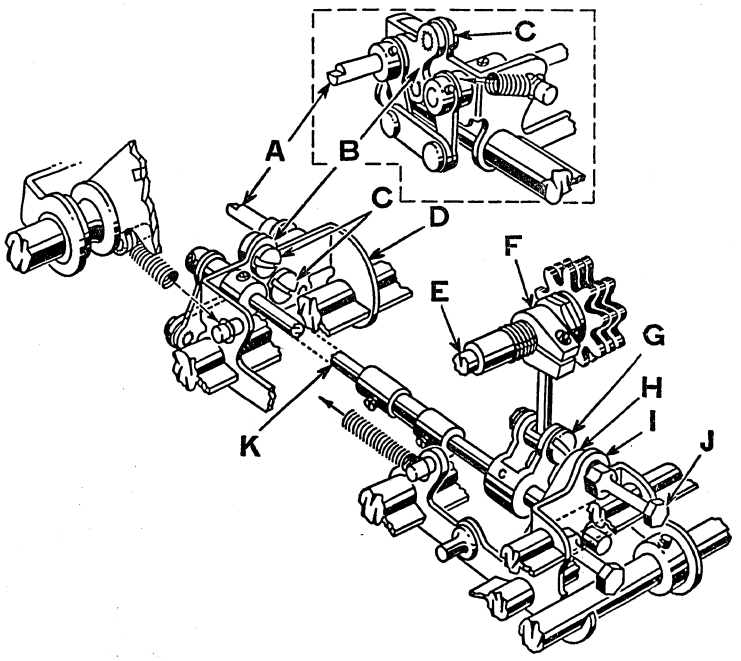
FLOATING BEARINGS FOR REGISTER INDEXING ASSEMBLIES, CLASSES 22 THRU 30 (Plate 30)

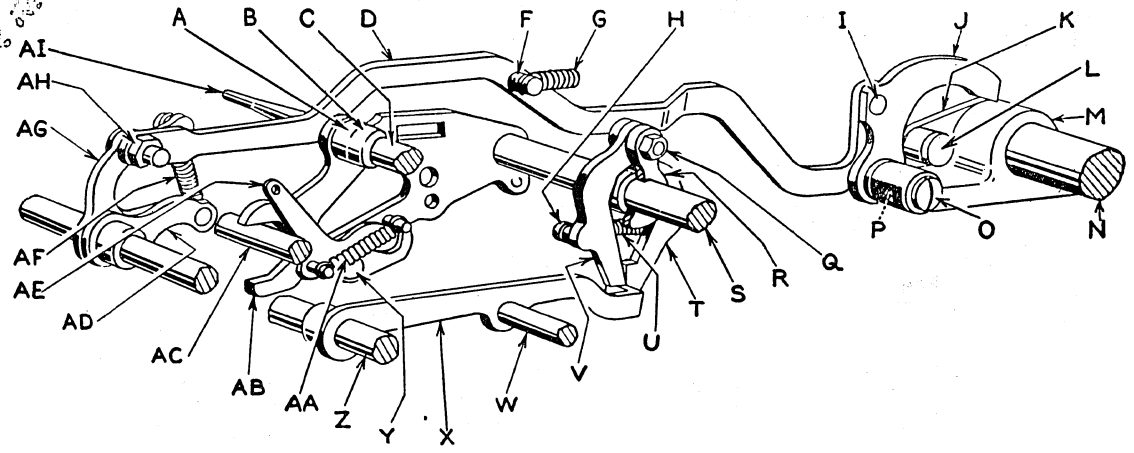


SYMBOLS (Plate 30)

A **1-69015A No. 2 (1A-69015D No. 2, 1-69114BL No. 2, 7356½, 2 req., 1-69114¼A)** for 14 digits on Style 17 and 10 digits on Style 13
1-69015B No. 1 (1-69015D No. 1, 1-69114¼A) for 13 or less digits on Style 17 and 9 digits on Style 13
B **69114½ No. 2** for 14 digits on Style 17 and 10 digits on Style 13
C **71517**
D **11-69114AL No. 2 (1A-69015D No. 2, 1-69114BL No. 2, 7356½, 2 req.)** for 14 digits on Style 17 and 10 digits on Style 13
E 69009A*
F **1A-69340A** for 13 or less digits on Style 17 and 9 digits on Style 13
1A-69340 No. 2 for 14 digits on Style 17 and 10 digits on Style 13
G **69560, 47** Nut
H **69114½ No. 1** for 13 or less digits on Style 17 and 9 digits on Style 13
I **11-69114AL No. 1** for 13 or less digits on Style 17 and 9 digits on Style 13
J **69534**
K 60002*

CARRY RACK RESETTING MECHANISM (Plate 34)

(Plates 31, 32 and 33 in Instruction Book only)



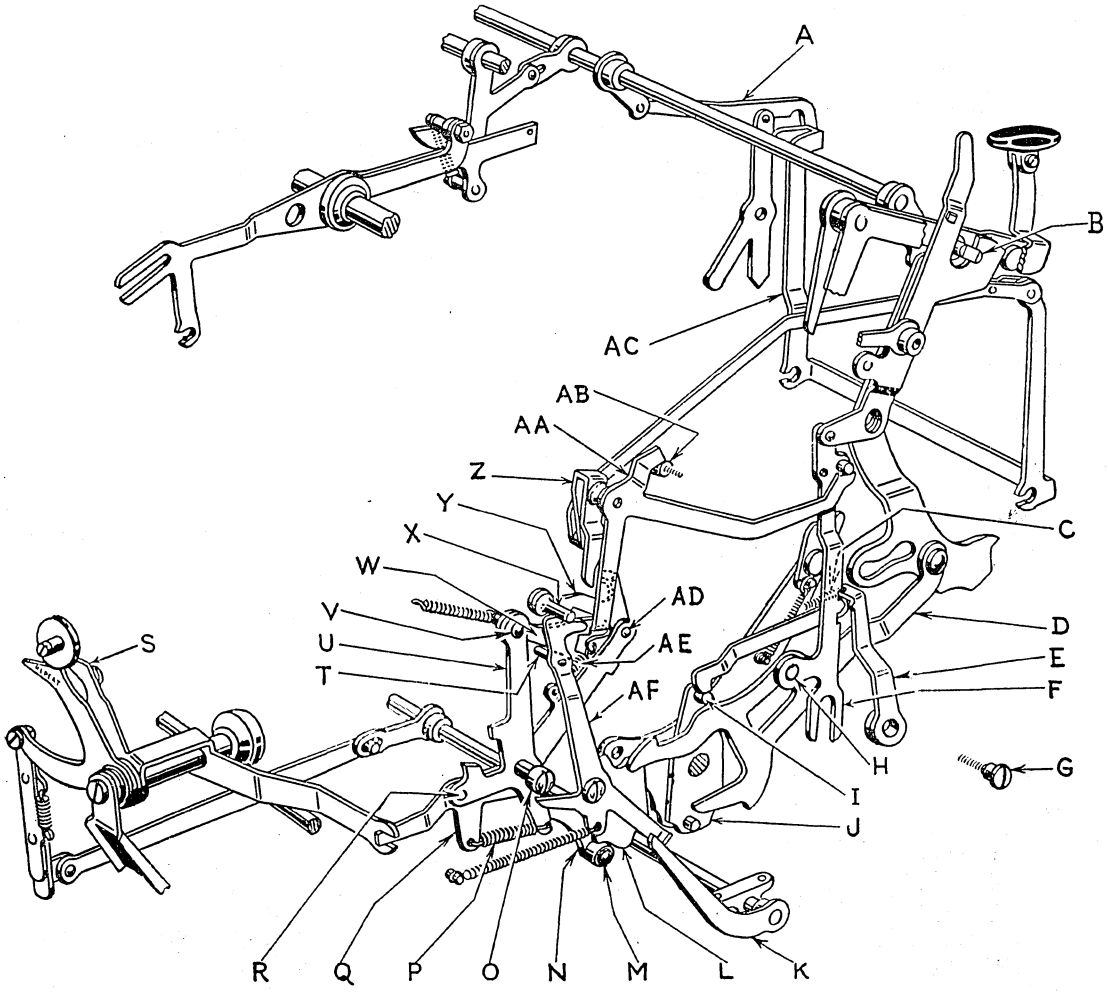
SYMBOLS (Plate 34)

A **69343**
B **69342**
C **69010 Style 13, 17**
D 1-60116A* included in J
1-60116B No. 1* included in J
F **2863½**
G **681** for early style
69802 for later style
H **3260**
I **7550½**
J **11-60115A** Early, includes D
11A-60115A Later, includes D
K 1-60117* included in N
L **60521** Stud, 12038⅛ roller
M **60664**
N **2A-60000 Style 17** includes K
O **69552**
P **60522**
Q **69550** Screw, 46 nut
R 1-69155* included in S
1-69115 No. 2* included in S
S **11A-69002 Style 13, 17** includes R & AB, see Plate 29 letter W
T **1-69123**
U **69809**
V **1-69124**
W **1-69011A Style 13 (1-69011 No. 10 Style 13, 69771)**
1-69011A Style 17 (1-69011 No. 10 Style 17, 69771) see Plate 29 letter Y
X 1-69121L* included in Z
Y **3255½**
Z **1-69003 Style 13, 17** includes X & AD
AA **69809**
AB 1A-69125L* included in S
AC **69004 Style 13, 17**
AD 1-69133* included in Z
AE **1-69113AL** included in AB
AF **69805A No. 1**
AG **1-69101**
AH **60523A** Screw, 46 nut
AI **69530 No. 1**

SEE EXPLANATION ON INSIDE OF FRONT COVER

AUTOMATIC BALANCE COLUMN INDEXING MECHANISM (Plate 37)

(Plates 35 and 36 in Instruction Book only)



SYMBOLS (Plate 37)

A **1-10214A**
B **62507**
C **3688** Spring
D **1-10020 (1-60120)**
E **1-20¾ Fte. 104**
F **1-20½ Fte. 104** includes shift lever
G **56½ Fte. 104**
H **10050**
I **68502** Short stud, 68503A No. 1 long stud
J 1-68112*
K 1-112⅞ Fte. 104*
L **110¼ Fte. 104** on bushing 151¾ Fte. 104, using screw 957½ and 46 nut
M **257½** Stud, 738 roll
N **1-110½A Fte. 104 (1-110½A Fte. 104)** includes M, X, Y, AD
O **152¼ Fte. 104**
P **10088A**
Q **10011½** for Style 17, 1011⅞ for Style 13
R **351½**
S **10012B Style 17** for separate register add and non-add mechanism for Cl. 11 thru 16, 21 thru 26
T **750¾ No. 2**
U **1A-114⅝ Fte. 104 Style 13, 17** includes Q, R, specify machine number
X **44532**
Y **1-111¾ Fte. 104**
Z **115¾ Fte. 104** on 154 Fte. 104 screw stud, using 46 nut, 10056 screw and 72167½ washer
AA **1-113¼ Fte. 104** specify machine number
AB **60517** Screw, 46 nut
AC **1-126½ Fte. 104 No. 2, 3, 6, 7, 8 & 9**
AD **351½**
AE **182⅝ Fte. 104**
AF **1-115⅞A Fte. 104** includes T

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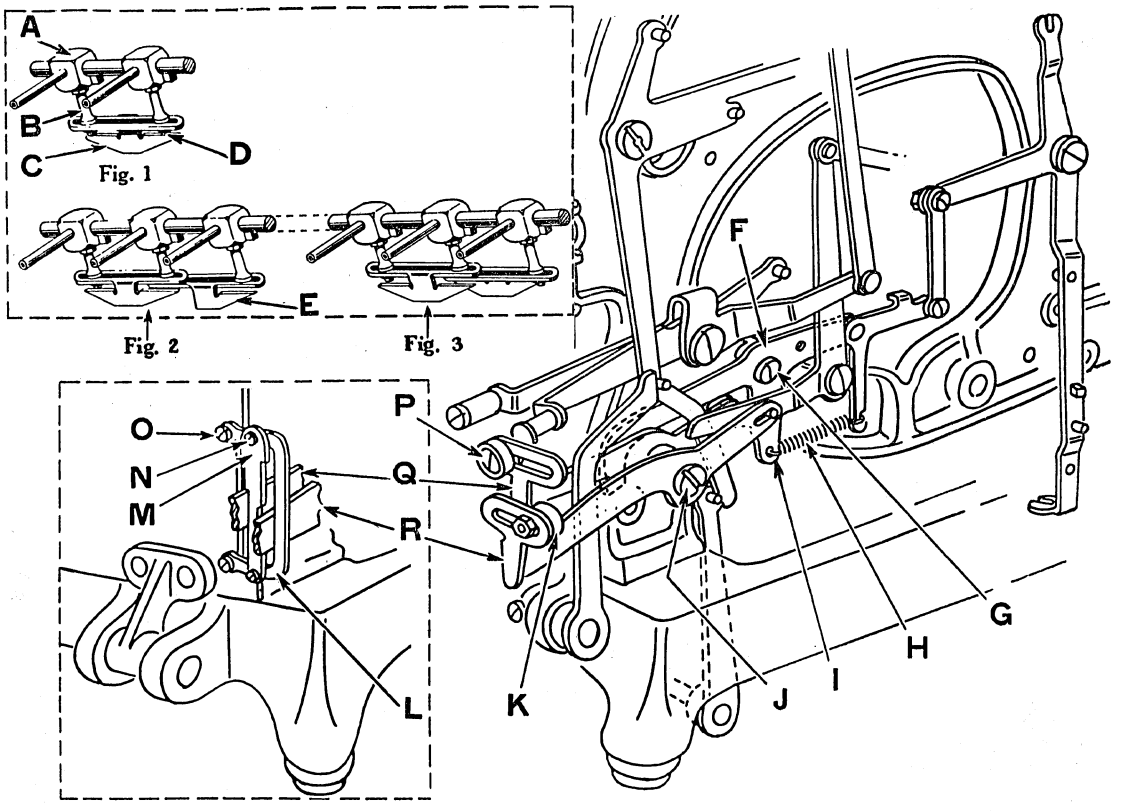
REGISTER TOTAL INDEXING LINKAGE, CARRIAGE CONTROLLED, EARLY
(Plate 38)



SYMBOLS (Plate 38)

A **2Z- or 12Z-10045⅞B No. 10** complete hanger; specify machine number
B **512A Fte. 209 No. 1** Long post
512A Fte. 209 No. 2 Short post
C **115B Fte. 209 No. 1** Narrow skid
115B Fte. 209 No. 2 Wide skid

NOTE: 512A Fte. 209 No. 1 is used with 115B Fte. 209 No. 2 for register total indexing lever

512A Fte. 209 No. 2 is used with 115B Fte. 209 No. 1 for non-add—non-print
D **514 Fte. 209** Screw, 131 Fte. 209 washer
E Same as C minus one wing
G **54¼A Fte. 103** Post, 3450½ Style 9 screw
J **506 Fte. 206**
K **33 Fte. 103** Roll, 56 Fte. 103 screw, 46 nut
L **146A Fte. 207**
M **148 Fte. 207 No. 2**
N **72592**
O **7562**
P **56 Fte. 103** Screw, 33 Fte. 103 roll, 46 nut
Q **1-23 Fte. 103**
R **1-141 Fte. 206**

SYMBOLS (Plate 39)

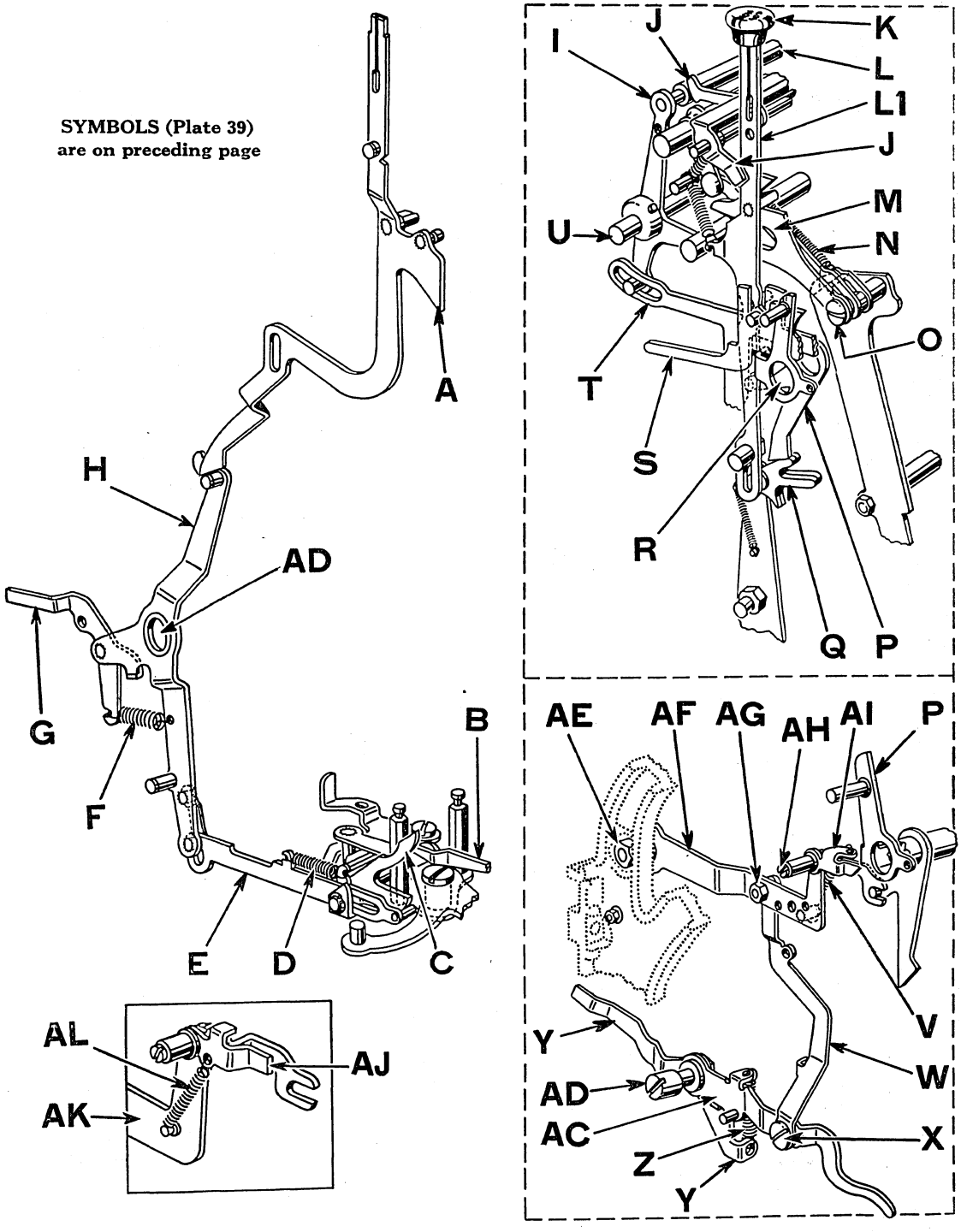
A **1-62221 Nos. 2-3-5** } Specify machine
1-62221 No. 4 } number,
(1-62221A No. 4) } reg. N.A. key
B **60108** included in E
C **60109 No. 4** see Plate 28-2
D **60807** included in E
E **1-60107A** complete assembly 1A-60133 Nos. 1 thru 6, specify machine number, includes B, C, D
F **2886½**
G Included in H
H **1-60106C**
I 1-219L No. 2* included in U
J **229¾B**
K **291½** (C.F.N.A. key)
L See Plate 7, keyboard symbol list

L1 **1-221½C** Cl. 1 } Use 1051½A
1-221½B Cl. 2 } screw, 46 nut,
1-10221½ Cl. 6 } 4487 spring
1-62222 use 60517 screw, 46 nut } Cl. 11
1-62222 No. 2 use to non-add both C.F. and reg. } thru 30
M **220¾** Cl. 1, 2, 6 } Cl. 11
1-62220 No. 1 } thru 30
N **283¼ (72806)** Spring
225½ (20 No. 36) Anchor
O **259⅝** Screw, 250¼A bushing, 46 nut
P **11A-3429⅛A**
Q **1-821B**
S **1-60118 No. 1**
T **1-202225**
U **21-202007 Style 13, 17**

V **60806A**
W **200224 No. 3**
X **259½** Screw, 46 nut
Y **60130**
Z **60809**
AC **1-60121 No. 2**
AD **60341, 60342 and 60343** Bushings, 1055⅜H screw
AE **3355½** Screw, 45 nut
AF **1-60126 No. 2** includes W, X, AC, AI
AG **10761¼** Screw, 46 nut
AH **74502**
AI **1A-3322½A No. 2**
AJ **3322½**
AK **11-60126A** includes W, X, AJ and parts similar to AC and AI
AL **284 Flex.**

NON-ADD CONTROL—CROSSFOOTER AND REGISTER (LATER) CLASSES 21 THRU 30 (Plate 39)

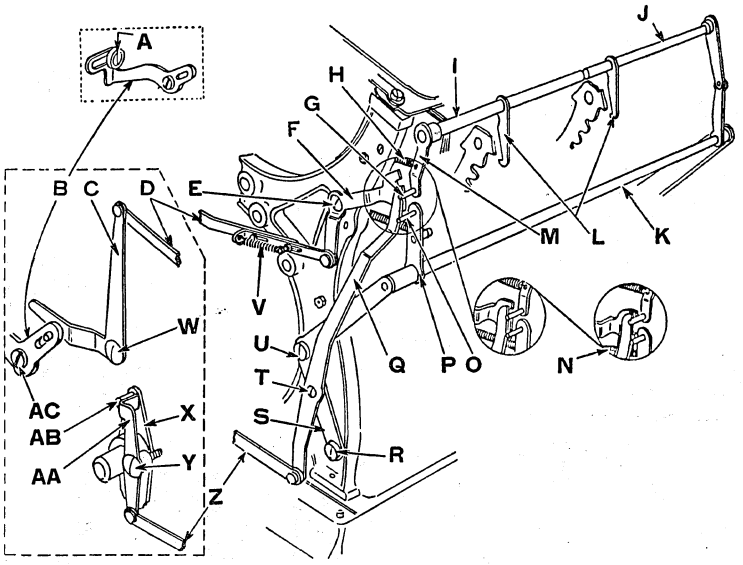
SYMBOLS (Plate 39)
are on preceding page



NON-ADD NON-PRINT, CARRIAGE CONTROLLED, CLASSES 6, 11 THRU 16, 20 THRU 30 (Plate 40)

SYMBOLS (Plate 40)

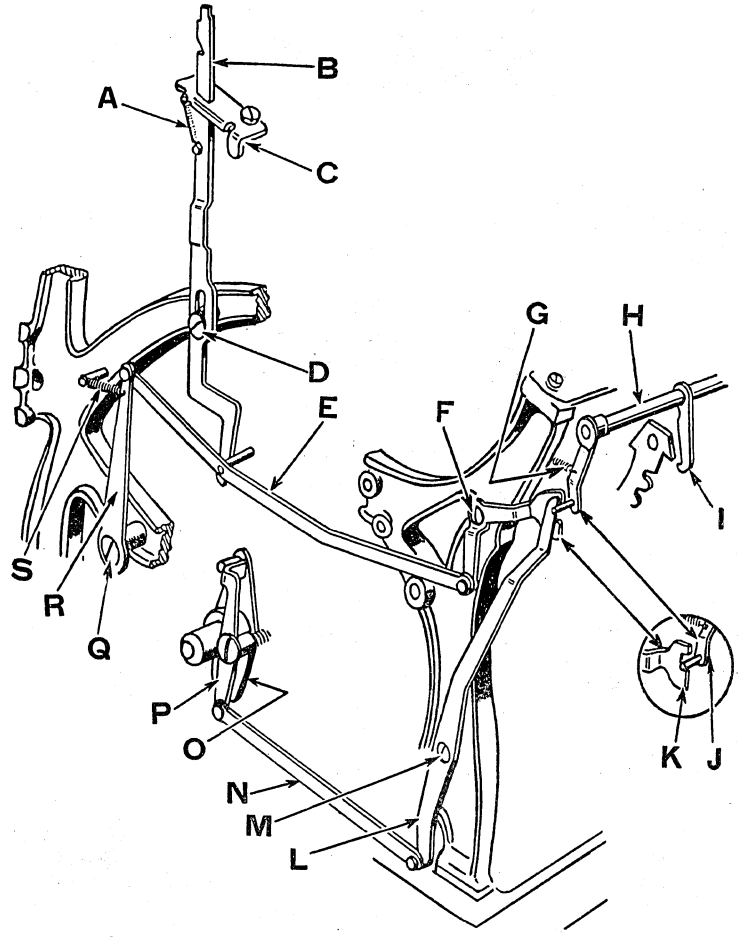
A **56 Fte. 103** Screw, 33 Fte. 103 roll, 46 nut
B **1-141 Fte. 206**
C 1-114 Fte. 206 No. 2* included in F
D 1-113A Fte. 206* included in F
E **12059⅝**
F **11-109 Fte. 206 No. 1, 2 or 3,** specify machine number
G **508 Fte. 206** included in M
H **681⅛**
I **1-2L Fte. 206 Style 13, 17 Nos. 6, 7, 8, 9** specify split
J **1-2R Fte. 206 Nos. 6, 7, 8, 9** specify split
K **1-3 Fte. 206 Style 17**
L **103 Fte. 206 P. 10, 12, 16**
M 1-100L Fte. 206* included in I
N **681⅛**
O **509 Fte. 206** included in P
P 1-101 Fte. 206* included in K
Q 106 Fte. 206* included in AA
R **64 Fte. 99**
S **1-108L Fte. 206**
T **12051⅞**
U **51½ Fte. 123 (553 Fte. 216)**
V **483**
W **4454¼ Style 11**
X 1-68112*
Y **4454¼ Style 11**
Z 105 Fte. 206* included in AA
AA **1-104 Fte. 206** includes Q & Z
AC **506 Fte. 206** Screw, 302 Fte. 206 collar



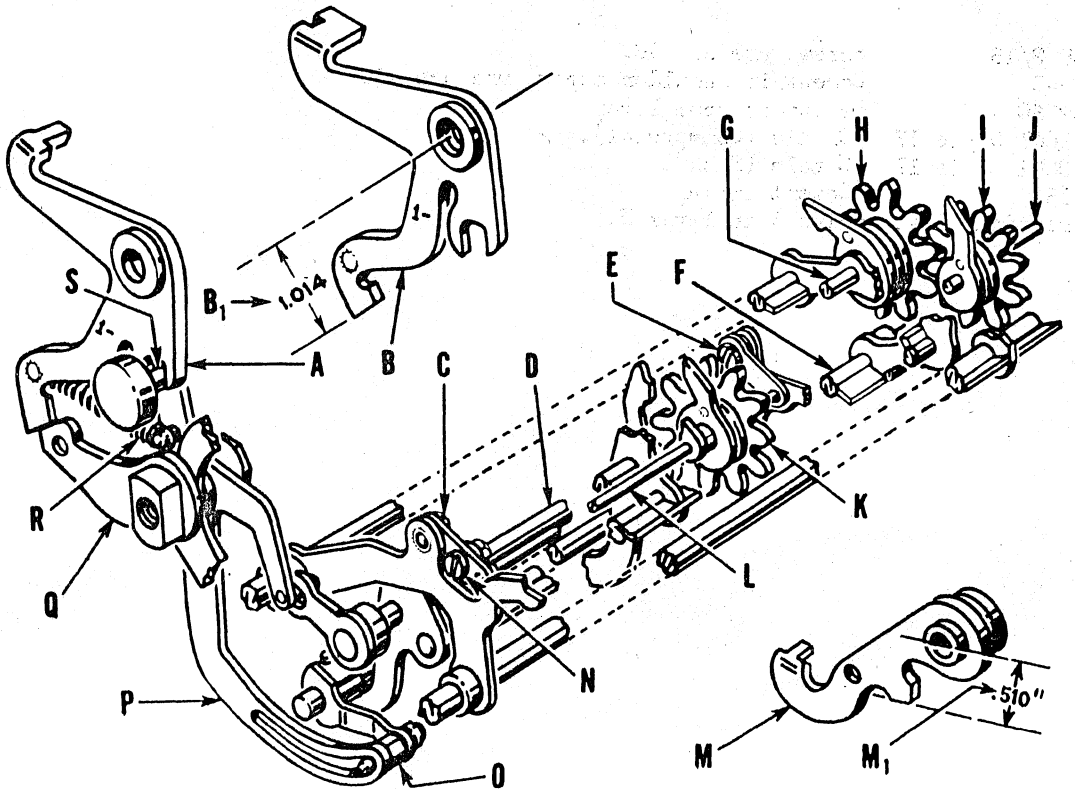
NON-ADD NON-PRINT, KEY CONTROLLED, CLASSES 6, 11 THRU 16, 20 THRU 30 (Plate 41)

SYMBOLS (Plate 41)

A **3282**
B **109 Env. 419E**
C **139 Fte. 207**
D **10056** Screw, 12047¾ nut
E 1-113 Fte. 206* included in K, early style shown here; later broken joint style is shown as part D, Plate 40
F **12059⅝**
G **681⅛**
H **1-4 Fte. 206 Style 13, 17**
I **103 Fte. 206 P. 10, 12, 16**
J 1-100L Fte. 206* included in H
K **1A-109 Fte. 206 Env. 419E No. 1, 2 or 3** specify machine number; includes R, E
L **106 Fte. 206** included in P
M **12051⅞**
N 105 Fte. 206* included in P
O 1-68112*
P **1-104 Fte. 206** includes N, L
Q **4454¼ Style 11**
R 1-114 Fte. 206 Env. 419E* included in K
S **480¼**



CROSSFOOTER AND REGISTER DETENTS
(Plate 42-1)



Symbols (Plate 42-1)

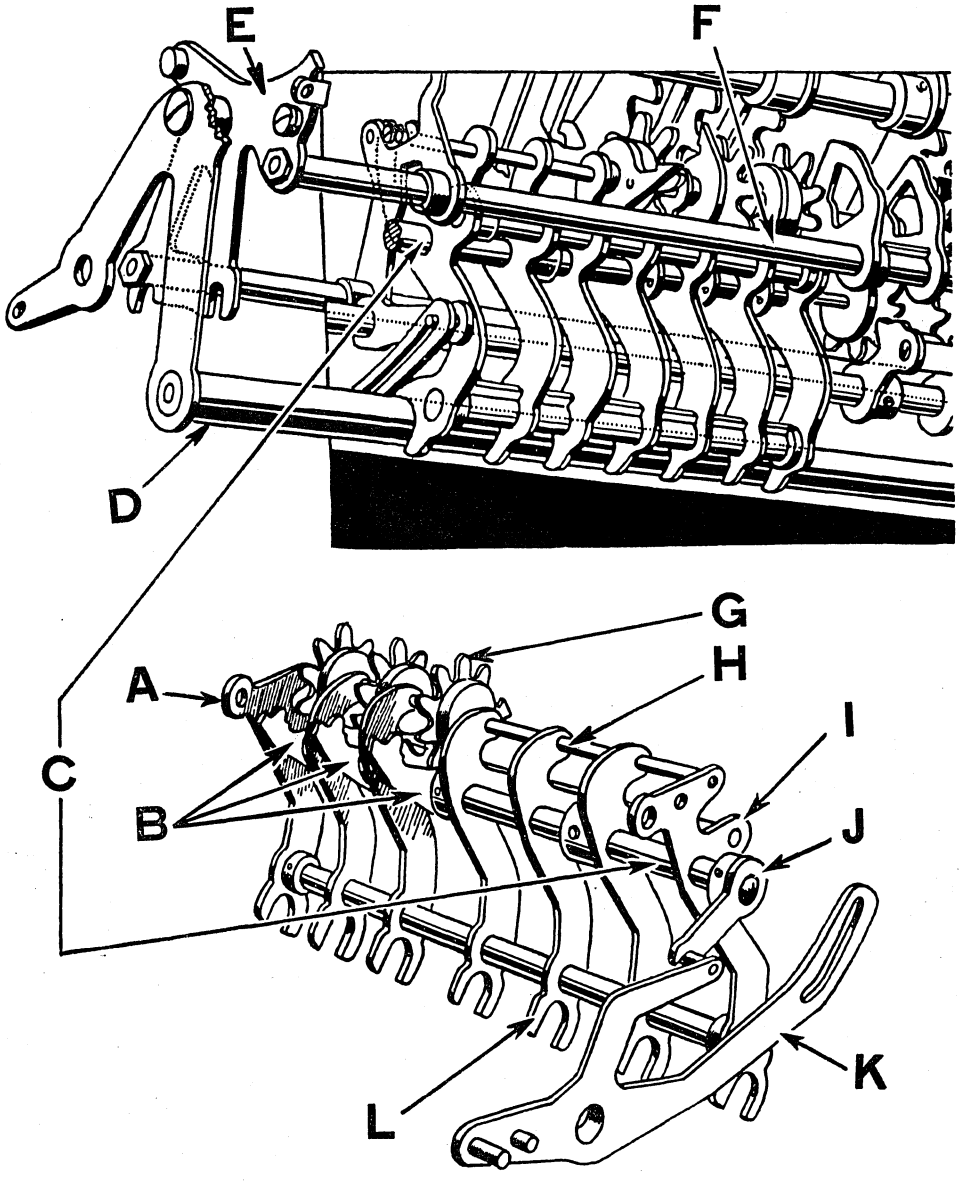
A	1-69117C No. 1	C.F. Detent (1.014" at B1).	Regular	Commercial
	11-69117C No. 1	C.F. Detent (1.007" at B1).		
	21-69117C No. 1	C.F. Detent (1.000" at B1).		
B	1-69117C No. 2	C.F. Detent (1.014" at B1).	Regular	Bank
	11-69117C No. 2	C.F. Detent (1.007" at B1).		
	21-69117C No. 2	C.F. Detent (1.000" at B1).		
C	72592	Screw.		
D	1B-2 Fte. 219 No. 1	Detent frame (Automatic Count in Column 11).		
	1B-2 Fte. 219 No. 2	Detent frame (Automatic Count in Column 10).		
E	72592	Screw		
F	31B-69013 Style 17	Detent frame (10 or more adding columns).		
	71B-69013 Style 17	Detent frame (Automatic Count in Col. 10).		
	81B-69013 Style 17	Detent frame (Automatic Count in Col. 11).		
G	10908 3/8 Style 17	Pinion shaft.		
H	1-10916R P10	Pinion (Upper, column 1).		
	1-10916 P10	Pinion (Upper, other than column 1).		
I	11-10916R P10	Pinion (Lower, column 1).		
	11-10916 P10	Pinion (Lower, other than column 1).		
J	10908 3/8 Style 17	Pinion shaft.		
K	1-134 Fte. 219	Pinion (count).		
L	5 Fte. 219 No. 1	Pinion shaft (Automatic count in Col. 11).		
	5 Fte. 219 No. 2	Pinion shaft (Automatic count in Col. 10).		
M	1A-69104	Register detent (.510" at M1) Regular, not stamped.		
	1A-69104 No. 2	Register detent (.506" at M1) Stamped "2".		
	1A-69104 No. 3	Register detent (.502" at M1) Stamped "3".		

Symbols continued on next Page

Symbols (Plate 42-1) continued

N	12055 9/16	Screw, use nut 46.
O	FX 45-2	Eccentric shoulder screw, use nut 46.
P	1-69216C	Detent control lever.
Q	2A-69001 Style 17	Cradle (Commercial).
	22-69001 Style 17	Cradle (Bank).
R	709813	Detent spring.
S	Description only, included in lever P.	

CROSSFOOTER SIMULTANEOUS ADDITION AND SUBTRACTION WITH AUTOMATIC COUNT—CARRIAGE CONTROLLED CLASSES 11 THRU 16, 20 THRU 30 (Plate 42)



SYMBOLS (Plate 42)

A Complete assembly of parts A, B, C and G to L inclusive:
1-2 Fte. 219 No. 1 for auto. count in 11th col., specify machine number
1-2 Fte. 219 No. 2 for auto. count in 10th col., specify machine number

B **1-131 Fte. 219**

C **1-3 Fte. 219 No. 1 (1B-3 Fte. 219 No. 1)** for auto. count in 11th col.
1-3 Fte. 219 No. 2 (1B-3 Fte. 219 No. 2) for auto. count in 10th col.

D **2A-69001 Style 17**

E **1-69211L**

F **69000 Style 17**

G **1-134 Fte. 219**

H **5 Fte. 219 No. 1** for auto. count in 11th col.
5 Fte. 219 No. 2 for auto. count in 10th col.

I **1-129L Fte. 219**

J **1-132 Fte. 219**

K **1-133 Fte. 219 (1-69216B)**

L **129 Fte. 219**

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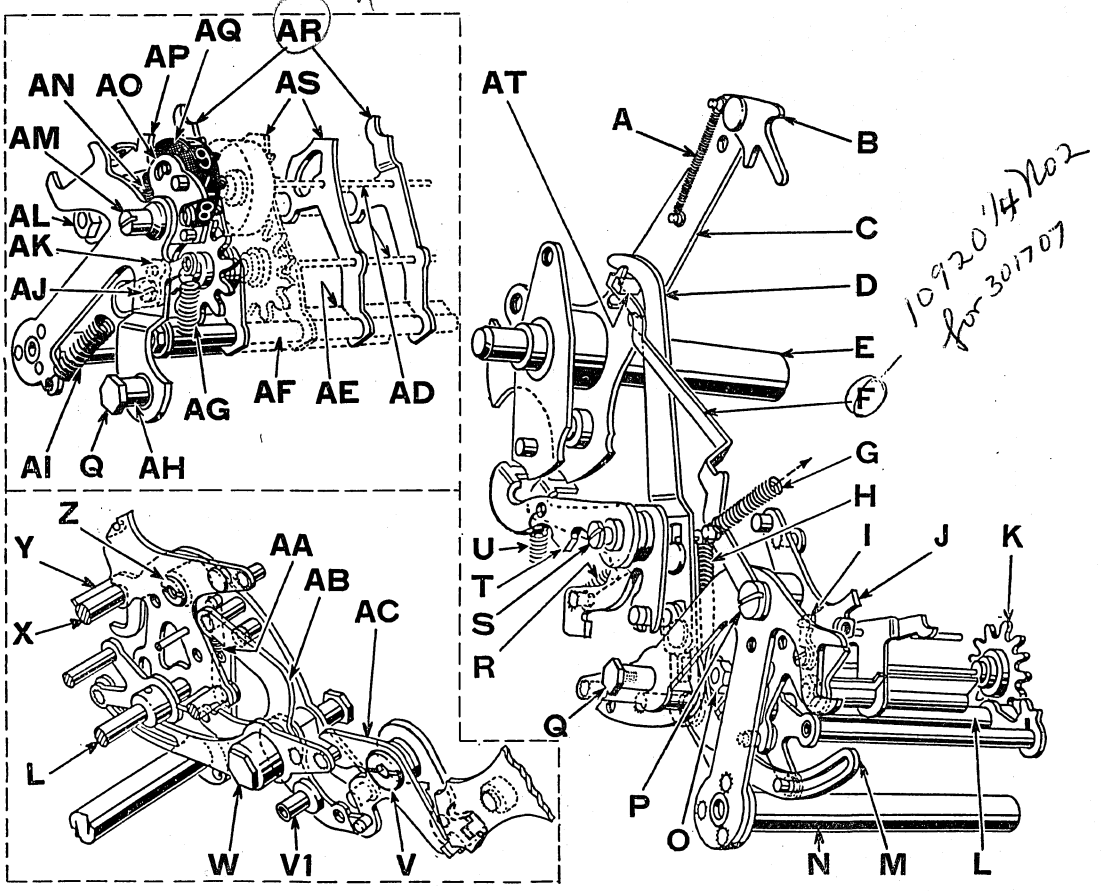
CROSSFOOTER MECHANISM, CLASSES 11 THRU 16, 20 THRU 30
(Plate 43)



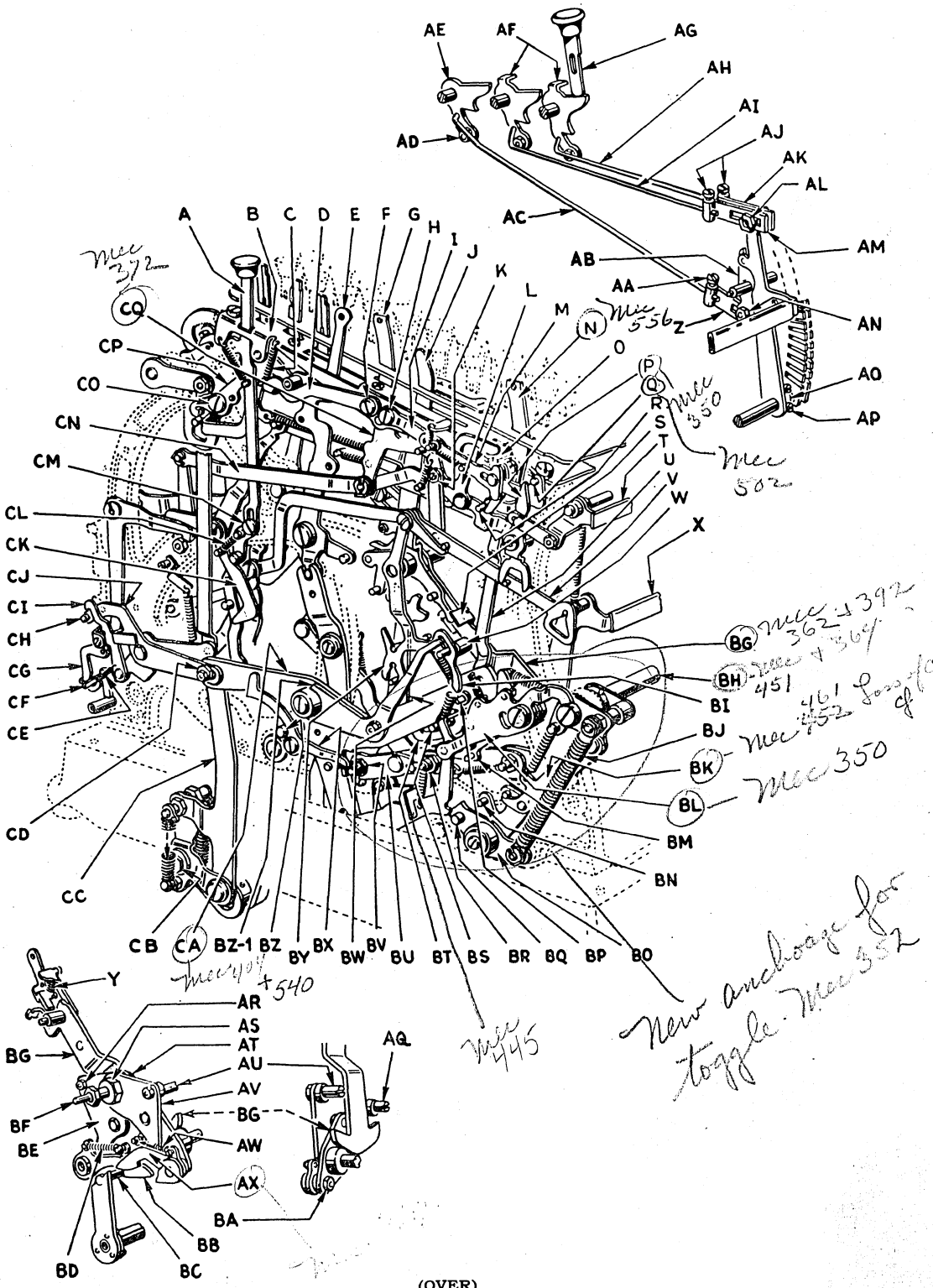
SYMBOLS (Plate 43)

2-69000 Style 13, 17 specify machine number, complete assembled crossfooter, includes assembly L and N
1-69000 Style 13, 17 Early, specify machine number, partial assembly of crossfooter, includes frame and all dial wheels, does not include assembly N
1A-69000 Style 13, 17 Later, specify machine number

A **1-883½A (1-84804)**
B **1-821B**
C 11-68113* Style 13, 17 included in E
D **1-209124A** use screw 8054¾
1-209124A No. 2 used on machines with cge. controlled C.F. totals and sub-totals
E **1B-68000 Style 17 (11-68000 Style 17, 1-69117B No. 2 or 3)** specify machine number
1C-68000 Style 13 (11-68000 Style 13, 1-69117B No. 2 or 3) specify machine number
21-68000 Style 13 (11-68000 Style 13, 1-69117B No. 2 or 3) specify machine number
21-68000 Style 17 (11-68000 Style 17, 1-69117B No. 2 or 3) specify machine number
41-68000 Style 13 used on machines with rotary consecutive numbering device or/and rotary cal. fte. or quick set rotary mechanism
F **1-10920¼B**
10920¼A Early style
G **1086**
H **1-209800 No. 3** use with 10 or more cols. of adding capacity
1-209800 No. 4 use with 9 or less cols. of adding capacity
I **929⅛** use screw 12055⅝
J **1-69211L**
K **1-10916 P. 10**
1-10916R P. 10 used in 1st col.
L 10905A* complete assembled detent rack 1-69013 Style 13, 17 early, specify machine number
1A-69013 Style 13, 17 Later, complete assembled detent rack, specify machine number
31-69013 Style 13 Early, used on machines having 10 col. capacity in C.F.
31-69013 Style 17 Early, used on machines having 14 col. capacity in C.F.
31A-69013 Style 13 Later, used on machines having 10 col. capacity in C.F.
31A-69013 Style 17 Later, used on machines having 14 col. capacity in C.F.
M **1-69216** Early
1-69216A Later
N 1-69001* complete assembly 2A-69001 Style 13, 17 specify machine number, Cl. 11 thru 16, 21 thru 30
12A-209001 Style 13, 17 Early, Cl. 20 only
12B-209001 Style 13, 17 Later, Cl. 20 only
O **45**
P **10960½**
Q **69554**
R **69804**
S **255¼**
T **1A-69104**
U **87802**
V **931¼ No. 2**
V1 69556*
W **69319A**
X **69000 Style 13, 17**
Y **69100 Style 13, 17**
Z **10960**
AA **1-69803** Spring
AB **1-69214**
AC **1-69117B** Late style
1-69117A use for Style 23 17 41 machines
AD **10908⅜ Style 9, 11, 13, 15, 17**
AE **69100 Style 13, 17**
AF **69000 Style 13, 17**
AG **63800**
AH **69320** Bushing
AI **69805A No. 1** used for 9 or more col. of adding capacity
69805A No. 2 used for 8 or less col. of adding capacity
AJ **12055⅝**
AK **69229**
AL **45**
AM **69557 (69557 No. 2)** 10955 Bushing
AN **284**
AO **1-10912**
AP **1-69211R**
AQ **1-990R P. 10 No. 1**
21-990 P. 10 No. 1 used in other cols., see Plate 2 for other styles
AR **1-69218A**
AS **69217**
AT **10856½A, 10856¼** Nut, 824¼ washer, 46 nut

SEE EXPLANATION ON INSIDE OF FRONT COVER

CROSSFOOTER CONTROL MECHANISM—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 43-1)*



*(See plate 43-2 for other symbols)

(OVER)

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SYMBOLS (Plate 43-1)*

A **1-118 No. 2 Fte. 219**
B **1-62215 No. 2**
C **10686½**
D **60165**
E **1-60100 No. 5**
F **10056**
G **11-62227**
H **10056**
I **1-69111½** includes M, Q
J **1-60110 No. 2**
K **62303** eccentric, use 75621 screw
L 62112* included in CR
M 69111¾* included in I
N **1-62127**
O **69111¼**
P **1-200299**
Q **760¼ No. 2**
R 62511A* included in CR
S 60612* included in BG
T **1-204140**
U **1-69111 No. 2** includes BS
V **1-200298**
W 60583* included in BG
X **1-200914**
Y **7282¼** spring
Z **202147**

AA **550¾**
AB **1-202146**
AC **202700 No. 3**
AD **46¼** nut, use 256⅛ screw
AE **1-217L No. 7**
AF **1-217L No. 9**
AG **221**
AH **202700 No. 1**
AI **202700 No. 2**
AJ **550¾**
AK **202147**
AL **702320** shoulder nut, use 76528 screw
AM **202147**
AN **49** nut, use 76528 screw
AO **1-200396A No. 1** includes AP
AP **709519** screw
AQ **69570**
AR **46** nut
AS **44** nut
AT **69364** bushing
AU **69569**
AV **69180 No. 2**
AW **284** spring
AX **1-69179 No. 2**

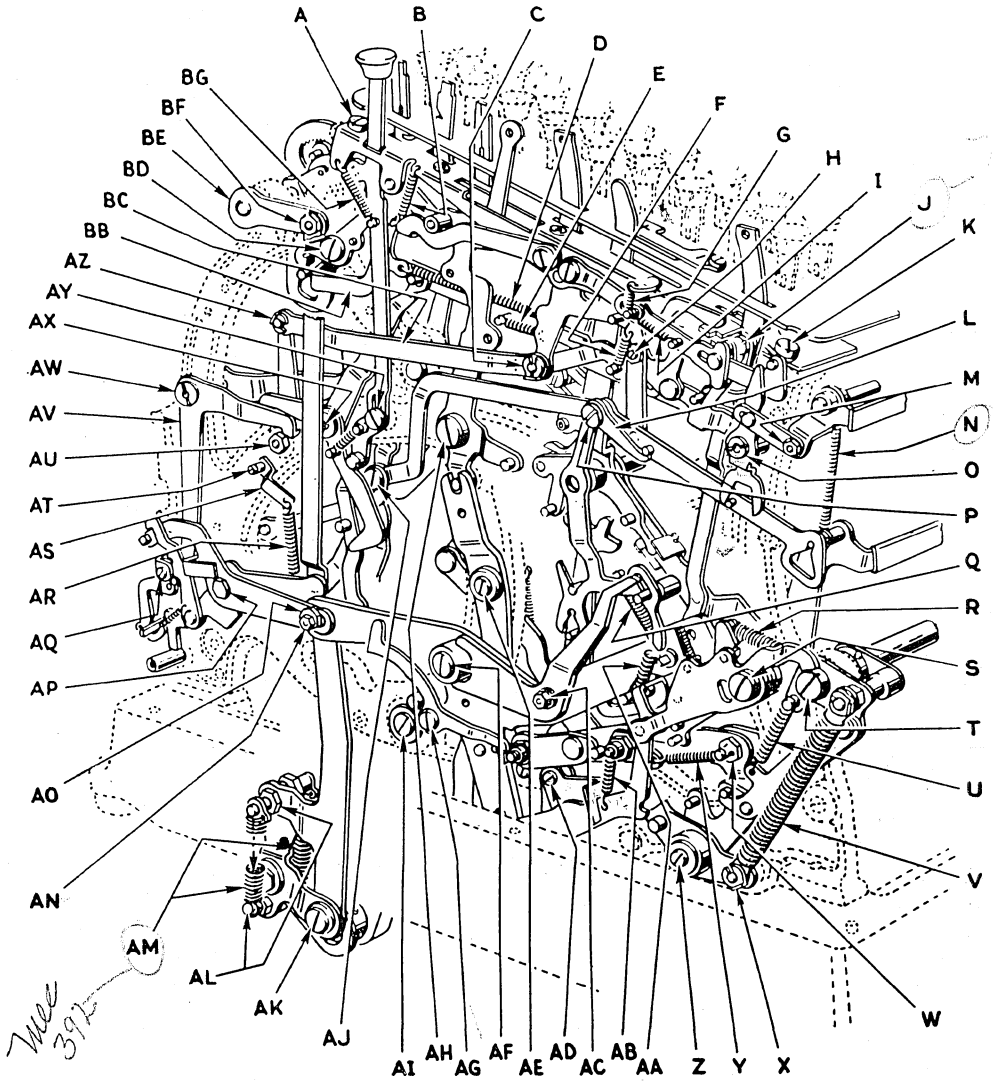
BA **46⅛**
BB **1-69179 No. 1**
BC 69568* included in 22-69001 Style 17
BD **284**
BE **69180 No. 1**
BF **209512**
BG **1-60161** includes S, W
BH **1-204003 Style 17 No. 2**
BI **680**
BJ **1-204804**
BK **1-204142** includes BN
BL **1-204145**
BM **1-204146**
BN 750¾ No. 1* included in BK
BO **1-204144** includes BQ
BP **200604½**
BQ 10850* included in BO
BR **209508** screw, use 209305 eccentric
BS 750¾ No. 2* included in U
BT **1-204134**
BU **1-209136**
BV **209508** screw, use 209305 eccentric
BW **1-60160**
BX **1-209133**
BY **60166**
BZ **1-209134**
BZ1 **60174**

CA **1-200297** includes BP
CB **200661A No. 2** eccentric screw
CC **2-200182½B No. 3**
CD **203495** eccentric, use 950⅝ screw and 46 nut
CE **7286½** spring
CF **60127¼**
CG **1-185A Fte. 207**
CH **200616½**
CI 186 Fte. 207 No. 1* included in CN
CJ **1-200158½ No. 2**
CK **1-117 Fte. 219 No. 2**
CL **10180** spring
CM **10056** screw
CN **1-136 No. 6 Fte. 207** includes CI
CO **513B Fte. 219**
CP **1-118½B Fte. 219**
CQ **61-62103** includes L, R

Mee 312

*(See plate 43-2 for other symbols)

CROSSFOOTER CONTROL MECHANISM—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 43-2)



SYMBOLS (Plate 43-2)

A **7059**
B **10686½**
C **21 No. 8**
D **983**
E **480¼**
F **69809**
G **7286½** spring
H **75621** screw, use 02303 eccentric
I **3280⅛**
J **9052½** screw
K **7059**
L **200298½**
M **49¼** nut, use 76528 screw
N **7382A**
O **200438**
P **71589**
Q **60812**
R **480¼**
S **204525** screw, use 204326 bushing
T **204524**
U **280¾**
V **1-204804**
W **209512** screw stud
X **21 No. 8** clip
Y **89800A**
Z **255⅛** screw, use 3820½ washer
AA **7382A** spring
AB **3280⅛**
AC **46** nut, use 1097¾ washer and 3952A screw
AD **2856⅞**
AE **705603 No. 2** screw, use 200380 No. 1 bushing
AF **200608½**
AG **709621** screw, use 3826½ washer
AH **60506** screw, use 47 nut
AI **12051** ⅛
AJ **10056** screw
AK **3450⅛ Style 9**
AL **200660 No. 2**
AM **1-2886¼D**
AN **46** nut
AO **203495** eccentric
AP **69554**
AQ **75602** screw, use 75346 bushing
AR **388**
AS **20 No. 114**
AT **203637**
AU **47** nut, use 200560½ screw
AV **1-200216C No. 6**
AW **200342**
AX **306 Fte. 207**
AY **10056**
AZ **21 No. 8** clip
BB **11-62109 No. 2**
BC **1-200294** includes AZ
BD **513B Fte. 219**
BE **1-12024 No. 38**
BF **10056**
BG **300812**

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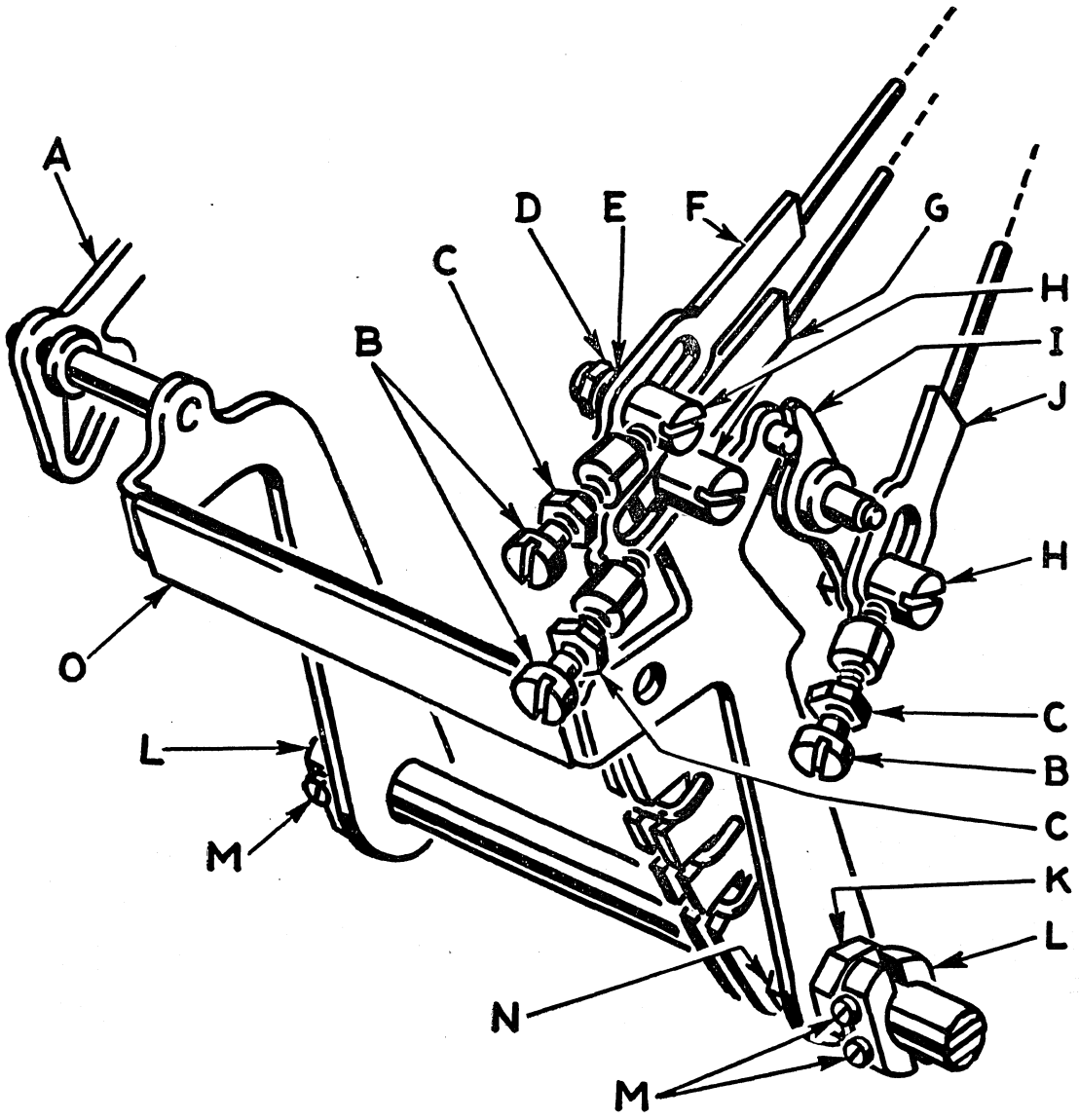
IMPROVED WIRE CONNECTIONS, COLUMN 14 NO SPACE STROKE TOTAL BANK POSTING MACHINE (Plate 43-3)



SYMBOLS (Plate 43-3)

A	1-200298	I	1A-202146
B	2850 3/16A	J	1-202700A No. 3
C	46 1/4	K	79350
D	49 1/4	L	1-200396A No. 1 includes M
E	1097 5/16 lock washer	M	709519
F	1-202700A No. 1	N	200396 No. 3
G	1-202700A No. 2	O	1-200914A No. 1
H	202527		

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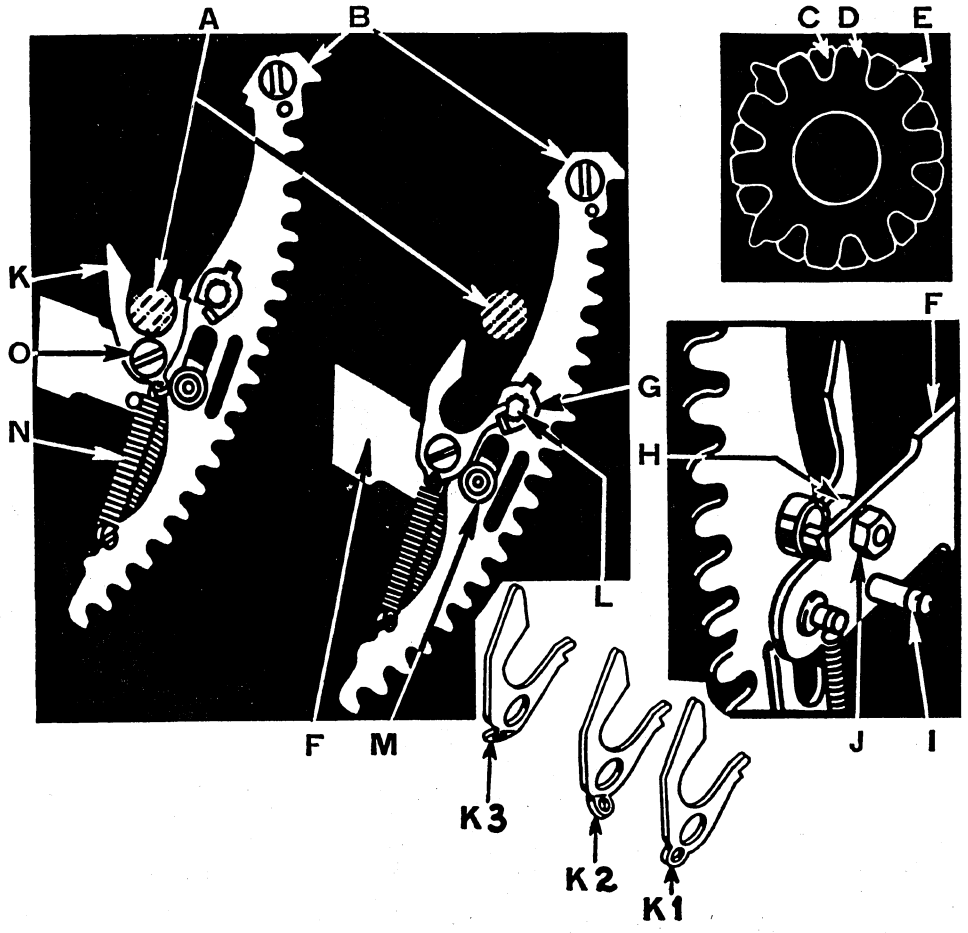
Mr M R Lovejoy
Buffalo N Y Branch
10-5

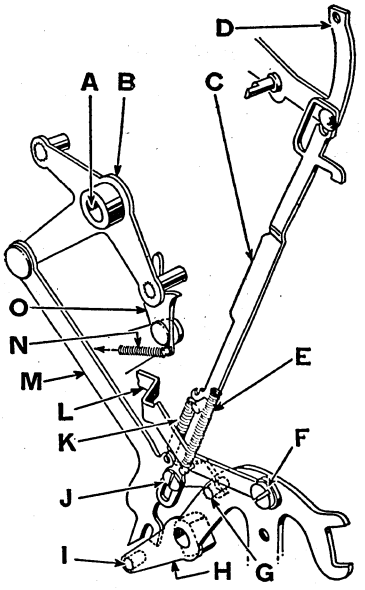
INERTIA LATCHES, CLASSES 21 THRU 30 (Plate 44)



SYMBOLS (Plate 44)

A **11-400A Style 13** Later
1-400A Style 9, 11, 13, 15, 17 Early, specify machine number
B **1- to 51-610R or L** see list, Plate 1
C Included in E
D Included in E
E **69116A P. 8, 10, 12** specify machine number
F **1Z-611F** see list, Plate 1
G 624 No. 3* for K2; 624 No. 4* for K1 or K3
H **66300 No. 1** Collar, 77133 thin washer
I **66502 (66502A)**
J **1097¾** Lock washer; 46 nut or 46¼ if H903
K1 **66117AR**
K2 **66117AL**
K3 **66117A**
L 651 Nos. 1*, 2* or 3*, 206300* Roll
M **655B and 633¼**
N **680**
O **66505** for K2 and K3
79548 for K1

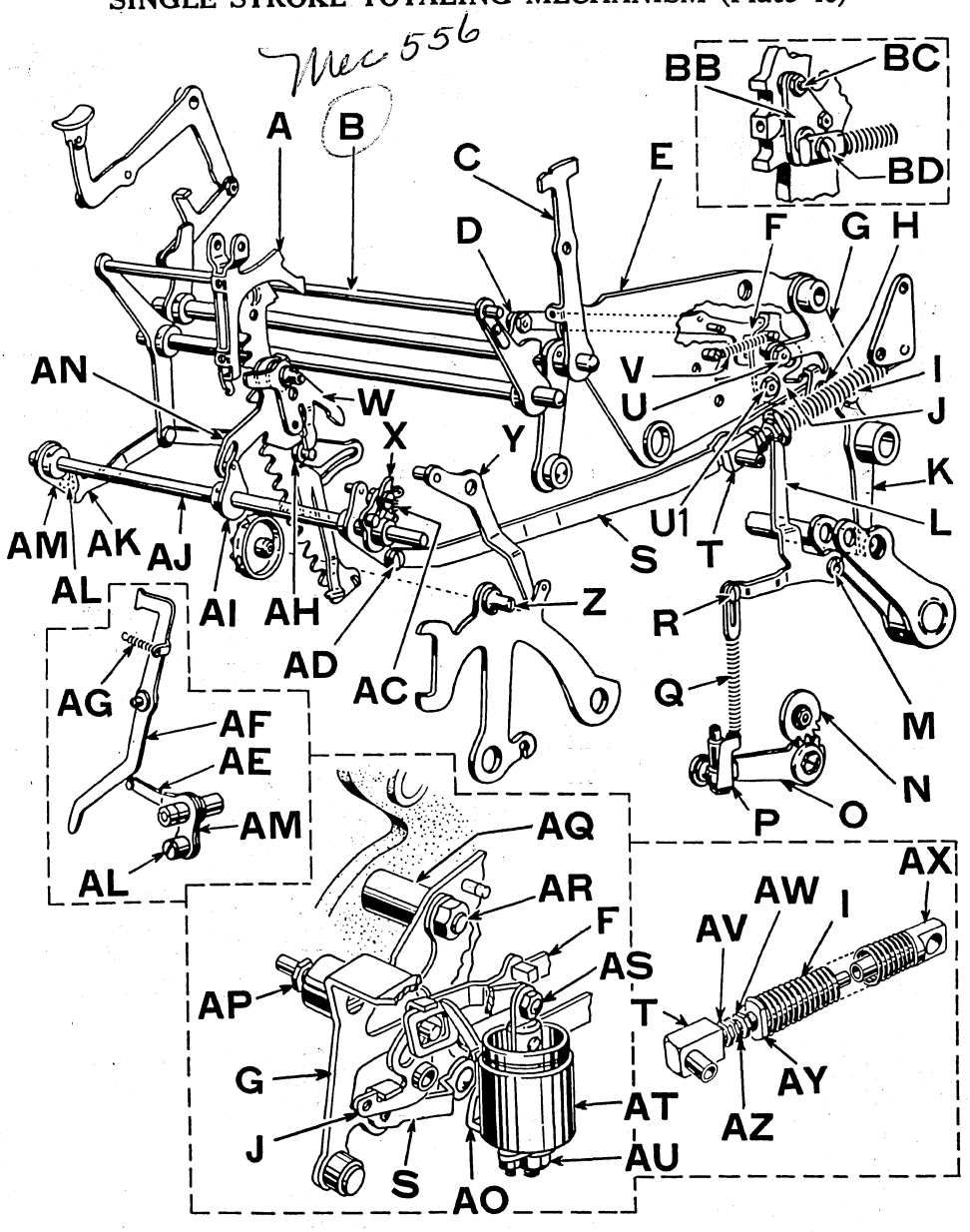
CROSSFOOTER TOTAL CONTROL MECHANISM, CLASSES 21 THRU 30 (Plate 45)



SYMBOLS (Plate 45)

A **10932⅜** Bushing, 255⅛ screw
B *Included in M
C **1-69111**
D **1-62127**
E **1086**
F **10960½** Screw, 10960 bushing
G **10941** Roll, 10958A stud
H 1A-69210L*
I **69520** Stud, 83451 roll
J **10056**
K **10983**
L **1-10920¼B**
M **1-69215A (1-69215 No. 2)**
N **1-883½A (1-84804)**
O **1-821B**

SINGLE STROKE TOTALING MECHANISM (Plate 46)



SYMBOLS (Plate 46)

A **411 No. 2**
B **902½A Style 7, 9, 11, 13, 15, 17**
C 1-205117* on 1-205002 Style 13, 17 No. 2
D **161⅜ Fte. 104** Eccentric, 1097⅞ washer, 45 nut
E **1-20110A**
21-20110A with "keyboard release during repeat print"
F **1-205115**
G **1-200136B No. 2** Later
1AZ-200136B No. 2 Early style
H **8054¾**
I **1-204800B No. 2**
J **1-200132A**
K **1-200137B**
L **1-200145A Later,** 1-200145 early style
M **12031½** Bushing
N **3616B**
O **11B-3615C**
P **20 No. 14**
Q **1A-201800**
R **2857⅞ (4857½)**
S **1-204114B**
T **1-204308** included in I
U **200555Z** Screw, 1097¾ lock washer, 46 nut
U1 **200512A**
V **12080⅝**
W **1-10413A**
X **1-204107A** use 3455⅜ screw, 204310 collar, 46 nut
Y **1-200139**
Z **69557 (69557 No. 2)**
AC **3286½**
AD **75633**
AE **1-204117**
AF **1-204110**
AG **10484**
AH 206300* Roll, 651 No. 1* stud
AI 1-204104*
AJ **1-204003 Style 13, 17** Cl. 20 thru 30 with 6 col. add. cap.
11-204003 Style 13, 17 Cl. 20 thru 30 with 7 col. add. cap.
21-204003 Style 13, 17 Cl. 20 thru 30 with 8 col. add. cap.
31-204003 Style 13, 17 Cl. 20 thru 30 with 9 col. add. cap.
41-204003 Style 13, 17 Cl. 20 thru 30 with 10 col. add. cap.
51-204003 Style 17 Cl. 20 thru 30 with 11 col. add. cap.
61-204003 Style 17 Cl. 20 thru 30 with 12 col. add. cap.
71-204003 Style 17 Cl. 20 thru 30 with 13 col. add. cap.
81-204003 Style 17 Cl. 20 thru 30 with 14 col. add. cap.
91-204003 Style 17 for Style 23 17 41 and 23 17 45, with 9 col. add. cap.
AK **209123A**

SEE EXPLANATION ON INSIDE OF FRONT COVER

Symbols continued on Next Page

SYMBOLS (Plate 46)—Continued

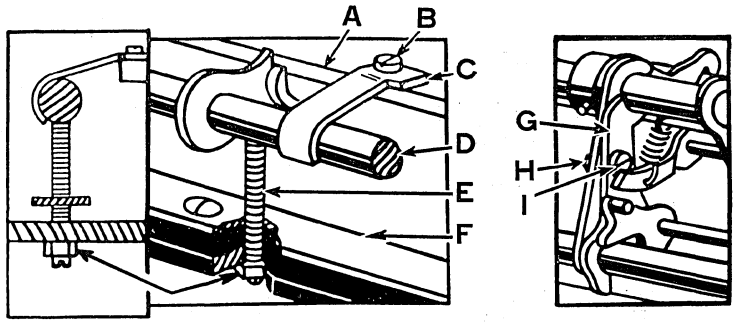
AL **204503A** Screw, 204303 roller, 1097⅞ washer, 46 nut
AM 1-204108* included in AJ
AN **204109**
AO **1-200278** Bracket; does not include set screw 10056¼ or two posts 200611, which are not pictured
AP **200518C** Tapped stud, 12050⅝ screw
AQ **334B**
AR **352¾** Screw, 47 nut
AS **69551** Screw, 47 nut
AT **1-10048¼** includes plunger
AU **393**
AV **204309 No. 1** included in I
AW **204309 No. 2** included in I
AX **1-204304A** included in I
AY **204512A** included in I
AZ **204504E** included in I
BB **1-200253B**
BC **200548½** Screw, 200253½ collar, 45 nut
BD **12051⅞**

REGISTER SECTION BRACES FOR TEN REGISTER CONSTRUCTION (Plate 48)

(Plate 47 in Instruction Book only)

SYMBOLS (Plate 48)

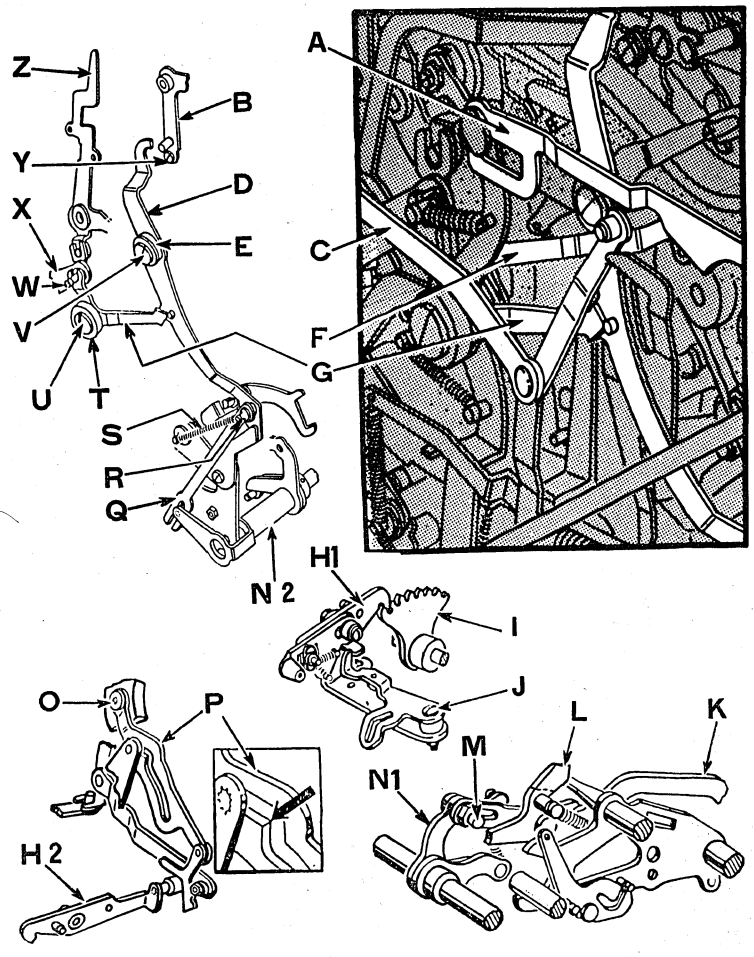
A **69135 Style 17 No. 10**
B **74523**
C **69178**
D 60002*
E **69559**
F **60114 Style 17 No. 10**
G **69115½Z No. 10**
H **46¼**
I **7562**



REGISTER CONTROL MECHANISM TO PROVIDE SUFFICIENT TIME FOR REGISTER TO POSITION CORRECTLY (Plate 49)

SYMBOLS (Plate 49)

A 200123½ No. 2*
11-200122½ (11B-200122½, 200380 No. 1, 200198¾, 200465½A, 200625A)
B **1-10227**
C 200120½* (1-200121½ No. 2)
D **1-200197½**
E **200377½**
F **1-200127½A No. 1**
G **200198½**
H1 **1A-60137B No. 2** } See Plate 28-1
H2 **11A-60137B No. 2** }
I 1-60140 No. 6*
J **60551**
K 60116A*
1-60115A (11-60115A)
L **1-60134**
M **60523A, 46** Nut
N1 **1-69101**
N2 **11A-69101**
O **60550** Screw, 200315 bushing
P 200164 No. 7* included in 61-200162
Q **200199½**
R **200632 (12062⅞)**
S **74812**
T **200410, 200380 No. 2** Flanged collar on inside
U **200625**
V **200630**
W **200647 No. 2**
X **1-200161½**
Y **251⅜ No. 4** Screw, 200411 washer
Z **41-60100**



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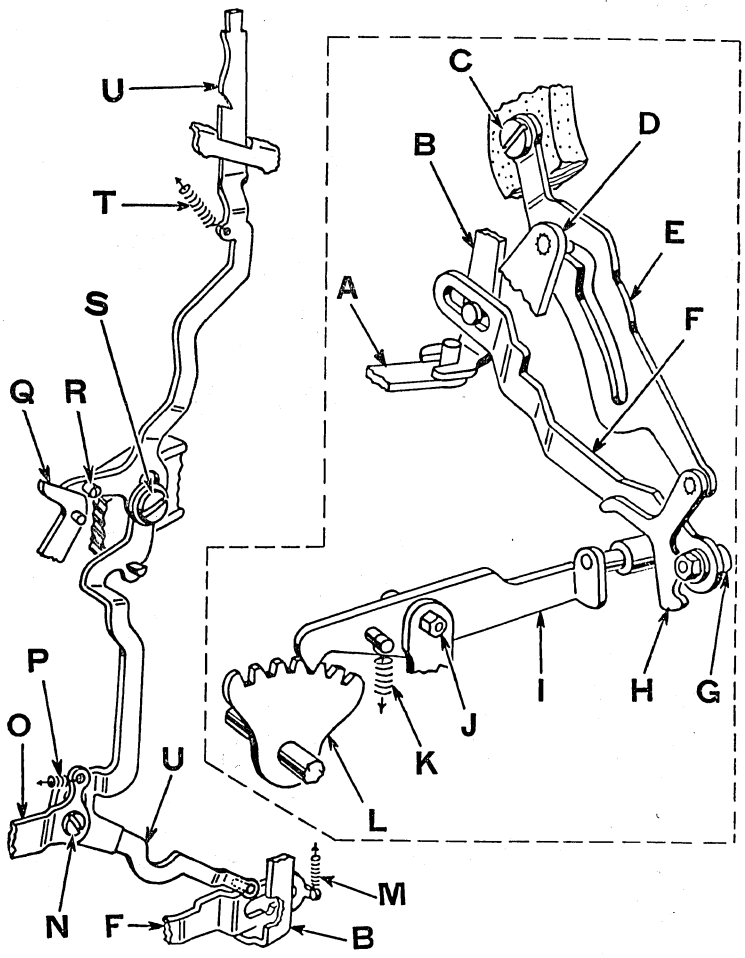
REGISTER SHIFT RELEASE MECHANISM WITH DISABLING KEY, CLASSES 22 THRU 30 (Plate 50)



SYMBOLS (Plate 50)

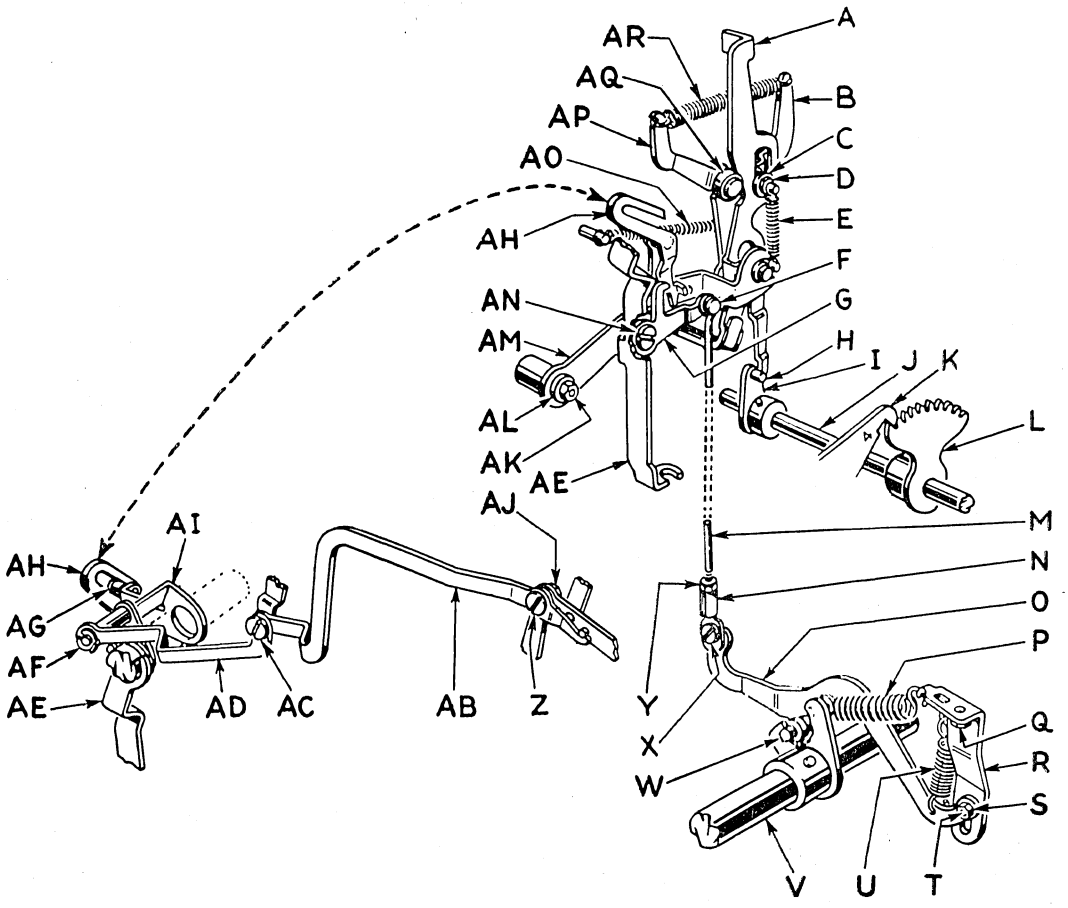
A **1-60111 (1-60111A)**
B **1-60101 No. 2 Env. 280G (1-109 Env. 280G)** included in F
C **200315** Bushing, 60550 screw
D 1-68112*
E Included in H
F **1-109 Env. 280G** includes B
G **200544** Screw, 47¾ nut
H **11-200162** includes E
I **1A-60137B No. 2** see Plate 28-1
J **60552 (76581)** Screw, 46 nut, 87309 collar or 60308⅞ No. 2
K **60804A**
L 1-60140 No. 6*, No. 10* for 10 reg. construction
M **7283¼**
N **4456½** Screw, 75342 eccentric
O **1-200159½**
P **480¼**
Q **1-200130½**
R **200520½** Screw, 49¾ nut
S **127 Fte. 213** Washer, 60352 nut
T **4487**
U **1-200143½ Env. 280G (1-200143½ No. 5)**

SYMBOLS (Plate 51)

A 1-60140 No. 10*
B **1-60138A No. 2 Env. 1631**
C **1-205312**
D **112 Env. 1631**
E **200621** Screw, 46 nut
F **1-113 Env. 1631**
G **115 Env. 1631**
H **106500**
I **801 Env. 1631**
J **1-10016 No. 2 Env. 1631**
K **1-12007 No. 1 Style 17 (1-12007 Style 17 No. 4, 1-540)**
L **1-12024 No. 1**
M **259½** Screw, 46 nut
N **1-118 Env. 1631**
O **10056**
P Included in J
Q **60803 No. 10**
Q1 **10080**
R **1-60129A Env. 1631** specify 10 reg.
S **3361¼A** Screw, 1097⅞ washer, 49¼ nut
S1 **79543**
T **200318 Env. 1631**
U **49¼** on 60003
V **1-60128 No. 10 Env. 1631**
W **1-60141 No. 10A Env. 1631**
X **200182 Style 17 Env. 1631** 10 reg.
Y **46**
Z **33 Fte. 103** Roll, 56 Fte. 103 screw
AB **1-1 Env. 1631**
AC **1653¼ Env. 1631,** 46 Nut
AD **259½,** 46 Nut
AE Part of AF
AF **1-117A Env. 1631 (1-117A No. 2 Env. 1631)**
AG **111A Env. 1631**
AH **1-60002 Style 17 No. 10 Env. 1631** includes W, AT, AV, AG
AI **302526 (514 Env. 1631),** 46 Nut
AJ **83883**
AK **7287 Style 5**
AL **1-116 Env. 1631** included in AB
AM **1-119 Env. 1631**
AN **100564**
AO **1-120A Env. 1631**
AP **12081½**
AQ **489**
AR **509 Env. 1631, 46** Nut
AS **1-109A Env. 1631**
AT **1A-107A No. 10 Style 17 Env. 1631**
AU **508 Env. 1631** Eccentric, 46 nut, 122 Env. 1631 washer
AV **1-108 Env. 1631** included in AH
AW **121 Env. 1631** Middle guide
AX **42-60000 Style 17 Env. 1631**
AY **1-110A Style 17 Env. 1631**

SEE EXPLANATION ON INSIDE OF FRONT COVER

REGISTER SHIFT FROM SUBTRACT OPERATION—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 50-1)



SYMBOLS (Plate 50-1)

A **1-60158**
B **11-60129C** includes C, D
C **3820½**
D **47¼** nut, use 3820½ washer and 108381A roller
E **84813 No. 2**
F **60580** rivet
G **1-60157** includes F, M
H 649½* included in I
I 1-60141 No. 10* included in J
J **1A-60002 Style 17 No. 10** includes H, I, L
K **11B-60137B No. 2** stamped "4"
L 1-60140A No. 10* included in J
M **72714 No. 1**
N **72110 No. 2**
O **60173**
P **87800 No. 4**
Q **86314 No. 2** shoulder nut
R **60159**
S **46**
T **9259⅝** screw
U **69800 No. 2**
V **1-200006B Style 17** includes W
W 515 Fte. 717* included in V
X **79510** screw, use 200393 shoulder nut
Y **49**
Z **71589**

AB **200298½**
AC **10056**
AD **60171**
AE **1-60156**
AF **21 No. 8**
AG 60584* stud, included in AI
AH 60169* included in AM
AI **1-60170** includes AG
AJ **58310** shoulder nut
AK **47**
AL **60367** sleeve
AM **1-60167** includes AH
AN **10056**
AO **10080**
AP **1-60128B** includes AQ
AQ 302302* included in AP
AR **60803 Style 17 No. 3**

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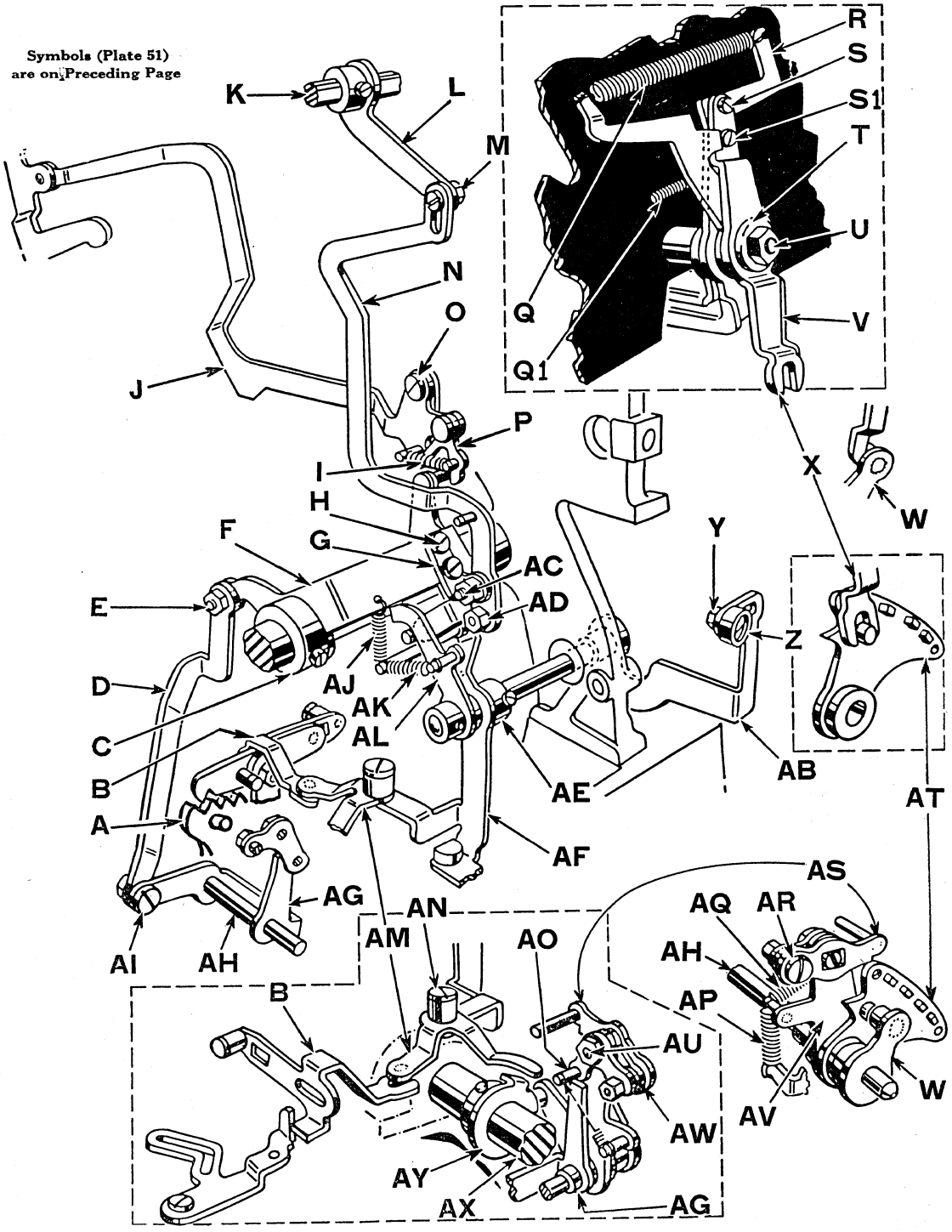
SYMBOLS (Plate 51)

A 1-60140 No. 10*
B **1-60138A No. 2 Env. 1631**
C **1-205312**
D **112 Env. 1631**
E **200621** screw, 46 nut
F **1-113 Env. 1631**
G **115 Env. 1631**
H **106500**
I **801 Env. 1631**
J **1-10016 No. 2 Env. 1631**
K **1-12007 No. 1 Style 17 (1-12007 Style 17 No. 4, 1-540)**
L **1-12024 No. 1**
M **259½** screw, 46 nut
N **1-118 Env. 1631**
O **10056**
P Included in J
Q **60803 No. 10**
Q1 **10080**
R **1-60129A Env. 1631** specify 10 reg.
S **3361¼A** screw, 1097⅛ washer, 49¼ nut
S1 **79543**
T **200318 Env. 1631**
U **49¼** on 60003
V **1-60128 No. 10 Env. 1631**
W **1-60141 No. 10A Env. 1631**
X 200182 **Style 17 Env. 1631** 10 reg.
Y **46**
Z **33 Fte. 103** roll, 56 Fte. 103 screw
AB **1-1 Env. 1631**
AC **1653¼ Env. 1631,** 46 nut
AD **259½,** 46 nut
AE Part of AF
AF **1-117A Env. 1631 (1-117A No. 2 Env. 1631)**
AG **111A Env. 1631**
AH **1-60002 Style 17 No. 10 Env. 1631** includes W, AT, AV, AG
AI **302526 (514 Env. 1631),** 46 nut
AJ **83883**
AK **7287 Style 5**
AL **1-116 Env. 1631** included in AB
AM **1-119 Env. 1631**
AN **100564**
AO **1-120A Env. 1631**
AP **12081½**
AQ **489**
AR **509 Env. 1631, 46** nut
AS **1-109A Env. 1631**
AT **1A-107A No. 10 Style 17 Env. 1631**
AU **508 Env. 1631** eccentric, 46 nut, 122 Env. 1631 washer
AV **1-108 Env. 1631** included in AH
AW **121 Env. 1631** middle guide
AX **42-60000 Style 17 Env. 1631**
AY **1-110A Style 17 Env. 1631**

SEE EXPLANATION ON INSIDE OF FRONT COVER

REGISTER SHIFT FROM SUBTRACT MECHANISM, BAR AND CARRIAGE CONTROLLED, CLASSES 22 THRU 30 (Plate 51)



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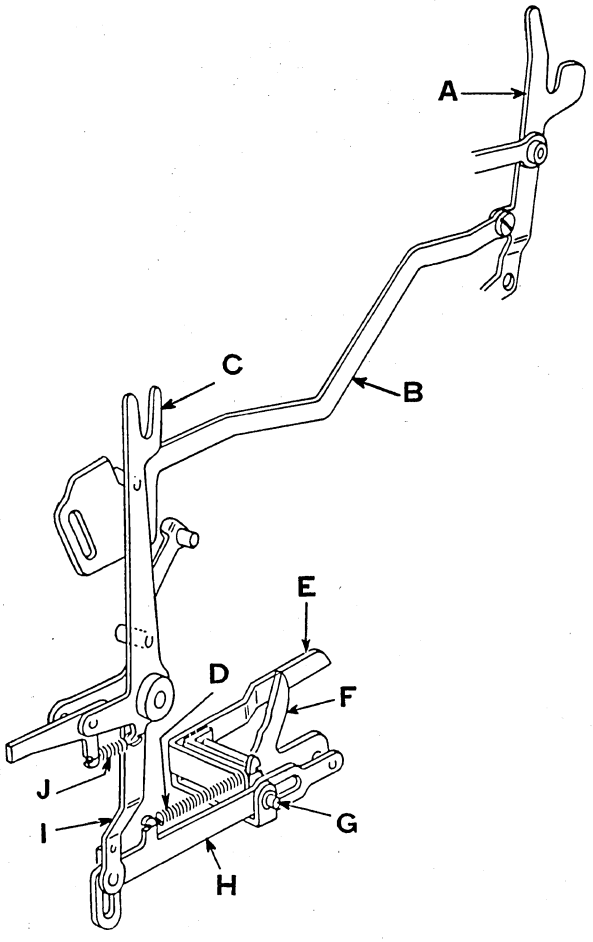
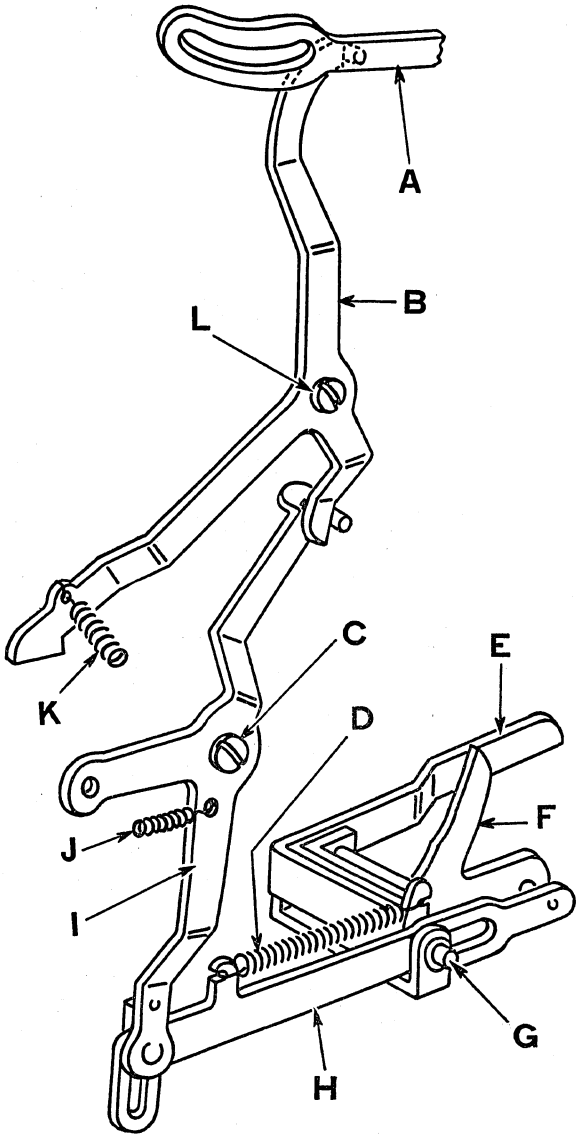
REGISTER NON-ADD FROM SUBTRACT MECHANISM, CLASSES 11 THRU 16, 21 THRU 30 (Plate 52)



SYMBOLS (Plate 52)

A	**2-60110A**
B	**1-10016A** use screw 10056
C	**1-162 Fte. 200 Style 13, 17**
D	**10983**
E	**60108**
F	**60109** see Plate 28-2
G	**60001** Shaft, 470 ring
H	**1-60107A**
I	**1-60106C**
J	**10088A**

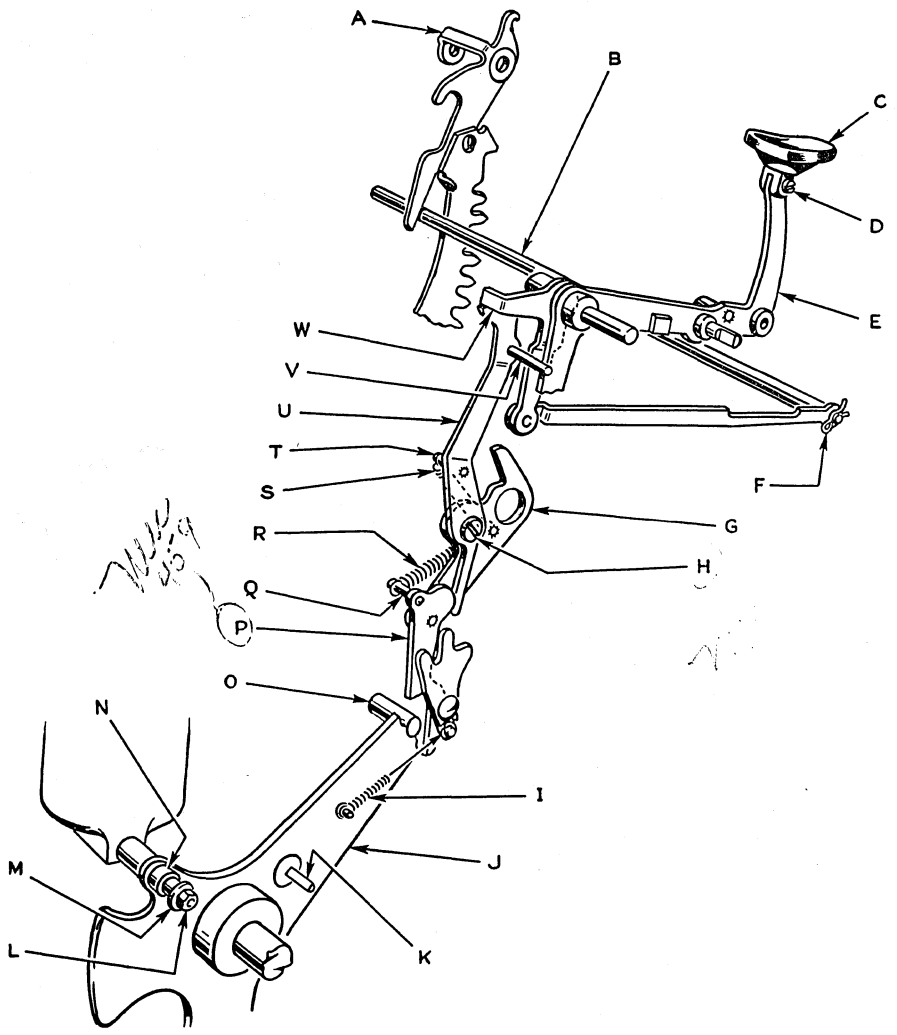
REGISTER NON-ADD CONTROLLED BY TOTAL KEYS, CLASSES 11 THRU 16, 21 THRU 30 (Plate 53)



SYMBOLS (Plate 53)

A	**1-202225**
B	**160 Fte. 200**
C	**1055⅜ Style H** Screw, 60342 bushing, 60343 stud
D	**10983**
E	**60108**
F	**60109** see Plate 28-2
G	**60001** Shaft, 470 ring
H	**1-60107A**
I	**1-60106C**
J	**2886½**
K	**10180**
L	**12055¼A**

SECTOR BAR LOCK—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 54-1)



SYMBOLS (Plate 54-1)

A **415 No. 1**
B **209 Style 17**
C **1-293½** specify color
D **255¼** screw
E **1-62127**
F **21 No. 15**
G **1-202148** includes P
H **3960** use 46 nut
I **1-84804**
J 1-68113 No. 2 Style 17* included in 11-68000 Style 17
K **10856½A** stud; use 824¼ washer, 10856¼ hex. bushing, and 46 nut
L **46**
M **7919½A** washer
N **10830** shoulder collar
O **68507**
P 1-202149* included in G
Q 10061¼* included in P
R **3283**
S **203819 No. 2** spring
T 10061¼* stud, included in U
U **1-202150** includes T, V
V 3850⅝* included in U
W **1-227⅛ No. 3**

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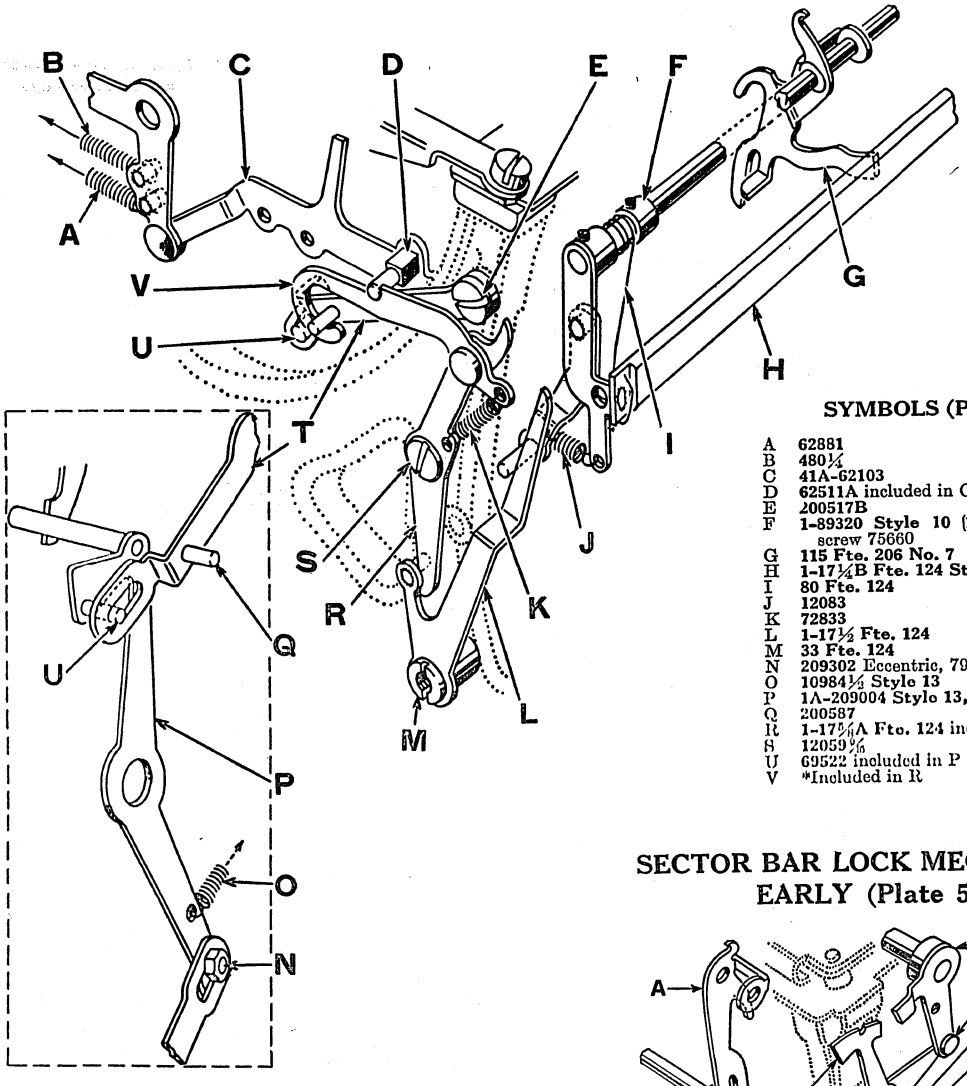
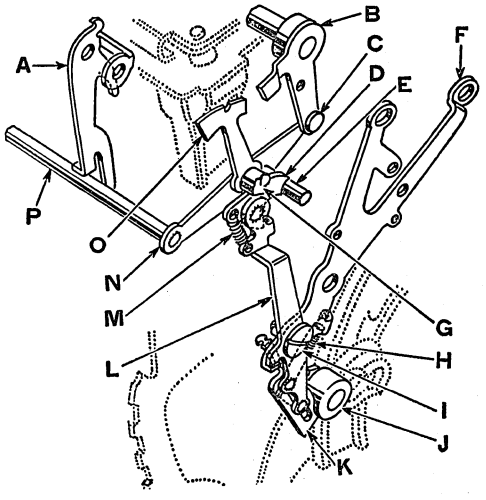
REGISTER TOTAL AND SECTOR BAR LOCK FROM REGISTER TOTAL INDEXING LEVER, CLASSES 21 THRU 30 (Plate 54)



SYMBOLS (Plate 54)

A 62881
B 480¼
C 41A-62103
D 62511A included in C
E 200517B
F 1-89320 Style 10 (1-64307) includes screw 75660
G 115 Fte. 206 No. 7
H 1-17¼B Fte. 124 Style 13, 17
I 80 Fte. 124
J 12083
K 72833
L 1-17½ Fte. 124
M 33 Fte. 124
N 209302 Eccentric, 79547 screw, 46 nut
O 109841/4 Style 13
P 1A-209004 Style 13, 17
Q 200587
R 1-17⅝A Fte. 124 includes K, V
S 12059⅝
U 69522 included in P
V *Included in R

SECTOR BAR LOCK MECHANISM, EARLY (Plate 55)



SYMBOLS (Plate 55)

A 415D
B 1B-204A Style 13, 17 if repeat print
21-204A Style 13, 17 if not repeat print
C 263
D 215⅜ (1-215⅜ No. 2) included in L
E 256¾ Screw, 1097¾ washer, 46 nut
F 1-215⅝ includes D, I, K and L
G Included in O
H 10983
I 256⅝ Screw, 1097¾ washer, 46 nut
J 3649
K 215¾ included in F
L 1-215⅝ included in F
M 9586
N 216AR
O 1-205002 Style 13, 17 (1-205002 Style 13, 17 No. 2, 552 Fte. 209, 1097¾, 46) for Classes 20-26
1A-10500¼ Style 9, 11, 13, 17 for Classes 11-16
P 209 Style 13, 17

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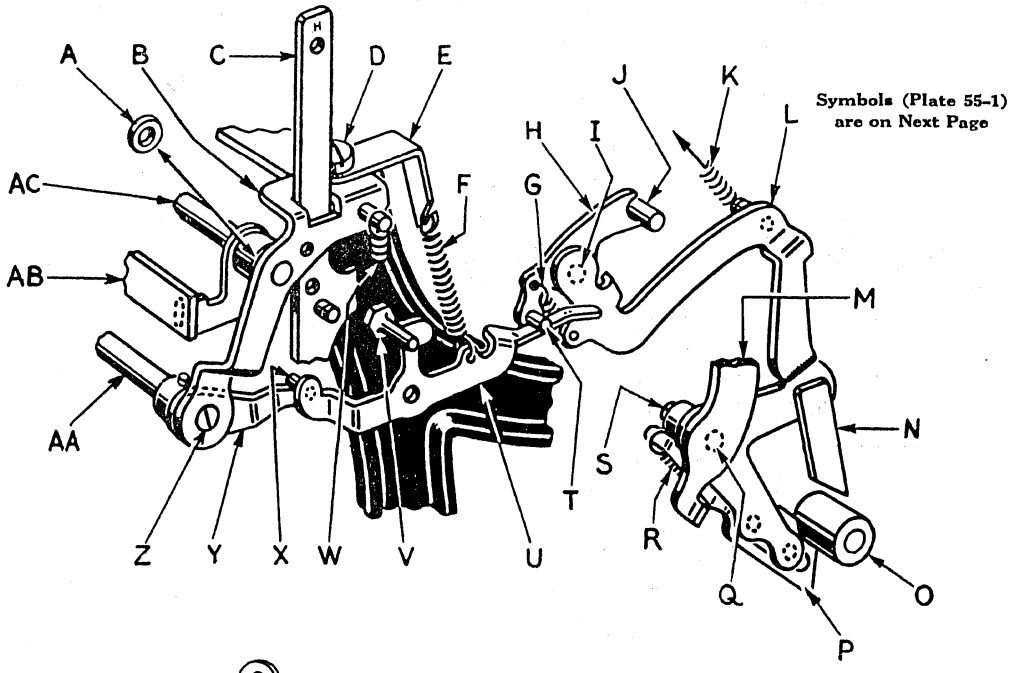
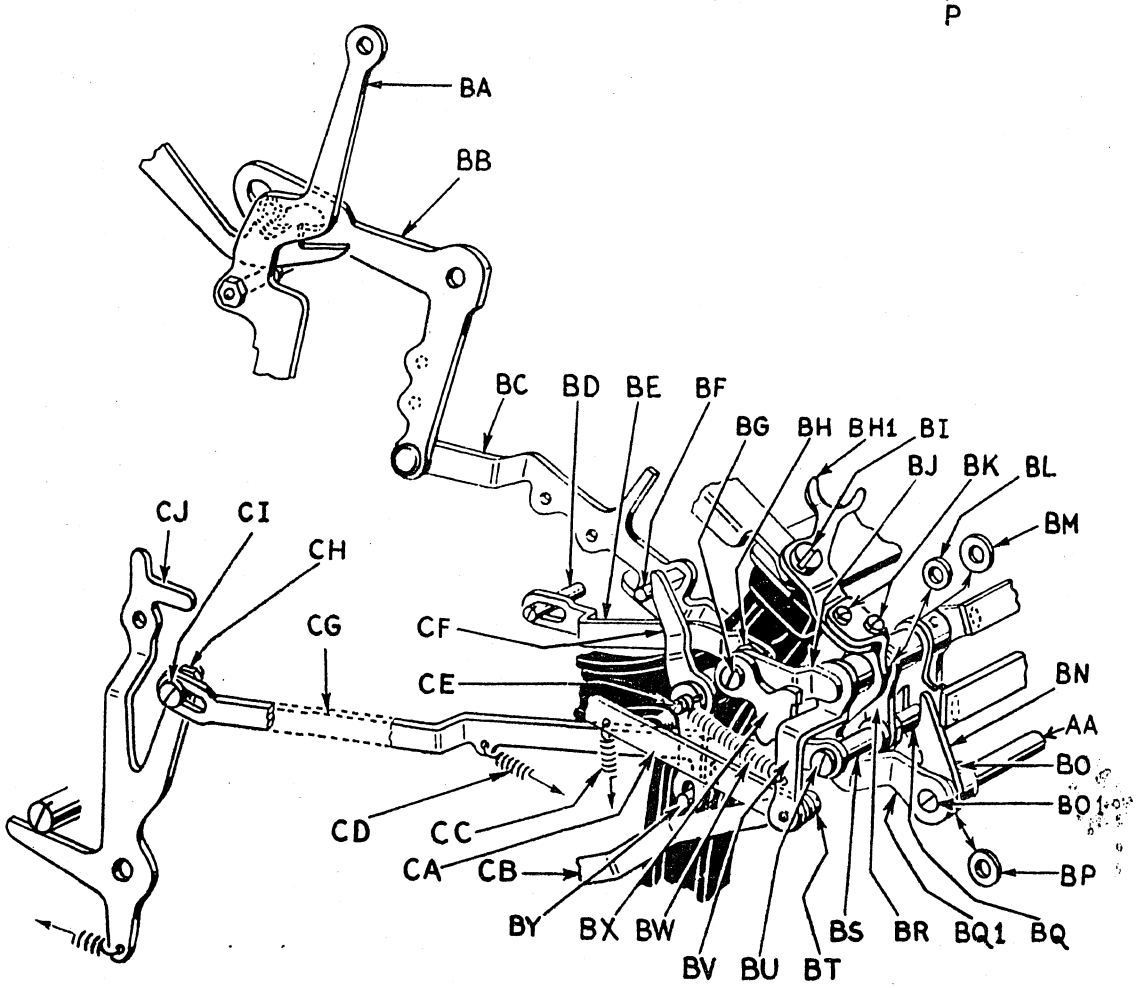
SECTOR BAR LOCK, IMPROVED (Plate 55-1)



Symbols (Plate 55-1) are on Next Page

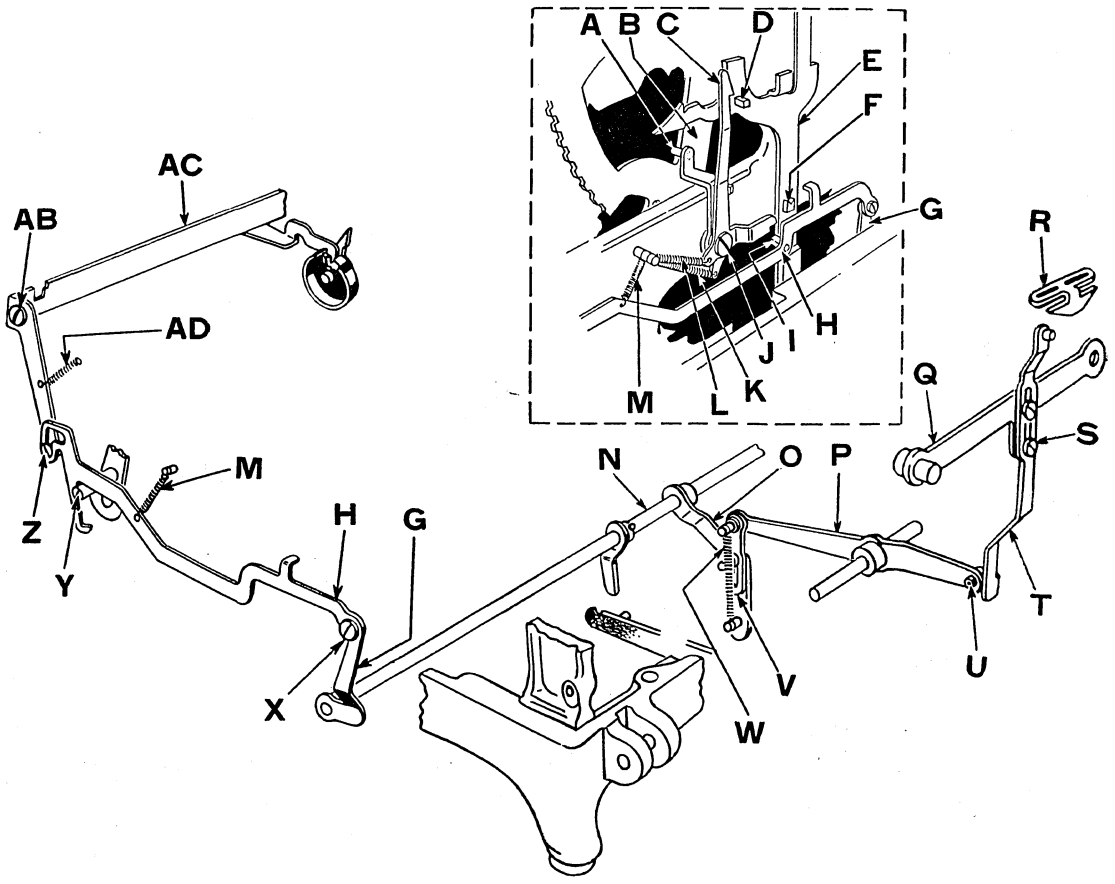


SYMBOLS (Plate 55-1)

*A	**216**1/8 Collar, use without **N.A.N.P.** **1-89325** Collar, use with N.A.N.P.
*B	**1-120187/8A No. 3**
C	**1A-12021**1/4 **No. 3**
D	**9251**15/16
*E	**20 No. 126**
*F	**7480B**
G	**709803** Spring
H	1-2153/8 No. 3* included in L
I	650A* included in L
J	**256**3/4**A**
K	**10983**
*L	**11B-2155/8 No. 2** includes H, I, N, P
M	**11-2151**15/16 **No. 3 (11-2151**15/16**A No. 3)** Brace only **1C-2151**15/16 **No. 3** Assembled brace includes H, I, L, M, N, P, Q, S
N	2151/4* included in L
O	**1-3662**1/4 **No. 3**
P	2153/4* included in L
Q	**75587*** included in M
R	**74809 No. 1** Spring
S	**957**1/2 Screw
T	9258**1/4*** included in H
*U	**1-200233**1/2**B No. 1** use without counter dials **1-200233**1/2**B No. 2** use with counter dials
V	**12053**5/8
W	**79813 No. 1**
X	**96508 Stud*** included in U
Y	1-204128BR* included in AA
*Z	**70528**
*AA	**1-204004 Style 17** without C.F.N.C. lock **11-204004 Style 17** with C.F.N.C. lock
AB	64104 Style 17 No. 1* included in AC
AC	**1-64001 Style 17 No. 3**
BA	**41-60100**
BB	1-62102 No. 3* included in BC
BC	**41A-62103** includes BB, BF
BD	**209503** Screw, 46 nut
BE	**200128**1/2
BF	62511A* included in BC
*BG	**4450**5/8**A**
BH	**75342** Eccentric
*BH1	**64108B**
BI	**9251**15/16
*BJ	**64108**1/2 use without counter dials **1-64108 Env. 903 No. 2** use with counter dials
*BK	**952**3/4
*BL	**216**1/8 use without N.A.N.P. **1-64307** Collar use with N.A.N.P.
*BM	**1028 Style 15**
BN	1-204128BL* included in AA
BO	**8050**3/8 Pin
*BO1	**70528**
*BP	**216**1/8
*BQ	**204312** Hex. bushing, used without N.A.N.P. **200470** Hex. busing, used with N.A.N.P.
*BQ1	**64108**1/4 Bracket
*BR	**1-204128**1/2
*BS	**204514A No. 1** Screw stud, used without N.A.N.P. **204514A No. 2** Screw stud, used with N.A.N.P.
BT	**200543**1/2 Screw
*BU	**73612**
BV	1-64106* included in AC
BW	**2887**
BX	**200129**1/2
BY	2643/4* Stud
CA	200123**1/2 No. 2*** Assembled 11B-200122**1/2**
CB	**200166**1/2
CC	**983**
CD	**780**1/8**A**
CE	**7064**3/8 Screw, **200389** bushing
CF	**1-200165**1/2
CG	**1-200142**3/4
CH	**46** Nut
CI	**200621 No. 2** Eccentric
CJ	**1-200142**1/2**B** includes CG, CH, CI

*Parts required for Field installation: (See TEXT, Plate 55-1, Accumulation Instruction Book)

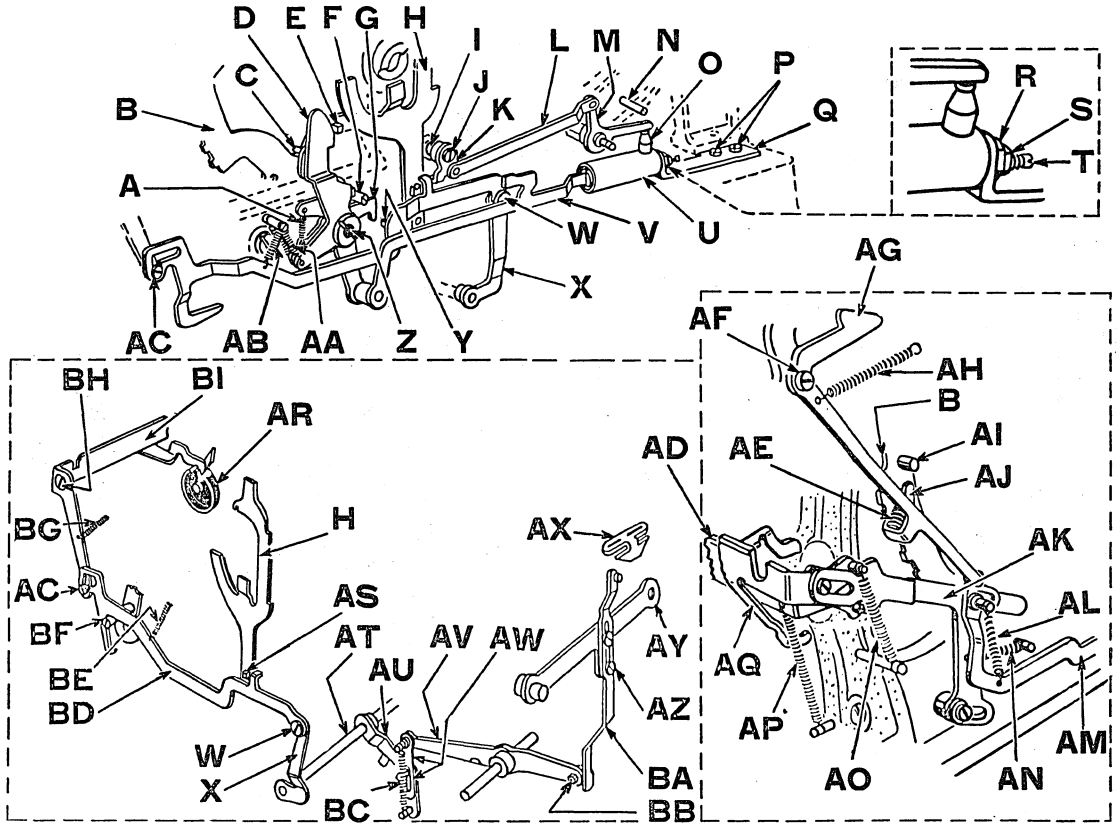
CROSSFOOTER NON-CLEAR MOTOR BAR LOCK NO. 1, EARLY STYLE, CARRIAGE CONTROLLED, CLASSES 11 THRU 16, 20 THRU 30 (Plate 56)



SYMBOLS (Plate 56)

A **1-135A Fte. 209**
B **1A-63111**
C **136 Fte. 209**
D 302518*
E **1A-127 Fte. 209**
F 508B Fte. 209* (3658⅝*)
G Included in N
H **1A-103 Fte. 209**
I Included in H
J **519 Fte. 209**
K **483**
L **3280⅛**
M **10082½ or 69809**
N **1A-4 Fte. 209 Style 17 (1B-4 Fte. 209 Style 17, 1A-12025 No. 9, 60804A)**
1A-4 Fte. 209 Style 13 (1B-4 Fte. 209 Style 13, 1-12025 No. 9 Style 13)
O 1-114A Fte. 209* (1B-4 Fte. 209 Style 17, 1A-12025 No. 9, 60804A)
1-114Z Fte. 209 Early style
P **1-12025 Style 13 No. 9** for Style 13
1-12025 No. 9 for Style 17
Q **1-1105A Fte. 209 Style 13, 17**
R **115B Fte. 209 No. 2**
S **8054¾**
T **1-104B Fte. 209**
U **520 Fte. 209 (251)** Screw, 46 nut
V **12025⅛**
W **77880 No. 4** for single lock
77880 No. 5 for double motor bar lock
X **506 Fte. 209**
Y **205533 No. 2 (552 Fte. 209)**
Z **259½**
AB **4454A**
AC **1-108A Fte. 209 Style 13, 17** Cut out to read C.F. dials, specify cut out
AD **10686½**

CROSSFOOTER NON-CLEAR MOTOR BAR LOCK NO. 2, AIRPOT AND CARRIAGE CONTROLLED (Plate 57)



SYMBOLS (Plate 57)

A **8384**
B **12B-311⅛** not auto. bank totals
22B-311⅛ auto. bank totals
C **1-104A Env. 1792 (1-144 Fte. 209)** uses spring 988
D **136 Fte. 209 No. 2 Env. 1792 (1-136 Fte. 209 No. 3)**
E 302518*
F **500 Env. 1792**
G **1-106 Env. 1792 (1-142 Fte. 209 No. 2)**
H **21-3627 No. 1**
I **666R Fte. 209 Env. 1792** Side frame
J **10056** Screw in 304 Env. 1792
K 101 Env. 1792*
L **1-107 Env. 1792** includes K and M
M 105 Env. 1792* uses bushing 507 Env. 1792 and screw 57¼ Fte. 44
N **506 Env. 1792 (542 Fte. 209)**
O **508 Env. 1792**
P **10056¾**
Q **109 Env. 1792 (146 Fte. 209)**
R **49⅞**
S **46¼**
T **103663**
U **305 Env. 1792 (310 Fte. 209)** uses spring 802 Fte. 146
V **1-108 Env. 1792** complete airpot assembly
W **506 Fte. 209**
X 1-106 Fte. 209* (1B-4 Fte. 209 Style 17, 1A-12025 No. 9, 60804A)
Y **504 Env. 1792 (530 Fte. 209)**
Z **510 Env. 1792 (519 No. 2 Fte. 209)**
511 Env. 1792 (511 Env. 1726) use three 309 Fte. 209 shoulder washers
AA **480B**
AB **72808**
AC **9259⅝**
AD **1-100 Env. 1170 Style 13, 17**
AE **489**
AF **12059⅚**
AG **1-104 Env. 1170**
1-104 Env. 1170 No. 2 if normalized from lower motor bar
1-104 Env. 1170 No. 3 if lower motor bar to latch down
1-200273 Env. 1170 for bank posting machines
AH **8384**
AI 63500*
AJ 106 Env. 1170*
AK **111 Env. 1792**
AL **72807 No. 1**
AM **1-112 Env. 1792**
AN **10983**
AO **87800 No. 2** for Style 17; 7283A No. 10 for Style 13
AP **81812**
AQ **1-108A Fte. 209 Env. 1170 Style 13, 17**
AR **1-990R P. 10 No. 1 Fte. 123 Env. 1170**
1-990 P. 10 No. 1 Reversed Fte. 123 Env. 1170
31-990 P. 10 No. 1 Env. 1170
AS 3658⅝*
AT **1A-4 Fte. 209 Style 17 (1B-4 Fte. 209 Style 17, 1A-12025 No. 9, 60804A)**
1A-4 Fte. 209 Style 13 (1B-4 Fte. 209 Style 13, 1-12025 No. 9 Style 13)
AU 1-114A Fte. 209* (1B-4 Fte. 209 Style 17, 1A-12025 No. 9, 60804A)
1-114Z Fte. 209 for field repair
AV **1-12025 Style 13 No. 9,** 1-12025 No. 9 for Style 17
AW 12025⅛* included in AV
AX **115B Fte. 209 No. 2**
AY **1-1105 Fte. 209 Style 13, 17 No. 2** used with 1410 construction
1-1105A Fte. 209 Style 13, 17 without 1410 construction
AZ **8054¾**
BA **1-104B Fte. 209**
BB **520 Fte. 209 (251)** 46 Nut
BC **77880 No. 5** for double motor bar lock
77880 No. 4 for single lock
BD **1-103 Fte. 209 Env. 1792**
BE **681**
BF **205533 No. 2 (552 Fte. 209)**
BG **480¼**
BH **4454A**
BI **1-108A Fte. 209 Style 13, 17** cut to read C.F. dial in first column

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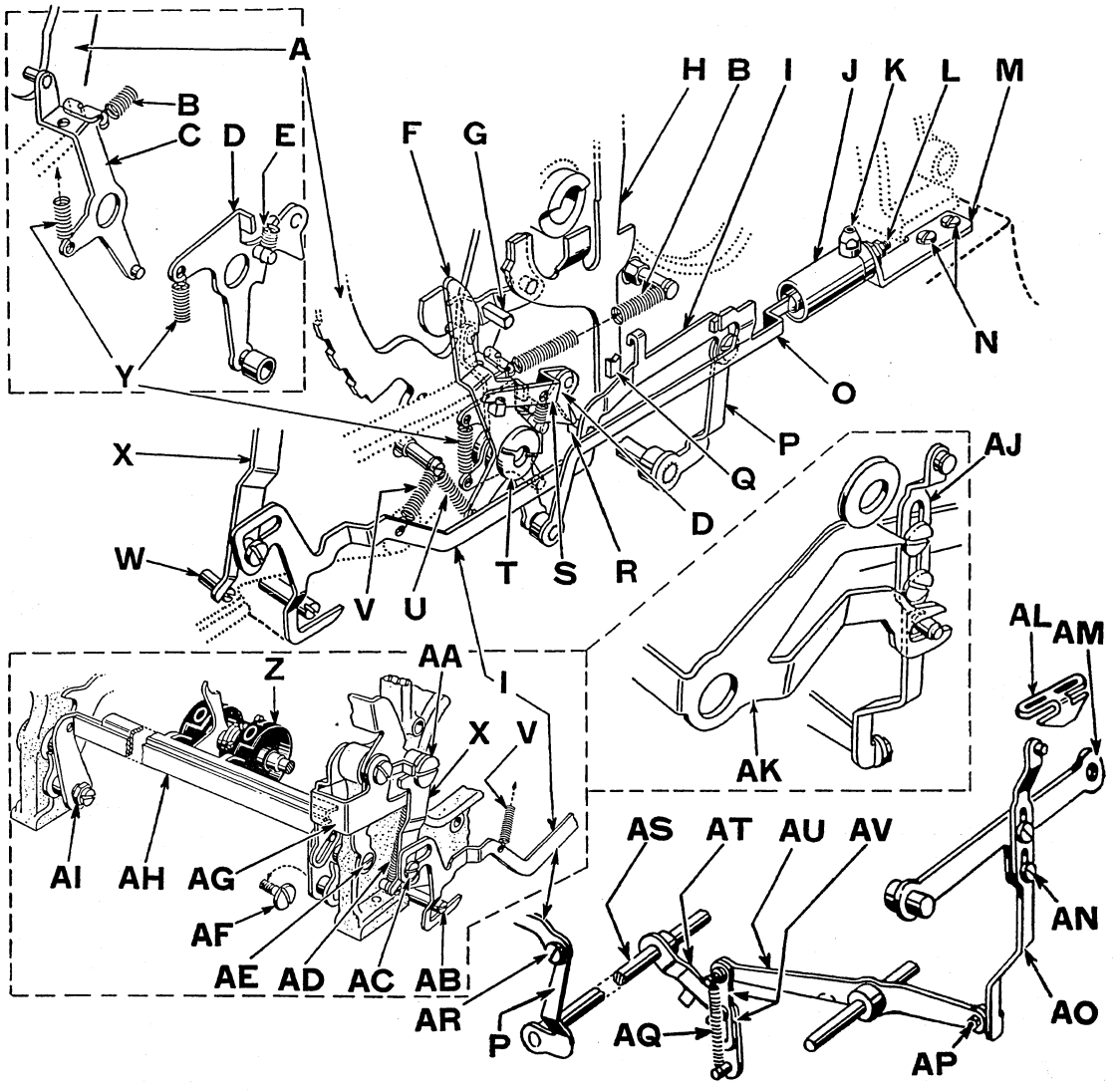
CROSSFOOTER NON-CLEAR MOTOR BAR LOCK, LATER, CARRIAGE CONTROLLED, FOR CONSUMPTION COLUMN (Plate 58)

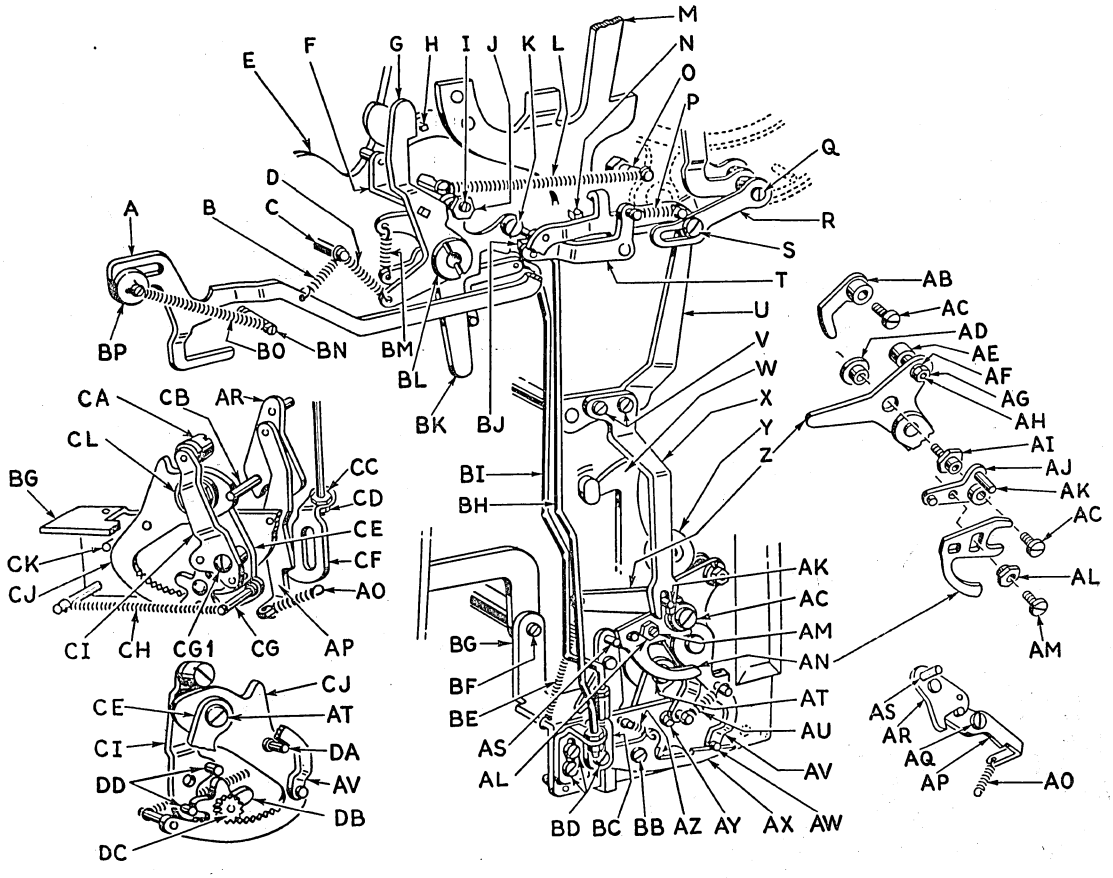


SYMBOLS (Plate 58)

A **12B–311⅛** not auto. bank totals
22B–311⅛ auto. bank totals
B **988**
C **1-104A Env. 1792 (1-144 Fte. 209)**
D **1-107 Env. 1928 (1-142 No. 1 Fte. 209)** includes S
E **283A**
F **1-136 No. 2 Fte. 209 Env. 1928 (1-136 No. 3 Fte. 209)**
G 302518*
H **21A-3627 No. 1** includes Q
I **1-103 Fte. 209 Env. 1928 (1-103A Fte. 209)**
J **305 Env. 1792 (310 Fte. 209)** uses spring 802 Fte. 146, inside of barrel
K **508 Env. 1792**
L **103663, 46¼** Nut
M **109 Env. 1792 (146 Fte. 209)**
N **10056¾**
O **1-108 Env. 1792** complete assembly of airpot, includes J, K, L, M
P 1-106 Fte. 209* (1B-4 Style 17 Fte. 209, 1A-12025 No. 9, 60804A)
Q 3658⅝*
R **504 Env. 1792 (530 Fte. 209)** Stud
S **108 Env. 1928 (143 Fte. 209)**
T **510 Env. 1792 (519 No. 2 Fte. 209)**
511 Env. 1792 (511 Env. 1726) use three 309 Fte. 209 shoulder washers
U **480B**
V **72808**
W **200516½**
X **1-105 Env. 1928**
Y **8384**
Z **1-990R P. 10 No. 1 Fte. 123 Env. 1928 (11A-990R P. 10 No. 1)**
1-990 P. 10 No. 1 Reversed Fte. 123 Env. 1928 (1A-990 P. 10 No. 1 Reversed)
AA **500 Env. 1928 (527 Fte. 209)** Screw
AB **205533 No. 2 (552 Fte. 209)** Screw, 1097¾ washer, 46 nut
AC **4857½**
AD **75804 No. 1**
AE **58½ Fte. 123 (554 Fte. 216)**
AF **259½**
AG **108¼ Fte. 209 Env. 1928 (140B Fte. 209, 1-141B Fte. 209, 541A Fte. 209, 549 Fte. 209, 680)**
AH **1-108 Style 17 Fte. 209 Env. 1928 (1-108B Style 17 Fte. 209)**
AI **79309** Eccentric nut, 72567 screw
AJ **1-104B Fte. 209**
AK **12110 No. 10**
AL **115B Fte. 209 No. 1 Env. 1928 (115B No. 6 Fte. 209)**
AM **1-1105 Fte. 209 Style 13, 17 No. 2** used with 1410 construction
1-1105A Fte. 209 Style 13, 17 used without 1410 construction
AN **8054¾**
AO **1-104B Fte. 209**
AP **520 Fte. 209 (251) 46** Nut
AQ **77880 No. 4** for single lock
77880 No. 5 for double motor bar lock
AR **506 Fte. 209**
AS **1A-4 Style 17 Fte. 209 (1B-4 Style 17 Fte. 209, 1A-12025 No. 9, 60804A)** includes P, AT
1A-4 Fte. 209 Style 13 (1B-4 Fte. 209 Style 13, 1-12025 No. 9 Style 13) includes P, AT
AT 1-114A Fte. 209* (1B-4 Style 17 Fte. 209, 1A-12025 No. 9, 60804A)
1-114Z Fte. 209 for field repair
AU **1-12025 Style 13 No. 9**
1-12025 No. 9 for Style 17
AV 12025⅛* included in AU

SEE EXPLANATION ON INSIDE OF FRONT COVER

TIMING MECHANISM TO DELAY MOTOR BAR RELEASE, CLASSES 20 THRU 30 (Plate 58-1)



SYMBOLS (Plate 58-1)

- ✱A **1-103B Fte. 209** with C.F.N.C. lock
- B **681** with C.F.N.C. lock
- C **532 Fte. 209** Spring stud
- D **60807**
- E **12B-311⅛**
- ✱F **1-144A Fte. 209**
- ✱G **136 Fte. 209 No. 3**
- H 203518½* included in M
- ✱I **255¼** Screw
- ✱J **79362** Eccentric
- ✱K **9052½**, 72324 Shoulder nut
- L **988**
- M **21B-3627 No. 1**
- N 3658⅝* included in M
- O **12053⅜**
- ✱P **7480B** with C.F.N.C. lock
- ✱Q **104504** with C.F.N.C. lock
- ✱R **1-217 Fte. 209** with C.F.N.C. lock
- ✱S **9259⅝** Screw, 3819⅛ washer with C.F.N.C. lock
- T 1-103½ Fte. 209* included in A, with C.F.N.C. lock
- U **1A-4 Fte. 209 Style 17 (1B-4 Fte. 209 Stylo 17, 1A-12025 No. 9, 60804A)** with C.F.N.C. lock
  1A-4 Fte. 209 Style 17 Env. 1985 with carriage opening control, with C.F.N.C. lock
  1A-4 Fte. 209 Style 17 Env. 2038 controlled from negative amount of value, with C.F.N.C. lock
- ✱V **72592** with C.F.N.C. lock
- ✱W **1-3818 No. 2**
- ✱X **204A Fte. 209** with C.F.N.C. lock
- ✱Y **1-201 Fte. 209** Cam
- Z **1-202 Fte. 209**
- ✱ **1Z-202 Fte. 209 (2-202 Fte. 209)** includes AE, AF, AG, AH, AU, AV, BE
- ✱AB **1-214 Fte. 209** without C.F.N.C. lock
- ✱AC **709607**
- ✱AD **316 Fte. 209**
- AE **315 Fte. 209** Collar, 74502 screw
- AF 1097¾ Lock washer
- AG **46** Nut
- AH **541 Fte. 217** Screw stud
- ✱AI **540 Fte. 209**
- ✱AJ **1-214 Fte. 209 No. 2** with C.F.N.C. lock
- AK 74582 No. 2* included in AJ
- ✱AL **317 Fte. 209** with C.F.N.C. lock
- ✱AM **75621** with C.F.N.C. lock
- ✱AN **214½ Fte. 209** with C.F.N.C. lock
- AO **77802**
- AP **1-206A Fte. 209**
- AQ **72627**
- AR 1-207A Fte. 209* included in AP
- AS 254⅝* included in AR
- AT **1054½** Screw, 201315 bushing
- AU 2886½
- AV 203 Fte. 209* included in Z
- AW 1363½* included in Z
- AX **1-205 Fte. 209**
- AY **952¾**
- AZ **4487**
- BB **72504**
- BC **72110 No. 1**, 49⅜ Nut
- BD **9755**
- BE **7382A**
- ✱BF **3857 No. 2**
- BG **1-210A Fte. 209** Bracket only
- ✱ **2-210A Fte. 209** Assembled bracket includes AO, AP, AQ, AT, AX, AY, AZ, BB, BC, BD, CA, CE, CG1, CH, CI, CJ, CL
- ✱BH **701 Fte. 209**
- ✱BI **700 Fte. 209**
- BJ 530A Fte. 209* included in T
- ✱BK **1-142B Fte. 209**
- BL **519 Fte. 209 No. 2** Screw, 309 Fte. 209 collar, 69317 collar, 12018 washer
- BM **8384**
- ✱BN **549 Fte. 209** with C.F.N.C. lock
- ✱BO **680** with C.F.N.C. lock
- ✱BP **541A Fte. 209** with C.F.N.C. lock
- CA **70521** Screw, 203423 No. 4 washer
- CB 53518* included in AR
- ✱CC **318 Fte. 200**
- ✱CD **49⅜** Nut, 2 req.
- CE **1-208 Fte. 209**
- ✱CF **213A Fte. 209**
- CG 83537* included in CJ
- CG1 **709607**
- CH **780⅛A**
- CI **1-209 Fte. 209**
- CJ **1-211A Fte. 209**
- CK 3459⅛* included in BG
- CL **201315**
- DA 547 Fte. 209* included in CJ
- DB 1-200 Fte. 209* included in CE
- DC 313 Fte. 209* included in CE
- DD 546 Fte. 209* included in CI
- ✱ **1-104C No. 1 Fte. 209** Not shown, used with C.F.N.C. lock
- ✱ Parts required for field installation

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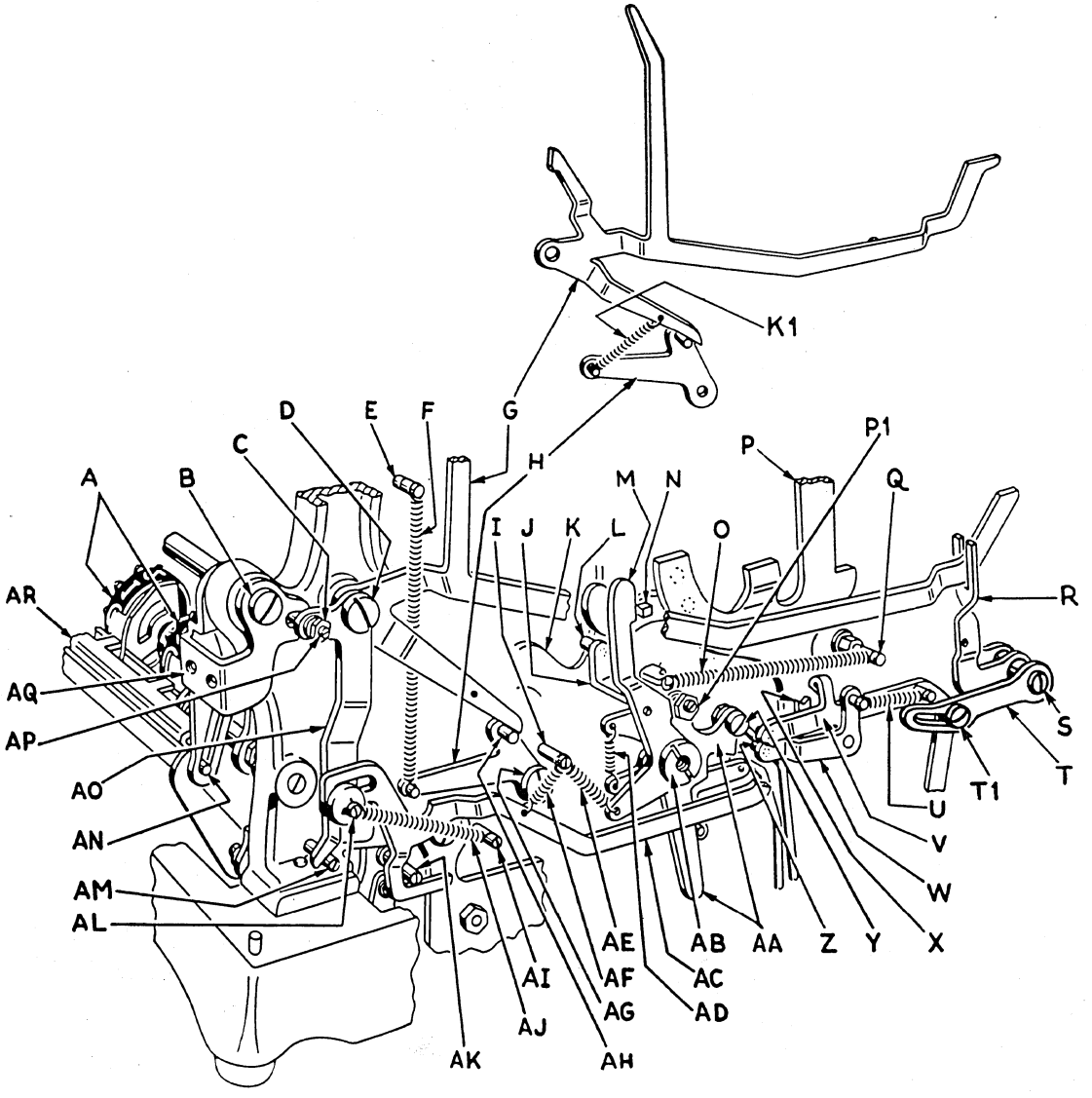
LOCK TO PREVENT MACHINE OPERATION CROSSFOOTER NON-CLEAR, CARRIAGE CONTROLLED. DISABLED FROM TOTAL, SUB-TOTAL OR MOTOR BARS, CLASSES 20 THRU 30 (Plate 58-2)



SYMBOLS (Plate 58-2)

A **31A-990 Pitch 2 No. 1** Class 6, 11 thru 16 and Types 20, 30, £.s.d., £.s.d.f., with crossfooter non-clear motor bar lock
31A-990 Pitch 10 No. 1 Class 6, 11 thru 16 and Types 20, 30, with crossfooter non-clear motor bar lock
1A-990 Pitch 10 No. 1 Reversed Class 6, 11 thru 16 and Types 20, 30, with crossfooter non-clear motor bar lock and reversed figures
11A-990R Pitch 10 No. 1 Class 6, 11 thru 16 and Types 20, 30, with crossfooter non-clear motor bar lock
21-990 Pitch 10 No. 2 Class 20-30 with reflector and light, negative amounts in add position in conjunction with crossfooter non-clear motor bar lock, carriage controlled
31-990 Pitch 10 No. 2 Class 20-30 with reflector and light, negative amounts in subtract position in conjunction with crossfooter non-clear motor bar lock, carriage controlled
21-990R Pitch 10 No. 2 Class 20-30 with reflector and light, negative amounts in add position in conjunction with crossfooter non-clear motor bar lock, carriage controlled
31-990R Pitch 10 No. 2 Class 20-30 with reflector and light, negative amounts in subtract position in conjunction with crossfooter non-clear motor bar lock, carriage controlled
21-990 Pitch 10 No. 3 Class 20-30 with reflector and light positive amounts in add position in conjunction with crossfooter non-clear motor bar lock, carriage controlled
31-990 Pitch 10 No. 3 Class 20-30 with reflector and light, positive amounts in subtract position in conjunction with crossfooter non-clear motor bar lock, carriage controlled
21-990R Pitch 10 No. 3 Class 20-30 with reflector and light, positive amounts in add position in conjunction with crossfooter non-clear motor bar lock, carriage controlled
31-990R Pitch 10 No. 3 Class 20-30 with reflector and light positive amounts in subtract position in conjunction with crossfooter non-clear motor bar lock, carriage controlled
21A-990R Pitch 12 No. 1 Class 6, 11 thru 16 and Types 20, 30, £.s.d., £.s.d.f. or 1/12 fraction with crossfooter non-clear motor bar lock

SEE EXPLANATION ON INSIDE OF FRONT COVER

Symbols continued on Next Page

SYMBOLS (Plate 58-2)—Continued

B **53521**
C **49¼** Nut, 1097⅝ lock washer
D **527 Fte. 209** use 400 No. 3 Env. 1928 thin flange collar, 308 Fte. 209 thick collar
E **10051¼ (705506A)**
F **384A**
G **1-60151 No. 3 Env. 440M** Trim as required
H **1-60150A**
I **532 Fte. 209**
J **1-144A Fte. 209**
K **12B-311⅛**
K1 **71805**
L 81517* included in J
M **136 Fte. 209 No. 3**
N 302518* included in P
O **988**
P **21-3627 No. 1**
P1 **79362** Eccentric bushing, 255¼ screw
Q 120533⅛
R 200227½
S **104504**
T **1-217 Fte. 209**
T1 9259¾ Screw, use 3810⅛ washer
U **7480B**
V Description only, see AC
W 1-103½ Fte. 209* included in AC
X 3658⅝* included in P
Y **9052½** Screw, 72324 shoulder nut
Z 530A Fte. 209* Stud, included in W

AA **1-142B Fte. 209**
AB **519 Fte. 209 No. 2** Screw, 309 Fte. 209 flange collar
AC **1-103B Fte. 209**
AD **8384**
AE **60807**
AF **681**
AG **60563A** Screw
AH 309517* included in H
AI **549 Fte. 209**
AJ **680**
AK **552 Fte. 209** Screw, 709146 lock washer, 46¼ nut
AL **541A Fte. 209**
AM **200516½**
AN 200550½* included in AR
AO **1-141B Fte. 209**
AP 203533¼
AQ **140B Fte. 209**
AR **1-108B Fte. 209 Style 17**

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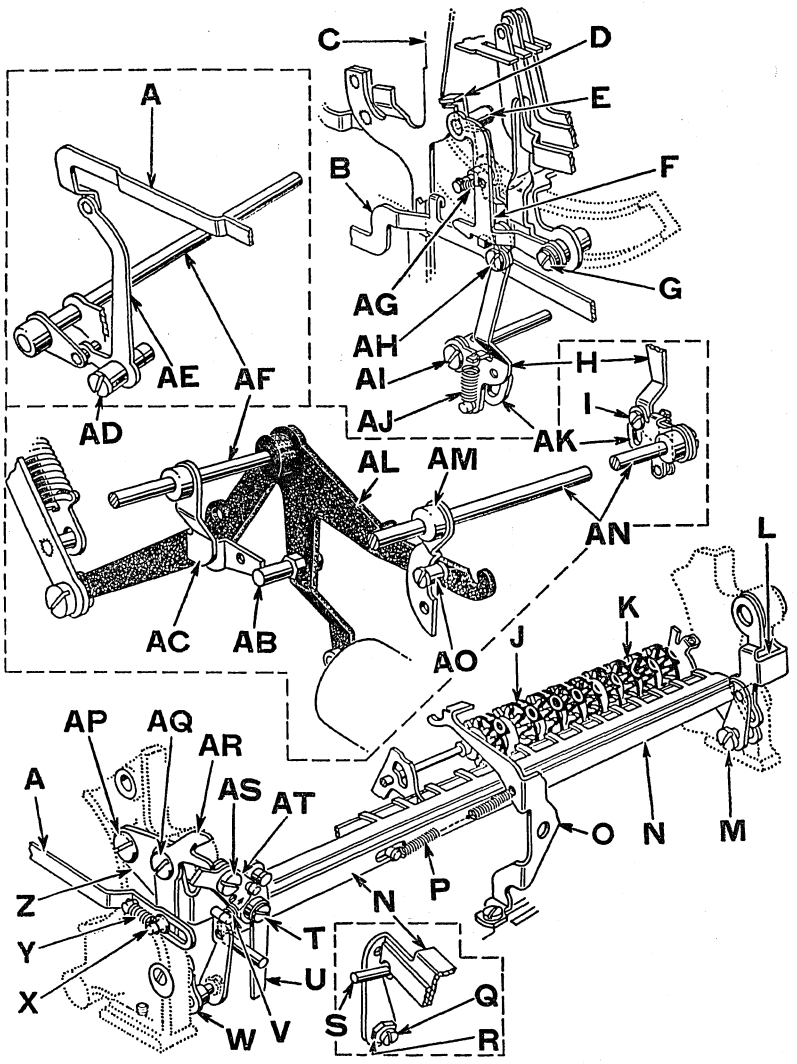
CROSSFOOTER NON-CLEAR MOTOR BAR LOCK WITH CARRIAGE OPEN IN CONJUNCTION WITH CROSSFOOTER NON-CLEAR LOCK CARRIAGE CONTROLLED FOR CONSUMPTION AND AMOUNT COLUMNS (Plate 59)



SYMBOLS (Plate 59)

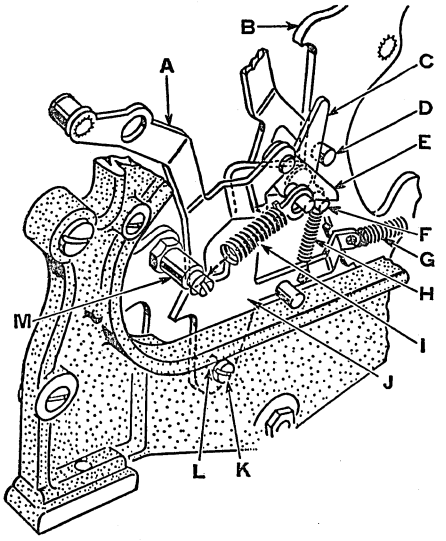
A **180 Fte. 216 No. 2 Env. 1985** included in AE
B **1-103 Fte. 209 Env. 1928**
C **21-3627 No. 1**
D **1-10025¾A**
E **200416** Roller, 200519½ stud
F **1-105 Env. 1985**
G **251¾** Screw, 12031½ bushing
H **1-106 Fte. 209 Env. 1985**
I **7357½** Screw, 701356 nut
J **1-990R P. 10 No. 1 Fte. 123 Env. 1928 (11A-990R P. 10 No. 1)**
1-990 P. 10 No. 1 Reversed Fte. 123 Env. 1928 (1A-990 P. 10 No. 1 Reversed)
K **1-990R P. 10 No. 1 Env. 1985** Thin dial for col. 1
21-990 P. 10 No. 1 Env. 1985 Thin dial, for cols. except col. 1
L **108¼ Fte. 209 Env. 1928 (140B Fte. 209, 1-141B Fte. 209, 541A Fte. 209, 549 Fte. 209, 680)**
M **259½**
N **1-108 Fte. 209 Style 17 Env. 1985**
O **223¼C Env. 1985**
223¼ No. 2 Env. 1985 for machines with counter-dial
P **9085**
Q **72567**
R **79309** Eccentric
S **306 Env. 1985**
T **709607**
U **1-102 Env. 1985 (110 Env. 1985)**
V **3981**
W **2A-69001 Style 17 Fte. 209 Env. 1928**
X **8458**
Y **3489**
Z **1-100 Env. 1985**
AB **530 Fte. 216** Eccentric stud, 1097⅞ lock washer, 47 nut; for machines without multiple skip-return
530 Fte. 216 No. 2 Env. 1358 Eccentric stud, 1097⅛ lock washer, 47 nut; for machines with multiple skip-return
AC Included in AF
AD **8054¾** Screw, 1097¼ lock washer, 1028 Style 15 washer, 520 Fte. 216 shaft
AE **1-178 Fte. 216 Env. 1985** for machines without item counter, includes A and AR
1-178 Fte. 216 No. 2 Env. 1985 (1-178A Fte. 216) for machines with counters dial, includes A and AR
1-178 Fte. 216 No. 3 Env. 1985 (1-178A Fte. 216) for machines with Env. 903 totals, includes A and AR
AF **1A-15A Fte. 216 Style 17** for machines without multiple skip-return
1-15A Fte. 216 No. 2 Env. 1358 for machines with multiple skip-return
AG **16880**
AH **506 Fte. 209**
AI **10056**
AJ **2886¾**
AK 1-104 Env. 1985* included in AN
AL **1-201107B Env. 1985 (1-201107C Env. 1985)**
AM 1-103 Env. 1985* included in AN
AN **1A-4 Fte. 209 Style 17 Env. 1985** includes AK, AM
AO **303 Env. 1985 (7644),** 709607 Screw
AQ **8457** Screw, 77133 washer
AR **179 Fte. 216 Env. 1985** included in AE
AS **702655**
AT **1-101 Env. 1985**

SEE EXPLANATION ON INSIDE OF FRONT COVER

BOOSTER FOR MESHING CROSSFOOTER IN NON-ADD POSITIONS, CLASSES 20 THRU 30 (Plate 60)

SYMBOLS (Plate 60)

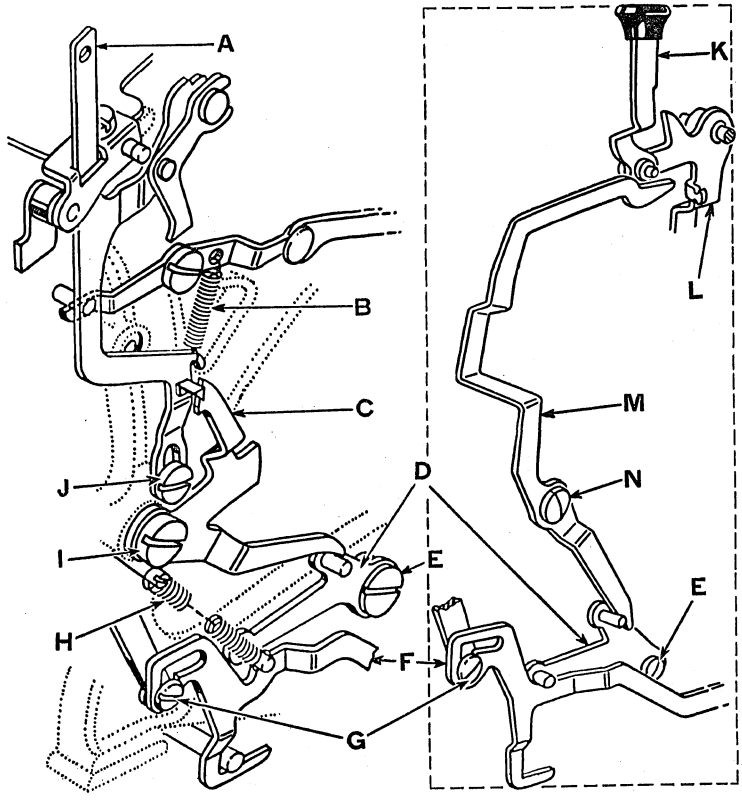
A **1-200139 Env. 1792 (1-200139A No. 2)** includes E
B **12B-311⅛**
C Included in J
D Included in B
E Included in A
F **69509**
G **79810**
H **51802**
I **1-801 Env. 1792 (1-200820)**
J **1-200231½** includes C
K **12051⅜** Screw, 701356 nut
L **200339½** Eccentric
M **522 Env. 1792 (69557 No. 2)**



CROSSFOOTER NON-CLEAR MOTOR BAR LOCK DISABLED BY LOWER BAR AND KEY, CLASSES 20 THRU 30 (Plate 61)

SYMBOLS (Plate 61)

A **1-12021¼ No. 3**
B **9086**
C **60151 Env. 440M (60151 No. 3 Env. 440M)**
D **1-60150A**
E **60563A**
F **1-103 Fte. 209 Env. 1792**
G **9259⅝**
H **680**
I **11051A**
J **200517B**
K Included with L
L **1-202236 Env. 1741** used with bank totals
11-20 Fte. 104 used without bank totals
M **100 Env. 1741 (157 Fte. 209)**
N **11051 Env. 1741 (545 Fte. 209)**



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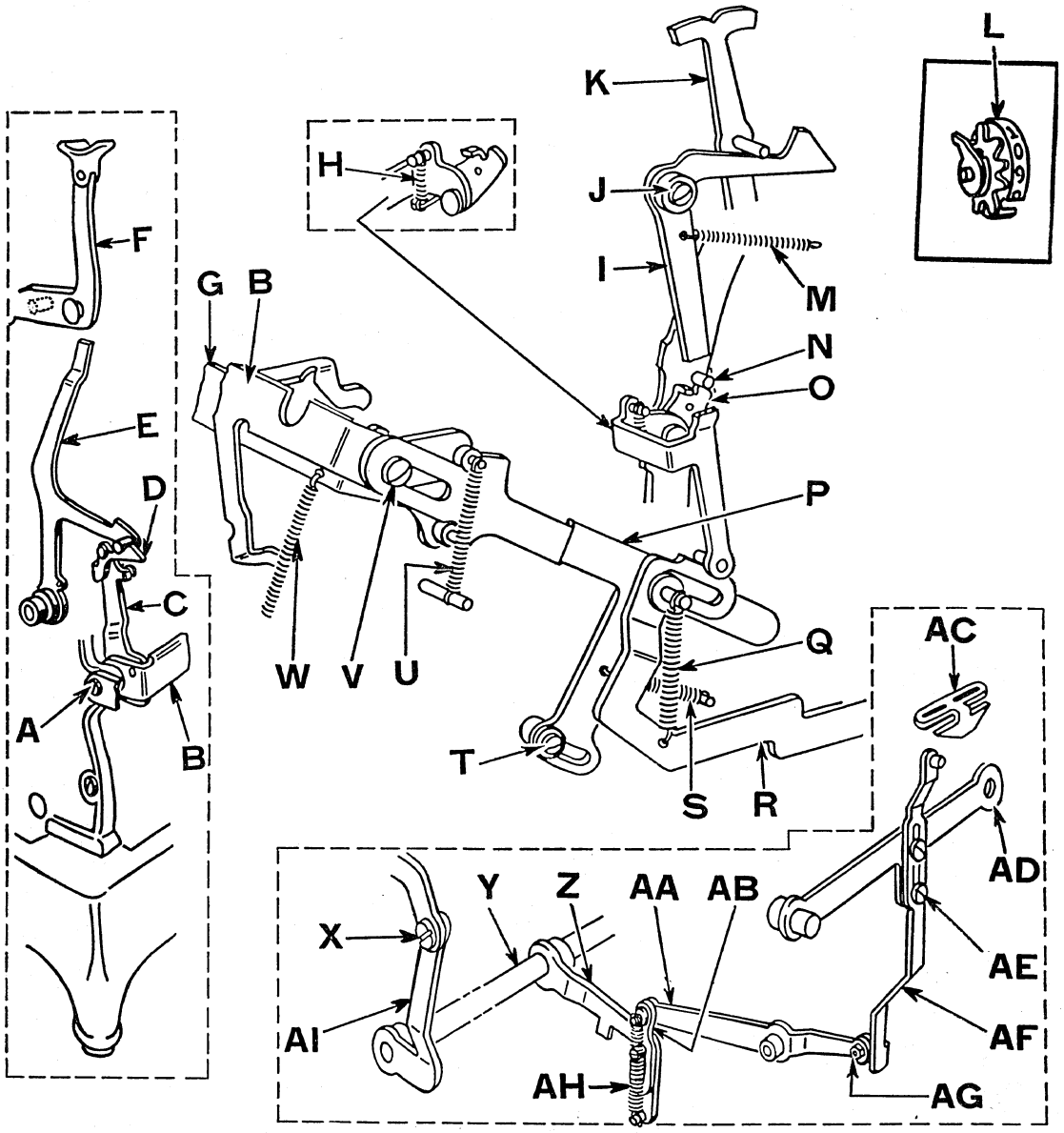
CROSSFOOTER NON-CLEAR TOTAL KEY LOCK, ADD AND SUBTRACT POSITION AIRPOT AND CARRIAGE CONTROLLED (Plate 62)

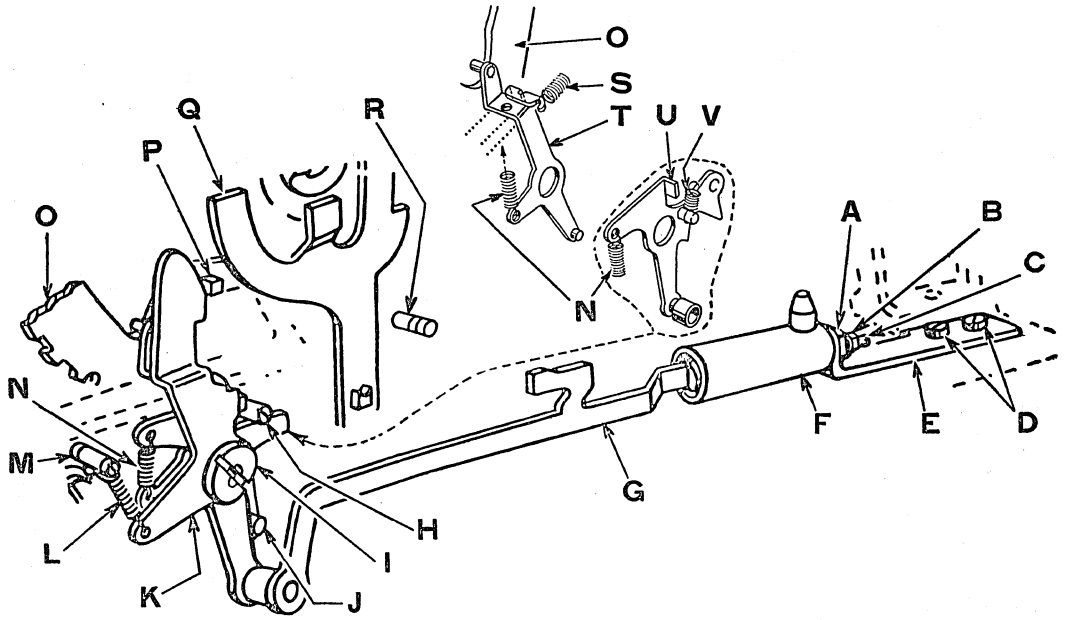


SYMBOLS (Plate 62)

A **53512 (704544)** Screw, 46¼ nut
B **1-108A Fte. 209 Env. 1170 Style 13, 17**
C **1-100 Env. 701** uses spring 44805
D **101 Env. 701** included in C
E **1-64100 Env. 701** uses spring 7480B
F **1-62127**
G **1-100 Env. 1170 Style 13, 17**
H **489**
I **1-104 Env. 1170**
1-104 Env. 1170 No. 2 if normalized from lower bar
1-104 Env. 1170 No. 3 if lower motor bar to latch down
J **12051/16 No. 2**
K **11-205117** on 1-205002 Style 13, 17 No. 2
L **1-990R P. 10 No. 1 Fte. 123 Env. 1170**
1-990 P. 10 No. 1 Reversed Fte. 123 Env. 1170
31-990 P. 10 No. 1 Env. 1170 Regular
M **72808**
N **355¼**
O 106 Env. 1170* included in I
P **111 Env. 1792**
Q **10983** uses 513 Env. 1792
R **1-112 Env. 1792**
S **72807 No. 1**
T **306 Env. 1792** Flanged collar, 113 Env. 1792 washer, 72617 screw
U **81812** uses stud 72609
V **502 Env. 1170** Screw, 322 washer
W **7283A Style 10,** use 702549 stud
X **506 Fte. 209**
Y **1A-4 Fte. 209 Style 17 (1B-4 Fte. 209 Style 17, 1A-12025 No. 9, 60804A** includes Z and AI
1A-4 Fte. 209 Style 13 (1B-4 Fte. 209 Style 13, 1-12025 No. 9 Style 13) includes Z and AI
Z **1-114A Fte. 209 (1B-4 Fte. 209 Style 17, 1A-12025 No. 9, 60804A)** included in Y
1-114Z Fte. 209 Early style
AA **1-12025 Style 13 No. 9** for Style 13
1-12025 No. 9 for Style 17
AB 12025¼* included in AA
AC **115B Fte. 209 No. 1** Short; No. 2 long
AD **1-1105A Fte. 209 Style 13, 17**
AE **8054¾**
AF **1-104B Fte. 209**
AG **520 Fte. 209 (251)** Screw, 312 Fte. 209 grooved nut, use 75819 spring and 20 No. 73 clip
AH **77880 No. 5**
AI 1-106 Fte. 209* included in Y

SEE EXPLANATION ON INSIDE OF FRONT COVER

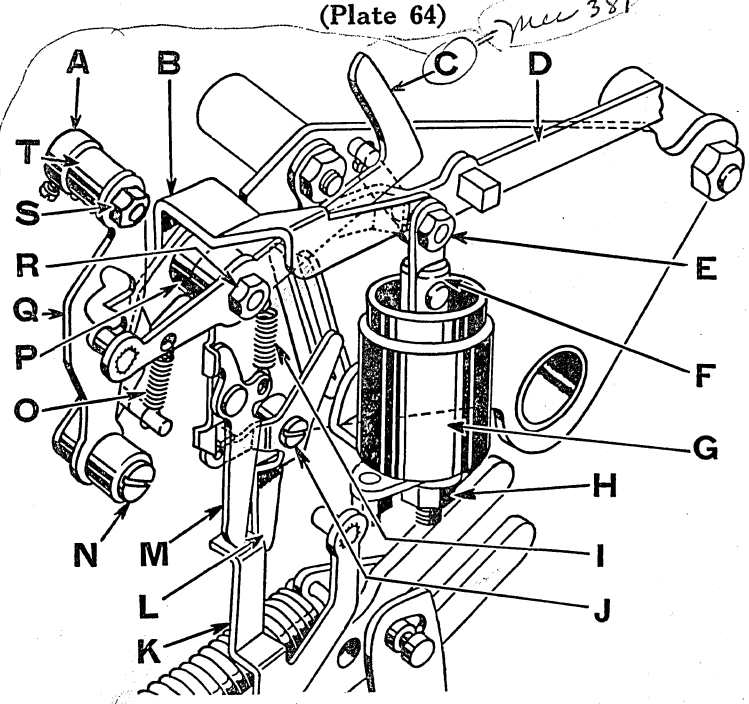
CARRY TIMING MECHANISM FOR TOTALS, AIRPOT CONTROLLED, CLASSES 21 THRU 30 (Plate 63)



SYMBOLS (Plate 63)

A 49⅞
B 46¼
C 103663
D 10056¾
E 109 Env. 1792 (146 Fte. 209)
F 305 Env. 1792 (310 Fte. 209) uses spring 802 Fte. 146 inside of barrel
G 1-108 Env. 1792 complete assembly of airpot
H 500 Env. 1792
I 510 Env. 1792 (519 No. 2 Fte. 209) 511 Env. 1792 (511 Env. 1726) use three 309 Fte. 209 shoulder washers
J Part of T
K 136 Fte. 209 No. 2 Env. 1792 (1-136 No. 3 Fte. 209)
L 480B
M 515 Env. 1792 (532 Fte. 209)
N 8384
O 12B-311⅛ not auto. bank totals
22B-311⅛ auto. bank totals
P 302518*
Q 21-3627 No. 1
R 12053⅜ Threaded stud or 71542 screw and 728½ spring anchor, if machine has "C.F. non-clear Motor bar lock airpot and carriage control"
S 988
T 1-104A Env. 1792 (1-144 Fte. 209)
U 1-107 Env. 1928 Late style, shown 1-106 Env. 1792 (1-142 No. 2 Fte. 209) Early, not shown
V 283A

CARRY TIMING MECHANISM—ESCAPEMENT ARM CONTROLLED BANK POSTING MACHINES (Plate 64)



SYMBOLS (Plate 64)

A 1-71330
B 1-200136B No. 2
C 1A-200187A (1-200187B)
D 1-205115
E 69551 Screw, 47 nut
F 1-10020⅜* included with G
G 1-10048¼ includes plunger
H 393
I 108806
J 8054¾ Screw, 1097¾ washer, 46 nut
K 1-201120C uses 2 screws 7562
L 200189A
M 200190A (1-200187B)
N 12051⅞
O 69809
P 71308 Collar
Q 1-200188 No. 3 for Style 17
1-200188 Style 13 No. 3 for Style 13
R 200602 No. 2 Screw, 47 nut
S 203625 No. 2 Screw, 46 nut
T 81313 Style 13 (200469), 203625, 46 Nut

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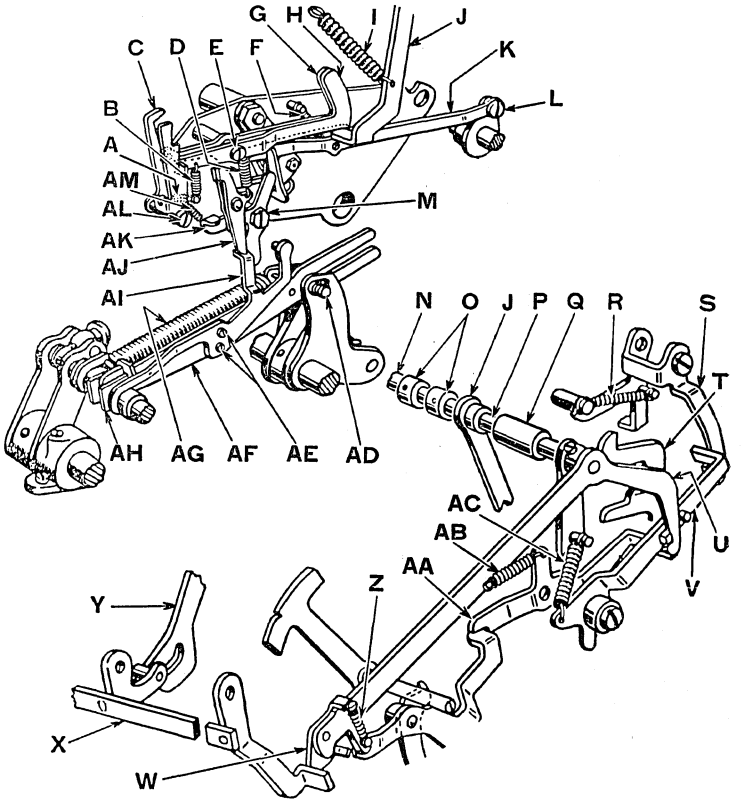
CARRY TIMING AND NEGATIVE TOTAL LOCK MECHANISMS TO CONTROL RELEASE OF AUTOMATIC TOTAL MECHANISM, BANK POSTING MACHINES (Plate 65)

SYMBOLS (Plate 65)

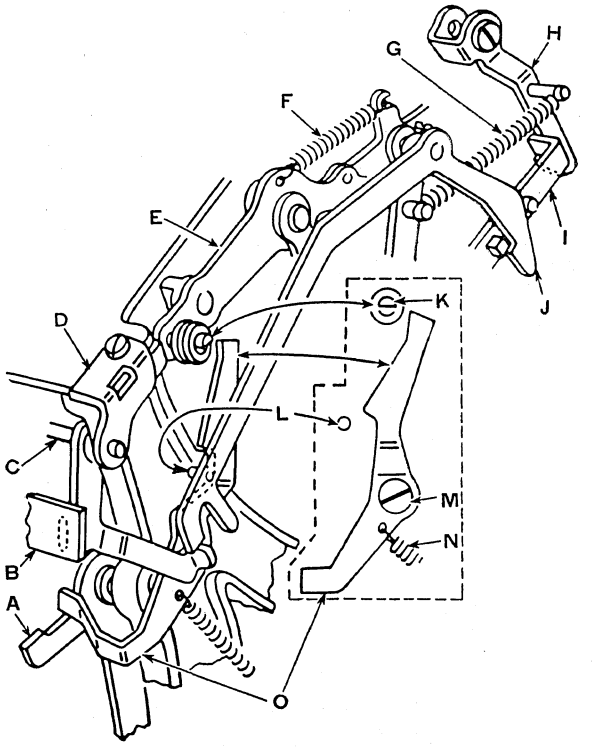
A **69809**
B **3480½**
C **200188**
D **7285½A**
E **200602B** Screw, 200518C bushing
F **681**
G **1A-200187A (1-200187B)**
H **1-200191A**
I **75804 No. 2**
J Included in P
K **1-205115**
L **205506A (161⅜ Fte. 104)**
M **12051⅞** Screw, 200512A bushing
N **200½L Style 13, 17**
O **1-8345**
P **1-200½R (1A-200½R)**
Q **235¼**
R **89800**
S **1-202235A No. 1**
T **1-200173A No. 2** part of 11B-200172
U **1-218⅝A** uses screw 4551½
V **1-200277B**
W **218 1/16** included in U
X **1A-204127½ Style 13, 17 Nos. 4 thru 12** Submit forms and machine number
Y **1-10214A**
Z **104806 (287½)**
AA **200275**
AB **16880**
AC **3281½**
AD **851 No. 2** Stud, 208334 roller, 885 Nos. 3 and 4 springs
AE **7562**
AF **1-201119 (1-119A)**
AG **1-63885** on 12B-311⅛
AH **132A Style 9**
AI **1-201120C**
AJ 200190A* (1-200187B*)
AK **200189A**
AL **12051⅞**
AM **10686½**



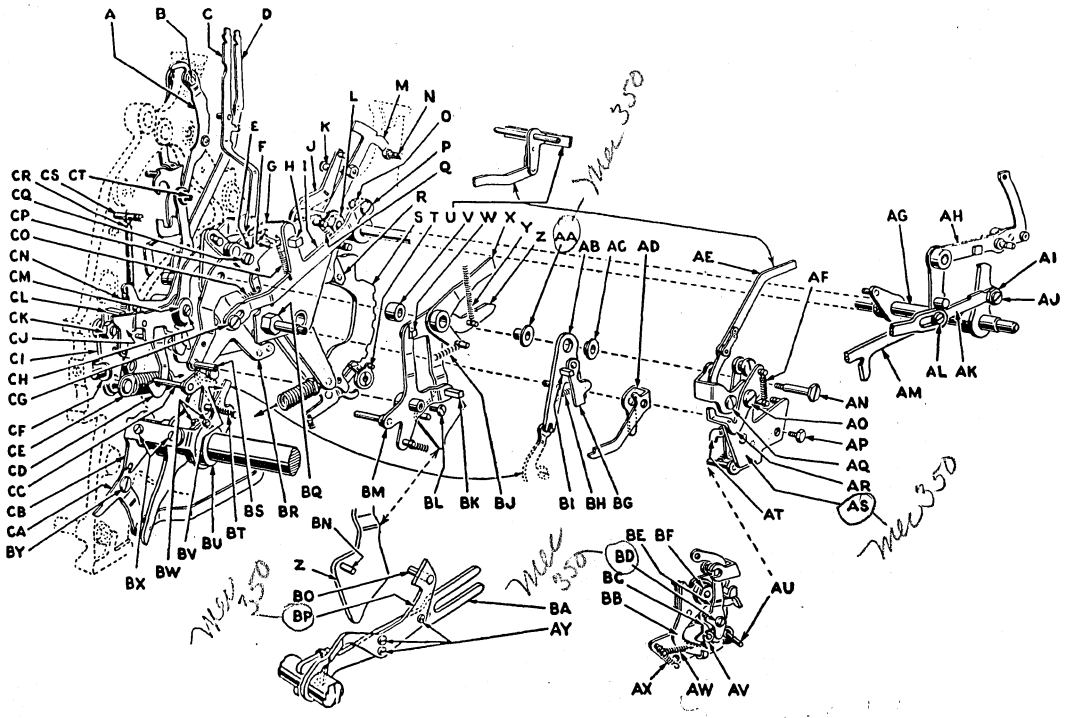
CARRY TIMING MECHANISM FOR AUTOMATIC 11 BANK POSTING MACHINES HAVING 10 OR MORE COLUMNS CONTINUOUS CARRY (Plate 66)

SYMBOLS (Plate 66)

A **1-204113R**
B **1A-204127½ Style 13, 17 Nos. 4 thru 12** Submit forms and machine number
C **64001 Style 13, 17 No. 2**
D **12018⅞ No. 2 (21-12018⅞ No. 3)** uses screw 7059
E **21-201123 (1A-201123, 1-201121A)**
F **7283A Style 10**
G **89800** for machine without F.R.K. **983** for machine with F.R.K.
H **1-202235A No. 1** for machine without F.R.K.
1-202235A No. 2 (1-202235B No. 2) for machine with F.R.K.
I **1-200277B**
J **1-218⅝ No. 2 (11-218⅝A)**
K **3657¼ No. 2**
L **307507**
M **12051⅜** Screw
32373/4 Collar
N **306804**
O **201132**



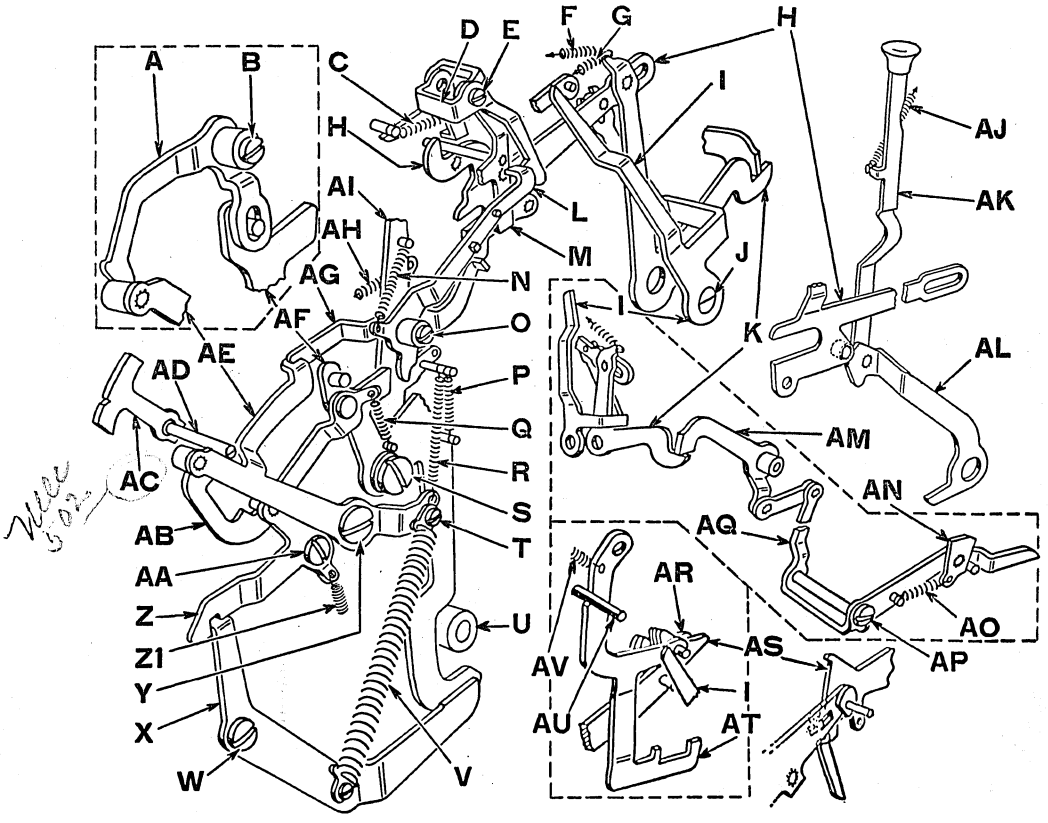
AUTOMATIC CROSSFOOTER TOTAL AND SUB-TOTAL MECHANISM, CARRIAGE CONTROLLED—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 67-1)



SYMBOLS (Plate 67-1)

A **1-200276A No. 8**
B **200591B No. 4** screw, use 76120 washer and 9945 nut
C **1-200230 No. 1**
D **1-12220 No. 5**
E **1-200285** includes F
F 200614½* included in E
G **205143**
H 205515* included in I
I **1-205142** includes H
J **1-200278½**
K **205533A No. 4** use 1097¾ washer and 46 nut
L **393** nut, use 352⅞ No. 2 screw and 334¼A sleeve
M 11-205117* included in AG
N **12053⅜ No. 3** use 12053⅝ screw
O **47** nut, use 1097⅞ washer
P **205546**
Q **10984½ Style 17** spring
R 315A* included in S
S **22B-311½** includes R
T **1-63113 No. 3** use 3455⅜ screw and 63339 nut
U **1-204140**
V **200498**
W 709538* included in Z
X 200286½* included in Z
Y **986** spring
Z **1-200286** includes W, X, BN
AA **200498½**
AB **1-200287** includes BG, BI
AC **200499**
AD **200288½**
AE **1-200286¼**
AF **3280⅛**
AG **21-205002 Style 17**
AH **1-62127**
AI **203495** eccentric
AJ **4456½** screw, use 1097¾ washer and 46 nut
AK **1416 No. 3**
AL **200610½** screw, use 200441 nut
AM **1-202225 No. 2**
AN **200591½**
AO **200592½**
AP **79598**
AQ **9052½**
AR **1-200290½**
AS **1-200289**
2-200289 complete assembly, includes AO, AQ, AR, AS, AT, AV, BB, BC, BD, BE, BF
AT **1-200290**
AU 200589½* included in BB
AV **21 No. 2** clip
AW **981¼**
AX **7286½** spring
AY **7562** screw
BA **11-119A**
BB **1-200289½** includes BC, AV
BC **1-200 Fte. 209**
BD **709607**
BE **1-200280¼**
BF **201315**
BG 200287½* included in AB
BH **3280⅛** spring
BI 511 Fte. 219* included in AB
BJ **3280⅛**
BK 203518½* included in BM
BL **73612**
BM **1-200288** includes BK, CC
BN 9253¼* included in Z
BO 203511 No. 2* included in BP
BP **1-201120 No. 2** includes BO
BQ **200590½** post, use 73561 screw
BR **1-200284**
BS 201559*
BT **69802** spring
BU **1-205312** collar, includes BW
BV **1-200292½**
BW **550¾** screw
BX **73514**
BY **10058¾** screw, use 7919½A washer and 46 nut
CA **1-10025¾ No. 2**
CB **200292**
CC 200587½* included in BM
CD **1-200172 No. 3**
CE **1-200828**
CF **11-12215 No. 1**
CG **8050½B** screw, use 1097¾ washer and 46 nut
CH **200537½** screw, use 2820½ washer and 46 nut
CI **11-200253B**
CJ **1A-200172¼ No. 2**
CK **45** nut, use 200548½ screw and 200253½ washer
CL **200172½** clip
CM **200458** sleeve
CN **480¼** spring
CO **3280⅛** spring
CP **480¼**
CQ **200594½**
CR **780½**
CS **200501½**
CT **71564** screw

AUTOMATIC CROSSFOOTER TOTAL AND SUB-TOTAL MECHANISM CARRIAGE CONTROLLED, BANK POSTING MACHINES (Plate 67)



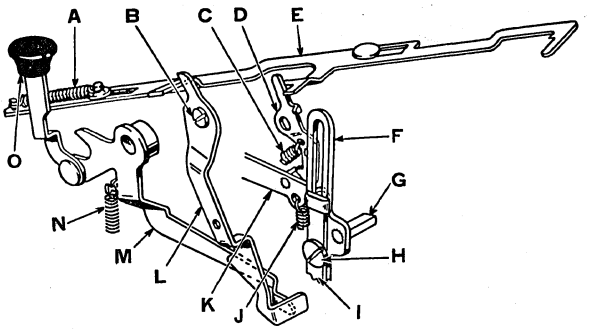
SYMBOLS (Plate 67)

A **1-200272A**
B **8054¾**
C **89800**
D **1-202235A No. 1**
E **7357½**
F **200818**
G **10080**
H **1-200173A No. 2** included in K
I **1-200266A**
J **200542** Screw, 46 nut, 7948 collar
K **11B-200172**
L **1-200277B**
M **1-201124A No. 2**
N **3281½**
O **9752½** Screw, 12044⅜ bushing
P **10086**
Q **7480B**
R **10782**
S **352⅞ No. 2** Tapped screw, 352⅜ screw
T **3961A**
U **3649 No. 2** Roller on 1-3662¼ No. 2; use 45 and 45⅛ nuts
V **1A-200807 No. 1** Ten cols. or less adding capacity
1A-200807 No. 2 Copper colored; over ten cols.
W **200610**
X **1-200273A**
Y **3450⅞ Style 9**
Z **1-200274**
Z1 **4489 (83800A)**
AA **8054¾**
AB **200271** included in AF
AC 11-205117* on 1-205002 Style 13, 17 No. 2
AD **205533 No. 3** Screw, 1097¾ washer, 46 nut
AE **1-200269**
AF **1-200270**
AG **200275**
AH **16880**
AI **1-215⅞ No. 2**
AJ **75804 No. 2**
AK **1-200230 No. 1**
AL **200174** included in AK
AM **1-200171 Style 13, 17**
AN **200268** included in AQ
AO **7280½** included in AQ
AP **200543**
AQ **1-200170 No. 3**
AR **623 No. 3** Short pawl, early style
623 No. 2 Long pawl, early style, use with either pawl, 632¾ finaged collar, 428 washer, 1-652A No. 2 stud 1-688 No. 2 spring
AS **623 No. 4** Later style, one used
AT **1-200276A No. 1 (1-200276A No. 3)** used with repeat totals
1-200276A No. 4 without repeat totals
AU **200590** Stud on motor bar
AV **83800A**

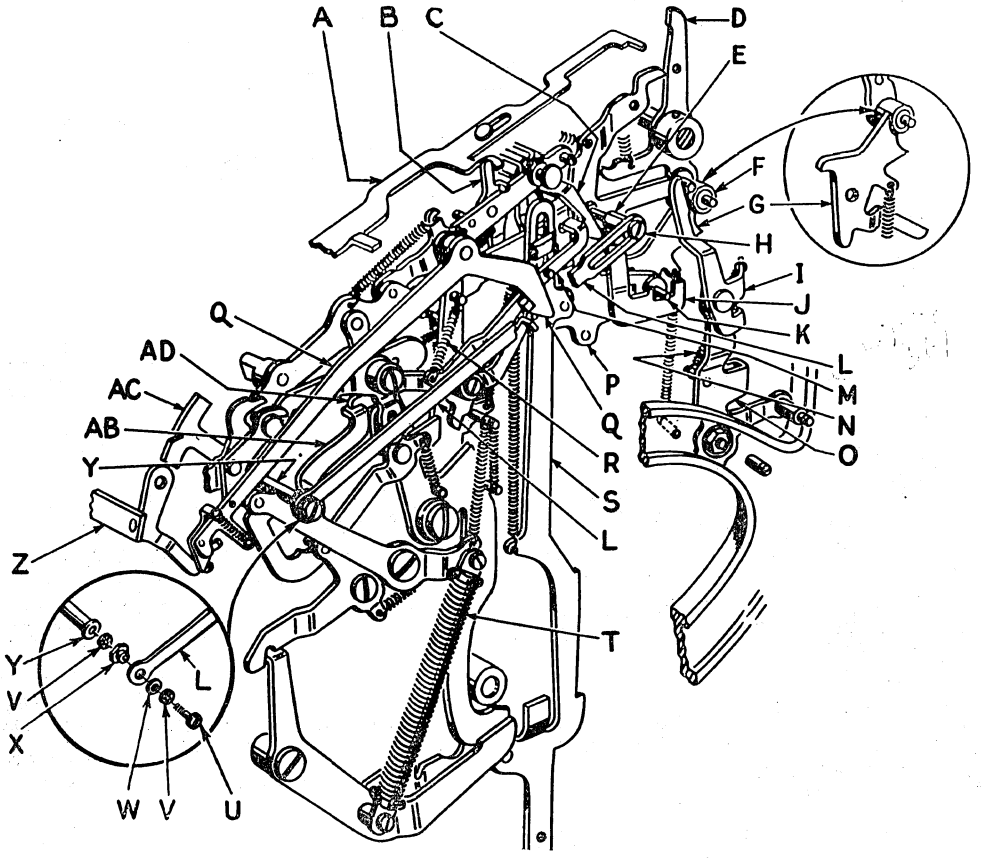
KEY TO RELEASE REPEAT LEVER, BANK POSTING MACHINES (Plate 68)

SYMBOLS (Plate 68)

A **480¼**
B **10056**
C **489**
81820A (73829)
D **1A-201121 (1-201121A, 1A-201123)**
E **1-202112 Style 13, 17**
F **1-3627 No. 1**
G Included in F
H **709607**
I **3627⅝**
J **3682**
K **1-201123 (1-201121A, 1A-201123)**
L **202234**
M **1-202236**
N **3281½**
O **291½ Plain,** specify color



MOTOR BAR RELEASE MECHANISM FOR OVERDRAFT OPERATION—BANK POSTING MACHINES (Plate 68-1)

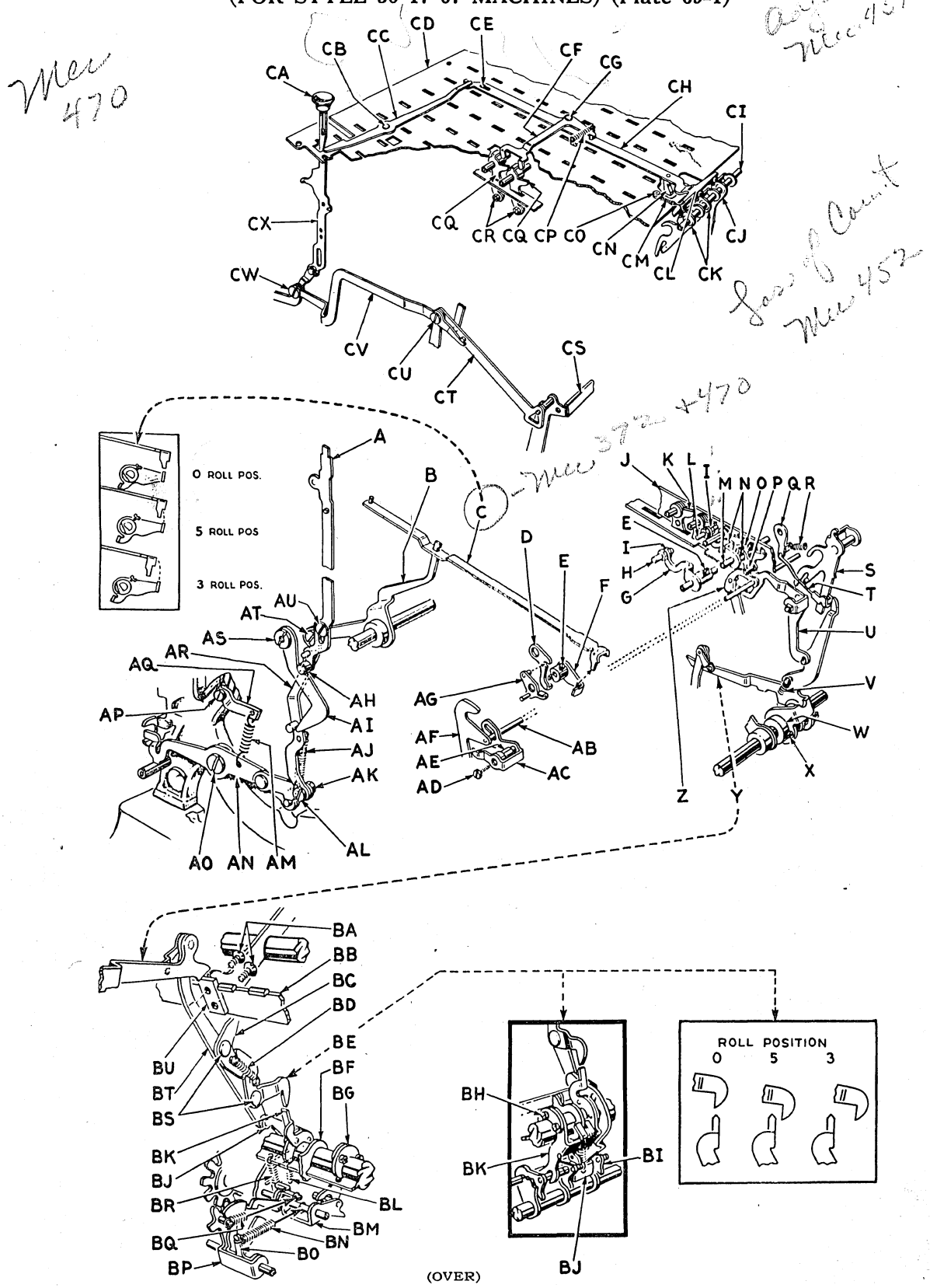


SYMBOLS (Plate 68-1)

A 1-202233 No. 2* included in 1-202112 Style 13, 17
B **1-201121A**
C **1-202235A No. 1**
D 1-202119R* included in 21-202007 Style 13, 17
E **200534½ No. 2**
F **202400A** included in D
G **623 No. 4** included in P
H **75615**
I 200266½* included in O
J **1-200276A No. 3** includes E
K 1-652 No. 4* included in P
L **200276½**
M **1-200277B**
N 3282 Spring
O **1-200266B**
P **1-622¼ No. 3**
Q **1-218⅝A**
R **200812**
S **1-3627 No. 1**
T **1A-200807 No. 1**
1A-200807 No. 2 for heavy duty
U **4456½**
V **1097⁷⁄₁₆**
W **2820½**
X **203495**
Y **205533A No. 4** Post, use 1097¾ washer, 46 nut
Z **1B-204127½ Style 13, 17 Nos. 4 thru 12** Submit forms and machine number
AB **1-200269A**
AC 11-205117* included in 1-205002 Style 13, 17 No. 2
AD **200275**
For other symbols—see Plate 67, Accumulation Symbol List

SEE EXPLANATION ON INSIDE OF FRONT COVER

AUTOMATIC COUNT—CROSSFOOTER AND REGISTER (FOR STYLE 30 17 07 MACHINES) (Plate 69-1)*



(OVER)

*(Plate 69 on succeeding sheet)

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SYMBOLS (Plate 69-1)

A **1-118 Fte. 219 No. 2**
B **1-115 Fte. 219**
C **202151**
D **202156**
E **73502½** screw
F **1-202157**
G **11-202162**
H **512A Fte. 219 No. 2**
I **47¾** nut
J **214 No. 105**
K **1-217AR**
L **512A Fte. 219 No. 1**
M **6L Fte. 219 Style 17**
N **1-202162** includes P
O **1-74326** collar, use 75618 screw
P 511 Fte. 219* included in N
Q **160 Fte. 219**
R **87801A**
S **108 Fte. 219**
T **11-138A Fte. 219**
U **1-202164**
V **12083½** spring, use 20 No. 73 clip
W **1-204317** includes X
X **550¾** screw
Y **1-202161**
Z **1-424⅛** No. 4* included in 41-204000 Style 17

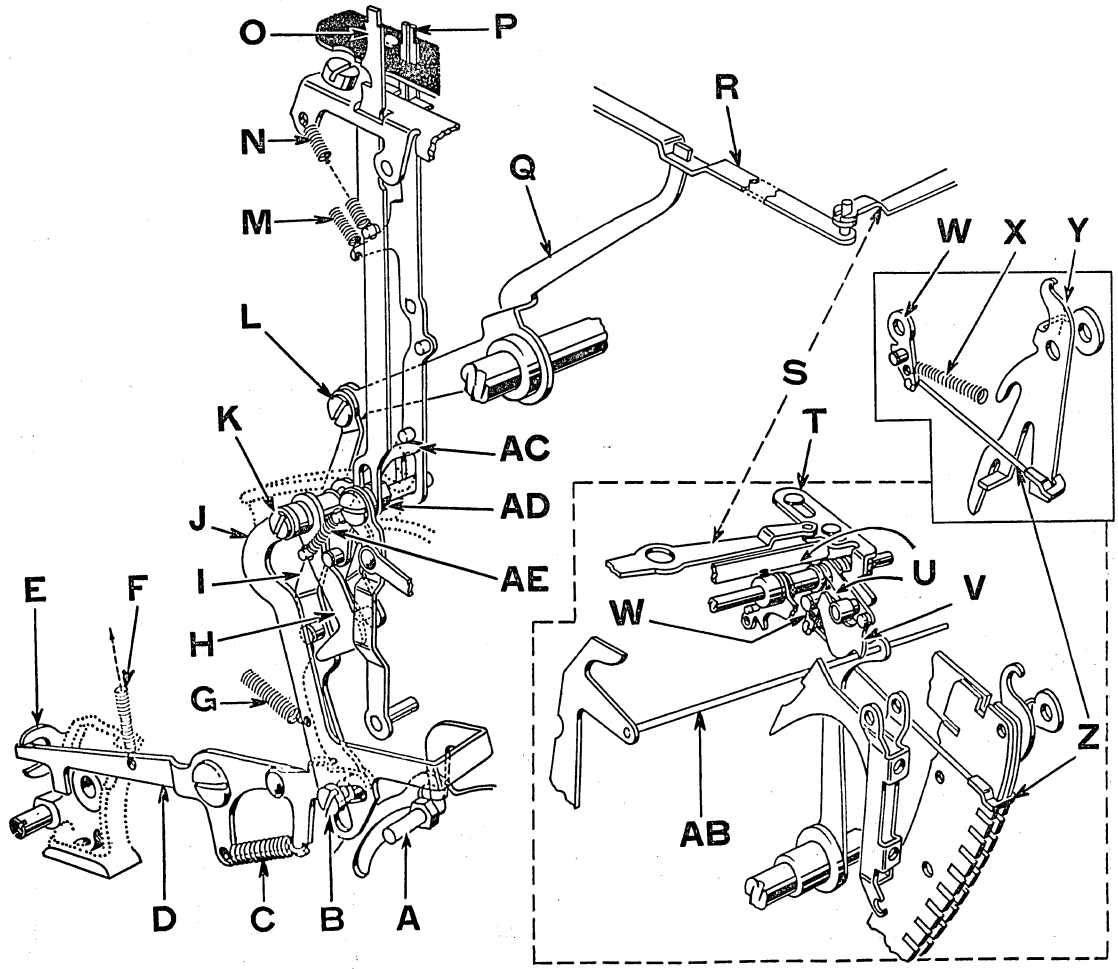
AB **402B Style 17** shaft
AC **64101A**
AD **72614**
AE **64301A** nut, use 64302 collar
AF 1-204124L* included in 41-204000 Style 17
AG **1-202155**
AH **53310** roller, use 53539 rivet
AI **1-117 Fte. 219 No. 2**
AJ **3687A**
AK **46** nut
AL **259½**
AM **80⅜ Fte. 104**
AN **1-162A Fte. 219**
AO **3450⅛ Style 9**
AP **203637** screw
AQ **20 No. 114** clip
AR **1-116A Fte. 219**
AS **306 Fte. 207** nut, use 72567 screw and 824¼ washer
AT **259½** screw, use 46 nut
AU **10056**

BA **70519**
BB **1-617 Style 17 No. 2** includes BA, BU
BC 69149* included in BT
BD **10180**
BE 69148* included in BT
BF **69173 No. 10**
BG **69145**
BH **709508** screw
BI **1-69109 No. 10**
BJ **1-69147**
BK **69146**
BL **709803** spring
BM **11-69109 No. 10**
BN **51802**
BO **69126½ P. 10 No. 10**
BP **1-69122 P. 10 No. 10**
BQ **69801** spring
BR **681** spring
BS **8353¼**
BT **1-69150** includes BC, BE, BS
BU **617⅛**

CA **291½** (Desc Only) brown inlay, ivory body
CB **8353¾** rivet
CC **202152**
CD **1-202112 Style 17 No. 2** includes C, CB, CC, CE, CF, CG, CH, CN
CE **8353¾** rivet
CF **202154**
CG **202524** rivet
CH **1-202153** includes CF, CG, CN
CI **64001 Style 17 No. 6**
CJ **108 Fte. 219**
CK **415 No. 1**
CL **20 No. 70** spring anchor
CM **709803**
CN **202519**
CO **20 No. 79** spring anchor
CP **7787**
CQ **1-217L No. 9**
CR **46¼** nut, use 256⅛ screw
CS **1-200914**
CT **1-200298**
CU **71589** screw, use 58310 shoulder nut
CV **200298½**
CW **10056**
CX **1-62222 No. 3**

COUNT AND NORMAL INDEXED FROM KEYBOARD, CARRIAGE CONTROLLED
(Plate 69)

Mr M R Lovejoy
Buffalo N Y Branch 10-5

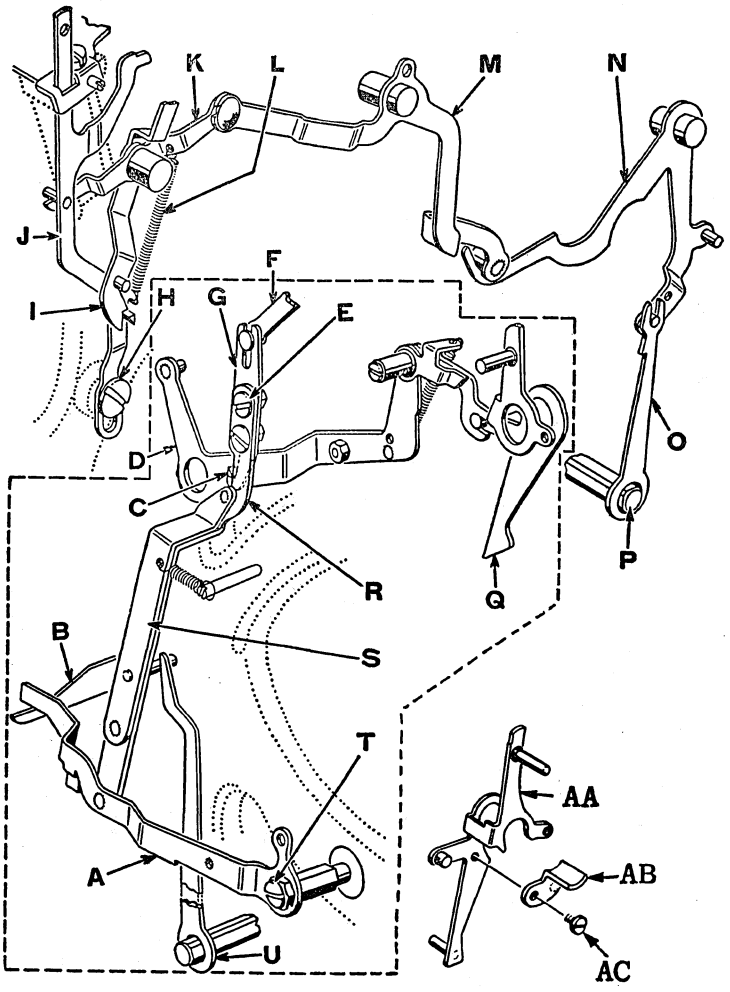


SYMBOLS (Plate 69)

A **68503A No. 2** screw stud, 45⅞ nut
B **508 Fte. 219 (12359½)** screw, 12046⅜ nut, 738 collar
C **3880½**
D **11-11½A Fte. 103** uses 3450⅞ Style 9 screw
E **11-27⅛A Fte. 99 Style 17 No. 2**
F **3480½**
G **680**
H **1-117 Fte. 219**
I **1-116 Fte. 219** early
1-116A Fte. 219 later
J **153 Fte. 219**
K **16855** screw, 203423 No. 5 collar
L **259½** screw, 46 nut
M **681**
N **81804 (803 Fte. 219)**
O **1-118 Fte. 219**
P **1-119 Fte. 219 (1-62222)**
Q **1-115 Fte. 219**
R **100 Fte. 219**
S **1-101 Fte. 219**
T **103 Fte. 219 No. 1**
U **801A Fte. 219**
V 104B Fte. 219*, 1-104BR or BL Fte. 219
W **1-105AR Fte. 219**
X **802 Fte. 219**
Y **108 Fte. 219**
Z **1-138R Fte. 219**
AB **402B Style 17**
AC **1-120 Fte. 219**
AD **60517** screw, 305 Fte. 219 bushing, 10056 screw
AE **10180**

Printed in U. S. America Revised 9-15-50 For Form 2963
Replaces Previous Plates 69, 70 and 71 Dated 2-1-50

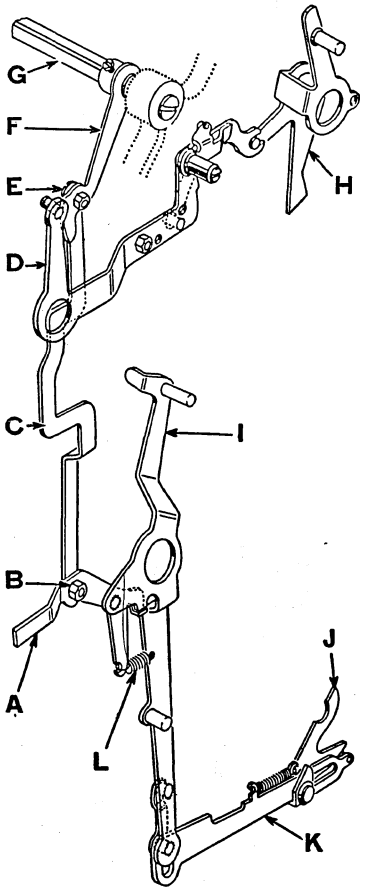
CROSSFOOTER ADD FROM LOWER BAR, CLASSES 11 THRU 16 AND 21 THRU 30 (Plate 70)



SYMBOLS (Plate 70)

A Included in R
B **1-12110 Style 13, 17 No. 1** thin lever
C Stud in D
D **1-216 Fte. 200 No. 3**
E **10058¾** screw, 1097¾ washer, 46 nut
F **1-12024 No. 30**
G **101A Env. 692**
H **200517B**
I **1-200194½ No. 1**
J **1-12021¼ No. 3**
K **1-200233 No. 3**
L **3683**
M **1-200144 No. 8**
N **1-200239 No. 2**
O **1-12025 No. 3**
P **12008 Style 13, 17 No. 1 Env. 692**
Q **11A-3429⅛A** for field replacement use 1-3429⅛AZ, 1-3429 1/16Z, 957½
R **1-100A No. 3 Env. 692** includes A and S, specify machine number
S Included in R
T **75342** eccentric
200646B (200646C, 73568) post
4456½ screw
U **1-103 Env. 692** } specify
1-103 Env. 692 Nos. 2 thru 5 } machine number
AA **1-3429⅛AZ**
AB **1-3429 1/16Z**
AC **957½**

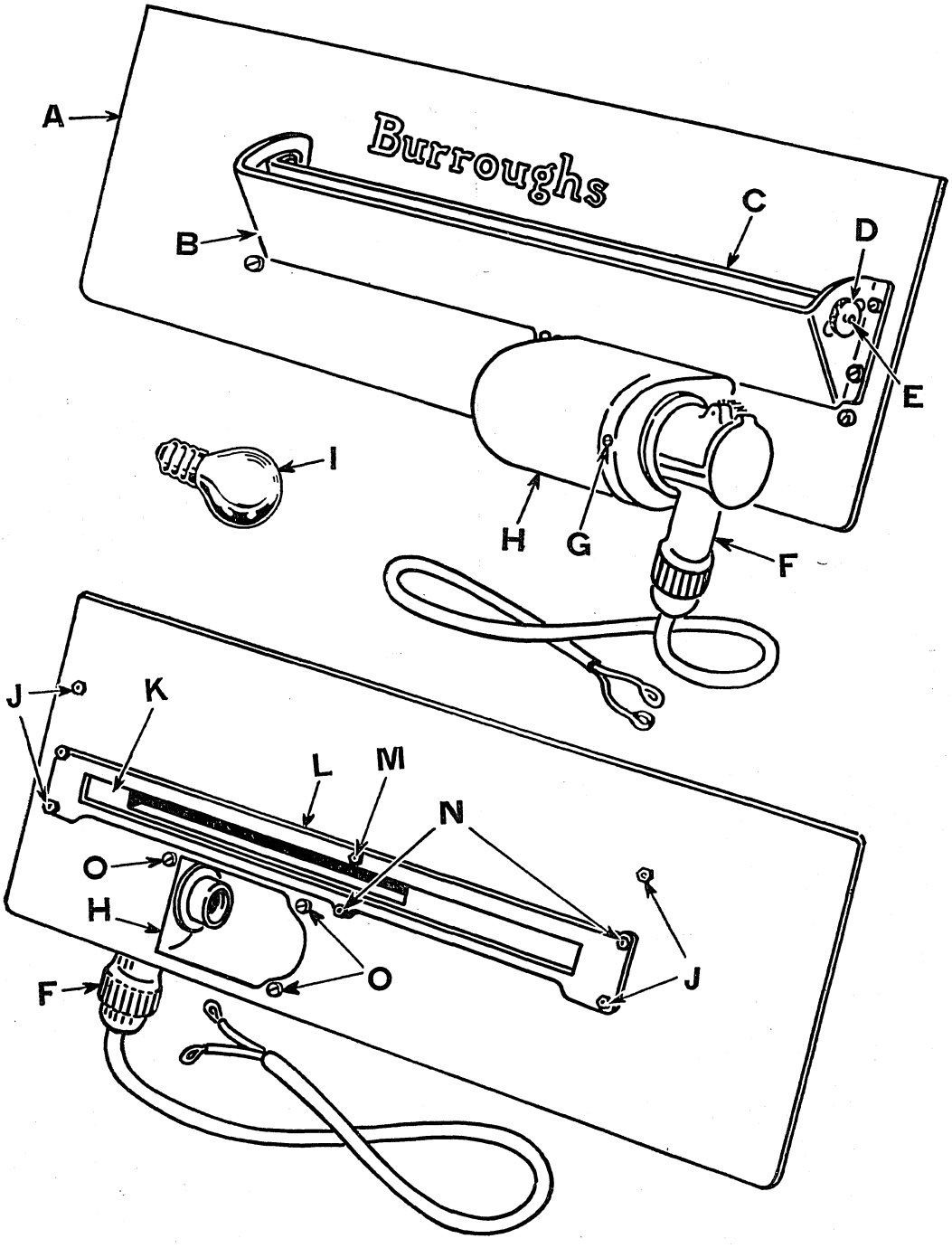
CROSSFOOTER ADD—REGISTER NON-ADD FROM UPPER BAR, CLASSES 11 THRU 16, 21 THRU 30 (Plate 71)



SYMBOLS (Plate 71)

A Included in I
B **259½** screw, 46 nut
C **214 Fte. 200**
D **1-216 Fte. 200 No. 1 (11-216 Fte. 200 No. 3)**
E **10056** screw, 46 nut
F **1-12024 No. 14** with front prong removed, specify machine number
G **12007 Style 13, 17 No. 2**
H **11A-3429⅛A** for field replacement use 1-3429⅛AZ, 1-3429 1/16Z, 957½
I **1-60106C**
J Refer to plate 22-8
K **1A-60133 Nos. 1 thru 6** specify machine number
L **2886½**

REFLECTOR AND LIGHT FOR READING DIALS (Plate 72)



A Complete assembly including front case panel:
- **1-103 Fte. 200 Style 13, 17 No. 1** used if dials are to be exposed on both R&L sides of brace 223¼B Style 15
- **1-103 Fte. 200 Style 13, 17 No. 2** used for columns 1 thru 5 on Style 13 and columns 1 thru 8 on Style 17
- **1-103 Fte. 200 Style 17 No. 3** used for columns 6 thru 10 on Style 13 and columns 8 thru 14 on Style 17

B **104 Fte. 200 Style 13, 17**

SYMBOLS (Plate 72)

C **105 Fte. 200 Style 17**
D **310 Fte. 200**
E **83512A**
F **1-925 Fte. 200**, 1-200907C No. 3 cord for 110V., 1-200907C No. 4 cord for 220V
G **536 Fte. 200** Plunger, 82 Fte. 98 spring, 73620 screw
H **1-670 Fte. 200** includes G parts
1-670L Fte. 200 includes G parts
I **200906 No. 2**
J **952¾** Screw, 46¼ nut
K **906 Fte. 200 Style 13, 17** Celluloid
906½ Fte. 200 Black celluloid, specify No. 1 to 13, No. 1 to cover 1 column, No. 2 two columns, etc.
L **106 Fte. 200 Style 17** Early style shown
106 Fte. 200 Style 17 No. 2 Later style
M **544 Fte. 200** Screw, 49¼ nut
N **75608** Screw, 46¼ nut
O **75602**

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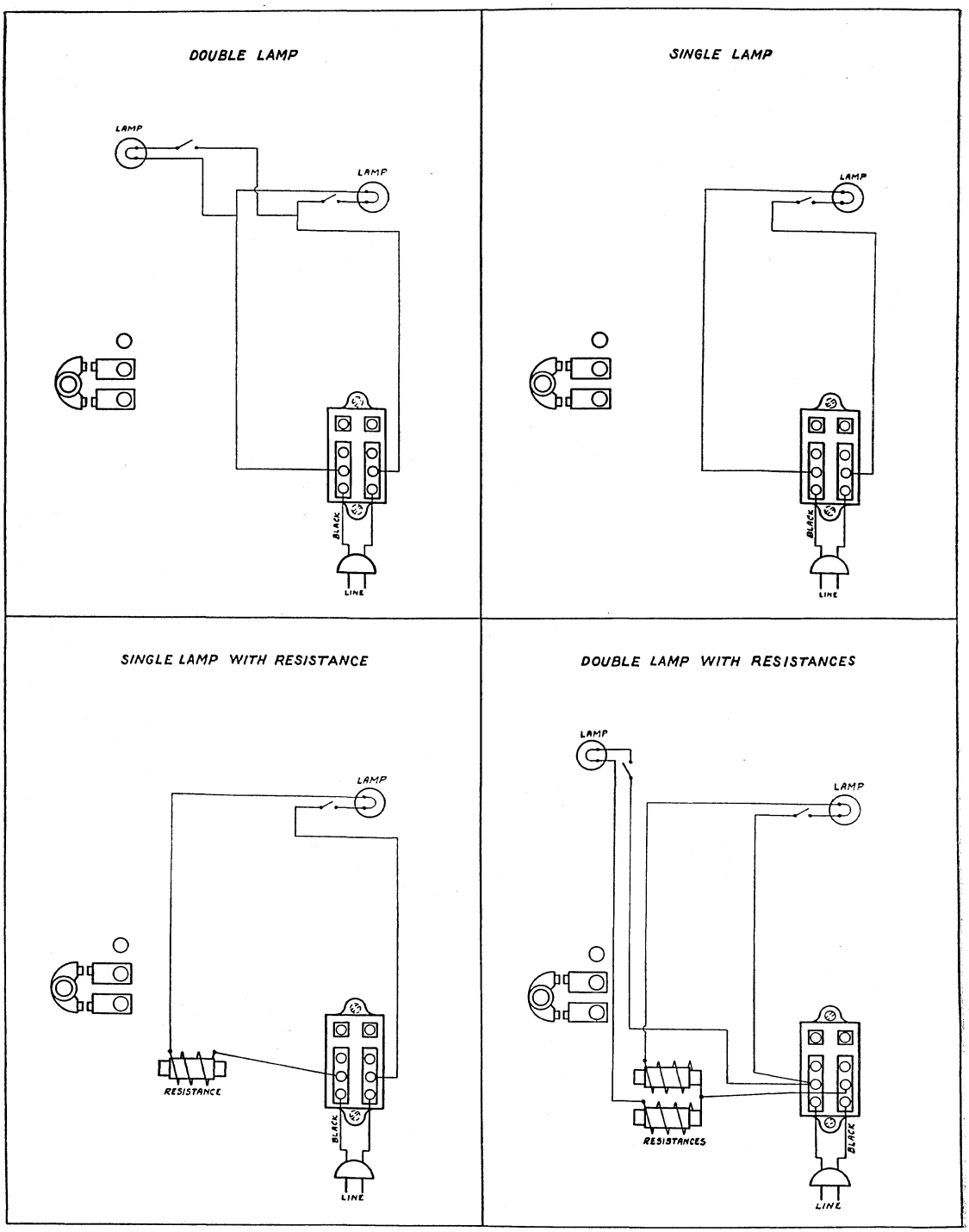
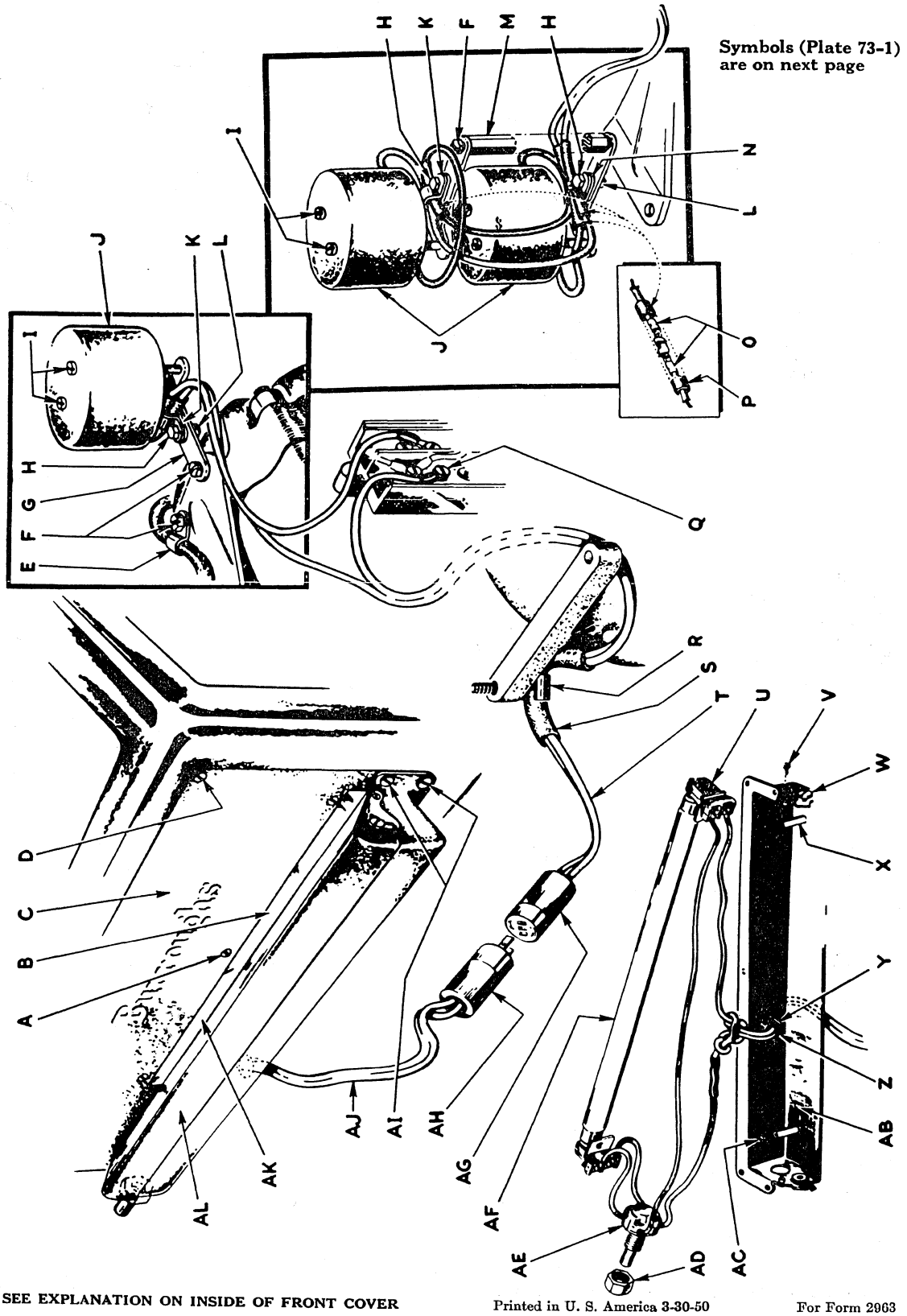
WIRING DIAGRAMS FOR REFLECTOR LAMPS (Plate 73)



FLUORESCENT LIGHT AND BALLAST COILS FOR READABLE DIAL WHEELS, WIDE BASE MACHINE (Plate 73-1)

(Showing wiring diagrams for single and double ballast coils)



Symbols (Plate 73-1) are on next page

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For Form 2963

SYMBOLS (Plate 73-1)

A **77515** screw, use 49¼ nut
B **917 Fte. 200** celluloid, use 106A Fte. 200 frame
C **1-103B Fte. 200 No. 1** black, **1A-103B Fte. 200 No. 1** gray, **1-103B Fte. 200 No. 2** black, **1A-103B Fte. 200 No. 2** gray — used without counter dials / used with counter dials — front panel only
2-103B Fte. 200 No. 1 black, **2A-103B Fte. 200 No. 1** gray, **2-103B Fte. 200 No. 2** black, **2A-103B Fte. 200 No. 2** gray — used without counter dials / used with counter dials — complete assembled front panel; includes A, B, C
D **300561A** screw
E **154R Fte. 200**
F **2859⅛B**
G **1-919 Fte. 200 Nos. 1, 2, 3 or 4** specify stamping ballast only, see chart, plate 73-4
2-919 Fte. 200 Nos. 1, 2, 3, or 4 specify voltages and cycles black, **2A-919 Fte. 200 Nos. 1, 2, 3 or 4** specify voltages and cycles gray — complete assembled ballast; includes G, H, I, J, K, L, M, N
H **60575**
I **73612**
J **272 Fte. 200** black, **272A Fte. 200** gray — cover only; see letter "G" for complete assembly
K **93⅛ No. 5**
L **104310** nut, use 1097 7/16 lock washer
M **557 Fte. 200** post, use 1097⅛ lock washer
N **93⅛ No. 4**
O **24 No. 9**
P **4190**
Q **4252** screw, use 2820½ washer
R **154R Fte. 200** clip
S **4696** sleeve
T **1-913 Fte. 200** black, **1A-913 Fte. 200** brown — includes AG
U **916 Fte. 200**
V **553 Fte. 200** screw
W **203578A No. 2** screw
X **555 Fte. 200**
Y **21 No. 23** clip
Z **320 Fte. 200** grommet
AB **1-104A Fte. 200** black, **1A-104A Fte. 200** gray — housing only
2-104A Fte. 200 black, **2A-104A Fte. 200** gray — complete assembly; includes U, V, W, X, Y, Z, AB, AC
AC **75621** screw
AD **402 Fte. 200**
AE **1-915 Fte. 200**
AF **911 Fte. 200** (lamp will not light unless light switch is held in "on" position for approximately 6 seconds)
AG **913 Fte. 200**
AH **914 Fte. 200**
AI **300561A**
AJ **1-914 Fte. 200** black, **1A-914 Fte. 200** brown — includes AH
AK **918 Fte. 200** paper
AL **105A Fte. 200** black, **105B Fte. 200** gray — reflector

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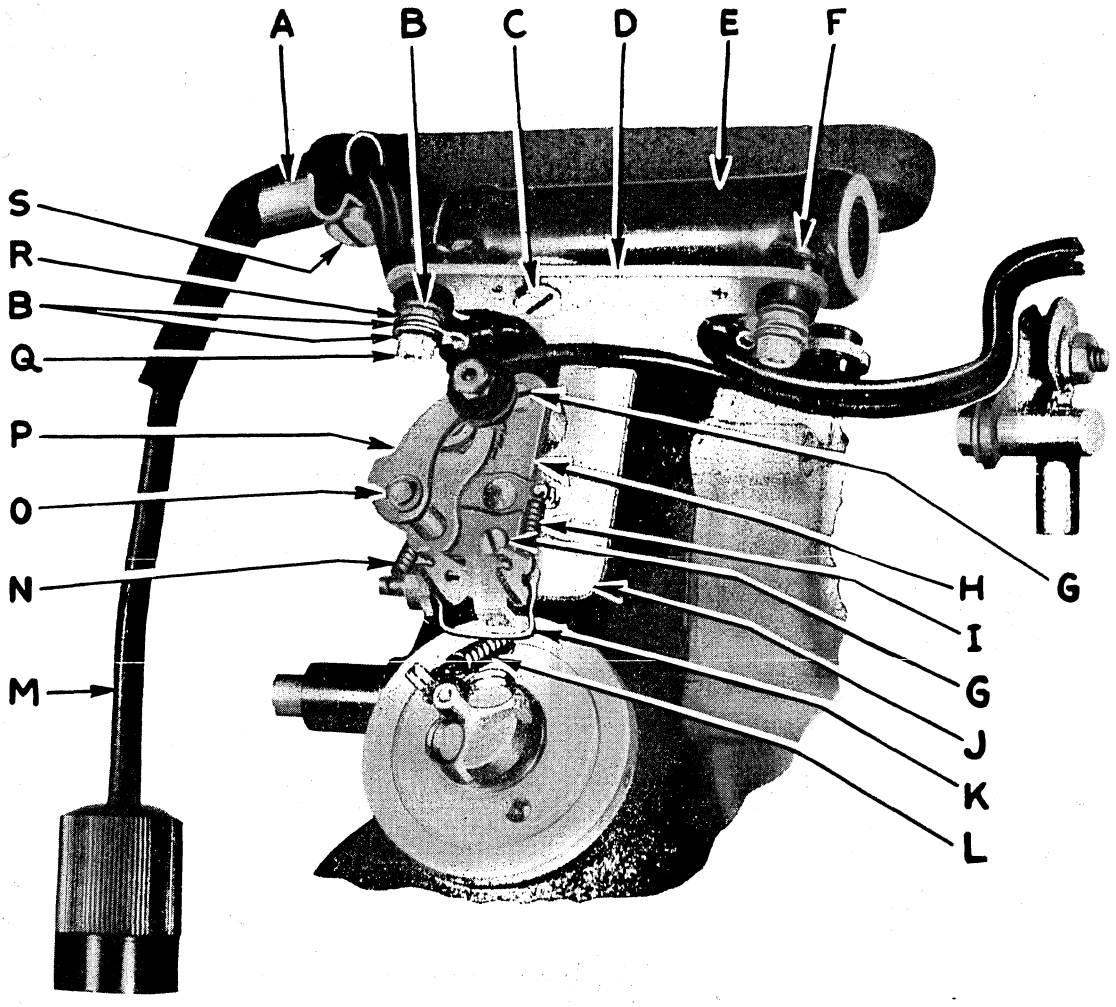
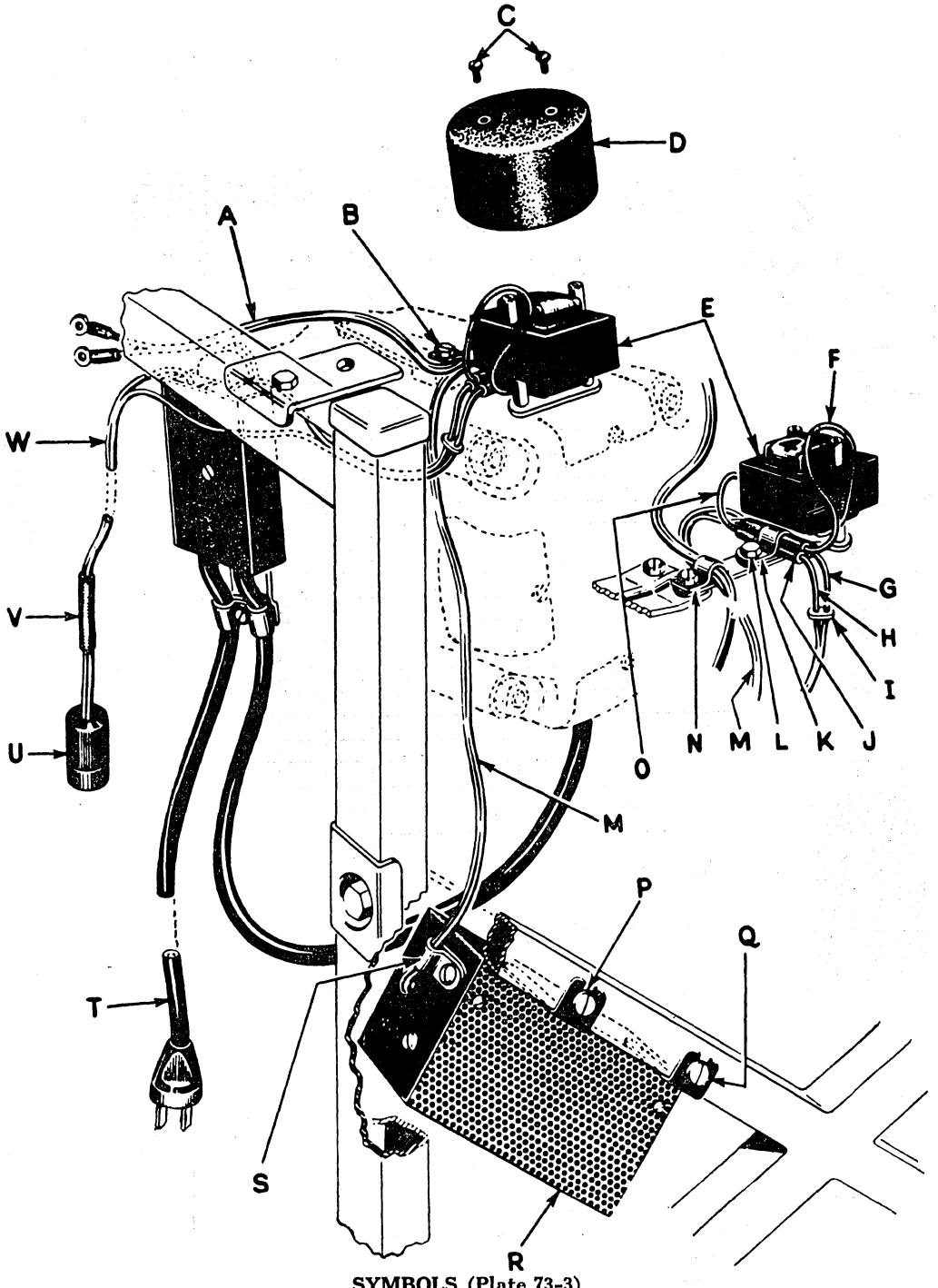
RESISTANCE COIL FOR DC CURRENT MACHINES (100-150 Volts) EQUIPPED WITH FLUORESCENT LIGHT FOR READABLE DIAL WHEELS (Plate 73-2)



SYMBOLS (Plate 73-2)

*A 154R Fte. 200
*B 7919½A washer, 6 required
*C 528 Fte. 207
*D 1-3810⅛ No. 2
*E 1B-200911 see chart, plate 73-4
*F 200538½ No. 1 screw
G 3663⅛
*H 11-3613⅝B
I 69806
*J 1-3810⅜
K 81703
L 3686A
*M 11A-013 Fte. 200
N 86803 spring
O 21 No. 20 clip
P 1-3615¼
*Q 46 nut
*R 46¼ nut
S 12055
*Parts used for Field installation;

BALLAST AND RESISTANCE COIL FOR DC CURRENT MACHINES (200-265 Volts) EQUIPPED WITH FLUORESCENT LIGHT FOR READABLE DIAL WHEELS (Plate 73-3)



SYMBOLS (Plate 73-3)

A **11-4670 No. 3**
B **2859⅛B**
C **73612**
D **272A Fte. 200**
E **1-919 Fte. 200** Nos. 1, 2, 3 or 4 specify stamping ballast only, see chart, plate 73-4
2A-919 Fte. 200 No. 4 complete assembled ballast; includes C, D, E, F, J, K, L, O
F Description only
G Description only
H Description only
I **200928**
J **4190** sleeve
K **93⅛ No. 6** plastic clip
L **60575** screw, use 1097⅞ washer and 104310 nut
M **1-706 Fte. 200**
N **4310½**
O Description only
P **203541** screw, use 1097⅞ washer and 45⅝ nut
Q Description only
R **1-920 Fte. 200** complete assembled resistance coil; see chart, plate 73-4
S **93⅛ No. 4**
T **1-3697½C**
U **913 Fte. 200**
V **4696** sleeve
W **1A-913 Fte. 200** includes I, V, W

Note: Use A No. 9 drill (.196) for drilling holes in the stand crossbrace in order to fasten the resistance coil bracket.

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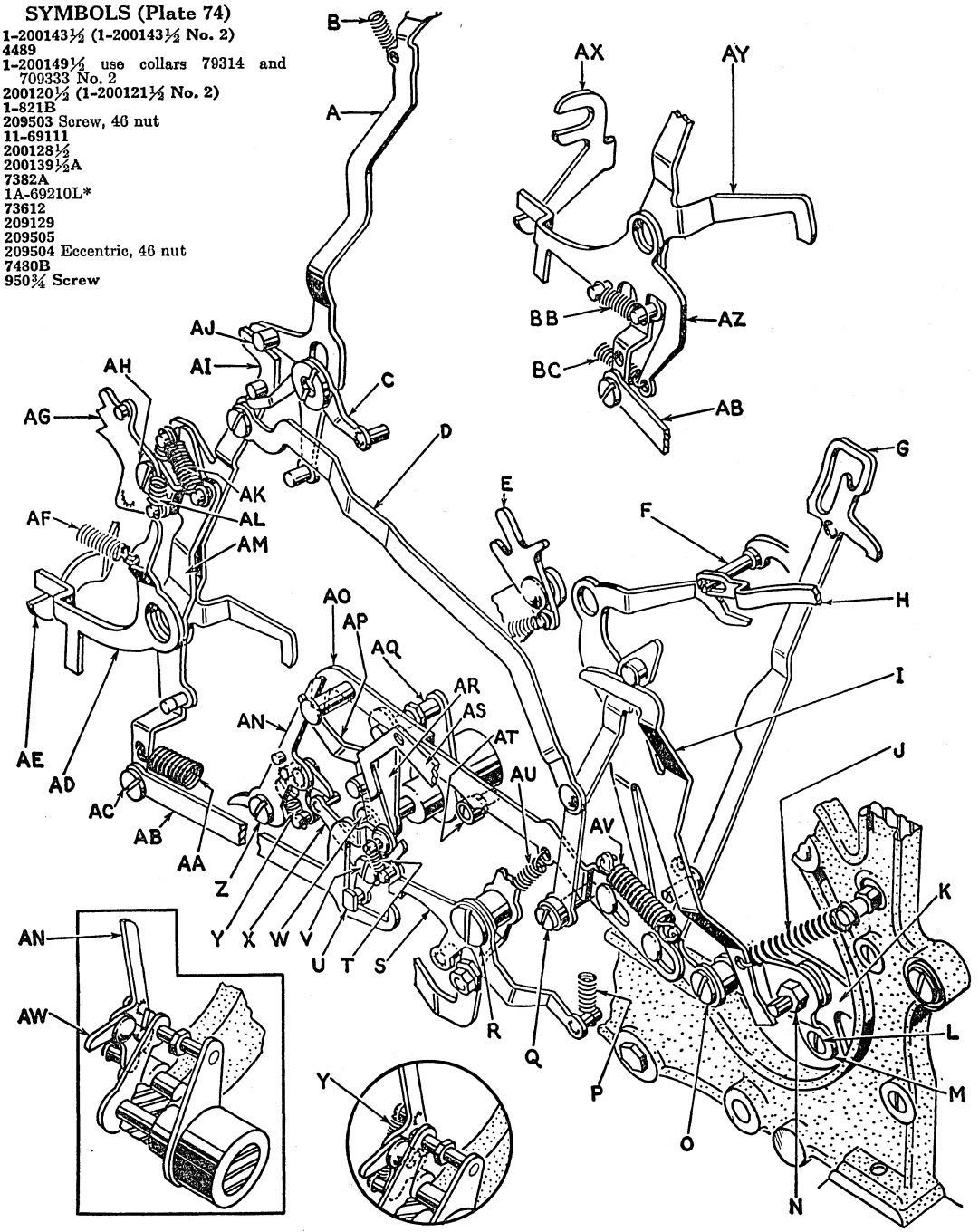
BALLAST AND RESISTANCE COIL CHART FOR MACHINES EQUIPPED WITH FLUORESCENT LIGHT FOR READABLE DIAL WHEELS (Plate 73-4)

Volts and Cycles		Ballast Coil				Resistance Coil				
Volts	Cycles	1-919 FTE. 200 NO. 1	1-919 FTE. 200 NO. 2	1-919 FTE. 200 NO. 3	1-919 FTE. 200 NO. 4	1B-200911 (250 OHM)	1B-200911 (300 OHM)	1B-200911 (465 OHM)	1B-200911 (1000 OHM)	1-920 FTE200
		NO. REQ.	NO. REQ.	NO. REQ.	NO. REQ.	NO. REQ.	NO. REQ.	NO. REQ.	NO. REQ.	NO. REQ.
115	25		2							
120	30		2							
115	40			1						
220	40				2		1			
250	40				2			1		
125	45			1						
150	45	1	1							
115	50		1							
125	50			1						
150	50	1	1							
180	50		2							
200	50		1	1						
220	50			1	1					
240	50			1	1					
115	60		1							
230	60		1		1					
250	60		1		1					
115	80	1								
240	80		2							
100	D.C.				1	1				
110-125	D.C.				1		1			
150	D.C.				1				2	
200-265	D.C.				1					1

CARRIAGE AND CROSSFOOTER CONTROLS, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 74)

SYMBOLS (Plate 74)

A 1-200143½ (1-200143½ No. 2)
B 4489
C 1-200149½ use collars 79314 and 709333 No. 2
D 200120½ (1-200121½ No. 2)
E 1-821B
F 209503 Screw, 46 nut
G 11-69111
H 200128½
I 200139½A
J 7382A
K 1A-69210L*
L 73612
M 209129
N 209505
O 209504 Eccentric, 46 nut
P 7480B
Q 950¾ Screw



104354 (200462) Eccentric
R 200658A
S 1-200174½
T 12084¼
U 200648*
V 79541
W 12051⅞
X 1-200135½ includes U
Y 12084¼
Z 200623A
AA 10984½ Style 17
AB 200137½
AC 200621 Eccentric, 46 nut
AD 200136½A
AE 11-27⅜A Fte. 99 Style 17 No. 2
AF 1-200819
AG 1-200130¼
AH 200621 Eccentric, 46 nut
AI 1-200130½A (1A-200130½A, 200136½B) includes AM
AJ 200520½
AK 200815A
AL 283A
AM 200130¾*
AN 1A-200131½ (1Z-200131½, 200131¼Z, 200447Z, 200623Z, 200627Z) includes AW
AO 1-209131B
AP 1-200134½
AQ 68503A No. 2, 45⅞ Nut
AR 68119
AS 1-200133½A
AT 501 Fte. 206 Screw, roll 200371, threaded stud 200629
AU 16880
AV 1088
AW 1-200132½*
AX 60127C Style 17 No. 4
AY 1-200130½ Early
AZ 1-200136½ Style 13, 17 Early
BB 200815
BC 3489

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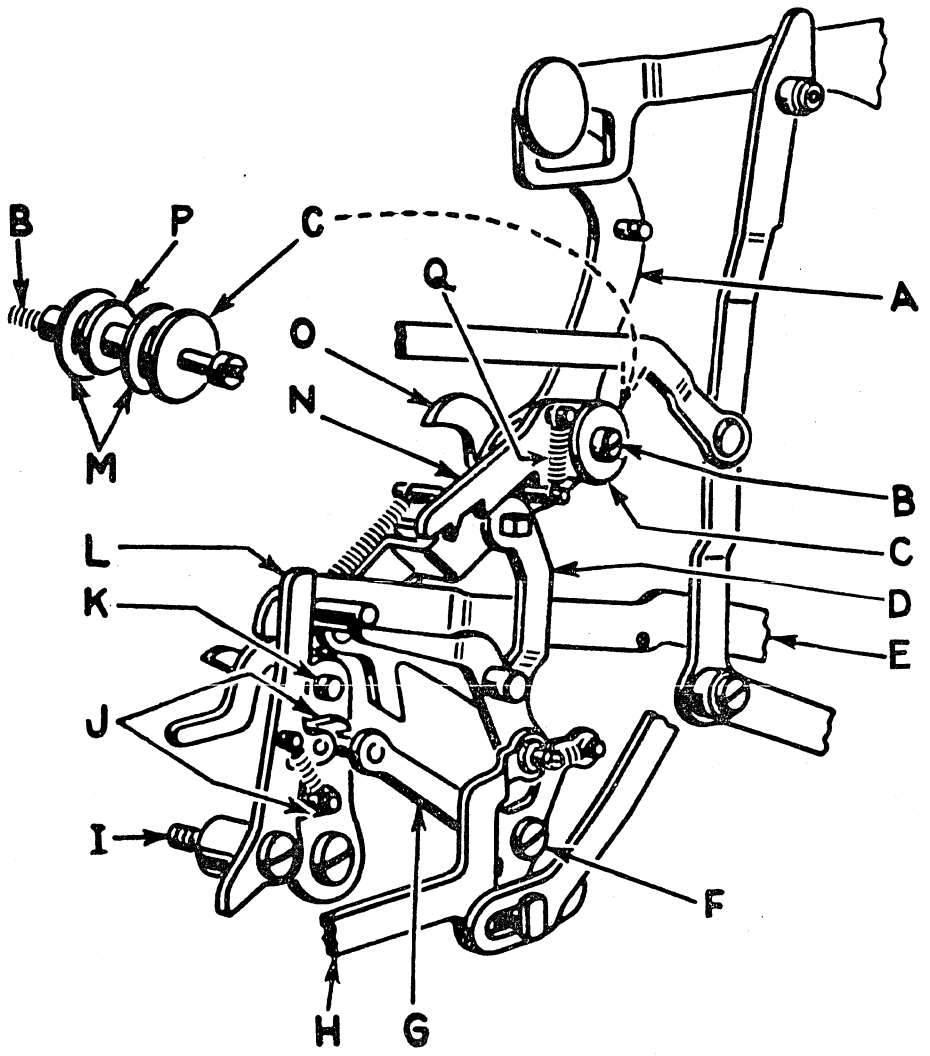
CROSSFOOTER TOTALS, CARRIAGE CONTROLLED INDEXING DETENT
(Plate 74-1)

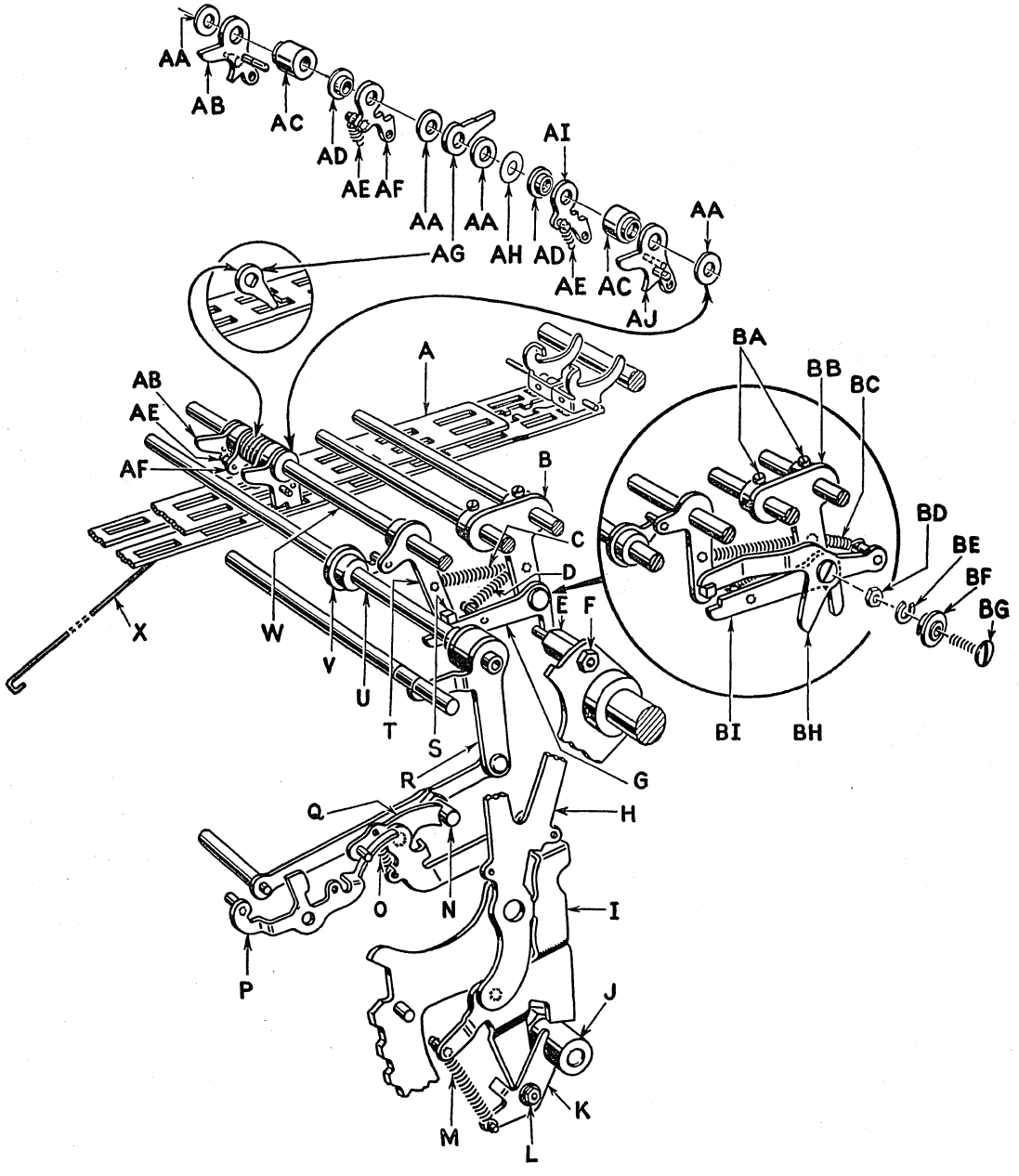


SYMBOLS (Plate 74-1)

✱A	**11B-200122½** use bushing M	
✱B	**200625A**	
✱C	**200465½A**	
✱D	**1-200134½A**	
E	**1-209131B**	
F	**79541**	
G	**1-200135½A**	
H	**200137½**	
I	**200623A**	
J	1-200132½* included in L	
K	**68503A No. 2**	
L	**1A-200131½**	
✱M	**200380 No. 1** Bushing	
✱N	**1-200134¼** use bushing C	
O	**1A-200140½ (1-200140½ No. 2)**	
✱P	**200380½** Bushing for O	
✱Q	**7480B**	

✱Parts required for field installation

CROSSFOOTER TOTALS WITH KEYS ON KEYBOARD DEPRESSED, IMPROVED, CLASSES 21 THRU 30 WITH H903 (Plate 74-2)



SYMBOLS (Plate 74-2)

A 214⅝A No. 1
B 1-222⅝
C 10080
D 71805 Spring
E 260⅜
F 46 use 1097¾ lock washer
G 222¾* included in B
H 1-215¹¹⁄₁₆A No. 3
I 1-215⅝ No. 3
J 1-3662¼ No. 3 use 45 nut
K 1-215¾ No. 2
L 46 use 1097¾ lock washer, 253⅛ No. 2 eccentric
M 483
N 256¾A, 47 Nut, 1097¾ lock washer
O 709803 Spring
P 1-200233½B No. 1
Q 1-215⅝ No. 3* included in I
R 1-227AR* included in U
S 200586* included in W
T 1-223⅜* included in W
U 41-204A Style 17
V 1-222⅜* included in U
W 1-200½ Style 17 No. 3
X 271¼R or L No. 1 thru 8
AA 295
AB 1-217L No. 2
AC 233½
AD 246
AE 287 Spring
AF 1-217L No. 3
AG 220⅝
AH 428
AI 1-217L No. 3
AJ 1-217R No. 2
BA 72573
BB 1-222⅝ Env. 3137
BC 483
BD 46
BE 1097¾
BF 53309A
BG 103500½
BH 1-100 Env. 3137
BI 1-222¾ Env. 3137

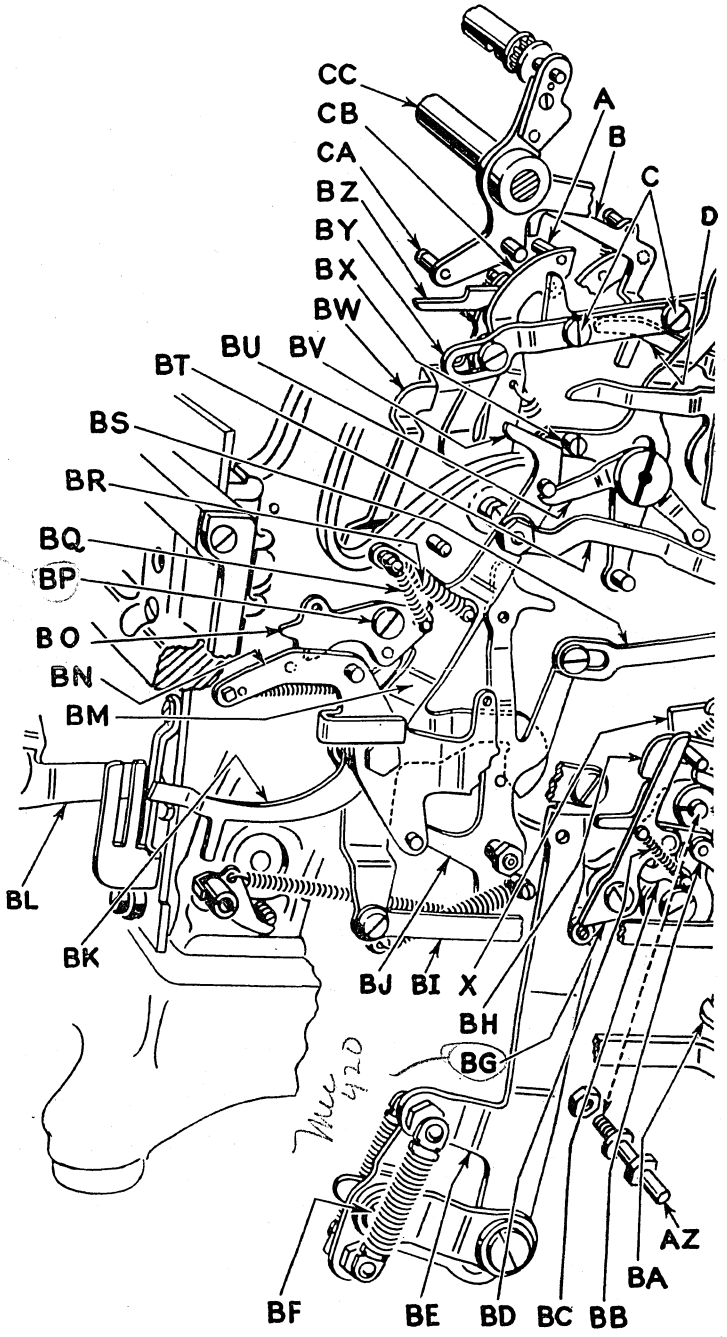
Printed in U. S. America 2-1-49

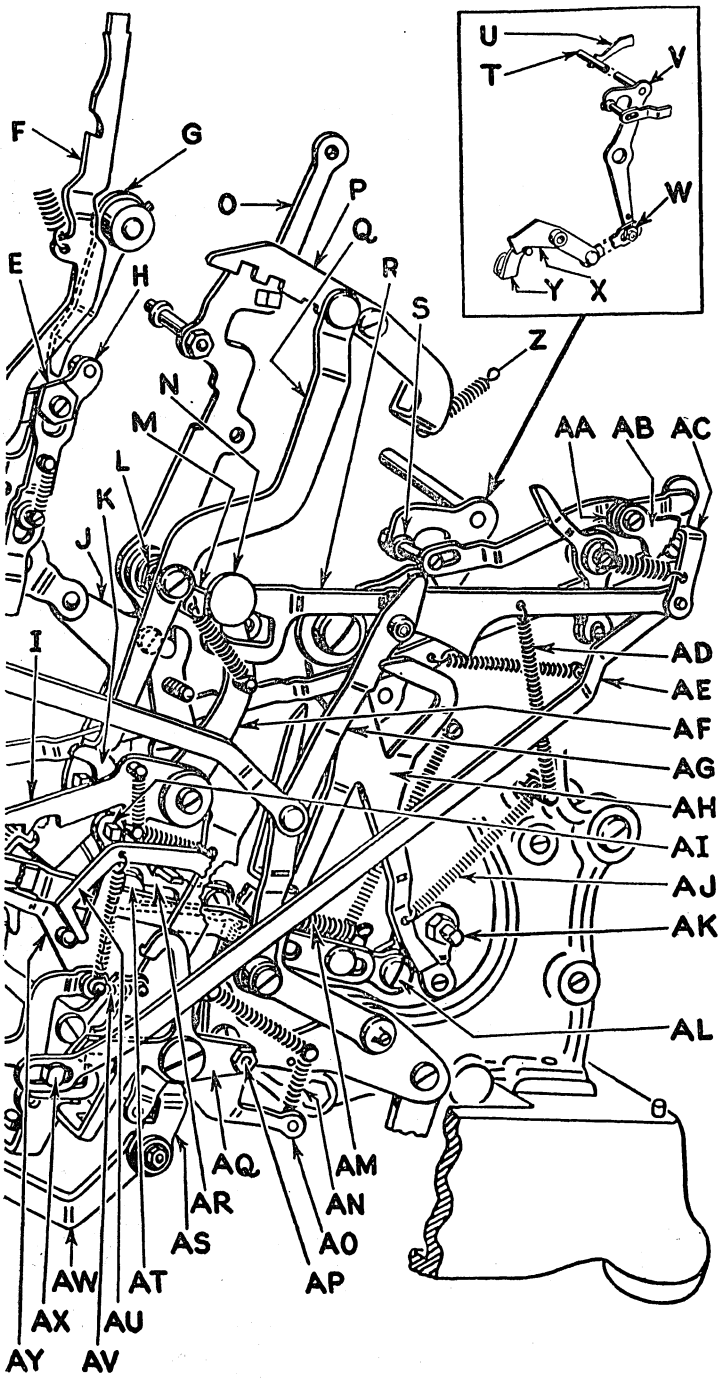
CROSSFOOTER TOTAL AND SUB-TOTAL MECHANISM—POSITIVE AND NEGATIVE—CARRIAGE CONTROLLED, IMPROVED, STYLE NO. 2, WITH H903 (Plate 74-3)

SYMBOLS (Plate 74-3)

A 350⅜ No. 2* included in CB
B **1-205123 No. 2** use 7262½ rivet
C **957½**
D **11-200138½**
E **200488** use screw 3456¾
F **1-200143½ No. 2**
G 1-62128* use 52 pin
H **1-200152½**
I **1-200134¼**
J **1-200125½B**
K **1-200140½A**
L **200489** Eccentric bushing
M **200141½A** Link
N 200617* included in AF
O **41-60100**
P **1-60153A**
Q 60154* included in P
R 200123½ No. 2* included in AF
S **209503** Screw stud
T **902½A Style 17**
U Description
V **21-209004 Style 17**
W **209302** Eccentric bushing
X **1-209128A**
Y **1-68116A Style 17**
Z **82813 (87801A)**
AA **75342** Eccentric bushing
AB **200129½**
AC **1-64106** use 8050⅜ pin
AD **983**
AE **200166½**
AF **11B-200122½**
AG **1-200121½ No. 2**
AH **200139½A**
AI 709538* included in AY
AJ **7382A**
AK **209505**
AL **209504**
AM **1088** Spring
AN **69809**

Symbols continued on Next Page





SYMBOLS (Plate 74-3)—Continued

AO 1-200174¾
AP 533 Fto. 217 Eccentric screw
AQ 1-200174½A
AR 200126½B* included in J
AS 1-200178½C
AT 200656* included in J
AU 1-200133½A
AV 120841/4 Spring
AW 1B-200176½
AX 200648* included in BB
AY 1-200134½A
AZ 68503A No. 2
BA 1-60101 No. 2
BB 1-200135½A
BC 1-200132½* included in BG
BD 120841/4 Spring
BE 1-200182½B
BF 200661 No. 2 Eccentric screw
BG 1A-200131½ (1Z-200131½, 200131¼Z, 200447Z, 200623Z, 200627)
BH 1-209131B
BI 200137½
BJ 200142½B* included in assembly 1-200142½B
BK 200136½B
BL 12110 No. 8 Style 17
BM 200130¾* included in BV
BN 1-200158½B
BO 1-200130¼
BP 200621
BQ 348041/4
BR 200815B Spring
BS 1-200142¾
BT 200120½ No. 2* included in AG
BU 1-200149¾
BV 1A-200130½A
BW 1-200150½A
BX 200520½ Stud, use 49¾ nut
BY 200151¾
BZ 1-12217¼A* included in CB
CA 250½ included in CC
CB 1-12216⅝C
CC 21-202007 Style 17

For other symbols see Plate 74-4 and 74-5

Printed in U. S. America 2-1-49

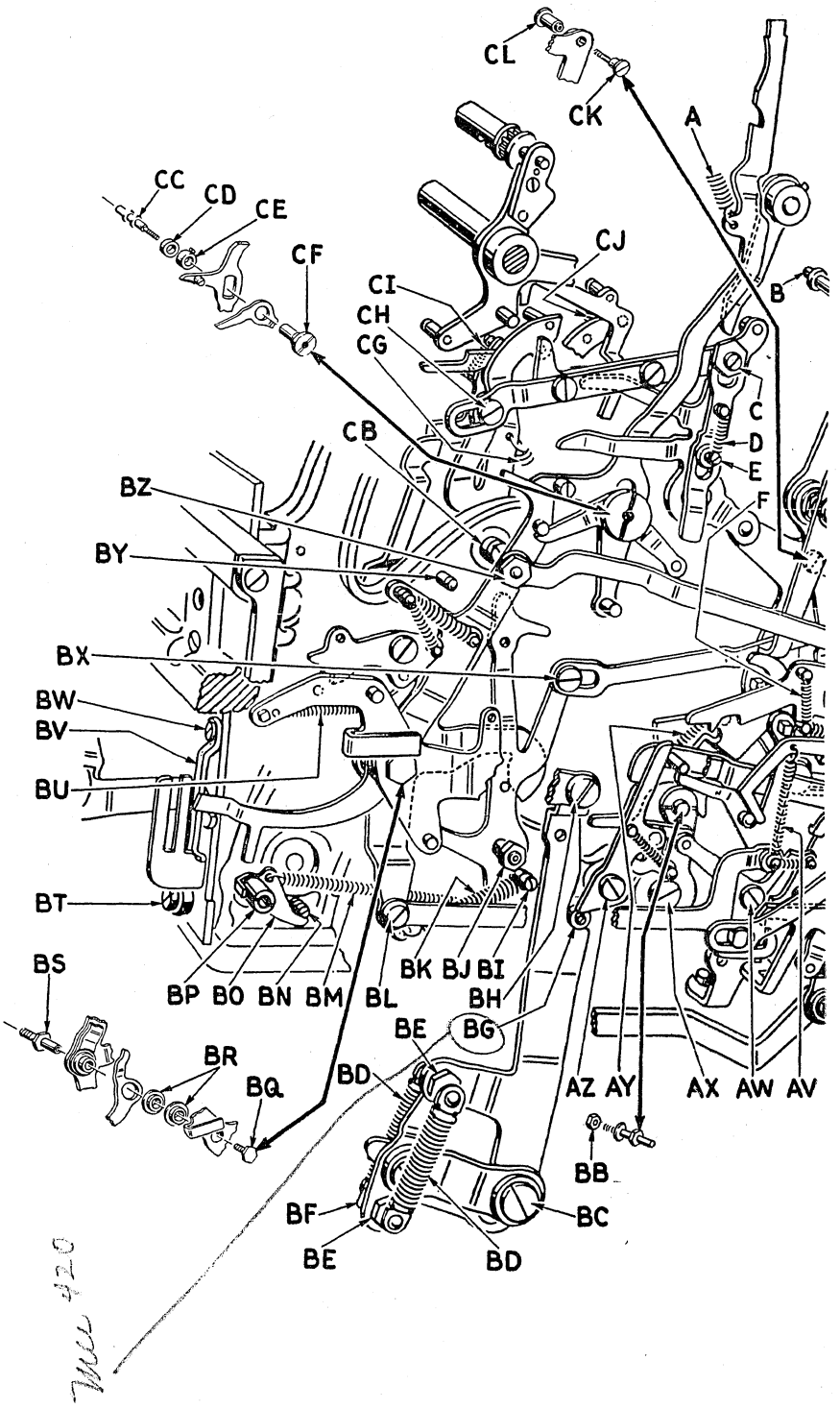
For Form 2963

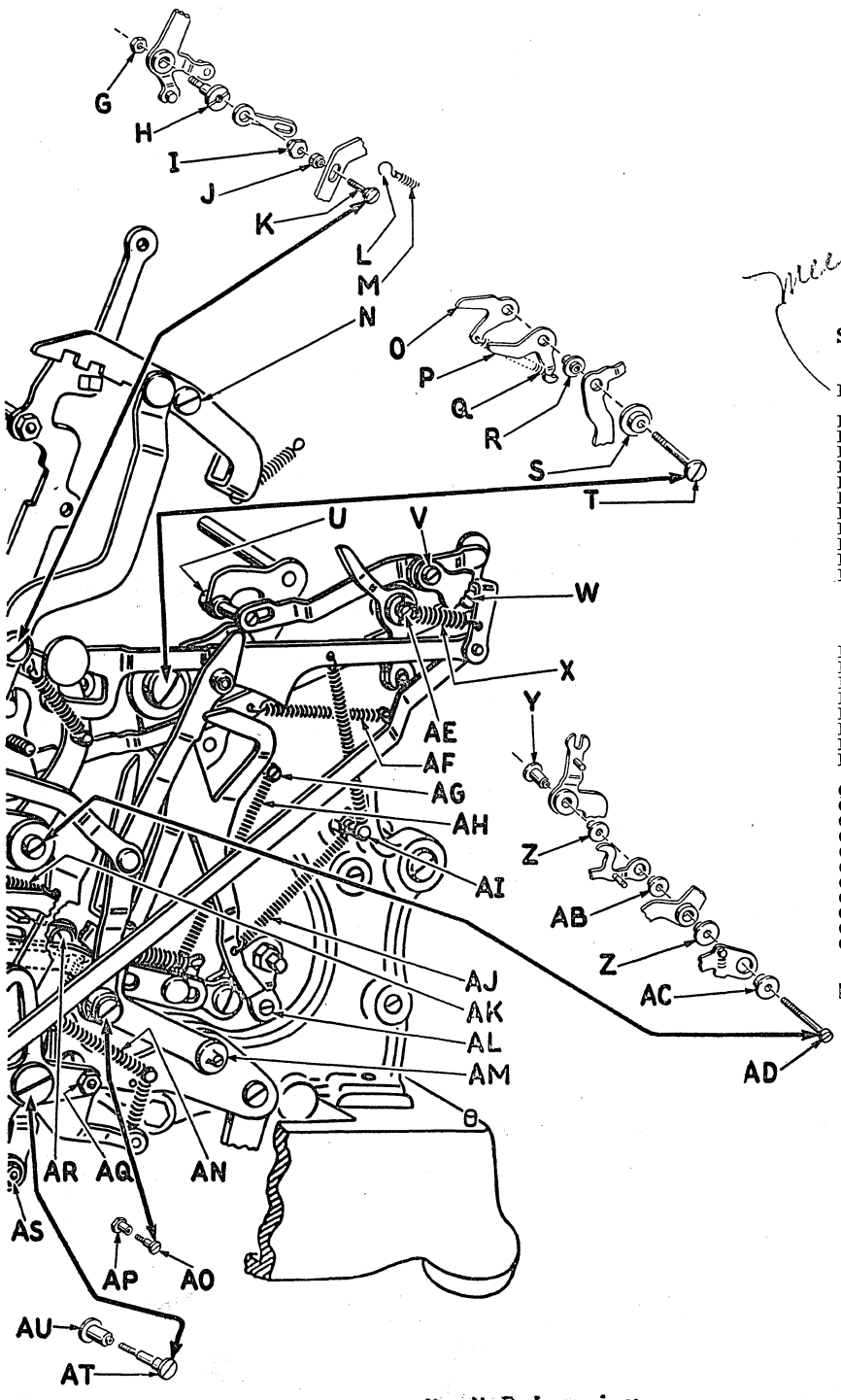
CROSSFOOTER TOTAL AND SUB-TOTAL MECHANISM—POSITIVE AND NEGATIVE—CARRIAGE CONTROLLED, IMPROVED, STYLE 2, WITH H903 (Plate 74-4)

SYMBOLS (Plate 74-4)

A 200827
B 60502 No. 1 use 46 nut
C 3456¾
D 82809
E 200634
F 7480B
G 47
H 60557
I 200489
J 60356
K 12059⅛A
L 20 No. 84 Spring anchor
M 3282 Spring
N 10056
O 60103
P 60102
Q 60800 Spring
R 200377 No. 1
S 200377½A
T 200630
U 46
V 4450⅝A
W 73612 Screw
X 2887
Y 10032
Z 200380 No. 1
AB 200380½
AC 200465½A
AD 200625A
AE 7064⅜ Screw
AF 200825
AG 200516½
AH 1086
AI 12053⅜
AJ 7382A
AK 10983
AL 103661
AM 200513½
AN 87800 No. 3
AO 950¾
AP 200462
AQ 46¼
AR 200654B
AS 46 Nut
AT 200658B
AU 931⅛ No. 2
AV 9280¾
AW 200566½
AX 12051⅞
AY 69809
AZ 200623A
BB 45⅞
BC 3450⅞ Style 9
BD 1-200816B
BE 200660 No. 2 Anchor screw
BF 200445 Anchor screw

Symbols continued on Next Page





SYMBOLS (Plate 74-4) —Continued

BG **200627** use 1097¾ lock washer
BH **10056**
BI **3350⅜**
BJ **200646C**
BK **10984¾ Style 17**
BL **709607**
BM **983**
BN **90607⅛**
BO **200229½A**
BP **200598**
BQ **69554**
BR **330 Fte. 207** use with printing control 8 position
200467 use without printing control 8 position
BS **200537⅛**
BT **72617**
BU **1-200819**
BV **146 Fte. 207 No. 8**
BW **952¾**, 2 required
BX **200621 No. 2**
BY **200501½**
BZ **12046⅝** use 200567½ screw
CB **12055¼B No. 1**
CC **154 Fte. 104**
CD **709333 No. 2**
CE **1-75332** use 75618 screw
CF **200342½**
CG **60804A** spring
CH **200621**
CI **12085½** spring
CJ **205801** spring
CK **200619**
CL **10932⅜**

For other symbols see Plate 74-3 and 74-5

Mr M R Lovejoy
Buffalo N Y Branch 10-5

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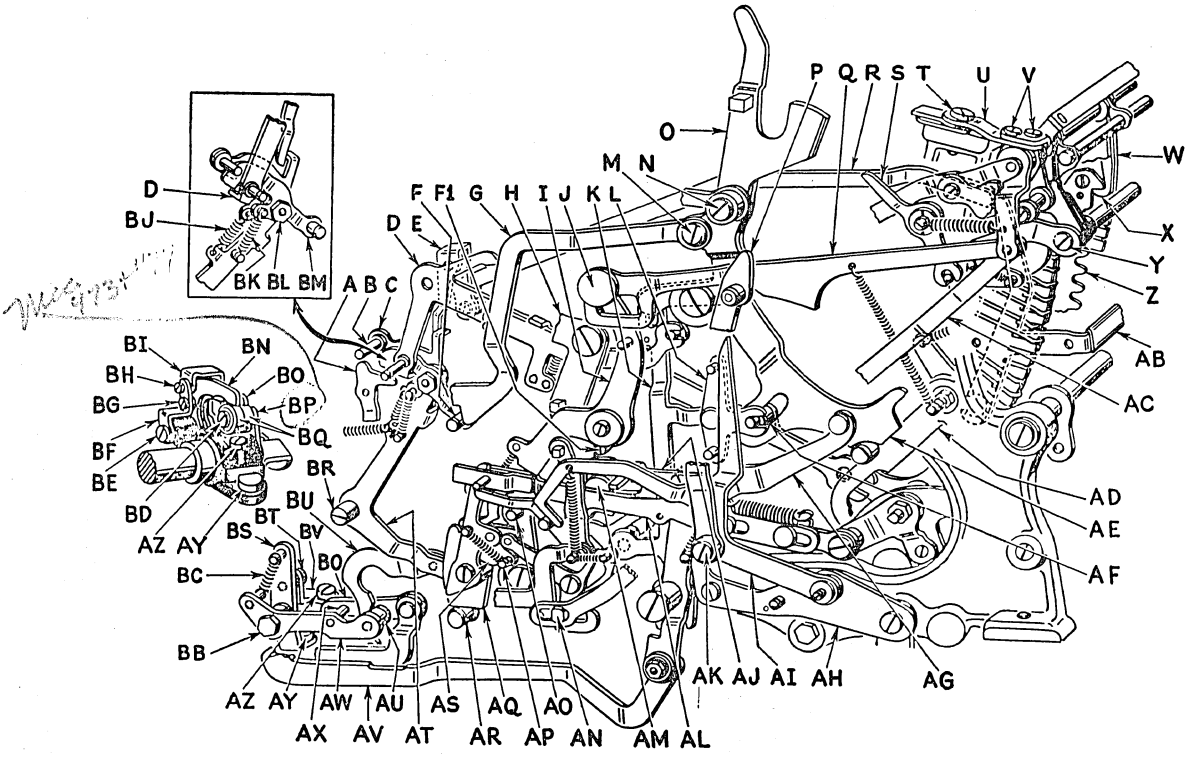
(Replaces corresponding pages dated 2-1-49)

SPACING STROKE MECHANISM, IMPROVED, CLASSES 21 THRU 30 WITH H903 (Plate 74-5)



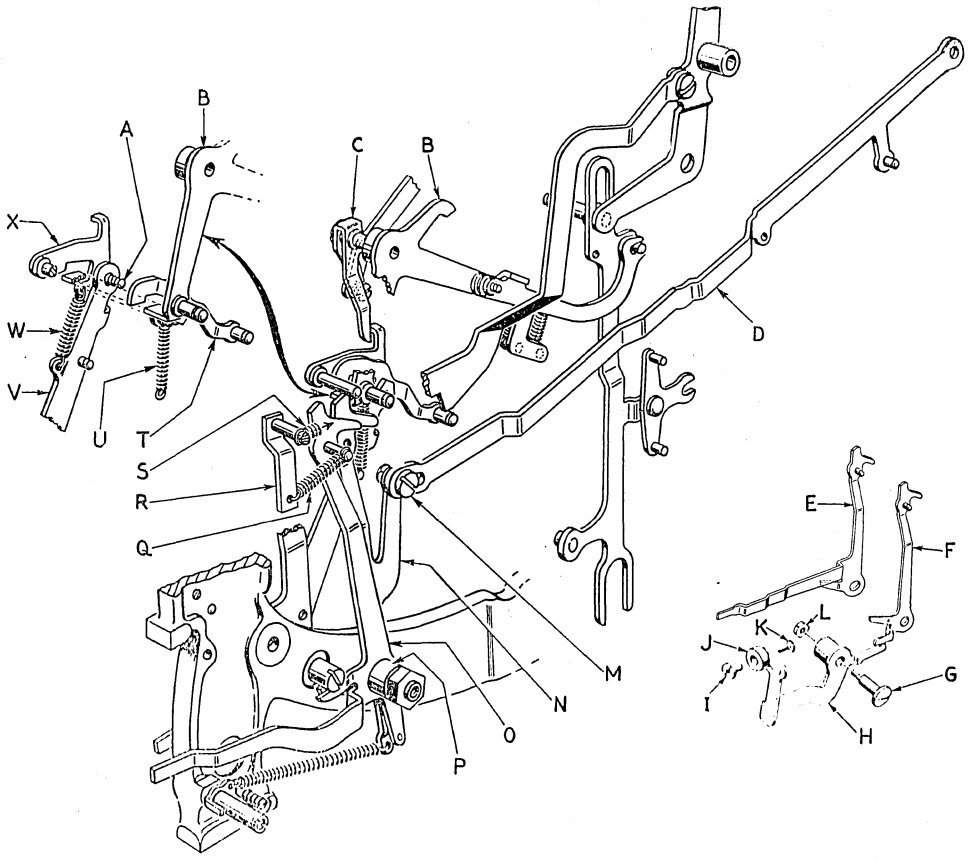
SYMBOLS (Plate 74-5)

A 200142½B* included in assembly 1-200142½B
B 44532* included in C
C **1-111¾ Fte. 104**
D **1-13¼A Fte. 124 No. 2**
E **115¾ Fte. 104**
F 12033⅝ Roller* included in BM
F1 **4462**
G **10016 No. 2**
H **1-200125½B**
I **11B-200122½**
J 200617* included in I
K 10019A No. 2* included in O
L 1-60145* included in O
M **10056**
N **60514 No. 2**
O **12A-60110A**
P **1-200121½ No. 2**
Q 200123½ No. 2* included in I
R **1-114 Fte. 104**
S **1-200165½**
T **9251⅝₆**
U **64108B**
V **952¾**
W Description
X **64107A P. 10, 12, 16**
Y **73612** screw
Z Description
AB **1-200145½C No. 2 thru 12** specify location of negative total lock
AC **200166½**
AD **1-10025**
AE **1-60120**
AF 10034* included in 1-10026
AG 60120* included in AE
AH **1-200154½A No. 1**
1-200154½A No. 2 for register totals
AI **1-200133½A**
AJ 200126½B* included in H
AK **950¾**
AL **1-209131B**
AM 200656* included in H
AN 200648* included in assembly 1-200135½A
AO **68503A No. 2**
AP 72359½*
1A-200131½ (1Z-200131½, 200131¼Z, 200447Z, 200623Z, 200627) Assembly Includes AP, AS
AQ **68118**
AR **738** roller, 257½ rivet
AS 1-200132½*
1A-300131½ (1Z-200131½, 200131¼Z, 200447Z, 200623Z, 200627) assembly includes AS, AP
AT **1-200146½A No. 2**
AU 302302* included in AW
AV **1B-200176½**
AW **1-200146¾**
AX 200587* included in AW
AY **200527** screw
AZ **653¾** screw
BB **709540**
BC **10082½**
BD **506 Fte. 209**
BE **8054¾**
BF **60152A**
BG **72581**
BH **70512**
BI **1-60116C No. 2**
BJ **182⅝ Fte. 104**
BK **63800**
BL **3434** use 3960 screw
BM **1-200146¾**
BN **1-60115C No. 2**
BO 200177½B* included in AV
BP 1-60177A* included in assembly 1A-60000 Style 17
BQ **1-60999,** 428 washer
BR **152¼ Fte. 104**
BS **1-200146⅝**
BT **73607** screw
BU 200146⅞* included in AT
BV **200146⅜** brace

For other symbols see Plate 74-3 and 74-4

SEE EXPLANATION ON INSIDE OF FRONT COVER

COMPLEMENTARY TOTALS AND SUBTOTALS—CARRIAGE CONTROLLED
(Plate 74-6)



SYMBOLS (Plate 74-6)

A **955⅝** use 3434 nut included in V
B **1-13¼A Fte. 124 No. 2**
C **115¾ Fte. 104** use 528 Fte. 207 screw
D **1-200142¾** included in N
E **1-115⅞B Fte. 104 Env. 903** use when roll controlled from control lever position 1
F **1-115⅞ No. 2 Fte. 104 Env. 903** use when skid controlled
G **200635**
H **1-200153½ No. 2 Env. 903**
I **200397½**
J **200396½**
K **200596½**
L **45**
M **200621 No. 2** included in N
N **1-200142½B No. 2 Env. 903** includes M, D
O **1A-200142½B Env. 903** use when roll controlled from control lever position 5
P **200446 Env. 903**
Q **7286½**
R **20 No. 114**
S **200824** spring
T **1-200146¾** included in V
U **63800**
V **1-200146½A No. 2** includes A, T, X
W **182⅝ Fte. 104**
X **1-111¾ Fte. 104** included in V

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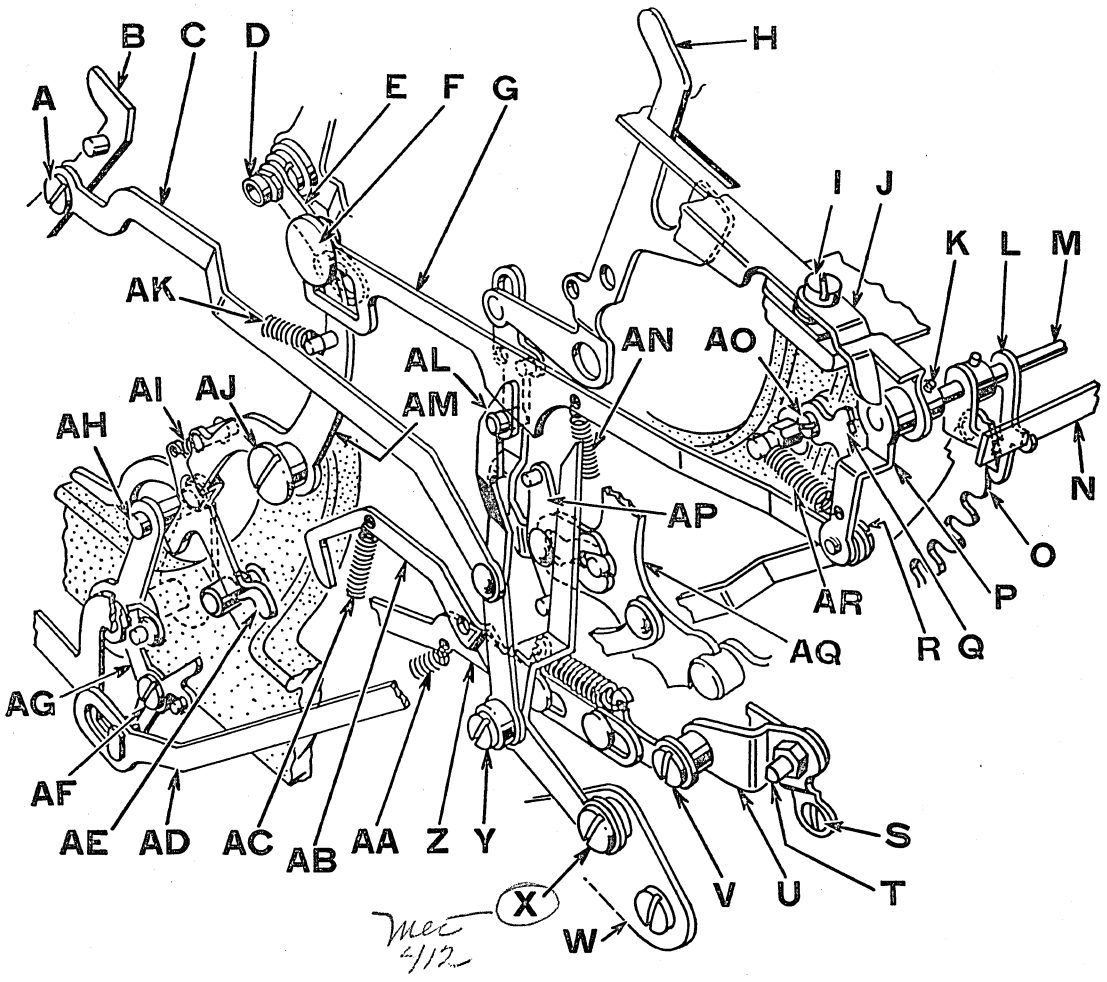
SPACING STROKE CONTROLLED FROM SUBTRACT SHIFT MECHANISM, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 75)



SYMBOLS (Plate 75)

A **200621** Eccentric, 46 nut
B **1-200130½**
C **200120½ (1-200121½ No. 2)**, Rivet 72021/2
D **60356** Collar, 72307 eccentric
E **200141½ (200141½A, 200489)**
F **200617**
G **200123½ No. 2**
H **12A-60110A**
I **7059**
J **64108**
K **1-89320 Style 10 (1-64307)** includes 75660 screw
L **64107** specify 10-12-16 pitch
M **1-64001 Style 13, 17 No. 3** includes N&P, used for all machines except 7 columns of adding
11-64001 Style 13, 17 No. 3 includes N&P, used for machines with 7 columns of adding
N Included in M
O **66106 No. 1 P. 10** see Plate 1, letter W, for other adding racks
P 1-64106*
Q **200129½**
R **203527**
S **73612**
T **209505**
U **209129**
V **209504** Eccentric, 46 nut
W **1-200154½B**, Screws 72617
X **200651 (200513½)**
Y **950¾** Screw, 200462 eccentric on inside
Z **1-209131B**, Heavy spring 1088
AA **681**
AB **1-200133½A**
AC **9280¾**
AD **200166½**
AE **200124½**, Rivet 200616
AF **79541**
AG **1-200135½**, Spring 12084¼
AH **68503A No. 2, 45⅞** Nut
AI **69809**
AJ **200625**
AK **4489 (83800A)**
AL **1-200121½ (1-200121½ No. 2)** includes C
AM **11-200122½ (11B-200122½, 200380 No. 1, 200198¾, 200465½A, 200625A)** includes F, G and AE
AN **983**
AO **519 Fte. 213**
AP **1-60145**, Rivet 60542
AQ **1A-10022**
AR **681⅛**

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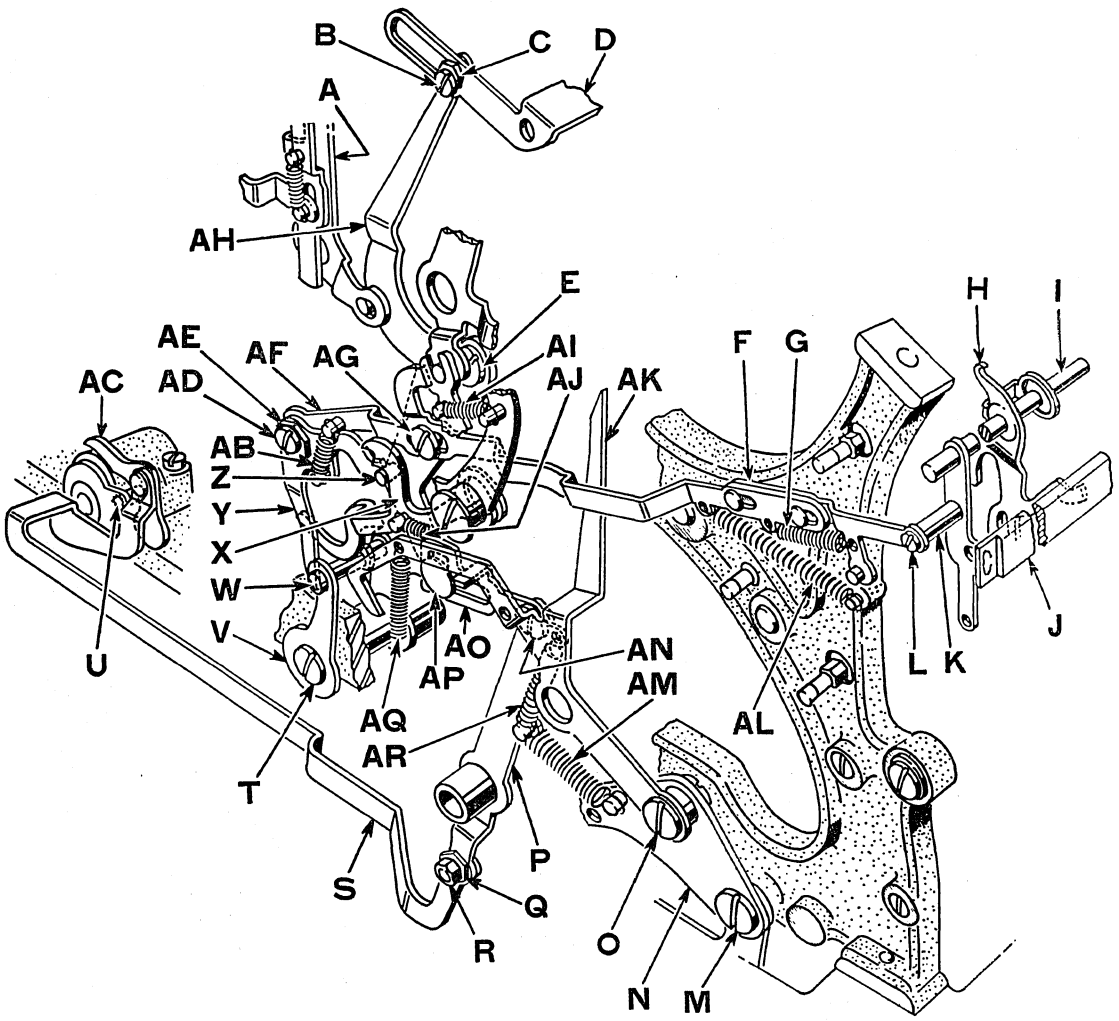
For Form 2963

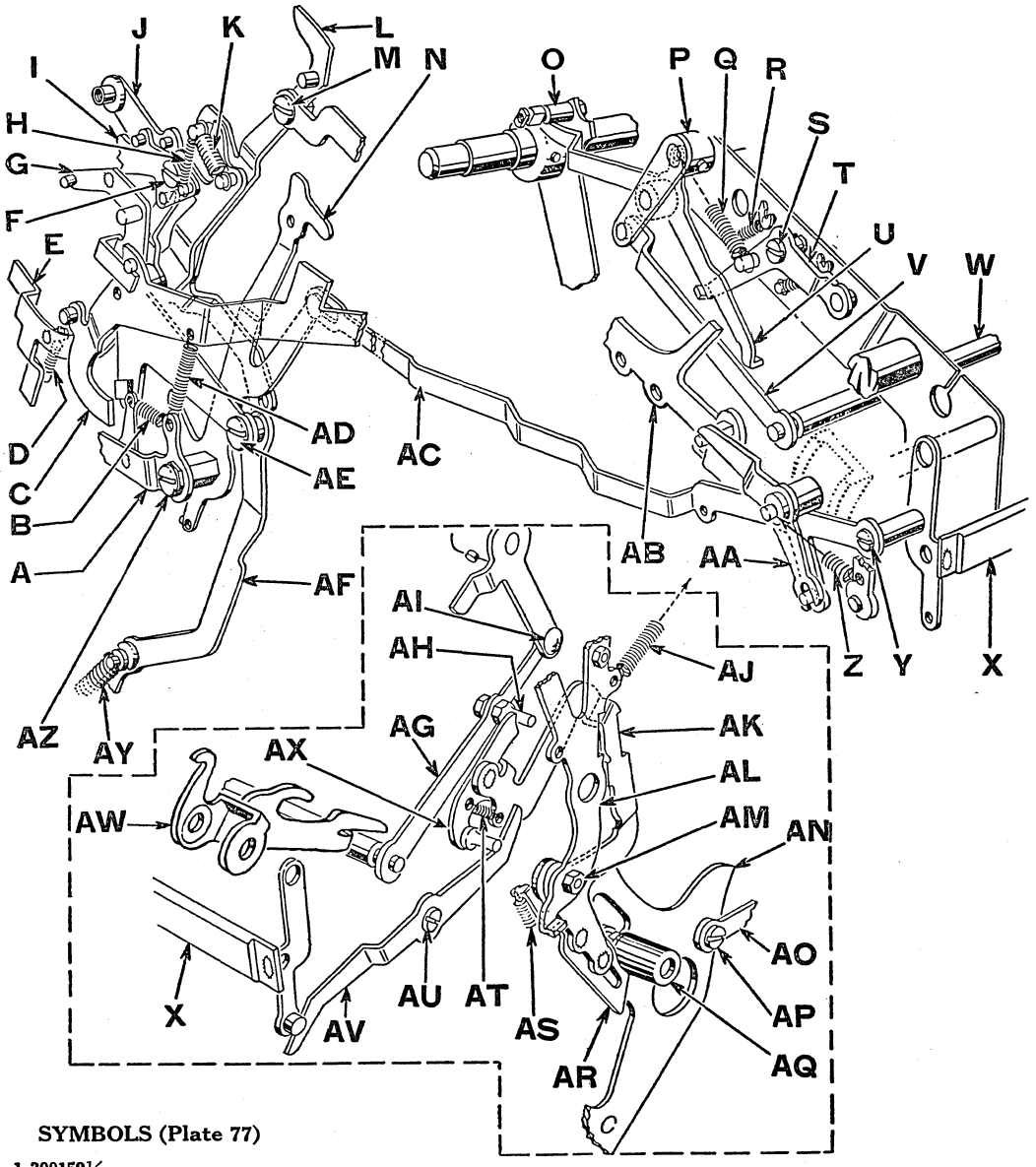
SECTOR BAR LOCK, EARLY, AND OTHER CONTROLS ACTUATED FROM MAIN (100) SECTION, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 76)



SYMBOLS (Plate 76)

A **1-200138½ (11-200138½ or 21-200138½)**
B **75615**
C **104380** Eccentric
D **21-221⅜**
E **200619**
F 1-200127¾* included in AF
G **89804 (709812)**
H **115 Fte. 206 No. 7**
I **1-64001 Style 13, 17 No. 3** see Plate 75, letter M
J 17¼B Fte. 124 Style 13, 17*
1-204129 Style 13 | Complete
1-204129 Style 17 | assembly
(1A-204129 Style 17) | includes J and K
K 204514*
L **73612**
M **72617**
N **1-200154½B**
O **200651 (200513½)**
P **1-200178½A (1-200178½B)**
Q **200398** Eccentric
R **46** Nut
S **1A-200176½** includes AC
T **120517⅞**
U **120381⅛** Roller, 60521 stud
V **68119**
W **68503A No. 2, 45⅞** Nut
X **1-200140½ (1-200140½ No. 2)**
Y **1-200175½A**
Z **200618**
AB **7282¼**
AC 200177½A*
AD **8357 (79505)** Screw, 46 nut
AE **200456 (1319 Fte. 209)** Eccentric
AF **1-200127½A No. 1** includes F, G
AG **200621** Screw, 46 nut
AH **1A-200125½** includes AO and AP
AI **4489 (83800A)**
AJ **10983**
AK **1-200133½A**
AL **780¼**
AM **87800 No. 3**
AN **200654A** Eccentric screw, 47 ¼ nut
AO 200126½B*
AP 200656*
AQ **9280¾**
AR **182⅝ Fte. 104**

SECTOR BAR LOCK MECHANISM AND PRIMARY OPERATING SECTION TO RELEASE ADDING RACKS, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 77)



SYMBOLS (Plate 77)

A **1-200159½**
B **7287 Style 5**
C **1-200161½ No. 2 (1-200158½B, 1-200161½)** for totals only
1-200161½ for totals and sub-totals
D **1-200819**
E **1-200136½ Style 13, 17**
F **200621** Screw, 46 nut
G **1-200158½B** for totals and sub-totals
11-200158½B for totals only
H **283A**
I **1-200130¼**
J **1-285A No. 2 Env. 903**
K **200815A**
L **1-200130½** Early
1-200130½A (1A-200130½A, 200136½B)
M **200621** Screw, 46 nut
N **1-200142½A Env. 1834**
O **250¼A** Screw, 46 nut
P **31-204A Style 17** includes U, V and AG
Q **986**
R **284**
S **75615** on shaft **1-200⅝** Style 17 No. 3
T **1-182 Env. 1834**
U Included in P
V Included in P
W **209 Style 9, 11, 13, 15, 17**
X **1A-204129 Style 17**
Y **73612**
Z **12083** Spring, 1059 spring stud
AA **1-200165½** uses 200389 bushing
AB **41A-62103** without keyboard register selection
51A-62103 with keyboard register selection, specify machine number
AC Included in N
AD **480¼**
AE **10056**
AF **1-200182½ (1-200182½A)**
AG Included in P
AH **256¾** Screw stud, **1097¾** washer, 46 nut
AI **263** Rivet
AJ **780⅜**
AK Included in AR
AL Included in AR
AM Included in AR
AN **2B-311⅛**
AO **1B-12016⅛** or **21-12016⅛** for combination cge. return or vertical space bar
AP **12059⅝**
AQ Included in AN
AR **1A-215⅛ No. 3 (1C-215⅛ No. 3, 200233½A, 20 No. 114, 69809, 203423 No. 4)** includes AK, AL, AM and AX
AS **7285½A**
AT **9586**
AU **1527 Fte. 214** if multiple skip
12051⅝ if not multiple skip
AV **181 Env. 1834 (200233½A, 20 No. 114, 69809, 203423 No. 4)**
AW **415 No. 1**
AX Included in AR
AY **1-200816A (1-88800B)**
AZ **4456½** Screw, 75342 eccentric, 200646 post

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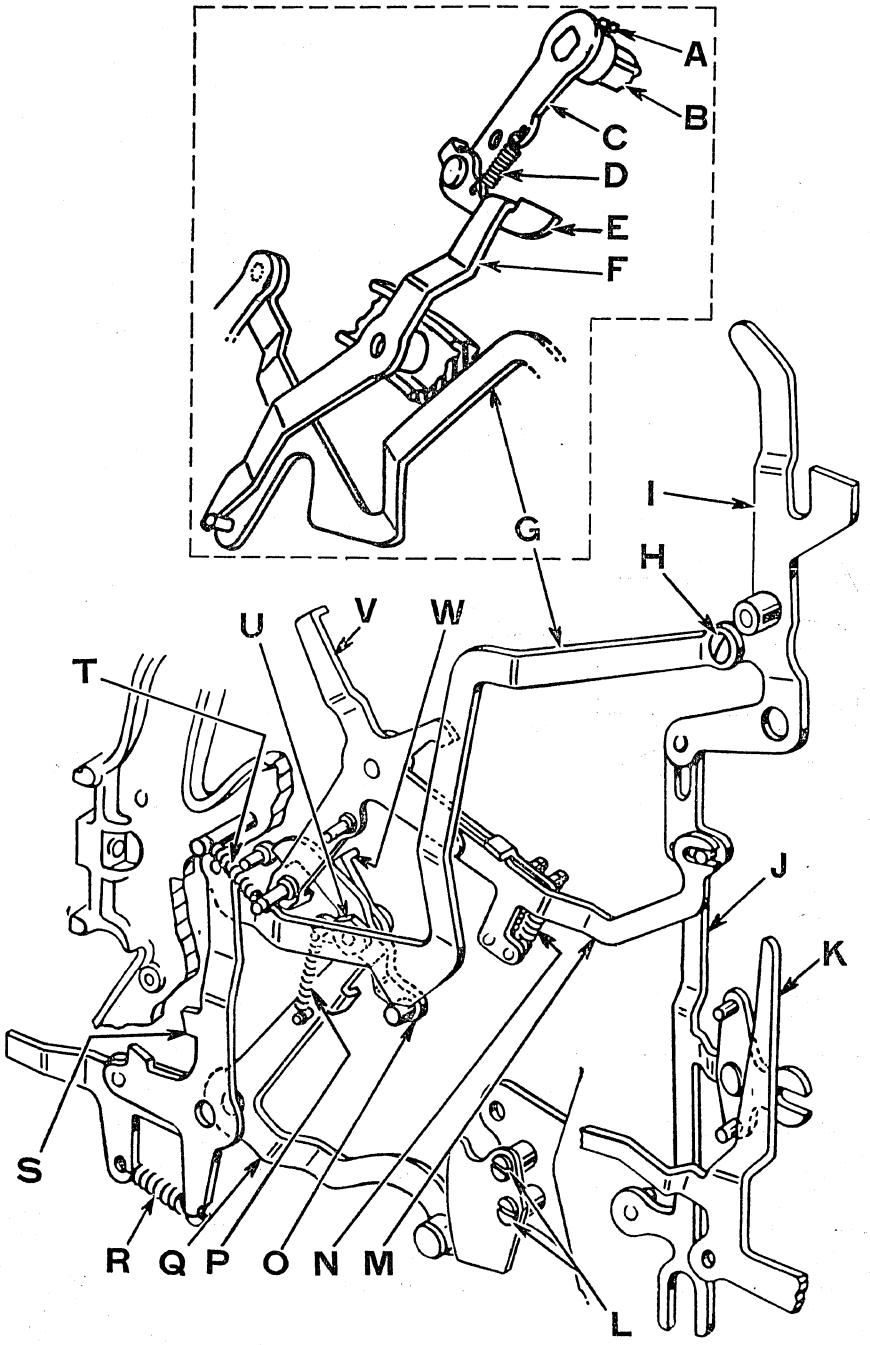
SUBTRACT MECHANISM JOINTLY INDEXED FROM SUBTRACT LEVER, CREDIT BALANCE, UPPERMOST BAR, CARRIAGE AND MACHINE OPERATION CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 78)



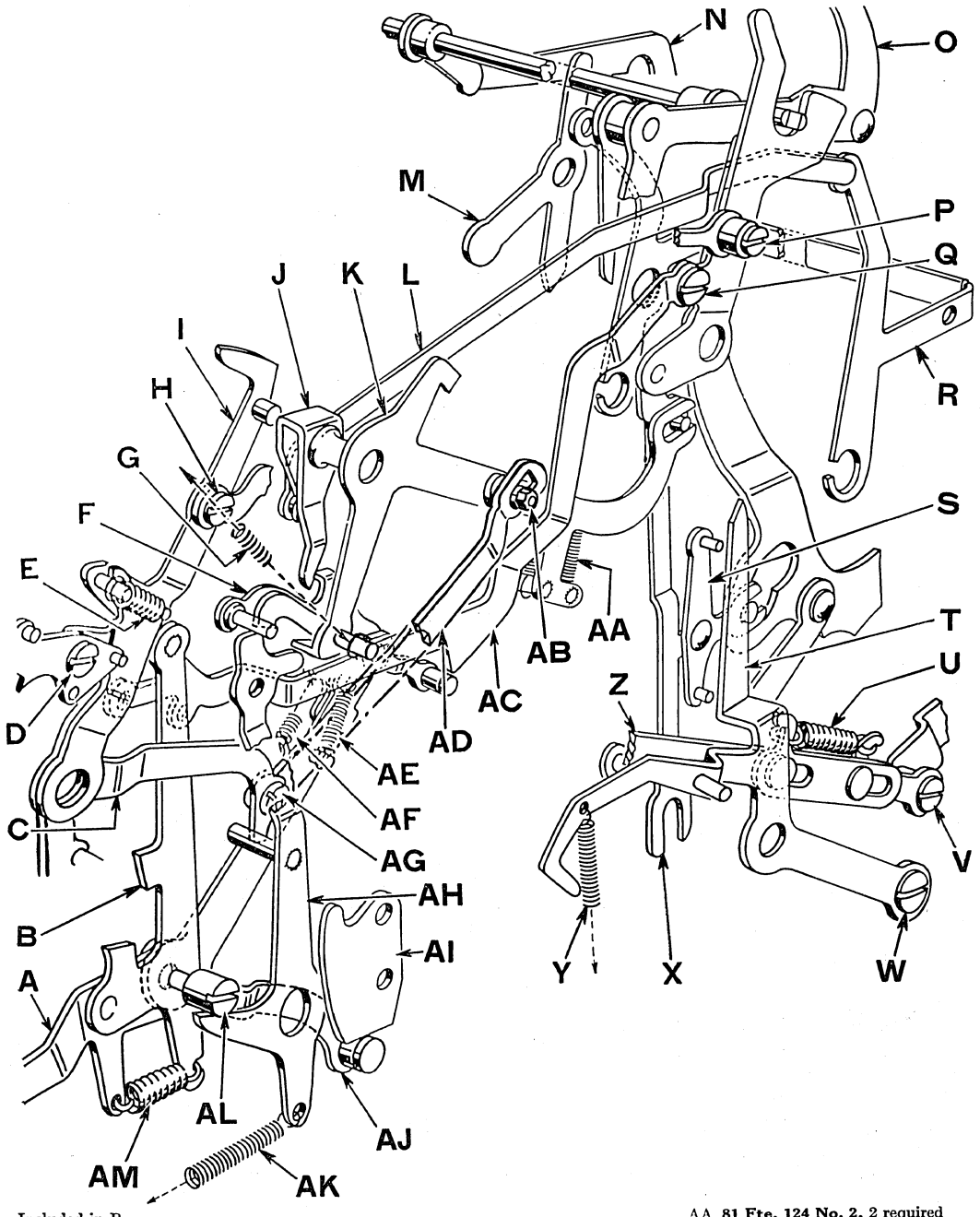
A 72573
B 1-12007 Style 13, 17 No. 1 (1-12007 Style 13, 17 No. 4, 1-540)
C 1-12024 No. 20
D 10686½
E 12025½* included in C
F 1-13¼ Fte. 124 No. 2 Env. 903
G 10016 No. 2
H 10056
I 12A-60110A

SYMBOLS (Plate 78)

J 10019A No. 2* included in I
K 1-200133½A
L 957½ Screws, 200631 screw space collars
M 1-13½ Fte. 124 No. 2
N 81 Fte. 124 No. 2, 2 required
O 1-200146¾ included in Q
P 63800
Q 1-200146½A No. 2
R 10088A
S 1A-114⅝ Fte. 104 Style 13, 17
11-114⅝ Fte. 104 Style 17 No. 2 used for H903 thin control and cam construction
T 3880½
U 3434 Nut, 3960 screw
V 1-13¼A Fte. 124 No. 2
W 1-111¾ Fte. 104 included in Q

SEE EXPLANATION ON INSIDE OF FRONT COVER

CREDIT BALANCE INDEXING MECHANISM, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 79)



A Included in B
B **11-114⅝ Fte. 104 Style 17 No. 2**
C Part of I
D **200621** Screw, 46 nut
E **200815A**
F **1-111¾ Fte. 104** included in AJ
G **3880½**
H **200621** Screw, 46 nut
I **1-200130½A (1A-200130½A, 200136½B)**
1-200130½ Early
J **115¾ Fte. 104** uses 154 Fte. 104 and 10056 screws
K **1-13¼A Fte. 124 No. 2**
L **1-114 Fte. 104**
M **21-10416A**
N **1-10214A**

SYMBOLS (Plate 79)

O **1-62127**
P **705603 No. 2** Screw, 200377 No. 1 collar
Q **10056**
R **1-200145½C Nos. 2 thru 12** specify location of negative total lock
S **1-60145** included in X
T **1-200133½A**
U **1088**
V **209504** Screw, 46 nut
W **200651**
X **12A-60110A**
Y **9280¾**
Z **1-209131B**

AA **81 Fte. 124 No. 2,** 2 required
AB **51½ Fte. 124** Screw, 49 nut, 200283 washer
AC **10016 No. 2**
AD **130A Env. 1370**
AE **63800**
AF **182⅝ Fte. 104**
AG **510A Env. 1370 No. 2**
AH **1-200142½ (1A-200142½, 344 Fte. 203)**
AI **68118**
AJ **1-200146½A No. 2** uses 3960 screw, 3434 nut
AK **983**
AL **152¼ Fte. 104**
AM **10088A**

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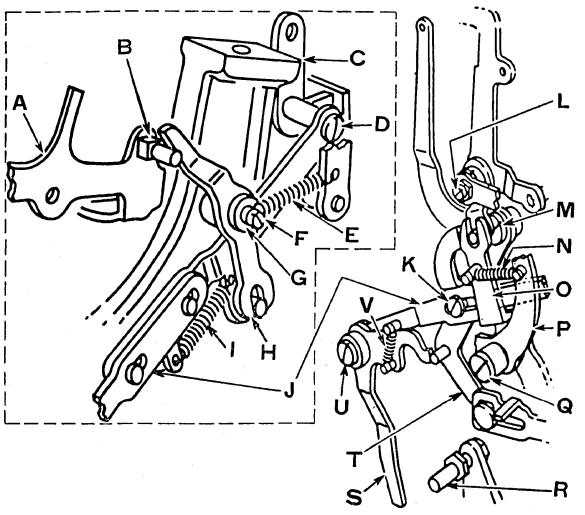
REGISTER TO TOTAL AND SUB-TOTAL FROM REGISTER TOTAL INDEXING LEVER, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 80)

SYMBOLS (Plate 80)

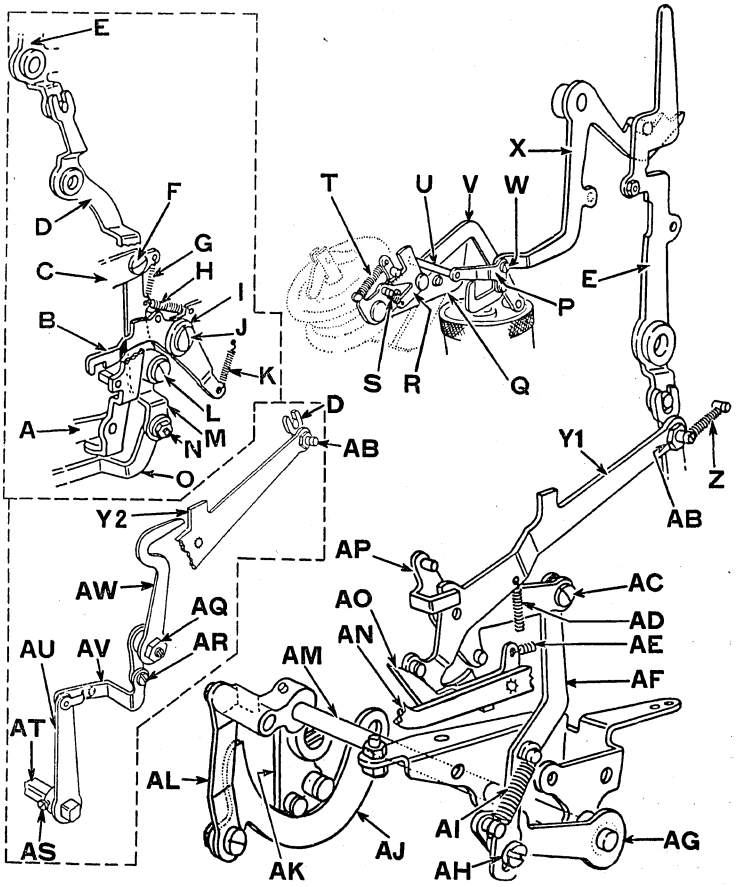
A **21A-62103**
B **62511A**
C **1-204129 Style 17 (1A-204129 Style 17)**
D **73612**
E **12083**
F **1059**
G **200389**
H **1-200165½**
I **89804 (709812)**
J **1-200127½A No. 1**
K **200621** Screw, 46 nut
L **72307** Eccentric, 550¾ screw
M **200619**
N **4489 (83800A)**
O **11-60101 No. 2** uses 1062½ screw stud
P **11-200122½ (11B-200122½, 200380 No. 1, 200198¾, 200465½A, 200625A)**
Q **200625**
R **68503A No. 2,** 45⅞ Nut
S **1-200175½A**
T **1A-200125½A**
U **8357 (79505)** Screw, 1319 Fte. 209 eccentric, 46 nut
V **7282¼**



REGISTER TOTAL INDEXING LEVER INDEXED BY CARRIAGE AND SHIFTED BY DRIVE MECHANISM, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 81)

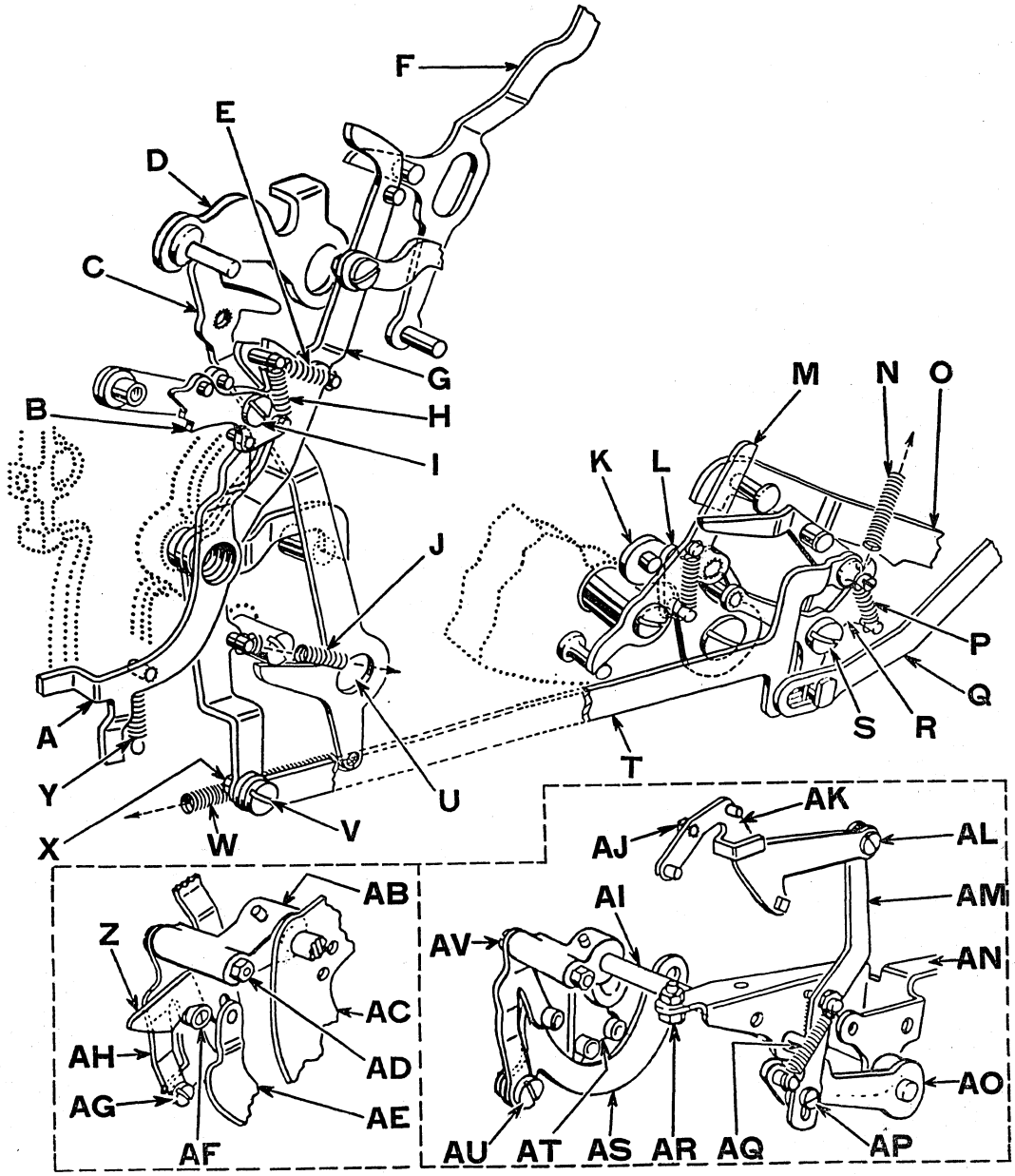
SYMBOLS (Plate 81)

A 200163* included in D
B **1-254 Fte. 200 No. 3 (1-254A No. 3 Fte. 200, 550A Fte. 200)**
C **1A-200125½A**
D **11-60101 No. 2**
E **41-60100**
F **200654A** Eccentric, 47¼ nut
G **82809**
H **182⅝ Fte. 104**
I 120351¼*
J **307519 (550 Fte. 200)**
K **489**
L **200658A**
M **1-200178½B**
N **3826½** Washer, 46 nut
O **1A-200176½**
P 1-62129* (1-62109 No. 2*) included in X
Q **1-200183½** includes R, S, T, V
R 200185½* included in Q
S **84810 (72820)**
T **72834**
U 62513*
V **1-200184½**
W **73563**
X **1-62109 No. 2**
Y1 **1-200161½**
Y2 **1-200161½ Env. 1813**
Z **4489 (83800A)**
AB **79362** Eccentric nut, 200647 No. 2 screw
AC **10056**
AD **480¼**
AE **7287 Style 5**
AF **1-200182½ (1-200182½A)**
AG **1-200179½** included in AM
AH **83568 No. 2,** 200399 Nut
AI **1-200816A (1-88800B)**
AJ **1-201130A**
AK **1-201105A**
AL **201131**
AM **1B-200006 Style 17**
AN **1-200159½** used with control rolls **1-200159½ No. 2** used with skid control
AO 200160½* included in AN
AP **1-200158½B**
AQ **200646B Env. 1813, 4456½** Screw
AR **7262½** Rivet
AS **72573**
AT **12008 Style 13, 17 No. 1**
AU **11-12025 No. 26 Env. 1813**
AV 1-102 Env. 1813* included in AW
AW **1A-300 Env. 1813 (1-100B Env. 1813)**



SEE EXPLANATION ON INSIDE OF FRONT COVER

CROSSFOOTER TOTAL AND SUB-TOTAL CARRIAGE CONTROLLED, INDEXED FROM CARRIAGE AND DRIVE TO SECURE EASY TABULATION, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 82)



SYMBOLS (Plate 82)

A **200136½A**
B **1-200130¼**
C **1-200142½A**
D **1-200146½A No. 2**
E **200815A**
F **1-200143½** (**1-200143½ No. 2**) use screw 200342¼
G **1-200130½** Early
1-200130½A (**1A-200130½A, 200136½B**) Later
H **283A**
I **200621** Eccentric, 46 nut
J **10984½ Style 17**
K **68119**
L 1-200132½* included in M
M **1A-200131½** (**1Z-200131½, 200131¼Z, 200447Z, 200623Z, 200627Z**)
N **9280¾**
O **1-209131B**
P **12084¼**
Q **200166½**
R **1-200135½**
S **79541**
T **200137½** use screw 200502½ in upper arm
U **200626A** Screw
V **200621** Eccentric
W **983**
X **46**
Y **1-200819**
Z 201137A* complete assembly 1A-201136 Style 17
AB 200913A* included in AI
AC **1-201129 No. 2**
AD **47** Nut
AE 1-201140* complete assembly 1-201139
AF **201331** Roll, 201536 screw and 47 nut
AG **83508 No. 2, 46** Nut
AH **201131B**
AI **1B-200006 Style 17**
AJ 302518*
AK **1-200158½B,** Screw shaft 200537⅛, 69554 hex. screw
AL **10056**
AM **1-200182½** (**1-200182½A**)
AN **1-169 Fte. 216 No. 2** use set collar 1-540—screw 550¾
AO **1-200179½** included in AI, use pin 63½
AP **83508 No. 2,** 200399 Nut
AQ **1-200816A** (**1-88800B**)
AR **3649** Nut—3415¼ washers
AS **1-201130A,** 201315 Nut
AT **1-201105A**
31-201002A (**31A-201002A**) complete assembly
AU **83508 No. 2, 46** Nut
AV **200659B, 1097⅞** Washer, 47 nut

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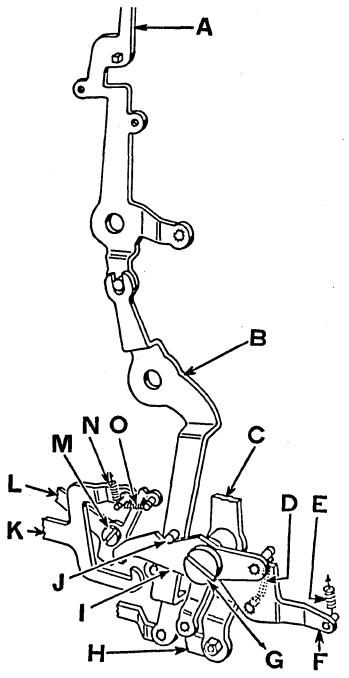
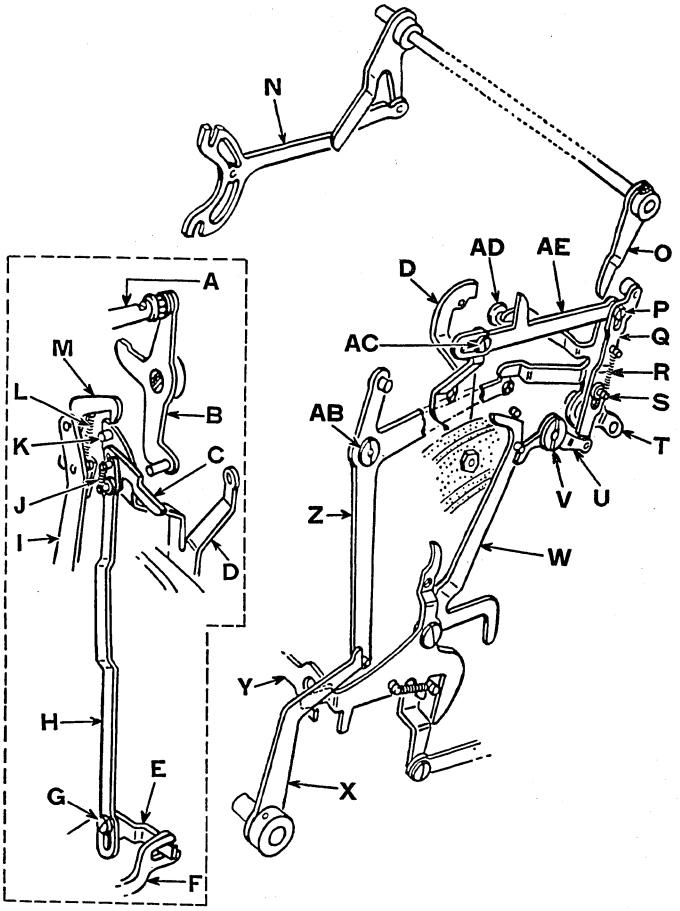
REGISTER TOTAL INDEXING LEVER AND MACHINE OPERATION TO DISABLE CROSSFOOTER AND REGISTER TOTAL AND SUB-TOTAL MECHANISM CARRIAGE CONTROLLED, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 83)



SYMBOLS (Plate 83)

A **41-60100**
B **1-60101 No. 2 Env. 903 (1-60101 No. 2)** for Class 21
11-60101 No. 2 Env. 903 (11-60101 No. 2) for Class 22 thru 30
C **1-200178½A Env. 903 (1A-200178½B)**
D **7480B**
E **7480B**
F **1-254½ Env. 903 (1-200174¾)**
G **200658A Env. 903**
H **1-200176½**
I **1-200174½ Env. 903 (1-200174½A)**
J Included in B
K **200137½**
L **1-200135½ Env. 903 (1-200135½A)**
M **79541**
N **9280¾**
O **12084¼**

TOTAL SYMBOL, RIBBON SHIFT, NON-ADD AND REPEAT RELEASE MECHANISMS, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 84)

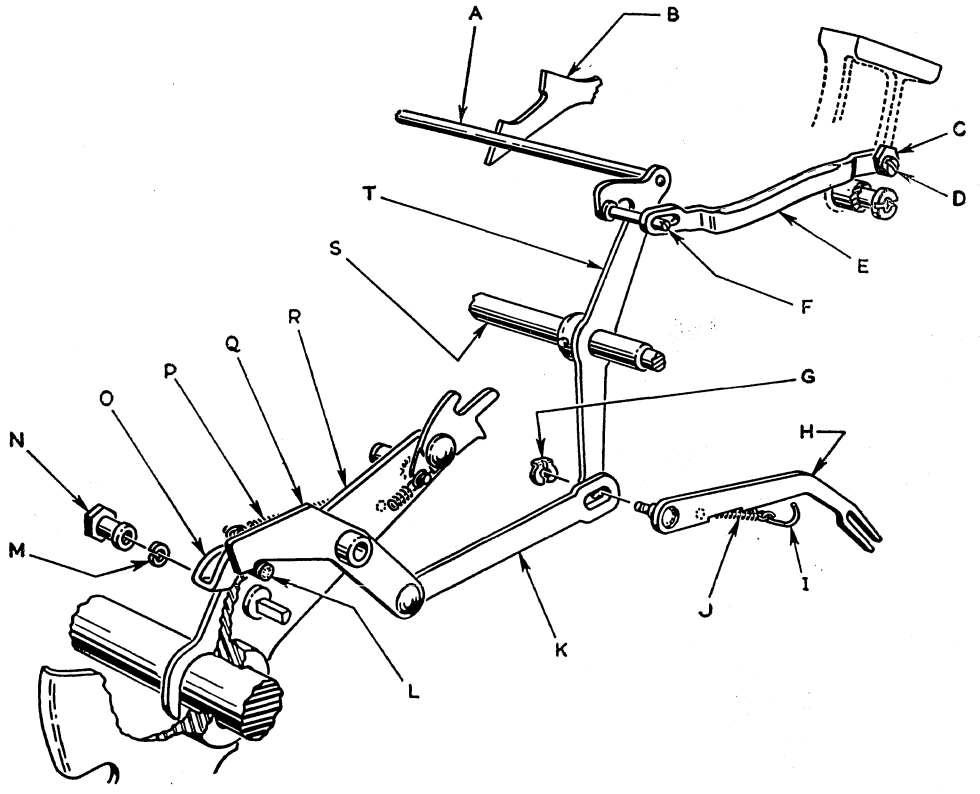


SYMBOLS (Plate 84)

A **1-202002R** see Plate 7, keyboard book for other styles
B 1-219L No. 2*
C **1-122171/4** part of D
D **1-122165/8A No. 2 (1-122165/8C, 2 req., 12238, 2 req., 120551/4B No. 1)** includes K
E **11-208 Fte. 200**
F **60127C Style 13, 17**
G **200500½**
H **1-200150½A**
I **1-205122 Style 13, 17 No. 3**
J **12085½** Spring
200632 (120627/8) Screw
K **3503/8 No. 2***
L **205801**
M **1-205123 No. 2** part of I
N **1-202110** use rivet 263
O 1-62128* complete shaft assembly 1-62002 Style 17 No. 2
P **28577/8 (4857½)**
Q **1-200152½**
R **71803**
S **200634**
T **11-200138½**
U **1-200149½** use collars 79314 and 709333 No. 2
V **200342½**
W **1-200130½A (1A-200130½A, 200136½B)**
X 1-200215R*
Y **11-273/8A Fte. 99 No. 2 Style 13, 17**
Z **1-200216A No. 3 (1-200216C No. 1)**
AB **200342**
AC **200621**
AD **1-60126 No. 2**
AE **200151½ No. 1 (200151½A, 200151¾, 957½, 2 req.)** included in T

SEE EXPLANATION ON INSIDE OF FRONT COVER

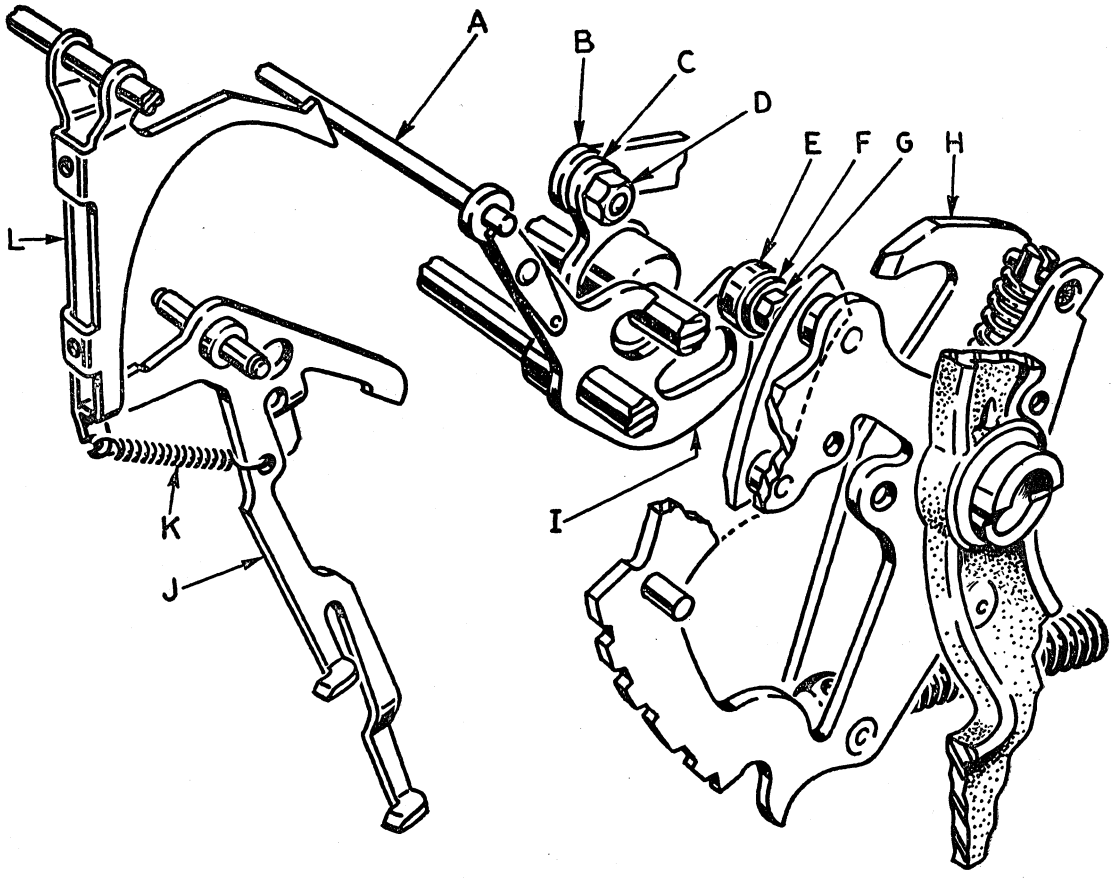
CARRY PAWL RESETTING MECHANISM—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 85-1)



SYMBOLS (Plate 85-1)

A **902½A Style 17**
B **411A No. 2**
C **200472** eccentric
D **72614** screw; use 200472 eccentric, 64101A, 64302 collar and 64301A nut
E **200128½**
F **69522**
G **21 No. 7**
H **1-209132**
I **20 No. 73**
J **10086** spring
K 209127 No. 2* included in Q
L 203443* included in O
M **1097¾**
N **68305**
O **1-68116A Style 17** includes L
P **1-68800A** spring
Q **1-209128 No. 2** includes K
R **11-68000 Style 17**
S **41-209004 Style 17** includes F, T
T 21-209122* included in S

CARRY RESET MECHANISM, IMPROVED (Plate 85-2)

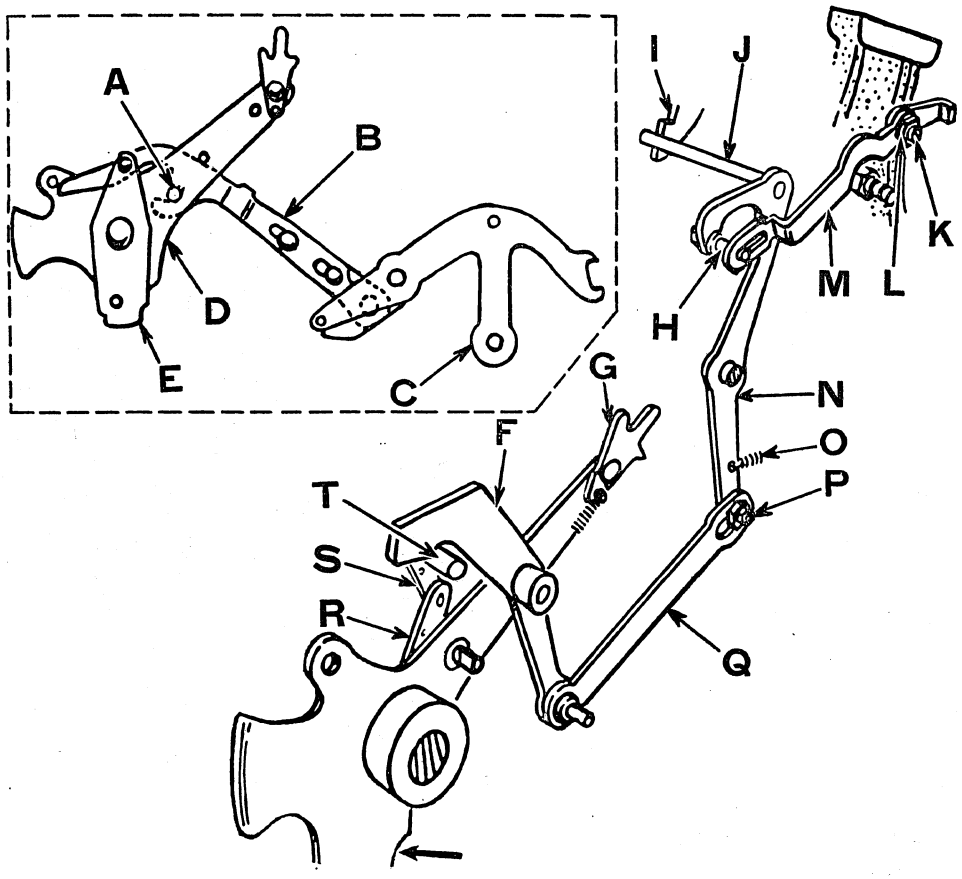


SYMBOLS (Plate 85-2)*

A **902⅓A Style 17**
B **205546** screw
C **1097⅞** lock washer
D **47**
E **1-60999** roller bearing
F **3826½** washer
G **46¼**
H **22C-311⅛**
I **21A-209004 Style 17**
J **1-10413A**
K **480¼**
L **411A No. 2**

*(Plate 85 continued on following page)

REVERSE PULL-IN AND CARRY PAWL RESETTING MECHANISM, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 85)

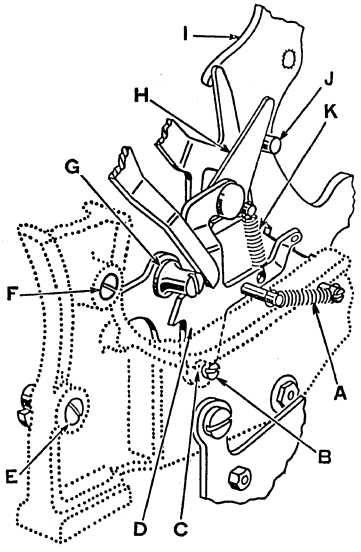


SYMBOLS (Plate 85)

A	**68305** Roller, 10856½A eccentric screw stud
B	**1-209124 No. 2 (1-209124A No. 2)**
C	1A-69210L*
D	11-68113A*
E	Included in D
F	**1-209128A** uses collar 209303B, screw 52519
G	**1-821B**
H	**69522**
I	**411 No. 2**
J	**902½A Style 13, 17**
K	**519 Fte. 213**
L	**75342** Eccentric
M	**200128½**
N	11-209122* on 21-209004 Style 17
O	**10984½**
P	**209302** Eccentric; 79547 screw
Q	Included in F
R	**1-68116A Style 17**
S	Part of R, uses spring 10085
T	**68503A No. 2**

DETENT TO HOLD CROSSFOOTER IN MESH UNTIL THE RETURN STROKE IS COMPLETED, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 86)

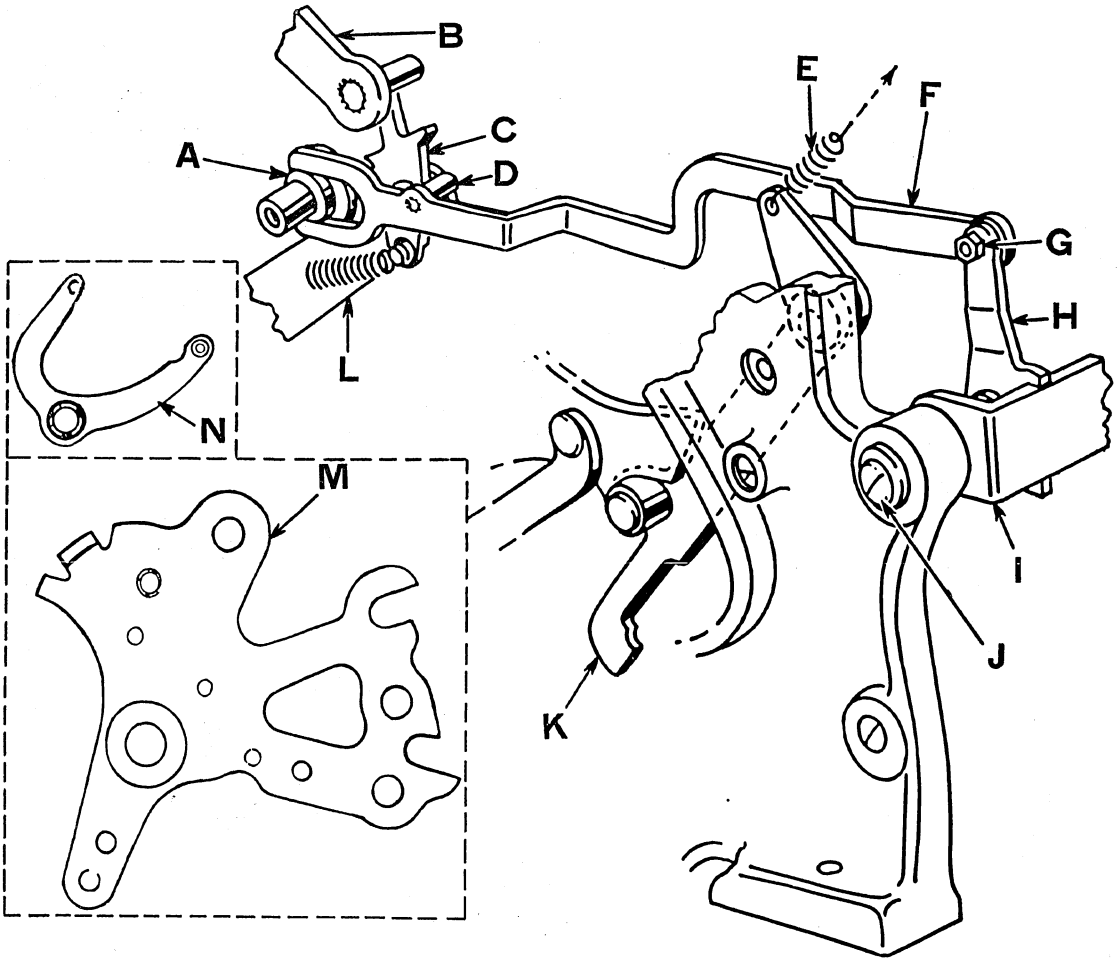
(For H903 machines of 10 or more columns capacity)



SYMBOLS (Plate 86)

A	**79810**
B	**12051⅜**
C	**701356**
D	**1-200231½**
E	**1050** 1/16 Screw and 10037 bushing
F	**255⅛**
G	**69557**
H	Part of D
I	**12B-311⅛ or 22B-311⅛** for H1358
J	Included in I
K	**51802**

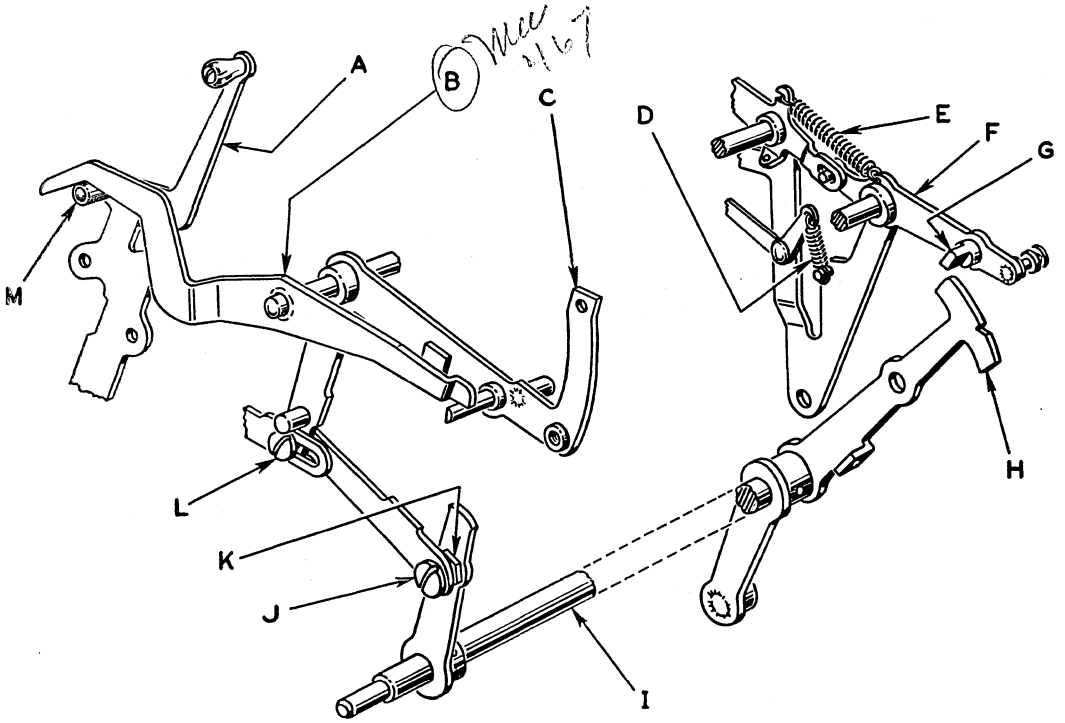
CROSSFOOTER MESHING PAWL DISABLED BY SAFEGUARD SYMBOL MECHANISM, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 87)



SYMBOLS (Plate 87)

A	**10032 Env. 903**
B	**1-10913 No. 2 (1-69215½)**
C	**1-821B**
D	Included in F
E	**3283**
F	**1-275 Env. 903**
G	**200621** Eccentric screw, 306105 Env. 903 bushing, 46 nut
H	**1-276 Env. 903**
I	**1-108A Fte. 209 Style 13, 17**
J	**204300 Env. 903** Collar, 3455⅜ screw
K	**1-10025 Env. 903 (1-10025)**
L	**11-68113A Style 13, 17** includes C
M	**1-69211L Env. 903**
N	**1-69214 Env. 903**

INTERLOCK TO PREVENT INDEXING OF MOTOR BARS, CONTROLLED THROUGH THE REGISTER TOTAL INDEXING LEVER—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 88-1)



SYMBOLS (Plate 88-1)

A **1-60100 No. 5** includes M
B **1-62217**
C **1-62127**
D **489**
E **10788**
F **1-201123 No. 2** includes G
G 201508* included in F
H 11-204117* included in I
I **21-205002 Style 17** includes H
J **4456½** screw, use 1097¾ washer and 46 nut
K **203495** eccentric
L **200610½** screw, use 200441 nut
M **1033** roller. use 1052⅝ rivet

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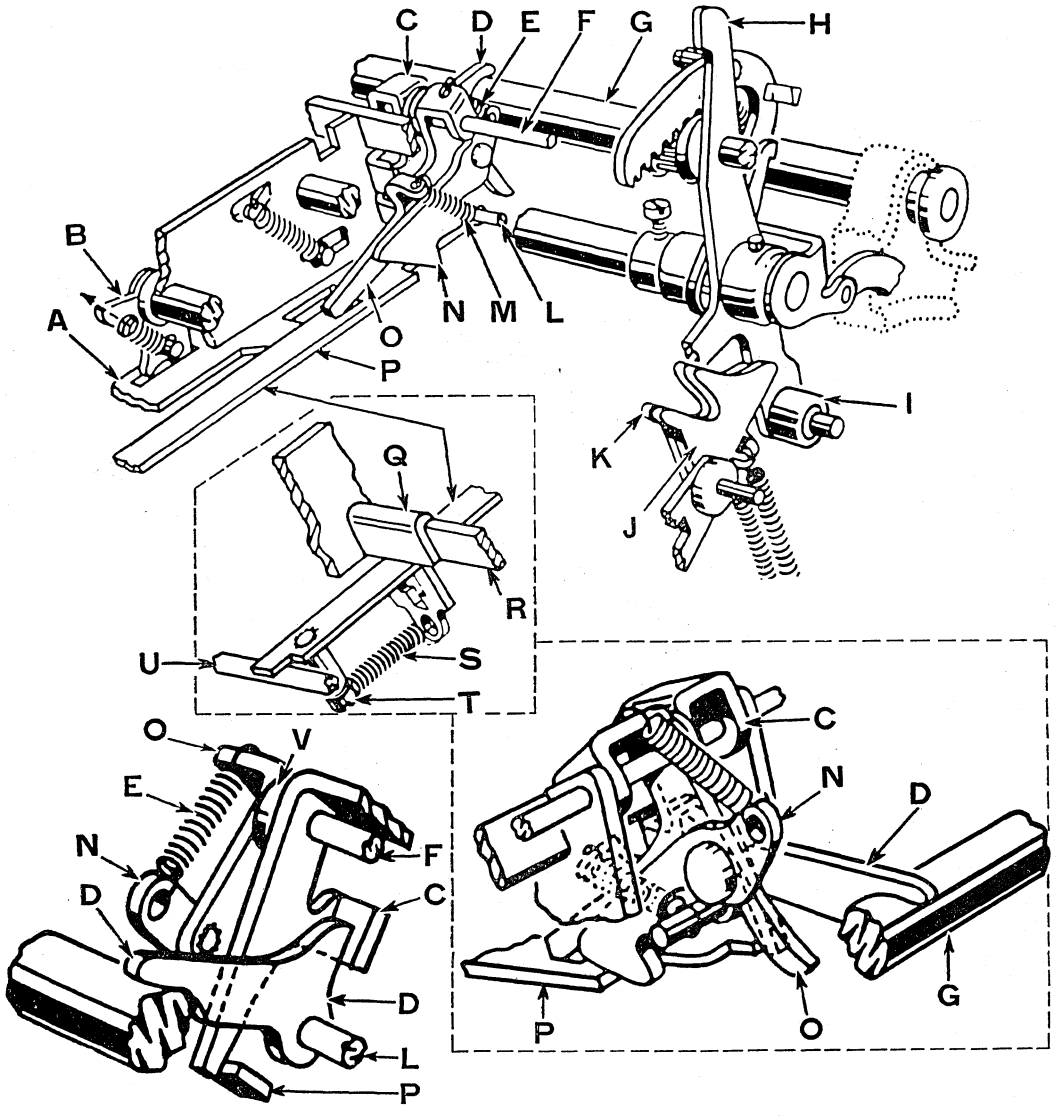
INTERLOCK TO PREVENT DEPRESSION OF KEYS ON KEYBOARD DURING AN OPERATION BEFORE TAKING AUTOMATIC CROSSFOOTER TOTALS CARRIAGE CONTROLLED, CLASSES 22 THRU 30 WITH H903 MECHANISM (Plate 88)



SYMBOLS (Plate 88)

A **214 No. 1** see reference chart, plate 65, keyboard symbol list for other styles
B **1-217AR**
C **202135**
D **202132**
E **89801**
F **1-200¾ Style 17**
G **1-202005 Nos. 1 thru 7** specify machine number, see Plate 7 in keyboard symbol list
H 1-202119R* includes I
I **202400A** Roller, 202503A stud
J **623 No. 2** Long
K **623 No. 3** Short
L **1-200¾ Style 17**
M **7282¼**
N 202131* included in O
O **1-202130** includes N
P **1-202133**
Q **202134**
R **224 Stylo 17**
S **60807**
T **52516** included in P
U **402B Style 7, 9, 11, 13, 15, 17**
V **81125 (202140)**

NOT SHOWN

111R Fte. 206 No. 6 (411¼R No. 2)
111L Fte. 206 No. 6 (411A No. 2)

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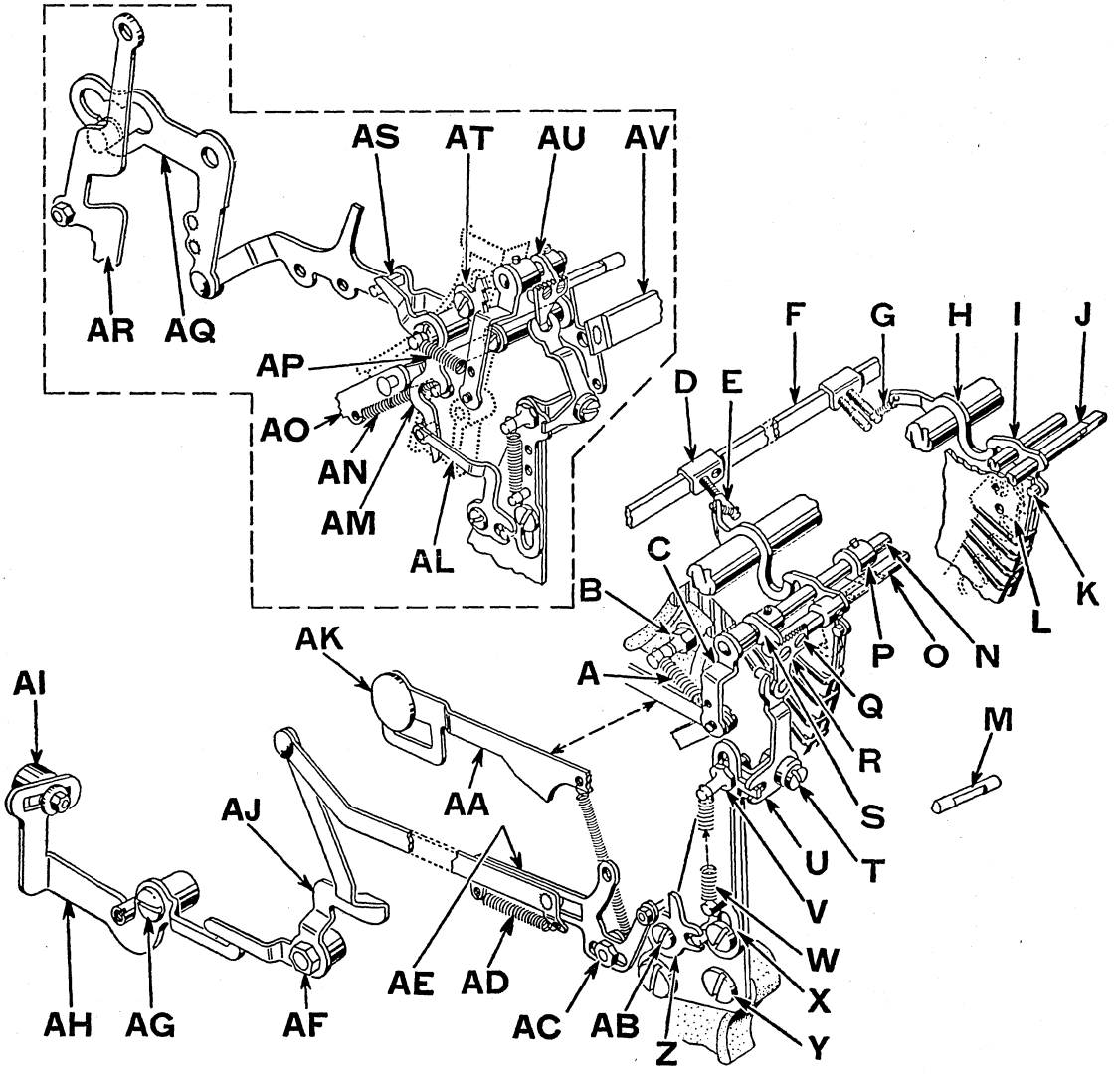
For Form 2963

ADDING AND PRINTING—CARRIAGE AND REGISTER TOTAL INDEXING LEVER CONTROLLED, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 89)

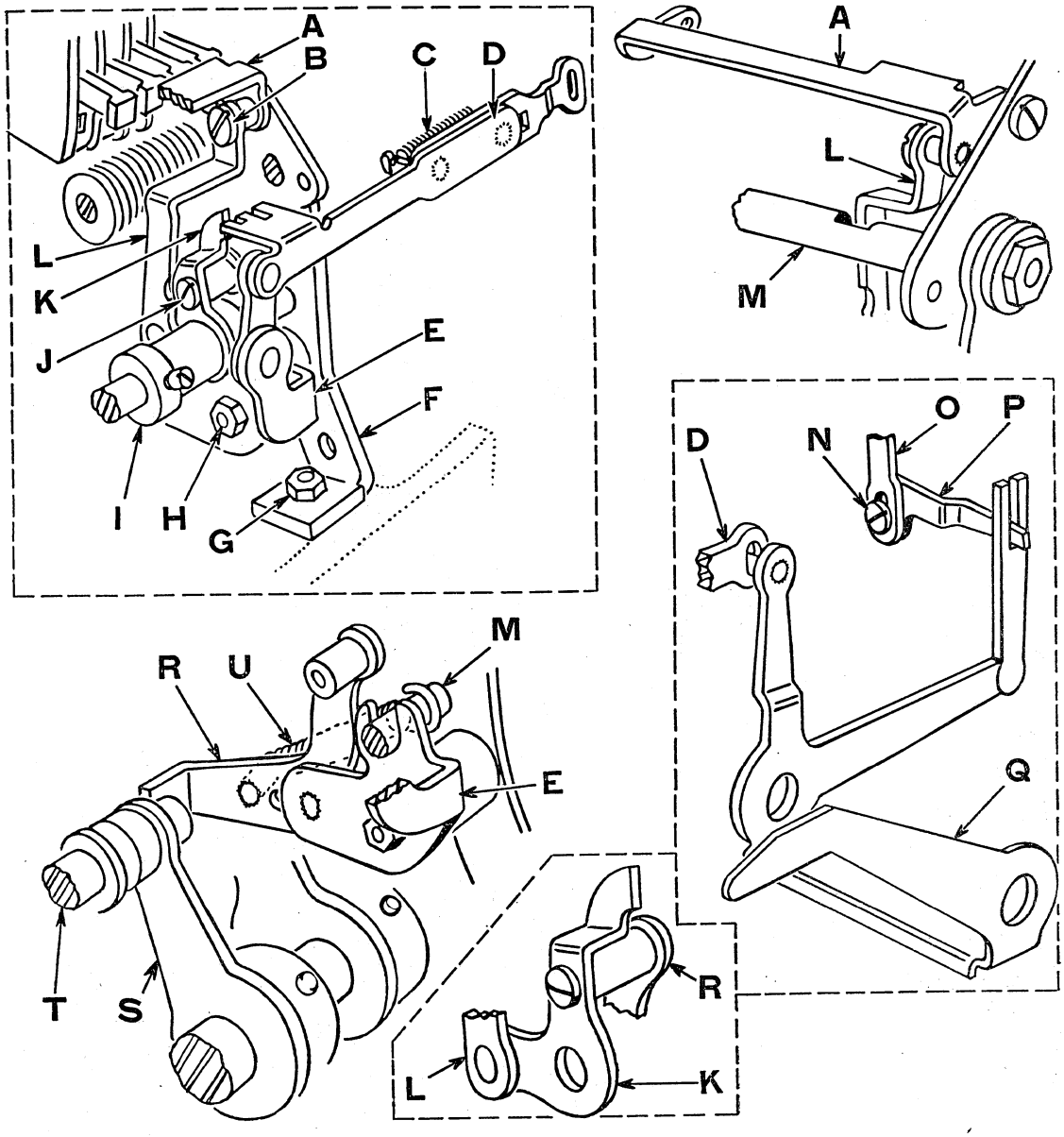


SYMBOLS (Plate 89)

A **681⅛**
B **655¼**
C Included in N
D **297R&L Env. 903**
E **9061⅛**
F **224 Style 17**
G **4487**
H **296R or L Env. 903**
I **1-64107 No. 2 Env. 903**
J **4R Env. 903 Nos. 1-2-3-4** specify split and roll size
K Included in I
L See 610's, adding rack chart—Plate 1
M Part of O or J
N **1-64001 Style 17 Nos. 1 thru 17 Env. 903** specify split
O **4L Env. 903 Nos. 1-2-3-4** specify split and roll size
P **1-290 Env. 903**
Q **100506**
R **1-292 Env. 903**
S **1-292½ Env. 903**
T **73564A**
U **1-289 Env. 903**
V **12058¾**
W **10983**
X **1-293 Env. 903**
Y **7559½**
Z **1-294 Env. 903**
AA **200123½ No. 2 11-200122½** (**11B-200122½, 200380 No. 1, 200198¾, 200465½A, 200625A**) Assembled, uses spring 983
AB **99565**
AC **12053⅜ Env. 1834** Screw, 12241 bushing, 824¼ washer, 46 nut
AD **681⅛**
AE **1-176 No. 2 Env. 1834**
AF **200646B Env. 1813**
AG **200635**
AH **1-200153½ No. 2 Env. 903**
AI **33 Fte. 103** Roller, 56 Fte. 103 screw, 46 nut
AJ **1-191 Fte. 216 Env. 1834** included in AE
AK **200617**
AL **1-294 No. 2 Env. 903**
AM **1-200165½ Env. 1834**
AN **983**
AO **1-200127½A No. 1**
AP **681⅛**
AQ **21A-62103** specify machine No.
AR **41-60100**
AS **62511A**
AT **200129½** uses screw 519 Fte. 213
AU **1-292½ Env. 903**
AV **1-204129 Style 13 1-204129 Style 17 (1A-204129 Style 17)**

SEE EXPLANATION ON INSIDE OF FRONT COVER

ADDING AND PRINTING MECHANISM CARRIAGE CONTROLLED FOR EARLY H903 MACHINES (Plate 90)



SYMBOLS (Plate 90)

A **1-107 Env. 1416 Style 17**
B **75648**
C **10686½**
D 11-103 Env. 1416* included in E
E **11-101 Env. 1416** includes D, R
F **1-207126 Style 13, 17**
G **1050⅝** Screw, 45 nut
H **10763 Style 17 Env. 1416** Screw, 45 nut, 730 collar
I **542½** uses 7562 screw
J **259½**
K 1-106 Env. 1416* included in L
L **1-105 Env. 1416** includes K
M **709½C Style 17 Env. 1416**
N 200500½ Screw, 46 nut
O **1-200150½A**
P **11-208 Fte. 200** uses spring 2886½
Q **1-12110 Style 17 No. 4**
R **1-100 Env. 1416** uses screw 75645, included in E
S 1-116 Style 15*
T **60004 Style 17**
U **3489** Spring, 20 No. 73 anchor

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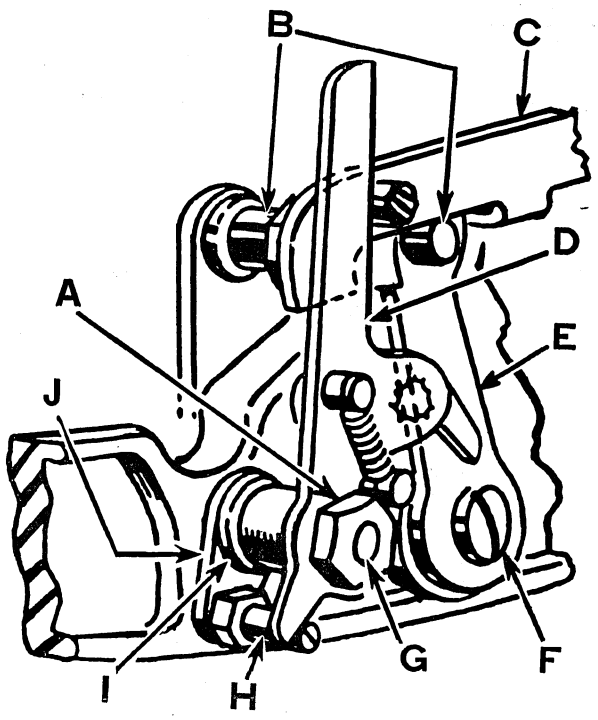
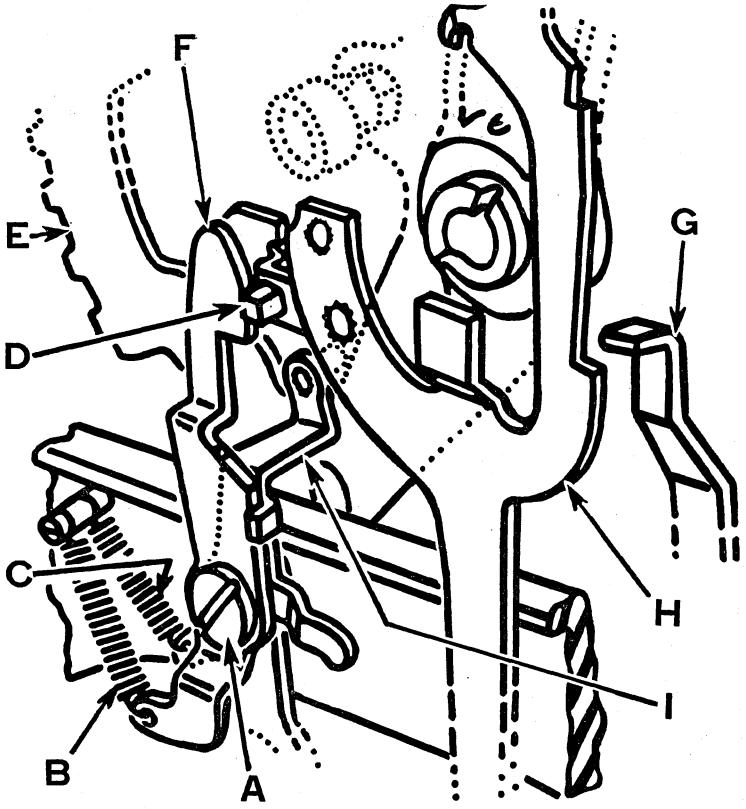
BRACE FOR STUD 68503AY, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 91)



SYMBOLS (Plate 91)

A	200447Z
B	68503AY No. 2, 45⅞ Nut
C	1-209131Z
D	1Z-200131½
E	68119Z
F	83512A Screw, 1097⅝ washer
G	200623Z Screw
H	200627Z
I	416Z Fte. 64
J	200131¼Z

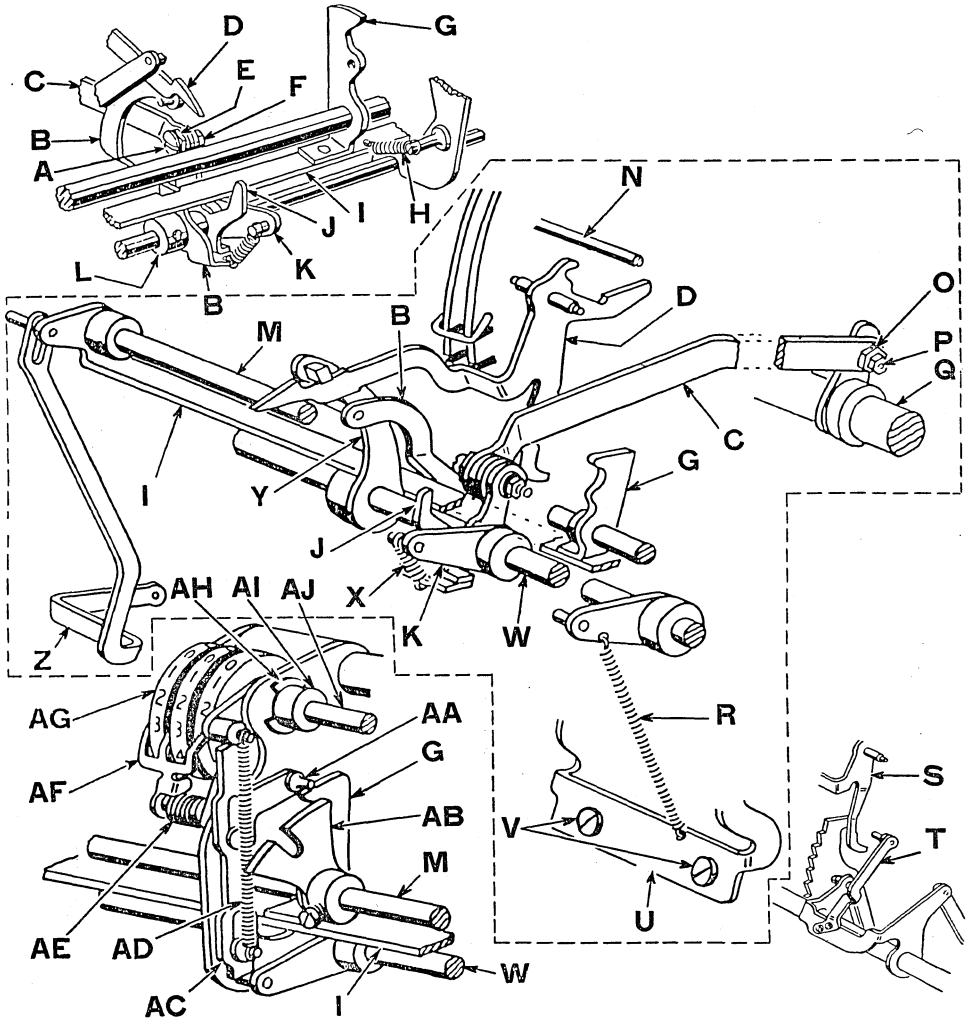
MECHANISM TO DELAY CLUTCH RELEASE FOR CARRIAGE CONTROLLED TOTAL OPERATION, CLASSES 21 THRU 30 WITH H903 MECHANISM (Plate 92)



SYMBOLS (Plate 92)

A	519 Fte. 209 Screw, 69317 bushing
B	483
C	3280⅛
D	302518
E	1A-63111 (12B-311⅛)
F	136 Fte. 209 No. 2
G	1A-10025¾
H	21-3627 No. 1
I	1-135A Fte. 209

COUNTERS-DIAL CONTROL MECHANISM, CLASSES 20 THRU 30, STYLE 17 (Plate 93)



SYMBOLS (Plate 93)

NOTE: When ordering parts for any counters-dial mechanism, specify if 3 or 4 digit construction and machine number if possible.

A **4456½**
B **1-227 Fte. 216**
C **156 Fte. 216**
D **1-228 Fte. 216 No. 1** uses spring 12083
E **79362**
F **46**
G 184 Fte. 216* included in I
H **12083**
I **1-183 Fte. 216 Style 17 No. 5** includes Z and G
J **11-201 Fte. 216**
K 11-153 Fte. 216* included in W
L **11-72363** uses screw 75660
M **13 Fte. 216 No. 1 Style 17 (13 Fte. 216 No. 4 Style 17)**
N **402B Style 17**
O **79362** Eccentric
P **4456½, 46** Nut
Q 206000 Style 17*
R **983**
S **1-228 Fte. 216 No. 2**
T **1-229 Fte. 216** uses screws 7562
U **220A Fte. 216**
V **957½**
W **1-13 Fte. 216 Style 17 No. 4** includes K
X **72803**
Y 1-226 Fte. 216* includes in W
Z **187 Fte. 216** complete assembly 1-186 Fte. 216 included in I
AA **518 Fte. 216** included in AC
AB **1-157 Fte. 216 Nos. 1 thru 6** for Cl. 21 thru 26
1-157½ Fte. 216 Nos. 1 thru 10 for Cl. 27 thru 30
AC **1-152 Fte. 216**
AD **84806**
AE **1686 No. 2**
AF **1620 No. 5**
AG **1A-1616C**
AH **210 Fte. 216 No. 2**
AI **1-8345**
AJ **1-14½ Fte. 216 Nos. 1 thru 10** specify machine number

SYMBOLS (Plate 94)

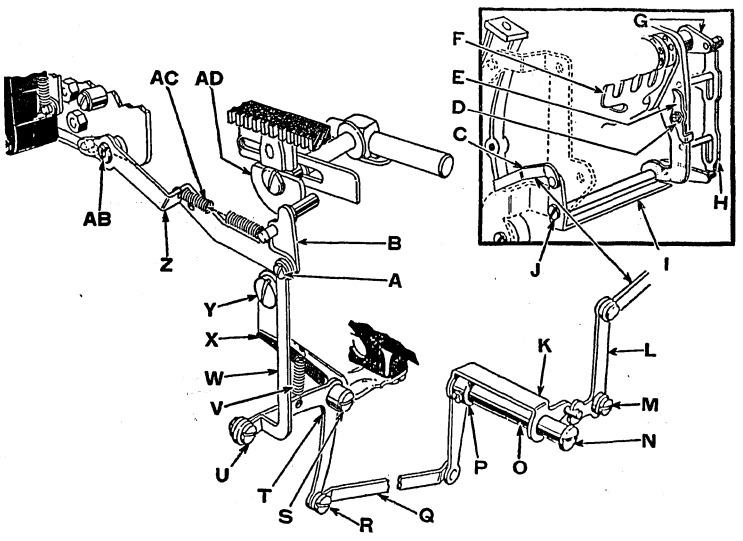
A **44504** Screw, 46 nut
B **1-174 Fte. 216**
C **164 Fte. 216** included in L
D **72307** Eccentric, 72567 screw, 1097¾ washer, 46 nut
E **215 Fte. 216**
F **1620A No. 3,** 4 digit construction
1620 No. 5, 3 digit construction
G **2-162 Fte. 216**
H **1-152 Fte. 216** with long stud
21-152 Fte. 216 with short stud
I **1-165 Fte. 216**
1-165 Fte. 216 Style 17
J **8054¾**
K **1-167 Fte. 216 Style 13, 17** includes Q
L **1-163 Fte. 216** includes C
M **9755**
N **8054¾**
O **520 Fte. 216**
P **11-72363** includes screw 75618
Q Included in K
R **251** Screw, 40 nut
S **12059⅝** Screw, 613½ washer, 46 nut

Symbols continued on Next Page

COUNTERS-DIAL ADVANCED FROM CARRIAGE RETURNS, CLASSES 11 THRU 16, 20 THRU 30 WITHOUT MULTIPLE SKIP RETURN (Plate 94)

(Plate 94 continued)

T **1-171 Fte. 216 Style 13, 17** specify machine number
1-171 Fte. 216 Style 13, 17 No. 2 for H903, specify machine number
U **251** Screw, 46 nut
V **2887**
W **173A Fte. 216 Style 13, 17**
X **1-60211 No. 2**
Y **2851⅝**
Z **1-172A Fte. 216**
AB **12051¼** Screw, 322 Fte. 216 bushing, 331 Fte. 216 collar
AC **480B**
AD **4443¼A**



SYMBOLS (Plate 95)

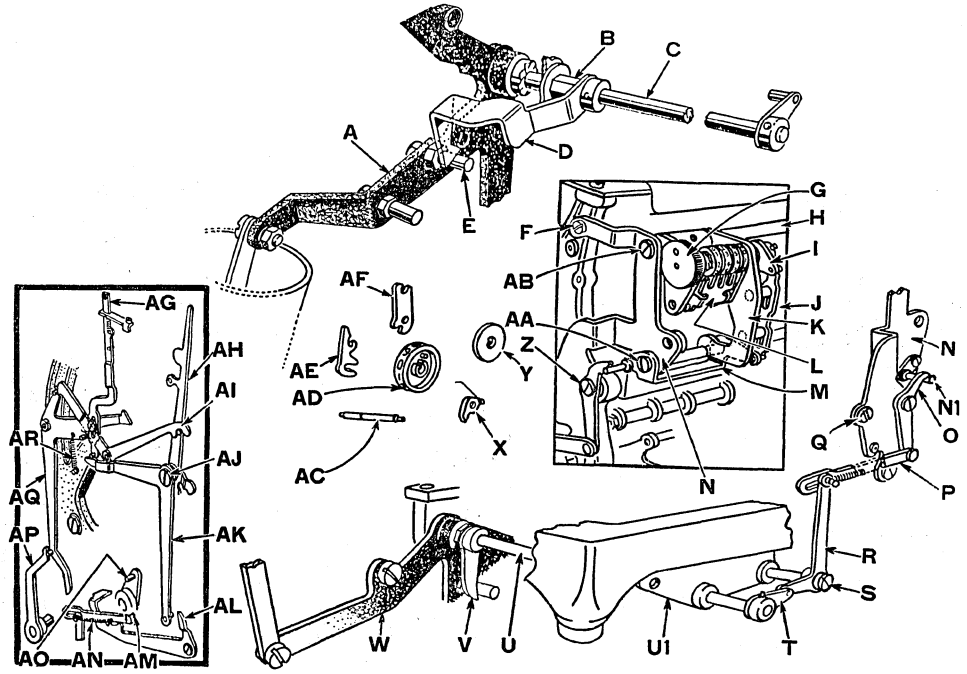
A **1A-201107B (1A-201107C)**
B **522A Fte. 216** Sleeve bolt, 330 Fte. 216 collar
C **1A-15A Fte. 216 Style 17 Env. 1358**
D 1-177 Fte. 216 Env. 1358* included in C
E **530 Fte. 216** Eccentric
F **519 Fte. 213** Screw, 9436¾ collar
G **11A-14 Fte. 216** specify machine number
H **10 Fte. 216 Style 13, 17**
I **2-162 Fte. 216**
J **1-152 Fte. 216** with long stud, 21-152 Fte. 216 with short stud
K **1-8 Fte. 216 to 61-8 Fte. 216** specify machine number
L **1620A No. 3**
M **1-181 Fte. 216** specify machine number
N **21-150L Fte. 216**
N1 1-176 Fte. 216* included in U
O Included in R
P Included in R
Q **51½ Fte. 123 (553 Fte. 216)**
R **1-178 Fte. 216 Env. 1166** includes O and P
1-178 Fte. 216 No. 2 (1-178A Fte. 216) for H903 machines
S **8054¾**
T 1-176 Fte. 216* included in U
U **1A-15A Fte. 216 Style 13, 17**
U1 **169 Fte. 216** Regular bracket
1-169 Fte. 216 No. 2 used for motor operated register total indexing lever, carriage controlled
V 1-177B Fte. 216* included in U
W **1-201107 No. 2 (1-201107C)**
X **1-1614B**
Y **1627**
Z **8457** Screw, 12241 washer
AA **8054¾** Screw, on shaft 13 Fte. 216 No. 4 Style 13, 17
AB **8054¾**
AC **1605 No. 2**
AD **1A-1616C**
AE **1613A**
AF **210 Fte. 216**
AG **1-102 Env. 1166**
AH **1A-60100**

COUNTERS-DIAL ADVANCED FROM CARRIAGE OPENINGS—DISABLING KEY (Plate 95)

AI **1-200217 No. 3**
AJ **60506 Env. 1166**
AK **1-100 Env. 1166**
AL **1-101A Env. 1166**
AM **750¾ No. 1**
AN **3489**
AO Stud in 1-68112 No. 2*
AP **1-200004 Style 13, 17 No. 1**
AQ **1-200216B No. 1 (1-200216C No. 1)**
AR **489**

NOT SHOWN

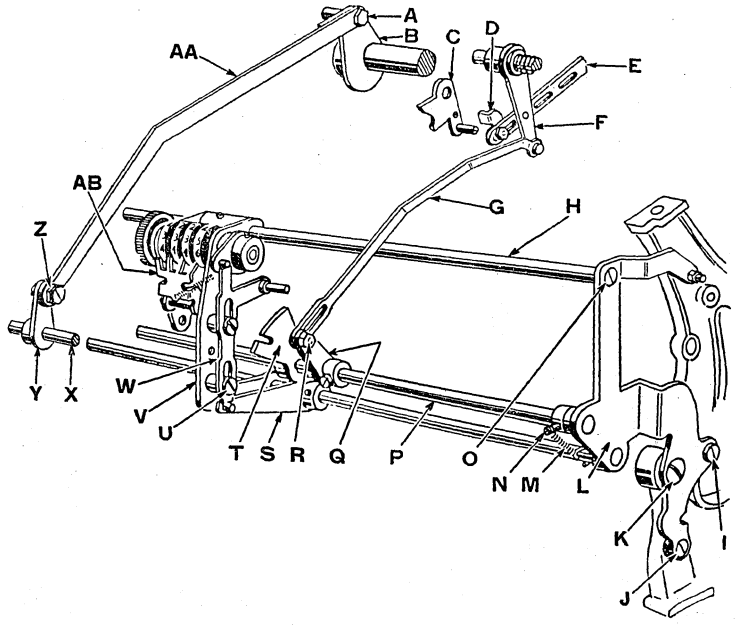
Front panel for counters, 1- to 12A-212 Fte. 216 all styles and numbers—if required, specify openings and machine number.



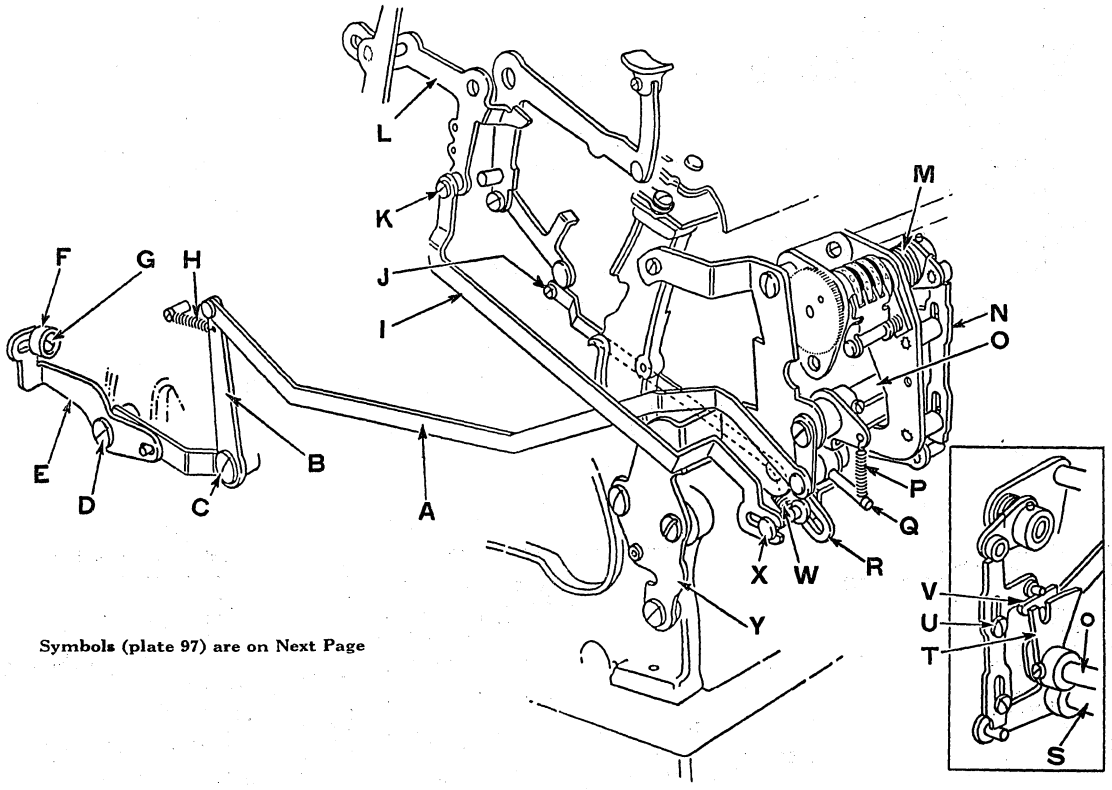
COUNTERS-DIAL ADVANCED FROM SELECTED KEY (Plate 96)

SYMBOLS (Plate 96)

A **10856¼ Bushing,** 71517 screw
B **1-206100 No. 2**
C **1-125L Fte. 207 No. 1**
D **205 Fte. 216** uses 72573 screw, 49¼ nut
E 158 Fte. 216* included in F
F **1-160 Fte. 216** uses sleeve 327 Fte. 216 for shaft
G 161 Fte. 216* included in F
H **10 Fte. 216 Style 13, 17**
I **51½ Fte. 123 (553 Fte. 216)**
J **58½ Fte. 123 (554 Fte. 216)**
K **10960½**
L **21-150AR Fte. 216**
M **10180**
N **3350⅜** Stud, 72363 collar
O **8054¾ or 8359**
P **13 Fte. 216 No. 3 Style 13, 17**
Q **1-204 Fte. 216**
R **49¼** Nut, 76528 screw
S 1-153 Fte. 216*
T **1-157½ Fte. 216 Nos. 1 thru 10** specify machine number, No. 1 for one counter, No. 1 and No. 2 for two counters, etc.
U **75615**
V **1-8 Fte. 216**
W **1-152 Fte. 216**
X **21-13 Fte. 216 Style 13, 17 No. 1 (11-13 Fte. 216 No. 2 Style 13, 17)**
Y 1-154 Fte. 216*
Z **79362** Eccentric, 4456½ screw, 46 nut
AA **156A Fte. 216**
AB **1620A No. 3,** 4 digit
1620 No. 5, 3 digit



COUNTERS-DIAL ADVANCED FROM TOTAL AND SUB-TOTAL—CARRIAGE CONTROLLED (Plate 97)



Symbols (plate 97) are on Next Page

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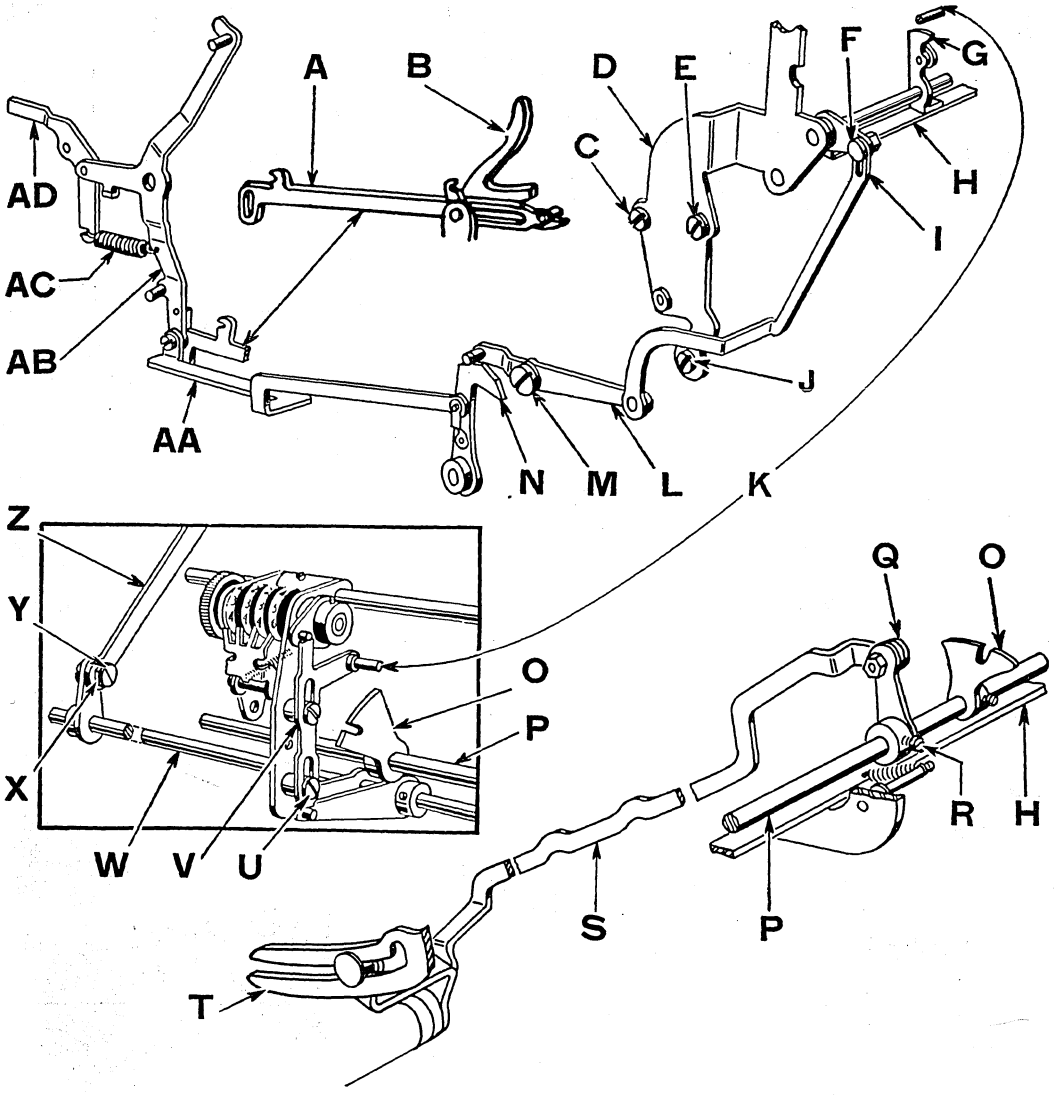
SYMBOLS (Plate 97)

A **192 Fte. 216** included in B
192 Fte. 216 No. 2 included in B
B **11-191 Fte. 216** or 21-191 Fte. 216 specify machine number
C **4454¼ Style 11**
D **8054¾**
E **1-141 Fte. 206**
F **302 Fte. 206**
G **506 Fte. 206** Screw, 46 nut
H **72826**
I **102 Env. 1373**
J **76558** Screw connecting arm R with shaft assembly 1-205002 Styles 13, 17 Env. 1373
K **79503**
L **1A- or 11A-62103 Env. 1373** specify machine number
M **1686½**
N **1-152 Fte. 216**
O **13 Fte. 216 No. 1 Style 13, 17 (13 Fte. 216 No. 4 Style 13, 17)**
P **3280⅛**
Q **3350⅜** Stud and 72363 collar
R **1-100 Env. 1373** included in X
S **21-13 Fte. 216 No. 1 Style 13, 17 (11-13 Fte. 216 No. 2 Style 13, 17)**
T **1-157½ Fte. 216 Nos. 1 thru 10** No. 1 for one counter, Nos. 1 and 2 for two counters, etc., specify machine number
U **75615**
V **1-183 Fte. 216 Nos. 1, 2, 4 or 5 Style 17** specify machine number
W **3981**
X **1-101 Env. 1373**
Y **21-150L Fte. 216**

COUNTERS-DIAL, COUNTS ITEMS ADDED IN REGISTERS (Plate 98)

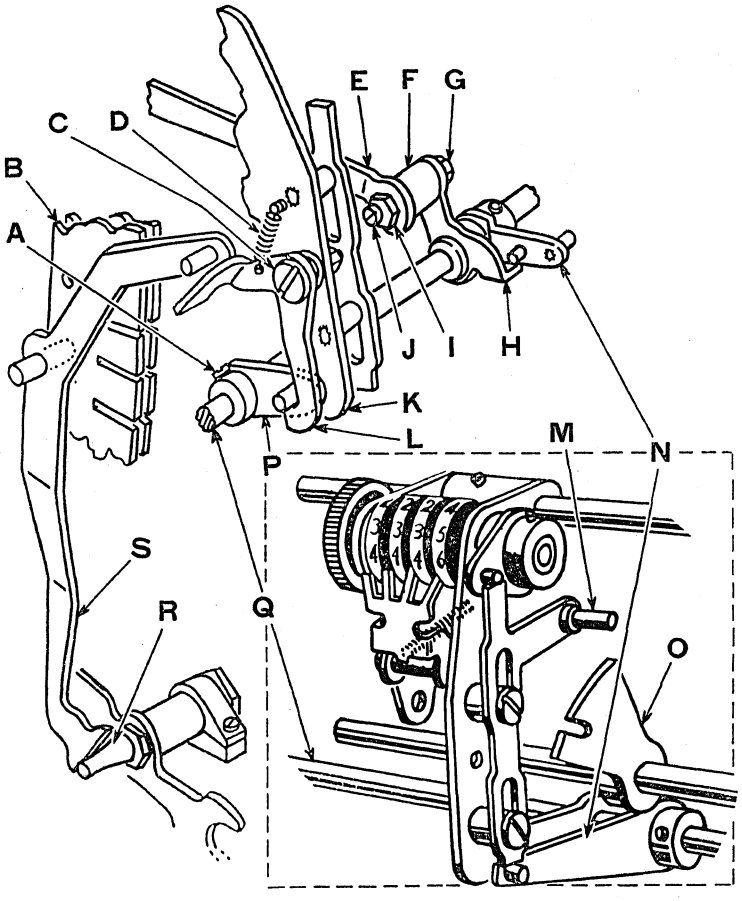


SYMBOLS (Plate 98)

A **1-60107A**
B **60109** see Plate 28-2
C **51½ Fte. 123 (553 Fte. 216)**
D **21-150L Fte. 216**
E **8054¾**
F **8353¾**
G 184 Fte. 216*
H **1-183 Fte. 216 No. 2** includes F, G, I, L
I **187 Fte. 216** included in L
J **64 Fte. 99**
K **518 Fte. 216**
L **1-186 Fte. 216**
M **528 Fte. 216** Screw, 328 Fte. 216 washer
N **1-188 Fte. 216 Nos. 1 thru 4** specify if keyboard reg. selection in col. 13
O **1-157 Fte. 216 Nos. 1 thru 6** No.1 for one counter, Nos. 1 and 2 for two columns, etc., uses screw 12055⅝
P **13 Fte. 216 No. 2 Style 13 (13 Fte. 216 No. 4 Style 13)**
13 Fte. 216 No. 2 Style 17 (13 Fte. 216 No. 4 Style 17)
Q **1-199A Fte. 216** Arm, 9153⅛ screw, 46 nut
R **12055⅝**
S **198A Fte. 216** use 198 Fte. 216 No. 3
T **1-100A Fte. 202 No. 10**
U **75615**
V **1-152 Fte. 216**
W **21-13 Fte. 216 Style 13 No. 2 (11-13 Fte. 216 Style 13 No. 2)** for Style 13
31-13 Fte. 216 Style 17 No. 1 (11-13 Fte. 216 Style 17 No. 2) for Style 17
X **79362** Eccentric
Y **4456½**
Z **156 Fte. 216 No. 2**
AA **194 Fte. 216**
AB 60106C* complete assembly 1-60106C
AC **2886½**
AD 60122* included in 1-60106C

SEE EXPLANATION ON INSIDE OF FRONT COVER

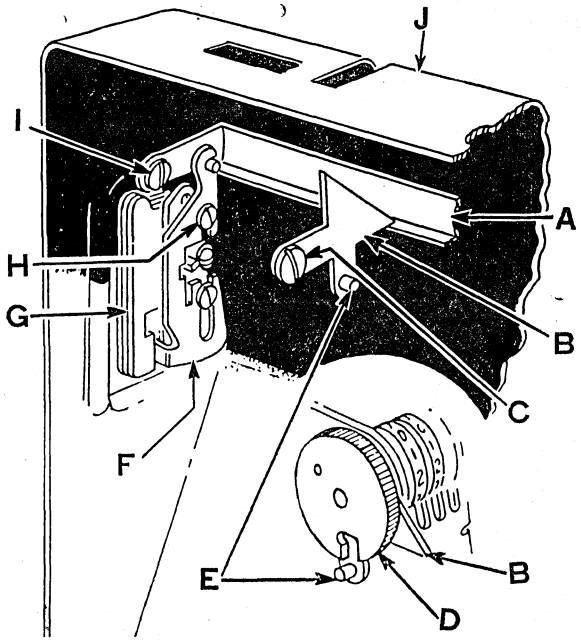
COUNTERS-DIAL OPERATION DELAYED UNTIL REGISTERS ARE MESHED (Plate 99)



SYMBOLS (Plate 99)

A	**76540**
B	**1-210AL P. 10**
C	**12051**⅛ Screw, 76120 collar, 46 nut
D	**7286**½ on stud 72574
E	**156 Fte. 216 No. 2**
F	**237**
G	**46**
H	**1-201 Fte. 216 (11-201 Fte. 216)**
I	**79362** Eccentric
J	**519 Fte. 213,** 4456½ is used when 237 is omitted
K	**151R Fte. 216** on 1-8 Fte. 216
L	**202A Fte. 216** Later **202 Fte. 216** Early
M	**518 Fte. 216** on 1-152 Fte. 216
N	1-153 Fte. 216*
O	**1-157 Fte. 216 Nos. 1, 2, 3, 4, 5, 6** to count from any selected key, Cl. 1, 2, 6, 11 thru 16, 20 thru 30 **1-157**½ **Fte. 216 Nos. 1 thru 10** to count items added in reg. Cl. 30
P	**1-182A Fte. 216 No. 2** Later **1-182 Fte. 216 No. 2** Early
Q	**31-13 Fte. 216 Style 17 No. 1 (11-13 Fte. 216 Style 17 No. 2)**
R	**69530 No. 1**
S	**1-156**½ **Fte. 216**

COUNTERS-DIAL—COVER AND LOCK, CLASSES 11 THRU 16, 20 THRU 30 (Plate 100)



SYMBOLS (Plate 100)

A	**1-206A Fte. 216 Style 13, 17**
B	**1-208 Fte. 216 No. 1**
C	**77529**
D	**11A-14 Fte. 216** specify machine number
E	94532* included in B
F	**207A Fte. 216**
G	**1-83173 No. 1, 2 and 3 Combination,** use key 168 Fte. 200 No. 123
H	**15520**
I	**10056**
J	**12-212 Fte. 216 Style 13, 17 No. 1 or No. 2** complete assembly, specify opening and machine No. No. 1 used for Cl. 1, 2, 6, 11 thru 16 No. 2 used for Cl. 20 thru 30

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SERIES H MACHINES

Classes 1, 2, 6, 11 thru 16 and 20 thru 30

POWER

Symbol List

February 15, 1949

Issued _____

To _____

Of _____

Property of and to be returned to

BURROUGHS ADDING MACHINE COMPANY

DETROIT 32, MICHIGAN

Mr H R Lovejoy
Buffalo N Y Branch 10-5

Printed in U. S. America 2-15-49

Form 2964

WHERE DISCARDED SYMBOLS (NOT REQUIRED FOR REPAIRS) ARE REPLACED BY ACTIVE SYMBOLS, THE ACTIVE SYMBOLS ARE SHOWN IN PARENTHESES FOLLOWING THE DISCARDED SYMBOLS.

EXAMPLE: 1-8817¼ (3261B, 1-8801AZ STYLE 12 OR 20, 1-8817BR NO. 4, 8817½ZL, 8828¼C, 8828½B, 47¾, 49¼—2 PCS., 79543—2 PCS.)

SYMBOLS WHICH ARE NO LONGER AVAILABLE AND WHICH HAVE NOT BEEN REPLACED BY ACTIVE SYMBOLS HAVE BEEN REMOVED FROM THE VARIOUS PLATES:

INDEX OF MECHANISMS

Description	Plate No.
Alternating Current Motor	11
Armature Puller for Types 2, 6 and 6A Motors	6–2
Ball Bearing Drive Mechanism and Motor Brush Assembly (Types 6 and 6A Motors)	6
Base Spring Assemblies	2
Brushes and Brush Holder (Improved) for Types 2, 6 and 6A Motors	6–1
Case Details	30
Centrifugal Governor Assembly (Early) (Type 6)	7
Clutch and Drive Mechanism	9
Cycle Mechanism, Fte. 104 (Classes 1, 2, 6, 11 thru 16)	27
Cycle Total Column Motor Bar Release	28
Direct Current Motor	10
Early Carriage Return Disabled from Carriage Normal Key (Upper Left); and Skip Tabulation from Upper Shaft (on Right) (Classes 20 thru 30)	23
Early Carriage Return from MRC Rack, Upper and Lower Bars (Classes 20 thru 30)	21
Early Carriage Return from Total Keys (Classes 20 thru 30 and H903)	22
Machine Drive to Control Printing, Carriage Tabulation and Carriage Return Mechanism (Classes 20 thru 30)	26
Motor Speed Governor Assembly, Type 6 Motor	7
MRC Clutch Mechanism (Improved) (Classes 20-30)	19–1
MRC Clutch Unit Used in Early Style Multiple Skip and Return Machines	17
MRC Feed Mechanism	18
MRC Governor (Later) and Friction Assemblies (Later)	16
MRC Space and Non-space Mechanism Indexed Jointly by Carriage and by Multiple Skip and Return Mechanism	25
MRC Unit	15
MRC Unit Plate Assembly	19
Multiple Skip—Return Mechanism Timing Control (Classes 20-30)	22–1
Operating Bar and Switch Control Mechanisms	13
Primary and Secondary Operating Sections	1
Rack Bars—Kinds (AB)	18
Radio Filter Replacement Chart—Types 2, 6, 6A Motors	13–2
Resistance Coil Chart	3–1
Reverse MRC Clutch Tripping Mechanism and Selective Column Return	20
Side Frames (Listed under AV)	1
Skip Tabulation from Bar and Shaft in Base and also from Carriage (Classes 20 thru 30)	24
Springs 885 Nos. 3 and 4 (How to Install)	29
Time Switch for AC and DC Motors	12
Type 2 Motor	8
Types 2, 6, and 6A Motors, Later	13–1
Type 6 Motor with Earlier Drive	5
Type 6A Motor and Drive with Centrifugal Governor (Right)	3
Type 6A Motor and Drive with Centrifugal Governor (Left)	4
Wiring Diagrams	14
Wire Connections for Types 2, 6 and 6A Motors (Later)	13–1

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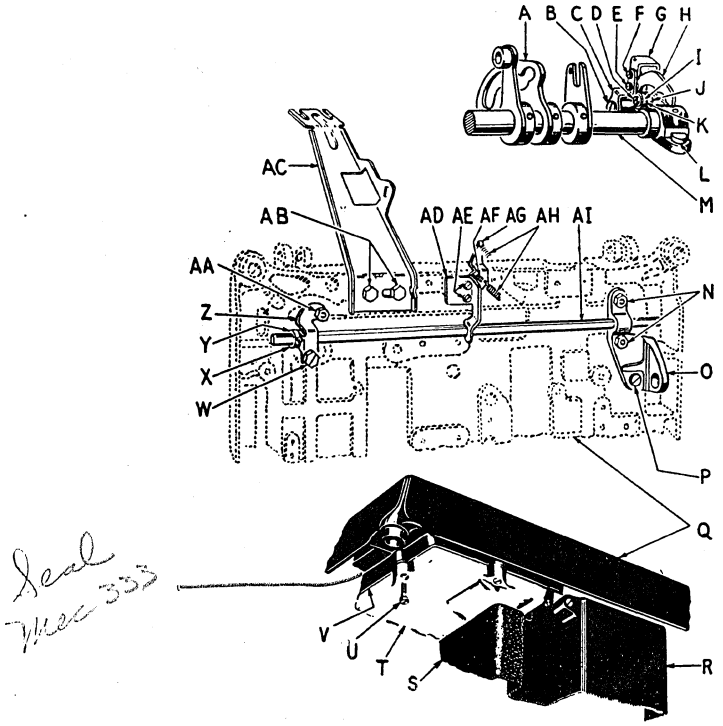
For Form 2964

WIDE BASE CONSTRUCTION (Plate 1-1)



SYMBOLS (Plate 1-1)

A 1-10121A* included in M
B **8054¾** screw
C **60152A**
D **506 Fte. 209** screw
E **72581**
F **70512**
G **1-60116C No. 2**
H **1-60115B No. 2**
I **1-60999** ball bearing
J **1-60999** for H903 construction
72321 for bank construction
K **428** washer
L **200527 No. 2** screw, 3645 nut
M **42A-60000 Style 17** shaft assembly includes A, D, I, J, K
N **3645** nut, 200527 No. 2 screw
O **1-200665½**
P **9251⅝**
Q **12-200665B Style 17** base
Note: Order by letter and only for actual replacement, also forward number removed from other base.
R **201668 No. 2**
S **201669B**
T **1-60601C Style 17** includes V
U **60504**
V **60900A Style 17** gasket
W **3655⅛**
X **550¾** screw
Y **1-540** collar includes X
Z **1-12022R No. 2**

AA **3645** nut, 200527 No. 2 screw
AB **200560**
AC **1-203181C**
AD **200230½**
AE **74523** screw
AF **984** spring
AG **20 No. 112A**
AH **75804 No. 1**
AI **12008 Style 17 No. 1**

Mr M R Lovejoy
Buffalo N Y Branch 10-5

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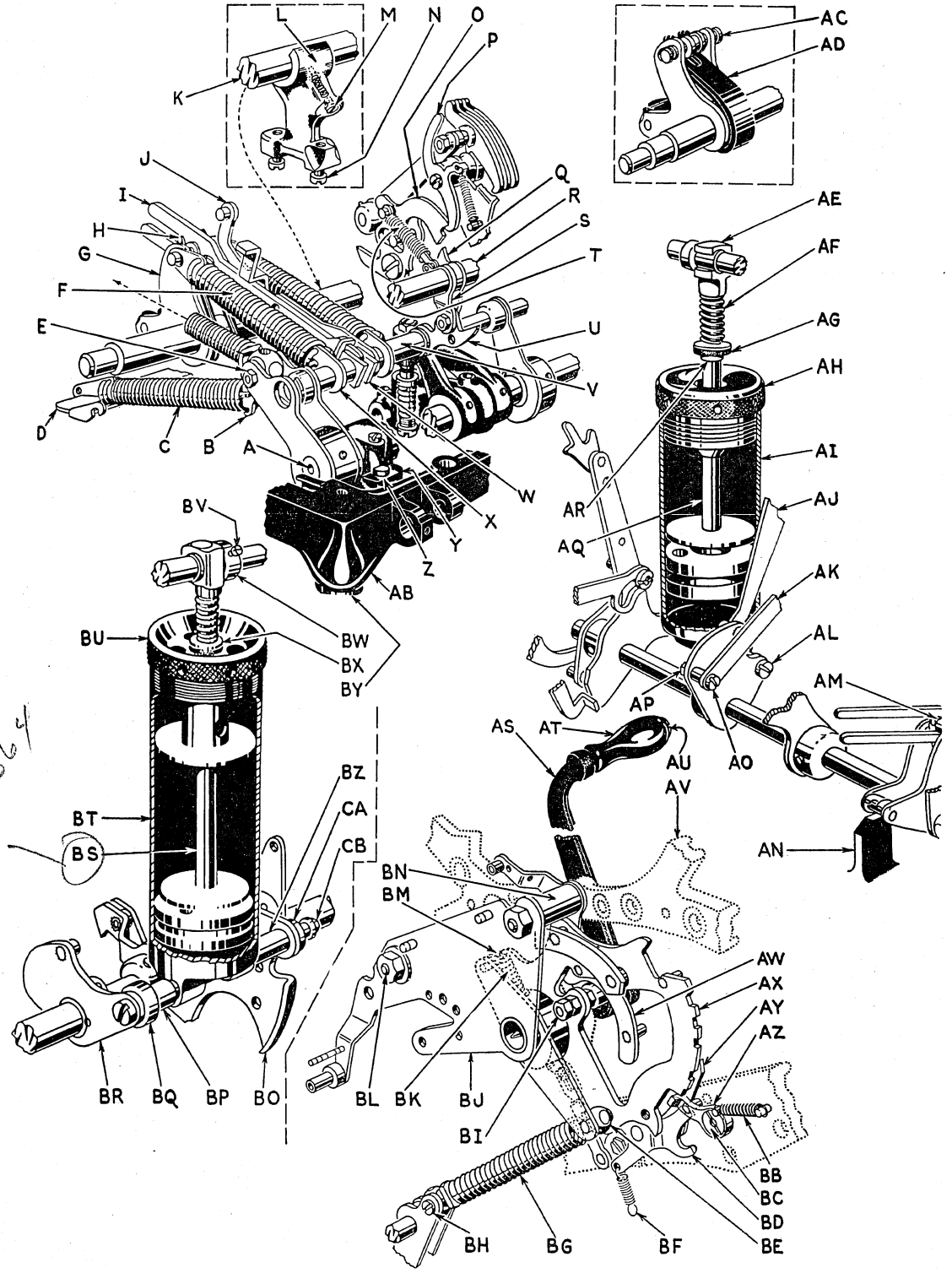
PRIMARY AND SECONDARY OPERATING SECTIONS (Plate 1)



SYMBOLS FOR PLATE 1 ARE ON NEXT PAGE

SYMBOLS (Plate 1)

A **2-60000 Style 13, 17** see list below for other styles
1A-100A Style 17H Cl. 1—hand
1B-100A Style 7E Cl. 1 elec. not SACT regular speed
2B-100A Style 9E, 11E, 13E, 15E, 17E Cl. 1-2 elec. not SACT regular speed, Style 13 can also be used with increased speed, Cl. 2
12-100A Style 9, 17 use for machines with increased speed, not SACT, Cl. 2
2A-3200½ Style 9E, 11E, 13E, 15E, 17E, Cl. 1-2 ACT regular speed
2A-3400½ Style 9E, 11E, 13E, 15E, 17E, Cl. 1-2 shuttle carriage regular speed
2A-10100 Style 9 Cl. 1-2-6 SACT regular speed, 116 close to 1-191
2A-10100 Style 9 No. 2 Cl. 1-2-6, SACT increased speed, 116 is ¼" from 1-191
2A-10100 Style 11, 13, 15 Cl. 1-2-6 SACT regular or increased speed
2-10100¼ Style 17 Cl. 1-2-6 SACT, tally roll—wide ribbon construction regular speed, one 116
2A-10100½ Style 17 Cl. 1-2-6 SACT regular speed, one 116
12-10100½ Style 17 Cl. 1-2-6 SACT, tally roll—wide ribbon constr., increased speed, two 116's
2B-10100½ Style 17 Cl. 1-2-6 SACT increased speed, two 116's
2-60000 Style 13 Cl. 11 thru 16, 21 thru 26 regular or increased speed
2-60000 Style 17 Cl. 11 thru 16, 21 thru 30 regular speed, one 116
2A-60000 Style 17 Cl. 11 thru 16, 21 thru 30, tally roll—wide ribbon constr., increased speed, two 116's
12-60000 Style 17 Cl. 11 thru 16 tally roll—wide ribbon constr., regular speed, one 116
42-60000 Style 17 use for H903 machines
2-200002 Style 13 No. 1 Cl. 20 old and new balance, regular or increased speed
2-200002 Style 17 No. 1 Cl. 20 old and new balance, regular or increased speed

B **1-20 No. 1** included with C
C **1-180 Nos. 2, 3, 5, 6, 7, 8** see reference chart, Plate 2
D **60114A Style 13, 17** Cl. 11 thru 26
60114 Style 13, 17 No. 10 Cl. 27 thru 30
1021 Style 9, 11, 13, 15 Cl. 1-2-6
60114 No. 2 Style 9, 11, 17 used with increased speed, Cl. 2
} Use 1054½ screws
E **46**
F **1-181 No. 2, 3, 4, 7** see reference chart, Plate 2
G 1-68111 Style 13, 17* included in K
H **885** Spring
I **1-201119** Cl. 20 thru 30
1-119A Cl. 1-2-6, 11 thru 16
J **1-201120C** use 7562 screws
K **11-68000 Style 13, 17** specify machine style and No., includes G, H, AC, AD, AM, BO, BR
L **1-866A Style 13, 17** includes M
M **850⅜** Screw, use spring and wick assembly 1-7189½
N **1050⅝**
O **1-713AR Style 9**
P **1-714A**
Q **1-527AL**
R **1-205001A Style 13, 17** includes Q, S, Cl. 20 thru 30
1-501A Style 9, 11, 13, 15, 17 includes Q, S, Cl. 1-2-6, 11 thru 16
S **1A-527BR**
T **1-783C**
U **120B Style 9** used for all styles
V **60004 Style 13, 17** Cl. 11 thru 30
60004 Style 13, 17 No. 2 used with increased speed Cl. 2 Style 17, not SACT
101 Style 9
101B Styles 11, 13, 15 used for Styles 11, 13, 15, 17, Cl. 1,2 6,
W **132A Style 7 (132A Style 9)** used for Style 9, 11, 13, 15, 17
X **1-20 No. 7** included with F
Y **1-166 No. 2 (166B No. 2)** included with A
Z **159**
AB Complete base. NOTE: Order by letter, and only for actual replacement, also forward number removed from other base.
AC **851** use 834 roller
851 No. 2 use 208334 roller, used for Style 17 machines with flat springs AD
AD **885 No. 3** Upper spring
885 No. 4 Lower spring
AE **840A**
AF **886**
AG **891** Leather washer, use 811½ steel washer on bottom
AH **848 Style 15** used with AI
AI **2-847A Style 37** complete assembled dashpot, used for Style 9 machines, Cl. 1-2-6
AJ 1-10711L Style 13* included with 1-67004 Style 13-17
AK 729 No. 2* included with 1-702B Style 7, 9, 11, 13, 15, 17
AL **853A Styles 9, 11, 13, 15, 17** Long screw, Cl. 1, 2
3453B Styles 9, 11, 13, 15, 17 Long screw, used on counter control machines, Cl. 2
10853A Styles 11, 13, 15, 17 Long screw, Cl. 6, 11 thru 16, 20 thru 30
AM **834** Roller
208334 Roller, see AC
AN Limit in base
AO 855 use 251⅜ screw for arm without hub
AP **46** Nut
AQ **1-847A Style 37** complete assembled plunger, used with AI
AR **870** Wire ring
AS **1-368B Style 9 (1-368C Style 17)** Short handle, includes AT, AU
1-368C Style 17 Long handle
AT **7392A**
AU **7356¾**
AV Side frame orders should specify machine style and number
1066DR for regular Cl. 1, 2, 6, 11 thru 16
1Z-1066DR for Field replacements on Cl. 1, 2, 6 with small diameter shafts
1Z-1066DL for Field replacements on Cl. 1, 2, 6 with small diameter shafts
1066DL for Cl. 1 and 2 with repeat print of totals and sub-totals after cge. return
1066DL No. 2 for machines with front panel item counters
10066L for Cl. 6, 11 thru 16 with repeat print of totals and sub-totals after cge. return
200666R (1Y-200666R) for Cl. 20 thru 30 without bank posting
200666R No. 3 (1Y-200666R) for Cl. 20 thru 30 bank posting machines, Styles 23 13 03, 23 13 05, 23 17 03, 23 17 41 and 23 17 45
1-200666R No. 3 Style 21 17 14 (1-200666R No. 6) for Styles 21 17 14 and 21 17 16
200666R No. 4 for £.s.d. Cl. 20 thru 30 bank posting machines
11A-200666L Style 13 for Style 13, Class 20 only
11A-200666L Style 17 for Style 17, Class 20 only
1B-200666L Style 13, 17 for Cl. 21 thru 30 without H903 mechanism
1-200666L Style 13, 17 No. 4 for Cl. 21 thru 30 with H903 mechanism
1Z-200666R-L for Field replacements on Cl. 20 thru 30 machines with small diameter shaft 1-12007
666L Fte. 200 for machines having C.F.N.A. bar, upper or uppermost, with shaft under base
666L Fte. 206 No. 1 for Cl. 20 thru 26 with non-add—non-print
666L Fte. 206 No. 2 for Cl. 11 thru 16 with non-add—non-print
666L Fte. 206 No. 3 for Cl. 1-2-6 with non-add—non-print
666L Fte. 207 for 8 Pt. printing control from register total indexing lever
AW **1-323½A**
AX **12B-311⅛** includes BE, BG, BI, see Plate 6 keyboard symbol book for other styles
AY 63124* included in BD
AZ **1-313C** used with extended totals
1-313E Cl. 1-2-6
1-63113 Cl. 11 thru 16, 20 thru 26
1-63113 No. 2 (1-63113 No. 3) used with 10 register construction
BB **63800** used with 1-63113 and 1-63113 No. 3
384A used with 1-313C and E
BC **63339** use 3455⅜ screw, Cl. 11 thru 16, 20 thru 30
339 Cl. 1-2-6
BD 63114* assembled 1-63114
314½* assembled 1-314½
BE **1-353¼B**
BF **388** used with 1-314½
60801 used with 1-63114
BG **1-351¼B** includes BE
BH **150** Screw, 46 nut
BI **45** Nuts, assembled 1-3662¼
BJ **1-201110A**
21-201110A
BK 380 Spring
BL **352¾ or 352⅞ No. 2** Long screw, use 393 nut
BM **350** Plunger, use 351 pin
BN **334B** use 352⅞ long screw and 393 nut
BO 11-68113A Style 13, 17* included in K
BP **838¼ Style 13, 17**
BQ **834½** use 833½ Style 9 for Style 9
BR 1A-823 Style 9 or 17* included in K
BS **1-847A** Stamped 25, 44, 47, 50, 57, 66 complete assembled plunger, used with BT
BT **2B-847A;** 25, 44, 47, 50, 57, 66 complete assembled dashpot
2B-847A; 25 used for Styles 13, 17 with code H903 and/or code H1429, Cl. 20 thru 30
2B-847A; 44 used for Style 17, Cl. 1-2-6
2B-847A; 47 used for Style 17, Cl. 11 thru 16, 20 thru 30
2B-847A; 50 used for Style 13, Cl. 1-2-6
2B-847A; 57 used for Style 11, Cl. 1-2-6
2B-847A; 66 used for Style 13, Cl. 11 thru 16, 20 thru 30
BU **1-848A Style 17** used with BT
BV **550¾**
BW **1-645**
BX **322** Washer
BY **1094 (1094B)** Rubber foot
BZ **831½A Style 15 (300362)** used for Style 11
836¼ Style 13 used for Styles 13, 17
CA **10830** used for Cl. 6, 11 thru 30
3432A used for counter control, Cl. 2
CB **46** use 7919½A washer, Cl. 6, 11 thru 30
850¼ Screw, replaces 46 nut on regular Cl. 2 machine

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BASE SPRING ASSEMBLIES (Plate 2)

CLASS	STYLE	PREVIOUS TO INCREASED SPEED — 1-180 TO BE USED					INCREASED SPEED — 1-180 TO BE USED					1-181 TO BE USED			
		#2	#3	#5	#6	#7	#2	#3	#6	#7	#8	#2	#3	#4	#7
1 or 2	9	3	1									1	1		
	11	3	1										2		
	13	4	1										2		
	17	5												2	
1 or 2	9		3	1								1	1		
	11		3	1									2		
	13	3		1									2		
	17	3	1	1										2	
1, 2, 6 or 20	9	1	3			1			1	1		1	1		
	11	2	2							2			2		
	13	3	1				1		2				2		
	17	3	2				3	2					1	1	
11 thru 16	13	4							3				2		
	17	4	1				4	1					1	1	
21 thru 30	13	4							3				2		
	17	4	1				4	1					1	1	
1, 2, 6 or 20	9	2	2							2		1	1		
	11	2	2							2			2		
	13	4							3				2		
	17	4	1				4	1					1	1	
11 thru 16	13	3	2						2	1			2		
	17	5					5						1	1	
21 thru 30	13	3	2						2	1			2		
	17	5					5						1	1	
11 thru 16	17	5	1				3		2					2	
21 thru 30	13						5								2
	17						5								2

Copper Colored Clip : One 1-180 No. 3—weighs 5 lbs.
Cadm. plate short Clip: One 1-180 No. 2—weighs 7½ lbs.
Cadm. plate long Clip : One 1-180 No. 5—weighs 7½ lbs.
Black Japan Clip : One 1-180 No. 6—weighs 10 lbs.
Red Enamel Clip : One 1-180 No. 7—weighs 12½ lbs.
Green Enamel Clip : One 1-180 No. 8—weighs 15 lbs.

1-181 No. 2, weight 4¾ lbs. Cadmium Plated.
1-181 No. 3, weight 6¾ lbs. Copper Plated
1-181 No. 4, weight 8¾ lbs. Enameled Light Blue.
1-181 No. 7, weight 10¾ lbs. Enameled Red.

BASE SPRINGS FOR MACHINES AFTER SERIAL NO. 809000 (Plate 2-1)

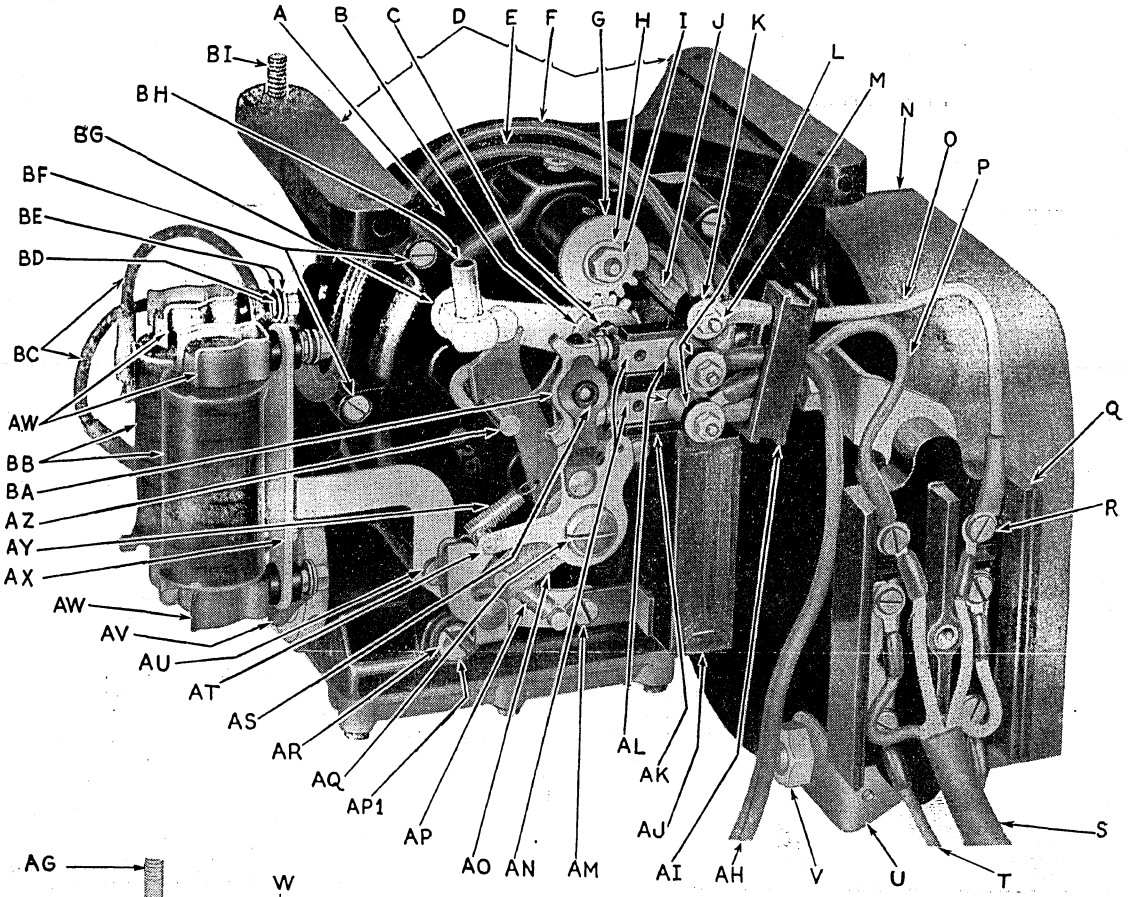
DESCRIPTION OF MACHINES	CLASS	STYLE	1-180 TO BE USED				1-181 TO BE USED				REMARKS
			#2	#3	#5	#6	#2	#3	#4	#7	
Other than Shuttle Carriage Machines	2	9				2	1	1			(Except Style 11) For any machine in this group having 12 or more banks adding capacity, add 2-1/2 lbs. to the 1-180 combination
		11 (13)	2	1				2			
		13 (17)		5				1	1		
		17	1	4					2		
Shuttle Carriage Machine	2	9		3	1		1	1			For any machine in this group having 12 or more banks adding capacity, a Flexible Keyboard or Unlimited Split, Add 2-1/2 lbs. to the 1-180 combination for each feature
		11 (13)		3	1			2			
		13 (17)	3		1			2			
		17	3	1	1				2		
BANK (N.S.S.T)	21 thru 30	13 (17)	4			1			1	1	If machine has Flexible keyboard, 12 or more banks adding, or Keyboard Selection of Register, add 2-1/2 lbs. to 1-180 combination for each feature
		17	4			1			1	1	
Commercial	21 thru 30	13 (17)	3			2				2	
		17	3			2				2	
Commercial	20	13 (17)	5						1	1	If machine has flexible keyboard, 12 or more banks adding, add 2-1/2 lbs. to 1-180 combination for each feature
		17	5						1	1	

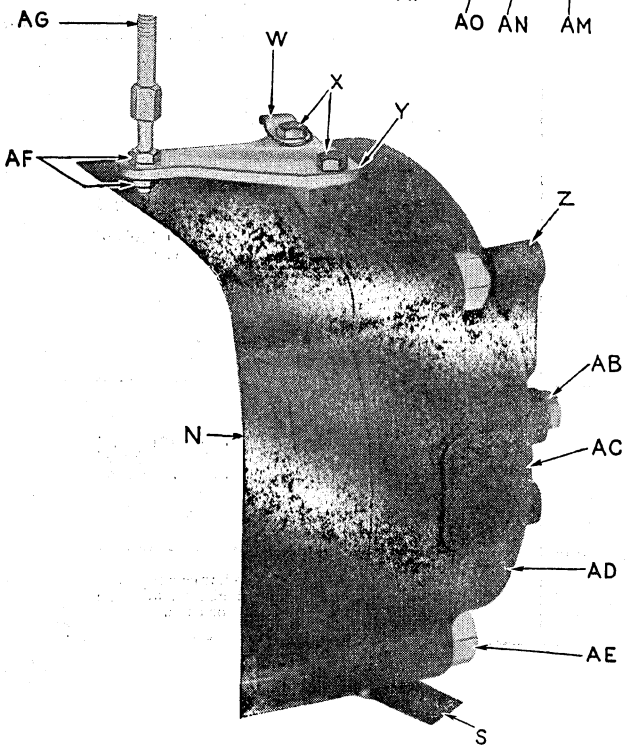
(Cadm. plate short clip): One 1-180 #2 - weight 7-1/2 lbs. 1-181 #2, weight 4-3/4 lbs. cadmium plated
(Copper colored clip) : One 1-180 #3 - weight 5 lbs. 1-181 #3, weight 6-3/4 lbs. copper plated
(Cadm. plate long clip) : One 1-180 #5 - weight 7-1/2 lbs. 1-181 #4, weight 8-3/4 lbs. enameled light blue
(Black japan clip) : One 1-180 #6 - weight 10 lbs. 1-181 #7, weight 10-3/4 lbs. enameled red
(Red Enamel clip) : One 1-180 #7 - weight 12-1/2 lbs.

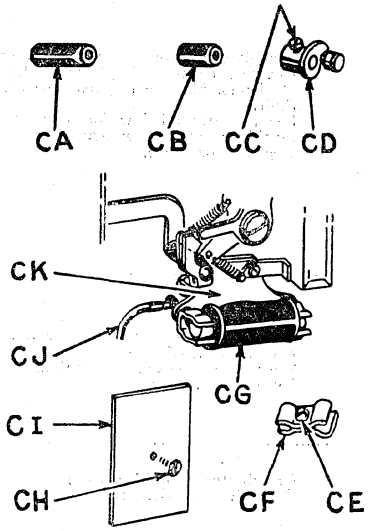
(Plate 2—Continued)

DESCRIPTION OF MACHINE	REMARKS
A.C.T. Machines	For any machine in this group having 12 or more banks adding capacity, a Flexible Keyboard or Unlimited Split, add 2½ lbs. to the 1-180 Combination for each feature.
Shuttle Carriage Machines	For any machine in this group having 12 or more banks adding capacity, a Flexible Keyboard or Unlimited Split, add 2½ lbs. to the 1-180 Combination for each feature.
Regular machines with or without Repeat Print, Carriage Return Bar, etc., but not including those mentioned in paragraphs below.	For 12 or more banks adding capacity, also for Class 30 Construction having 5 or more Registers, add 2½ lbs. to 1-180 Combination. For Sty. 13 on 17 Base, use five 1-180's of combined weight specified for Sty. 13.
Machines capable of making 5 or more carbons, or with Keyboard Selection of Registers, Flexible Keyboard or Unlimited Split. See paragraph below for 5 or 11 carbon machines with Keyboard Selection of Registers or Cycle.	(Except Style 11) For any machine in this group having 12 or more banks adding capacity, add 2½ lbs. to the 1-180 Combination. For Sty. 13 on 17 Base, use five 1-180's of combined weight specified for Sty. 13.
For all 11 carbon machines or for 5 carbon machines with Cycle. See remarks regarding 5 carbon Keyboard Selection Machines.	Use one 1-181 No. 3 and one 1-181 No. 4 in all Sty. 17 machines having Keyboard Selection of Registers with 5 carbon capacity.
Crossfooter Totals Carriage Controlled, Code H903 Construction.	If machine has 12 or more banks adding, or Keyboard Selection of Registers, add 2½ lbs. to 1-180 combination for each.

TYPE 6A MOTOR AND DRIVE WITH CENTRIFUGAL GOVERNOR, RIGHT (Plate 3)







SYMBOLS FOR PLATE 3 ARE ON NEXT PAGE

SYMBOLS (Plate 3)

2-4667¼ No. 4, 110, 150, 220 volts, complete assembled Type 6A motor and centrifugal governor drive for Cl. 20 thru 30 machines
1-4667¼ No. 4, 110, 150, 220 volts, complete Type 6A motor for Cl. 20 thru 30 machines, MRC
NOTE: Above items are to be ordered on separate Supply Order containing no other symbols.

A **1-3865B** Switch casting, includes AZ
B **3634¼A**
C **3660¾**
D **1-3666B No. 1** Drive casting only
42-3666B No. 1 complete assembled ball bearing drive unit with centrifugal governor, used with Type 6A motors with radio interference eliminator, Cl. 20 thru 30
E **1-3873**
F **1-3873**
G **3616B**
H **3612½**
I **45**
J **3852,** 3853 center and bottom post
K **3826½** Washer
L **3838** Rubber insulator
M **46** Nut, 1097¾ lock washer
N **1-4617 No. 2,** 32-4617 No. 2, 110, 150, 220 volts, complete assembled Field coil
O **1-3673A No. 1** Red wire
P **1-3673A No. 2** Green wire
Q **1-70903** use screws 3455⅜, 1097¾ washers to fasten to bracket U
R **4252** Screws, 2820½ washers, 6 req.
S **1-4671¾** Motor cord
T **1-3697½A** Wall cord
1-3697⅞ (6′ extension cord)
U **3611½**
V **4647**
W **4310½**
X **2859⅜B**
Y **4620 No. 3**
Z **4665⅜ (4665A No. 3, 4665⅜ No. 1, 4619A No. 2, 4619A No. 1, 2 req.; 2864⅝, 3 req.; 12055, 2 req.; 1097⅛, 2 req.)**
AB **12055**
AC **4619** use screw 2864⅝
AD **4665 No. 3 (4665A No. 3, 4665⅜ No. 1, 4619A No. 2, 4619A No. 1, 2 req.; 2864⅝, 3 req.; 12055, 3 req.; 1097⅛, 2 req.)**
AE **20747**
AF **45**
AG **3650½B**
AH **1-4670 No. 3** Black MRC cord
AI **3890⅛**
AJ **1-4699½ No. 2** see chart, Plate 13-2
AK **3891**
AL **3836B** Brass collars
AM **3857**
3857 No. 2 used with bracket CK
AN **1A-3826CR&CL**
AO **1-3818A**
AP **3883A**
AP1 **3697¼**
AQ **2851⅝** used for 3861A
AR **71620 (71616B)**
AS **3890¾**
AT **1B-3815B** includes AS, BA
AU **3857** Screw
AV **1-71701**
AW **200202** use screw 200538½ No. 1
AX **1-3810 No. 2, (1-3810 No. 3)**
1-3810A Short brace, used for drive without resistance coils
AY **3882A**
AZ **3852½A**
BA **1A-3842B**
BB **1B-200911** Specify resistance, see Plate 3-1
BC **1-3872**
BD **46¼**
BE **7919½A** Washers
BF **3661B**
BG **1-3615C,** 11B-3615C assembled includes BH
BH **1-3651¼E** use 3612½ washer, 45 nut
BI **12055,** 4 req.
12055A Env. 1753, 1 req., for multiple skip and return
CA **3839** Long } Rubber insulators
CB **3840** Short }
CC **4450⅛**
CD **1-3833A** includes screw 4450⅛
CE **709621**
CF **3611¾**
CG **1B-200911** specify resistance, see Plate 3-1
CH **79603**
CI **70902**
CJ **1-200908** Black wire
CK **1B-200201** includes CJ

MOTOR RANGE CHART

MOTOR TYPE	A. C. RANGE	D. C. RANGE
2-6-6A		32V
32V		50V
50V	50-60 Volts 25-85 Cycles	50V
	50-60 Volts 25-100 Cycles	85-125V
110V	85-125 Volts 25-85 Cycles	85-125V
	85-125 Volts 25-100 Cycles	130-160V
150V	130-160 Volts 25-85 Cycles	130-160V
	130-160 Volts 25-100 Cycles	175-260V
220V	175-260 Volts 25-85 Cycles	175-230V
	175-230 Volts 25-100 Cycles	235-260V
	235-260 Volts 25-100 Cycles	235-285V
	235-285 Volts 25-100 Cycles	
110V-100 Cy	Special	
220V-100 Cy	Special	

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RESISTANCE COIL CHART (Plate 3-1)

All Classes

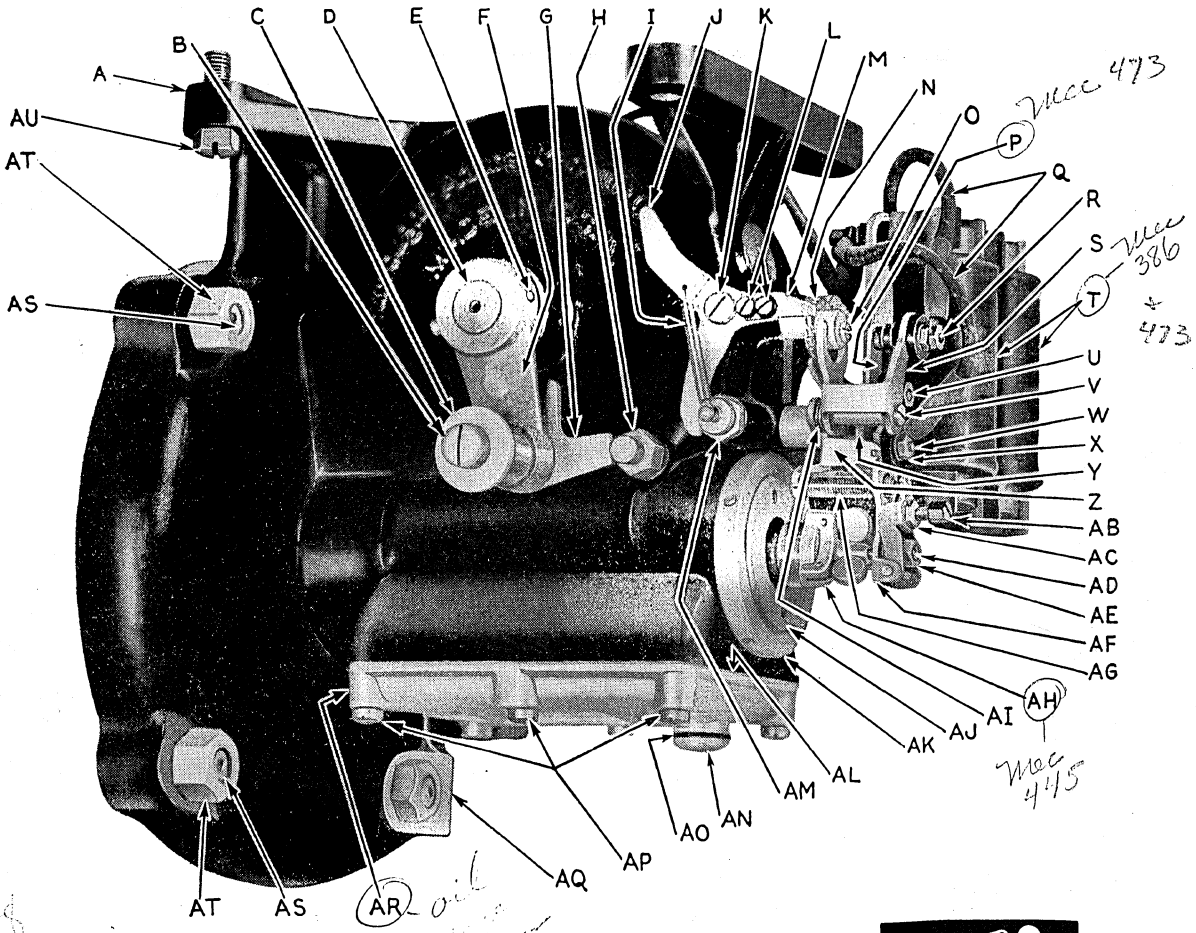
The resistance coil values indicated in the following chart have been found, through extensive tests, to be best suited for use with the specified line voltages. This information supersedes all resistance coil specifications previously set forth in Charts, Mecanograms, Prints, Symbol Lists, or Instruction Books.

The resistance value in ohms is marked on each coil.

MOTOR TYPE	SYMBOL	LINE VOLTAGE	OHMS	REQUIRED
Type 3 (Series "P" Machines)	1B-200911 (Specify Resistance)	110 150 220 250	250 465 1000 1460	1 1 1 1
Types 5A-B-C (Series "C" and "T" Machines)	1B-200911 (Specify Resistance)	110 150 220 250 285	250 465 1000 1460 1940	1 1 1 1 1
Type 6 (Single Coil Bracket) (Series "M" Machines)	1B-200911 (Specify Resistance)	110 150 220–250	250 465 1000	1 1 1
Types 6 and 6A (Double Coil Bracket) (Series "H" and "M" Machines)	1B-200911 (Specify Resistance)	110 150 220 250	65 140 250 300	2 2 2 2
Overdraft Lights and Aligning Lights	1B-200911 (Specify Resistance)	110 125 150 200–210 220–235 240–260 265–275	— 300 700 1000 1460 1940 2150	None 1 per bulb 1 per bulb 1 per bulb 1 per bulb 1 per bulb 1 per bulb

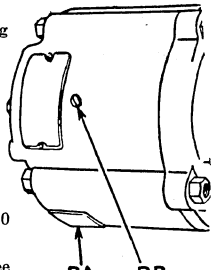
See Mec 386

TYPE 6A MOTOR AND DRIVE WITH CENTRIFUGAL GOVERNOR, LEFT (Plate 4)

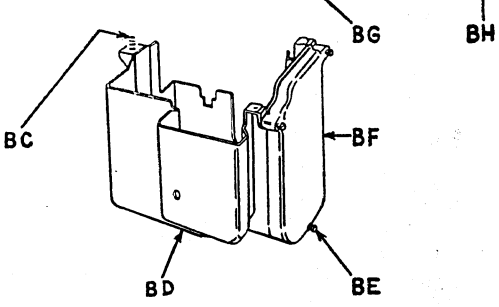


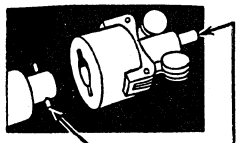
SYMBOLS (Plate 4)

A **1-3666B No. 1**
B **201501B** } Use nut 3631¾A
3653¾B Early } No. 2
C **201330A**
D **1-3800** includes E, F
E **3663½A**
F **1-3691D**
G **1-3612¼A No. 1, 2, 3, 4** use spring 3688
H **3659¾C**
I **86803**
J **1-3613¾A** includes L, M
K **3652⅜**
L **75620** use 1097⅝ lock washer
M **3613⅜**
N **1-81127**
O **73563**
P **1-81121** Contact points
Q **1-3872**
R **1-81590** Contact point, use 75210 washer, 49¼ nut
S **1-81240** includes R
T **1B-200911** specify resistance, see Plate 3-1
U **74528** Screw, 75210 washer, 49¼ nut
V **73563**
W **104501** Screw, 75210 washer
X **49¼**
Y **69806**
Z **1-3613⅝B** use screw 3663⅝
AB **81603**
AC **49¼**
AD **81615**
AE **47¼**
AF **1-81239A** includes P, U, W, X, AB, AC, AD, AE
AG **3686A**
AH **1-81667A**
AI **81816**



AJ **1-3639 No. 2**
AK **71339½**
AL **3694¾A** Gasket
AM **3652⅝**
AN **71616A (71616B)**
AO **3697¼** Washer
AP **77513**
AQ **3611½**
AR **1-3666¾A** complete splash gear assy.
AS **4650 No. 2**
AT **20747**
AU **12055**, 4 req.
12055A Env. 1753, 1 req., used only with multiple skip and return





BA **1-4619½**
BB **103505** Screw
BC **3860⅞** Screw
BD **201669B**
3869 Early
BE **3856** Screw, 3 req.
BF **201668B**
3868 without switch cut off plunger
1-3868A with switch cut off plunger
BG **2852⅛, 3662¾** No. 1 used on other end
81598Z used when replacing early style AII
BH **81601**

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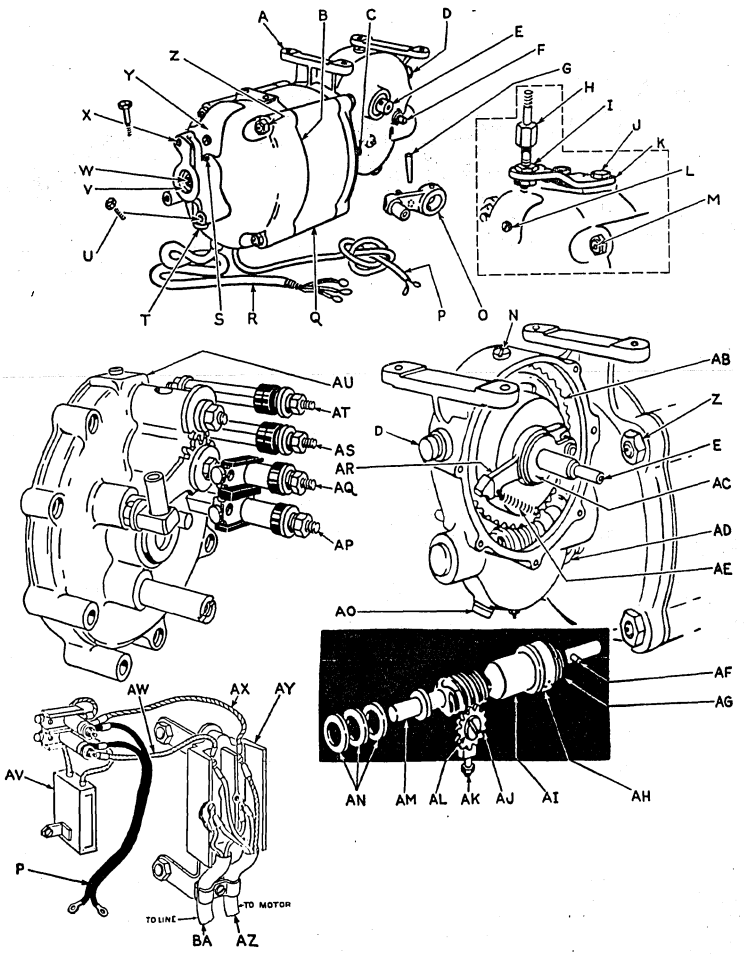
TYPE 6 MOTOR WITH EARLIER DRIVE (Plate 5)



SYMBOLS (Plate 5)

1-4667 No. 2 specify volts, complete assembled Type 6 motor without drive, not MRC, Cl. 1, 2, 6, 11 thru 16

2A-4667 No. 2 specify volts, complete assembled Type 6 motor and ball bearing drive, not MRC, Cl. 1, 2, 6, 11 thru 16

1-4667¼ No. 2 specify volts, complete assembled Type 6 motor without drive, MRC construction, Cl. 1, 2, 6, 11 thru 30

2B-4667¼ No. 2 specify volts, complete assembled Type 6 motor and ball bearing drive, MRC construction, Cl. 1, 2, 6, 11 thru 30

1-4667¼ No. 4 specify volts, complete Type 6A motor, MRC construction, used on all machines equipped with centrifugal governor, Cl. 20 thru 30

2-4667¼ No. 4 specify volts, complete assembled Type 6A motor and centrifugal governor drive, MRC construction, used on all machines equipped with centrifugal governor, Cl. 20 thru 30

NOTE: When ordering above items specify voltage, also order on separate supply order containing no other items.

Motors now supplied for Field replacement are constructed to eliminate radio interference. When present motor replaces earlier style motor, not constructed to eliminate radio interference, it will be necessary to install connecting parts which should be ordered separately, symbol **1Z-4299¾ No. 2.**

See Plates 3 and 4 for governor symbols
See Plate 3 for switch symbols

A **1-3666 No. 1 (22-3666B No. 1)** Casting only
22Z-3666B No. 1 complete assembled ball bearing drive unit for machines with Type 6 motor with radio interference eliminator for service replacement, Cl. 1, 2, 6, 11 thru 30

B **1-4665¼B (4665C; 1-4665⅝ No. 2; 4619A No. 1, 2 req.; 4619A No. 2; 2864⅛, 3 req.; 12055, 2 req.; 1097⅛, 2 req.; 4636; 2-4610A)** includes S, V and wick guide 4243½

C **3664¾A**

D **3661¼B** Cap, 3697¼ washer

E **1-3800** includes G, O

F **3659¾C**

G **3663½A**

H **3650½B**

I **45**

J **2859⅜B**

K **4620A**

L **1054½**

M **4650** Bolt

O **1-3691D**

P **1-4670 No. 3**

Q **12-4617A** Field coil assembly, specify

R **4271¾A** used without radio interference eliminator
1-4671¾, 4 wire conductor cord, used with radio interference eliminator

S **4257** Early
4657A Later

T **4233** use spring and wick 1-4281

U **12055**

V **4644B** Bearing

W **1-4200¼** specify voltage, use fibre washers 4224, 4223 or 4223½

X **12051¼**

Y **4619 No. 2**

Z **20747** Nut

AB **1-3667 No. 1** Gear ratio 14.75 to 1

AC **1-3613¼B**

AD **3690½** Drain

AE **3687 No. 2**

AF **3662¾ (3662¾ No. 1)**

AG **3639A**

AH **3693¼B**

AI **3690¾B**

AJ **1-3610½** includes AK, AL

AK **3654⅞** use 46 nut

AL **71512** use 46 nut

AM **3697 No. 1** (14.75 to 1) Shaft only

AN **3643¼**

AO **3661¼B** Cap, 3697¼ washer

AP **3853**

AQ **3853 No. 2** used on machines with radio interference eliminator, use 3829½ brace

AR **3690B**

AS **3852 No. 2** } Used on machines with
AT **3852 No. 3** } radio interference eliminator, use 3829½ brace

AU **1-3865A** plate without connecting parts, see Plate 3 for other switch parts

AV **1-4299¾ No. 2** see Plate 13-2

AW **1-3673A No. 2** Green wire

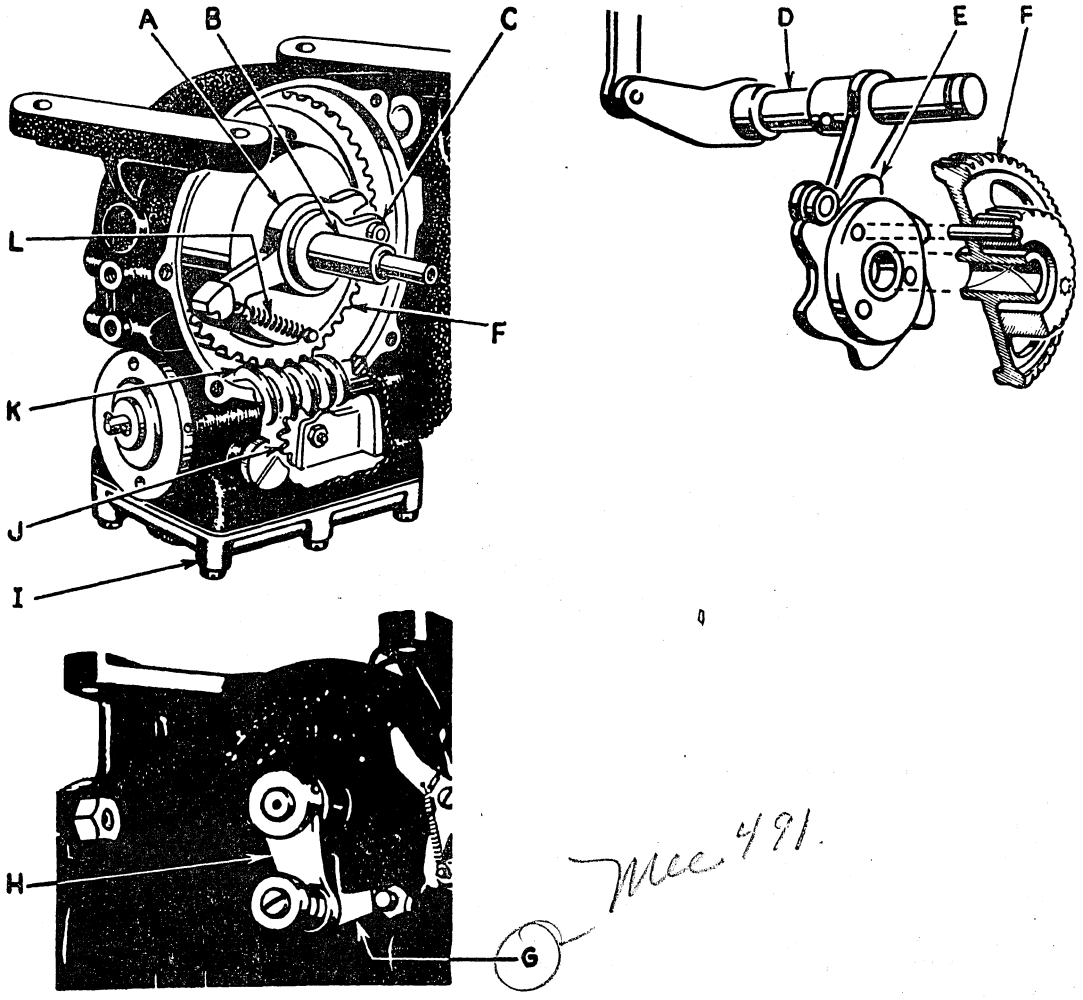
AX **1-3673A No. 1** Red wire

AY **1-70903**

AZ **1-4671¾**

BA **1-3697½A** Wall cord
1-3697⅞, 6' extension cord

TYPE 6A MOTOR AND DRIVE WITH 22 TO 1 GEAR RATIO CLASSES 20-30 WITH WIDE BASE CONSTRUCTION (Plate 5-1)



SYMBOLS (Plate 5-1)

A **3690B**
B **11-3800** shaft includes II
C **1-3613¼B**
D **1-1B Env. 1753** shaft assembly
E 901 Env. 1753* included in F
F **1-3667 No. 3 (22 to 1) Env. 1753** for machines with single stroke multiple print
1-3667 No. 3 (22 to 1) for machines without single stroke multiple print
G **1-3612¼ No. 5** use 3688 spring
H 1-3691D* included in B
I **21-3666¾A** complete splash gear assembly includes J
J **3610½ No. 3** gear use 3650⅞ screw, 7521½ washer, 47¾ nut
K **3697 No. 4** worm gear
L **3687 No. 2** spring

Mr M R Lovejoy
Buffalo N Y Branch 10-5

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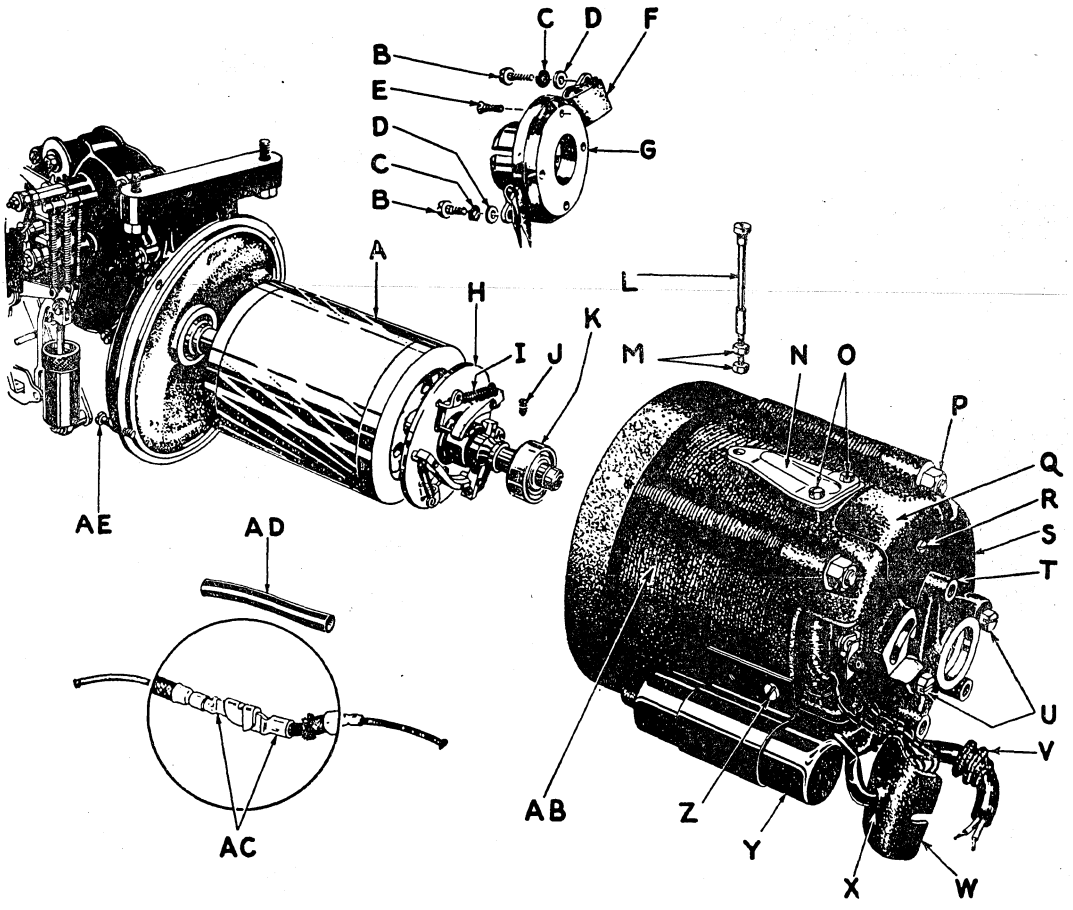
TYPE 1 ALTERNATING CURRENT MOTOR
CLASSES 1, 2 AND 6 MACHINES (Plate 5-2)

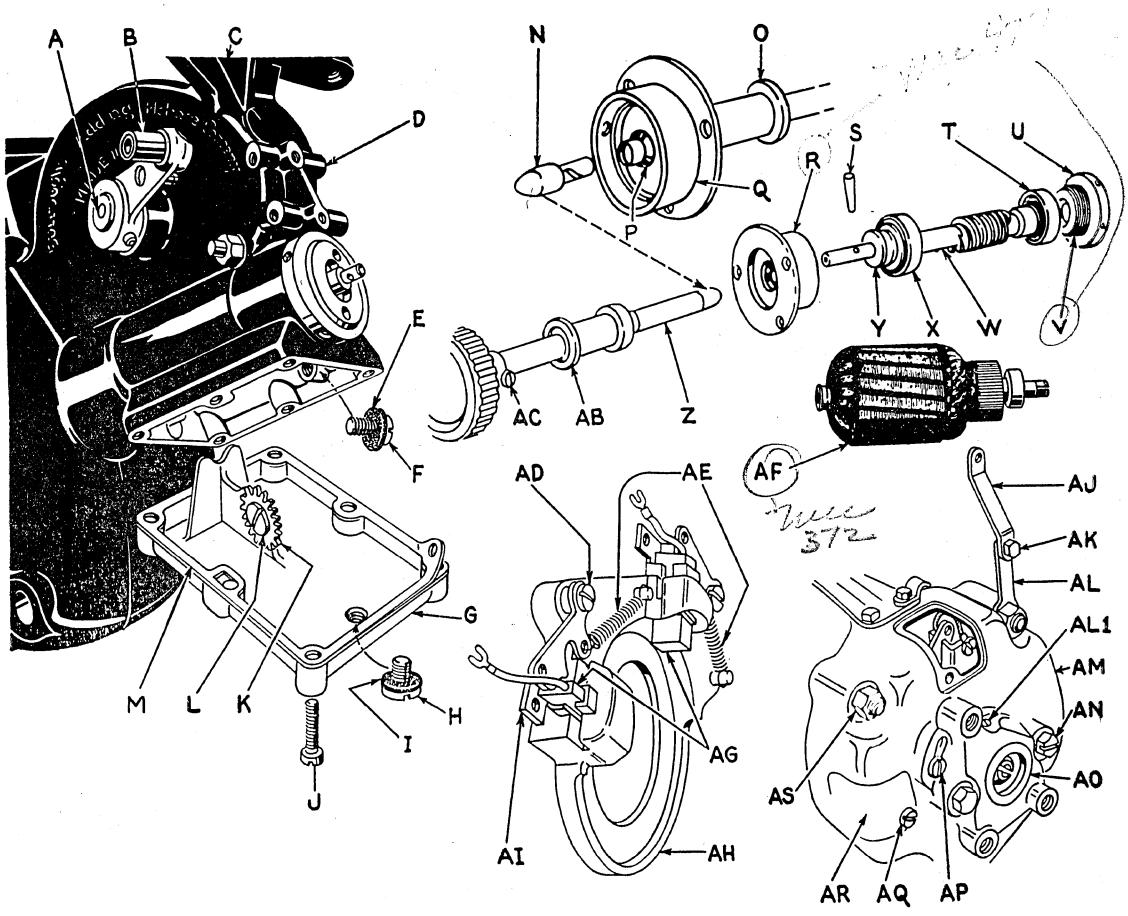


SYMBOLS (Plate 5-2)

A **1-4100A**
B **4055**
C **1097¼**
D **216⅛**
E **4151A**
F **4199**
G **1-4125**
H **12A-4140½** specify (700) (900) (1100) (1300) includes I, J
I **300809** for 700 RPM
4184 (900) for 900 RPM
4184 (1100) for 1100 RPM
82816 for 1300 RPM
J **4158** screw
K **1-4699**
L **3650½ No. 2**
M **45**
N **4620 No. 3**
O **2859⅜B**
P **20747**
Q **4619A No. 1**
R **2864⅝**
S **4165A**
T **4665¾ No. 1**
U **12055**
V **93½ No. 5** grommet
W **4619A No. 2**
X **93½ No. 2** grommet
Y **1-4199½** specify volts and capacity
Z **81609**

AB **2-4117** field coil assembly only, specify voltage
1-4167A complete Type 1 motor, specify votage
AC **24 No. 9**
AD **4190**
AE **3663¼**

BALL BEARING DRIVE MECHANISM AND MOTOR BRUSH ASSEMBLY, TYPES 6 AND 6A MOTORS (Plate 6)



SYMBOLS (Plate 6)

A **1-3800** includes B
B **1-3691D** use pin 3663½A
C **1-3666B No. 1** Drive casting only
D **1-3865B** Switch plate
E **3697¼**
F **71620**
G **1-3666¾A** complete splash gear assy., used with 6 and 6A motor
1A-3610½ complete splash gear assy., used with earlier 6 motor
H **71616A (71616B)**
I **3697¼**
J **77513**
2856⅞ used for early splash gear plate
K **3610½A** stamped 14.75
3610½ Early
3610½ No. 2 used with 19 to 1 gear ratio, stamped 19
L **3650⅞** use 7521½ washer, 47¾ nut
M **3694¾A** Gasket
N Part of Z
O Part of Z
P 3691⅜* included in Q or R
Q **1-3639½**
R **1-3639½**
S **3662¾ (3662¾ No. 1)**
T **1-3699⅛** used for 6 motor
1-71930 used for 6A motor
U **71339½**
V **3639B** used for 6 motor
1-3639 No. 2 used for 6A motor
W **3697C No. 1** (14.75 to 1) Shaft only for Type 6 motors
1Z-3697C No. 1 (14.75 to 1) assembled shaft for Type 6 motor, includes 1-71930 bearings
3697AZ No. 2 (14.75 to 1) Shaft only for Type 6 motor with governor, use 1-3639A No. 2 thrust bearing, 1-3639½A stationary bearing
3697CZ No. 1 (19 to 1) Shaft only for Type 6 motor without governor
1-3697CZ No. 1 (19 to 1) assembled shaft for Type 6 motor without governor, includes 1-71930 bearing
3697B No. 3 (19 to 1) Shaft only for Type 6A motors
1Z-3697B No. 3 (19 to 1) assembled shaft for Type 6A motor—includes 1-71930 bearings and 3635½ washer, use 1-3639A No. 2 thrust bearing and 1-3639½A stationary bearing
Note: **3697B** (24 to 1) Shaft only for early Type AC, DC motors
3697C (13 to 1) Shaft only for Type 2 motors, use 1-3667D (13 to 1) cast gear
X **1-71930**
Y **3611⅛ (84211⅛)**
Z Kit 71¾ includes N, O
AB Part of Z
AC **2850⅛**
AD **4654** Screw
AE **4680**
AF **1-4600 No. 2** used for 6A motor } Specify voltage
1-4200¼ used for 6 motor }
AG **1-4690** Brushes, use screws 4252
AH See Plate 6-1, letter H
AI **1-4612**
AJ **12121½A**
AK **10961¼A**
AL **12121¾**
AL1 **703509**
AM **4665 No. 3 (4665A No. 3, 4665⅜ No. 1,4619A No. 1, 2 req., 4619A No. 2, 2864⅝, 12055, 3 req., 1097⅛, 2 req.)** used for 6A motor
1-4665¼B (4665C, 1-4665⅜ No. 2, 4619A No. 1, 2 req., 4619A No. 2, 2864⅝, 3 req., 12055, 2 req., 1097⅛, 2 req., 4636, 2-4610A) used for 6 motor
AN **12055**
AO **4665⅜ (4665A No. 3, 4665⅜ No. 1, 4619A No. 2, 4619A No. 1, 2 req., 2864⅝, 3 req., 12055, 2 req., 1097⅛, 2 req.)**
AP **4659 (10056⅛)** used for 6A motor
4253 (81609) used for 6 motor
AQ **2864⅝**
AR **4619**
AS **20747**

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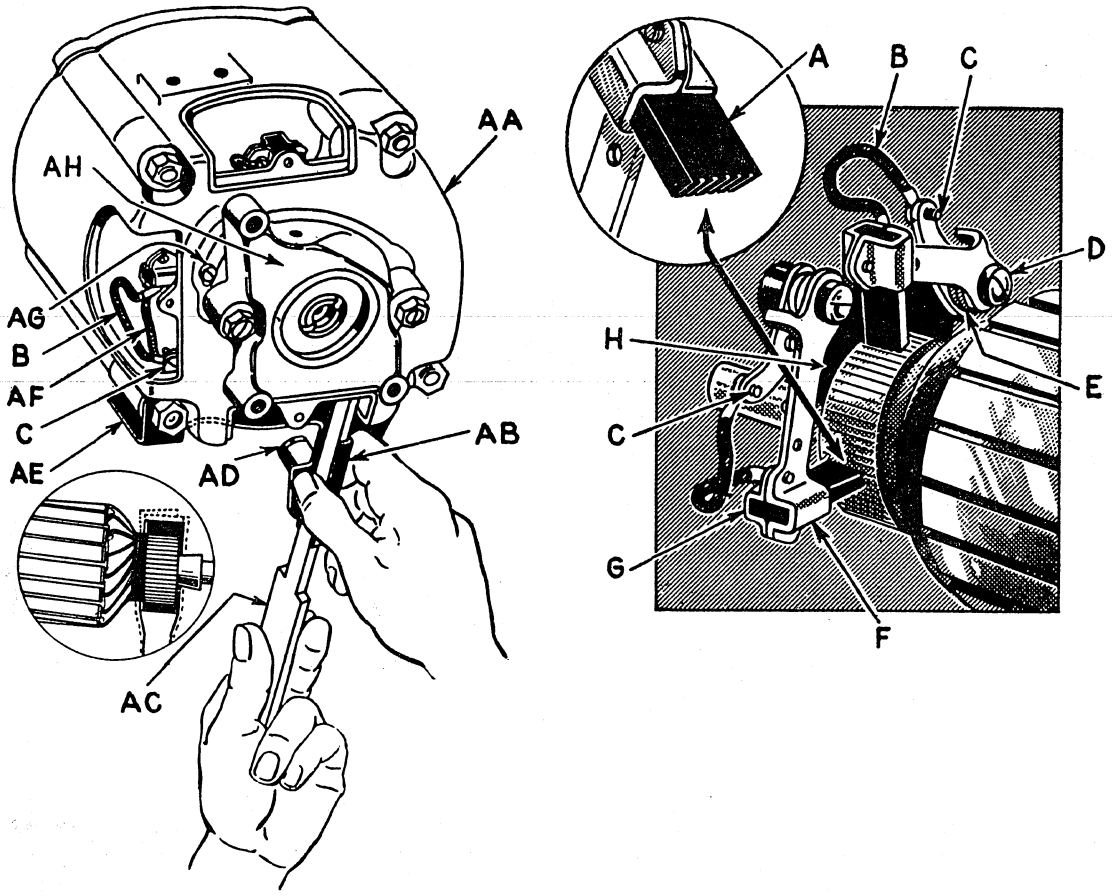
BRUSHES AND BRUSH HOLDER, IMPROVED, FOR TYPE 2, 6 AND 6A MOTORS (Plate 6-1)

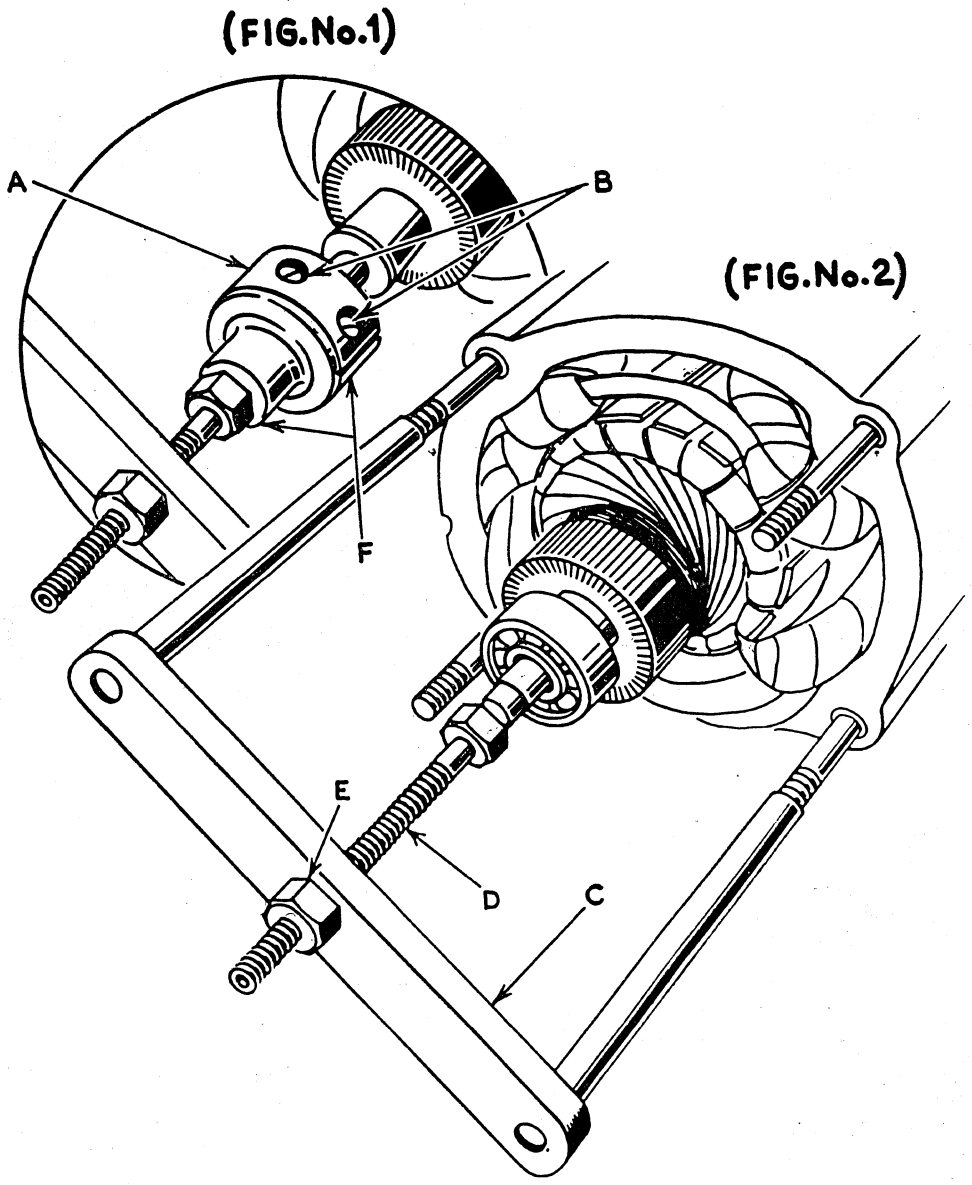


SYMBOLS (Plate 6-1)

A **4690A**
B **1-4670½**
C **4252** Screw, 2820½ washer
D **8054¾**
E **4680A** Coil spring
F **1-4611B** includes G
G **4611½** Retaining clamp, use 7562 screws
H **2-4610A** for Type 6 and 6A motors; **2-4610Z** for Type 2 and early Type 6 motors } Assembled brush holder

AA Description
AB 1-Kit 194-6 use screw Kit 194-5
AC 1-Kit 194-2
AD **103654** Screw
AE **Kit 194** assembled bracket includes AB, AC, AD
AF Description
AG Description
AH Description

ARMATURE PULLER FOR TYPES 2, 6 AND 6A MOTORS (Plate 6-2)



SYMBOLS (Plate 6-2)

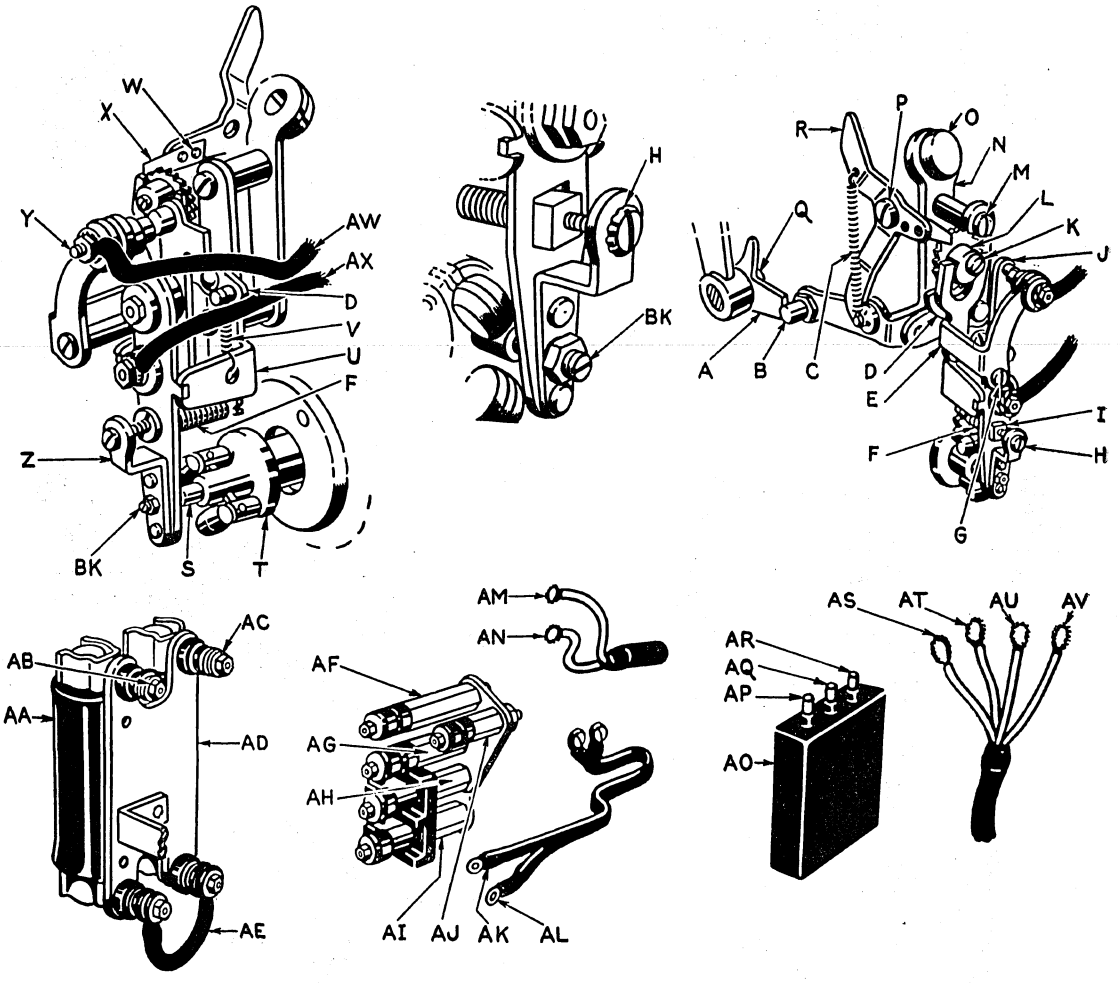
A	Kit 193-5	Complete assembly Kit 193
B	1050⅝	
C	Kit 193-1	
D	Kit 193-3	
E	Kit 193-4	
F	Kit 193-6	

The purpose of the armature puller is to permit easy removal of the armature from the worm shaft.

Figure 1—Illustrates the adapter F, which is required for armatures that do not have the threaded hole in the armature shaft.

Figure 2—Illustrates the armature puller as used for armatures with the threaded hole in the armature shaft.

MOTOR SPEED GOVERNOR ASSEMBLY, TYPE 6 MOTOR (Plate 7)

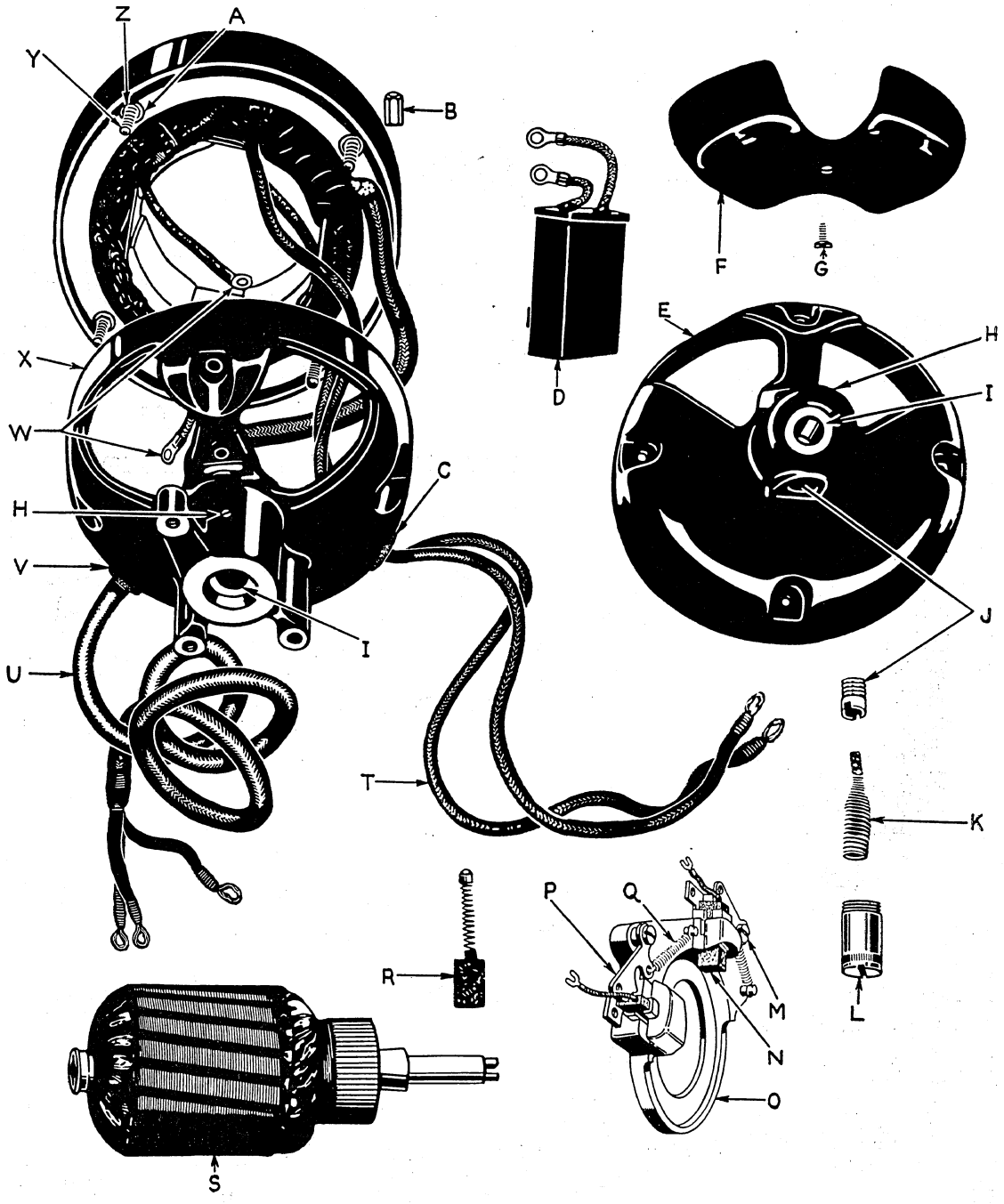


SYMBOLS (Plate 7)

A **1-3612¼A No. 4**
B **3659¾B**
C **86803**
D **1-81242** use 9253⅛ stud, included with U
E **1-81240** includes Y
F **1-3686** Spring
G **73563**
H **73660**
I Part of F
J **1-81121** inside contact point, use 74528 screw on top
K **73563**
L **1-81127**
M **75621**
N **1-3613½**
O **3661¼B** Cap, 3697¼ washer
P **3652⅝**
Q **3631¾A No. 2**
R **1-3613¾** includes W, X
S **81601**
T **1-81667A**
U **1-3613⅝A**
V **69806**
W **75620**
X **3613¾**
Y **1-81590** Outside contact points, use 75210 washer, 49¼ nuts
Z **1-81239A** Top screw 74528, bottom screw 104501, 75210 washer, 49¼ nut
AA **1B-200911** specify resistance, see Plate 3-1
AB **200538½ No. 1** Screw, 7919½A washers for black wire AW and other black wire leading to AJ
AC **46** Nut, 7919½A washers for black wire AX and for other black wire leading to AH
AD **1-3810 No. 2 (1-3810 No. 3)**
AE **1-71701**
AF **3852 No. 3** use 45 nut } Fastened to plate 3829½ No. 2
AG **3852 No. 2** }
AH **3853 No. 2** }
AI **3853**
AJ **3852 No. 4** use 45 nut
AK **1-4670 No. 3** MRC switch wire to AH
AL **1-4670 No. 3** MRC switch wire to AI
AM **1-3697½A** Wall cord to AG
AN **1-3697½A** Wall cord to AF
AO **1-4699½ No. 2** see chart, Plate 13-2
AP Green condenser lead to AI } Included in AO
AQ Red condenser lead to AJ }
AR Black condenser lead to AH }
AS Green wire to AI } Motor cord **1-4671¾**
AT Grey wire to AG }
AU Black wire to AF }
AV Red wire to AJ }
AW Black wire to AB
AX Black wire to AC
BK **81615**

SEE EXPLANATION ON INSIDE OF FRONT COVER

TYPE 2 MOTOR (Plate 8)



SYMBOLS (Plate 8)

1-4267 No. 2 specify volts and cycles, complete Type 2 motor equipped with radio interference eliminator, not MRC, Cl. 1, 2, 6, 11 thru 16

1-4267¼ No. 2 specify volts and cycles, complete Type 2 motor equipped with radio interference eliminator, MRC, Cl. 1, 2, 6, 11 thru 16

See note under motor and drive mechanism, Plate 5

A **1417** Washers
B **4231**
C **4294½ (93½ No. 5)**
D **1-4299¾** see chart, Plate 13-2
E **4265** not MRC
F **4619 No. 2**
G **1054½**
H **4257** Screw
I **4244** Bearing
J **4243½**
K **1-4281**
L **4233**
M **4654**
N **1-4690** Brushes, use screws 4252
O See Plate 6-1, letter H
P **1-4612**
Q **4680**
R **1-4290** used with early style brush holder
S **1-4200¼** specify voltage, fiber washers 4223 or 4223½ or 4224
T **4270 (1-4270)**
U **4271¾A** use 1-4271½A for motors without MRC
V **4294½ (93½ No. 5)**
W **4511¾ No. 1 (24 No. 5)**
X **4265¼** MRC
Y **4250**
Z **45** Nut

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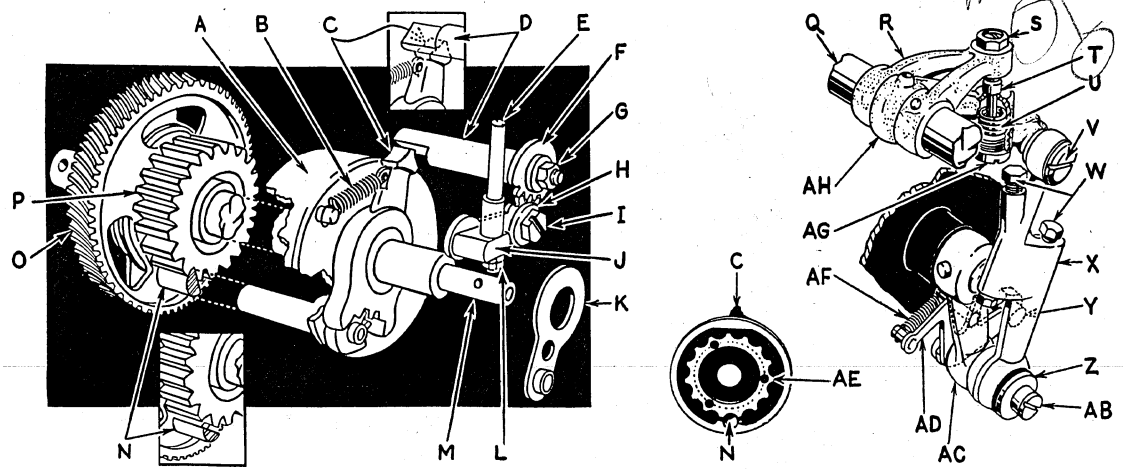
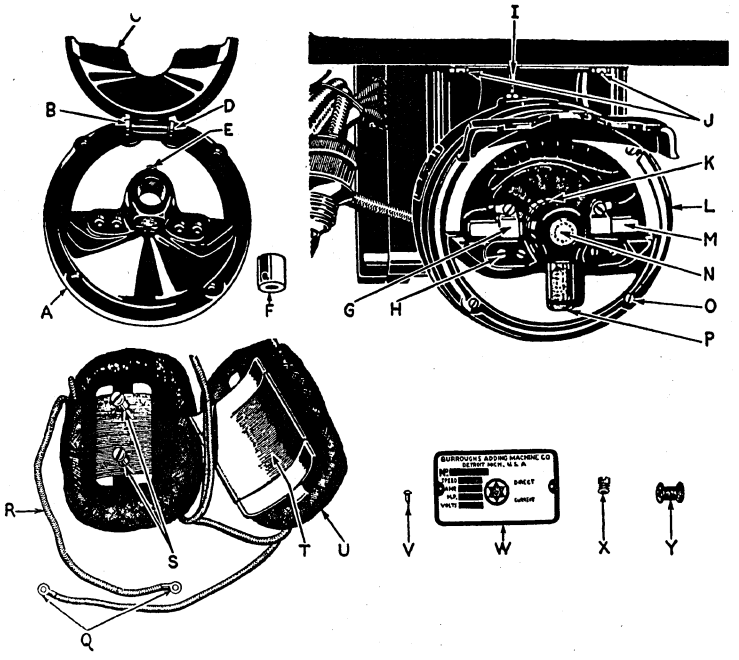
CLUTCH AND DRIVE MECHANISM (Plate 9)



SYMBOLS (Plate 9)

A **1-3800**
B **3687A** for 19 to 1
3687 (3687 No. 2) for 14.75 to 1
C **3690B**
3690 No. 2 (19 to 1)
D **3650C**
E **11-3627 No. 1**
F **3616B**
G **3612½** Washer, 45 nut
H **11B-3615C** includes J and L
I **3660¾** Screw, 3634¼A washer
J **1-3651¼E** included in H
K **1-3613¼B**
L **45**
M 3600B* included in A
N **3655¼A**
3655¾ No. 2 (19 to 1)
O **11-3667 No. 1 (19 to 1) Env. 1958 (1-3667 No. 2)** for machines without single stroke multiple print
1-3667 No. 2 Env. 1753 for machines with single stroke multiple print
P Included in O
Q 100A*
R 190C*
S **156 Style 9, 13** Screw; 199 Style 9, 13 nut
T **157A** Plunger
U **182A** Spring
V **1-3654¾C Style 9** includes 3654¾C Style 9 screw, 3641C collar, 199 Style 9 nut
W **3650⅛** Screws; wick 1-3689 Style 9 for Styles 11, 13, 15 and 17 or 1-201889 for Styles 7 and 9
X **1-3695¼A Style 9**
Y **3659¾C** Limit post
Z **201330A** Shoulder roll, 201501B screw, 3631¾A No. 2 nut
AB **3653¾B** Screw, 3631¾A No. 2 nut
AC **1-3691D**
AD **1-3612¼A No. 4**
AE 3693* included in 1-3667 No. 1, 14.75 to 1 ratio; or 1Z-3667D for 13 to 1 ratio; or 1Z-3667C for 7.5 to 1 ratio, worm and gear furnished together under symbol 1Z-3667C or symbol 1Z-3667D, see letter O for 19 to 1 ratio, use 3695B fiber washer between gear and housing
AF **3688**
AG **138A**
AH 191*

DIRECT CURRENT MOTOR (Plate 10)

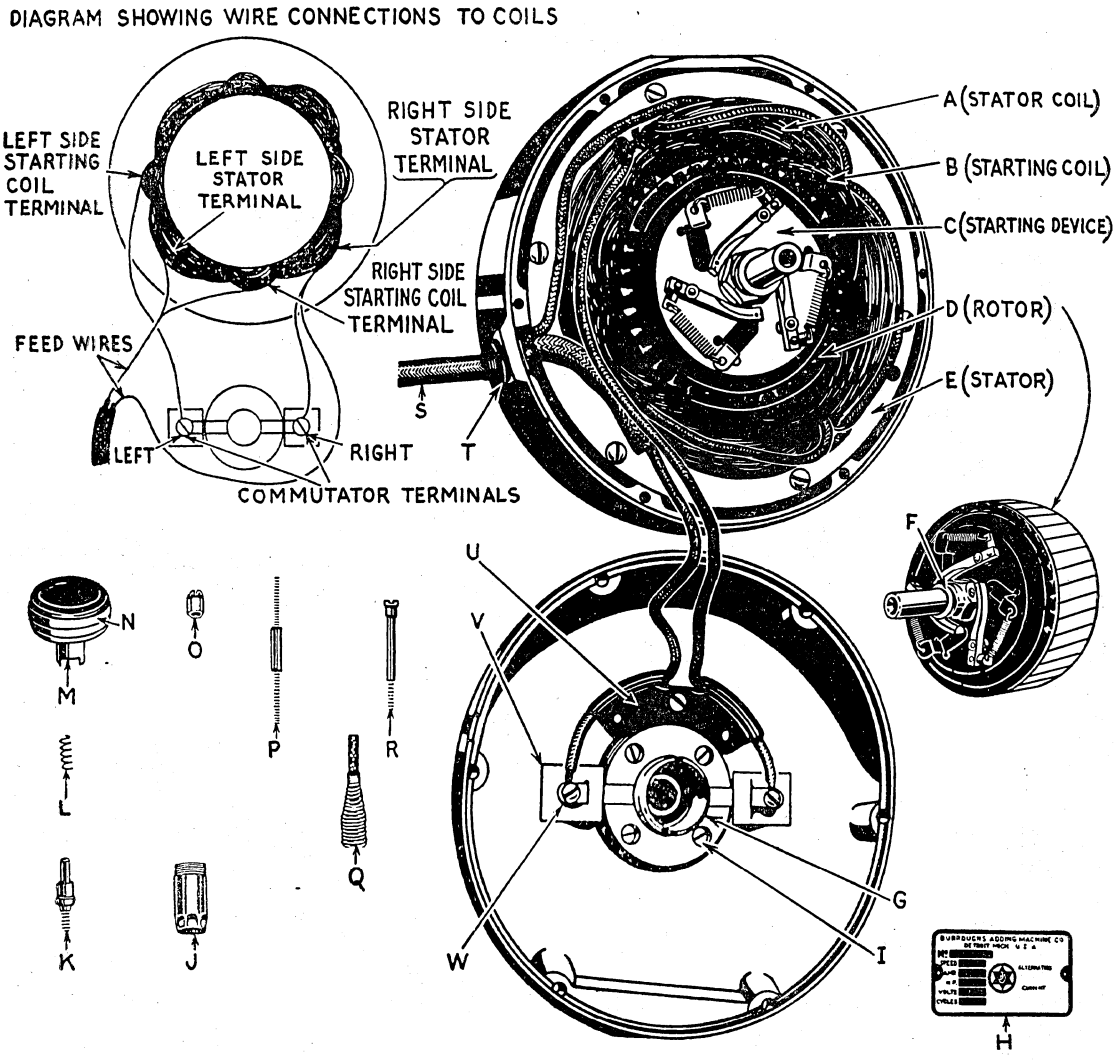


SYMBOLS (Plate 10)

A **4065** without MRC; 4265 with MRC **1-4065** or 1Z-4265 includes A, B, C, D and F
B **4012** Hinges, 2 req.
C **4068**
D **4051** Pin
E **4057** Screw
F **4044Z** Bearing
G **4066** Clamp, uses screw 4055 at top
H **4093** Fiber insert
4013 Metal retainer, 4056 screws, 2 req.
4035, 2 req. Fiber collars for 4056's
I **3650½A** Strain bolt—early; use nut 3645
3650½B—later; use 45 nut
J **3663¼**
K **1-4000** Armature, specify H. P., and voltage; space washer 4096 1/64 not included
L **4067,** 1-4067 is complete motor; specify H. P. and voltage and order on supply order containing no other items
M **4090** Brush, 4014 brush holder, 4080 spring
N **4030** Cap
O **4056**
P **4011 (4233, 1-4281)**
1-4281 Spring, includes wick 15921
Q **4511¾ No. 1**
R **1-4097½** includes Q
T **1-4069; ⅛,** 1/10 H. P.
U When ordering fields for D. C. motors, specify:
Large fields "single wound" 1-4073; ⅛, 1/10 H. P.
Small fields "double wound" 1-4073; ⅛, 1/10 H. P.
Large field, single wound, held in motor with a pin
Small field, double wound, held in motor with two screws
V **4291⅛** Pins for W
W **4096⅛**
X **4243½** Guide for wick
Y **70994 (93½ No. 4)**

SEE EXPLANATION ON INSIDE OF FRONT COVER

ALTERNATING CURRENT MOTOR (Plate 11)



SYMBOLS (Plate 11)

NOTE: When ordering complete A. C. Motor, 1-4167 or 1-4167¼ MRC, specify H. P., voltage, cycles, and order on Supply Order containing no other items.

A, B and E—not furnished

C **2A-4140½** specify 700-900-1100-1300 R.P.M.
Separate parts not furnished; order 2A-4140½ complete.
The number marked on the starting device is the revolutions per minute required to disengage the shoes from the commutator which is assembled on the motor back plate.

R.P.M. marked on starting device	R.P.M. marked on motor name plate	For motors running between
700	880,970,980 R.P.M.	850 to 1000 R.P.M.
900	1180, 1225, 1300, 1325, 1370 R.P.M.	1000 to 1370 R.P.M.
1100	1470, 1570 R.P.M.	1400 to 1570 R.P.M.
1300	1760, 1825, 1840, 1980 R.P.M.	1600 to 2000 R.P.M.

D **1-4100** specify H.P., voltage, and cycles, uses bearing 4130Z
F **4196,** 1/32" or 1/64" Washer
G **1-4125**
H **4196⅜** uses 2 screws 4291⅛
I **4151,** 4 req.
J **4233** Later or 4111A earlier
K **4154⅛C (Kit 117-2)**
L **4282 (Kit 117-3)**
M **Kit 117** Motor twirler
N **Kit 117-6** Rubber grip
O **4131** for P, 12 req.
P **4101,** 6 req.
Q **1-4281** includes wick 15921
R **3651½** Strain bolt
S **1-4271½A**
T **4294½** Rubber sleeve
U **4122** Clip, uses 4157 screw
V **4199** Paper insulator, 2 req.
W **4055,** 2 req.

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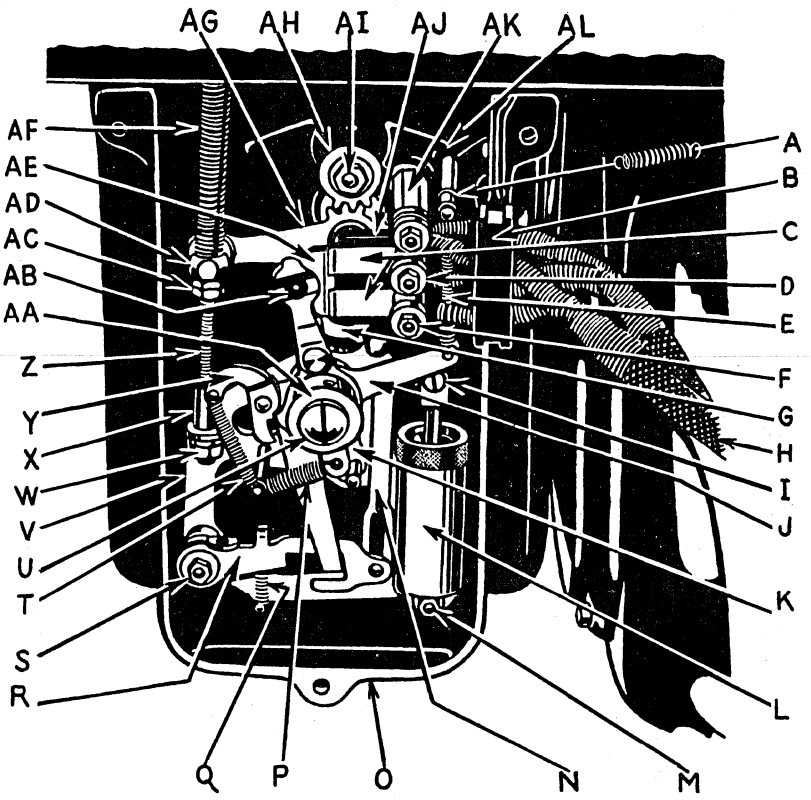
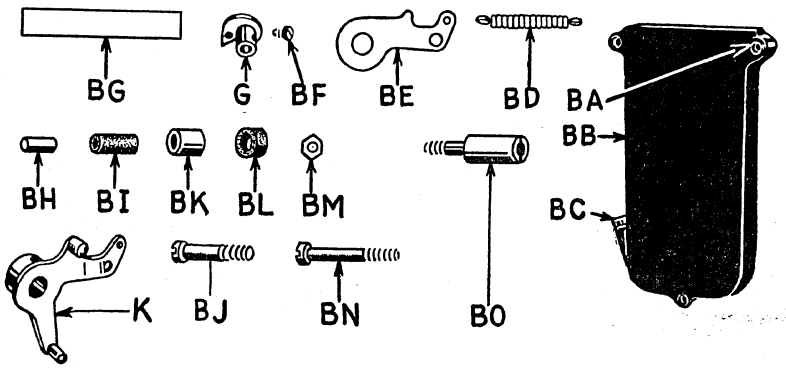
TIME SWITCH FOR AC AND DC MOTORS (Plate 12)





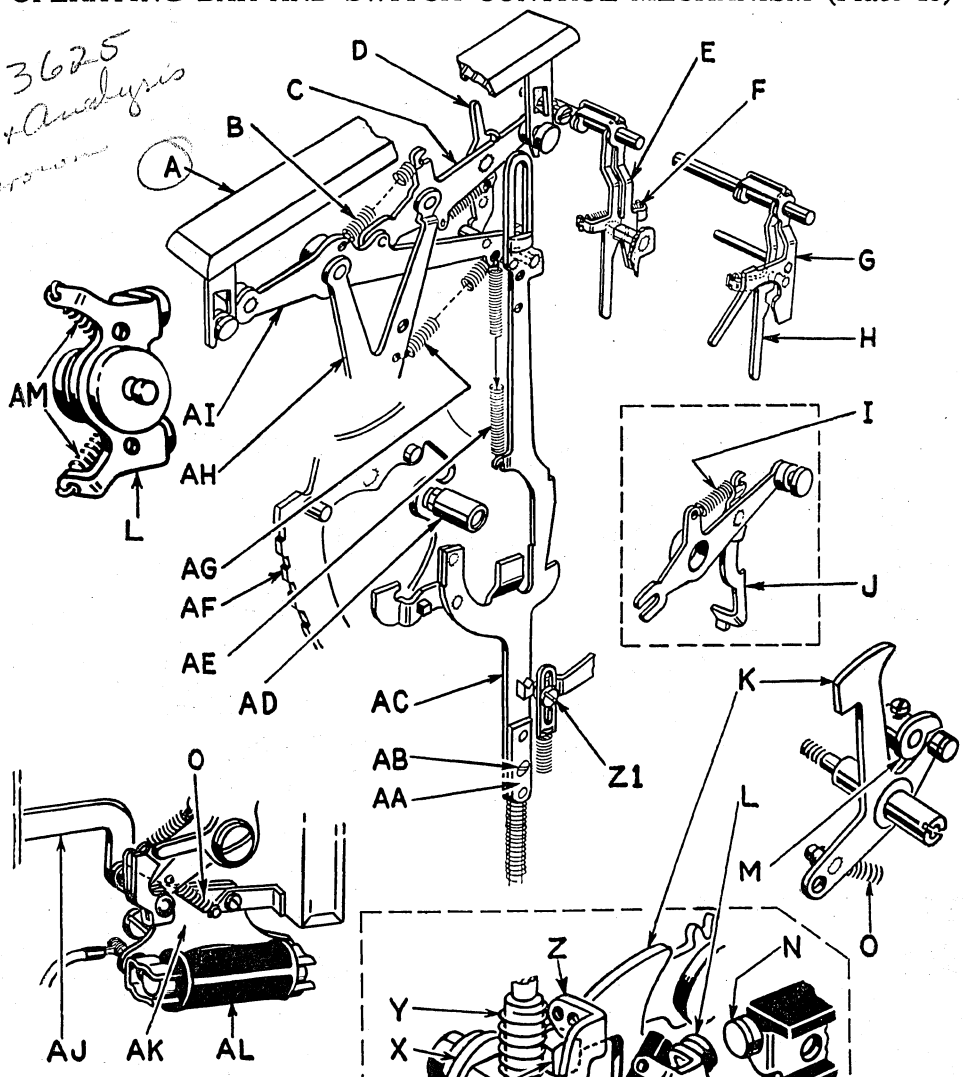
SYMBOLS (Plate 12)

A **680**
B **3890** (3890⅛)
C **3826A**
D **3826½**
E **981¼**
F **46**
G **1-3833** use screw 4450⅛
H **1-3697½A** Wall cord
1-3697⅞, 6′ extension cord
I **3855** Screw, 46 nut
J **1-3818**
K **1-3814A**
L **1-3802B** complete assembled switch dashpot
M **46** Nut, 3819⅛ washer
N **3811**
O **3869**—Specify machine No., use screws 3660¾
P **3882**
Q **480¼**
R **1-3817A**
S **3819⅛** Washer, 46 nut
T **483**
U **7356¾**
V **1A-3810** Frame
W **45**
X **3835**
Y 3812* included in AA
Z **3651⅝Z** used with 11B-3827, use screw 3651⅜
AA **1A-3815** complete assembly, includes Y, AB, AE
AB **3837B** use fiber washer 3829A
AC **45**
AD **1-3651¼E** use 3612½ washer, 45 nut
AE **3824A**
AF **3684A**
AG **1-3615C** complete assembly 11B-3615C
AH **3616B**
AI **3650C** Clutch pawl, use 3612½ washer, 45 nut
AJ **3891**
AK **3852** Top post, 3853 center post, **3854** lower post
AL **1-3865** Switch casting, includes AK
BA **3856** Screws for cover
BB **1-3868A**
BC **1-3850⅞A** assembled shut off button, includes plunger 3850⅞A, 3830¼ retainer, 2881⅛ spring and 3810¼ washer
BD **3283½** used with BE
BE **3814½**
BF **4450⅛**
BG **3818¼** Flat spring retainer for felt pad 3890¼ in driver cover
BH **3840** Short tubing for AK
BI **3839** Long tubing for AK
BJ **3661B** Short screws, 5 req., for AL
BK **3836½** Brass collar for AK
BL **3838** Fiber collar for AK
BM **46**
BN **3857** Long screws, 2 req., for AL
BO **3861**

SEE EXPLANATION ON INSIDE OF FRONT COVER

OPERATING BAR AND SWITCH CONTROL MECHANISM (Plate 13)

21-3625
Cl + Analysis
Brown



SYMBOLS (Plate 13)

A **1-3625** Regular
11-3625 for bank posting "tabulate"
1-3625 No. 2 for cycle mechanism
B **7283A Style 10**
C **1A-201121**
D Included in C
E **3614¾**
F **7286½** without R.P.M., 283A with R.P.M.
G **1-201124A No. 2** with R.P.M.
1-10114¾ No. 2 without R.P.M.
H **3614½**
I **10180**
J **1-12013⅞**
K **1-3818A**
L **1A-3842B**
M **1-3833A**
N **1A-3826CR&CL**
O **3883A**
P **2851⅝**
Q **1B-3815B** includes L
R **3882A**
S Included in K
T **3852½A**
U **45** Nuts, 2 req.
V **1-3651¼E**
W Included in X
X **1-3615C** Trip arm only
11A-3615C Early } Assembled trip arm,
11B-3615C Later } includes V, W, X
Y **3684B**
Z **1A-201800**
Z1 **2857⅞ (4857½)**
AA **3651⅝** included in AC
AB **3651⅜** included in AC
AC **21-3627 No. 1**
AD **1-3662¼**, 45 Nut
AE **3682**
AF **2B-311⅛**
AG **680**
AH **2227⅛** for Cl. 1-2-6
215⅞ for repeat of totals
1-215⅞ No. 2 for bank posting
1-215⅞ No. 3 (1C-215⅞ No. 3, 200233½A, 20 No. 114, 69809, 203423 No. 4) for mult. skip-return
AI **1-201123 (1A-201123, 1-201121A)**
AJ **1-3810 No. 2 (1-3810 No. 3)**
AK **1B-200201**
AL **1B-200911** specify resistance, see Plate 3-1
AM **3885B**

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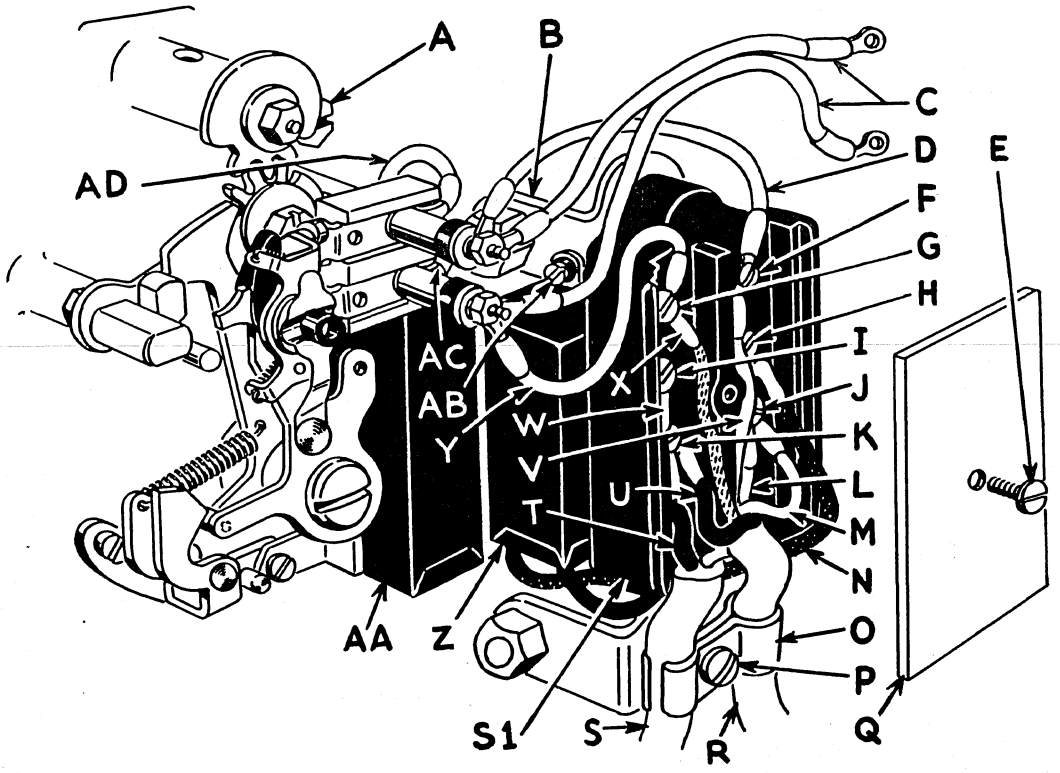
TYPES 2, 6, AND 6A MOTORS, LATER (Plate 13-1)



The radio filter is now assembled to the outside bracket B on machines using Types 2, 6 and 6A motors instead of inside the motor as formerly.

When replacing a Type 2, 6 or 6A motor, the radio filter, bracket and other necessary parts may be ordered as a consistency under symbols 12Z-4699½B for Type 2, and 2Z-4699½B for Types 6 and 6A or individually by their symbol numbers.

WIRE CONNECTIONS FOR TYPES 2 AND 6 MOTORS (See Note Below for 6A Motors)

(C) Twin wires from drive switch to MRC switch.
(D) Red wire from screw F to upper switch post.
(Y) Green wire from screw G to lower switch post.
(X) Green wire from motor cord R to screw G.
(V) Red wire from motor cord R to screw F.
(U) Black wire from motor cord R to screw K.
(M) White wire from motor cord R to screw J.
(T) Black wire from line cord S to screw K.
(L) White wire from line cord S to screw J.
(N) Long wire from radio filter Z to screw H.
(W) Short wire from radio filter Z to screw I.
(AD) Wire from condenser AA to upper switch post.
(AC) Wire from condenser AA to lower switch post.

NOTE: Wire connections for Type 6A motors are the same as shown on Plate 3, Power Symbol List, except when installing radio filter Z, shown above, the long wire N is connected to screw H and the short wire W is connected to screw I.

SYMBOLS (Plate 13-1)

A **3660¾**
B **3611½** for Type 6 or 6A
3611½ No. 2 for Type 2
C **1-4670 No. 3**
D **1-3673A No. 1**
E **79603**
F, G, H, I, J, K—**4252** Screw, 2820½ washer
O **3611¾**, 2 req.
P **709621**
Q **70902**
R **1-4671¾**
S **1-3697½A**
1-3697⅞, 6′ extension cord
S1 **1-70903** use screws 3455⅝, washers 1097¾
Y **1-3673A No. 2**
Z **1-4699½B** see chart, Plate 13-2
AA **1-4299¾ No. 2** see chart, Plate 13-2
AB **3256**1/16 Screw, 1097¾ washers, 3 req.

SEE EXPLANATION ON INSIDE OF FRONT COVER

RADIO FILTER REPLACEMENT CHART—TYPE 2, 6, 6A MOTORS (Plate 13-2)

Motors WITHOUT SPLIT FIELD COILS may be easily identified by the 2 or 3 wire cable from the motor.
Motors WITH SPLIT FIELD COILS may be easily identified by the 4 wire cable from the motor.

SYMBOLS	DESCRIPTION
1-4099¾ No. 2	Radio Filter for D. C. Motors, use 84558¾ screws
1-4299¾	Combination Radio Filter and Condenser for Type 2 and Type 6 motors WITHOUT GOVERNOR AND WITHOUT SPLIT FIELD COILS. Replaces D, Plate 8, Power Symbol List and is located at switch. Connect as follows: Red wire to top post. Black wire to center post. Green wire to bottom post.
1-4299¾ No. 2	Radio Filter, AA, Plate 13-1, Power Symbol List Supplement, for Type 2 and Type 6 motors WITHOUT GOVERNOR AND WITH OR WITHOUT SPLIT FIELD COILS.
1-4699½B	Radio Filter, Z, Plate 13-1, Power Symbol List Supplement, for Type 6 and Type 6A motors WITH SPLIT FIELD COILS. This filter is also used for replacement on Type 2 motors where bracket B, Plate 13-1, Power Symbol List Supplement, has been installed, see note below.
1-4699½ No. 2	Radio Filter for Type 6 and Type 6A motors WITH GOVERNOR AND WITH SPLIT FIELD COILS. Located in position AA, Plate 13-1, Power Symbol List Supplement.

NOTE: Radio Filters located on inside of motors are not available for replacement. When it is necessary to replace this filter, order bracket assembly 12Z-4699½B for Type 2 motors, and 2Z-4699½B for Type 6 and Type 6A motors which includes 1-4699½B radio filter and attach to outside of motor as illustrated in Symbol List Supplement, Plate 13-1.

All Radio Filters are now stamped with Symbol Number, Type of motor, and Series of machines it will accommodate and the date of manufacture.

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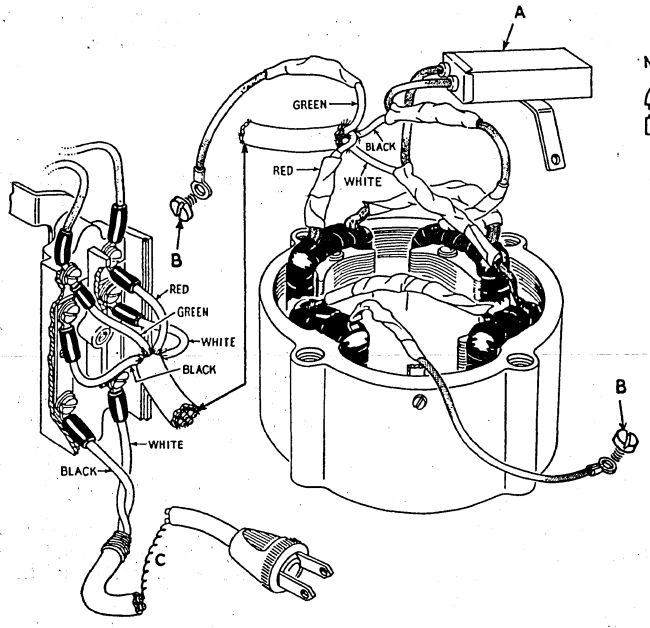
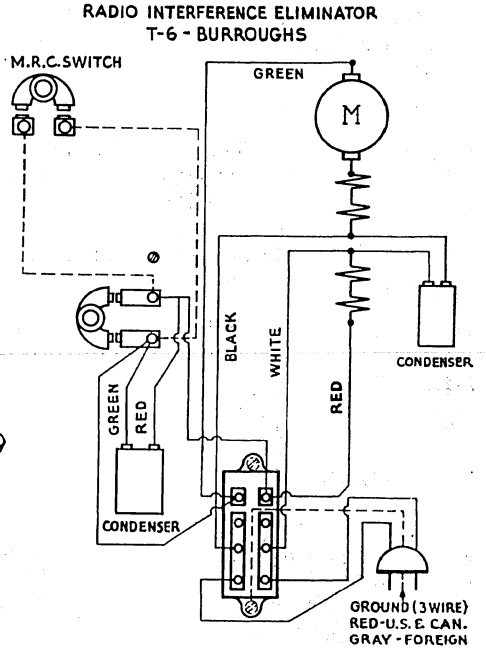
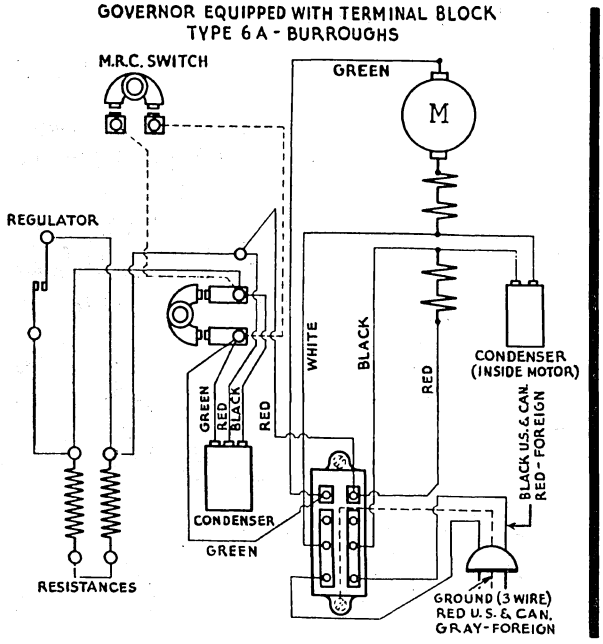
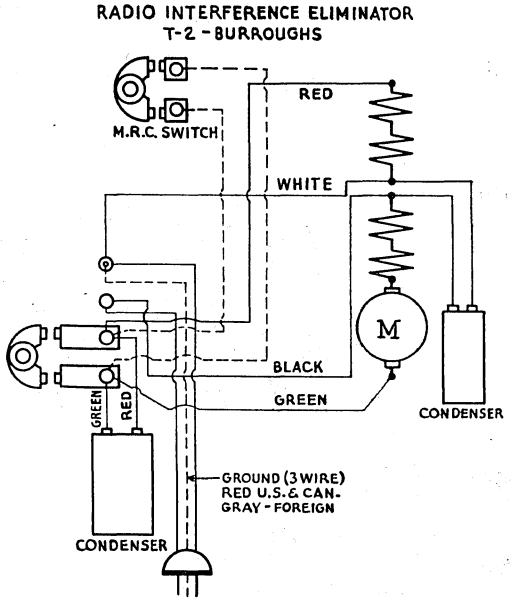
WIRING DIAGRAMS FOR TYPES 2, 6 AND 6A MOTORS (Plate 14)





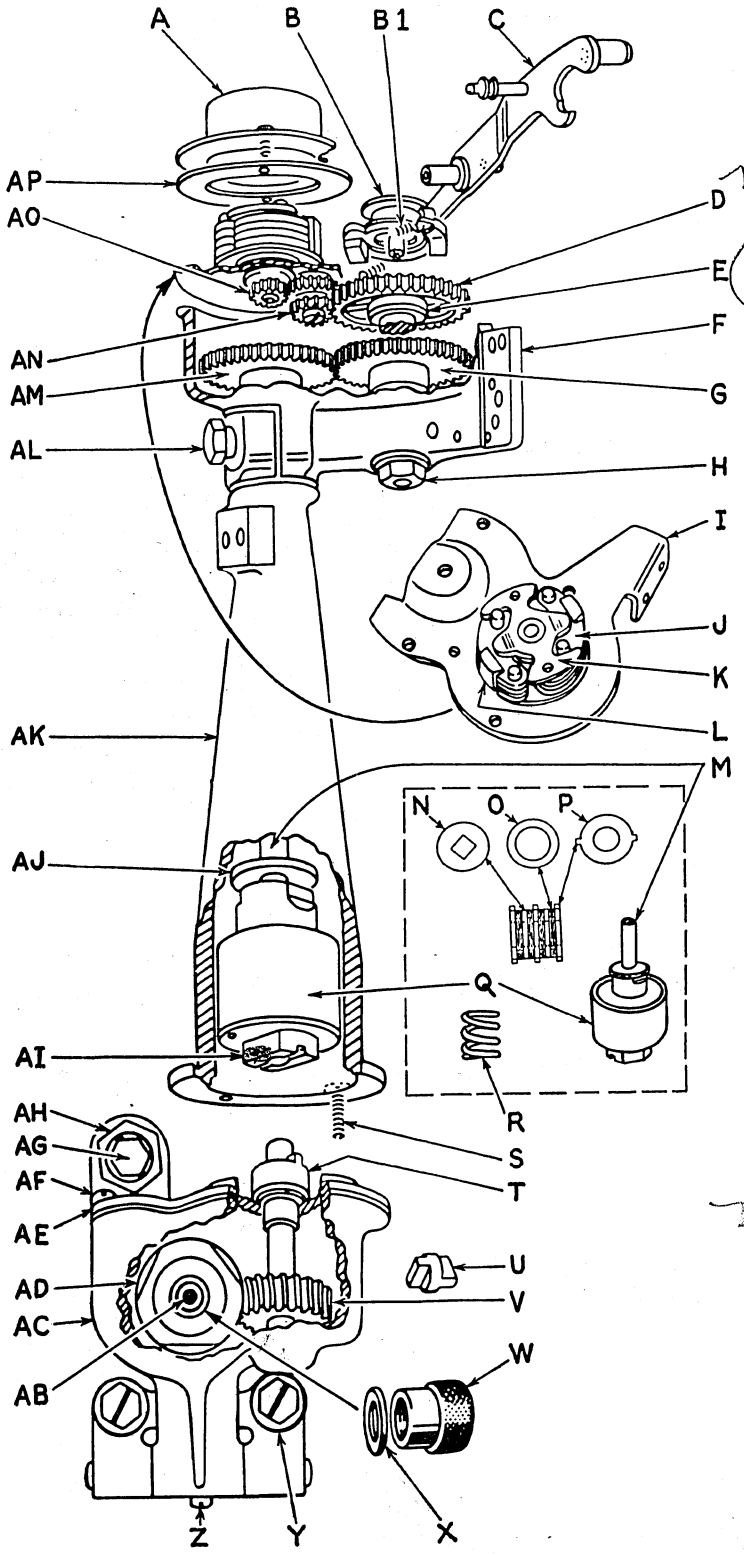




SYMBOLS (Plate 14)

A See chart, Plate 13-2
B 4252
C 1-3697½A
1-3697⅞, 6′ extension cord

MRC UNIT (Plate 15)



SYMBOLS (Plate 15)

A **12011 No. 2** uses screws 12052
B **1-12002 No. 1 (1A-12002, 12040 No. 1, 1-12041BZ)**
B1 **12080**
C **1-12015A**
D **1-12041A (1A-12002, 12040 No. 1, 1-12041BZ)**
E **12027⅛ No. 2** bronze washer
F **1-12066¼A** or 1-12066¼ No. 2 for mult. skip-return
G **12040 No. 1**
H **12001** shaft, 393 nut, 3417¼ washer
I **1-12010½B**
J **12026⅛ No. 2**
K **1-12028B No. 2 (1-12010½B)**
L **12098A** brown
M **1-12006** uses pin 54½
N **12024⅛B**
O **12024⅜B**
P **12024⅞A No. 2** N, O and P in sets, 1Z-12024⅜B
Q **1-12047½A**
R **12085B**
S **12050** 4 req.
T **1-12003**
U **12064⅛**
V **12090⅝A** for Types 2, 6 and 6A motors
12090⅝ for 1500 R.P.M. motors
12090A for 1200 R.P.M. motors
W **12044½A**
X **12095½A** paper washer
Y **12055** screw, 1097⅛ lock washer
Z **12055⅝** screw, 12060 pin for hinging 12068
AB **1-12004B** uses washer 12097¼
AC **2-12066¾** stamped "26" for Types 2, 6 and 6A motors
2-12066¾ stamped "15" for 1500 R.P.M. motors
2-12066¾ stamped "12" for 1200 R.P.M. motors
AD **12097⅝A** for Types 2, 6 and 6A motors
12097⅝ for 1500 R.P.M. motors
12097A for 1200 R.P.M. motors
AE **1-12010¾** cover, 12094½ paper gasket
AF **12051 (73561)**
AG **12041¾** bushing, 12051¾ screw
AH **12045¼** nut
AI **12047A**
AJ **71910A**
AK **1-12065½** for Cl. 1, 2, 6, 11 thru 16 includes top bushing 12031A
1-203668 for Cl. 20 thru 30
AL **12053¾**
AM **12043**
AN **1A-12048A** uses screw 7357½
AO **1-12028B No. 2 (1-12010½B)**
AP **12091** paper gasket

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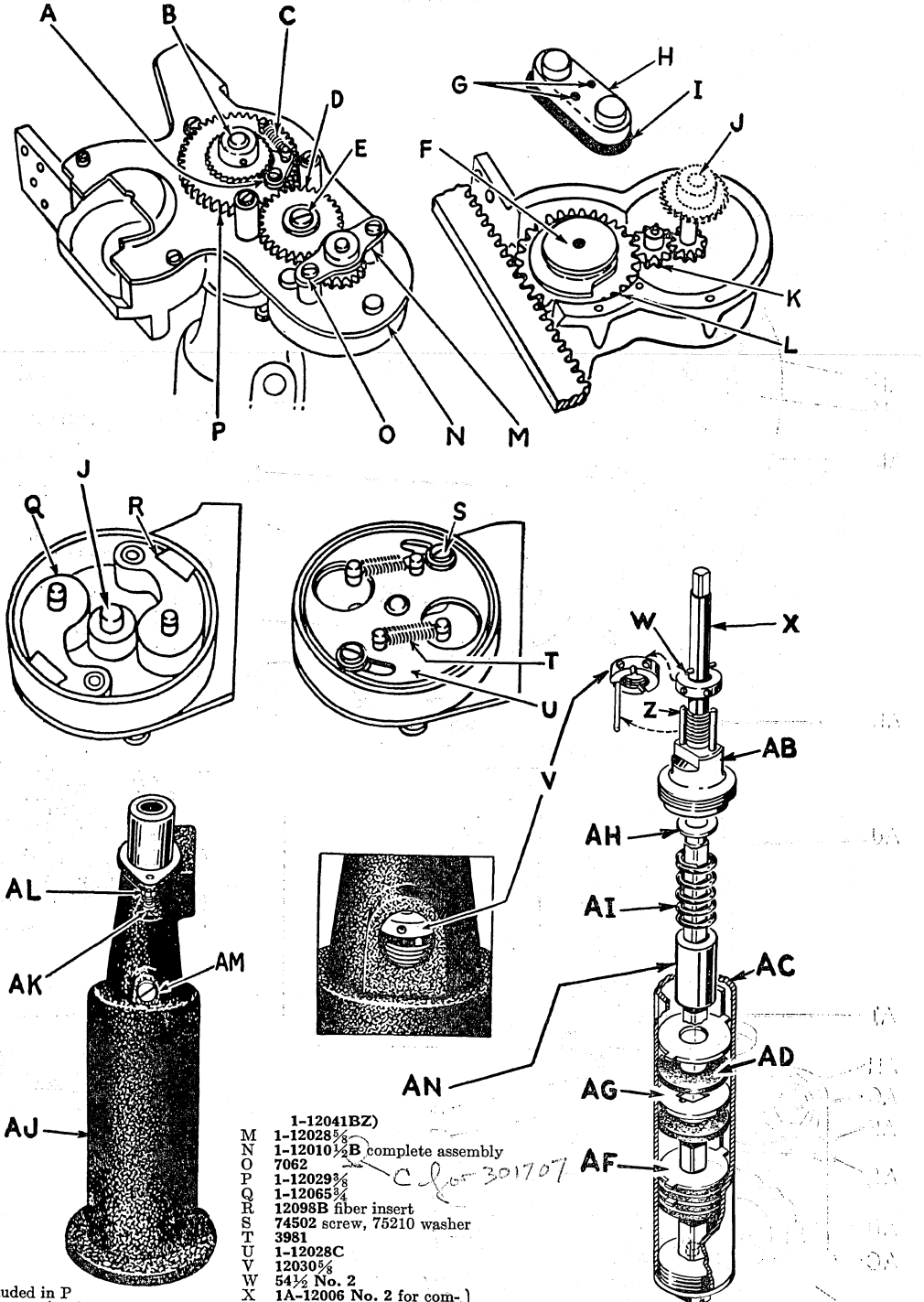
Replaces Plates 15, 16 Dated 2-15-49

MRC GOVERNOR LATER, AND FRICTION ASSEMBLIES, LATER (Plate 16)



SYMBOLS (Plate 16)

A Pawl, included in P
B **1-12039C** uses pin 52
C **7781A**
D **1-12043¾**
E **7357½**
F **1-12002 No. 1 (1A-12002, 12040 No. 1, 1-12041BZ)**
G **12052⅝** screw
H **12065¼** cap
I **12098½** cork gasket
J **1-12005½** includes gear 12043⅜* and pin 8050⅜
K **1-12048B (12048C, 12048¾Z)**
L **1-12041A (1A-12002, 12040 No. 1, 1-12041BZ)**
M **1-12028⅝**
N **1-12010½B** complete assembly
O **7062**
P **1-12029⅜**
Q **1-12065¾**
R **12098B** fiber insert
S **74502** screw, 75210 washer
T **3981**
U **1-12028C**
V **12030⅝**
W **54½ No. 2**
X **1A-12006 No. 2** for commercial machines; **11A-12006 No. 2** for bank machines } complete clutch
Z **12062⅝A**
AB **12049¼ No. 2**
AC **1-12047½ No. 2**
AD **12024⅜ No. 2**, 24 required for commercial machines, 16 required for bank machines
AF **12024⅞A No. 3**, 13 required for commercial machines, 9 required for bank machines
AG **12024⅛ No. 2**, 12 required for commercial machines, 8 required for bank machines
AH **12026⅝**
AI **12085 No. 2**
AJ **1-203668 No. 3** black, includes AK, AL, AM; **11-203668 No. 3** gray, includes AK, AL, AM
AK **75609**
AL **46**
AM **203655**
AN **12034⅛A** for bank machines only

SEE EXPLANATION ON INSIDE OF FRONT COVER

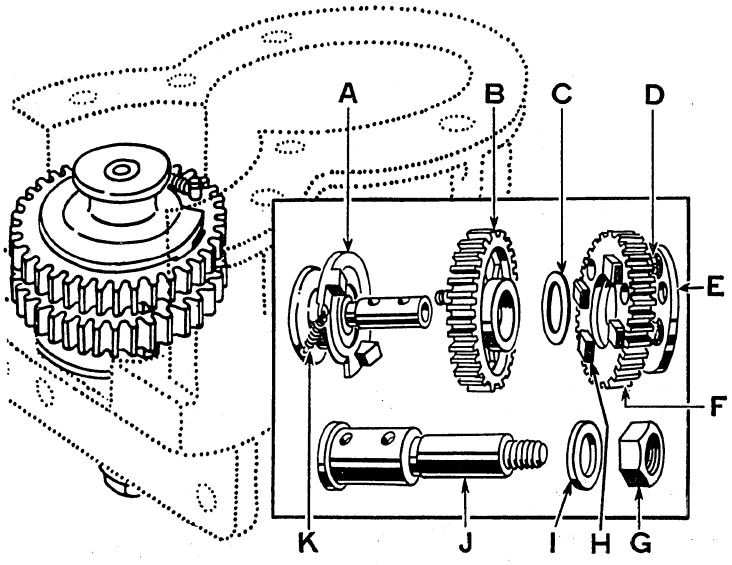
MRC CLUTCH UNIT USED IN EARLY STYLE MULTIPLE SKIP AND RETURN MACHINES (Plate 17)

SYMBOLS (Plate 17)

A 1-12002 No. 2 includes K
B 1-12041A (1A-12002, 12040 No. 1, 1-12041BZ)
C 12027⅛ (12027⅛ No. 2)
D 807 Env. 1358
E Included in F
F 1-12040A Env. 1358
G 393
H 901 Env. 1358
I 3417¼
J 12001
K 12080

SYMBOLS (Plate 18)

A 1-12028¾ (11-2828¾R No. 1, 203423 No. 2) Early style
B 2886⅞ No. 2
C 2841A
D 1-12025½A Early, 1-12025½B later style
E Included in D
F 1-2828¾R No. 1 (11-2828¾R No. 1, 203423 No. 2) use screw 7357½ and spring 12083
G 203159
G1 12026¼L use 47 nut and 1097⅞ lock washer
H 7357½
I 1-2816A No. 1
J 1-2849D
K 1-12017 No. 2 Style 17 (12") (18") see letter AB for other styles
L 1-203166 No. 3 Style 12 (1A-203166 No. 3, Style 12, 203456½)
1-203166 No. 3 Style 15 (1A-203166 No. 3 Style 15, 203456½)
1-203166 No. 3 Style 18 (1A-203166 No. 3 Style 18, 203456½)
M Included in K, uses 47 nut
N 1-12026¾CL
O 12026⅞ No. 2
P 1A-218AR Fte. 203
(See Symbol List Supplement—CGE., Plate 51-7)
Q 53805 Style 13
R 203177A No. 2 uses 73611 screw
S 2824⅝
T 1-203117R
U 1-3383¼C Style H, K
V 1A-203166 Styles 12, 15, 18 (1-203166 No. 3 Styles 12, 15, 18)
W 1-203176L
X 1-12026¾CL
Y 12026⅞B use 12054¾ screws, 1097¾ lock washers and 16340 collars
(See Symbol List Supplement—CGE., Plate 51-7)
Z 12081A
AA 1-12023 includes screw 12057¼
NOTE: For dimensions of rack bars see Plates 51-1 thru 51-6 Cge. Symbol List.
AB 1-12017A Style 9H used on Style 9 machine with 12" cge., Cl. 1, 2, 6
1-12017A Style 11H used on Style 11 machines with 12" cge., Cl. 2, 6
1-12017A Style 11K used on Style 11 machine with 18" cge., Cl. 2, 6
1-12017 Style 13H Early—not toggle feed, used on Style 13 machine with 12" cge., Cl. 1, 2, 6, 11 thru 16
1-12017A Style 17H used on Style 13 or 17 machine with 12" cge., not multiple skip and return, Cl. 1, 2, 6, 11 thru 16, 20 thru 30
1-203167 (15") used on Style 15" cge., not multiple skip and return, Cl. 20 thru 30
1-12017A Style 17K used on Style 13 or 17 machine with 18" cge., not multiple skip and return, Cl. 1, 2, 6, 11 thru 16, 20 thru 30
1-12017 Style 17H Early—not toggle feed, used on Style 17 machine with 12" cge., Cl. 2, 6
1-12017 Style 17K Early—not toggle feed, used on Style 17 machine with 18" cge., Cl. 2, 6
1-12017 Style 17 (12") No. 2 used on Style 13 or 17 machine with 12" cge., multiple skip and return, Cl. 20 thru 30



1-203167 (15") No. 2 used on Style 15" cge. with multiple skip and return, Cl. 20 thru 30
1-12017 Style 17 (18") No. 2 used on Style 13 or 17 machine with 18" cge., multiple skip and return, Cl. 20 thru 30
1-12017 (18") No. 3 (1-12017B No. 3 Style 18) used with platen to space from MRC, space and non-space manual controlled
1-12017 (24") used on 24" cge., Cl. 1, 2, 6, 11 thru 16
1-12017 Style 13 13 34 used for Style 13 13 34 only

1-17 Fte. 86 Style 17 (12") No. 1 used on Style 17 machines with 12" cge.
1-17 Fte. 86 Style 17 (15") No. 1 used on Style 17 machines with 15" cge.
1-17 Fte. 86 Style 17 (18") No. 1 used on Style 17 machines with 18" cge.
} Used on S&N cge. with 1" spacing on both sides, not mult. skip and return, Cl. 1, 2, 6, 11 thru 30

1-17 Fte. 86 Style 17 (12") No. 2 used on Style 17 machines with 12" cge.
1-17 Fte. 86 Style 17 (15") No. 2 used on Style 17 machines with 15" cge.
1-17 Fte. 86 Style 17 (18") No. 2 used on Style 17 machines with 18" cge.
} Used on S&N or regular cge. with 1" spacing on right side only, not mult. skip and return, Cl. 1, 2, 6, 11 thru 30

1-17⅞ Fte. 88 Style 17K used with wide ledger chute, not sel. col. return
1-17⅞A Fte. 88 Style 17K used with sel. col. return with ledger chute in center of cge.
1-17⅝ Fte. 88 Style 17K used with sel. col. return and when ledger chute is not in center of cge.
} Used for public utility cges. Cl. 1, 2, 6, 11 thru 16

AC 1A-203260R see Symbol List Supplement—CGE., Plate 51-7
AD 1-203176R
AE 11-2828¾R No. 1 see Plate 9, carriage book for other styles
AF 79333 No. 1 Eccentric
AG 203642
AH 1-203189 includes AF, AI, AK, AL, AO
AI 203190 included in AH
AJ Included in AB
AK 203199
AL 203816 Torsion spring
AM 12026¼R use 47 nut and 1097⅞ lock washer
AN 12083½
AO 46 Nut, 203576 No. 2 screw, 69108 washer
AP 1-203258A* on 11-203008A Style 12, 15, 18
AQ 12083

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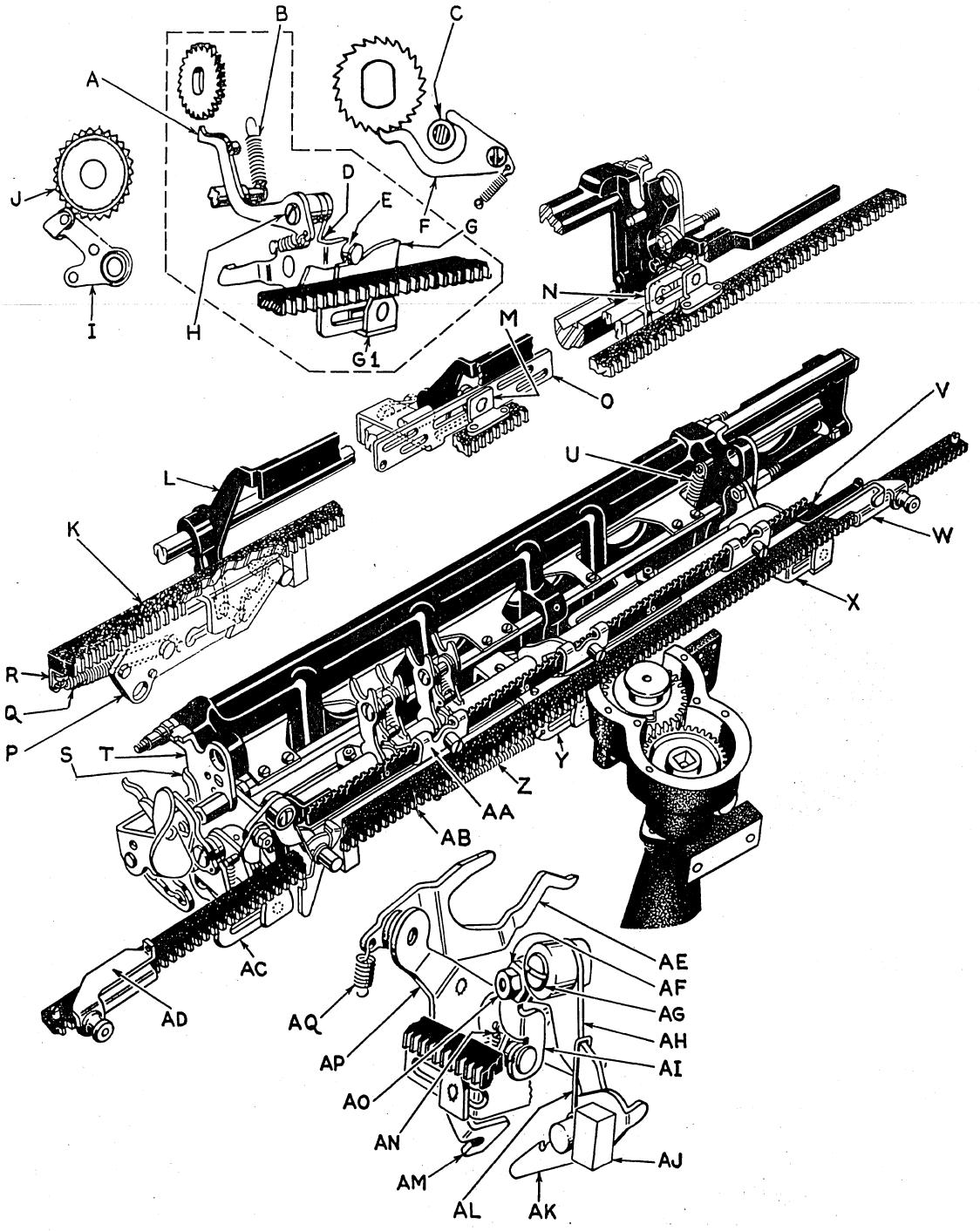
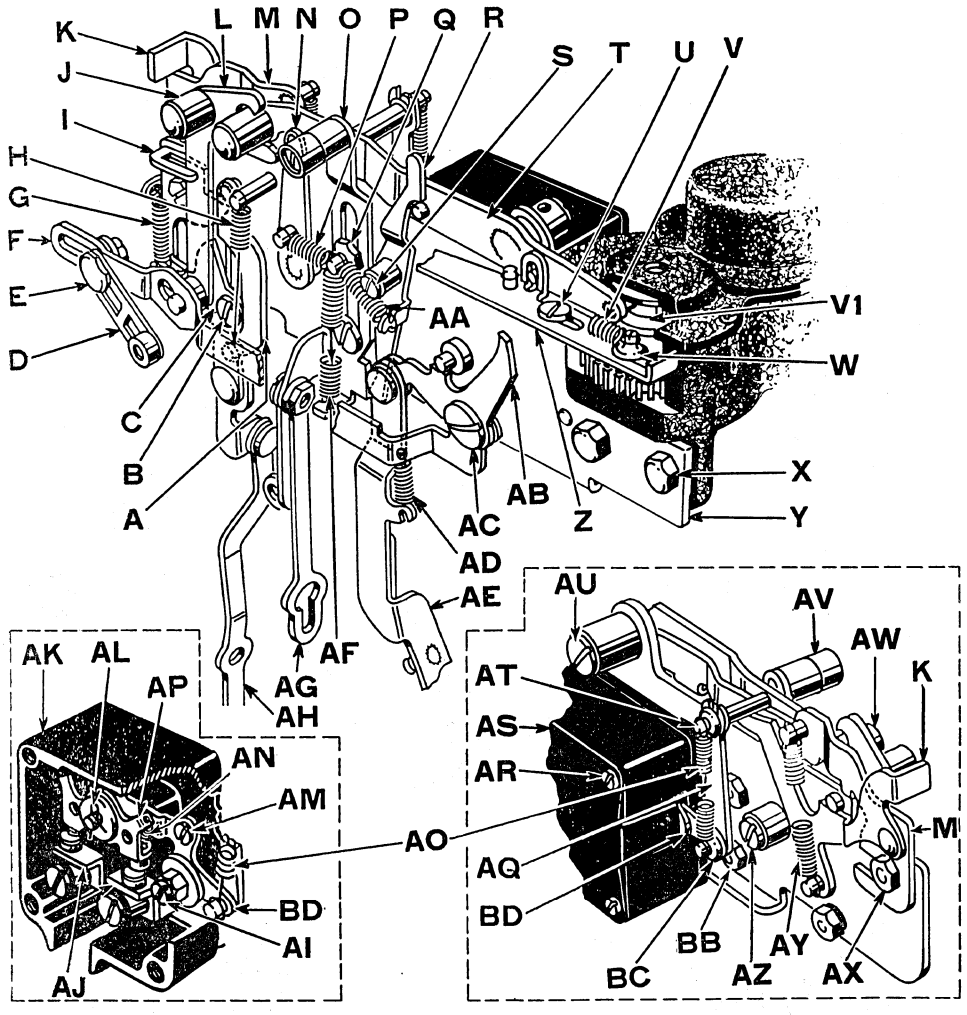
MRC FEED MECHANISM (Plate 18)



SYMBOLS FOR PLATE 18 ARE ON PRECEDING PAGE

MRC UNIT PLATE ASSEMBLY (Plate 19)



SYMBOLS (Plate 19)

A Included in AH
B **12051¼** Screw, 12046½ nut
C Included in L
D **1-12022⅝A**
E **12058⅝A** Screw, 47 nut, 1097¼ and 3820½ washers
F **12022⅛A**
G **10785½**
H **986**
I **12013½**
J **12038⅛** Roll
K Included in M
L **1-12018½ No. 3** Regular, or H903 with early cge. return
M **1-12014¼A** Regular, with cge. opening mechanism
11-12014¼A Regular, without cge. opening mechanism
1-12014¼ No. 2 for early cge. return with cge. opening mechanism
11-12014¼ No. 2 for early cge. return without cge. opening mechanism
N **1A-12012**
O **1-12013 (1-12013 No. 3, 12028½ No. 2, 259½, 1097¾, 46)** for skip tab
1-12013 No. 3 for skip tab carriage controlled
1-12013 No. 4 for skip normalizing mechanism
P **7287 Style 5**
Q **12058¾** Stud, 12046½ nut
R **1-12011½A**
S **2850⅝**
T **1-12015A**
U **105502**
V **75817**
V1 **1-12002 No. 1 (1A-12002, 1-12041BZ, 12040 No. 1)**
W **12063⅞**
X **2859⅛B**
Y **1A-12010** Plate with studs and hubs only, regular
71-12010 Plate with studs and hubs only, for skip normalizing mech.
Plate assembly complete without MRC governor or bottle castings; specify machine number
2B-12010 Style 13 for Cl. 6 or 11-16 with skip tab.
12A-12010 Style 13 for Cl. 6 or 11-16 skip tab. cge. controlled
32A-12010 Style 13 for Cl. 6 or 11-16 skip tab. cge. controlled with cge. return key
22B-12010 Style 17 for skip tab. cge. controlled with cge. return key
62A-12010 for Cl. 20 thru 30 with early cge. return
Z **1-12014⅛ No. 3** Regular, has short foot
1-12014⅛ Nos. 1 or 2 with long foot for indexing return; submit forms if ordering
AA **10180**
AB Included in AE
AC **12062⅝** Screw, 12037¾ bushing
AD **10180**
AE **1-12018⅜A**
AF **3489**
AG **12028½ No. 2** included in O, for early cge. return
AH **21-203161**
AI **7356½** Screw, 71380 nut
AJ **1A-12021¾AR&AL** Switch points **4252** Screws, 1097⅞ lock washers, 12045 nuts
AK **1C-12092** Switch and box; cover and 7562 screws not included; screws 12055⅝ used to fasten box to casting, includes BD
AL **72 No. 1 (21 No. 15)**
AM **952¾**
AN **3885B**, 2 req., included in AP
AO **10082½**
AP **1A-3842B** includes 3824¼ washer, 20 No. 77 wire, 3842B collar, AN&AL
AQ **12023⅞** included in BD
AR **7562** 4 req.
AS **12023½** Cover plate
AT **12063¾A**
AU **8054¾**
AV **12036¼A** Roll, 7357½ screw
AW **12035** Roll
AX **12059½** Hexagon screw, 12046 nut
AY **12080⅜**
AZ **2850⅜**
BB **12060¼** Screw, 12046½ nut
BC **12064¾** Spring stud
BD **1B-12023¾B** includes AP

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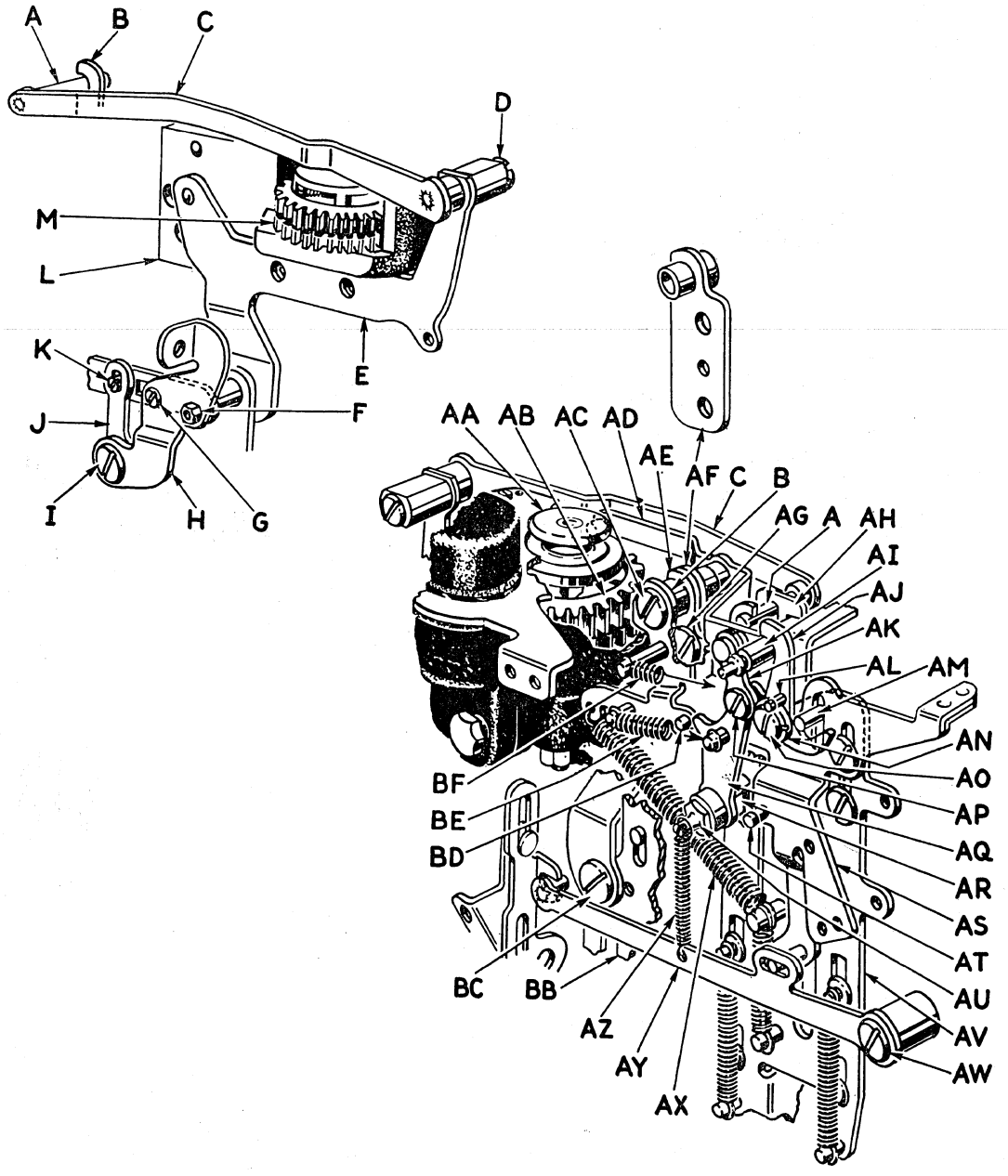
MRC CLUTCH MECHANISM, IMPROVED, CLASSES 20-30 (Plate 19-1)

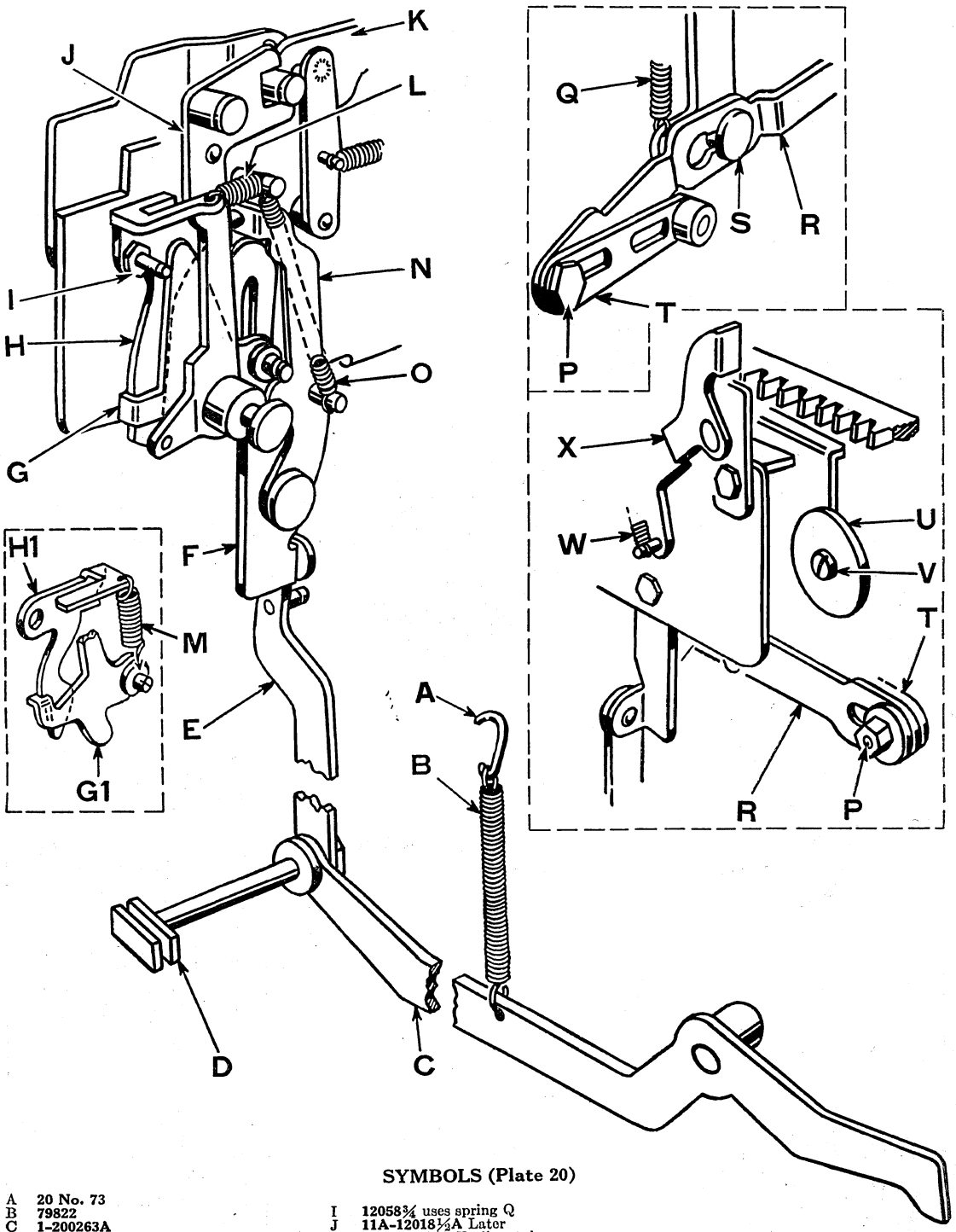


SYMBOLS (Plate 19-1)

A 12354½A* included in C
B 1-12318¼
C 1-12317B
D 8054¾
E 1-12317¼A
F 46 Nut, 12359⅛ screw
G 73611
H 12315½R No. 1
I 3455⅝
J 1-12311¾AR
K 12353½ Eccentric, 49 nut
L 1-12066¼ No. 2
M 12040A No. 1
AA 1B-12002
AB 1-12041B
AC 12051⅞
AD 1-12015A No. 2
AE 1-12310A
AF 1-12319½Z
AG 12355 (2833⅝)
AH 12314⅝A No. 1 thru 6 specify stamping, see Plate 37-1 carriage symbol list
AI 12063¾ No. 2* included in AD
AJ 1-12321⅞C
1-12321⅞ No. 2 for space or non-space
AK 1-12319¾* included in AD
AL 1353¼* included in AJ
AM 12357½* included in AU
AN 12335A Collar
AO 10057⅝ Screw, 1097¾ lock washer
AP 3960
AQ 1-12318¾
AR 12354⅜ Stud
AS 1-12322
AT 1353¼* included in AS
AU 71614
AV 1A-12310½
AW 203522½A
AX 12386
AY 1-203105½A
AZ 780¼
BB 1-12310A
BC 12359⅛
BD 264¾* included in B
BE 3489
BF 780¼

SEE EXPLANATION ON INSIDE OF FRONT COVER

REVERSE MRC CLUTCH TRIPPING MECHANISM AND SELECTIVE COLUMN RETURN (Plate 20)



SYMBOLS (Plate 20)

A **20 No. 73**
B **79822**
C **1-200263A**
D **12061⅝**
E Included in F
F **11A-203161**
21-203161 used for H903 machines
G Included in J
G1 Included in J
H **12013½ No. 2** Earlier
H1 **12013½A No. 2** Later
12013½ for H903 machines
I **12058¾** uses spring Q
J **11A-12018½A** Later
11-12018½A Earlier style
1-12018½ No. 3 for H903 machines
K **1-12015A**
L **7287 Style 5**
M **480¼**
N Included in F
O **780⅝**
P **12058⅝A** Screw, 47 nut, 1097¼ and 3820½ washers
Q **10785½** for stud I
R **12022⅛A**
S 12057⅜* included in J
T **1-12022⅝A**
U **4443¼A**
V **7357½**
W **12080⅜**
X 1-12015½A* included in M, Plate 19

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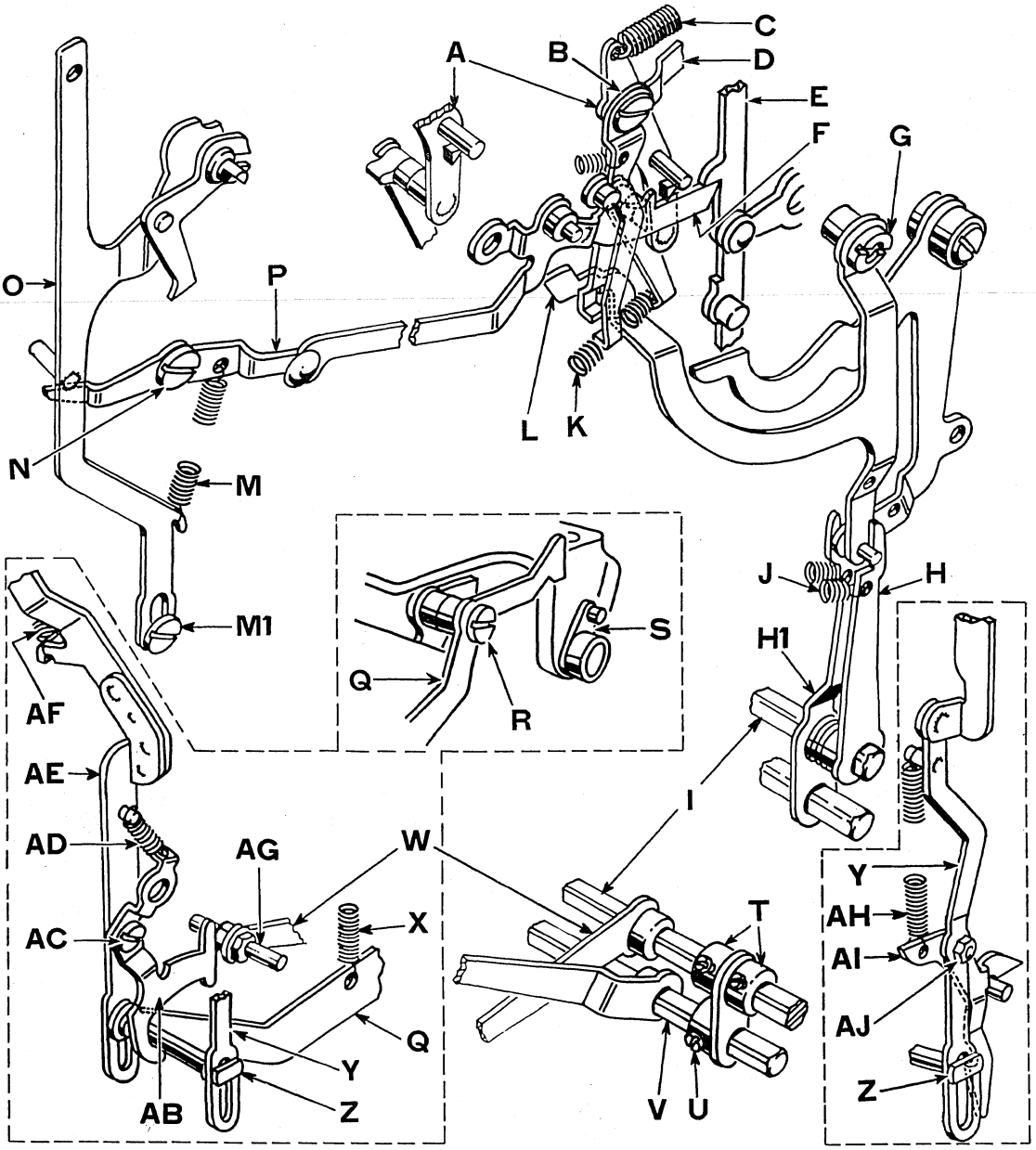
EARLY CARRIAGE RETURN FROM MRC RACK, UPPER AND LOWER BARS, CLASSES 20 THRU 30 (Plate 21)

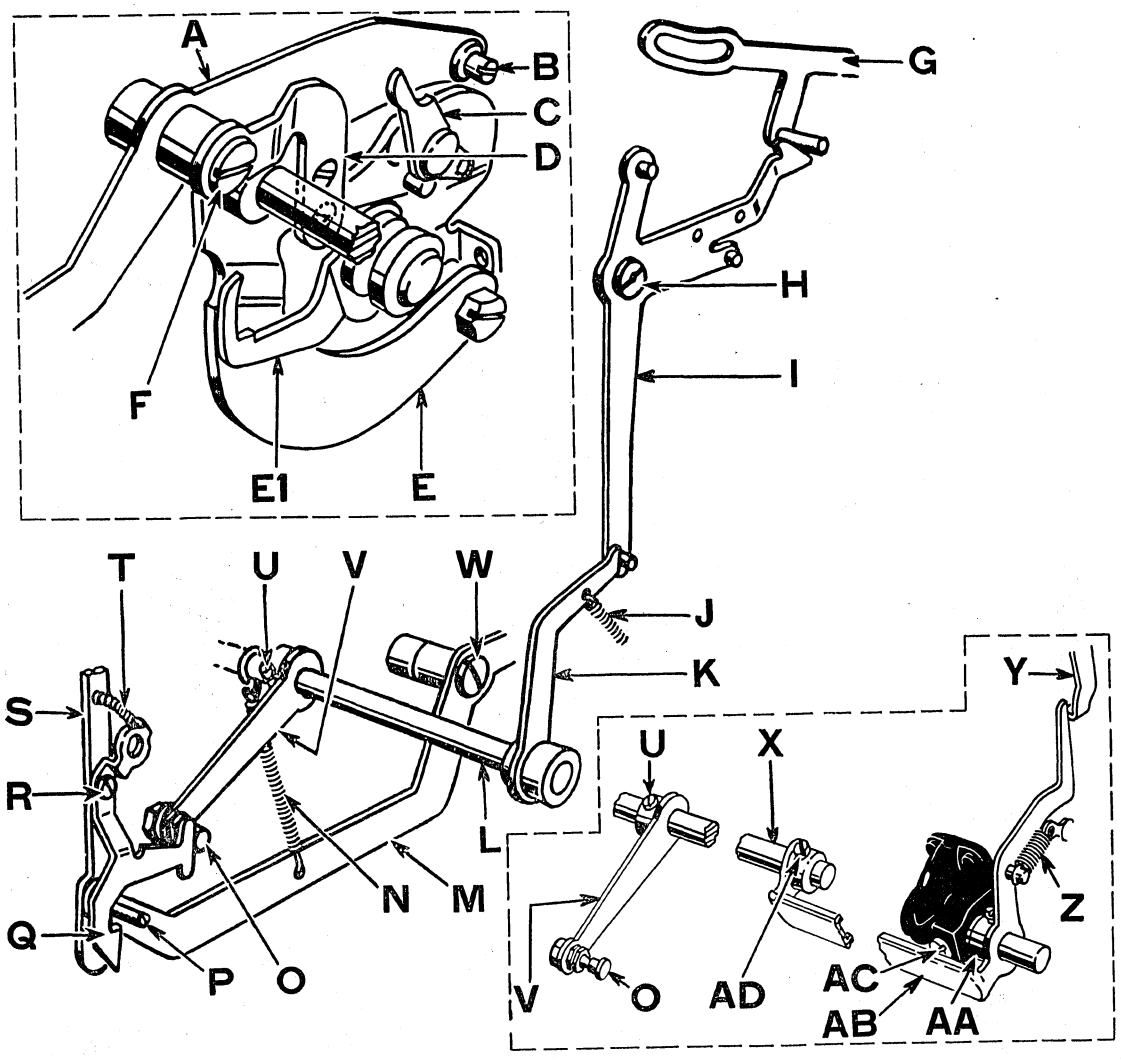


SYMBOLS (Plate 21)

A **11-12024⅝A No. 1** Regular
1-12024⅝A No. 3 for bank posting
B **200244 No. 4** uses screw 12051⅝ No. 3 and spring 489
C **2887**
D **200244A No. 1**
E **1-200241B No. 2** specify machine number
F **1-200144 No. 2** use 84618 screw, springs 10180 and 7283A Style 10
G **12031½**
H **1-12025 No. 4**
H1 **1-12025 No. 5**
I **12008 Style 13, 17 No. 1**
J **10082½**
K **72807 No. 1**
L **1-12027⅝ No. 2**
M **9086**
M1 **200517B**
N **12051⅝ No. 1** for 1-200233
12051⅞ for 1-200233 No. 2
O **1-12021¼A** Later
1-12021¼ No. 2 Early style
P **1-200233** MRC vertical posting bar
1-200233 No. 2 for automatic total—bank posting
Q **1-200263A (1-200263 No. 4)**
R **201515** Screw, 201504B tapped screw
S **1-201114**
T **1-540** includes 550¾ screws
U **72573**
V **12008 No. 2**
W **1-12025 No. 18**
X **79822** Spring, 20 No. 73 wire
Y **11A-203161**
Z **12061⅝**
AB **12018⅝ No. 1**
AC **9259⅝** Screw, 46 nut
AD **283A**
AE **1-12018⅝A**
AF **10180**
AG **12061⅞**, 47 Nut
AH **76808**
AI **12018⅝A No. 2**
AJ **9259⅝** Screw, 46 nut

SEE EXPLANATION ON INSIDE OF FRONT COVER

EARLY CARRIAGE RETURN FROM TOTAL KEYS, CLASSES 20 THRU 30 AND H903 (Plate 22)



SYMBOLS (Plate 22)

A **1-200263 No. 3 (1-200263 No. 6)**
B **200512½ (200512½A)** Screw, 47 nut
C **1-201142 (201520A, 1-201142A)** use spring 1-201804 included in assembly 1-201139
D **201138** uses two 10750⅜ Style 9 screws
E **1-201129 No. 2** use screw 201521 and (3) 10056¾ screws
E1 **1-201133** use spring 780⅝
F **2851⅝** Screw, 201504A No. 2 tapped screw, 393 nut
G **1-202225**
H **200597** Screw, 200342 bushing
I **1-200216C No. 1**
J **3281½**
K 1-200215R* use 82501 pin
L **1-200004 Style 13, 17 No. 4**
M **1-200263A (1-200263 No. 4)**
N **79822** Spring, 20 No. 73 wire
O **1-203370** Plunger, 203371 nut
P **12061⅝**
Q **12018⅝ No. 1**
R **9259⅝** Screw, 46 nut
S **1-12018⅜A**
T **283A**
U **12055⅝**
V **1-200218 No. 2**
W **201515** Screw, 201504B screw stud, 393 nut
X **200004R Style 17 No. 6**
200004L No. 6
Y **1-200216B No. 2 Env. 1358**
Z **44800**
AA **1-4442½ (1-75332)** Collar includes 7562 screw
AB **1-200219½ Style 13, 17 No. 2**
AC **1057½ No. 1**
AD **4450⅛**

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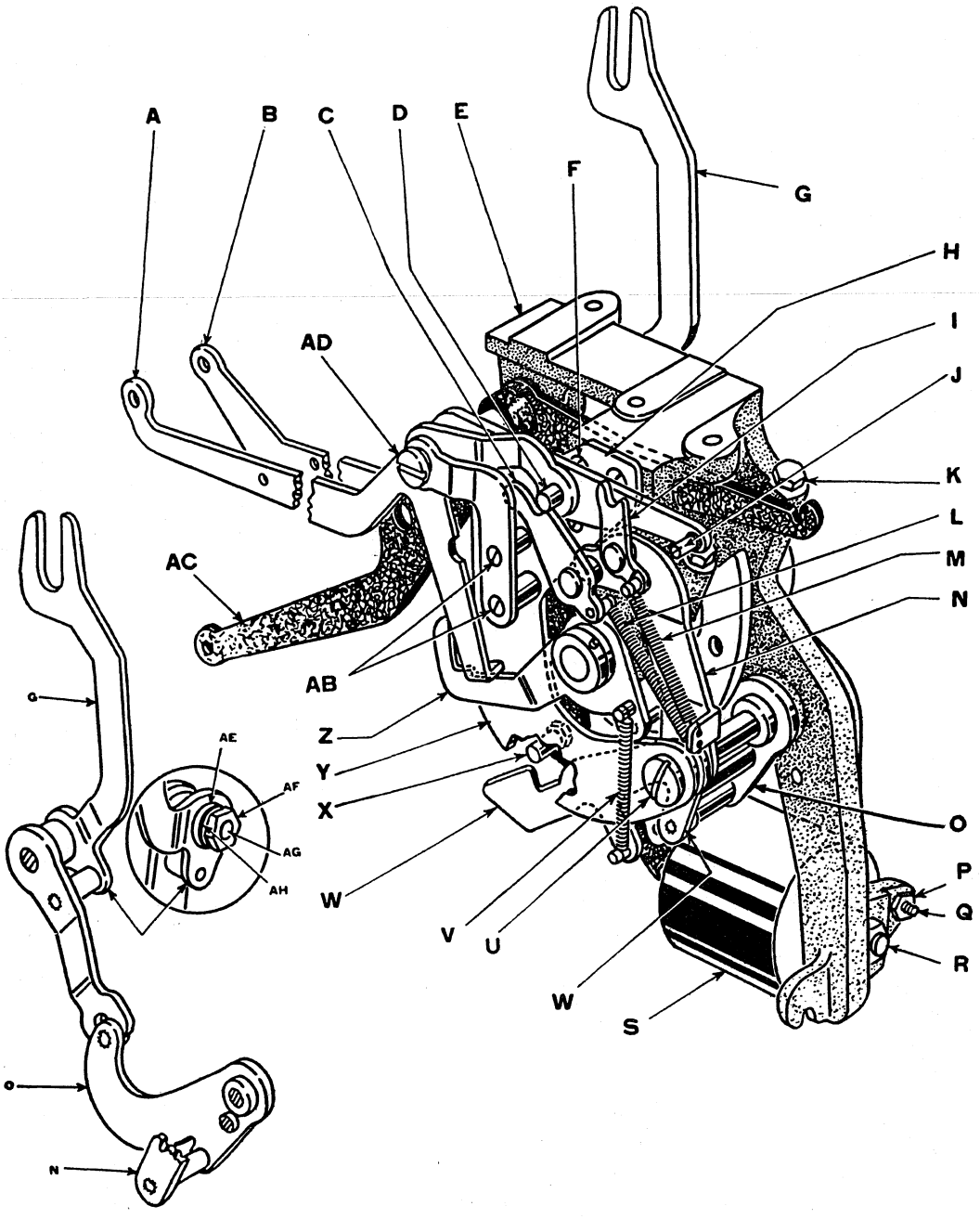
MULTIPLE SKIP—RETURN MECHANISM TIMING CONTROL, CLASSES 20-30 (Plate 22-1)



SYMBOLS (Plate 22-1)

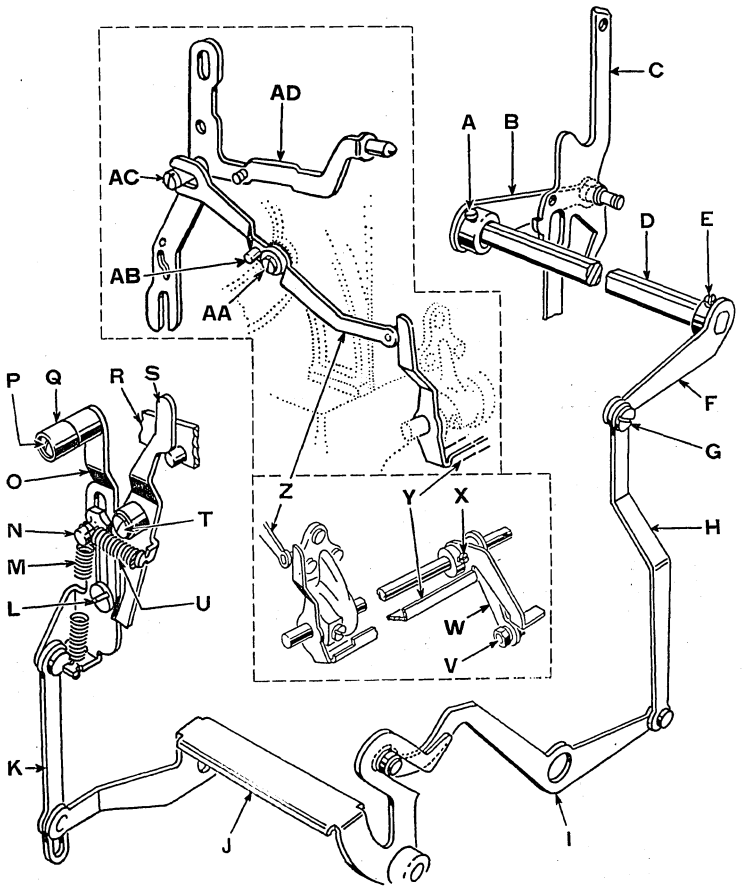
A **1-201134 No. 1**
B **1-200263 No. 3 (1-200263 No. 6)**
C **1-201141**
D **68502** Stud included with "A"
E **1-201665 No. 3 (1A-201665 No. 3)** use 200558 screws
F **300561A** Screw
G **1-201136 Style 17 (1A-201136 Style 17)**
H **1-201129 No. 2**
I **1-201142 (1-201142A, 201520A)**
J **200512½ (200512½A)** Screw, 47 nut
K **3650⅛**
L **1-201803**
M **1-201804**
N **1-201139** Assembly
O **1-201140**
P **49¼**
Q **201512** Headless screw
R 201447* part of S
S **1-201448** Plunger and cup assy.
U **201521**
V **780⅝**
W **1-201135**
X **201513**
Y **1-201129 No. 2**
Z **1-201133**
AB **10750⅜ Style 9** Screws, **201533** studs
AC **1A-201107B (1-201107C)**
AD **352⅜ No. 2**
AE **201326** Sleeve
AF **393** Nut
AG **201504B** Short threaded shaft **201504A No. 2** with mult. skip
AH **201321** Collar

SEE EXPLANATION ON INSIDE OF FRONT COVER

EARLY CARRIAGE RETURN DISABLED FROM CARRIAGE NORMAL KEY, UPPER LEFT; AND SKIP TABULATION FROM UPPER SHAFT, ON RIGHT, CLASSES 20 THRU 30 (Plate 23)

SYMBOLS (Plate 23)

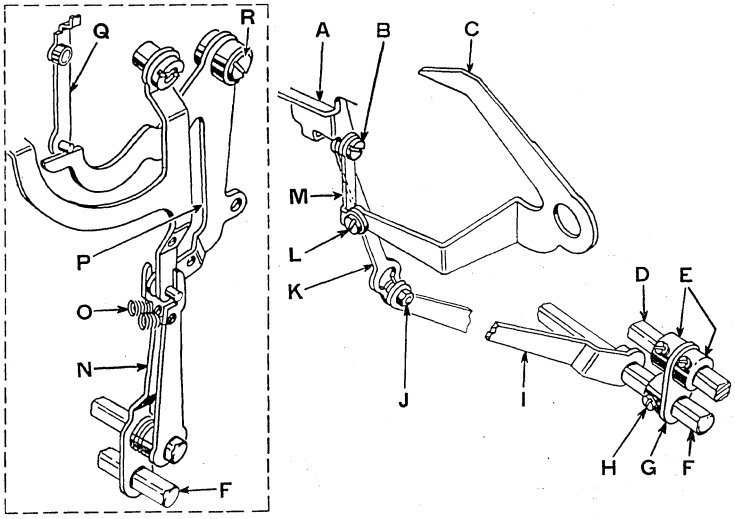
A **3451⅞**
B Included in D
C **1-200241B No. 2** specify machine number
D **1-12007 Style 13, 17 No. 1 (1-12007 Style 13, 17 No. 4, 1-540)**
E **72573** included in F
F **1-12024 No. 1**
G **259½** Screw, 46 nut
H 12019⅜* included in I
I **1-12018⅛A** use 12041⅛ roller and 12052⅛ stud
J **1-12010¼A Style 13**
1-12010¼B Style 17
K **12028½ No. 2** included in O
L **12060½** Screw, 12046½ nut
M **3489**
N **12058¾** Screw stud, 12046½ nut
O **1-12013 (1-12013 No. 3, 12028½ No. 2, 259½, 1097¾, 46)**
P **7357½**
Q **12036⅛A** Roller, 12059A stud
R **1-12015A**
S **1-12011½A**
T **2850⅜**
U **10180**
V **1-203370** Plunger, 203371 nut
W **1-200218 No. 2** includes V
X **7562** included in 1-75332
Y **200282** use 480¼ spring
Z **1-200280A**
AA **79603** Screw, 200350 collar
200515 No. 2 Tapped screw
AB Included in Z
AC **75615** Screw, 12031⅞ roller, 12055⅛ stud
AD **11-12215 No. 1**



SKIP TABULATION FROM BAR AND SHAFT IN BASE AND ALSO FROM CARRIAGE, CLASSES 20 THRU 30 (Plate 24)

SYMBOLS (Plate 24)

A **11-12013 (1-12013 No. 3, 203162 No. 3, 259½, 1097¾, 46)**
B **251** use 3434 shoulder nut
C **12028⅛A Style 13**
12028⅛B Style 17
D **12008 Style 13, 17 No. 1**
E **1-540** includes 550¾ screws
F **12008 No. 2**
G **1-12025 No. 34**
H **72573**
I **1-12025 No. 19**
J **46** Nut, 251 screw
K 203162* included in A
L **251** Screw, 46 nut
M **12027¾ Style 17 No. 2**
N **1-12025 No. 5** use screw 72573
O **10983**
P **1-200239A**
Q **11-200241B No. 4**
R **3450⅝ Style 9**



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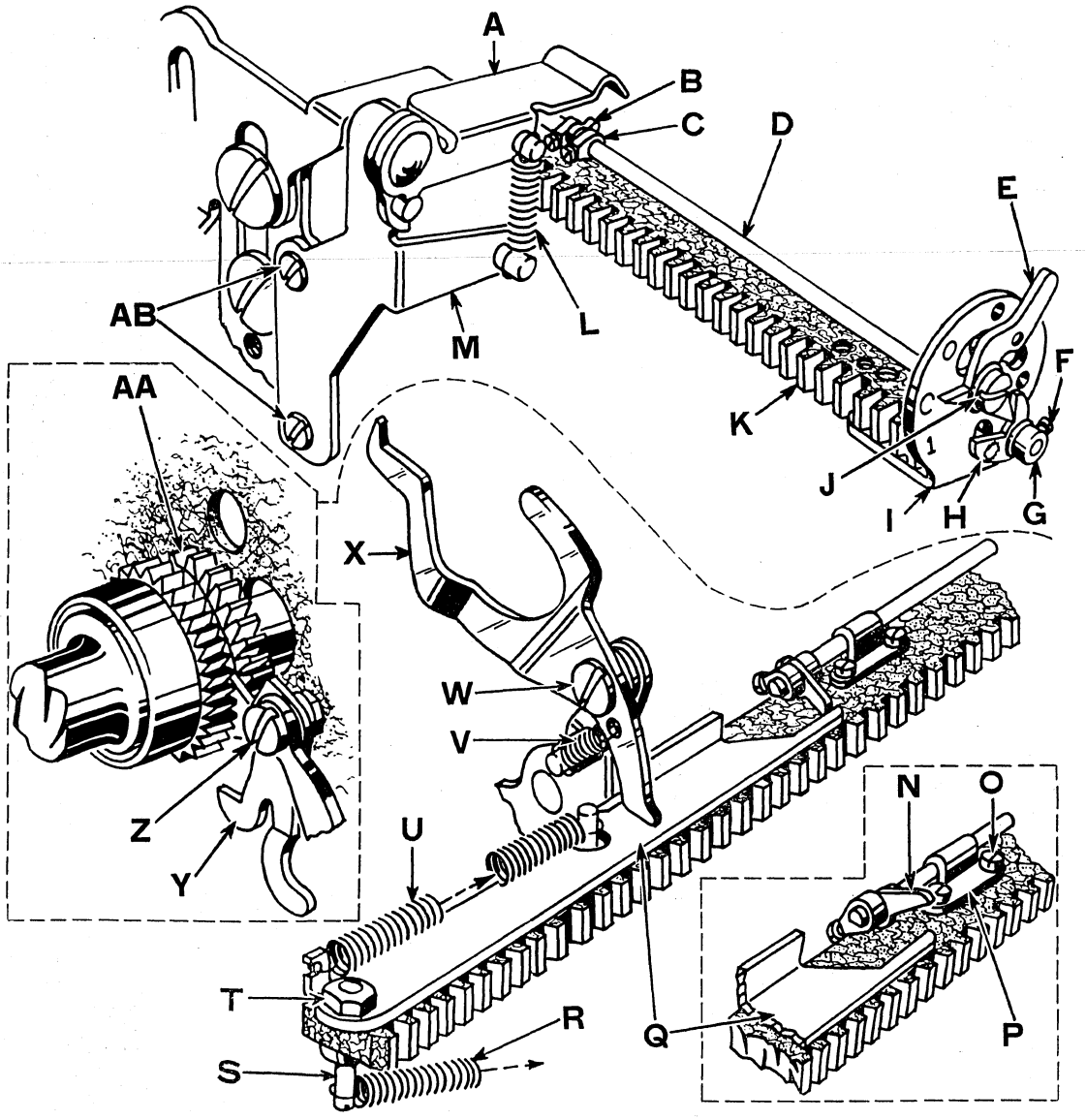
MRC SPACE AND NON-SPACE MECHANISM INDEXED JOINTLY BY CARRIAGE AND BY MULTIPLE SKIP AND RETURN MECHANISM, CLASSES 11 THRU 16, 20 THRU 30 (Plate 25)



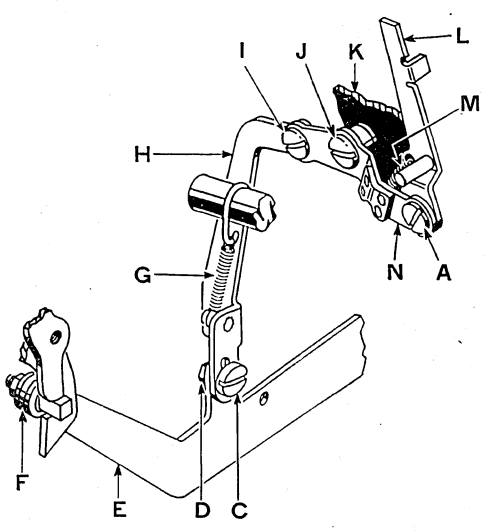
SYMBOLS (Plate 25)

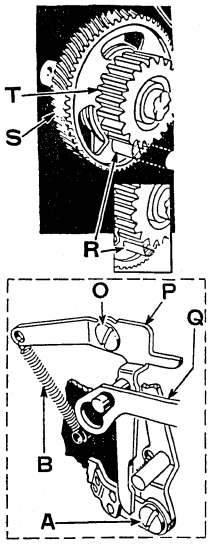
A 102 Env. 1925*
B **106 Env. 1925**
C **900 Env. 1925**
D **1 Env. 1925** use flat spring 203117¾
E **1-110 Env. 1925**
F **16857**
G **1-300 Env. 1925**
H **1-109 Env. 1925**
I **108 Env. 1925**
J **75636 Env. 1925** use 72158 washer, 49⅜ nut
K **1-12017A Style 17K Env. 1925**
L **60801**
M **1-101 Env. 1925** includes A
N **107 Env. 1925**
O **2853¼**
P **100 Env. 1925**
Q **203177½A (203177½B, 203120½AR)**
R **53805 Style 13** use 12081A for 12″ and 15″ cges.
S **503 Env. 1925,** ⅜″ shoulder
203535½ 7/32″ shoulder **(203177A No. 2, 300359, 72567, 1097¾)**
T **76308**
U **96801A Style 10**
V **12083**
W **7357½**
X **1-2828¾AR No. 5**
Y **1-2822 No. 2**
Z **2858⅛**
AA **1-2849D**
AB **73612**

MACHINE DRIVE TO CONTROL PRINTING, CARRIAGE TABULATION AND CARRIAGE RETURN MECHANISM, CLASSES 20 THRU 30 (Plate 26)

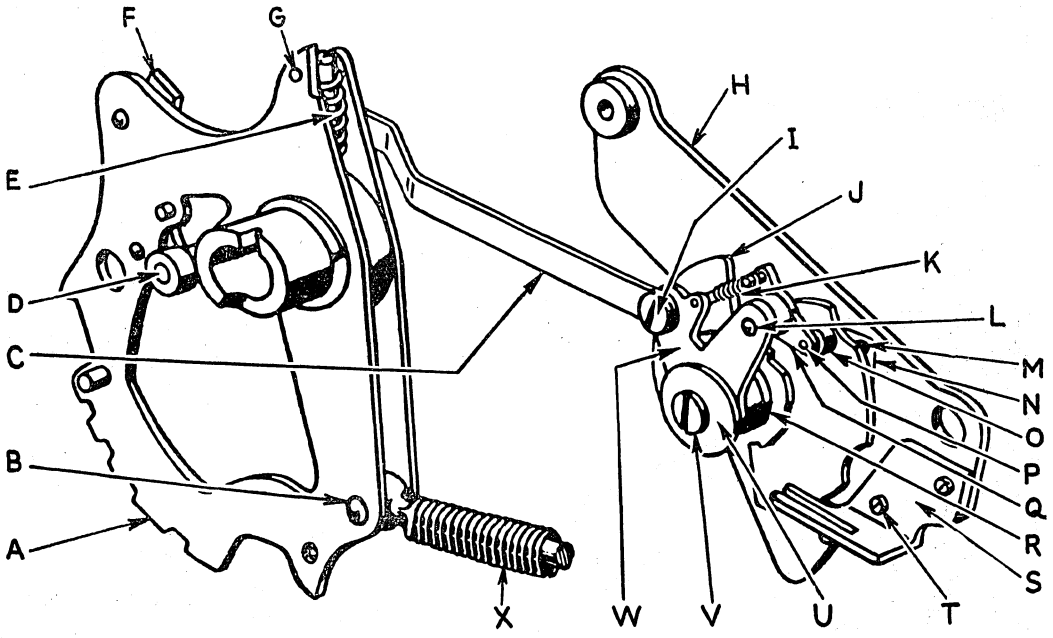
SYMBOLS (Plate 26)

A **74587**
B **10086**
C **12355¼**
D **46**
E **1-200263A Env. 1958 (1-200263 No. 4)**
F **200511½** Eccentric, **72167½** and **109734** washers, 46 nut
G **10983** Early, use spring anchor 20 No. 73
79822 Later
H **1-101 Env. 1958**
I **74587**
J **9052½** Screw, 500 Env. 1958 tapped stud
K **1-12012½ Style 17 No. 2 Env. 1958 (1-12012½ Style 17 No. 21A Env. 1753)** Back plate, specify mach. No.
L **1-12014⅜ Env. 1958**
M **10784**
N **1-100 Env. 1958**
O **12059⅛A**
P **1-10014¼ No. 3 Env. 1958**
Q **1-200108 Style 17**
R **3655¾A**
3655¾ No. 2, 19 to 1
S **11-3667 No. 1 (19 to 1) Env. 1958 (1-3667 No. 2)** for machines without single stroke multiple print
1-3667 No. 2 Env. 1753 for machines with single stroke multiple print
T Included in S





CYCLE MECHANISM, FTE. 104, CLASSES 1, 2, 6, 11 THRU 16 (Plate 27)



SYMBOLS (Plate 27)

A **11-126⅛ Fte. 104** includes B, C, E, F, G, X, for Cl. 6, 11 thru 16
22-126⅜ Fte. 104 for Cl. 1, 2
B **358**
C **126¼ Fte. 104**
D **1-3662¼** Screw, 45 nut
E **380**
F 315A*
G **351** Cross pin, 350 lock pin
H **1-129 Fte. 104,** 11-129 Fte. 104 assembly includes parts J to W
I **161⅜ Fte. 104**
J **1-129½ Fte. 104**
K **7480B** Spring
L **160⅜ Fte. 104**
M **252⅝** Screw, 2 req.
N **129¾ Fte. 104** Flat spring
O **133⅛ Fte. 104 (83424)** Roll included in Q
P **160¼ Fte. 104** Stud, included in Q
Q **1-129½ Fte. 104** included in W
R **160¾ Fte. 104** Bushing
S **129⅝ Fte. 104** included in H
T **7562,** 2 req.
U **1-129⅞ Fte. 104**
V **201515**
W **1-129⅜ Fte. 104** includes Q
X **1-63885**

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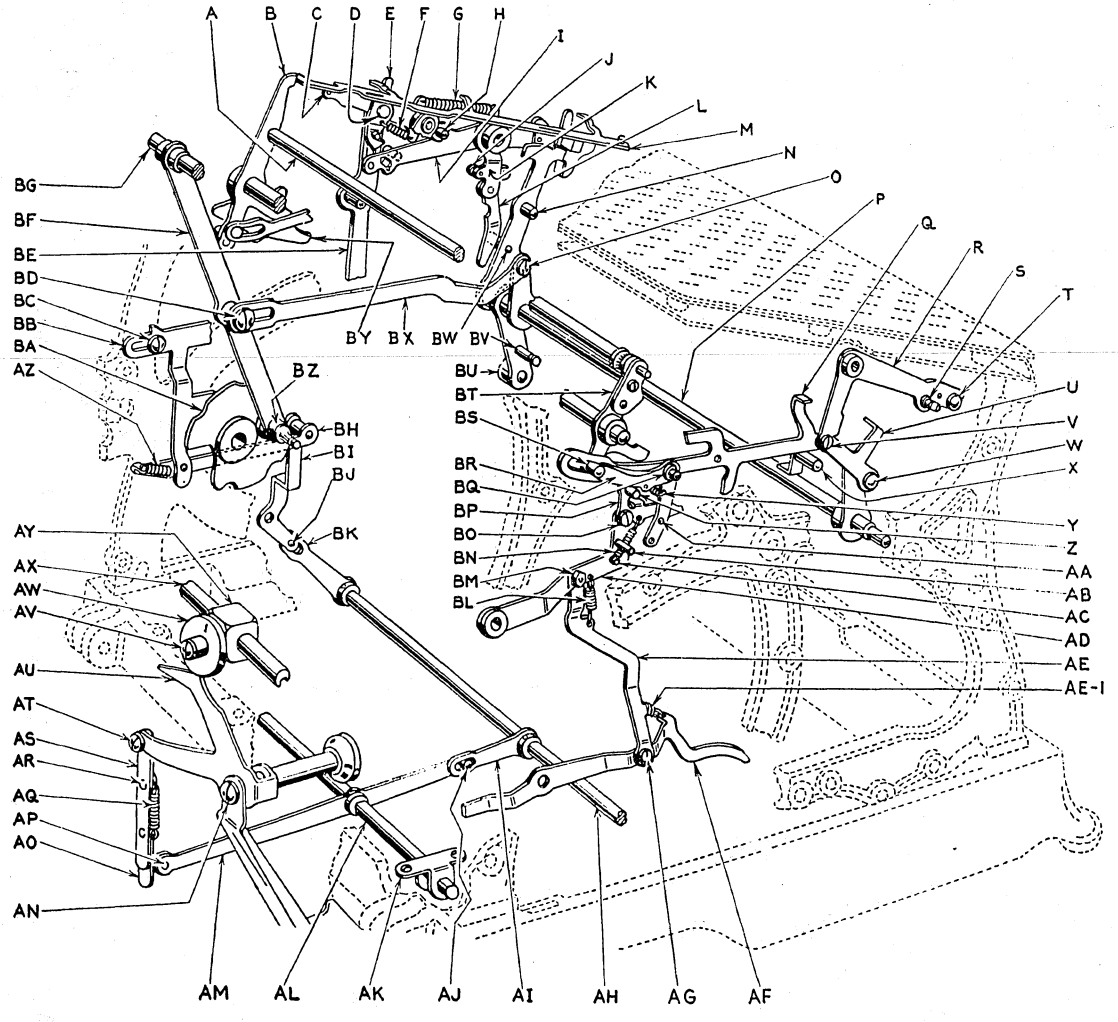
For Form 2964

CYCLE TOTAL COLUMN MOTOR BAR RELEASE (Plate 28)



SYMBOLS (Plate 28)

A **1-202005 No. 1 thru 7** specify machine number, see Plate 7 in keyboard symbol list

B 1-10219½R* included in 1B-10207 Style 9, 11 or 21-202007 Style 13, 17

C **1A-201121 (1-201121A, 1A-201123)**

D **351½**

E **1-201122** included in C

F **489** Short spring
81820A (73829) Long spring

G **7283A Style 10**

H **3655¼A**

I **2-122⅜ Fte. 104** includes J, K, L

J **103653** Stud, use spring 180⅛ Fte. 104

K **1-122⅞ Fte. 104** included in I

L **1-122¾ Fte. 104** included in I, use 351½ rivet

M **1-124 Fte. 104** included in 1-112⅛ Style Fte. 104 specify machine No., use spring 480¼, rivets 308519, spring stud 202504

N **1458**

O **162⅜ Fte. 104 (550A Fte. 200)** Screw, 47 nut

P **1-105¼ Fte. 104 Style 13, 17** specify machine No.

Q **1-119⅝ Fte. 104 No. 1** includes AA, BQ, BR for cycle with single auto total
1-119⅝ Fte. 104 No. 2 for cycle when auto totals or sub-totals are taken in the same position

R **1-128⅜ Fte. 104**

S 155 Fte. 104*

T **83502**

U **1-115 Fte. 104**

V **251⅜** Screw, 46 nut, 824¼ washer

W **9051⅞**

Y **10686½**

Z **1056⅞**

AA **3456⅝**

AB **750¾ No. 2**

AC **3454¾**

AE **200224 No. 1**

AE1 **7480B**

AF **10024¾A Style 13** use bushing 10038¼, screw 10060¾A

AG **259½** Screw, 46 nut

AH **1-1 Fte. 104 Style 13, 17** specify machine No., includes AI, BK

AI 1-10⅞ Fte. 104* included in AH, use 52 pin

AJ **3655¼A**

AK **12022L** use two screws 200527, two shoulder nuts 200312, two plain nuts 3645

AL **12008 No. 1 Style 9, 11, 13, 17**

AM **1-12025 No. 8** includes AJ, AO, AP, AQ, AR, AS

AN **2851⅝**

AO 12025⅞* included with AS

AP **8050¾**

AQ **2886¾**

AR **79623**, 2 req.

AS **1-12025⅝** includes AO, AR

AT **251** Screw, 46 nut

AU **1-12⅞ Fte. 104 No. 2**

AV **7357½**

AW **10043¼A No. 7, 8, 9, 10, 11, 12, 13**
10043¼A No. 5 (83443 No. 1) use space collar 12042⅜ when req.

AX **3203¾A Style H, K**

AY **4445¼A** use screw 4462¼

AZ **82 Fte. 104**

BA **1-126⅝ Fte. 104**

BB **2-11¾ Fte. 104**

BC **10056** Screw, 162⅛ Fte. 104 stud, 132¼ Fte. 104 sleeve, 45¾ nut

BD **10056**

BE **11-3627 No. 1**

BF **1-128⅝ Fte. 104**

BG 503*

BH **1-13 Fte. 104** Fastened to BI with 2855⅝ screw and BB with 4857½

BI **1-11⅛ Fte. 104**

BJ **264¾**

BK 1-10¾ Fte. 104* included in AH, use 52 pin

BL **3283**

BM **46** Nut, 10761¼ screw

BN **284**

BO **259½** Screw, 629 washer, 46 nut

BP **1-60113** includes Z

BQ **155½ Fte. 104**

BR **1-119½ Fte. 104 No. 1**

BS **82502** included in BT

BT 1-219L No. 2* includes screw 8064⅝

BU **1435** Roller, 1455 stud

BV **1450¼**

BX **126⅝ Fte. 104**

BY **623B**

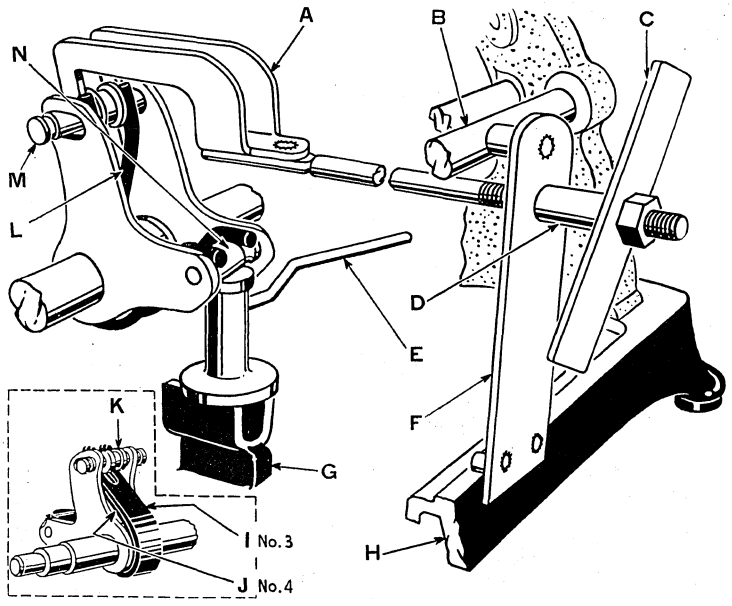
BZ **161⅛ Fte. 104** Stud, 134⅝ Fte. 104 roller, use 1-184A Fte. 104 spring

SEE EXPLANATION ON INSIDE OF FRONT COVER

SPRINGS 885 NOS. 3 AND 4, HOW TO INSTALL (Plate 29)

SYMBOLS (Plate 29)

A **Kit 150B**
B **1-204003 Style 13, 17**
C Included in A
D Included in A
E **Kit 150½**
F Included in A
G **60602**
H Machine base
I **885 No. 3**
J **885 No. 4**
K **208334** Later
834 Early
L **885** Early
M **851 No. 2** Later
851 Early
N **862** on 1-811 Style 9 or 1-811 Style 17



HOW TO INSTALL

Disconnect power and remove case, and if convenient remove the crossfooter.

Unhook top eyes of 1-181 springs from shaft M in 800 section.

Beginning with machine normal, insert anchor tool E through the 311, slowly pull handle forward enough to allow anchor tool to rest in bottom of base and under N.

Remove third 413. Place head of removal tool A through from front, prongs pointing sideways. Give ¼ turn so prongs will point downward, push tool until prongs rest over top of springs L.

Place heavy blank F with studs on edge of base and single stud on carry restoring shaft B.

Tighten tool thus closing spring L, relieving pressure on shaft M. Remove shaft M. **DO NOT** remove 119.

Loosen tool and remove springs L.

Replace shaft M, 851 and roller 834 with the later shaft 851 No. 2 and roller K, 208334.

Hold both new springs J and I in place; No. 4 (J) the shorter fits inside the No. 3 (I), and place tool A as noted above.

Tighten tool to close the springs and replace shaft M.

Remove tool; replace 413 and hook up 181's.

Release 800 section and test.

SYMBOLS (Plate 30)

A NOTE: List shown below is the complete case assembly for various constructions of machines most commonly used for Classes 1, 2, 6, 11 thru 16, 20 thru 30. When ordering a case, specify style and machine number.

1-67½ Fte. 88 Style 13 No. 5 Public utility, four motor bar construction with ege. return key, Cl. 1, 2, 6

1-67½ Fte. 88 Style 17 No. 4 Public utility, four motor bar construction with normalizing key, Cl. 1, 2, 6

11-67½ Fte. 88 Style 13 No. 5 Public utility, four motor bar construction
11-67½ Fte. 88 Style 17 No. 4 Public utility, four motor bar construction
} Classes 11 thru 16

1A-1067C Style 7E, 15E Early, not MRC, Cl. 1, 2, 6

11A-1067C Style 9E, 11E
11A-1067C Style 13E (1-60667 Style 13 No. 4)
11A-1067C Style 17E (1-60667 Style 17 No. 4)
} Not MRC, Cl. 1, 2, 6

1A-3967 Style 9E, 11E
1A-3967 Style 13E (11-60667 Style 13 No. 4)
1A-3967 Style 17E (11-60667 Style 17 No. 4)
} Unlimited split, not MRC, Cl. 1, 2, 6

1-12067 Style 13 Nos. 1 thru 10 (1-60667 Style 13 No. 4)
1-12067 Style 17 Nos. 1 thru 10 (1-60667 Style 17 No. 4)
} MRC construction, Cl. 1, 2, 6

1-12067 No. 11 Style 13, 17 specify front panel, used with counter dials

11-12067 No. 7 Style 13 (11-60667 Style 13 No. 4)
11-12067 No. 7 Style 17 (11-60667 Style 17 No. 4)
} MRC with unlimited split, Cl. 1, 2, 6

11-44667 Style 9 Nos. 1 thru 10 Upfeed T.R. with C.F. ribbon
1-44667 Style 11 Nos. 1 thru 10 Upfeed T.R. with C.F. ribbon
} Not MRC, Cl. 2, 6

11-44667 Style 13, 17 No. 7 MRC with upfeed T.R., Cl. 2, 6

1-44668 Style 13, 17 No. 7 MRC with upfeed T.R., Cl. 11 thru 16

1-60667 Style 13, 17 No. 5 MRC construction, savings bank, Cl. 11 thru 16

1-60667 Style 13, 17 No. 7 MRC construction, Cl. 11 thru 16

1-200667 Style 13, 17 Nos. 1 thru 10 used for narrow base—constructed machines, Cl. 20 thru 30

1-200667A Style 13 No. 1 Two motor bar construction
1-200667A Style 13 No. 4 Three motor bar construction, with two normalizing keys on left
1-200667A Style 13 No. 2 (1-200667A Style 13 No. 4, 12027⅜ No. 1 and 2)
1-200667A Style 17 No. 4 Three motor bar construction, with two normalizing keys on left
1-200667A Style 17 No. 7 Two motor bar construction, with one normalizing key on left
1-200667A Style 17 No. 1 (1-200667A Style 17 No. 7, 12027⅜ No. 1)
1-200667A Style 17 No. 2 (1-200667A Style 17 No. 4, 12027⅜ No. 1 and 2)
1-200667A Style 17 No. 5 (1-200667A Style 17 No. 4, 12027⅜ No. 2)
} Used for wide base constructed machines, Classes 20 thru 30

NOTE: Narrow case or wide case can be identified by stamping on inside, lower left side.

B **3656¼**
3656¼ No. 2 used for Style 16 13 00 machine (36707)
C **3698¾A** Rubber cushion 21-3625
D **1-3625**
11-3625 used for bank posting machines with wording "tabulate"
1-3625 No. 2 used for machines with cycle construction, Cl. 6, 11 thru 16
E **12027 No. 1** plate, same on left
F **3952½**
G **12027 No. 2** plate, same on left, use 3952½ screws
H **9259⅝** Screw, 1097¾ washer, 46 nut
I **1A-200211**
11-200211 used for bank posting machines, with wording "vert"
J **193 Fte. 200 (193A Fte. 200)**
K **200900 Keytop, 200510 stem, 200801 spring, 1026 washer**
1-200303A (1-200303B, 22 No. 2) complete assembly
L **2851⅛**, 2 req.
M **1-200118 Style 13, 17**
N **1-200117R or L** use 3489¾ spring, 4857½ screw
O **72647 (200565½)**
P **200115AR** used for reflector and light
200115R No. 2 used without reflector and light
200115L
1-200115AL No. 2 used with quick set rotary cal. fte. on left
} Classes 20 thru 30

1012⅜R&L Cl. 1, 2, 6, 11 thru 16
1612⅜AL used for counter-dials, Cl. 1, 2, 6

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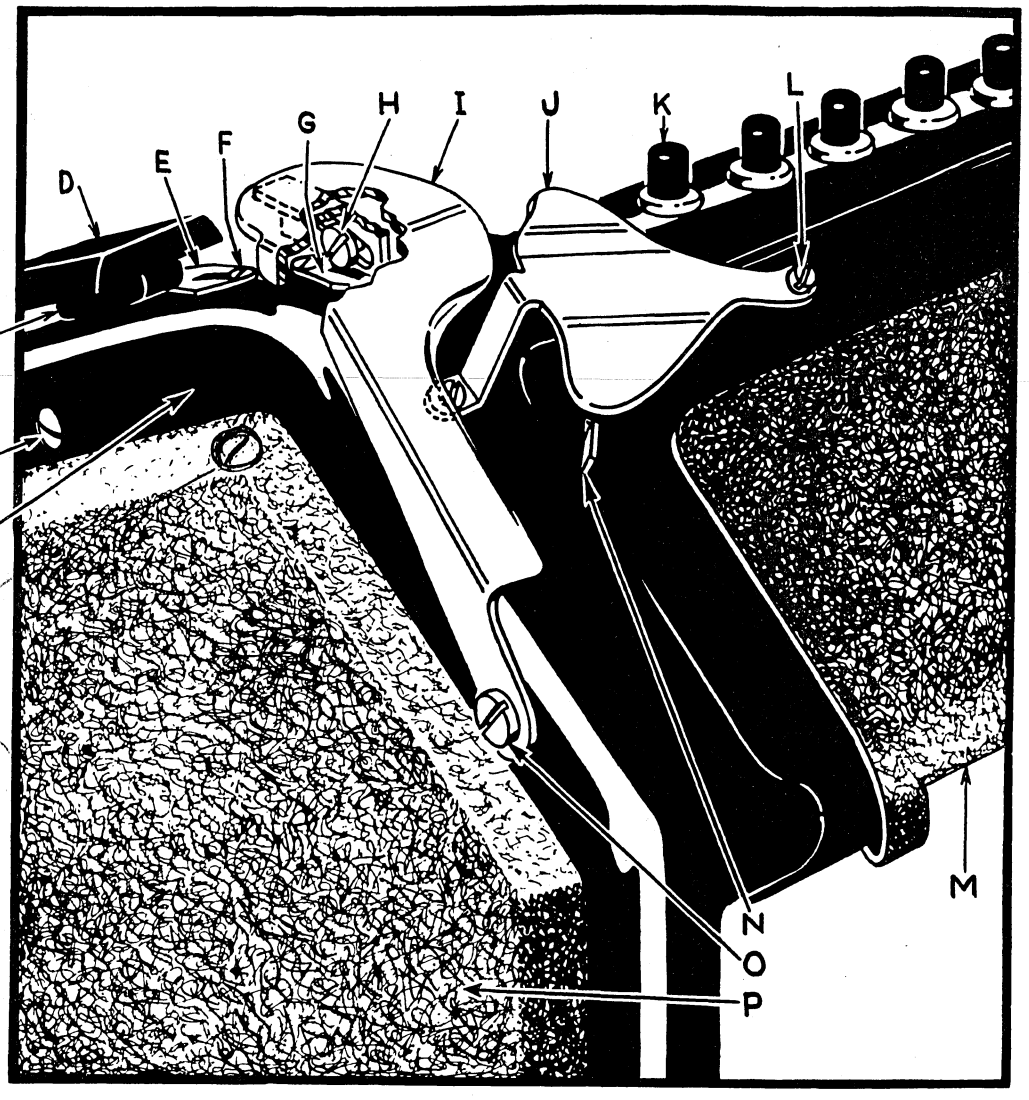
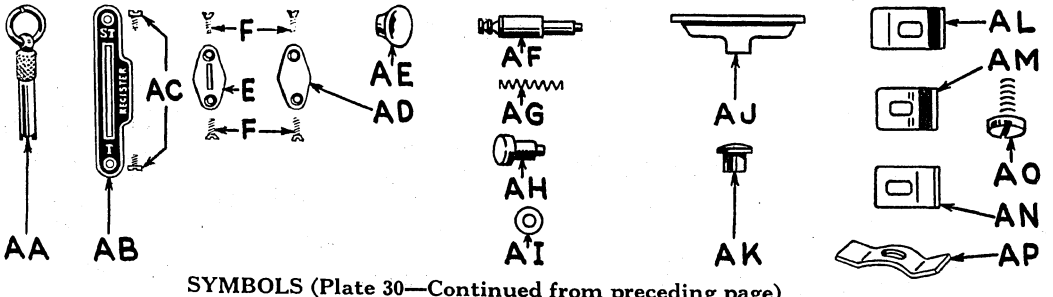
CASE DETAILS (Plate 30)





SYMBOLS (Plate 30—Continued from preceding page)

FRONT PANELS:

1-1012⅞ Styles 9, 11, 13, 17 Metal panel
1-1091 Styles 7, 9, 11, 13, 15, 17 Glass panel, early
1-212 Fte. 216 Styles 13 and 17 Nos. 1 thru 8 Front panel for counter-dials, specify openings and machine number

AA **1-1056**
AB **60112**
AC **7562**
AD **12027⅜ No. 1** Straight plate
12027⅜ No. 2 Curved plate
AE **291⅛** Red S.C.R. key
AF **1057A** Stem
AG **2881⅛** Spring
AH **1030¼A** Barrel
AI **1025** or 1026 Washer
} 1-1030¼A complete assembled S.C.R. key
AJ **3699¼ (90¼ No. 8)**
AK **1056⅛** Early
200551 (200303 No. 2, 22 No. 2) Later
} Plug for case
AL **1011A**
AM **1011¼**
AN **1011¾**
AO **1053⅛**
AP **200252**

SEE EXPLANATION ON INSIDE OF FRONT COVER

CLASSES 1, 2, 6, 11 thru 16 and 20 thru 30 CARRIAGES

Instruction Book

September, 1939

Reprinted—July, 1946

*Issued*_____

*To*_____

*Of*_____

Property of and to be returned to

BURROUGHS ADDING MACHINE COMPANY

DETROIT, MICHIGAN

FOREWORD

This Instruction Book covers constructions, functions and adjustments of all styles of carriages used on the High Keyboard type machines. Mechanisms which control, actuate or otherwise affect carriages are also covered.

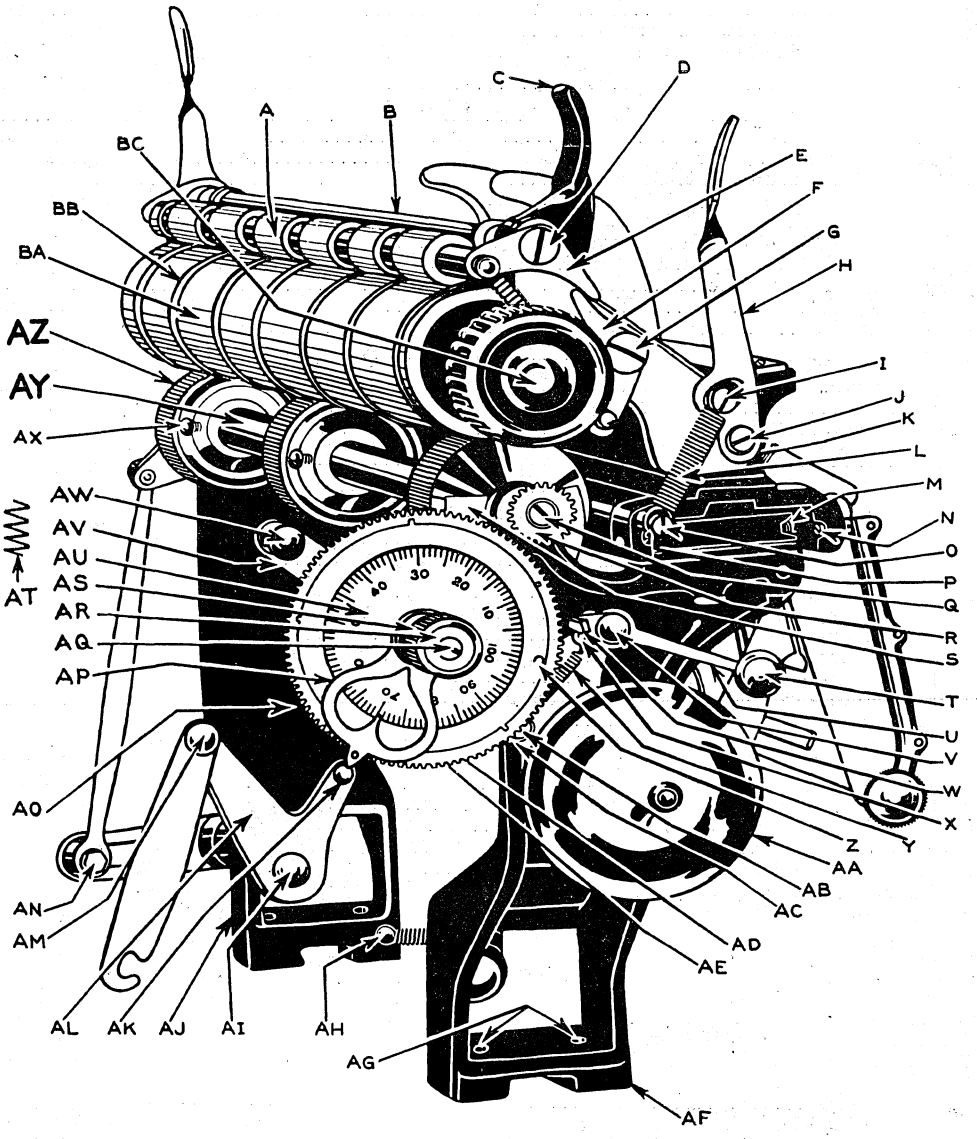
This book supersedes carriage subjects now in Instruction Books on Classes 1, 2, 6 and Type 20. Carriage and related subjects that have been issued in the form of special or general prints are also revised and included.

While the plate numbers of the illustrations in this book are identical with the same illustrations in the Symbol List, they are not consecutive, due to the fact that the Symbol List contains more illustrations to cover symbol requirements.

INDEX OF MECHANISMS

	Plate No.
Air Cushion, Inside Back Plate	34
Air Cushion, Outside Back Plate	35
Air Cushion, Shuttle Carriage	33
Aligning Bail, Visible	29
Analysis Column Selector, Motor Bar Controlled	14-1
Automatic Cross-Tabulating Mechanism	21
Bill Ejector, Automatic	55, 56, 57, 59, 60, 61
Carriage Control of Automatic Total and Repeat of Machine Operation	54-1
Carriage Opening Mechanisms	73, 74, 75
Carriage Opening and Closing Actuating Mechanism	76
Carriage Opening from Multiple Skip-Return	50
Carriage Opening from Return, Closed by Hand	81
Carriage Opening from Total Keys and Bars Without Tabulation, Including Manual Control	75-1
Carriage Opening from Total Keys and Operating Bars	79
Carriage Opening from Total Keys and Return Bar	78
Carriage Opening, Manual Control	77
Carriage Stop Dogs	20
Carriage Tabulation from No. 14 Stop, Carriage Controlled	14-2
Deep Ticket Box for Bill Ejector	63
Feed Rolls, Type 20	28
Floating Stops	20
Friction Feed Carriage	1, 2
Geared Pressure Rolls	36
Injector and Ejector Device	23
Journal Sheet Lock	30
Levers, Standard Roll Controlled	83
Levers, Thin Roll Construction	82
M.R.C. Non-Space from Partial Carriage Opening	86
M.R.C. Space or Non-Space, Manual Control	85
M.R.C. Space or Non-Space, Adjustable	87
Multiple Return Release Latches, Flexible	37-4
Multiple Skip-Return—General	37, 38
Multiple Skip-Return—Carriage Opening from Return Mechanism	50
Multiple Skip-Return—Normalizing Key	49
Multiple Skip-Return—Normalized from Total Keys or Carriage	45
Multiple Skip-Return—Release from Selective Operation Control	47
Multiple Skip Release Locked During Carriage Return	37-3
Multiple Skip-Return—Repeat Machine Operation Normalizer	46
Multiple Skip-Return—Return Key Controlled	44
Multiple Skip-Return Mechanism, Front View	37-1
Multiple Skip-Return Mechanism, Rear View	37-2
Multiple Skip-Return—Timing Control	41, 42, 43
Multiple Skip-Return—To Open Pressure Rolls	48
Multiple Skip-Return—Total Keys and Upper Bars Controlled	40
Multiple Skip-Return—Vertical Space Bar	39
One Inch Spacing	90
Platens	28
Platen Space and Non-Space, Skid Controlled	88
Platen Spacing from M.R.C. (Manual Adjusted to Space or Non-Space) Controlled from M.R.C. Rack	87-1
Platens, Split and Normal	31
Positive Feed Carriage	12
Pressure Roll Opening Mechanism Disabled Carriage Controlled	48-1
Raceway Bearings	32
Roll Combinations	54
Rotating Stop Bars	20
Selective Operation Control Mechanism	54
Semi-Automatic Cross Tabulating Mechanism	13
Shuttle Carriage	22
Skip Tabulation	14
Spring Barrel	19
Spring Barrel Assembly (Exterior) Classes 20 thru 30	19-1
Triple Spacing	89
Type 20 Carriage	28
Variable Line Space	23
Vertical Space Bar (Multiple Skip)	39
Vertical Space from Auxiliary Bars	17
Vertical Spacing from Total Key, Early	15
Vertical Spacing from Total Key, Later	16

FRICTION FEED CARRIAGE (Plate 1)



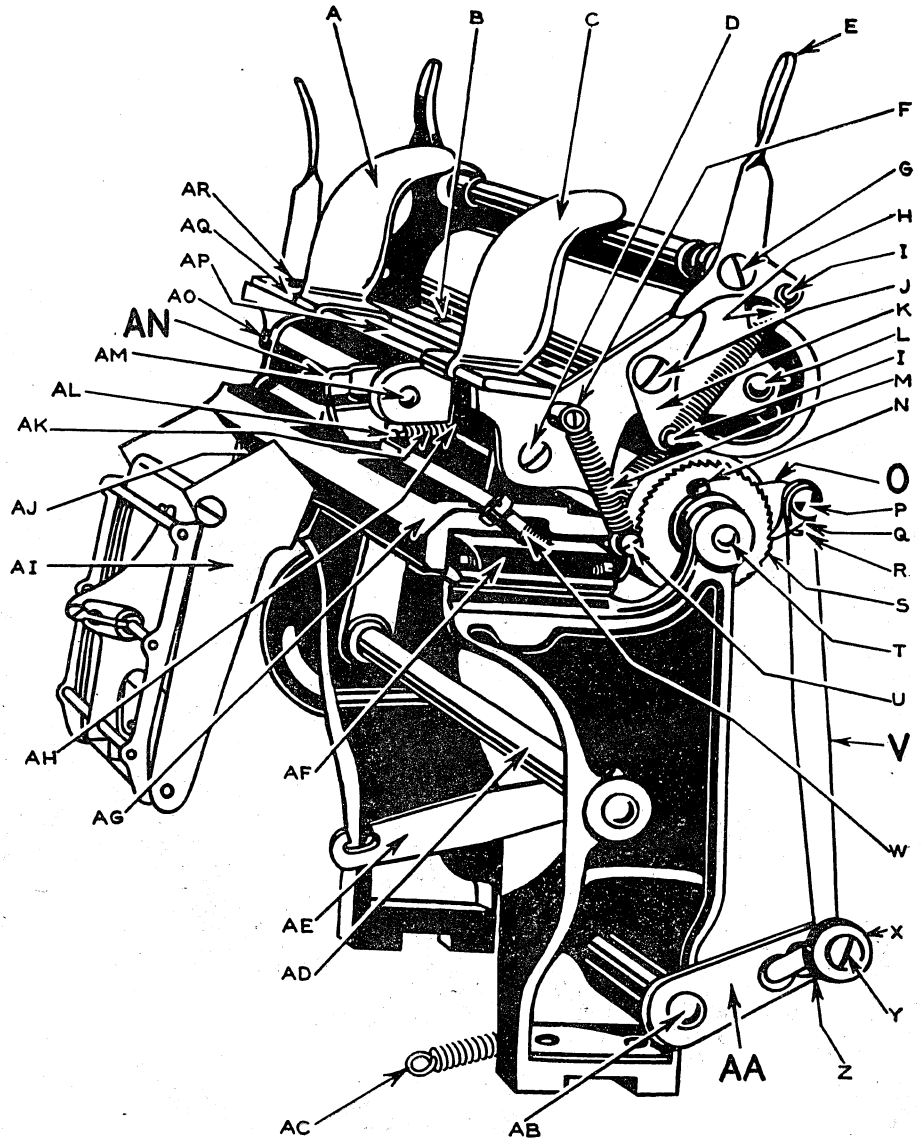
Friction Feed Carriage (Plates 1 and 2)

The friction feed carriage has been superseded by positive feed carriages, however, on account of ease of handling there are still quite a number of these carriages in use and for that reason, instructions and symbols are of value.

The platen 10¼″ long has no direct feeding connection. The platen is turned by contacting on knurled steel rolls AZ (Plate 1) carried by shaft AY, on the latter ratchet and pawl assembly O (Plate 2) is connected with link V and lever assembly AA, the latter being connected to the main operating section through the ribbon pawl frame.

Shaft AY (Plate 1) receives the complete forward and rearward movement of the machine. The width of spacing is increased or decreased as the diameter of the steel rolls is increased or decreased.

FRICTION FEED CARRIAGE (Plate 2)



In order to facilitate insertion of sheets, narrow bands BB (Plate 1) extend partly around the platen. The sheet is held against the platen by long pressure rolls A. The effect of the pressure rolls is increased by the direct contact of the sheet running between the platen and the steel rolls.

The medium that feeds the paper in this carriage is the rotary friction of the platen and steel rolls and also the rotary friction of the pressure rolls. Any stationary friction, such as bands pressing against the platen, binding of pressure rolls or platen in their bearings, will overcome the feed friction and cause irregular or no spacing.

Adjustments

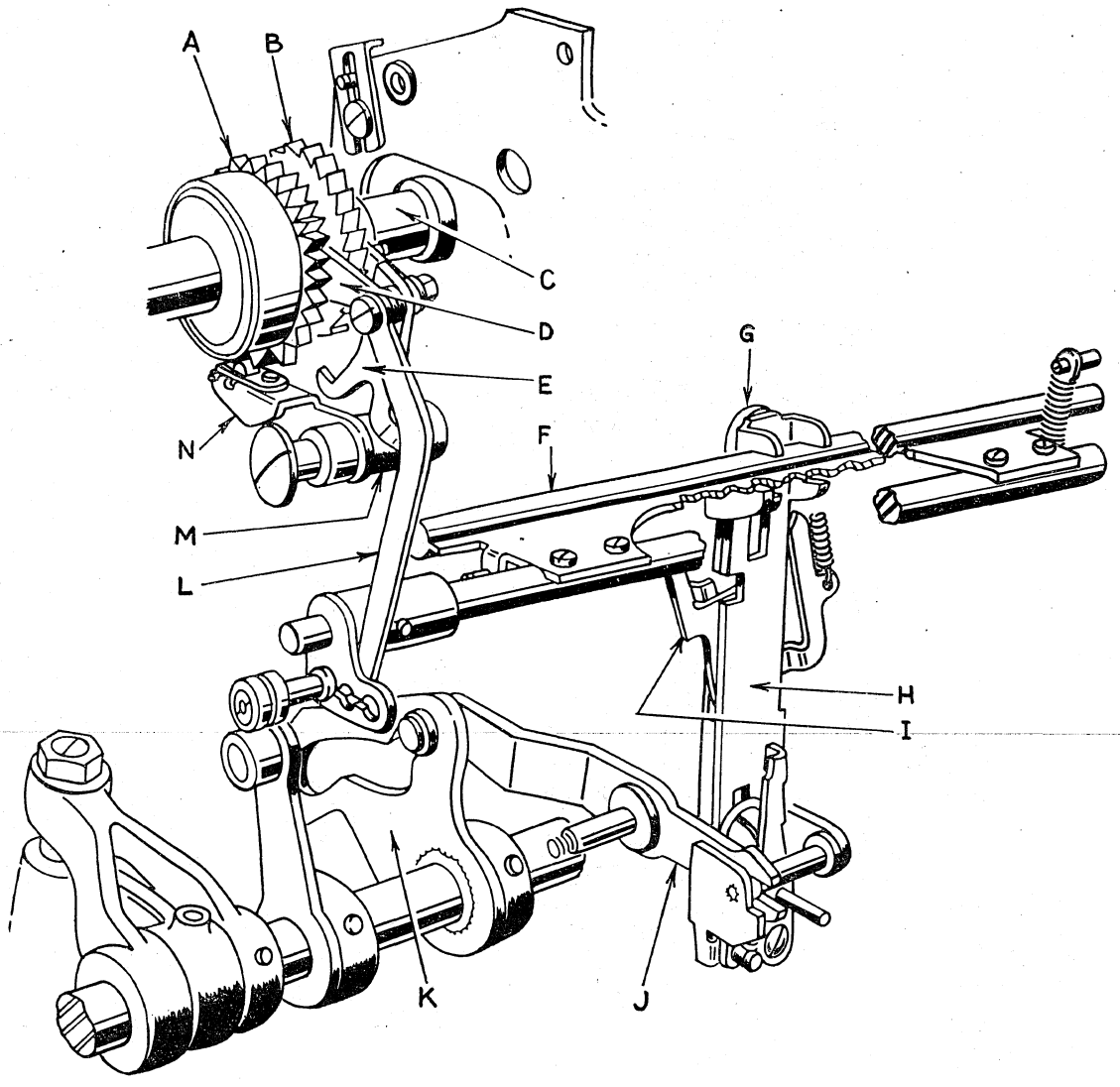
Platen shaft and pressure roll shaft free running with pressure rolls released and springs unhooked.

Pressure rolls to have even contact on the platen to insure positive friction. Bands BB (Plate 1) to have even clearance all around platen. Steel rolls AZ and ratchet tight on shaft. Sufficient pressure by friction springs on right steel roller.

To shift the carriage to print in another column, the carriage is swung back, handle H depressed, which raises latch AN (Plate 2) out of the casting slots and carriage moved to right or left.

POSITIVE FEED MECHANISM (Plate 12)

(Plates 3 thru 11 in Symbol Book Only)



Positive Feed Carriage (Plate 12)

Positive feed carriages have the feed movement applied directly by feed pawl E to ratchet wheel B which is fastened to platen shaft C. The actuating power is taken from cam K of the main operating section through lever J, the rear arm of which is connected to outer slide H.

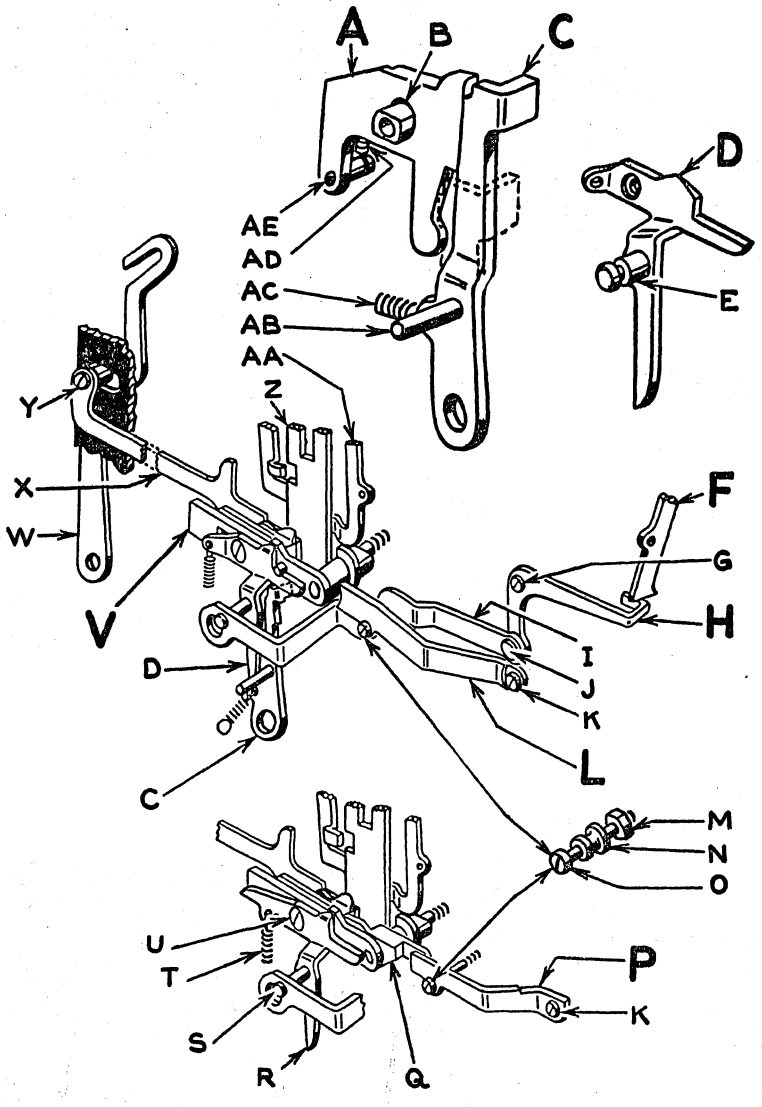
Feed pawl assembly D is connected with link L to bail assembly F, the latter is in constant mesh with outer slide H which is connected to inner slide G by coupler I through certain carriage stops, total keys, bars, etc. Feed pawl E is not engaged with ratchet B when the machine is normal. Feed pawl E is disengaged from ratchet B when its cam arm contacts on M at the end of the return stroke.

Accurate spacing is secured by the roller of detent N seating in the spaces of detent wheel A. Single, double and triple spacing is secured by locating knurled knob in positions 1, 2 or 3.

Tests and Adjustments

Feed pawl E requires sufficient lead at the end of the forward stroke to allow detent N to seat correctly in detent wheel A.

SEMI-AUTOMATIIC CROSS-TABULATING MECHANISM (Plate 13)*



(*Plate 12*) (*Cont.*) For more or less lead the curve in link L is increased or bent nearer to a straight line.

To delay the disengagement of feed pawl E its cam end is raised. This adjustment is made by applying a brass rod to the curve in the cam arm and giving the brass rod a sharp hammer tap. To advance the disengagement of the feed pawl the cam arm of E is lowered. This adjustment is made with the handle stopped on the forward stroke, feed pawl seating in one of the ratchet teeth. A brass rod is applied to the extreme end of the cam arm by giving the brass a sharp hammer tap.

These instructions are applicable to all positive feed carriages.

Semi-Automatic Cross-Tabulating Mechanism (Plate 13)

Tabulation takes place on the return stroke when lift pawl C raises the carriage stop above stop block V to allow the spring barrel to draw the carriage to the next column. Lift pawl C which is carried by inner slide D (Plate 15) is controlled to tabulate or non-tabulate through cam D.

When cam D is in normal position, lift pawl C is cammed out of the range of the stop dog. Tabulating stops contact cam D and swing it away from lift pawl C, allowing it to locate under the stop dog on the forward stroke, raising the stop bar on the return stroke to tabulate the carriage.

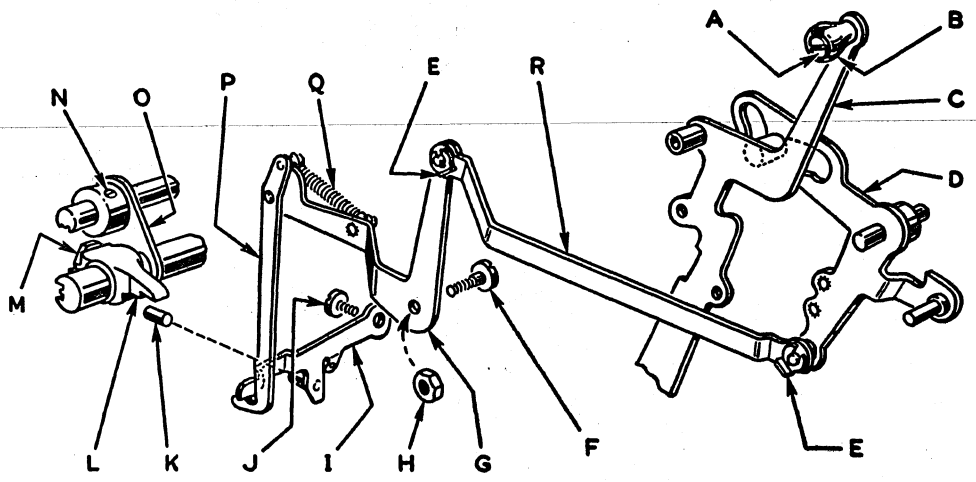
Non-tabulating stops which do not contact on cam D, allow it to remain normal, camming lift stop C out of the path of the stop dog on both forward and return strokes resulting in non-tabulation. When the carriage normal key is latched down, link X swings and holds lift pawl C to clear the stop dogs. When either total key is depressed with a non-tab stop, lever F swings bellcrank H which through link I swings cam D to allow lift pawl C to locate under the stop dog. All machines are now equipped with stop block limit parts L and P. Part L is used for non-skip blocks. Part P being used for skip blocks.

Early Tabulation

Early tabulation was for a while standard for Classes 20-30 excepting machines having skip stop block construction, also machines having multiple skip and return mechanism. Early tabulation is no longer installed in new machines, however, this mechanism is not being changed in machines which have it.

Early tabulation functions as follows: Lift pawl C, when moving upward contacts on intermediate A which contacts on and lifts the stop dog. When the stop bar is raised sufficiently, the foot of intermediate A cams lift pawl C out of engagement allowing the stop bar to drop to normal position.

CARRIAGE TABULATION CONTROLLED FROM REGISTER TOTAL INDEXING LEVER—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 13-1)



Carriage Tabulation Controlled from Register Total Indexing Lever—For No Space Stroke Total Bank Posting Machines (Plate 13-1)

Purpose

This mechanism positions the carriage to allow columns 1 thru 13 to print on the journal sheet when taking register total of old balance pickup.

Operation

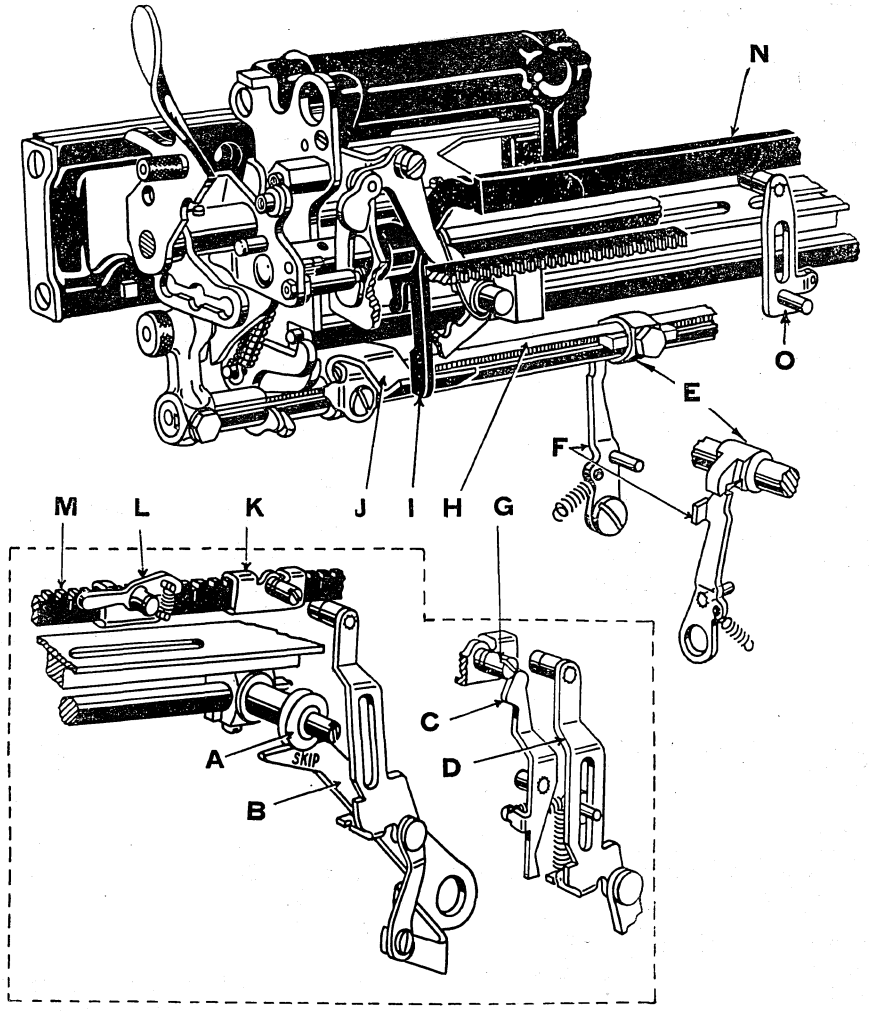
With the carriage located in the first carriage position, shifting of register total lever C (to total or sub-total position) rocks bellcrank D to raise arm I through linkage R, G, and P, thereby causing stud K to contact and raise part L to permit the carriage to tabulate to the second carriage position.

Adjustment

Stud K should raise part L sufficiently to permit the carriage to tabulate when register total lever C is shifted to a total or sub-total position; when the lever is normal, stud K should have slight clearance under part L.

To adjust, raise or lower the left end of arm I.

SKIP TABULATION (Plate 14)



Skip Tabulation (Plate 14)

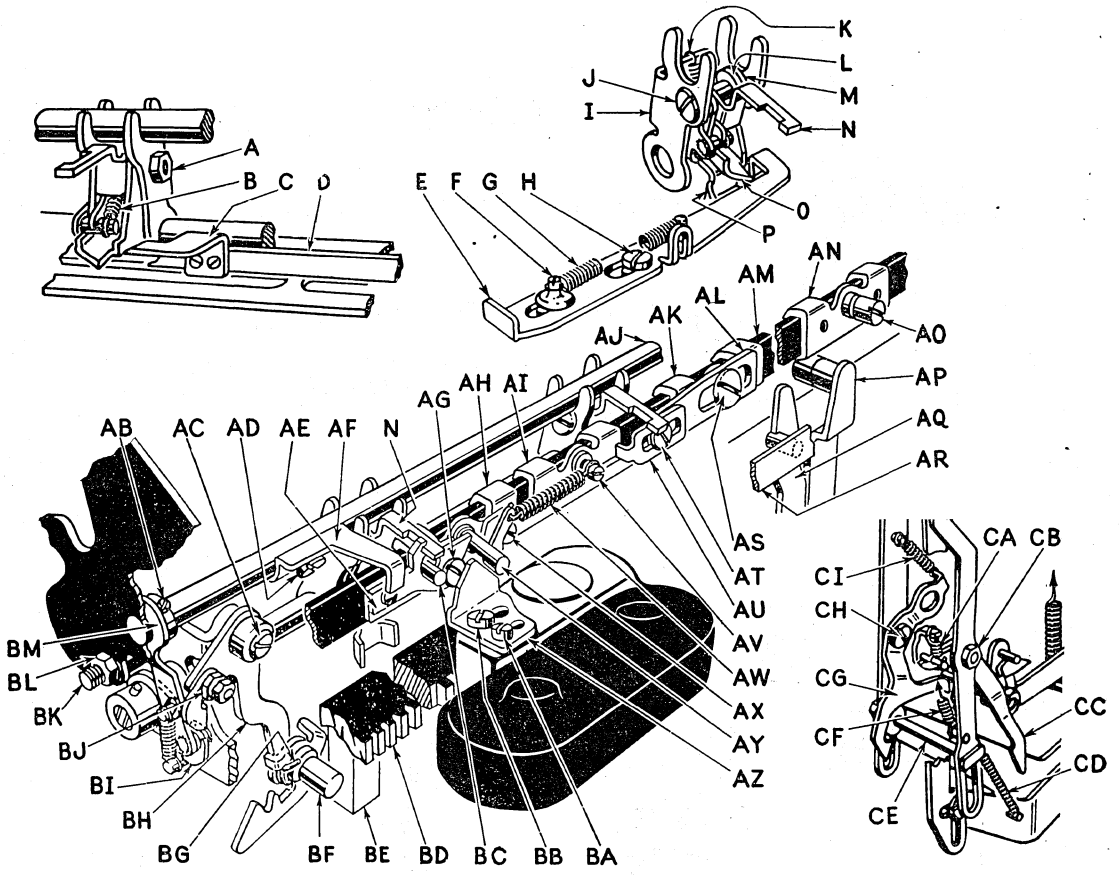
The purpose of skip tabulation is to select any carriage position without tabulating from stop to stop. When stop bar H is raised by lift pawl F contacting stop E, H is latched by the foot of bail N blocking arm J.

Bail N is controlled to latch or not latch arm J by the position of skip slide O (multiple skip and return mechanism) and by skip slide D (single skip mechanism).

The non-skip position of skip slides O and D is upward holding the foot of bails M and N to clear arm J. Skip slides O and D are indexed (pulled down) by carriage, motor bar and total keys. The indexing of skip slide O and its release is covered by the multiple skip and return instructions. Skip slide D when indexed, is latched by latch C which is released by the stud of assemblies K and L.

Carriage controlled single skip is indexed by control roll A depressing lever assembly B which pulls down slide D and is then latched by latch C. Assembly K is held on bail M by release screw G. Assembly L held on bail M by a spring holding its lever in one of the spaces of bail M. Assembly L is used for Selective Debit and Credit operations—assembly L being shifted for either operation.

ANALYSIS COLUMN SELECTOR, MOTOR BAR CONTROLLED, CLASSES 20 THRU 30 (Plate 14-1)



Analysis Column Selector, Motor Bar Controlled, Classes 20 thru 30 (Plate 14-1)

Purpose

The purpose of this mechanism is to index an earlier carriage return from a motor bar (eliminating the necessity of shifting the O.C.L.) when no posting is desired in either the analysis column of the statement or the uncollected fund column of the ledger.

Operation

The location of the O.C.L. in its No. 1 position, for statement posting, causes arm C on slide D to be moved into the path of carriage return indexing pawl O of the first (leftmost) assembly I, disabling the pawl.

When the Skip Mechanism is indexed by the upper motor bar, in deposit column, bail AM follows link AP downward, positioning stud AY in the path of cam AZ.

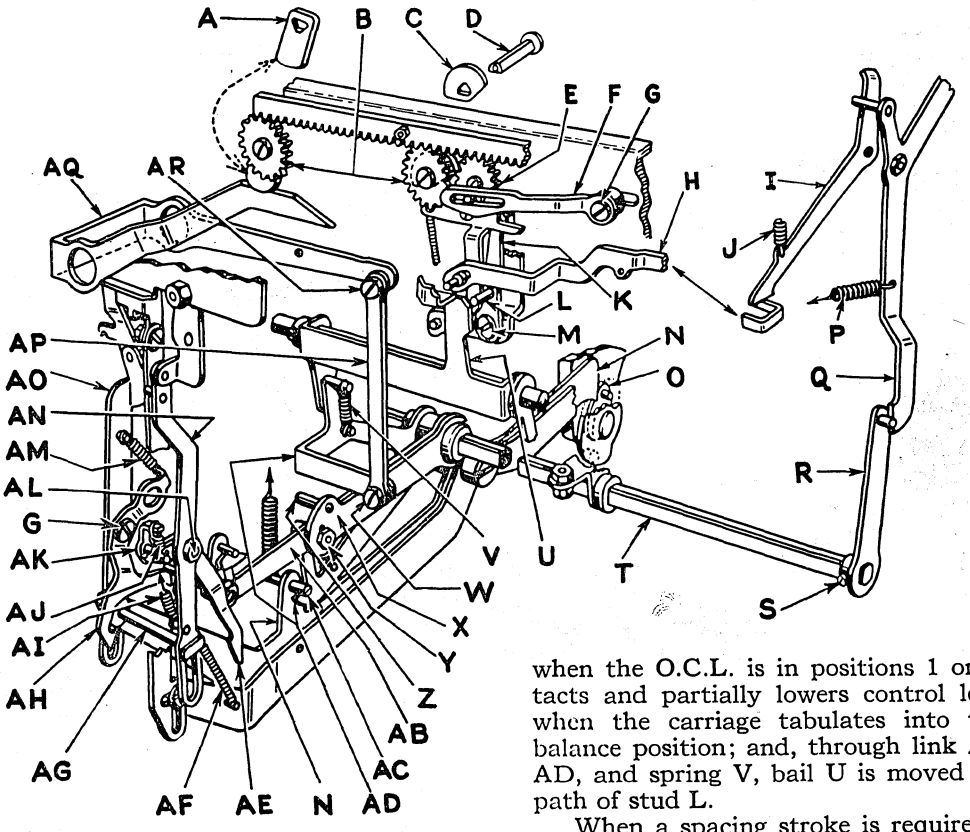
During carriage tabulation from deposit column, stud AY contacts cam AZ, moving slide AL to the right to limit against shoulder screw AS, locating part AU under arm N of the first (leftmost) assembly I, and positioning the higher surface on the right end of slide AL under pawl N of the second (rightmost) assembly I.

Following this positioning of slide AL, continued carriage tabulation causes stud AY to ride over cam AZ, raising bail AM and causing latch AE to engage the step of arm N of the second (rightmost) assembly I. Bail AM and arms N are thus held in raised position and pawl O of the second (rightmost) assembly I is located in the path of the offset in the carriage return indexing slide E, while pawl O of the first assembly I is held inactive by arm C. When bail AM is raised (by stud AY and cam AZ) the lower vertical arm on the right end of the bail is moved rearward off the stop bar arm (J, Plate 14) releasing the stop bar, allowing the carriage to stop in total position, and causing pawl O to move slide E to the left to partially index the Carriage Return Mechanism.

Upon the return of the carriage, rack BD is moved to the right, causing square stud BD to contact stud BF, rocking bell-crank BH, which, through arms BI and BM, rocks

BALANCE TRANSFER INDEXED FROM OPERATION CONTROL LEVER (Styles 23 13 05 and 23 17 45) (Plate 14-1A)

(Text for Plate 14-1—Continued Page 7B)



Balance Transfer Indexed From Operation Control Lever (Styles 23 13 05 and 23 17 45) (Plate 14-1A)

Purpose

By eliminating the use of the No. 6/14 turnover stop and by providing an O.C.L. arrangement which permits the transferring of balances as well as the posting of statements and ledgers, this mechanism affords an easier and faster selection of operations.

O.C.L. position No. 1 is used for posting statements; O.C.L. position No. 2 for posting ledgers; and O.C.L. position No. 3 for transferring balances.

Operation

WITH THE O.C.L. located in positions 1 or 2 skid C actuates bail U to prevent tabulation of the carriage out of the 1st balance position (should a spacing stroke in the 1st balance position be necessary); and slide H disables bail U to permit carriage tabulation when the total key is actuated.

Skid C, which is located in active position when the O.C.L. is in positions 1 or 2, contacts and partially lowers control lever AQ when the carriage tabulates into the first balance position; and, through link AP, arm AD, and spring V, bail U is moved into the path of stud L.

When a spacing stroke is required in the first balance position (before the total key can be actuated) bail U remains in contact with stud L throughout the downward and upward movements of lift pawl K disabling the lift pawl and preventing tabulation of the carriage out of the 1st balance position.

If no spacing stroke is required, the total key is actuated in the usual manner, rocking arm I, and moving slide H to the right where it contacts the offset in the upper portion of bail U and moves bail U rearward out of the path of stud L. Lift pawl K is thus permitted to raise the No. 6 stop to tabulate the carriage.

THE EARLY CARRIAGE RETURN Mechanism is indexed in the "Uncollected Fund" column, with the O.C.L. in position 2, by means of the M.R.C. trip cam (BB, Plate 54, Carriage Symbol List). The M.R.C. slide (BQ, Plate 54) is moved to the left, bell-crank (BS, Plate 54) is rocked, and link AO is lowered to position hook AH under stud AG. When the machine is operated (in the "Uncollected Fund" column) arm N is rocked by cam O, and stud AG and arm AO are lowered to initiate the return of the carriage.

Mr M R Lovejoy
Buffalo N Y Branch 10-5

(Plate 14-1A) Continued

In O.C.L. position No. 1 the Early Return Mechanism is indexed in the "Analysis" column by means of M.R.C. slide cam (BE, Plate 51, Carriage Symbol List). Hook AH is engaged with stud AG through the slide cam (BE, Plate 51) to produce an early return upon operation of the machine in the "Analysis" column.

THE BALANCE TRANSFER operation, an operation which utilizes the two balance positions, is indexed in O.C.L. position No. 3 by skid A and arm F. Skid C is positioned upward in inactive position during the Balance Transfer operation.

When the carriage tabulates into the second balance position, skid A lowers control lever AQ, link AP, and arm AD, and through stud Z lowers arm AB to position hook AE under stud AG. When the machine is operated (in second balance position) arm N is rocked by cam O, and stud AG and arm AN are lowered to initiate the carriage return.

As the carriage is returning, during the Balance Transfer operation, the roller in the M.R.C. release arm (D, Plate 19, Power Symbol List) is contacted by arm F to release the Return Mechanism, allowing the carriage to stop in the first balance position.

Adjustment

1. With the O.C.L. in position No. 1 or 2 and the carriage located in the first balance position, bail U should have a full hold on stud L.

To adjust, raise or lower arm AQ.

2. When the total key is depressed, with the O.C.L. in position No. 1 or 2 and the carriage located in the first balance position, arm H should move bail U rearward out of the path of stud L.

To adjust, bend the offset in the upper portion of bail U.

3. With the carriage located in the "Uncollected Fund" column and the carriage return indexed, bail U should have a full hold on stud L.

To adjust, turn eccentric screw AC.

4. With the O.C.L. in position No. 3 and the carriage located in the second balance position, hook AE should have a full hold under stud AG.

To adjust, loosen nut Y, and raise or lower part X.

Skip and Return Mechanism (Improved) With Carriage Controlled Normalized Tabulation (Plates 14-1B)

Purpose

This mechanism provides a means for securing the following operational functions of the machine.

(1) Vertical form spacing or carriage return—indexed from the depression of motor bar No. 101 (A).
(2) Carriage Return—indexed from the depression of the total key, with the carriage located in a single total position.
(3) Skip tabulation of the carriage—indexed from the depression of motor bar No. 103 (H), or from the shifting of the register total lever.

In addition to the operational functions afforded, this mechanism also provides a means for preventing a partial tabulation of the carriage before the M.R.C. clutch is indexed—when the carriage is being returned from any position.

Operation

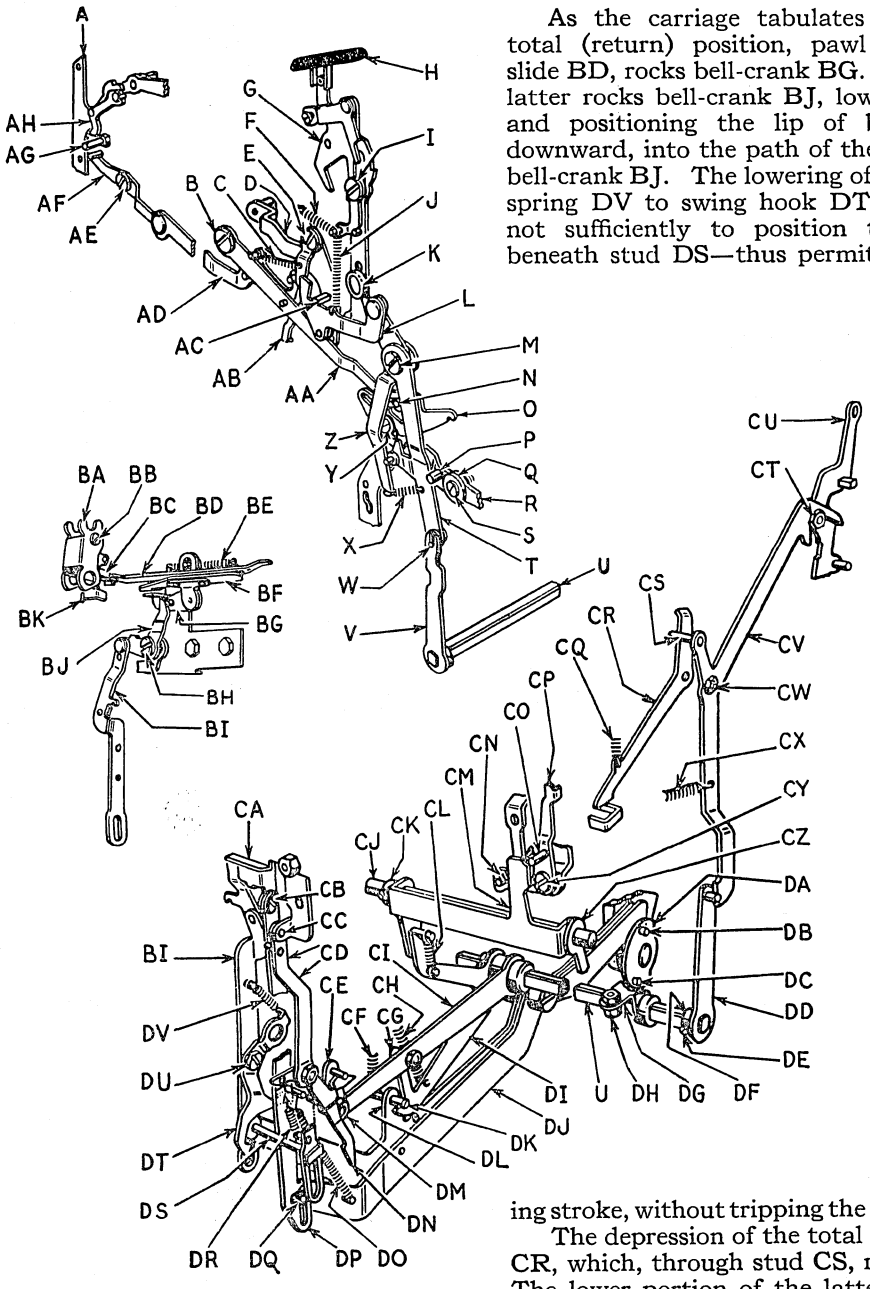
THE VERTICAL FORM SPACING MECHANISM is indexed from the depression of motor bar No. 101 (A)—when the same is depressed, and held depressed during a portion of the forward stroke of the machine operation. The downward movement of the motor bar rocks levers AF and AD to lower arm L out of the path of stud AC; and, through arm AA, to lower stud N into the pocket of cam O. In the forward stroke of the machine operation, stud N rocks cam O to lower roll Y, which completes the indexing of the Vertical Form Spacing Mechanism, and normalizes the Carriage Tabulating Mechanism (as explained in Plate 17, Carriage Instruction Book). Arm R, being rocked by roll Y, moves stud P forward to limit the rearward motion of arm T, thus preventing the indexing of the Carriage Return Mechanism.

THE CARRIAGE RETURN MECHANISM is indexed from the depression, and immediate release, of motor bar No. 101 (A). The motor bar, being depressed, rocks levers AF and AD, lowering the step on the rear of lever AD out of the path of stud AC (in lever D); and, as the motor bar is released, detent AH (by limiting against stud AG) prevents the complete restoration of motor bar No. 101, and the levers AF and AD, to thus retain the step (on the rear of lever AD) in its lowered position. During the forward stroke of the machine operation, spring F rocks lever D, moving stud AC forward. Stud AC contacts the vertical surface of arm L, drawing arm L forward to rock lever Z, which, through lever T and arm V, rocks shaft U to lower arm CI and part CE. A stud in the latter swings hook DN under stud DS.

As disk DA rotates (during the machine operation) roller DB rocks lever DL, which, through stud DS and hook DN, lowers link CD to index the M.R.C. clutch.

THE CARRIAGE RETURN MECHA-

SKIP AND RETURN MECHANISM (IMPROVED) WITH CARRIAGE CONTROLLED NORMALIZED TABULATION (Plate 14-1B)



As the carriage tabulates into a single total (return) position, pawl BC, through slide BD, rocks bell-crank BG. A stud in the latter rocks bell-crank BJ, lowering link BI, and positioning the lip of bell-crank BG downward, into the path of the upper arm of bell-crank BJ. The lowering of link BI allows spring DV to swing hook DT forward—but not sufficiently to position the hook DT beneath stud DS—thus permitting the spacing stroke, without tripping the M.R.C. clutch.

The depression of the total key rocks lever CR, which, through stud CS, rocks lever CV. The lower portion of the latter moves away from the stud in arm DD, permitting springs DV and DR to raise arm CI, which allows hook DT to locate beneath stud DS.

As the machine operates, roller DB rocks lever DL (lowering its rearward portion), which lowers link BI through stud DS and hook DT. Link BI, through bell-cranks BJ and BG, draws slide BD to the left to index the M.R.C. clutch.

THE SKIP TABULATING MECHA-

(Plate 14-1B) Continued

NISM is partially indexed (carriage controlled) when the carriage is located in a single total position; and, with the carriage thus positioned, is completely indexed from the depression of the total key.

Note: The partial indexing of the Carriage Return Mechanism permits the operation (spacing stroke) of a machine containing an overdraft.

(Plate 14-1B) Continued

NISM is indexed from the depression of motor bar No. 103 (H), or from the shifting of the register total indexing lever CU.

The depression of motor bar No. 103 (H) lowers roll K to rock lever Z, which, through spring X, lever T and arm V, rotates shaft U to swing arm CI upward. The raising of the latter permits spring DO to move link DP forward and position its horizontal slot over the shoulder of screw DQ.

The shifting of the register total indexing lever CU (to its total or sub-total position) rocks lever CV. The lower portion of the latter moves away from the stud in arm DD, permitting springs DV and DR (through their associated hooks) to raise arm CI, which allows the horizontal slot of link DP to locate over the shoulder of screw DQ.

As the machine operates, roller DC rocks arm DJ, which through screw DQ, lowers link DP to index the Skip Tabulating Mechanism.

THE CROSS TABULATING MECHANISM is normalized from the Carriage Return Mechanism—when indexed from any source. The depression of motor bar No. 101 (A) lowers arm CI, which, through stud CG, bell-crank DI and spring CL, rocks the upper portion of bail CM forward. The upper portion of bail CM, being thus positioned into the path of the stud CO, cams the lift pawl to the left (during the machine operation) to prevent the tabulation of the carriage.

The partial indexing of the Carriage Return Mechanism—with the carriage in single total position—lowers arm DL, which, through stud DK, bell-crank DI and spring CL, rocks the upper portion of bail CM forward to normalize the Cross Tabulating Mechanism.

Adjustment

1. When the carriage tabulates into the single total position, pawl BC in the left assembly BA should move slide BD to the left as far as possible—without moving part 1-12014½A (M, Plate 19, Power Symbol List).

To adjust, loosen the screw in collar (AC2, Plate 51, Carriage Symbol List) and position the left assembly BA as required.

2. With the carriage located in a single total position, and the Carriage Return Mechanism partially indexed, there should be slight clearance between hook DT and stud DS.

To adjust, bend the lower portion of lever CV forward or rearward.

3. When the Carriage Return Mechanism is partially indexed, the depression of the total key should permit hook DT to swing forward and have a full hold on stud DS.

To adjust, swing stud CS forward or rearward by bending the rearward projection in the upper portion of arm CV.

Note: When making the above adjustment, do not swing stud CS forward sufficiently to permit the horizontal slot of link DP to locate over the shoulder of screw DQ.

4. When the Carriage Return Mechanism is indexed from the location of the carriage in a non-total position, pawl BC, in the right assembly BA, should move slide BD sufficiently to position hook DT for a full hold on stud DS.

To adjust, loosen the screw in collar (AC, Plate 51, Carriage Symbol List), and position right assembly BA as required.

Note: The M.R.C. switch points should not close until the machine is operated. If closing too soon, readjust the switch points.

5. Motor bar No. 103 (H), when depressed, should raise arm CI sufficiently to permit the horizontal slot of link DP to locate over the shoulder of stud DQ.

To adjust, turn eccentric screw W as required.

Note: When motor bar No. 103 (H) is depressed, there should be slight clearance between the cutout slots in the machine base and the forward vertical surface of arms V and DD. To provide clearance, remove stock from the forward portion of the slots in the base.

6. When the machine is operated, with motor bar No. 101 (A) depressed and held down, stud AC should clear over the projection in the forward portion of arm L by approximately 1/64″.

To adjust, bend the rearward portion of lever AF up or down.

7. Hook DN should have a full hold on stud DS, when the Carriage Return Mechanism is indexed from motor bar No. 101 (A). The carriage-normal key (when in carriage-normal position) should hold hook DN clear of stud DS, and prevent motor bar No. 101 (A) from indexing a carriage return.

To adjust, loosen nut DM and locate part CE as required.

8. Stud N should ride in the horizontal slot of cam O, when motor bar No. 101 (A) is depressed and released immediately. The latter, when held depressed during a portion of the forward stroke of the machine operation, should locate stud N in the pocket of cam O.

To adjust, bend the rearward portion of arm AA.

9. With the Carriage Return Mechanism indexed from the depression of motor bar No. 101 (A), the upper portion of bail CM should have a full hold on stud CO.

To adjust, turn eccentric stud CG.

10. With the Carriage Return Mechanism partially indexed (the carriage being in single total position), the upper portion of bail CM should have a full hold on stud CO.

To adjust, turn eccentric stud DK.

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CARRIAGE TABULATION FROM NO. 14 STOP, CARRIAGE AND/OR MOTOR BAR CONTROLLED—CLASSES 20-30 (Plate 14-3)

FIG. 1

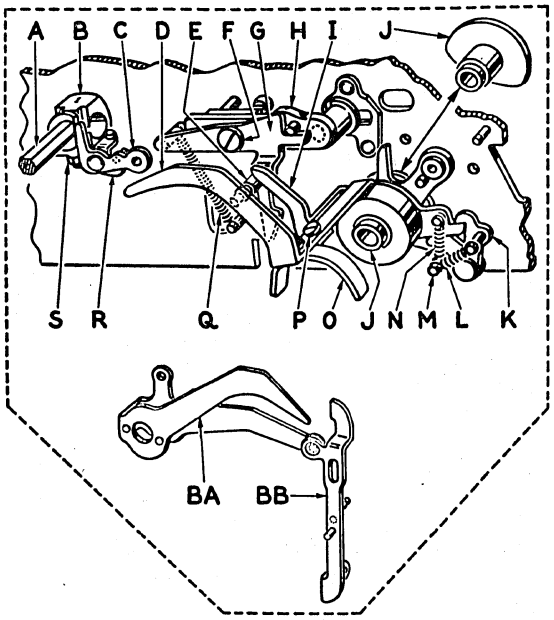
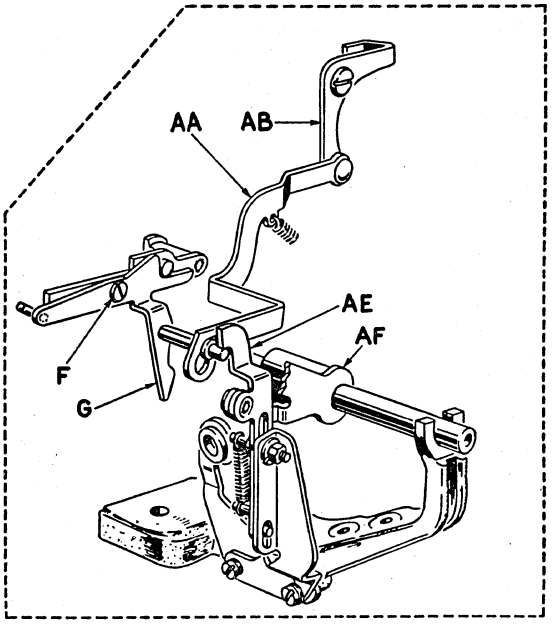


FIG. 2



Carriage Tabulation From No. 14 Stop, Carriage and/or Motor Bar Controlled Classes 20-30 (Plate 14-3)

Related Material

Semi-automatic cross tabulation mechanism, Plate 13.

Purpose

This mechanism, in its various forms, provides carriage tabulation from a No. 14 stop through sources other than the depression of the total keys.

Construction

Various constructions (as described below) are offered to provide tabulation from the sources indicated:

1. Control lever AF and camming slide AE (Fig. 2) are indexed by a control roll.

2. Control lever BA and camming slide BB (equipped with a lower extension), are indexed both by a control roll and by depression of a motor bar.

3. Control lever D and camming arm I (Fig. 1), which are installed only when all the roll space on the control hangers is taken up, are indexed by roll C of hanger B, when the former is lowered into active position through the O.C.L. Mechanism.

Operation

When a control roll moves into position, control lever D, BA, or AF is lowered (control lever BA may be lowered also from a motor bar depression) to cam slide AE or BB or arm I, which, through stud E, moves cam G to the right; thus permitting the lift pawl to raise the No. 14 stop to tabulate the carriage.

On machines equipped with bellcrank AB and link AA, depression of a total key will move cam G to the right to permit carriage tabulation.

Installation

To install the mechanism illustrated in Fig. 1, the following parts are required: sleeve A, hanger B, assembly R, bushing J, part O, screws P, and assembly D.

Adjustment

1. With the machine normal and no roll on lever BA, stud E should be located below the vertical surface of camming slide AE (or BB) and should be located on the vertical surface of the slide when the latter is indexed by a control roll through lever AF (or BA).

To adjust, raise or lower lever AF (or BA).

2. On machines equipped with assembly R, the roller C, when lowered and in contact with lever D, should move stud E, through arm I, to its rightmost limit without binding stud E.

To adjust, bend arm I.

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shaft AJ to lower arm AF. Lowering of arm AF releases latch AE, allowing spring AW to restore slide AL to the left and bail AM to restore downward, thus allowing arms N and pawls O to return to normal inactive position.

WHEN THE O.C.L. is located in its No. 2 position, for ledger posting, arm C (on slide D) is moved to the left out of the path of carriage return indexing pawl O in the first (leftmost) assembly I, enabling the pawl to index an early return from the total position (carriage position No. 5), by means of slide AL, latch AE, part AU, and arm N, when the upper motor bar is used.

Adjustment

1. When the left assembly I is indexed for a carriage return, during ledger posting, and the carriage is located in total position (carriage position No. 5), there should be slight clearance between hook CG and stud CE.

To adjust, loosen the screw in the collar (CA-2, Plate 51, Carriage Symbol List) and position the left assembly I as required.

2. When the right assembly I is indexed for a carriage return, during statement posting, and the carriage is located in total position (carriage position No. 6), hook CG should have full hold on stud CE.

To adjust, loosen the screw in the collar (CA-2, Plate 51, Carriage Symbol List) and position the right assembly I as required.

3. When slide AL is in its normal position, there should be 1/32″ clearance between latch AE and the left side of arm N (on the right assembly I).

To adjust, loosen screw AV and move hanger AI as required.

4. Latch AE should have 1/32″ latching lead to the right of arm N when slide AL is held to its right hand limit.

To adjust, loosen screw AS and move hanger AK as required.

5. When slide AL is in its normal position there should be 1/32″ clearance between part AU and the left side of arm N (on the left assembly I).

To adjust, loosen screw AT and move part AU as required.

6. Indexing pawls O should have a full hold on the offset in slide E, when the Carriage Return Mechanism is indexed from the upper motor bar.

To adjust, bend arms N up or down.

7. The ears on the lower portion of parts P should clear the carriage return rack BD when stud AY is on the high point of cam AZ.

To adjust, bend the ears of parts P.

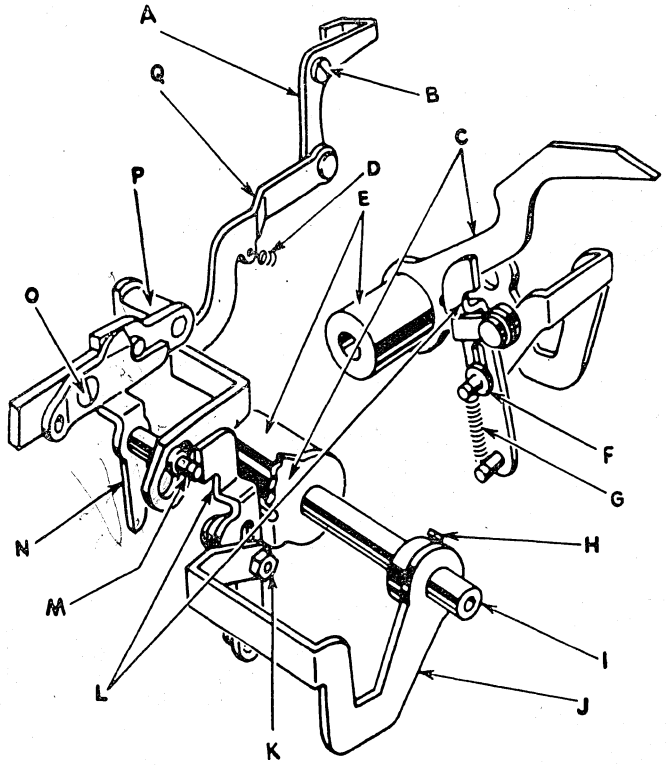
CARRIAGE TABULATION FROM NUMBER 14 STOP, CARRIAGE CONTROLLED, CLASSES 20-30 (Plate 14-2)

Carriage Tabulation from Number 14 Stop, Carriage Controlled, Classes 20-30 (Plate 14-2)

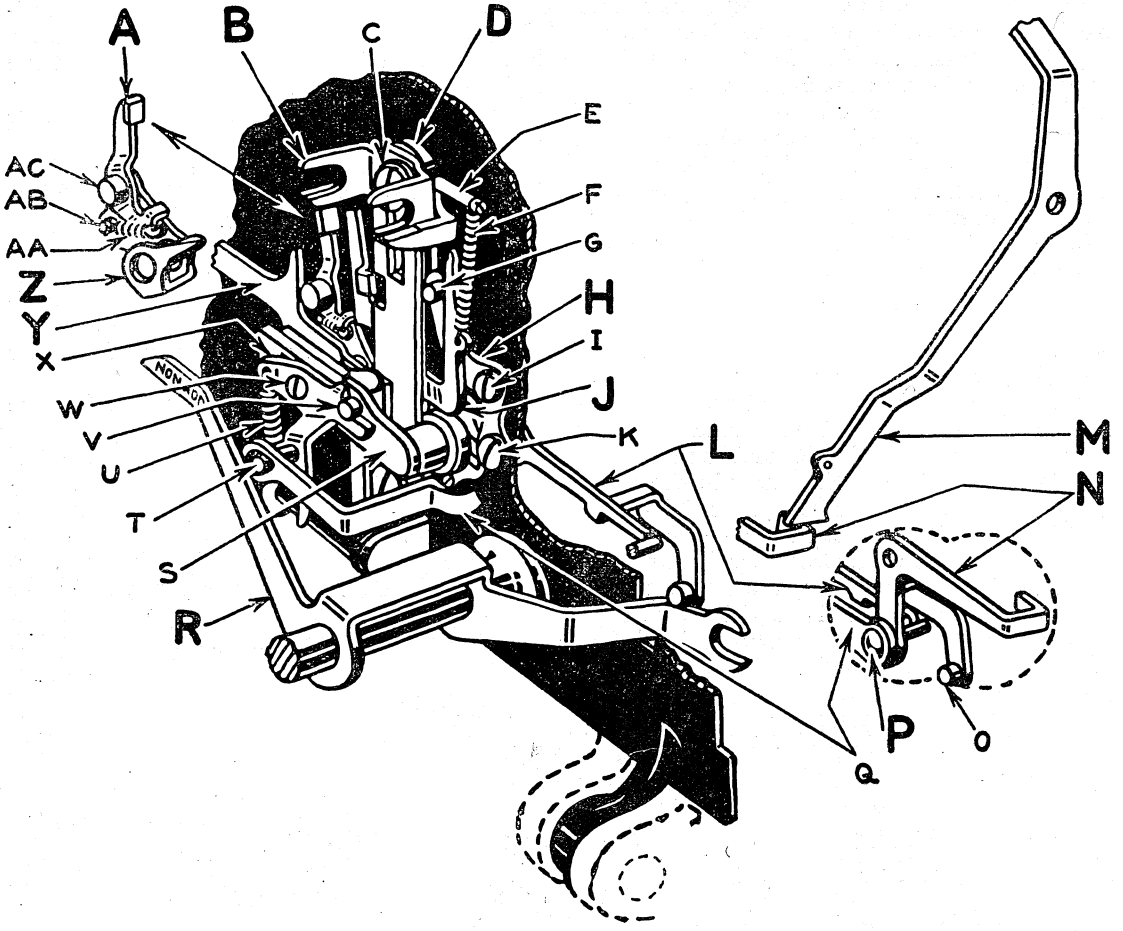
The purpose of this mechanism is to provide tabulation from a No. 14 stop when a control roll depresses lever C in addition to tabulation from the total keys.

When the carriage moves a control roll on lever C, part L is carried downward, which swings cam N to allow the lift pawl (not shown) to raise the No. 14 stop and thus allow the carriage to tabulate.

Tabulation is also secured when the total keys depress bell-crank A, which through link Q swings cam N.



VERTICAL SPACING FROM TOTAL KEY, CARRIAGE CONTROLLED (EARLY) (Plate 15)



Vertical Spacing from Total Key, Carriage Controlled (Early) (Plate 15)

The semi-automatic carriage mechanism causes the carriage to horizontally space or tabulate from the left into the right columns.

The carriage is returned to its left columns in one of two ways, viz.: by the operator manually moving it backward or automatically by the motor return unit. The semi-automatic carriage mechanism also vertically feeds the carriage and under certain conditions it spaces the carriage vertically and horizontally.

Both vertical and horizontal spacings are secured through upward and downward movement of feed slides on the back plate. Non-tabulating carriages where only the platen turns have a one piece feed slide on the back plate. Tabulating carriages have two slides, an inner slide and an outer slide. Inner feed slide D is operated directly by the main operating section through feed arm J (Plate 12). Outer feed slide B is free on inner feed slide D. Coupler J (pivots on lower part of D) has a projection which, when seated in the slot of outer slide B causes the feed bail to lower on the forward stroke and raise on the return stroke to feed the paper.

Coupler J is controlled from three sources, viz.:

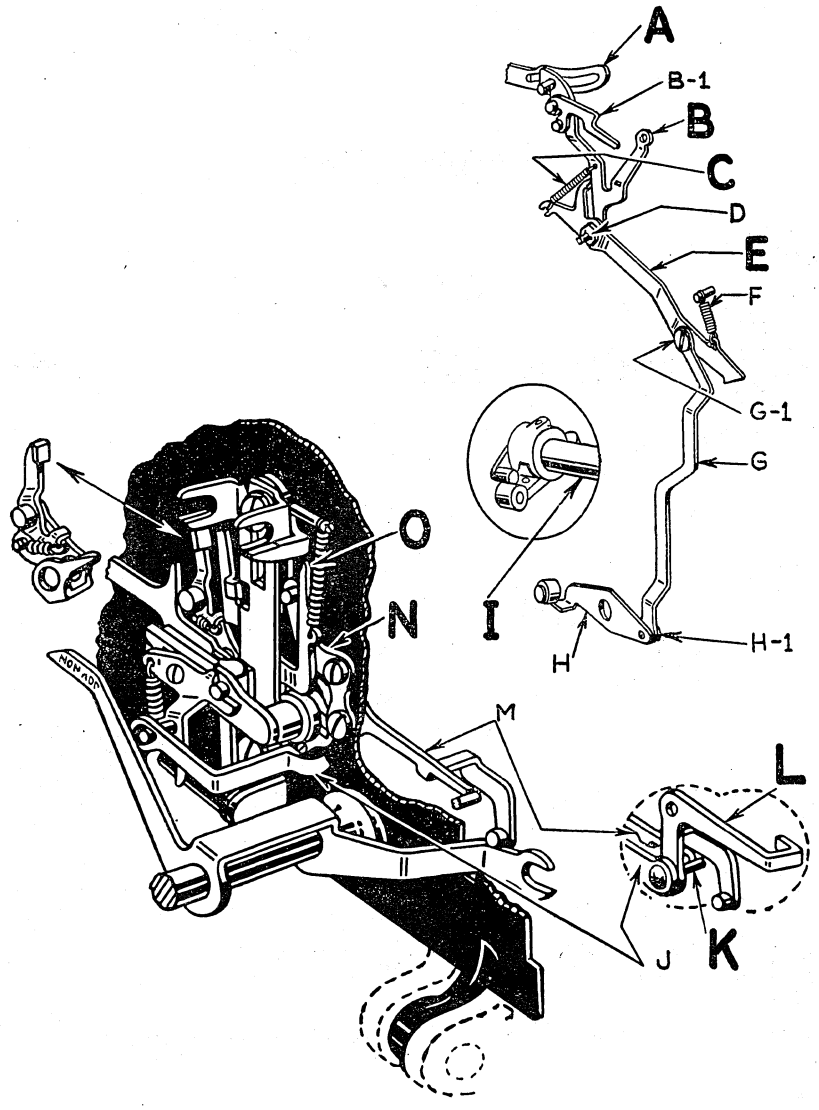
1. Carriage normal key when latched down causes link Y to push and hold the projection of coupler J in the slot of outer slide B.

2. Stops resting on bell-crank Z causes vertical member A to seat the projection of coupler J in the slot of outer feed slide B.

3. Total keys when depressed through lever M contact on bell-crank N, the latter having stud P which pushes slide assembly L to seat the projection of coupler J into outer slide B through bell-crank H.

Vertical spacing from total keys is disabled when a control roll contacts on non-add lever R which raises slide assembly L out of the path of the stud in bell-crank N.

VERTICAL SPACING FROM TOTAL KEY, CARRIAGE CONTROLLED (LATER) (Plate 16)



Upper and lower vertical posting bars when depressed secure vertical spacing by indexing the carriage normal key mechanism through the machine operation. Combination vertical posting and carriage return bars when held depressed also index the carriage normal key mechanism to secure vertical spacing.

Vertical Spacing from Total Key, Carriage Controlled, Later (Plate 16)

The purpose of this mechanism is to insure vertical spacing when the carriage tabulates with the total key depressed from No. 3 or No. 5 rolls contacting on the non-add lever.

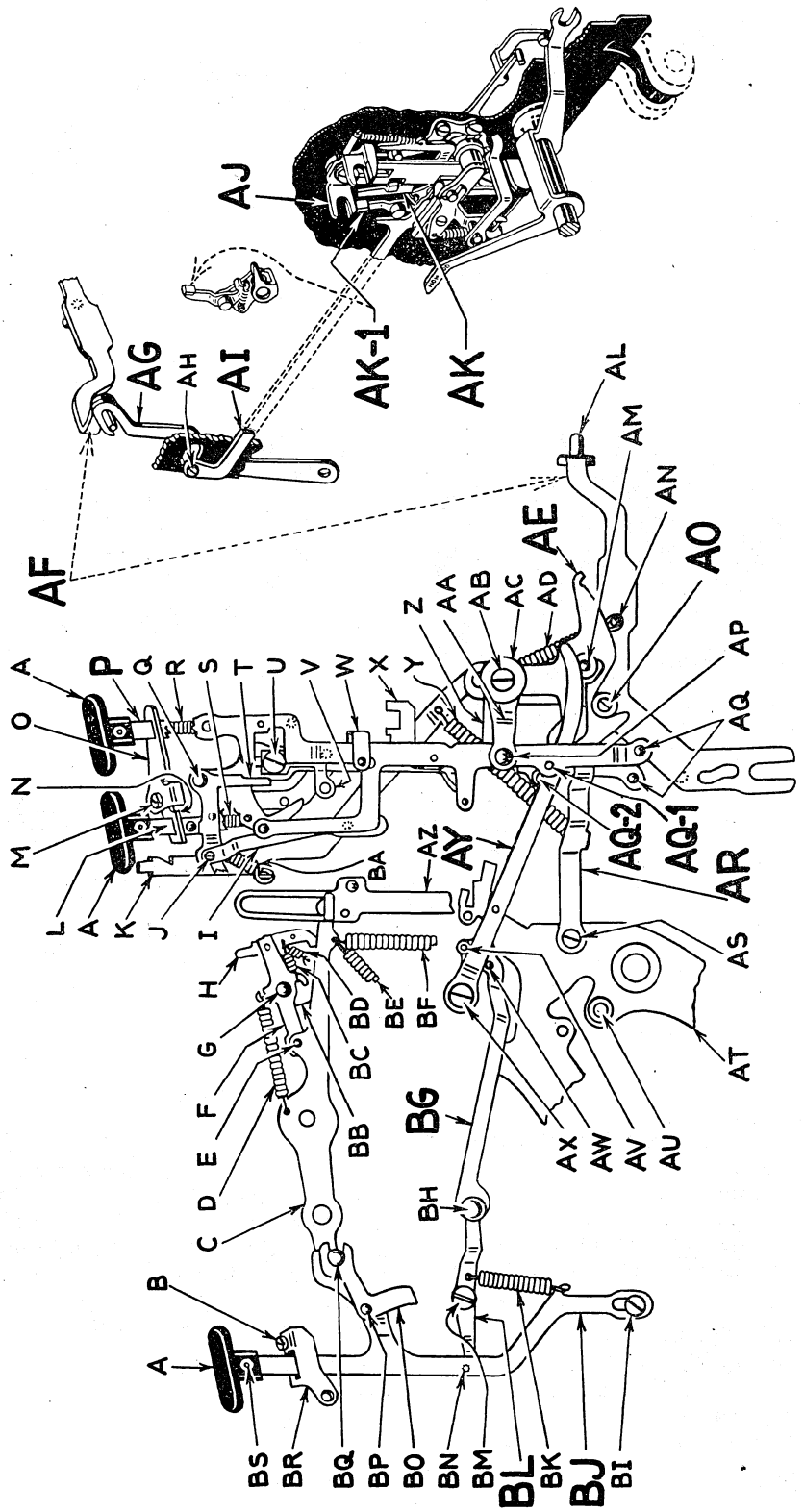
Sequence

When the total key is depressed, link A swings arm B and places spring C under tension. At the beginning of the machine operation, the turning of shaft I allows spring C to pull the rear arm of lever E downward which rocks bell-crank L. Stud K moves part M which rocks bell-crank N to seat coupler O in the slot of the outer feed slide.

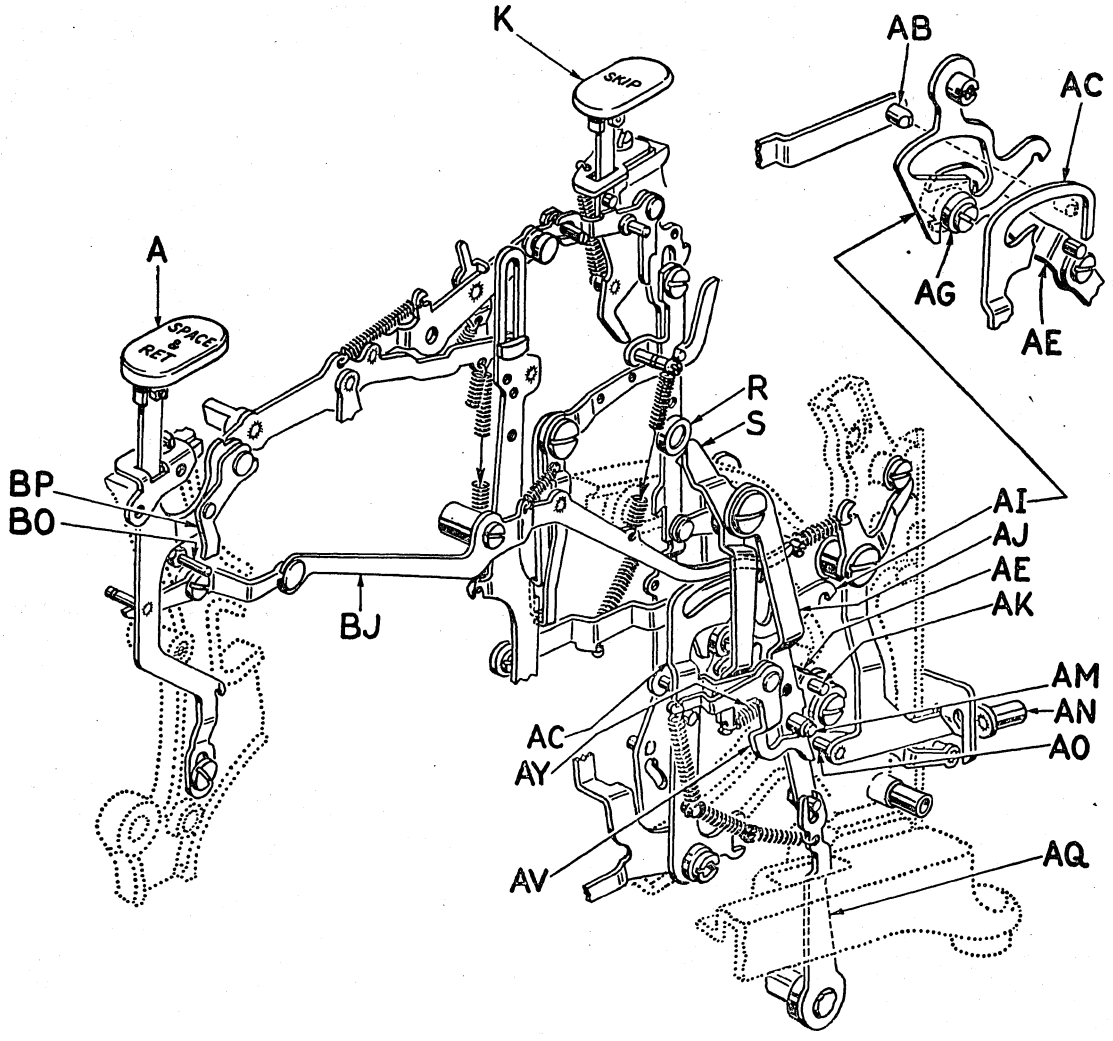
Note: Part M has stock removed to prevent feed when a No. 3 roll is on the non-add lever.

Stud K is under-cut to insure hold on part M when No. 5 roll is used.

VERTICAL SPACING FROM UPPER AND LOWER AUXILIARY MOTOR BARS (Plate 17)



FORM SPACE OR CARRIAGE RETURN—INDEXED FROM MOTOR BAR NO. 101, AND CARRIAGE SKIP TABULATION—INDEXED FROM MOTOR BAR NO. 103 (Plate 17-1)



Form Space or Carriage Return—Indexed From Motor Bar No. 101, and Carriage Skip Tabulation—Indexed From Motor Bar No. 103 (Plate 17-1)

Purpose

This mechanism provides a means for securing the following operational functions of the machine:

1. Vertical Form Spacing or Carriage Return—indexed from the depression of motor bar No. 101.

2. Skip Tabulation of the Carriage—indexed from the depression of motor bar No. 103.

This mechanism also provides easier depression of the motor bars, and insures the correct indexing of the Carriage Return Mechanism from motor bar No. 101.

Operation

The Vertical Form Spacing Mechanism is indexed from the depression of motor bar No. 101A—when the same is held depressed during a portion of the forward stroke of the machine operation. The downward movement of the motor bar rocks lever BJ to lower stud AB into the pocket of cam AI. During the forward stroke of the machine operation, stud AB rocks cam AI to lower roll AG, which completes the indexing of the Vertical Form .

Spacing Mechanism (as explained in Plate 17). Arm AE, being rocked by roll AG, moves stud AK forward to limit the rearward motion of arm AJ, thus preventing the indexing of the Carriage Return Mechanism.

The Carriage Return Mechanism is indexed from depression—and immediate release—of motor bar No. 101A. The motor bar, being depressed, rocks lever BJ, lowering stud AB. As the motor bar is released, detent BP (by limiting against stud BO) prevents the complete restoration of motor bar No. 101A, lever BJ, and stud AB to thus retain the latter in line with the pocket of the projection in assembly AC. During the forward stroke of the machine operation, stud AB rocks assembly AC, and, through part AV and roller AM, rocks lever AJ rearward. The latter swings arm AQ rearward to index the Carriage Return Mechanism. During the return stroke of the machine operation, stud AB contacts the vertical projection in assembly AC, moving the latter rearward to its normal position.

Indexing of the Carriage Return Mechanism is prevented (when motor bar No. 101 is depressed) by a skid in the control bar lowering roller AN which swings stud AO forward to limit the rearward motion of arm AJ.

The Skip Tabulation Mechanism is indexed from motor bar No. 103K, the depression of which lowers roller R to rock lever S, which, through spring AY and lever AJ, swings arm AQ forward.

Adjustment

1. (a) When the machine is operated with motor bar No. 101A in its normal position, stud AB should clear over the projection in assembly AC.
   (b) Motor bar 101A, when depressed and immediately released, should align stud AB with the pocket of the projection in assembly AC.
   (c) With motor bar No. 101 depressed and held down, stud AB should locate in the pocket of cam AI.

   To adjust, raise or lower the rearward portion of lever BJ.

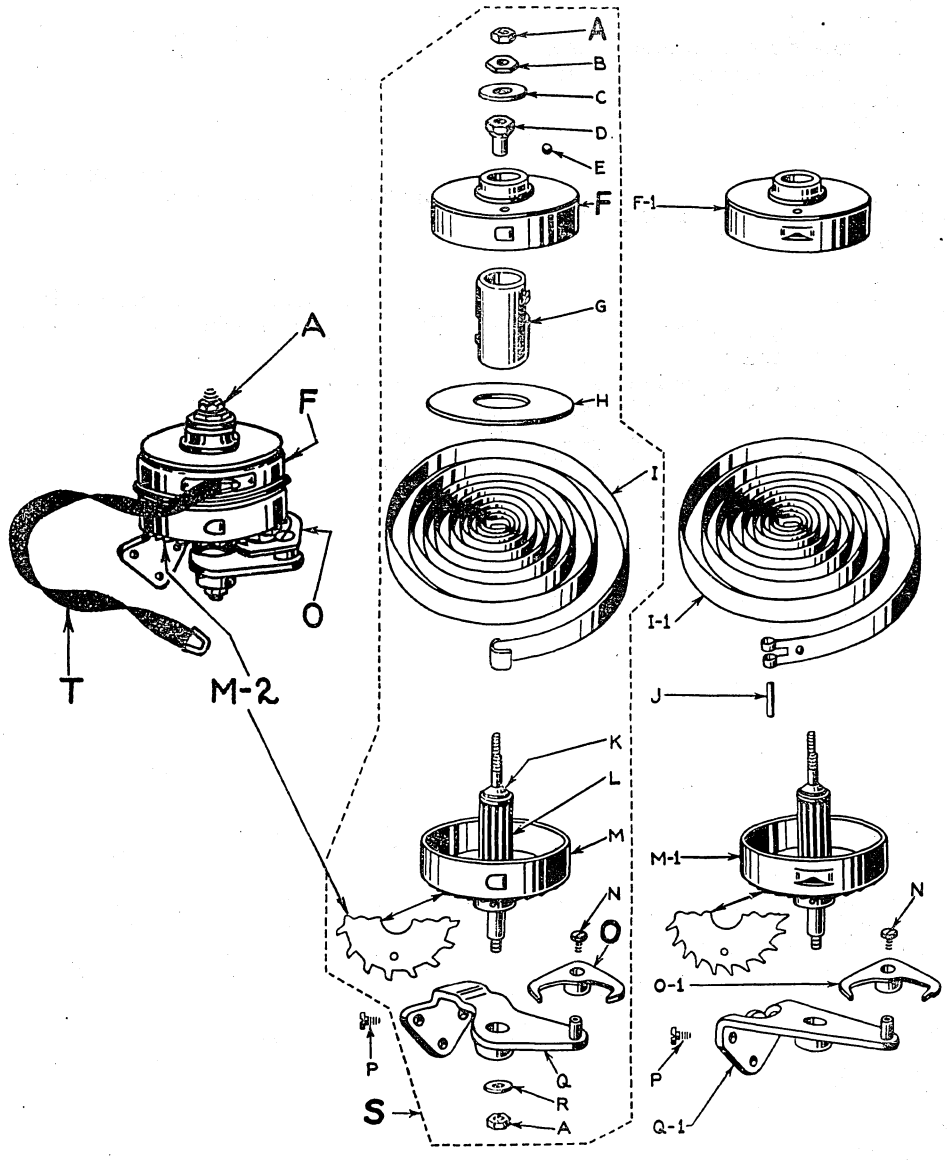
2. Arm AJ should move rearward and limit on stud AK when the Carriage Return Mechanism is being indexed through motor bar No. 101A.

To adjust, raise or lower the forward arm of part AV.

Mr M R Lovejoy
Buffalo N Y Branch 10-5

SPRING BARREL ASSEMBLY (Plate 19)

(Plate 18 in Symbol Book only)



Vertical Spacing from Upper and Lower Auxiliary Motor Bars (Plate 17)

The depression of the lower or either of the upper auxiliary motor bars locates power arm AR in the vertical slot of cam AE. During the machine operation, cam AE contacting on roller AO, lowers part AF which by riding in cam slot of part AG, pushes link AI and intermediate AK-1 to seat coupler AK into the slot of feed slide AJ.

The lower bar locates power arm AR through stem BJ, levers BL, BG and arm AY.

The uppermost arm locates power arm AR through stud AQ-1 in stem P contacting on arm AY.

The upper bar locates power arm AR through roller AQ-2 contacting on power arm AR.

When the carriage normal key is latched down, part AF is located and held downward which holds coupler AK in the slot of outer slide AJ.

Spring Barrel Assembly (Plate 19)

The purpose of the spring barrel assemblies is to actuate the cross-tabulating movement

of the carriage. The spring barrel assembly is fastened to the left side of the back plate and is connected to the right end of the carriage by tape T.

Core G revolves around pin assembly L, in the late styles, in the earlier styles the core revolved around the shaft. Pin assembly L reduces friction and binding and enables the spring barrel assembly to operate more efficiently.

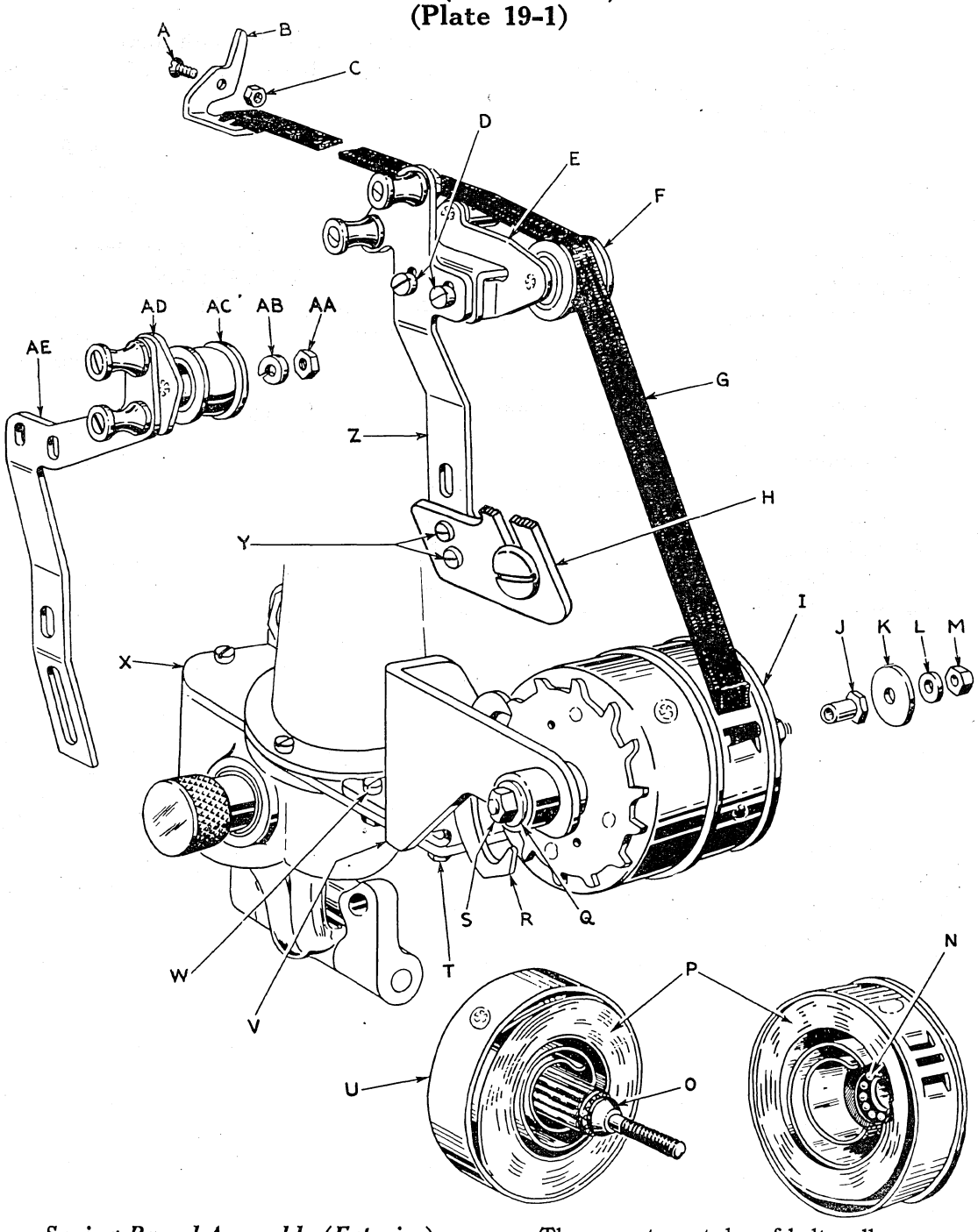
Core G serves as an anchor to which the two clock springs are attached, to give the same action as a single spring.

When the carriage moves, upper half F revolves as a drum, winding tape T as the carriage tabulates and unwinding when the carriage is returned. Lower half M remains stationary and as one end of spring I is anchored to M and the other end of spring I is anchored to upper half F, the winding of springs I places a tension on the carriage which creates the tabulating movement when lift pawl releases one of the stop dogs on the carriage stop bar.

Ratchet M-1 is integral with lower drum M and held by escapement arm O. The purpose of M-2 and O is to permit reducing the tension of spring I. The tension of spring I is increased by turning nut A. In the earlier styles, a twirler was used which has been replaced by nut A. Minimum tension is the most practical. When the carriage is in extreme right position, the tape should have sufficient slack to allow the tape to be pulled about an inch beyond the carriage casting. Exceptions are when the carriage load is unusually heavy, the slack can be reduced to minimum.

Note: Spring I is anchored to a lug on drum M, whereas the earlier spring I-1 is anchored to drum M-1 with pin J.

SPRING BARREL ASSEMBLY (EXTERIOR) CLASSES 20 THRU 30 (Plate 19-1)



Spring Barrel Assembly (Exterior) (Plate 19-1)

The advantages of the exterior spring barrel assembly are: Accessibility for adjusting, and no interference on the inside of the machine.

Bracket V of the spring barrel assembly is fastened to the lower MRC gear housing.

There are two styles of belt pulley assemblies, Style No. 1 (AE) having a single pulley for maximum travel to the last carriage position.

Style No. 2 (Z) is used when maximum travel to the first carriage position is required. Style No. 2 has an additional guide pulley to hold the belt to clear the top of the MRC unit.

Carriage Stop Dogs (Plate 20)

No. 1 vertical feed and tabulator stop, A.C.T. carriage.

No. 2 tabulator stop A.C.T.C.

No. 3 release stop A.C.T.C.

No. 4 resetting stop A.C.T.C.

No. 5 old style stop dog A.C.T.C. to hold carriage in stationary position.

No. 5 stationary stop for hand shift carriages.

No. 6 tabulating stop S.A.C.T.

No. 6 floating stop.

No. 7 stationary stop.

No. 10 limits stop bar against stop block S.A.C.T. not M.R.C.

No. 12 vertical feed, tabulate from total keys.

No. 13 tabulate and vertical feed.

No. 14 spacing stroke stop vertical feed and tabulation from total keys.

No. 14 floating stop.

No. 15 tally roll pickup.

No. 16 combination 6 and 14 floating stops.

No. 17 No. 6 stop with short offset used against carriage side plate.

No. 18 No. 14 stop with short offset.

No. 19 combination 6 and 12 floating stops.

No. 20 combinations 6 and 13 floating stops.

No. 21 combination 12 and 14 floating stops.

No. 22 combination 13 and 14 floating stops.

No. 23 double 14 and 14 floating stops.

No. 24 double 6 and 6 floating stops.

No. 25 No. 6 tally roll pickup stop.

No. 26 No. 13 stop with long offset.

No. 27 combination 6 and 14 stops with long offset.

No. 28 No. 6 stop with long offset.

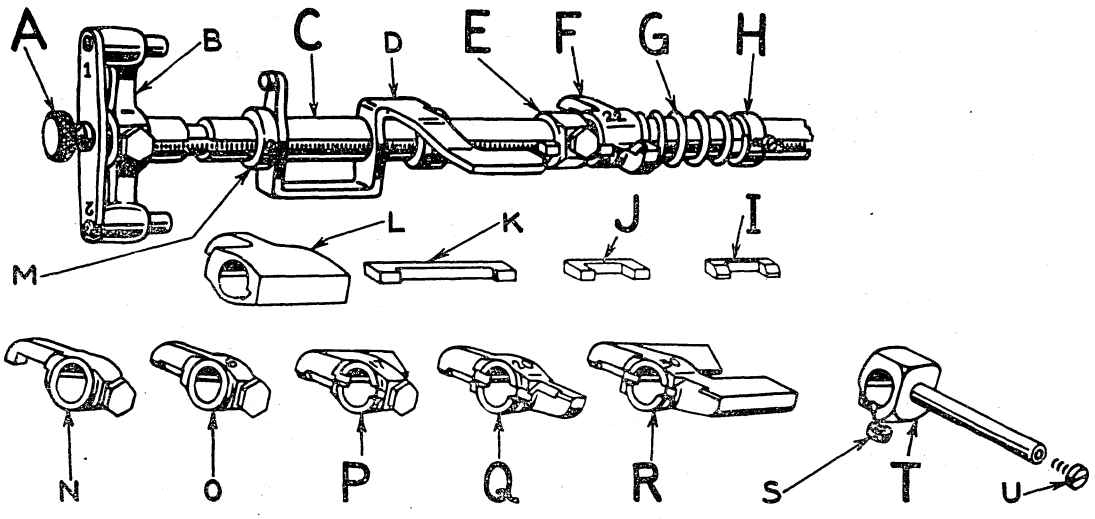
No. 29 No. 14 stop with long offset.

No. 30 floating double No. 13 stops having long offset.

No. 31 combination floating 13 and 14 stops with long offsets.

No. 32 floating double No. 6 stops having long offset. (1-901 Fte. 137) skip block release stop.

CARRIAGE STOP DOGS (Plate 20)



Floating Stops (Plate 20)

The purpose of floating stops is to permit the operator to eliminate carriage positions when single stops are used and to change to another style stop when double or combination stops are used.

Floating stops F are anchored to the stop bar by slots in the stop engaging non-slip key J in collar E. Floating stops F are held against collar E by spring G which is held under tension by set collar H, the latter is held to stop bar by non-slip key J having one corner removed. To change position of floating stop F the latter is pulled sidewise to disengage it from non-slip key J, given half turn and released, which permits spring G to engage the stop with J in E.

Offset Stops

Offset stops R are used when the carriage sideplate prevents locating the stop for required carriage positions.

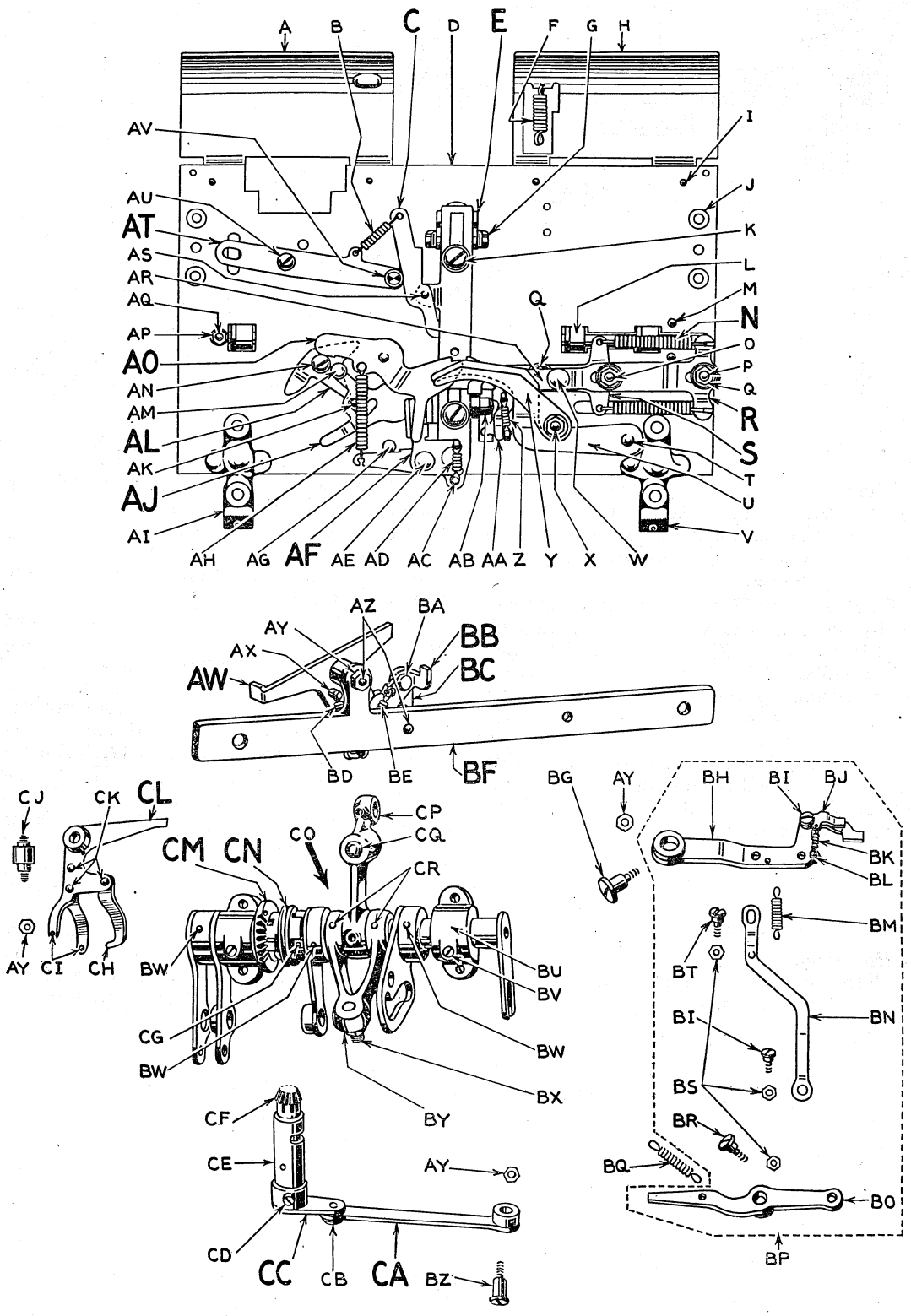
Rotating Stop Bars

The purpose of rotating stop bars C is to secure different styles of stops in common carriage positions by using double ended combination stops Q. Rotating stop bars C also permit the elimination of stops in certain carriage positions, using single stops P. Knurled knob A is withdrawn and the stop bar assembly C given a half turn which locates the opposite stop or no stop in active position.

Floating stops and stops on rotating stop bars are limited to No. 6 and No. 14 and combinations of No. 6 and No. 12, No. 6 and No. 13, No. 14 and No. 12 and No. 14 and No. 13. No. 12 and No. 13 double stops can not be used on account of these longer stops not clearing the control hangers. Control hangers T have stock removed to clear No. 6 and No. 13 stops, also non-slip key I is angled to conform to the angle of control hanger.

Stops F and collars E used on rotating stop bars have stock removed on the hub and have smaller hexagon screws to clear the stop block when the stop bar is rotated.

AUTOMATIC CROSS-TABULATING CARRIAGE MECHANISM
(Plate 21)



Automatic Cross-Tabulating Carriage Mechanism (Plate 21)

This mechanism tabulates the carriage from column to column similar to the shuttle carriage mechanism and is returned to first position by the barrel spring assembly.

The carriage normal key, when depressed, disables the tabulating movement and couples the feed slides to feed the paper. Depressing normal key swings part CL which disengages clutch members CM and CN to stop tabulation. The depression of the normal key also rocks lever AT which swings coupler C into the path of inner feed slide E to actuate the paper feed mechanism.

Tabulating Movement

Carriage normal key released to disconnect the feed slides and engage clutch members CM and CN.

Carriage on first stop, machine operation slide bar BF is carried to the right by the semi-circular movement of crank assembly CC and CA, operating dog AW engages the next stop. On the return stroke the carriage is moved to the left a distance equal to the length of crank CC, if the stops have been set up accordingly. The same operations are repeated until the stop next to the last, on the right-hand end of the carriage is reached.

The first or left-hand stop is No. 4. The intermediate stops are No. 2. The next to the last stop is No. 1 and the last right-hand stop is No. 3. When the carriage comes to rest on stop No. 1, cam AO is permitted to rise a trifle higher than with the other stops, which allows lower coupler AF to move into the path of inner feed slide E to couple the feed slides to actuate the paper feed mechanism. Stop No. 1 determines the last printing position.

During the forward stroke, carriage on stop No. 1, operating dog AW contacts on the beveled extension on the underside of the last stop (No. 3). AW trips down and is latched in that position so that it cannot engage with any other stop on the return stroke. Instead a wing on the right end of AW engages with cam AL on the back plate, swings it over, depresses the point of the right-hand cam AJ and permits the carriage to be drawn over to the right by means of the spring barrel assembly which the left-hand travel of the carriage has put under tension.

Movement of the carriage beyond the first stop (No. 4) is arrested by an elongation on this stop, which engages block S, the end of which is directly behind right-hand cam AO. Block S also serves as a buffer to take up any shock due to the rapid return of the carriage.

To restore tripped operating dog AW, an extension on the underside of the first stop contacts with lever BB on slide bar BF, throws over latch BC and releases AW which immediately takes its normal position as well as cams AL and AJ.

Tests and Adjustments

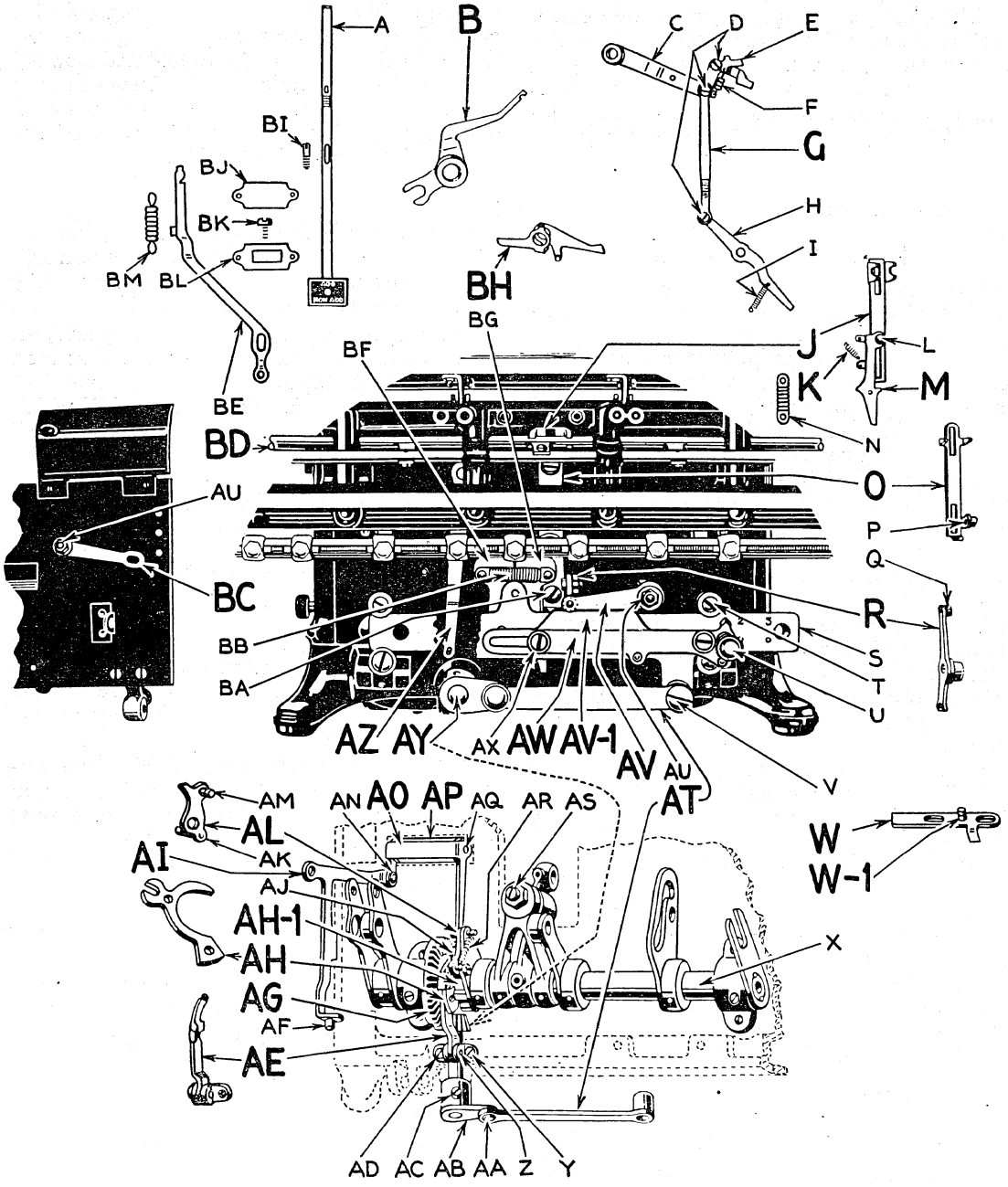
No. 2 stop dog must clear R.

No. 4 stop dog must clear AR when the carriage is moved by hand.

The tail of AO should rest against AF when the carriage is held in position by stop No. 1. When AO is depressed by stop No. 2, AF must clear slide E by 1/32″. Feed lever R (Plate 15) must have slight play at the end of the stroke.

AJ must be perfectly free when the carriage is in feed position. Stops No. 2 and No. 1 must clear end of S. Stop No. 4 must clear springs N.

SHUTTLE CARRIAGE MECHANISM (Plate 22)



Shuttle Carriage Mechanism (Plate 22)

When the carriage normal key is released part AI is carried upward rocking assembly AP. The stud in bail AO being engaged in the fork of AH carries the latter away from the lip of AE.

With the operation of the machine on the forward stroke the roll on AL travels over the lip of AE and drops, allowing the point of AL to engage one of the pockets of AH-1. On the return stroke the roll on AL engages and raises AE releasing AH-1.

Part AL actuates part AH-1, gear AG moving the carriage through AY and AT.

In coupling slides J and O and disabling the main (100) section, the depression of the carriage normal key depresses AI which moves the wide cam of AH behind the lip of AE so that when the machine is operated, pawl AL will not engage with the pockets of AH-1, due to cam AH preventing pawl AL from dropping under the lip of AE and from engaging AG resulting in no shifting of the carriage.

When AI is being depressed, the vertical feeding mechanism is also being actuated. The stud in AI contacts with arm BC which operates AZ. The stud in AZ contacts on the end of slide W, the lip on W moves out of the path of coupler M. Spring K pulls coupler M to seat under the beveled foot on the lower end of inner slide O. When these slides are coupled, both operate with each stroke of the handle, causing the paper to feed.

Tests and Adjustments

With the carriage in non-add position, roller on AV must clear the highest point on cam AV-1.

Adjustment: The offset in link G is adjusted.

When arm AV is in add position, there should be clearance between the stud in BH and assembly G. When the carriage is in right-hand position, carriage normal key latched down, coupler M should limit on the screw in the back plate. Feed arm R should have slight play at each stroke with carriage in both positions.

Shuttle Carriage Paper Feed Mechanism

Machines with shuttle carriages have a double feed slide similar to semi-automatic carriage machines. With the carriage normal key latched down, inner feed slide O is coupled to outer feed slide J by coupler M. Coupler M is spring actuated and has a step which swings under the beveled foot of inner slide O. The inner slide being actuated by the machine operation carries the outer slide downward, thereby spacing the platen through bail and shaft assembly.

When the carriage normal key is raised, with the carriage in right-hand position the vertical arm of disabling bell-crank AZ swings over to the right, slide W is pulled by spring (attached to stud W-1) to follow. Coupler M is drawn over to clear inner slide O.

During the machine operation inner slide O idles, feed bail and shaft assembly BD remain stationary because the top of inner slide O is below the feed bail, the latter is held upward by spring N on bail assembly BD.

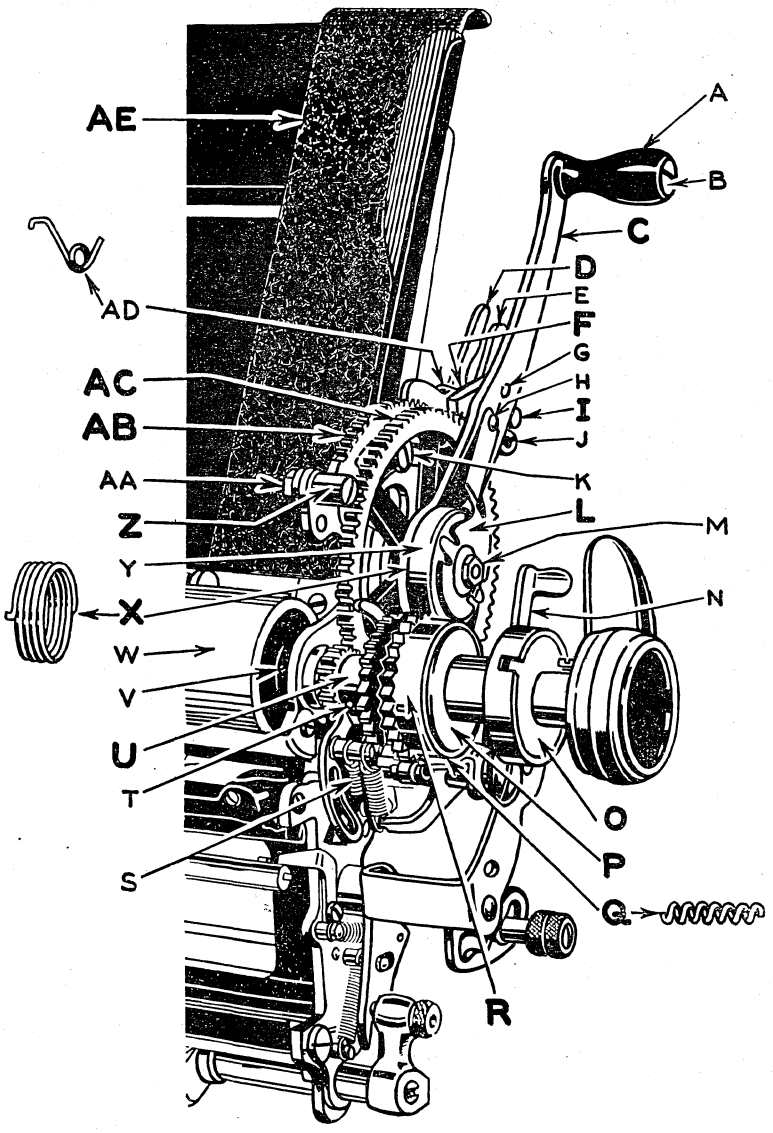
On the completion of the carriage toward the left, coupler M swings under the beveled foot of inner slide O. During the next machine operation both feed slides are brought down together and as the carriage comes to rest coupler M is kicked out by the lug on slide. The result is that two items have been printed side by side, i. e., on the same line: The carriage has returned to its original position and the paper spaced up one notch under the previous item ready for the next item.

Shuttle Carriage Non-Add Control

One of the two shuttling positions non-adds the item. The right and left non-add positions are selected by shifting cam AV-1 to position one or three. When cam AV-1 is shifted to position two both positions non-add.

When arm AV is on the decline of cam AV-1 the amount is added. When the carriage shuttles to the opposite position, arm AV is raised by locating on the high portion of cam AV-1 which causes assembly G through part B to disable the accumulating control (821).

INJECTOR AND EJECTOR DEVICE (Plate 23)



Injector and Ejector Device (Plate 23)

This device is used on non-opening carriages of Classes 6 and 11 to 16 machines to permit more rapid handling of forms.

The forms are dropped between guides AE and handle pulled to locate the form to printing position. The distance that the form moves around the platen to printing position is controlled by setting lever D into the teeth of AB which limits the movement of lever C between stud I and stud Z.

As lever C starts to inject the form to printing position, the tension of flat spring L rocks pawl F in mesh with gear AC. Stud Z limits the forward stroke of lever C.

When lever C is returned to normal by spring X, pawl F is released and held out of the teeth of gear by the tension of flat spring L. When lever C is operated gear AC revolves the platen through pinion U which is fastened to the platen shaft. As the platen revolves, the form is drawn between the feed roll and the platen and fed to printing position.

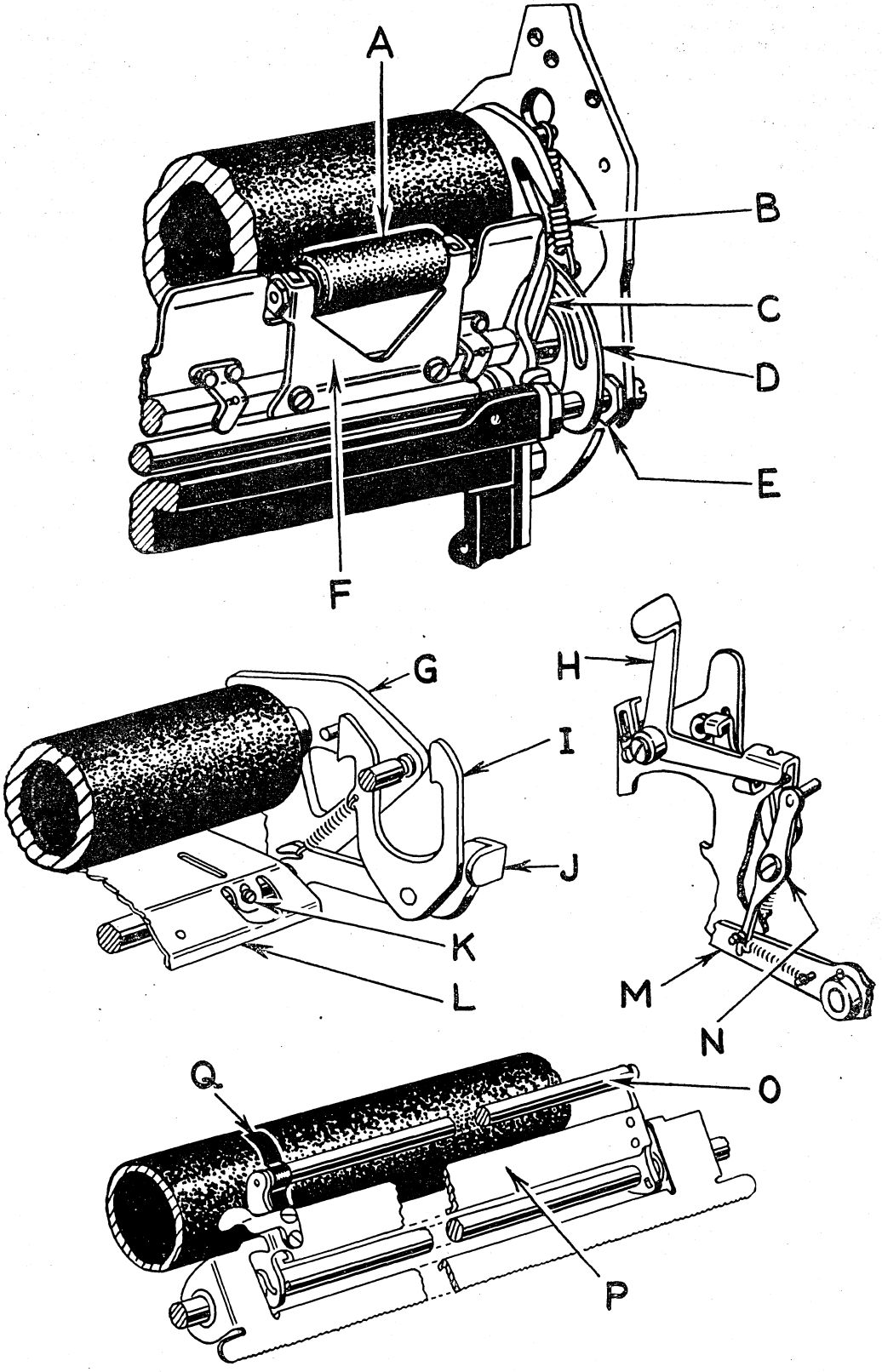
Variable Line Space Device

The variable line space device permits adjusting forms to the exact printing line by holding clutch member P outward and turning the platen twirler. Clutch member P has a milled convex surface which engages the milled concave surface of clutch member R, through the tension of spring Q.

Clutch member R carries the ratchet and detent wheel assembly which is free on the platen shaft, when clutch member P is held outward, the latter slides on the platen shaft and is held to it by key plate O.

TYPE 20 CARRIAGE (Plate 28)

(Plates 24 thru 27 in Symbol Book only)



Type 20 Carriage (Plate 28)

Type 20 carriages are automatically and manually controlled to open, i. e., the ledger shield and pressure rolls move forward and the platen assembly swings rearward, which provides an opening between the platen and pressure rolls for rapid and easy insertion and removal of ledger sheets.

When the carriage is opened by hand, it is latched by part N swinging over the square stud in part M.

The carriage is released to close by bell-crank H which swings part N off the square stud in M.

Carriage opening on forward tabulation and also from carriage return are covered under their own headings.

The printing line is found when the carriage is open with the visible aligning bail and also with the glass and reflector and light assembly.

The journal sheets are held around the platen by shield L against the bottom of the platen and also by long steel pressure roll O on the top of the platen.

To insert the journal sheet (carriage open) shield L is swung from and locked by moving lever J to swing latch I over the stud in G. Pressure roll O is raised and locked by moving P sidewise.

Tests and Adjustments

Even contact of shield L on the platen is essential to correct spacing.

The tension is tested by inserting a piece of paper in each end and in center and judging the tension by pulling the paper. The contact of shield L on the platen is increased or decreased by loosening screws K and shifting shield L in the slots.

Printing line indicator Q is carried by bail P for finding the printing line on journal sheets.

Feed Roll and Feed Roll Release Mechanism

When the carriage is being opened, the stud in arm C limits in the upper slot end of link D, holding the feed roll assembly while the platen swings rearward.

This mechanism produces more space between the feed rolls and the platen and with quicker action than the previous style of mechanism.

Eccentric E

The purpose of eccentric E is to insure that the platen will locate in the correct normal position and not limit by arm C in link D.

When the platen is in printing position, link D should have slight play. Eccentric E is turned.

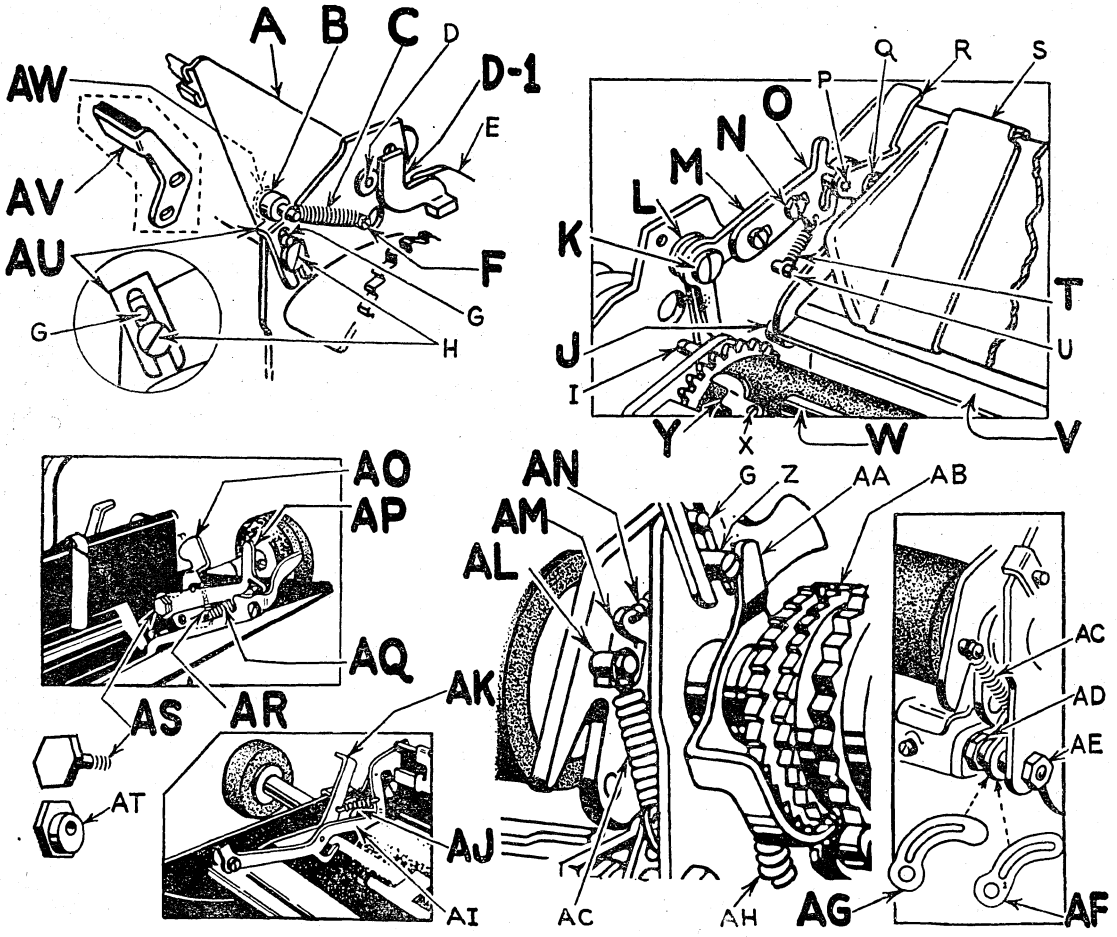
Feed Rolls A

To secure even tension of feed rolls A, a bender is applied to part F and the latter bent to or from the platen.

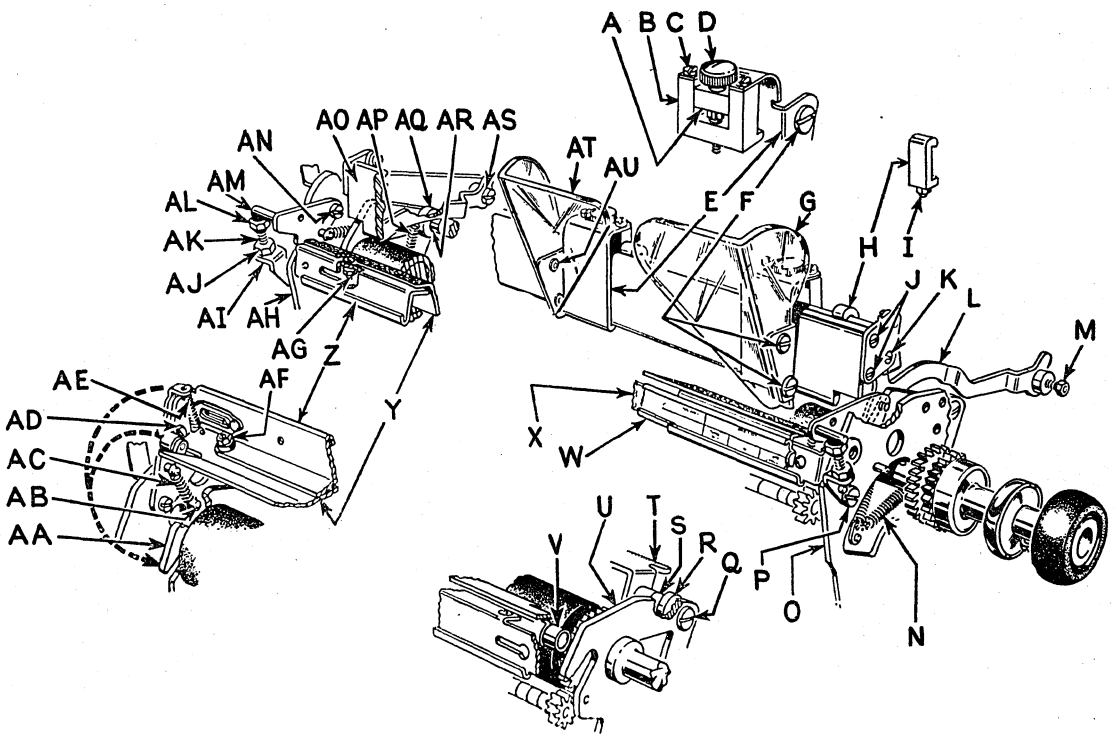
Platens

Type 20 platens have a double layer of rubber which reduces the printing sound and also permits more carbon copies to be made. The standard platen produces five carbon copies. A nine carbon platen is also provided. The standard platen of Classes 11 to 16 carriages has a single layer of rubber and produces two carbon copies.

VISIBLE ALIGNING BAIL (Plate 29)



VISIBLE ALIGNING BAIL—IMPROVED BANK POSTING MACHINE SERIES H MACHINES (Plate 29-1)



Visible Aligning Bail—Improved Bank Posting Machine Series H Machines (Plate 29-1)

Purpose

This mechanism provides faster insertion and alignment of forms.

Operation

Line finder Y, under tension of springs AE, is flexibly mounted on bail Z by screws AD. Bail Z, which pivots on screws AN, is limited by screws AK in carriage open position, and is raised to clear the printing line by rolls V riding on the cam surfaces of inner carriage side plates U and AA when the carriage closes.

The forms are inserted through guides AT and G and are aligned by setting the bottom of the previous posting directly in line with the top surface of line finder Y.

Adjustment

1. Bail assembly Z should be set for 1/6″ spacing of the forms.

To adjust, loosen lock nuts AJ and raise or lower limits AL.

Note: When limits AL are set for 1/6″ spacing, the ends of screws AK should protrude about 1/32″ through brackets AI. Studs AM should be square on limits AL.

2. Line finder Y should hold the form against the platen with sufficient pressure to prevent slippage.

To adjust, loosen lock nuts AF and turn limit screws AG to swing the line finder toward or away from the platen.

Note: Use a wrench, kit 19⅝A (F, Plate 3, Tool Equipment List) as a feeler gauge; insert it between the platen and the wide portion of line finder Y.

3. The forward ends of the form chutes and the guides, which rest on a shaft in the carriage, should seat squarely and have a slight bearing on the flat surface of the shaft with the carriage closed.

To adjust, bend the forward end of the from chute or the guide.

4. To align the form chute, insert the proper form, squaring the ruled line at the top of the form with aligning bail Y; align the left and right form chutes for an even amount of clearance along the entire length of the form.

5. With the forms inserted well into the form chute, there should be a minimum clearance between the outer edges of the form and the plastic guides AT and G.

To adjust, loosen screw D and move guides AT or G.

6. Plastic guides AT and G should be set in the highest point of the slot in bracket E.

To adjust, loosen screws F and raise guides AT and G.

7. The lower edge of the aligning table should be set toward the front of the machine.

To adjust, loosen screws K and swing the lower edge of the table forward.

Mr M R Lovejoy
Buffalo N Y Branch 10-5

Visible Aligning Bail (Plate 29)

The purpose of aligning bail V is to provide visible alignment when a form is inserted with the carriage open.

The formed handle of aligning bail V is depressed which swings bail V to contact on the form and to hold it against the lower aligning table.

The printing line is indicated by the edge of bail V to which position the desired printing line on the form is shifted.

When aligning bail V is raised, it is latched by latch assembly M and O on the stud in aligning bail V. When the carriage closes, spring stud AL contacts on the foot of latch member M, swinging it to release and allow aligning bail V to drop to normal position. Latch assembly consists of members M and O held by screws N. Latch member O is slotted to permit latching adjustment.

Instructions for Installing the New Latching Mechanism

Remove and discard parts AS, AO, AP, AQ, AR, AJ and AK. Also, remove stud of spring for AO. Some carriages have a spring stud above the spring stud for spring T; this upper stud also is removed. The only stud remaining is the one used for spring T. Latch AK is not required with the new latching mechanism. The new latch assembly swings on bushing L.

The new latch assemblies are made in two styles; one style for 20 30 00 carriages and the other style for Fte. 213 carriages. These carriages can be readily identified by links AG and AF. Link AF is found in 20 30 00 carriages and link AG is found in Fte. 213 carriages. When the new latch assemblies have been installed, the following tests and adjustments should be made.

Tests and Adjustments

As a basic point to start from, set limits AU to have $\frac{1}{16}''$ clearance between top of slot and side plate as shown. Before adjusting the aligning bail for 1/6″ spacing, it is well to make sure that the pressure rolls are contacting on the platen when the aligning bail is released so that the ledger sheet will not be loose on the platen.

Test: Hold carriage open, latch aligning bail V, allow carriage to close slowly, pressure rolls should contact on platen. When bail V does release before the pressure rolls contact the platen, the foot of member M is bent.

Check alignment of aligning bail V for 1/6″ spacing with printed item. To adjust, loosen screws N and move member O as required. The release of aligning bail V is again tested and if necessary, adjusted as has been explained. Also, check thumbpiece Y to clear aligning table A when the carriage is partially closed, manually with aligning bail V latched. Thumbpiece Y should be no higher than steel pressure roll W. If necessary, bend Y downward.

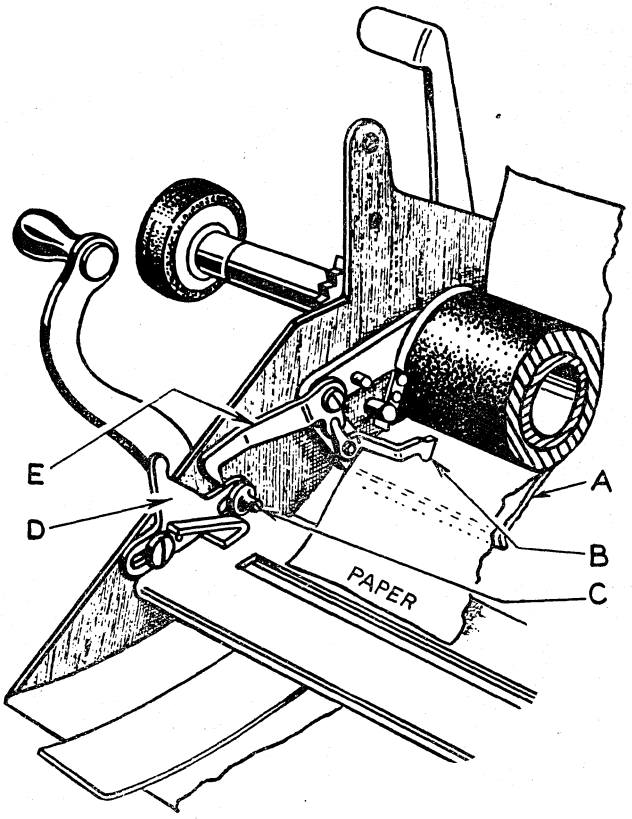
Previous to the adoption of limits AU, limits AV were used. This part is the basic point to start from, similar to limit AU. In some cases where carriages are used for heavy forms, spring C may be required. To install spring C, the present limit stud for aligning table A is removed and in its place stud B is riveted, using washer AW next to the aligning table to rivet against. Center punch spot for stud F, same measurements as the spring stud on the opposite side of the side plate, use 37 drill and $\frac{1}{8}$ by 44 tap. Remove ear of D-1, as shown.

Machines having triple spacing mechanism must have the stud for spring AN removed and spring anchor AM installed in its place.

Spring anchor AM hooks on the underside of stud AL, also a space washer is placed between bushing L and latch member M. Screw K is special, being longer.

Machines having pressure roll opening mechanism must have large roller J installed in place of the standard roller.

JOURNAL SHEET LOCK (Plate 30)



Journal Sheet Lock (Plate 30)

When the journal sheet feeds to within about two inches from the bottom and the carriage is automatically opened, it is locked in that position, warning the operator. The operator releases the lock by pulling carriage opening lever with index finger and release lever with thumb and pushing release slide D forward, and sub-totals all registers. When the new sheets have been inserted, release slide D is moved rearward.

Sequence and Construction

When the bottom of the journal sheet feeds past the slot in shield A, part B drops into the slot, which permits hook E to fall over the shoulder of screw C, which prevents the carriage being closed. When release slide D is moved forward, hook E is cammed above screw C.

Split and Normal Platen Assembly (Plate 31)

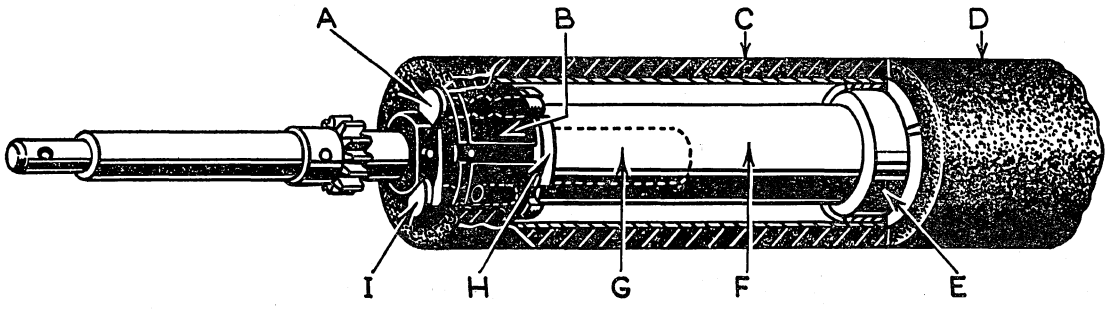
The purpose of the split and normal platen is to permit spacing one of two forms and non-spacing the other or spacing both forms.

The split and normal platen assembly consists of two members, D and C, which revolve independently or together through a clutch connection.

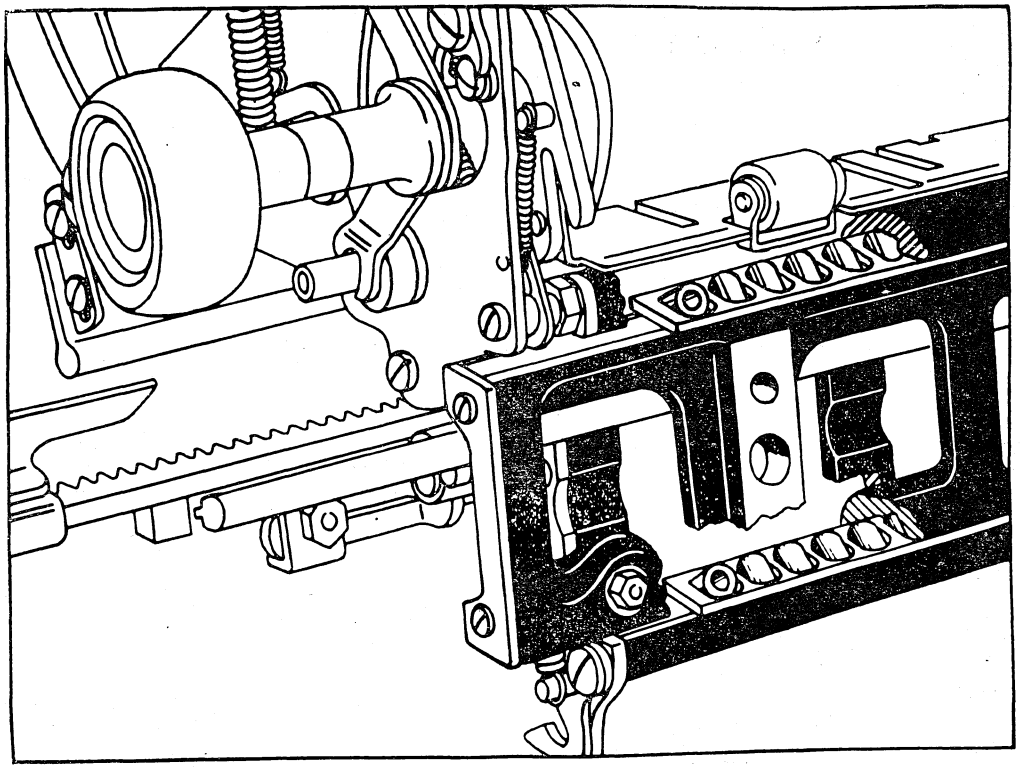
One member D usually the long platen, has a full length core F with four slot disk H and bearing for short shaft G of the other member C. The clutch carried by the other member consists of plunger B having two opposite button ends A and I; when button I is pushed in, the plunger seats in one of the slots of H which couples the two platen members. When button A is pushed in, the plunger emerges from the slot in disk H which allows the platen members to turn independently. Platen member C, which carries the clutch, has short shaft G which turns in bearing of H in core F, the core end of member C turns on bearing E on core F.

The illustration shows a platen assembly for Classes 11 to 16 carriages. The split and normal platens for Type 20 carriages have the same construction, however the rubber is of the cushion style, i. e., double layers.

SPLIT AND NORMAL PLATEN ASSEMBLY (CLASSES 11-16) (Plate 31)



RACEWAY BEARINGS (Plate 32)



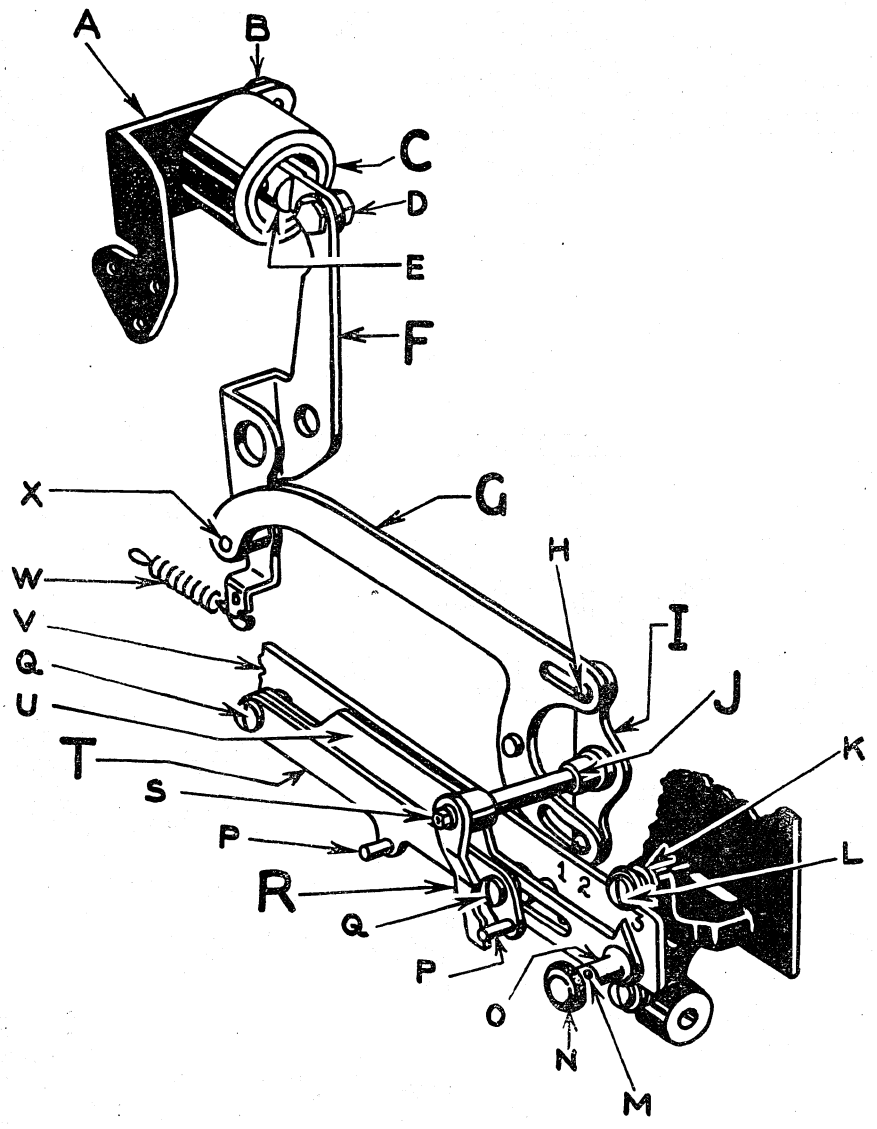
Raceway Bearings (Plate 32)

Twenty-four bearings are used in all carriages 12″, 15″, 18″ and 24″. Bearings are supplied in three diameters .264″, .265″ and .266″.

Bearings are placed in raceways in Classes 20 to 30 as shown, the extreme end bearing being inclined forward, the balance being inclined rearward.

Bearings in Classes 1 to 6 and 11 to 16 are staggered, each bearing being inclined in opposite direction.

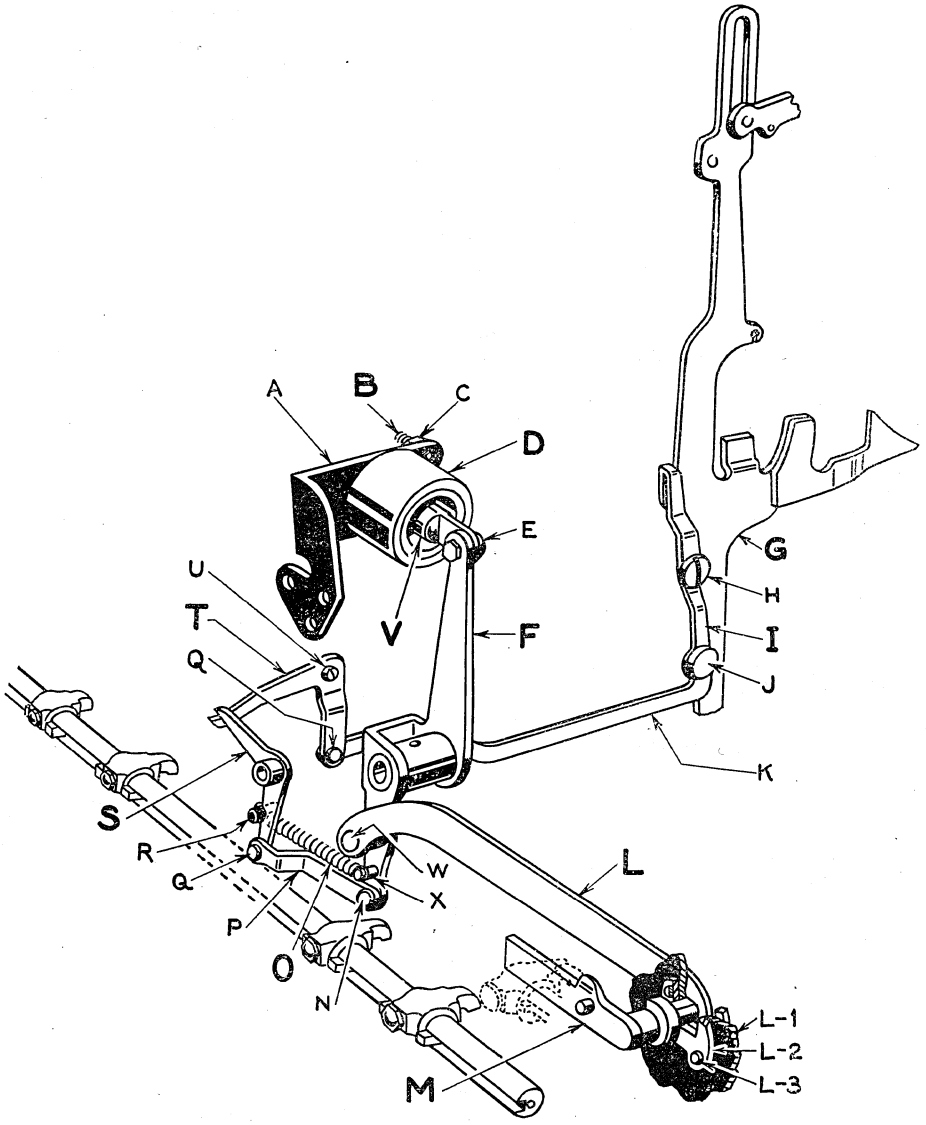
AIR CUSHION FOR SHUTTLE CARRIAGE (Plate 33)



Air Cushion for Shuttle Carriage (Plate 33)

When the carriage is shuttling, one of the studs in bar T rocks arm R on the rear end of shaft J. Arm I on the front end of shaft J carries two studs which alternately contact in the ends of the slots of part G. The movement of part G rocks lever F which operates the plunger in dashpot C. A small hole in the bottom of the dashpot allows the air to escape slowly which absorbs the shock of the carriage coming to a stop. The air outlet is governed by a screw in front of the hole. The air resistance is increased or decreased by turning the screw toward or from the hole. All parts must move freely.

AIR CUSHION ASSEMBLY ON INSIDE OF BACK PLATE (Plate 34)



Air Cushion Assembly on Inside of Back Plate (Plate 34)

The purpose of the air cushion assembly is to absorb the shock when the carriage limits on the stop block and also to prevent machine operations while the carriage is in motion before limiting on the stop block.

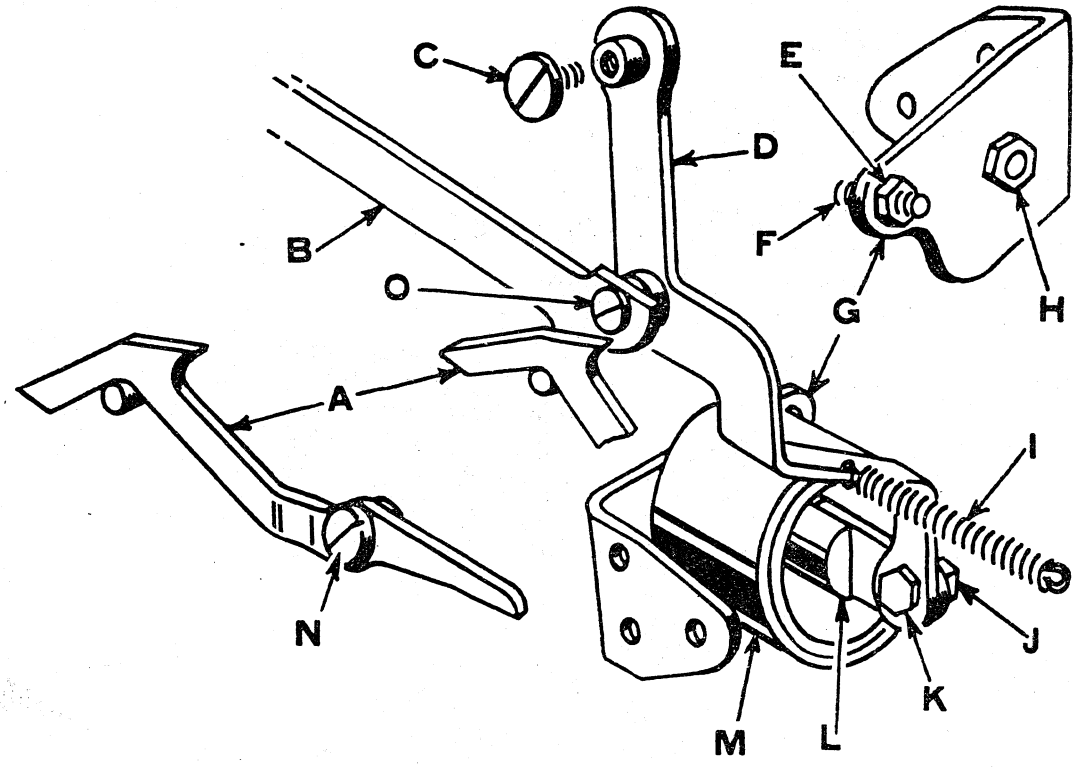
Stop block M which is connected to lever F by link L to lever F. The upper arm of lever F connects to plunger V. When the carriage limits on stop block M plunger V is driven into dashpot D, the air resistance absorbing the shock. The air escapes slowly through the vent. When the carriage tabulates to the next position spring O acting on lever F pulls plunger V outward before the carriage limits on the next stop. Quietness of operation depends on the correct rate of air leakage which is controlled by vent screw B.

When the carriage moves off stop block M the movement of lever F through link and bell-crank assemblies T and S swing detent I over the step of drive control G thereby delaying drive release until the carriage limits on stop block M, the movement of F swinging detent I out of the path of G.

Air cushion stop blocks are now provided with a direct limit instead of limiting in the slot of the back plate which prevents breakage of stop blocks.

As shown on Plate 13, two styles of limits are used, L for standard stop blocks and P for skip stop blocks Q. Parts L and P are fastened to the back plate by screw K and stud assembly M, N and O.

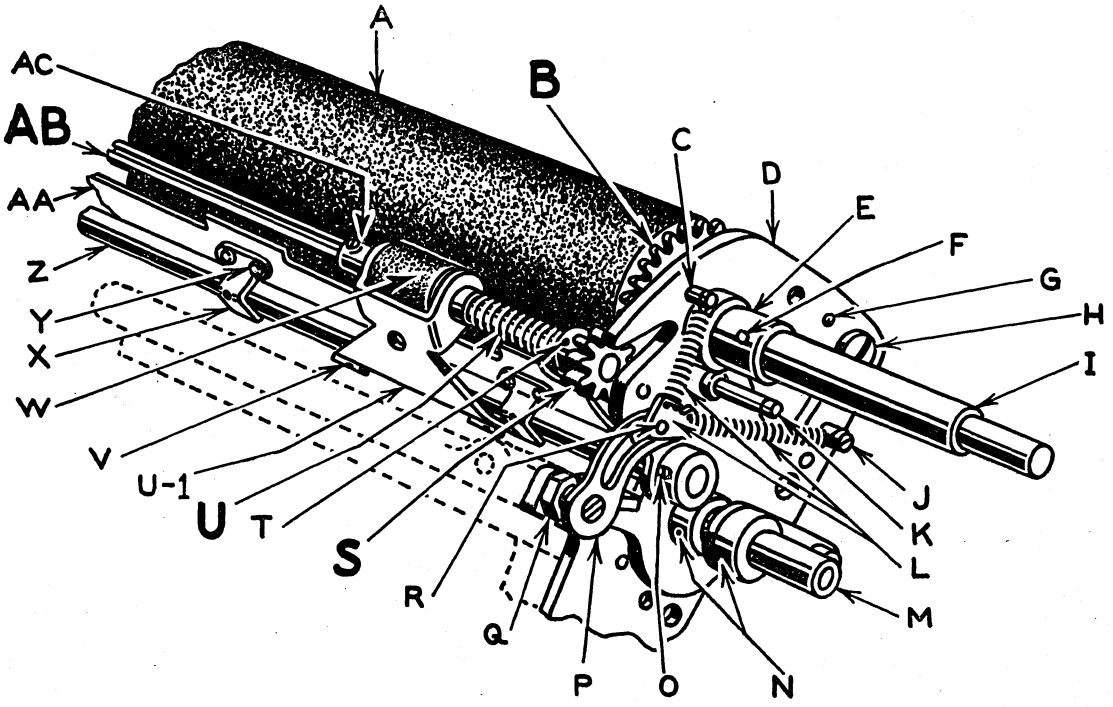
AIR CUSHION ASSEMBLY ON OUTSIDE OF BACK PLATE (Plate 35)



Air Cushion Assembly on Outside of Back Plate (Plate 35)

This mechanism is used in all machines having Rotary Consecutive Numbering Device, Safeguard Symbol Printing mechanism or other mechanisms which occupy the space required for the standard air cushion assembly.

GEARED PRESSURE ROLLS (Plate 36)

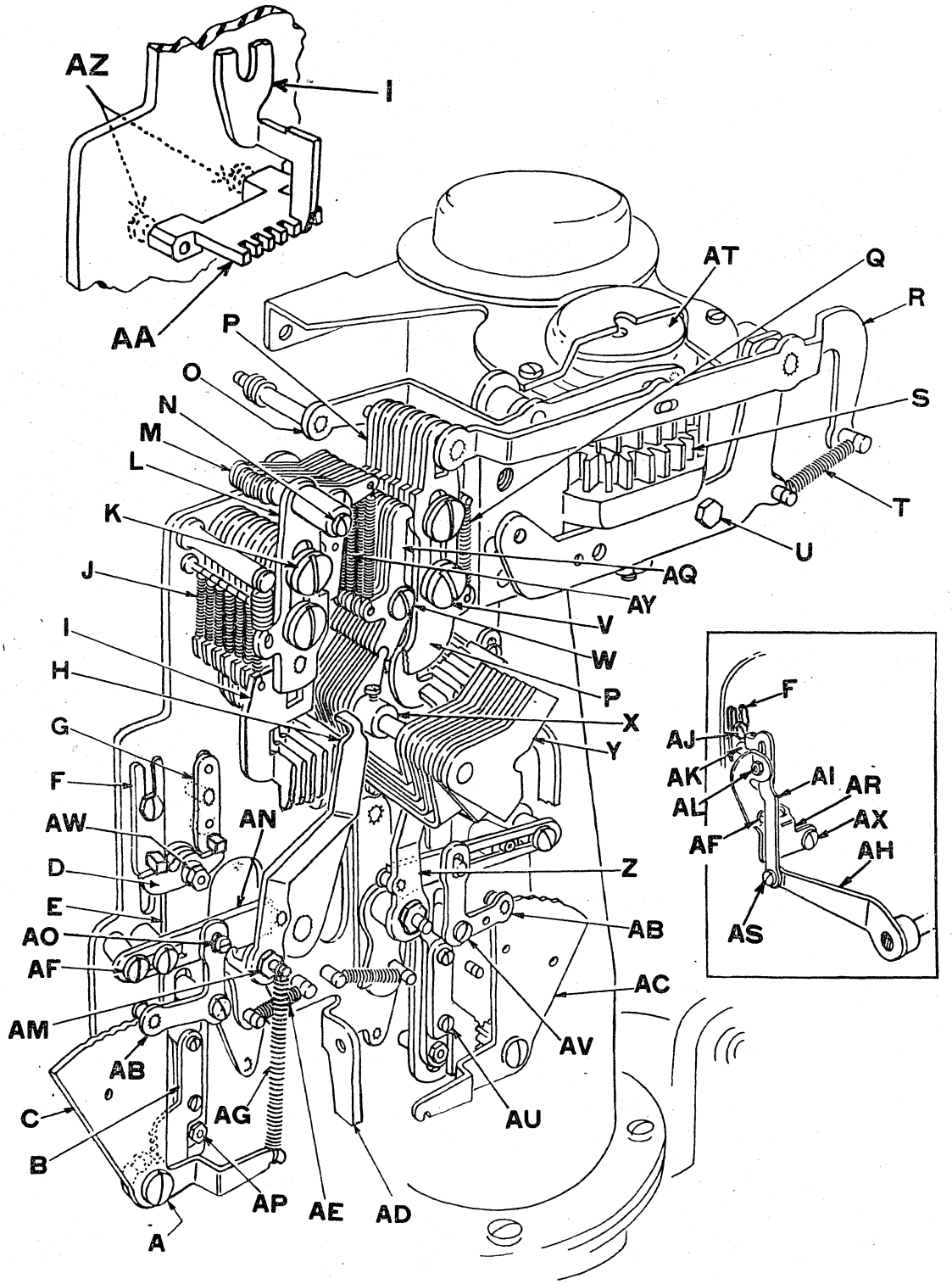


Geared Pressure Rolls (Plate 36)

The purpose of geared pressure rolls is to cause the contact surfaces of the platen and of the pressure rolls to rotate equally which prevents slipping of the forms to insure correct spacing.

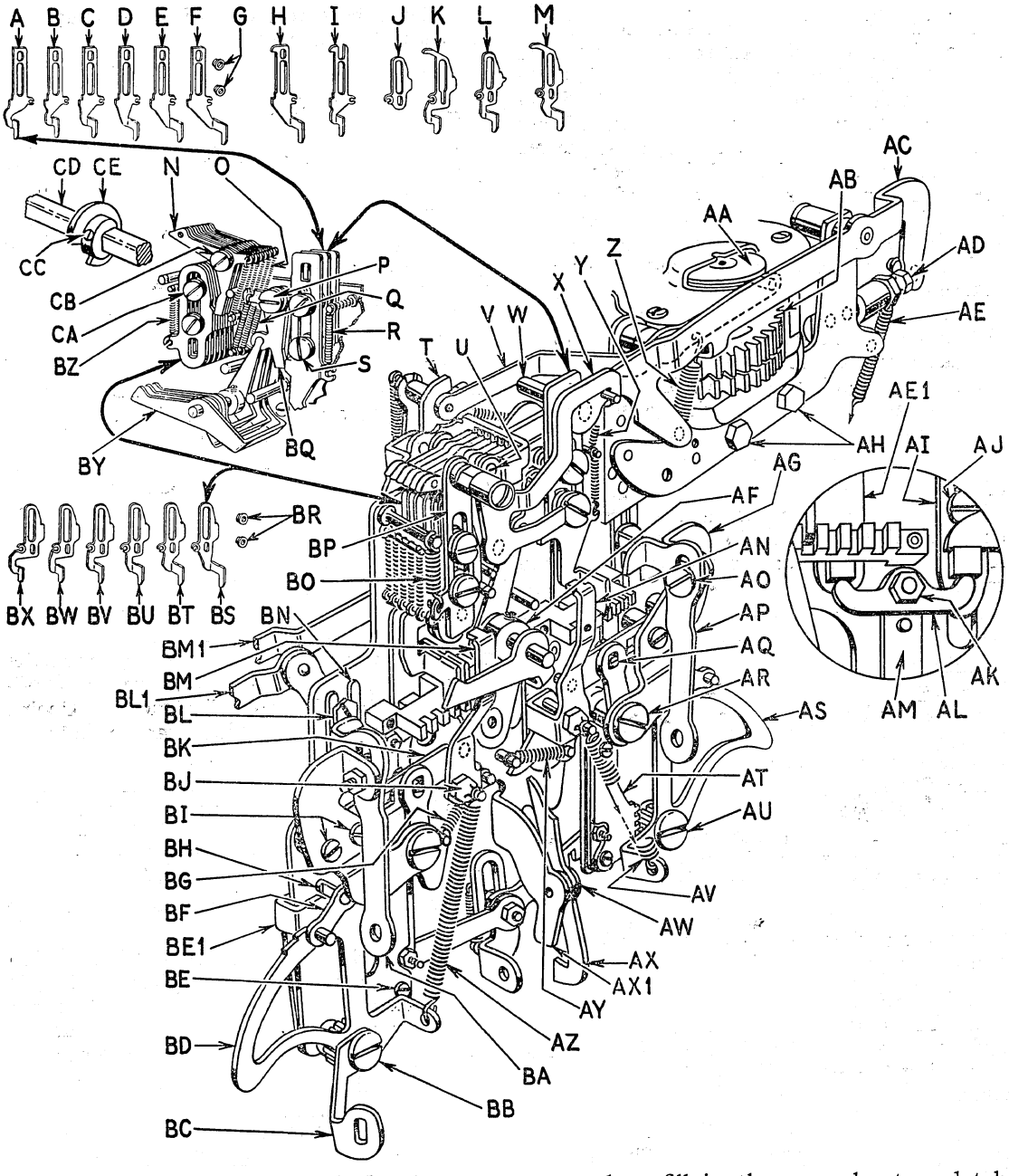
The purpose of spring U is to hold pressure roll shaft AB from turning when the pressure rolls are opened in order to insure correct meshing of gears S and B when the pressure rolls are allowed to contact on the platen.

MULTIPLE SKIP—RETURN MECHANISM (Plate 37)



(See Pages 31-32 for Text)

MULTIPLE SKIP—RETURN MECHANISM, FRONT VIEW, CLASSES 20 THRU 30 (Plate 37-1)



Multiple Skip—Return Mechanisms (Plates 37-1 and 37-2)

This mechanism controls the skip and return of the carriage, in addition, the pressure roll and carriage opening mechanisms are also indexed from this source. A maximum of six skip and return positions may be had. When less than six of the available skip and return positions are used, only the required latches are assembled on the unit. Space collars G are used to fill in the unused return latch positions. Parts J which are dummy skip latches are used to fill in the unused skip latch positions.

The desired steps or positions on segments AS and BD are selected by control rolls, total keys and operating bars, the indexing of the mechanism being completed by the machine operation itself.

Sequence (Plate 37-1)

When the carriage places a control roll or skid on the skip or return arms, links BL1 and BM1 through their bell-cranks, lower slides AE1 and racks AT to move segments AS and BD. The step selected depends upon the size of the control roll used. Additional points of throw of segments AS and BD are secured through the movement of slides AI and BN by links AP and BA. Their movement is secured from the rotation of the back plate hinge shaft R (Plate 40, Carriage Instruction Book) by segment T (Plate 40) which is rotated over the stud in arm Q (Plate 40) by the total keys and the various motor bars. The lower portion of segment T (Plate 40) is notched and cut to varying depths. This can be made so that from one to six additional points of throw of segments AS and BD are secured through the differential movement of part AL.

Arms BE1, right and left, time the locating of bell-cranks BF, right and left, on segments BD and AS until their vibration has stopped, at which time arms BM and AN are free to follow up slides BK, right and left, under the tension of springs BG and AY to locate themselves over the selected skip and return latches BX and A.

The operation of the machine results in the lowering of slide AX1 and arms BM and AN and the latching up of the skip and return latches. The lowering of skip latches BS to BX also lowers slide BP since it carries a stud which fits into the lower slot of latches BS to BX. The lowering of slide BP allows the projection of the skip tab bail to locate itself over shelf J on stop bar H (Plate 14, Carriage Instruction Book) and set up a skip tab.

Skip release disks CE contact on latches N to permit spring BO to raise slide BP and release the skip tab bail off of the stop bar.

Slide BP now includes a tapped shoulder screw in place of a stud and roller. This facilitates the removal of the carriage without disturbing the back plate and all of its controls.

Skip latches BX to BS are numbered from 1 to 6 and are so stamped. The drawing illustrates the manner in which they are assembled on the unit plate, latch BS being installed first.

The downward movement of slide AX1 lowers arm AN and latch A to rock arm AC and expand spring Z since arm AC carries stud W which fits into a slot in the upper portion of return latches A to F. Latch T is moved off the stud in arm V to permit spring Z to rock arm V and engage M.R.C. clutch members AA and AB with the lower M.R.C. gear. Detent BA (Plate 37-2) locates itself under the stud in arm V to prevent the M.R.C. clutch members from becoming disengaged on the return of the carriage.

Clutch member AA and gear AB now have three projections and openings instead of two. Part AA has .010″ play in its supporting bushing (J, Plate 17, Power Book). This permits the self alignment of clutch member AA and the lower M.R.C. gear, and a more uniform releasing thereof.

The purpose of adjustable screw AD is to prevent breaking of return latches A to F by serving as a limit for arm AC instead of allowing stud W to limit in the slots of the latches.

The present style releasing cams BY permit the placing of the M.R.C. shut off rolls on the same hanger which carries the control rolls for the carriage position to which the carriage has just been returned. In the early style, the shut off rolls are set ahead of the position to which the carriage is to be returned.

Cams BY for detents BQ of return latches A to F are also made in half sizes, and are symbolized 12315⅜ Nos. 1 to 5. The U bend is of a different width than the standard. They are used on machines which have the overlapping control roll actuating gears (AM-2, Plate 54, Carriage Instruction Book). This is necessary to provide clearance between gears AM-2 and cams BY.

Return latches A to F are numbered from 6 to 1 and are so stamped. The drawing illustrates the manner in which they are assembled on the unit plate. Latches H, I, K, L and M are special and can be had in any number from 1 to 6, according to the set-up.

Skip latch M has an outward extension which contacts against the projection on slide BC (Plate 37-2) to lower it and operate either the pressure roll or carriage opening mechanism in addition to indexing the skip tab.

Skip latch K differs from latch M in that the skip tab mechanism is not indexed since that portion which contacts against the stud in the lower portion of slide BP has been removed.

Skip latch L has a double step and is used in conjunction with bail X when a carriage return and skip tab have been set up on the same operation.

Skip latch J has no lower arm or latching in step. It is used as a fill up in positions where no skip latch is required. It is used as a limit for release arms N, a full set of which is placed on each unit.

Return latch H has a projection which contacts against a second projection on slide BC (Plate 37-2) to lower it and operate either the pressure roll or carriage opening mechanisms in addition to indexing the return mechanism.

Return latch I differs from latch H in that the M.R.C. clutch mechanism is not indexed since the portion which contacts against stud W in arm AC has been omitted.

Tests and Adjustments (Plate 37-1)

The following tests and adjustments may be applied to the unit whether or not it is fastened to the machine.

When parts AS and BD are in the home position, there should be between 1/32″ and 1/16″ of the landing visible beyond the edge of stud BH.

Racks AT are raised or lowered.

Skip and return arms BM and AN should align centrally with skip and return latches BX and A when parts BD and AS are placed in each one of its six positions.

Eccentric screws AQ are adjusted.

There should be .010″ clearance between stud W in rocker arm AC and the top of the slot in return latches A.

Screw AD is adjusted.

With the unit normal, turn upper M.R.C. gear AB; there should be clearance with the projections of clutch AA and the lower M.R.C. gear. If there is no clearance, readjust screw AD to allow arm AC to raise up slightly, reducing the clearance between stud W in arm AC and the return latch to .005″.

Latch in return latch A, turn upper M.R.C. gear AB; there should be no click or contact of the projections on the M.R.C. gear and clutch AA. With return latch A still latched in, release hook T, allowing clutch AA to drop down. There should be a full hold of clutch AA on the lower M.R.C. gear.

Remove arms AC and V, take off a slight amount of stock on arm V where it contacts the projection on arm AC.

Depress release cam BY to disengage the M.R.C. clutch, hook T should locate itself over the stud in arm V.

Adjust arm V.

When testing bail X, place skip arm BM in align with skip latch L, and return arm AN in align with return latch A, lower skip and return arms BM and AN all the way by moving slide AX1. Bail X should latch in over the lower step of skip latch L and have ½ to ¾ hold.

The upper portion of bail X, where it contacts on the stud in arm AC, is adjusted as required.

Skip latch L and return latch A should latch in simultaneously.

The offset in skip arm BM is adjusted.

Before placing the unit in position check the M.R.C. rack for free and parallel.

Align the control cams with the control rolls both on carriage tabulation and return.

The shaft through the back plate hinge must be absolutely free.

Place the M.R.C. unit in position.

Check the mesh of the rack and gears.

The upper M.R.C. gear AB should be flush with the top of the M.R.C. gear rack.

Raise or lower the top of the M.R.C. unit as required.

Swing the left side of the unit in as close as possible so that the spring stud just clears the M.R.C. rack.

With the unit in position, move the carriage so that the shut off roll is over release cam BY; there should be approximately 1/16″ play in the release cam. The unit is then secured in position.

Align shaft CD so that skip release disks CE are centrally aligned with skip latches N; there should be clearance between the hubs of disks CE and latches N.

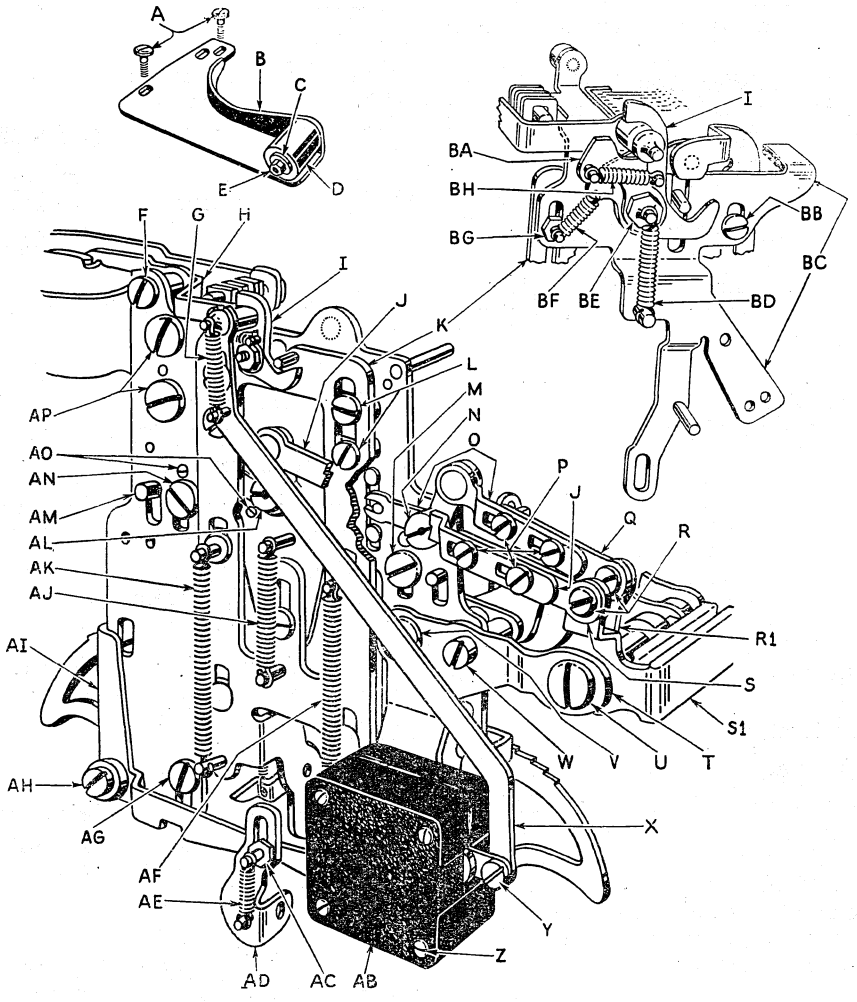
Prior to checking the various carriage control rolls for the correct movement of segments AS and BD, the control roll hangers should limit against the square shaft in the carriage.

Screws P (Plate 37-2) in bell-cranks O and J (Plate 37-2) are loosened and the links on the bell-cranks moved so that stud BH (Plate 37-1) is located in the middle of the selected position of segments AS and BD. To secure additional throw, it may be necessary to peen the individual control skids, similar to AT (Plate 54, Carriage Instruction Book).

(Plate 37-2)

The switch points are set as follows: The screw in the bell-crank carrying the switch points is loosened and set for the maximum clearance. The adjustment of eccentric screw Y is secured by releasing latch I from the stud in arm H, arm X is then moved

MULTIPLE SKIP—RETURN MECHANISM, REAR VIEW, CLASSES 20 THRU 30 (Plate 37-2)



upward until M.R.C. clutch member AA (Plate 37-1) and the lower M.R.C. gear click simultaneously with the starting of the motor.

Sequence Covering the Removal of the Carriage and the Installation of Skip Slide BP (Plate 37-1)

Break off old skip roll stud.

Unhook the carriage tape.

Remove return release rolls on extreme left end of carriage.

Remove roller D (Plate 80, Carriage Symbol List).

Remove plate BC (Plate 37-2) in machines having carriage opening mechanism.

Remove screws holding extended line finder to carriage.

Remove screws holding carriage on right side.

Remove screws holding carriage on left side.

Tilt right end of carriage about 60° and move toward the right, exercising extreme care to avoid bumping skip and return mechanism parts, especially spring studs for springs Q and BZ (Plate 37-1).

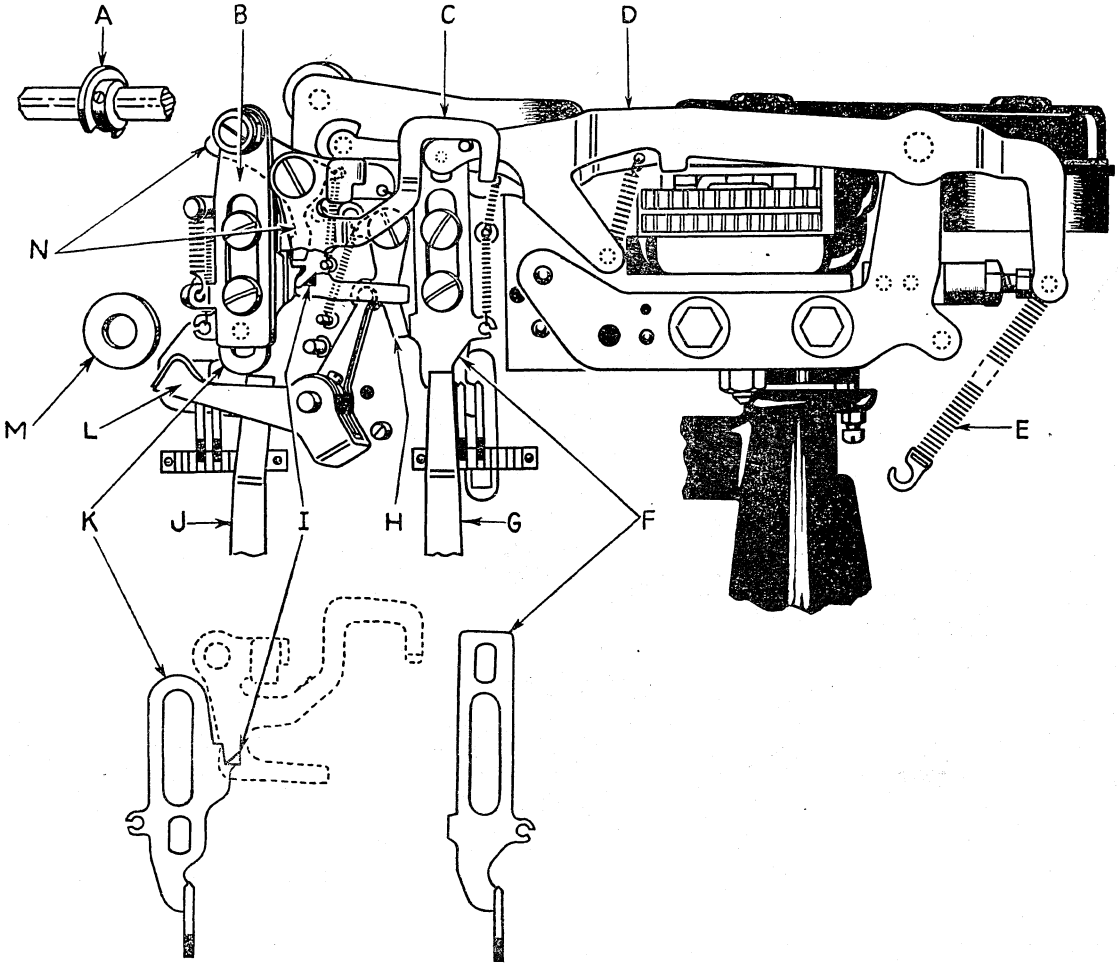
Remove the old skip slide using offset screw driver for screws CA.

Remove shoulder screw, roller and nut from new skip slide BP and install the new slide.

Re-install the carriage in reverse order.

Attach shoulder screw, roller and nut in slide BP.

MULTIPLE SKIP RELEASE LOCKED DURING CARRIAGE RETURN, CLASSES 20 THRU 30 (Plate 37-3)



Multiple Skip Release Locked During Carriage Return (Plate 37-3)

The purpose of this mechanism is to retain the skip tab set up while the carriage is being returned. It is used on machines where carriage return operations are set up and the carriage is returned to positions where stops are set close together, permitting the carriage to be returned beyond the selected position and then releasing the return latch with the carriage floating or skipping into the correct position.

When skip and return latches K and F are latched by their respective detents N and H, angular stud I on bail C is free to locate itself over the lower step on skip latch K. As the carriage is returned, skip release disk A rides over detent N, but since bail C holds skip latch K lower, detent N is free to locate itself over the stop on skip latch K.

When shut off roll M releases detent H, spring E is free to disengage the M.R.C. clutch through arm D, the carriage will then skip or float into its selected position until skip release disk A releases skip detent N.

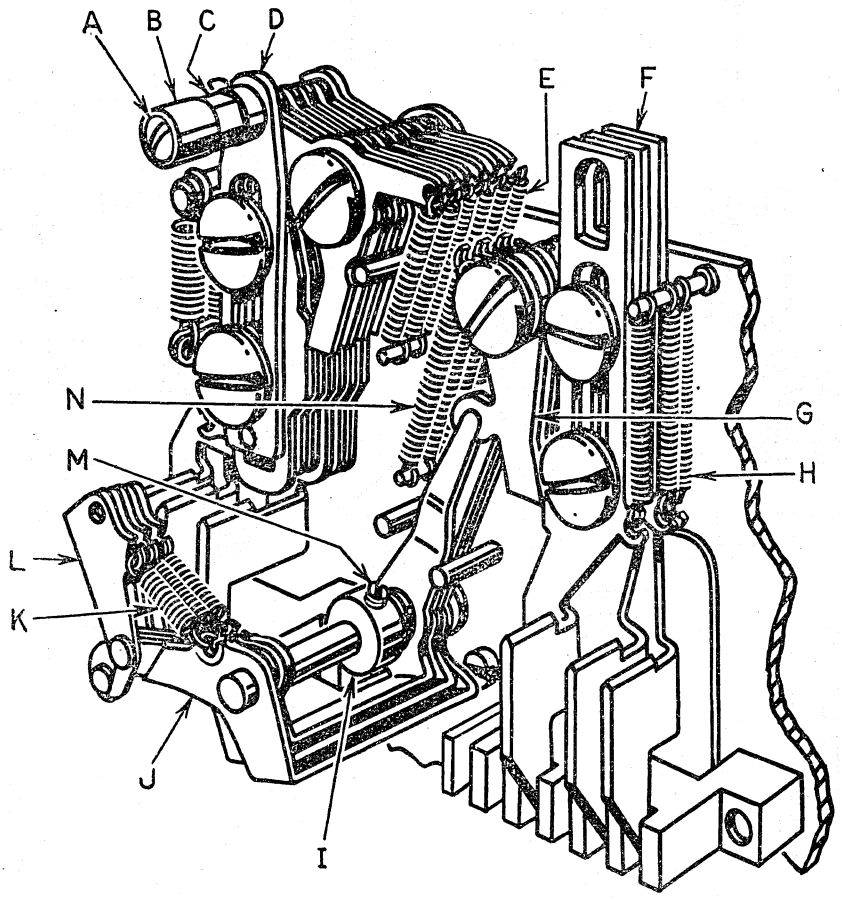
Tests and Adjustments

Bail C through stud I must latch skip latch K at the same time as return latch F is latched by detent H.

Arm J is adjusted at the offset.

When testing bail C, place skip arm J in align with skip latch K, and return arm G in align with return latch F, lower skip and return arms J and G all the way by moving slide K (Plate 37-2). Bail C should latch in over the lower step of skip latch K and have ½ to ¾ hold.

MULTIPLE RETURN RELEASE LATCHES, FLEXIBLE, CLASSES 20 THRU 30 (Plate 37-4)



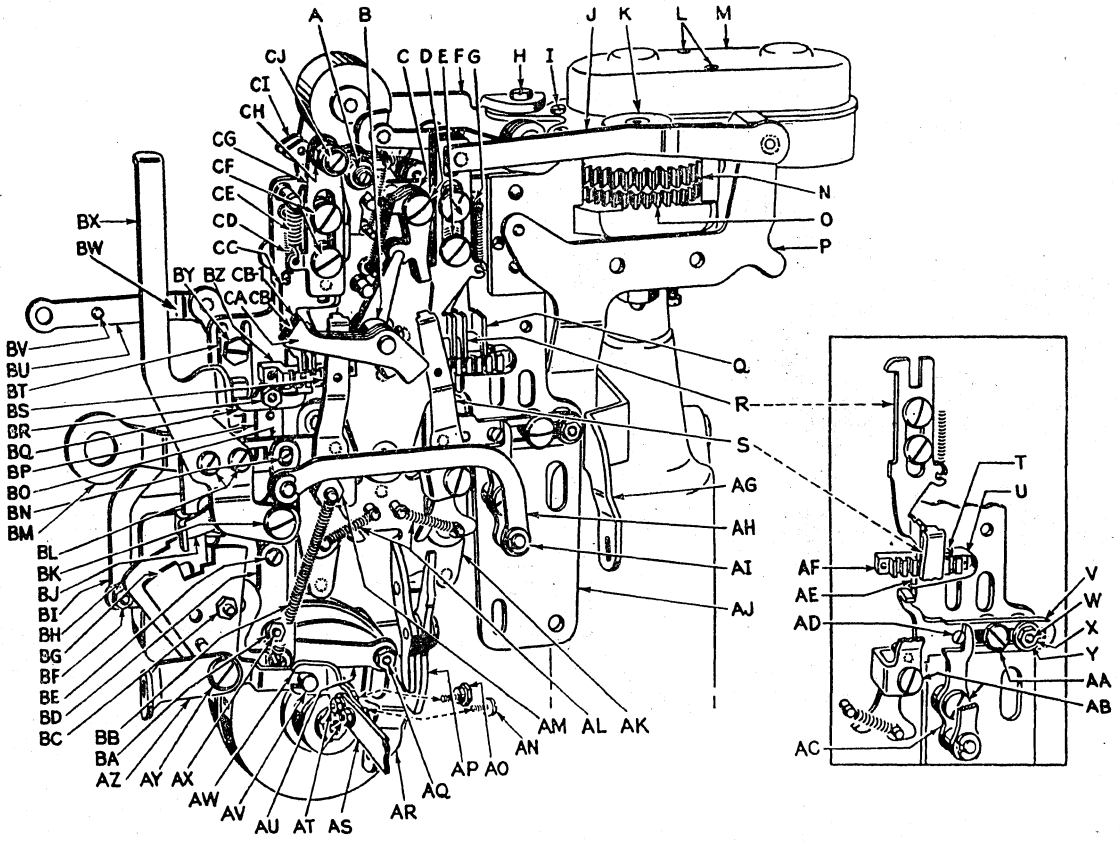
Multiple Return Release Latches, Flexible (Plate 37-4)

The purpose of release latch assembly J is to permit the setting up of carriage returns in the position to which it has just been returned, using the same latch F. The shut off rolls for the carriage position are now placed on the control roll hanger which carries the rolls governing that carriage position.

When the carriage is being returned, the shut off roll contacts release latch assembly J, releasing the M.R.C. clutch. The carriage floats slightly beyond the position enabling the shut off roll to pass over passby pawl L. As the carriage settles on the stop block, passby pawl L should be to the right of the shut off roll (rear of the machine), breaking the joint to permit the relatching of the same return latch F.

They can be assembled on the same unit in conjunction with the regular release cams BY (Plate 37-1).

MULTIPLE SKIP AND RETURN MECHANISM—SIMPLIFIED (Plate 37-5)



Multiple Skip and Return Mechanism—Simplified (Plate 37-5)

Purpose

This mechanism is particularly adapted for use on Bank Posting Machines and provides a more positive method of indexing the Carriage Skip and Return Mechanism.

Operation

INITIAL INDEXING of a skip or return operation is accomplished by positioning one of the steps of segment BH under the stud in bell crank BJ; and/or, by positioning one of the steps on segment BG under the lip of bell crank BJ.

The lever (M, Plate 38, Carriage Symbol List) when depressed by a control roll, rocks assembly BW which, through its bell crank, actuates rocker arm BQ to lower slide BP and plate BD. The latter swings segment BH to the right, locating one of its four steps (depending on the size of the control roll) under the stud in bell crank BJ.

When motor bars 101 or 103, or the total or the sub-total keys are depressed, segment BG is rocked, through A linkage that engages stud AV, to locate one of its steps under the lip of bell crank BJ.

PARTIAL INDEXING is accomplished during the early portion of the machine operation by locating arms BS and/or S over a selected skip or return latch (CC or Q).

Link AR, being raised when the machine is operated, rocks bell crank AU which moves the cam on its upper arm out from under the stud in bell crank BJ. Thus, the latter is allowed to swing downward (through the tension of springs AL) and limit on the indexed step of segment BH or BG, which, through stud BN and slide BO, limits the travel of arm BS. Link AH, being connected to bell crank BJ through lever AC and slide V, limits the travel of arm S.

COMPLETED INDEXING occurs during the early portion of the return stroke of the machine operation.

The arm (B, Plate 42, Carriage Symbol List) which is rocked by the drive mechanism, through hook AP lowers slide AK which

carries indexing arms BS and S. The skip or return latch aligned with indexing arm BS or S is pulled downward to index the Skip or Return Mechanism, and is locked in a lowered position by its respective latch CI or C during the skip or return operation.

Levers CB, when depressed by a control roll, rock latches C which release the return latch to shut off the carriage return. Latch CI, when rocked by a disc on the skip release shaft, releases the skip latch to shut off the Carriage Skip Mechanism.

THE ANALYSIS COLUMN SELECTOR affords a means for preventing the indexing of a carriage return which would otherwise be set up automatically during the total or sub-total operation.

Latch R, when indexed in the deposit column (using motor bar 102) lowers the analysis selector pin AE. The latter, while held in its lowered position by latch R, limits the travel of slide V and indexing arm S, which causes the indexing arm to align with a blank position in comb AF. As the carriage tabulates into the analysis column, latch R is released allowing pin AE to restore, which permits the indexing arm to swing to the right and align with the No. 2 return latch.

Adjustment

1. When segment BH is in its normal position, there should be approximately 1/64″ clearance between the right vertical surface of the segment and the stud in bell crank BJ.

To adjust, loosen screws BE and raise or lower plate BD.

2. Indexing arms BS and S should align centrally with the skip and return latches when bell crank BJ limits on each step of segments BH and BG.

To adjust, turn eccentric screws BN or AD.

3. When the machine is operated with segments BH and BG in normal position, the lip of bell crank BJ should locate centrally in the lowest cut out on segment BG.

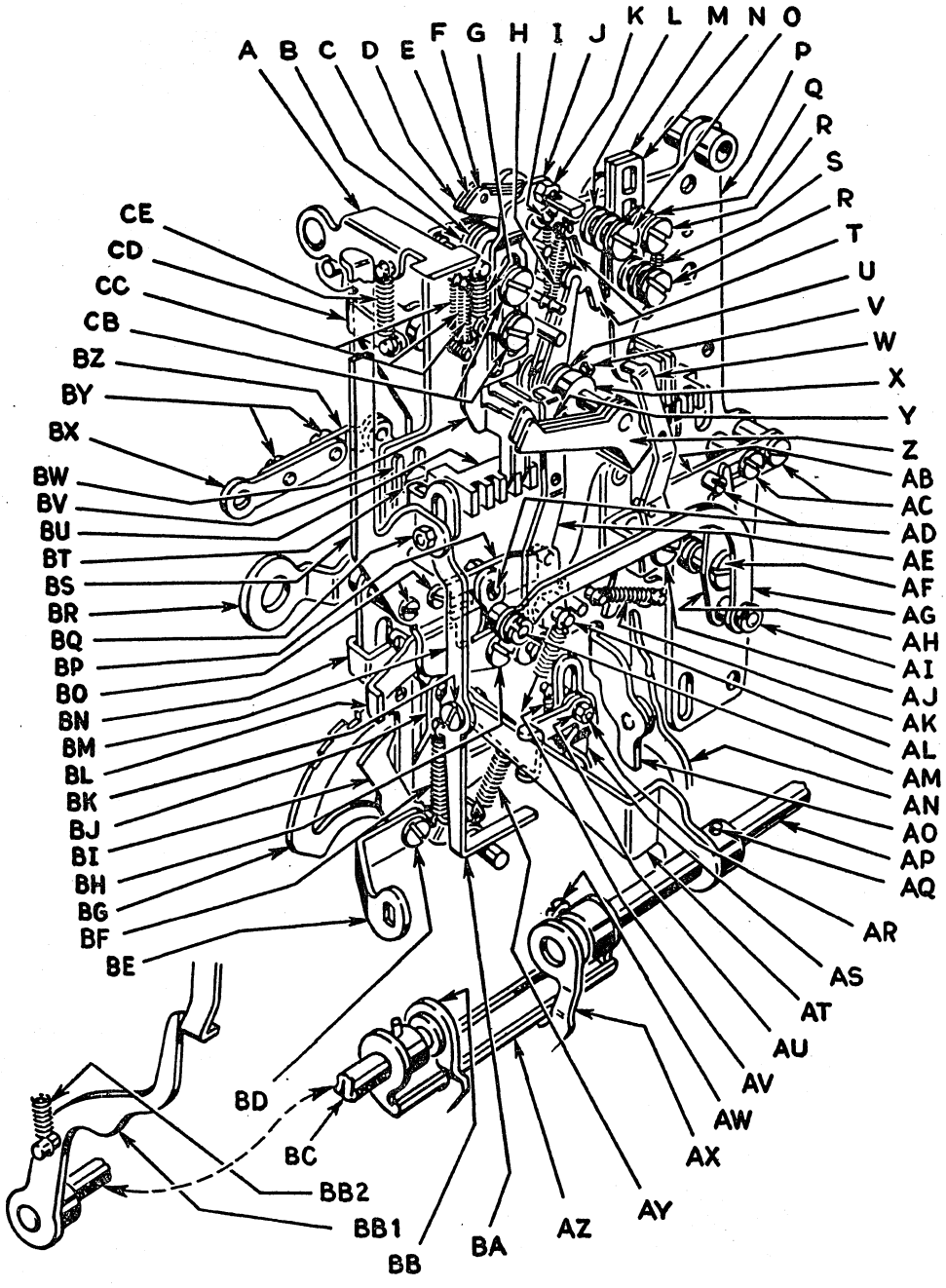
To adjust, loosen nuts AT, and turn eccentric screw AO.

Mr M R Lovejoy
Buffalo N Y Branch 10-5

Printed in U. S. America

(For Form 3753)

MULTIPLE SKIP AND RETURN MECHANISM, STYLE NO. 3
(Plate 37-6)



(OVER)

Multiple Skip and Return Mechanism, Style No. 3 (Plate 37-6)

Purpose

This mechanism controls the carriage skip and return, and is particularly adapted for use on No Space Stroke Total Bank Posting Machines.

Operation

INITIAL INDEXING of a skip or return operation occurs when one of the steps in segment BG is positioned under the stud in bellcrank BL; and/or when the auxiliary segment BI is positioned under the lip of bellcrank BL.

The skip and return cam, when depressed by a control roll, rocks assembly BZ which, through its linkage swings segment BG to the right, locating one of its steps (depending on the size of the control roll) under the stud in bellcrank BL.

Selection of a step other than the one selected from a control roll, is secured by providing additional movement of the segments through the rotation of shaft AP. The latter, when rotated, through arm AT and link BM lowers slide BV, which through its linkage swings segment BG to the right; and arm BA, which is also lowered by arm AT, swings segment BI to the right. The depths of the cutouts in the comb (BE, Plate 62-1, Motor Bars) determine the amount of additional movement (1 to 6 points of throw) of segments BG and BI.

PARTIAL INDEXING occurs during the early portion of a machine operation when arms W and/or AE are located over a selected skip or return latch.

Link AS, being raised when the machine is operated, rocks bellcrank BN which moves the cam on its upper arm from under the stud in bellcrank BL. Thus, the latter is allowed to swing downward (through the tension of springs AK) and limit on the indexed step of segments BG or BI, which, through stud AD and slide BP, limits the travel of arm AE. Link AG, being connected to bellcrank BL, limits the travel of arm W through lever AH and slide AB.

COMPLETED INDEXING occurs during the early portion of the return stroke of the machine operation.

The arm (B, Plate 42, Carriage Symbol List) which is rocked by the Drive Mechanism, through hook AN lowers slide AO which carries indexing arms AE and W. The skip or return latch which is aligned with indexing arm AE or W is pulled downward to index the Skip or Return Mechanism; and is locked in its lowered position by its respective latch D, E, F, or T during the skip or return operation.

Levers Y, when depressed by a control roll, rock latches T which release the return latches M to shut off the carriage return. Latch D, E, or F, when rocked by a disc on the skip release shaft, releases its respective skip latch B, C, or BW, to shut off the Carriage Skip Mechanism.

Adjustment

1. Skip indexing arm AE should align centrally with the No. 5 skip latch when the stud in bellcrank BL limits on segment BG with the segment in normal position.

To adjust, turn eccentric screw AD in slide BP.

2. Return indexing arm W should align centrally with the No. 4 return latch when the lip of bellcrank BL limits on segment BI.

To adjust, turn eccentric screw AD in slide AB.

3. When the machine is operated in various carriage positions with a control roll (Nos. 1 thru 6) located on the skip and return indexing cam, the stud in bellcrank BL should locate centrally on the steps of segment BG.

To adjust, loosen screws BY and position slide BZ.

Note: In some carriage positions, it may be necessary to raise or lower the control hanger to centrally locate the stud in bellcrank BL on the step of segment BG.

4. When the additional movement of segment BG (points of throw) has been indexed, through the depression of the motor bars, the stud in bellcrank BL should locate centrally on the steps of segment BG.

To adjust, turn eccentric screw BK.

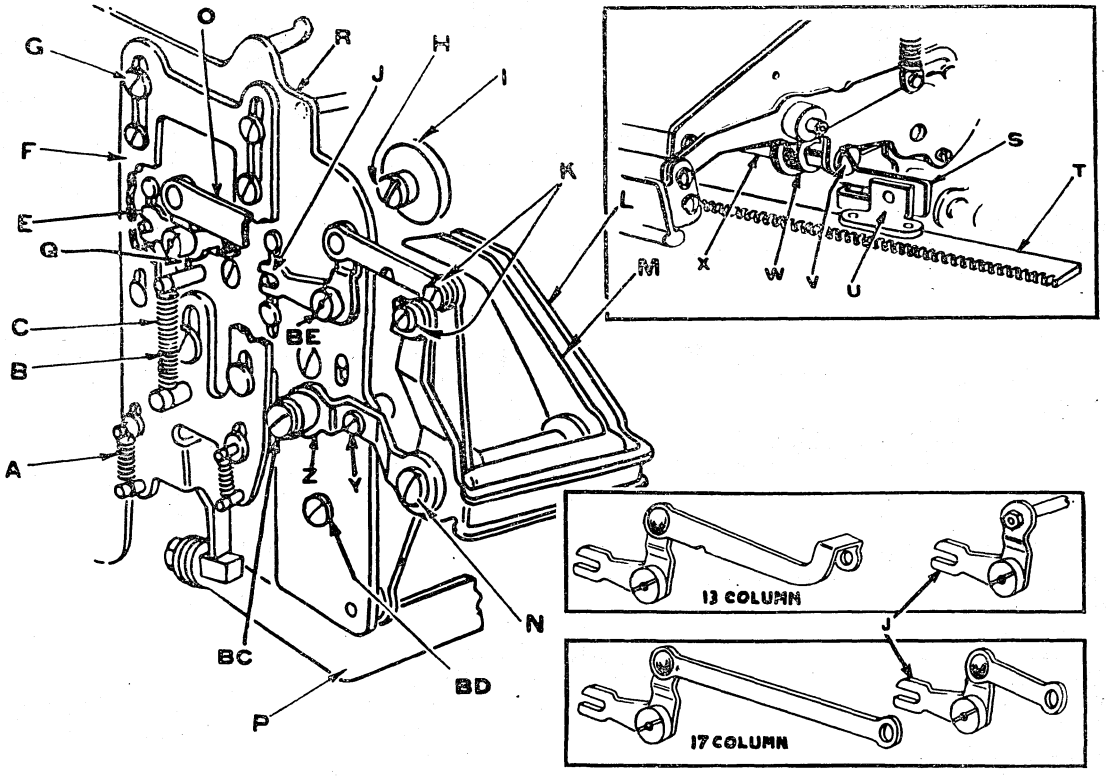
5. Depression of the sub-total key should produce 3 points of throw on segment BG.

To adjust, bend the arm which actuates arm BB1.

6. When segment BI is in its normal position, and with 2 points of throw indexed, the upper horizontal surface of the segment should remain under the lip of bellcrank BL; and when 3 points of throw are indexed (sub-total key depressed), there should be slight clearance between the lip of bellcrank BL and the left vertical surface of segment BI.

To adjust, raise or lower the foot of arm BA.

MULTIPLE SKIP—RETURN MECHANISM (Plate 38)



Multiple Skip—Return Mechanism (Plate 37)

This mechanism has a maximum of six skip and six carriage return positions.

When less than six positions of skip and carriage return are required, only as many parts lettered P, M, J and Y (Plate 37) are used in assembling the unit as are required. The functions, tests and adjustments are the same irrespective of the number of positions of the unit.

The selected positions are partly indexed by control rolls, total keys and operating bars. The indexing is completed and actuated by machine operation.

When the machine is in normal position, the actuating mechanism is disconnected, similar to when the normalizing key is latched down; however, carriage control total and operating bars connect the mechanism with the machine operating mechanism.

Sequence

When the carriage moves one of the control rolls on skip lever M (Plate 38), bell-crank assembly J moves slide G (Plate 37) downward, the stud in G contacts on lever D moving slide E downward. Geared part B which is carried by E indexing notched segment C to a position corresponding to the size of roll on levers M or L (Plate 38). Spring AE (Plate 37) swings arm H to follow link and detent AB assembly which locates arm H over the selected latch I.

When the carriage moves one of the control rolls on return lever L (Plate 38), bell-crank assembly E moves slide G (Plate 37) which indexes notched sector AC to locate arm Z as explained in covering arm H.

Machine Operation

When segments C Plate 37 (shown as A on Plate 49) are indexed from any source, cam levers P allow springs I to pull latches H under square stud E. The machine operation pulls slide AD (Plate 37) downward through latches H (Plate 49) to complete the indexing of the skip-return mechanism.

When slide AD (Plate 37) moves downward, pawls I pull skip control L downward which allows skip bail to swing its foot to block and hold the stop bar when the machine tabulates and thereby bring about skip tabulation. Skip control L is latched in downward position by latch M. The downward movement of slide AD also pulls downward one of pawls P, which rocks return clutch lever R to engage M.R.C. clutch AT and close the switch points through lever O.

The skip mechanism when indexed from any source is released by disks W (Plate 38) contacting on latches M (Plate 37). The return mechanism is released by control rolls contacting on latches Y (Plate 37).

Tests and Adjustments (M.R.C. Unit not Attached to Machine)

Studs in part G (Plate 37) should be at the top of slots in R (Plate 38). This is important. The normal position of segments C and AC (Plate 37) should be secured by raising or lowering rack B.

The normal position of segment C is not more than 3/32″ from the 7th pocket of C indicated by the stud of AB resting on C with stud in part G at top of slot. A uniform adjustment should be secured on both parts C and AC. Adjust fingers H to align with latches I and P when stud in AB is in the pocket relative to that latch. Adjustment: Eccentric screw AO is turned.

Note: .010 overthrow is desirable so that on its downward movement, H does not set up a cramp against slide AN. Check each latch I to see that it is securely locked.

Each latch P should be pulled down and parts Y on either side of the Y holding the latched P should be worked to check positive latching of latches P. Friction in the "U" bends sometimes causes latches P to be prematurely released.

With latches P locked down clutch arm R should hold clutch spool AT down for full hold of studs in clutch gear S, but not limit downward travel of parts P. A slight play should therefore be felt in AT when it is locked down.

To adjust, raise or lower clutch arm R.

Before placing unit in position, check M.R.C. rack for free and parallel.

Align control cams and test for proper level and throw.

Locate shaft through carriage hinges; this shaft must be absolutely free.

When using 1410 cam construction, bail 1-115 No. 2 Env. 1410 should be in place.

Now place M.R.C. unit in position.

Check mesh of rack and gears.

Swing left side of unit in as close as possible.

Spring stud for skip latch to just clear M.R.C. rack.

Tilt unit to right or left so skip release disks W (Plate 38) will contact latches M (Plate 37) with not more than 1/64″ camming action and observing at same time that disk W clears hub of rocker arm R; it may be necessary to lower gear head slightly to obtain desired results.

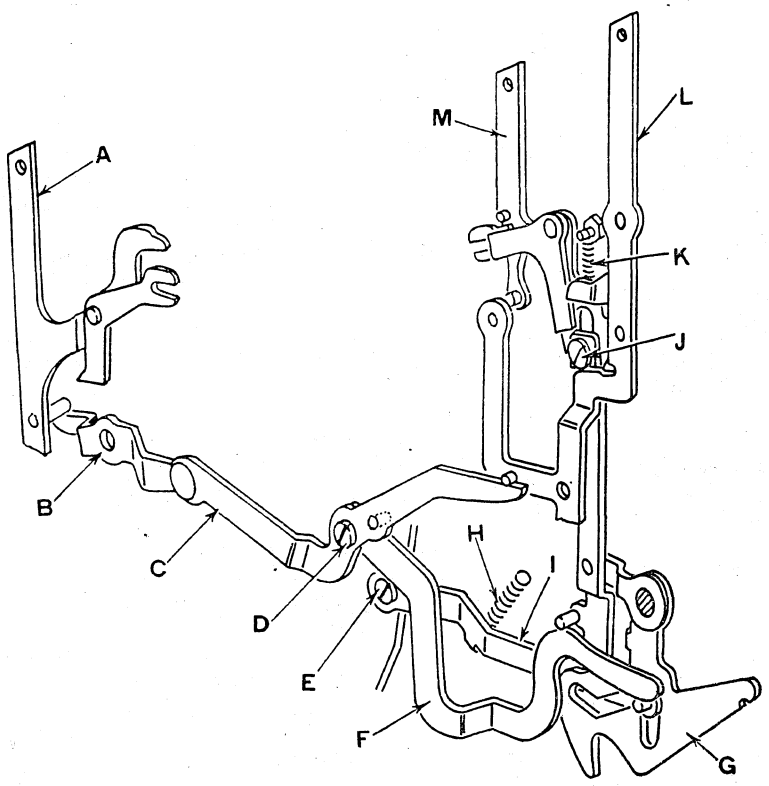
Align shaft X (Plate 38).

Brackets holding shaft may be moved forward or rearward.

See that disks W clear pan on carriage.

Fit and align brace Z (Plate 38).

MULTIPLE SKIP—RETURN MECHANISM VERTICAL SPACE BAR (Plate 39)

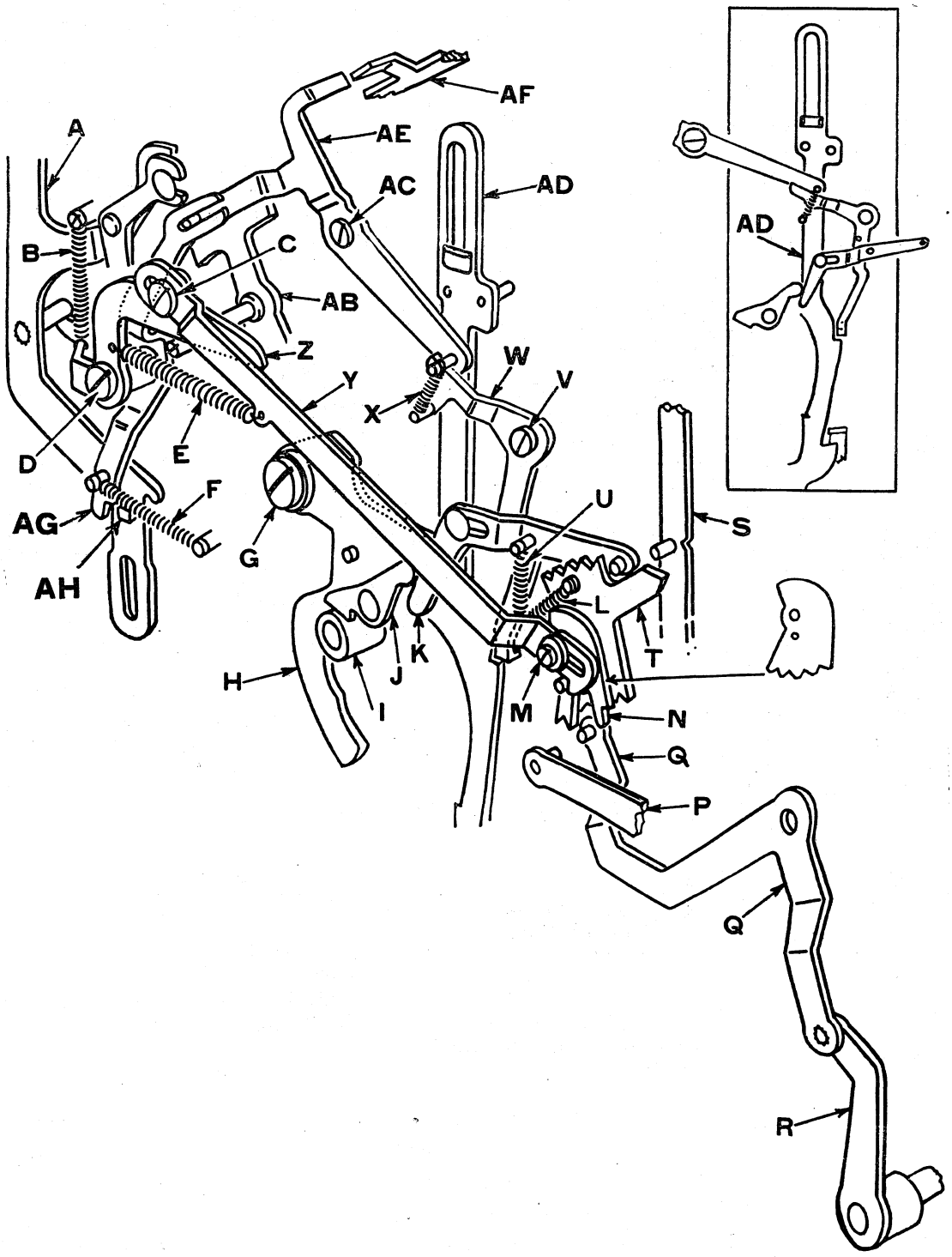


Vertical Space Bars—Skip and Return Mechanism (Plate 39)

The purpose of this mechanism is to provide vertical spacing from lower and upper bars. This mechanism is actuated by the machine operation.

When lower bar A is depressed, levers B and C swing arm F downward, which lowers arm I to locate its stud in the vertical slot of driver cam G. During the machine operation, arm I drives cam G to index vertical spacing.

MULTIPLE SKIP—RETURN MECHANISM TOTAL KEYS AND UPPER BARS CONTROLLED (Plate 40)



Multiple Skip and Return Mechanism Total Keys and Upper Bars Controlled (Plate 40)

The purpose of this mechanism is to pre-index the carriage return mechanism when either one of the total keys, upper or lower bars are depressed. The machine operation completes the indexing and also actuates the return mechanism.

Sequence

When the total key is depressed, the long stud in part AB in moving rearward rocks part Z, the latter is also moved when the lower bar is depressed. Part Z through link Y swings index plates T and N to locate one of the upper pockets (of T) in line with the stud in detent K and locates the lower arm of T in line with part Q for carriage return and locates the lower arm of N in line with part P for normalizing the repeat operation mechanism. When the upper bars are depressed, a stud in the bars directly swings index plates T and N. The purpose of having a series of pockets is to index each source separately which permits the removal of the lower portion of T and N, when neither carriage return or repeat machine operation normalizing is required. At the beginning of the machine operation roller I swings arm H, carrying downward index plates T and N, part J permitting spring U to seat detent K in the pocket of T, the latter rocks part Q to index the carriage return mechanism. Index plate N actuates the repeat normalizing mechanism —this subject is covered under its own heading, Plate 46.

Shaft assembly R (Plate 40) has two arms, the left one is shown on Plate 37 as AH. It controls segment C (skip) and the right one (not shown) controls segment AC (return). When total keys or bars are used, both segments C and AC are indexed. Usually the skip and return are jointly indexed by carriage control and by total keys and bars. However, 1 of 1 to 6 positions can be secured through total keys and bars when the lower projection of index plate T (Plate 40) has the correct length. When either skip or return is not required in certain positions, latches I or Y (Plate 37) are not used.

Tests and Adjustments (Plate 40)

Check upper motor bar to index 1st step of T for alignment with stud of detent K.

Check uppermost bar to index 2nd step of T for alignment with stud of detent K.

Check lower bar to index 3rd step of T for alignment with stud in detent K.

Adjustment from eccentric screw C.

Total Keys to index 4th step of T for alignment with stud of detent K.

Adjustment is made from bending arm Z, for required throw.

Detent W (Plate 40)

The purpose of detent W is to secure a complete depression of the lower bar before the motor is allowed to operate. When the lower bar is depressed, stud AH cams part AG, which through intermediate AE swings detent W to block part AD until bar A is completely depressed.

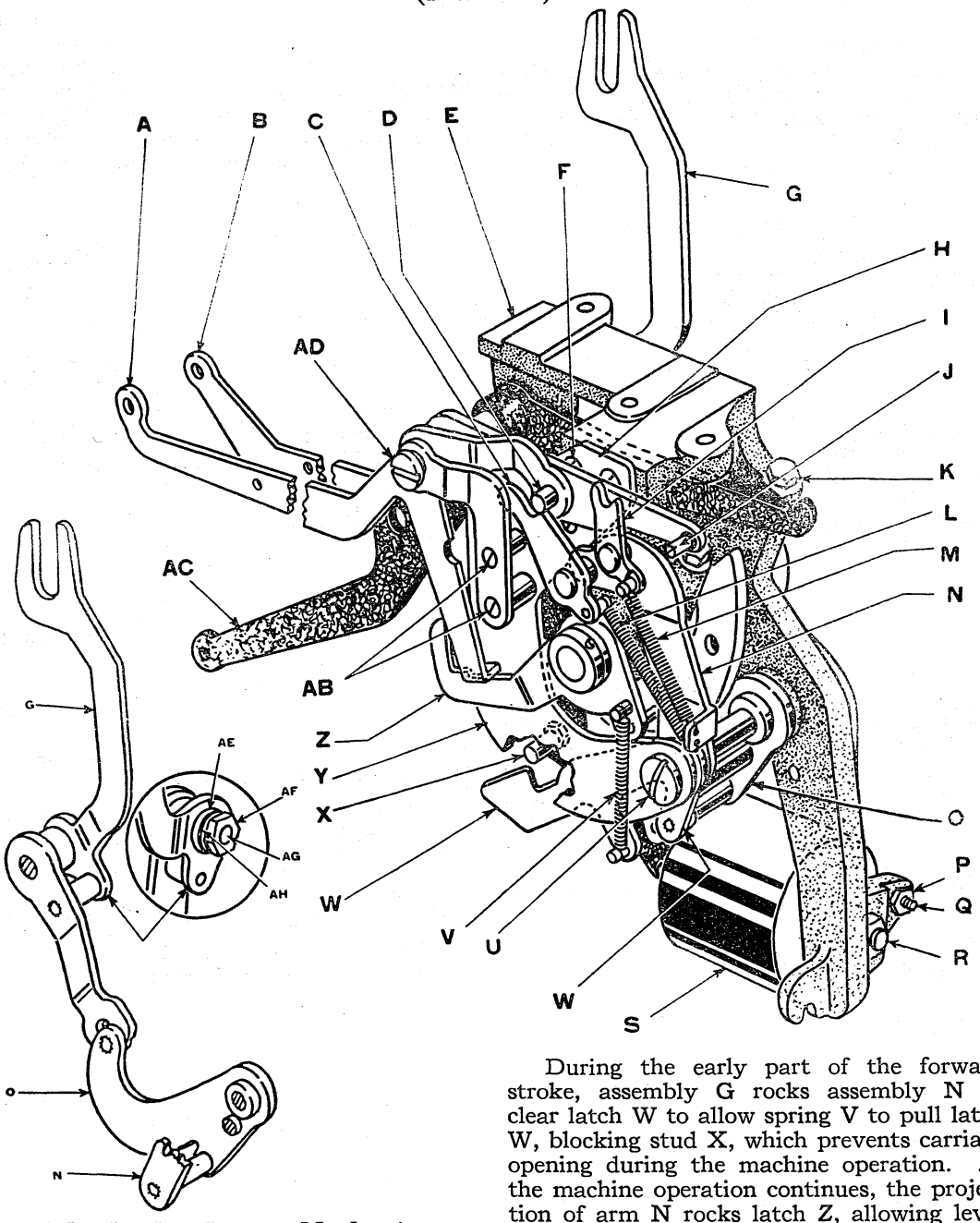
When lower bar A is depressed, detent K should seat in No. 3 pocket of T.

Adjustment: Eccentric screw C is turned.

The indexing movement of AB should seat detent K in No. 4 pocket of T.

Adjustment: Arm Z is bent.

MULTIPLE SKIP—RETURN MECHANISM TIMING CONTROL
(Plate 41)

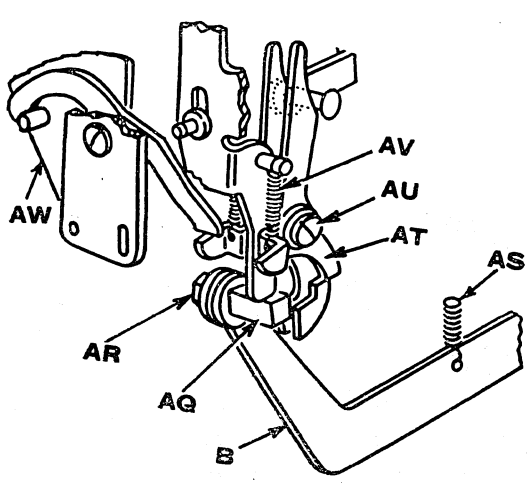


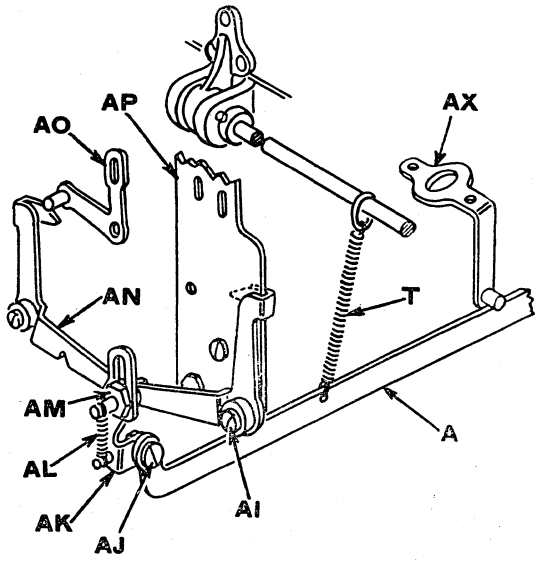
Multiple Skip-Return Mechanism Timing Control Mechanism (Plate 41)

The purpose of this mechanism is to secure positive and timed operation of the skip-return mechanism. This mechanism is actuated by the main (100) section, the timing effect is obtained by passby pawls I and C and latch W which become active at various positions of the main (100) section.

During the early part of the forward stroke, assembly G rocks assembly N to clear latch W to allow spring V to pull latch W, blocking stud X, which prevents carriage opening during the machine operation. As the machine operation continues, the projection of arm N rocks latch Z, allowing lever A to move to the upper step of latch Z, which through part AK (Plate 42) rocks right and left bell-cranks AN, allowing detents AO to seat in the pocket of segment AW that was indexed by carriage position. At the beginning of the return stroke, passby pawl I (Plate 41) rocks lever B, which through latch AT (Plate 42) pulls down slide AD (Plate 37) the latter through parts H indexes the skip pawls I and return pawls P.

MULTIPLE SKIP—RETURN MECHANISM TIMING CONTROL (Plate 42)





During the continuation of the return stroke, passby pawl C (Plate 41) rocks lever A, which through part AK (Plate 42) rocks bell-cranks AN to swing detents AO to clear the pockets of segment AW.

Screw AJ (Plate 42) is eccentric; its purpose is to locate bell-cranks AN to hold detents AO clear of AW when the machine is in normal position.

Tests and Adjustments

Assemble AX (Plate 42) on brace J (Plate 76) and position to machine.

Now hook up arms A & B (Plate 42) and adjust.

Eccentric screw AJ (Plate 42) connecting arm A to link AK is adjusted so arm AN will hold stud in AO clear of segments C and AC (Plate 37) in a normal position.

If more adjustment is required, it will be necessary to bend arm A.

Arm B (Plate 42) should be adjusted to pull down slide F (Plate 38), full length of slots but must not limit on screws G.

Arms H (Plate 37), must be in normal position.

Adjust by bending arm B (Plate 42) up or down.

Connect skip and return cams L & M, (Plate 38), with links on unit with eccentric screws K.

Adjust so each position of carriage has the throw designated on analysis sheet.

Due to the inability of raising or lowering skip cam on Style 13 machine, a temporary hook up with eccentric equalized should be made when aligning unit to M.R.C. rack and a near adjustment obtained by tilting M.R.C. unit.

Install throwback plate and booster spring bracket (Plate 76).

Connect arms AH (Plate 37) on shaft through carriage hinges to link AI with eccentrics AS.

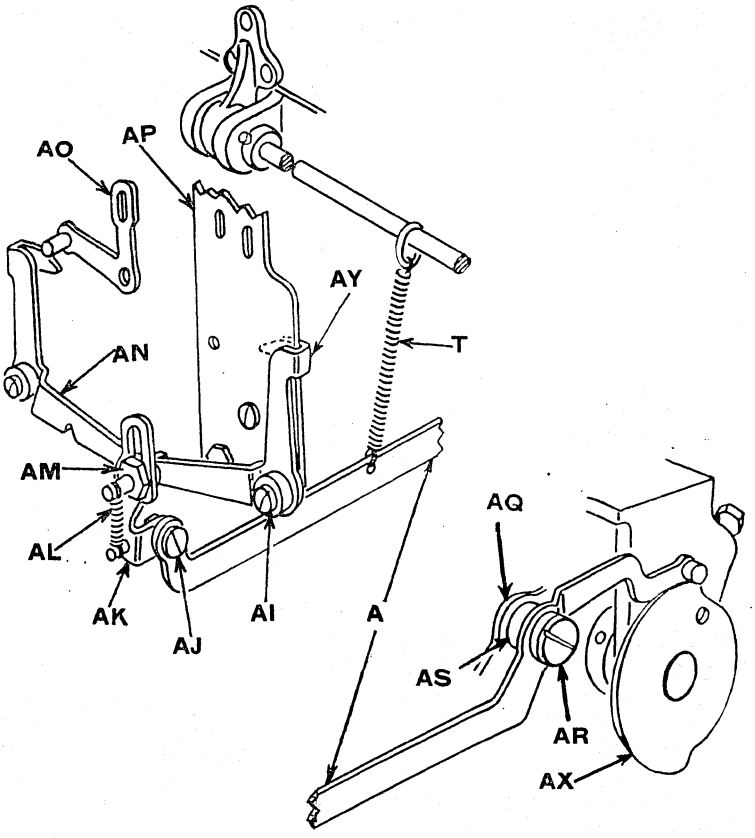
Adjust each eccentric for link AI (Plate 37) to contact stud AK simultaneously, but ascertain that G is in home limit of plate R (Plate 38), both sides at all times.

Test each bar and total keys, handle operation for throw of segments C and AC (Plate 37); if both overthrow or underthrow, adjust offset in blank H.

If there is a variation in segments C and AC, eccentric screw AS connecting AH to AI (Plate 37), may be slightly turned, watching at the same time stud in part G (Plate 37) remains at home limit.

Carriage Normal Key and V.S.B. should normalize AT (Plate 42) from stud AQ; adjustment is made at offset of bail on shaft through carriage hinges.

MULTIPLE SKIP—RETURN MECHANISM TIMING CONTROL NO. 1 (Plate 43)



Multiple Skip and Return Mechanism, Timing Control No. 1 (Plate 43)

The purpose of this mechanism is to insure correct indexing by raising detents AO (Plate 43) which allows the carriage to locate segments C (Plate 37), with less resistance.

Tests and Adjustments

Skip release parts W (Plate 38) on shaft X should clear hub of bracket R (Plate 37) and parts W should have slight contact on all latches M (Plate 37).

Adjustment: To align gears and parts W (Plate 38), for contact of parts W on latches M (Plate 37) and clearance of W and R is accomplished by raising, lowering and swinging complete bottle to right or left. Also M.R.C. head may require swinging inward or outward.

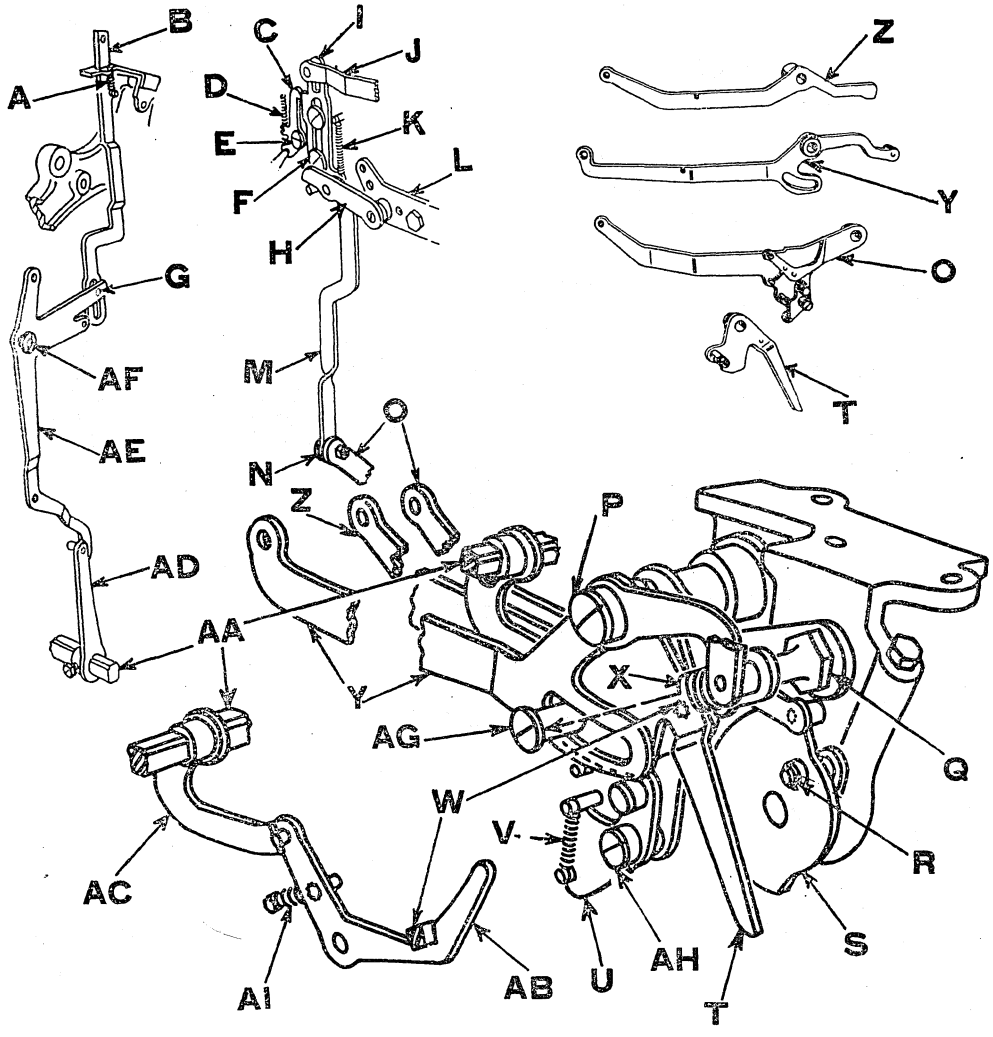
When connecting links AI (Plate 37), and link of J (Plate 38) be sure that stud in part G (Plate 37) is in top of slot in R (Plate 38).

Note: Screws AS (Plate 37) are eccentric which, when turned, compensate the variation when the M.R.C. unit is swung either way for adjusting purposes.

When screws AS are turned, the studs in G (Plate 37) should not be below the top of the slot in R (Plate 38).

Connect arm A (Plate 43) to part AK (Plate 43) with eccentric screw AJ. Adjust screw AJ to hold detents AO clear of segment AW when the machine is in normal position with the rear arm of lever A on the high portion of cam AX.

MULTIPLE SKIP—RETURN MECHANISM, RETURN KEY CONTROLLED (Plate 44)



Multiple Skip—Return Mechanism, Return Key Controlled (Plate 44)

The purpose of this mechanism is to secure light depression of the carriage return key which is accomplished by a power spring placed under tension by the drive mechanism.

Sequence and Construction

When return key B (Plate 44) is depressed, levers AD and AE rock shaft AA. Arm AC (on shaft AA) swings latch AB to release stud W (in driver T) which allows power spring X to swing driver T upward; the latter contacting on the stud in passby pawl U pushes arm O downward, which through link M and lever H pulls slide I and lever J downward; slide I is latched by latch C.

Lever J indexes the carriage return mechanism, arm O pivots on spring stud Q, the latter is held by the drive housing. Cam S is the same as cam AX shown on Plate 43. Arm Y performs the same functions as arm A, also shown on Plate 43. The changed design is required for clearing power spring X. Arm Z is shown as arm F on Plate 49. Power spring X is reset by cam S, roller R contacting on driver T, the latter is latched by part AB over square stud W.

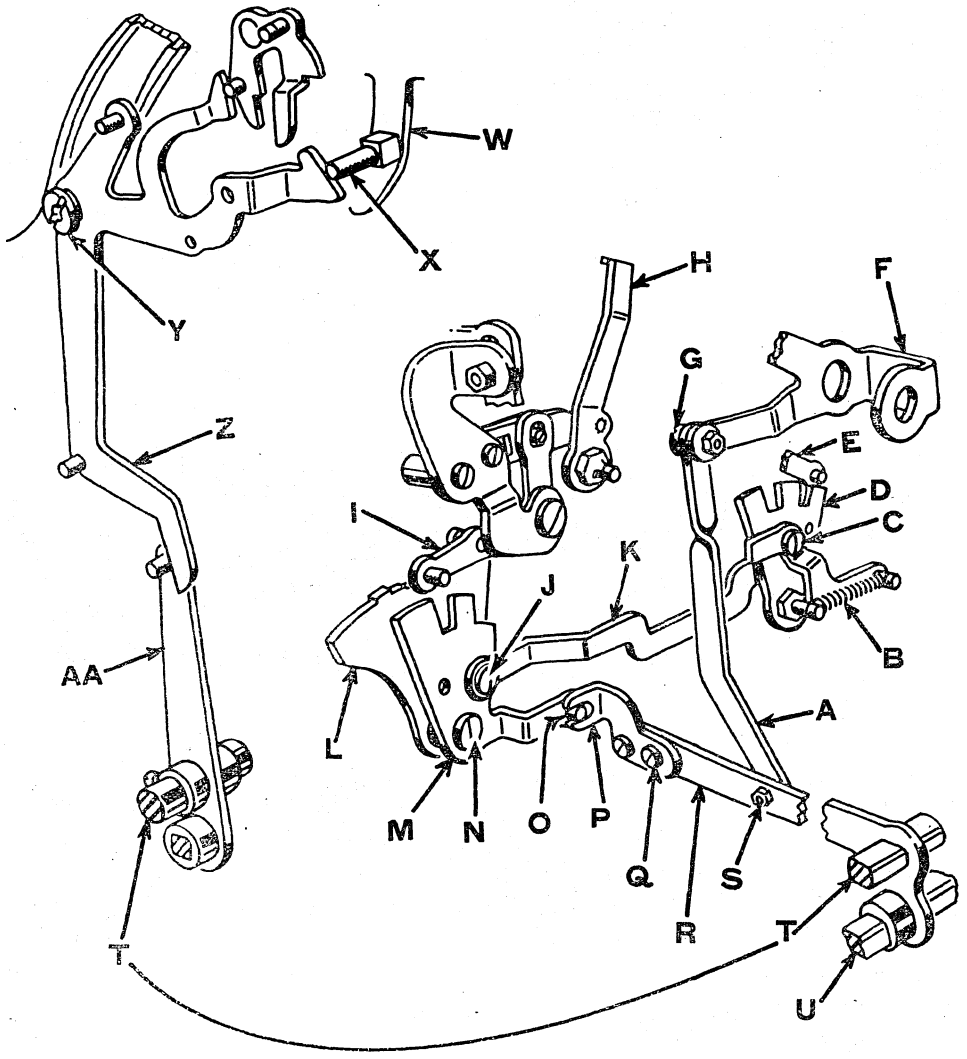
Tests and Adjustments

Slide I should have lead over latch C when it is being pulled downward.

Adjustment: Eccentric screw N is turned.

Driver T should latch under square stud W with lead. This is a Factory adjustment which should not require attention.

MULTIPLE SKIP—RETURN MECHANISM NORMALIZED FROM TOTAL KEYS AND/OR CARRIAGE CONTROL (Plate 45)



Multiple Skip—Return Mechanism Normalized from Total Keys and/or Carriage Control (Plate 45)

The purpose of this mechanism is to provide maximum combinations by normalizing skip or return positions or both.

Auxiliary segments M and D having high projections to block bell-cranks I and E, prevent indexing skip and return selection arms H. Slots in segments M and D provide operation of skip and return by permitting bell-cranks I and E to function. Skip can be operative while return is blocked and vice versa.

When total keys are depressed stud X in link W rocks part Z, which rocks shaft U through arm AA. Arm R carried by shaft U and pivoting on shaft T rocks segments M and D, the latter being joined by link K.

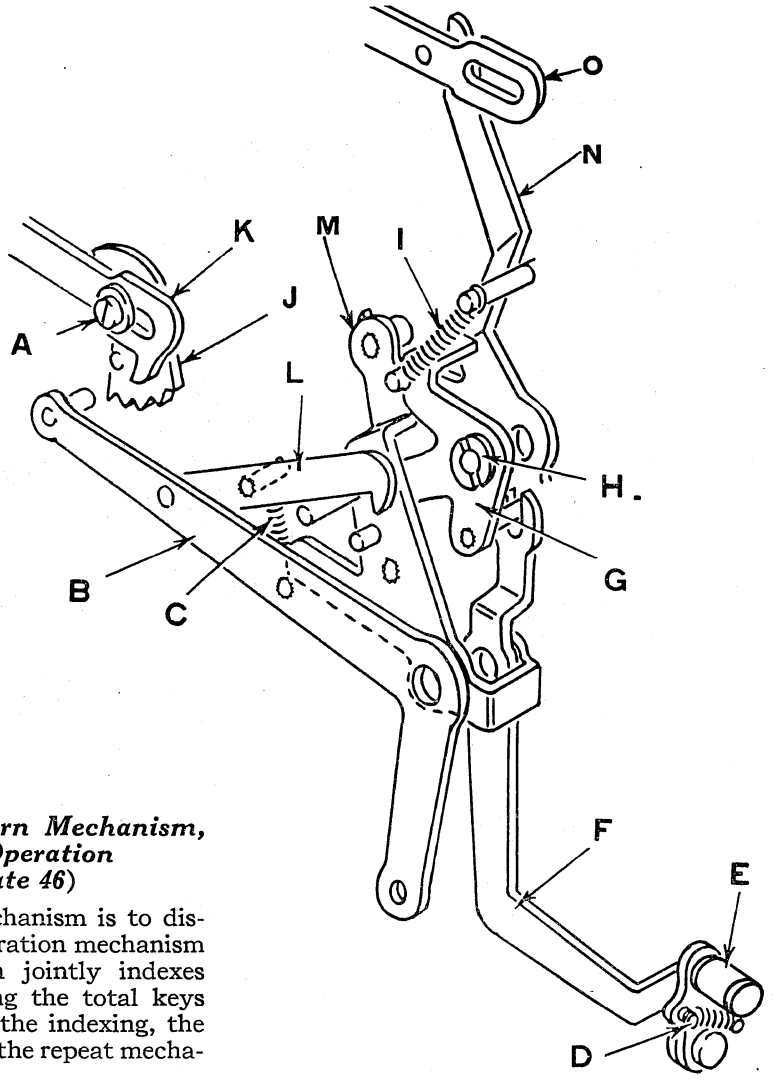
Carriage control is accomplished through roll control of lever F, connected to arm R by link A.

Tests and Adjustments

The projection of segments M and D are aligned with the studs in I and E by turning eccentrics S and G for carriage control.

Part Z is bent to align the projections of segments M and D for total control.

MULTIPLE SKIP—RETURN MECHANISM, REPEAT MACHINE OPERATION NORMALIZER (Plate 46)



Multiple Skip and Return Mechanism, Repeat Machine Operation Normalizer (Plate 46)

The purpose of this mechanism is to disable the repeat machine operation mechanism when the carriage position jointly indexes this mechanism. Depressing the total keys or operating bars complete the indexing, the machine operation disabling the repeat mechanism.

Sequence

When the carriage moves a skid on E (Plate 46), lever F swings part G downward, which allows spring C to pull hook L over the stud in part M. During the machine operation, part K through index plate J swings part B, which moves repeat slide O rearward through parts M and N.

Tests and Adjustments

When the carriage moves a skid on assembly E, hook L should have minimum play on the stud in part M.

Adjust hook L to clear upper stud in M by bending control G for earlier or later limit on side frame.

Place carriage in a Repeat Nor. Carriage Controlled position; hook L should have full hold on stud in M; adjustment from control arm.

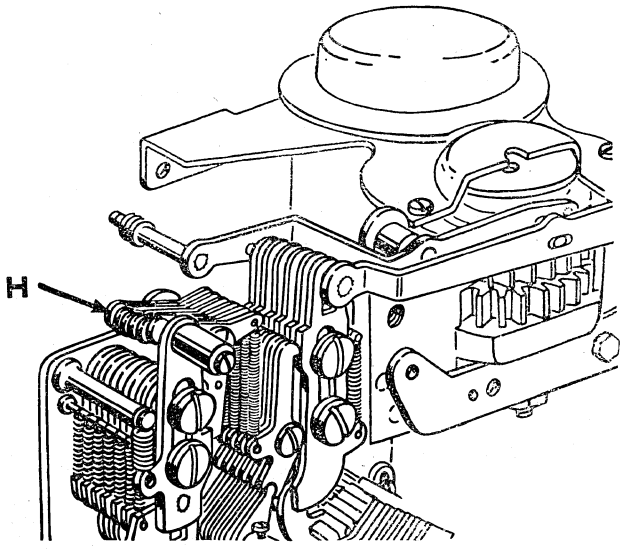
Take up excess play between hook L, and stud in M by bending lower arm of M which serves as limit for arm B.

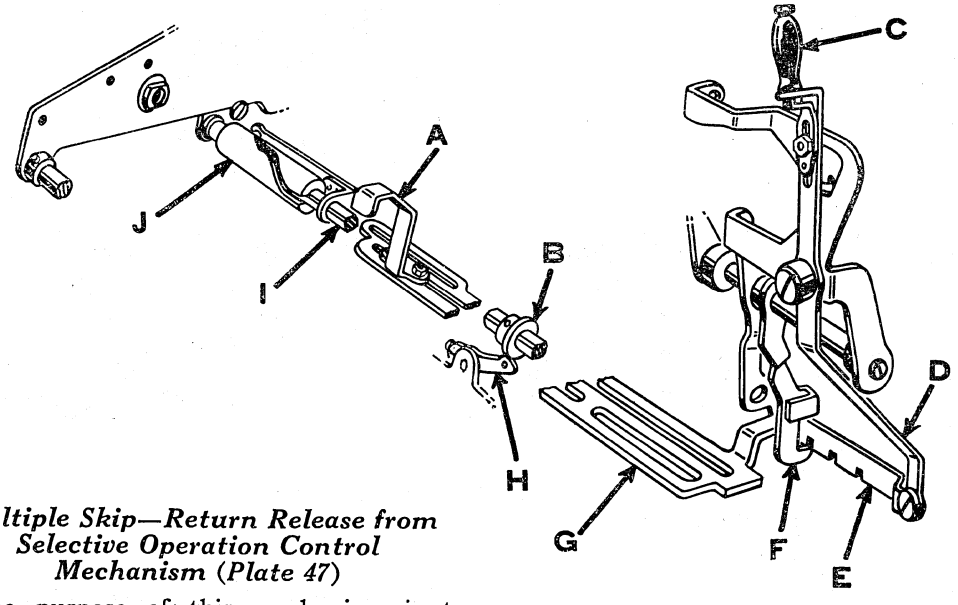
Stud in M should contact N and hold B just clear of J; adjustment from offset in M.

Locate limit against M to prevent upward movement of B above segment J.

Remove stock from segment J where contact is made with stud in arm B from motor bars not indexing Repeat Nor. Carriage Controlled Feature.

MULTIPLE SKIP—RETURN RELEASE FROM SELECTIVE OPERATION CONTROL MECHANISM (Plate 47)





Multiple Skip—Return Release from Selective Operation Control Mechanism (Plate 47)

The purpose of this mechanism is to provide several combinations for releasing skip setups. When lever C is shifted to one of three positions, arm A (carried by slide G) moving in the cam slot of drum J, turns shaft I, which indexes disk cams B to contact on selected latches H.

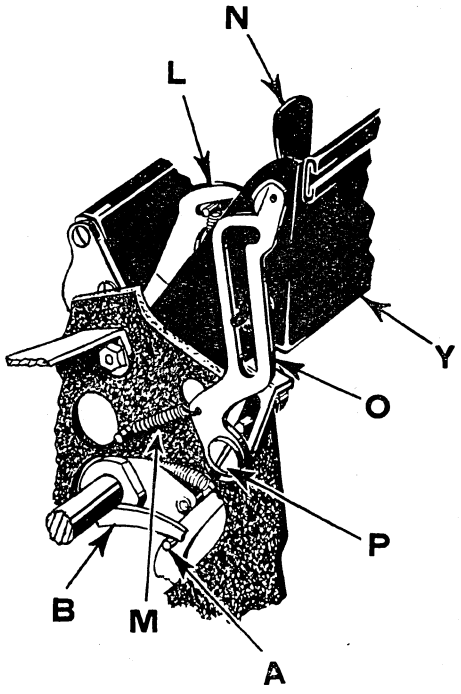
Selective operation control feature covered in detail under Plate 54.

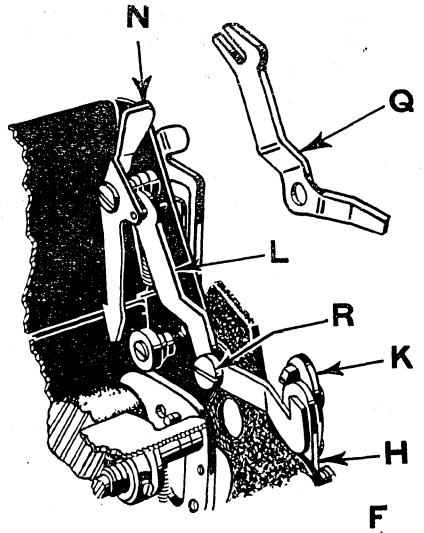
Multiple Skip—Return Mechanism to Open Pressure Rolls (Plate 48)

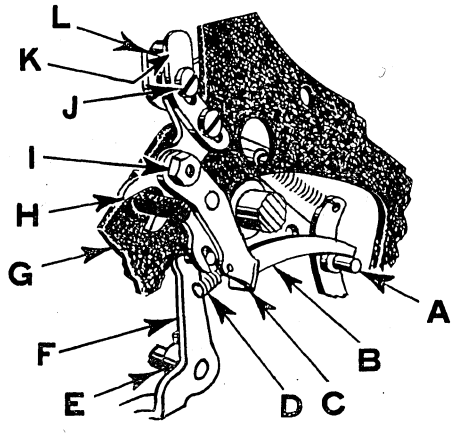
This mechanism opens the pressure rolls when the carriage is opened, through part B blocking pressure roll shaft A. There are two styles of part B, B-1 not shown which blocks shaft A when no roll is used on latches S or T, and the other style B which is indexed to block shaft A when a control roll indexes either latches S or T, this style is illustrated.

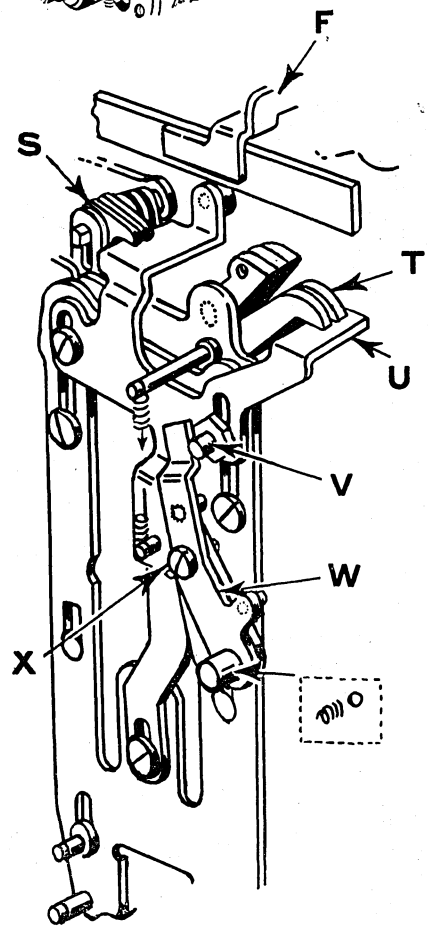
When a control roll depresses latches S or T, part U is moved downward, which allows bail F to swing part B downward to block shaft A, causing the platen to move away from the pressure rolls when the carriage is opened.

MULTIPLE SKIP—RETURN MECHANISM TO OPEN PRESSURE ROLLS (Plate 48)









Aligning Bail N Control

When the pressure rolls are opened, aligning bail N remains normal. However, when no roll contacts on latches S and T, then lever L is blocked by the stud in part K, which causes the carriage opening movement to swing and latch bail N in aligning position.

There are two styles, lever L and lever Q. Q is used when the pressure rolls are opened without rolls on S or T. Part O is used in carriages having pressure roll opening mechanism to limit the backward movement of table Y.

(Plate 48)—Continued
Tests and Adjustments

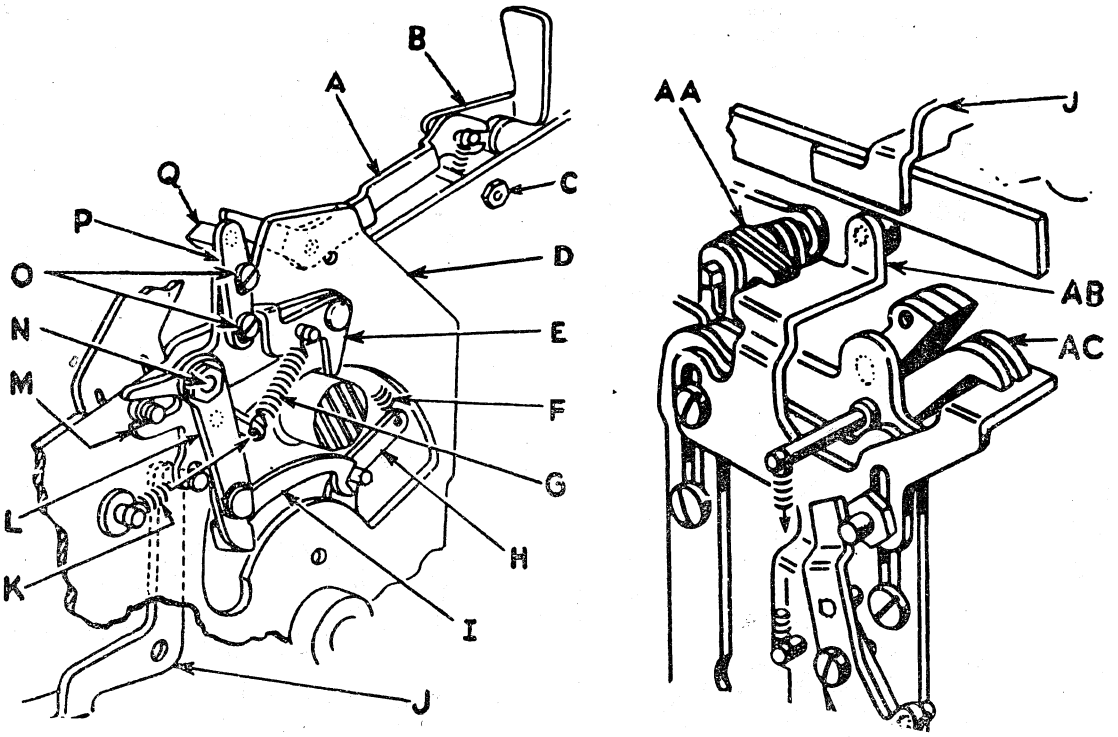
Aligning bail N is adjusted first for 1/6" spacing and released when the carriage closes; after that, slotted part K is located for the necessary amount of movement to latch aligning bail N.

When a control roll indexes B, it should align correctly to block A.

Adjustment: The arm of B is bent. The same test is applied to part B-1 (not shown).

Aligning bail N adjusting covered by instructions under Plate 29.

PRESSURE ROLL OPENING MECHANISM DISABLED, CARRIAGE CONTROLLED, CLASSES 20-30 (Plate 48-1)



Pressure Roll Opening Mechanism Disabled, Carriage Controlled, Classes 20-30 (Plate 48-1)

The purpose of this mechanism is to select non-pressure roll opening when latches AA or latches AC are indexed through carriage control.

When latches AA, or latches AC are indexed, slide AB moving downward, allows bail J to rock assembly M which contacts stud in L, rocking the latter to swing arm I below the stud in pressure roll assembly H thereby disabling the pressure roll opening mechanism.

The movement of assembly M also locates square stud Q in the range of part A which causes the carriage opening movement to swing and latch aligning bail B in aligning position. When the carriage closes, passby pawl E contacts platen shaft which moves Q to clear A to allow the release of the aligning bail on the right side as explained in Plate 29, carriage instruction book.

Tests and Adjustments

When latches AA or AC are not indexed, arm I is normally indexed to open the pressure rolls when the carriage is opened. With I normal, there should be no play between bail J and slide AB.

Adjustment: Play is reduced by bending slide AB upward.

Passby pawl E to pass over platen shaft when the carriage opens.

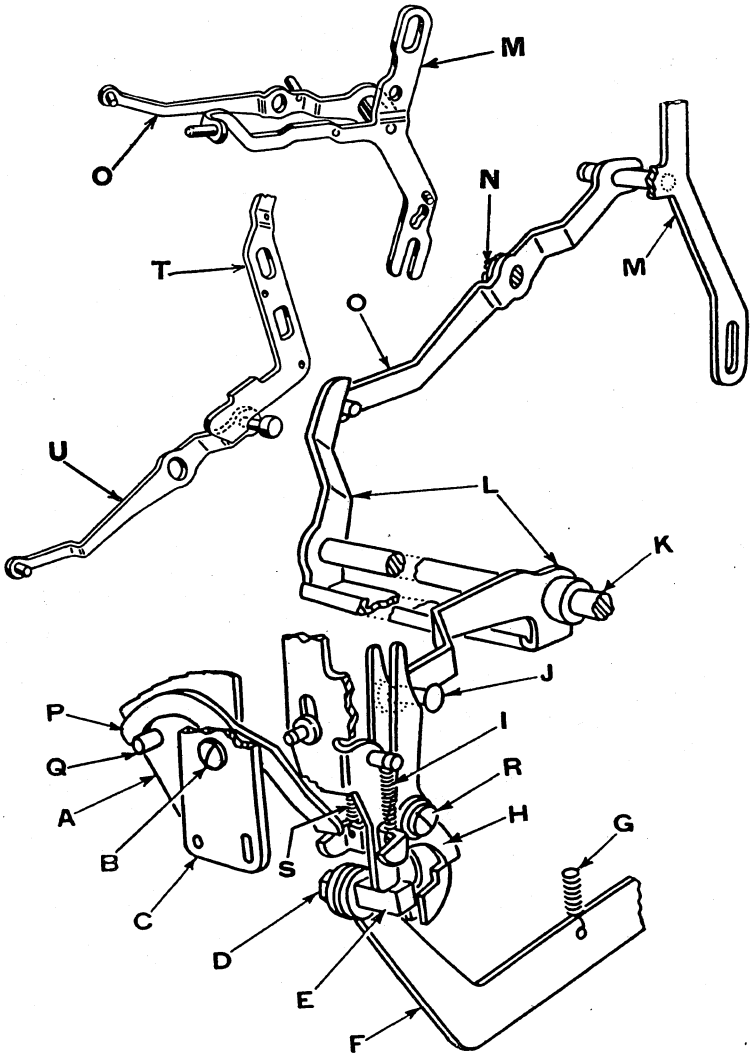
Adjust lower prong of part M.

When the carriage is closed manually arm I should have full hold on stud in H.

Adjustment: Arm I is bent.

The correct movement of aligning bail B is secured by loosening screws O, and moving arm P to locate stud Q as required.

MULTIPLE SKIP NORMALIZING KEY (Plate 49)



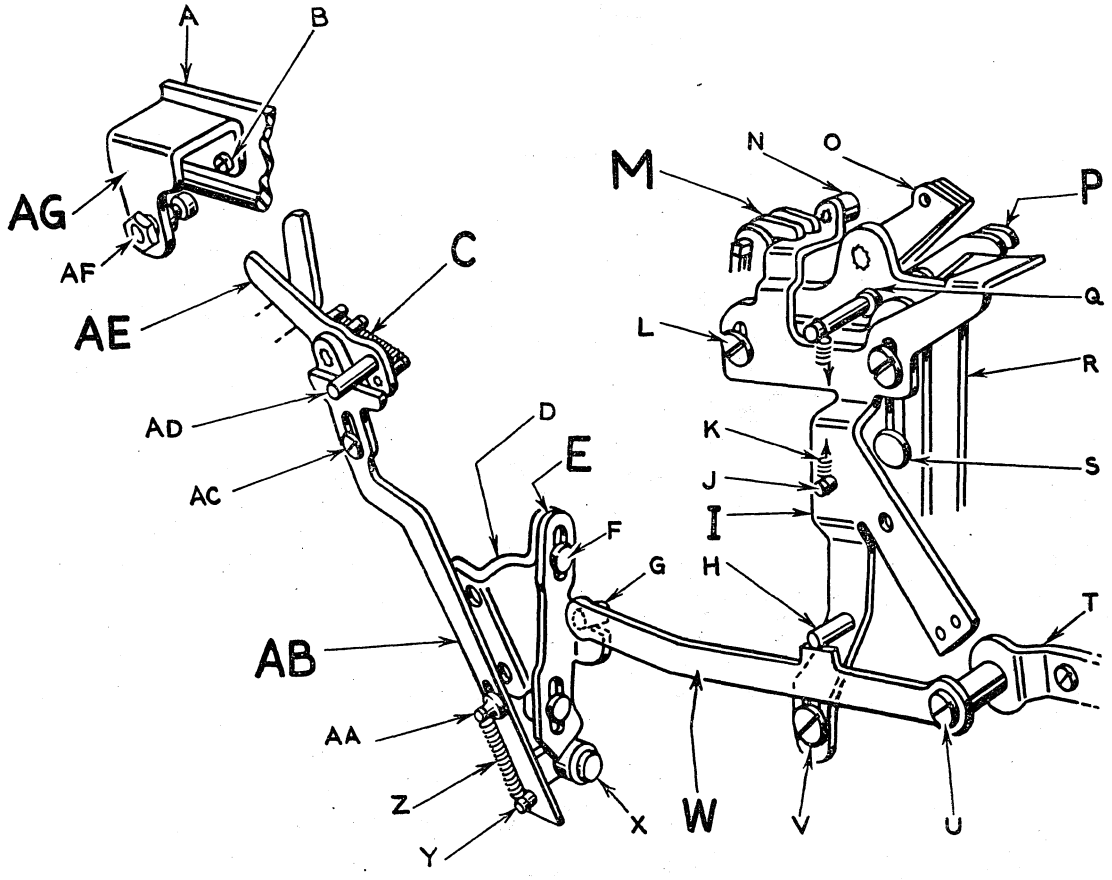
Normalizing Key M (Plate 49)

When key M is depressed and latched, lever O rocks bail L, locating stud J below the incline of latch H, which prevents spring I pulling latch under stud E.

Tests and Adjustments

When key M is released, stud J should clear latch H sufficiently to allow spring I to pull latch H under square stud E.

MULTIPLE SKIP—CARRIAGE OPENING FROM RETURN MECHANISM (Plate 50)



Multiple Skip—Carriage Opening from Return Mechanism (Plate 50)

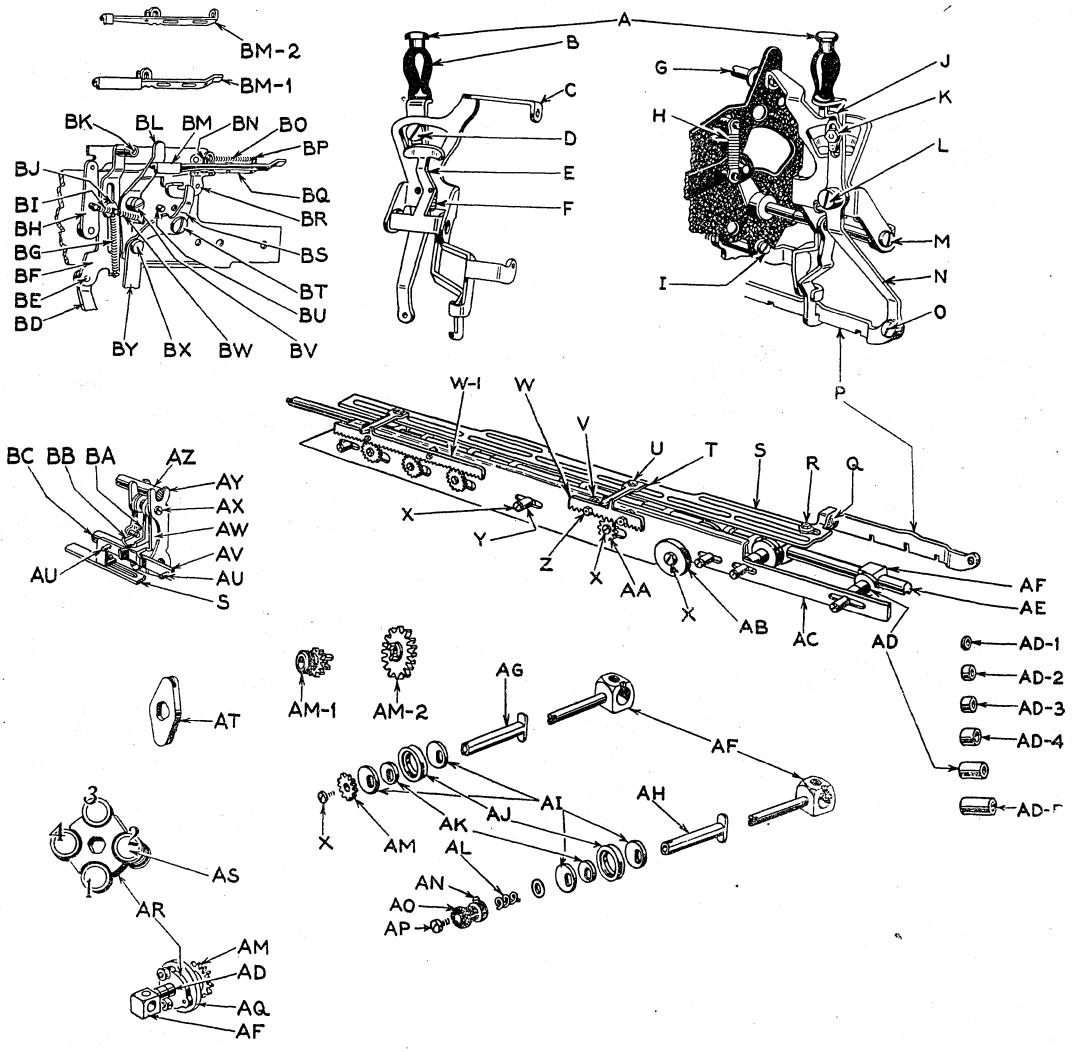
The purpose of this mechanism is to have the carriage open only when the multiple skip and return mechanism is actuated; when the latter is inactive, the carriage opening mechanism is disabled.

When the multiple skip and return mechanism is indexed, latches P or M depress vertical slide I, the latter swings lever W downward which lowers cam slide E.

The spear point of E lowers link AB which allows spring C to swing arm AE in vertical position, which locates AE in the path of trip assembly AG. When the carriage tabulates, AG contacts on AE releasing the carriage opening mechanism.

SELECTIVE OPERATION CONTROL FEATURE (Plate 54)

(Plates 51 thru 53 in Symbol Book only)



Selective Operation Control Feature Two, Three and Four Position (Plate 54)

This mechanism provides two, three and four combinations of control rolls through shifting the control lever.

Normally, control lever N is locked by the foot of E seating in one of the notches in link P. To release lever N, button A is depressed, which through a cam swings E to clear P, permitting lever N to be swung to the various positions. The movement of lever N through link P moves slide S which carries and moves racks W and W-1 to turn pinions AM which turn sleeve AG and eccentric disks AI and AK to secure contact or non-contact on the levers in the back plate.

Rolls consist of rings AJ which are raised and lowered through eccentric disks AI and

(Plate 54)—Continued

AK. One thick disk AK is located in the center, and two thin disks AI are located in the recesses of ring AJ. Eccentric Disks AJ and AI are held non-turnable by flat surfaces on sleeve AG.

3 and 4 Way Selection

Assembly AR is used for selecting automatic totals and automatic sub-totals.

Lever N in position No. 1 has No. 1 roll effect twin rolls, indexing automatic total and crossfooter non-add for repeat on sub-total.

Lever N in position No. 2, has No. 2 roll effect single roller indexing automatic total for repeat off total.

Lever N in position No. 3, has No. 3 roll effect twin rolls indexing automatic total and crossfooter non-add for repeat on sub-total.

Lever N in position No. 4, has No. 4 roll effect single roll indexing automatic total for repeat off total.

The carriage return mechanism is indexed by studs AU and part AV contacting cam AW which through spring BA, pulls part BB in the path of the projection on slide BM. When the carriage tabulates into the total column, part BB locates arm BR in line with lever BS. Studs AU are located in part AV according to the form used.

During the total operation, lever BS pulls slide BQ to trip the M.R.C. clutch. Non-printing is accomplished by part AT having two blocking positions.

Adjustable Rolls

Adjustable rolls are manually controlled to contact or non-contact on back plate levers by withdrawing and turning button AO. Eccentric disks AI and AK and rings AJ are the same as used in gear control.

Sleeve AH differs having holes for anchoring screw AN of button AO. For adjustable rolls, Class 4 and 41 machines special sleeves AH and posts AF are required.

CARRIAGE CONTROL OF AUTOMATIC TOTAL AND REPEAT OF MACHINE OPERATION (Plate 54-1)

FIG. 1

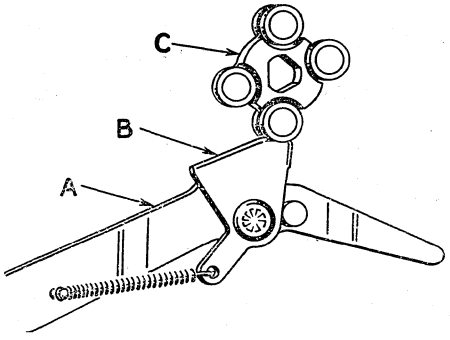
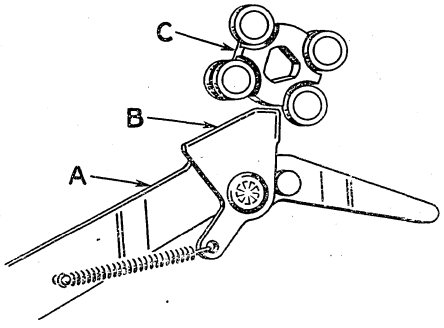


FIG. 2



Carriage Control of Automatic Total and Repeat of Machine Operation (Plate 54-1)

When the carriage tabulates into the first total position, with lever N (Plate 54) set in position No. 1 or 3, the outside roll of the double rolls (in assembly C) locates on cam B (Fig. 1), lowering lever A which indexes the Automatic Total Mechanism, Lever A, being thus held in a lowered position during the total operation, indexes the Repeat Mechanism. The inside roll lowers the crossfooter non-add cam, causing the machine to sub-total.

With lever N (Plate 54) set in position No. 2 or 4, the single rolls in assembly C become active. Due to the design of assembly C, the single rolls, when active, are positioned further to the left (than the double rolls), and ride over and beyond cam B (Fig. 2) when the carriage tabulates into the total position, permitting lever A to restore to normal. Lever A is not held depressed, and the Repeat Mechanism is not indexed during the total operation.

When the repeat operation is not required in a sub-total position, the outside roll of the double roll in assembly C is removed; and, a No. 3 roll is installed (to index the Automatic Total Mechanism) on a hanger just ahead of the total position.

SELECTIVE OPERATION CONTROL

Combinations

Roll Effect	0-5-5 AK No. 11	(1 reqd.)	5-0-5 AJ No. 11	(1 reqd.)	5-5-0 AI No. 11	(2 reqd.)
Roll Effect	0-0-5 AK No. 12	0-5-0 AJ No. 12	5-0-0 AI No. 12			
Roll Effect	0-3-3 AK No. 13	3-0-3 AJ No. 13	3-3-0 AI No. 13			
Roll Effect	0-1-1 AK No. 14	1-0-1 AJ No. 14	1-1-0 AI No. 14			
Roll Effect	0-5-3 AK No. 15	0-3-5 AJ No. 15	5-3-0 AI No. 15	3-5-0	3-0-5	5-0-3*
Roll Effect	0-5-1 AK No. 16	0-1-5 AJ No. 16	5-0-1 AI No. 16	5-1-0	1-5-0	1-0-5*
Roll Effect	0-1-3 AK No. 17	0-3-1 AJ No. 17	3-0-1 AI No. 17	3-1-0	1-0-3	1-3-0*
Roll Effect	5-3-1 AK No. 18	5-1-3 AJ No. 18	3-1-5 AI No. 18	3-5-1	1-5-3	1-3-5*
Roll Effect	5-5-1 AK No. 19	5-1-5 AJ No. 19	1-5-5 AI No. 19			
Roll Effect	3-1-1 AK No. 20	1-3-1 AJ No. 20	1-1-3 AI No. 20	5-3-3 AK No. 20	3-5-3 AJ No. 19	3-3-5 AI No. 20
Roll Effect	5-1-1 AK No. 21	1-5-1 AJ No. 21	1-1-5 AI No. 21			
Roll Effect	5-5-3 AK No. 22	5-3-5 AJ No. 22	3-5-5 AI No. 22	3-3-1 AK No. 22	3-1-3 AJ No. 21	1-3-3 AI No. 22

*The additional combinations are secured by sliding the roll assembly off the sleeve, giving the roll assembly 1/3 turn and sliding it back on the sleeve.

2 Position Combinations

Roll Effect	1-0 AK No. 2	(1 reqd.)	AJ No. 2	(1 reqd.)	AI No. 2	(2 reqd.)
Roll Effect	1-3 AK No. 5		AJ No. 10		AI No. 5	
Roll Effect	1-5 AK No. 9		AJ No. 9		AI No. 9	
Roll Effect	3-0 AK No. 7		AJ No. 7		AI No. 7	
Roll Effect	5-0 AK No. 3		AJ No. 3		AI No. 10	
Roll Effect	3-5 AK No. 5		AJ No. 5		AI No. 5	

D MULTIPLE SKIP AND RETURN UNIT—IMPROVED —CLASSES 20-30 (Plate 54-2)

ple Skip and Return —Classes 20-30 e 54-2)

pose

g of the carriage during nd to provide a positive ne Multiple Skip and carriage.

stment

sitioning of the Multiple t, the following condi-

ave a secure mesh with, 10″ play in rack P at ravel.

n the lock nut (AH, ruction Book) and turn crease or in to decrease

y variation between the ities of carriage travel ng one of the following ehind the ***right-hand***

1	(.006)
	(.015)
217	(.025)
	(.031)

be square with rack P. hould have equal clear- l flat surface M.

the bolts (AG and Y, ruction Book) and uni- ift the unit.

ge closed and centrally ise discs K should have clearance over flat sur-

screw BK and raise or

ig, use kit 124¾ gauge d .050″ "no go" limits. s (M, Plate 37) should heir respective slots in

screw BK and universal e unit.

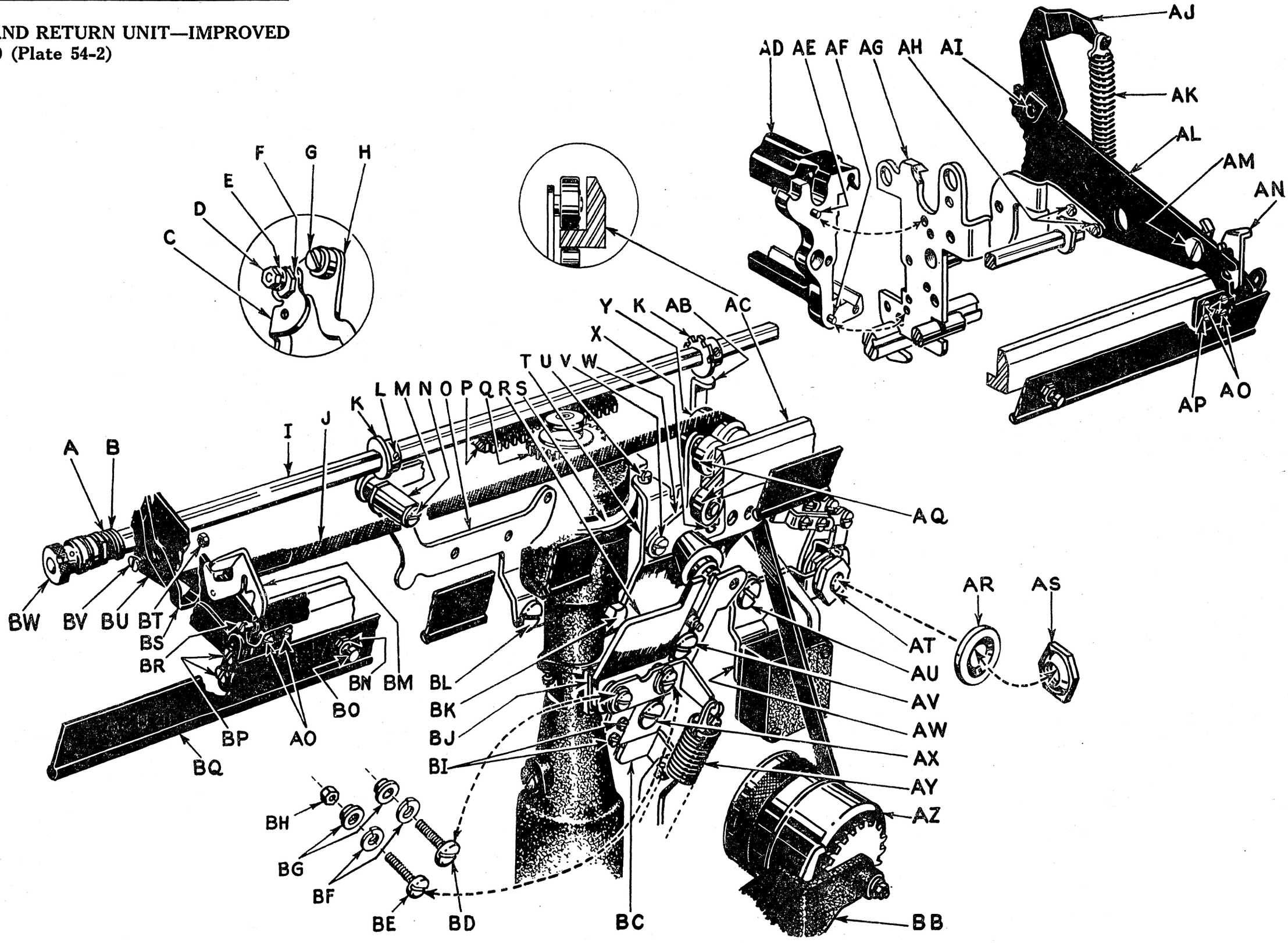
ge closed and located in ower roller AQ should rail AC.

centric screw X.

screw X is turned, re- 3.

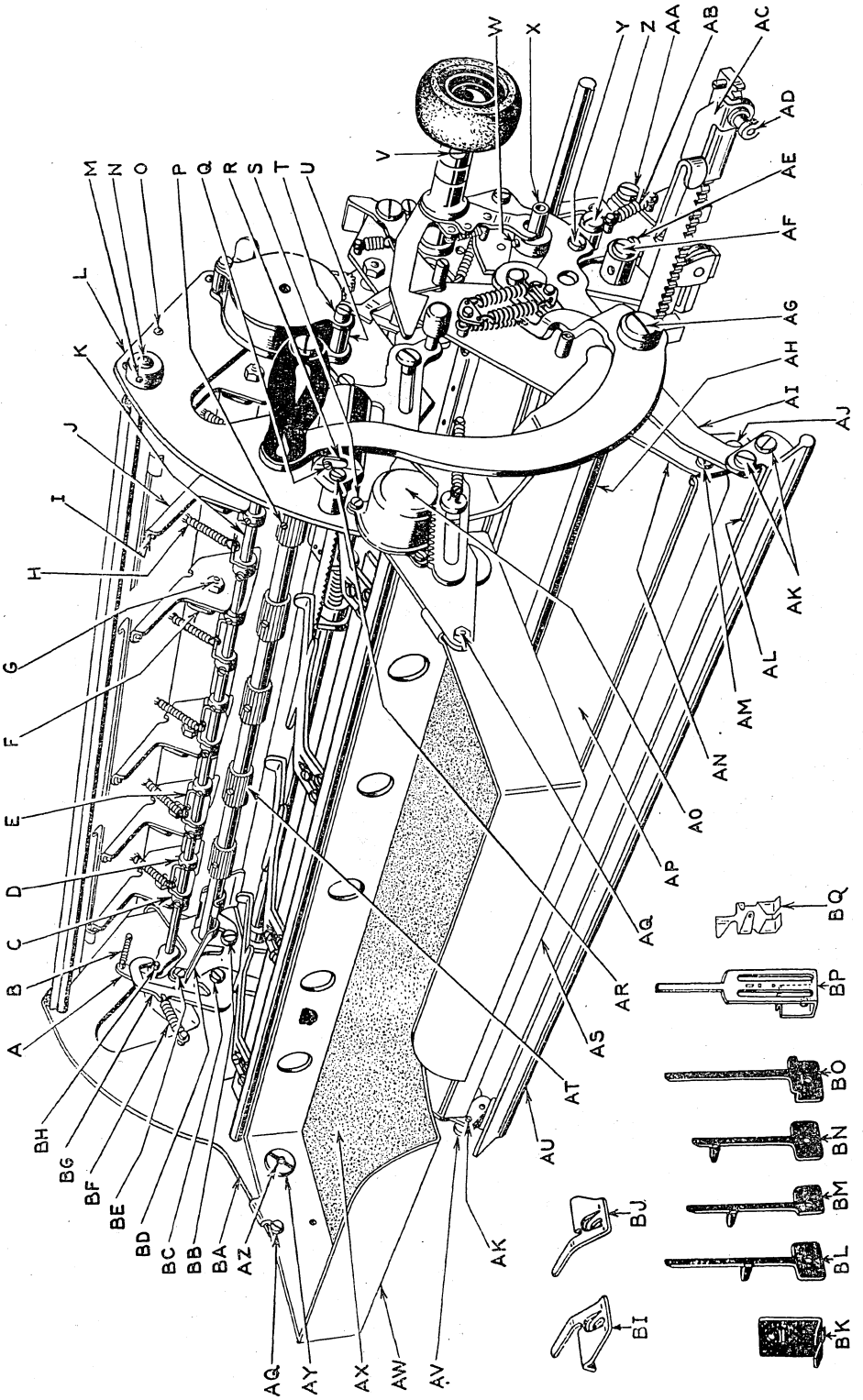
should clear the verti- by .010″ at all points

crew U and shift part T.

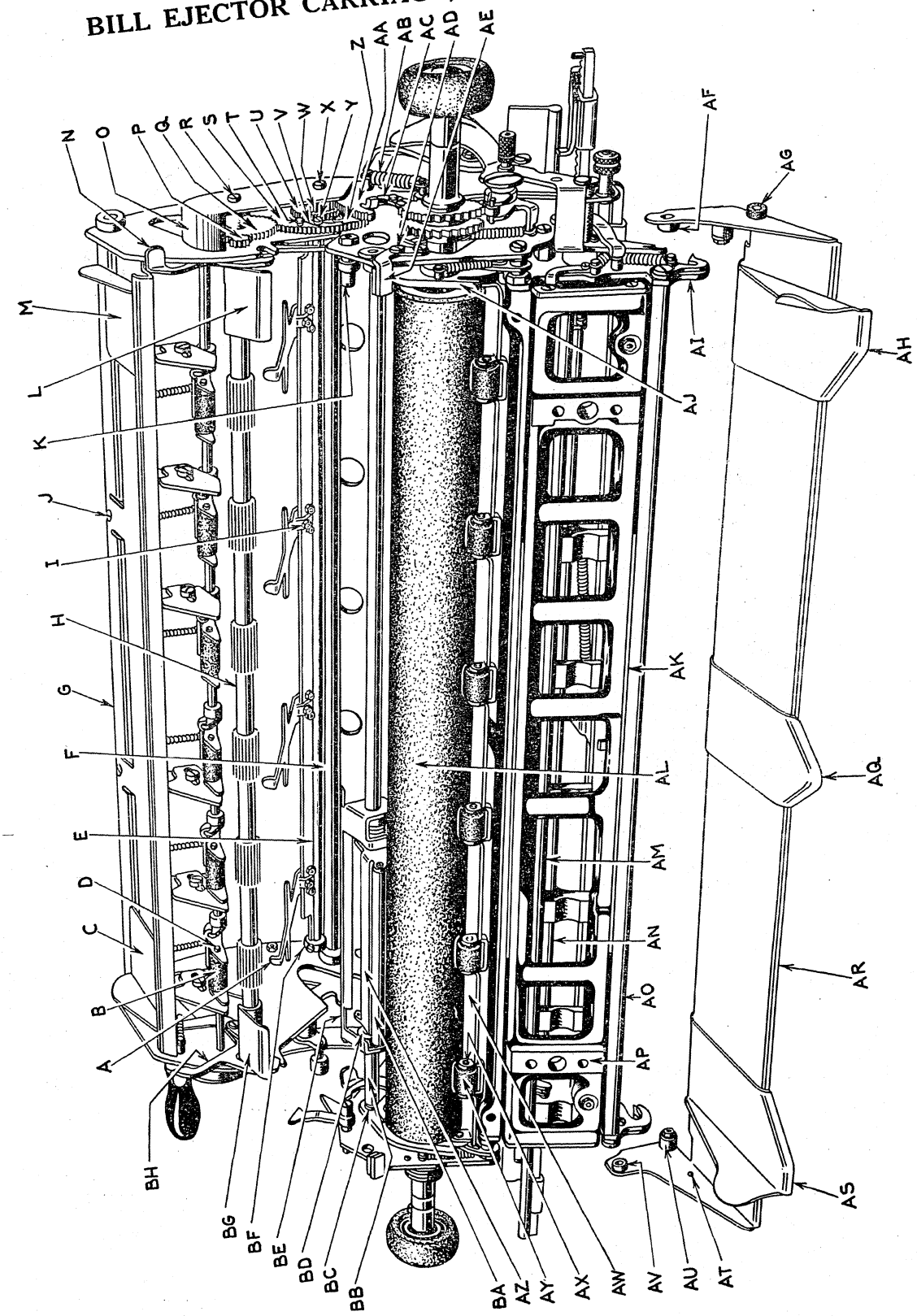


(For Form 3753)

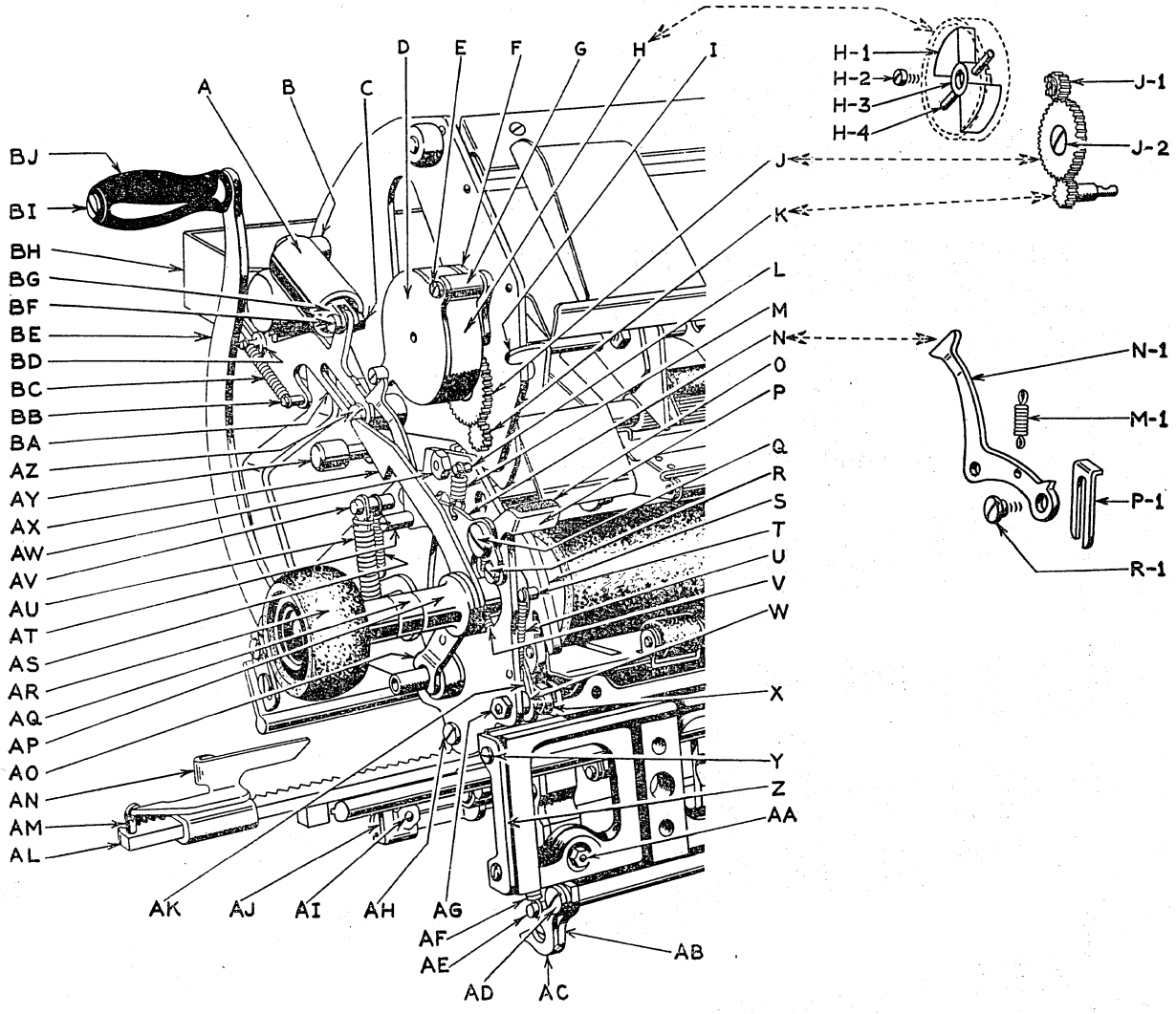
BILL EJECTOR CARRIAGE, AUTOMATIC (Plate 55)



BILL EJECTOR CARRIAGE, AUTOMATIC (Plate 56)



BILL EJECTOR CARRIAGE, AUTOMATIC (Plate 57)



Bill Ejector Carriage
(Plates 55, 56, 57, 59, 60, 61)

This mechanism is actuated by the carriage opening and closing mechanism. The carriage is opened and closed by machine operation.

The carriage can be manually held open by a special handle located on the left side.

When the carriage starts to open, the upward swinging of the platen places the bill into the space between the feed rolls.

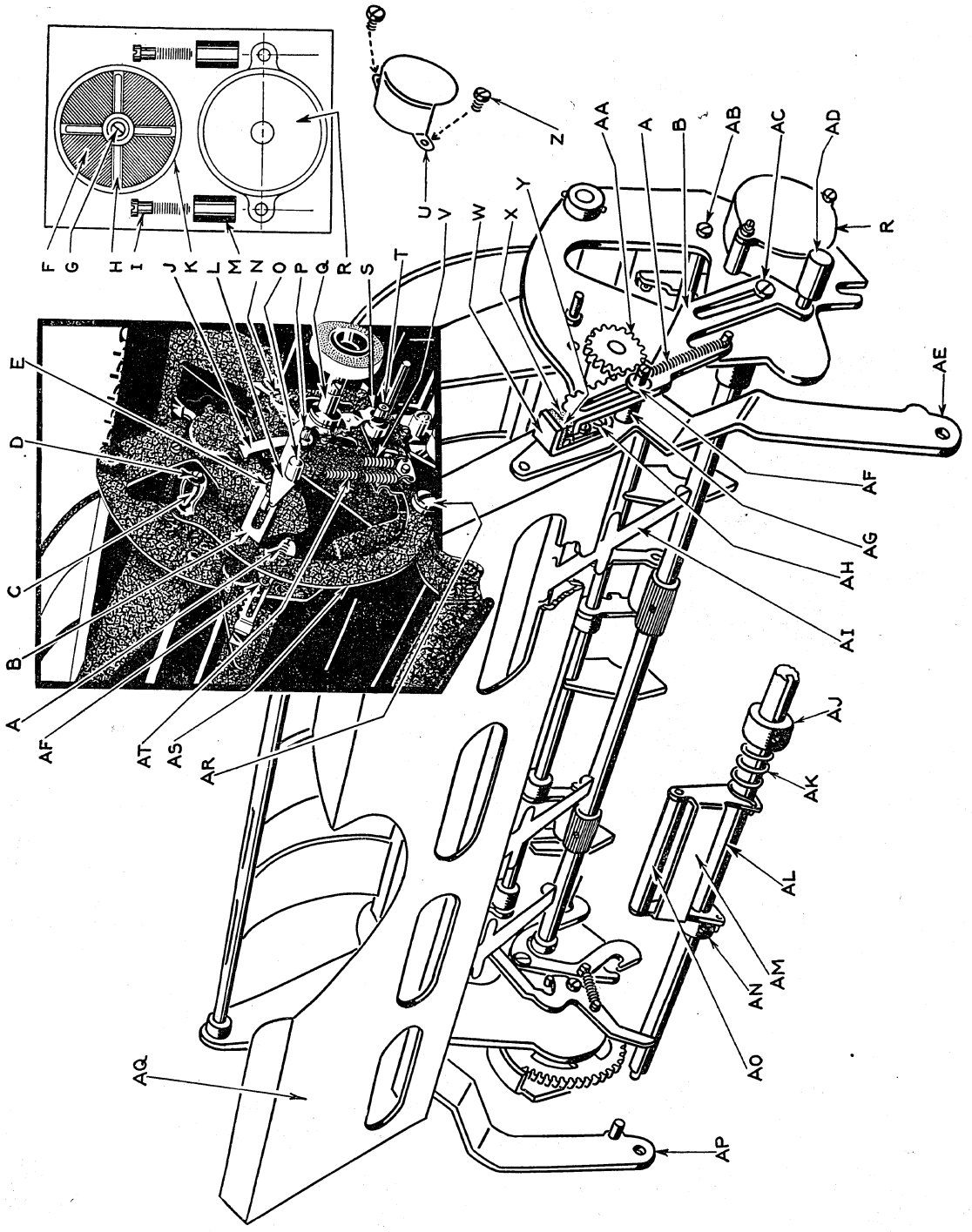
The further opening of the carriage causes the feed rolls to come together holding the bill.

Before the completion of the carriage opening, the lower pressure roll is rotated by the segment and gears which feeds and places the bill on the tines.

When the next bill is dropped in place and the motor bar is depressed, the closing of the carriage places the bill in the bill box.

BILL EJECTOR CARRIAGE, AUTOMATIC (Plate 59)

(Plate 58 in Symbol Book only)



Sequence and Construction

When the carriage opens the bill enters into and passes through the space between pressure rolls I and J (Plate 60). When shaft M contacts on and rocks part Q to clear stud A of shaft assembly G, spring E pulls pressure roll I to contact on pressure roll J.

Stud H (Plate 61) gradually swings latch G to release segment A, which permits spring B to pull segment A which revolves gear R, ratchet T, gear U, pawl N, gear W and gear Z on shaft M (Plate 60). The revolving pressure rolls feed the bill laying it on tines AI (Plate 59).

When the next bill is dropped in place and the motor bar is depressed, the carriage closes which causes tines AI to turn over placing the bill face down on the shelf of box AQ (Plate 59).

The bill ejecting mechanism is assembled as a unit which pivots on shoulder screws E (Plate 61) in the unit side plates. The front of the bill ejecting unit is held by latches.

The bill ejecting mechanism can be readily swung back to make the carriage accessible for sheet insertion.

When the carriage is closing, the downward movement of the platen pulls rack B (Plate 59) downward through hook arm L which pivots on the platen shaft. Rack B turns gear AA (Plate 59) which being fastened to the shaft, carries tines AI, causing the latter to lay the bill face down in bill box.

The purpose of part N-1 (Plate 57) is to prevent hook AX (Plate 57) latching over spring stud AV (Plate 57) when the carriage is opened with the bill ejector assembly in raised position.

Stud F (Plate 61) contacting on the heel of segment A, swings the latter backward to normal position which places spring B under tension.

Injector carriages built previous to 12-1-38 have the governors illustrated on Plate 59 to control the speed of the revolving pressure rolls.

The carriages several years previous to 12-1-38 also have the air cushion shown on Plate 57. The governor and air cushion were discarded as explained under subject "Deep Ticket Box" (Plate 63).

Tests and Adjustments

Carriage opening rail AU (Plate 55) should be adjusted for minimum play with the lift roll of the carriage opening mechanism.

Adjustment: Screws AK (Plate 55) are loosened and rail AU raised or lowered.

Carriage closed, bill to pass under deflectors L and BG (Plate 56) with 1/32″ clearance.

Adjustment: Screws are loosened and deflectors swung upward or downward, rearward or forward.

The purpose of deflectors (Plate 56) is to prevent the bill striking the center of the steel pressure roll shaft.

Adjustment: Deflectors (Plate 56) are shaped as required by hand.

Pressure rolls I (Plate 60) should release before latch G (Plate 61) releases segment A.

Adjustment: Lower part of G is bent.

The spring tension of the upper feed rolls should be equalized.

Adjustment: A coil is removed to increase tension.

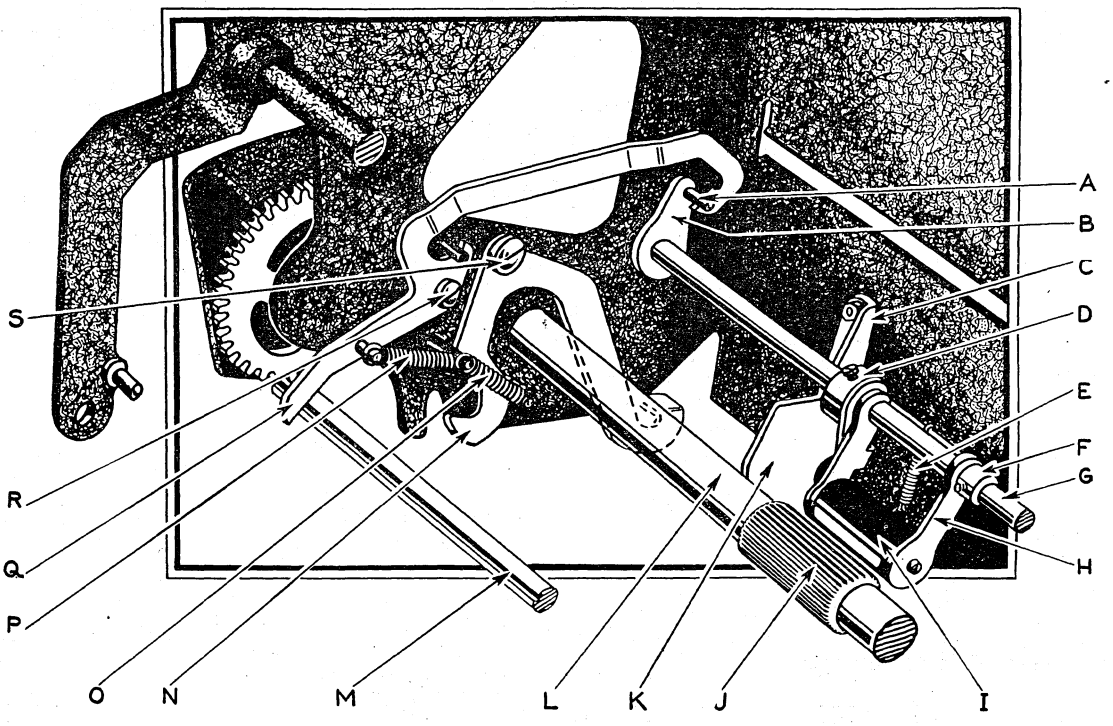
The space between pressure rolls I and J (Plate 60) should equal the thickness of an ordinary hexagon pencil.

Adjustment: Screw in collar F (Plate 60) is loosened and arm C located as required.

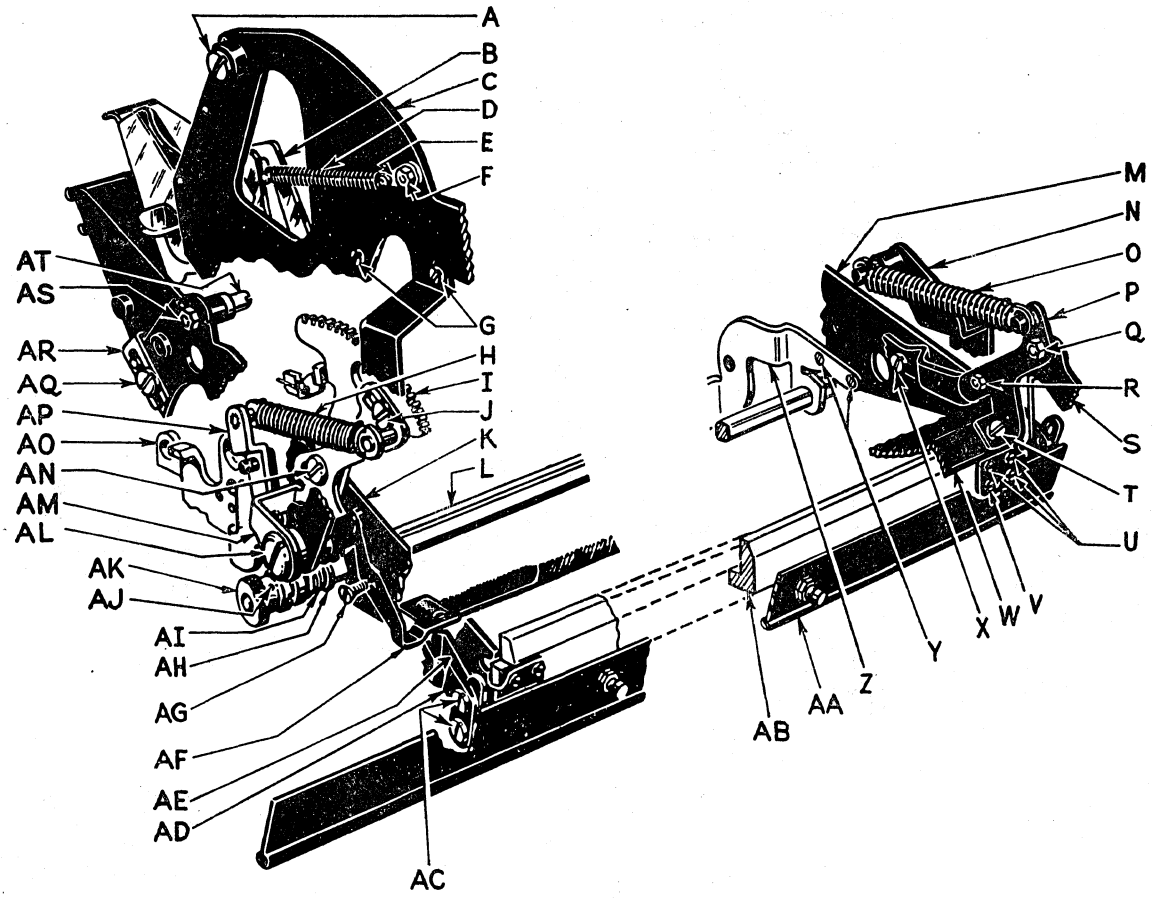
Tine A (Plate 56) assembly should have correct movement to place bill in bill box. The tine assembly is set as required by meshing gear AA (Plate 59) and rack B (Plate 59). When carriage is opened, hook AX, (Plate 57) should pass over stud AY (Plate 57) with slight lead.

Adjustment: Eccentric screw AT (Plate 57) is turned as required.

BILL EJECTOR CARRIAGE, AUTOMATIC (Plate 60)



BILL EJECTOR CARRIAGE—IMPROVED—CLASSES 20-30
(Plate 61-1)



Bill Ejector Carriage—Improved—Classes 20-30 (Plate 61-1)

Purpose

—To assure a more positive ejection of bills.

Adjustment

1. Spring D, through arm B, should open the bill ejector rolls (E, Plate 55) when the carriage is being closed.

Adjustment: If the rolls fail to open fully, replace spring D with stronger spring 12081.

2. Spring O should completely close the carriage with forms inserted.

Adjustment: If the carriage fails to close fully, replace spring O with stronger spring 1-814 Fte. 213.

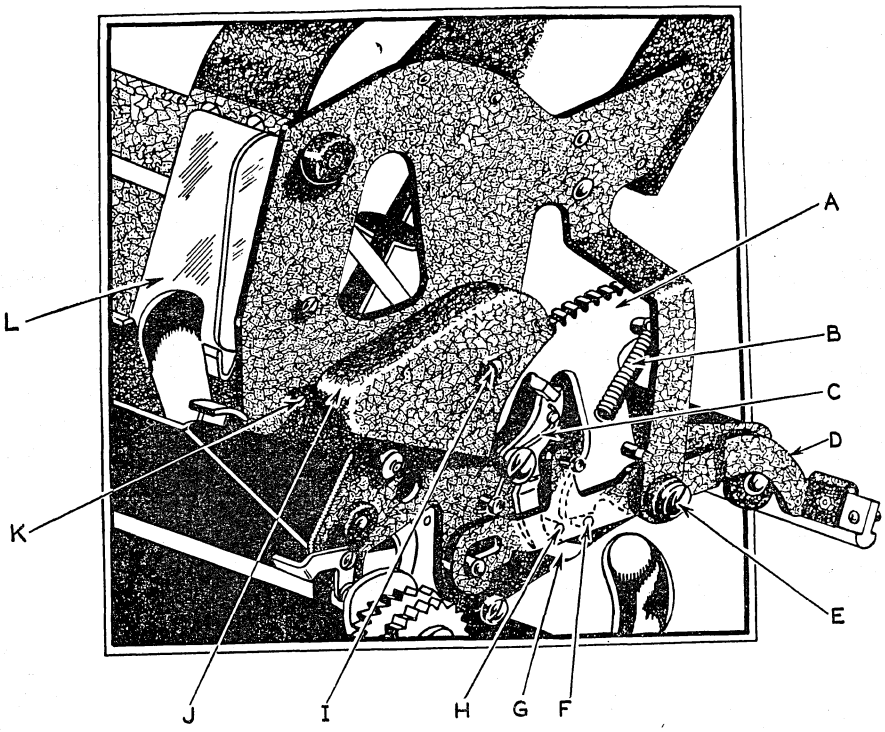
3. End plates C should lock on studs AT and should be square when normal.

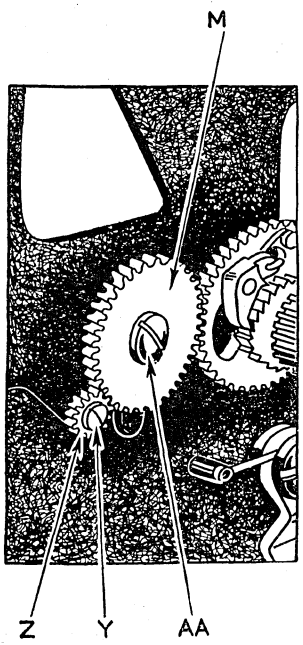
Adjustment: Align eccentric studs AT centrally with the slots in end plates C, keeping the high points of the studs upward.

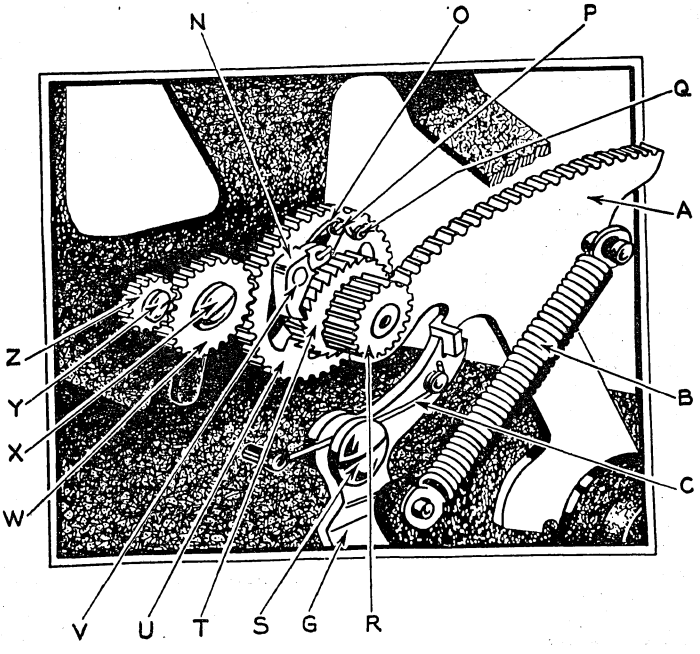
Mr M R Lovejoy
Buffalo N Y Branch 10-5

Printed in U. S. America 1-4-49

BILL EJECTOR CARRIAGE, AUTOMATIC (Plate 61)

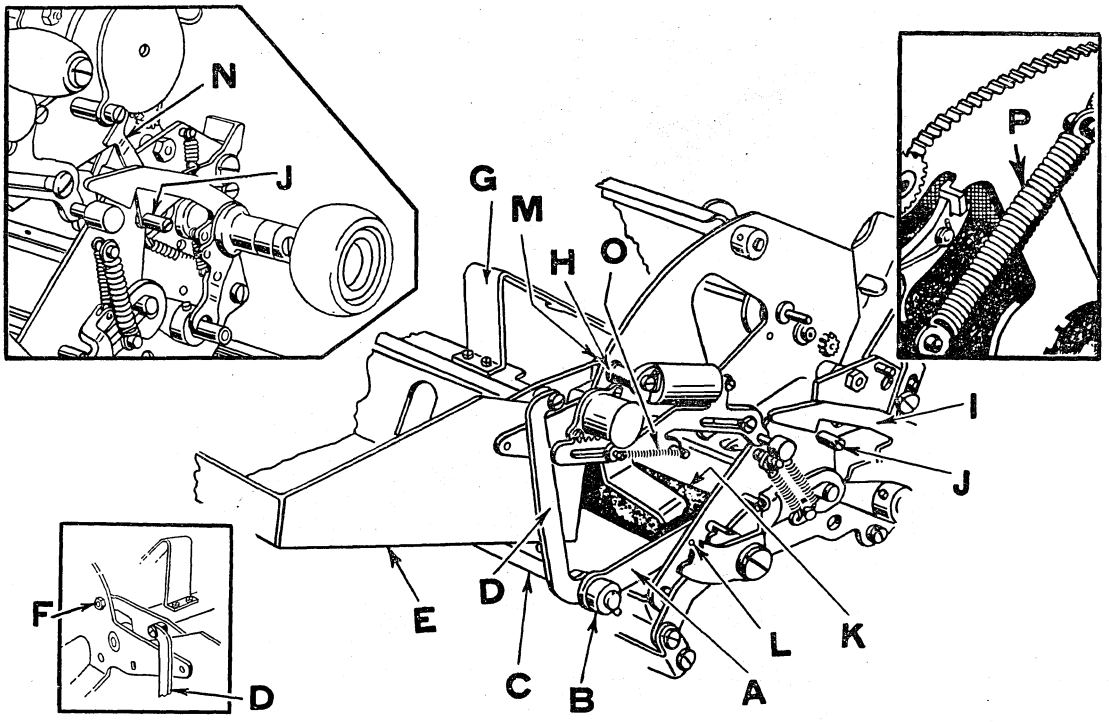






DEEP TICKET BOX FOR BILL EJECTOR CARRIAGE (Plate 63)

(Plate 62 in Symbol Book only)



Deep Ticket Box for Bill Ejector Carriage (Plate 63)

The deep ticket box provides more space and being made of aluminum is lighter than the steel shallow box.

The deep ticket box swinging on links D when the carriage opens, moves in a slight arc, thereby not interfering with ledger guides.

The deep ticket box is supported on the left side by shoulder screw M passing through the arm into part H which replaces a similar part which used a nut. The arm on the right side is fastened with screw and nut F, which is in the same position as screw M. Arms A are held by screws L. Links D pivot on shaft C.

Improved tines G handle bills without the need of the governor which has been discarded.

The elimination of the governor requires replacing spring O with the symbol listed also spring P is replaced with one of three springs each differing in tension. The correct spring P is determined by the following test:

When a bill is ejected manually by grasping the carriage opening rail, the bill should stop about one inch above the hook of tines G in order to prevent overthrow of the bill.

Instructions for Installing Ticket Box E

Machines having shaft C, remove and discard present part similar to part H.

Drill hole for screw F using template, 37 drill, $\frac{1}{8}$ by 44 tap.

Remove governor parts as shown (not required with the new tines).

Fasten box with shoulder screw M in H and F on the right side.

Loosen collars B and slide out shaft C to pass shaft C through hubs of links D.

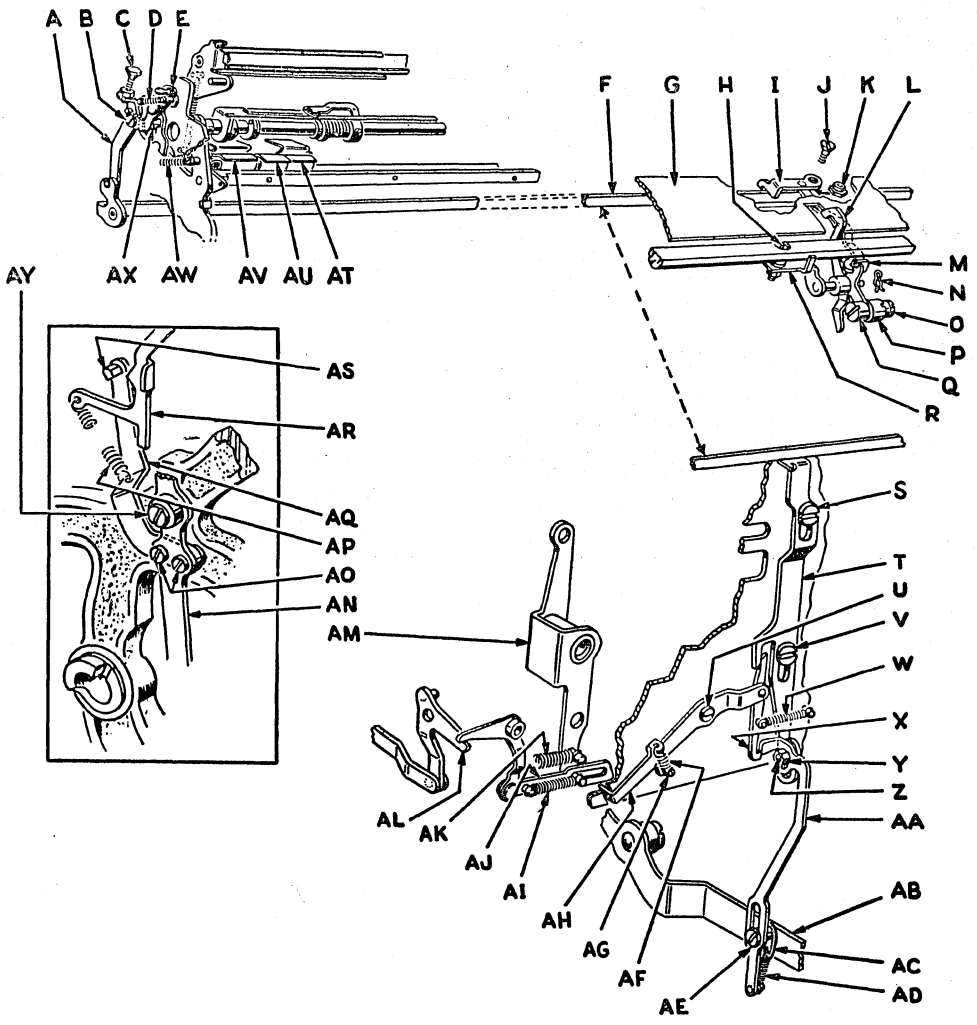
Remove and discard part N. Drill hole in side plate with $\frac{1}{8}$ drill, using template. Place eccentric J in this hole.

Install tines G in place of the old style.

To install shaft C, remove and discard screws holding table K.

Place arms A and fasten with screws L through arms A and table K.

LEDGER END LOCK (WITH DISABLING MECHANISM) (Plate 71-1)



Ledger End Lock (with Disabling Mechanism) (Plate 71-1)

Purpose

To prevent printing less than 1½" from the bottom of the forms.

Operation

The ledger end lock is held inactive during machine operation whenever any portion of the ledger form is located over cam L.

When the carriage closes, the form lowers cam L which, through link M, locates latch I over bail F to block the upward movement of slide T and link AA near the end of the forward stroke of a machine operation. Hook X is thus prevented from engaging the projection of link AA during the return stroke of the machine.

As the end of the form leaves cam L, weight P rocks the cam and moves latch I rearward to clear bail F. Arm AB, which is rocked near the end of the forward stroke, raises link AA and slide T through spring AD. As slide T is raised, its projection clears the upper portion of latch X, allowing spring W to swing the latch under the projection of link AA. When so engaged, the lowering of arm AB and link AA in the early portion of the return stroke will rock arm AH through latch X, raising the lip of arm AH into the path of link AJ, thus preventing its restoration. When link AJ is held by the lip of arm AH, stud AS

(Plate 71-1)—Continued

is held in the path of latch AR by means of linkage AL, AN, and AQ, thus preventing release of the motor bar link and the tripping of the clutch and the motor switch points.

Manual disabling of the lock, to permit the printing of a complete line of posting, may be effected by moving control lever E rearward to latch on stud AX. By so doing, bellcrank A is rocked and bail F forces slide T downward to rock latch X and to release arm AH. Release of arm AH allows link AJ to restore to its normal position, moving stud AS out of the path of latch AR and permitting the machine to operate. When the carriage is opened at the end of the posting line, the platen shaft contacts the lower projection of control lever E to release its latch on stud AX.

Continued disabling of the lock is effected by moving control lever E forward to engage its forward pocket with stud AX, causing bellcrank A to lower bail F to disable latch X in a manner described above. The latch is held in this position (disabled) until control lever E is manually restored to normal.

Adjustment

1. The lip of arm AH should have approximately 1/3 hold on link AJ when latch X is lowered by link AA.

To adjust, turn eccentric screw AE.

2. When the machine is normal and the carriage is closed, latch I should have minimum clearance over bail F, and stud AX should have a safe hold (minimum of 1/3 hold) on the vertical surface of control lever E with the carriage located in all positions.

To adjust, raise or lower screw Z in the elongated slot of link AA.

3. Latch I should have a safe hold over bail F with the carriage closed and with the form inserted, and should clear bail F with the form removed.

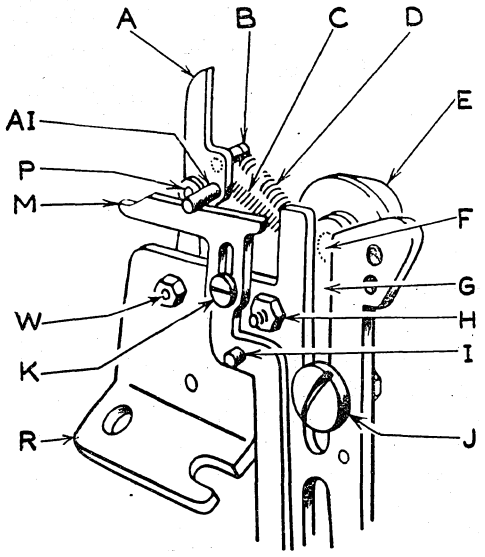
To adjust, weave the projection on the rearward portion of link M.

4. The top of cam L should be flush with plate G when the carriage is opened and the form is removed.

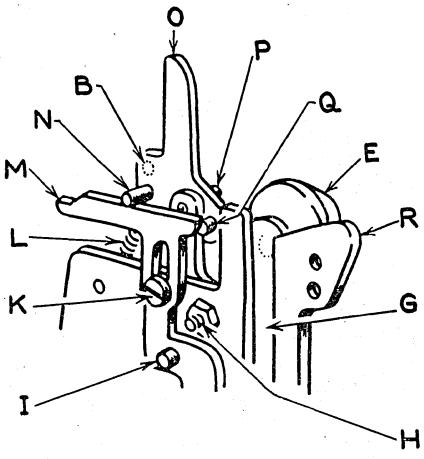
To adjust, bend the lower rear projection of cam L.

CARRIAGE OPENING MECHANISMS (Plate 73)

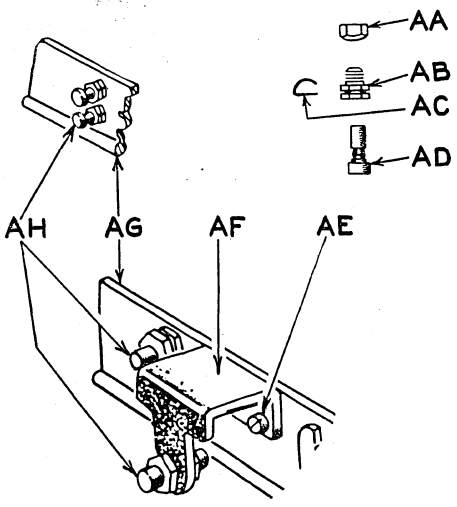
(Plates 64 thru 72 in Symbol Book only)



NON-OPENING ON RETURN FROM TOTAL KEYS, UPPER OR LOWER BARS.



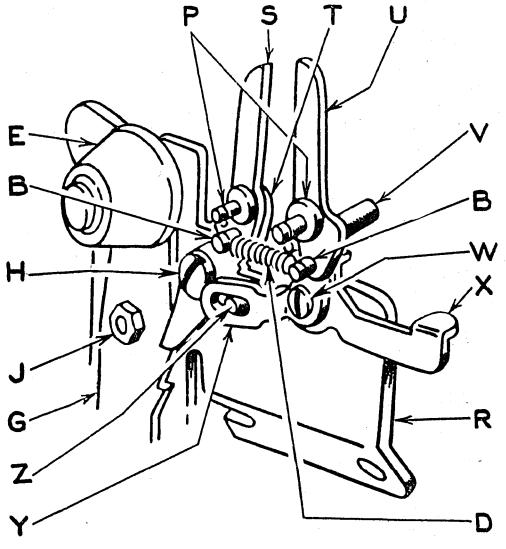
NON-OPENING ON TABULATION FROM TOTAL KEYS, UPPER AND LOWER BARS.



Carriage Opening Mechanisms (Plate 73)

There are two kinds of carriage opening mechanism, the early kind which is actuated by the carriage return movement (see Plate 81) and the later kind which is actuated by the drive mechanism.

The late carriage mechanism is controlled by the carriage from forward tabulation, carriage return movement, total keys and operating bars.



OPENED ON TABULATION AND ON RETURN

When the carriage opening is controlled in selected carriage positions, non-opening can be secured through non-opening mechanism, the latter is controlled from total keys and operating bars. Carriage opening controlled from the carriage can be disabled by depressing trip studs AH (Plate 73).

Carriage Control (Plate 73)

Carriage control is secured by trip stud assemblies AH in rail AG contacting on latch S during tabulation, or trip stud assembly AH contacting on latch U during carriage return. In either case slide G is driven upward by spring X (Plate 76) which raises rail AG and thereby opens the carriage.

Latches S and U are not in line, latch S being to the rear and in line with the trip stud in bracket AF, whereas latch U is in line with the trip stud in rail AG (Plate 73).

Non-Opening

Non-opening in selected opening carriage positions from total keys, upper and lower bars, is accomplished by rocking shaft assembly F (Plate 79) the arm of the latter pulling downward link M (Plate 73) which allows spring L to pull passby pawl O out of the range of trip studs AH, thereby preventing carriage opening during tabulation.

When passby pawl A is pulled out of the path of trip stud AH, carriage opening is prevented during return of carriage. When link M is not pulled downward, the carriage will open through trip studs AH contacting on passby pawls O and A, tabulation and return.

Partial Opening (Plate 74)

Partial opening makes the last line visible and retains the printing line.

Trip studs F in rail G are located above the position of the trip studs F for complete opening; the upper studs make a shorter contact, which causes passby pawl V to engage the upper notch in slides B or C resulting in latching the slide before complete opening. The trip studs for full opening are located .250″ from bottom of rail to center of stud. Trip studs for partial opening are located .850″ from the bottom of rail to center of stud.

There are two slides used, No. 4 (B) to open the carriage to one line above the printing line and No. 6 (C) to open the carriage on the actual printing line.

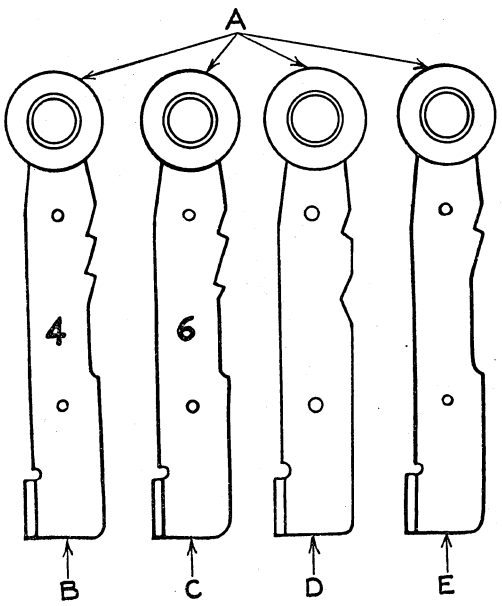
To adjust height of line, the screws holding rail G are loosened and rail G located as required. Slide No. 4 (B) is used in some cases for complete opening, however, in other cases it will open partially unless the lower projection is removed, (D). Slide No. 6 (C) on account of the considerably lower notch can not be used for complete opening.

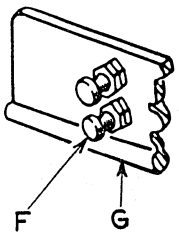
Carriage Opening and Closing from Machine Operation Also Opening from Tabulation or Return (Plate 74)

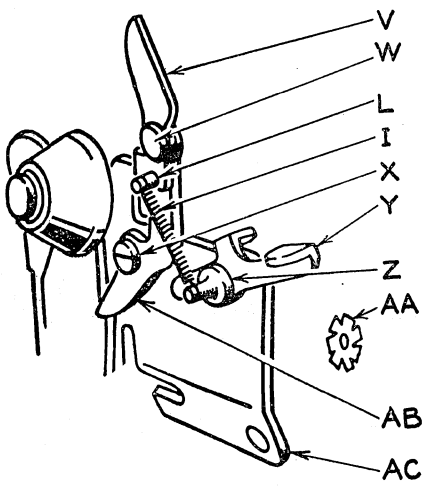
When levers Y and O are set below the horizontal, the latches of passby pawl V and J clear slide B or C, which will cause the carriage to open or close during each machine operation.

When levers Y or O are located above the horizontal, the carriage will open during tabulation or open during return when trip studs F contact on passby pawls V or J.

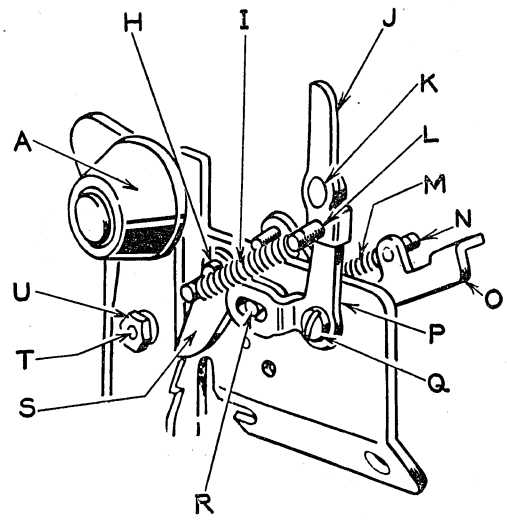
CARRIAGE OPENING MECHANISMS (Plate 74)





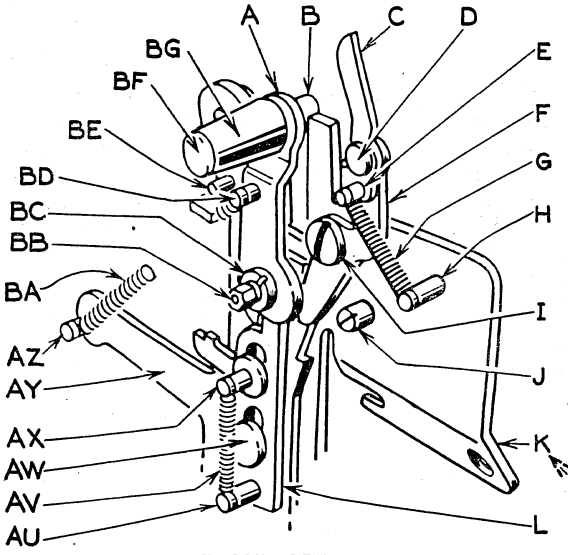


CARRIAGE TO OPEN AND CLOSE BY MACHINE OPERATION, ALSO OPENS ON TABULATION

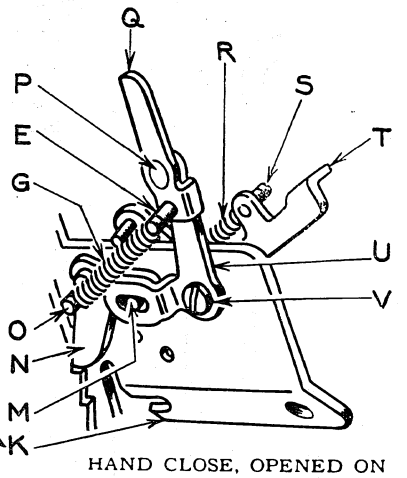


CARRIAGE TO OPEN AND CLOSE BY MACHINE OPERATION, ALSO OPENS ON RETURN

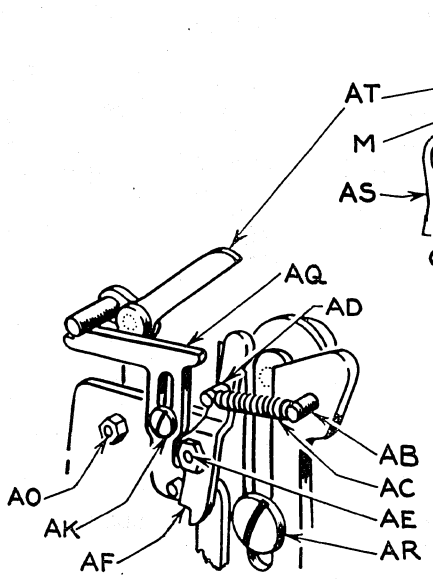
CARRIAGE OPENING MECHANISMS (Plate 75)



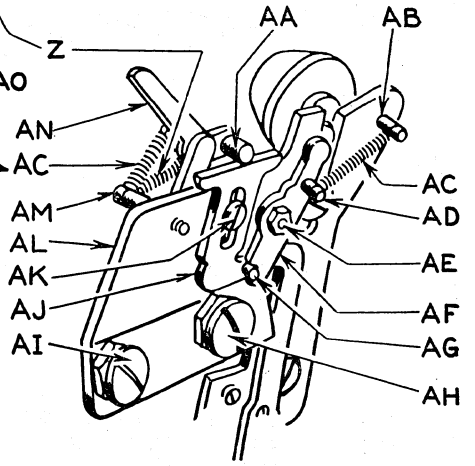
HAND CLOSE, OPENS ON TABULATION



HAND CLOSE, OPENED ON RETURN



INDEXED BY TOTAL KEY, OPENED ON RETURN



INDEXED BY TOTAL KEY, OPENED ON TABULATION

Carriage Opened During Tabulation or Return, Closed Manually (Plate 75)

When a trip stud contacts on passby pawl C during tabulation, slide AY is driven upward, arm A raising rail AG (Plate 73). Arm A is swung by spring BA to clear rail AG (Plate 73) when the arm of detent L contacts the lug on Plate K (just below screws J). The carriage can then be closed manually.

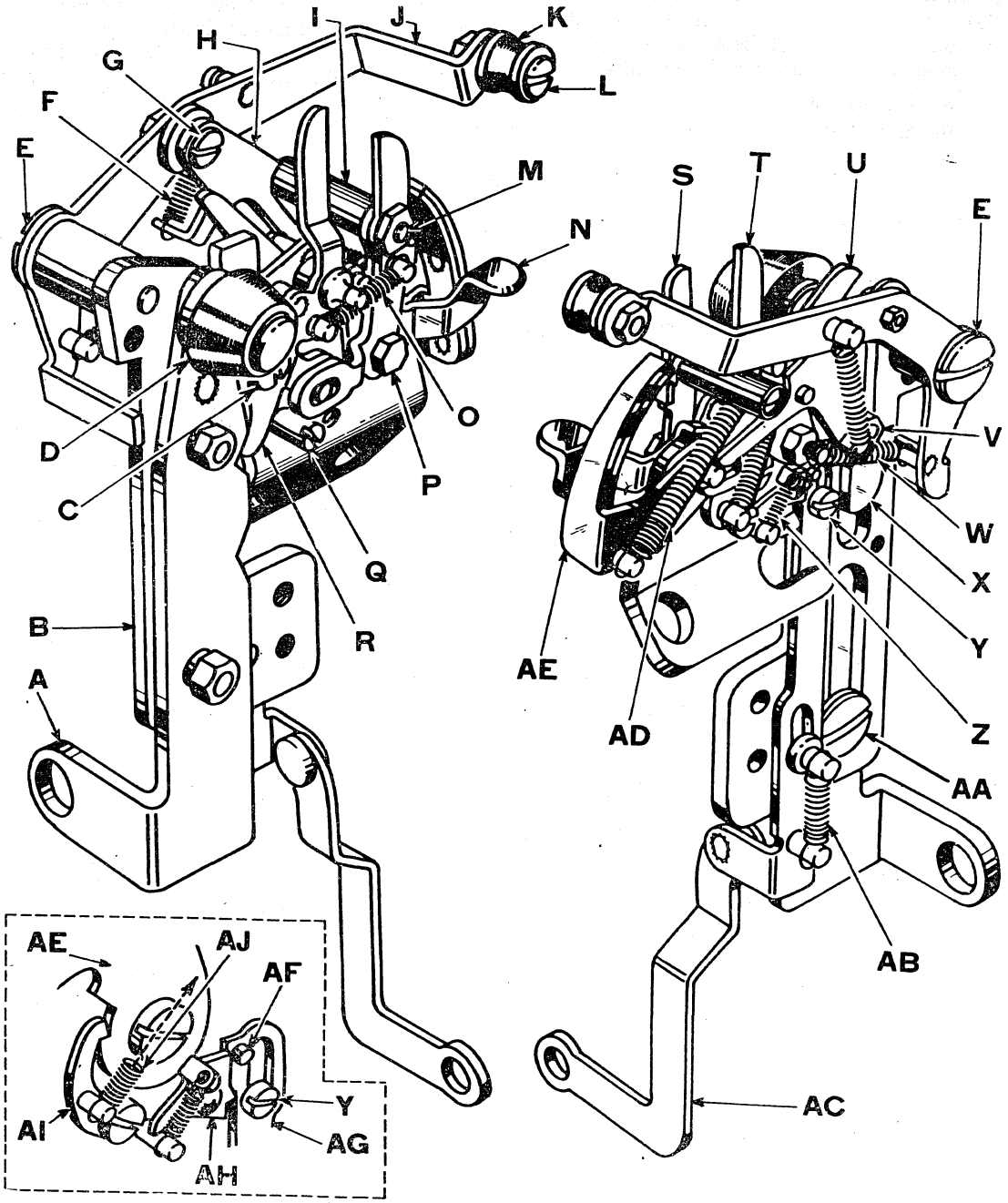
When a trip stud contacts on passby pawl Q during the return movement of the carriage, the latter is opened as described in the preceding paragraph.

Tests and Adjustments

When detent L contacts on the projection of plate K, detent L should clear arm A. To secure clearance screws J are loosened and the lug is located as required.

When passby pawl C is tripped, arm A must rise sufficiently to completely open. To increase the lift, eccentrics BP and BB (Plate 76) are turned.

CARRIAGE OPENING FROM TOTAL KEYS AND BARS WITHOUT TABULATION, INCLUDING MANUAL CONTROL, CLASSES 11-16 AND 20-30 (Plate 75-1)



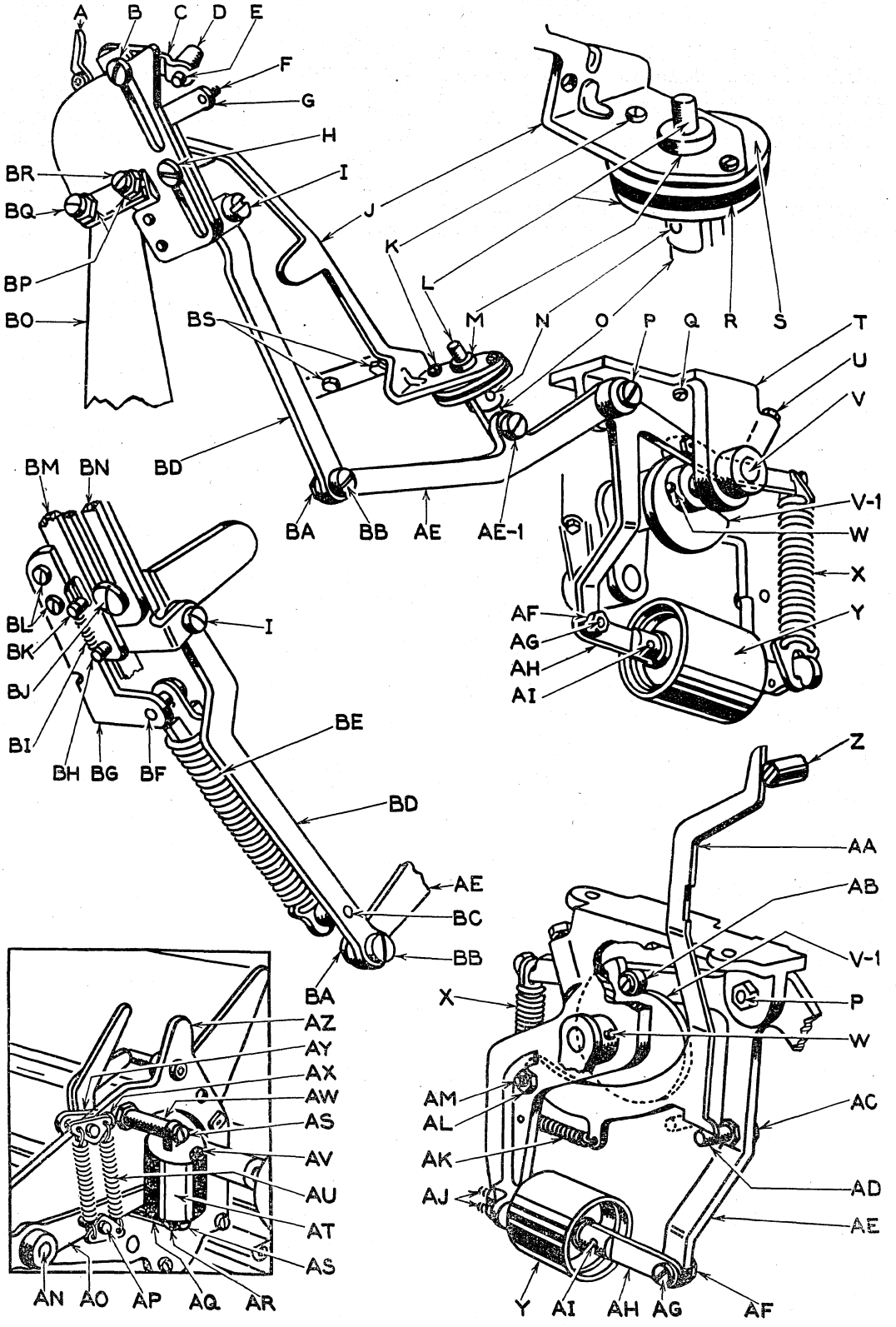
Carriage Opening from Total Keys and Bars Without Tabulation, Including Manual Control, Classes 11-16 and 20-30 (Plate 75-1)

These mechanisms which are in part redesigned supersede the mechanisms covered on pages 64 and 65 of the Instruction Book on Carriages, Classes 1-2-6, 11 thru 16, and 20 thru 30. When either total keys or bars are depressed, the machine operation pulls slide AG downward which carries stud AF below passby pawl AH. When total keys or bars restore, the upward movement of slide AG through passby pawl AH trips latch AI which permits spring AD to drive pawl AE against latch T, releasing driving slide A to open the carriage.

Manual Opening: The carriage opening lever is pulled forward which causes the carriage rail to push lever J downward, passby pawl H by contacting on lever J swings latch R to release driving slide A to open the carriage.

This manual opening mechanism is non-standard; however, when it is not used pawl 1-203268B is used in place of pawl AE.

CARRIAGE OPENING AND CLOSING ACTUATING MECHANISMS
(Plate 76)



Carriage Opening and Closing Actuating Mechanism (Plate 76)

Slide assembly BD is driven upward by spring X, the latter is placed under tension by cam V-1 raising the front arm of part AE, which pulls slide assembly BD downward in which position it is latched by A.

Carriages which require more tension to open have the additional spring BE.

Tests and Adjustments

Slide assembly BD must move freely. Link BD must align perfectly with AE and slide C. Assembly BD must also move straight up and down when it is pulled by spring X. Assembly BD is adjusted for moving straight by turning eccentric bushings BP.

Brace J must not cause a bind or cramp between BD and AE. When a bind is present, screws BS are loosened to allow assembly BD to become free and as the screws are being tightened, assembly BD is constantly tested for moving freely.

When slide assembly BD is being reset, latch A should have about 1/32″ lead; eccentrics BA on I and BB are turned to increase or decrease the latching lead.

Silencing Mechanism (Plate 76)

The purpose of this mechanism is to secure quieter carriage opening. There are two styles of this mechanism, viz.: Carriages opened through the drive mechanism as illustrated on Plate 73, and carriages opened by the M.R.C. movement.

Carriages Opened Thru the Drive

When this mechanism is tripped, spring X (also BE) rocks part AE. The rear arm through link BD opens the carriage. The lower arm of AE draws plunger AH outward which is controlled by the air seeping into cylinder Y.

When the mechanism limits, the shock is absorbed by sponge rubber washer R which is located between disks S and L.

In the event that the carriage movement were to become too free, which would require more resistance, the latter can be secured by turning the adjusting screw in cylinder Y.

Carriages Opened by M.R.C.

When the carriage is opened, plunger AS is drawn out of cylinder AT. When the carriage is released to printing position, the action is silenced by the plunger moving into and creating pressure in cylinder AT. The resistance of the plunger can be increased or decreased by turning adjusting screw AV.

Carriage Opening and Closing Timing Mechanism (Plate 76)

The purpose of this mechanism is to delay the opening of the carriage until the return stroke of the machine is being completed. This mechanism is common to machines that are used for transferring balances, which requires constant opening and closing of the carriage by machine operation.

Sequence

Cam V-1 contacting on roller AB rocks part AE, placing spring X under tension, part AE is then latched by spring AK pulling part AA over stud AD.

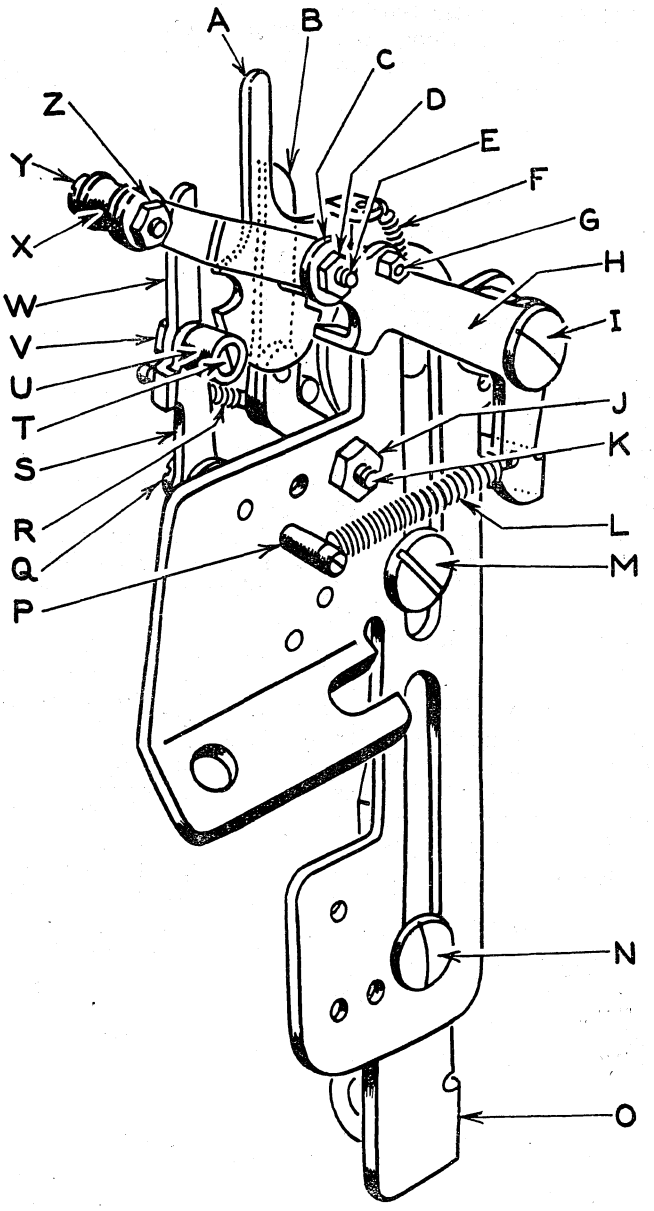
As the return stroke is nearing completion, shaft Z contacts on and swings part AA off stud AD, releasing spring X, which drives part AE to open the carriage.

Tests and Adjustments

There should be .010″ to .015″ clearance between the step of part AA and stud AD to insure positive latching of part AE.

Adjustment: Eccentric stud AD is turned and thoroughly tightened with nut AC.

CARRIAGE OPENING MECHANISM (MANUAL CONTROL) (Plate 77)



Carriage Opening Mechanism, Manual Control (Plate 77)

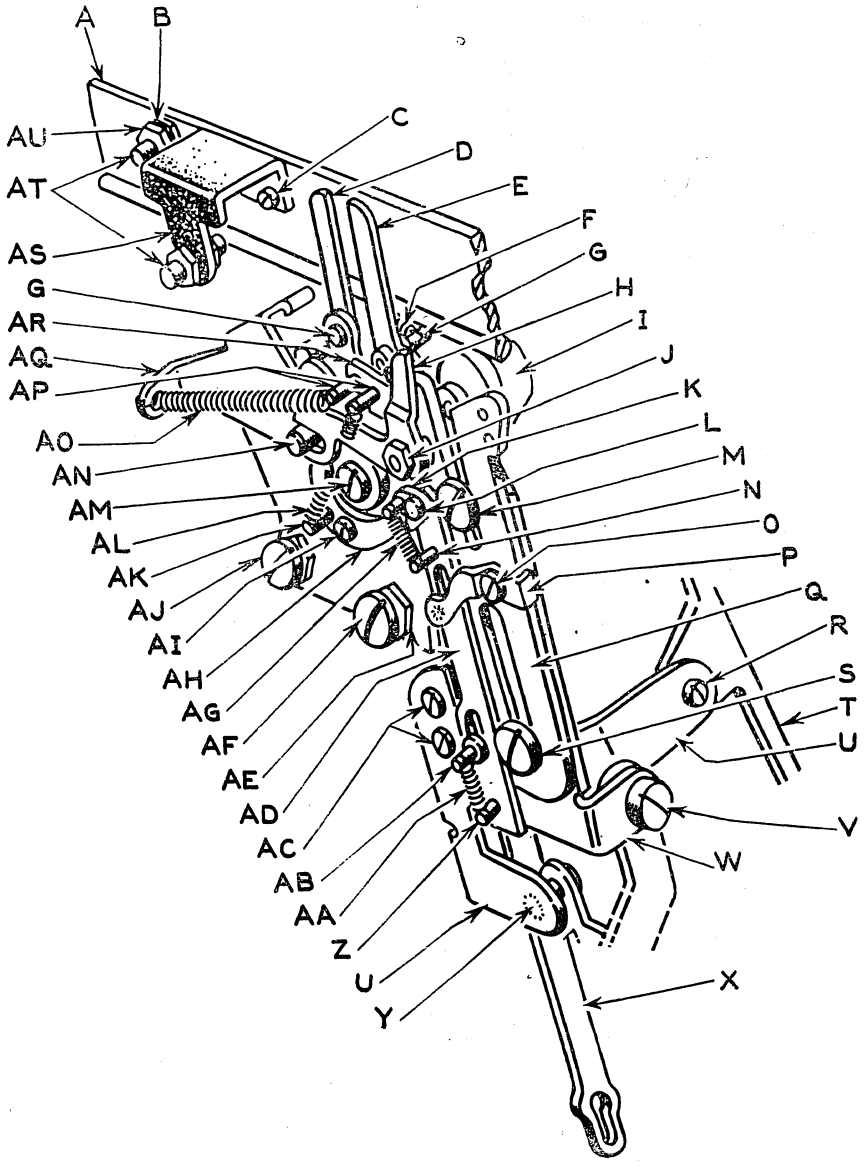
The purpose of this mechanism is to permit the carriage to be opened and remain open in any column.

When the carriage is located in one of the non-carriage controlled opening columns, the carriage is opened manually as follows: The opening lever on the carriage is pulled forward which causes the carriage rail to depress lever H, part A (on H) swings latch S releasing slide assembly O which moves upward opening and holding the carriage open.

This mechanism also opens the carriage on forward and return through parts S and B. The carriage is closed during machine operation as slide assembly O is being restored.

Note: When used for opening the carriage during tabulation and return, the upper part of A is removed.

CARRIAGE OPENING FROM TOTAL KEYS AND RETURN BAR WITHOUT TABULATION (Plate 78)



Carriage Opening from Total Keys or Return Bar Without Tabulation (Plate 78)

When total keys or bars are depressed, slide X is pulled downward, which carries passby pawl K below latch AH. When the total key or bar mechanism restores, pawl K contacts on and rocks latch AH, releasing part AQ, which driven by spring AO, swings latch E, releasing slide W to open the carriage.

Part AQ is restored by the upward movement of slide W, the guide screw in the latter contacting on part H.

Tests and Adjustments

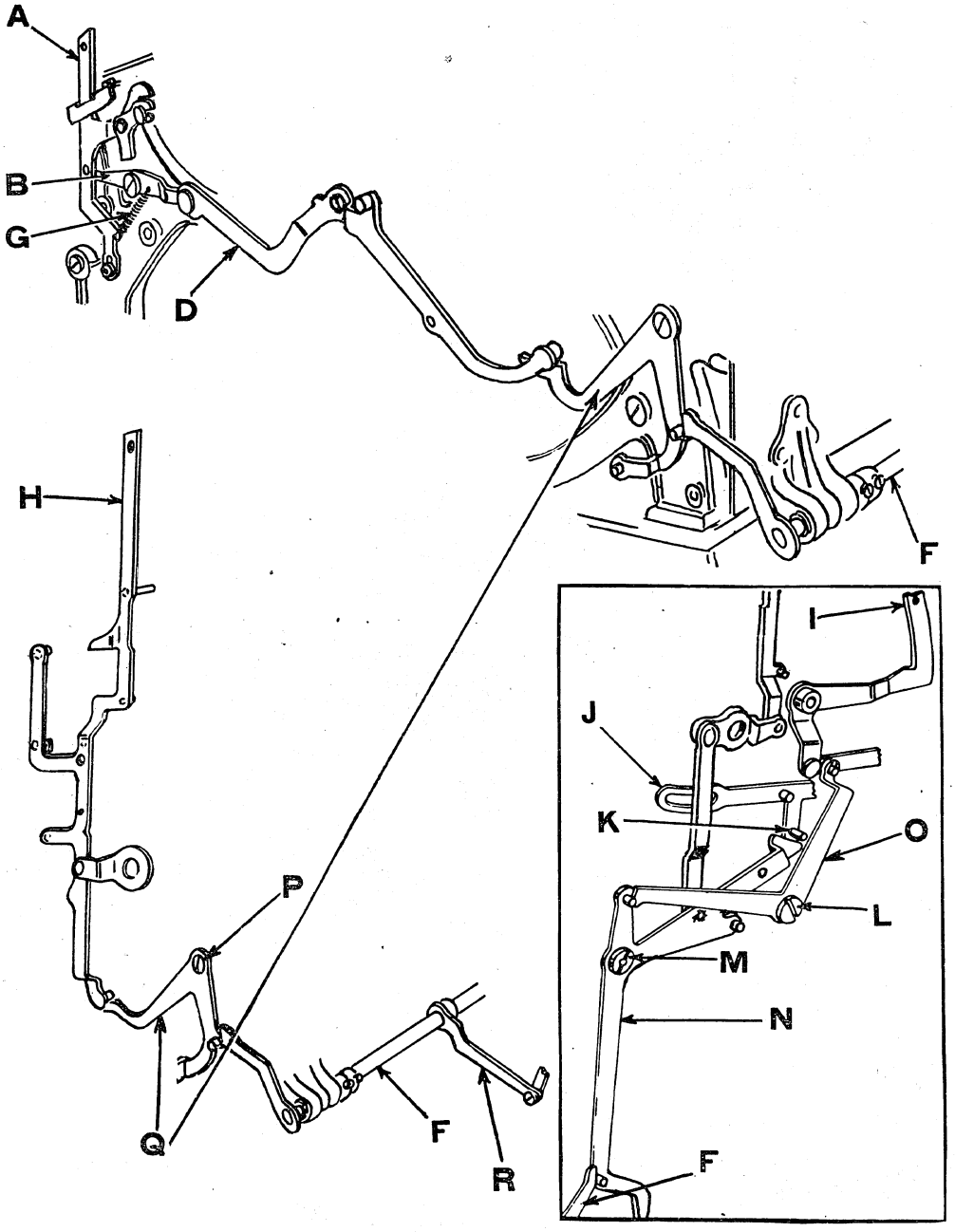
When total key or bars are depressed, passby pawl K should locate under latch AH.

Adjustment: Lost motion between J and N (Plate 79); also between N and F (Plate 79) should be reduced to minimum.

When passby pawl K moves upward to normal position, it should clear latch AH, in order to allow slide W to reset.

Slide AD, which carries K, is pried over with screw driver, screw O which holds part P is tightened. Part P acts as a guide for slide AD.

CARRIAGE OPENING, CONTROLLED FROM TOTAL KEYS AND OPERATING BARS (Plate 79)



Carriage Opening, Controlled from Total Keys and Operating Bars (Plate 79)

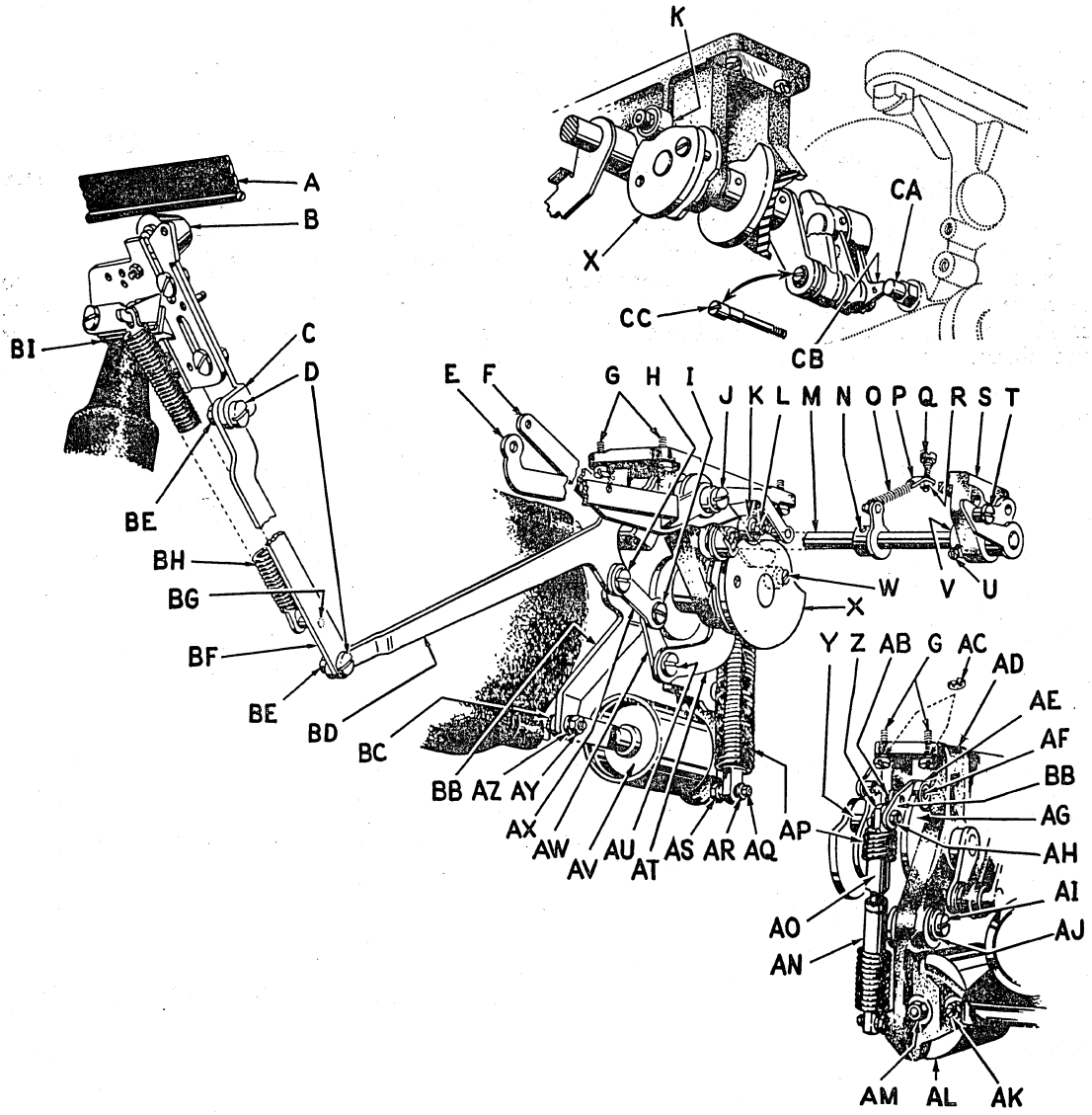
When the total key is depressed, link J through stud K rocks part N, which in turn rocks shaft assembly F. Arm R on shaft assembly F pulls down a link that connects to opening or non-opening mechanism, which is described under various headings.

When sub-total key I is depressed, it rocks part O in the opposite direction; not moving shaft assembly F and therefore does not open the carriage.

When part O is not used, sub-total key depression opens the carriage the same as when the total key is depressed.

Depressing lower bar A or depressing upper bar H rocks shaft assembly F to open or non-open the carriage.

CARRIAGE OPENING AND CLOSING MECHANISM—TOGGLE CONSTRUCTION—CLASSES 20 AND 30—WIDE BASE CONSTRUCTION WITH 22 TO 1 GEAR RATIO DRIVE (Plate 81-1)



Carriage Opening and Closing Mechanism Toggle Construction

Classes 20 and 30—Wide Base Construction with 22 to 1 Gear Ratio Drive (Plate 81-1)

Purpose

This mechanism assures full opening of the carriage.

Operation

Carriage opening is achieved when slide C, released by its latch (S, Plate 74), permits power springs AP and BH to rock bellcrank BB and to drive link AT downward. The latter, through arm AW and link AX, rocks arm BD upward which, through link BF, slide C, and roll B, raises rail A.

The fixed opening limit for this mechanism is the pitman in spring AP.

Carriage closing is accomplished during a machine operation when cam AG, contacting roll AE, rocks bellcrank BB, which places springs AP and BH under tension and raises link AT to restore arm AW and link AX. Slide C, being lowered through arm BD and

link BF, permits latch S, Plate 74, to locate in the cutout in slide C, thus holding the latter in its lowered position.

Note: Spring BH is not used in Bank Posting Machines.

Adjustment

1. Slide C should have 1/32″ latching lead on its latch (S, Plate 74), when roller AE is on the high point of cam AG. Operate the machine with the carriage closed and observe for 1/32″ movement of slide C below its latched position.

To adjust, turn eccentric screws D.

2. Roll B should raise rail A sufficiently, when slide C is released, to fully open the carriage without causing the inner carriage to bind on the opening stops in the carriage end plates.

To adjust, loosen the screws which fasten rail A to the side plates, and shift the rail up or down.

Note: This adjustment should be made with the carriage in the rightmost and the leftmost positions.

3. Cylinder AL, which controls the speed of the carriage opening, should be adjusted to fully open the carriage with a minimum of shock.

To adjust, turn the set screw AK.

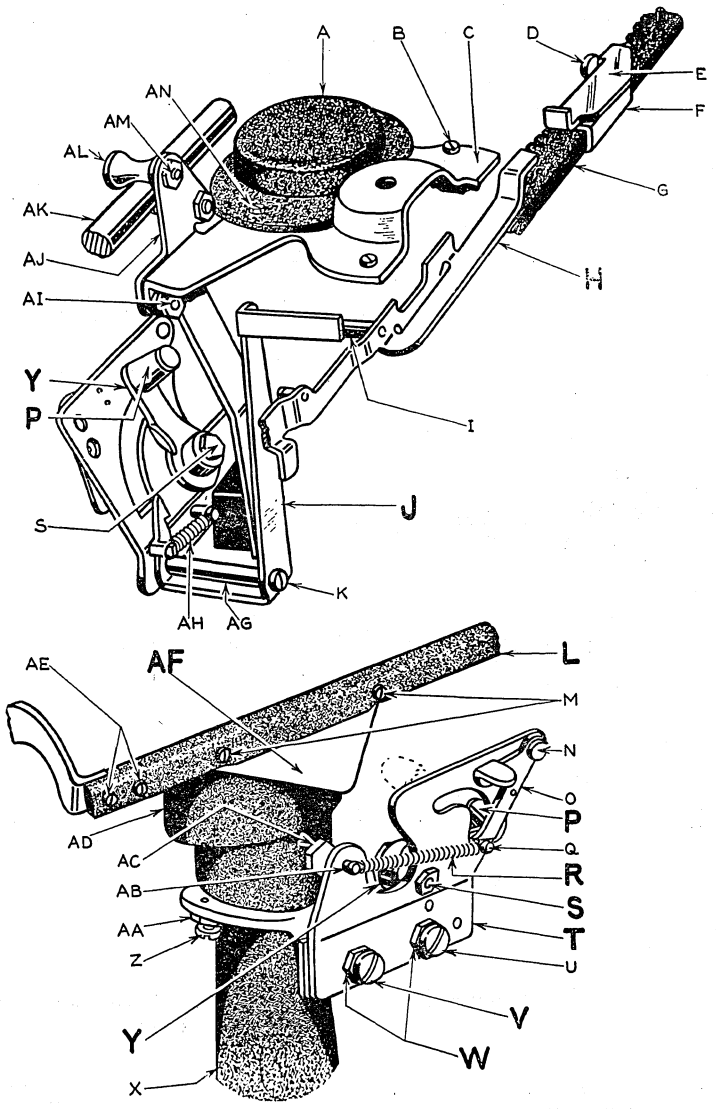
4. When the machine is normal, there should be .010″ (minimum) clearance between the incline of cam X and roller K.

To adjust, turn eccentric screw CC.

Note: A minimum of .010″ clearance between the roller and the incline of the cam is necessary to assure latching lead of passby pawl CB on stud CA.

CARRIAGE OPENING FROM CARRIAGE RETURN MOVEMENT, CLOSED BY HAND (Plate 81)

(Plate 80 in Symbol Book only)



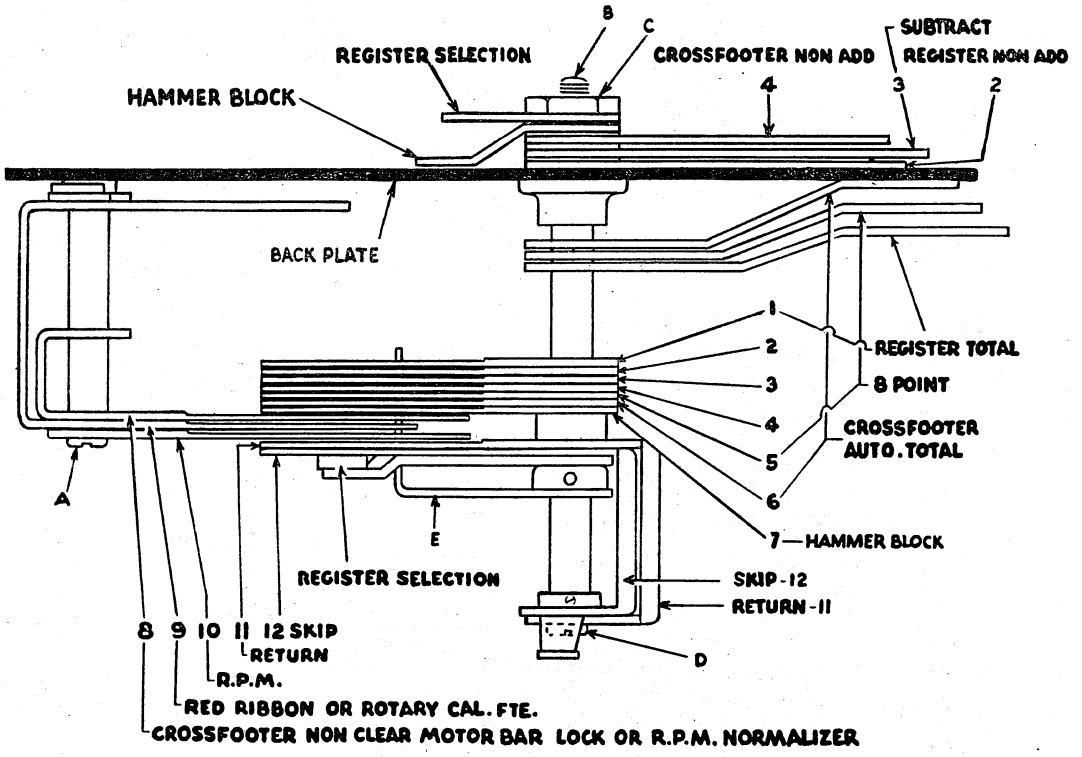
Carriage Opening from Carriage Return Movement, Closed by Hand (Plate 81)

When the carriage tabulates out of the new balance column to trip the M.R.C. mechanism, slide H rocks part J which releases arm Y allowing spring R to pull it into vertical position. The return movement of the carriage cam AF contacting the roller P raises rail L causing the carriage to open. The carriage is latched in open position by lever N (Plate 28), moving over the square stud in M (Plate 28). The carriage, when locked in open position, is released by swinging handle H (Plate 28) which rocks lever N. Arm Y is reset by cam AF during the tabulating movement of the carriage and latched by the hook arm of J.

Bracket Assembly T

Bracket assembly T is fastened to the M.R.C. bottle by eccentric bushings W and screws V. The purpose of eccentric bushings W is to permit adjustment of the movement when the carriage is opened by cam AF.

LEVERS ASSEMBLED ON BACK PLATE (ROLL CONTROLLED, THIN LEVER CONSTRUCTION (Plate 82)



Tests and Adjustments (Plate 81)

When the peak of cam AF is on roller P as the carriage is being returned, lever N (Plate 28) should have sufficient lead to insure latching. To increase or decrease the lead of lever N eccentrics W are turned.

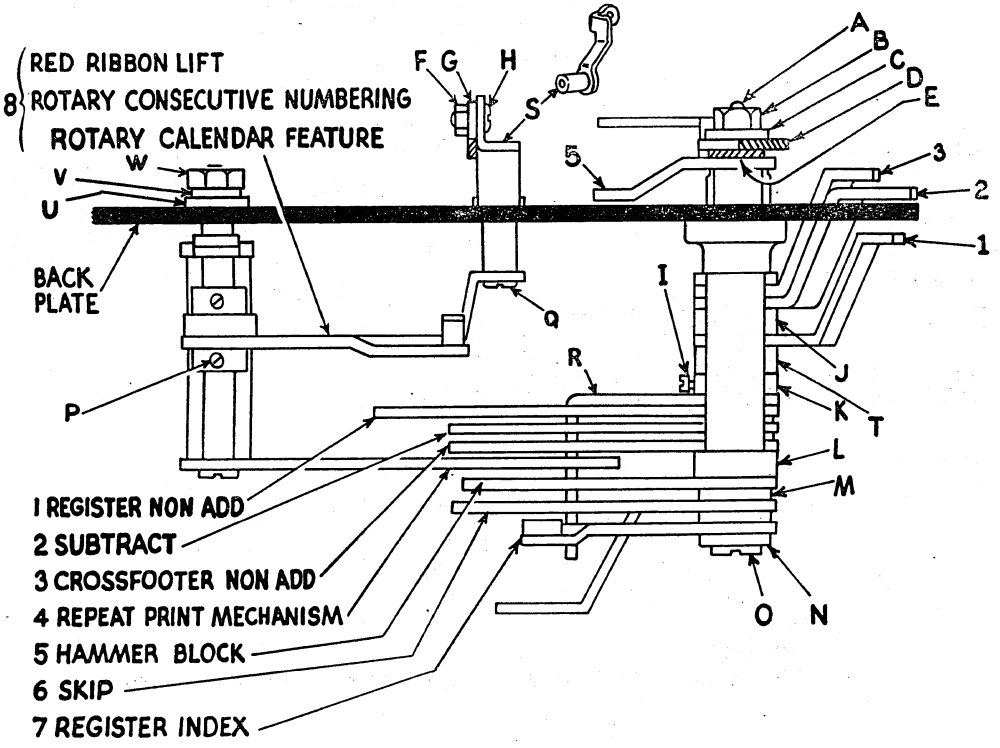
When the peak of cam AF is on roller P as the carriage tabulates the projection on arm Y should have lead over bail J. To increase or decrease lead of Y, eccentric screw S is turned.

Note: It is sometimes necessary to adjust eccentric S to favor carriage opening movement and in that event the projection of arm Y is bent. If this adjustment is made it is essential that the high point of eccentric S be to the right of center in order not to sacrifice hold of Y on J.

Levers Assembled on Back Plate Roll Controlled, Thin Lever Construction (Plate 82)

The purpose of the thin lever construction is to provide roll control for all levers.

LEVERS ASSEMBLED ON BACK PLATE (STANDARD) (ROLL CONTROLLED) (Plate 83)

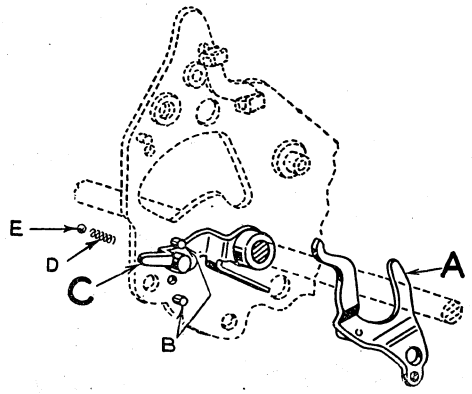


Levers Assembled on Back Plate, Standard, Roll Controlled (Plate 83)

The standard lever construction has seven roll controlled levers and one (8) skid controlled lever. When required, it is possible to replace C. F. N. A. (3) with two thin levers, repeat print normalizer pivoting on the right, its cam in line with 1 to 7 cams. The other thin lever C. F. N. A. pivoting in the same position as the standard lever which the thin lever replaces. Skip lever (6) can be replaced with two thin levers, skip tab stop block carriage controlled on the outside and C. F. total carriage controlled on the inside.

M.R.C. SPACE OR NON-SPACE MANUAL CONTROL (Plate 85)

(Plate 84 in Symbol Book only)



M.R.C.—Space or Non-space Manual Control (Plate 85)

M.R.C. spacing pawl A is disabled when part C is in upper position, the lower arm of C contacting on the stud of A.

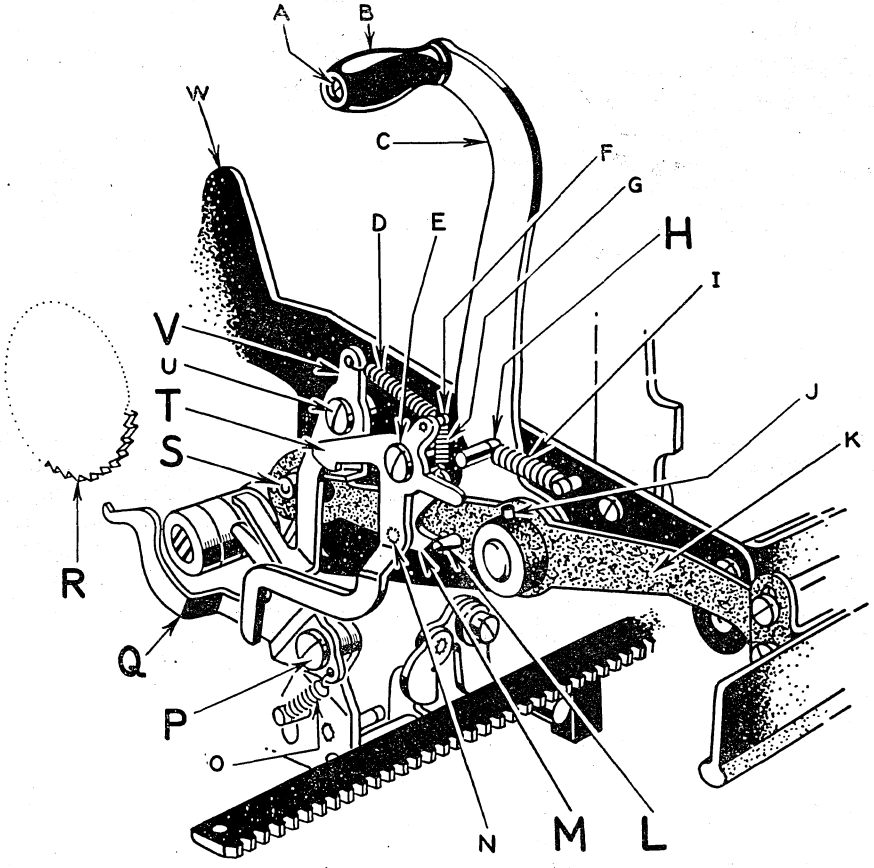
This non-space mechanism is special to the triple spacing mechanism, the standard non-space mechanism not being applicable.

M.R.C. Non-space from Partial Carriage Opening (Plate 86)

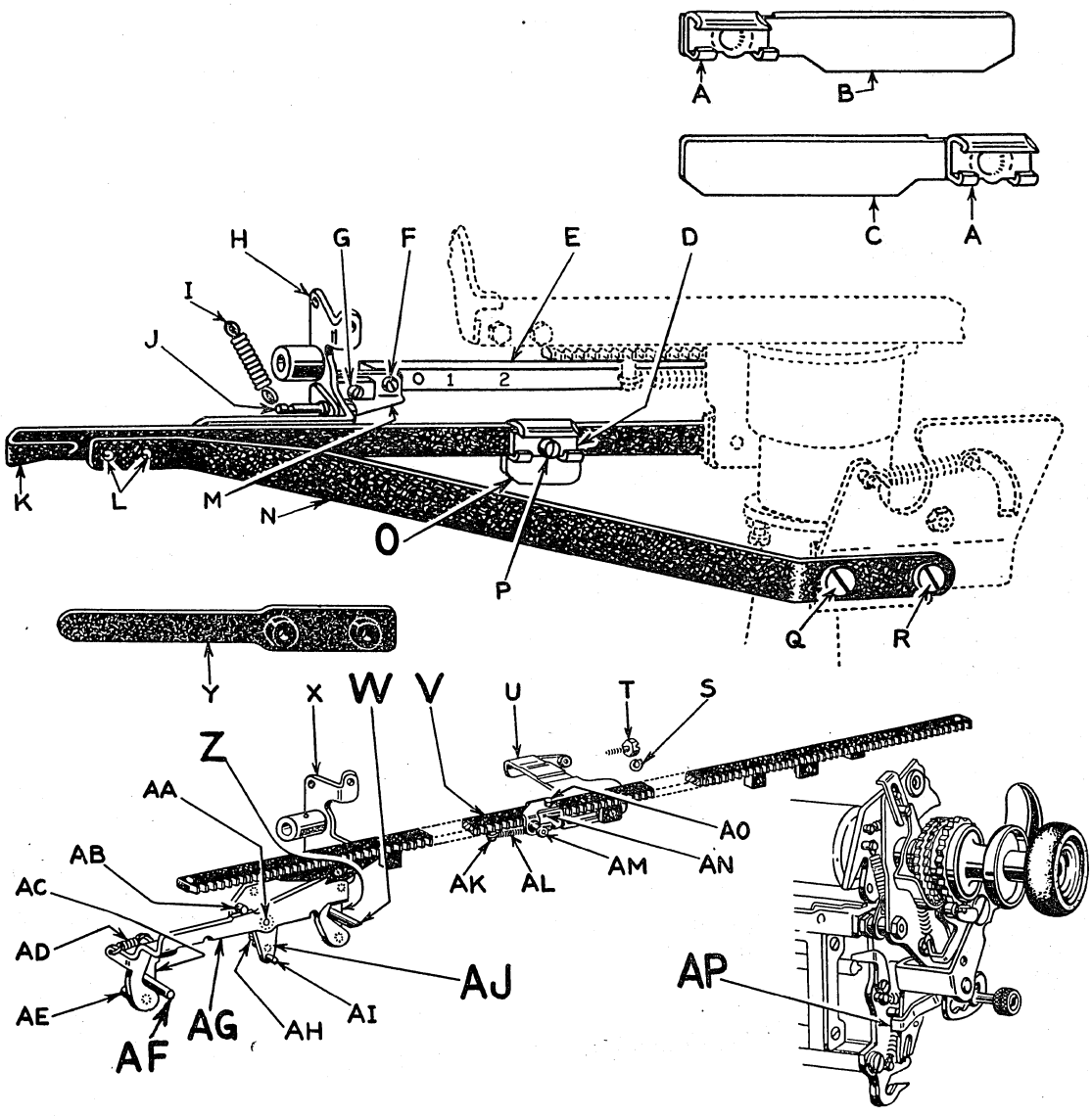
The purpose of this mechanism is to non-space the platen when the carriage is partially opened, and to space the platen when the carriage is fully opened.

When the carriage is partially opened, stud S cams part V downward, which in turn swings feed pawl Q below ratchet wheel R. Part V is latched in downward position by part T. When the carriage returns to normal position, screw P contacting on the foot of part T raises the hook of the latter above the lip of part V. When the carriage is fully opened, pawl M trips off stud L which raises the hook of part T to clear the lip of V. When the carriage is manually opened, latching of part V is prevented by the long shank of spring stud H contacting on the rear projection on latch T.

M.R.C. NON-SPACE FROM PARTIAL CARRIAGE OPENING (Plate 86)



M.R.C. SPACE OR NON-SPACE (Plate 87)



M.R.C. Space or Non-Space (Plate 87)

The purpose of this mechanism is to secure spacing or non-spacing in one or more carriage positions, when the carriage is being returned.

Non-spacing is the result of partially blocking M.R.C. rack.

For normal spacing, the left arm of AG is tilted downward, spring anchor AJ to the right.

Now, when the carriage moves cam O to contact on stud AF, the step on part AG moves into the path of M.R.C. rack V, partially limiting its movement to raising the stop dogs sufficiently to clear the stop block without actuating spacing pawl.

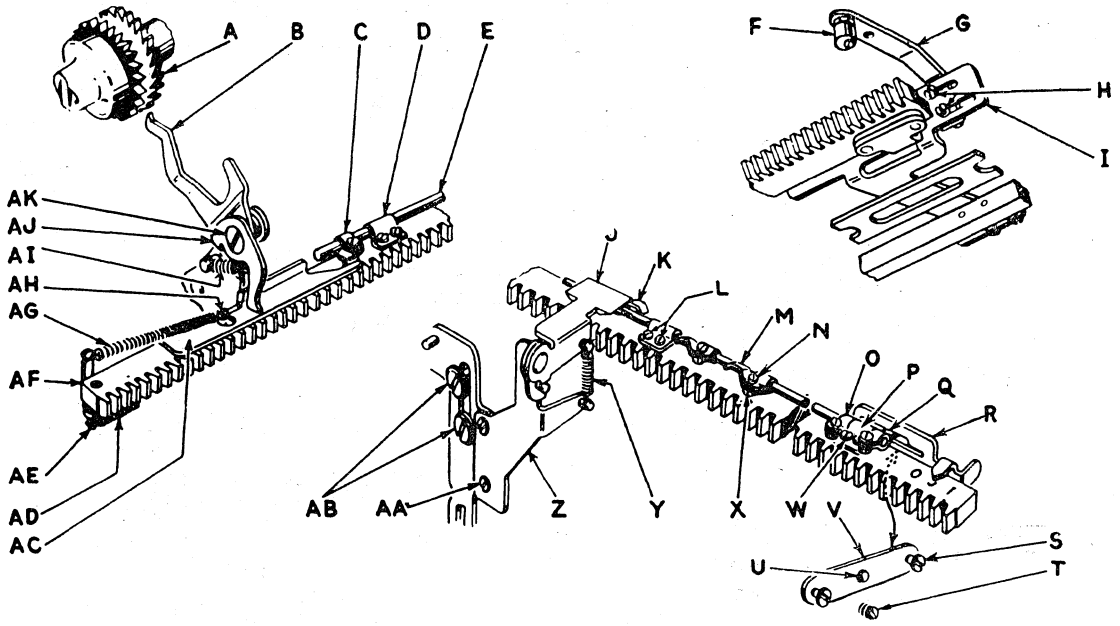
For normal non-spacing, spring anchor AJ is swung to the left which tilts the left arm of G into the path of M.R.C. rack. When the carriage moves cam O onto stud W in the left arm of Z, the latter is tilted to clear M.R.C. rack, thereby allowing the platen to be spaced.

Tests and Adjustments

In non-space position, the carriage stop dogs should clear the stop blocks.

Adjustment: Arm AP is bent rearward.

PLATEN SPACING FROM M.R.C. (MANUAL ADJUSTED TO SPACE OR NON-SPACE) CONTROLLED FROM M.R.C. RACK (Plate 87-1)



Platen Spacing from M.R.C. (Manual Adjusted to Space or Non-space) Controlled from M.R.C. Rack (Plate 87-1)

Non-spacing is secured by disabling M.R.C. spacing pawl B. Spacing, or non-spacing carriage controlled, and non-spacing is secured by placing indicator slide R in position I, C or O respectively.

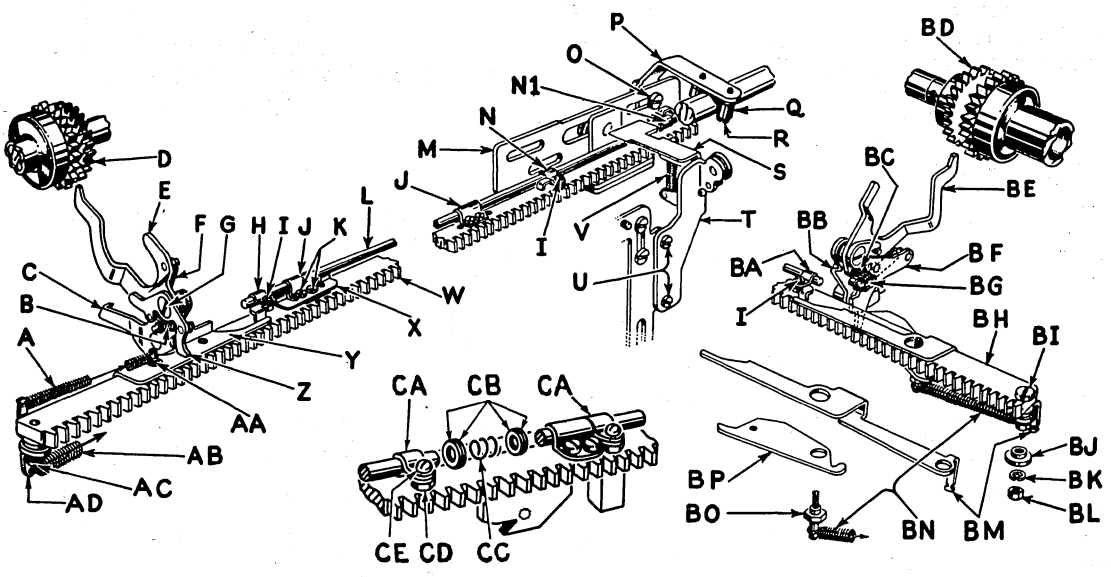
The illustration shows indicator slide at C or carriage control. Pawl B is disabled by being tilted when moving over the ledge of plate AC when the latter is blocked by arm C on shaft E during rack AF spacing movement. When indicator slide R is placed in position O, arm Q on shaft E is cammed upward into the lower narrow slot of R which raises and holds it to clear plate AC and allows plate AC to move with spacing pawl B without tilting the latter, which permits spacing pawl B to engage ratchet A and space the platen.

When indicator slide R is placed in position C, arm Q is placed into the middle wide slot of R; this position allows shaft E and arm C to float, i. e., they have no definite positions.

During the machine operation as arm J is being pulled down by the Multiple Skip and Return Mechanism, if arm J contacts stop K, arm C is pulled up to clear plate AC and thereby allows space pawl B to space the platen. When arm J contacts stop M, arm C is swung down to block plate AC which tilts spacing pawl B and prevents spacing pawl B engaging ratchet A, resulting in non-spacing.

When indicator slide R is placed in position I, arm Q is located in the upper slot of R which swings arm C to block plate AC resulting in non-spacing as explained in the previous paragraph. Spacing pawl B is spring connected to prevent a bind when it contacts on the shaft (not shown), and is tilted by plate AC when the latter is blocked by arm C during non-spacing operations. Indicator slide R is held in its respective positions by ball U seating in pockets in rack AF. Ball U is carried by retainer V.

FORM SPACE RIGHT OR LEFT SIDE FROM M.R.C. (CARRIAGE CONTROLLED) STYLE 2 (Plate 87-2)



Form Space Right or Left Side From M.R.C. (Carriage Controlled) Style 2 (Plate 87-2)

Purpose

This mechanism, which is indexed by the Multiple Skip and Return Mechanism, affords a means for controlling the spacing and non-spacing of the platen as the carriage returns.

Construction

Latch 1-12321⅞C No. 2 (similar to latch I, Plate 37-2, Carriage Symbol List) which is used with this mechanism only, has stock removed from its lower extension to delay the indexing of the carriage return clutch and to allow additional time for the indexing of the Platen Spacing Mechanism.

A stud 71535 may be required in the hole in the upper portion of arm N, Plate 41, to effect an earlier release of arm S. The stud is required when, with the carriage in a position to index a carriage return operation, an arm N or N1 is in a raised position and is located 1¼" or less to the left of arm S.

Note: When required the stud should be, installed to the rear of the lower portion of passby pawl I, Plate 41.

Operation

The indexing of the spacing or non-spacing of the platen is controlled through the Multiple Skip and Return Mechanism. When arm S, which is lowered on every machine operation, is located over arm N or N1, the latter is lowered to rock shaft L which positions arm H (on the right side of the carriage) or arm BA (on the left side of the carriage) downward or upward.

Spacing of the platen by the mechanism on the right side of the carriage is effected by the raising of arm H to prevent plate Y to move forward with lever Z. The forward portion of lever Z is then raised by spring B to engage feed pawl E with ratchet gear D to space the platen.

Non-spacing of the platen by the mechanism on the right side of the carriage results from the lowering of arm H, which prevents the forward movement of plate Y. The movement of the M.R.C. rack to the right (as the carriage returns) positions the upper lip of plate Y into the path of lever Z; and, as lever Z moves forward, its rear portion rides over the lip of plate Y, lowering the lever's forward portion and feed pawl E, through spring F, to prevent the spacing of the platen.

Spacing of the platen by the mechanism on the left side of the carriage is indexed when arm BA is lowered into the path of lever BM, thus limiting the rearward movement of plate BP. As the M.R.C. rack is moved to the right (during a carriage return operation) plate BP contacts and rocks lever BF forward, raising its upper projection and allowing spring BC to raise feed pawl BE into position to engage ratchet gear BD and to space the platen when arm BB is moved forward.

Non-spacing of the platen by the mechanism on the left side of the carriage is indexed

when arm BA is raised out of the path of lever BM, permitting lever BM to be moved forward and plate BP to be moved rearward. Thus plate BP will not rock lever BF (as the M.R.C. rack moves to the right on a carriage return operation) and the upper projection of lever BF will, through the stud in feed pawl BE, hold the feed pawl in its lowered position to secure the non-spacing of the platen.

Friction, which is applied to shaft L through the tension of spring CC, retains the shaft and its indexing arms N and N1 in the position indexed during the machine operation.

Adjustment

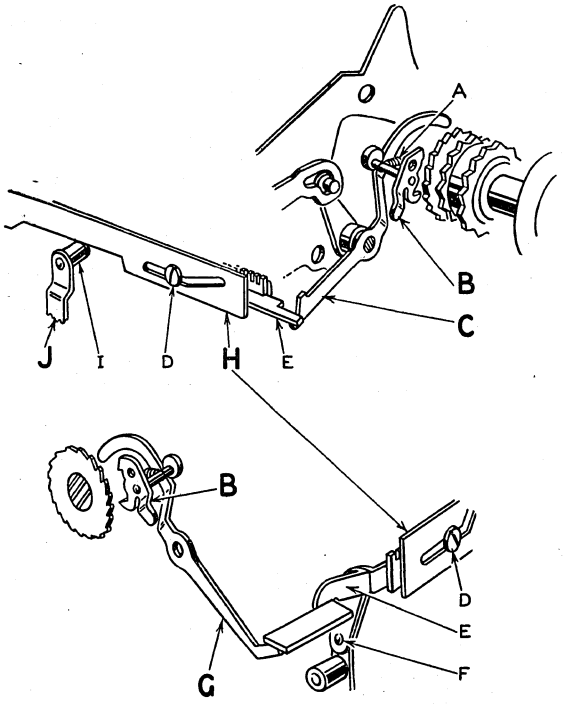
1. Arm H (or BA) and the nuts under arms N should limit simultaneously on rack bar W.

To adjust, loosen the screws in the arms N, and raise or lower the arms.

2. With arm H (or BA) raised approximately 1/32″ above plate Y (or BM), the nuts under arms N1 should limit on rack bar W.

To adjust, loosen the screws in the arms N1 and raise or lower the arms.

PLATEN SPACE AND NON-SPACE, SKID CONTROLLED (Plate 88)



Platen Space and Non-Space, Skid Controlled, Type 20 (Plate 88)

The purpose of this mechanism is to non-space the left split of the platen when the right side is being used and vice versa.

Sequence and Construction

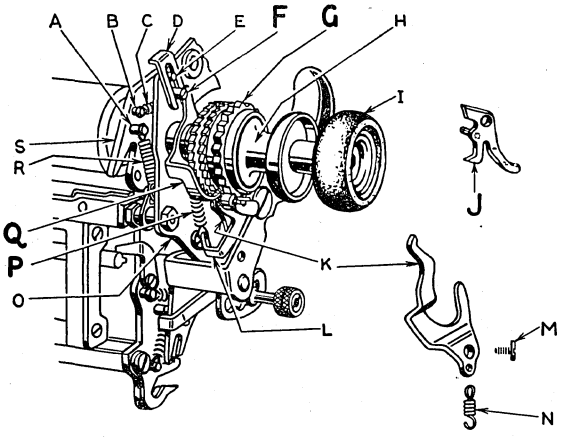
When the carriage locates the cut out of skid H on skip link J, lever C is rocked, which swings space pawl B out of the range of the ratchet wheels to prevent spacing of the left platen.

When the carriage locates the high surface of skid H on skip link J, lever C allows space pawl B to be active. Lever G is rocked, which swings space pawl B out of the range of the ratchet wheel to prevent spacing of the right split platen.

Link J is permanently fastened to the M.R.C. plate.

Adjustment: To secure more or less movement of skid H, link J can be moved upward or downward; also skid H can be moved in the angle slots.

TRIPLE SPACING MECHANISM (Plate 89)



Triple Spacing Mechanism (Plate 89)

The purpose of this improved mechanism is to prevent spacing when the carriage closes.

When the carriage opens, the rearward movement of the platen allows spring P to swing part Q, its shoe covering the ratchet teeth to prevent spacing pawl J engaging ratchet assembly G.

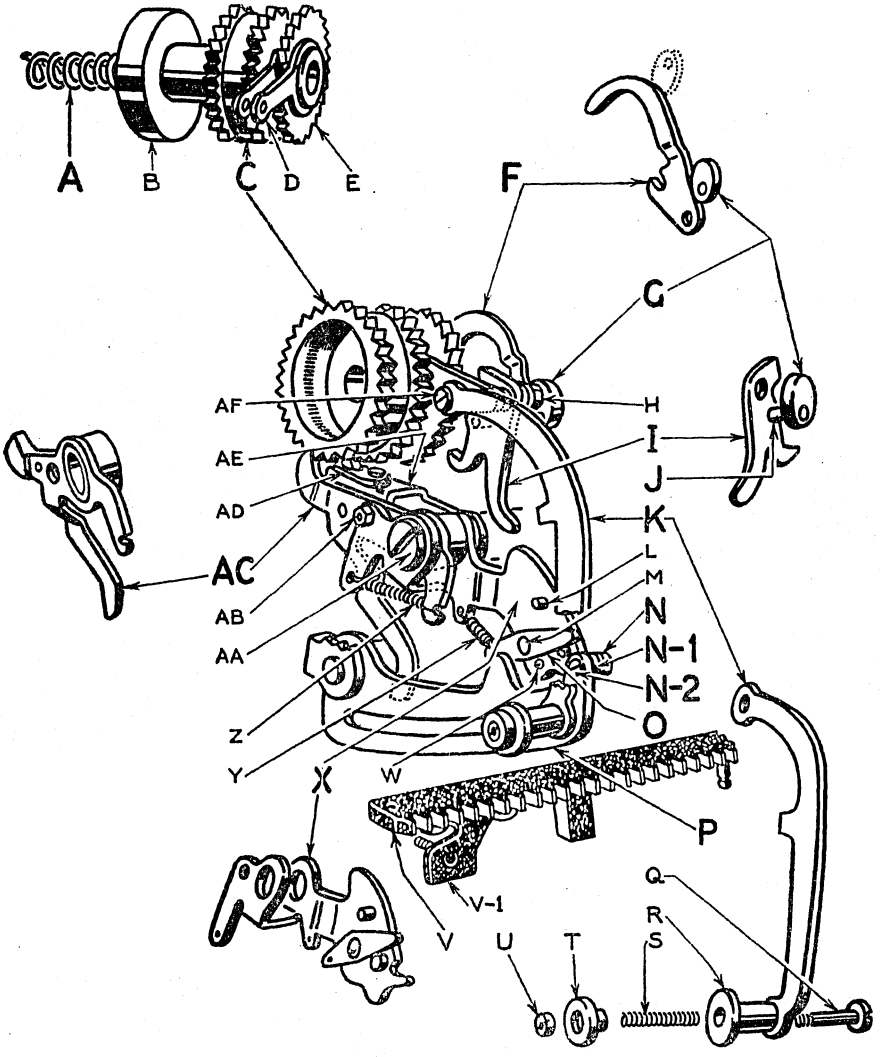
Part Q remains in the path of spacing pawl J until the carriage is almost closed. Before the carriage completely closes, the projection of part Q contacts on stud F which swings part Q to clear the active ratchet teeth to permit spacing.

One Inch Spacing, Type 20 Carriage (Plate 90)

One inch spacing is secured by this mechanism through feed arm P which swings pawl I forward to engage the required number of teeth of ratchet C.

Overthrow of the platen is prevented by brake assembly arm AC which becomes active near the completion of the return stroke when eccentric roller N-1 contacts on passby pawl O, causing pressure to be applied by assembly X and AC when the latter is about to engage the last tooth in star wheel C.

ONE INCH SPACING, TYPE 20 CARRIAGE (Plate 90)



Tests and Adjustments

It is important that the correct amount of pressure be exerted by assembly AC when the machine is motor operated. The degree of pressure is secured by loosening and turning eccentric screw N-2 for minimum pressure during motor bar operation. Excessive pressure causes an undesirable bind which should be avoided. When excessive bind cannot be reduced by turning eccentric screw N-2, a little stock is removed from the elongated slot in part AC, however, this could only be necessary when installing new parts.

When the carriage is placed in non-print position, feed pawl I should clear the ratchet in upper center and lower position. Feed pawl I carries eccentric G which contacts on cam F. To secure clearance of feed pawl I in upper, center and lower position, eccentric G is turned.

Note: Eccentric G is fastened to rivet J, the latter is fastened to feed pawl I. When it is necessary to turn eccentric G, it should be re-riveted.

The lead of feed pawl I is adjusted in the usual manner, decreasing the bend of link K to secure more lead. Also, the disengagement of feed pawl I is adjusted just as in standard machines, i. e., bending the curved arm.

Note: It is advisable to check the feed bail screws for being tight.

An extra spring is used on the right end of the bail on account of the extra long movement. It is possible that this spring may prove too strong or even unnecessary after the machine has been used for a period of time.

In the event that a spacing overthrow should take place with the adjustments made as outlined in these instructions, it is advisable to strengthen clutch spring A.

Mr M R Lovejoy
Buffalo N Y Branch 10-5

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CLASSES 1, 2, 6, 11 thru 16 and 20 thru 30 KEYBOARD

Instruction Book

July, 1940

Reprinted—September, 1946

*Issued*_____

*To*_____

*Of*_____

Property of and to be returned to

BURROUGHS ADDING MACHINE COMPANY

DETROIT, MICHIGAN

KEYBOARD

FOREWORD

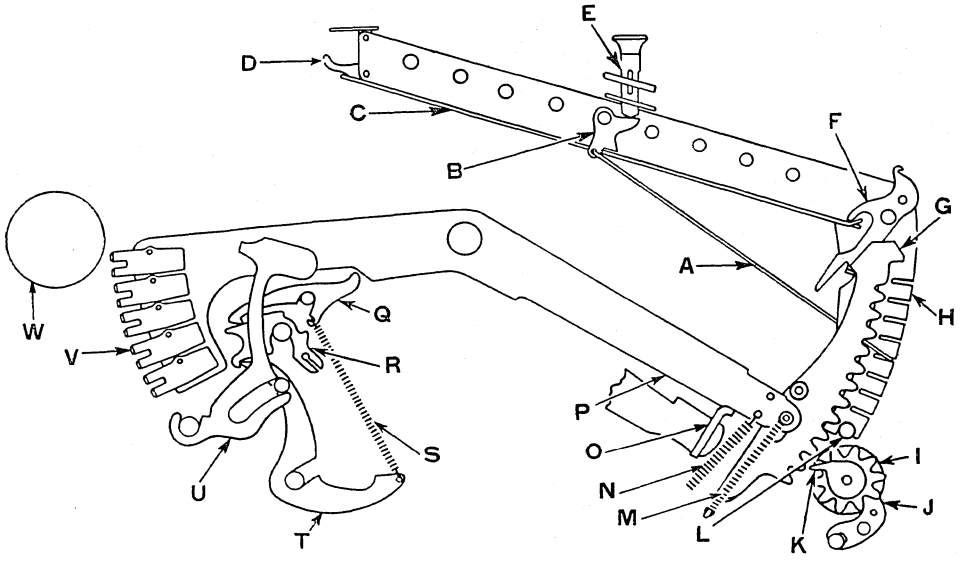
This Instruction Book covers the following subjects: Keyboard indexing, interlocking, repeating and key restoring mechanisms.

Mechanisms controlled from keys and motor bars which are in or attached to the keyboard and their functions, tests and adjustments are also included.

INDEX OF MECHANISMS

Description	Plate No.
Automatic Repeat Mechanism (Classes 20 thru 30)	13
Automatic Repeat Mechanism (Classes 11 thru 16)	14
Automatic Repeat Normalizing Key Non-cycle (Classes 11 thru 16)	15
Automatic Total Repeat Mechanism Normalized by Carriage Return (Bank Posting)	21
Carriage Return Bar, Lower	62
Carriage Return Bar, Upper	61
Count and Normal Mechanism Indexed from Machine Operation	26
Counter Control Mechanism (Class 6)	11
Crossfooter Add Bar Carriage Controlled	36
Crossfooter Add—Register Non-add Bar (Uppermost)	37
Crossfooter Sub-total or Total Key to Total in Last Repeat Operation via Automatic Register Total Mechanism	38
Crossfooter Subtract Mechanism Indexed from Key	32
Crossfooter Total Key Sub-total in Crossfooter Add Position and Total in Crossfooter Non-add Position	34
Crossfooter Total with Keys on Keyboard Depressed (H-903 Machines)	33
Date Repeat Key Mechanism	7
Enforced Designation Normalized by Total and Sub-total Keys, Carriage Controlled	27
Flexible Keyboard	28
Installing of Repair 1A-210 AR-AL Env. 1242	63
Interlock to Block Depression of the Regular Bar Following Depression of Upper and Uppermost Bars	58
Interlock to Block Regular Motor Bar Following Depression of Upper or Lower Bars, Carriage Controlled	60
Interlock to Block Sub-total Key When Subtract Lever is in Subtract Position	35
Interlock to Prevent Depressing Regular Motor Bar Following Depression of Upper or Lower Bars	56
Interlock to Prevent Depressing Upper Bar Following Depression of Other Motor Bars	59
Keyboard Indexing	1
Keyboard Interlocks	6
Keyboard Register Selection	47
Key Restoring Mechanism	7
Key to Normalize Register Shift Release and to Normalize Sub-total from Total Mech.	52
Lock and Key to Prevent Totaling Registers and to Block Motor Bar and Total Keys	29
Lock-down Total Mechanism	10
Motor Bar Interlocks	56, 57, 58, 59, 60
Negative Total Lock Disabling Mechanism	31
Non-transfer to Crossfooter	39
Non-transfer to Register	39
Partial Keyboard Repeat, Single, Carriage Controlled and Normalized from Upper Motor Bar (Classes 11 thru 16 and 20 thru 30)	24
Partial Keyboard Repeat, Duplex	25
Positive Counter Control (Class 2)	12
Register Shift from Subtract Lever	49
Register Total from Register Total Indexing Lever	43
Register Total Indexing Mechanism	41
Register Total Indexing and Subtract Levers Locked During Machine Operation No. 2	53
Register Total Indexing Lever to Normalize Carriage Opening Mechanism	54
Register Total Key Interlock	42
Register Total Symbol Mechanism	9
Register Total to Add in Non-add Position	46
Repeat and Cycle Normalizing Key (Classes 11 thru 16)	16
Repeat Machine Operations Indexed from Total Keys and Lower and Upper Bars	22
Repeat of Machine Cycle, Carriage Controlled (Improved)	13–1
Repeat Print Keyboard Lock	23
Repeat Print of Sub-totals (Classes 11 thru 16, Early Style)	17
Repeat Print of Sub-totals (Classes 11 thru 16 and 20 thru 30)	19
Safeguard Keyboard and Motor Bar Lock Mechanism	30
Single Stroke Total Interlock	44
Skip Tabulating Motor Bar Mechanism (Bank Posting Machine)	55
Total and Sub-total Mechanism	8
Uppermost Bar Blocked by Regular and Auxiliary Motor Bars, Released from Total Keys	57

KEYBOARD INDEXING (Plate 1)



Keyboard Indexing (Plate 1)

Indexing, in general, is the process of setting up limits to which parts are moved. Indexing as applied to the keyboard means that depressed keys control the differential movement of toothed racks G to turn the adding wheels when the machine is operated.

Keys are arranged in columns in the order of 1-9 to correspond to the figures on the adding wheels.

Toothed racks G move between guides H having cross slots spaced to correspond to the order of the keys 1-9 and to the figures on the adding wheels.

Limit wires A have one end connected to key levers B and the other end lies in the cross slot of sector guide H.

When a key is depressed, key lever B pulls limit wire A deeper into the cross slot of guide H that corresponds to the key order of the depressed key, placing it into the path of adding rack G. Also latch F is raised to allow adding rack G to move downward when the machine is operated.

Example: No. 5 key pulls limit wire A deeper into the 5th cross slot of guide H. Locking strip C which cams latch F upward, is in turn latched in rearward position by latch D. The No. 9 key has no limit wire. When the 9 key is depressed, latch allows adding rack to drop and limit on shaft L.

Adding and printing is indexed simultaneously, i. e., during the machine operation, the adding racks are carried downward by the front arm of the type sector, the latter moves upward correspondingly, locating the No. 5 type to the printing line of the platen.

The indexed type is then struck by hammer U and 5 printed, covered in detail under subject "Printing."

It will be noted that indexing refers to the adding rack when the adding wheel is not meshed with it. The adding wheels are meshed with the adding rack at the beginning of the return stroke and are turned when the adding rack is moved back to normal position.

The subject of indexing as covered so far, refers to the high keyboard machine. The low type keyboard has no index wires, Class 4 machines have an index bar stop directly on the depressed key, the indexed bar carries the adding rack. The Classes 8-9-10 machines also have index bars which limit on the keystem.

Keyboard Tests

Keystems E should align with levers.

Keystems, when depressed, limit on the upper keyboard plate which is the true limit for lever B, wire A, locking strip C and shaft 402B.

Wire A must have definite length, not too long to jar out of place nor too short to limit the movement of locking strip C.

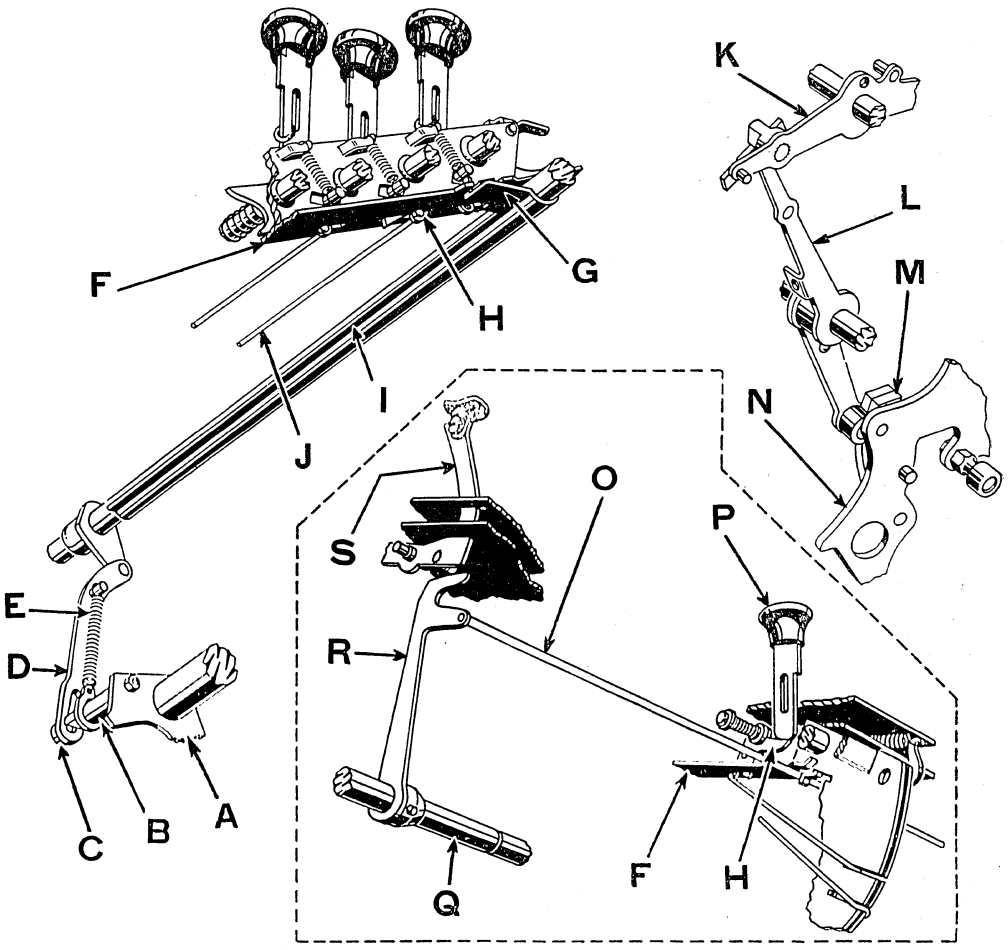
Locking strip C should have lead over latch D and align centrally with latch D. The curved end of C should be adjusted so as not to clear adding rack G before wire A has been drawn in place.

Test for Free Action of Keys

A key should always be depressed in some other column than the one receiving the test. This is essential so as to eliminate spring 482 tension assisting in restoring locking strip C, which depends wholly on spring 284.

KEYBOARD INTERLOCKS (Plate 6)

(Plates 2-3-4-5 in Symbol Book Only)



Keyboard Interlocks (Plate 6)

The purpose of interlocks is to prevent misoperations that could cause incorrect results and, or cause damage to the mechanisms.

When one key in any column is depressed, all the other keys in that column are blocked against depression. When no key is depressed, the slots in bar F are in line with the heel of lever H, now, when one key is depressed, bar F moves rearward, the slots in bar F moving out of the path of H, thereby preventing the depression of any other key in that column.

When the machine operation starts, hooks G are moved into one of two spaces in bars F by the secondary section A through link D, spring E and shaft assembly I which locks the entire keyboard against depression and correction. Columns having keys depressed are blocked by hooks G entering the rear space of bars F whereas columns having no keys depressed, are blocked by hooks G entering the front space of bars F.

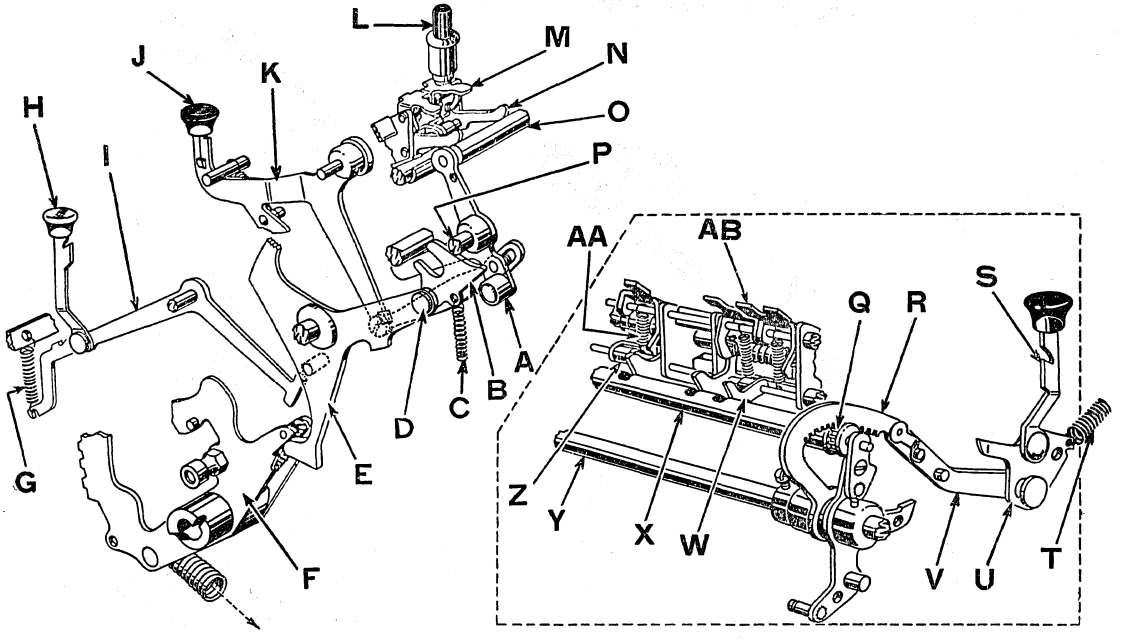
Error key J (Plate 7) is blocked by part E (Plate 7) during the machine operation.

When any key is depressed, total lever S is blocked by arm R. Depressing key P causes H to push bar F rearward, its ear contacting shaft O, swinging arm R under the stud in total lever S. When total key S is depressed, it locates the stud in rear of arm R which blocks shaft O.

When total keys are partially depressed, the motor bar is blocked by the upper arm of part L being in the path of the stud in part K. When the motor bar is depressed, the upper arm of L is blocked by the stud in part K which blocks the total keys.

When the operating handle is partially moved segment M is in the path of the lower arm of part L which also blocks the total keys. When the total keys are partially depressed, the operating handle is blocked by the lower arm of L being in the path of segment M.

KEY RESTORING MECHANISM AND DATE REPEAT KEY MECHANISM (Plate 7)



Key Restoring Mechanism (Plate 7)

On the forward stroke as full stroke assembly F clears assembly E, spring C rocks assembly E, passby pawl B passing roller A.

At the end of the return stroke, full stroke segment F rocks assembly E, passby pawl B rocking restoring shaft assembly P to raise latches N exactly as when error key J is depressed.

Repeat Key

To repeat print and add the same key set up a number of times, the repeat key is latched down which locates its rear arm in the path of assembly E, thereby repeating the same number as long as the repeat key is latched.

Error Key

To release depressed keys in all columns, error key J is depressed, the foot of K rocks restoring shaft assembly P, shaft O rolling under and raising latches N.

Separate Column Release Keys

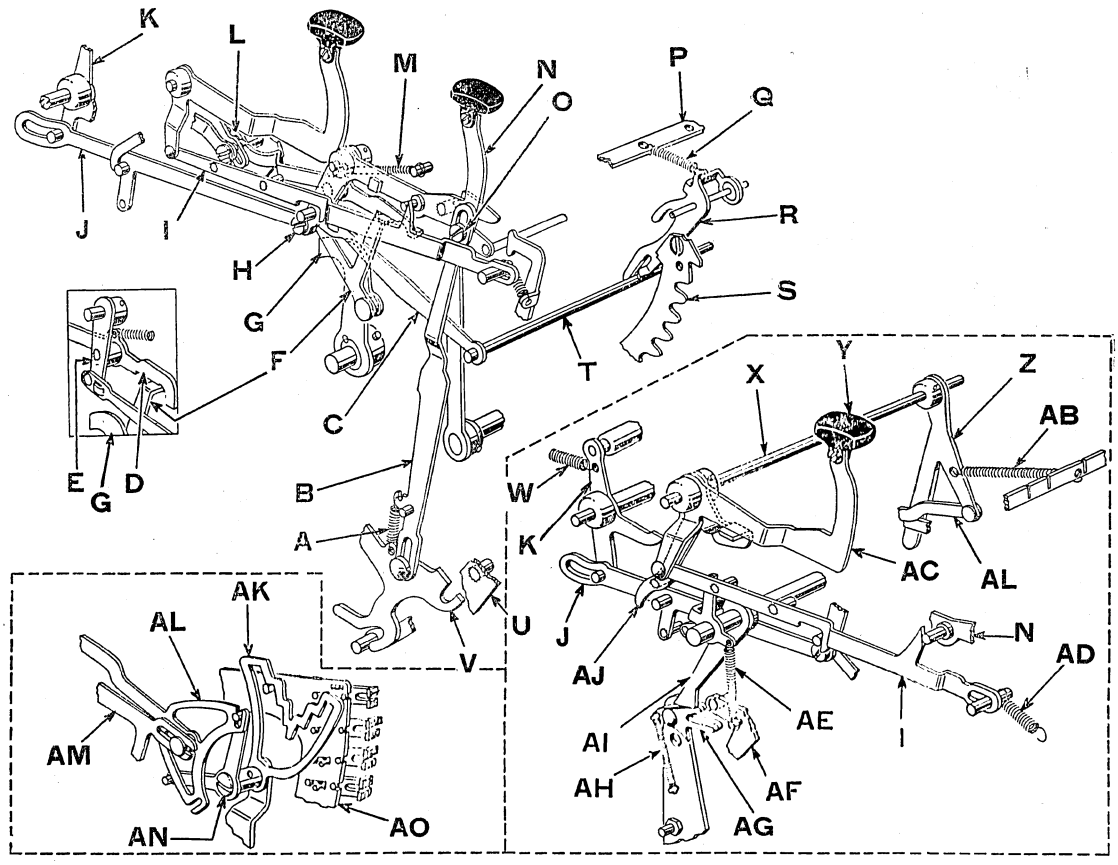
In order to correct one or more figures of an amount set up on the keyboard, button L is depressed which contacting on intermediate M raises latch N.

Date Repeat Key Mechanism

The purpose of the date repeat key mechanism is to hold the date keys depressed when amount and other keys are restored.

This is accomplished by slots in restoring shaft X which prevent the raising of latches W. When keystem S is depressed, it swings part U which through link V swings toothed arm R forward. The teeth of R being meshed with pinion Q of shaft turns the latter so as to locate its slots under latches W to allow the latches to remain normal when restoring shaft operates.

TOTAL AND SUB-TOTAL KEY MECHANISM (Plate 8)



Total and Sub-total Key Mechanism (Plate 8)

When total lever N is depressed, arm F contacts coupler D which pulls bail E rearward and through link C and shaft T raises latches R to allow adding racks S to move downward during the machine operation.

Link B lowers part V which disengages it from the upper stud in U to cause the crossfooter to stay in mesh during the forward stroke. The total symbol is indexed when the stud in link J contacts arm AJ to rock shaft assembly X which through arm Z and link AL swings index arm AK to select and locate the step in the path of the limit stud in symbol sector AO.

At the beginning of the forward stroke, link B drops and the lower part of V engages the lower stud in U. Before the end of the forward stroke, collar L contacts on and rocks coupler D, allowing bail E, link C, shaft T and latches R to restore, which prevents adding racks S dropping in any column having adding wheels in cipher position.

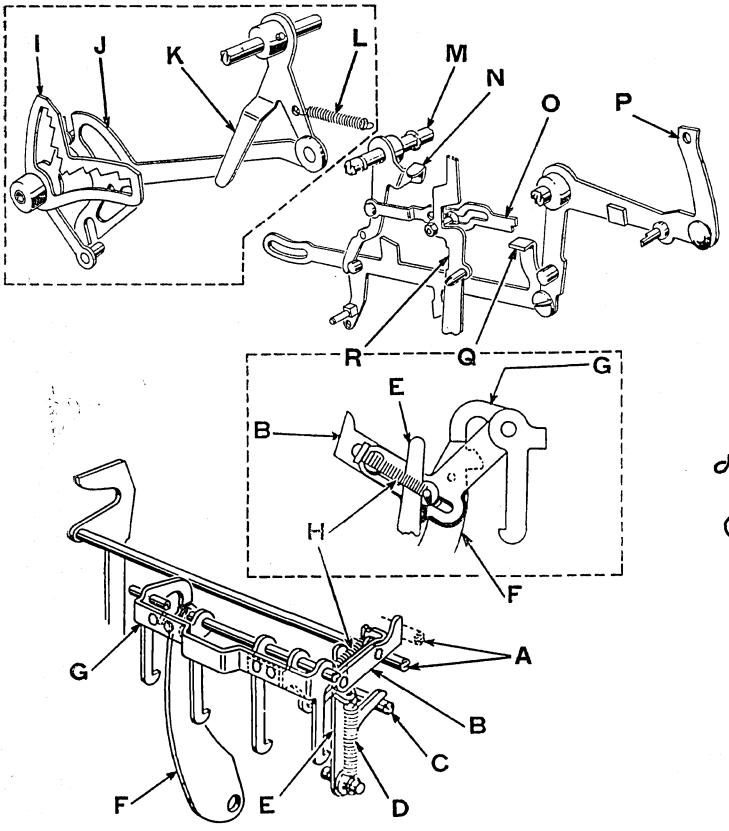
On the return stroke, passby pawl AG engages the stud in part AF, rocking it, which through part V, disengages the crossfooter and allows adding racks S to return to normal, thus causing the adding wheels to remain clear.

When the sub-total key is depressed, link I contacts on the stud in N rocking total lever N which through link C and shaft T raises latches R.

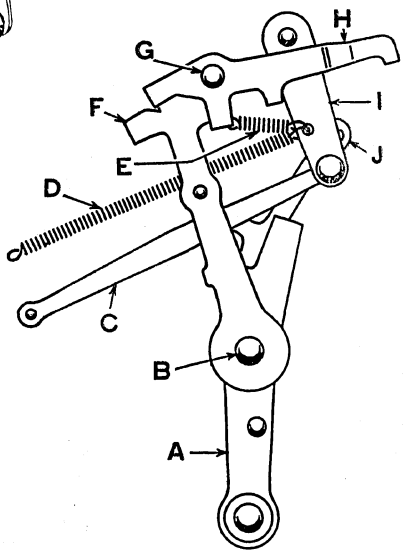
Link B also lowers part V. The sub-total symbol is indexed by sub-total lever AC contacting on the horizontal arm of AJ which rocks shaft assembly X to swing index arm AK to select and locate its step in the path of the limit stud in symbol sector AO.

The depression of the sub-total key through the stud in I swings non-add control AI to block passby pawl AG to prevent disengaging the crossfooter on the return stroke and thereby retain the total.

REGISTER TOTAL SYMBOL MECHANISM (Plate 9) (Classes 11 thru 16 and 21 thru 30)



LOCK DOWN TOTAL MECHANISM (Plate 10)



Register Total Symbol Mechanism (Plate 9)

When register total indexing lever R is placed in total position, the lower step of link O locates in the path of arm Q. When the total key is depressed, index arm assembly J is located to index the register total symbol type. When the register total indexing lever is placed in sub-total position, the upper step of link O is placed in the path of arm Q. When the total or sub-total key is depressed, the register sub-total symbol type is indexed.

Tests and Adjustments

When either total or sub-total keys are depressed with register total indexing lever R in normal position, there should be clearance between link O and arm Q.

When either total or sub-total are depressed with the register total indexing lever in total or sub-total position, link O should have good hold on arm Q.

Adjustment: The lip on arm Q is bent upward or downward to equalize the hold and clearance of arm Q.

Auxiliary Date Printing Control Indexed from Keys and Operated from the Machine

The purpose of this mechanism is to lighten the key depression. When keys are depressed, shaft A moves rearward, clearing slide B. When the machine operation gets under way, adding racks F move downward permitting spring D to swing hook assembly G to clear adding racks F.

When the total key is depressed, shaft C rocks arm E, the latter pulls slide B forward.

Lock Down Total Mechanism (Plate 10)

High keyboard machines not having repeat print or automatic totaling mechanisms are equipped with the lock down total mechanism. When the total key is depressed latch H drops into the notch in F. This mechanism is released before the end of the forward stroke by the sector bar lock mechanism, by arm I raising latch H.

Counter Control Mechanism, Class 6 (Plate 11)

The function of the counter control mechanism is to automatically change the position of the shift lever from add to subtract and vice versa, either by the machine or the carriage movement. The tumbling of the adding wheels takes place on first machine operation.

The counter control mechanism has three positions, any one of which can be secured by latching or unlatching one or both of the counter normal or carriage normal keys.

1. When the counter key is latched, the counter control mechanism is inactive, the shift lever then must be changed by hand.

2. When the counter key is unlatched with the carriage key latched, the shift lever is alternately moved from add to subtract and vice versa by the operation of the machine.

3. When both keys are unlatched, the shift lever is located in subtract position by control rolls on the carriage.

Shift lever B is directly connected to the forward end of link F, the other end of F is slotted and connected to rocker L by shoulder screw Q. Rocker L is connected with the machine movement, when the counter normal key is unlatched with the carriage normal key latched, as follows:

AQ moves upward, this allows shaft assembly J to raise and limit on AS. Arm P permits F to move upward in its slot, so as to permit index arm U to assume a position during the machine operation, so that its slot will allow an open path for stud V. Now, when the machine is operated, on the forward stroke, roll S (on shaft R) contacts on and lowers bell-crank T. On the return stroke Z seats in one of the pockets of L, and at the end of the return stroke when AB is released by stud in AK, spring W pulls bell-crank T upward, which causes Z to move L in the opposite direction carrying with it F and shift lever B.

When the counter normal key and the carriage normal key are unlatched, arm AS moves upward, J follows, which allows F to rise and to cause its upper pocket to move into the path of stud E, thereby connecting the shift lever with D. The upward movement of F also permits index arm U to swing forward, so that its rear arm will move into the path of stud V. During a machine operation Z is now prevented from actuating rocker L.

Rocker D is connected with the carriage by control rolls contacting on subtract lever; the latter which has a forked end that engages AA which pivots on D, these parts being connected with spring Y.

One purpose of spring Y is to provide a yielding connection by allowing a control roll to depress subtract lever when interlock AB is blocking the subtract shift mechanism, during machine operations. When the machine becomes normal, interlock AB releases the subtract shift mechanism, permitting the tension of spring Y to index the subtract shift mechanism.

The other purpose of spring Y is to insure that all control rolls will completely move the subtract shift mechanism without adjusting each roll position.

Tests and Adjustments

When the carriage normal key is depressed, the inner and outer feed slides on the back plate must be completely coupled and the lift pawl completely moved out of the path of the stop dogs. To secure more movement, the horizontal arm of AS is bent sufficiently downward without causing a bind.

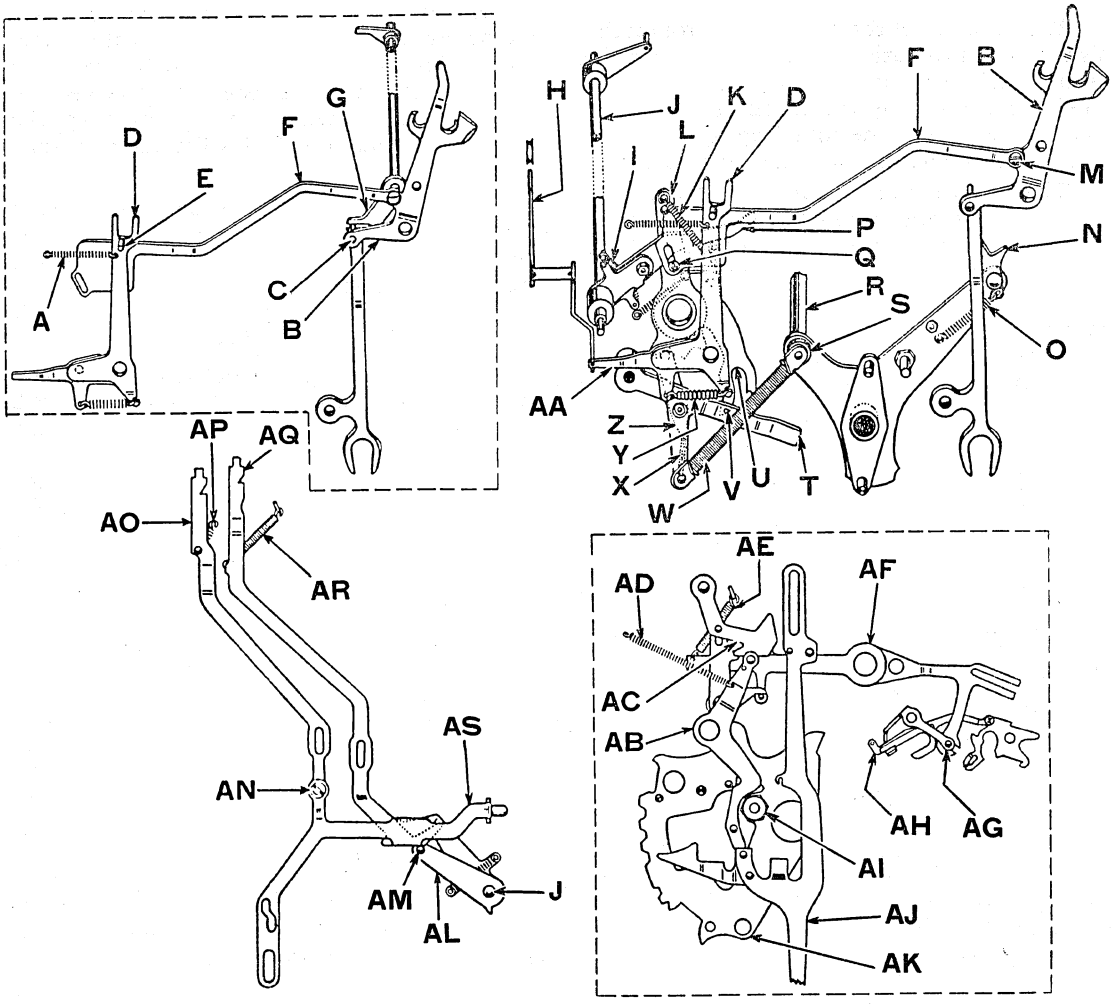
When the carriage normal key is latched with the counter control key released, and the machine operated, index arm U must assume a correct relative position with respect to stud V to insure proper location of U when, after machine has been operated with both keys unlatched, carriage normal key has been latched and machine operated; rear prong must positively clear V.

When the counter control key is unlatched, index arm U contacts on and is limited by part F which moves with and in the same direction as the shift lever.

When machine is operated with carriage normal key depressed, and counter control key unlatched, F is limited by means of its roll under P; as F is moved forward and rearward, the roll limits at two different points of P, consequently F may raise and lower during its movement, which will change the location of U with each operation of machine. With handle in forward position and with F at its highest position, stud V should be centrally located between the two prongs of U; at its lowest position, V will be closer to the front prong than the rear.

Adjustment is made by locating U either forward or rearward; to locate forward, stock may be removed from AS, where stud AM contacts; to locate rearward, arm AL may be slightly twisted to tip stud AM upward for earlier contact with AS, or P may be adjusted at its limit point, to locate it a little higher; as P must have a little play, with both control keys unlatched and pocket of F engaged with stud E, this must be considered when making the above adjustment, which will affect the play to some extent.

COUNTER CONTROL MECHANISM (CLASS 6) (Plate 11)



When operating machine with carriage normal key latched and counter control key unlatched, the shift lever should have from 1/32″ to 1/16″ play at each end of the slot in the keyboard, and this play should be equalized; it is equalized by operating on the offset of F to shorten or lengthen; to increase play, T is bent upward, and to decrease, downward.

It is essential that there be from 1/32″ to 1/16″ play of shift lever so that when the counter and carriage keys are unlatched there will be no bind, when F raises to engage its pocket with stud E.

There is a slight difference in the movement of the 1-10800 which affects the seating of stud V in the front pocket of U. When the machine is operated extremely fast on the forward stroke, 1-10800 does not move as far as when machine is operated at normal speed; therefore, when adjusting T to regulate movement of shift lever in slot of keyboard, care should be taken that T is carried down far enough on a fast stroke to carry stud V clear of the front prong, to insure its engagement with the front pocket, when counter control key is depressed, after operating with the key unlatched.

Test F for correct mesh with stud E when the carriage normal key is released. ***Adjustment:*** When shift lever is in add position, the front prong on D is bent rearward or forward. When shift lever is in subtract position, the rear prong is bent rearward or forward.

When the carriage tabulates, causing the control rolls to seat on the subtract lever, there should be a slight expansion of spring Y. This is to insure that the shift lever will be completely moved by all rolls. ***Adjustment:*** The rear arm of D is bent downward to expand or increase the expansion of spring Y.

(Plate 11—Continued)

Caution: Excessive expansion must be avoided as it results in a hard operation of the subtract lever and a slowing up of the carriage.

Test for slight play of P, with both carriage and counter control keys released, and pocket of F engaged with stud E; to adjust, raise foot of AQ slightly. In raising, care must be taken that when AQ is depressed, it will cause U to travel far enough rearward for its front pocket to fully engage stud V.

Final test to insure that when the counter control key is depressed, counters will not shift, also absence of friction in closed slot of F and proper tension of springs.

Place shift lever in add position by machine action; place shift lever in lower position against spring tension, latch counter normal key lightly; take fast stroke of handle and at the same instant release shift lever; lever should remain in lower position. Make the same test with lever in add position against tension. Then make both tests with slow operation of machine. The fast stroke tests the downward movement of T, and the slow stroke the proper tension of the springs involved and freedom of movement of F up and down.

When the counter and carriage normal keys are both latched, the shift lever is held in upper or lower position by cam lever AB contacting on cam AC. In order to insure that F will properly mesh with stud E when the counter and carriage normal keys are released, the parts affecting the position of the shift lever when these keys are latched, must be considered.

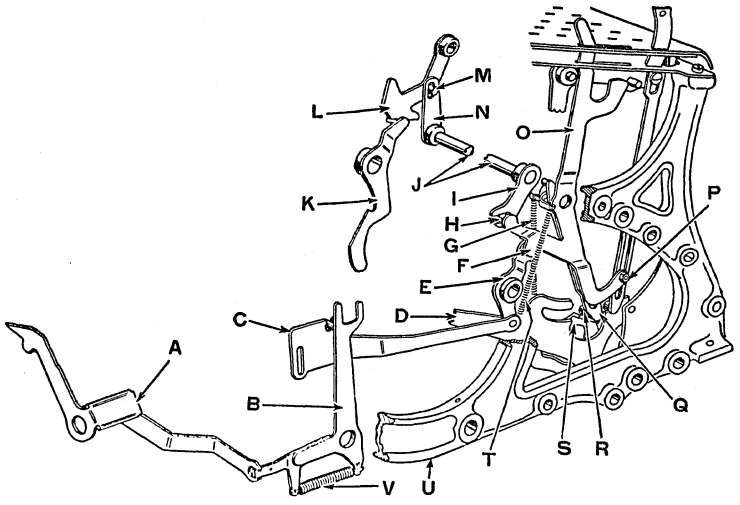
The slot of arm G must fit snugly on stud C, but must not bind, so that the shift lever will remain in a permanent position, with counter and carriage control keys latched; when the shift lever is in add position, the upper prong of G is in contact with stud C and when lever is in subtract position, the lower prong is in contact; if the prongs are spread, and the lever has play when in add position, the upper prong should be bent downward; when the lever is in subtract position, the stud is located at the base of the slot; if the lower prong was bent down, and the lever was moved to add position, this prong may not give enough movement to the shift lever, to pocket F with stud E on release of counter and carriage control keys.

When the counter and carriage control keys are both latched, and shift lever is in add position, there must be no expansion of spring AE, at the broken joint of AF; expansion of AE will overbalance spring AD, which would allow the shift lever to move out of its true position; expansion of AE is usually due to the forward arm of AG being located too low, and therefore being held by AH, this arm of AG should be bent upward. Expansion of AE will interfere with engagement of pocket of F with stud E.

In order to properly locate stud of AB in relative position to AJ, AB must have equal clearance from hexagon AI with shift lever in either add or subtract positions. To equalize this clearance, either shorten AB by operating on the offset, or locate upper end rearward.

It may be necessary to decrease clearance between AB and 361¼ stud in AK, in order that pocket of F may freely engage stud E after making final test.

POSITIVE COUNTER CONTROL (CLASS 2) (Plate 12)



Positive Counter Control, Class 2 (Plate 12)

This positive counter control is used in connection with S.A.C.T. carriages. The purpose is to locate the shift lever by control rolls on the carriage similar to the counter control used in Class 6 machines.

When a roll depresses lower counter lever A, shift lever O is moved from upper to lower position in the slot of the keyboard. Roller R on part Q carried by O enters the fork of D camming the latter downward, disconnecting it from the upper accumulator and permitting spring G to pull S upward, connecting the latter with the lower accumulator.

The lower counter lever is connected to shift lever O through E, the fork of E meshing with roller F on the lower part of the arm on the shift lever.

Roller H on the upper part of the arm on O meshes with the fork of arm I on shaft J, arm N on the opposite end of shaft J meshes with roller M.

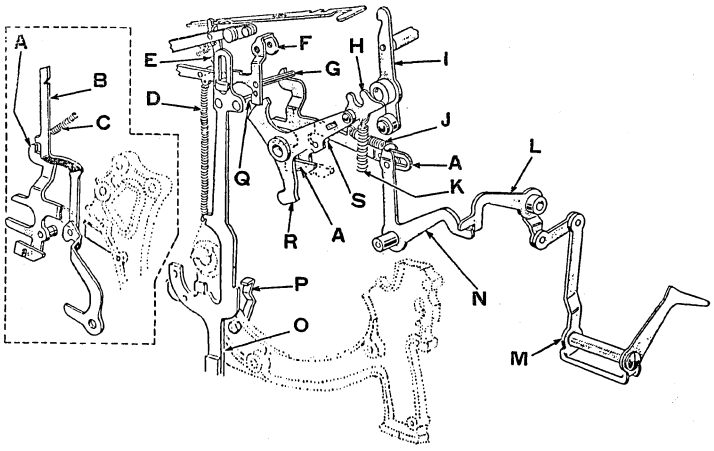
The upper part of shift lever O has an arm for blocking the total key when O is partly moved, cam L being only used for operating K similar to Class 6 construction.

This mechanism is subject to the tests and adjustments of similar parts on Class 6.

Tests and Adjustments

When a control roll is on the lower counter arm the spring on B should be slightly expanded, this is to insure complete movement of shift lever O. The expansion of this spring can be secured by bending upward, toward the control roll, arm of A. The position of lever O to locate completely in upper or lower position is secured by increasing or decreasing the offset in part C.

AUTOMATIC REPEAT MECHANISM (Plate 13) (Classes 20 thru 30)



Automatic Repeat Mechanism, Classes 20 thru 30 (Plate 13)

This mechanism repeats items set up on the keyboard, also machine operations with one keyboard set-up and one motor bar depression.

Sequence and Construction

When the carriage moves a number 3 roll on the decline of lever M, slide A moves into the path of stud S through bell-crank N and assembly L.

When the motor bar is depressed, part O is raised through spring D, part O is held upward by hook E. During the machine operation, detent F moves over stud Q, blocking the upward movement of part O as the spring D is being placed under tension. Passby pawl H cannot drop, due to stud S in part R being blocked by shelf of part A, which prevents the release of the clutch and the depressed keys.

When the carriage tabulates to the next position, the number 3 roll moving over the peak of lever M causes slide A to move sufficiently rearward to pull detent F off stud Q and as soon as the machine becomes normal spring D will raise part O to trip the drive.

This mechanism can be normalized by depressing and latching stem B which blocks slide A.

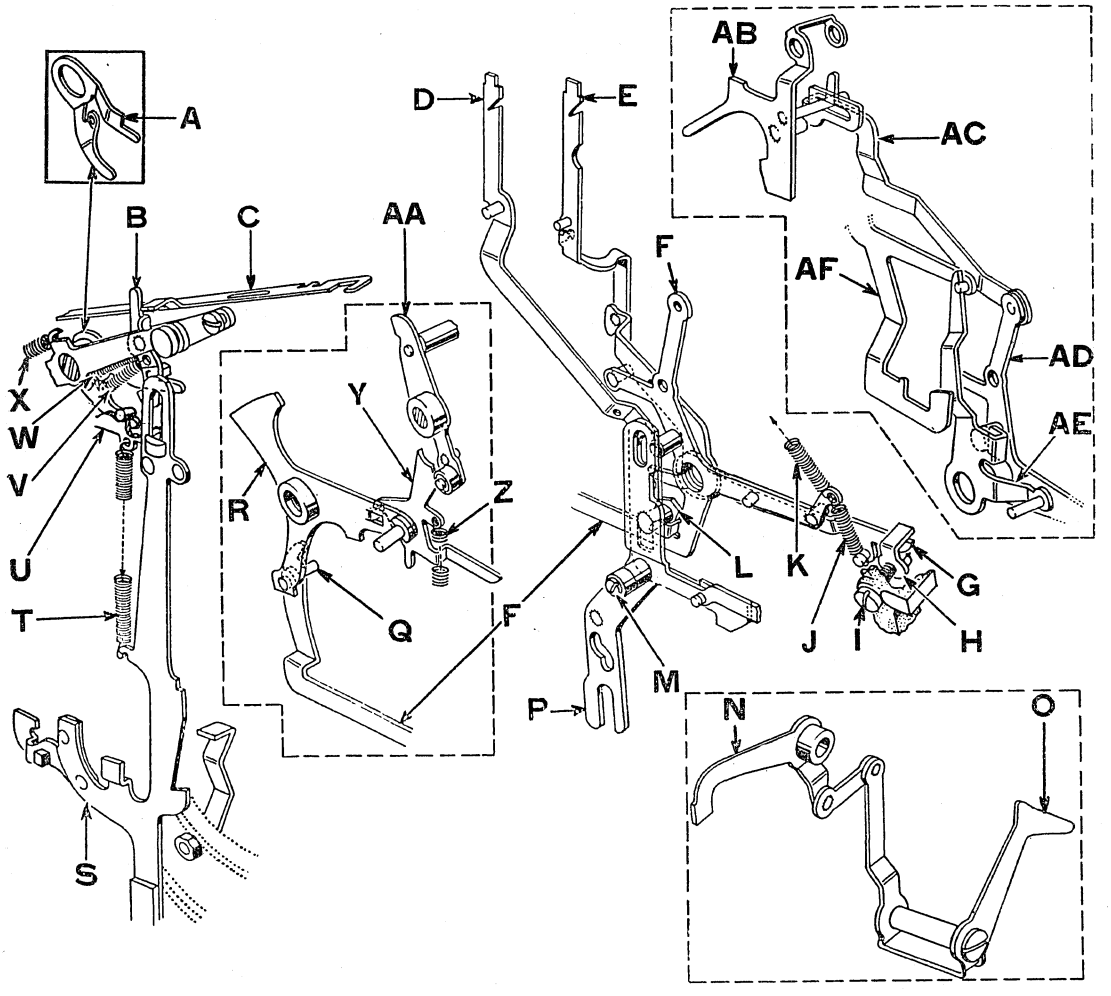
Tests and Adjustments

Cam of M should align with the control roll.

Repeat On: No. 3 rolls are located on the decline of cam lever M (before roll passes over high point of M) to secure full hold of slide A on stud S.

Repeat Off: No. 3 roll is located below high point of M (after roll passes over high point of M).

REPEAT OF MACHINE CYCLE, CARRIAGE CONTROLLED (IMPROVED) (Plate 13-1)



Repeat of Machine Cycle, Carriage Controlled (Improved) (Plate 13-1)

This mechanism has lighter carriage and disabling key action than the earlier style.

When the carriage locates a No. 3 roll on lever O, bell-crank N rocks spring connected repeat control levers G and F, which seats stud Q in the lower pocket of F and prevents flipper Y dropping below the roller in key restoring assembly AA. Key and drive restoring are thus disabled, resulting in repeat printing or non-printing, and repeat adding or non-adding during the machine operations.

When a No. 5 roll is used, stud Q locates in the upper pocket of F which allows the lower pocket of flipper Y to locate in line with the roller in key and drive restoring assembly AA which causes the latter to release the depressed keys, without restoring the drive during the machine operation.

When the carriage position does not locate a roll on lever O, flipper Y drops below the roller in AA which causes AA, through slide C, to release latch B. In the event that the motor bar is held depressed, latch B is held in unlatched position by detent A; the latter is released by springs X and T when the motor bar is released by the stud in U.

Disabling key E, when depressed and latched by contacting on the arm of repeat control lever F, rocks the latter to normal position and when it is in carriage indexed

(Plate 13-1—Continued)

position, which expands spring J. When F is not carriage indexed, it is blocked by E.

Carriage normal key D when depressed, disables this mechanism through collar L contacting the lower arm of F.

Bank posting machines have repeat control lever AF which is indexed from the carriage through part AD which differs from repeat control lever F insofar that it does not extend to key restoring assembly R. Part AD is indexed from the carriage exactly like repeat control lever F. The upper arm of AF carries link AC which pulls detent AB off drive control S and simultaneously indexes repeat control AF through the stud in AD, swinging arm AE which in turn indexes repeat control AF. This mechanism is disabled from key E when the latter is depressed and latched by the stud in the upper part of key E camming AF.

Tests and Adjustments

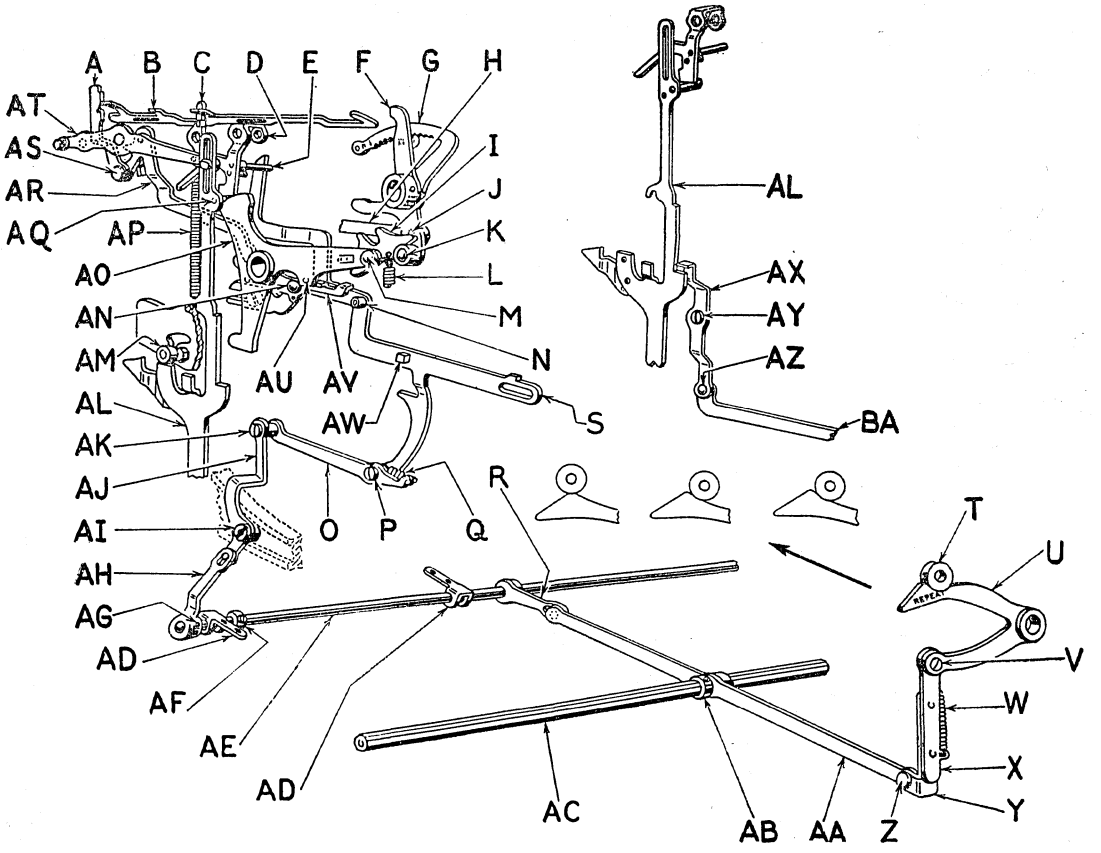
Lever O to align correctly with the repeat rolls.

Rolls No. 3 and No. 5 are set on the peak of lever O.

When a No. 3 roll locates on lever O, stud Q should fully seat in the lower pocket of F. A No. 5 roll should fully seat stud Q in the upper pocket of F.

Adjustment: The lower arm of F is bent and equalized to meet this test.

AUTOMATIC REPEAT MECHANISM (Plate 14)
(Classes 11 thru 16)



Automatic Repeat Mechanism Sequence of Operation (Plate 14)

When the motor bar is depressed, lever AT lifts part AL through spring AP. When AL has been lifted its full height to trip the drive, hook C passes under stud in AT thereby holding the drive in tripped position.

During the machine operation, roller AM contacts on and carries downward part AL placing spring AP under tension and temporarily resetting the drive. When part has been entirely pulled down, detent D moves over stud AQ, thereby preventing spring AP from lifting part AL to trip the drive until the carriage movement pulls a No. 3 roll over the repeat lever.

When the repeat lever is completely depressed by a control roll, repeat slide S moves rearward, its hook contacting on stud E and pulling detent D off stud AQ allowing spring AP to lift part, thereby tripping the drive.

Repeat Printing

The keys are held depressed by a No. 3 roll on the repeat lever, during a machine operation when the carriage is stationary. The roll is set on the decline of the repeat lever, which places a shelf of the repeat slide in the path of a stud in the key restoring arm, symbol AO, thereby disabling its operation.

Repeat Off Operation

When the carriage reaches the last column, the control roll which tripped the drive allows the keys to be restored. The control roll in this column is set further on the decline so as not to place the shelf on the repeat slide in the path of the stud in arm AO.

It will be noted that the control roll in this last column is used to trip the drive when the carriage is tabulating to the last column and has no function to perform when the carriage is located in the last column. When the keys are being restored, arm F moves slide B forward, the latter rocks hook C which allows part AL to restore to normal position.

Automatic Repeat Mechanism Construction

Repeat lever U is connected to the rear arm of lever AA by flexible link X. The front arm of lever AA is connected to slotted

(Plate 14—Continued)

arm R, on shaft assembly AE. Slotted arm AH (of shaft assembly AE) is connected with lever AJ, the latter pivots on the right side frame. Lever AJ is connected to repeat slide S by link O.

Tests and Adjustments

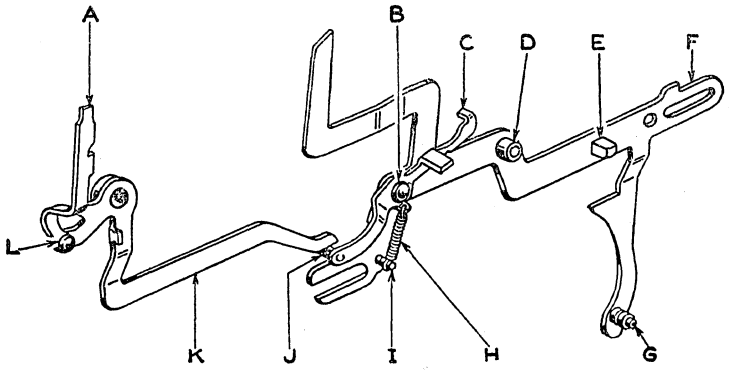
When the carriage is tabulating to the left, there should be slight clearance between the peak of repeat lever U and control roll space collars. This will provide the necessary play of slide S.

Adjustment: To secure clearance between U and control roll collars, apply bender to horizontal part of lever AJ.

When a repeat roll is resting on the decline of the repeat lever with the operating handle drawn to the first stop, stud AU should have ¾ hold on arm AV. Since the adoption of repeat timer AX it is not quite as necessary to test for half hold of detent D on stud AQ in AL. However, when repeat timer AX is used, the correct hold of D on stud AQ must be considered. Hold of stud AU is secured by locating the repeat roll higher or lower on the decline of the repeat lever.

The free movement of lever U and its alignment with the control rolls is essential.

AUTOMATIC REPEAT NORMALIZING KEY (NON-CYCLE) (Plate 15) (Classes 11 thru 16)



Automatic Repeat Normalizing Key (Non-Cycle) (Plate 15)

The automatic repeat mechanism of non-cycle machines is disabled when key A is depressed which rocks shelf lever C out of the path of the key restoring mechanism.

REPEAT AND CYCLE NORMALIZING KEY (Plate 16) (Classes 11 thru 16)

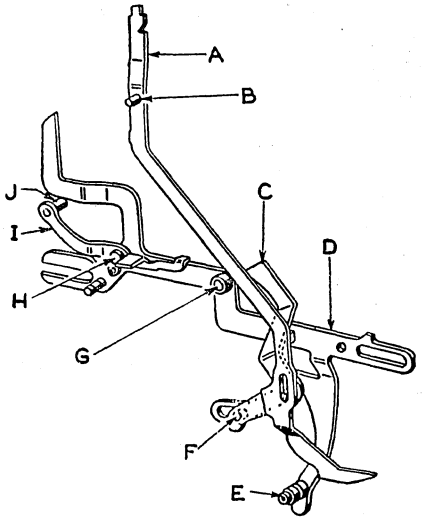
Repeat and Cycle Normalizing Key (Plate 16)

The purpose of key A is to normalize the cycle and the repeat mechanism.

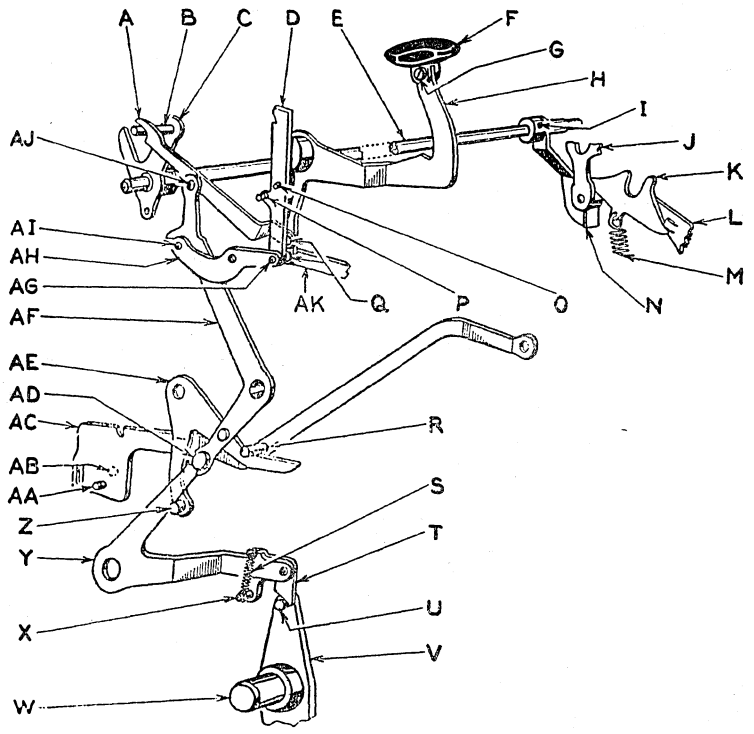
Sequence and Construction

When key A is depressed, its front arm rocks bell-crank C which either blocks or moves repeat slide D to normal position.

When there is no roll on the repeat lever, bell-crank C moves into the path of the repeat slide. When a control roll is on the repeat lever bell-crank C cams the repeat slide to normal position.



REPEAT PRINT OF SUB-TOTALS (EARLY) (Plate 17)
(Classes 11 thru 16)



Repeat Print of Sub-totals (Early) (Plate 17)

When the sub-total key is depressed, link A rocks shaft assembly E, placing arm N in the path of passby pawl K.

When the motor bar is depressed with the sub-total key held down, hook C (Plate 14) passes under stud in AT (Plate 14) to hold the drive tripped.

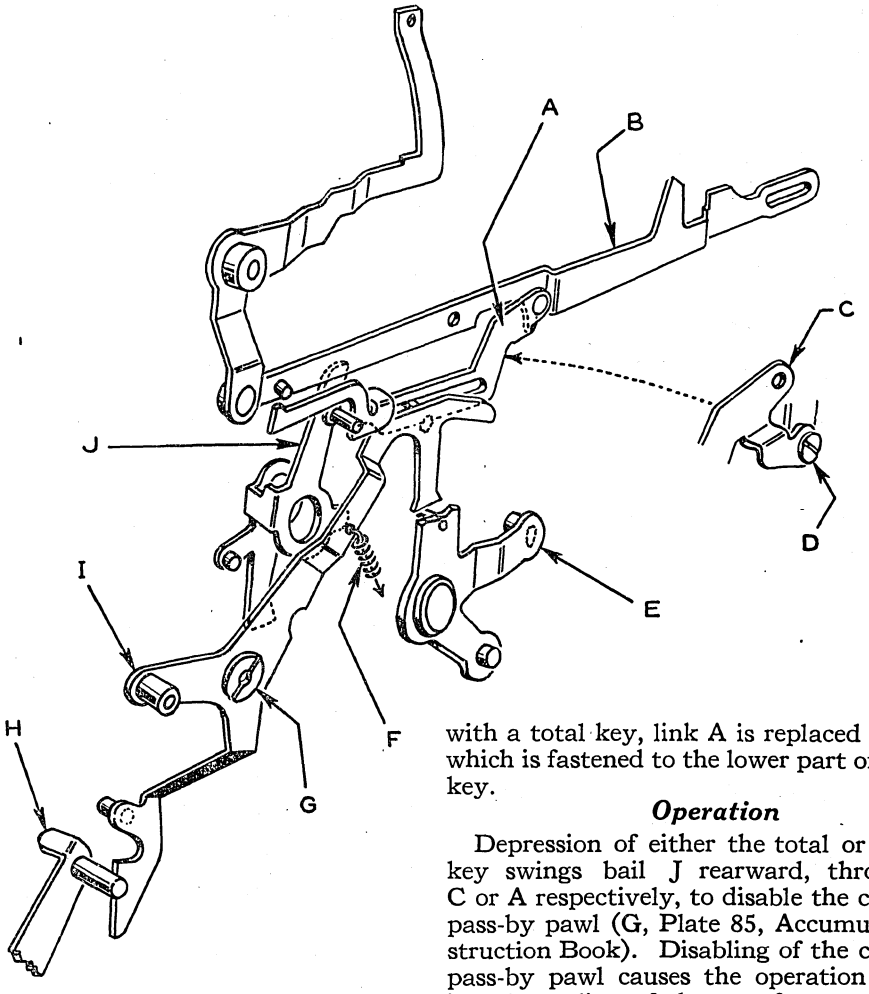
During the return stroke of the machine operation as the stops are being lifted above the stop block the movement of the latter causes timer AX (Plate 14) to move in the path of a step on AL (Plate 14) to delay the tripping of drive until the carriage reaches the new balance column and the stops are seated on the stop block, the movement of which causes timer AX (Plate 14) to trip the drive.

After timer AX (Plate 14) has blocked AL (Plate 14), upper stud U (in V) contacts on passby pawl T and rocks bell-cranks Y and AF; the upper end of AF raises arm A which releases shaft assembly E and allows passby pawl K to rock J to release AT (Plate 14) through slide B (Plate 14).

This mechanism can be disabled in two ways, viz.: by the latching of normalizer key AH and by the latching of the carriage normal key.

Normalizer key AH swings on the upper part of the left side frame. The horizontal part of AH contacts under a projection of bell-crank AF so that when key AH is latched down, AF is rocked, the latter's upper part then raises arm A above the stud in C. The lower part of AC rocks bell-crank Y, so that passby pawl T will be above upper stud U (in V).

TOTAL OR SUB-TOTAL KEY TO CLEAR THE CROSSFOOTER IN THE LAST POSITION ONLY OF A REPEAT TOTAL OPERATION—CARRIAGE CONTROLLED (Plate 19-1)



Total or Sub-Total Key to Clear the Crossfooter in the Last Position Only of a Repeat Total Operation—Carriage Controlled (Plate 19-1)

Purpose

To total the crossfooter in only the last position of a repeat total operation—and to sub-total the crossfooter in all preceding repeat total positions.

Ordinarily during a total operation, the crossfooter is cleared. With this mechanism, the crossfooter pass-by pawl (G, Plate 85, Accumulation Instruction Book) is disabled, allowing the crossfooter to retain the amounts until reaching the last position of repeat total operation.

Construction

When this mechanism is used in conjunction with a total key, link A is replaced by link C which is fastened to the lower part of the total key.

Operation

Depression of either the total or sub-total key swings bail J rearward, through link C or A respectively, to disable the crossfooter pass-by pawl (G, Plate 85, Accumulation Instruction Book). Disabling of the crossfooter pass-by pawl causes the operation to result in sub-totaling of the crossfooter.

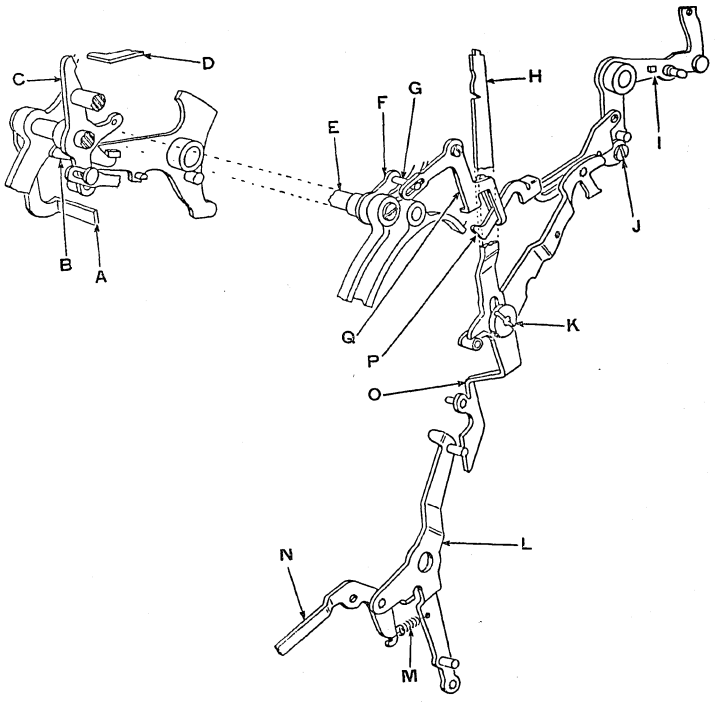
As the carriage tabulates into the last position of a repeat total operation, the active control roll rocks bell crank H. The latter, through bell crank I and link A, releases bail J. Bail J then swings out of the path of the crossfooter pass-by pawl, thus permitting a crossfooter total operation to be indexed and subsequently clear the crossfooter.

Adjustment

1. With the total or sub-total key depressed and the carriage moved into the last position of the repeat total operation, link A (or C) should be raised clear of the stud in the upper part of bail J to allow the latter to swing clear of the crossfooter pass-by pawl.

To adjust, bend the lower arm of bell crank I forward or rearward.

REPEAT PRINT OF SUB-TOTALS (Plate 19)
(Classes 11 thru 16 and 20 thru 30)
(Plate 18 in Symbol Book Only)



Repeat Print of Sub-totals (Later) (Plate 19)

The purpose of this mechanism is to automatically repeat a sub-total after the carriage has been returned to the new balance column.

Sequence and Construction

When a No. 3 roll depresses the non-add lever, part L rocks part O, raising part P in line with the step on Q. Now, when total key I is depressed, part P will rock part Q, the latter rocks shaft E through arm F and stud G, which moves arm A into the path of passby pawl B, thereby preventing the restoring of the clutch.

As the carriage is being returned, a No. 1 roll contacts on non-add lever, raising part P above part Q, which permits passby pawl B to drop and release the clutch through arm C contacting on slide D. This mechanism can be normalized by depressing and latching key H.

Tests and Adjustments

When a No. 3 roll is on the non-add lever, part P should be located sufficiently above the step on part Q.

Adjustment: Weave part O, this adjustment is limited by the release of part P when a No. 1 roll depresses the non-add lever.

To prevent premature release of part P, the spring on part F should be relatively stronger than the spring on P.

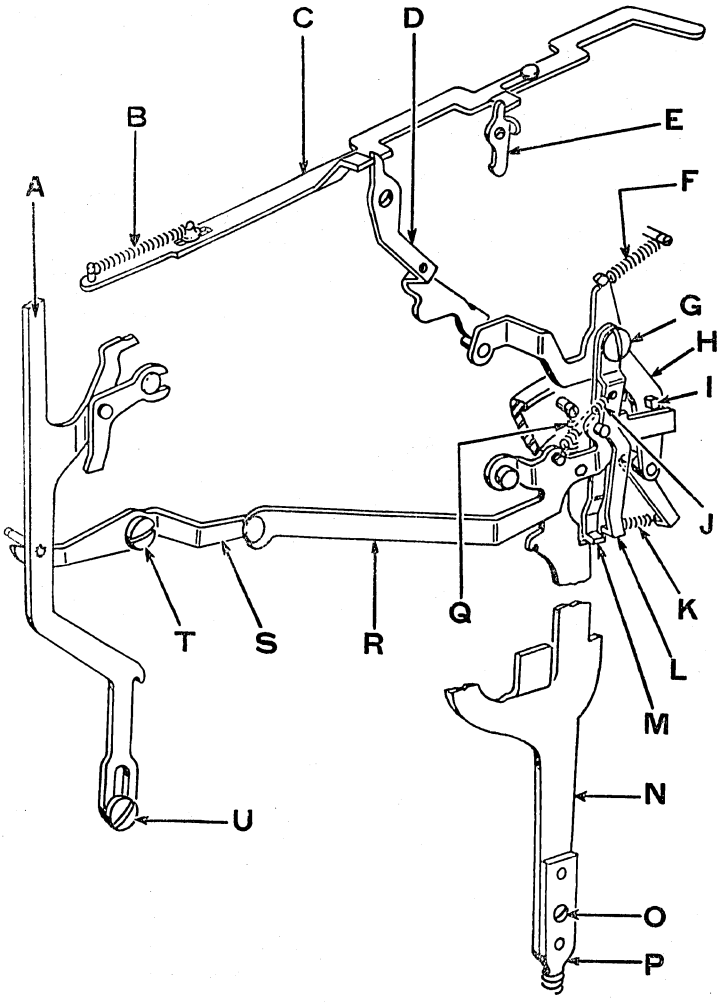
When the total key is depressed, arm A should be sufficiently forward to prevent passby pawl B rocking the key restoring mechanism.

Adjustment: Bend arm A. This adjustment is limited by arm A clearing the key restoring mechanism when the total key is normal.

AUTOMATIC TOTAL REPEAT MECHANISM NORMALIZED BY CARRIAGE RETURN (Plate 21)

(Bank Posting Machine)

(Plate 20 in Symbol Book Only)



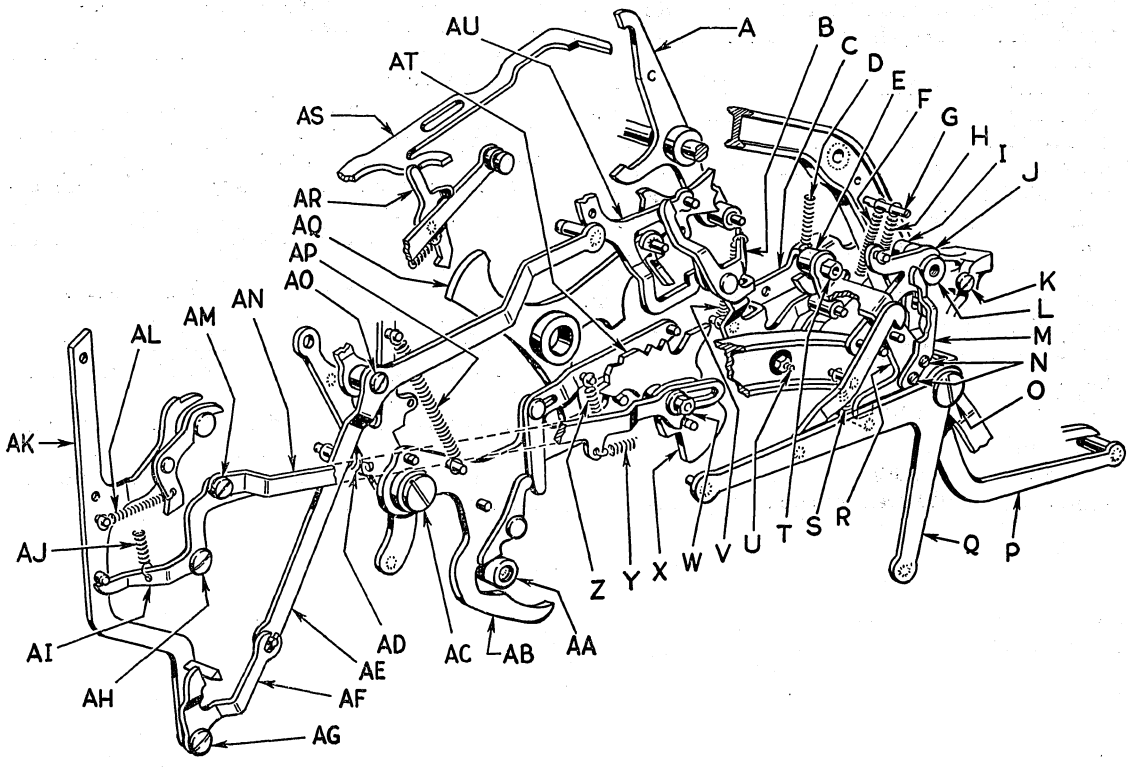
Automatic Total Repeat Mechanism Normalized by Carriage Return Key (Bank Posting Machine) (Plate 21)

When return key A is depressed, lever S rocks part R to clear stud I.

During the machine operation, springs F and K swing bell-crank H, which in turn swings part D to move slide C to trip latch E, thereby stopping the automatic operation. The purpose of detent M is to block drive trip N when the skip bar is held down.

The purpose of detent L is to block drive trip N when key A is depressed with the automatic repeat mechanism indexed by the carriage.

REPEAT OF MACHINE OPERATION INDEXED FROM THE LOWER BAR—OR DISABLED FROM THE LOWER BAR, CARRIAGE CONTROLLED (Plate 22-1)



Repeat of Machine Operation Indexed from the Lower Bar—or Disabled from the Lower Bar, Carriage Controlled (Plate 22-1)

Purpose

To index a repeat machine operation from depression of the lower bar unless disabled by carriage control.

Operation

Indexing of a repeat of machine operation occurs when lower motor bar AK is depressed with no disabling control roll active on the carriage.

Depression of bar AK rocks arms AF and AE lowering the rearward stud in arm AE and permitting control arm AU to move forward.

During the forward stroke, flipper AQ pivots rearward. Its rearward arm moves downward to align the lower pocket of the attached pawl with the roller on rocker shaft assembly A. Downward travel of the rearward arm is limited by its rearward stud resting on the step of control arm AU.

During the return stroke, flipper AQ pivots forward and rocks assembly A. Because the roller of assembly A is in alignment with the lower pocket of the pawl on flipper AU, assembly A travels only far enough to release the keys in the keyboard and yet retain the switch points closed. The switch points remaining closed retains the Repeat of Machine Operation Mechanism indexed.

Disabling of a repeat of machine operation occurs when a carriage control roll has rocked bell crank P before the lower motor bar is depressed.

Rocking of bell crank P pivots arm J which through a stud in its forward arm lowers the hook of the arm on bell crank Q over the stud in arm R. Depression of lower bar AK aligns cam X over the stud in bell crank Q through bell crank AI, link AN, and spring Y.

During the forward stroke of the machine operation, roll AA rocks assembly AB to swing cam X downward and rock bell crank Q. Rocking of bell crank Q lowers cam C through assembly R and roll E to swing arm B and move control arm AU rearward.

(Plate 22-1) Continued

Flipper AQ then pivots downward and the upper pocket of the attached pawl is aligned with the roller on rocker shaft assembly A. The flipper is limited by the stud in its rearward arm resting in the pocket of control arm AU.

During the return stroke of the machine operation, flipper AQ pivots forward and rocks assembly A. Because the roller of assembly A is in alignment with the upper pocket of the pawl on flipper AU, assembly A is rocked far enough to not only release the keys in the keyboard but also far enough to move slide AS. Moving of slide AS trips latch AR, to release the motor bar slide arm and open the switch points, thereby disabling the Repeat of Machine Operation Mechanism.

Adjustment

1. During the forward stroke of a repeat of machine operation, the rearward stud of flipper AQ should seat on the step of arm AU.

To adjust, shorten or lengthen the rearward offset of arm AE.

2. During the forward machine stroke of a repeat of machine operation, the lower pocket of the pawl on flipper AQ should align with the roller of rocker arm A.

To adjust, bend the lower projection of control arm AU up or down.

3. With the lower bar depressed and the Repeat Normal Mechanism indexed by a carriage control roll, the following conditions should be checked and adjusted in the sequence given:

a. Cam X should have full hold on the stud of bell crank Q.

To adjust, turn eccentric screw AM.

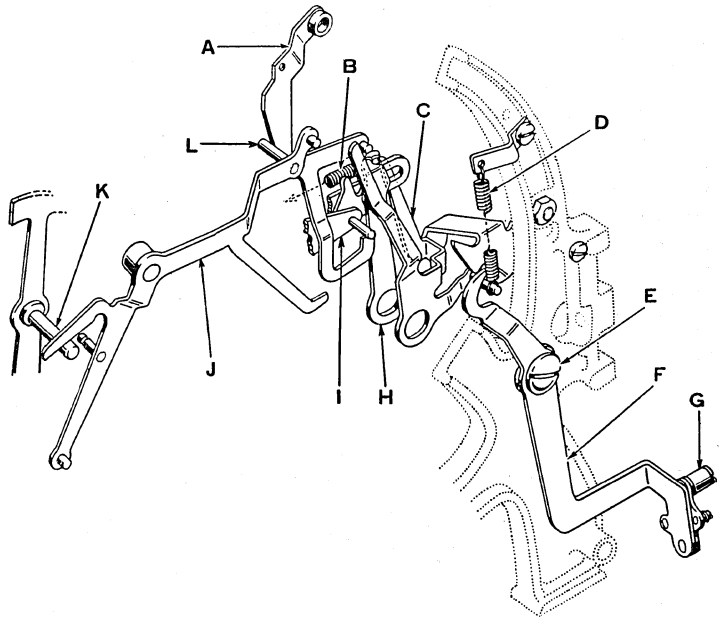
b. The hook of bell crank Q should have full hold on the stud of arm R.

To adjust, bend the rearward end of arm P up or down.

c. The rearward stud of flipper AQ should seat in the pocket of control arm AU.

To adjust, bend the upper part of arm B forward or rearward.

REPEAT MACHINE OPERATIONS (INDEXED FROM TOTAL KEYS AND LOWER AND UPPER BARS) (Plate 22) (Classes 20 thru 30)



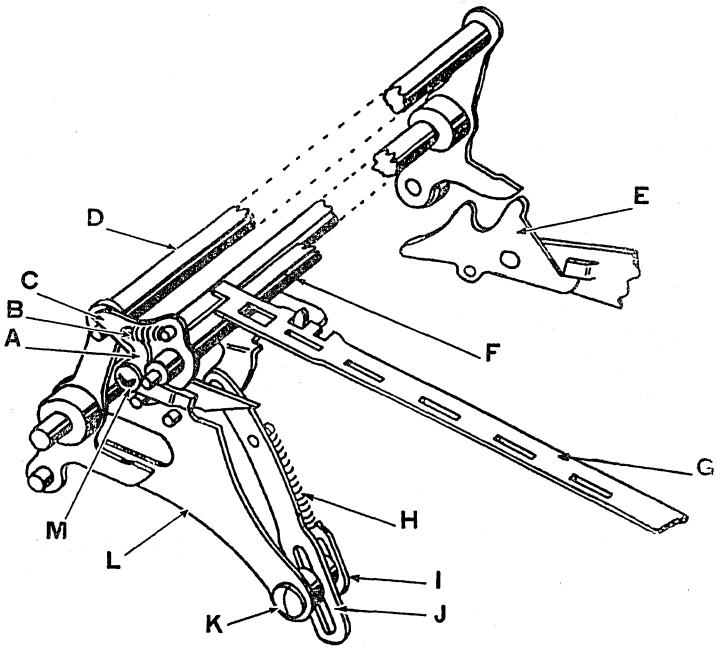
Repeat Machine Operation Indexed from Total Keys and from Lower and Upper Bars (Plate 22)

This print illustrates repeat indexing from the total keys.

When either total key is depressed, stud K rocks part J; stud L swings repeat control A to block assembly I which disables key and drive restoring.

This mechanism is normalized by a skid contacting roller G, rocking lever F; the latter cams part H which swings repeat control A forward clearing the stud in key and drive restoring assembly I to permit its active operation.

REPEAT PRINT KEYBOARD LOCK (Plate 23)



Repeat Print Keyboard Lock (Plate 23)

F locks the keyboard during and between repeat or automatic repeat print operations, the keyboard being released only when passby pawl E actuates the key restoring mechanism.

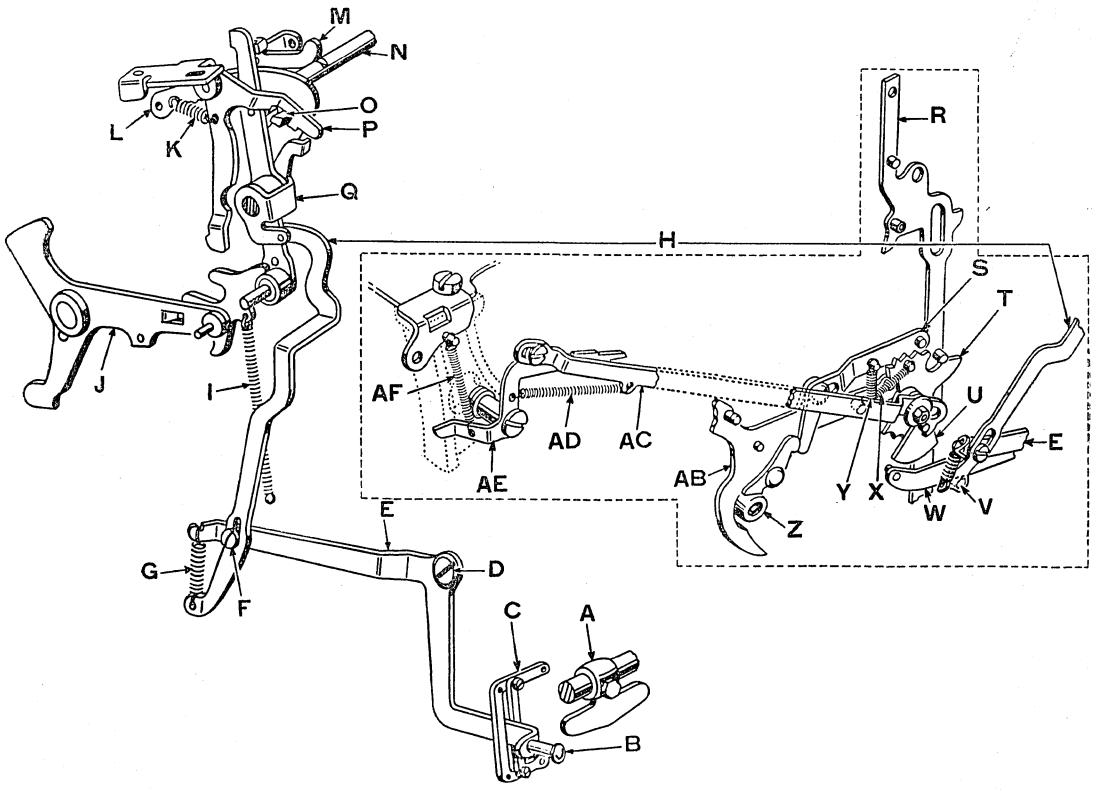
At the beginning of the forward stroke, L moves forward, allowing special spring H to pull link J forward, rocking F and locking strips G.

On the latter part of the return stroke a stud in L moves under bell-crank A (swings on C) which permits the hooks in F to remain in the slots of strips G until passby pawl E actuates rocker shaft D at which time shaft D contacts on part C rocking F which allows bell-crank A to move from over the top of the stud in L, and disengages the hooks from strips G.

Now, when a repeat roll is on the repeat lever and also when the regular repeat key is latched, passby pawl E does not actuate the key restoring mechanism which causes the keyboard to be locked.

The slot in link J is considerably longer than the slot in regular part 220¼. This long slot in J permits spring H to hold F in engagement with locking strips G, when bell-crank A is over the stud in L. When bell-crank A is in rear of the stud in L, F remains disengaged from locking strips G.

PARTIAL KEYBOARD REPEAT, SINGLE, CARRIAGE CONTROLLED NORMALIZED FROM UPPER MOTOR BAR (Plate 24)



Partial Keyboard Repeat, Single, Carriage Controlled—Normalized from Upper Motor Bar (Plate 24)

The purpose of this mechanism is to retain the keyboard set-up in one or more adjoining columns when the carriage tabulates into the control column. This is shown by the upper sketch. This mechanism is normalized from upper motor bar by the additional mechanism shown by the lower sketch. It will be noted that part H is slightly different in the lower sketch, it having a projection that is engaged by arm W.

Sequence

When skid A contacts on roller B, lever E raises link H to rock lever Q, which swings segment L to turn shaft N, which locates the cut outs in line with latches M. Segment L is latched in this position by latch P. Toward the end of the return stroke, assembly J rocks the restoring assembly, shaft N moving forward does not raise latches M due to the cut outs in shaft N.

When the machine is in normal position, part J holds latch P above the stud in segment L, the latter being latched by P only during the machine operation.

When it is desired to allow keys to restore in this carriage position, motor bar R is depressed, its stud contacting on part T swings its lower segment over the stud in arm W. At the beginning of the machine operation, roller Z swings assembly AB which through T lowers arm W, the latter contacting on stud V pulls part H downward which allows segment L and shaft N to remain in restoring position.

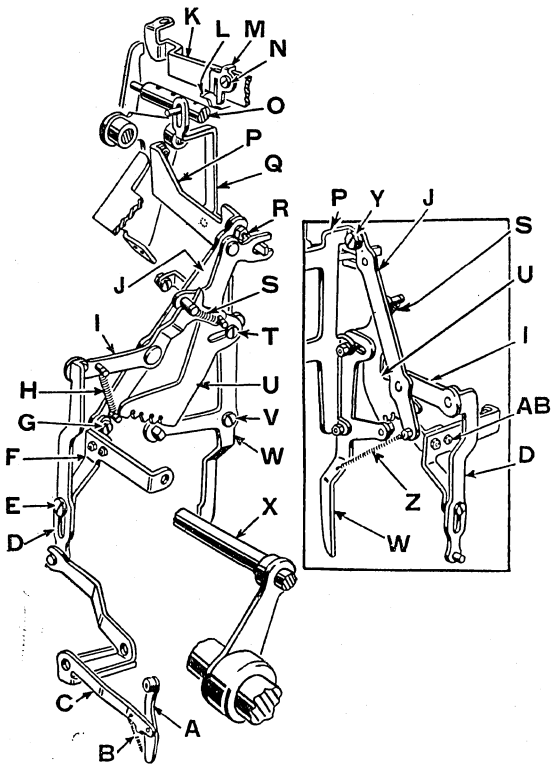
Tests and Adjustments

With skid A on roller B, arm of Q should have latching clearance when latch P moves downward during machine operation.

Adjustment: The offset of link H is changed as required. With machine normal, J should raise latch P to clear stud O in L.

Adjustment: The foot of latch P is bent.

DUPLEX PARTIAL KEYBOARD REPEAT MECHANISM (Plate 25)



Duplex Partial Keyboard Repeat Mechanism (Plate 25)

This mechanism provides one to three partial keyboard repeat operations.

Sequence and Construction

When a skid contacts on passby pawl A (carriage tabulating), link D is raised which rocks lever I. Spring S swings index arm U, the fork of the latter rocks part Q, which slides shaft O to align its slots with latch L, which disables key restoring. Skids of different widths are used to secure different partial repeat combinations.

During the machine operation, this mechanism is locked by detent W which moves a square stud into one of the spaces of index arm U. Detent W is swung forward by shaft X to clear index arm U, which permits spring Z to swing detent W to seat its square stud into the spaces of index arm U. Spring H restores this mechanism when the skid moves off passby pawl A.

Count and Normal Mechanisms Indexed from Machine Operation (Plate 26)

The purpose of this mechanism is to secure easier key depression.

Sequence

The depression of the first key indexes the count mechanism by swinging shaft X rearward to clear lever assembly N. At the beginning of the machine operation, the downward movement of bail I permits spring L to swing driver M which pushes limit wire Y into the path of the adding rack. Limit wire Y swings latch G rearward to release the adding rack. When keys are depressed in the count columns with button V in count position, driver M is blocked by stud Q in arm P contacting on bar R. When no keys are depressed in the count columns stud Q passes through the opening in bar R. Parts W, O and P are in all count columns.

Normal Position

When button V is moved to lower position (marked normal) the cam slide S blocks the square stud in part W which blocks the movement lever assembly N and driver M.

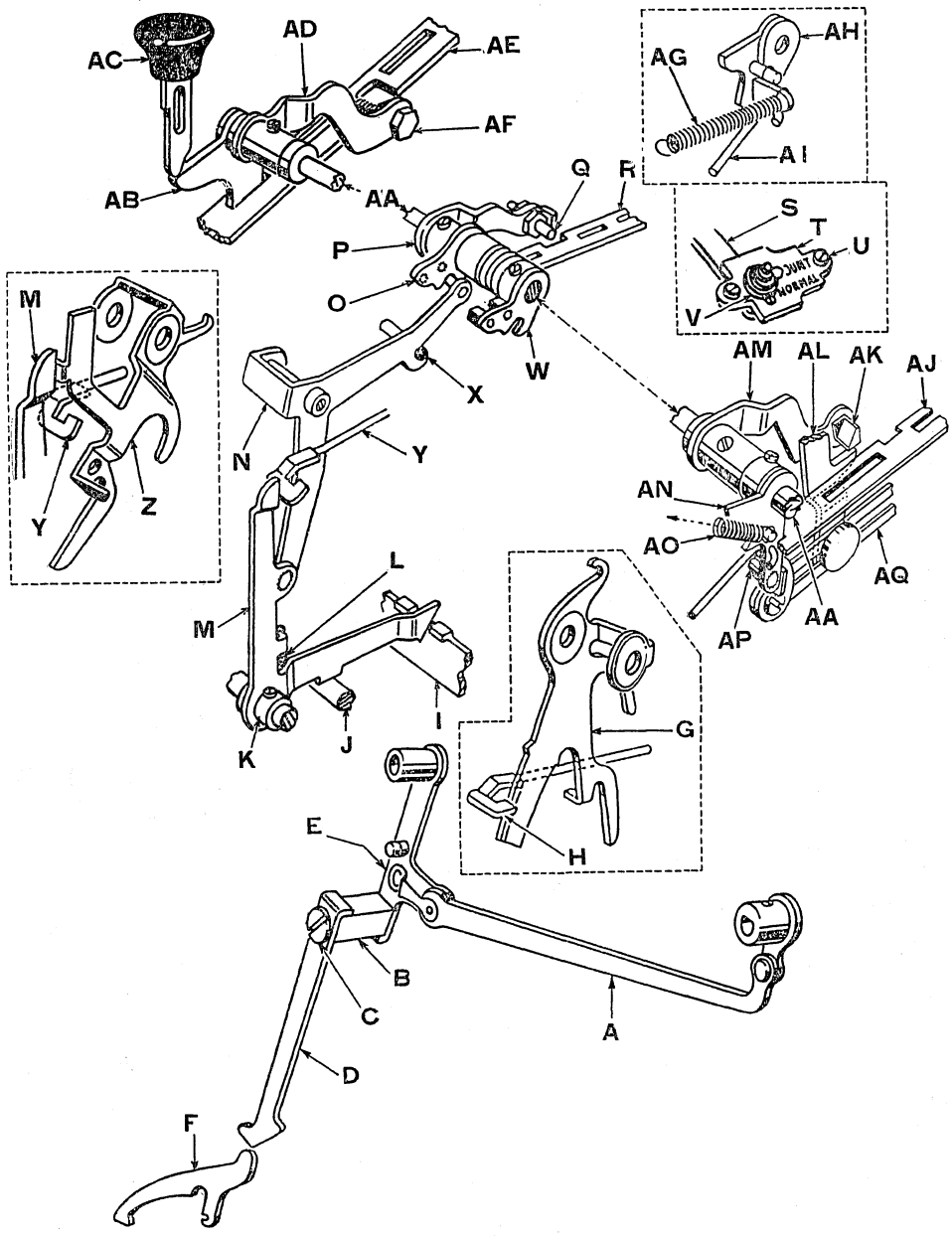
Printing Control

When button V is moved to count position cam slide S swings detent arm D over pawl F which tilts and disconnects pawl F thereby preventing printing.

Flexible Keyboard

Intermediate lever AH is used in flexible keyboards.

COUNT AND NORMAL MECHANISMS INDEXED FROM MACHINE OPERATION (Plate 26)



Total Operation

During total operations shaft X blocks driver M through lever assembly N.

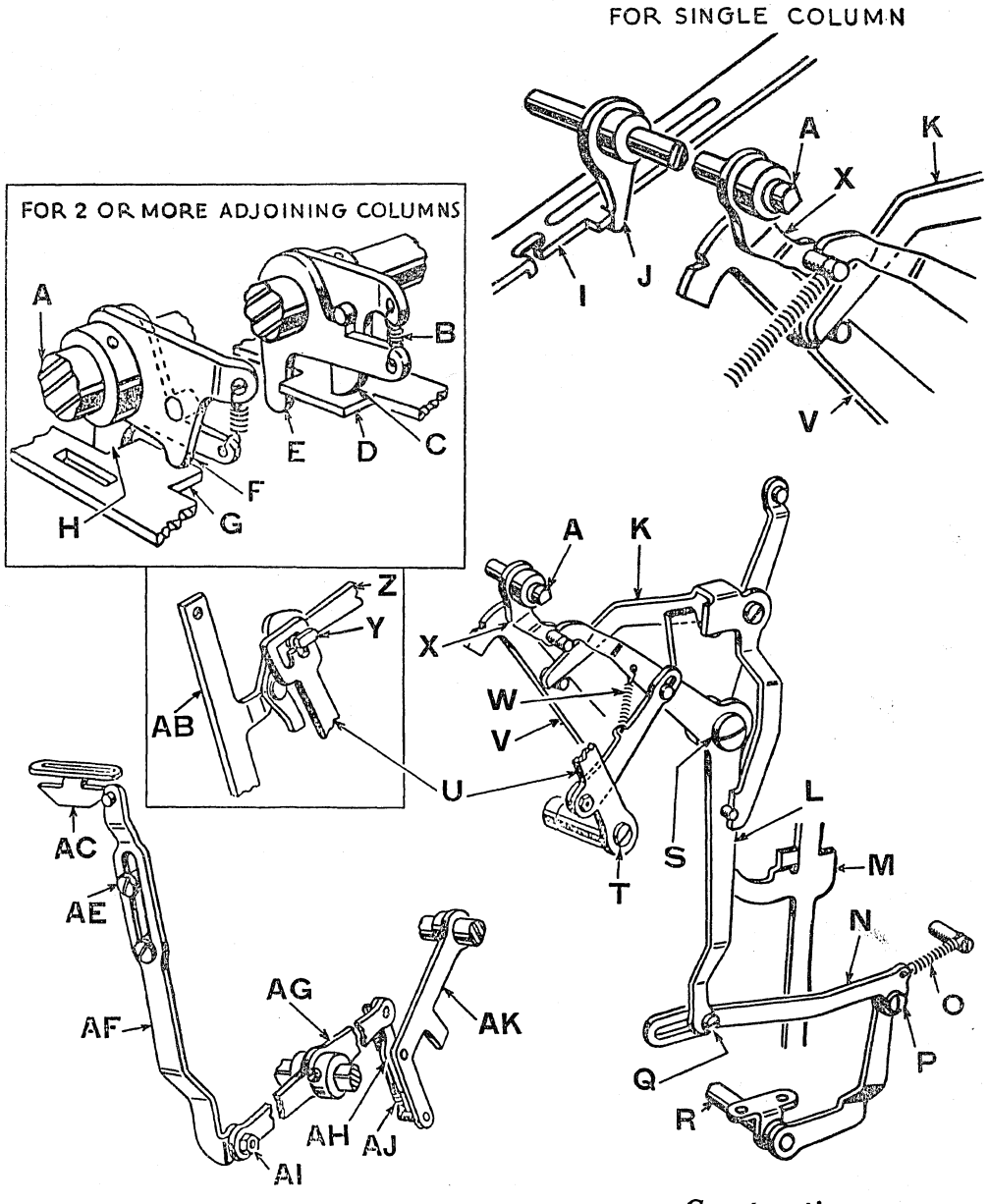
Count Mechanism Normalized from Enforced Designation Keys

When the selected designation key is depressed, bell-crank lever AN and stud AP move slotted bail AQ rearward. Part AL (on AQ) moves into the path of stud AK preventing the downward movement of arm AM, thereby blocking shaft AA, part O through lever N blocking driver M which prevents counting.

Normalizing Key AC

The purpose of normalizing key AC is to prevent counting when there are a number of items on the order. Normalizing key AC is restored at each machine operation. When key AC is depressed, bell-crank AB pushes bar AE under stud AF, which blocks arm AD, shaft AA, and through arm O and lever N, driver M is blocked, which prevents counting.

ENFORCED DESIGNATION MECHANISM NORMALIZED BY TOTAL AND SUB-TOTAL KEYS—CARRIAGE CONTROLLED (Plate 27)



Enforced Designation Mechanism Controlling Two or More Adjoining Columns—Normalized by Total and Sub-total Keys Carriage Controlled (Plate 27)

The purpose of this mechanism (except the parts in the figure marked "for single column") is to compel the operator to depress one of the keys in each of two selected columns, in order to depress the motor bar.

Construction

Motor bar is blocked when the projection of interlock U is under stud Y. When the machine is in normal position, Y is located in the rear open space of U which permits depressing the motor bar. When the carriage moves skid AC on AK, part L through spring W moves U under Y, which blocks the motor bar.

When a key in each of the two selected columns is depressed, arm X rocks L, which through spring W locates the front open space of U in line with Y, which permits depressing the motor bar.

Sequence (Plate 27)

When a key is depressed, (AC on AF) in right selected column, bell-crank E pulls in the index wire and pushes D rearward, the front curved end of D raising the adding sector latch and the rear end of D being latched. Spring B is expanded due to lever C being pinned to shaft A which is held by lever F (also pinned to A). F is blocked by G. When a key in the left selected column is depressed, E pulls in index wire, raises adding sector latch, etc. D and G having moved rearward, allows C and F to follow E, which swings A, X and L and through spring W interlock U is pulled completely rearward to clear Y and permit the motor bar to be depressed.

Total and Sub-total Key Control

When either total or sub-total keys are depressed, the stud in assembly V rocks part K, which swings part L and through spring W locates interlock U to clear stud Y to permit the motor bar to be depressed.

Tests and Adjustments

When skid AC is on AF, the lug of U should be under stud Y.

Adjustment: The offset in AF is increased or decreased as required.

Springs B should be of minimum tension in order to avoid heavy key touch.

When the second key is depressed, the lug of interlock U should clear stud Y. Advancing the upper arm of lever L will result in more movement of U. All parts must move with absolute freedom.

Enforced Designation Mechanism Controlling One or More Columns NOT Adjoining, Normalized from Total and Sub-total Keys, Carriage Controlled

This mechanism, which does not have parts B to H inclusive, compels depressing one of the keys in selected columns. Failure to do so blocks the motor bar.

Sequence

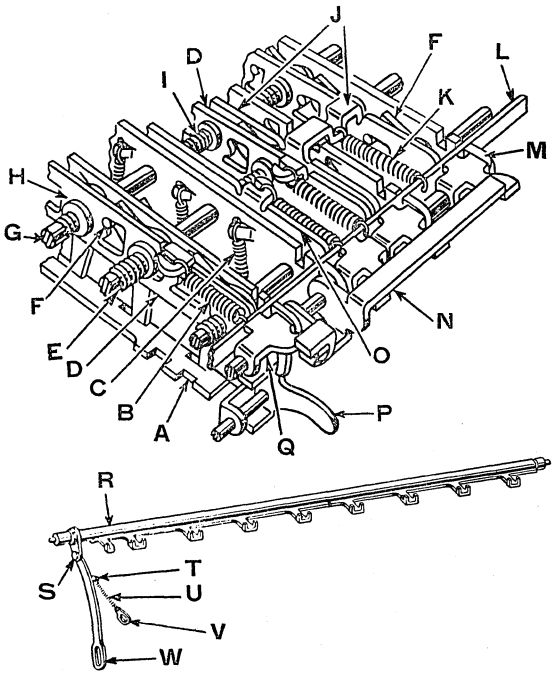
When no keys in the selected column or columns are depressed, part U is located in the path of stud Y, which blocks the motor bar.

When keys are depressed in selected column or columns, slide I through arm J, shaft A and arm X rocks arm L. Spring W pulls interlock U completely rearward, aligning the vertical slot of U with Y, which permits the motor bar to be depressed.

Total and Sub-total Key Control

When either total or sub-total keys are depressed, the stud in V rocks K which swings L. Spring W pulls interlock X to permit depression of motor bar.

FLEXIBLE KEYBOARD (Plate 28)



Flexible Keyboard (Plate 28)

When a key is being depressed, the stud in key lever F moving downward on the cam edge of locking strip D moves the latter forward. After it reaches the high point of D, locking strip D moves rearward, the stud in key lever F seating in the pocket of D, which holds the key depressed. When another key is being depressed, the key which was previously depressed restores to normal when the stud in key lever F reaches the high point of the cam surface of D. Locking strip is held and moved rearward by spring B.

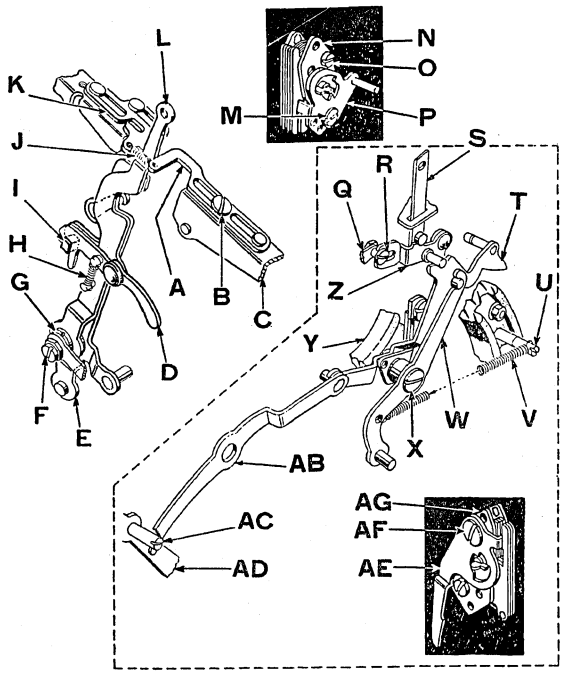
It will be noted that key levers F have no heel to be blocked by strip A, which is similar to the locked keyboard locking strip. In flexible keyboards strip A is used only for the purpose of raising the adding rack latch and to lock the keyboard during machine operation in the same manner as in locked keyboards.

In order to restore a depressed key to cipher position, single column release keys, when depressed, contact on the horizontal arm of lever P, which in turn contacts on the end of locking strip D, pushing the latter forward to allow the stud in key lever F to restore.

When the error key is depressed and also when the key restoring mechanism functions, the restoring shaft, which is shown under key restoring, also raises levers P which by contacting on locking strips D allows all key levers to restore.

In machines having the calendar feature, locking strips J cover one column and are bridged over to partially cover the adjacent column.

LOCK AND KEY MECHANISMS TO PREVENT TOTALING REGISTERS AND TO BLOCK MOTOR BAR AND TOTAL KEYS (Plate 29)



Lock and Key Mechanisms to Prevent Totaling Registers and to Block Motor Bar and Total Keys (Plate 29)

The purpose of the upper left mechanism is to block the movement of the register total indexing lever to total position, and to permit indexing to sub-total position. When the key in lock N is turned clockwise the stud in tumbler P clears lever D, which permits spring H to pull the hook of lever D over square stud I in assembly E. When register total indexing lever L is pulled to total position, assembly E indexes the register total mechanism.

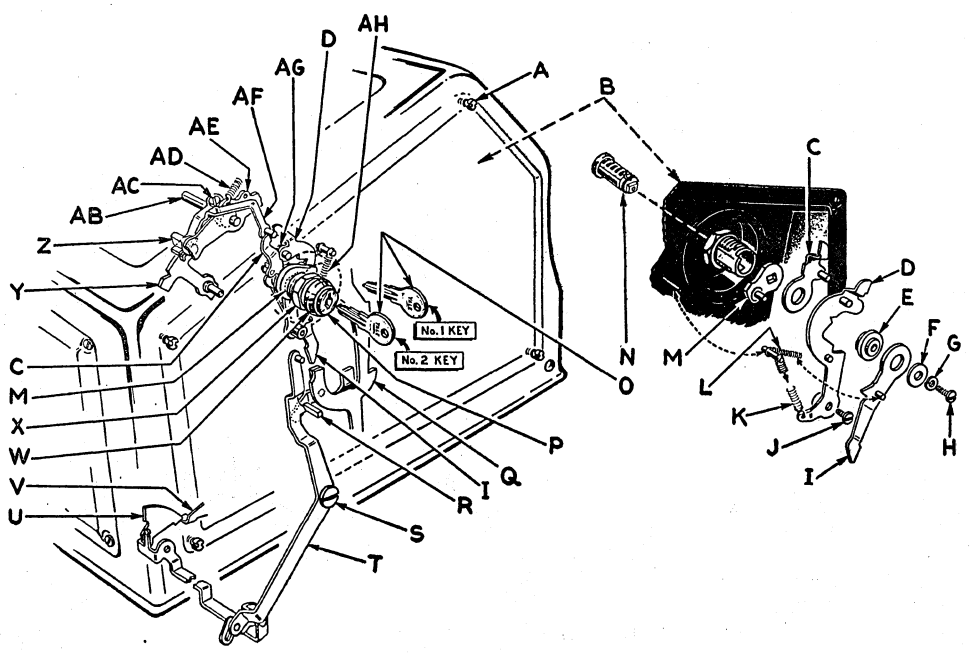
When the key is turned anti-clockwise the stud in tumbler P swings lever D to clear square stud I so that when the register total indexing lever is pulled to total position, lever L moves freely without affecting assembly E. When the register total indexing lever is moved to sub-total position, lever L contacts on square stud I, moving assembly E which indexes the register to sub-total position.

The purpose of the lower right mechanism is to block the upper motor bar and also to block the total key.

When the key in lock AG is turned clockwise, the arm on coupler AE swings lever W to clear the stud in interlock T, which allows interlock T to swing away from the stud in arm Z to permit depressing motor bar S. The front arm of interlock T swings the front arm of lever AB to clear stud AC in interlock AD to permit depressing the total key.

LOCK TO PREVENT MACHINE OPERATION—POSITION 89
(For Wide Base Machines) (Plate 29-1)

Mr M R Lovejoy
Buffalo N Y Branch 10-5



Lock to Prevent Machine Operation—Position 89
(Plate 29-1)

Purpose

This mechanism, by preventing machine operation until released by an appropriate key, provides a means of audit control and serves to notify the operator when the capacity of the register has been exceeded.

Operation

When tumbler N is located in normal active position, the stud of part M holds arm D in its rearmost position, thereby causing spring AG and arm C to hold latch AF in active blocking position with respect to stud Z and arm Y—thus preventing operation of the machine.

Counterclockwise rotation of either Key No. 1 or Key No. 2 causes the stud of part M to move into a pocket of arm D, permitting spring K to move arm D forward to pivot the forward projection of latch AF out of alignment with stud Z and arm Y—thereby permitting manipulation of the motor bars and operation of the motor.

When the capacity of the register is exceeded, carry pawl V actuates arm T, through bail U, to latch over stud R—thereby preventing operation of the machine.

Machine operation with the capacity of the register exceeded may be allowed by turning Key No. 2 clockwise, thereby permitting arm D to move forward a greater distance and causing the stud in arm D to rock arm I forward to release latch arm T from stud R.

Adjustment

1. Latch AF should have a full hold on stud Z and arm Y when the lock is in normal active position, and should clear stud Z and arm Y during listing, total and subtotal operations when either Key No. 1 or Key No. 2 is turned counterclockwise.

To adjust, bend latch AF between the stud and the first offset.

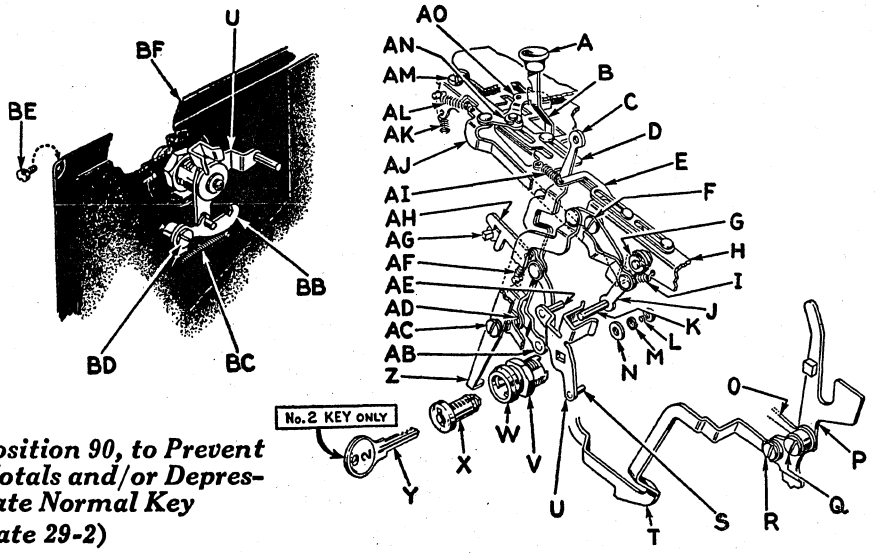
2. Latch T should have minimum clearance from stud R when the lock is normal and the capacity of the register is not exceeded, and should have a secure hold over stud R when the capacity of the register is exceeded.

To adjust, bend latch T between the screw and the step.

3. When the capacity of the register is exceeded, clockwise turning of the No. 2 Key should move latch T clear of stud R with minimum clearance.

To adjust, bend latch T above the step.

LOCK WITH KEYS, POSITION 90, TO PREVENT MANUAL REGISTER TOTALS AND/OR DEPRESSION OF THE DATE NORMAL KEY (For Wide Base Machines) (Plate 29-2)



Lock With Keys, Position 90, to Prevent Manual Register Totals and/or Depression of the Date Normal Key (Plate 29-2)

Purpose

This mechanism provides audit control of posting operations, by preventing manual register totals and manipulation of the date normal key, until such time as the lock is released by a No. 2 Key.

Operation

When the lock mechanism is active, tumbler X positions part U so that stud S is retained in the forward notch of latch BB. With part U so positioned, stud AE contacts latch arm AH to hold the latch clear of square stud AG, and the slot of part U is situated rearward to permit spring AL to hold slide AJ rearward and the projection of bellcrank AO in the path of date normal key B.

When register total indexing lever C is manually moved forward to total position with stud AE in contact with latch arm AH (as described above), latch AH clears stud AG and lever AB is not shifted to index a register total operation. The register total indexing lever is restored to its normal position, in such cases, by spring AI and slide E. Movement of the register total indexing lever to subtotal position indexes a register subtotal operation regardless of the position of tumbler X and part U, since the rearward movement of lever C causes the lower projection of latch AH to contact stud AG and to shift lever AB to register subtotal position.

When Key No. 2 is turned clockwise tumbler X positions part U so that stud S engages the rear notch of latch BB. With part U so positioned stud AE is located away from latch arm AH to permit engagement of latch AH with stud AG, and the slot of part U holds stud K and slide AJ forward against the tension of spring AL. With slide AJ positioned forward, bellcrank AO is rocked out of the path of key B, thereby permitting depression of the date normal key. Forward movement of register total indexing lever C, with latch AH engaged with stud AG, results in the forward shifting of shift lever AB to register total indexing position.

Construction Note

As indicated in the illustration, this lock mechanism is assembled to case panel BF, which is attached to the case by means of special screws BE.

Due to the depth of the lock mechanism, it is necessary to remove a case panel to which a lock is attached, before removing the case from the machine. Removal of screws BE requires the use of a case key.

Adjustment

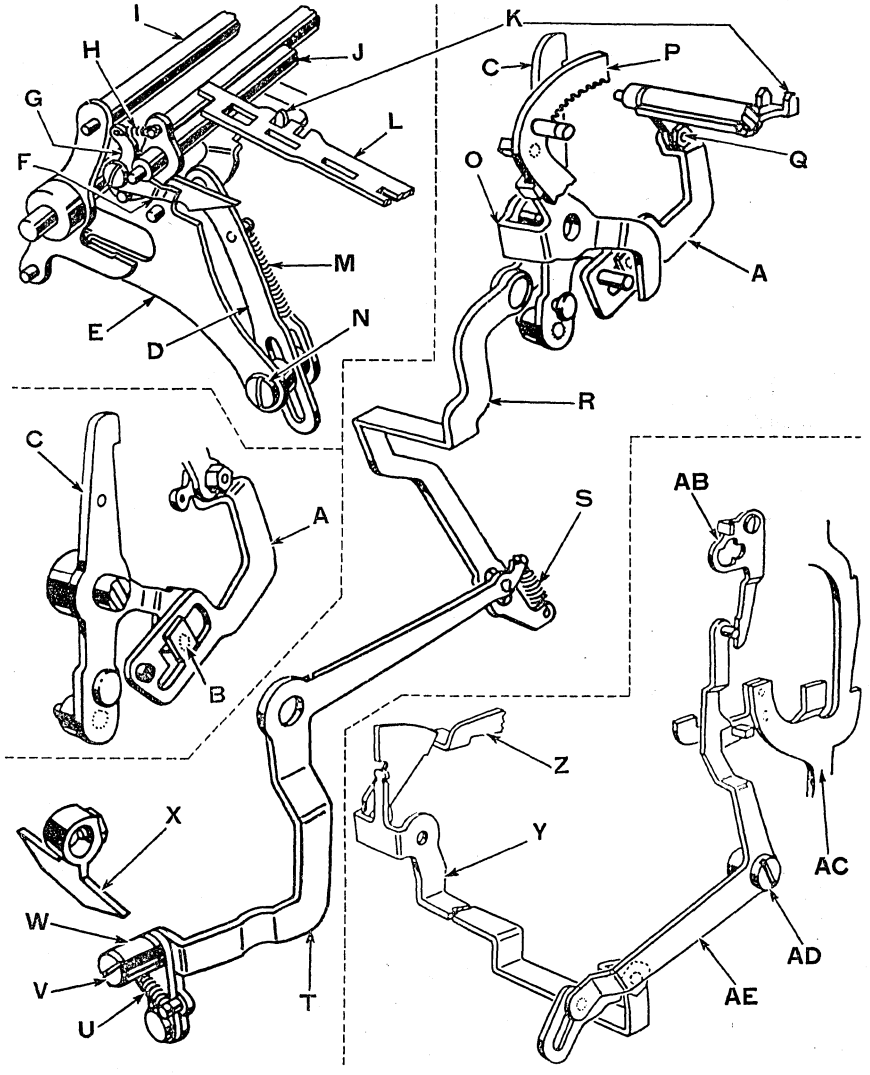
1. Bellcrank AO should have a safe hold under the step of date normal key B when the lock mechanism is active, and should have safe clearance from the step when Key No. 2 is turned clockwise in the lock.

To adjust, weave arm J as required.

2. Latch AH should have minimum clearance over square stud AG when the lock is active, and should engage stud AG with full hold when Key No. 2 is turned clockwise in the lock.

To adjust, weave the rear arm of part U to move stud AE forward or rearward.

SAFEGUARD KEYBOARD AND MOTOR BAR LOCK MECHANISM (Plate 30)



Safeguard Keyboard and Motor Bar Lock Mechanism (Plate 30)

The purpose of these mechanisms is to prevent subtracting from the register by causing the motor bar to lock when complements are added. The purpose is also to show on the keyboard the amount that was being subtracted by retaining the keyboard in locked position.

Motor Bar Lock

When the machine is operated with 9's set up to the left of the complements, the carry in the last left column causes auxiliary latch Y to swing detent AE over the square stud in part AC, thereby preventing machine operation by locking the motor bar.

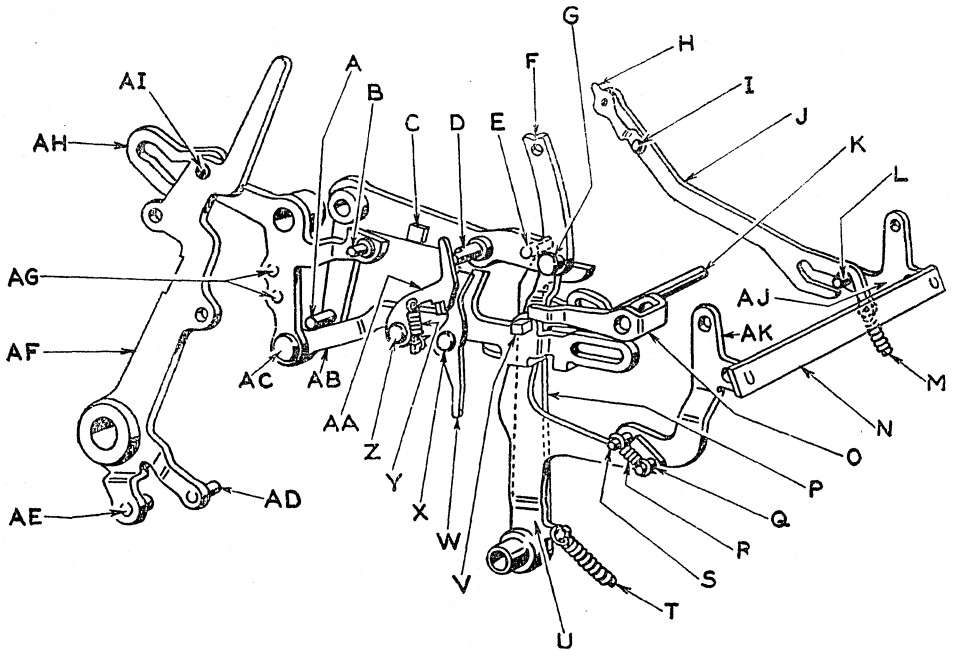
In the event that the machine becomes locked due to adding complements, the machine can only be released by inserting and turning the key in the panel, which causes part AB to swing part AE off the square stud in AC.

Keyboard Lock

When the carriage moves skid X on assembly W lever T is rocked, which in turn rocks part O through link connection R. The cam arm of part O moves link A, locating its horizontal slot in line with stud B (in C), so that the key restoring mechanism cannot restore the hook assembly K. When the key restoring assembly C is rocked, stud B merely idles in the slot of link A.

When skid X is not on assembly W, stud B is located in the vertical slot of link A which permits key restoring assembly C to restore hook assembly K.

NEGATIVE TOTAL LOCK DISABLING MECHANISM (Plate 31)
(Classes 6, 11 thru 16 and 20 thru 30)



Negative Total Lock Disabling Mechanism (Plate 31)

When the total key is blocked by the negative total lock, the latter is disabled when the register lever is placed in either total or sub-total position so as to permit the depression of total or sub-total key and thereby transfer an amount in the register to the negative amount in the crossfooter.

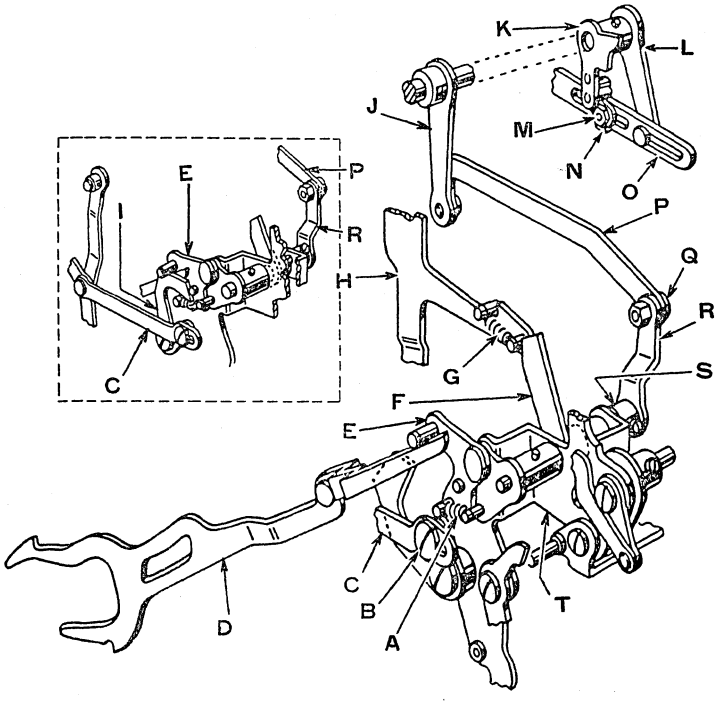
When the carry pawls are in carried position, the total key is blocked by P. However, when the total key is blocked by the negative total lock, then the total key is locked by bell-crank U which moves freely on shaft and is spring connected with bail N, the upper arm of N resting on link J, the lower being connected with bell-crank U by spring R. When link J is moved from one of its pockets to the centre dwell, bail N is raised, its vertical arm pulling bell-crank U rearward through spring R. Now, when register total indexing lever AF is moved to either total or sub-total position, a lip on part AB moves bell-crank rearward out of the path of the total key.

When link J is moved from its dwell to its pocket, bell-crank U is moved to normal position by spring T.

Tests and Adjustments

The correct relative tension of springs R and T is essential. Spring R, which is used as a spring connection between U and N, is smaller but stiffer than spring T, which is used on the lower part of U. These springs must not be interchanged.

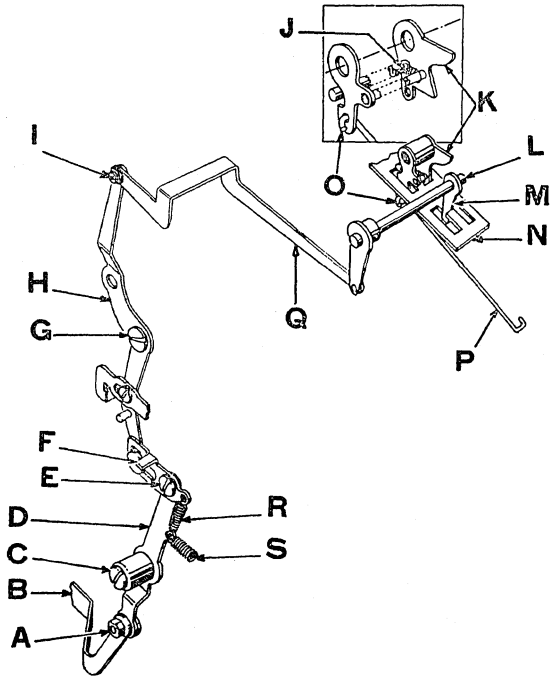
CROSSFOOTER SUBTRACT MECHANISM INDEXED FROM KEY (Plate 32) (Classes 20 thru 30)



Crossfooter Subtract Mechanism Indexed from Key (Plate 32)

When the selected key is depressed, bell-crank K contacting on lug N moves link O rearward. Arms L and J through link P swing arm R which in turn rocks part D to index the subtract mechanism through lever E and spring A. Arm F swings interlock H in the path of the total key. Interlock I blocks the stud in lever E to prevent indexing part D when the carriage has indexed the carriage controlled Total and Sub-total mechanism. Interlock I is connected by link C to part 1-200130½.

CROSSFOOTER TOTAL WITH KEYS ON KEYBOARD DEPRESSED (Plate 33) (Classes 21 thru 30 with H-903)



Crossfooter Total with Keys on Keyboard Depressed (Plate 33)

The purpose of this mechanism is to permit totaling the crossfooter without restoring the keyboard set-up.

Limit wires P are attached to auxiliary bell-crank Q with spring J to regular bell-crank K. When during the automatic totaling operation, link B through lever D and pawl F rocks lever H, part Q rocks assembly L, arm M pulls slide N, which moves the limit wires to restored position, expanding springs J. When the total mechanism restores to normal, spring J pulls limit wires P to former depressed position.

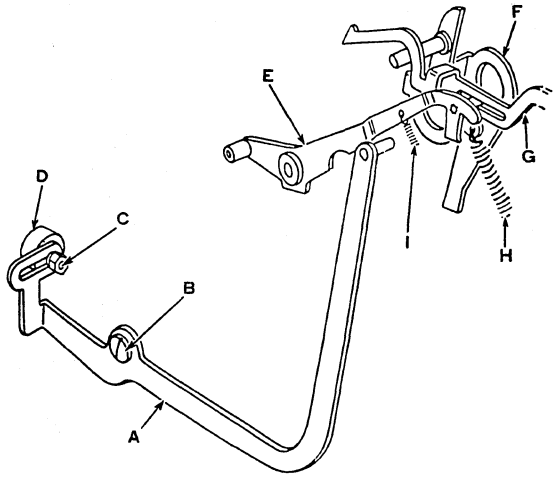
Test all wires P for free movement and offset to clear tail on latch 415. Depress all No. 1 keys and manually pull Q rearward.

Check to see if No. 1 wires are backed out uniformly and out far enough to allow adding sectors to pass by with 1/64″ clearance. Repeat this test 1 to 9 inclusive.

With 9's in crossfooter and No. 1 keys depressed, operate machine and then see if No. 1 wires are backed out from automatic total operation sufficiently for adding sectors to clear wires H. Repeat this test 1-8 inclusive.

When there is not sufficient movement, turn eccentric I or increase movement by bending Q, then readjust I. Check all keyboard strips 223⅝ for being in position and securely anchored.

C. F. TOTAL KEY SUB-TOTAL IN C. F. A. POSITION AND TOTAL IN C. F. N. A. POSITION (Plate 34)
(Classes 21 thru 30)

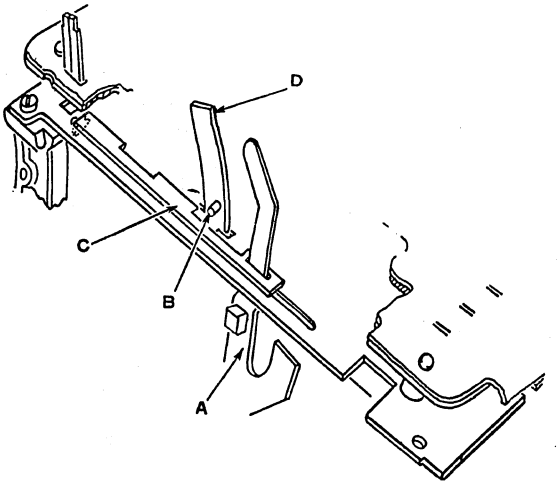


C. F. Total Key Sub-total in C. F. A. Position and Total in C. F. N. A. Position (Plate 34)

When the total key is depressed, link G indexes non-add control F to block the accumulating passby pawl (821) to sub-total.

When the carriage locates a skid on roller D, lever A raises part E, which in turn lifts link G to allow F to restore, which permits the accumulating passby pawl to function.

INTERLOCK TO BLOCK SUB-TOTAL KEY WHEN SUBTRACT LEVER IS IN SUBTRACT POSITION (Plate 35)
(Classes 11 thru 16 and 20 thru 30)

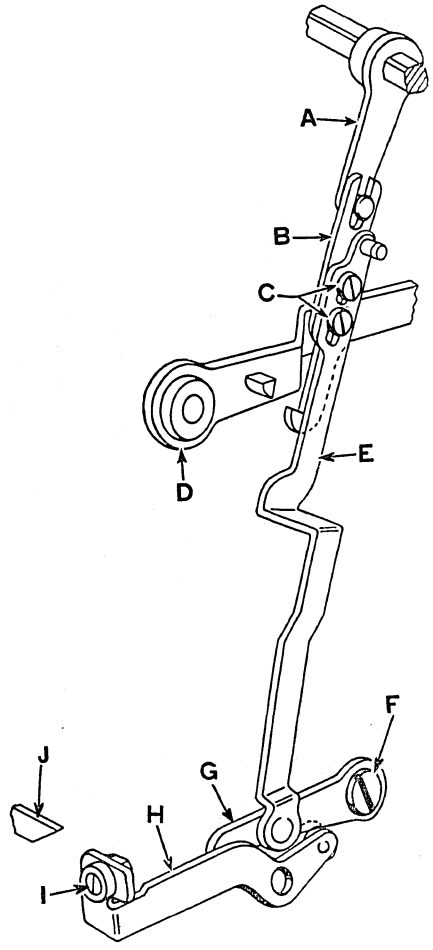


Interlock to Block Sub-total Key When Subtract Lever is in Subtract Position (Plate 35)

Sequence

When subtract lever A is moved downward to subtract position, slide C is located in the path of stud B, which prevents sub-total lever D being depressed. When sub-total lever D is depressed, stud B blocks slide C.

CROSSFOOTER ADD BAR (UPPER OR UPPERMOST) (Plate 36) (Classes 11 thru 16 and 21 thru 30)



Crossfooter Add Bar (Upper or Uppermost) (Plate 36)

The purpose of this mechanism is to index the crossfooter to add when the carriage position is non-add. This mechanism is applicable to upper or uppermost bars.

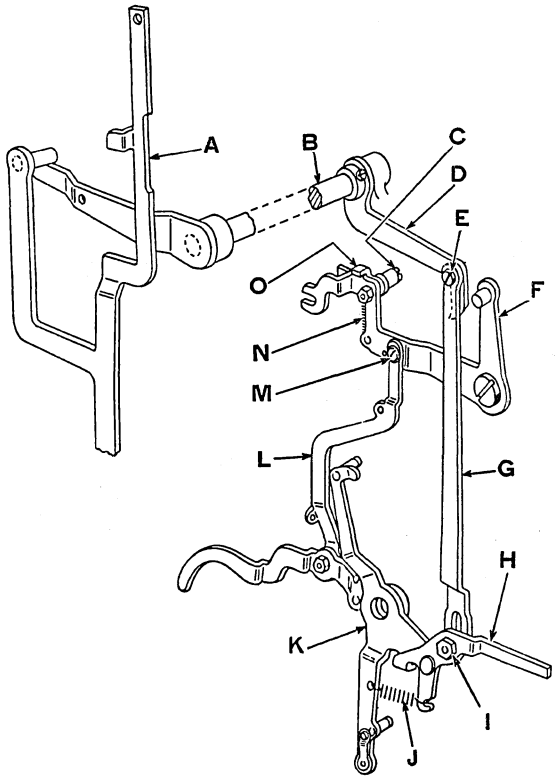
When the upper or uppermost bar is depressed arm A swings hook B under the triangular stud in arm D. When the carriage tabulates into the selected column, skid J contacts roller I, rocking lever H which raises arm G, link E and arm D to disable the non-add mechanism.

Tests and Adjustments

When skid J is on roller I, hook of B should clear triangular stud in D.

Adjustment: Screws C are loosened and hook B located as required.

CROSSFOOTER ADD—REGISTER NON-ADD BAR (UPPERMOST) (Plate 37) (Classes 11 thru 16 and 21 thru 30)



Crossfooter Add—Register Non-add Bar (Uppermost) (Plate 37)

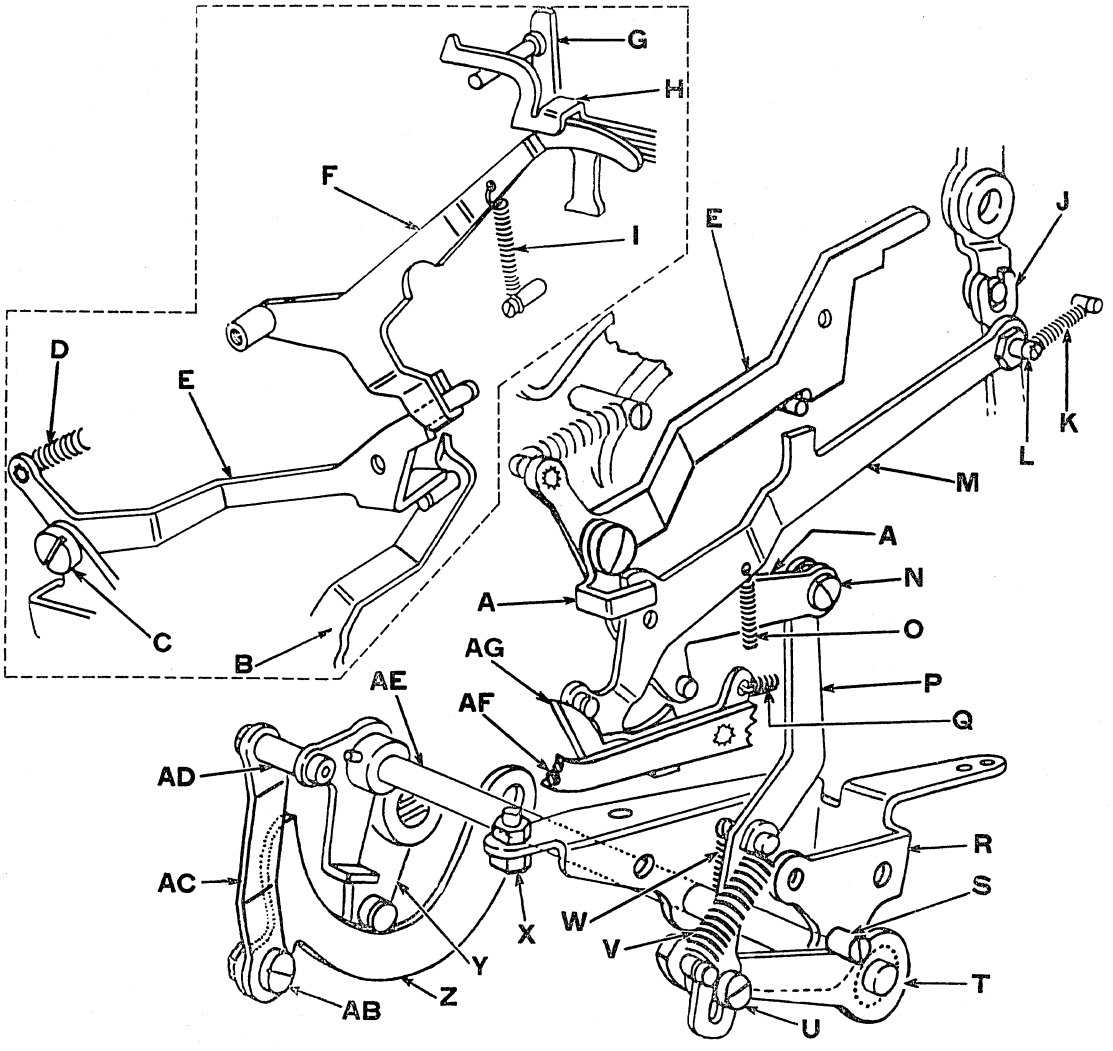
The purpose of this mechanism is to reverse the operation of the crossfooter and the register when the uppermost bar is depressed.

Sequence and Construction

When bar A is depressed, shaft assembly B is rocked. Arm D of B contacts on and swings part F which disables the crossfooter non-add control.

Arm D indexes the register non-add control through link G, parts H and K.

C. F. SUB-TOTAL OR TOTAL KEY TO TOTAL IN LAST REPEAT OPERATION VIA AUTOMATIC REGISTER TOTAL MECHANISM—CARRIAGE CONTROLLED (Plate 38) (Classes 21 thru 30)



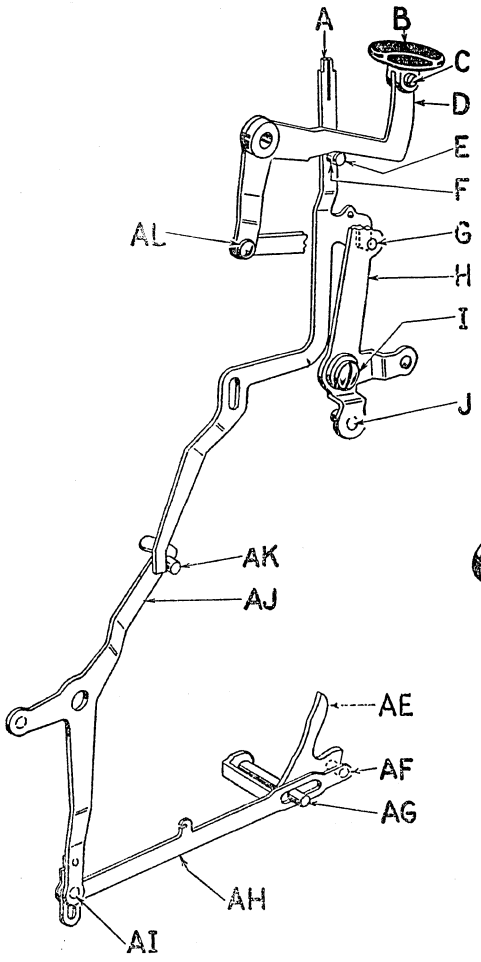
C. F. Sub-total or Total Key to Total in Last Repeat Operation Via Automatic Register Total Mechanism—Carriage Controlled (Plate 38)

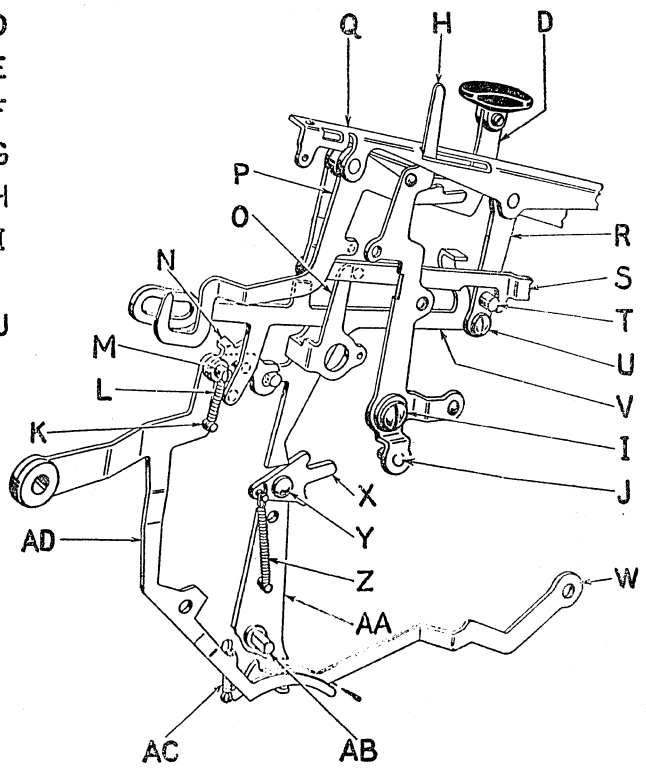
This mechanism is indexed by the carriage from the register non-add cam and actuated by the machine operation via Env. 1429 mechanism.

When the carriage locates a control roll on the register non-add lever, part B allows part E to move downward, its step locating in line with the foot of part F.

During the machine operation, shaft assembly AE through link P and arm M moves part E forward, which swings part F upward to raise part H, which allows non-add control G to move to normal position.

NON-TRANSFER TO REGISTER NON-TRANSFER TO CROSSFOOTER
(Plate 39)
(Classes 11 thru 16 and 21 thru 30)





Non-transfer to Crossfooter Mechanism (Plate 39)

When the sub-total key is depressed, part O is rocked through stud in "S" which lowers part AD through a stud in the horizontal arm of O riding in the fork of AD, the latter disables pull in arm W by moving it below stud AB (in AA).

The mechanism in the earlier machines is illustrated under heading Register Total Indexing (Plate 41).

Note: The above subject is confined to total keys and register indexing bar control, the register and crossfooter are in add position when the keyboard is normal.

Crossfooter to Register Transferring (Plate 39)

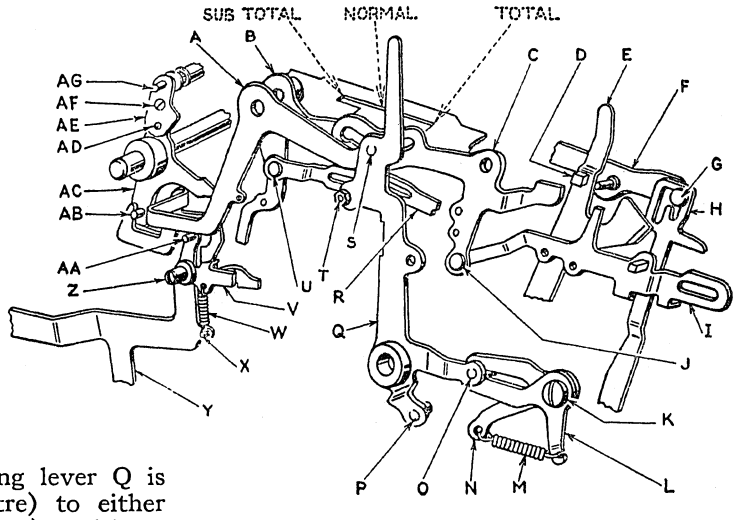
When the crossfooter is sub-totaled the amount is automatically non-transferred to the register. In machines below serial 1116601 when the crossfooter is sub-totaled the amount is transferred to the register unless the register non-add key and the sub-total key are depressed at the same time.

The non-transfer in the late machines is automatically secured by the redesigned parts D and A and the removal of stud G (in lever H).

The new sub-total arm contacts on roll F in register non-add stem A which depresses the latter.

When the total key is used the crossfooter is cleared and the amount is transferred to the register unless the register non-add key and the total key are depressed which will clear the crossfooter and non-transfer the amount to the register.

REGISTER TOTAL INDEXING MECHANISM (Plate 41)
(Classes 11 thru 16 and 21 thru 30)
(Plate 40 in Symbol Book Only)



Register Total Indexing Mechanism (Plate 41)

Register total indexing lever Q has three positions; normal (centre), total (lower) and sub-total (upper). Lever Q is held in its normal position by detents L and N, which are operated by spring M.

When register total indexing lever Q is moved from its normal (centre) to either total (lower) or sub-total (upper) positions, roller S on its upper projection rocks part C. Flanged screw T in a projection at a lower point rocks part R into the path of the total mechanism. Part R controls the indexing of register total symbols.

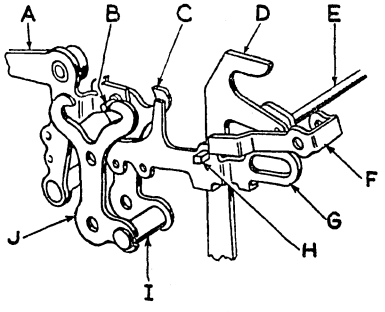
Lever Q is held in total or sub-total positions by roller S seating in one of two pockets in detent lever P (Plate 39) (A in early machines) which swings on keyboard shaft. The rear end of detent levers A and P (Plate 39) has an upper hook which is engaged by stud AB (in AC) when the error key is depressed, which allows detents to restore register total indexing lever to its normal position. The lower hook of A raises detent V when lever Q is moved to either sub-total or total position. This permits the crossfooter non-add key to be depressed with the total keys.

Note: Other late parts illustrated on Plate 39.

When lever Q is moved to total or sub-total position, the front arm of lever C moves into the path of square stud D in add and subtract lever E to prevent movement of the latter. The lower arm of C moves link I forward. This movement of link I disconnects the crossfooter totaling mechanism from the total key by moving H out of the path of the stud in the total key.

The vertical projection of link I prevents the release of the register lever when it is in total or sub-total position with the total key depressed. The vertical projection of link I also prevents depression of the total or sub-total key when the register lever is partially moved from its normal position.

REGISTER TOTAL KEY INTERLOCK (Plate 42)
(Classes 11 thru 16 and 21 thru 30)



Register Total Key Interlock (Plate 42)

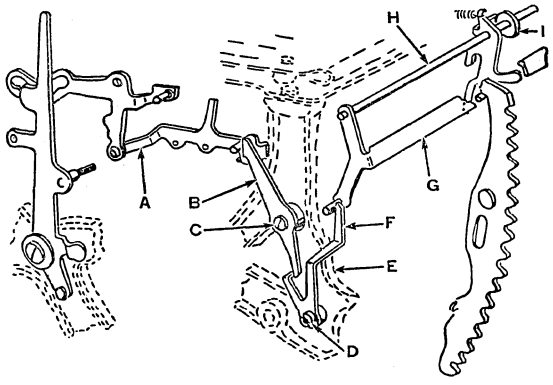
Stud H in G moves into the path of F, the movement of which is controlled by shaft E. Part F swings on a screw in the left side frame; it has two arms, the inside one having a cam slot into which shaft E extends, the outside arm engaging stud H for blocking part G when numeral keys are depressed or when the carry pawls are tripped.

Interlock J operates simultaneously with interlock C, the latter blocking the total key when the add and subtract lever is shifted and interlock J blocking the register lever.

Tests and Adjustments

To insure correct operation of the compulsory spacing interlock, there should be .005″ clearance between F and stud H. This clearance is increased or decreased by adjusting the offset of F.

REGISTER TOTAL FROM REGISTER TOTAL INDEXING LEVER (Plate 43)



Register Total from Register Total Indexing Lever (Plate 43)

The purpose of this mechanism is to secure a total of the registers when the register total indexing lever is moved to the total position without depressing the total key.

Sequence and Construction

When the register total indexing lever is moved to total position bail G is rocked through link A, lever B and bell-crank F. Bail G by contacting on the front arm of latch I moves the latter out of the path of the adding sectors, permitting the latter to move downward during the total stroke.

Tests and Adjustments

When register total indexing lever is in normal (non-total) position, there should be .010 clearance between bail G and the front panel. To secure clearance the offset arm of bell-crank F is bent rearward.

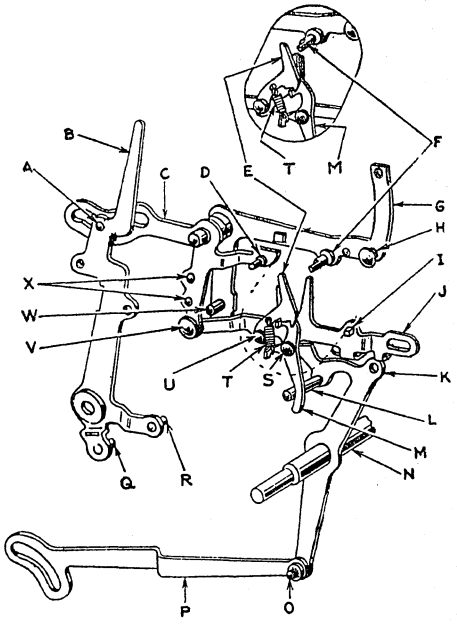
SINGLE STROKE TOTAL INTERLOCK (Plate 44) (Classes 11 thru 16 and 21 thru 30)

Single Stroke Total Interlock (Plate 44)

When the total or the sub-total key is depressed, with the register in total or sub-total position, stud F cams upward latch E, which allows spring T to pull interlock M from the first step and limit against stud F (in total key G). When the total key is being restored at the end of the return stroke, interlock M limits on the front step of latch E. Now, in the event that the register total indexing lever is again placed in total or sub-total position, interlock M will block the total key against depression.

Interlock M is allowed to reset when latch E is rocked by stud L (in K) during listing and spacing operations.

The purpose of interlock M is to allow a register shift to take place when the carriage tabulates into another column, by compelling the taking of a spacing stroke at which time the register detent is raised.



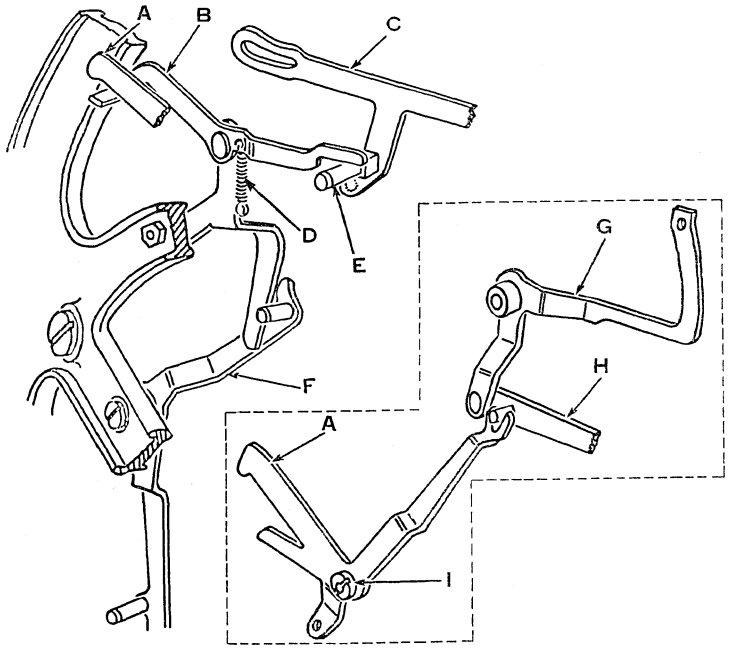
Tests and Adjustments

On a forward spacing stroke following a register total operation, interlock M should have $\frac{1}{32}$ inch lead over the rear step of latch E.

The lead of interlock must not be so excessive as to allow it to reset during a register total operation.

Adjustment: The lower part of interlock is advanced toward stud L to increase lead and retarded from stud L to reduce lead.

REGISTER TOTAL TO ADD IN NON-ADD POSITION (Plate 46)
(Classes 11 thru 16 and 21 thru 30)
(Plate 45 in Symbol Book Only)



Register Total to Add in Non-add Position (Plate 46)

The purpose of this mechanism is to cause the total key depression to disable the register non-add control when the latter is indexed by the carriage. The sub-total key when depressed, disables this mechanism.

Sequence and Construction

When the total key is depressed, stud E in link C pushes assembly B rearward. The foot of assembly B rocks lever F which locates the register in add position. When the sub-total key is depressed, the stud in link H rocks part A which swings the lever of assembly B to clear stud E, thereby disabling the mechanism.

Keyboard Selection of Registers (Plate 47)

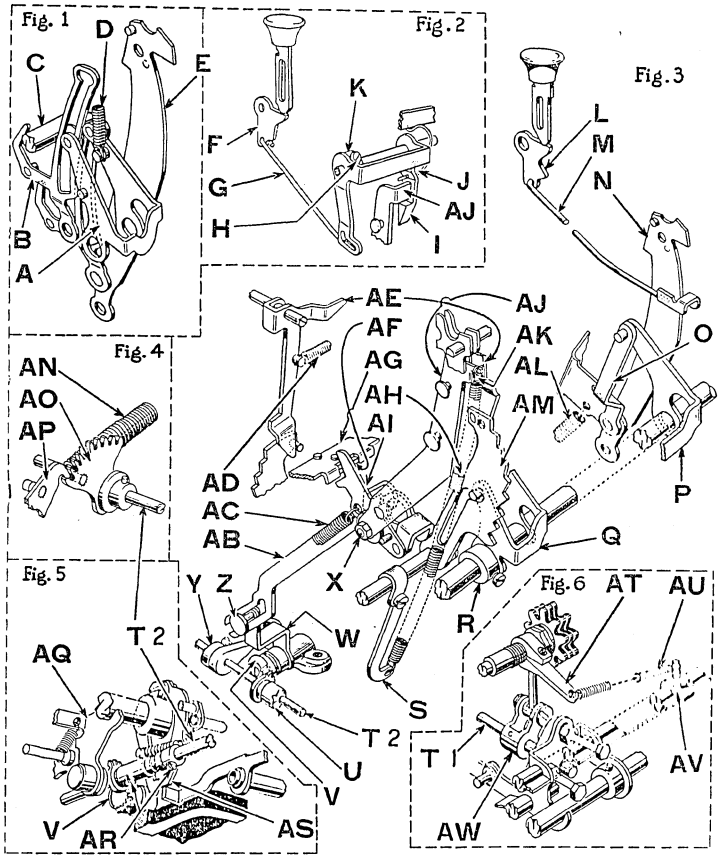
This mechanism permits the selection of registers from the keyboard when the carriage position has indexed register No. 10 or No. 6 in extreme right position. Register selection from the keyboard is limited to the selection of register in one direction. The register which is selected from the keyboard remains active only until the beginning of the following machine operation when detent AP (Fig. 4) is raised, which allows spring AN to restore the register assembly to the extreme right.

(Fig. 3.) When the register selecting key is depressed, wire M is pulled into the path of sector N. On the forward stroke spring AL pulls sector N to limit on wire M, which rocks bail P in column 1, or bail Q in some column to the left. Bails P or Q swing index AM to locate the step corresponding to the indexed register.

Sector AJ moves down to limit on the located step of AM, which through part AI and link AB, swings gear arm assembly W to turn gear U on shaft T2 to swing universal AW (Fig. 6) which moves register assembly AX to index the selected register.

The normal position of sector AJ is maintained by limit arm AE which indexes register No. 10. The purpose of the pocket in link AB is to prevent overthrow of the moving register. When sector AJ contacts the indexed step of index arm AM, sector AJ locates its pocket on stud Z, which is disengaged on the return stroke when bail assembly AG contacts part AI.

KEYBOARD SELECTION OF REGISTERS (Plate 47)
(Classes 12 thru 16 and 22 thru 30)



Tests and Adjustments (Plate 47)

With the key which indexes the No. 1 register depressed, screws AR are located to clear part AQ and parts AS (Fig. 5). Sector AJ should drop freely with spring AH unhooked. On the return stroke, sector AJ should move freely above latch AE.

Note: There are two styles of bails, P and Q; one style for register selecting No. 1 to No. 9 and the other style for register selecting No. 1 to No. 10.

When the handle is pulled, with the key depressed which indexes the middle register, it should not move beyond its correct position. When the register overthrows, screws AR are loosened (detent AP set) and register allowed to settle and screws AR tightened. When there is lack of movement to allow the register to correctly locate, screws AR are loosened and arm W pulled to locate sector AJ 1/64″ above the indexed step of index arm AM. Excessive or insufficient backlash between gears of V and U is adjusted by locating collar Y as required.

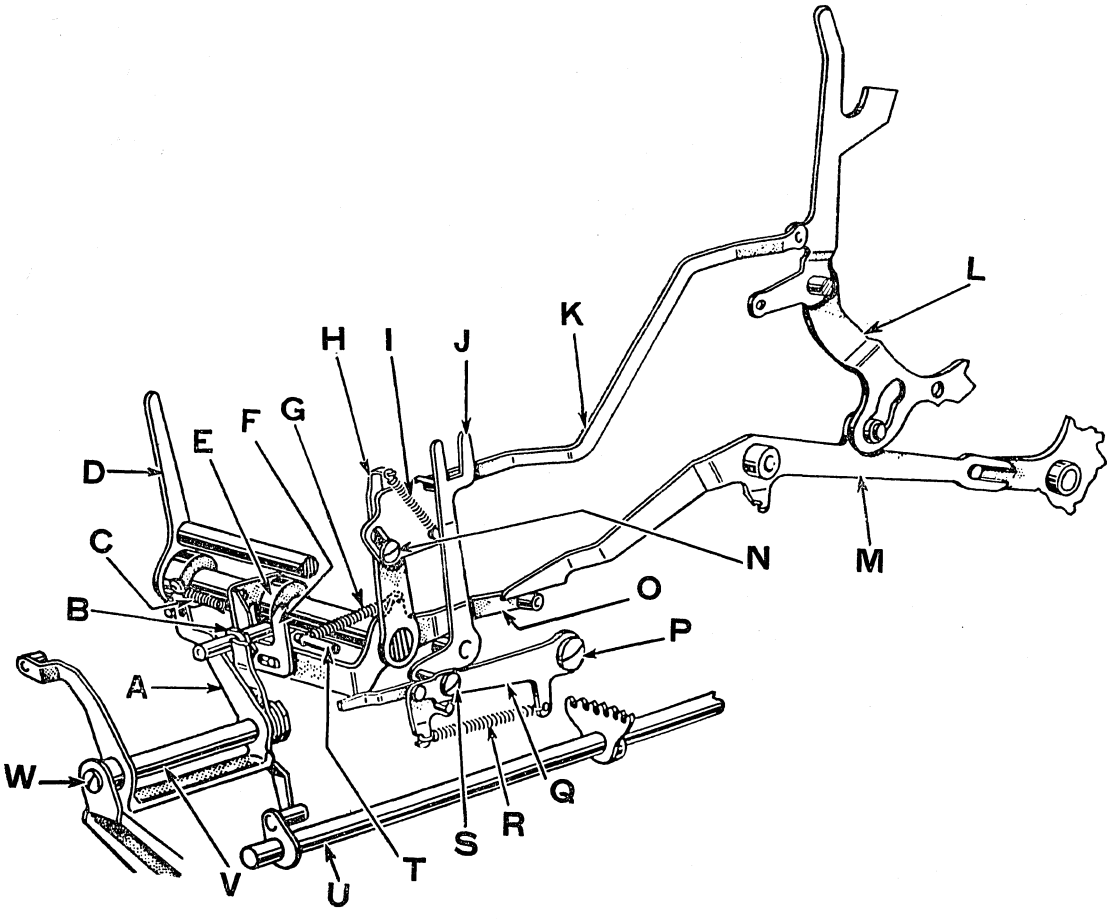
Two Column Keyboard Selection: This mechanism permits register selection from two columns.

When a key is depressed in one of the register selecting columns, sector E carries part B downward, the latter's pocket engaging the stud in bail A, rocking the latter to locate one of the steps of index arm AM, bail A being similar to bails Q and P.

When sector E restores on the return stroke part B contacts on shaft C, which disengages the stud in bail A from the pocket in part B.

Normalizing Mechanism: When the key is depressed bell-crank F, through wire G, swings bail I to locate its foot under sector AJ, which prevents indexing sector AJ and thereby disables register selection from the keyboard.

REGISTER SHIFT FROM SUBTRACT LEVER (Plate 49)
(Classes 12 thru 16 and 22 thru 30)
(Plate 48 in Symbol Book Only)



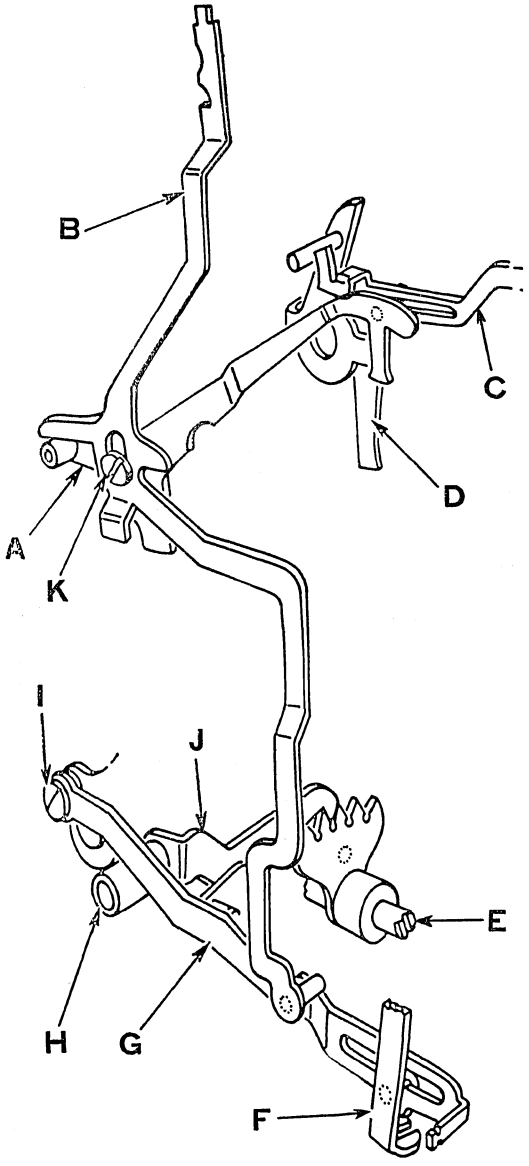
Register Shift from Subtract Lever (Plate 49)

The purpose of this mechanism is to shift from the last to the next register when the control skid is indexing the last register, or from the first to the second register when the control skid is indexing the first register.

When the subtract lever is moved to subtract position and the machine is operated, lever M rocks bail assembly O. Vertical cam of F places spring C under tension, which causes shaft assembly U to shift to another register position.

KEY TO NORMALIZE REGISTER SHIFT RELEASE AND TO NORMALIZE SUB-TOTAL FROM TOTAL MECHANISM (Plate 52)

(Plates 50 and 51 in Symbol Book Only)

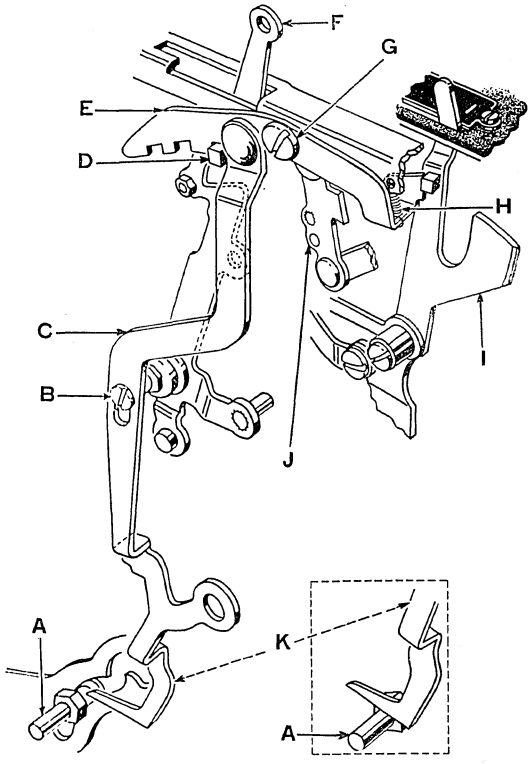


Key to Normalize Register Shift Release and to Normalize Sub-total from Total Mechanism (Plate 52)

The purpose of this key is to permit selection of and totaling registers in a certain column.

This key also permits totaling when the total key normally sub-totals. Depressing key B lowers arm G which raises the stud in register totaling lever F out of the pocket in arm G and locates the stud in the horizontal slot of arm G, which disables the register shift release mechanism. Key B also rocks A which raises part C above the stud in non-add control D and thereby disables the non-add when the total key is depressed.

REGISTER TOTAL INDEXING AND SUBTRACT LEVERS LOCKED DURING MACHINE OPERATION NO. 2 (Plate 53)



Register Total Indexing and Subtract Levers Locked During Machine Operation No. 2 (Plate 53)

The purpose of this mechanism is to prevent a machine lock due to the operator shifting the register total indexing lever during the machine operation. This mechanism also provides an immediate and positive lock for the subtract lever when the machine operation starts. This mechanism also permits discarding interlock 1-323½ (not shown) which blocks the stud in full stroke segment 311⅛ when a No. 5 roll is on the subtract cam.

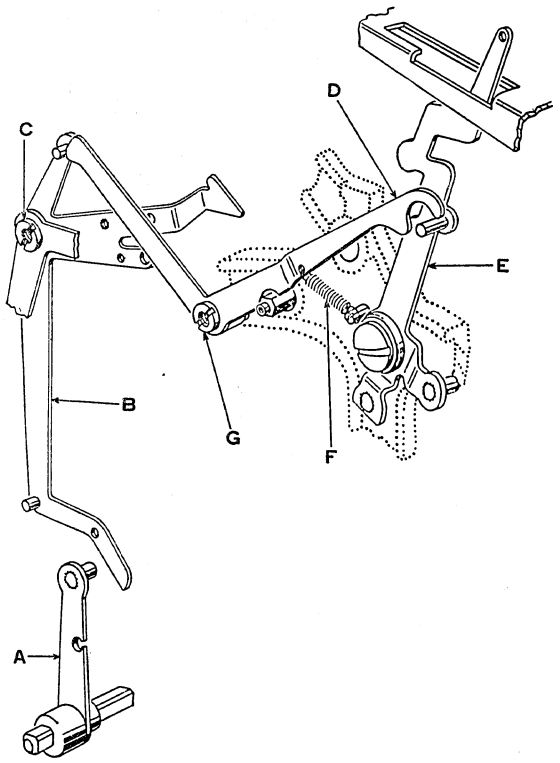
This mechanism which locks the register total indexing levers in all positions total, normal and sub-total, is effective throughout the forward and the return stroke.

The hook of interlock J which formerly blocked the subtract lever has been cut off, since it is no longer needed. By locking lever F in total and sub-total position the tendency to restore lever F by other mechanisms which may also be indexed from lever F is overcome.

Sequence

At the beginning of the machine operation, stud A clearing part K allows spring H to rock lever E to block lever F by one of the pockets of lever E seating around stud D. At the end of the return stroke part K raises link C which restores lever E.

REGISTER TOTAL INDEXING LEVER TO NORMALIZE CARRIAGE OPENING MECHANISM (Plate 54) (Classes 11 thru 16 and 21 thru 30)

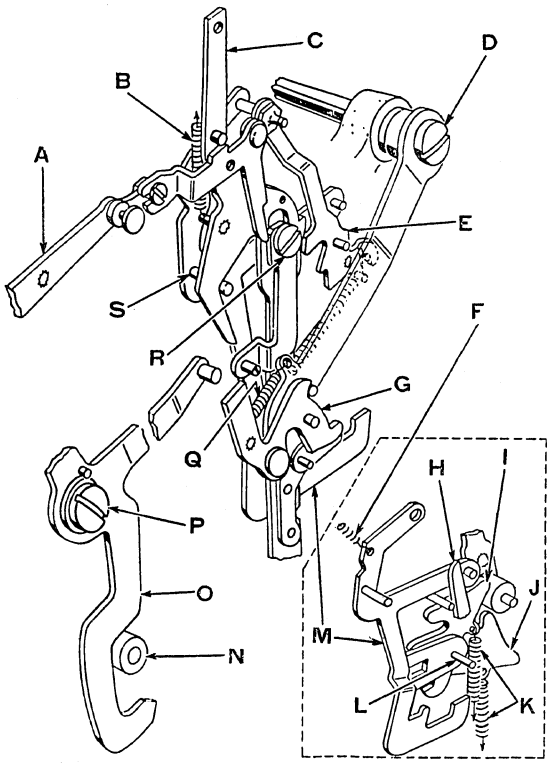


Register Total Indexing Lever to Normalize Carriage Opening Mechanism (Plate 54)

The purpose of this mechanism is to prevent carriage opening taking place, when registers are being totaled.

When register total indexing lever E is moved to totaling position, bell-crank lever D swings part B to clear the total key mechanism.

SKIP TABULATING MOTOR BAR MECHANISM (Plate 55) (Bank Posting Machine)



Skip Tabulating Motor Bar Mechanism (Plate 55)

This mechanism for Bank Posting Machine trips the drive, indexes the key and drive trip restoring and skip mechanisms.

When key C is depressed the projection on C allows spring Q to swing pawl G under the stud in horizontal arm of bell-crank O. The depression of key C also allows spring F to index repeat control M to prevent restoring keys and drive.

When key C is depressed, but not held down, the extension of the pivot stud for I and J limits on the rear step of repeat control M, which permits inside passby pawl J to drop and restore the keyboard mechanism but allows the repeat machine operation to continue which causes the carriage to skip to the balance column when there is no deposit. In the balance column a No. 12 roll locating on the repeat lever causes lever H to restore repeat control M.

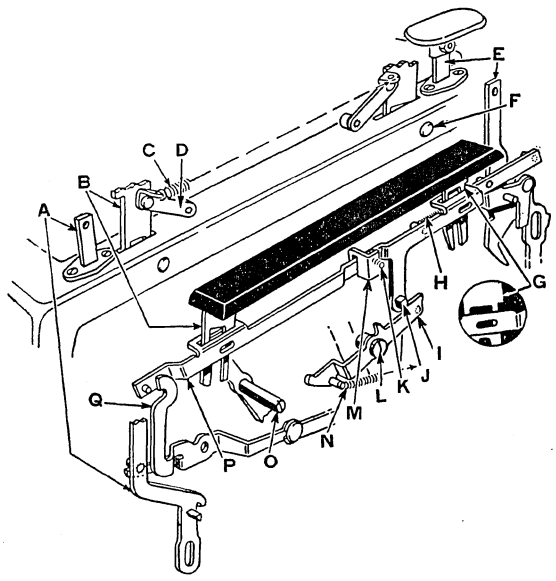
Where there is a deposit involved, key C is held down which allows both passby pawls I and J to drop to restore keyboard and drive trip mechanisms.

Key C, being held down, trips the drive which is prevented by detent M (Plate 21) blocking drive trip N (Plate 21) and the restoring of key C. During the machine operation roller N rocks bell-crank O, which, by contacting pawl G, indexes the skip mechanism.

Tests and Adjustments

Detent M (Plate 21) should have maximum hold on N (Plate 21) when key C (Plate 55) is held down, but should clear N (Plate 21) when key C is normal. The upper arm of detent M (Plate 21) is adjusted.

INTERLOCK TO PREVENT DEPRESSING REGULAR MOTOR BAR FOLLOWING DEPRESSION OF UPPER OR LOWER BARS (Plate 56)



(*Plate 56*)

When upper motor bar E is depressed, slide P is cammed forward through the stud in slide P moving out of the pocket in bar E. The forward movement of slide P is latched by lever I engaging square stud J. When slide P moves forward, it locates under step G which prevents regular motor bar depression until lever I is released.

When lower bar A is depressed, part Q moves slide P forward, in which position it is latched by lever I.

When the total key is depressed, stud O rocks lever I, releasing slide P, allowing it to move to normal position.

In the event that the case of the machine is removed, the following procedure for replacing the case is suggested:

Pull motor cable.

Depress total key.

Place case, holding it upward and pulling slide P forward to allow stud in slide P to locate in pocket of bar E.

Lower bar A locates to the left of slide P.

UPPERMOST BAR BLOCKED BY REGULAR AND AUXILIARY MOTOR BARS. RELEASED FROM TOTAL KEYS—CARRIAGE CONTROLLED (Plate 57)

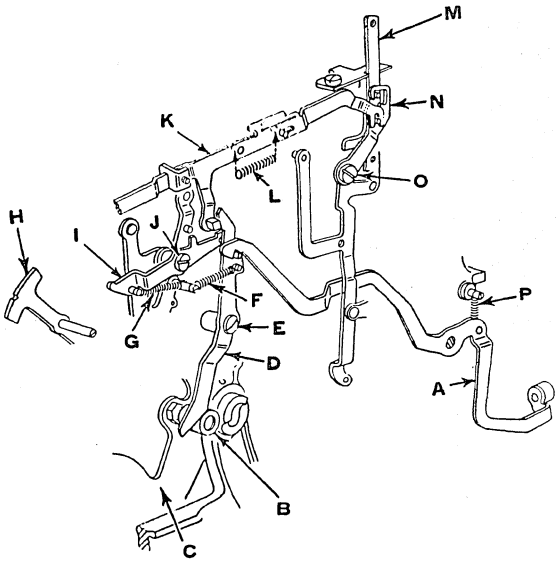
(*Plate 57*)

The purpose of this mechanism is to prevent depressing the single line bar when multiple line bills are being written.

When a skid contacts on part A, the hook on its front arm clears the stud in lever D. When the regular or one of the auxiliary bars is depressed, the machine operation allows spring F to swing part D, which pushes slide K forward.

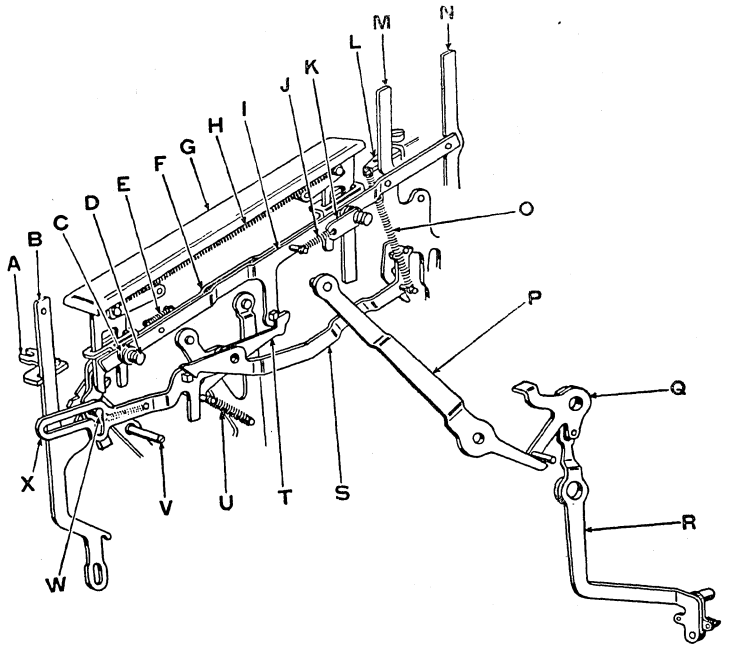
The forked arm of slide K swings interlock N under the stud in single line bar M, blocking it. Slide K is held in forward position by latch I.

During the total operation, the stud in part H raises latch I, which allows spring L to restore slide K.



INTERLOCK TO BLOCK DEPRESSION OF THE REGULAR BAR FOLLOWING DEPRESSION OF UPPER AND UPPERMOST BARS. RELEASED FROM THE TOTAL KEY, DISABLED FROM CARRIAGE CONTROL. LOWER BAR LOCKED FROM TOTAL KEY AND RELEASED FROM UPPER BAR

(Plate 58)



(Plate 58)

To compel the proper sequence of depression of the various motor bars. It prevents the possibility of using the regular motor bar (single line bar) and making a single line bill after once having started a multiple line bill operation by blocking its depression until the total key is used.

Also locks the lower motor bar against depression unless the upper motor bar or last service motor bar has been previously depressed.

Sequence

When the uppermost or multiple line bar N is depressed, it contacts studs and moves slide I, latching same by means of detent S. Bar G is locked against depression in carriage position A, preventing the return of the carriage and its opening with amounts still in the register. However, bar G can be depressed in selected carriage positions to permit entering "Meter readings and consumption" by means of skids actuating arms R, Q and P and moving slide F from under notches in lower portion of bar G. When the carriage leaves the selected positions, spring E again pulls slide F under notches.

The stud V contacts and releases latch T, allowing spring J to restore slides F and I to normal, when the bill is totaled; at the same time slide X is latched by detent S and blocking the depression of the lower or arrears and miscellaneous motor bar. This prevents the entering of arrears and miscellaneous items until the upper or last service motor bar is used, when latch S is lowered, releasing slide X. The depression of this motor bar returns the carriage to a selected carriage position where the working register is totaled into the crossfooter. When the lower bar is used, amounts are only accumulated in the C. F. direct and keyboard selected registers. The total key then is used to total the C. F. and release slides F and I and then return carriage to its starting position, open up and eject the completed bill.

Tests and Adjustments

Slide I should have 1/64″ latching in lead over latch T and slide F should block bar G. Adjust foot of slide I.

Total key should latch slide Y with 1/64″ lead.

Lower projection of X is bent.

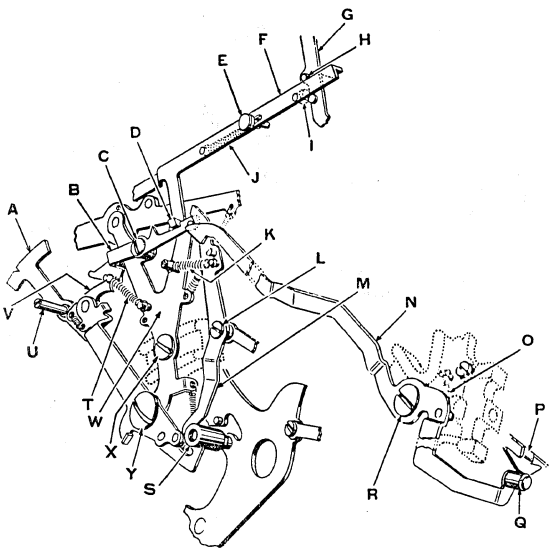
Latch T should release slide I with 1/64″ clearance.

Latch T is adjusted. Skids should open up bar G.

Lower portion of arm P is adjusted.

Vertical slot in slide X should align with stud in lower motor bar B.

INTERLOCK TO PREVENT DEPRESSING UPPER BAR FOLLOWING DEPRESSION OF OTHER BARS
(Plate 59)



(*Plate 59*)

The purpose of this interlock is to prevent writing a single line bill when a multiple bill has been started.

Sequence

When writing a multiple bill, the carriage moves skid P over roller Q during the repeat operation which swings lever N to clear the stud in lever M. Spring K swings lever M to contact on square stud D, moving slide F forward which locates square stud I under stud H in upper bar G, thereby blocking bar G. Slide F is latched in forward position by B. Slide F is restored by spring J during the total operation when stud U raises the front arm of lever B.

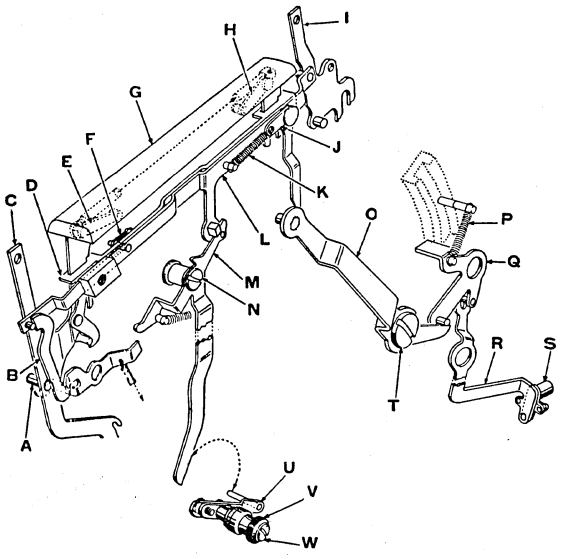
This interlock is not effective when upper bar G can be depressed due to square stud I being blocked by stud H in order to permit making successive single line bills.

Tests and Adjustments

Slide F should have 1/64 latching lead over square stud D. Projection of slide F is bent.

Total operation: Latch B should release slide F with 1/64 lead of latch B. Latch B is adjusted. Skid P should swing lever N to clear the stud in lever M.

INTERLOCK TO BLOCK REGULAR MOTOR BAR FOLLOWING DEPRESSION OF UPPER OR LOWER BARS—CARRIAGE CONTROLLED (Plate 60)



(Plate 60)

When the lower bar is depressed, stud A rocks arm B, the latter pulls outer slide L downward, inner slide D follows through spring F connection. Slide D when in forward position is under the front and rear step of motor bar G. Outer slide L is latched by latch M and unlatched during the total operation by the stud in interlock 1415 rocking latch M.

Outer slide L can be released manually by withdrawing knob V and turning assembly U which swings latch M to clear the square stud in slide L. When the upper bar is depressed, the cam surface on stem I pushes slide L forward and is latched by latch M.

This mechanism is normalized by carriage position when a skid contacts on roller S which holds slide D rearward through levers R, Q and O, the latter contacting on the foot of slide D.

Tests and Adjustments

When lower or upper bars are depressed, the square stud in L should have lead over latch M.

Adjustment: The foot of L is bent as required.

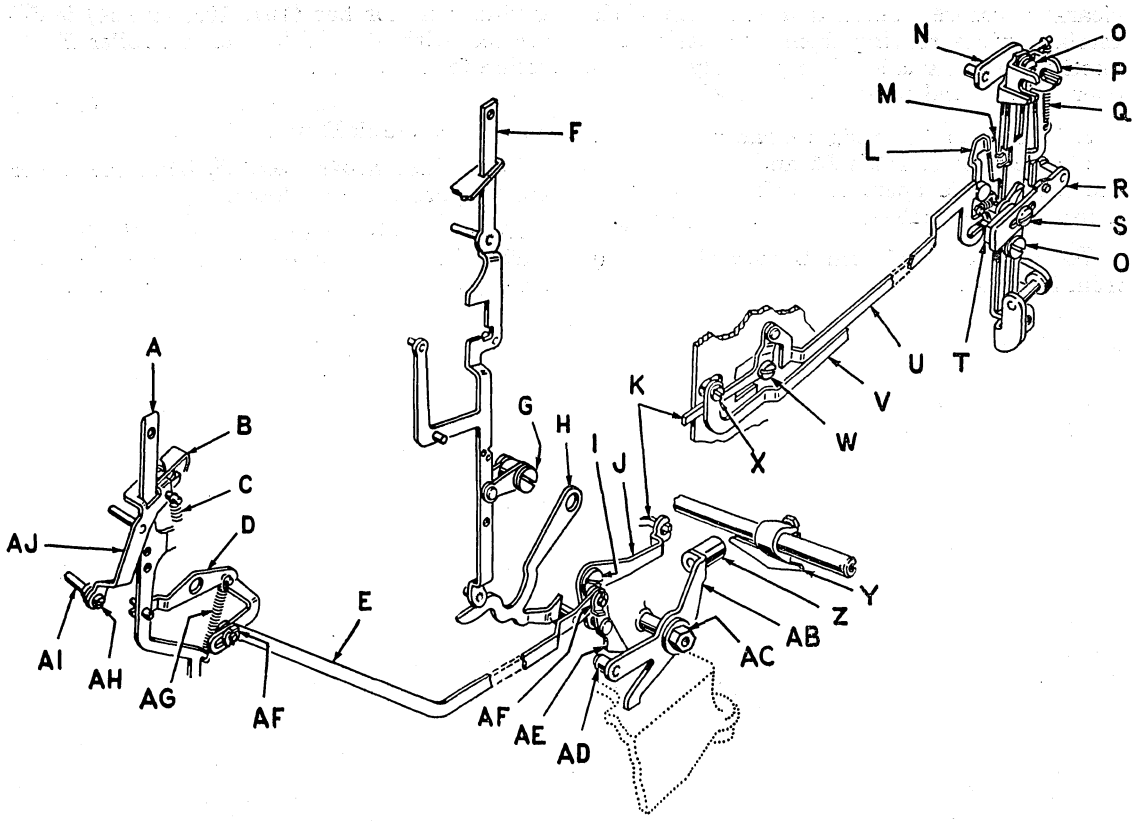
During total operation, M should clear the square stud in L.

Adjustment: Latch M is bent as required.

When a skid is on roller S, slide D should clear steps of G without bind.

Adjustment: The foot of D is bent as required.

FORM SPACING—INDEXED FROM AUXILIARY MOTOR BARS—CARRIAGE CONTROLLED (Plate 60-1)



Form Spacing—Indexed from Auxiliary Motor Bars—Carriage Controlled (Plate 60-1)

Purpose

To provide a means of spacing forms when posting multiple debits or credits; and to permit printing the first and second "Old Balance" pickups on the same line for easier and faster comparison.

When this mechanism is used, form spacing from the Motor Return Carriage is not required.

Construction

This mechanism cannot be installed on machines having the following features:

1. Crossfooter Add, Carriage Controlled, Indexed from the Lower Motor Bar (101).

2. Multiple Print Control Indexed from the Lower Motor Bar (101).

Operation

Form spacing, carriage controlled but indexed from the auxiliary motor bars, occurs only when skid Y is positioned on roller Z. Skid Y when so positioned raises stud AD into the path of the lower arm of lever AE. Lever AE is rocked by depression of motor bar A through bell crank D and link E; and by depression of motor bar F through arm H and link E.

With skid Y positioned over roll Z raising stud AD—and an auxiliary motor bar depressed rocking lever AE, stud AD blocks the lower part of lever AE thus causing bell crank J to rock. The latter, through bell crank W, slide U, and part L, drives the projection of latch M into the cutout of slide P to index a form spacing operation.

Adjustment

1. In the carriage position where this mechanism is active, there should be a mini-

(Plate 60-1) Continued

mum distance of ¾" between the active stop and the adjacent stops (right and left). This clearance assures sufficient momentum of the carriage when moving from one position to another to allow skid Y to properly position over roller Z and fully raise stud AD.

2. There should be slight clearance between the projection of latch M and slide P when the machine is operated with the auxiliary motor bars normal—to assure non-spacing.

To adjust, bend arm L toward or away from latch M.

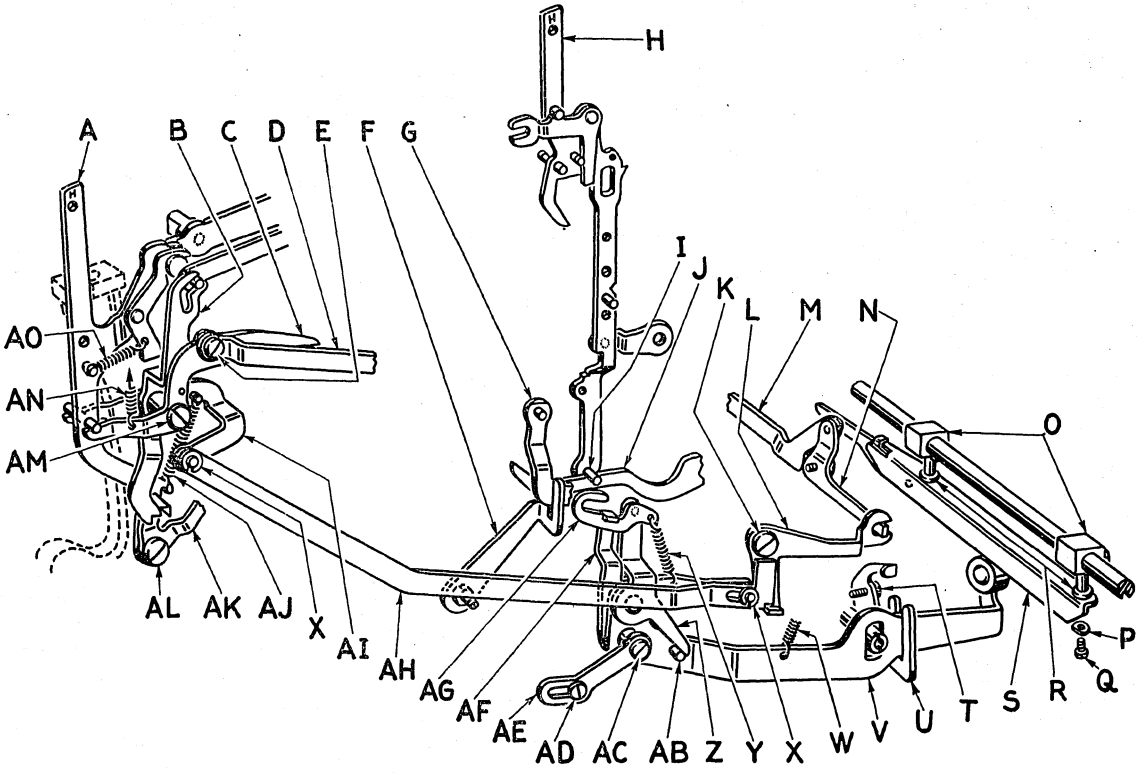
3. The projection of latch M should have a full hold in the cutout of slide P when an auxiliary motor bar (101, 103, or 104) is depressed with skid Y located on roller Z—to assure form spacing.

To adjust motor bar A, bend the forward arm of bell crank D up or down.

To adjust motor bar F, bend the upper arm of part H up or down.

Note: To increase or decrease the hold of latch M from all motor bars, bend the rearward portion of bell crank J up or down.

FORM SPACING—INDEXED FROM THE LOWER (101) MOTOR BAR, CARRIAGE CONTROLLED—DISABLED FROM THE UPPER (103) MOTOR BAR (Plate 60-2)



Form Spacing—Indexed From the Lower (101) Motor Bar, Carriage Controlled—Disabled From the Upper (103) Motor Bar (Plate 60-2)

Purpose

To index the Form Spacing Mechanism in specified carriage positions from depression of the lower motor bar.

This mechanism is used in payroll machines —particularly in Style 30 17 62 machines— for listing deductions.

Operation

As the carriage moves into a specified position, skid S rocks lever V. The latter, through bell crank Z and latch AG, rocks bell crank AF to lower link AH into the path of the projection on bell crank L. Depression of lower motor bar A then moves link AH rearward and through bell cranks L and N, shifts link M to the left. Shifting of link M indexes the Form Spacing Mechanism by moving the feed pawl into the notch of the feed slide.

Form spacing from motor bar A is disabled when depression of motor bar H precedes depression of motor bar A. With skid S holding lever V in a lowered position, depression of motor bar H rocks latch AG to release bell crank AF. The latter, through the tension of spring Y, raises link AH to clear the projection of bell crank L. As motor bar A is depressed to index the following operation, link AH moves rearward without rocking bell crank L, thus disabling the indexing of the Form Space Mechanism. Link AH remains in its raised (disabled) position until lever V is restored to normal.

Adjustment

1. With lever V normal, latch AG should have minimum latching lead in front of the lip of bell crank AF.

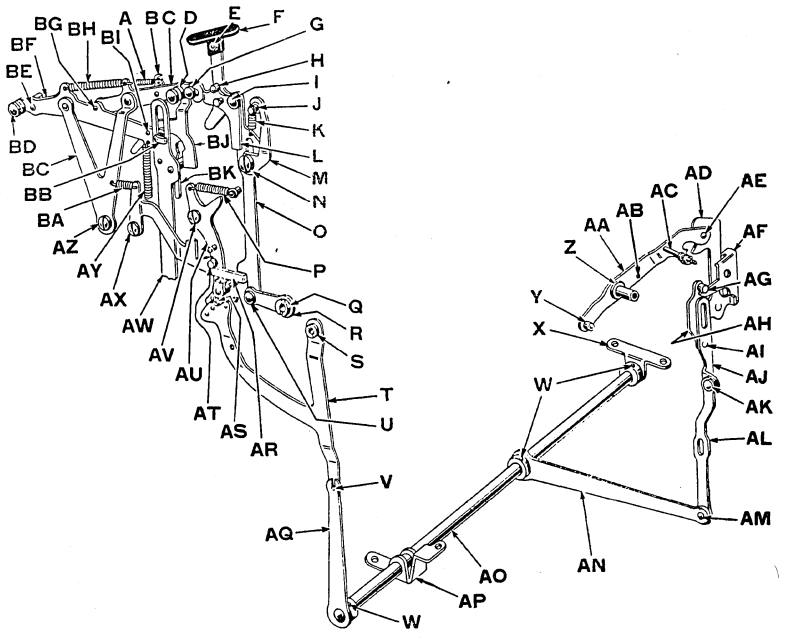
To adjust, bend the lower arm of bell crank Z toward or away from stud AB.

2. With lever V normal and motor bar A depressed, link M should be moved to the left just far enough to move the feed pawl into the notch of the feed slide without a bind.

To adjust, raise or lower the lower projection of arm AI.

Note: Recheck arm AI and link AH for correct alignment with each other.

CARRIAGE RETURN BAR, UPPER (Plate 61)
(Classes 11 thru 16 and 20 thru 30)



Upper Carriage Return Bar (Plate 61)

When the upper carriage return bar is depressed stem O lowers bell-crank AR out of the path of stud in arm AU. The downward movement of stem also trips the drive.

At the beginning of the machine operation spring P pulls lever AU over and beyond passby pawl AS. On the return stroke the lower portion of T (Plate 62) contacts on passby pawl AS and rocker arm T which trips the M.R.C. clutch through the movement of shaft assembly AO and link AL.

Lower Carriage Return Bar (Plate 62)

The carriage return bar mechanism operates in connection with the selective column return mechanism. The carriage return bar is used when more than one debit or credit posting is made. When the carriage return bar is depressed, the M.R.C. clutch is tripped as the keys are being restored.

The drive is released by increasing the movement of the short passby pawl AB as follows: Lever AH raises arm AG in the path of stud AE; the latter rocks part W to move slide N. Thus the carriage is returned to the debit column of the ledger sheet without printing the new balance on the statement or ledger.

Construction

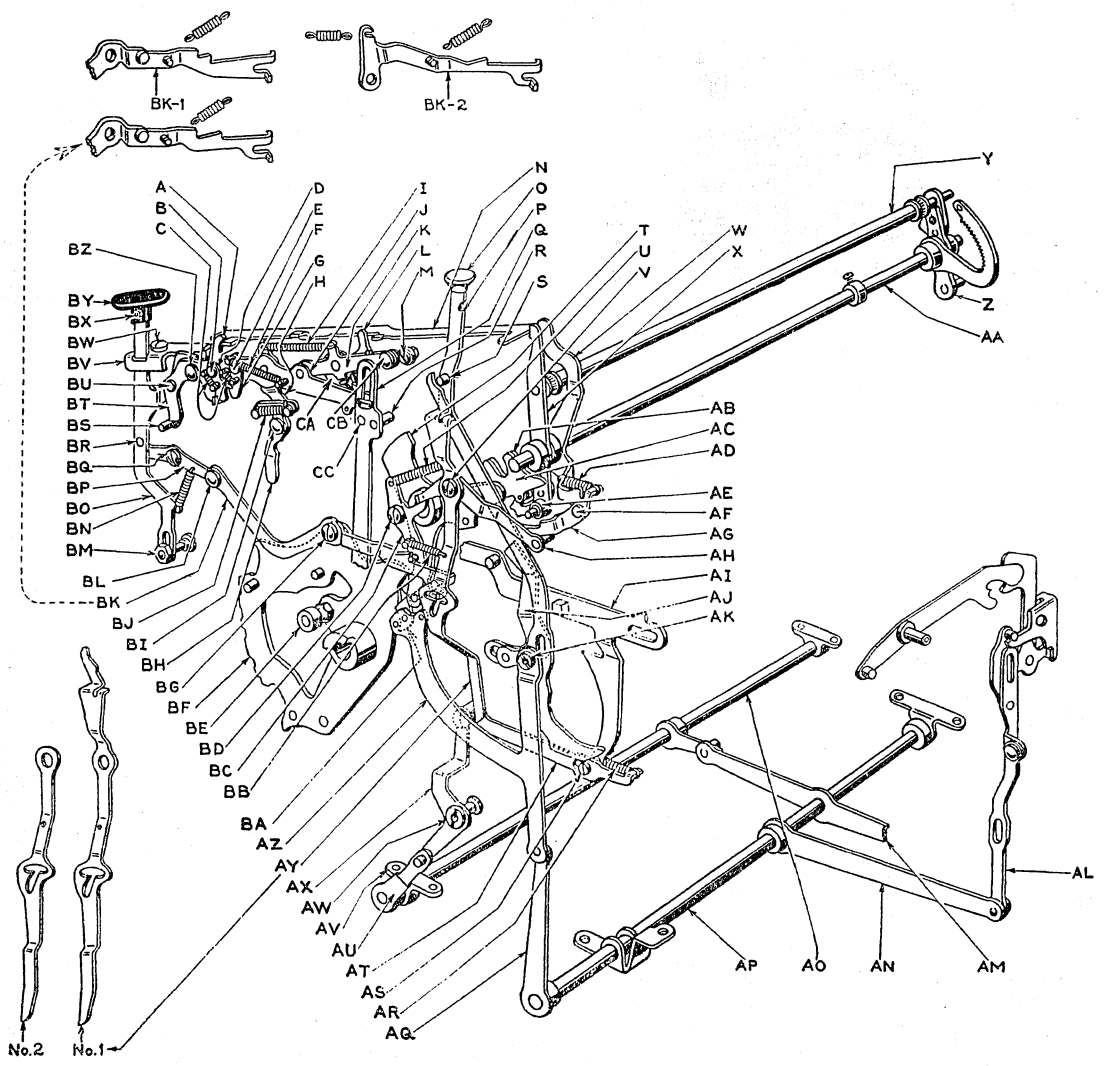
When the carriage return bar is depressed, stem BO rocks lever BP, the latter rocks detent lever BK out of the path of arm BC. Stem BO now trips the drive by contacting on stud BZ (in J). At the beginning of the machine operation spring U pulls arm BC forward and over and beyond passby pawl BA. On the return stroke of the first repeat-off operation (debit or credit column of statement) the lower part of T contacts on and moves arm AZ rearward, the latter contacts on passby pawl BA and rocks AZ which trips the M.R.C. clutch, through arms AQ, AN and link AL.

Interlock "AY" (Plate 62)

The purpose of interlock AY is to prevent depression of the carriage return bar in any columns other than the debit column of the ledger sheet when the repeat mechanism is used.

Interlock AY is controlled from three sources, viz.: The repeat mechanism, the

CARRIAGE RETURN BAR, LOWER (Plate 62)
(Classes 11 thru 16 and 20 thru 30)



(*Plate 62—Continued*)

cycle mechanism and the repeat mechanism normalizing key.

The carriage return bar is blocked when a stud in detent lever BK does not align with the vertical slot in AY.

When a repeat roll is in repeat-on position in Cr. or Dr. column of the ledger sheet, lever AT swings the lower part of AY to align the vertical slot with the offset in BK.

When the cycle mechanism is active, lever AT swings AY beyond the vertical slot blocking the shuttle bar.

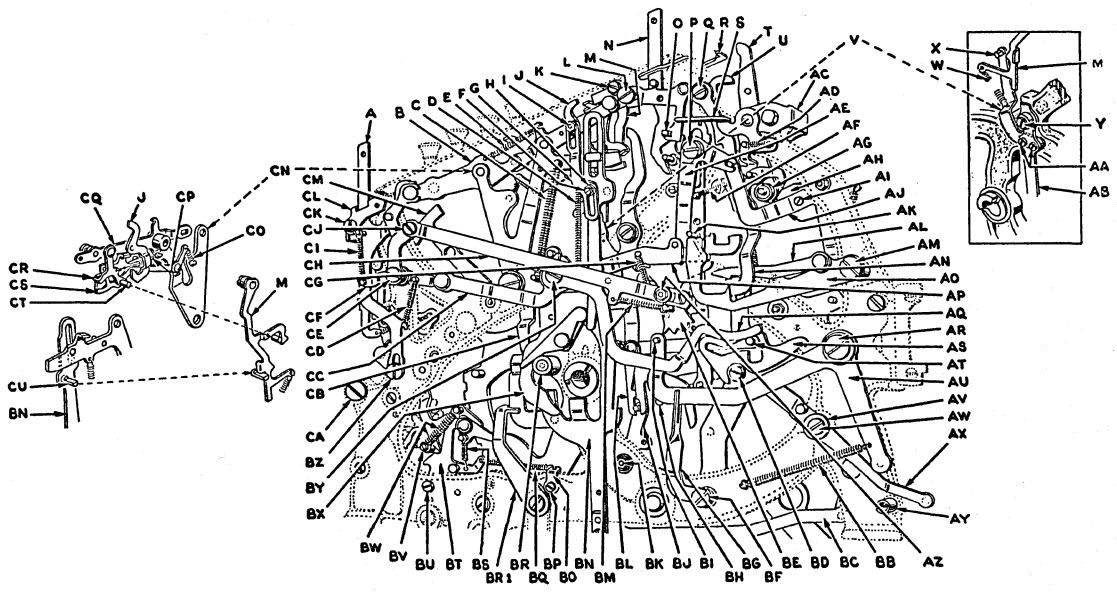
When the repeat normalizing key is depressed, the repeat mechanism is made inactive, simultaneously a stud in this normal key cams the vertical slot in AY to align with the formed ear in detent lever BK to permit the depression of the shuttle bar in any column.

Adjustments (Plate 62)

When the repeat mechanism is in "repeat-on" position, the formed ear in lever BK is aligned with the vertical slot in interlock AY by bending the lower part of AY to or from lever AT.

When the repeat normalizing key is depressed, the formed ear in lever BK is aligned with the vertical slot in interlock AY by bending the upper part of AY to or from the stud in the normalizing key "P."

MOTOR BARS—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 62-1)



Motor Bars—For No Space Stroke Total Bank Posting Machines (Plate 62-1)

Purpose

This improved motor bar construction permits easier depression of the motor bars, and provides a means of changing the multiple skip and return results from motor bars 101 and 103.

Operation

Depression of a motor bar (101, 102 or 103) lowers latch CR so that its lip rides against the vertical surface of part CN. Upon completion of the motor bar's depression, latch CR clears the vertical surface of part CN and is swung forward by spring CP to contact and move latch M forward through stud CT. As latch M is moved forward, stud CU is released and spring D raises link BN to trip the motor switch points and the clutch.

When a total key is indexed (either manually or automatically), stud BH rocks assembly BL, the upper arm of which cams latch M forward to release stud CU, thereby permitting spring D to raise link BN to trip the motor switch points and the clutch.

The motor bars and latch CR are reset during machine operation. On the forward stroke of a machine operation, roller BR lowers link BN; and link BC, which is rocked during each machine operation, swings arm V rearward through assembly BL, thereby causing stud X to move latch M over stud CU to block link BN in its normal position. During the return stroke of the machine operation, arm T is rocked and slide R rocks part J which, through stud CT, cams latch CR rearward where it is engaged by latch CS to prevent a repeat operation and to permit restoration of the motor bars.

Motor bars 101 and 102 are blocked against depression in the first balance position in order to eliminate misoperation caused by depressing the wrong motor bar on a minus balance (overdraft) operation.

Location of a control roll on the repeat cam (in first balance position) causes bail AC to rock, lowering arm S into the path of stud O to block the depression of motor bars 101 and 102.

Repeat Totals: The total key is held in its depressed position during the repeat total operations by motor bar 102 which is indexed and retained in indexed position during the 1st and 2nd total operations.

Link BN is lowered during the forward machine stroke and motor bar 102 is indexed by link G. The lowering of the large stud in the forward portion of arm B into the path of arm CM, when motor bar 102 is indexed, blocks the restoration of arm CM and restoration of the total key. Location of a No. 3 roll on the repeat cam (full repeat) in the first total position, disables the actuation of arm T and permits latch CR to retain motor bar 102 in its

(Plate 62-1)—Continued

indexed position. On the 2nd total operation (no repeat), arm T is actuated, and latch CR is rocked through slide R and cam J to release motor bar 102 and to allow the total key to restore to normal.

Multiple Skip and Return results are also changed through the indexing of motor bars 101 and 103.

Upon depression of motor bar 101, the 3rd notch of comb BE is positioned over stud BI. As the machine operates, roller BR rocks part BX to lower comb BE which actuates bellcrank AU, through stud BI, to change the multiple skip and return results.

When motor bar 103 is depressed and immediately released, the 1st notch of comb BE is positioned over stud BI. The lowering of stud AK lowers latch AO, thereby permitting arm AN to swing forward and to block the full restoration of latch AO. With AO so positioned, a stud in its upper portion positions the 1st notch of comb BE over stud BI, where it is retained during all successive repeat operations. On the return stroke of a non-repeat operation, the stud in roller AG rocks arm AN rearward where it is engaged by latch AL to retain the arm in its rearward position until latch AO is raised sufficiently to engage arm AN.

When motor bar 103 is held depressed or locked in depressed position by latch AE, the 2nd notch of comb BE is located over stud BI. Stud AK in such cases holds latch AO in a lower position in which a stud in AO's upper portion positions the 2nd notch of comb BE over stud BI. When a control roll is located on the repeat cam (in first total position) arm AJ is permitted to swing latch AE rearward to engage stud AK, thereby locking the motor bar in full depressed position. During the return stroke of the machine, roller AG contacts cam AH to rock arm AJ and latch AE to release the motor bar.

Adjustment

1. The slot in the rearward portion of link CH should limit on the stud in part BX, simultaneously with the limiting of the lower arm of bellcrank CF on the stud in link A (motor bar 101).

To adjust, turn eccentric screw CJ.

2. The lip of latch CR should have maximum clearance under the arm of brace CN without binding arm CQ, when link BN is moved to its lowest point by roller BR (handle all the way forward).

To adjust, turn eccentric bushing H.

3. When the machine is normal and the carriage is located in a non-repeat position, there should be approximately $\frac{1}{32}''$ clearance between stud AK and arm AE.

To adjust, bend the upper portion of arm AJ.

4. There should be approximately $\frac{3}{32}''$ clearance between the upper arm of assembly BL and latch M when the machine is normal.

To adjust, bend the upper arm of assembly BL.

5. Arm AE should be rocked sufficiently to release stud AK when the machine is operated in a non-repeat position.

To adjust, loosen screw AI, then raise or lower cam AH.

6. Arm S should align with stud O when a control roll locates on the repeat cam.

To adjust, bend arm S.

7. When the machine is operated, with motor bar 101 held depressed, stud AT should align in the pocket of the vertical slot in cam AS, and when motor bar 101 is depressed and immediately released, stud AT should locate in the horizontal slot of cam AS.

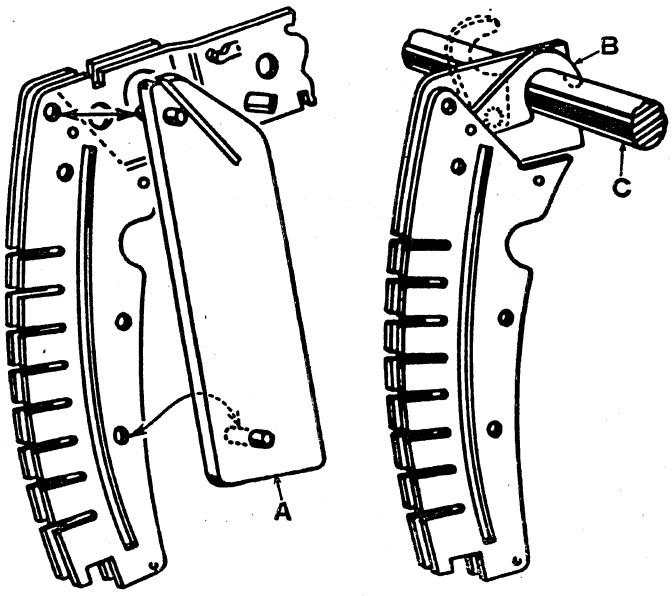
To adjust, raise or lower the rearward portion of arm AQ.

8. Latch M should have a maximum of $\frac{1}{16}''$ hold on stud CU, when the machine is locked in half-cycle position by toggle lock 120B Style 9 (U, Plate 85-1, Power Symbol List); and should have a minimum of $\frac{1}{32}''$ hold when the handle is restored half way during the return stroke.

To adjust, loosen screws AA and swing arm V forward or rearward.

Note: Check latch M for $\frac{1}{32}''$ hold when the stops are off the stop block, and when the ledger end lock is active.

INSTRUCTIONS FOR INSTALLING REPAIR 1A-210 AR-AL ENV. 1242 (Specify Pitch) (Plate 63) (Classes 1, 2, 6, 11 thru 16 and 20 thru 30)



Instructions for Installing Repair 1A-210 AR-AL Env. 1242 (Specify Pitch) (Plate 63)

Remove keyboard.

Remove 411's and 415's in column to the right and to the left of the damaged part.

Remove tie strip.

Remove 402 shaft, 270's and 214 in column to be changed.

Place cut off jig A as shown in sketch.

With hack saw guided by slot in jig; cut off the damaged assembly. Break the 210AR off shaft.

Install new part B by placing on shaft 205, on shaft (C) 201½ and lock in place with latch over shaft C.

Note: Latch should fit tight.

Order 1A-210AR or AL Env. 1242 (specify pitch) and Kit Env. 1242 (the jig). Machine number and column must be specified. Return jig to Home Office.

Mr M R Lovejoy
Buffalo N Y Branch 10-5

Printed in U. S. America

Form 3754—6M-6-47-Service (D1105)

CLASSES 1, 2, 6, 11 thru 16 and 20 thru 30

PRINTING

Instruction Book

March, 1941

Reprinted—November, 1946

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To Mrs. Lovejoy

Of _____

Property of and to be returned to

BURROUGHS ADDING MACHINE COMPANY

DETROIT, MICHIGAN

FOREWORD

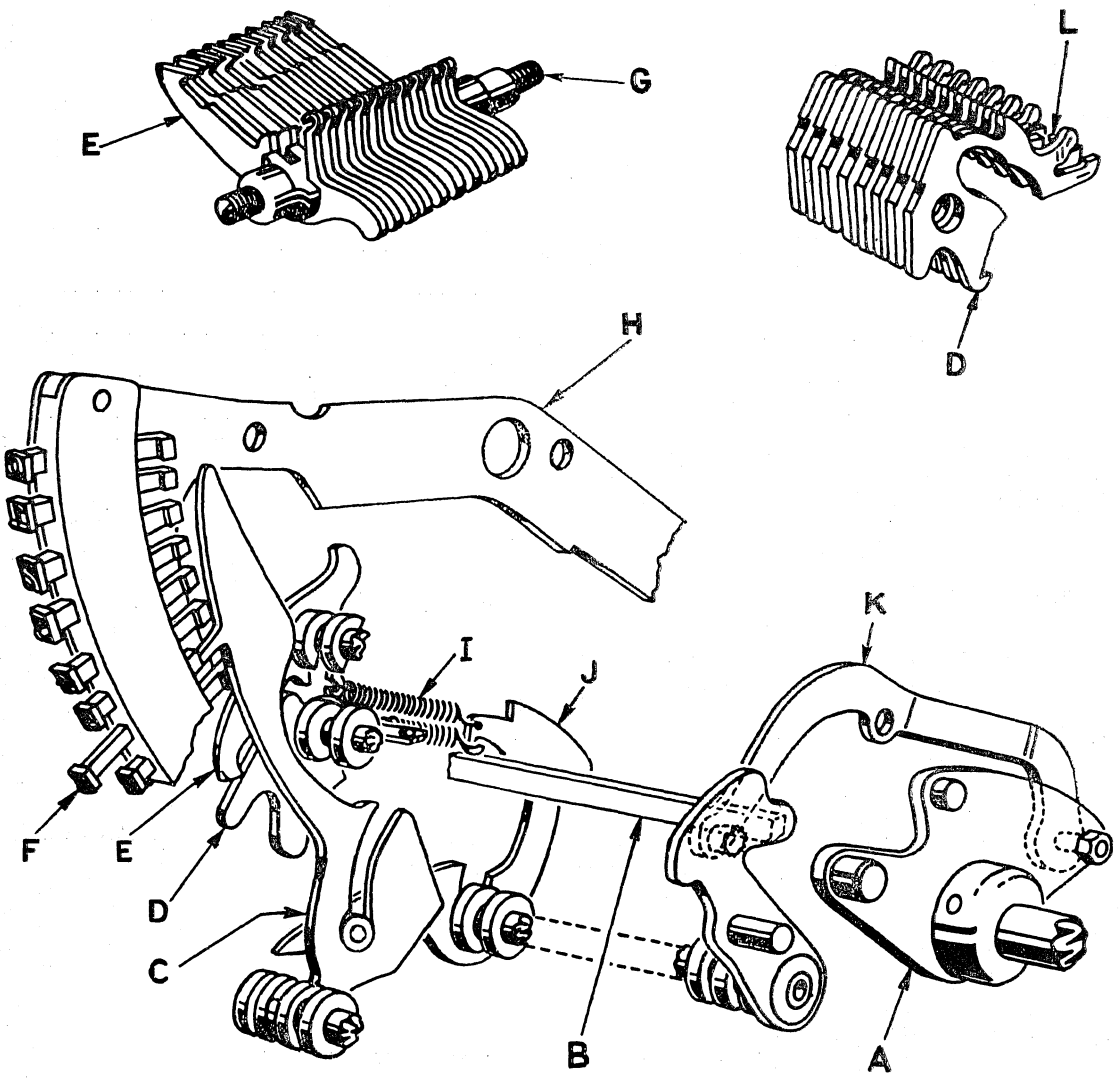
This book covers the indexing and the control from all sources for printing or non-printing amounts. The indexing and control of the ribbon mechanisms and selectivity of the ribbon colors is also covered.

The operation and the adjusting of printing and ribbon mechanisms of early and late styles, also type and type alignment is included. Some subjects formerly in other books and special prints were revised and added to this book.

INDEX OF MECHANISMS

Description	Plate No.
Calendar Feature, Printing Control	9
Case Shutter	48
Cipher Cut-out Mechanism	5
Closed Account Symbol Printing	9
Closed Account Symbol and Consecutive Number Not to Print During Spacing Stroke (H903 Machines)	11
Crossfeed Ribbon, Feature 69 (Style 2 09 09 Tally Roll)	45
Crossfeed Ribbon Mechanism (Type 20) (Early Style)	39
Crossfeed Ribbon Mechanism (Improved)	38–1
Crossfeed Ribbon Mechanism (Type 20) (Later Style)	38
Crossfooter Detent for Single Stroke Multiple Print	28
Delayed Cipher Printing Mechanism	5
Double Bail Printing Control	6
Driver Assembly for Single Stroke Multiple Print	24
Eight Point Printing Control, Carriage and Keyboard Lever Controlled, Lever Restores at Each Machine Operation	14
Eight Point Printing Control—Indexed and Disabled from Various Sources and Shifted Thru Machine Operation—In Conjunction with the Count Mechanism (Class 20 Bank Machines)	13–1
Eight Point Printing Control from Carriage Controlled Total and Sub-total Mechanism (H903 Machines)	15
Eight Point Printing Control from Character Keys	20
Eight Point Printing Control from Keyboard Button	18
Eight Point Printing Control Shifted from R. T. Indexing Lever and C.F.N.A. Key	19
Eight Point Printing Control from Total Key Disabled by Keyboard Button	17
Eight Point Printing Control from Total and Sub-total Keys, Carriage Controlled	16
Eight Point Printing Control from Upper and Lower Motor Bars	21
Eight Point Printing Control Indexed from all Sources—Actuated by Machine Operation	13
Hammer Release and Driver Resetting Control	23
Items to Print in Red, Carriage Controlled (Early Style)	42
Items to Print in Red, Subtract Lever Controlled (Early Style)	42
Items to Print in Red, Carriage Controlled (For Later Ribbon Mechanism)	41
Items to Print in Red—Manual Control	40
Items to Print in Red, Subtract Lever Controlled (Later)	43
Mechanism to Prevent Minus Symbol Printing with Added Amounts and Insure Printing with Subtracted Amounts (Bank Posting Machines)	12
Printing	1
Printing and Non-printing Control	2
Printing Control Camshaft Rotated from Upper or Uppermost Bar	22
Printing Control Indexed from Carriage and Machine Operation	6–1
Printing Control for Symbol Type (Later)	8–2
Printing Control for S&N, Closed Account Symbol and Calendar Feature	9
Printing Control from Character and Total Keys	26
Printing Control—Roll and Skid Controlled	25
Rapid Ribbon Change Device	49
Ribbon Mechanism, Vertical	46
Ribbon Shutter Mechanism	47
Rotary Calendar Feature Carriage Controlled	33
Rotary Calendar Feature Quick Set	36
Rotary Consecutive Numbering Device Controls	35
Rotary Consecutive Numbering Device, Carriage Controlled	34
Safeguard Symbol Printing Control	31
Safeguard Symbol Printing Mechanism Disabled by Register Total Indexing Lever	32
Safeguard Symbol Printing Mechanism, Style 2	31–1
Safeguard Symbol Printing Mechanism Listing and Totaling	29
Safeguard Symbol Printing Mechanism (Totaling)	30
Single Stroke Multiple Print	23 thru 28
Single Stroke Multiple Print Disabled by Carriage Normal Key and Also by Spring	27
Single Operation Multiple Print (Improved) Indexed and Disabled from Control Rolls	27–1
Single Operation Multiple Print Hammer Release and Driver Resetting Control (Improved)	23–1
Single Operation Multiple Print Printing Controls (Improved)	25–1
Split and Normal Printing Control	9
Symbol Indexing Controls	8
Symbols Print Only with Amounts in Conjunction with Closed Account Feature (Classes 20 thru 30)	8–1
Symbol Type Printing Control	10
Totals to Print in Red with Subtract Lever in Subtract Position	44
Type Alignment	51
Type Magazine 1-611⅛B for 16 Pitch (to install)	53
Type Magazine 1-611⅛Z Pitch 8-10-12 (to install)	52
Type Mechanism	50
Unlimited Split Mechanism	37

PRINTING (Plate 1)



Printing (Plate 1)

Printing is accomplished by hammers C striking the indexed type. Hammers are actuated by drivers J which are driven by springs I.

Printing in the columns indexed is controlled by the type sectors. When the machine is operated, the upward movement of the adding racks when 1 to 9 are indexed, allows pawl E to raise latch D releasing driver J to drive hammer C against the type. In columns to the left of the item, pawl E contacts on the cam portion of type sector H which raises the hook of pawl E and thereby prevents printing ciphers to the left of the amount.

When there are ciphers in the amount, pawl E is raised as explained, the ciphers being printed through latches D as follows: Each latch D has a projection which overlaps the next latch to the right. When pawl E raises latch D, the latter raises the latch to the right, thereby printing ciphers in every column where no pawl E releases drivers.

Drivers J are reset on the return stroke of each machine operation by bail assembly B, link K being connected to the secondary section A.

When the left type sectors are used for printing dates, the overlapping projection of latch D is removed (at L), so that ciphers will not print between the date and the amount. Also when one-half of the machine is used for one purpose and the other half for another, the overhanging arm of latch D in the right column of the left side is removed. The removal of the overhanging arm of latch D is known as permanent splitting.

Tests and Adjustments

Test for resetting drivers; one is added in the extreme left column, handle allowed to restore slowly and noted whether or not the last latch D to the right covers driver J. Resetting of drivers under all conditions is essential to insure positive printing.

Hammers C must have full contact and align with the 0 and 9 type. Hammers C must be free with no excessive side play.

Pawls E should align with sectors.

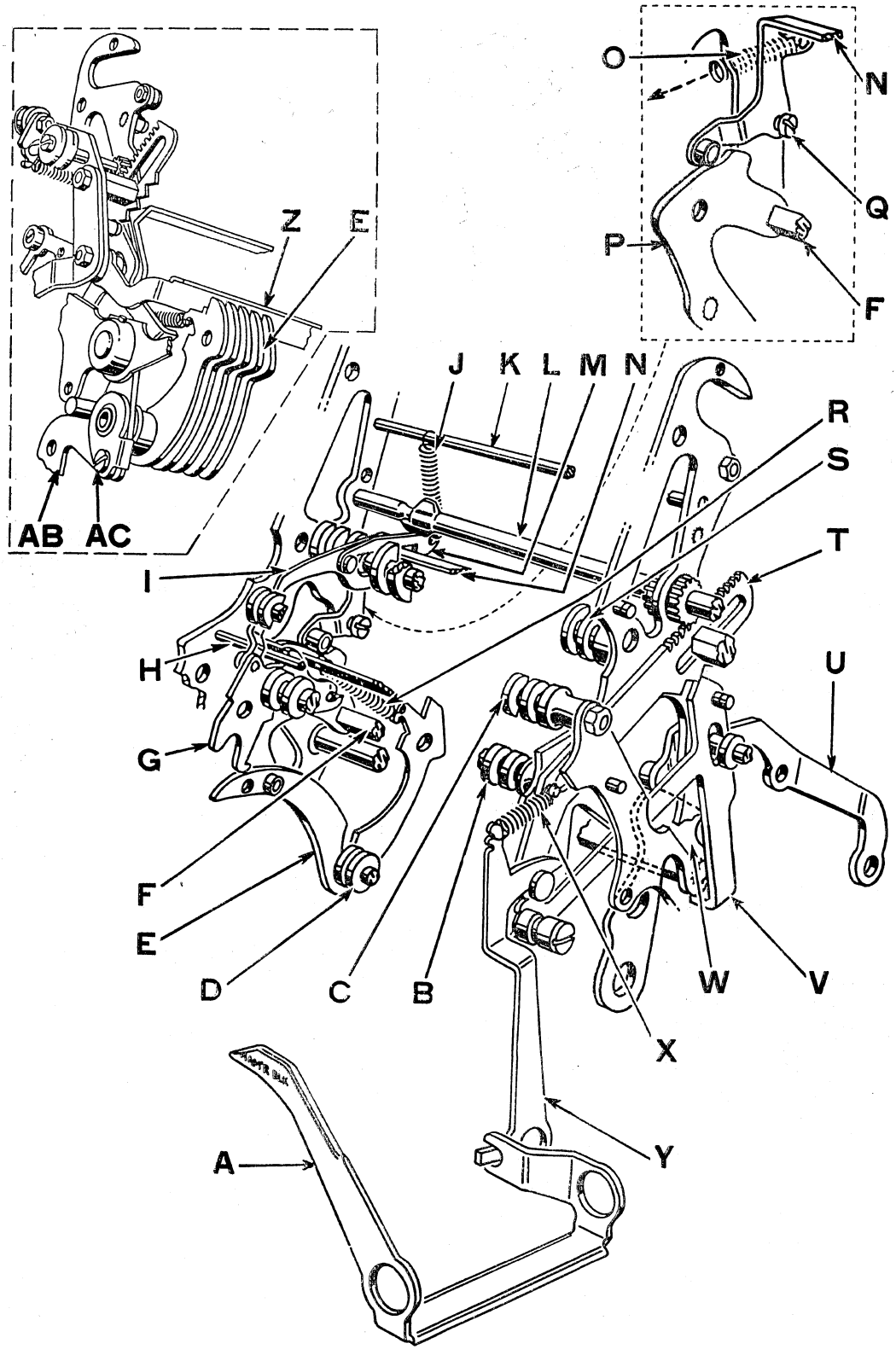
The printing section is the important factor in the timing control of the machine, due to its releasing the toggle after all the functions on the forward stroke have been completed. All ciphers including the lower counter symbol should be printed before the toggle is released. In most cases, adjusting the toggle gives the desired results. Sometimes it is necessary to check the complete timing operation which is covered under its own heading, since accumulation and other conditions are also important factors which must be considered.

Hammers C are released consecutively in groups in the large machines whereas in the smaller nine bank machines, the hammers are released consecutively in one group.

The distance from the contact edge to the pivoting center of pawls E varies as shown at G, the shortest releases first, the longest, last.

The shortest pawl E is located toward the dashpot. The last pawl E toward the handle side of the machine releases the symbol hammer through latch D, this pawl E is of the same length as pawl No. 4. Pawls E are number stamped, the first one toward the dashpot being No. 0, the one in the unit column being No. 8.

PRINTING AND NON-PRINTING CONTROL (Plate 2)



Printing and Non-printing Control (Plate 2)

Non-printing is accomplished in two ways, viz.: Blocking drivers with bail Z, and or by raising pawls G at the beginning of the forward stroke and allowing drivers E to limit on and move with restoring shaft F which prevents hammers striking the type.

The number of drivers E which can be allowed to move out with shaft F is limited to five columns and under, in 13 column machines, and six columns and under in 17 column machines.

When more drivers are allowed to move out with shaft F, the tension of driver springs R combines with the pull of the secondary springs, resulting in disturbing the timing control of the machine.

Single, double and triple bails Z, are used in combination with drivers E moving out with shaft F. Pawls G which are raised have links I pivoted on them, the other end of links I which are forked, are supported by recessed shaft S. Arms M which pivot on links I are engaged by lower bail N and pulled forward which raises pawls G and allows drivers E to move rearward without striking the type.

Bail N is moved forward by riding on the cam surface of arm P. On the return stroke, bail N is restored by spring O. Arms M are moved into and out of the path of bail N by projections on camshaft L, the latter is indexed by control rolls of different diameters through lever A and arm Y, which move rack T, the latter being meshed with the pinion on camshaft H.

Camshaft Lock

During every machine operation, rack T is locked by detent V, its spear point seating in one of the spaces on the bottom edge of rack T. Slightly before the end of the return stroke, the front part of arm W contacts on and lowers detent V disengaging it from rack T. At the beginning of the forward stroke, arm W releases detent V allowing it to seat in one of the spaces of rack T.

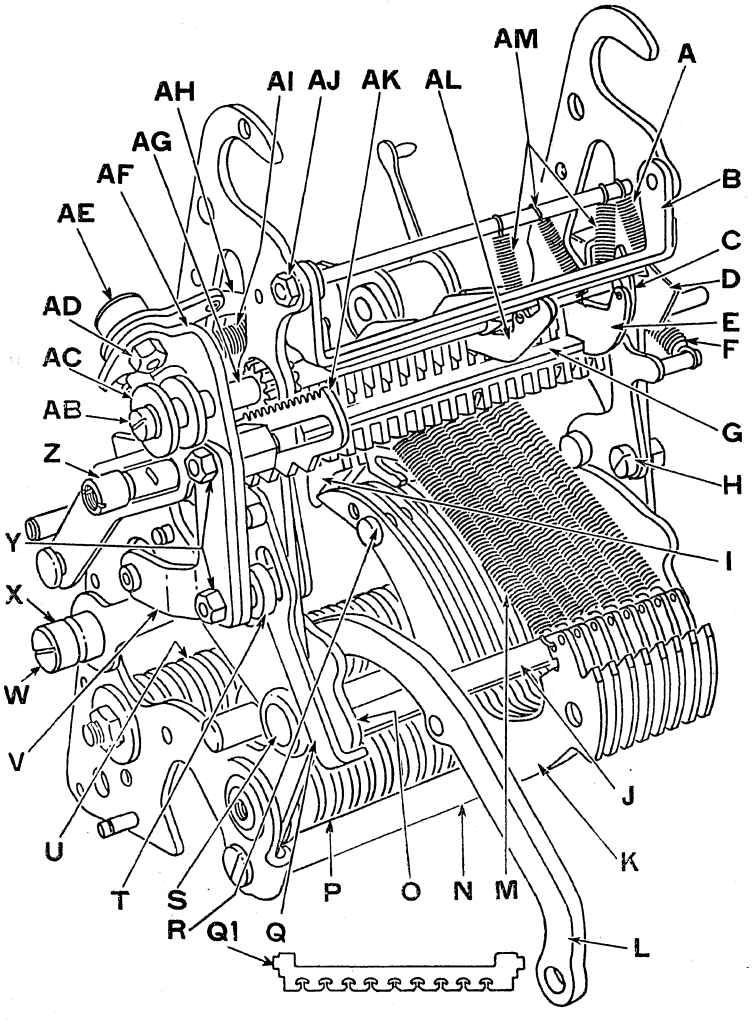
Four point printing control consists of indexing camshaft L by control rolls and also indexing from total keys, keyboard or bars.

Eight point printing control consists of shifting camshaft L sidewise from total keys, keyboard, bars and carriage.

Camshaft L four point differs from camshaft L eight point; both receive a rotary movement, but the eight point when indexed is given a sliding movement, its projections having a cam surface.

DELAYED CIPHER PRINTING AND CIPHER CUT-OUT MECHANISMS (Plate 5)

(Plates 3 and 4 in Printing Symbol Book only)



Delayed Cipher Printing Mechanism (Plate 5)

The purpose of the delayed cipher printing mechanisms is to permit non-printing in the right columns and printing in the left columns. Ex: Non-printing cents and printing dollar symbol and ciphers in payroll machines.

The carriage position locates camshaft AG to hold coupler E over lower bail G. At the beginning of the machine operation bail G through coupler E tilts pawl I (in unit col.), which allows drivers K to move outward with resetting shaft J. Pawl I (in unit col.) through coupler assembly C pushes upper bail B forward. The lower front edge of bail B contacts on coupler AL which tilts pawl I to release driver K and hammer to strike the type.

Note: The lower edge of the bail B causes later contact on coupler AL which releases the drivers and hammers after restoring shaft has cleared the drivers.

The upper edge of bail B is used to print safeguard symbols when units and tens columns print instead of being blocked.

Cipher Cut-out Mechanism (Plate 5)

The purpose of the cipher cut-out mechanism is to prevent printing ciphers in the units and tens columns when numbers are listed in the columns to the left of the units and tens columns.

The carriage position locates the camshaft to lower hook of coupler assembly E over lower bail G. At the beginning of the machine operation, bail G lifts pawl I through coupler AL which allows drivers K to idle out without striking the platen.

When the cipher cut-out mechanism is in operating position with the shift lever in subtract position, the minus symbol prints as follows:

The curved upper arm of coupler assembly C in unit column moves upper bail B forward pulling coupler E to release driver K in the symbol column.

DOUBLE BAIL PRINTING CONTROL (Plate 6)

Double Bail Printing Control (Plate 6)

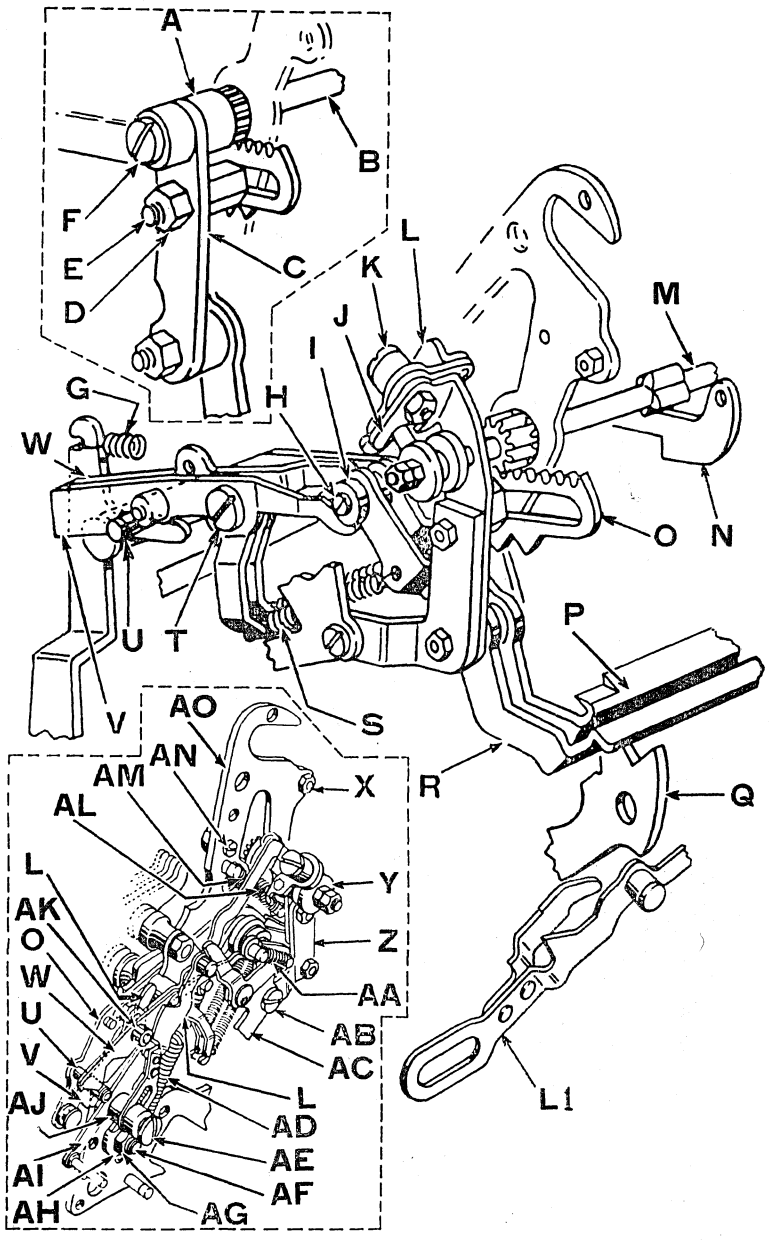
The double bail mechanism provides a wide range of printing control combinations not obtainable with the single bail mechanism.

The middle and lower figures cover the 8 point style of printing control, whereas the upper figure, letters A to F, shows the 4 point control adaptation.

Tests and Adjustments

The edge of bails R and P should align square with points of drivers Q, if necessary the bails are aligned by weaving. When roller U is contacting on the widest part of V or W, there should be 1/32″ clearance between bails R or P and drivers Q.

When clearance is lacking, it may be due to part AI limiting on AJ, in that case the upper arm of R or P is bent. When part AI is not limiting on AJ, clearance between bails R or P and drivers Q can be secured by bending downward the forward arm of parts V and W near their pivot point. With the detent V seated in notch (see plate 2) of rack O and roller U seated in the shallow notch of V or W, the partial non-print of bails P or R should have 1/32″ hold on drivers Q. Also there should be 1/64″ clearance between the full non-print edge of bails V and W and drivers Q not latched.



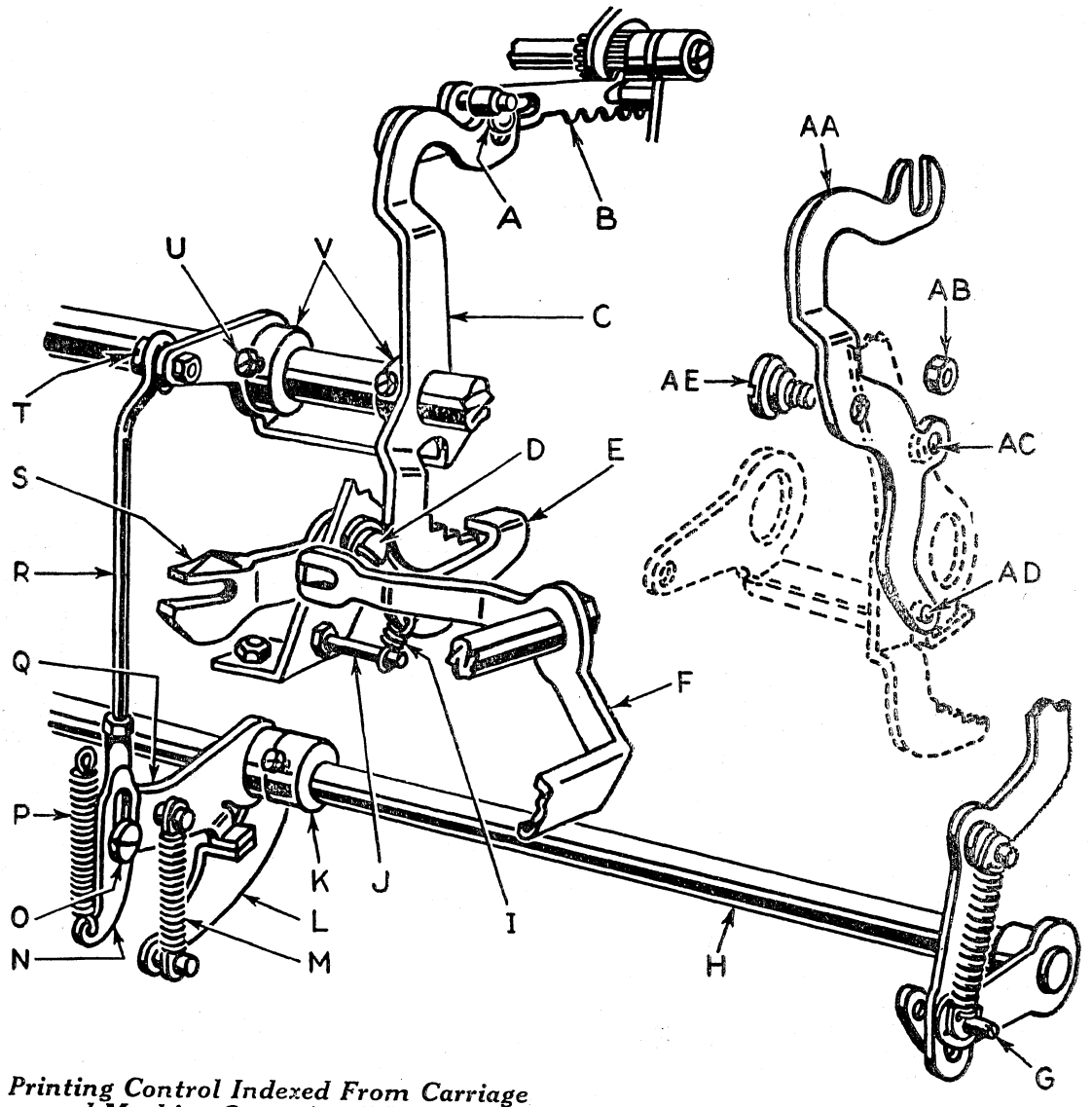
To increase hold, the front point of the forward arm of V and W is tilted upward. Since increasing the hold of one edge of the bails decreases the clearance of the other edge, it may be necessary to equalize these adjustments.

To decrease hold, the front point of the forward arms V and W are bent downward.

When roller U is seated in the deeper notch of V or W, the full blocking edge of bails P or R should also have 1/32″ hold on drivers Q.

When camshaft M is moved sidewise from any source, cam link L cams V and W to active or inactive position. Cam link L in the lower assembly drawing allows both V and W to remain normal. Cam link L drawn individually to the right causes both V and W to be inactive when the camshaft is shifted. Cam links L in other cases cause V to be active and W to be inactive and vice versa. When V is active and W inactive the arm of L if necessary, can be bent upward to raise W.

PRINTING CONTROL INDEXED FROM CARRIAGE AND MACHINE OPERATION (Plate 6-1)



Printing Control Indexed From Carriage and Machine Operation (Plate 6-1)

Purpose

This mechanism provides a means of controlling the Printing Control Mechanism, and reduces to a minimum the load on the carriage.

REPAIR PART AA is now available for use in the Field, and can be readily installed should breakage of bail C occur.

Operation

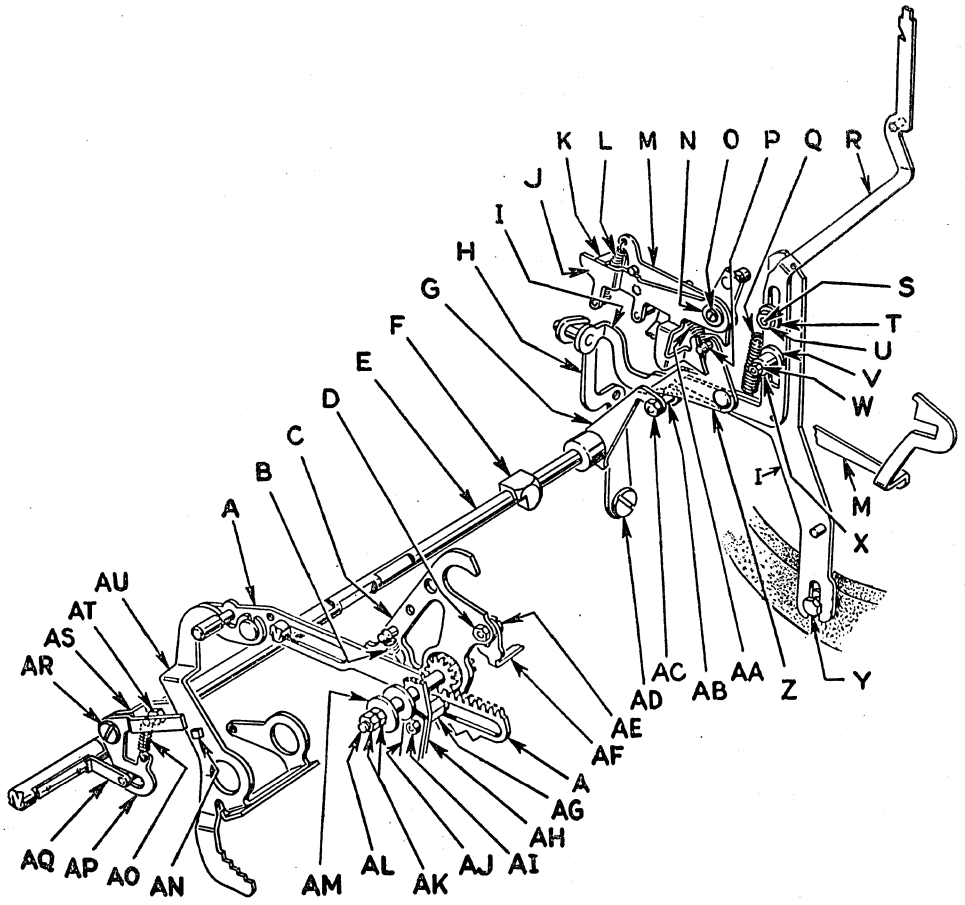
When lever F is actuated by a carriage control roll, arm E is rocked so that its forward portion is raised to align with one of the steps in bail C (the step selected being determined by the size of the control roll).

Tripping of the drive and operation of the machine will cause shaft H to turn, lowering arm L, and, through spring M, pulling arm Q and wire R downward. Downward movement of wire R will rock bail C and move slide B rearward (to position the printing control shaft) until the selected step in the lower part of bail C limits on arm E.

The Printing Control Mechanism and shaft H are restored to normal position by spring P.

PRINTING CONTROL SELECTED FROM NON-TAB KEY (8-0), DISABLED BY REPEAT CONTROL ROLL (Plate 6-3)

(Plate 6-2 in Printing Symbol Book only)



Printing Control Selected From Non-tab Key (8-0), Disabled by Repeat Control Roll (Plate 6-3)

Purpose

To permit printing the accumulated amounts (1) in columns 1 through 13 in each carriage position when taking register totals; and (2) in columns 1 through 17 when the carriage is located in the first automatic total position.

Operation

Depression of the non-tab key R (8-0) lowers cam Z which, through stud AB rotates shaft E, causing arm AQ to swing the upper arm of part AP in the path of stud AN, thus blocking the printing control camshaft in O roll position which permits the printing of columns 1 through 13.

A control roll when located on the repeat cam (first automatic total position) rocks part J, which through a cam in its forward portion contacts stud P to rock cam Z. The rearward portion of cam Z being raised permits spring AO to rock shaft E and part AP, raising the arm of part AP to clear stud AN, thus permitting rotation of the printing control camshaft to the position selected by a control roll.

Adjustment

When non-tab key R is depressed, the arm of part AP should have a safe hold (1/32″ minimum, 3/64″ maximum) on stud AN.

To adjust, swing stud AB toward or away from cam Z by weaving arm G.

(Plate 6-1 Text Continued on Page 7B)
Printed in U. S. America 4-17-50

(Plate 6-1—Continued)

Installation (of repair part AA)

When installing repair part AA in the Field, the following outline may be used as a guide:

1. Break off the upper portion of bail C at the offset.

2. Index the Printing Control Mechanism (from a No. 1 control roll) locating bail C in a No. 4 hammerblock position.

3. Couple the forked portion of part AA with stud A, then locate stud AC on the forward vertical surface of bail C.

4. Release the Printing Control Mechanism, allowing bail C to restore to normal position.

5. Locate stud AD in the pocket of bail C, and assemble eccentric screw AE and nut AB on part AA.

6. Turn eccentric screw AE until part AA is held firmly on bail C, and tighten nut AB.

Note: Order repair part AA only as required.

Adjustment

1. With slide B and the machine in normal position, there should be slight play between the shoulder of screw O and the lower end of the slot in turnbuckle N.

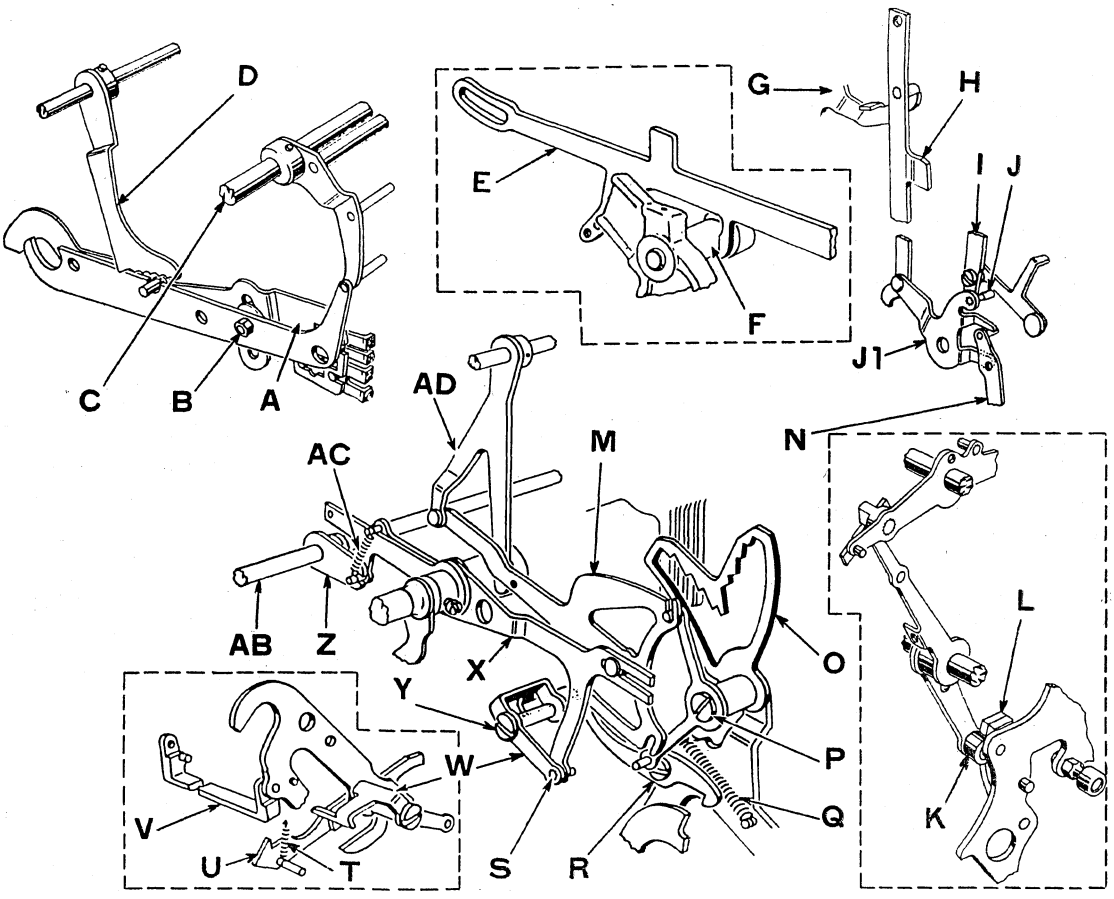
To adjust, turn turnbuckle N.

2. When the Printing Control Mechanism is indexed (regardless of the size of the actuating control roll), arm E should have a full hold on the selected step of bail C.

To adjust, raise or lower lever F, to affect the alignment of all steps; or tilt the control roll hanger, to affect alignment of an individual step.

SYMBOL INDEXING CONTROLS (Plate 8)

(Plate 7 in Printing Symbol Book only)



Symbol Indexing Controls—Character Symbols (Plate 8)

Class 1 machines automatically print symbols to identify non-add, sub-total and total;

Class 2 prints the additional symbols of transfer total, lower counter items and lower counter totals.

Class 6 does not have transfer total symbol, but has a minus symbol in place of the Class 2 lower counter symbol.

The earlier style Class 1 symbols are indexed from index arm D, which is given a differential movement in one direction by total and non-add keys.

Classes 2 and 6 symbols are indexed by index arm O, which has a series of forward and rearward steps; index arm O is given a differential movement in forward position to index upper counter symbols in Class 2 and to index add position symbols in Class 6, Index arm O is also given a differential movement in rearward position to index lower counter and transfer total symbols in Class 2 and to index subtract symbols in Class 6.

Classes 11 thru 16 and 20 thru 30 machines have four additional symbols, i. e., register totals, add and subtract. For that reason index arm O has two additional steps forward and two additional steps rearward. The forward and rearward steps of index arm O are brought into position by the upper forks of part M engaging the upper stud in the upper arm of index arm O. When the shift lever is moved, the forward or rearward steps of index arm O are selected by the movement of the shift lever rocking shaft assembly AB; the forked arm Z of the latter rocks assembly X which swings part M downward in subtract position, meshing its lower fork with the stud in lower arm of index arm O. When the shift lever is moved to add position, part M is swung upward, its upper fork meshing with the stud in the upper arm of index arm O.

The differential movement of index arm O is imparted by total, sub-total and other keys.

Tests and Adjustments (Plate 8)

The basic limit for total, sub-total and transfer total Class 2, and total and sub-total Class 6, is the prong on link E against shaft F, all Classes.

Total keys normal and handle started, roller K must clear cam L and not bind. The correct adjustment is secured by earlier or later limit of the total key against the lower keyboard plate.

With total or sub-total or transfer total keys depressed Class 2, or total or sub-total keys depressed Class 6, and handle forward there should be no play between roller K and cam L and no excessive bind.

Adjustment made by bending prong on link E to advance or retard contact on shaft F.

Class 2 Machines: Total key depressed, there should be 1/64″ to 1/32″ clearance between stud J and part I; a binding condition at this point will cause interference with restoring of the total keys. Too much clearance will permit lower counter to be drawn into mesh. With transfer total key depressed, machine on forward stroke, there should be non-binding contact of stud J and I; play at this point may result in printing sub-total symbol. To adjust: Part of J1 where stud J is located is operated on. The location of O for transfer total symbol is secured by locating G for earlier or later contact with the stud in transfer total stem H.

This adjustment will affect the sub-total symbol and it will be necessary to again apply the sub-total test. With the shift lever in upper position, depress the sub-total and bring operating handle to second stop; in this position the stud in symbol sector B (Plate 50) must have full hold on the third step of O. When the sub-total symbol has been disturbed by adjusting the transfer total symbol, the sub-total symbol is adjusted by bending the ear of G upward or downward, causing earlier or later contact with sub-total key. Index arm O must clear the sector comb, and also clear screw P.

The movement of index arm O must be the same in both directions. When the shift lever is oscillated, the forks of M must engage the studs in the upper and lower arms of O immediately before the operation of the machine takes place, this depends on the limit of bell-crank AD on the hub of A, Plate 50. To equalize the movement of O its arms are adjusted.

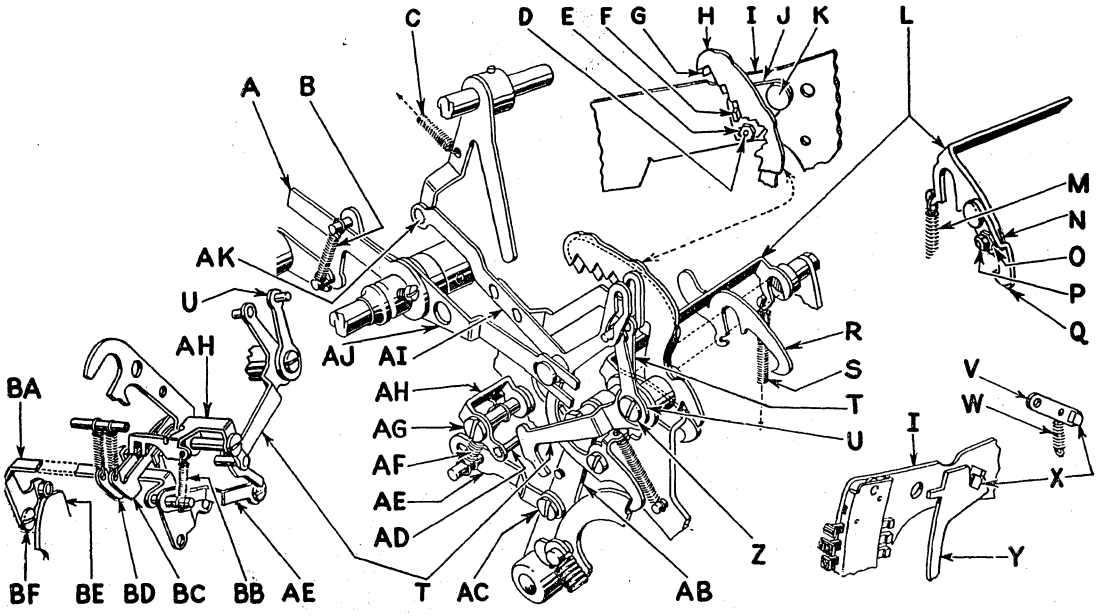
Caution: This is a Factory adjustment and rarely requires adjustment.

With no keys depressed, machine normal the symbol type should align in height with the figure type. The offset of the arm of A, Plate 50 is adjusted.

To adjust the total symbol to index correctly, the rear arm of G is bent.

To adjust the non-add symbol to index correctly, the contact point of the non-add keystem with arm G is adjusted rearward.

SYMBOLS PRINT ONLY WITH AMOUNTS IN CONJUNCTION WITH CLOSED ACCOUNT FEATURE (Classes 20 thru 30) (Plate 8-1)



Symbols Print Only With Amounts in Conjunction With Closed Account Feature (Classes 20 thru 30) (Plate 8-1)

Purpose

The fourfold purpose of this mechanism is as follows:

1. To prevent the printing of symbols during a subtract, non-add or add operation, in which no keys are indexed on the keyboard.

2. To prevent the printing of total symbols (CF or Register) during a total or sub-total operation of a clear machine.

3. To control the indexing of the debit and credit symbols.

4. To print a clear signal of two ciphers in the first and second columns, during a total or sub-total operation (CF or Register) of a clear machine.

Operation

During a subtract or non-add operation in which no keys are indexed on the keyboard, or during a total or sub-total operation of a clear machine, the regular type sectors I remain in their normal position, causing the forward extensions of pawls R to be cammed downward as the pawls are carried forward (in the usual manner). As the forward extensions of pawls R move downward, springs S and M are permitted to rock bail L, raising pawl Q to clear over its associated driver latch to prevent the printing of a symbol.

During a subtract, non-add, total or sub-total operation, in which an amount is printed, the raised type sectors permit the forward extensions of their associated pawls R to remain raised. These pawls R, by preventing the rocking of bail L, retain pawl Q in its active position to release the driver and to print an indexed symbol.

IN AN ADD operation, the symbol sector is not raised, and the printing of a symbol is prevented by stud X (in the symbol sector) through the hook of hammer Y.

During a machine operation in which a symbol is indexed, the symbol sector is raised and stud X clears the hook of hammer Y to permit the firing of the hammer when its driver is released.

DEBIT AND CREDIT symbols are controlled through the counter control lever. Indexing arm G is active when the counter control lever is in add position. When the counter lever is moved to subtract position and the machine is operated, arm A—through arms AJ and AI, the enclosed cam of arm AI, and arm U—rocks indexing arm G rearward, permitting arm H to become active.

(Plate 8-1—Continued)

DURING A TOTAL operation (CF or Register), the forward arm of bell-crank T is raised to permit spring BB to rock bail AH. The fingers of bail AH, in moving downward, lower the steps of arms BC and BD into the path of bail BA. As the machine operates, the forward motion of arms AB, through link AE and bail BA, carries arms BC and BD forward to release the respective drivers and to print ciphers in the first and second columns.

Adjustment

1. Pawl Q should have approximately 1/32" clearance over its driver latch during a total operation of a clear machine, and during a listing operation in which no keys are indexed on the keyboard; and should have full hold on its driver latch during a listing or totaling operation in which an amount is printed.

To adjust, turn eccentric bushing O as required.

2. With the counter control lever in subtract position, and the machine operated, the steps of arm H, when indexed, should have full hold on stud F; and during an add operation, the vertical surfaces of the steps on indexing arm G should align with the vertical surfaces of the steps on indexing arm H.

To adjust, bend arm U and the upper arm of bell-crank T.

3. When positioned for printing, the symbol type should be aligned with the regular type.

To adjust, loosen nut E, and turn eccentric screw D.

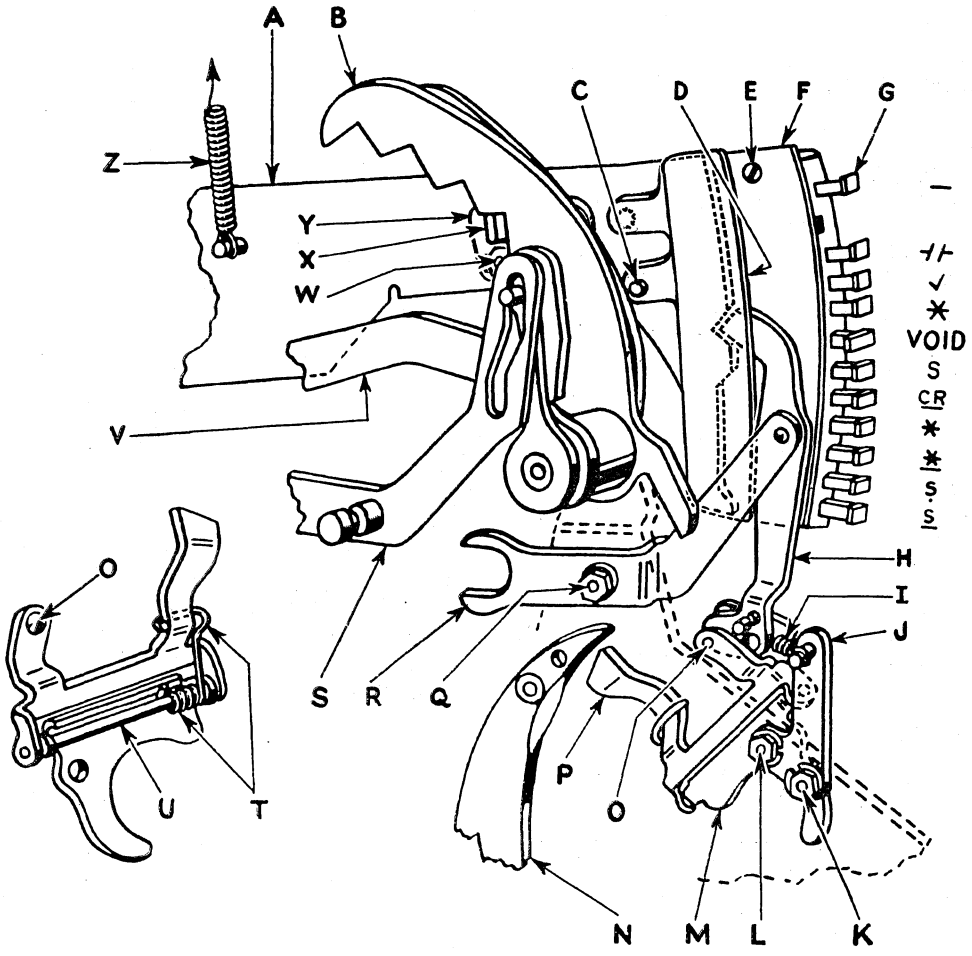
4. The printing of the clear signal (two ciphers) should occur at the same time during a machine operation as the regular printing.

To adjust, lengthen or shorten link AE by bending at its offset.

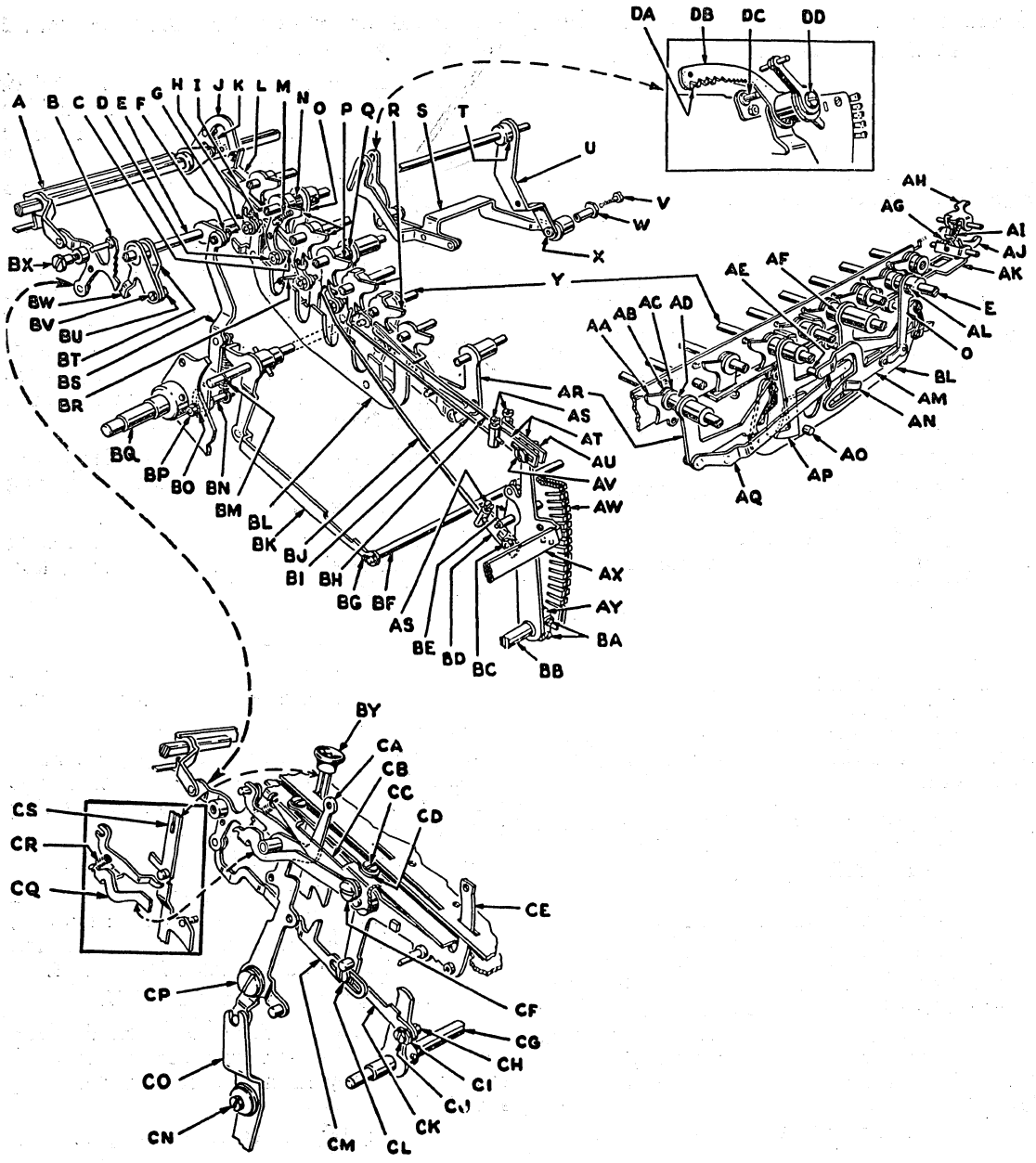
5. Stud AD should remain on the higher surface of the forward arm of bell-crank T when the arm is raised by the indexing of a non-add symbol, and should rest on the lower surface when the other symbols are indexed;

To adjust, bend the forward arm of bell-crank T upward or downward.

PRINTING CONTROL FOR SYMBOL TYPE (Later) (Plate 8-2)



SYMBOL INDEXING CONTROLS—FOR BANK POSTING MACHINE (IMPROVED) (Plate 8-3)*



(OVER)

*(Plate 8-2 text contained on page 9D)

Symbol Indexing Controls—For Bank Posting Machine (Improved) (Plate 8-3)

Purpose

To print the characters in column 14 to the right of the indexed amounts.

Operation

Depression of a key (4 thru 9—in column 14) rocks its corresponding bellcrank P or R, aligning the stud C with a step of sensing bar BL. Lock strip L, being moved rearward when the key is depressed, rocks lever J and bail A, thereby swinging the lower projection of limit B to clear sensing arm BW.

During a machine operation in which a key (4 thru 0—column 14) is depressed, shaft assembly BQ is rocked to rotate shaft E through link BS. Shaft E, through arm O, pulls slotted link AM rearward, which, through stud AN, rocks bellcrank AF raising sensing bar BL which limits on the pre-positioned stud C, thus halting the rotation of shaft E. The latter, through link S, positions segment DA or DB to print the character indexed from the key. Any further rotation of shaft assembly BQ causes spring BM to expand.

The purpose of link AQ is to maintain proper operating relationship between bellcranks AF and AR, and to serve as a normal limit for sensing bar BL through bellcrank AR contacting the stud in link AQ.

Sensing bar BL is disabled during the total and sub-total operations. When the total or the sub-total key is depressed, the sector bar lock becomes active and, through shaft Y, swings arm AP rearward. The latter, through stud AE, raises slotted link AM to align its horizontal slot with stud AN, thus permitting rotation of shaft E; and the foot of arm AP is positioned over stud AO to block the upward motion of sensing bar BL.

During a total, sub-total, register total or register sub-total operation, or a machine operation in which key 3-14 or the register non-add key is depressed, segment DA or DB is positioned by means of limit B and sensing arm BW.

The total or the sub-total key, when depressed, rocks limit B, through link CM, to select the No. 1 step (from the total key) and the No. 2 step (from the sub-total key).

Register indexing lever CA, when shifted, rocks indexing limit B, through link CQ, to select the No. 4 step for register total and the No. 3 step for register sub-total.

Register non-add key BY, when depressed, lowers link CQ which positions the indexing limit B to select the No. 3 step.

Key 3-14, when depressed, rocks indexing limit B, through lock strip L, lever J, and bail A, to select the No. 3 step.

Adjustment

Note: Before making the following adjustments, turn the high point of eccentric bushing F downward to avoid false limits.

1. When a character is indexed in column 14 and the machine is operated, stud DC should have a full hold on the corresponding step of the segment DA or DB.

To adjust, turn eccentric bushing W.

2. When sensing arm BW locates on a step of indexing limit B to index a symbol, stud DC should have a full hold on the corresponding step of segment DA or DB.

To adjust, turn eccentric nut BU.

3. When the machine is normal there should be a minimum of clearance between the forward projection on limit B and sensing arm BW.

To adjust, turn eccentric bushing F.

Printing Control for Symbol Type (Later) (Plate 8-2)

Purpose

This mechanism provides a means for controlling the printing and non-printing of the symbol characters.

Operation

The recesses and dwells of plate D (on symbol sector F), which are arranged according to the individual printing requirements of the machine, determine which symbol characters are permitted to print.

When a dwell of plate D holds the upper portion of arm H rearward, the hole in the lower portion of arm H is aligned with stud O, allowing spring T to move detent P into the path of driver N to prevent the printing of the indexed symbol character.

When a recess of plate D permits the upper portion of arm H to move forward through spring tension, the hole in the arm's lower portion moves out of engagement with stud O, camming detent P out of the path of driver N to allow the printing of the symbol character.

Adjustment

1. Plate D should be straight and should lie snugly against symbol sector F.

To adjust, bend plate D.

2. The upper portion of arm H should be aligned with plate D.

To adjust, bend the upper portion of arm H.

3. The forward projection of arm J should contact (but not bind) the lower portion of arm H.

To adjust, bend the forward projection of arm J.

4. With the upper portion of arm H located on a dwell of plate D, stud O should align centrally with the hole in the lower portion of arm H.

To adjust, bend the rear extension of arm R.

5. With stud O situated in the hole of arm H, detent P should be aligned with driver N; and, with stud O on the flat of arm H, detent P should clear driver N.

To adjust, weave detent P.

PRINTING CONTROL FOR S&N, CLOSED ACCOUNT, SYMBOL AND CALENDAR FEATURE (Plate 9)

Closed Account Symbol Printing (Plate 9)

The purpose of the closed account symbol mechanism is to print two ciphers in addition to the regular total symbol.

Pawls H and I are permanently coupled. Pawl M in the symbol column has a curved arm which contacts on the coupled pawls to release hammers in units and tens column.

Carriage Controlled Closed Account Symbol (Plate 9)

Pawl G in the symbol column has no arm contacting on the coupled pawls, but instead has square stud K on coupler L which contacts on and pulls link J to release the drivers and hammers in the units and cents column. To non-print the symbols and ciphers, the carriage position locates the camshaft to lower the square stud in coupler L below link J.

Symbol Printing Couplers (Plate 9)

In order to print minus symbols, couplers are used which work in connection with upper bail P. Link Q is curved upward in line with bail P. Coupler O controls the unit column so that when printing takes place, bail P is moved forward by link Q. Hook of coupler O is curved upward in the path of upper bail P, the latter moves link T to raise pawl M which releases driver and hammer.

Calendar Feature Printing Control (Plate 9)

Pawl V overlaps pawl U for printing dates. Pawl U is also used in the month column.

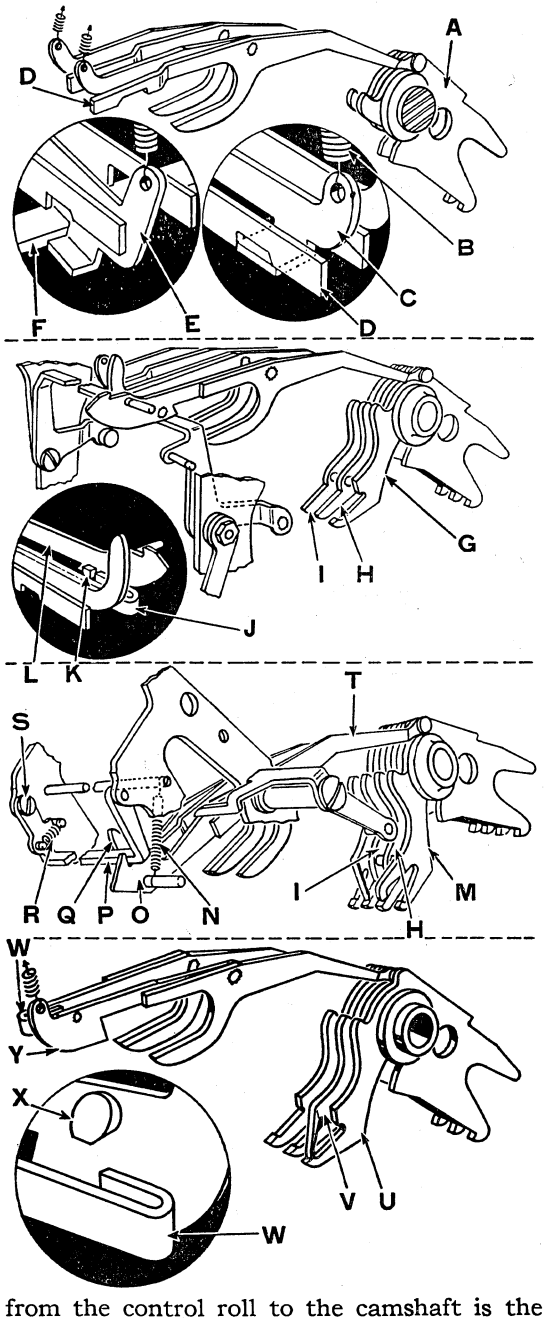
Non-printing of Calendar Feature: The camshaft lowers coupler Y, stud X locating in line with link W. The step of coupler Y also aligns with the lower bail. During the machine operation, the lower bail pulls coupler Y to tilt pawls U and V to allow the drivers to idle out. Stud X contacting on link W tilts pawl U in the month column to allow its driver to idle out. Stud X is angled to allow shifting the camshaft in 8 point hammerblock mechanisms.

Split and Normal Printing Control (Plate 9)

One or more splits which can be indexed by carriage, keyboard, motor bar and result keys, are secured by pawls A having links D and couplers C. The couplers serve the same purpose as the overlapping arms on pawls. Couplers C which pivot on links D are engaged by steps on the next link to the left.

To split or prevent cipher printing projections on the camshaft, hold coupler C below the step on link D. The camshaft is indexed from the carriage through control rolls.

When carriage controlled, the mechanism

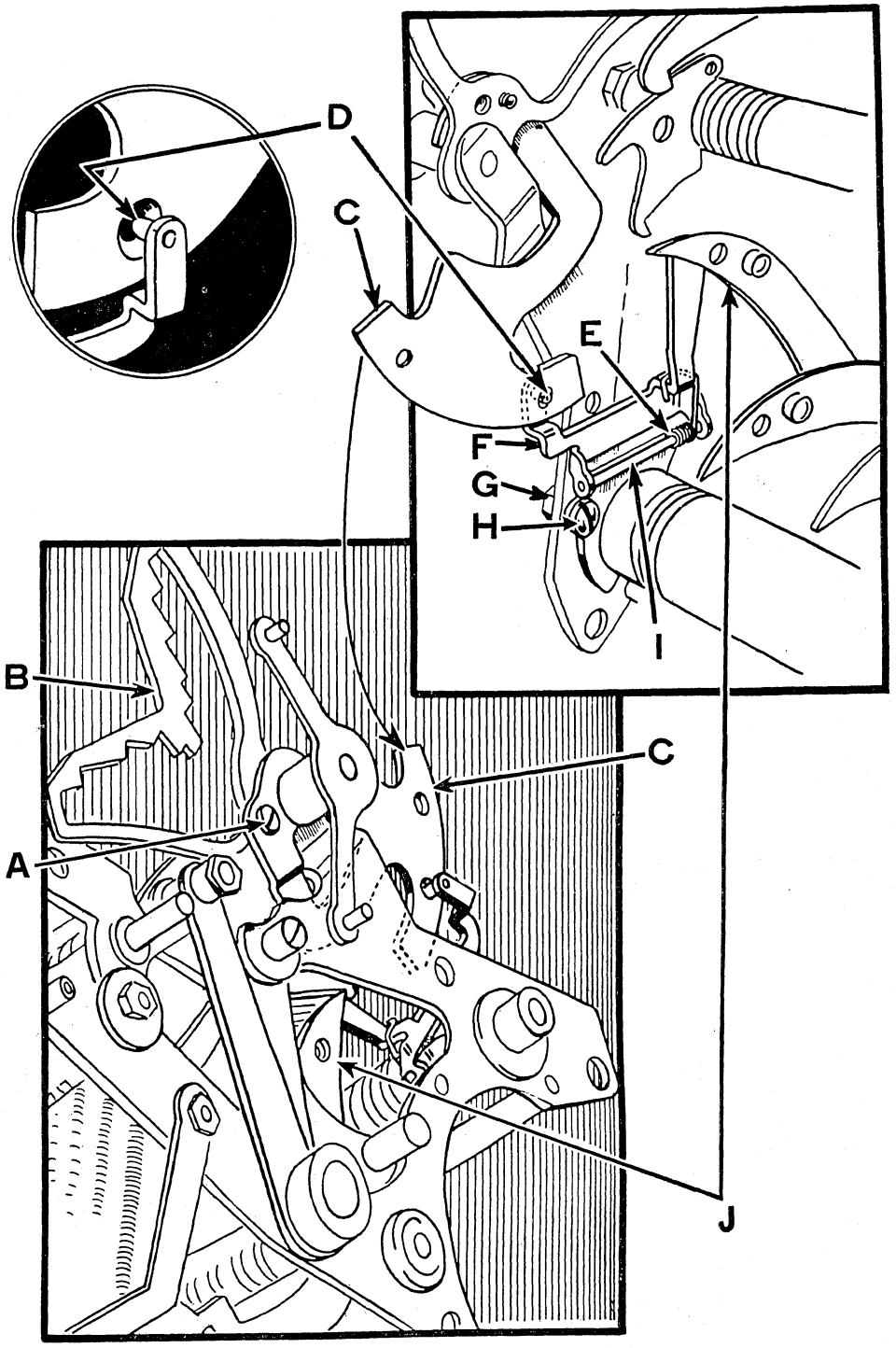


from the control roll to the camshaft is the same as that mechanism shown under the subject "Non-printing Control."

Combination couplers to cipher split or block; the projection on coupler E is deeper to permit engaging blocking bail F when fully depressed. When coupler E is partially depressed, a cipher split is secured.

Non-splitting couplers to prevent splitting when the camshaft is shifted and no split desired in the shifted position; coupler C has stock removed where the camshaft contacts.

SYMBOL TYPE PRINTING CONTROL (Plate 10)



Symbol Type Printing Control (Plate 10)

The purpose of this mechanism is to prevent the printing of one or more symbols.

Sequence and Construction

Control cam C is fastened to index arm B. Part F which blocks driver J, pivots on shaft I. When index arm B locates symbol type which is not to be printed, stud D seats in a taper hole of control cam C which allows spring E to move part F into the path of driver J. When index arm B locates a symbol which is to be printed, stud D contacts on the flat surface of control cam C which holds part F out of the path of driver J.

Installing Symbol Type Printing Control Mechanism

The former index arm is replaced with index arm B, control cam C is placed and fastened to index arm B as illustrated. Blocking arm F is placed as shown and fastened with screw H and nut G.

Adjustments

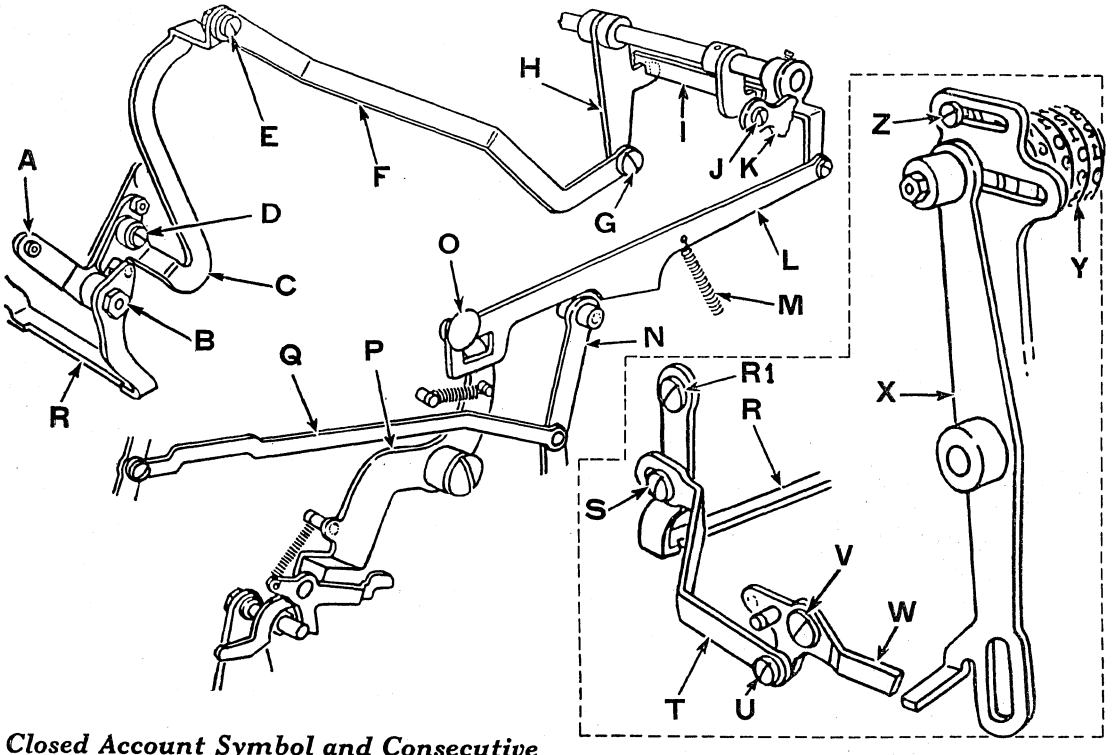
Part F should align with driver J when stud D is seated in the holes of cam C. Also part F should clear driver J when stud D is contacting on the flat surface of cam C.

Arm of part F is bent to obtain this adjustment.

Caution: Hold part F to side plate while bending.

The symbol sector should be examined for clearing cam C; if it does not clear, bend the sector toward the center of the machine.

CLOSED ACCOUNT SYMBOL AND CONSECUTIVE NUMBER NOT TO PRINT DURING SPACING STROKE (H903 Machines) (Plate 11)



Closed Account Symbol and Consecutive Number Not to Print During Spacing Stroke (H903 Machines) (Plate 11)

During total operations, assembly P swings printing control bail R to clear the hammer driver (not shown) through L, I, H, F and C.

When an O.D. occurs, part N raises link L to locate stud O in the horizontal slot of L. When the spacing stroke is made to mesh the lower wheels, assembly P idles in slot of L causing bail R to block drivers in order not to print symbol.

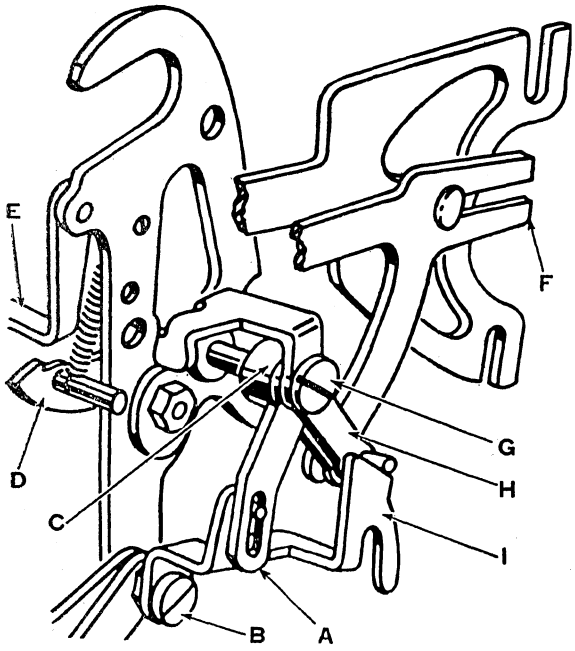
Machines having consecutive count mechanism have the latter disabled by bail R swinging part W to block part X through link T.

Tests and Adjustments

Bail R should clear the drivers during totaling and block the drivers during spacing stroke.

Adjustment: The offsets in link F are increased or decreased as required.

MECHANISM TO PREVENT MINUS SYMBOL PRINTING WITH ADDED AMOUNTS AND INSURE PRINTING WITH SUBTRACTED AMOUNTS (Bank Posting Machines) (Plate 12)



Mechanism to Prevent Minus Symbol Printing With Added Amounts and Insure Printing With Subtracted Amounts

(*Bank Posting Machines*) (*Plate 12*)

The purpose of this mechanism is to prevent motor bar depression when the subtract lever is partially moved from add position. This mechanism delays the movement of hook arm D to engage bail E until interlock 1-323 (not shown) blocks the motor bar.

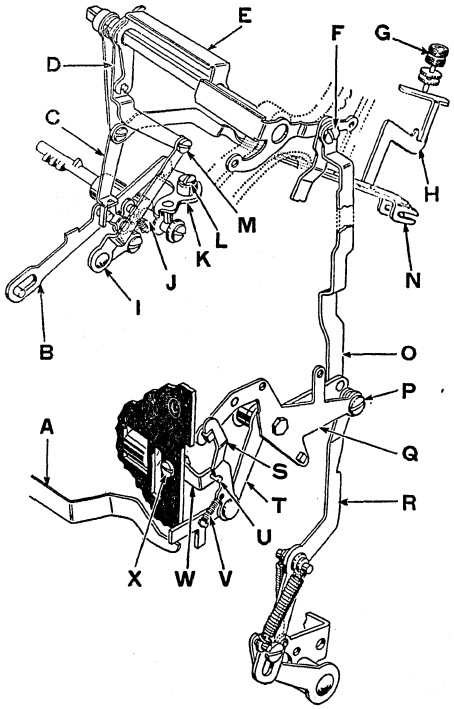
When the subtract lever is pulled toward subtract position, part F rocks bell-crank A to lower arm I, which by compelling a slow follow up of part H, delays the movement of hook arm D.

Tests and Adjustments

Part H should have slight play when the machine is in add position. The amount of play at this point is limited to retaining sufficient clearance between D and E.

If necessary to install on earlier Bank Posting Machines, parts A, B, C, G, H and I are required.

EIGHT POINT PRINTING CONTROL, INDEXED FROM ALL SOURCES, ACTUATED BY MACHINE OPERATION (Plate 13)



Eight Point Printing Control, Indexed From All Sources—Actuated by Machine Operation (*Plate 13*)

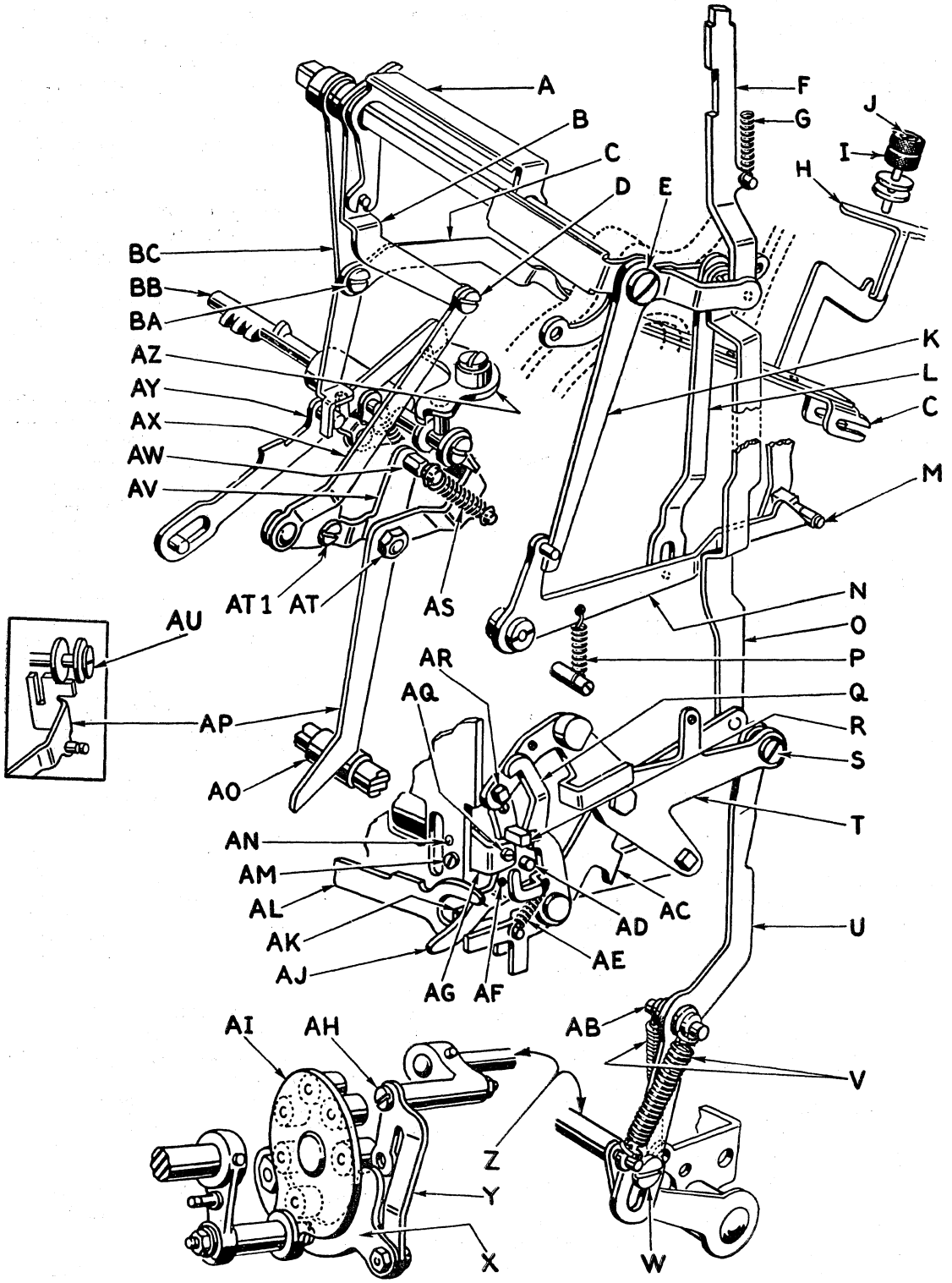
The purpose of this mechanism is to secure light bar depression and light carriage indexing.

When a control roll or skid moves on lever A, lever T is rocked raising pawl S which is cammed over the square stud in part Q by the pocket in pawl S riding over stud U. During the machine operation, assembly R rocking part Q which through link O, bail E and arm D, swings camshaft shift assembly I, the latter pulls link B downward to swing bell-crank K and shift camshaft J.

When auxiliary bars are used to index the eight point printing control, a partial depression of the bar rocks lever T sufficiently to swing pawl S over the square stud in lever Q, the machine operation completing its depression.

Assembly R which actuates this mechanism is covered in the instructions on Env. H1429 mechanism.

EIGHT POINT PRINTING CONTROL—INDEXED AND DISABLED FROM VARIOUS SOURCES AND SHIFTED THRU MACHINE OPERATION—IN CONJUNCTION WITH THE COUNT MECHANISM (Class 20 Bank Machines) (Plate 13-1)



(Plate 13-1—Continued)

Eight Point Printing Control—Indexed and Disabled From Various Sources and Shifted Thru Machine Operation—In Conjunction With the Count Mechanism

(Class 20 Bank Machines) (Plate 13-1)

Purpose

This mechanism affords a flexible means for indexing and disabling the Eight Point Printing Control Mechanism, and permits easier carriage tabulation, since the power to shift the printing control camshaft is now supplied by the Drive Assembly.

Operation

INDEXING of the Eight Point Printing Control Mechanism is effected through the depression of the total or sub-total key, the shifting of the register total indexing lever, or by carriage control roll.

The Printing Control Mechanism and the Automatic Count Mechanism (Plate 69, Accumulator Instruction Book) are both indexed through control lever AL (when carriage controlled) and may be indexed simultaneously or independently, depending upon the size of the actuating control roll or upon the construction of arm AJ.

WHEN ARM AJ contains stud AD and square stud R, the indexing of the Eight Point Printing Control Mechanism is affected by the various carriage control rolls as described in the following:

With no control roll located on control lever AL, arm AJ remains in its normal position and stud AD holds hook Q forward out of the path of square stud AR, thus preventing the indexing of the Printing Control Mechanism. Since arm AK also remains in its normal position, the Automatic Count is not indexed.

With a No. 13 roll located on control lever AL (roll No. 6A used with thin cams), the rear extension of arm AJ is raised to rock stud AD away from hook Q, allowing spring AE to position hook Q rearward into the path of stud AR to index the Printing Control Mechanism. The upward movement of arm AK (from the No. 13 roll) is not sufficient to index the Automatic Count Mechanism.

With a No. 3 roll (roll No. 3A used with thin cams) located on control lever AL, stud R is moved into contact with hook Q and moves the hook out of the path of stud AR, thus preventing the indexing of the Printing Control Mechanism. Since a No. 3 roll raises arm AK, the Automatic Count Mechanism is indexed. (The accompanying illustration shows the location of the various parts as positioned by a No. 3 roll.)

IF ARM AJ contains stud AD, and an eccentric stud 103609 (installed in the uppermost hole of arm AJ, with stud R omitted), the indexing of the Eight Point Printing Control Mechanism is affected by the various carriage control rolls as outlined in the following—providing, in addition to previously described arrangements, the simultaneous indexing of the Printing Control Mechanism and the Automatic Count Mechanism.

With no control roll located on control lever AL, neither the Printing Control Mechanism nor the Automatic Count Mechanism is indexed.

With a No. 13 roll located on control lever AL, the Printing Control Mechanism alone is indexed—by stud AD moving away from hook Q.

With a No. 3 roll located on control lever AL, arm AJ is rocked to index the Printing Control Mechanism, and arm AK is raised to index the Automatic Count Mechanism. (Eccentric stud 103609 is not positioned forward sufficiently to contact and disable hook Q.)

With a No. 1 roll (roll No. 3C used with thin cams) located on control lever AL, the Printing Control Mechanism is disabled by the eccentric stud 103609, and the Automatic Count Mechanism is indexed by the raising of arm AK.

THE EIGHT POINT Printing Control Mechanism may be indexed from the shifting of the register total indexing lever, or from the depression of the total or sub-total key, when stud AF is omitted or when the rear projection of hook Q is adjusted to clear stud AF.

Depression of the total or sub-total key—through stud M, lever N, and link L—lowers link O, rocks lever AC and raises hook Q. As hook Q moves upward, its lower step clears over stud AD, allowing spring AE to position hook Q rearward into the path of stud AR to index the mechanism.

The shifting of the register total lever, through its connecting linkage, also lowers link O and raises hook Q to index the Printing Control Mechanism.

ON MACHINES equipped with stud AF (where the stud is able to contact the projection of hook Q), the Eight Point Printing Control Mechanism is indexed partially from the depression of the total keys or the shifting of the register total lever, and partially from the rocking of arm AJ by means of a No. 3 carriage control roll. Stud AF, by limiting

(Plate 13-1—Continued)

the rearward movement of hook Q when the latter is moved upward by the depression of the total keys or the shifting of the register total indexing lever, prevents the positioning of the hook over stud AR until a No. 3 roll is located on lever AL. When a No. 3 roll is so located, arm AJ is rocked and stud AF is moved rearward, allowing hook Q to engage stud AR to index the Printing Control Mechanism (stud R clearing the upper step of hook Q with the latter in its raised position).

SHIFTING OF the camshaft BB, during a machine operation in which the Eight Point Printing Control Mechanism is indexed (hook Q positioned in the path of stud AR), is accomplished by the turning of the rollers on drive plate AI and the actuation of cam X, link Y, shaft Z, link U, and lever T. As lever T rocks, stud AR engages hook Q and rocks lever AC, which through link O, bail A, arm B, assembly AX and link AY, swings bell-crank AZ to shift the camshaft to the left. (When free to restore, camshaft BB is positioned to the right by spring tension.)

TO LOCK CAMSHAFT BB in its normal or shifted position during a machine operation, shaft AO, when lowered on the forward stroke, permits spring AS to draw the projections on the upper portion of arm AP into the path of the flanges on camshaft BB, thus preventing its shifting to either side. During the return stroke, shaft AO, by contacting the lower portion of arm AP in its rearward travel, lowers the upper portion of the latter to permit the shifting of camshaft BB.

DISABLING of the Printing Control Mechanism may be accomplished from the depression of key F, or from the shifting of keyboard button I.

Key F, when depressed, raises the forward extension of lever N above stud M, to prevent the indexing of the Printing Control Mechanism from the depression of the total or sub-total keys.

Keyboard button I, when shifted forward, moves link C and arm BC forward to limit the rearward travel of link AY, compelling the broken joint in assembly AX to yield during a machine operation in which the Printing Control Mechanism is indexed. The shifting of camshaft BB (when indexed from any source) is thus prevented.

Adjustment

1. Stud AD should hold hook Q forward to prevent its engagement with stud AR, during a machine operation in which control lever AL is located in normal position (no roll).

To adjust, bend bracket AG.

2. Stud R should hold hook Q forward to prevent its engagement with stud AR, during a machine operation in which a No. 3 control roll is located on control lever AL.

To adjust, weave control lever AL.

3. On machines equipped with eccentric stud 103609 (in place of stud R), the eccentric stud should hold hook Q forward to prevent its engagement with stud AR, during a machine operation in which a No. 1 roll is located on control lever AL.

To adjust, turn eccentric stud 103609.

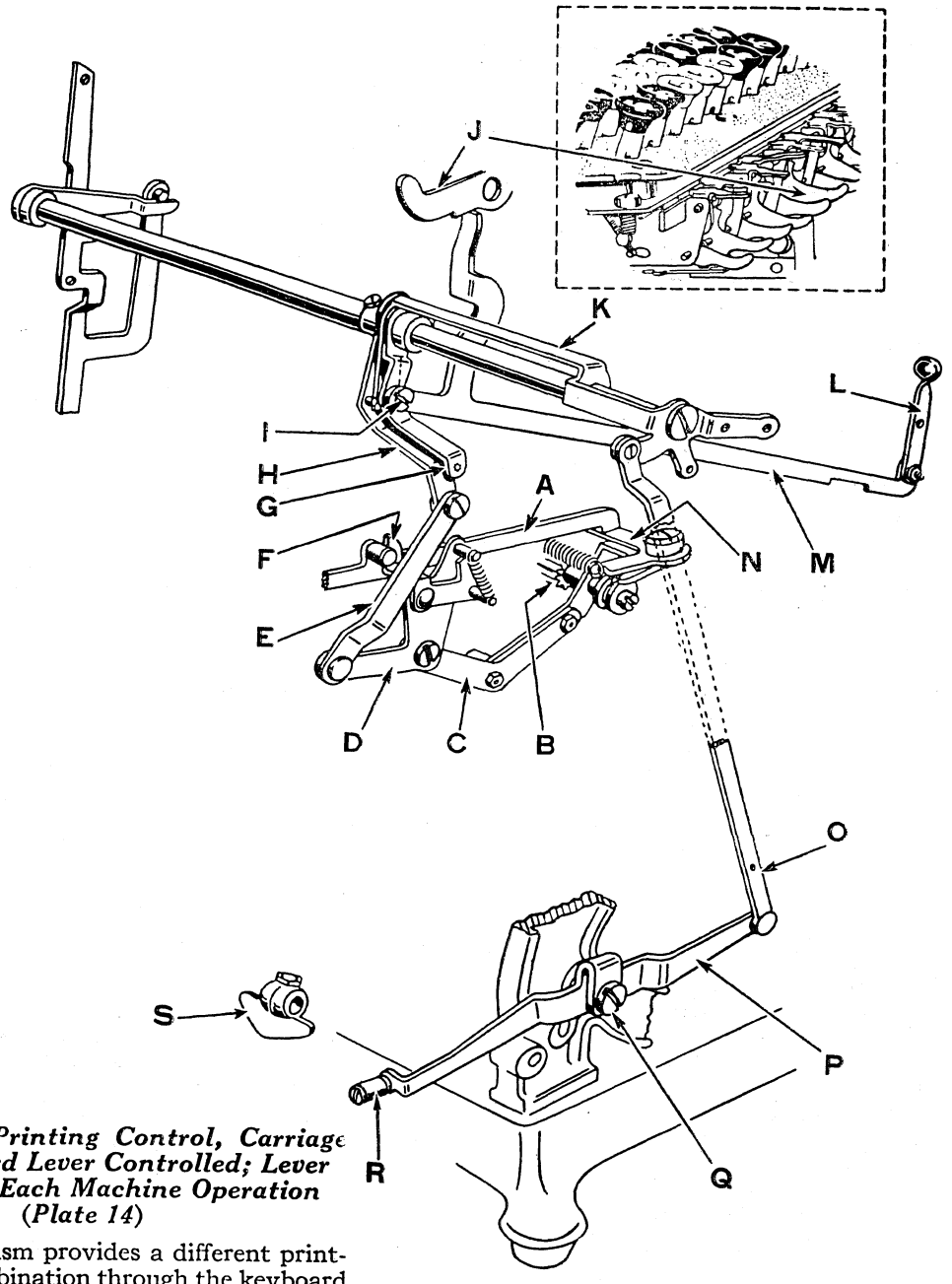
4. During a machine operation in which the Eight Point Printing Control Mechanism is indexed from the depression of a total key, hook Q should be positioned into the path of stud AR.

To adjust, lengthen or shorten link O by bending at its offset.

5. On machines in which the Eight Point Printing Control Mechanism is indexed partially through carriage control and partially through the depression of the total keys or the shifting of the register total lever, stud AF should hold hook Q forward to prevent its engagement with stud AR during a machine operation in which a total key is depressed (or the register total lever is shifted), but during which control lever AL remains in its normal position (no roll).

To adjust, bend the rear projection of hook Q.

EIGHT POINT PRINTING CONTROL, CARRIAGE AND KEYBOARD LEVER CONTROLLED; LEVER RESTORES AT EACH MACHINE OPERATION (Plate 14)



Eight Point Printing Control, Carriage and Keyboard Lever Controlled; Lever Restores at Each Machine Operation (Plate 14)

This mechanism provides a different printing control combination through the keyboard lever or the carriage position.

Sequence and Construction

When lever L is moved forward, link M swings arm G which swings arm H, link E and part D. Bell-crank F (of assembly D) contacting on roller of link A swings bell-crank N to shift camshaft B to a different position.

Lever L is latched in forward position by latch J, which, when restored at the end of the return stroke, allows the mechanism to restore to normal.

When the carriage moves skid S on roller R, lever P through link O rocks the foot of bail K which by contacting on stud in arm H shifts camshaft B as described under above heading.

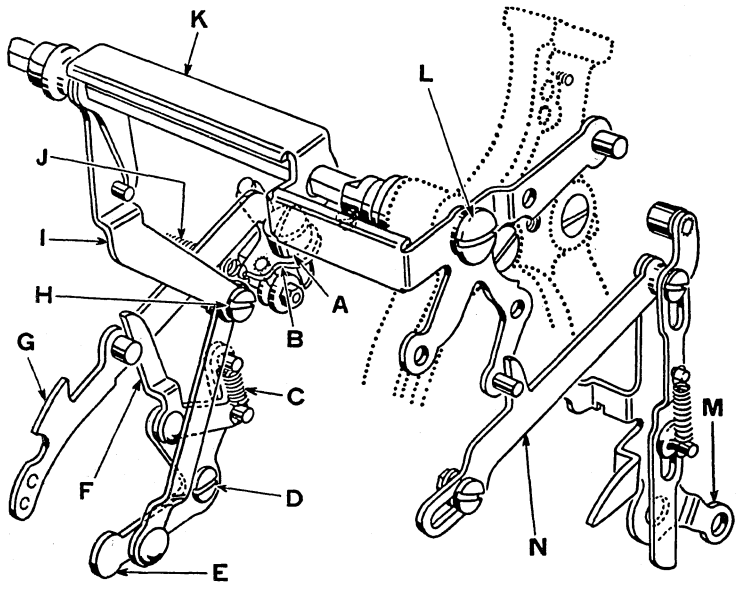
8 POINT PRINTING CONTROL FROM CARRIAGE CONTROLLED, TOTAL AND SUB-TOTAL MECHANISM (H903 Machines) (Plate 15)

8 Point Printing Control From Carriage Controlled, Total and Sub-total Mechanism (H903 Machines) (Plate 15)

The purpose of this mechanism is to provide a different printing control when the carriage controlled total and sub-total mechanism is indexed.

Sequence

When the carriage controlled total mechanism is being indexed, arm M moves link N rearward, the latter rocking bail K, which through lever I, flexible assembly E, link G and bell-crank B, slides the camshaft to index the selected cam points.



EIGHT POINT PRINTING CONTROL FROM TOTAL AND SUB-TOTAL KEYS, CARRIAGE CONTROLLED (Plate 16)

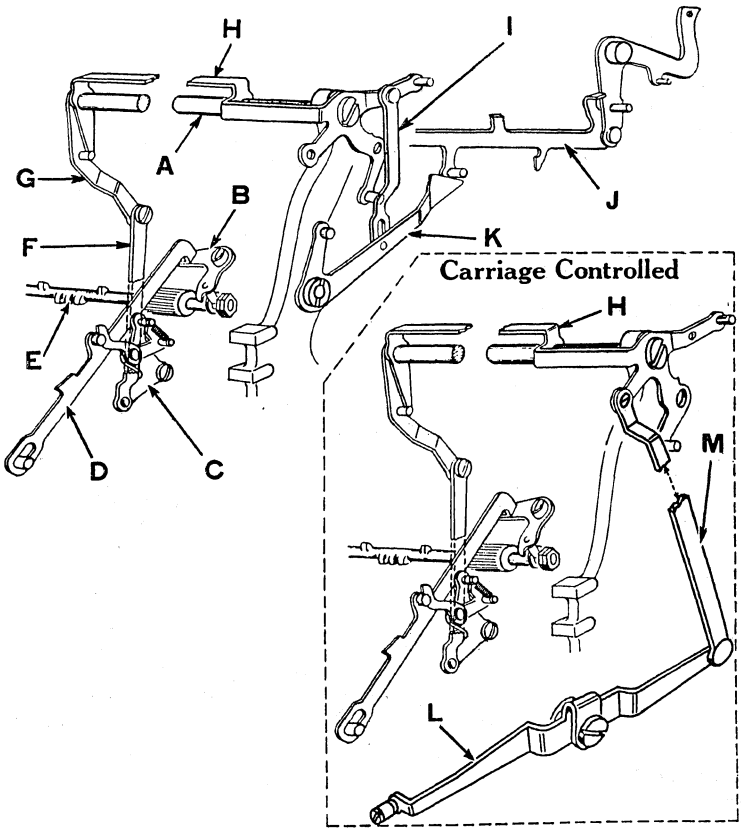
8 Point Printing Control From Sub-total and Total Key (Plate 16)

When the total key is depressed, the lower projection on link J contacts on and rocks arm K which rocks bail H through link I. The arm of bail H swings arm G (on shaft A) which raises link F to rock spring joint assembly C. The upper member of C pulls downward part D which swings bell-crank B to shift camshaft E.

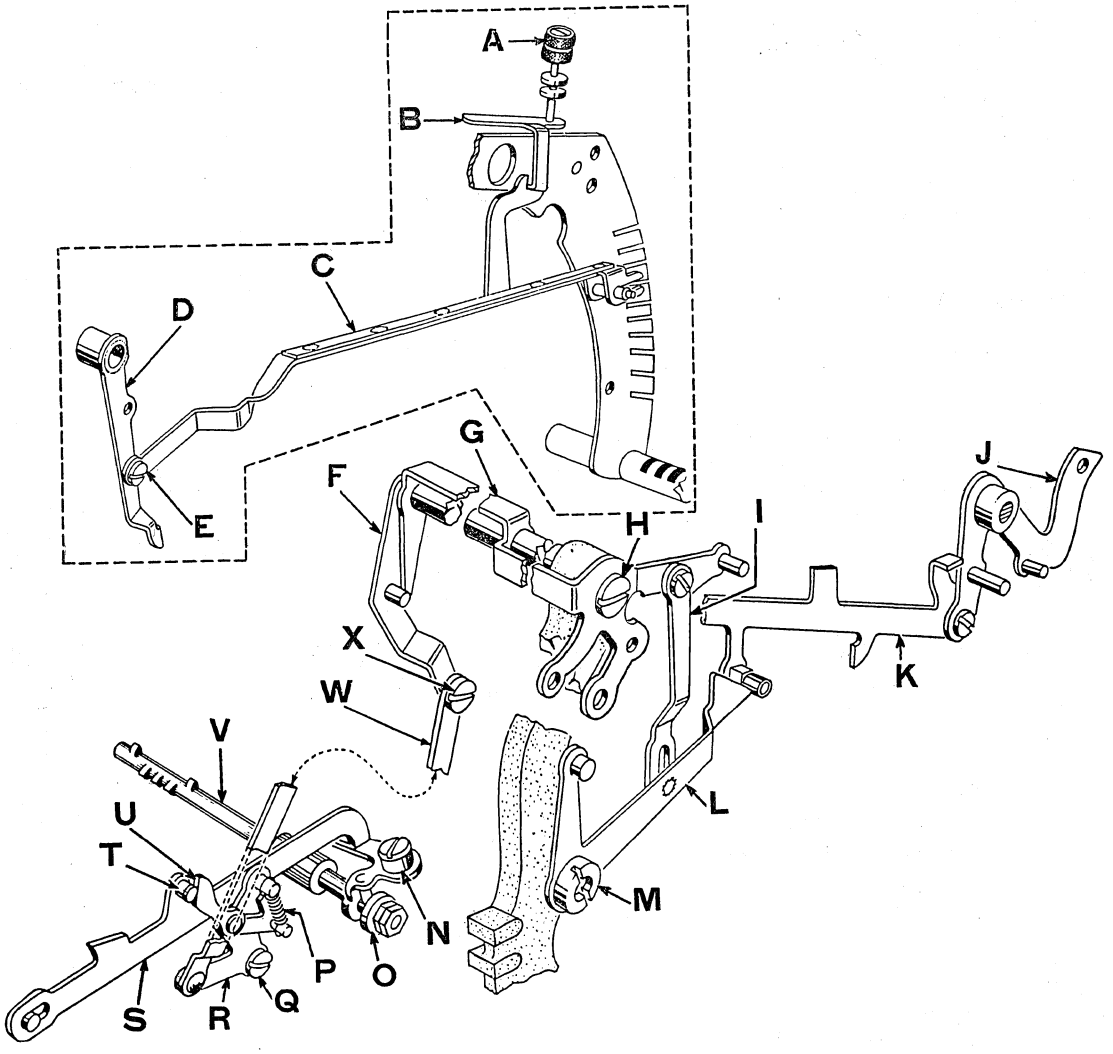
Tests and Adjustments

When the total or the sub-total key is depressed, camshaft E should shift completely.

Adjustment: Weave the arms of bail H.



EIGHT POINT PRINTING CONTROL FROM TOTAL KEY, DISABLED BY KEYBOARD BUTTON (Plate 17)

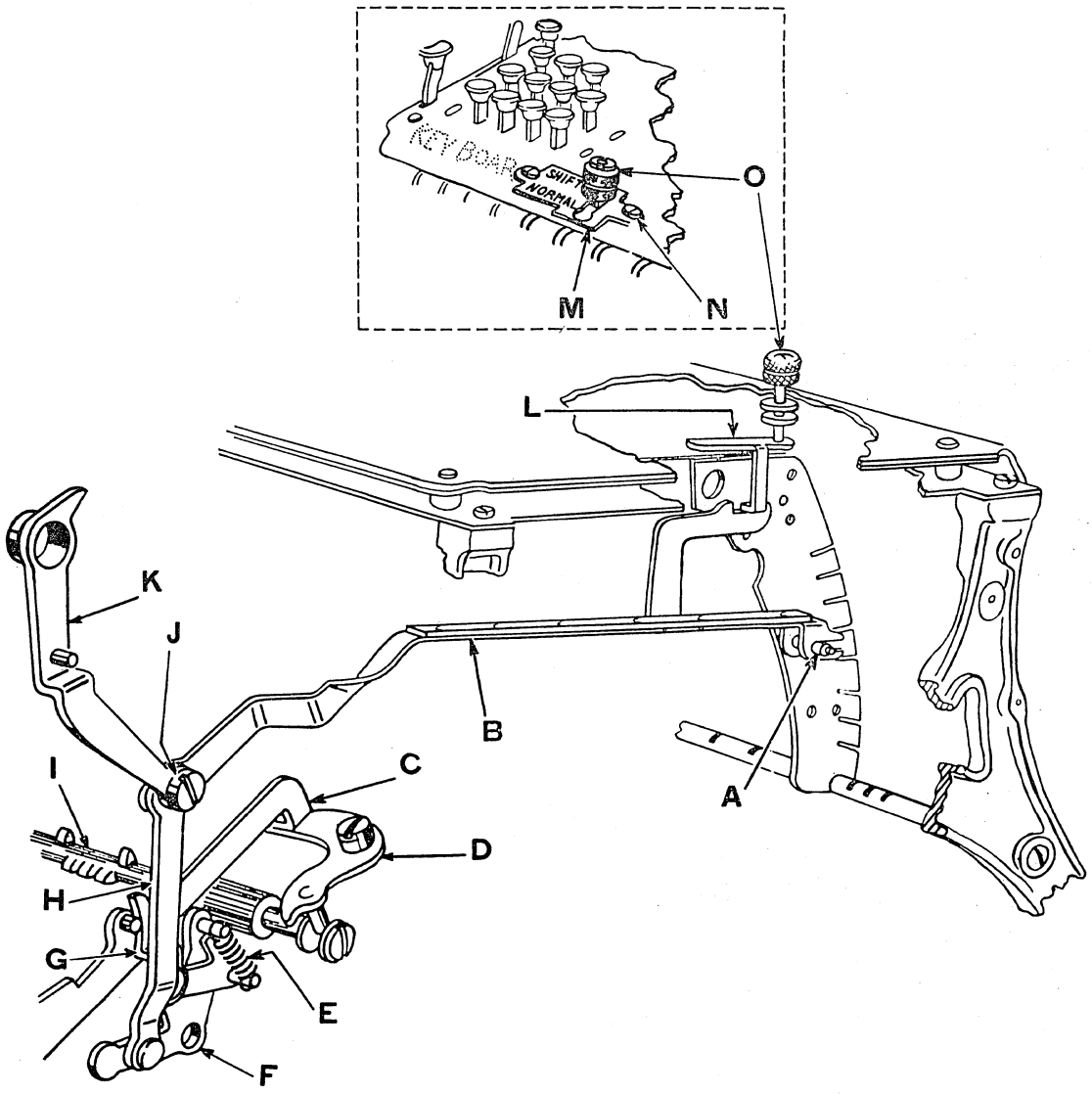


Eight Point Printing Control From Total Key, Disabled by Keyboard Button (Plate 17)

When button A is moved to rearward position, part B and part C swing arm D rearward to clear stud T, which allows free movement of assembly S.

When the total key is depressed, it rocks bell-crank L through link K. Bell-crank L through link I rocks bail G which swings link W downward rocking bell-crank R, the latter through spring P and lever U move assembly S rearward, shifting camshaft V.

EIGHT POINT PRINTING CONTROL FROM KEYBOARD BUTTON (Plate 18)



Eight Point Printing Control From Keyboard Button (Plate 18)

The purpose of this mechanism is to select combinations of printing control through a knob on the keyboard.

When knob O is shifted to upper position part L moves slide B rearward, which through link H rocks bell-crank assembly F to shift camshaft I by arm G pulling link C to rock bell-crank D.

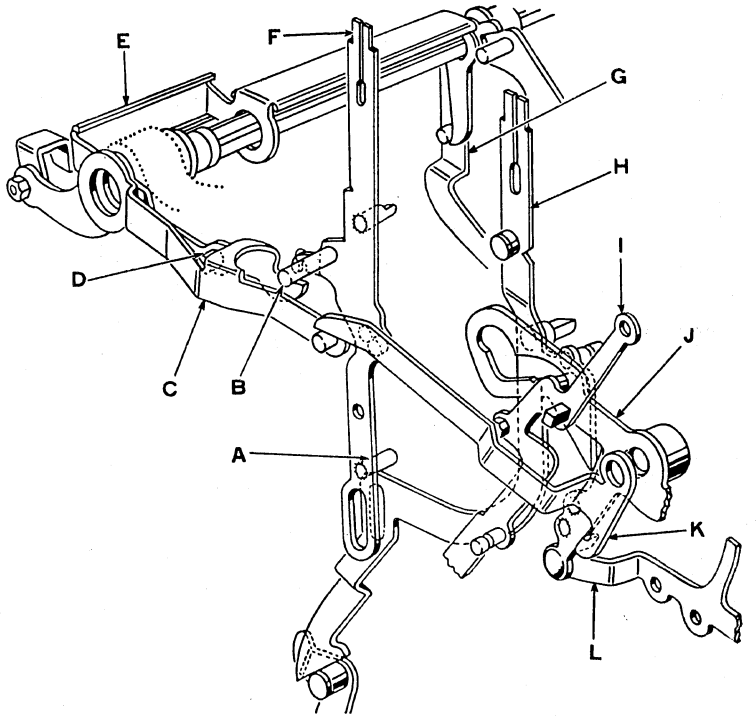
EIGHT POINT PRINTING CONTROL SHIFTED FROM REGISTER
Total Indexing Lever and C.F.N.A. Key (Plate 19)

Eight Point Printing Control Shifted From Register, Total Indexing Lever and C.F.N.A. Key (Plate 19)

When register total indexing lever I is moved to total position, the lip of cam lever J swings arm K which rocks intermediate lever C, stud D contacting on and swinging bail E which in turn shifts the camshaft assembly through link G.

When crossfooter non-add key F is depressed, stud B contacts on the arm of C which swings bail E and link G to shift the camshaft assembly.

Crossfooter non-add key F also depresses register non-add key H through stud A contacting on H.



EIGHT POINT PRINTING CONTROL FROM CHARACTER KEYS
(Plate 20)

Eight Point Printing Control From Character Keys (Plate 20)

This mechanism partially indexes the eight point printing control from the keyboard and completes the indexing by machine operation.

Sequence

When the character key is depressed key lever A through wire Y and stud Z pulls linkage C and AA rearward, which through arm W, bail X, link F and lever K swings pawl J over the square stud in part I.

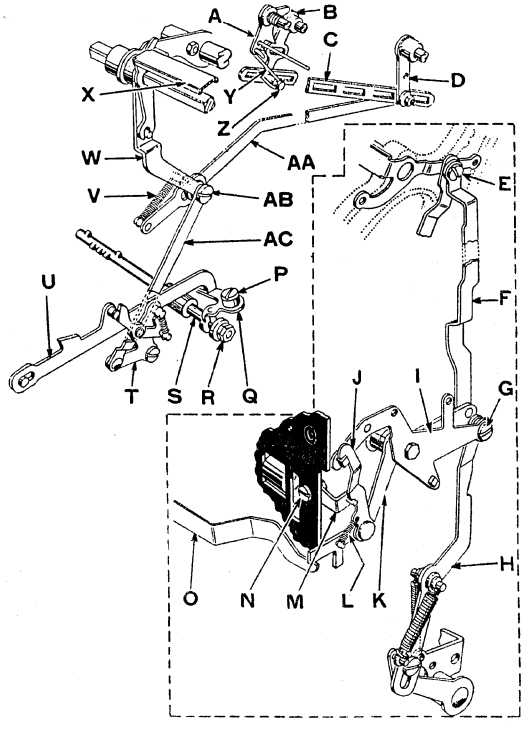
When the drive operation takes place, part I raises pawl J, the latter rocks lever K, which through link F rocks bail X to swing arm W, which through link AC, assembly T and part U moves camshaft S sidewise.

Tests and Adjustments

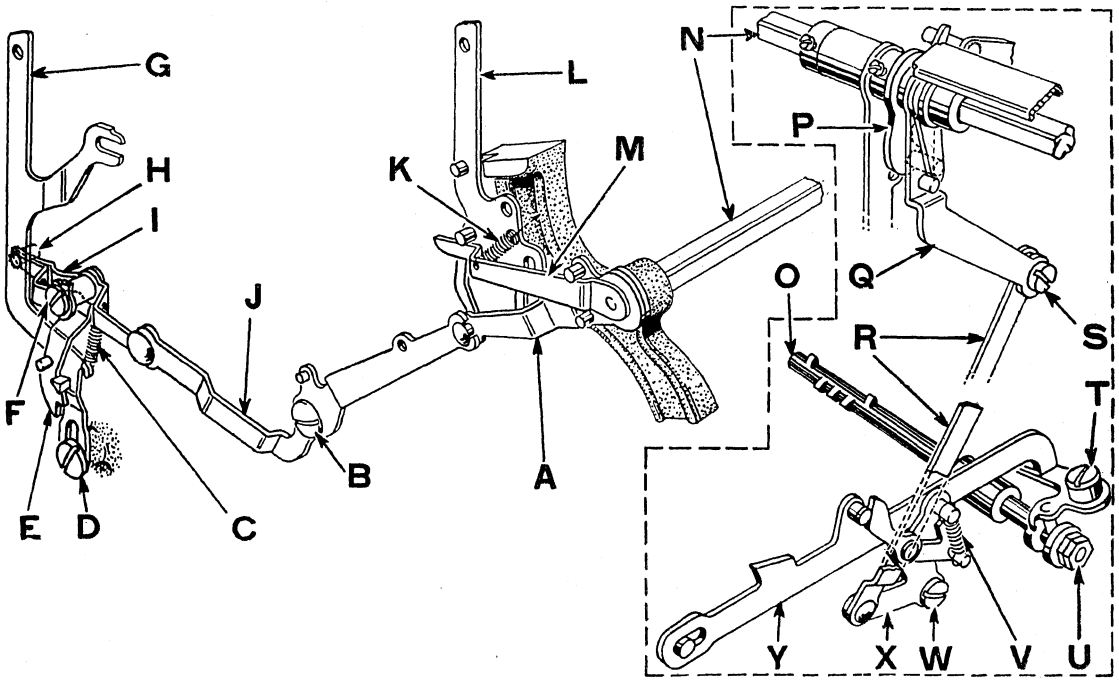
When key lever A is depressed and latched, assembly T should locate right up to the stud in U and pawl J should locate over the square stud in I.

Adjustment: Wire Y is adjusted.

Note: When the character key is in other than 9 position the lug (not shown) in slotted link C is located as required.



8 POINT PRINTING CONTROL FROM UPPER AND LOWER MOTOR BARS (Plate 21)



8 Point Printing Control From Upper and Lower Motor Bars (Plate 21)

When lower bar G is depressed stud H contacting on lever I rocks the latter, which in turn rocks lever J, arm A, shaft assembly N. Arm P swings lever Q which through link R, flexible assembly X and assembly Y moves camshaft O sidewise to cause the cam points to engage a different combination of couplers.

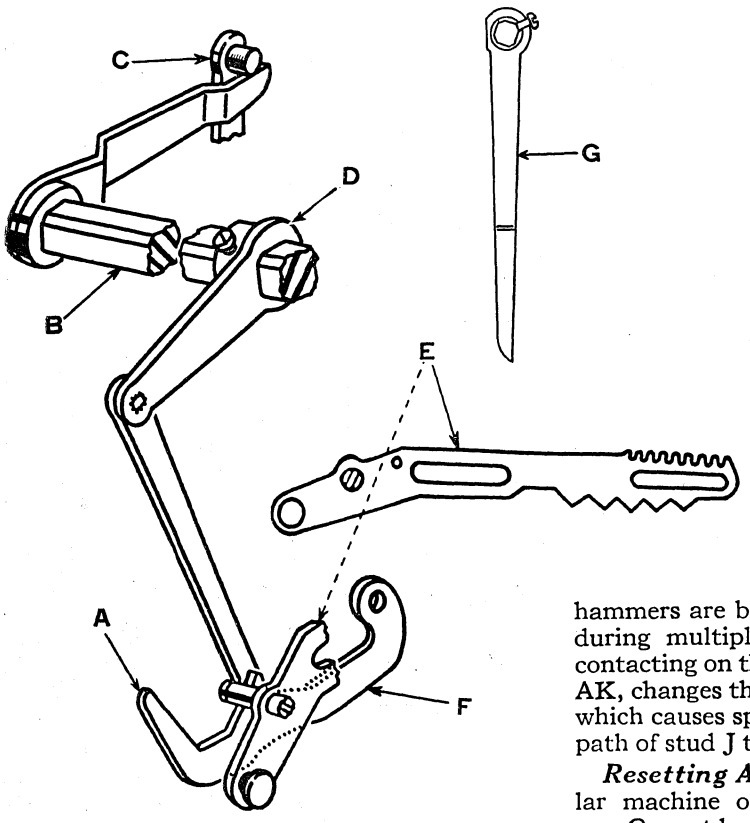
When the lower bar is fully depressed it is latched by latch E engaging the triangular stud in G. The depression of upper bar L directly rocks shaft assembly N.

Printing Control Camshaft Rotated From Upper or Uppermost Bar (Plate 22)

The purpose of this mechanism is to change the printing control combination that is indexed from the carriage by the depression of the auxiliary motor bar.

When a No. 1 roll is on the back plate lever, depressing the auxiliary motor bar, part C contacting on the right arm of shaft assembly B raises part A which indexes rack E to No. 3 roll position. When the auxiliary motor bar is depressed with no roll on the back plate lever, rack E is indexed to No. 3 roll position.

PRINTING CONTROL CAMSHAFT ROTATED FROM UPPER OR UPPERMOST BAR (Plate 22)



Hammer Release and Driver Resetting Control (Single Stroke Multiple Print) (Plate 23)

This mechanism repeat prints with one machine operation as the carriage is returning. When the carriage indexes this mechanism as explained by instructions and plate 27 pawl K moves into the path of stud T in toggle release G. When the motor bar is depressed the succeeding machine operations are made with the regular hammer and driver resetting mechanisms disabled.

Resetting Mechanism: Five cam points on disk AB contact on roller of arm Y, through arm W and link N, resetting arm Q is given an oscillating swinging movement. Angular stud J contacts part S driving the complete driver resetting assembly which places the driver-springs under tension; in this position they are latched by lever AF.

When resetting is completed the spring stud in arm V contacts the front flexible arm of assembly AK changing the pulling direction of spring AI, which causes spring AI to pull pawl S upward clearing stud J which prevents assembly AG interference as the hammers are being actuated. When printing during multiple print operation, stud in V contacting on the rear flexible arm of assembly AK, changes the pulling direction of spring AI which causes spring AI to pull pawl S into the path of stud J to allow resetting of the drivers.

Resetting Arm Q Control: During regular machine operation (not multiple print) arm Q must be held inactive to allow sufficient time for hammers to strike the type and insure printing. The round stud in toggle release G contacts part U which raises the latter to block the angular stud R which holds resetting arm Q and arm N upward, the tips of disk AB just touching the roller on arm Y.

The movement of the resetting assembly is just slightly more when the drivers are reset from the 800 section. When toggle hammer G is in normal position its tail holds the hook of latch AF below the stud in assembly AG to allow the drivers to actuate the hammers when the multiple print is not indexed.

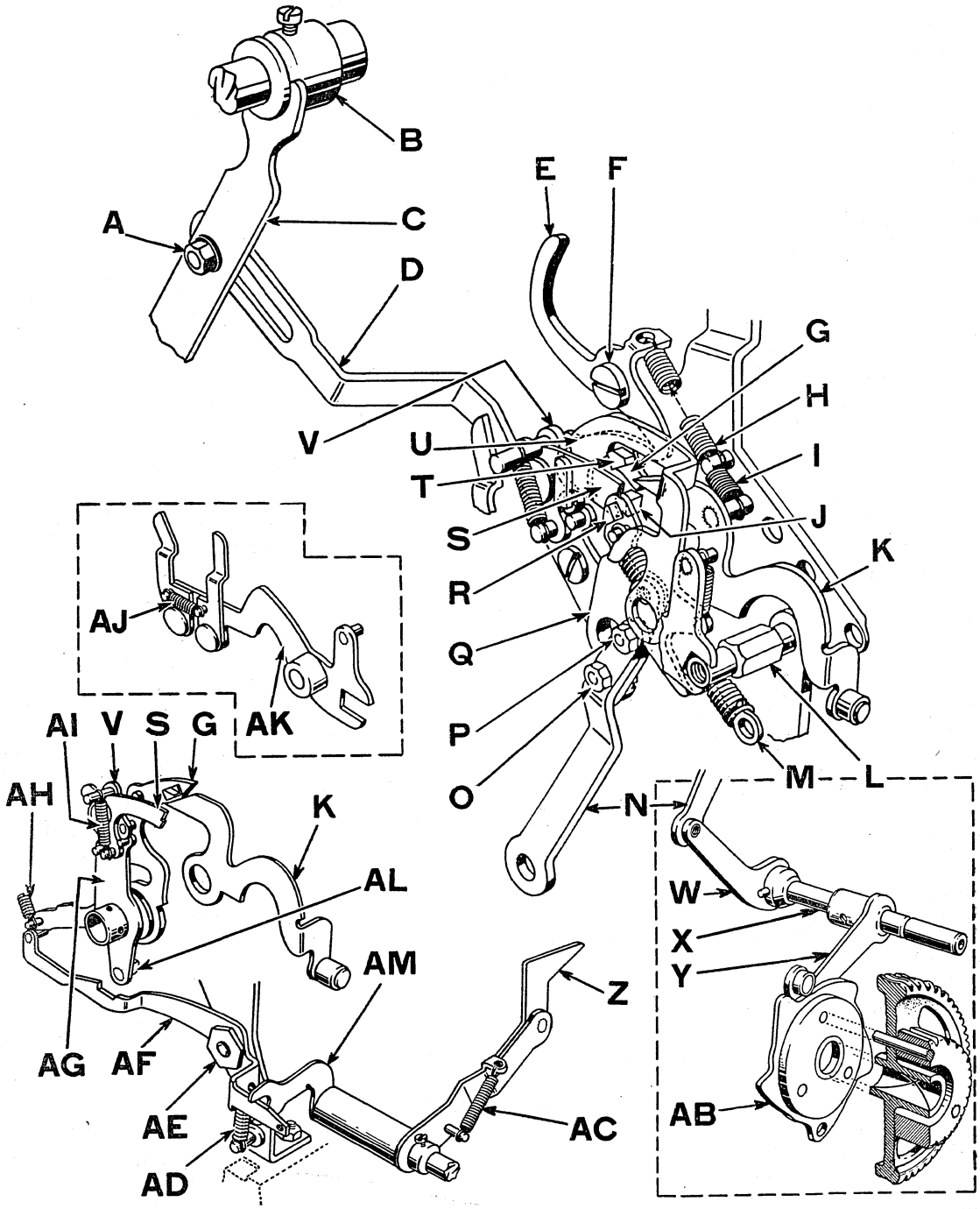
Multiple Printing: When the carriage tabulates into the next column, a control roll contacts passby-pawl Z, lowering latch AF to release the resetting unit AG which allows the drivers to actuate the hammers.

Tests and Adjustments

When normal, the roller on arm Y should rest on the lowest part of cam disk AB. When normal there should be 1/32″ clearance between pawl S and square stud J.

When the roller on arm Y is on the peak

HAMMER RELEASE AND DRIVER RESETTING CONTROL
(Single Stroke Multiple Print) (Plate 23)



of cam of AB, stud AL in part AG should have 1/64″ lead with all hammers being reset.

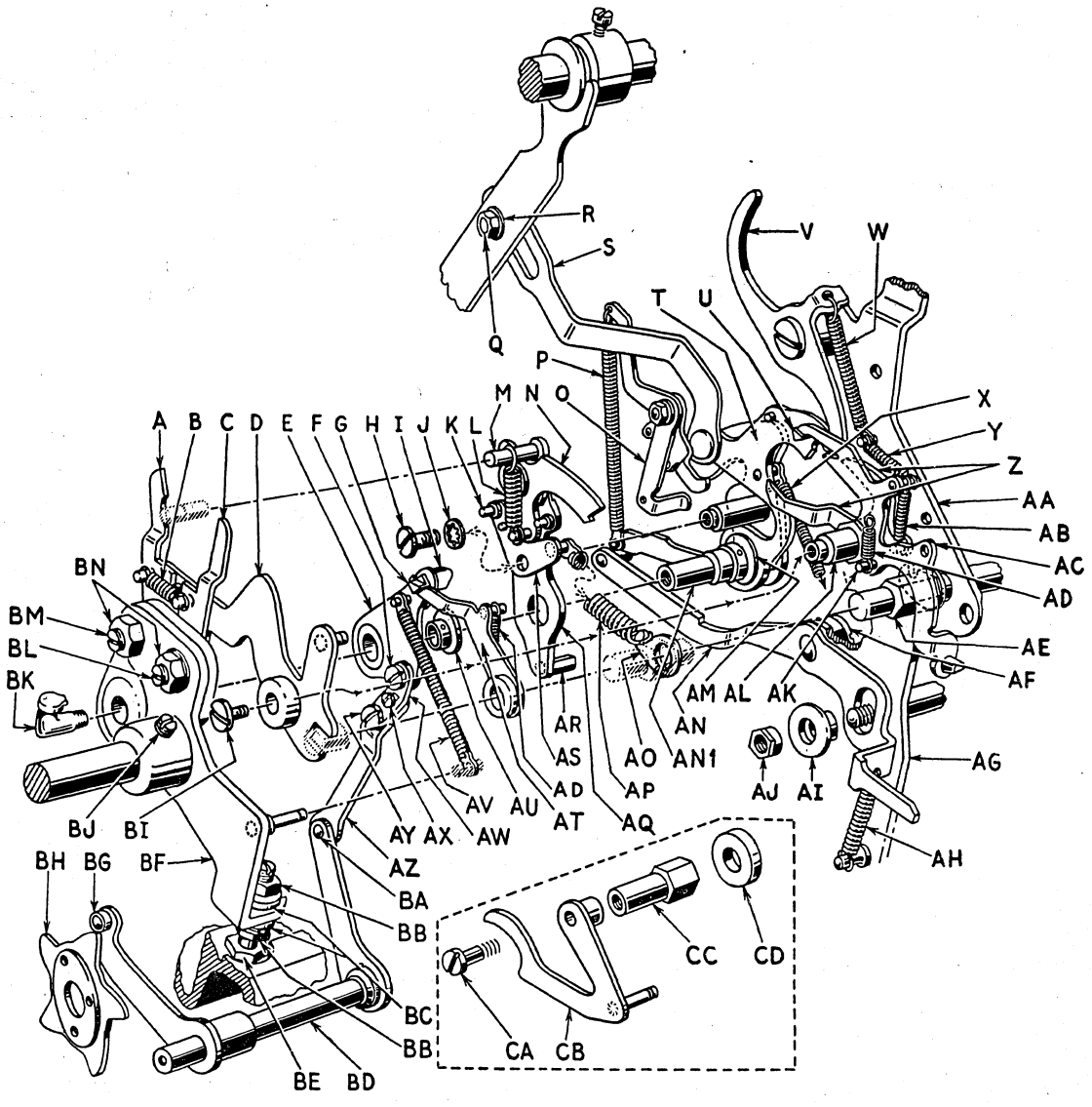
Adjustment: Nuts on screws P and O are loosened, and eccentric O turned as required and nuts tightened. When multiple print is not indexed, there should be about 1/32″ clearance between lower arm of part U and stud R, the latter stud should have ½″ hold on arm of U.

Adjustment: If necessary, part U is weaved.

Machine normal latch E should clear toggle release G by 1/32″.

Adjustment: Turn Eccentric A.

SINGLE OPERATION MULTIPLE PRINT HAMMER RELEASE AND DRIVER RESETTING CONTROL (IMPROVED) (Plate 23-1)



Single Operation Multiple Print Hammer Release and Driver Resetting Control (Improved) (Plate 23-1)

Purpose

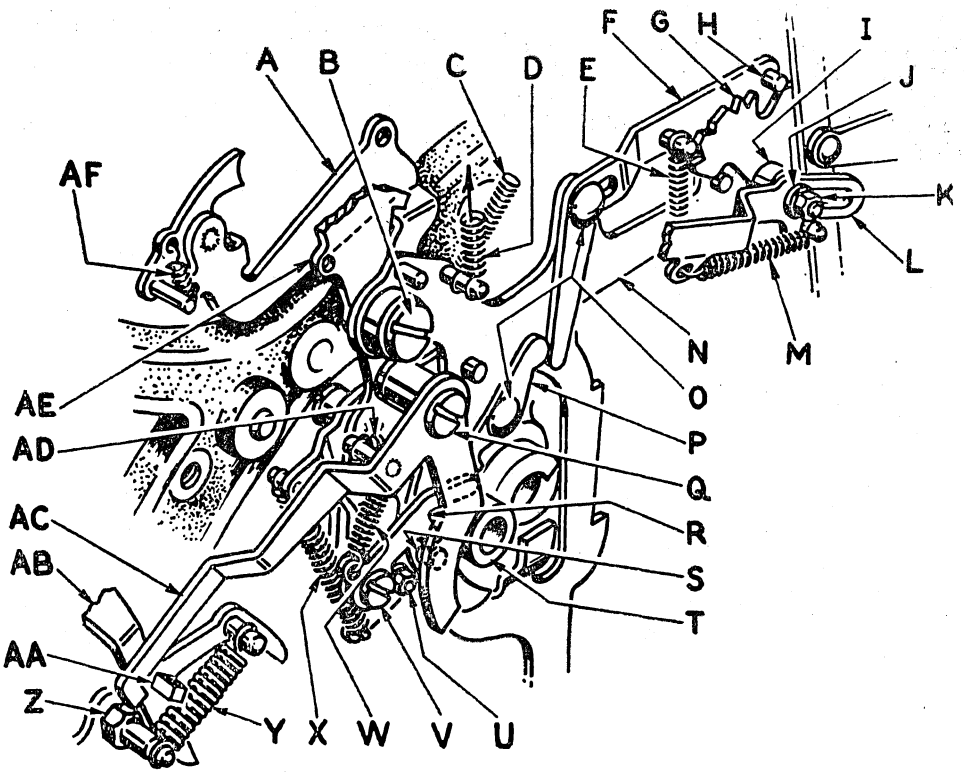
This mechanism provides a repeat of prints during a single machine operation as the carriage is returning.

Operation

The multiple print mechanism is partially indexed by a No. 4 roll on the carriage control bar (see Plate 27-1).

AS THE MAIN operating section (800) is rocked rearward on the forward machine stroke of a multiple print operation, assembly AQ is pulled rearward by spring AP and spring (V, Plate 25-1); stud M, in the upper portion of assemblyAQ, is moved forward by flexible arm C to change the pulling direction of spring L and to locate pawl N in its lower position; the drivers and hammers are fired in the regular manner to print the first print; and toggle release T is released by latch V, allowing part AC to be rocked by spring Y so that the pocket in its forward portion is

SAFEGUARD LATCHES FOR SERIES H MACHINES EQUIPPED WITH MULTIPLE PRINT MECHANISM (Plate 23-2)



Safeguard Latches for Series H Machines Equipped with Multiple Print Mechanism (Plate 23-2)

Purpose

Latch AC prevents the repeat prints of a multiple print total operation from raising and printing above the horizontal printing line of the forms.

Latch R safeguards the indexing of a skip or return, indexed from a motor bar, on multiple print machines.

Operation

Latch AC prevents partial disengaging of the crossfooter from the adding racks during the repeat prints of the multiple print total operation. This eliminates a slight downward movement of the adding racks which would cause the type to raise above the horizontal printing line of the forms.

With the Multiple Print Mechanism indexed and the machine locked in half-cycle position, roller T is moved downward sufficiently to allow spring AD to rock latch AC. The hook on the forward arm of the latter, being lowered into the path of stud AA, locks the crossfooter in mesh with the adding racks.

When the Multiple Print Mechanism is released and the machine is returning to normal, roller T contacts and rocks latch AC, raising the hook on the forward arm of the latter out of the path of stud AA.

Latch R retains arm N in its lowered position for a longer time during the return stroke of the machine. The later release of arm N is necessary (on multiple print machines) due to the fact that the Multiple Skip and Return Mechanism is indexed later.

Roller T, moving downward when the machine is operated, rocks part N. The lower arm of the latter being moved forward, allows latch R to drop over stud S, thus locking part N in its lowered position.

On the return stroke of the machine, roller T moves upward and contacts the rearward projection of latch R, raising the latter to release stud S, which allows part N to restore

(*Plate 23-2*) *Continued*

to normal after the Multiple Skip and Return Mechanism has been indexed.

Adjustment

1. With latch AC latched over stud AA at the end of the forward stroke, there should be a minimum clearance between stud AA and the vertical, rearward surface of the hook on latch AC.

To adjust, shorten or lengthen latch AC by bending it at its offsets.

2. Latch AC should release stud AA just prior to the time pass-by pawl 1-821B (G, Plate 85, Accumulation Symbol List) starts to move the crossfooter out of mesh with the adding racks.

To adjust, raise or lower the forward arm of latch AC.

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(Plate 23-1—Continued)

lowered into the path of angular stud U. The toggle release is thus disabled and the machine is locked in half cycle position.

AS THE REAR portion of part AC moves upward, stud AK raises detent AT above angular stud G, allowing spring AV to pull part E rearward and allowing roller BG to move downward into active engagement with 5-point cam BH. Roller BG is actuated by 5-point cam BH, which gives part E an oscillating movement through shaft assembly BD and arm AZ.

Oscillation of part E will cause stud I to pick up pawl N (which, as explained above, has been lowered by the pivoting action of stud M during the forward machine stroke) driving pawl N forward, rocking assembly AQ, resetting the drivers, and latching stud AR on arm AN.

As assembly AQ is rocked forward, stud M contacts flexible arm A, reversing the pulling direction of spring L, causing pawl N to be moved to its upper position, and allowing oscillating pawl E to idle under pawl N until the succeeding print is indexed.

A NO. 3 ROLL on the carriage control bar will rock arm AN and release stud AR, permitting spring AP and spring (V, Plate 25-1) to rock assembly AQ and its resetting shaft rearward, and allowing the driver springs to actuate the drivers and the hammers to print the first of the multiple prints.

Succeeding prints are accomplished in the same manner: pawl N is lowered by the pivoting of stud M; 5-point cam BH oscillates stud I and moves assembly AQ rearward to reset the drivers; and a No. 3 roll on the control bar releases assembly AQ and allows actuation of the drivers and hammers.

THE TOGGLE is released, on the last print, by the rocking of part AC (as indexed by a No. 1 roll), and the rearward rocking of assembly AQ. As part AC releases toggle release T, a stud in the left side of the toggle release limits on the upper projection of part Z. As assembly AQ rocks rearward (during the last print), a stud in the left side of AQ contacts the lower projection of part Z, raising part Z and releasing the toggle release T. The toggle release, being driven rearward by the tension of spring X, breaks the toggle and allows the machine to restore to normal.

The toggle release T is restored to normal position, during the return machine stroke, and is held in normal position by arm S. The lower arm of the toggle release holds the forward portion of arm AN downward to clear stud AR, allowing the drivers to actuate the hammers in the regular manner when a multiple print is not indexed.

Construction Notes

1. A new spring anchor is now provided for machines manufactured prior to 5-2-40, which contained the old style brace (Y, Plate 24, Printing Symbol Book). To install the new spring anchor, which permits the use of longer spring AV on such machines, remove post AE and the spring stud in the brace (Y, Plate 24); replace post AE with post CC, and attach spring anchor CB to post CC with screw CA.

2. On machines which do not require part Z, space collar CD should be installed in its place,

3. When installing new parts E and AQ on old machines, use bushings AU and AM, the thinner shoulders of which permit a better alignment of parts.

Adjustments

1. Latch V should have at least 1/64″ latching lead on toggle release T when the machine is in a normal position.

To adjust, turn eccentric screw Q.

After making the above adjustment, the stud in arm AN should have slight play under the lower arm of toggle release T.

2. Stud AR should clear over the latch in arm AN as the toggle release limits on the hook portion of latch V on the forward stroke.

To adjust, replace arm AN.

3. Stud AR should latch on arm AN, with no lead, when the accumulated weight of all the hammers is being reset (by turning the motor manually with the crank).

To adjust, loosen screw AX and turn eccentric AY.

Note: A bronze link which is .046 shorter than link AW may be used when the above adjustment cannot be procured through eccentric AY on link AW.

With the machine locked in half cycle position, the hammers fired, and stud I positioned at its rearmost point of travel, there should be 1/32″ clearance between stud I and pawl N.

4. There should be 1/32″ clearance between pawl N and stud I when the machine is in normal position and stud G is limiting on arm AT.

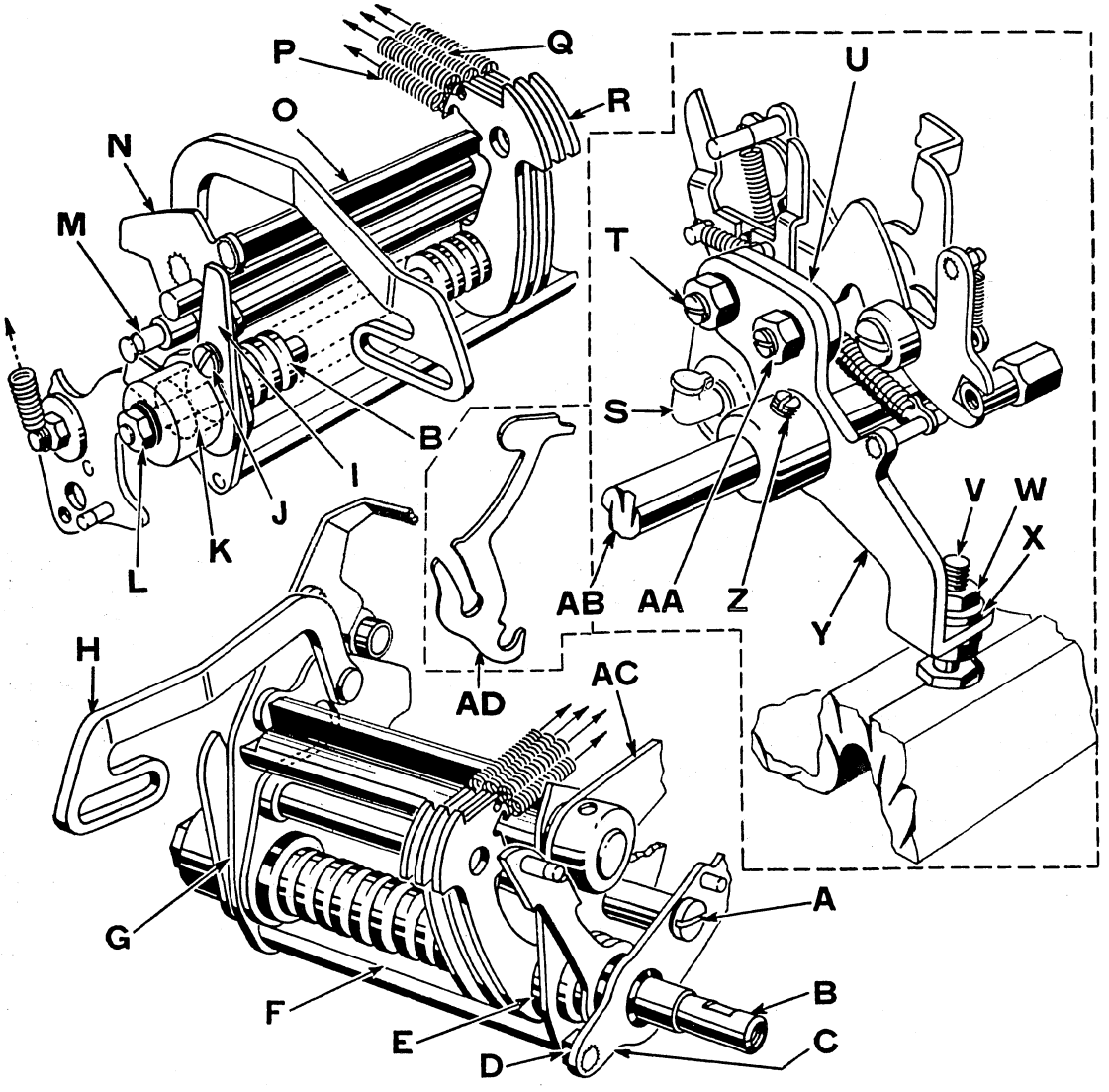
To adjust, bend arm AT at its offset.

5. Stud U should have .010 hold on latch AC when the oscillating movement of part E is blocked by arm AT.

Method: Lock the machine in half cycle position; oscillate part E (by turning the motor manually with the crank); manually raise latch AC until the oscillation of part E is blocked by arm AT; and observe for .010 hold of stud U on latch AC.

To adjust, bend arm AT up or down.

DRIVER ASSEMBLY (Single Stroke Multiple Print) (Plate 24)



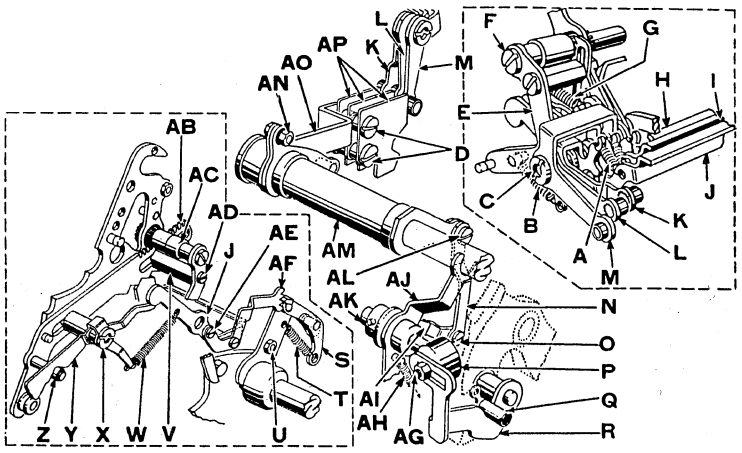
Driver Assembly (Single Stroke Multiple Print) (Plate 24)

The purpose of this mechanism is to eliminate the drag of the driver springs from the resetting movement. Recessed shaft B is stationary being anchored to the left side plate C.

Restoring shaft O is carried by left arm N and right arm E; these arms which pivot on shaft B have bronze bearings. Bearing K (dotted lines) in left arm N is of the oilless type. The bronze bearing in right arm E is lubricated by oil cup S which is screwed into shaft B; the latter is partially hollow and has feed holes leading into the bearings. The purpose of brace assembly Y is to prevent possible vibration due to the resetting thrust from the drive mechanism.

Brace member U is mounted on shaft B. Brace member Y is mounted on shaft AB, its lower arm is fastened to the base by screw V and locknuts X. Brace members U and Y are held together by screws and nuts T and AA. Correct alignment is secured by member Y being slotted for screws and nuts T and AA. A non-binding position of shaft AB is secured by adjusting nuts W.

PRINTING CONTROL, ROLL AND SKID CONTROLLED
(Single Stroke Multiple Print) (Plate 25)



Printing Control—Roll and Skid Controlled (Single Stroke Multiple Print) (Plate 25)

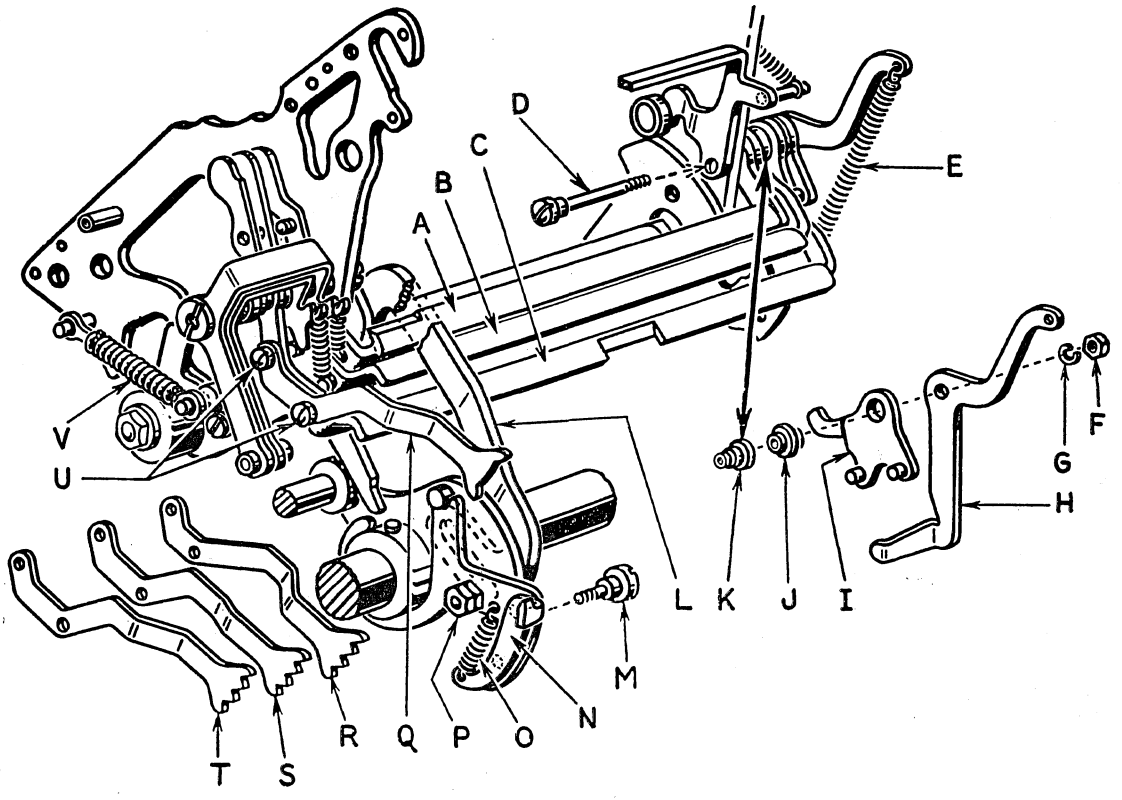
The purpose of the skid control mechanism is to permit the skid to index the printing control when the carriage is returning with the machine stopped on the forward stroke.

Three styles of skids (Nos. 1, 2 and 3) are used on roller P to impart a differential movement to arm AO, in order to index cam plates AP; the latter have pockets which vary in depth.

When the carriage moves a skid on roller P, arm R rocks shaft assembly AK, which through arm AI and link N rocks assembly AM. Arm AO which carries cam plates AP, raises to locate the pocket of the selected cam plate AP in line with the roller on arms M, L or K, which allows spring B to pull arms M, L or K to limit in the pocket of cam plates AP. Arms M, L or K through spring A, index the selected bail J, I or H. The roll controlled printing control indexes one or more of bails H, I and J through rack AB the latter also turns the camshaft to index the four point printing control.

When the carriage position indexes rack AB to seat roller Z in the pocket of lever Y, the front arm of lever Y rocks bail J into active position. At the beginning of the machine operation, spearhead S seats into one of the notches in detent AF to prevent carriage tabulation setting up a different printing control.

SINGLE OPERATION MULTIPLE PRINT PRINTING CONTROLS (IMPROVED) (Plate 25-1)



Single Operation Multiple Print Printing Control (Plate 25-1)

Operation

By disabling the lower control bail C, the printing control of multiple print machines may be changed, through part I, after the first print of a multiple print operation.

When lower bail C is indexed and the drivers are being reset after the first print of a muliple print, the stud in the resetting assembly (K, Plate 23-1) contacts and rocks part I, rocking bail C forward out of engagement with the drivers. Since the multiple print resetting assembly does not move the drivers far enough forward to permit re-engagement of the bail with the drivers, the bail remains inactive during the succeeding prints of the multiple print operation.

ON MACHINES containing the Rotary Calendar Feature Quick Set Mechanism and providing for the actuation of bail C to change the printing control during a multiple print operation, arm Q is used to prevent bail C from overthrowing and interfering with the Quick Set Mechanism.

LOCKING ARMS T, S, and R, which lock bails C, B, and A in positions selected on the first multiple print, prevent the bails from changing the printing control due to vibrations caused by the multiple print resetting mechanism. The notches in the locking arms permit locking of the bails in normal, partially-indexed, and fully-indexed positions.

During the forward machine stroke of a multiple print operation, part N rocks rearward and the detent in part N engages the indexed notches in the locking arms. The bails are thus locked until the machine restores at the end of the operation.

Bails which are actuated during a multiple print operation can not be provided with corresponding locking arms.

Construction

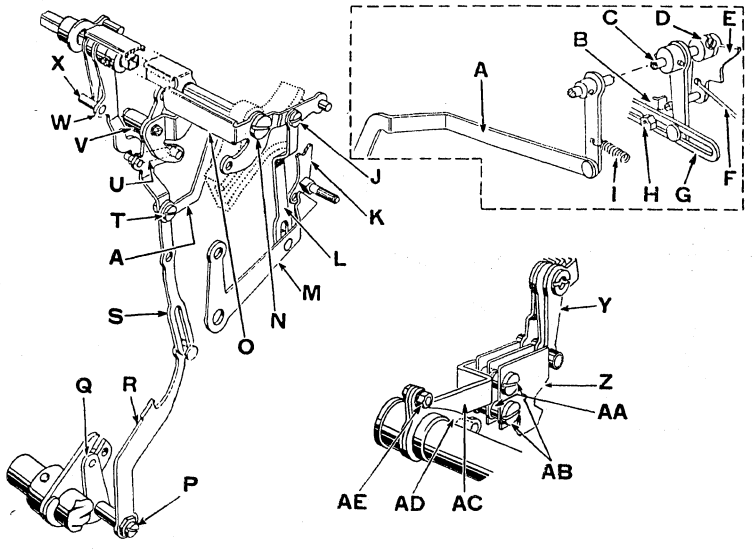
Part N has been re-enforced to give added support to eccentric M and to safeguard the adjustment and operation of resetting arm L.

Use of a longer spring is permitted by improved spring anchor H, thus providing easier toggle action.

Installation

When installing part I or anchor H, bushings K and J, part I, and anchor arm H should be assembled as illustrated.

PRINTING CONTROL FROM CHARACTER AND TOTAL KEYS
(Single Stroke Multiple Print) (Plate 26)



Printing Control From Character and Total Keys (Single Stroke Multiple Print) (Plate 26)

This mechanism is indexed from character key depression and also from total key depression. When key lever E is depressed wire F indexes the character type. The stud in key lever E contacts on lug B, moving slotted link G rearward, which in turn swings shaft assembly C and link assembly A rearward; the latter being connected to part S rocks the latter which swings link R in line with the stud in arm AD.

When the total keys are depressed link assembly K rocks bell-crank M; link L rocks bail assembly O the latter through arm W rocks arm S to swing link R in line with the stud in arm AD.

At the beginning of the machine operation arm Q carries link R upward which swings assembly AC upward resulting in cam plates Z indexing the printing control bails covered on plate 25.

Tests and Adjustments

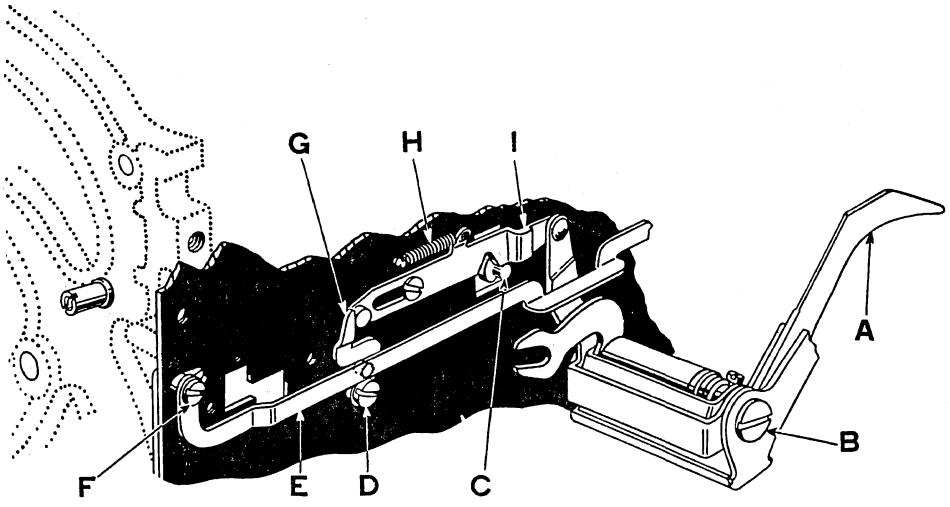
The stud in arm AD should seat in the pocket of link R when bell-crank E is depressed and latched.

Adjustment: Lug B is moved as required.

The offset in link L is adjusted to seat the stud in arm AD when the total keys are depressed.

Eccentric P is adjusted to secure the correct lift of arm assembly AC.

SINGLE STROKE MULTIPLE PRINT DISABLED BY CARRIAGE NORMAL KEY AND ALSO BY SPRING (Plate 27)



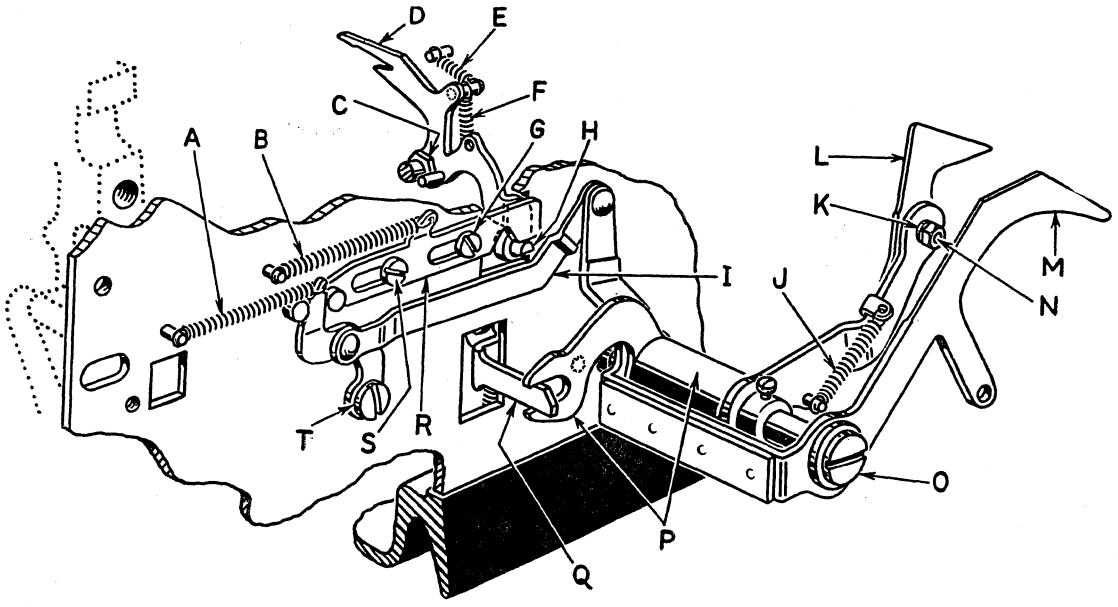
Single Stroke Multiple Print Disabled by Carriage Normal Key and Also by Spring (Plate 27)

When no roll is on lever A, spring H holds link I over stud C, which prevents blocking the machine at the end of the forward stroke.

A number 5 roll locates link I to allow stud C to move upward which indexes the multiple print. A number 3 roll locates slide I over stud C which disables multiple print and indexes repeat machine operation.

When the carriage normal key is depressed, link E swings arm G against link I locating the latter over stud C to prevent blocking the machine at the end of the forward stroke.

SINGLE OPERATION MULTIPLE PRINT (IMPROVED) INDEXED AND DISABLED FROM CONTROL ROLLS (Plate 27-1)



Single Operation Multiple Print (Improved) Indexed and Disabled From Control Rolls (Plate 27-1)

Operation

Lever M and slide R are held in their normal positions by springs A and B. Slide R is located over stud H when normal and holds the forward portion of latch D upward and out of the path of the toggle hammer, allowing normal operation of the machine when a multiple print is not indexed.

WHEN A NO. 4 roll in the carriage control bar contacts lever M slide R is cammed to the left locating the cut-out portion of the slide over stud H. Spring E is thus permitted to rock latch D, during the forward machine stroke, lowering the forward portion of latch D into the path of the toggle hammer and causing the toggle to lock at the end of the stroke.

WHEN A NO. 3 roll on the carriage control bar contacts passby pawl L, as the carriage is being returned, lever P and arm Q are rocked, releasing the drivers and allowing the machine to print.

ON THE LAST multiple print, a No. 1 roll on the carriage control bar rocks lever M and cams slide R to the left over stud H, which rocks the forward portion of latch D upward and out of the path of the toggle hammer. A No. 3 roll rocks passby pawl L and arm Q, releasing the drivers, allowing the toggle hammer to break the toggle and permitting the machine to restore to normal.

Adjustments

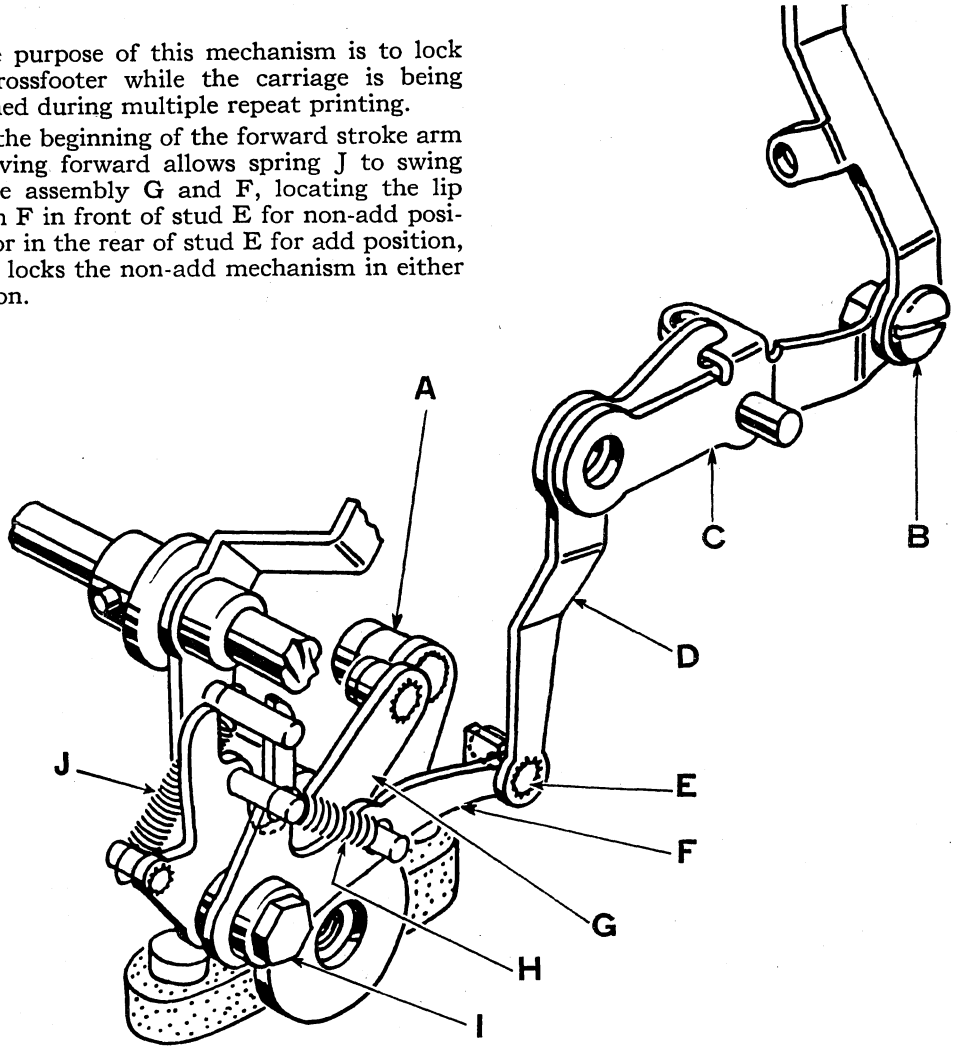
1. The throw of lever P, which must be sufficient to release the drivers, may be adjusted by turning eccentric N.

2. The No. 3 rolls which contact passby pawl L to release the drivers and hammers, should be positioned on the carriage control bar as follows: the first control roll—not less than $1\frac{1}{2}''$ to the left of the stop where the multiple print mechanism is indexed; and each succeeding control roll—at intervals of not less than 3″ apart.

CROSSFOOTER DETENT (Single Stroke Multiple Print) (Plate 28)

The purpose of this mechanism is to lock the crossfooter while the carriage is being returned during multiple repeat printing.

At the beginning of the forward stroke arm A moving forward allows spring J to swing flexible assembly G and F, locating the lip of arm F in front of stud E for non-add position, or in the rear of stud E for add position, which locks the non-add mechanism in either position.



Safeguard Symbol Printing Mechanism, Listing and Totaling, Carriage Controlled (Plate 29)

This mechanism automatically prints a single safeguard symbol to the left of totals and listed amounts. The safeguard type is located above the O-1 type. When the machine is normal, the safeguard symbol is in printing position.

Sequence and Construction

When the carriage moves skid L on roller M, slide N moving downward rocks lever O, the latter through spring Q rocks shaft assembly R. Link AA (Plate 31) swings bail assembly A which allows spring E to swing the foot of part G under stud H. When an amount is set up on the keyboard, slide F contacts on part G and swings the latter to clear stud H. Parts G have overlapping arms for the purpose of swinging parts G to the right in order to print ciphers in the event that no keys to the right are depressed. During the machine operation, one dollar or pound symbol is printed to the left of the amount.

When the total key is depressed, link AA (Plate 31) rocks bail Z which through springs K rocks cam B, the hooks of which can enter the pockets of dials AA. Cams B move part G, through hooks locating under stud H to index the safeguard type.

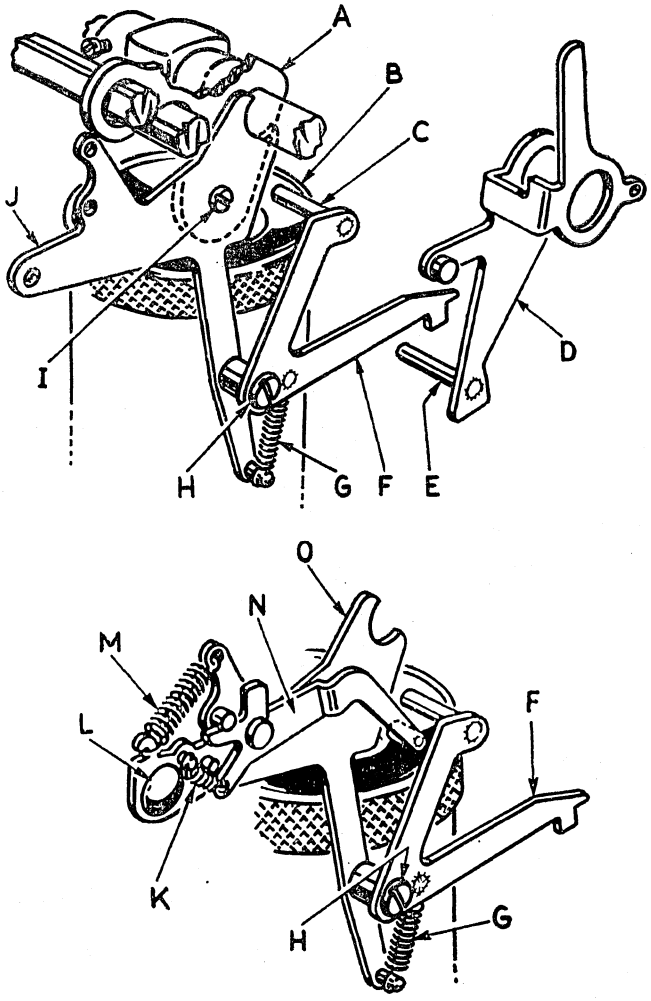
Adding wheels not in cipher position do not allow the hooks of cams B to enter the pockets of the dials AA in order to permit the adding sectors to be released for totaling. During the machine operation, one safeguard symbol is printed as explained under the dollar or pound symbol printing control.

Tests and Adjustments

Listing

Skid L on roller M.

CROSSFOOTER DETENT FOR SINGLE OPERATION MULTIPLE PRINT MACHINES—IMPROVED (Plate 28-1)



Crossfooter Detent for Single Operation Multiple Print Machines—Improved (Plate 28-1)

Purpose

The purpose of this mechanism is to lock the crossfooter non-add mechanism in the position indexed (add or non-add) on the first print and to retain the same indexed position during all repeat prints of the multiple print operation.

Operation

Dashpot B, when lowered on the forward stroke of the machine operation, allows spring G to swing latch F downward. The projection on the forward arm of latch F, being lowered into the patch of stud E, locks arm D in the position indexed (add or non-add) and retains the arm D in that same position during all repeat prints of the multiple print operation.

When the Multiple Print Mechanism is released and the machine returns to normal position, dashpot B, through stud C, raises latch F to clear stud E, which allows arm D to be repositioned (add or non-add position) for the following machine operation.

Stud E when located to the rear of the projection on latch F locks arm D in a crossfooter add position; and when stud E is located in front of the projection it locks arm D in a crossfooter non-add position.

Bracket O is used on machines which contain Automatic Register Totals.

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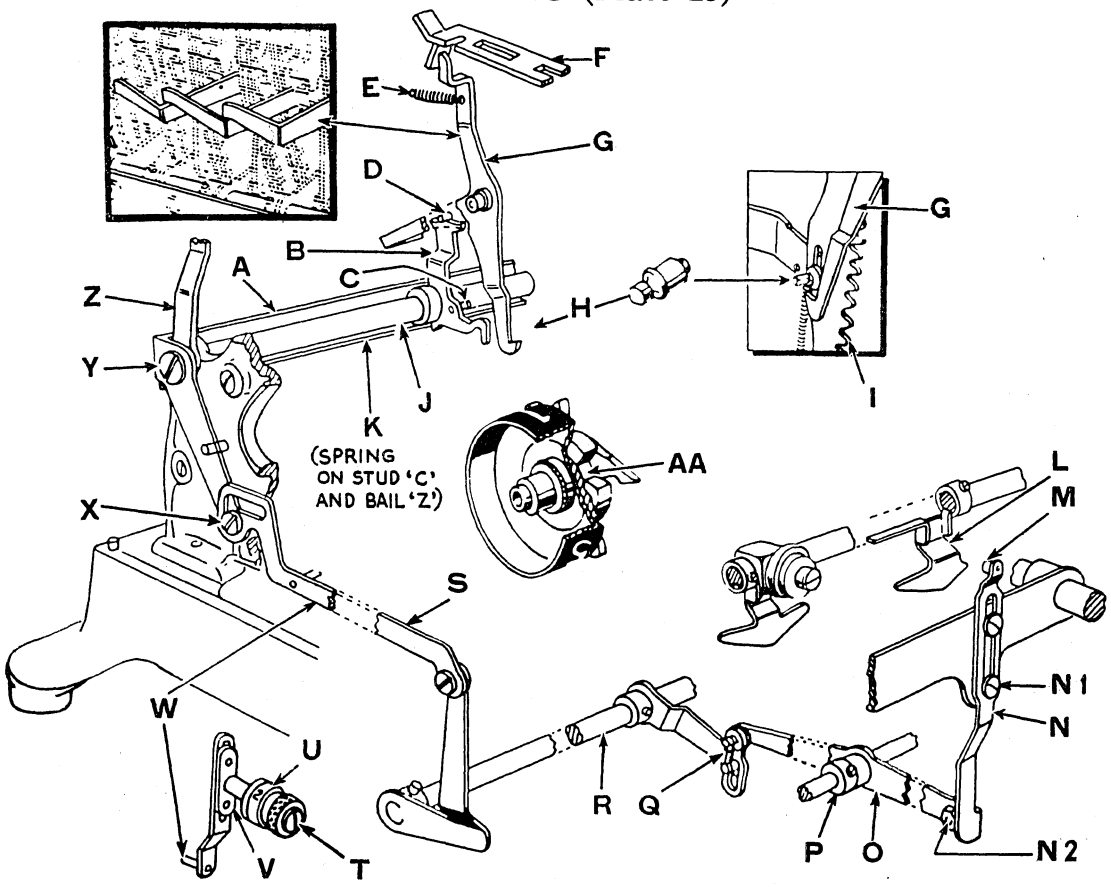
SAFEGUARD SYMBOL PRINTING MECHANISM, LISTING AND TOTALING (Plate 29)



With keys depressed, hooks of B to clear studs H.

Adjustment: Lip of slide F is bent. This test should be applied to all columns.

With no keys depressed, hooks of B to hold studs H.

Adjustment: Overlapping arms of parts G are bent.

Caution: Limitation of this adjustment is that there be clearance between roller D on part G and cam B. Clearance at this point can be noted by pulling handle, holding and lifting arms of part G.

Totaling

When the total key is depressed with adding wheels clear, all rollers D (on G) should be on the front side of cam B, each cam should be tested.

Test bail Z for being straight. When the total key is depressed (power off) with an amount of four or five columns, cams B on the extreme left should have clearance in forward position. In the event that the bail is warped, it should be removed and straightened.

Inasmuch as springs K pull cams B forward, excessive contact of the overhanging arms of parts G on each other must be avoided when it is present, springs K can fail to pull cams B to locate rollers D off the high point of cams B. When the overhanging arm of one part G is too low, part G which is being moved will pick up other parts G which places a heavy load on one cam B.

Adjustment: The vertical arm of bail Z is bent.

When only a few rollers D fail to locate in front, the surface of cams B where they contact in bail Z are stoned.

Note: The forward and backward movement of cams B must be equalized.

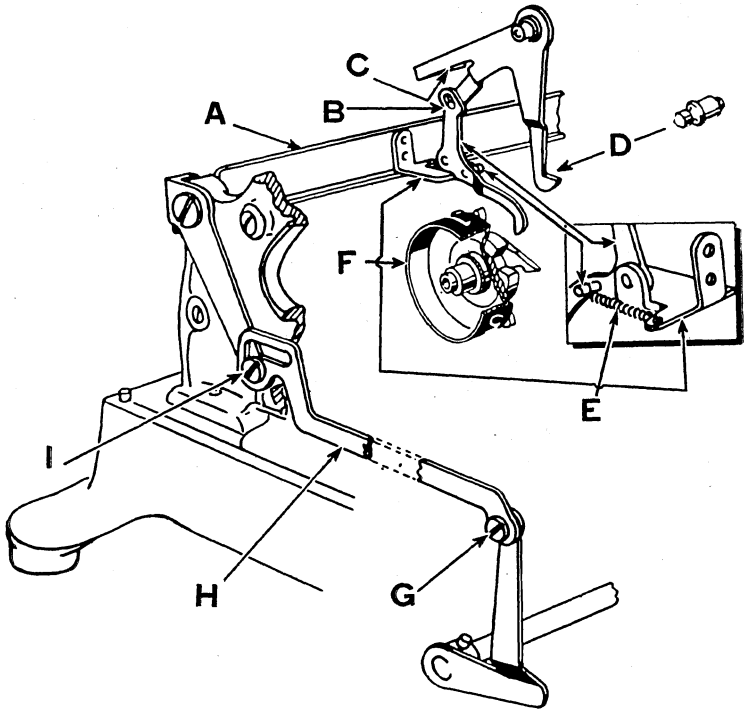
The hooks of cam B should freely enter the pockets of dials AA.

Caution: Hooks of cams B must not be bent, instead the pocket in dial AA is chamfered.

Register Totaling

In order to total registers, the hooks of parts G must clear studs H which is accomplished by disabling the carriage control when skid L is on roller M. Knob U is pulled out and given a half turn to position No. 2. The stud in assembly W lowers link S to locate its horizontal slot in line with screw X.

SAFEGUARD SYMBOL PRINTING MECHANISM (Totaling) (Plate 30)



Safeguard Symbol Printing Mechanism (Totaling) (Plate 30)

This mechanism automatically prints asterisk symbols to the left of totals when the latter consist of less than a fixed number of columns.

Sequence and Construction

The asterisk type is located above the cipher type and is therefore in printing position when the machine is normal. When a total is taken with dials in 3, 4 or 5 columns at cipher position the type sectors in those columns are prevented from moving downward, retaining the asterisk type in printing position.

Carriage Control

When the carriage moves into the totaling column a skid, (L, Plate 29) contacts on roller M in slide N, (Plate 29) which rocks bail A, causing arm B to enter pocket in adding wheel F. The movement of arm B rocks part C into hook moving into the path of stud D.

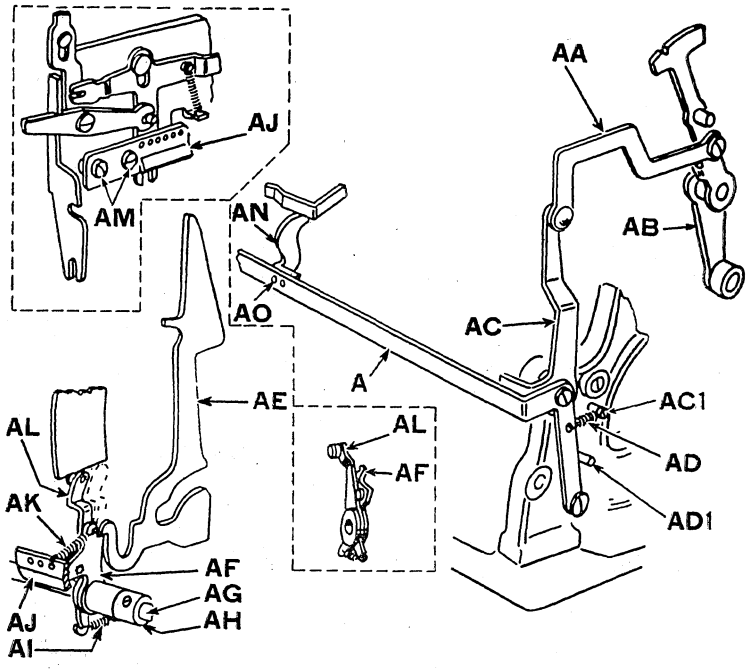
During the totaling operation the sectors cannot move downward in columns having the adding wheels at cipher which indexes the asterisk.

Asterisk Control

When the carriage moves into the totaling column with one or more adding wheels above cipher position, the pocket of the adding wheels not being in line with hooks of part B prevent sufficient movement to move part C under stud D.

When there are one or more ciphers to the right of an amount, i. e., 10.00, the asterisk is prevented printing in column three as follows: Part C has arms which overlap the arms of similar parts to the left. Part C in column 3 is prevented from moving under stud D by its arm resting on part C in column 4. During the early part of the totaling operation the sectors in column 4 will drop to index 1 and will detain part C in column 3, until the sector has indexed to cipher and passed hook of part C. Part C in column 5 can enter in pocket of the adding wheel in that column, blocking the sector and printing asterisk to the right of *10.00.

SAFEGUARD SYMBOL PRINTING CONTROL (Plate 31)



Safeguard Symbol Printing Control (Plate 31)

The purpose of this mechanism is to restrict the printing to a single dollar or pound symbol when otherwise more would print due to the reverse printing control.

This mechanism consists of latch assemblies AL and AF which engage and hold hammers AE. Latch assemblies pivot on shaft AG between spacing bushings AH. Latch assemblies AL and AF consist of arm and roller AL and limit arm AF connected by spring AI. Latch assemblies AL and AF are held in active position by the type sectors contacting on the roller of arm AL, limit arm AF blocks the hammer to the left.

When the machine is operated, the raising of the type sectors that are indexed through the keys allows springs AI to move the latches out of the path of hammers AE. The raising of the type sector in the last column to the left of the listed item releases the hammer in the next left column which prints the dollar or pound symbol. The other dollar or pound symbols to the left are prevented from printing by latch assemblies AL and AF which are held down by the non-indexed type sectors.

Six latch assemblies AL and AF are used, being located in columns 6 to 11 inclusive.

Tests and Adjustments

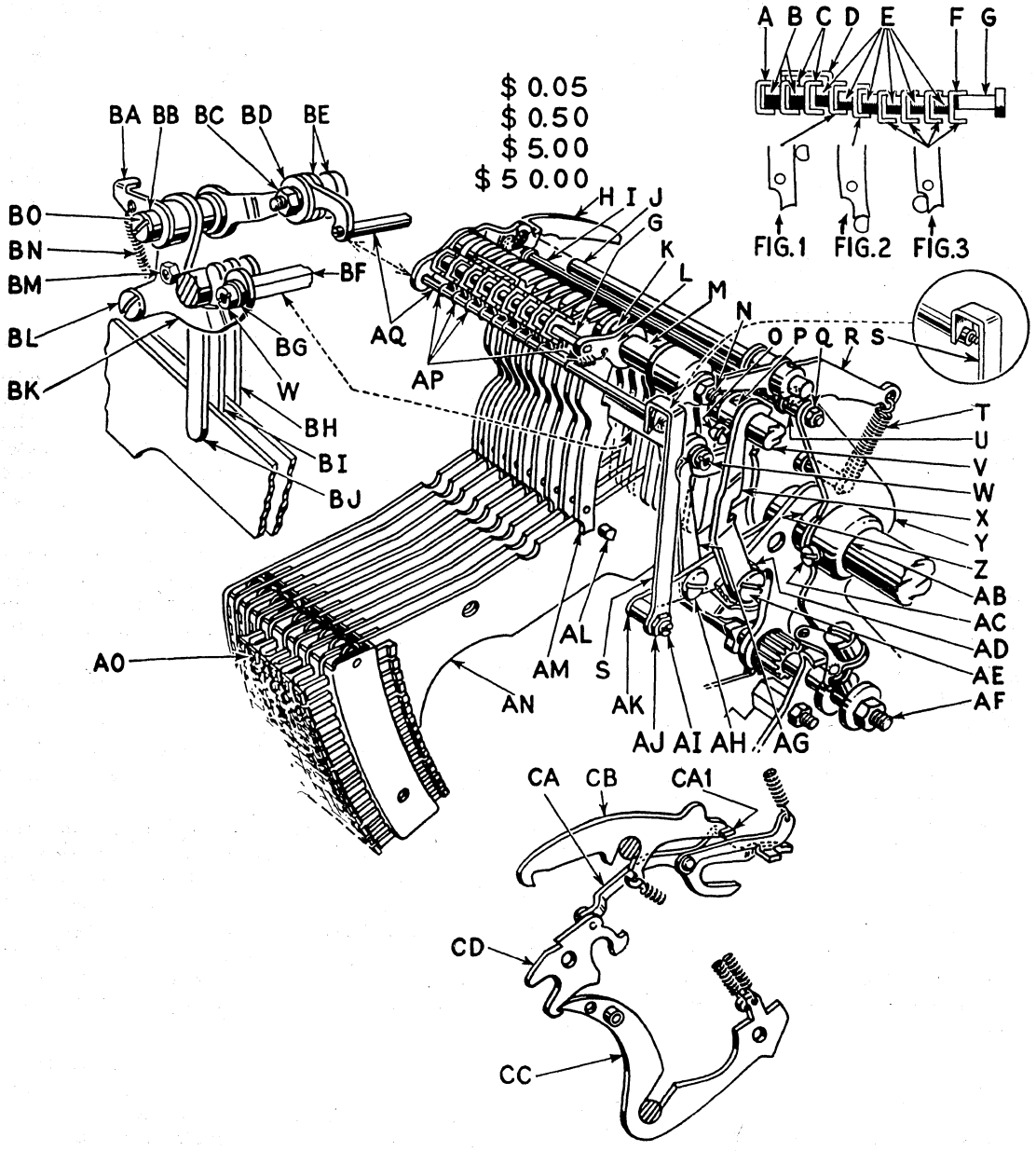
There should be at least 1/64″ clearance between limit arm AF and hammer AE, when the type sectors are in cipher position (skid L off roller M, Plate 29).

Adjustment: Clearance is increased by adjusting the offset in arm AL to lower it. Latch assemblies AL and AF should freely pass under hook of hammer AE when the type sectors are in cipher position.

Adjustment: When latches AL and AF do not pass freely under hammer AE, the top of limit arm AF or the bottom of hook of hammers AE are stoned.

The roller on arm AL should align with type sectors. Latch assemblies must move freely.

SAFEGUARD SYMBOL PRINTING MECHANISM, STYLE 2
(Plate 31-1)



Safeguard Symbol Printing Mechanism, Style 2 (Plate 31-1)

Purpose

The purpose of this mechanism is to print a safeguard symbol, in the first column to the left of an amount being listed or totaled, thus preventing a willful increase of the printed amount.

Construction

The safeguard symbol type is located one position above the cipher type, and is lowered (when required) into alignment for printing by pawls AM which extend downward between the type sectors.

Operation

On the forward stroke of every machine operation arms Y move forward to rock levers R and H through rolls U. The rocking of levers R and H lowers pawls AM which are assembled on shaft N.

INDEXING of the Safeguard Printing Mechanism is effected by the actuation of the printing control camshaft AF through the control rolls on the carriage control bar.

When a cam on camshaft AF is located under the forward arm of bell-crank AG (as indexed by carriage control), the vertical arm of the bell-crank is moved rearward, rocking bail L and raising stud G. As stud G is raised it contacts the upper lip of the leftmost pawl AM and holds the pawl's lower extension rearward in inactive position (Fig. 1). The adjoining pawls AM (to the right) are retained in their rearward positions by the limiting effect of studs E and B.

When the cams on camshaft AF are removed from under the forward arm of bell-crank AG (as indexed by carriage control), spring AP is allowed to rock bail L and to lower stud G away from the upper lip of the leftmost pawl AM. With stud G so situated the Safeguard Printing Mechanism is in indexed position.

PRINTING of the safeguard symbol, when an amount is listed or totaled with the Safeguard Printing Mechanism indexed, is effected (1) by positioning pawl AM, in the adjoining column to the left of the column containing the amount to be printed, in line with its corresponding stud AL in the adjoining type sector, (2) by forcing the type sector downward to locate the safeguard symbol in printing position, and (3) by coupling pawls CB and CD (in this same adjoining column) to trip the driver CC.

When, for example, an amount is being listed or totaled in the fourth printing column (with the Safeguard Printing Mechanism indexed), stud AL in the fourth column moves upward (Fig. 1) in front of its corresponding pawl AM—while the pawls AM are momentarily limited rearward by square shaft BF. As pawls AM and shaft N are lowered, by the rocking of levers R and H, the steps of the pawls clear under shaft BF, the pawl in the fourth column moves forward slightly to limit against stud AL in the fourth column sector, and the pawls to the right are limited rearward through studs E and B. Pawls AM to the left of the fourth column are swung forward by springs AP. Pawl AM in the fifth column, being limited by its stud E contacting against the lip of the fourth column pawl, is positioned over its associated stud AL (Fig. 2). Pawls AM from the sixth column leftward are located forward from their associated studs AL (Fig. 3): stud E in the sixth column being limited by the lip of pawl AM in the fifth column, and pawls AM to the left of the sixth column being limited by stud G through studs E.

As pawls AM and shaft N continue their downward motion, pawl AM in the fifth column (Fig. 2) contacts its stud AL to lower the type sector AN, thus locating the safeguard symbol AO in the fifth column in printing position. The type sector, as it is lowered, contacts the dwell of pawl CB and aligns the notch in the pawl's forward portion with projection CA-1, enabling pawl CB to trip the driver CC, through link CA and pawl CD.

When only the type sector in the first column is active (with the Safeguard Printing Mechanism indexed), stud AL in the first column holds its respective pawl AM rearward, which in turn, through the large studs B, holds the pawls AM in the second and third columns rearward, causing a safeguard symbol to be indexed and printed in the fourth column.

ON EARLIER MACHINES, a safeguard symbol is indexed and printed in the third and fourth columns, when an amount is printed in the first column (with the Safeguard Printing Mechanism indexed). In such cases pawl AM in the second column is held rearward due to its being pinned to pawl AM in the first column. The pawl in the third column is positioned over its respective stud AL due to the limiting of its stud (same as stud E on the later mechanism) on the lip of the second column pawl AM. The pawl AM in the fourth column is positioned over its respective stud AL as a result of the limiting of its extension D on the upper lip of pawl AM in the second column.

(Plate 31-1—Continued)

Adjustment

1. The safeguard symbol type should be aligned with the regular type (on the printing line) when the safeguard symbol is printed.

To adjust, loosen nuts Q and turn eccentric shaft I.

2. Rocker shaft 1-202005 (D, Plate 23, Keyboard Symbol List), should have slight clearance over pawls AM, when the shaft is manually held to its forward limit.

To adjust, loosen screw AI and turn eccentric bushing AJ.

3. Brace X should have a snug hold on shaft V, when the machine is in its normal position.

To adjust, loosen screw AE and turn eccentric bushing AD.

4. The steps of pawls AM should limit against square shaft BF (when an amount is being printed with the Safeguard Printing Mechanism indexed), until the studs AL of the active sectors are positioned in front of the forward vertical surfaces of pawls AM; and should clear under shaft BF soon enough to allow pawls AM in the columns to the left of the printed amount, to clear over studs AL.

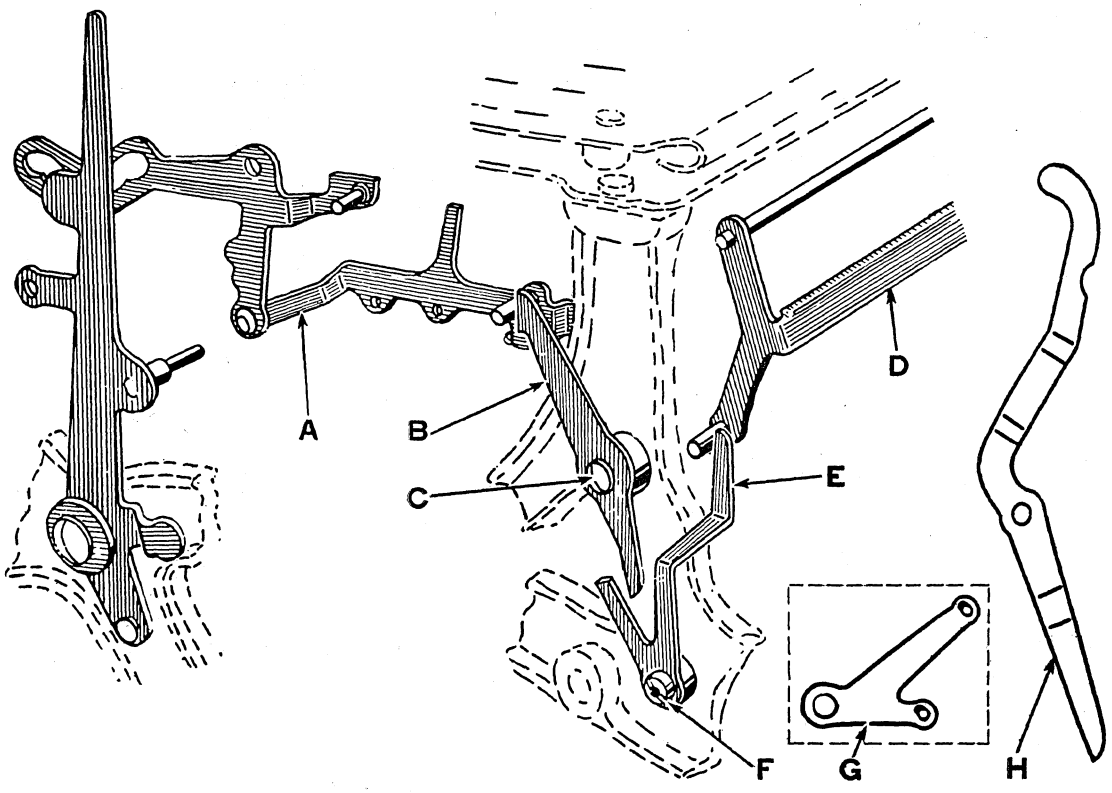
To adjust, loosen screws W (on both ends of shaft BF), and raise or lower shaft BF as required.

Note: The square shaft BF should have approximately $\frac{1}{2}''$ hold on pawls AM, when the machine is normal.

5. When the machine is normal and a cam on camshaft AF is located beneath the forward arm of bell-crank AG, stud G should contact (but not raise) the upper lip of pawl AM.

To adjust, bend bell-crank AG.

SAFEGUARD SYMBOL PRINTING MECHANISM DISABLED BY REGISTER TOTAL INDEXING LEVER (Plate 32)



Safeguard Symbol Printing Mechanism Disabled by Register Total Indexing Lever (Plate 32)

When the register total indexing lever is pulled to total position, assembly A rocks levers B, E and bail D, the latter rocks lever H, which through bell-crank G, lowers link S (Plate 29) locating its horizontal slot in line with screw X (Plate 29), thereby disabling the carriage control of the safeguard symbol printing mechanism.

Note: Bell-crank G and lever H pivot on the right sideframe and function similar to the key and bar to disable the motor bar lock mechanism.

Rotary Calendar Feature Carriage Controlled (Plate 33)

This mechanism prints the month, date and year with the machine operation when it is indexed by the carriage. The month, date and year are changed manually. The rotary calendar feature is located either to the right or to the left of the printing section. This mechanism is carriage controlled either singly or in conjunction with the consecutive numbering device.

Rotary Calendar Feature Left

With single control latch AJ or double control latch BB indexed to clear the projection of lever M: During the early part of the machine operation, the roller in arm AR contacts on driving arm AS to place spring AQ under tension. During the latter part of the forward stroke, sleeve AO on the dashpot shaft swings latch AM to clear the projection on lever M, which allows driving spring AQ to drive the upper arm of lever M rearward, causing the type to strike the platen and print.

Disabling Lever

When lever R is latched down, latch T is swung over the stud in lever M thereby disabling the latter when it is indexed by the carriage.

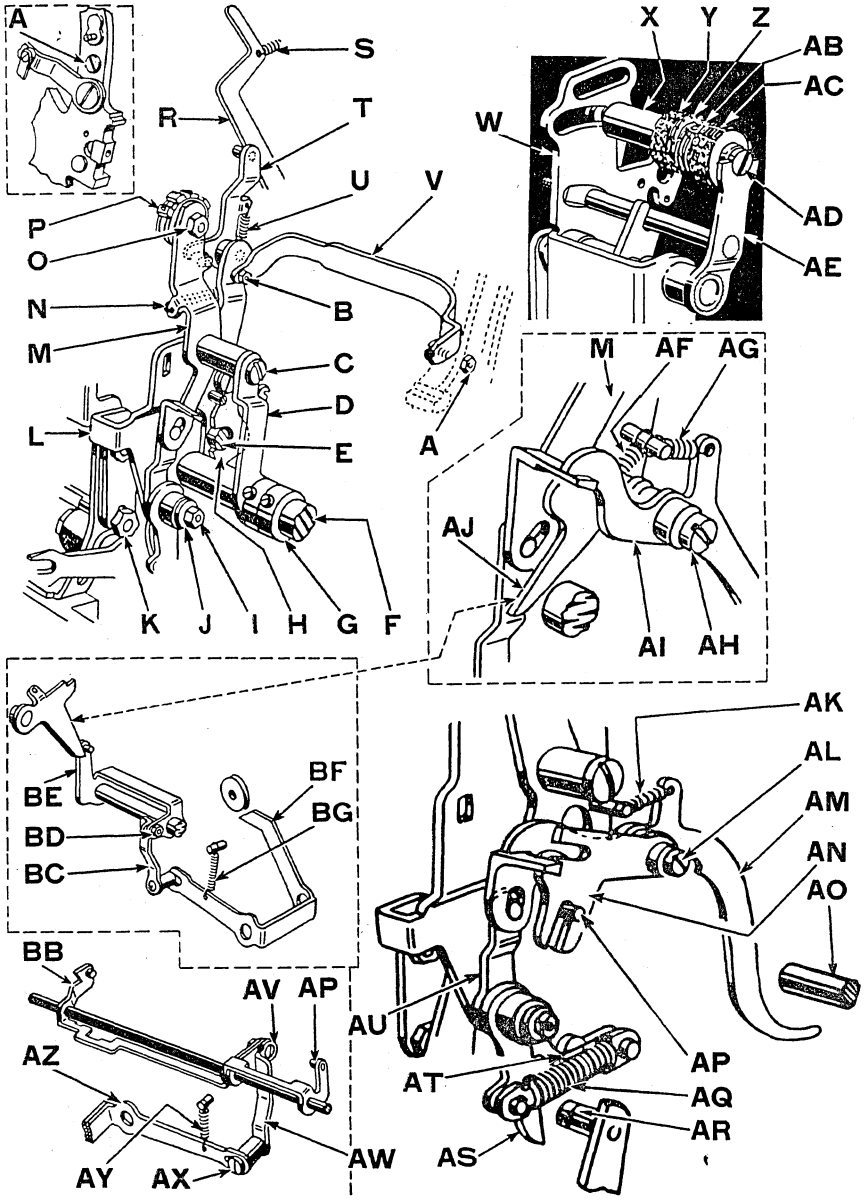
Rotary Calendar Feature Right

The rotary calendar feature type assembly P is used in both right and left installations. It is carried in the standard consecutive numbering frame W. In order to adapt the calendar type assembly to the wider frame, bushing X and special shaft AD are used.

Carriage Controls

Single: Control roll No. 3 on lever BF

ROTARY CALENDAR FEATURE; CARRIAGE CONTROLLED
(Plate 33)



through link BC and intermediate BE lowers latch AJ to clear the projection on M.

Double: No roll on lever AZ, the lower step of AN blocks the projection on M. No. 7 roll on lever AZ aligns slot of AN which permits the release of lever M to print the calendar feature.

No. 3 roll locates upper projection to block AN, which indexes the consecutive numbering device by the hook of bail BB clearing the projection of the lever which carries the consecutive type assembly.

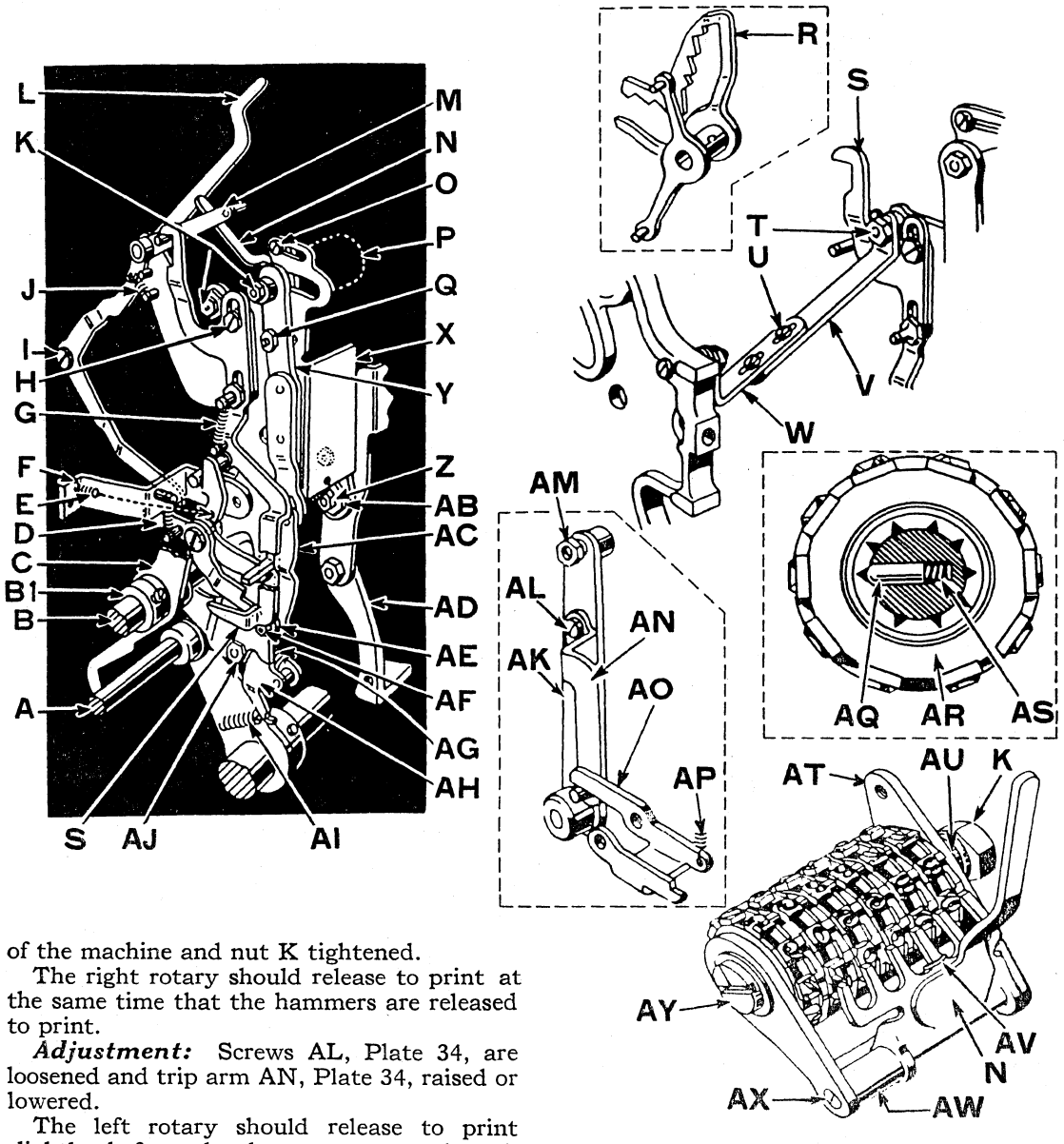
No. 1 oversize roll on lever AZ clears the projection of both levers and prints the calendar feature and consecutive number, however, the consecutive numbering device will not count.

Tests and Adjustments

To align right and left rotaries, the two lower nuts and the one upper nut which hold the rotaries to the printing section are loosened and the rotaries raised or lowered as required.

If the right rotary prints the left side lighter than the right side, nut K is loosened, the dark printing side is pushed toward the front

ROTARY CONSECUTIVE NUMBERING DEVICE, CARRIAGE CONTROLLED (Plate 34)



of the machine and nut K tightened.

The right rotary should release to print at the same time that the hammers are released to print.

Adjustment: Screws AL, Plate 34, are loosened and trip arm AN, Plate 34, raised or lowered.

The left rotary should release to print slightly before the hammers are released. Handle completely forward, rotary when released should have 1/16″ play.

Adjustment: Turn lower eccentric AT.

Rotary Consecutive Numbering Device Classes 11-16 and 20-30 (Plates 34-35)

The purpose of this mechanism is to automatically print consecutive numbers independent of the regular printing and adding mechanism.

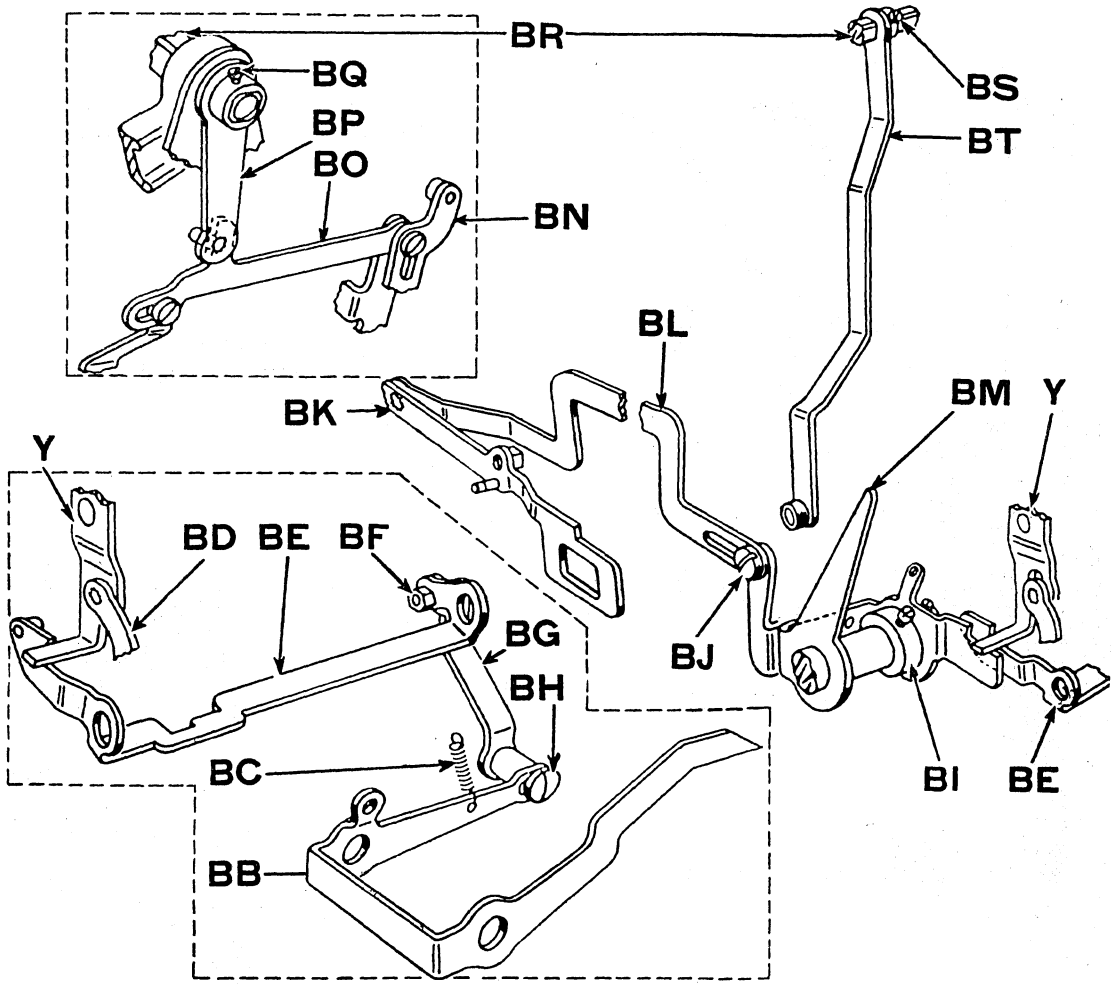
The rotary consecutive numbering device is controlled by carriage and/or by totaling position, and can be disabled from the keyboard.

The later mechanism has been strengthened and refined. The printing release is now controlled by the hammer release latch assembly AK instead of the toggle mechanism.

Note: Plate 34 covers the rotary mechanism and Plate 35 covers carriage and totaling controls. Both plates should be referred to in conjunction with these instructions.

Printing is accomplished by driving the complete type unit assembly against the platen. Driving spring AG is hooked from the stud in driving lever AC to the stud in

ROTARY CONSECUTIVE NUMBERING DEVICE CONTROLS (Plate 35)



resetting arm AH. Driving spring AG is placed under tension by shaft A moving rearward.

Printing is timed to take place when arm AN (on hammer release assembly AK) rock latch AO, which allows spring AG to drive lever Y. The upper arm of lever Y carries type unit P against the platen. However, unless the carriage position has lowered the latch on bail BE, lever Y is blocked, thereby preventing printing.

The latch of bail BE is controlled by large and small rolls on lever BB through link BG. The small roll lowers the latch sufficiently to clear lever Y to print and count. The large roll lowers the latch and through the stud in BE also lowers disabling slide S, which through lever M swings pawl assembly N to clear the ratchets of dial assemblies AR to prevent counting, in order to permit repeat printing.

Lever Y is reset by spring AI as shaft A moves back to normal position. Single stroke total releases this mechanism through links BK and BL rocking latch assembly BM. Automatic carriage controlled total and subtotal mechanism (H903) releases this mechanism through parts BN and BO rocking shaft assembly BR. Arm BT on BR rocks latch assembly BM to clear lever Y.

Note: Plate 35 shows carriage control latch BE plus total control latch BM, this combination is supplied when it is specified on the F. O.

Counting

The unit wheel is advanced one space by multiple pawl N when type assembly P is restored with the small roller on lever BB. Multiple pawl N is actuated by the movement imparted to the frame that carries type assembly P by the cam slots stationary frame X.

When the unit wheel registers 9 the unit prong of pawl N drops into the carry pocket, which allows the tens prong to engage and

(Plates 34 and 35—Continued)

turn the tens wheel one space. During the next restoring operation, multiple pawl N is again raised, the unit prong engaging the ratchet tooth and the tens prong clearing the tens wheel. When the units and tens wheel arrive at 99, the hundred prong engages the hundred wheel, etc.

Tests and Adjustments

The turning movement which is applied to the wheels should cause plunger AQ to seat in the pockets of wheels AR. An approximate location is secured as follows:

Handle forward, nut is loosened and screw AY turned to locate the notch in the screw to the printing of the machine type. When the machine is allowed to return slowly, the unit wheel should come to a definite stop seating the plunger in the pockets of the wheel, which is indicated by the numbers of the unit wheel aligning with the numbers of the balance of the wheels. The seating of plunger can also be readily felt by placing the finger on the wheel turning it slightly in one direction and then in the other direction, in either case spring AS should snap the plunger in the pocket of the wheel. If the plunger does not seat without overthrow, the nut is again loosened and screw sufficiently turned to correctly seat the plunger.

Arm S should clear stud in BE when a carry is required in the last left column.

Test: Set all wheels at 9, No. 3 roll on BB, operate machine, when clearance is lacking between stud in BE and arm S, the latter is bent.

Pawls of multiple pawl N to the left of that pawl which contacts on the ratchet should just clear wheels AR. The pawls of multiple pawl N should align in center of ratchets.

Adjustment: Pawls of N are carefully bent.

To align rotary P, loosen two lower nuts and upper nut, which hold the rotary frame X to the printing section and raise or lower rotary as required.

If rotary figures on left print lighter than figures on right, or vice versa, loosen nut Q; push dark print side toward the front of machine and tighten nut Q. In the event that type print off feet, that is lower or upper figures light, nut K on rotary head is loosened and rotary head turned.

Note: Rotary head P correctly assembled should have the little dot on head of screw AY in line with the type figures that strike the platen.

Rotary P should release to print at the same time that the hammers are released to print.

Adjustment: Loosen screws AL and raise or lower trip arm AN.

On the beginning of the return stroke, rotary P should be clear of platen 1/8" or more before tabulation takes place.

Adjustment: Loosen nut on lower eccentric AJ and turn eccentric.

Rotary Calendar Feature Quick Set (Plate 36)

The rotary calendar mechanism is attached to the left side of the hammer section. The date, month and year are easily and quickly changed by turning graduated dials which are carried by a shaft extending through the case.

This mechanism is actuated by the machine operation, controlled by the carriage and disabled through bar, total and disabling keys.

Carriage Control

When a control roll contacts on lever A, bail C through link B swings latch F downward to clear the arm of part H.

The carriage control illustrated is the single bail control used in machines having only Rotary Calendar Feature on the left. Machines having Rotary Consecutive Numbering mechanism in addition, use the double bail control shown on the plate covering left calendar feature.

Disabling Control

This mechanism is disabled from three sources, viz.: Disabling Key shown on plate covering left calendar feature and Bar Control shown on the plate covering this mechanism.

When the total key is depressed, link T rocks bail Z, which swings part AL to block the arm of part H. When bar P is depressed, the right arm on shaft assembly R through arm S swings part AL to block the arm of part H.

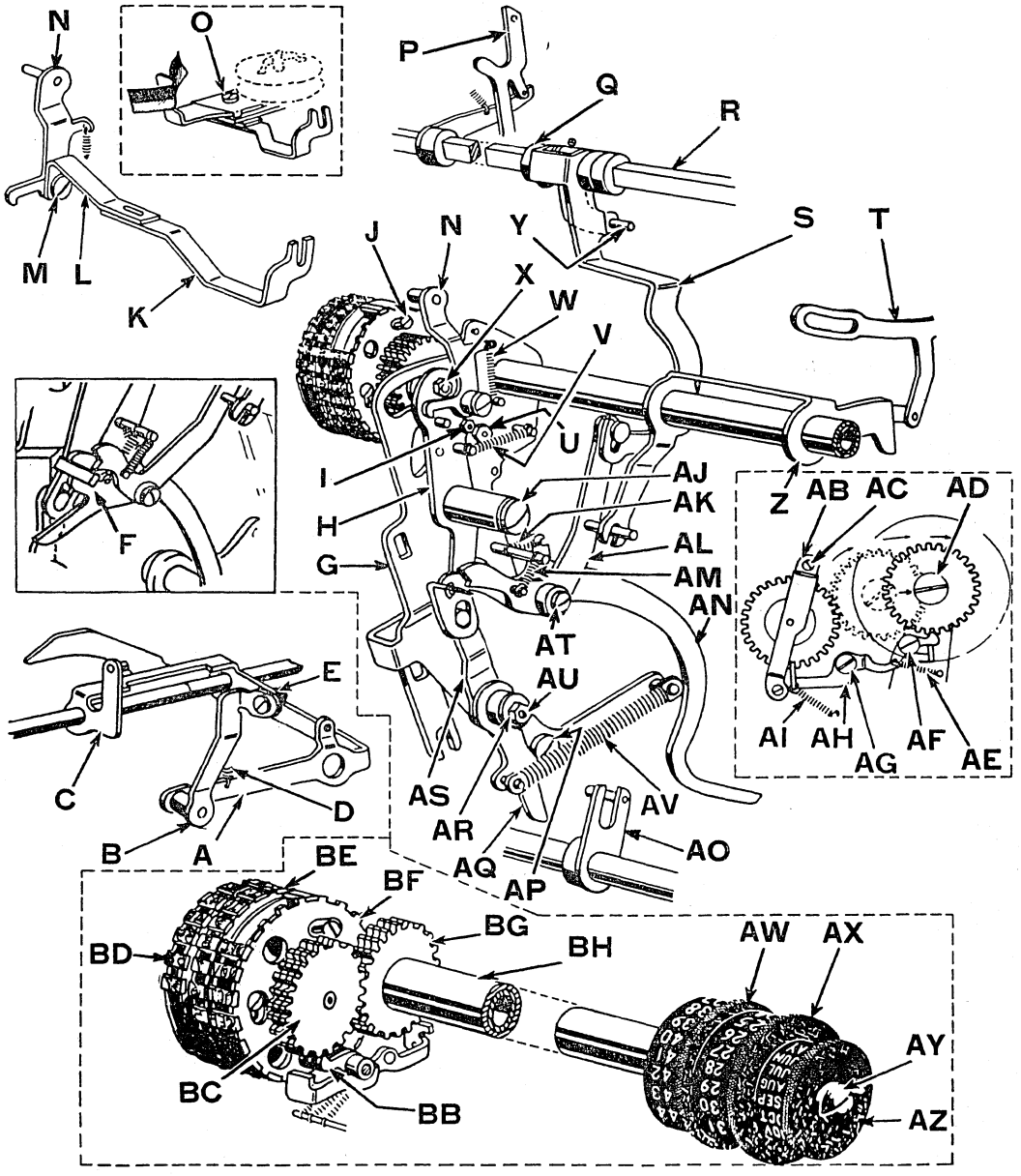
When the disabling key is latched down, part H is locked in normal position by part N.

Printing

During the early part of the forward stroke, driving spring AV is placed under tension by the stud in part AO of the main operating section. As the forward stroke is nearing completion, the dashpot supporting shaft (not shown) swings latch lever AN to clear the arm on lever H, which allows spring AV to drive the type assembly against the platen.

Type disk assemblies BD, BE and BF are held in alignment by detents BB. When the type are driven to stroke the platen, gear assemblies BC and BG are locked by part AH, which holds detents BB into the tooth spaces of gears BC.

ROTARY CALENDAR FEATURE; QUICK SET (Plate 36)



Tests and Adjustments

In the event that the type in printing position are out of step with the indications on drums AW, AX and AZ, the type disks are manually turned with the machine held in forward position.

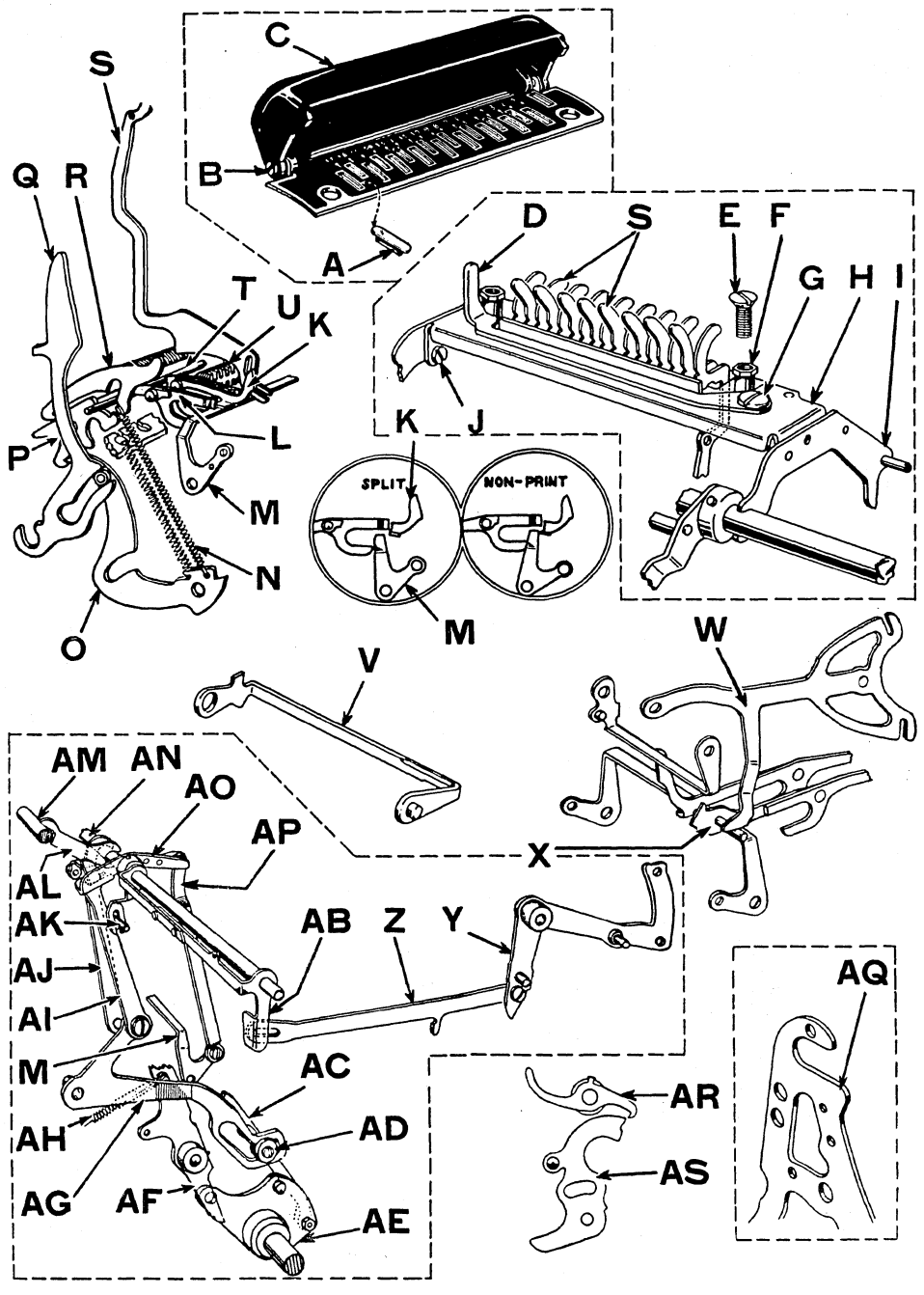
The alignment of the rotary type with the machine type is secured by loosening the nuts which hold the rotary assembly to the hammer section, raising or lowering the rotary assembly and tightening the nuts.

To align the type of the rotary disks with each other, screws J are loosened and the type turned as required. Screws J in disks BE and BD can be reached by turning disks in front of the one to be aligned until the holes of disks are in line with screws J. The printing release of the rotary assembly should take place as late as possible in order to expand driving spring AV to its maximum. The printing of the rotary should take place not earlier than the printing of the machine type.

Split Braces L and K

Split braces L and K are now used in all machines having the quick set rotary calendar feature. These braces hold the unit rigid to insure correct printing.

UNLIMITED SPLIT MECHANISM (Plate 37)



Unlimited Split Mechanism (Plate 37)

The unlimited split mechanism is a combination of cipher split and hammerblock mechanism; it is controlled by split levers S. The split levers are located directly to the rear of the No. 9 keys. There is a split lever for each column and one lever (D) for restoring split levers that were latched down.

The split levers have three positions: First: Normal. Second: When they are partly depressed and latched by the first notch; which prevents automatic cipher printing by disconnecting pawls P. Third: When the split levers are completely depressed and latched by the second notch; the hammerblock mechanism is thus set to become active when the total or sub-total keys are depressed in addition to causing cipher split.

The special pawls P which are used in the unlimited split mechanism have couplers K which swing on links L. The rear end of link L pivots on pawl P.

With the split levers normal, when one of pawls P is raised by latch R, link L moves toward the front of the machine, a step on link engages the coupler on the next right pawl P, moving it in the same direction which rocks pawl P and trips driver O.

Split levers S have a fork on their lower end, which is engaged with a roller stud in the upper part of coupler K. When a split lever is depressed and latched in the first notch, coupler K is lowered to clear the front edge of link L to the right, which prevents the release of driver O and stops the printing of ciphers to the right of the split.

When a split lever is completely depressed and latched on its second notch, the projection on coupler K is placed in the path of lower bail M. This second position of the split levers still retains the split for listing and adding operations. However, when the sub-total or total keys are depressed and the machine operated, bail M immediately moves forward with the couplers, which releases all drivers O to the right before springs N are under tension, allowing the hammers to move out without striking the type.

The movement of bail M is secured as follows: When either one of the total keys are depressed and the machine is operated, bail AB (pivots on shaft AN) is rocked, its forked end being engaged with stud AK moves the latter out of the slot and under lever AO.

During a machine operation with either total key depressed, cam arm AG is moved upward by stud and roller on AC, and since arm AI is carried by AG, lever AO is also moved upward, which causes shaft assembly to be rocked. The front part of lever AO and arm 3923R (not shown) move downward; this motion is applied to the horizontal arms of the bell-cranks on bail M through being connected by links AP, causing the bail to move toward the front of the machine.

Tests and Adjustments

When sub-total or total key is depressed, Z should move AB to properly limit arm AI without binding.

Adjustment: To increase or decrease the movement, AB is advanced to or retarded from Z.

Brace AL should fit snug in order to properly align shafts AM and AN. Test for no play between these shafts.

Adjustment: To eliminate play AL should be lengthened.

Brace AJ should fit snug under shaft AN. Test for no daylight between AJ and AN.

Adjustment: AJ should be lengthened when it does not fit snug under shaft AN.

When split levers are latched on the first notch, the projection of coupler K should clear lower bail M by .003″ to .004″. This amount of clearance is essential for all columns.

When a split lever is depressed to the second notch, the foot of W should release X when the sub-total or total key is depressed during a lower counter operation.

Adjustment: W is advanced toward the stud in X to secure more clearance between X and upper bail.

Test for free moving R. Depress all No. 1 keys and all split levers. Operate the machine a number of times. Failure to print indicates sticky R.

Test for true and free running shaft T. This test is to insure that pawls P will drop to their normal position when split levers are being restored.

Test for proper balance of springs AH and N and shaft T. List and add all figures 4. Depress all split levers except extreme left one to second notch, and sub-total. Restore each split lever and sub-total each column consecutively. When one or more figures fail to print, it can be due to weak AH or strong N, or shaft T binding.

When split levers are latched for hammer blocking (2nd notch) sub-total key depressed and handle started, drivers O should all be timed to release when roll AD (on AC) is on the peak of cam in lever AG.

Adjustment: The upper arm of AG is bent upward or downward.

Test for 1/64″ clearance between shaft 202 (not shown) and split levers.

Adjustment: To increase clearance, limit arms 1-219AL and AR (not shown) are adjusted to limit sooner on shaft 602 (not shown).

The clearance between the projection on coupler K and the end of link L should be about .002″. When the clearance exceeds .002″, it can seriously affect the timing of the machine by delaying the toggle release.

Adjustment: The printing section is removed and the offsets in link K lengthened or shortened.

Flanged shaft U must clear split levers when the handle is entirely forward with the split levers depressed to the second notch.

Adjustment: The lower part of AF is slightly bent from stud in AE, so as to provide a little play of AF.

(Plate 37—Continued)

Note: When this adjustment is made, the timing test should be applied for the reason that in unlimited split machines timing is very important. The clearance between AR and AS should be between 1/16″ and 1/32″. Test for side clearance of couplers, also for clearance between the projection of K and lower bail. Depress every other No. 1 key and also depress a split lever in the same columns. Operate the machine a number of times. Apply the same test to the No. 1 keys and split levers that were normal in the preceding test.

Crossfeed Ribbon Mechanism, Type 20 (Later Style) (Plate 38)

The purpose of the later ribbon mechanism is to feed the ribbon in either color position and also to secure positive ribbon reverse.

Slide A carries feed pawls F which turn ratchets AK. Slide A in turn is carried by lift slide B, which carries ratchets AK and the entire ribbon assembly.

Slide A is oscillated by feed slide W through the enclosed cam of bell-crank X and reverse link V. Slide A in the first style of this mechanism is oscillated by the main operating section through parts AY, BA, BB and BD, the latter meshes into and rocks lever BI which oscillates slide A through arm V and reverse flipper BK.

Ribbon Lift

The ribbon change from black to red is controlled from total keys, Plate 44, subtract lever, Plate 43, or carriage, Plate 41, joint manual and carriage control is by manual lever AO and from carriage by roll on lever AN. Joint control from carriage is by skid on lever BM or roll on lever AN, in combination with the mechanism shown on Plate 43, bell-crank F.

Ribbon Reverse

The ribbon reverse takes place when the ribbon is unwound sufficiently to permit the upper arm of part K to drop into the spool opening, which locates the lower arm of K to block pawl lever G, preventing the complete movement of slide A, causing reverse flipper BK to swing to the opposite side, which results in the ribbon winding up on the empty spool.

Tests and Adjustments

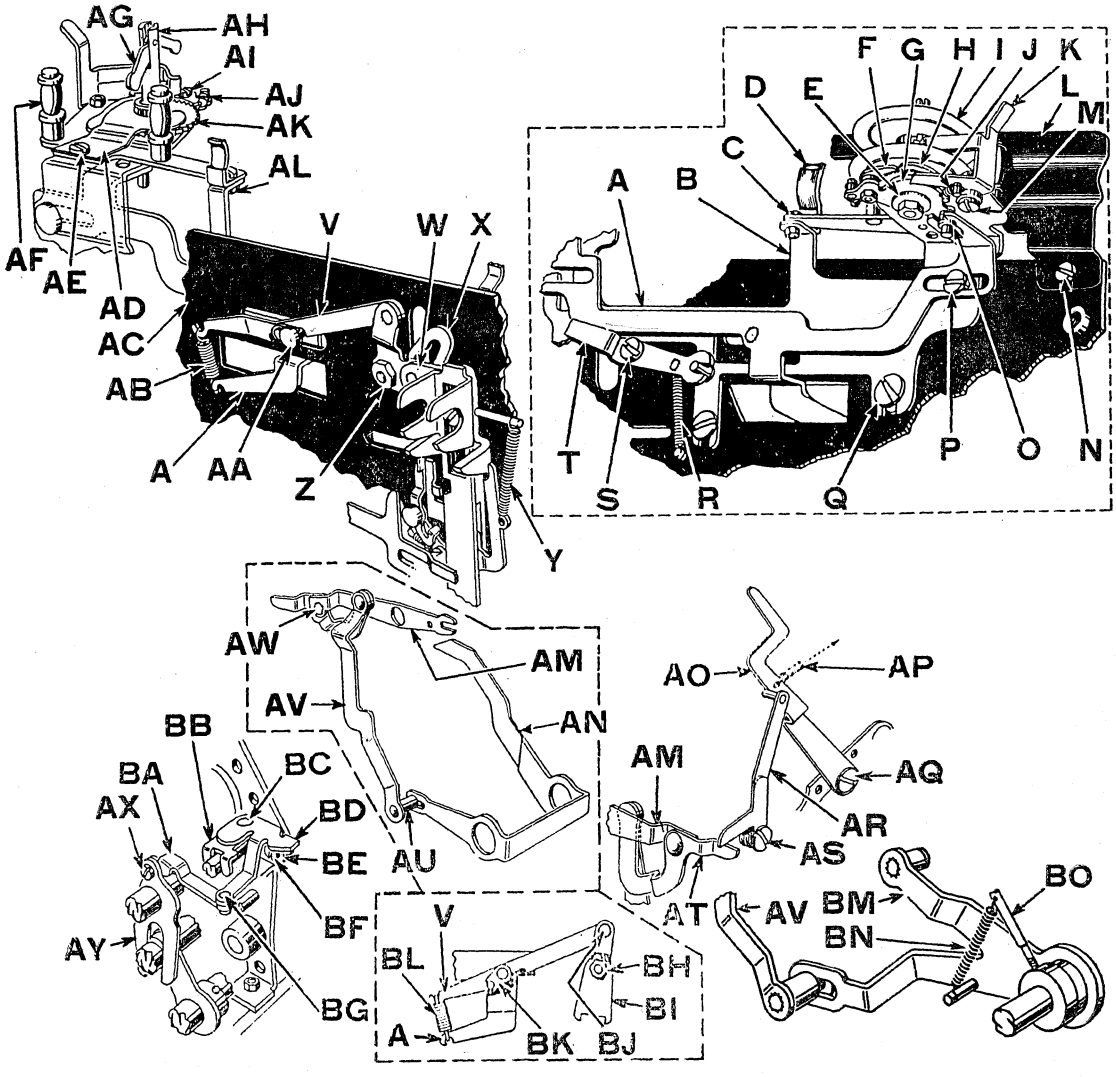
Feed pawls F should pick up 5½ teeth when winding up the ribbon on either side.

To pick up the correct number of teeth, pivot screws AI are loosened and located in the slot of pawl lever G as required.

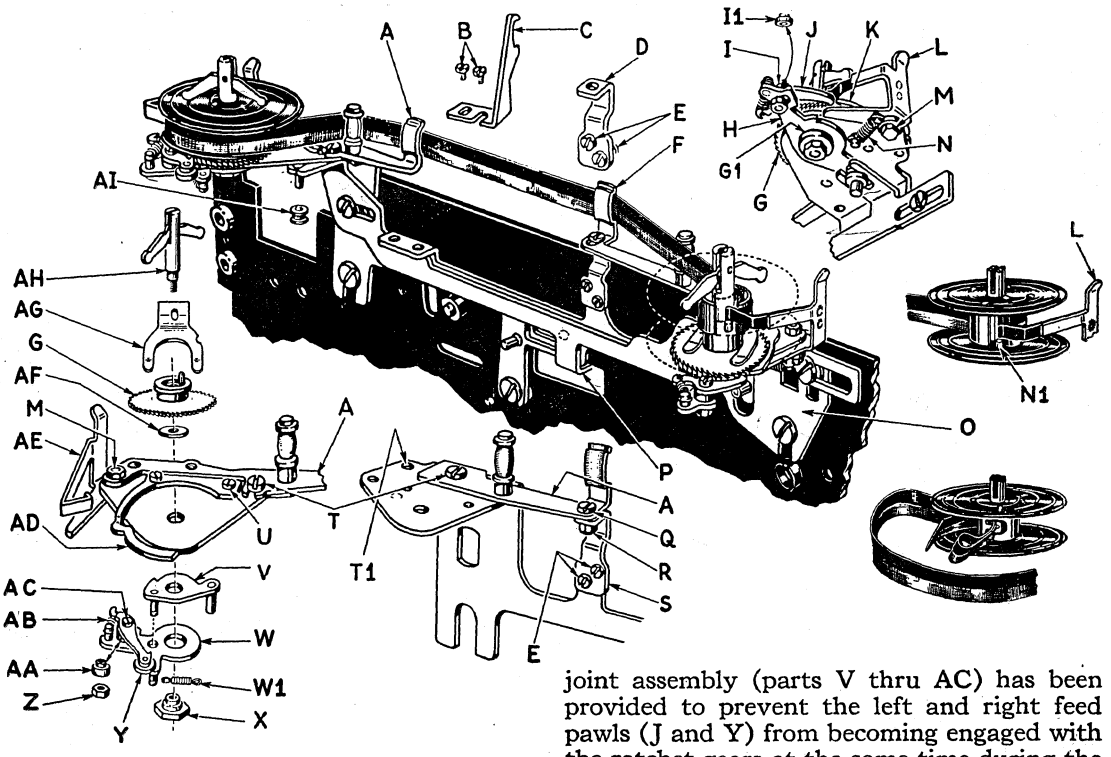
The drag of active feed pawl F on the idle stroke is held in control by the friction springs AD, which are adjusted as required. In the first style of this mechanism, the feeding movement should be equalized which is accomplished by turning eccentric shoulder screw BH.

Note: The ribbon in this late mechanism runs off the outside of the spool compared to the ribbon in the early mechanism which runs off the inside of the spool as shown on Plate 39.

CROSSFEED RIBBON MECHANISM
(Type 20, Later Style) (Plate 38)



CROSSFEED RIBBON MECHANISM (IMPROVED)
(Classes 20 thru 30) (Plate 38-1)



Crossfeed Ribbon Mechanism, Improved (Classes 20 thru 30 Machines) (Plate 38-1)

Purpose

By redesigning the left spool assembly, an improved Ribbon Mechanism has been provided, which enables winding of the ribbon onto the left spool (as well as onto the right spool) during the return machine stroke. By feeding the ribbon only on the return stroke, ribbon slack resulting from printing is taken up as the type sectors are being restored—the tendency of the ribbon's becoming entangled with the type thus being eliminated.

Construction

The improved mechanism provides for the ribbon's running off the inside of the left spool and off the outside of the right spool.

Some of the earlier machines equipped with this mechanism did not include the latest improvements. The conversion of the earlier mechanism requires parts F, K, L, V, W, W1, X, Z, AA, G1, and AC.

The location of the post in part F has been moved to the left so that it will have a guiding effect on the ribbon at all times.

The upper arm of part L, is now designed to insure the proper indexing of the reverse mechanism.

Part K has been lengthened, and a broken joint assembly (parts V thru AC) has been provided to prevent the left and right feed pawls (J and Y) from becoming engaged with the ratchet gears at the same time during the machine operation.

Installation

When installing the improved Ribbon Mechanism on Field Machines remove the guide roller from point T1.

Installation on machines not equipped with a Rotary Printing Device requires parts A, G (one required), AE, L, AD, M (two required), Z, V, W, W1, X, Y, AA, AC, F, G1, and K.

Machines equipped with a Rotary Printing Device assembled on the right require additional parts Q, S, R, and E (two required).

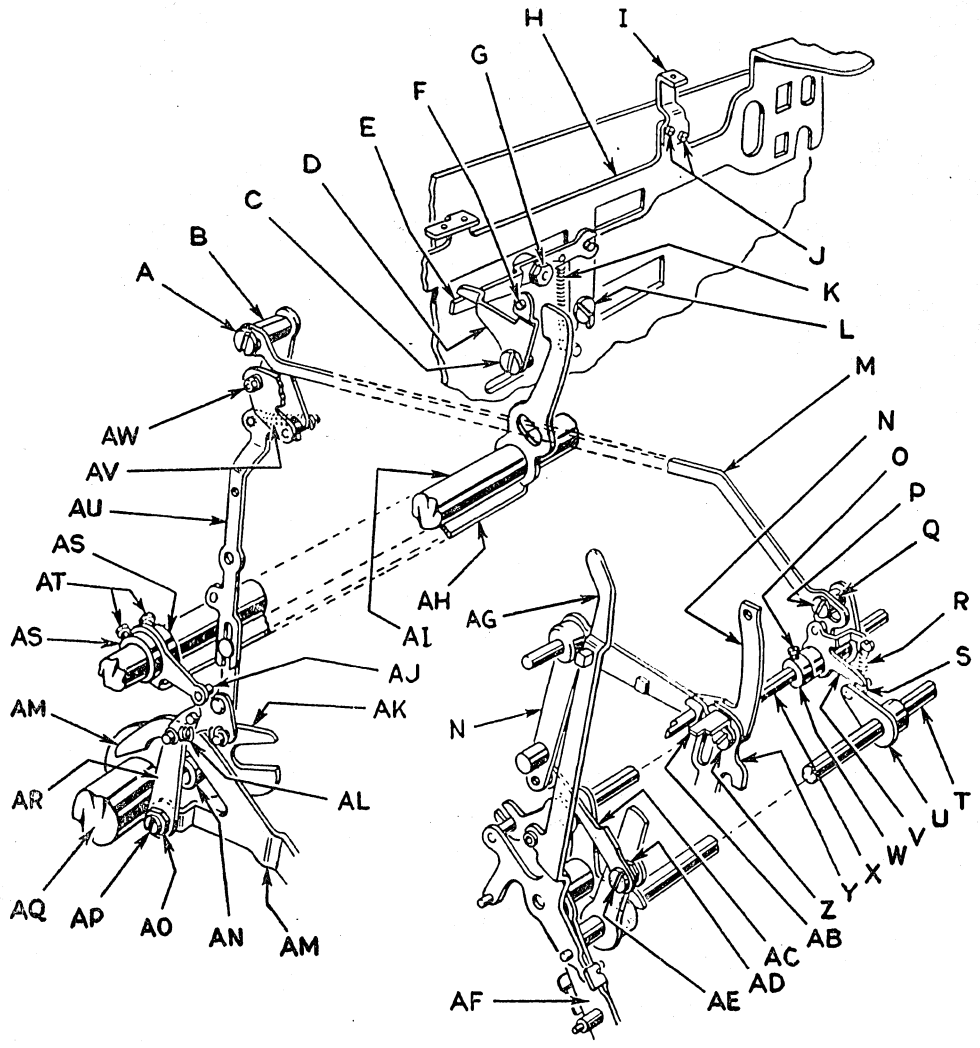
Machines equipped with a Rotary Printing Device assembled on the left require additional parts F, D, E (two required), and A (1-205102AL No. 2 Style 13).

To facilitate the installation in a machine not covered in the above paragraphs, it is recommended that the machine number be furnished the Service Research Department so that they may arrive at the correct consistency of parts.

Operation

As the inner feed slide (W, Plate 38, Printing Symbol List) is lowered on the forward machine stroke, slide P is moved to the left (through bellcrank X and reverse link V, Plate 38), and feed pawls J and Y are moved to the right through part H, and

RIBBON SHIFT, CONTROLLED THROUGH THE COUNTER CONTROL LEVER AND THE TOTAL KEYS (Plate 38-2)



Ribbon Shift, Controlled Through the Counter Control Lever and the Total Keys (Plate 38-2)

Purpose

To print all minus totals in a contrasting color.

Construction

Link M is controlled by the counter control lever and the total keys. The link, when located in its rearward (normal) position allows the Ribbon Shift Mechanism to remain inactive; and when the link is shifted forward, causes the Ribbon Shift Mechanism to become active.

Operation

The counter control lever AG, when shifted to subtract position, swings stud Q, through shaft X, to the forward end of slot in link M. With stud Q so positioned, a depression of a total key rotates shaft T and lowers stud S, which, through spring R and bellcrank V, moves link M forward. The latter rocks arm AU to align the pawl on link AR under stud AJ. As the machine operates, roller AN, through cam AM, raises link AR to rock bail AH, which, through bellcrank D, rocks lever E to raise slide H; thus raising the ribbon in position to print a contrasting color.

When counter control lever AG is in subtract position, with the total keys normal,

(Plate 38 Text Continued on Page 39B)
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(Plate 38-2)—Continued

stud S, through bellcrank V holds link M in its rearward position.

Link M, when so positioned, through arm AU positions the pawl on link AR to clear stud AJ, thus allowing the Ribbon Shift Mechanism to remain inactive.

When the counter control lever is in add position, stud Q holds link M in its rearward position and causes spring R to yield when the total keys are depressed.

Adjustment

1. When the machine is normal, there should be slight clearance between stud F and the upper arm of bail AH.

To adjust, move limit screw AT in collar AS up or down.

2. The pawl in link AR should clear stud AJ by approximately 1/32″ when the machine is operated with the counter control lever in subtract position and the total key normal; and, when the counter control lever is in add position with the total key depressed.

To adjust, bend arm AU.

3. The pawl on link AR should have clearance under stud AJ when the machine is normal; and should rock bail AH sufficiently to raise slide H to its limit when the machine is operated with the Ribbon Shift Mechanism indexed.

To adjust, turn eccentric bushing AO.

(*Plate 38-1—Continued*)

assembly V and W respectively. On the return machine stroke, as slide P is moved to the right, feed pawls J and Y are moved to the left to wind the ribbon onto either the left or right ribbon spool, depending upon which of the two pawls is active.

WHEN THE STUD in slide P is located in the right pocket of the reverse link (V, Plate 38), the disc of feed pawl Y rides on the outer surface of part AD, during both the forward and return machine strokes, holding feed pawl Y out of mesh with ratchet gear G, and feed pawl J, being permitted to mesh with ratchet gear G, turns gear G on the return machine stroke to wind the ribbon onto the right spool.

When the stud in slide P is located in the left pocket of the reverse link (V, Plate 38), the action of the feed pawls is reversed: feed pawl J, being repositioned to the right by slide P, is held inactive by contacting on the outer surface of part K; and feed pawl Y, being permitted to mesh with ratchet gear G, turns gear G on the return machine stroke to wind the ribbon onto the left spool.

RIBBON REVERSAL takes place when the ribbon on the left or right spool is unwound sufficiently to permit the upper arm of part AE or L to drop into an opening in its respective spool, thus locating the lower arm of part AE or L in the path of a notch in part V or H, respectively. By blocking part H in this manner, as the ribbon has been fully unwound from the right spool, the complete "idling" movement of slide P is prevented during the forward machine stroke, causing the reverse flipper (BK, Plate 38) to raise the reverse link (V, Plate 38) and the right pocket of the latter to engage the stud in slide P.

When part V is blocked in a manner described above, the complete "feeding" movement of slide P is prevented during the return machine stroke, causing the reverse flipper (BK, Plate 38) to raise the reverse link (V, Plate 38) and the left pocket of the latter to engage the stud in slide P. Repositioning the stud in slide P in the opposite pocket of the reverse link (V, Plate 38) changes the position of slide P and of feed pawls Y and J, reversing the action of the feed pawls and causing the ribbon to wind onto the opposite spool.

Adjustment

The ribbon should be attached to the left and right ribbon spools as shown in the illustration. If improperly installed, the ribbon may interfere with arm AE or L, preventing the indexing of the Ribbon Reverse Mechanism.

1. At the end of the return stroke of the machine operation (with the ribbon being wound onto the left ribbon spool) the flange of feed pawl Y should limit on the beveled surface of part AD without raising the feed pawl out of engagement with ratchet gear G.

To adjust, loosen screw AC and shift feed pawl Y as required.

2. When the ribbon's feeding direction is reversed—so that the ribbon will wind onto the right ribbon spool—feed pawl Y should be raised out of engagement with ratchet gear G, before pawl J engages the ratchet gear.

To adjust, loosen screw I and shift feed pawl J as required.

3. With the ribbon unwound sufficiently (from the right or left ribbon spool) to permit the upper arm of part L or AE to drop into the opening of its respective ribbon spool, the upper arm of part L or AE should have slight clearance over stud N1.

To adjust, raise or lower the upper arm of part AE or L.

4. With one full turn of the ribbon wound onto either the left or right ribbon spool, the lower arm of part AE or L should clear the notch of part V or H respectively (during the machine operation) by approximately 1/32".

To adjust, bend the upper arm of part AE or L toward or away from the ribbon spool.

5. Springs AG should prevent the ratchet gears G from being turned by their respective feed pawls on the forward stroke of the machine.

To adjust, bend the springs to increase the tension on the ratchet gears.

Note: The bushings in ratchet gears G, and the contact points between the ratchet gears and springs AG should be lubricated before condition No. 5 (above) is effected.

6. The high points of eccentric screws M should be set away from the respective ribbon posts, in order to provide (for easy installation and removal of ribbon spools) clearance between the ribbon spools and the upper arms of parts AE and L.

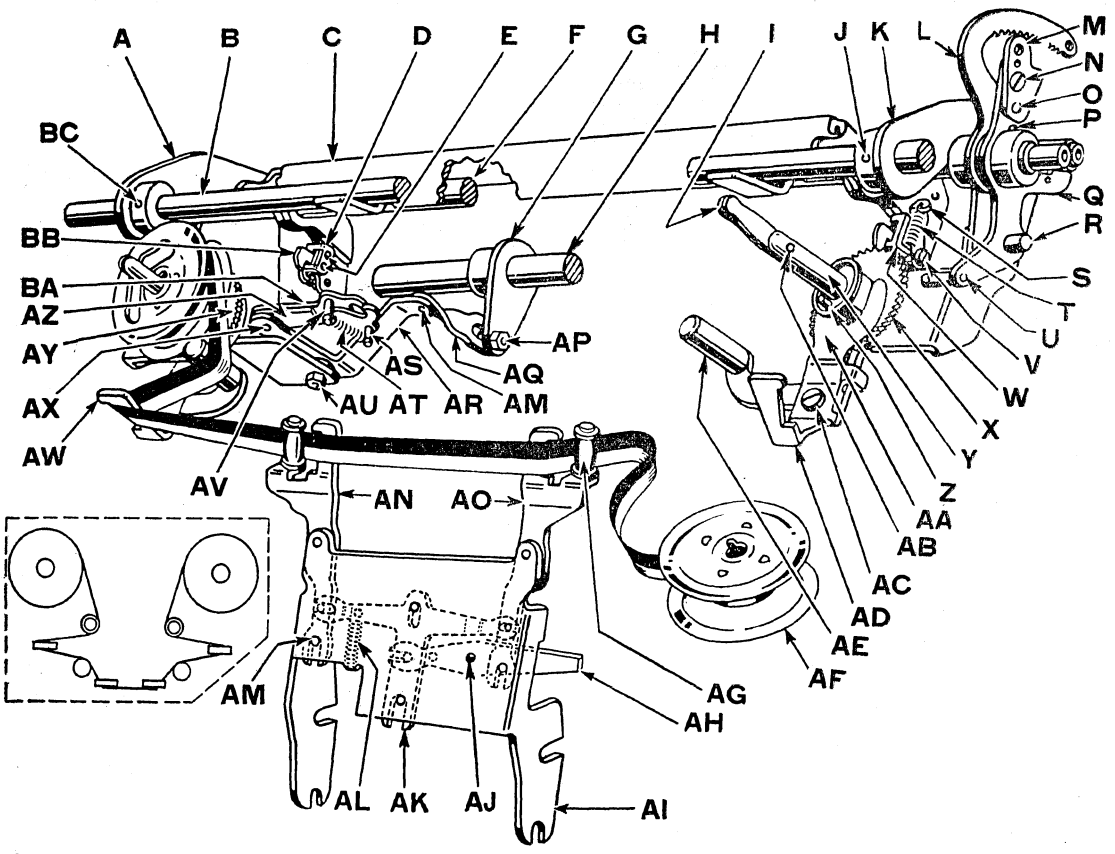
7. When the ribbon is unwound sufficiently from the right spool to permit the upper arm of part L to drop into the opening of the spool, the notch in part H should have approximately 1/64" latching lead beyond the extremity of the lower arm of part L at the end of the return machine stroke.

To adjust, turn eccentric screw M on the right spool assembly.

8. When the ribbon is unwound sufficiently from the left spool to permit the upper arm of part AE to drop into the opening of the spool, the notch in part V should have approximately 1/64" latching lead beyond the extremity of the lower arm of part AE at the end of the forward machine stroke.

To adjust, turn eccentric screw M on the left spool assembly.

CROSSFEED RIBBON MECHANISM (Type 20, Early Style) (Plate 39)



Crossfeed Ribbon Mechanism Type 20 (Early Style) (Plate 39)

This mechanism has been superseded by the later style shown on Plate 38, it is however, still used in machines having the quick set rotary calendar feature.

Actuating Movement

Ribbon spools AF are turned by pawls BB which pivot on the right and left end of oscillating bail C. The movement is applied to bail C by shaft H through arm G, link AQ, bell-crank AR and reverse links BA.

Ribbon spools AF revolve on posts Y. Spools AF seat on the hubs of ratchets X, a pin in A seating in the hole of spools AF, the latter are held on posts Y by wings I which pivot in the slot of Y.

During each machine operation, only one of the two feed pawls engages and turns one of the ribbon spools winding the ribbon off the other spool. The inactive feed pawl does not contact on the spool.

The ribbon spool which is being unwound is held taut by friction spring AA. When the ribbon has been completely unwound, a strain is placed on ribbon reverse links BA which causes the stud in bail C to move into the other pocket of reverse links BA, resulting in the opposite feed pawl BB becoming active and the ribbon winding on the empty spool. The ribbon is guided by vertical rollers AE and AG.

Tests and Adjustments

Arm AR should be free with minimum play, free at all joints. Test with handle normal and forward.

Reverse links BA should align in center of the stud in C without bind in either pocket. Feed pawls BB should be free and engage six teeth of ratchet. Feed pawls BB should not unwind ribbon returning from feed stroke. To adjust, bend K.

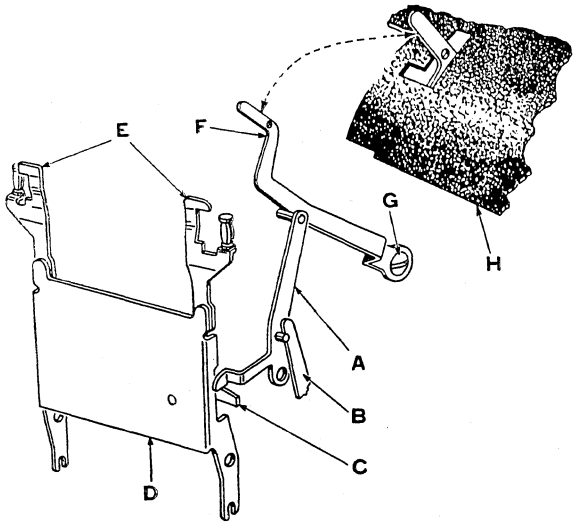
Tension of spring AA should be sufficient to prevent loose winding which would cause delayed reverse. Ribbon spools AF should be free on Y and fit snug on the pin without binding. Test spool on post, drawing ribbon from spool by hand.

Wings I should be free and hold ribbon on hub. Rollers AE on AD should be free and parallel with the ribbon spool. Adjust end of AD to feed ribbon in center of spool.

Guides AG should hold ribbon from type without soiling ledger with journal and carbon around platen.

Assembly AN and AO should be free and restoring spring AL have sufficient tension to restore AN and AO after taking subtract total.

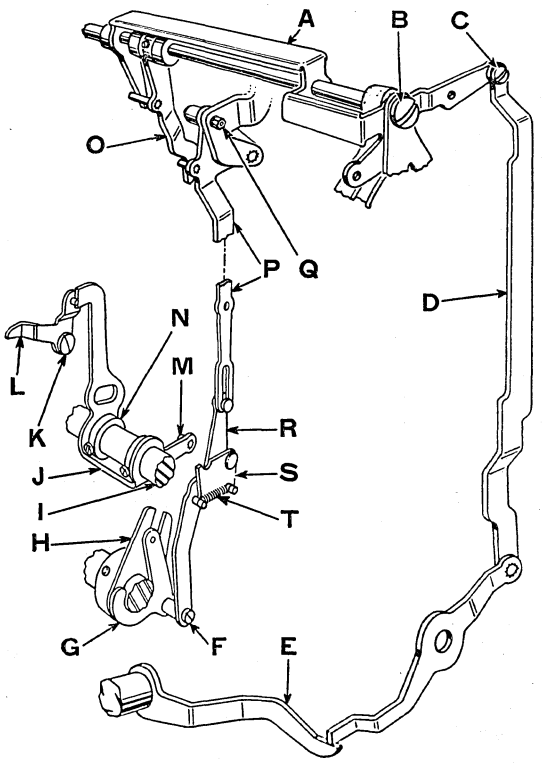
ITEMS TO PRINT IN RED, MANUAL CONTROL (Plate 40)



Items to Print in Red, Manual Control (Plate 40)

The purpose of this mechanism is to raise and hold the red portion of the ribbon in printing position. Lever F when pushed downward rocks lever A which in turn rocks lever C, raising ribbon guides E and the ribbon.

ITEMS TO PRINT IN RED, CARRIAGE CONTROLLED, FOR LATER RIBBON MECHANISM (Plate 41)



Items to Print in Red, Carriage Controlled, for Later Ribbon Mechanism (Plate 41)

When the carriage moves a skid on lever E, assembly D rocks bail A, which through arm O swings parts P and R rearward to locate pawl S in the path of stud M. At the beginning of the machine operation, part H of the main operating section rocks assembly G, raising part R, which rocks assembly J and bell-crank L; the latter contacts on ribbon lift lever shown as T (on Plate 38).

Note: Eight point printing control from the carriage is excluded with this mechanism owing to the fact that bail A is used

FIGURE 1, ITEMS TO PRINT IN RED, CARRIAGE CONTROLLED (Early Style) (Plate 42)

FIGURE 2, ITEMS TO PRINT IN RED, SUBTRACT LEVER CONTROLLED (Early Style) (Plate 42)

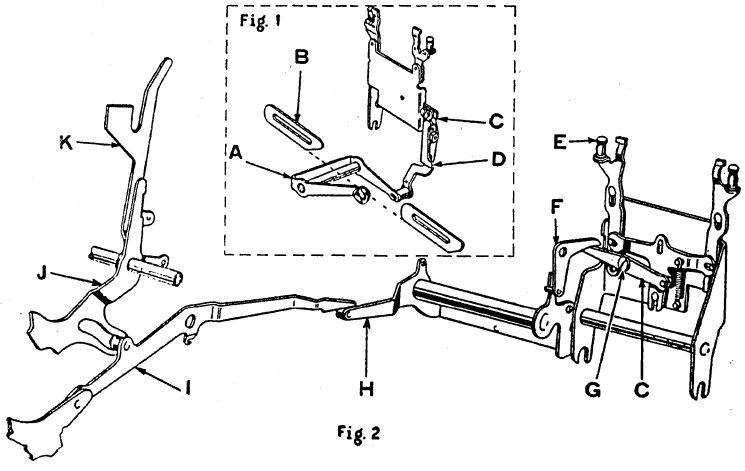
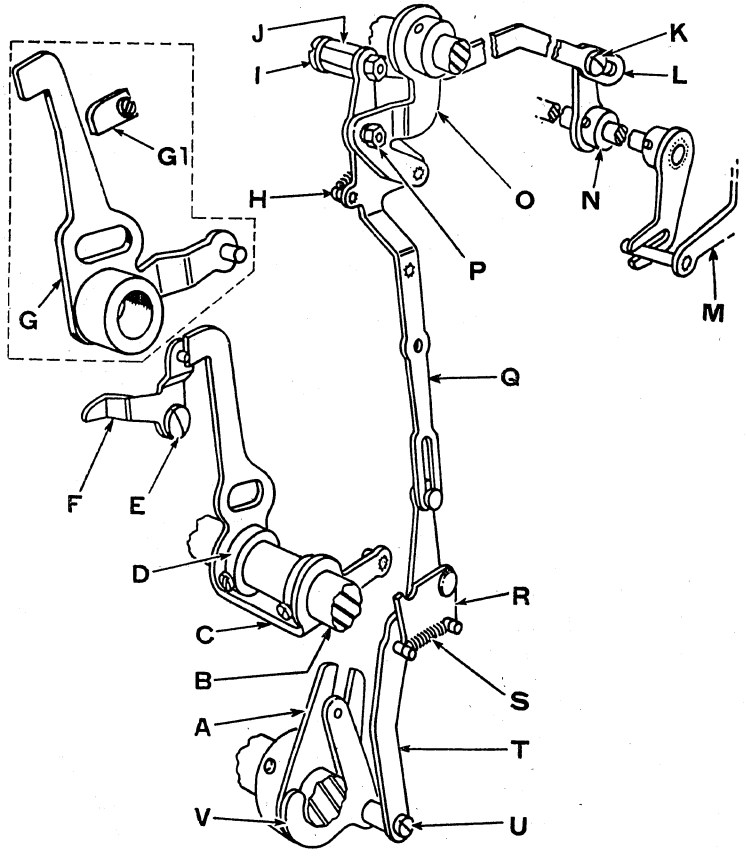


Fig. 2

ITEMS TO PRINT IN RED, SUBTRACT LEVER CONTROLLED (Later) (Plate 43)



Items to Print in Red, Carriage Controlled, Early Style Ribbon Mechanism (Plate 42)

The purpose of this mechanism is to print items in red in selected carriage positions. Carriage moves skid B onto the rear arm of bail A, the front arm of A through link D rocks lever C, which raises the red portion of the ribbon.

Items to Print in Red, Subtract Lever Controlled, Early Style (Plate 42)

The purpose of this mechanism is to print subtracted items and credit balances in red.

When the machine is operated with subtract lever K in subtract position, lever I rocks bail H, which rocks lever C through bell-crank F. The movement of lever C raises the red portion of the ribbon.

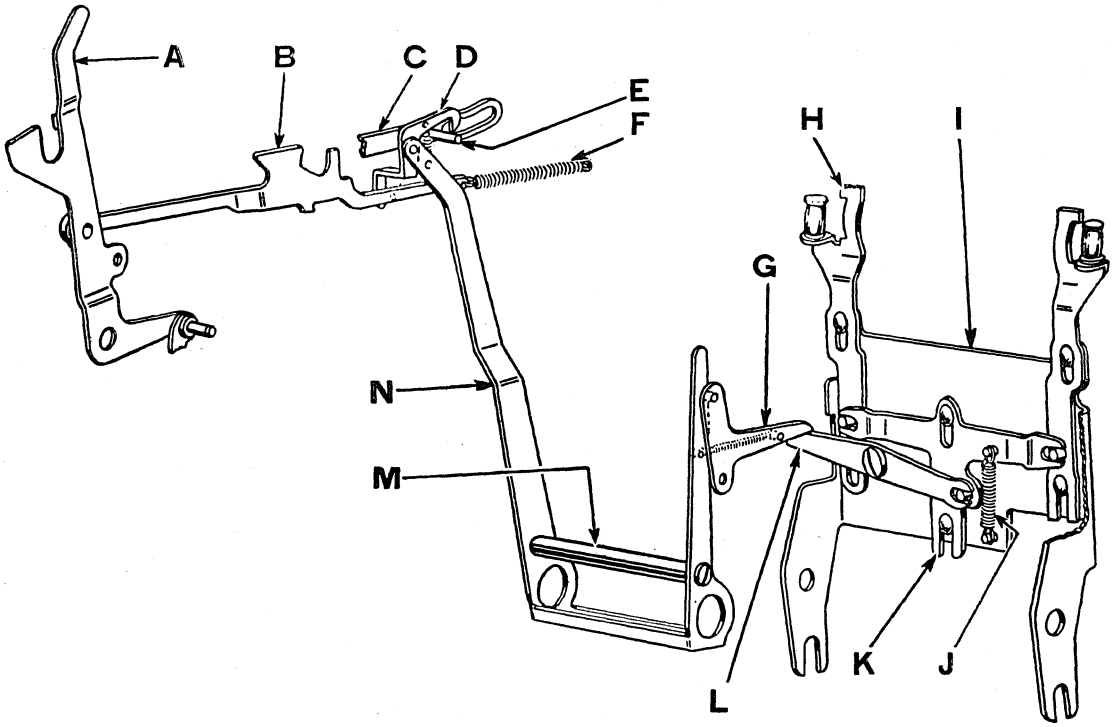
Items to Print in Red, Subtract Lever Controlled (Later) (Plate 43)

This mechanism operates in connection with the "Crossfeed Ribbon, Later" covered by Plate 38.

When subtract lever M is moved to subtract position, assembly N is rocked which through link L and lever Q locates passby pawl R in the path of the stud in bail C.

At the beginning of the machine operation, part A of the main section rocks assembly V raising part T which in turn rocks bail assembly C and bell-crank F, the latter contacts on ribbon lift lever, (shown as T on Plate 38) to actuate the ribbon lift.

TOTALS TO PRINT IN RED WITH SUBTRACT LEVER IN SUBTRACT POSITION (Plate 44)



Totals to Print in Red With Subtract Lever in Subtract Position (Early and Late Styles Ribbon Mechanism) (Plate 44)

When subtract lever A is pulled to subtract position, the forward movement of B permits spring F to pull hook lever D over stud E. When the total key is depressed, link C rocks bail assembly N, which rocks lever L through intermediate arm G. Lever L raises cross piece K, which raises the red portion of the ribbon.

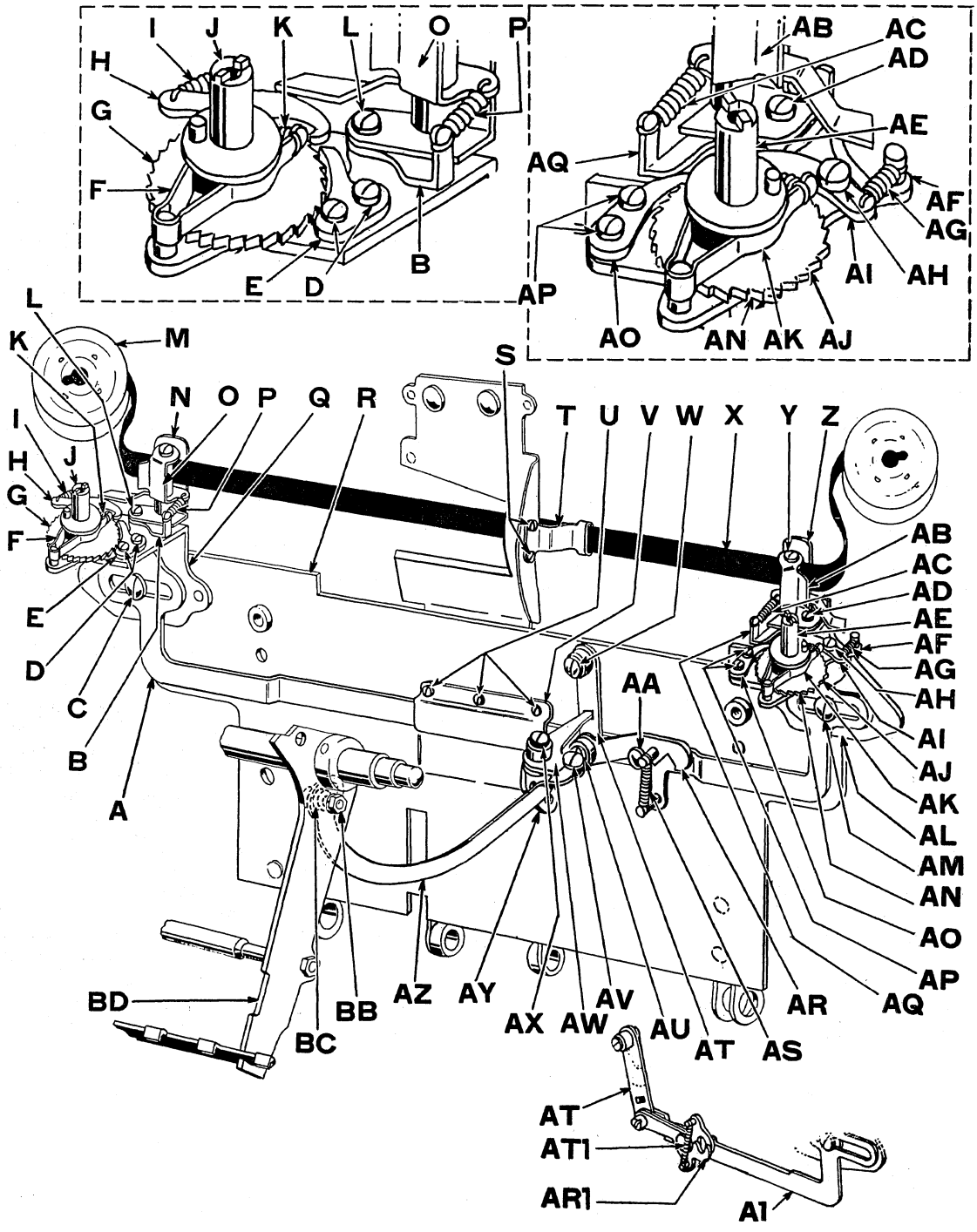
Tests and Adjustments

Lever L, cross piece K and ribbon guides H are carried by bracket I, on which they pivot; these parts must be free moving with spring J unhooked.

Intermediate arm G must barely contact on K when the total key is normal.

In late style ribbon mechanisms, intermediate arm G contacts on lever T (Plate 38) which raises the red portion of the ribbon.

CROSSFEED RIBBON FEATURE 69 (Style 2 09 09, Tally Roll) (Plate 45)



Crossfeed Ribbon Fte. 69 (Plate 45)

Machines with this crossfeed ribbon mechanism are equipped with double spring hammer sections regular 5 carbon construction.

The crossfeed ribbon mechanism is assembled on back plate R. Ratchet wheel assemblies G and AJ are carried by brackets Q and AL; standard ribbon posts J and AE being used.

During each machine operation one of the ratchet wheel assemblies is turned by feed pawls H and AI to wind the ribbon. The other ratchet wheel assembly is sufficiently turned by feed pawl to hold the ribbon taut.

Feed pawls H and AI are actuated by the machine movement as follows: Link AZ connects arm BD with one arm of bell-crank lever AW, the other arm of bell-crank AW is seated in a slot of arm AT which carries arm AR, the latter has two slots one of which engages W in oscillating slide A to rock pivot arms AF which carry feed pawls H and AI.

The machine movement causes the feed pawl to engage the fifth tooth of the winding ratchet wheel and the first tooth of the unwinding ratchet wheel.

Tests and Adjustments

The machine movement must be equalized to insure that the feed pawls will engage the correct number of teeth of the ratchet wheels, which is indicated by an equal amount of clearance between spring studs in pivot arm AF and brackets B and AQ. This test should be applied to one stud, the ribbon reversed and applied to the other stud.

Adjustment: Later machines are equipped with eccentric AV which connects link AZ and bell-crank AW. Eccentric AV is turned in order to equalize the clearance between stud in AF and brackets B and AQ. Early machines have non-eccentric stud, 56 Fte. 69, which necessitates the removal of link AZ and to lengthen or shorten it by bending.

Feed pawls H and AI are disengaged by cams E and AO which should be tested to permit the engagement of one tooth of each ratchet when it is in unwinding position. In the event that one tooth fails to engage when unwinding a little stock is removed from cam.

Ribbon Reverse Timing

When the ribbon has been unwound the decreased diameter of the ribbon spool causes the ribbon to swing reverse arm O or AB in the path of spring stud in AF blocking the movement of oscillating slide A allowing the machine movement to exert a pull on arm AR disengaging one slot and seating the other on roller A, thereby reversing the ribbon mechanism.

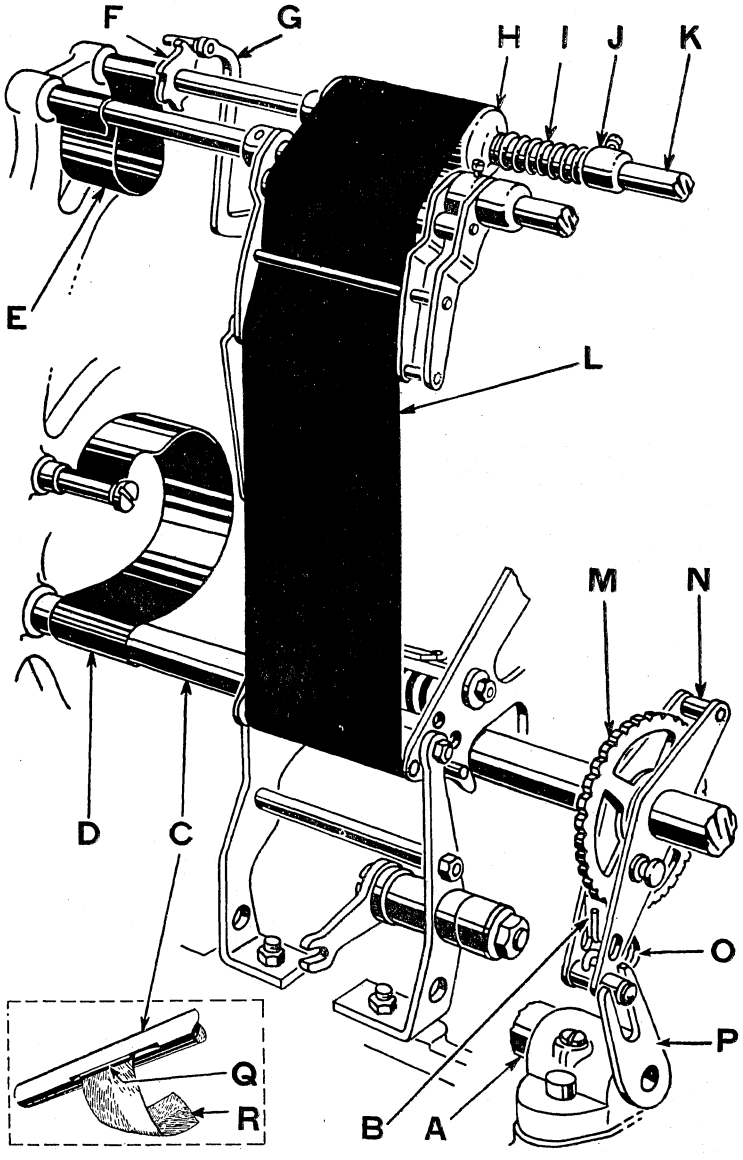
Tests and Adjustments

Reverse arms O and AB are timed for earlier or later release by bending rearward or forward the lip of arms O and AB. When making this adjustment test for slight clearance between studs in AF and the arms on O and AB after the reverse has taken place.

Installing Ribbons

Remove ribbon cap screw and ribbon cap. Remove ribbon spools and ribbon end from the empty spool. Double fold small part of the new ribbon, thread through the empty spool and hook. Place spools so that ribbon will run off the outside between reverse levers O and AB and vertical guides N and Z. With spring hook place ribbon in guide T.

RIBBON MECHANISM, VERTICAL
(Classes 1, 2, 6 and 11 thru 16) (Plate 46)



Ribbon Mechanism, Vertical (Plate 46)

The vertical ribbon mechanism is the earlier style and is still used in Classes 1, 2, 6 and 11 thru 16. Type 20 machines use the horizontal style which permits selective printing of different color totals and subtracted amounts.

The vertical ribbon provides multi-colored printing of one or more columns, however the printing color is fixed.

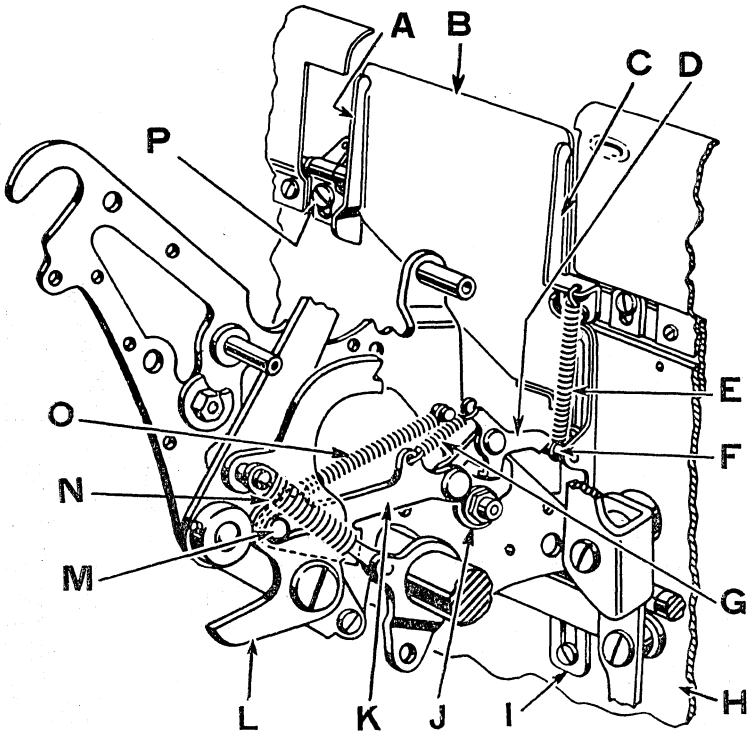
Shaft C serves as the lower spool and is the reversing medium, carrying ratchet wheel M. Feed pawl B pivots in oscillating frame N which receives its movement from forked arm P on main operating shaft A. Feed pawl B is held in contact with ratchet M by spring O which permits pawl B to operate on either side of ratchet M.

When the ratchet has wound the entire ribbon off upper spool H, a continued pull throws feed pawl B to the opposite side of ratchet wheel M which by reversing the shaft movement unwinds the ribbon off shaft C. Upper spool H which is constantly being rotated by arm G takes up the ribbon as it unwinds off shaft C. Upper spool H is free on shaft K and is held against a fixed collar by spring I. When the upper spool is winding up the ribbon, H is turning with shaft K. When the upper spool is unwinding, it turns in opposite direction which insures tight winding of the ribbon on shaft C which is necessary to insure positive reversal and catching in the ribbon.

Springs D and E are used to overcome the drag of feed pawl B on ratchet M and of arm G on ratchet F. Spring D should have sufficient tension to overcome the tension of spring O; the latter should have sufficient tension to insure tight winding.

Springs D and E should provide smooth friction, biting action interferes with the reverse. In the event that these springs have a biting action, a few light hammer blows on the spring loop around the shaft will usually correct this condition. The springs should occasionally be pushed aside and a drop of oil put on the shaft.

RIBBON SHUTTER MECHANISM
(Classes 6, 11 thru 16) (Plate 47)

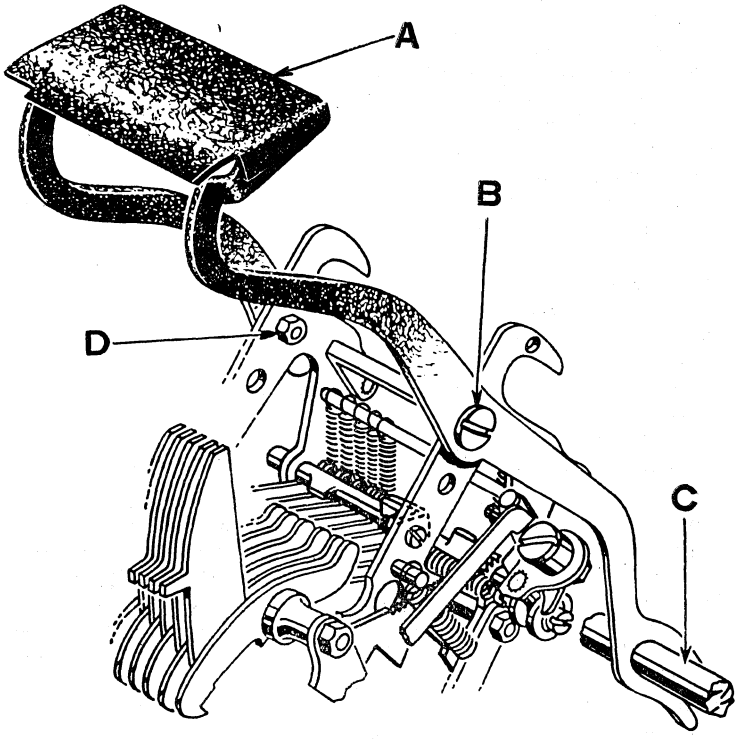


Ribbon Shutter Mechanism (Plate 47)

The purpose of the ribbon shutter mechanism is to prevent forms wedging in the line finder when the forms are being inserted.

Ribbon shutter B slides on back plate H. When toggle release L moves rearward, spring O drives assembly K rearward, bell-crank D contacting spring stud F pulls ribbon shutter B downward. Assembly K is restored by driver restoring assembly M on the return stroke. Ribbon shutter B is restored by springs E.

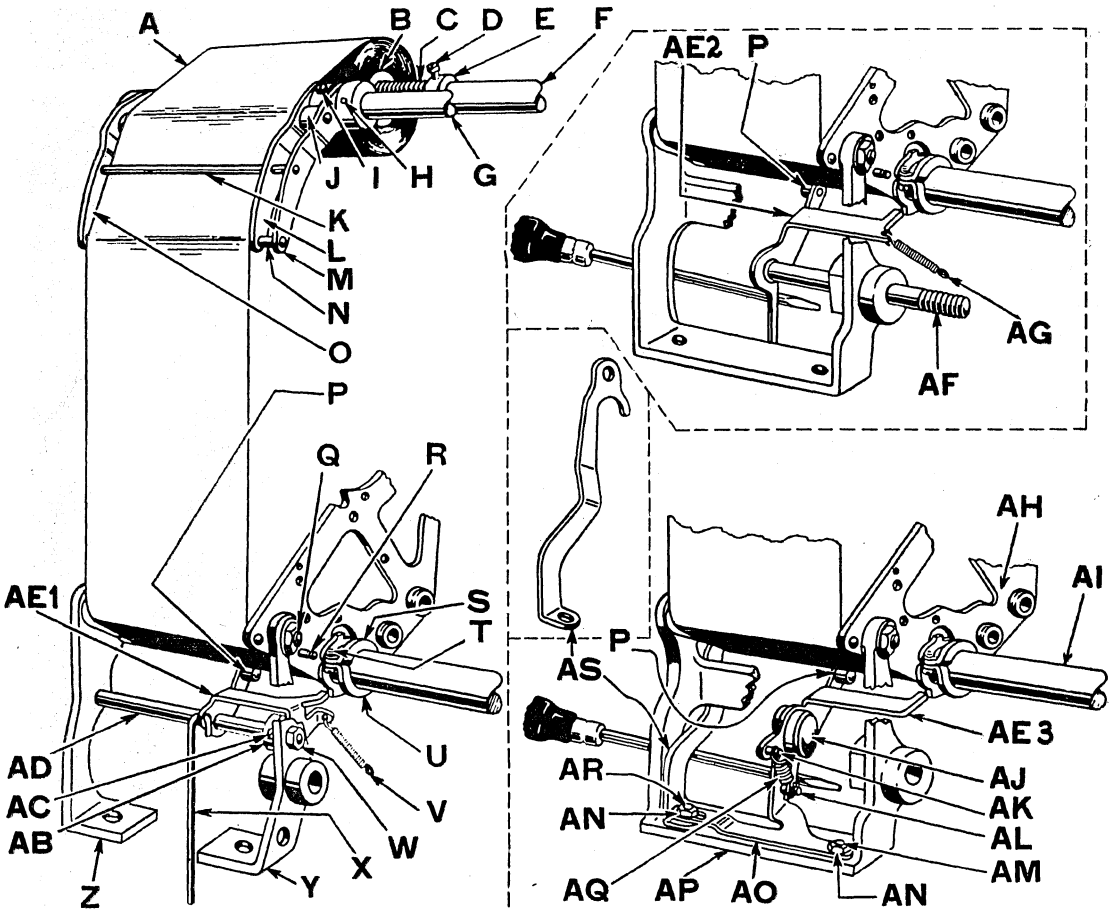
CASE SHUTTER (Plate 48)



Case Shutter (Plate 48)

The purpose of shutter A is to close the case when the machine is not in action. When the machine operation begins, shaft C rocks the arms of shutter A which swing shutter A above the opening in the case to allow the type sectors to move upward.

RAPID RIBBON CHANGE DEVICE (Plate 49)



Rapid Ribbon Change Device (Plate 49)

This mechanism permits installing new ribbons without lowering the carriage. This result is secured by using a long tape which can be pulled above the platen, to permit pinning the ribbon.

The ribbon reverse is advanced to take place before the long tape reaches the No. 9 type when the ribbon has unwound as follows:

The roller on part AE contacting on the ribbon raises with the unwinding of the ribbon, blocking shaft AI which has the same effect as when the short tape completely unwinds. To change the ribbon in the rapid change mechanism, it is necessary to swing the arm of AE downward with a screw driver or push up rod X and pull the tape upward sufficiently high to remove and replace the pin holding the ribbon.

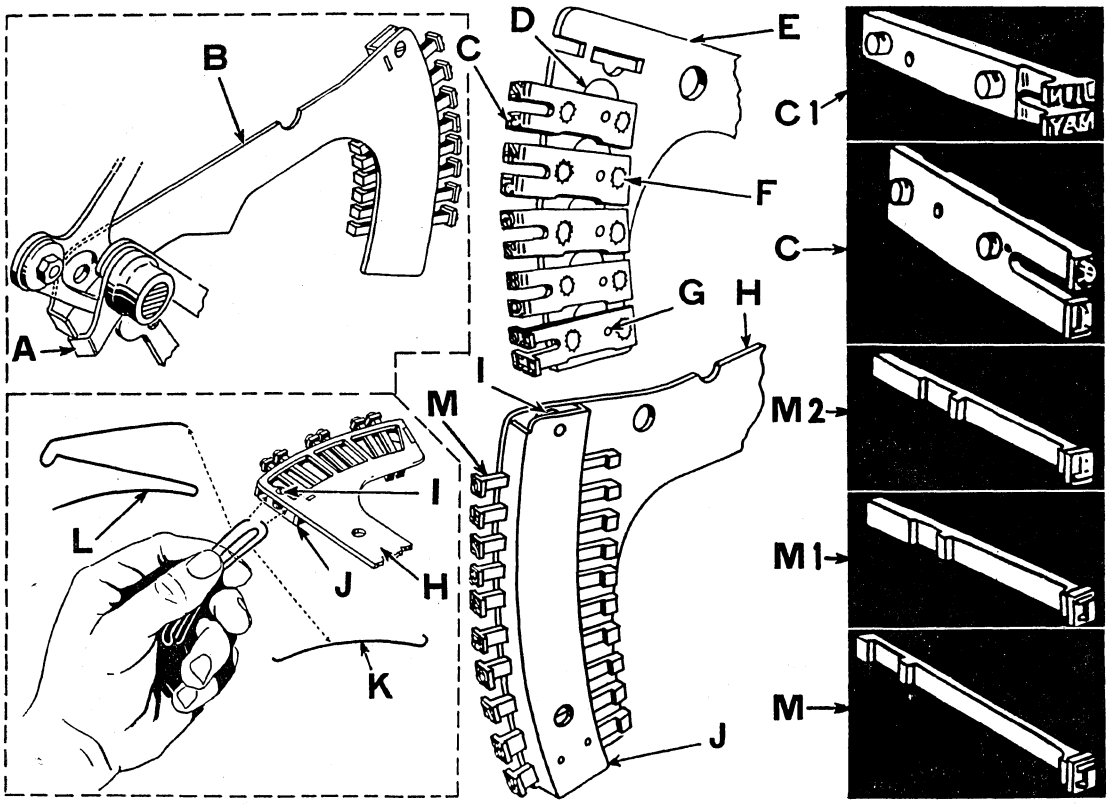
Tests and Adjustments

To locate stop cam U: Wind the tape on the ***underside*** of shaft until the pin which fastens the ribbon is considerably below the No. 9 type. Loosen screws in stop cam U and back up one of the cam points against the arm of part AE and fasten AE in this position.

Test for clearance between screws holding the split stop cam and the arm of part AE. The latter should contact on cam point only. Clearance is adjusted by moving stop cam assembly U sidewise.

Test reverse by winding the ribbon a number of turns on shaft AI and operating the machine. The reverse should take place when the pin holding the ribbon approaches the position for which the cam point was set. To change the timing of the reverse, bend the arm of part AE upward or downward as required.

TYPE MECHANISM (Plate 50)



Type Mechanism (Plate 50)

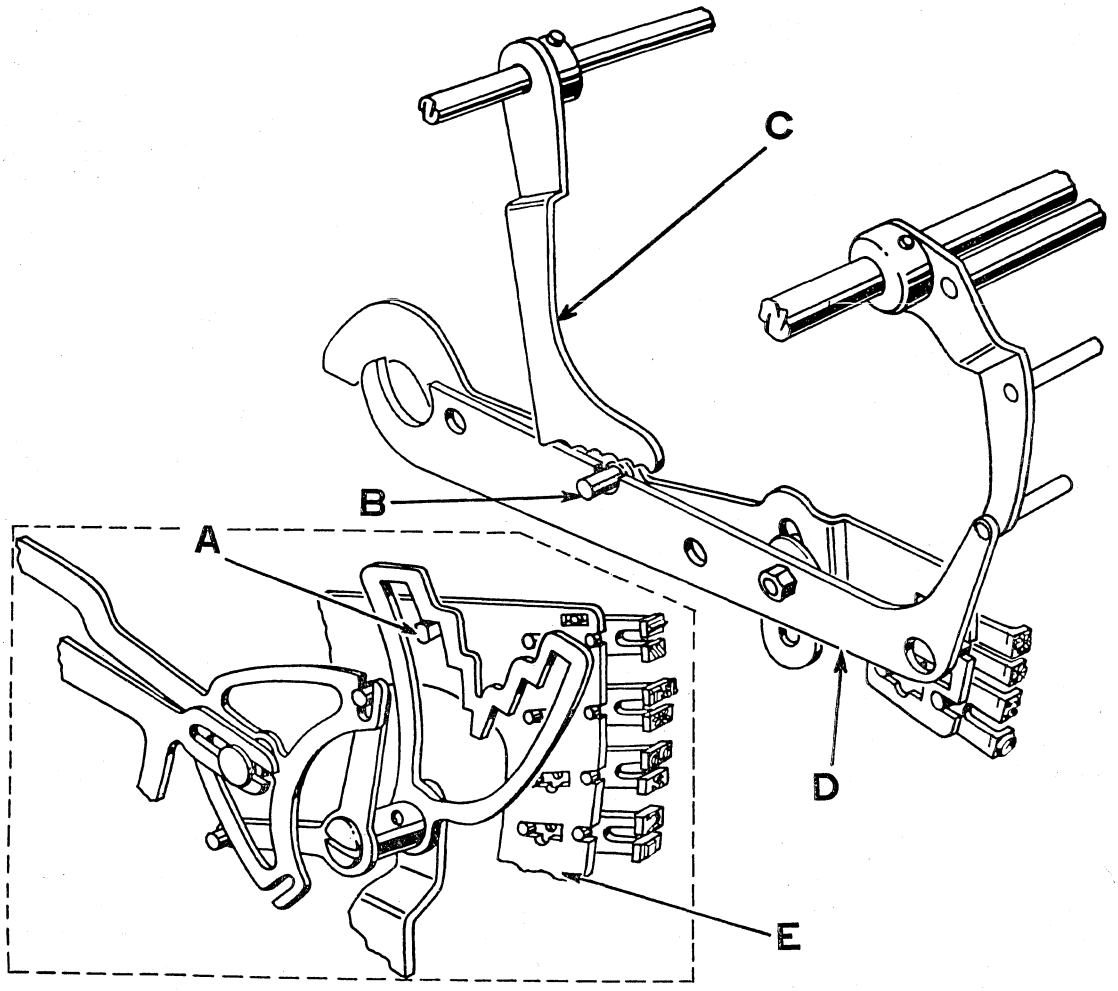
The earlier double type C which has two type faces, slides in slots of type sector E on grooved studs F. Each double type C is restored by individual torsion springs D. Type C is retained on sector by stud G.

The late single type M is carried by and slides in magazine J, and is restored by springs K and L. Spring K cushions the blow on spring L which prevents breakage of spring L.

The bottom of magazine J is dovetailed to sector H and the upper part fastened to sector with screw I.

The magazine with the type is attached to sector as follows: Hold lower end of magazine J at the bottom of sector, incline magazine J sufficiently to engage dovetailing, gradually swing magazine against sector, seat the projection in slot of sector and fasten the magazine to sector with screw I. Replacement magazine (Plate 52) is installed when slots in type sectors are badly worn. ***Exception:*** Sector 611B* 16 Pitch which cannot use the magazine, would require replacement by later sector 1Z-611F, (or 2Z-611F complete assembly).

TYPE ALIGNMENT (Plate 51)



Type Alignment (Plate 51)

The listing alignment is the first adjustment of the type. A slip is made showing the printing of all figures including the ciphers.

Print mix up.

1 2 3 4 5 6 7 8 9
9 8 7 6 5 4 3 2 1

Align mix up, selecting type making the best impression.

Align all 1s, 2s, 3s, etc., with the respective 1s, 2s, 3s, that were aligned in the mix up.

If the entire column is high, examine the adding racks and type sector connections, a new adding rack will usually correct this. Should the column be low examine the pivot bearing for free action, and also the index wires for condition.

The alignment must provide a full face print in addition to being square with the edge of the paper.

As the 9s limit on the 205 shaft both in the listing and totaling, they are aligned 1/64″ higher in the listing and will show 1/64″ low in the totals. This is necessary to get the clearance of the adding wheel cam over the foot of the carry pawls.

Total alignment—When printing a total the adding wheel cam limits on the foot of the carry pawl to locate the type in the printing position with the exception of the 9s which limit on the No. 9 limit shaft.

Examine all carry pawl detents, adding rack latches and carry pawls for condition and free action. Test for 1/64″ clearance of the adding wheel cam over the foot of the carry pawl with 480s unhooked, by rocking the 900 section in and out (with the hand), having all 3s, then 5s and 7s in printing position, handle forward and full stroke pawl in the last notch of the full stroke sector.

Align totals

3 9 3 9 3 9 3 9 3
3 9 3 9 3 9 3 9 3 S
9 3 9 3 9 3 9 3 9
3 3 3 3 3 3 3 3 2 ✲
3 3 3 3 3 3 3 3 3
3 3 3 3 3 3 3 3 3 ✲

When aligning totals, print total of all 3s. Raise the figures which print low, by slightly lengthening the foot of the respective carry pawls. The feet of the carry pawls must be kept at right angles and in good condition.

After the totals are aligned test the adding wheel cams for clearance over the foot of the carry pawls and for clearance under the adding wheel cams with 9s in.

3 0 3 0 3 0 3 0
3 0 3 0 3 0 3 0 ✲

3 0 3 0 3 0 3 0 3
3 0 3 0 3 0 3 0 3 ✲

Alignment of Ciphers—The ciphers are aligned in the totals first, by adjusting the type, using the 3s as shown above.

The ciphers print automatically in the listing from the foot of the adding rack latches and are aligned by adjusting the foot of the adding rack latches up or down using the 3s as a guide.

See that the adding rack latches have proper side-hold on adding rack and clear the No. 2 index wires.

1 0 0 0 0 0 0 0
1 0 0 0 0 0 0 0
1 0 0 0 0 0 0 0
1 0 0 0 0 0 0 0
1 1 1 1 1 1 1 1
2 2 2 2 2 2 2 2
3 3 3 3 3 3 3 3
4 4 4 4 4 4 4 4
5 5 5 5 5 5 5 5
6 6 6 6 6 6 6 6
7 7 7 7 7 7 7 7
8 8 8 8 8 8 8 8
9 9 9 9 9 9 9 9
1 0 0 0 0 0 0 0
1 0 0 0 0 0 0 0
1 0 0 0 0 0 0 0
1 0 0 0 0 0 0 0

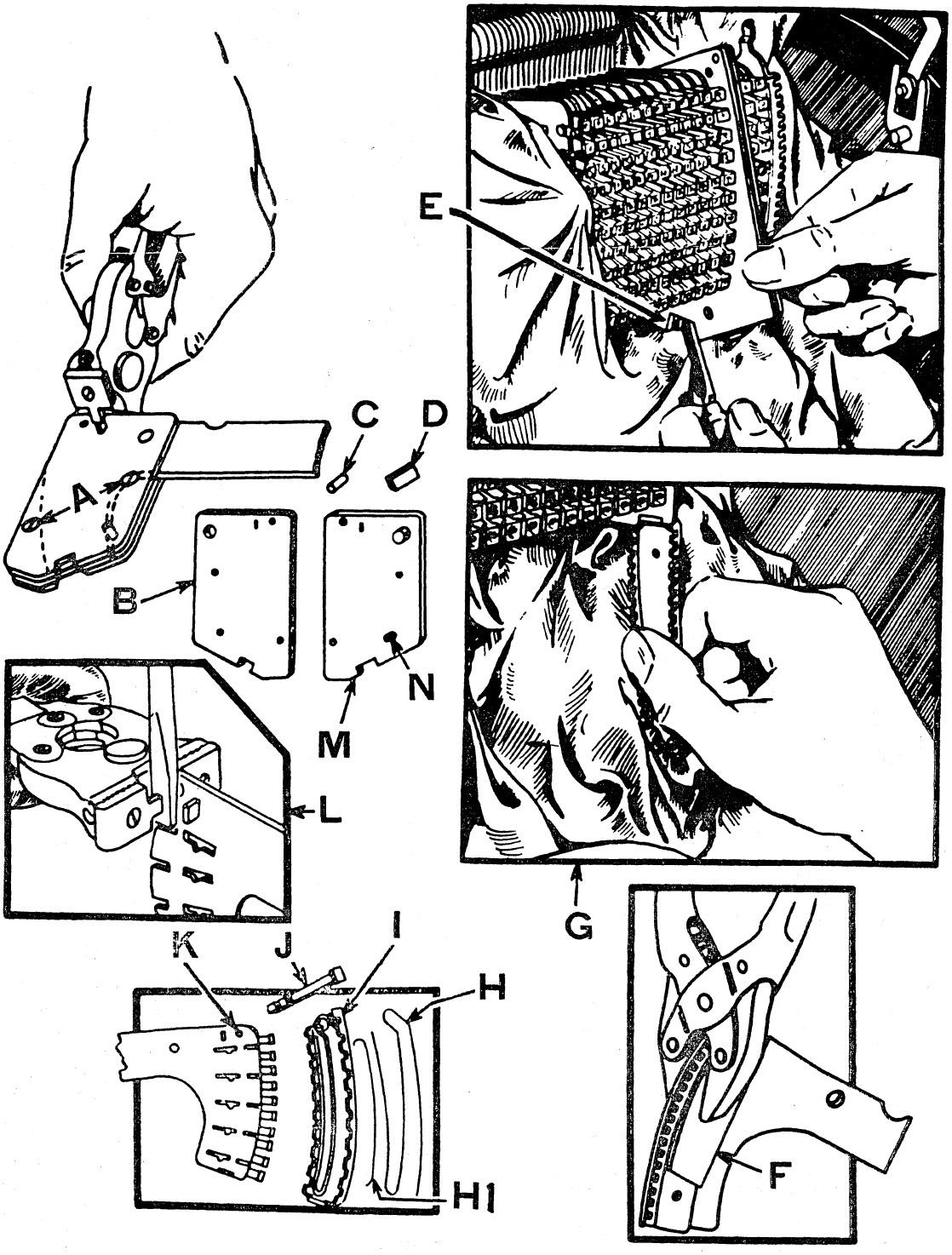
Align symbol type by bending the type to align with the top of the figures. When all symbol types print high, stock is removed from stud A in sector E.

In the early Class 1 machines, inspect for position of part D and when all symbol type are high or low locate stud B to contact sooner or later on index arm C. Test adding wheel cam for clearing the foot of carry pawls with 9s in the machine.

Test carry pawls for 3/64″ hold and 1/64″ clearance with carry pawl detents (411). In order to insure good impression, the platen must be set at the correct distance from the type which is determined by the clearance between the type and the platen. The present machines with the one piece type should have .130″ to .140″ clearance. The .085″ type with 1/8″ type centers should have .117″ to .130″ clearance. Machines below serial number 881255 should have .040″ to .050″ clearance. Machines above 881255 (non-tally roll construction) should have .070″ to .080″ clearance.

Machines with tally roll device should have .097″ to .112″ clearance.

TYPE MAGAZINE 1-611⅛Z PITCH 8-10-12 (To Install) (Plate 52)



Installing Type Magazine 1-611⅛Z Pitch 8-10-12 (Plate 52)

Remove carriage and back plate assembly.
Remove ribbon guide assembly.
Remove type from sector.
Sector in 9 position.
Place template member M, pilot studs seating in holes of sector.
Place template member B, the pilot stud seating in holes of B.
Place and start screws A to hold the template members, hold template with limit stud N contacting against sector and tighten screws A.

Caution: Limit stud N must positively contact on the sector to insure that the magazine will be correctly located.

Check correct position of template by lowering sector to cipher position and raising the other sectors to nine position. Unless limit stud N contacts on the sector, there will be unequal stock visible where the dovetail edges are to be filed.

Insert punch D in die hole of template member (marked "enter punches").

Apply converted cutters as shown and press punch D through template die. Push slug through by placing screw driver bit between punch and jaw of cutter, Fig. L.

Insert punch C and press through die, pushing slug through as explained for punch D.

Lower sector to cipher position and raise the other sectors to nine position.

File lower notch and dovetail by applying files until the hard surface is reached, Fig. E.

Use 4″ No. 2 square file for depth and 4″ No. 2 narrow pillar file for angles.

Remove template by prying the template members apart, using small screw driver.

Countersink hole in sector for screw K (handle side of machine) using No. 12 drill held in twirler.

Test dovetailing by applying the lower part of the type magazine, turning the magazine end for end, Fig. G. If it is necessary to remove stock that was overlooked, the template should again be attached to the sector.

It is sometimes necessary to slightly dish the magazine so that its center projection shall contact on the sector.

Attaching the New Magazine

Place the type in the magazine, first testing each type for free action.

Hold lower end of magazine at bottom of sector, incline the magazine sufficiently to engage dovetailing, gradually swing the magazine against sector, seat the projection in the slot of the sector and fasten the magazine to the sector with screw.

The type which is supplied for use with this magazine has an offset to the left (dashpot side), of .020″. This offset is necessary for the reason that new type lies against the sector whereas the double type is carried by studs which cause the type to clear the sector.

When the new magazine has been installed, the sector is bent toward the handle side sufficiently to allow the magazine to clear the type studs in the sector to the left and also to center the type column.

Caution: Owing to the fact the side wall of the magazine is ground quite thin, the magazine must be supported in the event that type requires side bending. Large parallel pliers and a metal strip where the type which is to be bent is located, should be applied as shown.

Type Restoring Spring H

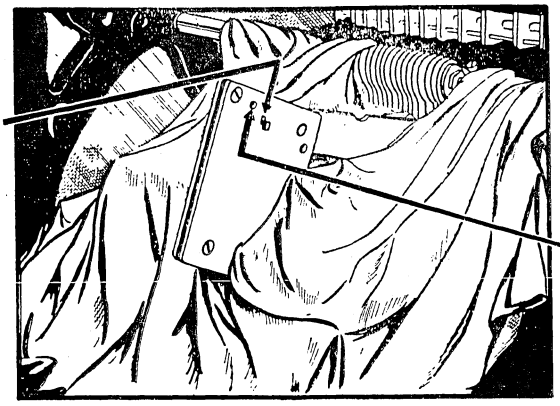
To insure that all type will completely restore and not interfere with the ribbon, the tension of the spring must be correct and equal. Sketch of spring shows the correct distance from bends to prongs. Sketch of type magazine shows position of spring. The radius of the curved front branch should be same as radius of magazine. When the spring is placed on a flat surface, both branches should be parallel to the flat surface. (Leaf H1 is now also used as pictured on Plate 50, K.)

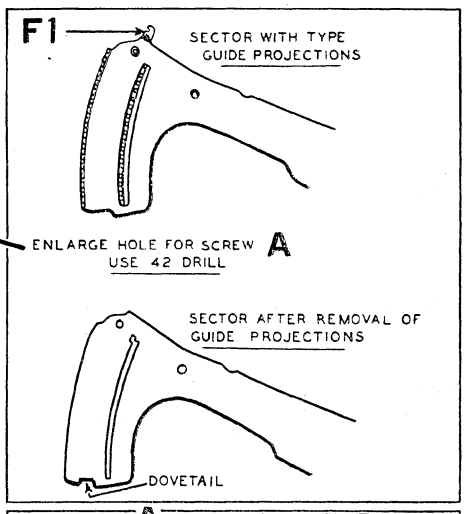
Inserting Type Spring H

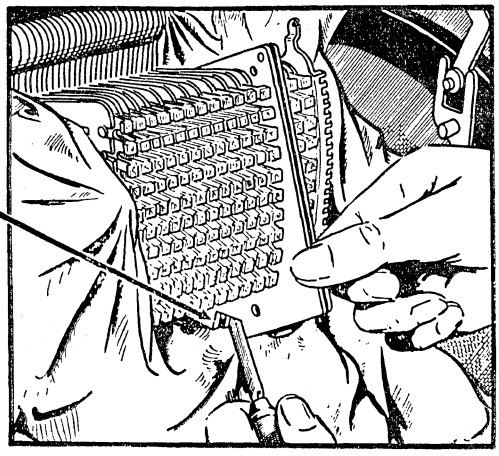
Caution: If the spring is placed in position improperly, it is possible to lose the true radius, the spring should be held so that its concave curve will pass between projection and screw boss and pushed in opening until its bend limits on the screw boss. The spring is now swung into a vertical position and the other end of the spring started in and the entire spring pushed in until it snaps under the screw boss.

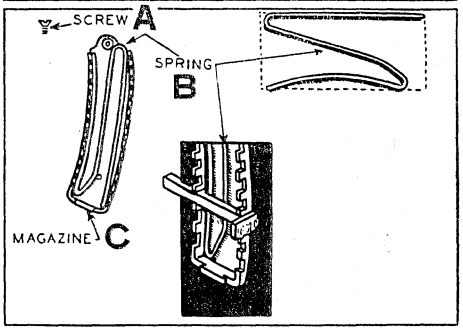
The templates will be furnished on supply order giving the machine number.

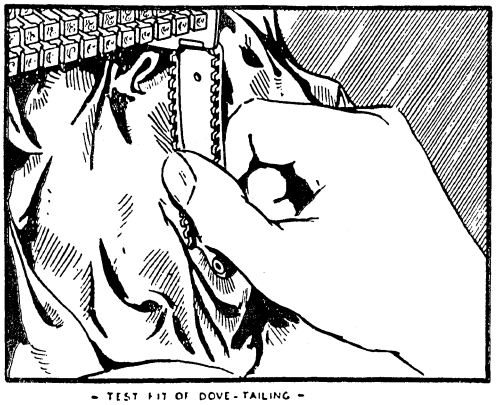
TYPE MAGAZINE 1-611⅛B PITCH 16 (To Install) (Plate 53)

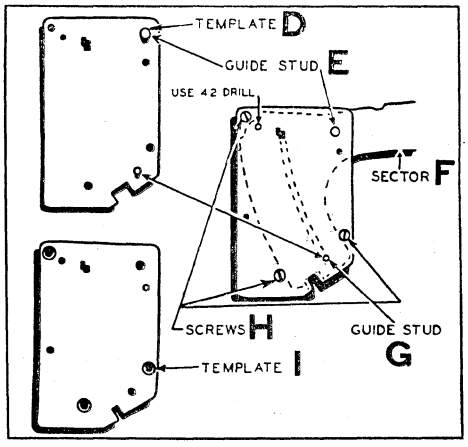












Type Magazine 1-611⅛B for 16 Pitch Type Sector (Plate 53)

This magazine has type guide projections which were formerly on the type sector.

The magazine is fastened to the sector by a lower dovetail joint, an upper locating projection and a screw A.

The magazine can be replaced without dismantling the machine. The type also has been changed on account of the restoring spring being carried on the opposite side of the type. The type restoring spring has also been changed. The magazine can be installed in Service Stations to replace sectors having broken webbing. ***Exception:*** Sector 611B* 16 Pitch which cannot use the magazine, would require replacement by later sector 1Z-611F, (or 2Z-611F complete assembly).

Instructions for Installing

Remove carriage and back plate assembly:

Remove ribbon guide assembly.

Remove type.

Remove type guide projections from sector F, using parallel pliers or large cutters.

Caution: Cover hammer section and other mechanisms with cloth to prevent filings getting into bearing surfaces.

With sharp file, file flush remaining stock of lugs that have been broken off.

Caution: File must be applied parallel to sector at all times, the latter must be flat from edge to edge otherwise type will be loose causing bad alignment.

Remove spring stud and break off spring projection F1 from upper edge of sector.

Attach filing template I, place template D having pilot studs, the upper round stud in hole of the sector and the lower round stud in slot of sector, fasten template sections with the 3 screws H; do not fully tighten any one screw at one time, tighten all screws a little at a time until all are tight.

File lower notch and dovetail by applying files until the hard surface of template is reached. Use 4″ No. 2 square file for depth and 4″ No. 2 narrow pillar file in sides.

File upper slot using No. 2 needle file furnished with template, applied horizontally and after that the file is used vertically until the hard metal is reached.

Enlarge hole for screw, using No. 42 drill through pilot hole in template. Drill is held in twirler or tap wrench.

Remove template and countersink hole in sector for the screw on the handle side of machine, using No. 12 drill.

Test fit of dovetailing by applying the lower part of the type magazine, (turning the latter end for end), if necessary the filing template is again put on the sector and any surplus removed.

Caution: The dovetailing must fit snug to hold the magazine when the hammer blow takes place with platen out of printing position. If the dovetailing fits too tight it is more difficult to install the magazine with type in place.

It is sometimes necessary to slightly dish the magazine so that its center projection shall contact on the sector.

Attaching Magazine

Place the type in the magazine, first testing each type for free action.

Hold lower end of magazine at bottom of sector, incline magazine sufficiently to engage dovetailing, gradually swing magazine against sector, seat the projection in the slot of the sector and fasten magazine to sector with screw 652⅞.

Mr [redacted]
Buffalo N Y Branch 10-5

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CLASSES 1, 2, 6, 11 thru 16 and 20 thru 30 ACCUMULATION

Instruction Book

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BURROUGHS ADDING MACHINE COMPANY

DETROIT, MICHIGAN

FOREWORD

This book covers the subject of accumulating amounts that were indexed and printed, or non-printed as explained in the instruction books entitled "Keyboard" and "Printing." The basic accumulating mechanisms common to all classes of machines are treated under the original Class 1.

Upper counter, lower counter and transfer mechanisms, controlled manually and from the carriage follow the Class 1 mechanisms. Adding and subtracting basic mechanisms used in Classes 6, 11 thru 16 and 20 thru 30 are covered under Class 6, which subject follows Class 2. Multiple register, adding and carrying mechanisms found in Classes 11 thru 16, 20 thru 30 are treated under their respective classifications.

Mechanisms common to Bank Posting machines are covered. Item counter mechanisms, non-clear motor bar locks and other mechanisms which concern accumulation and which were previously covered by prints have been revised and included in this instruction book.

The "crossfooter total and sub-total mechanism, carriage controlled," (H903) is also included, redrawn and revised in general.

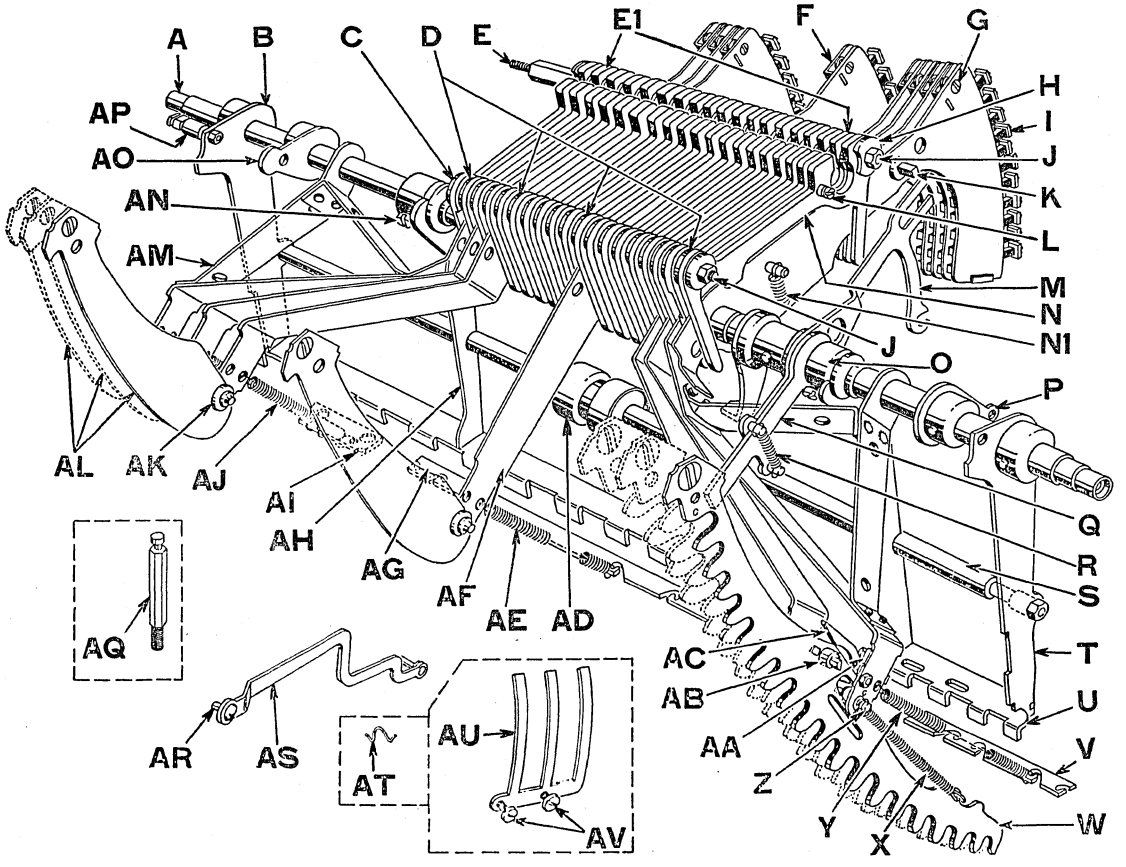
Throughout this book tests and adjustments are included with their subjects.

INDEX OF MECHANISMS

Description	Plate No.
Accumulator Meshing Controls and Adjustments	2
Adding and Printing, Carriage and Register Total Indexing Lever Controlled (Classes 21 thru 30 with H903 Mechanisms)	89
Adding and Printing, Carriage Controlled (for Early H903 Machines)	90
Adding Wheels Mesh, Class 6	10
Add-Subtract Lever, Class 6	18
Arm to Insure Meshing of Register Wheels and Carry Racks	22
Automatic Balance Column Indexing Mechanism	37
Automatic Crossfooter Total and Sub-total Mechanism, Carriage Controlled (Bank Posting Machines)	67
Automatic One, Extra	15
Automatic One for Register Selection (Column 1)	15
Automatic One Mechanisms	14
Booster for Meshing Crossfooter in Non-add Positions, Classes 20 thru 30	60
Brace for Stud 68503AY (Classes 21 thru 30 with H903 Mechanism)	91
Carriage and Crossfooter Controls (Classes 21 thru 30 with H903 Mechanism)	74
Carrying, Class 1	3
Carrying Mechanism	32
Carrying Mechanism Adjustments	33
Carrying Mechanism, Ten Construction	47
Carry Rack Resetting Mechanism	34
Carry Timing and Negative Total Lock Mechanisms to Control Release of Automatic Total Mechanism (Bank Posting Machines)	65
Carry Timing Mechanism, Airpot Controlled, for Totals, Classes 21 thru 30	63
Carry Timing Mechanism, Escapement Arm Controlled (Bank Posting Machines)	64
Carry Timing Mechanism for Automatic One (Bank Posting Machines)	66
Compulsory Spacing Stroke, Class 2	5
Counter Control, Class 2 Shuttle Carriage	9
Counter Shift Mechanism, Class 6	18
Count and Normal Indexed from Keyboard, Carriage Controlled	69
Counters—Dial, Advanced from Carriage Openings	95
Counters—Dial, Advanced from Carriage Returns	94
Counters—Dial, Advanced from Selected Key	96
Counters—Dial, Advanced from Total and Sub-total, Carriage Controlled	97
Counters—Dial, Control Mechanisms (Classes 20 thru 30, Style 17)	93
Counters—Dial, Counts Items Added in Registers	98
Counters—Dial Operation Delayed Until Registers are Meshed	99
Credit Balance Indexing Mechanism (Classes 21 thru 30 with H903 Mechanism)	79
Crossfooter Mechanism, Class 6	16
Crossfooter Add from Lower Bar	70
Crossfooter Add—Register Non-add from Upper Bar	71
Crossfooter Mechanism (Classes 11 thru 16, 20 thru 30)	43
Crossfooter Meshing Pawl Disabled by Safeguard Symbol Mechanism (Classes 21 thru 30 with H903 Mechanism)	87
Crossfooter Non-clear Motor Bar Lock Disabled by Lower Bar and Key (Classes 20 thru 30)	61
Crossfooter Non-clear Motor Bar Lock, Later, Carriage Controlled (For Consumption Column)	58
Crossfooter Non-clear Motor Bar Lock No. 1, Early, Carriage Controlled	56
Crossfooter Non-clear Motor Bar Lock No. 2, Airpot and Carriage Controlled	57
Crossfooter Non-clear Motor Bar Lock with Carriage Open in Conjunction with C. F. N. C. Lock, Carriage Controlled (For Consumption and Amount Columns)	59
Crossfooter Non-clear Total Key Lock, Add and Subtract Positions, Airpot and Carriage Controlled	62
Crossfooter Simultaneous Addition and Subtraction with Automatic Count, Carriage Controlled	42
Crossfooter Total and Sub-total, Carriage Controlled, Indexed from Carriage and Drive to Secure Easy Tabulation (Classes 21 thru 30 with H903 Mechanism)	82
Crossfooter Totals, Carriage Controlled Indexing Detent	74–1
Crossfooter Total Control Mechanism (Classes 20 thru 30)	45
Depth Mesh	31
Detent Bail "G"	35
Detent to Hold Crossfooter in Mesh Until Return Stroke is Completed (Classes 21 thru 30 with H903 Mechanism)	86
Floating Bearings for Register Indexing Assemblies	30
Inertia Latches, Classes 21 thru 30	44
Installing Register and Crossfooter	26
Interlock to Prevent Depression of Keys on Keyboard During An Operation Before Taking Automatic Crossfooter Totals, Carriage Controlled (Classes 22 thru 30 with H903 Mechanism)	88

Description	Plate No.
Key to Release Repeat Latch (Bank Posting Machines)	68
Lock to Prevent Machine Operation Crossfooter Non-clear, Carriage Controlled. Disabled from Total, Sub-total or Motor Bars	58–2
Mechanism to Delay Clutch Release for Carriage Controlled Total Operation (Classes 21 thru 30 with H903 Mechanism)	92
Meshing of Adding Wheels Register and Crossfooter	25
Negative Total Lock Mechanism Blocking Total Key	11
Negative Total Lock Mechanism, Credit Balance	12
Negative Total Lock Mechanism, Debit Balance	13
Non-add Control Crossfooter and Register	24
Non-add Control, Crossfooter and Register, Later	39
Non-add—Non-print, Carriage Controlled	40
Non-add—Non-print, Key Controlled	41
Register Aligning Detent (Early)	28
Register Control Mechanism to Provide Sufficient Time for Register to Position Correctly	49
Register Detent Release Mechanism, Improved Style	27–2
Register Meshing Control	21
Register Non-add Mechanism	23
Register Non-add Controlled by Total Key	53
Register Non-add from Subtract Mechanism	52
Register Section Braces, Ten Register Construction	48
Register Shift, Airpot Controlled Mechanism	27–1
Register Shift from Subtract Mechanism, Bar and Carriage Controlled (Classes 22 thru 30)	51
Register Shifting Mechanism	27
Register Shift Release Mechanism with Disabling Key (Classes 22 thru 30)	50
Register Total Indexing Lever	20
Register Total Indexing Linkage, Carriage Controlled (Early)	38
Register Total Indexing Lever, Indexed by Carriage and Shifted by Drive Mechanism (Classes 21 thru 30 with H903 Mechanism)	81
Register Total Indexing Lever and Machine Operation to Disable Crossfooter and Register Total and Sub-total Mechanism, Carriage Controlled (Classes 21 thru 30 with H903 Mechanism)	83
Register to Total and Sub-total from Register Total Indexing Lever (Classes 21 thru 30 with H903 Mechanism)	80
Register Total and Sector Bar Lock from Register Total Indexing Lever (Classes 21 thru 30)	54
Reverse Pull-in and Carry Pawl Resetting Mechanism (Classes 21 thru 30 with H903 Mechanism)	85
Sector Assembly	1
Sector Bar Lock, Early	55
Sector Bar Lock (Early) and Other Controls Actuated from Main (100) Section (Classes 21 thru 30 with H903 Mechanism)	76
Sector Bar Lock, Improved	55–1
Sector Bar Lock Mechanism and Primary Operating Section to Release Adding Racks (Classes 21 thru 30 with H903 Mechanism)	77
Single Stroke Totaling Mechanism (Classes 20 thru 30)	46
Spacing Adding Wheel	36
Spacing Stroke Controlled from Subtract Shift Mechanism (Classes 21 thru 30 with H903 Mechanism)	75
Subtract Control Indexed from Carriage	19
Subtract Mechanism Jointly Indexed from Subtract Lever, Credit Balance, Uppermost Bar, Carriage and Machine Operation (Classes 21 thru 30 with H903 Mechanism)	78
Sub-transfer Total Mechanism, Class 2	7
Timing Mechanism to Delay Motor Bar Release	58–1
Total Lock Detent, Class 6	17
Total Symbol, Ribbon Shift, Non-add and Repeat Release Mechanism (Classes 21 thru 30 with H903 Mechanism)	84
Transfer Mechanism, Carriage Controlled, Class 2	8
Transfer Total Mechanism, Class 2	6
Upper and Lower Counter Mechanisms, Class 2	4

SECTOR ASSEMBLY (Plate 1)



Sector Assembly (Plate 1)

Sectors AF pivot on shaft A. These sectors are spaced by the guide comb assembly which is removable as a unit. The complete unit consists of plates N held together on shafts J by nuts. Plates N are separated by washers D.

Sectors should have .003 play; excessive play can cause scattered printing, for that reason washers D, varying in thickness, .041 to .045 are used. Follow up shafts are used when washers are being changed.

Adding racks W are carried on the front arm of sectors AF. The slots of adding racks W move on hardened shoulder collars carried by studs Z, the latter are riveted to sectors AF.

Sectors are pulled downward to limit on the index wires by springs AE and AJ which are hooked to spring anchors V, AG and AI.

Accumulator Meshing Controls (Plate 2)

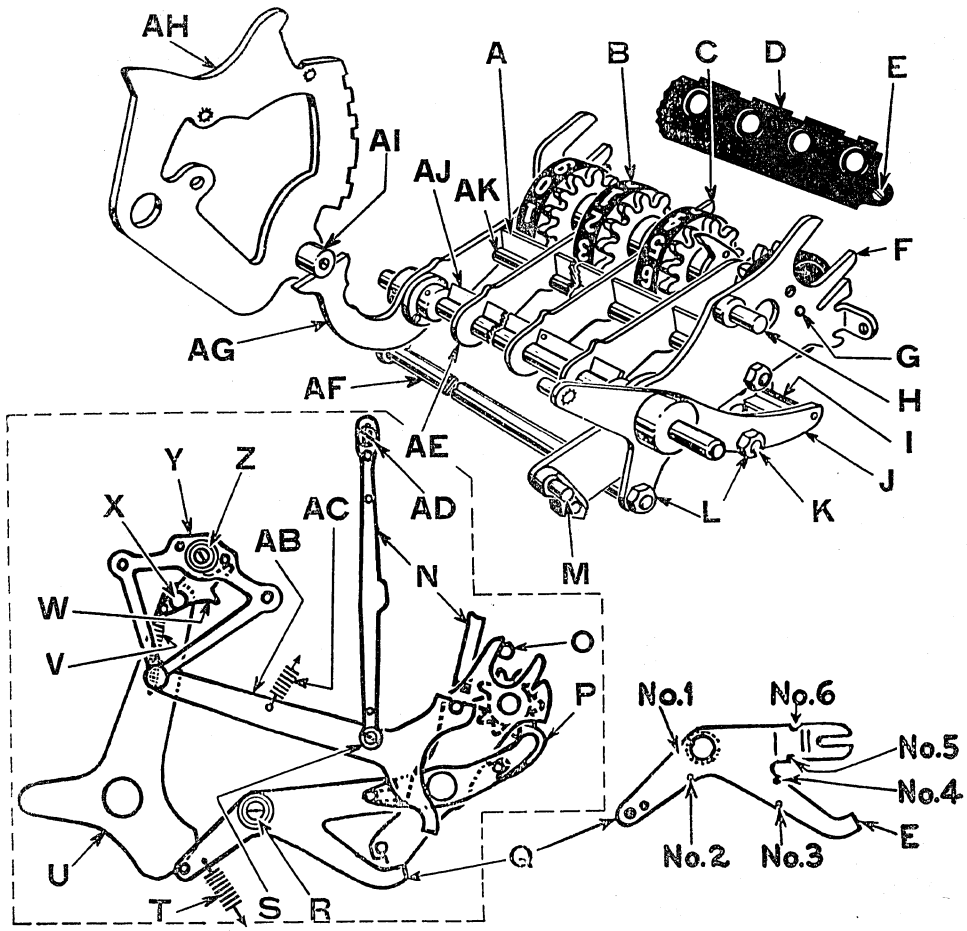
The accumulator is meshed into and out of the adding rack teeth by passby pawl W engaging forward or rearward studs in part Y. At the beginning of the forward stroke, passby pawl W is inclined rearward. When part U which carries passby pawl W, moves rearward, the latter straightens out which rocks part Y causing pitman AB to rock the accumulator forward and out of mesh from the adding racks. As the forward stroke is being completed, passby pawl W inclines forward, its rear pocket lining up with the rear stud in Y. As the rear stroke goes under way, passby pawl W again straightens out, rocking part Y which through pitman AB pulls accumulator F rearward, thereby meshing it into the adding rack teeth.

When the machine is normal, accumulator F is held in meshed position by roller AI in full stroke sector AH contacting cam AG.

When the total key is depressed, link N lowers pitman AB disengaging it from stud H which disables pitman AB, and holds the accumulator in mesh as required in order to cause adding wheels to index adding racks.

At the beginning of the return stroke, passby pawl W rocking part Y, causes pitman AB by its contacting lower stud M in the side plate to pull the accumulator out of mesh with the teeth in the adding racks. At the end of the return stroke, roller AI contacting cam AG, rocks the accumulator in mesh with the adding racks.

ACCUMULATOR MESHING CONTROLS AND ADJUSTMENTS (Plate 2)



Accumulator Tests and Adjustments (Plate 2)—Continued

The purpose of part Q is to lock the accumulator when in mesh or when out of mesh with the adding racks. When out of mesh with the adding racks, the adding wheels are locked by detents P. When the accumulator is disengaged from the adding racks, part Q swings detents P upward to meet the outcoming adding wheels, thus locking the latter before they are disengaged from the racks.

Part Q pivots on bushing assembly R fastened to the left side frame. During the forward and return stroke, it is blocked by the cam of U. At the beginning of and at end of the forward stroke, cam U clears part Q, at this time only can the accumulator be disengaged. Although cam U clears Q at the end of the return stroke, the accumulator cannot be disengaged due to roller AI in the full stroke segment AH blocking the lower arm of the right side plate of the accumulator.

Adjustments: The accumulator should be adjusted for correct mesh of the adding rack and the adding wheels.

There should be a little play of the teeth for the entire length of the adding rack. Play is reduced or increased by bending the prongs of the accumulator side plates where it limits on O. Q should be free without side play.

Fork of part N free without play, adjusted to secure 1/32″ play of detents M and adding wheels.

If the accumulator fails to disengage at the right time in totaling, hook of W is adjusted to take hold quicker, being careful not to lose clearance of 1/32″ over stud M.

To Adjust Loose and Tight Points

1. Peening at No. 1, loosens loose and tight points.

2. Peening at No. 2, tightens loose and tight points.

3. Peening at No. 4, loosens loose point.

(Plate 2)—Continued

4. Peening at Nos. 2 and 4, tightens tight point.

5. Peening at Nos. 1 and 3, tightens loose point and loosens tight point.

6. If end at E is too long, peen at No. 1 and No. 3.

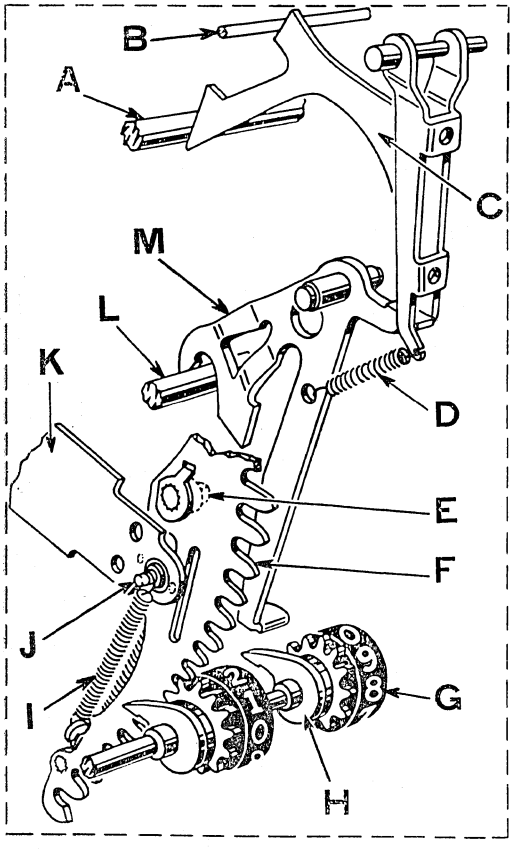
To Adjust Rack

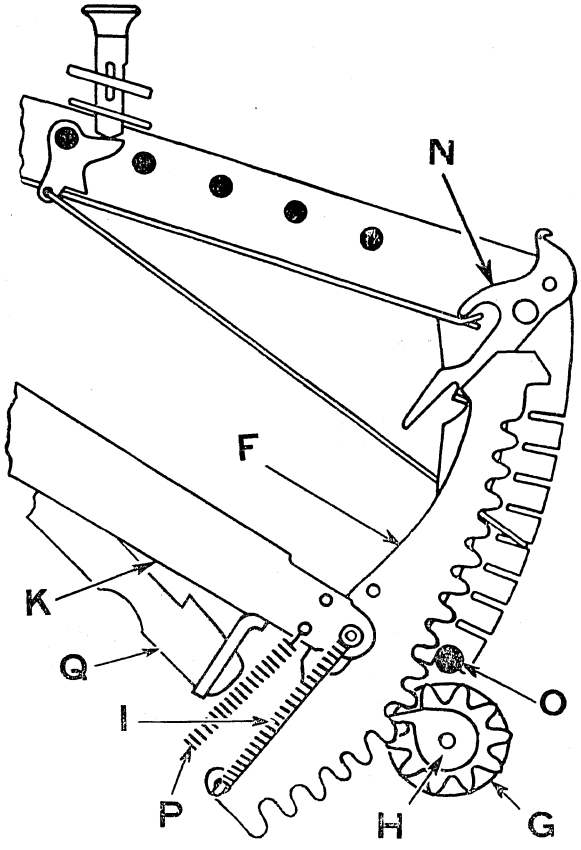
1. Peening at No. 5 brings rack farther from the 916.

2. Peening at No. 6 brings rack closer to the 916.

Note: Adjust loose and tight points before adjusting the rack. Use blunt chisel in peening No. 3, No. 4, No. 5, No. 6.

CARRYING (Class 1) (Plate 3)





Carrying (Class 1) (Plate 3)

When an adding wheel makes a complete turn, 1 is carried in the next column to the left.

Carrying is accomplished by the adding rack in the next left column moving one additional tooth space upward. When no carry is required the upward or carry movement of the adding rack is blocked by stud E contacting on the arm of carry pawl M.

When an adding wheel turns past 9, cam H pushes carry pawl M out of range of stud E, which allows springs I to drive adding rack F in the next column to its upper limit thus adding 1.

Sectors K which carry adding racks F are the drivers. These driving sectors always travel the full distance required to add from 1 to 9. The slots in adding racks F permit this when carry pawl M is not in carried position.

Cam H action can take place at any portion of the return stroke. When the carrying pawl is shifted it is held in that position by detent C. The extra one is not added until restoring bail Q comes to normal position.

The Compulsory Spacing Stroke (Class 1)

Since the adding rack during the carry period is driven by springs I independent of driving sectors K, the adding wheels must be disengaged at the beginning of the forward stroke before the adding racks or sectors move downward, otherwise the downward movement of the adding rack would turn the adding wheel backward and thereby lose the carry, that is why a spacing stroke is necessary before taking a total.

Other machines than Type 20 and all earlier machines have the total key blocked after a carry, compelling a spacing stroke before totaling.

When during a carry, detent C moves rearward, its upper projection contacts shaft B swinging arm G (Plate 5) under the total key to prevent its depression until the carry racks are reset.

Resetting Carry Pawls (Class 1)

Detents C are moved forward beyond normal position by restoring shaft A toward the end of the forward stroke. Carry pawls M are pulled by detents C through spring D in the same direction, carry pawl M limiting on shaft L, detent C moving beyond its normal position to allow carry pawl M to seat under detent C.

Tests and Adjustments (Plate 3)

The adjustments of carrying pawl are based on relative action and location of other parts, i. e., adding wheel cam H and adding rack F.

The spring resistance which must be overcome by cam H when it trips carry pawl M varies according to the position of adding rack F. When cam H trips carry pawl M before adding rack F limits on carry pawl M, then only spring D tension is involved. On the other hand when adding rack F is limiting on carry pawl M (just before the machine becomes normal) springs I are expanding which adds additional resistance for cam H to overcome.

The cam of the adding wheels driven by springs I on adding rack F to the right, overcomes the resistance of the springs I to the left through the medium of the longer lever; i. e., the longer foot of carry pawl M.

In adjusting carry pawl M its relation to the action of cam H must be considered to insure smooth and rapid carrying. The power of cam H is the most effective nearest its center (center of wheel) when it shifts carry pawl M. As the foot of M moves backward on cam H, the power of cam H diminishes, the resistance of M increases as it is shifted off stud E. It is therefore advisable to avoid too much clearance between H and M with the 9's on the wheels.

Carry pawl M should be examined for condition and tight stud. The arm of carry pawl M which limits stud E has definite length, this is indicated by the amount of play between the arm of M and stud E. Too much play allows carry rack F to ascend higher which reduces the clearance between cam H and the carry pawl in the next column.

Lack of play interferes with free carrying and when it lacks considerably can interfere with the engagement of adding rack F and latch N.

Hold the carry pawl M on stud E should be flush looking from above, M limiting on shaft L. Clearance of 1/32″ between foot of carry pawl M and cam H 9's on adding wheel adding rack E limiting on latch N. Clearance of 1/32″ between foot of carry pawl M and cam H, adding rack F limiting on upper stops (carried position).

Side hold of cam H on top of foot of carry pawl M to prevent slipping when totaling. Clearance of cam H over foot of carry pawl M, cipher on adding wheel G, adding rack F limiting on latch N. The same must be present with rows of keys depressed to limit adding racks F on the index wires and shaft O.

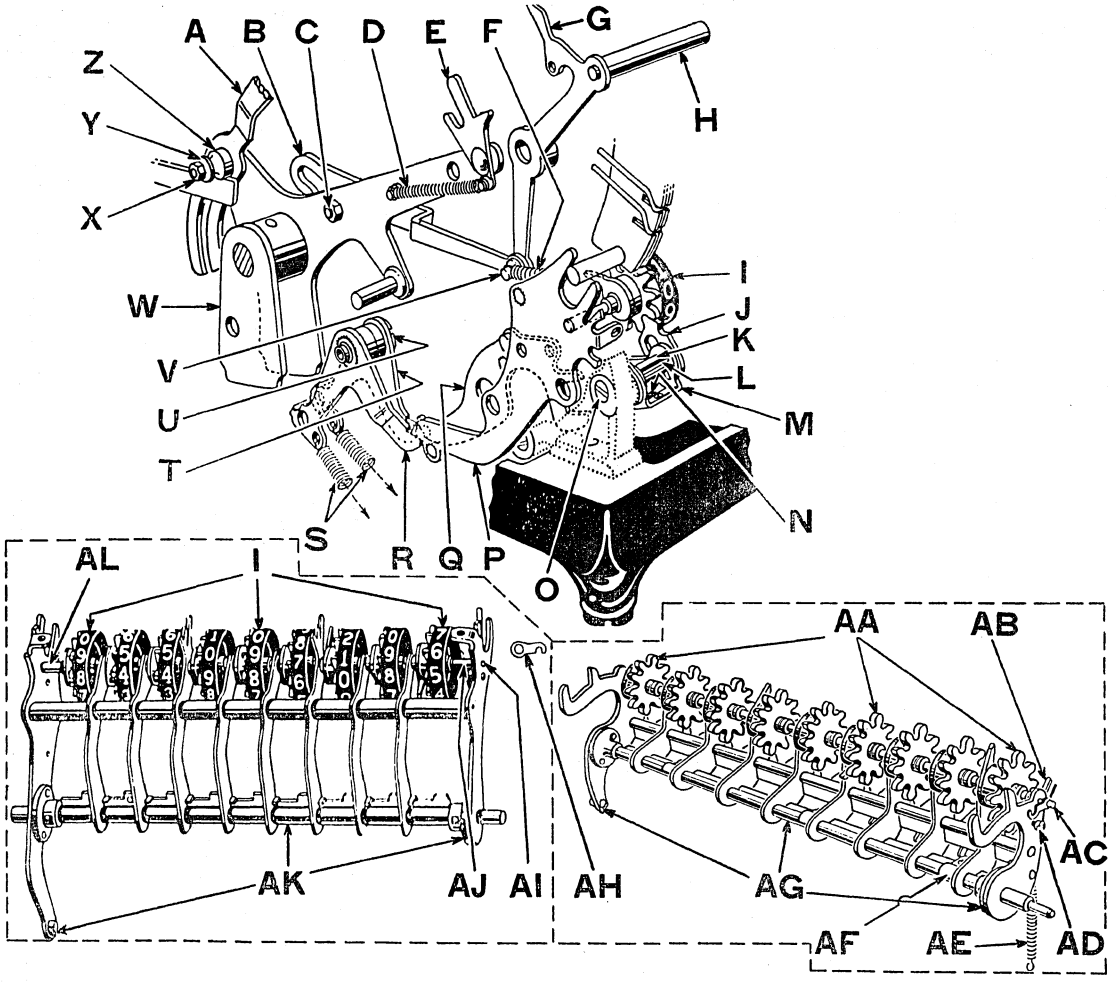
Test: Unhook springs D, draw handle to forward stop, rock adding section in and out. No movement of carry pawl M indicates clearance. Hold of detent C on carry pawl M should be 3/64″ (normal position).

When carrying, carry pawl M should have sufficient lead to allow clearance of 1/64″ between carry pawl M and detent C.

Test: Add 1, now, draw handle forward and drop adding rack F in column having 1, allow handle to return slowly, raise detent C and observe clearance. Test for carrying after carry pawls have been adjusted. Add 9's in all columns, add 1 and before handle becomes normal, stop second adding wheel with finger and hold, now stop third wheel allowing second wheel to turn very slowly.

This test should be applied to all columns. A more sensitive test consists of adding all 9's, then adding 1 and allowing the handle to return very slowly, so that springs I in the second column will shift the next left carry pawl M. This test should also be applied to all columns.

UPPER AND LOWER COUNTER MECHANISMS (Class 2) (Plate 4)



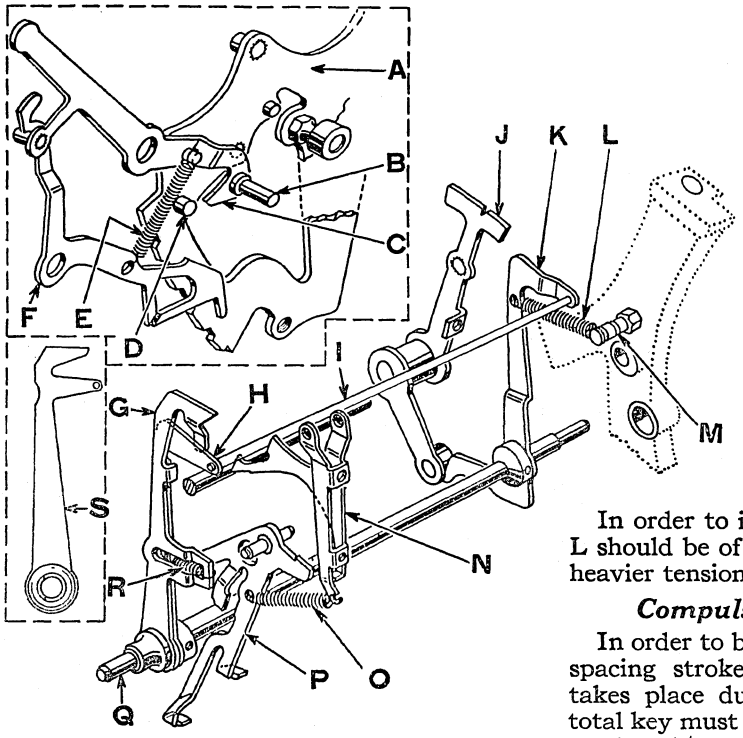
Upper and Lower Counter Mechanisms (Class 2) (Plate 4)

The tests governing the mesh and engagement of the upper and lower counters are the same as in Class 1.

Pitmans R and S (Plate 6) which mesh either the upper or lower counters become active when the shift lever is placed in upper or lower position. Pitmans R and S (Plate 6) are held upward by springs AB (Plate 6). The tight and loose points of both counters are controlled by parts R and T. However, these parts do not control detents J and M, the latter are flexible adjusting themselves to the adding wheels.

There should be 1/32″ clearance between detents J and adding wheels I, this also holds true for detents M and the lower wheels. With the shift lever in lower position, counters clear, depress No. 9 keys and draw handle all the way forward, rock upper counter in mesh, allow handle to return slowly and observe clearance. Clearance can be secured by adjusting forks of P and Q. This adjustment is made before adjusting parts R and T.

COMPULSORY SPACING STROKE—COMPULSORY TOTAL KEY RELEASE MECHANISMS (Class 2) (Plate 5)



Compulsory Spacing Stroke Compulsory Total Key Release Mechanism (Class 2) (Plate 5)

The compulsory spacing stroke mechanism in Class 2 machines differs from that in the Class 1 machine, so as to function when a carry takes place during transfer totaling.

During totaling in Class 1 machines arm S is held rigidly forward by the depressed total key for the purpose of locking the keyboard. When a carry occurs in Class 1 machines, the upper projection of detent N contacting on shaft I moves arm S under and blocks the total key.

In Class 2 machines arm G moves freely on shaft Q, arms H and K which carry shaft I are pinned to shaft Q. Arm G is connected to arm H by spring R.

The total key when depressed holds arm G forward to lock the keyboard the same as in Class 1 machines. The total key is blocked by detent N moving shaft I rearward, which through spring R moves arm G under the total key. When a carry occurs during a transfer operation, detent N contacting on shaft I moves arm H rearward, expanding spring R. When the transfer and total keys restore, arm G moves rearward through spring R to block the total key. In Class 1 machines the tension of spring L on detent N during a carry is relieved by the depressed key pushing shaft I rearward; this is also true in Class 2 listing operations. However, when a carry occurs during transferring, there being no keys depressed, the tension of spring L is relieved by the roller on the foot of interlock J contacting arm K, to swing the latter rearward.

Note: Class 2 machines equipped with item counters, or semi-automatic keyboard counters, have arm K removed to prevent a count taking place during the transfer total operation.

In order to insure positive carrying, spring L should be of lighter tension or springs O of heavier tension.

Compulsory Total Key Release

In order to block the total keys to compel a spacing stroke being taken, when a carry takes place during transferring the transfer total key must be released. During a transfer total and/or a total operation, stud D trips pawl F, which allows spring E to swing the foot of lever C into the path of stud D. On the return stroke of the machine stud D locates over the foot of lever C which prevents a hand operation. Stud B blocks the drive trip.

Carrying Pawls (Plate 5)

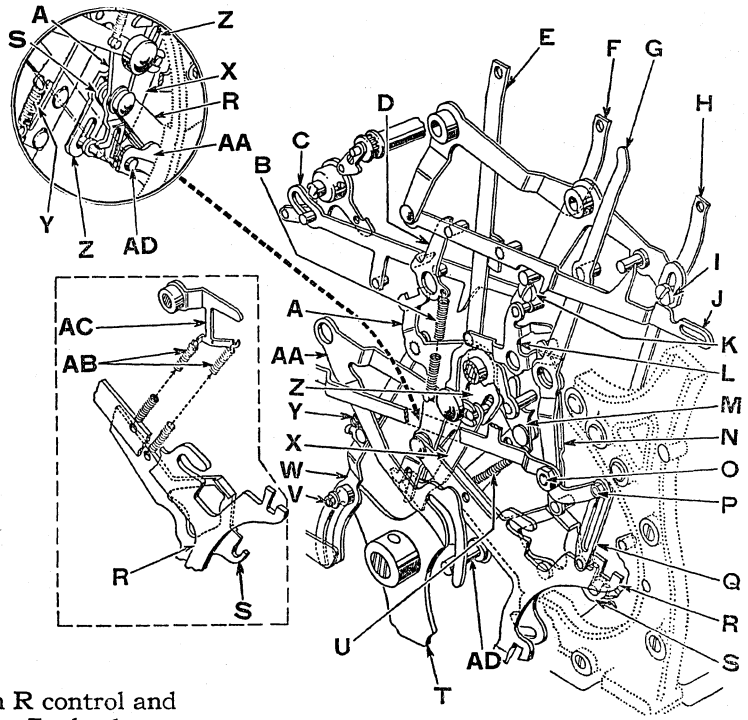
Carry pawls P have an additional foot for carrying in the lower counter.

The same tests as those used for Class 1 hold true, however these tests must be applied to both upper and lower feet.

During a transfer operation the lower counter is drawn in mesh with the adding racks. The cam of the adding wheel when in upper position, must clear the lower foot of carry pawl P as the mesh takes place, as the adding racks were limiting on the index wires. With the lower counter clear, transfer total key depressed and handle forward, springs O are unhooked and lower counter rocked in and out. Movement of P indicates no clearance.

To determine the amount of clearance, the test is made the same way, except that springs O are hooked up and the upper counter rocked in and out of mesh. The amount of movement of the adding racks indicates the amount of clearance. Excess clearance would result in failure of the adding rack latches (415) engaging the upper step of the adding racks when totaling the lower counter.

TRANSFER TOTAL MECHANISM (Class 2) (Plate 6)



Transfer Total Mechanism (Class 2) (Plate 6)

The purpose of this mechanism is to accumulate in the lower counter the individual totals of items that are added in the upper counter.

When transfer total key E is depressed, part L is rocked, its stud lowering total key H in order to secure a total operation. The foot of transfer total key E lowers part AA to align its cam slot with stud AD. The fork of part AA being meshed with the stud in coupler X, lowers the latter.

During the machine operation stud AD moving in the cam slot of part AA swings the latter downward, carrying coupler X further downward. which disengages upper pitman R control and pushes coupler X against part Z, the latter carrying lower counter pitman S, meshes the lower counter with the adding racks that were indexed during the total operation. On the return stroke, passby pawl M disengages the upper counter which swings part A to align with the stud in coupler X, and as part AA returns to normal position, the stud moves into the slot of part A, thereby coupling it to part Z.

Tests and Adjustments

With transfer total key E depressed, handle forward to last stop, there should be at least 1/64″ clearance between roller on N and pitman S, in order that S will have full hold on the upper stud in the upper counter; since the lower prong of L determines the positive engagement of S and the stud in the lower counter adjustment is made by bending the lower prong upward.

With the upper counter in mesh, handle normal, part L should have no more than 1/64″ play to prevent engagement when shift lever G is in upper position or vice versa. This adjustment is secured by bending the upper prong of L. No play would prevent total keys restoring completely.

With the transfer total key depressed and handle at the last stop, there should be 1/64″ clearance between the lower stud in coupler X and part A.

With the total keys normal and handle on first stop, there should be 1/64″ clearance between part AA and stud AD; excessive clearance between part AA and stud AD will permit stud AD to engage the point of the lower prong of AA and lock the machine. Excessive clearance can be reduced by locating the upper arm of AA higher.

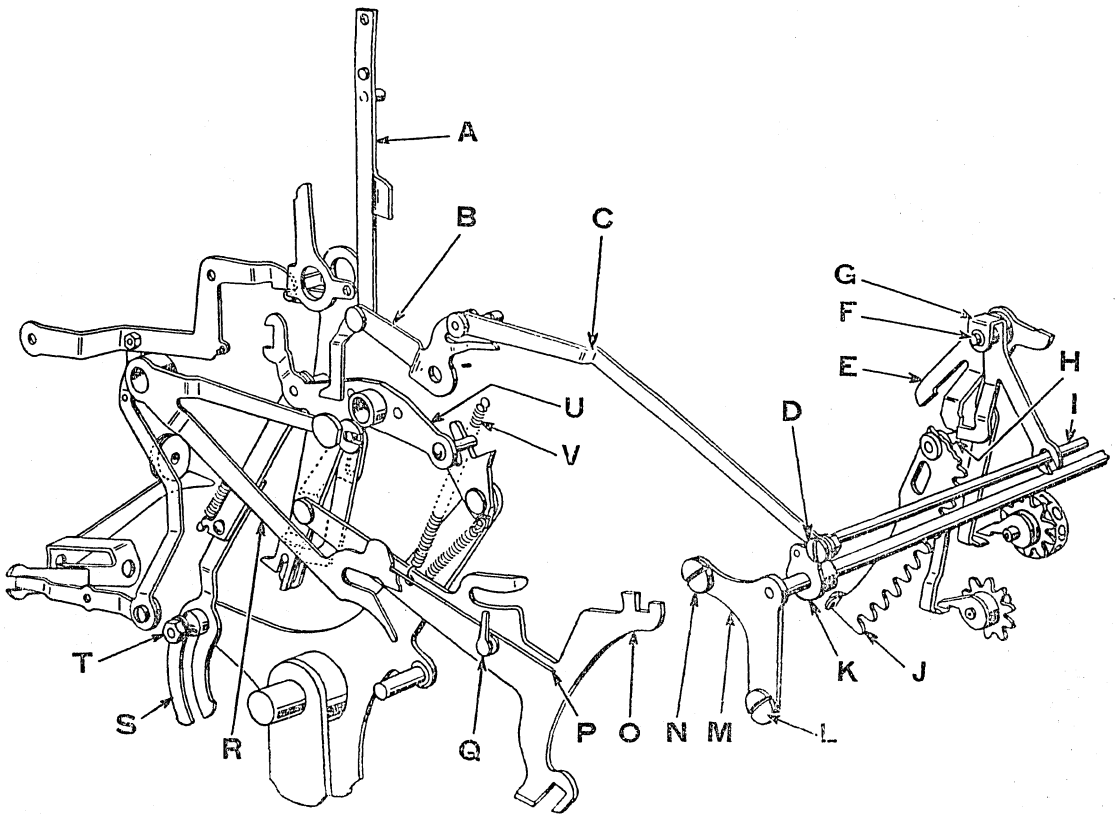
However, this adjustment will reduce the clearance between the lower stud in X and A and should there be no clearance to spare at this point, the upper arm of AA should not be changed.

With the transfer total key depressed, handle all the way forward, part X must have just enough clearance so as not to bind the hook of S on the upper stud in the lower counter.

To Adjust: The arm of part T which holds stud AD is bent so that stud AD will lean forward or backward.

When listing non-added items in Class 1 machines, the adding section is drawn in mesh by a roller on the full stroke sector contacting the arm on the side plate of the adding section. On Class 2 machines when items are non-added, the counters are meshed by link W contacting screw V. The purpose of spring Y is to prevent a bind by permitting sufficient play of link W.

SUB-TRANSFER TOTAL MECHANISM (Class 2) (Plate 7)



Sub-transfer Total Mechanism (Class 2) (Plate 7)

The purpose of the Sub-transfer Total mechanism is to retain on the upper wheels the amount which is being transferred to the lower wheels.

This mechanism is effective only when a control roll is on the non-add arm which prevents the disengagement of the upper adding section at the beginning of the return stroke of transfer operations. Sub-transfer Total mechanism is installed in machines having positive counter control.

Mechanical Operation

When transfer total key A is depressed, bail K is rocked, which moves auxiliary carry pawls G into the path of studs H (in adding racks J). When one or more carries take place during the transfer operation, they are prevented from accumulating by auxiliary pawls G which remain over studs H until the upper adding section is disengaged from the adding racks at which time the adding racks are released to accumulate the carries in the lower adding section.

Construction

Auxiliary carry pawls G swing on studs F, the forked arm of G meshes on shaft I (of bail K). Part R is used in place of regular 1-1612 1/8, the special part has the upper cam removed and a straight piece of spring wire P inserted. During a Sub-transfer Total operation part Z (Plate 6) remains disengaged from S until the Transfer key restores to normal, which causes a bind that is prevented by wire P in R.

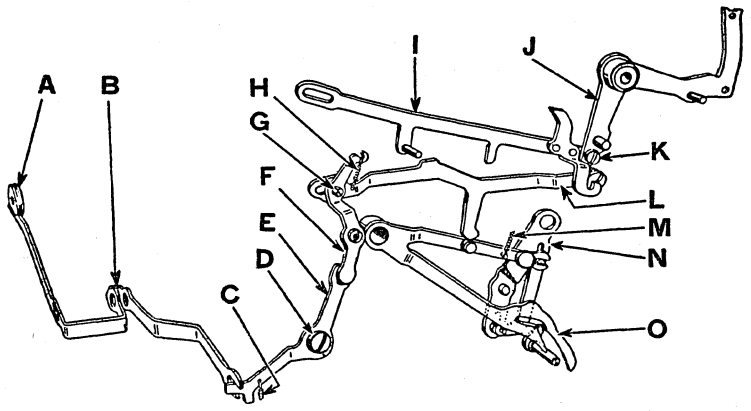
Tests and Adjustments

When the T. T. key is depressed each pawl G should have slight play over studs H. This play should only be sufficient to provide a non-binding contact.

To secure play at this point for all pawls link C is lengthened by reducing its offset. To secure play for individual pawls the arm over the studs is bent forward.

Wire P is adjusted to lie as close as possible to stud Q without disturbing the normal position of O.

TRANSFER MECHANISM, CARRIAGE CONTROLLED (Class 2) (Plate 8)



Transfer Mechanism, Carriage Controlled (Class 2) (Plate 8)

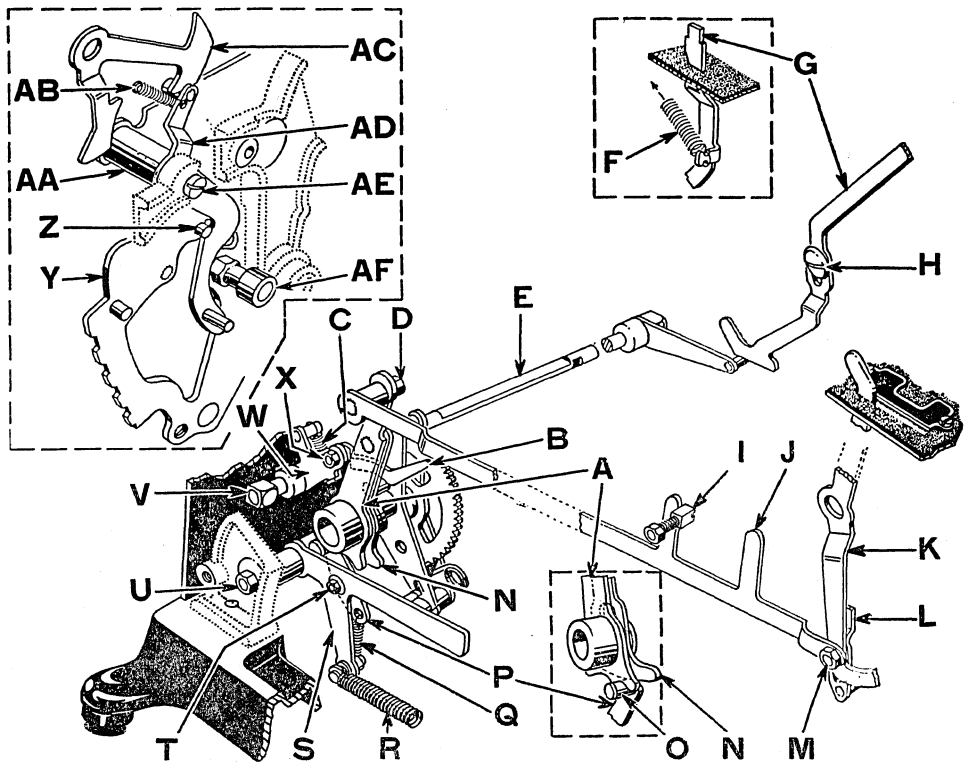
When the total key is held depressed and the carriage moved so as to cause a No. 3 roll to depress transfer lever B, levers E and F are rocked. Shoulder screw G moves link L rearward, a lower extension on the latter cams part O downward, thereby connecting the transfer and totaling mechanisms.

When the total key returns to its normal position a roll on the lower extension of lever I cams link L downward, aligning the horizontal slot of link L with shoulder screw G. When the total key is normal, the depression of transfer lever B merely causes shoulder screw G to idle in the slot of link L.

The depression of the total key allows spring H to raise link L and mesh in pocket with shoulder screw G.

The carriage controlled transfer mechanism is used when sub-totals are automatically repeated before a final total operation. No. 3 rolls are used on the non-add lever for sub-totaling, no roll used on the non-add lever for totaling and a No. 3 roll used on the transfer lever in the total column.

COUNTER CONTROL (Class 2 Shuttle Carriage) (Plate 9)



Counter Control for Class 2 Shuttle Carriage (Plate 9)

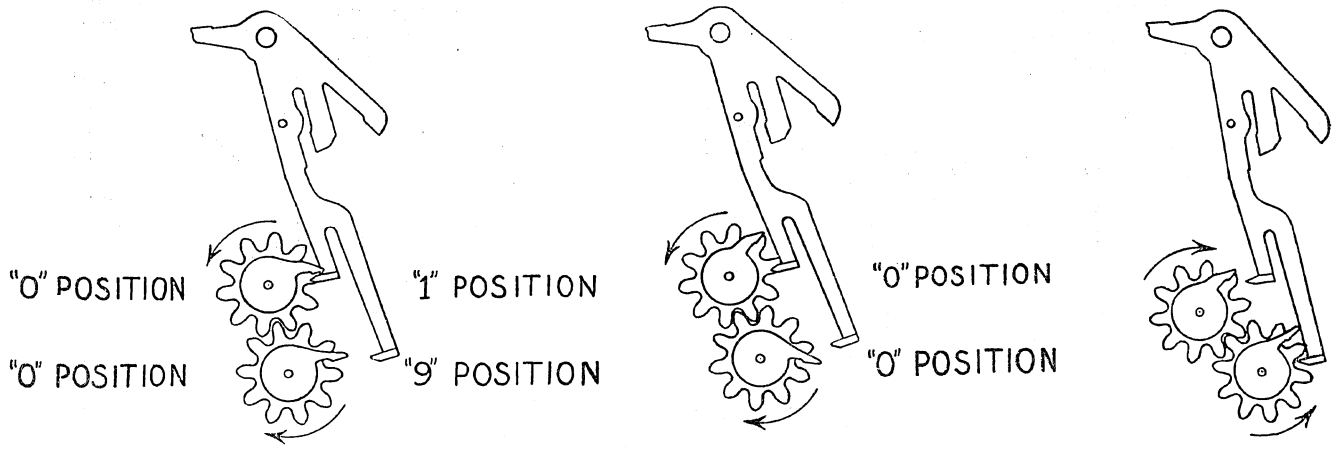
The counter control mechanism covered in this subject is used in shuttle carriage machines. The counters are shifted automatically during machine operation. This mechanism can be disabled by latching down key G.

Sequence

Operating lever A is given a backward and forward movement by pawl P through stud O engaging either the front or rear pocket in the lower arm of operating lever A. Pawl P pivots on power arm S, which is actuated by spring R, the latter is placed under tension on the forward stroke by the dashpot shaft (not shown) contacting arm S.

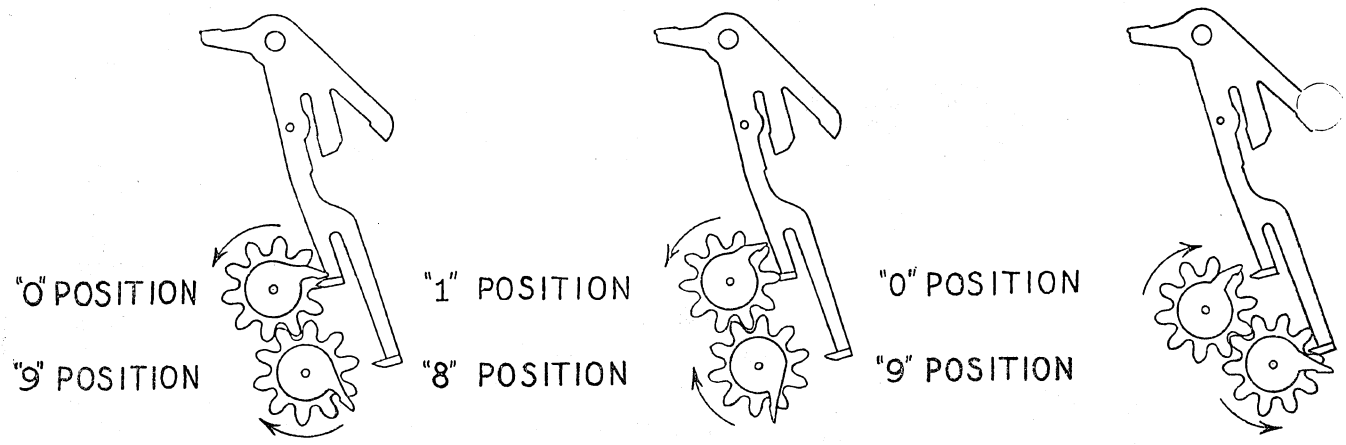
The movement of operating lever A is applied to shift lever K through link J. Shift lever K being moved from upper to lower, and lower to upper positions alternately by machine operations. This mechanism is timed to operate not before end of the return stroke, to insure complete accumulation before shifting to the other counter. Cam AC carried by a shaft having fork connection (not shown) to shift lever K is held by detent lever AD, which is blocked by stud Z in full stroke sector Y. At the end of the return stroke as stud Z moves off detent lever AD, releasing cam AC, spring R drives power arm S, which through pawl P swings operating lever A to move shift lever K through link J. Disabling key G when depressed, swings shaft assembly E. Arm B of shaft assembly E lowers blank N, the latter having no pockets causes pawl P to idle during the machine operations.

ADDING WHEELS INCORRECTLY MESHED (Plate 10)

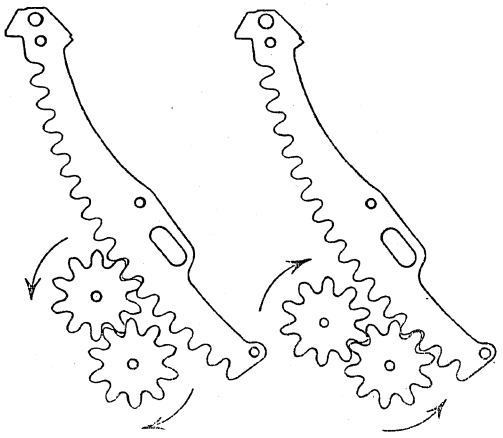


Counters Clear | After Adding 1 | After Subtracting 1

ADDING WHEELS CORRECTLY MESHED



Counters Clear | After Adding 1 | After Subtracting 1



GENERAL INFORMATION

Mechanical adding and carrying is an operation of turning the wheels forward.

Mechanical subtraction and reduction is an operation of turning such wheels backward that were previously turned forward.

Two wheels in mesh with each other turn in opposite directions. If one of them is meshed with an adding rack it turns forward and the other one turns backward.

If the mesh of the adding rack is now changed to engage with the other wheel, the first one will turn backward towards the starting point depending on the amount of movement of the adding rack and the other one will turn forward towards its starting point.

This is the principle involved in the construction of the Class 6 which is an adding machine with an accumulator having two sets of wheels in constant mesh with each other (Plate 10).

To provide for the changing of the mesh of the wheels and the adding rack, the frame carrying the wheels can be tripped up or down according to the position of the shift lever, thereby engaging either set of wheels with the adding rack.

The location of the cams of the adding wheels with respect to each other is very important.

In order to obtain correct results they are meshed in such a manner that the cams of the upper set are on top of the carrying pawls (0 position) and the cams of the lower set are below the foot of the lower carrying pawls (9 position). When the shift lever is reversed, the position of the cams in relation to the carrying pawls is also reversed.

The necessity of properly locating the cams in meshing the adding wheels can be shown as follows:

Suppose the upper and lower adding wheels were so meshed that with a clear machine the cams in both sets of adding wheels were on top of the carrying pawls (cipher position). (No automatic 1 involved in this case.)

If with the shift lever in add position, 1 were added, then the cam on the upper adding wheel would be one point above the carrying pawl (1 position) and the cam on the lower adding wheel would be one point below the carrying pawl (9 position). Were the shift lever now changed to subtract position and 1 subtracted, then the upper cam would rotate back to cipher position and the lower cam would rotate forward to cipher position; in doing this, however, it would shift the carrying pawl off the stud on the adding rack in the next bank and register 1 on the adding wheel in the next left bank in which the counter would show 10 whereas 1 subtracted from 1 should show 0.

By meshing the upper and lower adding wheels so that when the cams of one set are above the carrying pawls, the cams of the other set are below the carrying pawls 1 added and later subtracted will produce a clear machine.

Note: With a clear machine, and shift lever in add position, if 1 is added the cam of the upper adding wheel will be one point above the carrying pawl and the lower cam two points below the carrying pawl. If the shift lever is now changed to subtract position and 1 is subtracted, the lower cam will turn forward 1 point without shifting the carry pawl and the upper adding wheel will turn back one point.

A carry of the adding wheels that are in mesh with the adding racks reduce by 1 the corresponding wheels in the opposite set.

If 12 has been added and 6 subtracted it is necessary to automatically reduce the next column to the left by one while turning the adding wheel backward from 2 to 6. This corresponds to the borrowing process in ordinary subtraction.

With a clear machine and shift lever in add position, add 12. The cams on the upper adding wheels have advanced 1 and 2 points respectively from the top of the carry pawl, and the cams of the lower adding wheels have turned from the bottom of the carry pawl correspondingly.

The shift lever is now changed to subtract position; subtract 6. The cam of the lower adding wheel will now advance 6 points, shifting the carry pawl and allowing a carry in the second bank, resulting in reducing the first bank in the upper adding wheel to 5 and the second bank to 0. The shift lever is now returned to add position and with the first handle stroke, the automatic 1 will operate indicating the correct result, viz., 6. (Full description of Automatic one follows.)

Note that with a clear machine if the shift lever remains unchanged in either position all items depressed are added in a regular manner.

Negative Total Lock and Automatic One

A. When one or more amounts (the sum of which is less than capacity of the machine) are added in a clear machine with the shift lever in add position, a total can be taken only when the shift lever is in add position.

The total key is locked against depression when the shift lever is in subtract position in

GENERAL INFORMATION—Continued

this case because the other wheels were rotated in the opposite direction and the numbers are complements or negative and have no value. The mechanism which prevents the totaling of negative numbers is known as the negative total lock, which is described later under its own heading. This is explained in the following example:

Example:

Upper	Clear	00000000	Positive Number
		146	
		2000	Total can be
		12516	printed.
		14662	
Lower	Clear	99999999	Negative Number
		99999853	
		99997853	Total cannot
		99985337	be taken.

The same results are secured with the shift lever in either add or subtract position.

B. With a clear machine, a clear signal can be printed in either position of the shift lever. When the shift lever is in add position, the active or upper adding wheels are at cipher position. The inactive or lower wheels are at 9 position. When the shift lever is moved from add to subtract, the lower wheels become active, 1 is automatically added to the 9's resulting in ciphers, this one is subtracted from the inactive adding wheels thereby placing the upper wheels at 9 and the lower wheels at 0. Simultaneously, the carry across changing 9's to 0 also reverses the negative total lock, so as to permit the total key to be depressed in subtract position.

The mechanism which changes the 9's to 0 and the position of the negative total lock is known as the automatic one mechanism.

Example:

Upper	00000000	Shift lever at
Lower	99999999	Add.
Automatic	1	
Upper	99999999	Shift lever at
Lower	00000000	Subtract.

C. When a smaller number is subtracted from a larger number, the latter is reduced; however, the difference is still a positive number. For that reason a total can only be taken with the wheels having the positive numbers, which requires the shift lever to be moved from subtract to add position.

Example:

Upper	Clear	00000000	Positive Number
	Add	1250	
	Sub.	1000	Total can be
		250	printed.
Lower	Clear	99999999	Negative Num-
		99998740	ber. Total can
		99999740	not be printed.

D. When a larger number is subtracted from a smaller number, the larger number is reduced, increasing the complements beyond 9's which causes a carry across to take place, resulting in reversing the position of the negative total lock. At the same time, one is automatically added in the first column. The smaller number is reduced beyond ciphers to complements.

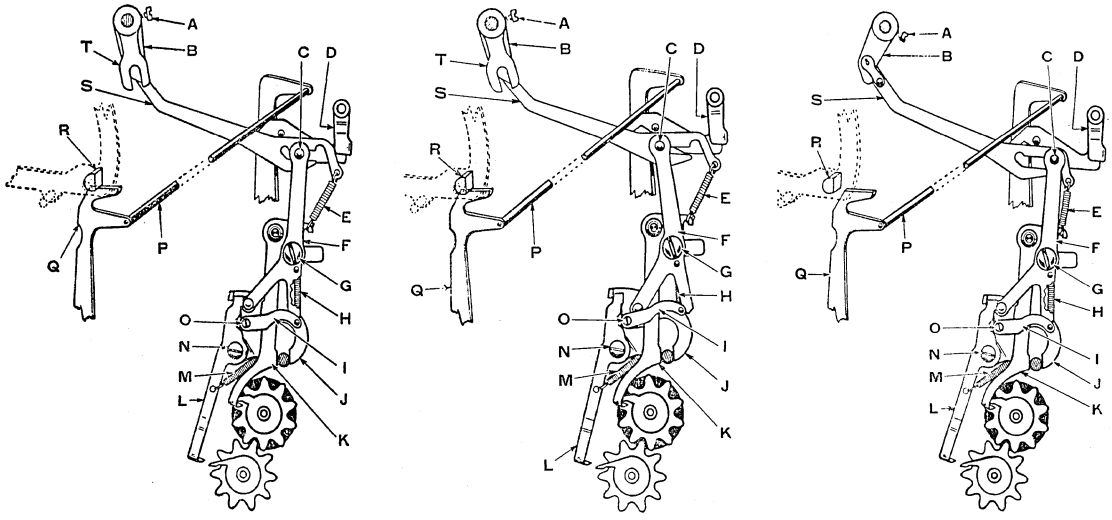
A total can only be taken with the wheels that have the positive numbers which in this case requires that the shift lever remain in the subtract position.

Example:

Upper	Clear	00000000	Negative
	Add	1000	Number.
	Sub.	1250	Total can not
		99998849	be taken.
Lower	Clear	99999999	Positive
		99998999	Number.
		00000249	Total can
		1	be taken.
		250	

From the preceding subjects A, B, C and D, it is evident that the purpose of the negative total lock is to prevent the printing of complements by blocking the depression of the total key when adding wheels having complements are in mesh with the rack bars. It is also evident that the purpose of the automatic 1 is to operate the negative total lock when the shift lever is moved from add to subtract in a clear machine and the machine operated and also to add one in the first column when the negative total lock is reversed through subtracting a larger from a smaller number.

NEGATIVE TOTAL LOCK MECHANISM (Plates 11, 12 and 13)



Negative Total Lock Mechanism (Plates 11, 12 and 13)

The total key is locked against depression by the negative total lock through detent D and upward movement of link S.

Link S swings on arm B, its forward end having two pockets and a dwell between them. When stud C is seated in either pocket, link S is in its lower position and detent D is also in its lower position which allows the total key to be depressed. Now, when the shift lever is moved from add to subtract, with a positive amount on the upper adding wheels, and the machine operated, link S is moved forward simultaneously with the shifting of the adding wheels having complements. During the forward movement of link S, its pocket moves from stud C and its dwell moves on stud C, thereby moving upward and raising detent D, which holds Q backward, thus blocking the total key, and preventing printing of the complements.

When a larger number is subtracted from a smaller number as explained in subject "Automatic one," the carry across causes cam 924½ (on lower adding wheels) to contact on and move lever L which moves F rearward, its upper end moving off the dwell into the rear pocket of link S, allowing S to assume its lower position. After a spacing stroke has been taken the total key can be depressed and the difference between the two amounts printed.

Now, in the event that the total is not taken, if the subtract lever is moved to add position, and the machine operated, link S will move rearward on stud C, to its dwell, moving upward and raising D.

The total lock detent moves Q rearward and Automatic "1" mechanism operates, 10411 holding Q when total lock detent is restored; a spacing stroke restores 10411, and Q is held rearward by D, blocking the total key, and preventing printing of the complements.

When the subtract lever is moved from add to subtract or vice versa, machine clear and the machine operated, a dual operation takes place; on the forward stroke link S moves upward, its pocket moving from stud C and its dwell moving on stud C while on the return stroke the carry across moves C into a pocket of link S so that after a spacing stroke is taken the total key can be depressed and a clear signal printed.

Sequence of Negative Total Lock Mechanism Tests

The different tests and adjustments covering the negative total lock can be classified under six subjects. These tests should be made in sequence so that one adjustment will not interfere with another.

1. Test shaft P for being parallel, and J to fit snug on 205 shaft.

2. Test for correct movement of pawls K and L, and for clearance from 924¼ and 924½, with cams in 9 position.

3. Test for proper hold of spear cam of F on stud of I.

4. Test for 1/32" hold of R on Q.

5. Test for free movement of S, and for correct tension of springs E, H and M.

6. Test for hold of cams 924¼ and 924½ on carry pawls K and L.

Negative Total Lock Tests and Adjustments (Plates 11, 12 and 13)—Continued

The first test applied to this mechanism is to parallel shaft P; trip the first and last carry pawls, and move Q forward with the finger; the 411B's should move at the same time; when necessary, arms Q (right and left) can be located to parallel shaft P; observe amount of hold and clearance of stud R and Q.

The correct amount of movement of K and L when these pawls are engaged by cams 924¼ and 924½ is another important factor for insuring positive operation of the negative total lock. This condition takes place when a larger amount is subtracted than added and also when the machine is clear and subtract lever is moved from upper to lower position or vice versa and the machine operated.

When F is being shifted by cams 924½ or 924¼ the spear point should be completely over the center of stud on detent I, before cams 924¼ or 924½ have reached the highest point of contact with pawls K or L.

When cams 924¼ and 924½ are contacting on pawls K and L at the highest point, there must be not only ample movement to trip K and L, but also a little play between the cam contact and the limiting points of K and L.

Test: The fork of J must have a snug fit on 205 shaft, then with counter clear shift the subtract lever to subtract position and operate the machine; as the carry across occurs, hold the last wheel, and permit it to turn slowly, and observe whether or not the spear cam passes completely over the stud of I before the 924½ reaches the highest point of contact with foot of L. When the 924½ has reached its highest point of contact, test L with a spring hook; L should have play; make the same test in reverse order to test 924¼ and K; to adjust operate on J, K or L. As this adjustment affects the position of the spear cam, and may affect the clearance of 924¼ and 924½ from pawls K or L, the positions of these parts must be considered in making adjustments.

Test hold of detent I on F. With the negative total lock removed, a 715 bender kit 55 (which is of the same diameter as shaft 205) is placed in the crotch of J, for testing the proper hold of detent I on the spear cam of F. This test should be applied with F in both forward and rearward positions.

The stud in detent I must have ample hold on spear cam F when the latter is in either position. The amount of hold is secured through the movement of the rear arm of F, the latter is limited in the rear by the upper part of L contacting against a bend of J. The rear arm of F is limited in the front by K contacting against shaft 205. On account of the spear cam on F having two positions, one when the complements are on the lower wheels and the other when the complements are on the upper wheels, the relative position of the spear cam must be equalized, to provide an equal hold of detent I in either position. This result is secured by bending the rear arm of F either forward or backward. Inasmuch as this equalizing process can neither increase nor decrease the amount of hold, it is necessary to increase the movement of F when the hold is insufficient.

Increase of movement is obtained by removing stock from one or more of four contact points; K with 205 shaft, lower stud of F with K; lower stud of F with L, or L with lip of J; the point of operation is determined by consideration of the preceding tests.

Excessive hold of spear cam on I must be avoided, as it may prevent the adding wheel from tripping the negative total lock.

After the adjustments of the hold of the spear cam on I have been completed, movement of pawls K and L and clearance of cams 924¼ and 924½ from these parts should again be tested.

Test for 1/32″ hold of total key on Q when the active counter (the counter in mesh) has the complements. The purpose of this test is to insure against printing complements. With machine clear, an amount is set up on the keyboard, machine operated, and subtract lever placed in subtract position and the machine operated twice. The sub-total key is now given a number of sharp depressions to determine whether it is possible to completely depress it. The same test is made with the subtract lever, first in subtract position, then the subtract lever is moved to add position.

The hold of stud R (of the total key) on Q is the result of the movement of D, when it is raised by link S, as the dwell moves on the upper stud (C) of F; this hold must be equalized by loosening screw A and locating link S either forward or rearward; the amount of hold can be increased by operating on D to tilt its stud downward; as D must have play under normal conditions, this play must not be taken up entirely, when stud of D is tilted; play of D must be tested with both counters, and should be equal, thereby insuring equal hold of R on Q when complements are on either set of wheels when active; it is taken for grated that all parts move freely.

To insure that the total key can be depressed when the negative total lock is operated through a carry by cams 924¼ and

(*Plates 11, 12 and 13*)—*Continued*

924½ the following 4 conditions must be considered:

1. Free movement of link S on the flanged stud C in upper part of F. When sluggish or binding will cause a drag on spring H.

2. Standard tension of spring E. When the tension is excessive, it will also cause a drag on spring H.

3. Standard tension of spring H on detent I.

4. Standard tension of spring M on L.

When for any reason, the tension of H is increased or decreased above or below the correct tension, the movement of F may not be positive. When the tension is excessive, the spear point of F can fail to go over detent I. When the tension is weak, the front foot of F can move backward.

Test: Machine clear, subtract lever in add position, all 2's except the extreme left 2, are accumulated. Subtract lever placed in subtract position and all 3's except extreme left 3 are accumulated. Handle is allowed to return very slowly. This test is also applied in the opposite way, subtracting all 2's except the last 2 and adding all 3's except the last 3. Test No. 2 is more sensitive than test No. 1 because the carry-across takes place before cam 924½ engages L which prevents the vibration of the carry-across from assisting the trip of the negative total lock.

Test for hold of cams 924¼ and 924½ and correct angle of feet of pawls K and L to insure against cams slipping off K and L.

A row of 5's is accumulated, sub-total printed a number of times, handle pulled rapidly, also operating the machine by power in both positions, add and subtract.

When machines fail to meet this test, it can be due to the angle of the feet on pawls K and L, i. e., feet being inclined downward or else lack of hold of cams on feet of K or L.

Instruction for Changing the Location of the Negative Total Lock

Remove the keyboard.

Remove the sub-total key.

Remove part C, plate 18.

Remove the total key.

Loosen the screw that holds cam lever U, Plate 18. This facilitates the removal of the total key, and allows the disengagement of fork T with the stud in the cam lever U, Plate 18.

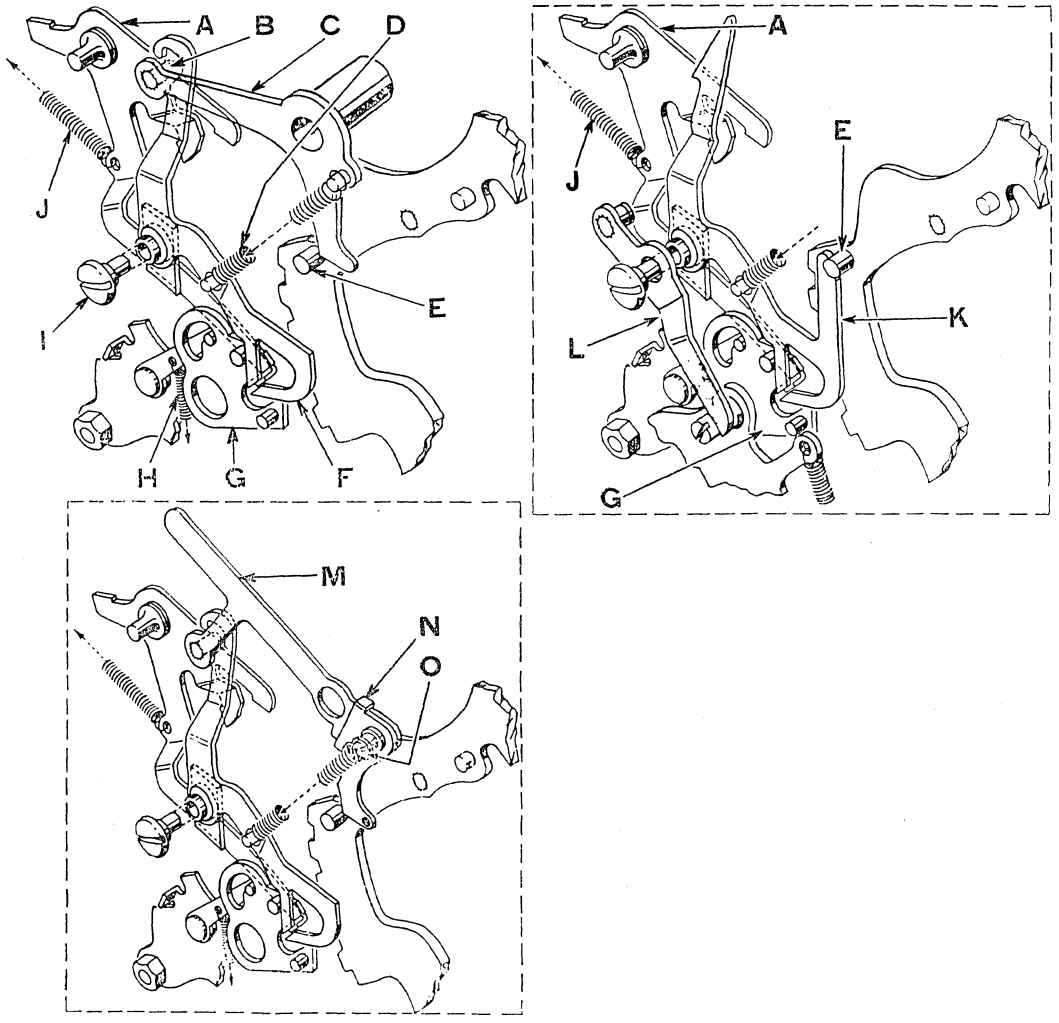
Release screw A holding lever B and turn the fork T so that the shaft can be withdrawn. Use a follow-up shaft while removing, then place lever B in the desired column.

Place negative total lock unit in proper column and connect link S with stud C (in F).

Remove and replace detent D in the proper column.

When the negative total lock is moved into another column to the right, stud 651 No. 1 (in adding rack) must be removed in that column. When it is moved to the left, stud 651 No. 1 must be installed in the column in which it was previously located.

AUTOMATIC ONE MECHANISMS (Plate 14)



Automatic One Mechanisms (Plate 14)

The purpose of the automatic one is to add 1 to the inactive adding wheels when they become active by being meshed with the adding racks.

Sequence

On the forward stroke immediately after the add and subtract lever is moved to its opposite position, the tumbling of the accumulator locates trip pawl G in line with the foot of carry pawl A. When the crossfooter is meshed, trip pawl G pushes carry pawl A rearward, clearing the adding rack in the first column.

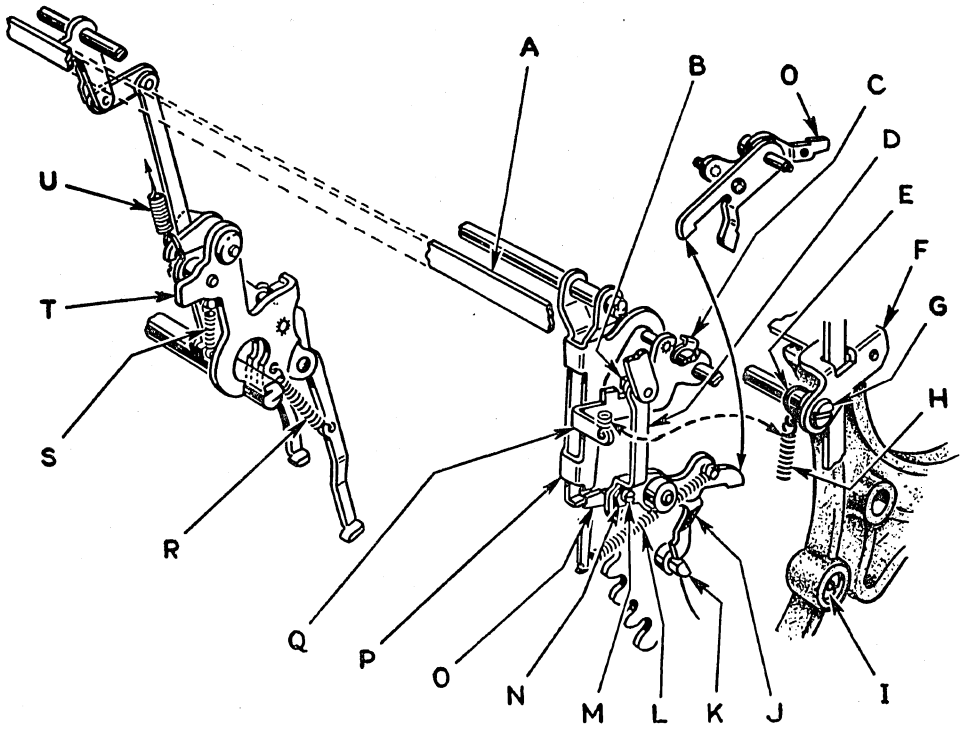
Just before the end of the return stroke, stud E contacts part C, stud B moving in the cam pocket of F, swings the latter to neutral position. This resetting mechanism insures automatic one accumulation during crossfooter non-add subtract operation.

Automatic One Mechanism (Early)

This mechanism differs from the late style insofar that the resetting of trip pawl G occurs slightly earlier. Stud E directly contacts part K to reset trip pawl G which takes place at an earlier time period.

The late style delayed resetting of the automatic one trip pawl can be installed in the field. Arm N is attached to part M with screw O, the hole in M is enlarged to fit screw O. Resetting arm F is installed in place of resetting arm K.

AUTOMATIC ONE—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINE (Plate 15-1)



Automatic One—For No Space Stroke Total Bank Posting Machine (Plate 15-1)

Purpose

To add one in the first column when the capacity of the crossfooter (in add or subtract position) has been exceeded.

Operation

When the capacity of the crossfooter is exceeded (crossfooter add or subtract position), the upper arm of the negative total lock T rocks bail A to swing arm D either forward or rearward. The forward or rearward movement of arm D lowers pawl O to release arm P which is moved rearward through the tension of spring L. The lip of arm P contacts the camming surface of pawl O, and rocks carry pawl J to release stud K which allows the sector to raise and add one in the first column.

Interlock Q locks bail A and the negative total lock in their shifted positions during the automatic one operation. The hook in the upper portion of arm P, being moved away from the stud in interlock Q during the indexing of an automatic one, permits the interlock to raise into the path of stud B through the tension of spring H, thus locking bail A in its shifted position.

The hook of arm P, which is lowered when the arm is restored to normal during the forward stroke of the following machine operation, lowers interlock Q to clear stud B, which permits actuation of bail A.

Adjustment

1. The clearance between eccentric bushing N and the top of the slot in arm D should remain constant whether arm D is located in its forward or its rearward position.

To adjust, weave the right end of bail A.

2. The shifting of arm D (forward or rearward) should lower pawl O sufficiently to release arm P without rocking carry pawl J.

To adjust, turn eccentric bushing N.

3. When the machine is normal, the lip of arm P should have a safe hold on pawl O; and when arm P is released (automatic one operation) the lip of the arm should rock pawl O and carry pawl J sufficiently to release stud K.

Note: There should be slight clearance between stud K and carry pawl J when the latter is tripped.

To adjust, raise or lower the lip of arm P. Note: If the lip of arm P is bent to provide the above adjustment, recheck adjustment No. 2.

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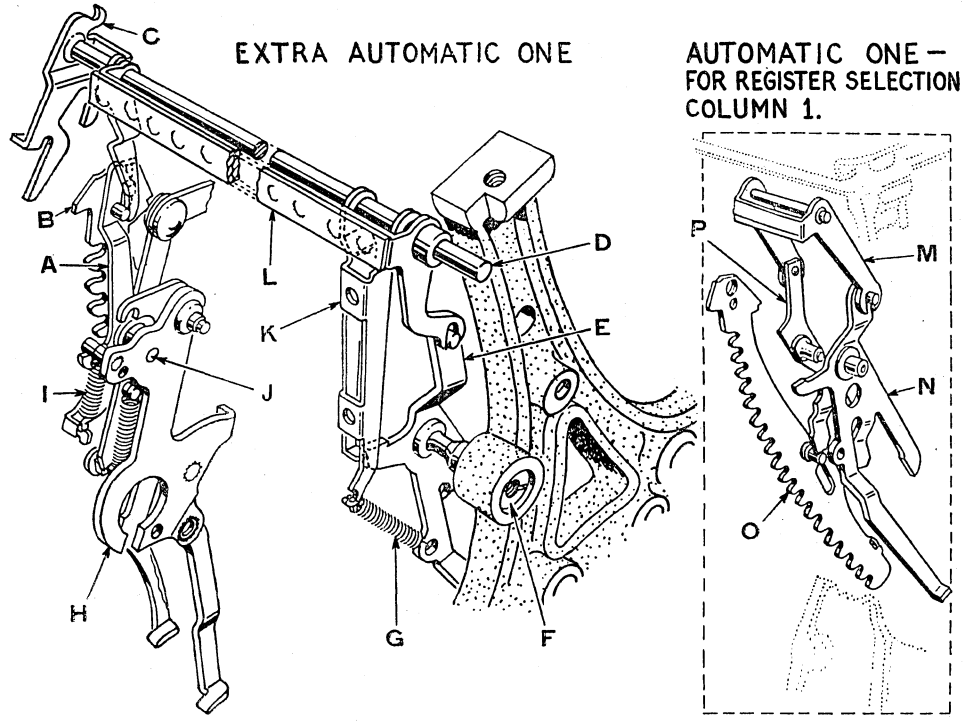
For Form 3756

EXTRA AUTOMATIC ONE AND AUTOMATIC ONE FOR REGISTER SELECTION—COLUMN 1 (Plate 15)



Extra Automatic One and Automatic One —for Register Selection—Column 1 (Plate 15)

The purpose of the extra automatic one mechanism is to carry one in the column to the left of the negative total lock in split machines, when a credit balance accumulates in the right portion of the machine. When the subtract lever moves to subtract position, the following machine operation trips carry pawl E, which through bail L swings arm A to clear the square stud in adding rack B, allowing the latter to move upward turning the adding wheel one point to add 1.

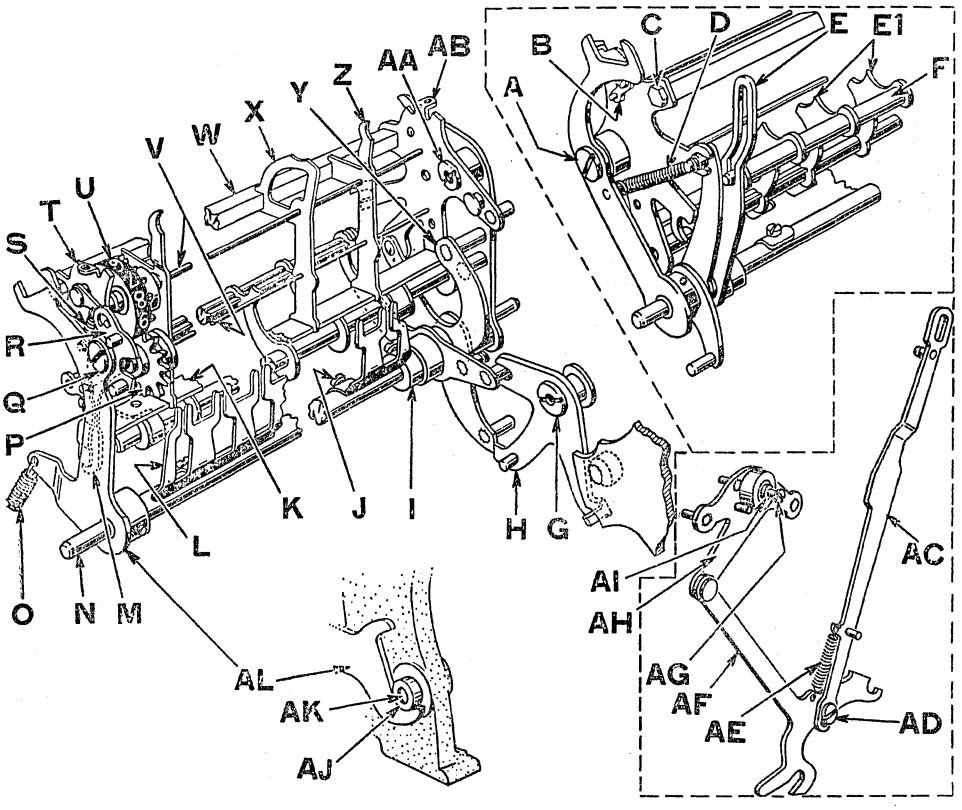
Automatic One—Register Selection Column 1

This mechanism releases the automatic one in the second column in machines which have keyboard register selection in the first column.

Sequence and Construction

When the position of the subtract lever is changed from add to subtract or vice versa and the machine operated, carry pawl N moves auxiliary pawl P through bail M, which releases the adding rack in the second column to accumulate one in that column.

CROSSFOOTER MECHANISM (Class 6) (Plate 16)



Crossfooter Mechanism (Class 6) (Plate 16)

The accumulator used in Class 6 machine has two sets of adding wheels U and P which are in mesh with each other. The upper wheels are in mesh with the adding racks when the subtract lever is in add position. The lower wheels are in mesh with the adding racks when the subtract lever is in subtract position.

The adding wheels revolve on shafts V in the side plates; the complete assembly pivots on bushings AA in the arms of assembly N. Detent H, although different in design, has the same functions as detent Q (Plate 2) in Class 1 machines, however, the adjustments are somewhat closer.

In Classes 6, 11 thru 16 and 20 thru 30, the mesh of the adding racks and adding wheels is adjusted by advancing or retarding the projections of side plates AL from or to bushings AJ.

The slot in the lower part of AC permits a flexible connection through spring AE between AC and AF after a total operation; the adding section is left out of mesh and as the total key is released, AF is prevented from restoring by contact of the upper roller in the side plate of frame assembly N. The slot in AC is necessary for the total key to restore. On the following stroke, AF is moved forward and spring AE draws the upper fork of AF to engage the upper roller in the side plate of frame assembly N. Sector guide L must clear the detents E1. The position of guides L must be equalized so that when the accumulator is disengaged on the forward stroke, guides L will be slightly further forward than the bottom of the teeth on the adding racks. When the accumulator is in mesh with the adding racks, guides L must clear the spring anchors on the adding racks.

Classes 6, 11 thru 16 and 20 thru 30 with the exception of the very early Class 6 machines, mesh the crossfooter at the end of the forward stroke by link F illustrated on Plate 43 which covers the crossfooter mechanism, Classes 20 thru 30.

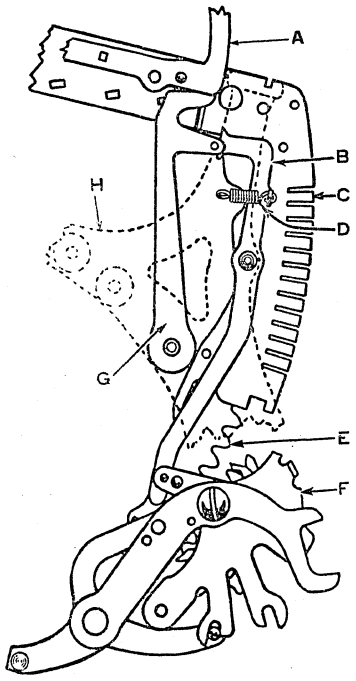
The reason for meshing the crossfooter on the forward stroke is to secure a better alignment of 9's and totals by taking advantage of

(*Plate 16*)—*Continued*

the tension of the carry pawl springs being increased when the carry pawls are being reset which prevents tripping the carry pawls. The use of link F referred to in the previous paragraph, permits using carry pawls having slightly shorter feet which prevents figures printing too high. When the total key is depressed manually or automatically, the stud in link AC disables link F (Plate 43).

Note: The carry pawls used in Classes 6, 11 thru 16 and 20 thru 30 are the same, shown by letter W, single stroke totaling mechanism (Plate 46). The tests and adjustments required for the carry pawls are the same as those for Class 1, however, the tests and adjustments must be applied to both upper and lower feet of the carry pawl.

TOTAL LOCK DETENT (Class 6) (Plate 17)



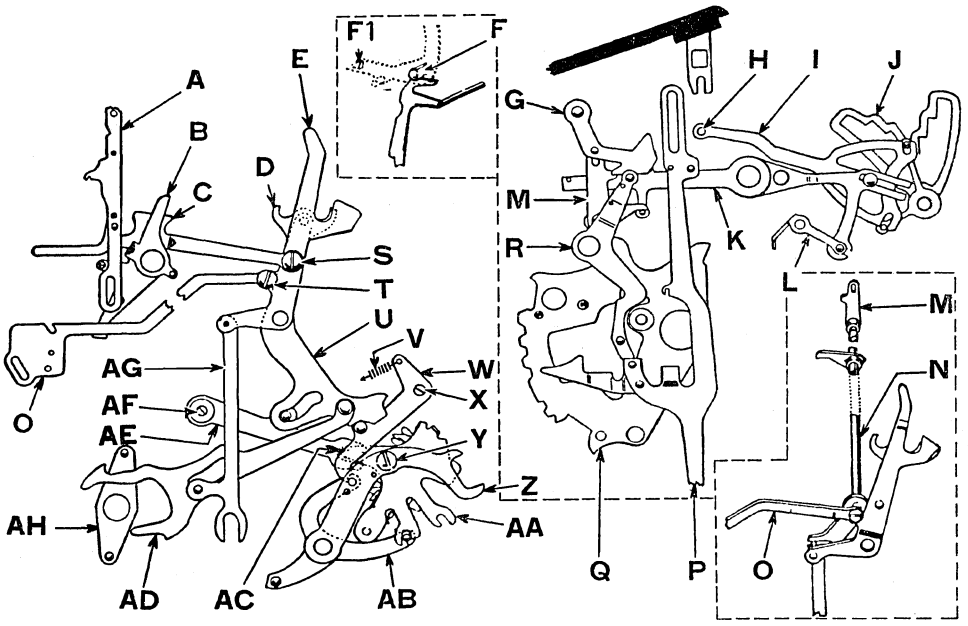
Total Lock Detent (*Class 6*) (*Plate 17*)

This detent swings between H and C. Its function is to lock the total key against depression when the accumulator is not in mesh with the adding racks.

For Example: With detent removed: register .07 on the upper wheels, move shift lever to subtract position and subtract, .05. Move shift lever to add position, depress non-add key. After the machine is operated the accumulator will be left out of mesh with the adding racks. When the total key is depressed and the machine operated, at the beginning of the forward stroke the Automatic 1 mechanism will trip carry pawl 1-10413R, allowing adding rack to move upward on stud 655, and as the machine operation continues, the sectors and adding racks move downward as a unit. Since the movement of the sector starts at one point below cipher, the printed result will be 1 instead of 2. This loss of 1 is more completely explained under "Compulsory Spacing Stroke" (Plate 5).

It will be observed that the meshing of the accumulator with the adding racks causes the total lock detent to release assembly G.

ADD-SUBTRACT LEVER AND COUNTER SHIFT MECHANISM (Class 6) (Plate 18)



Add-Subtract Lever and Counter Shift Mechanism (Class 6) (Plate 18)

The purpose of the add and subtract lever is to index the counter shift mechanism.

When lever E is moved to subtract position, link AG raises pitman AD in line with the upper stud in part AH.

Lever E moves part C to block non-add key A. Lever E also rocks shaft assembly N which, through arm M and cam arm G, rocks interlock R to block drive release part P when lever E is only partially moved. The inside arm of shaft assembly N rocks lever K to mesh part I with the lower stud in index arm J to index lower subtract symbols. Lever K also indexes the minus symbol couplers. Index arm J and its controls are fully covered in the instruction book on printing. When lever E is partially moved, the total key is blocked by the upper arm of lever E blocking stud F. When lever E is completely moved to subtract position, the total key is blocked by interlock D locating in the path of rear square stud in the total arm.

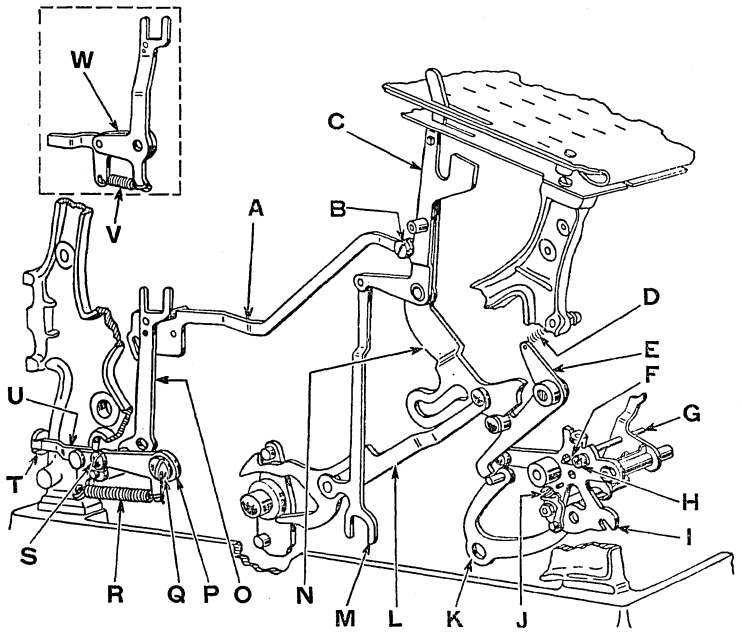
During the forward stroke part AH pulls pitman AD rearward, the latter swinging actuating cam lever U, its bottom cam surface swinging arm W downward which moves detent AB out of the pocket in the rear projection of AA. The closed cam slot of cam lever U, swings arm AE downward, its forked arm swinging frame AA to locate the lower wheels in line with the adding racks. The movement of cam arm U also swings interlock D to clear the total lever after the adding wheel shift is completed.

Tests and Adjustments

The studs in AB should engage the corresponding slot in AA when the movement of AE is completed. To adjust AE, its fork is located upward or downward. The fork of AE should fit the stud in AA snugly.

Note: When the lever E is moved from subtract to add position pitman AD locates in line with the lower stud in AH and during the machine operation the upper wheels locate in active position.

SUBTRACT CONTROL INDEXED FROM THE CARRIAGE (Plate 19)



Subtract Control Indexed from the Carriage (Plate 19)

When the carriage moves a control roll on lever T, arm U, through spring R in 13 column machines, or spring V in 17 column machines, swings vertical O forward, which through link A, swings subtract lever C to subtract position. The vertical arm of subtract lever C raises link M, which in turn, raises part L in line with the stud in the actuating member which operates during the following machine operation (covered in detail under subject of shift lever).

This mechanism is disabled when the carriage normal and counter normal keys are depressed.

GENERAL INFORMATION, CLASSES 11 THRU 16

General Information, Classes 11 thru 16

The construction of the Burroughs Duplex-Subtractor includes another accumulator having one to six sets of adding wheels in addition to the adding and subtracting mechanism that is used in Class 6 machines.

This additional accumulator is called the register and is located on the base level to the rear of the front upper and front lower adding wheels, the latter two now being known as the crossfooter.

Registers are single or multiple. Single registers have one adding wheel for each adding sector excepting those sectors used for calendar feature and characters. These adding wheels are separated by long spacing sleeves.

Machines which are equipped with single registers are known as Class 11 machines.

Multiple registers have two or six adding wheels for each adding sector, excepting those sectors used for calendar feature and characters. These adding wheels rotate on a sleeve which is shifted from right to left in order to place different sets of adding wheels in mesh with the adding racks.

Machines having two sets of adding wheels are known as Class 12 machines.

Machines having three, four, five, or six sets of adding wheels are known as Class 13, 14, 15, or 16, respectively.

Multiple registers are selected by the carriage, keyboard, subtract lever, etc. Each method is covered in this book.

In the early Class 11-16 machines non-adding in the register is indirectly controlled by the non-add arm. An intermediate arm having pockets is used between the register and the non-add arm, the pockets for adding and the dwell on the arm for non-adding. Different size rolls are used on the non-add arm to locate the intermediate arm.

Non-adding in the crossfooter is directly controlled by the non-add arm in the usual manner. With this construction, it is possible to non-add in the crossfooter and add in the register, non-add or add in both register and crossfooter. This flexible adding and non-adding control also permits simultaneous adding in register and crossfooter.

Late machines have separate control levers for crossfooter and registers which simplify

GENERAL INFORMATION—Continued

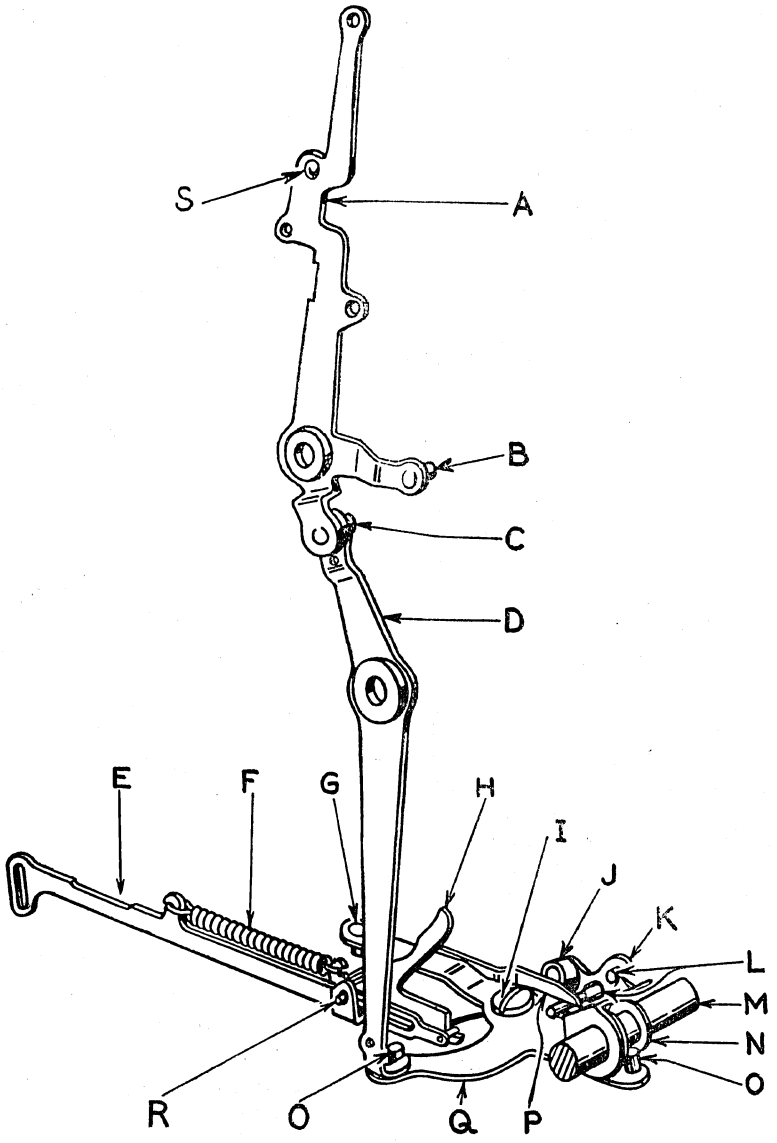
the selection and control. This subject is covered under its own heading.

Totaling and sub-totaling of register and crossfooter is secured by the same total and sub-total keys. To total or sub-total the crossfooter, the register total indexing lever must be in normal position, then either total or sub-total key is depressed and the machine operated.

To sub-total or sub-total the register, the register total indexing lever is placed in total or sub-total position, which disconnects the crossfooter from the total key and aligns the total and sub-total meshing cams with the register. The total or sub-total key is depressed and the machine operated.

Transferring from the crossfooter to the register is secured by allowing the register to add during a crossfooter total operation. Transferring from the register to the crossfooter is secured by allowing the crossfooter to add during a register total operation.

REGISTER TOTALING INDEXING LEVER
(Classes 11 thru 16) (Plate 20)



REGISTER MESHING CONTROL (Plate 21)

Register Meshing Control (Plates 20 and 21)

Meshing and unmeshing of adding wheels and adding sectors and also meshing and unmeshing of adding wheels and carry racks for listing, sub-totaling, and totaling positions of the register is obtained through cams A engaging passby pawl D and J of assembly G.

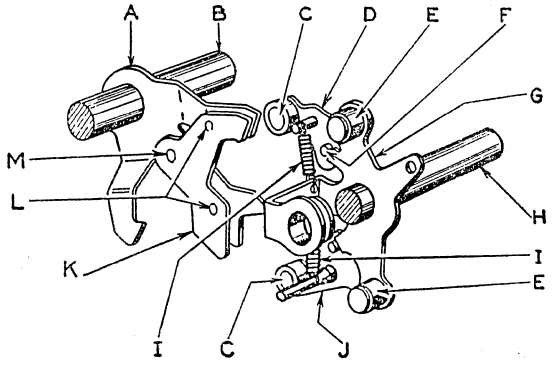
Cam assembly A consists of cams A and K, the latter cam being pinned to and carried by cam A. Cam assembly A has 6 projections, two each for listing, sub-totaling and totaling.

Passby pawl assembly consists of passby pawls D and J, which pivot on bracket G. The complete assembly which slides freely on shaft H is located and held in one of three positions by register lever A (Plate 20), link E (Plate 20) and bell-crank D (Plate 20).

When register lever A (Plate 20) is in its normal position in the center of the slot in the keyboard, which is the listing position, the rolls on passby pawls D and J are in line with the center projections of cam assembly A, the lower one which contacts on the lower passby pawl for meshing the adding wheels out of the carry racks into the adding racks at the end of the forward stroke. The upper center projection, which contacts on the upper passby pawl, meshes the adding wheels out of the adding racks into the carry racks at the end of the return stroke.

When register lever A (Plate 20) is moved to the lower end of the slot in the keyboard, which is the total position, the rolls on passby pawls D and J are placed in line with the right projections of cam A. The lower projection meshes the adding wheels out of the carry racks into the adding racks at the beginning of the forward stroke. The upper projection meshes the adding wheels out of the adding racks into the carry racks at the beginning of the return stroke.

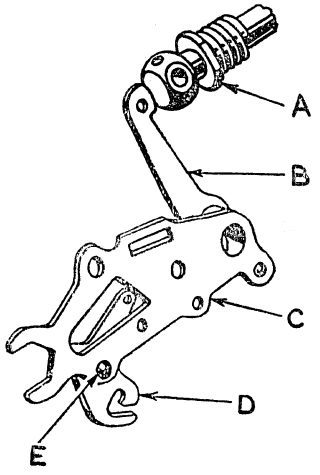
When register lever A (Plate 20) is moved to the upper end of the slot in the keyboard, which is the sub-total position, the rolls on passby pawls D and J are placed in line with the left projections of cam K. The lower projection meshes the adding wheels out of the carry racks into the adding racks at the beginning of the forward stroke, just as when register handle A (Plate 20) is in total position. The upper projection meshes the adding wheels out of the adding racks into the carry racks, just as when shift lever A (Plate 20) is in center or normal position.



Cam Assembly "A" (Plate 21)

When register total indexing lever is in normal position passby pawls D and J should be in the center between cams A and K, to insure that there will be no interference which could result in engaging or disengaging the register at the wrong time. The lower part of lever D (Plate 20) is bent to locate passby pawls correctly.

ARM TO INSURE MESHING OF REGISTER WHEELS AND CARRY RACKS (Plate 22)

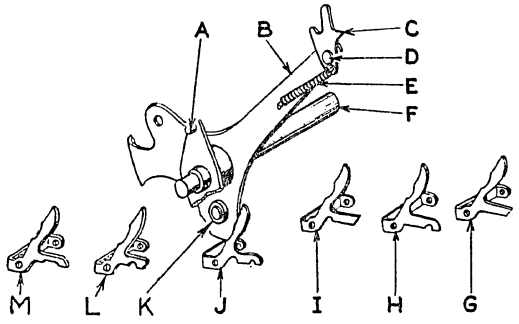


Arm to Insure Meshing of Register Wheels and Carry Racks (Plate 22)

The purpose of arm B is to provide positive action when the meshing cam disengages the register wheels from the adding racks.

With the machine normal, there should be minimum clearance between arm B and pitman A.

REGISTER NON-ADD MECHANISM (Plate 23)



Register Non-add Mechanism (Plate 23)

Machines which sub-total with the total key are equipped with part H (Plate 24) having a low projection. When a No. 3 roll is used, the crossfooter will add and sub-total with the total key.

When the projection on part H (Plate 24) is low throughout, a No. 1 roll will also add; however, when the projection is high on the front end a No. 1 roll will cause the crossfooter to non-add. The standard bell-crank J No. 2 has 4 positions as follows:

1st Position. No roll. Register non-adds. Crossfooter adds.

2nd Position. No. 5½ roll. Register and crossfooter add.

3rd Position. No. 3 roll. Register and crossfooter non-add using high H (Plate 24).

No. 3 roll. Register non-adds, crossfooter adds using low H (Plate 24). Sub-totals with total key.

4th Position. No. 1 roll. Register adds crossfooter non-adds using high H (Plate 24). No. 1 roll. Register adds crossfooter adds using low AC (Plate 24).

When register add key is depressed, it contacts on roller I (Plate 24) on Y (Plate 24) which moves link R (Plate 24) causing stud O (Plate 24) to move into a pocket in bell-crank M (Plate 24), which holds the latter out of the path of B.

In earlier machines bell-crank I was shorter and has only one pocket, its four positions are:

1st Position. No roll. Register and crossfooter add.

2nd Position. No. 5½ roll. Register non-adds, crossfooter adds.

3rd Position. No. 3 roll. Register and crossfooter non-add using high H (Plate 24). No. 3 roll. Register non-adds. Crossfooter adds using low H (Plate 24). Sub-totals with total key.

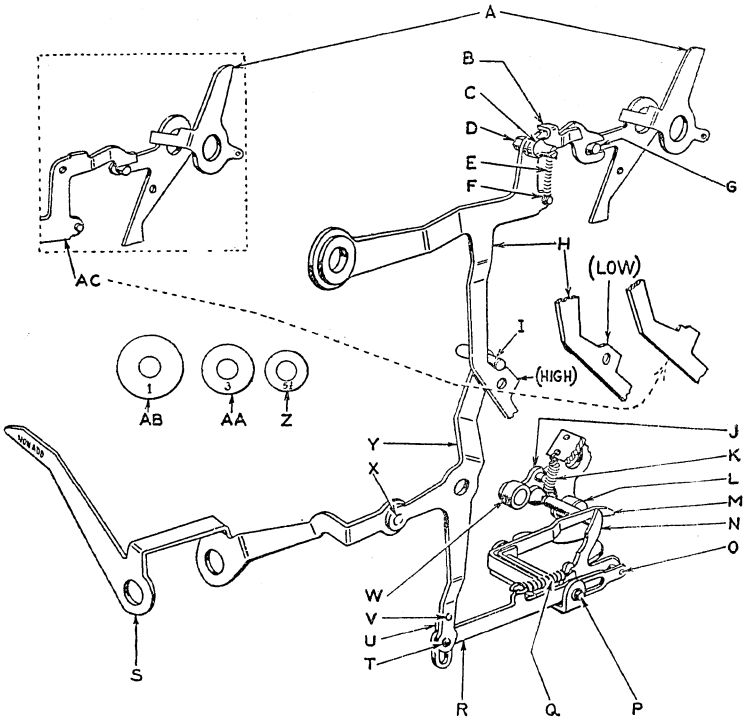
4th Position. No. 1 roll. Register add crossfooter non-adds using high H (Plate 24). No. 1 roll. Register adds crossfooter adds using low AC (Plate 24).

Bell-crank H is similar in length to bell-crank J, however it has only the front pocket. Bell-crank H was used in early style Savings Bank Machines. Part AC (Plate 24) used in connection with bell-crank H has a high and low step. The low step causes a partial movement of A (Plate 24) for sub-totaling with the total key when a No. 3 roll is used.

Tests and Adjustments

Non-add Test: When the register non-add key is depressed, there should be $\frac{1}{32}$ inch clearance between roll C (Plate 21) and the lower projection of cam A (Plate 21) during the machine operation. This clearance can be readily observed by looking through the right side when making this test. When there is none or insufficient clearance at this point, take up lost motion between roll K (on B) and arm of bell-crank lever J.

NON-ADD CONTROL REGISTER AND CROSSFOOTER (EARLY) (Plate 24)



Non-add Control Register and Crossfooter (Early) (Plate 24)

Non-adding of the register is secured through moving lower passby pawl J downward and out of the path of cams A (Plate 21), thereby preventing the meshing of the adding wheels and the adding racks.

Passby pawl J is moved downward or disabled by the movement of section B (Plate 23), this movement being applied to passby pawl J through roller K (Plate 23) in B (Plate 23) rocking bell-crank N, the latter rocking part M which contacts on and lowers passby pawl J.

Selective adding and non-adding of the register and the crossfooter is directed by control rolls on the non-add lever and also by the non-add key, register add key and register non-add key.

When a control roll moves on the non-add lever, the latter moves part Y, the lower part of which moves link R, the latter rocks bell-crank N into or out of the path of B (Plate 23) to control adding and non-adding of the register.

The upper portion of part Y moves part H to rock A into or out of the path of passby pawl C (Plate 23) to control adding or non-adding of the crossfooter.

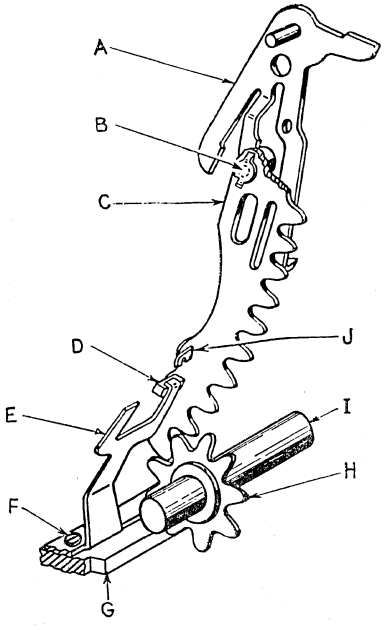
To non-add in the register: Stud O (in link R) must be under a dwell in bell-crank N so as to raise it into the path of roller K (Plate 23) on B (Plate 23), thereby disabling passby pawl J.

To add in the register: Stud O (in link R) must be in a pocket of bell-crank N, causing the latter to remain out of the path of roller K (Plate 23) in B (Plate 23), thereby allowing passby pawl to be engaged by cams A (Plate 21).

On account of the fact that the non-add lever is used for both register and crossfooter, the size of the roll used will affect either one or both, depending also on the shape of the projection on part H.

Machines which do not sub-total with the total key are equipped with part H having a high projection. When a No. 3 or a No. 1 roll is used, the crossfooter will non-add.

MESHING ADDING WHEELS OF REGISTER AND CROSSFOOTER (Plate 25)



Meshing Adding Wheels of Register and Crossfooter (Plate 25)

The register is meshed with the adding racks on the latter part of the forward stroke simultaneously when the crossfooter is meshed with the adding racks.

The register is meshed with the carry racks on the latter part of the return stroke when studs B in C contact on carry pawls A.

When a carry is set by the crossfooter during simultaneous adding, thereby moving carry pawl A out of the path of stud B in C, a possible overthrow of the rack is arrested by studs D contacting on the lip of guide E. If overthrow of racks were present at the time the register was being disengaged from the racks, it would cause the adding wheels to be turned one point more or cause a carry pawl to be released when the wide tooth was at 9 position.

Guide E is fastened to lock bar G, thereby moving into and out of the path of studs D when the register is meshed into and out of the racks.

Test for hold of studs D on the lips of guide E. Add 9's in register, take spacing stroke releasing all carry pawls A on the return stroke, slightly before register is disengaged from the adding racks, apply upward pressure to each adding rack.

Adjustment: The lip of guides E is slightly bent in order to secure more hold.

Test for clearance between the square studs and the back of the guide, with clear crossfooter and register. Apply same test with adding racks limiting on No. 1 keystem wires. Adjust for clearance by bending guides further forward.

Installing Register and Crossfooter (Plate 26)

Install crossfooter hanger G, passing it upward through opening in base.

Place and fasten right pivot bushing L using one washer and hexagon screw K. Place and fasten left pivot bushing L, first putting on it parts AO and B, using 2 washers and hexagon screw K.

Place and hook spring H. Place and fasten bushing W and screw X (for P). This is to facilitate the installing of the register.

Place register in position, register lever in sub-total position holding it at an angle, right and downward and forward. Guide spear arm M under bushing W, guide U so that spool V will clear over Q, pull register lever in total position and guide stud R in T under bell-crank S. The latter is important to prevent a tight lock. Swing register to the right and upward into position and carefully engage guides Y with adding sectors Z.

Fasten register to right side frame, placing short bushing K into side frame for front arm, and fasten both arms with slotted screws I. ***Note:*** The rear bushing is placed in side frame during a previous assembling operation.

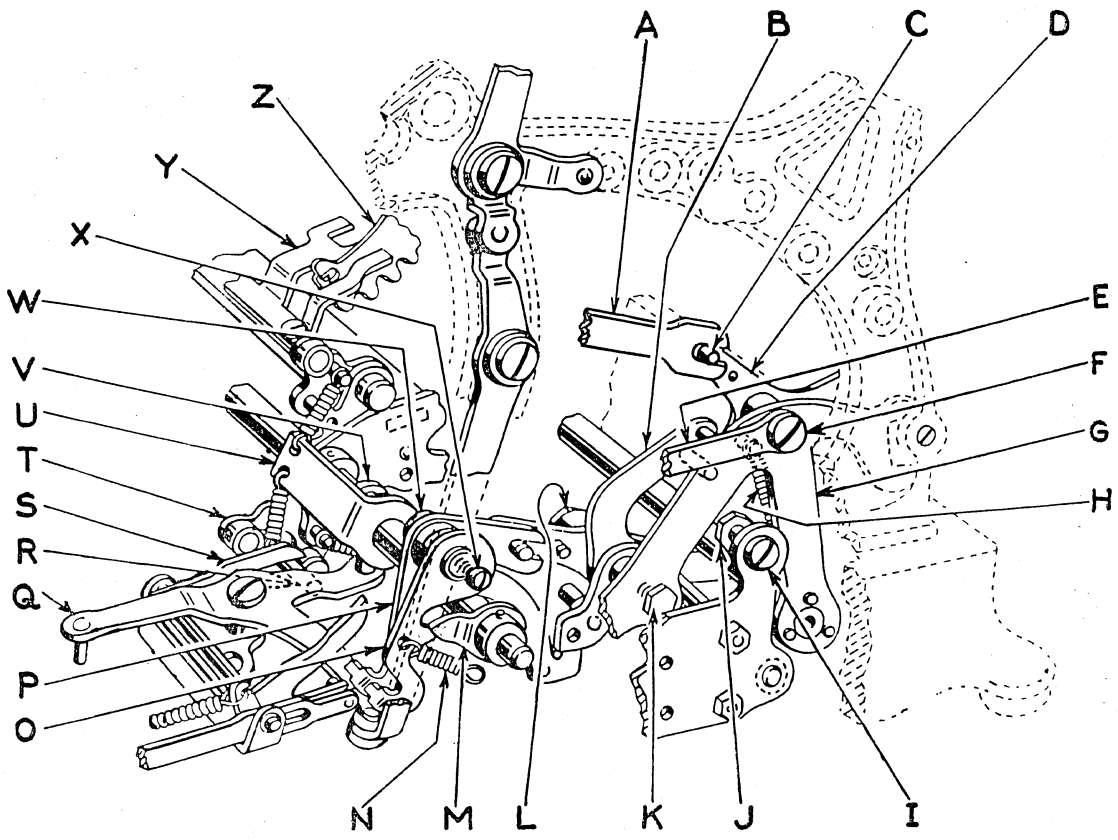
Fasten register to left side frame, using 2 long bushings J and two screws I. Connect resetting link AJ with screw AI, washer AL and nut AK.

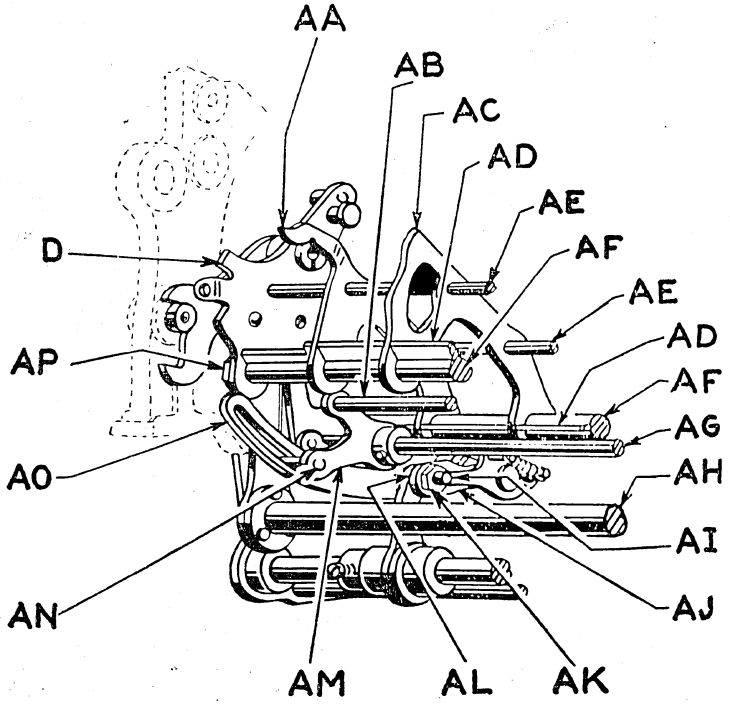
Hook spring to stud in right side frame from end plate on right end of shaft.

Remove bushing W, pass it through O and P and place the latter in position, fastening it with screw X. Install crossfooter, handle forward, subtract lever in lower position.

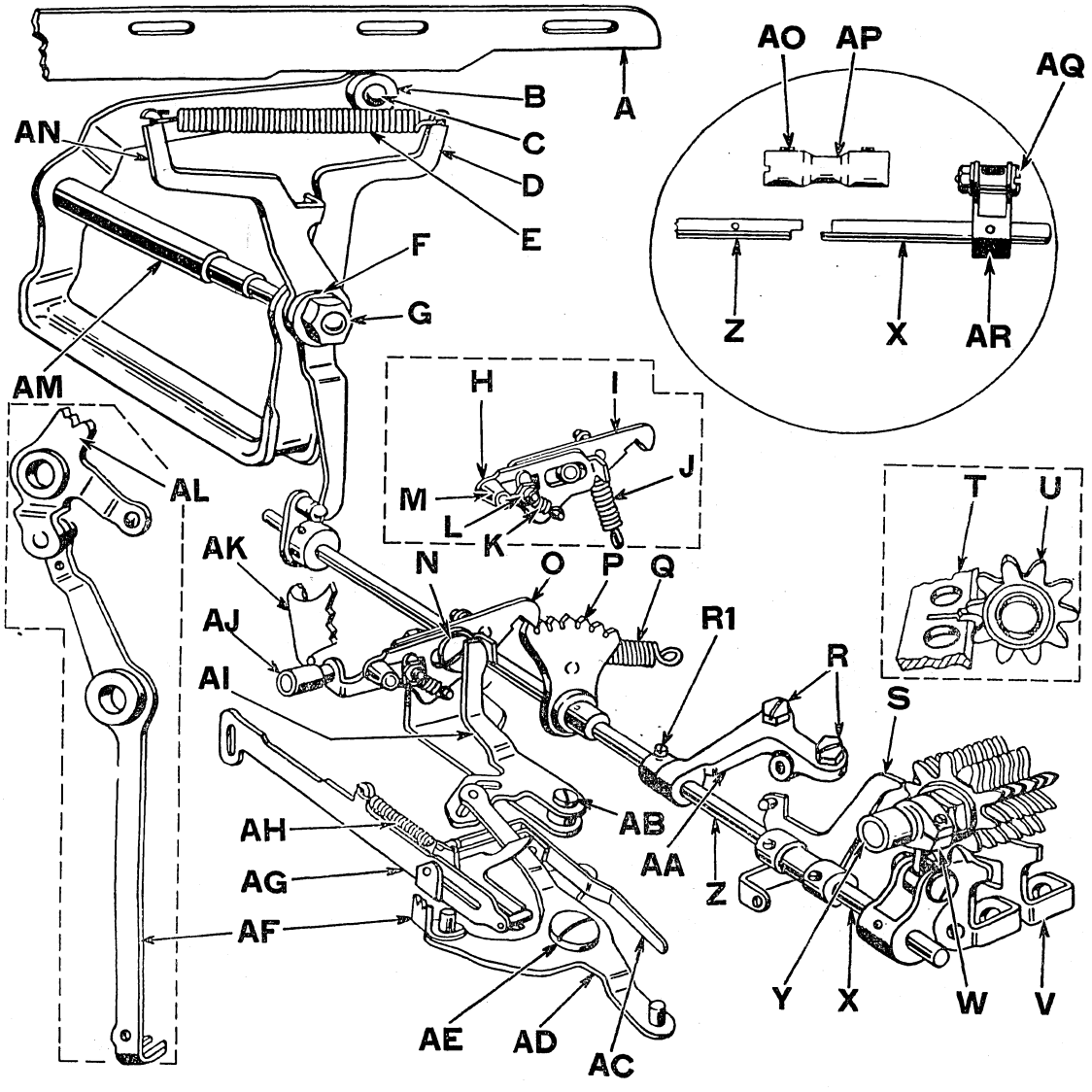
Place left side of crossfooter, guiding stud AN (in arm AM) into slot of AO and stud C (in D) into fork A. Swing crossfooter towards the right into position. Fasten left side with screw F, passing it through link E into bushing. Fasten right side with screw I.

INSTALLING REGISTER AND CROSSFOOTER (Plate 26)





REGISTER SHIFTING MECHANISM (Carriage Selection)
(Classes 12 thru 16 and 22 thru 30) (Plate 27)



Register Shifting Mechanism (Carriage Selection) (Plate 27)

The carriage movement causes skid A to depress lever D which places spring E under tension. On the forward stroke of a listing or spacing operation, AK (68113A*) rocks detent I or O to clear index sector P which allows spring Q to move lever AN, the latter turns shaft assemblies Z and X. The movement of shaft assemblies Z and X is applied to the adding wheel assembly through universal joint AR and arm W, the latter is threaded on tube Y. At the end of the forward stroke, AK (68113A*) moves off roller M, which allows spring J to seat detent I or O in the indexed tooth space of index sector P. On the return stroke, AK cams slide H in its slot.

During totaling, register total indexing lever AL, through lever AF, bell-cranks AD and AI slide part H, locating roller M out of the path of AK to allow detents I or O to lock index sector P during the total operation, which totals the register indexed by the then present carriage position.

Machines equipped with register release mechanism permit registers other than the one in the present carriage position to be totaled. Register shift release mechanism is covered in detail under (Plate 50).

Tests and Adjustments

Listing: Roller M should have minimum clearance from AK.

Adjustment: For more or less clearance, AK is bent outward or inward. At the start of the return stroke, AK should cam slide H without bite. For best results AK should contact roller M at 45° toward the left side frame. If AK contacts on the bottom of roller H, a lock takes place, resulting in breaking the detent.

Totaling: When the register total indexing lever is moved to lower position, there must be no bind to slide H. When a bind is present, bell-crank lever AI is bent to allow slide H minimum clearance.

Register Construction

When the adding wheel assembly is being shifted to another register position, there must be no interference between the adding wheels and carry racks or between the adding wheels and bar T.

When the adding wheel assembly is manually moved so that the adding wheel teeth will be partly on bar T and partly on carry rack V, there should be slight play of the adding wheels. This test should hold true for both normal and carry position of V. This condition insures clearance between the adding wheels and bar T and clearance between the adding wheels and carry racks V which indicates the correct relation of bar T and carry racks V.

Tests and Adjustments

Test for interference of adding wheels and right side of opening in bar T by adding and repeating all 9's, pressing adding wheel assembly towards right on the return stroke. When adding wheels interfere, loosen screw holding W, turn complete adding wheel assembly towards rear pushing on lock nuts (similar to screwing bolt in nut). Repeat test for interference of adding wheels and right side of bar T.

Apply same test holding adding wheel assembly towards the left to test for interference of adding wheels and trip arms S. When interference is present, the complete adding wheel assembly is turned towards the front (similar to unscrewing bolt out of nut). There must be no interference on either side of the adding wheels, for that reason the available clearance must be equalized.

Note: The preceding instructions are applicable to both 6 and 10 register assemblies.

Shafts "Z" and "X"

Bushing AP should fit tight on pin in shaft Z. Test tightness of Z and X in bushing AP when loose, spot shaft X for set screw in AP.

With the register total indexing lever in normal position the stud in AD should be on the peak of the closed cam slot in AI; this position of the stud in AD insures full movement of AD.

When the stud is on either side of the peak of the closed cam slot in AI, the lower part of AF is bent to locate the stud correctly. When this adjustment is made pawls D and J (Plate 21) should be tested to clear cam A as it may be necessary to equalize the position of AF.

REGISTER SHIFT, AIRPOT CONTROLLED MECHANISM
(Plate 27-1)

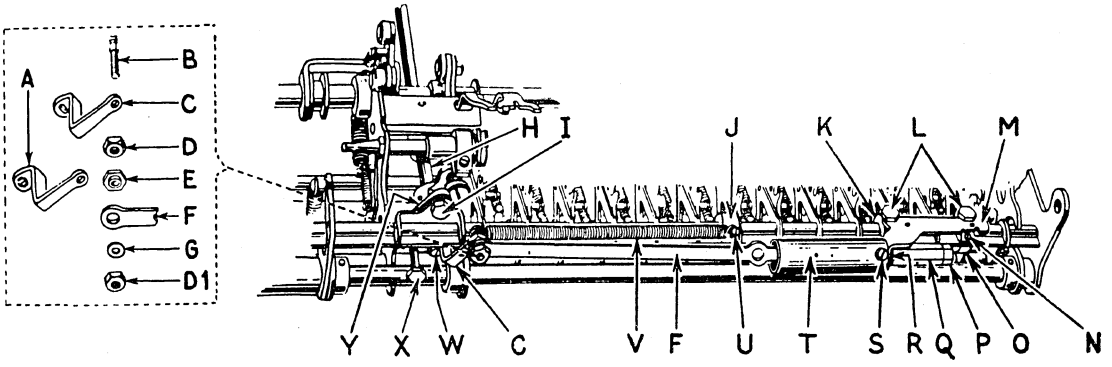


FIG.No.1

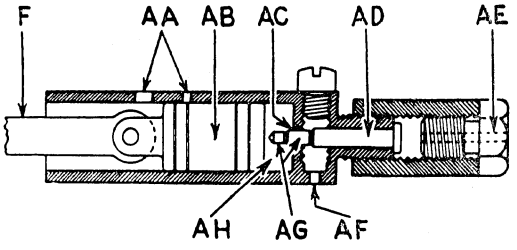


FIG.No.2

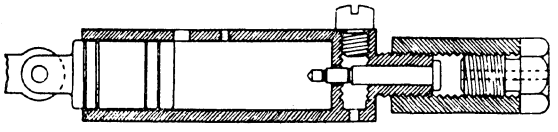


FIG.No.3

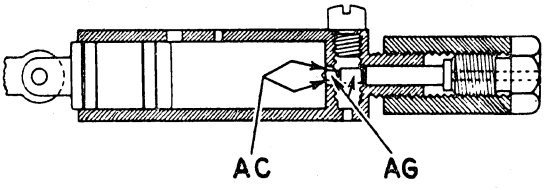
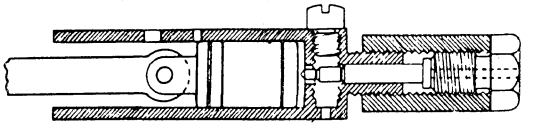


FIG.No.4



Register Shift, Airpot Controlled Mechanism (Plate 27-1)

This mechanism governs the shifting of the register pinion assembly by controlling the momentum when the register pinion assembly is shifted in either direction.

By controlling the momentum, the register pinion assembly is not permitted to run ahead and consequently does not have to recover, therefore, less time is required to perform a register shift operation. The time of register shifts vary according to the particular jump involved.

With this new control mechanism, the register pinion assembly is properly located at the time the register detent is released by the 800 section.

This mechanism can only be installed in machines with registers having the floating bearing construction as illustrated.

Sequence

The register back plate spring U, (Plate 48, Keyboard Symbol List) is the means of shifting the register from right to left or from register ten to one. At this time, piston AB and needle valve AD are moved to the left. This is called the suction stroke. Air is drawn through air vent AF and controlled intake AC into the air chamber AH. The continued movement of the piston results in it moving beyond the relief intakes AA whenever any register numbered less than four is selected. This results in additional air drawn in permitting an increased acceleration of the register pinion assembly beyond this point.

Fig. 1—Illustrates the piston AB at the beginning of the suction stroke, with needle valve AD in its correct position.

Fig. 2—Illustrates the piston at the end of the suction stroke.

(Plate 27-1)—Continued

When the register pinion assembly is shifted from position one to ten by the register base spring AU, (Plate 47, Keyboard Symbol List) piston and needle valve are moved to the right. This is called the compression stroke.

Fig. 3—Illustrates the piston at the beginning of the compression stroke with the needle valve in its correct position.

Fig. 4—Illustrates the piston at the end of the compression stroke.

Since the register base spring is lighter in comparison with the register back plate spring, the diameters AG of the needle valve AD in the controlled intake opening AC is of two different sizes to compensate for the difference in the spring tensions. This allows an air intake and exhaust in correct relation to the light and heavy register actuating springs. Furthermore, the relief intakes AA insures a rapid degree of acceleration of the register pinion assembly when shifting from one to ten. After the register pinion assembly has reached its number four position, the relief intakes are closed by the piston; the needle valve then controls the air escapement.

Air vent AE permits the free movement of needle valve.

Installation Notes

When assembling this mechanism in machines with register adding capacity not exceeding 13 columns, collars K are placed against the right-hand division plate of the second and fourth carry pawl space from the right. Spring anchor collar J is placed against the right-hand division plate of the sixth carry pawl space from the left.

With the register pinion assembly located in No. 1 register position, plunger AB must extend approximately .030″ beyond the edge of the cylinder T.

Adjust arm A or C at the offset.

There must be clearance between cylinder T and shaft N, (Plate 43, Accumulation Symbol List).

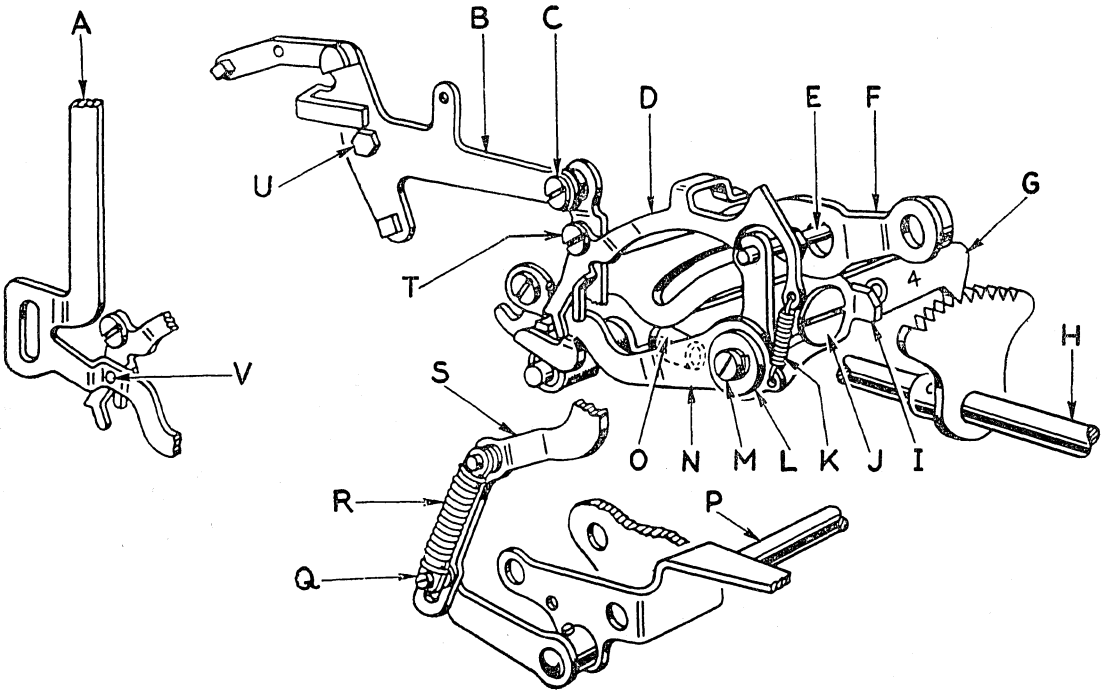
Adjust the forward portion of plate M upward.

Registers with 14 columns adding capacity, necessitates moving all the collars over one column to the left.

To insure proper function of this mechanism, the register base and back plate springs should be of correct tension, and ***must*** be replaced if not on test. Machines with the feature "Keyboard Selection of Registers" requires spring 1-806 Fte. 202 No. 2 in place of spring AH, Plate 47, Keyboard Symbol List.

Since assembly H is constructed in two styles, either arm A or C is required.

REGISTER DETENT RELEASE MECHANISM, IMPROVED STYLE (Plate 27-2)



Register Detent Release Mechanism, Improved Style (Plate 27-2)

The purpose of this mechanism is to provide more available register detent opening time by raising the detent earlier in the machine cycle through the crank mechanism. Its use reduces the number of restricted register jumps.

This mechanism is effective on all listing, crossfooter and register totaling operations.

The depression of the normal key disables the mechanism.

Sequence

The movement of assembly P by the crank, lowers link S and pawl D, and through arm N raises the detent G clear of the segment in assembly H. Before pawl D is disengaged from arm N by link F, the 800 section has been moved far enough to retain the detent in its raised position in the usual manner.

Stud E acts as a limit for pawl D, preventing it from swinging beyond the projection on arm N.

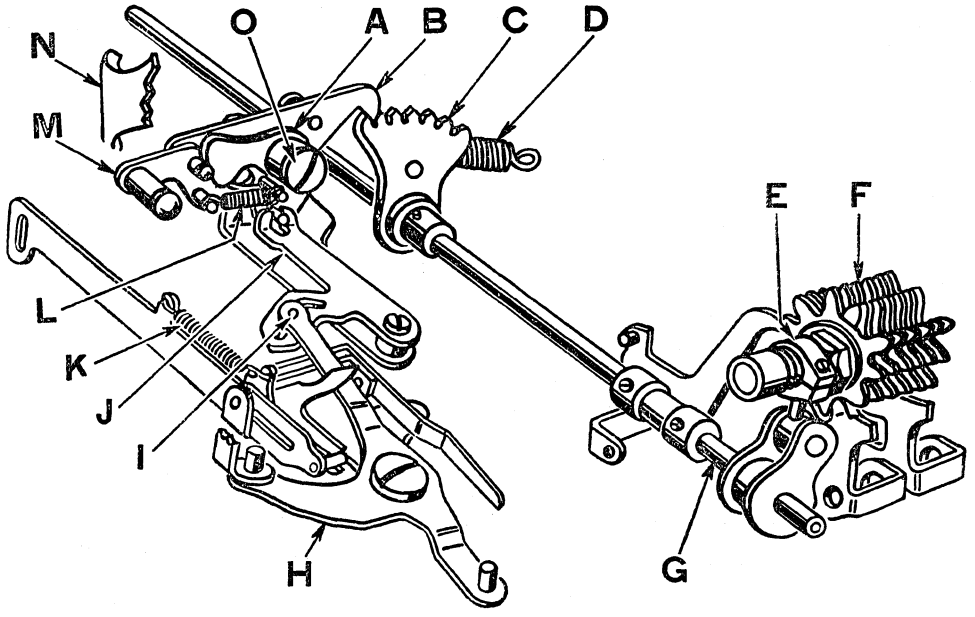
The depression of normal key A through stud V contacts against and moves pawl D clear of the projection on arm N.

Tests and Adjustments

When the cam of the 800 section engages roller O of the detent G, the pawl should be disengaged from the projection of arm N.

Adjust the extension of pawl as required.

REGISTER ALIGNING DETENT (EARLY) (Plate 28)



Register Aligning Detent (Early) (Plate 28)

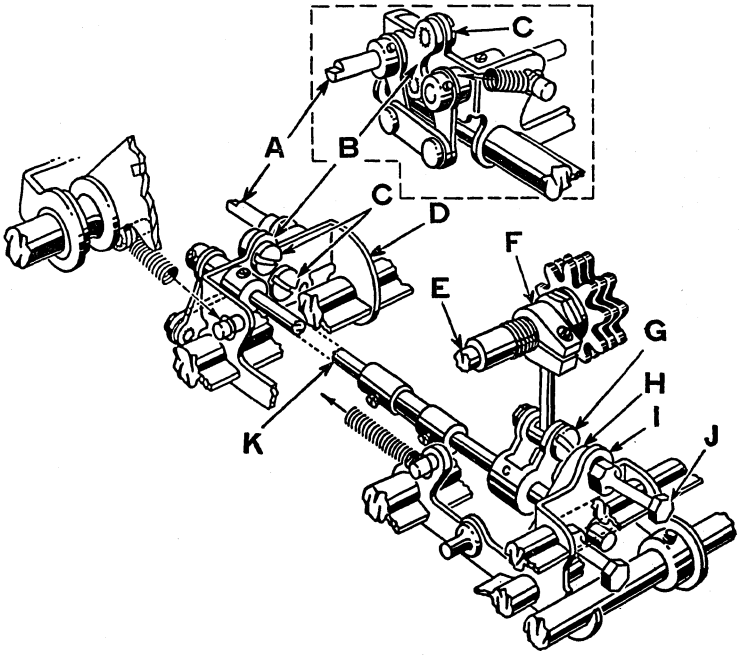
When the register total indexing lever is moved to total or sub-total position, the rear arm of H cams bell-crank J, the latter turns part A which allows spring L to pull passby pawl M out of the path of N, thus preventing the shifting of registers while the adding wheels are engaged with the adding racks during a total operation.

FLOATING BEARINGS FOR REGISTER INDEXING ASSEMBLIES (Classes 22 thru 30) (Plate 30)

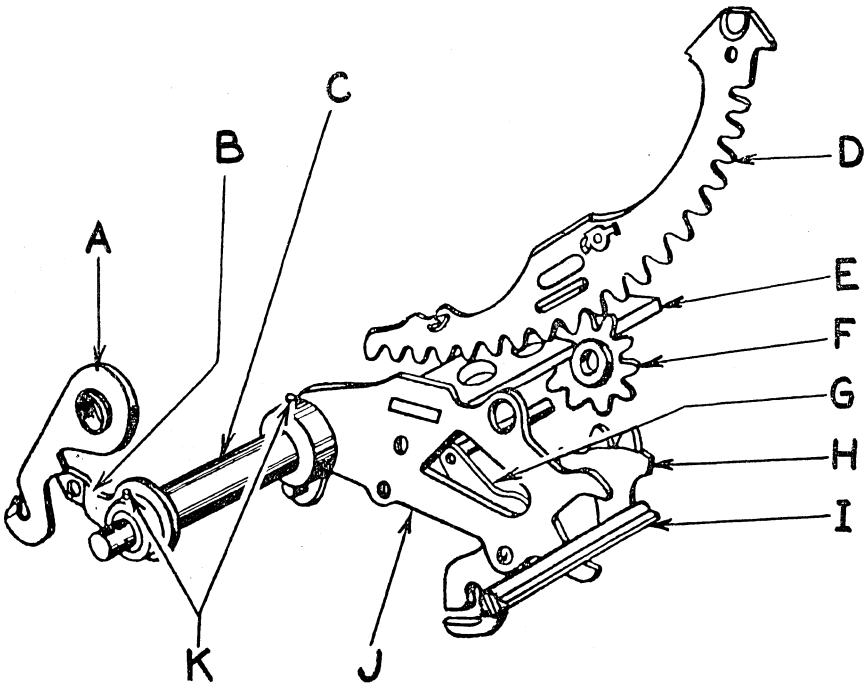
(Plate 29 For Symbol Book Only)

Floating Bearings for Register Indexing Assemblies (Classes 22 thru 30) (Plate 30)

The purpose of floating bearings B and H is to permit aligning shaft A in order to insure free shifting of the registers. When registers are installed, screws C in 14 bank capacity and screw J in 13 bank capacity are loosened and bearings B and H allowed to assume their positions, then screws C and screw J are tightened.



DEPTH MESH (Plate 31)



Depth Mesh (Plate 31)

The depth mesh of adding wheels F is determined by the upper and lower prongs of side plates J right and left limiting on tie rod I.

The upper prong is adjusted to secure the correct backlash when the adding wheels are in mesh with carry racks H. ***Caution:*** This adjustment is made at the factory.

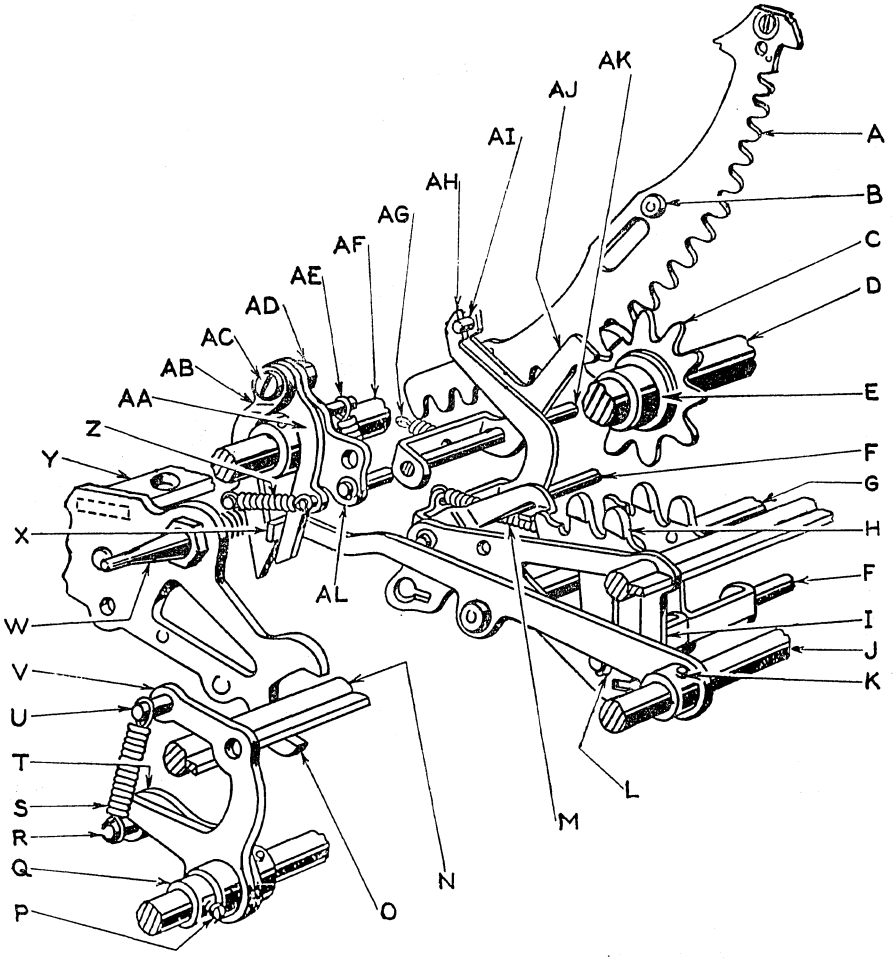
The lower prong is adjusted to secure the correct backlash when the adding wheels are meshed with the adding racks. When the backlash is increased, i. e., the adding wheels set out, it is advisable to test for the free movement of detent bail in G. Tests and adjustments of the latter are shown under its own heading (refer to Plate 35). The register is locked in or out of mesh with the adding racks by arm A.

Tests and Adjustments

Detent A should swing freely on bushing with very little side play.

Detent A is now adjusted for non-binding contact on both forward and return stroke. In earlier machines, detent A was adjusted to have a loose point on the forward stroke and a tight point on the return stroke.

CARRYING MECHANISM
(Classes 11 thru 16 and 21 thru 26) (Plate 32)



Carrying Mechanism (Plate 32)

A carry is set during the time that adding wheels C are meshed with the adding racks as follows: The wide tooth on adding wheel C moves trip arms AJ rearward, the latter rocks carry pawl AH which releases carry rack H. The movement of carry rack H is limited by shaft G (in arm X) until adding wheels C are meshed with carry racks H, at which time shaft G clears carry racks H permitting spring M to pull carry rack H rearward, which turns the adding wheel one point.

When a carry occurs during the time that adding wheels C are meshed with carry racks H, the latter is released immediately. ***Example:*** When adding 1 to 99, the wide tooth of the unit adding wheel trips the carry rack while the adding wheels are in mesh with the adding racks. When the adding wheels are meshed with carry rack H, the carry rack in the second column is released which directly trips the carry rack in the third column.

Tests and Adjustments

When carry pawls AH are tripped during the time that adding wheels C are meshed with adding racks A, right and left, carry rack H should not be released until the adding wheels have been correctly meshed with the carry racks. The correct depth mesh is indicated by the release of carry racks which were set for carries when a gauge .015 inch thick is placed between the upper prong of side plate O and tie rod N and by the non-release of carry racks when a .062 inch gauge is used.

Test: Rows of 9s are listed so as to cause carry pawls AH to trip when the adding

(*Plate 32*)—*Continued*

wheels are meshed with the adding racks. Before adding wheels C are meshed with carry racks H a .015 thickness gauge is placed between the upper prong of side plate O and tie rod N. At this time shaft G should release carry racks H. When a .062 gauge is used carry pawls AH should not release carry racks H.

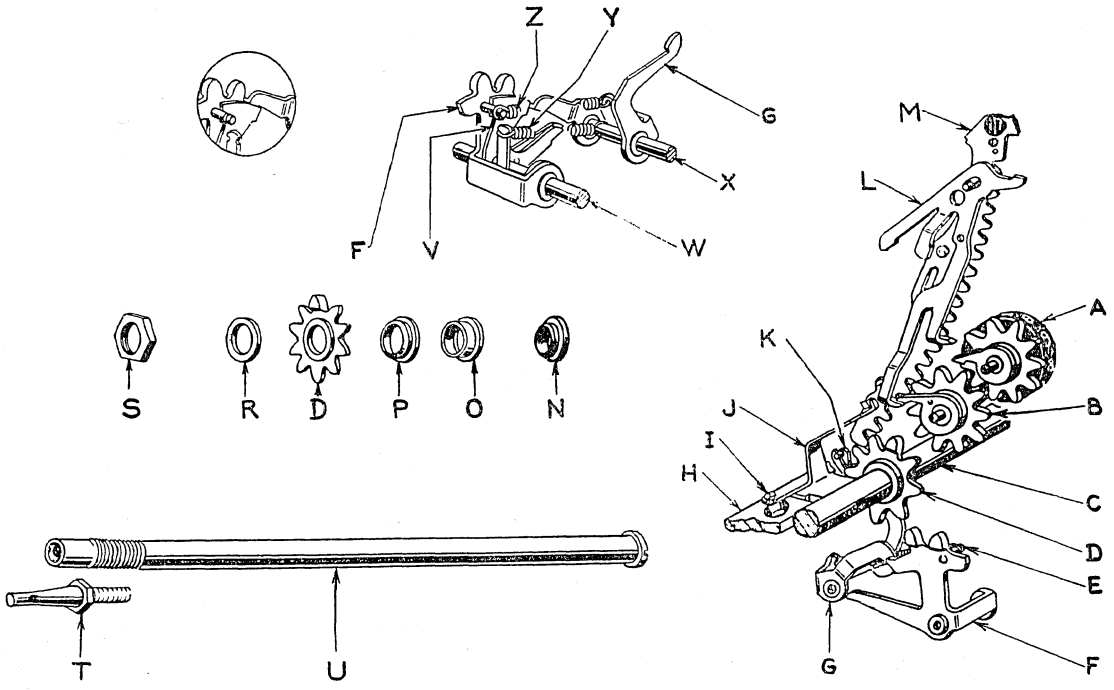
Adjustment: When carry racks H fail to release on the .015 test, their release can be advanced by spreading arm AB which will reduce the hold of arm X. When carry racks H release on the .062 test, their release can be retarded by increasing the curve of arm AB.

When the wide tooth of adding wheel C moves trip arm AJ, carry pawl AH should clear carry rack H by .030 inch at its high point.

Adjustment: To secure the correct amount of clearance between carry pawl AH and carry rack H when in carried position, all play should be reduced between pawl AH and the stud in AJ, by bending the lower part of AH upward.

When the adding wheels are being meshed with the adding racks, arm AA is rocked off arm X which permits spring S to pull resetting assembly upward, shaft G resetting carry racks.

CARRYING MECHANISM ADJUSTMENTS (Classes 11 thru 16 and 21 thru 26) (Plate 33)



Carrying Mechanism Adjustments (Classes 11 thru 16 and 21 thru 26) (Plate 33)

When an amount is added simultaneously in the crossfooter and the register which will produce carries in the crossfooter and 9s in the register and cause the square stud in the adding rack to limit on J, then the correct hold of carry pawl G on carry rack F is extremely important.

Ex.	666666	in crossfooter
	555555	added
	1222221	
	444444	in register
	555555	added
	999999	

.008 excess hold of pawl G on carry rack F will provide a safe hold and prevent tripping of carry racks F when the register wheels move to 9 position with carry pawls L tripped in the crossfooter during simultaneous addition.

Adjustment: The arm of G which limits the carry rack in a non-carried position is lowered to increase the hold.

(Plate 33)—Continued

Note: When the hold is increased over .008, there will be play between the stud in K and G due to G limiting on carry rack F in carried position. Carry pawl G must be perfectly free when it is adjusted for hold.

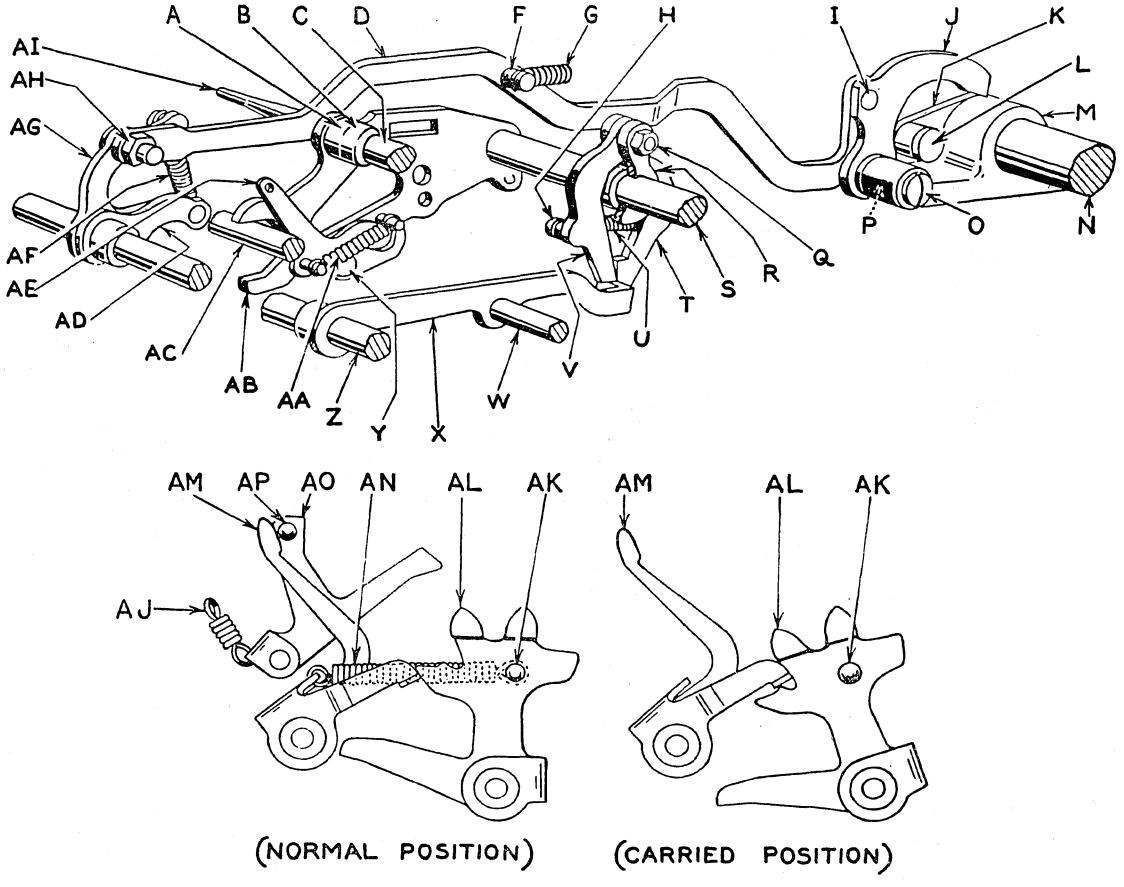
Collars for Adding Wheels (Plate 33)

Ground shoulders of collars P and O are the bearings for adding wheel D. Collar O has a recess for a shoulder on tube shaft U. Collar N is a space collar used for 2, 3, 4 and 5 registers. Washer R is used between last left wheel and locknuts.

The purpose of auxiliary latch V is to prevent resetting of carry rack F or under carry. Latch V pivots on shaft W between the arms of carry rack F. When carry pawls G are tripped, latch V moves under carry pawls G in the same manner that carry rack F does.

In the event that the carry rack is rocked by the adding wheel as the latter is being meshed with the carry rack, auxiliary latch V will hold carry pawl G in tripped position by preventing resetting of carry rack F and carry pawl G.

CARRY RACK RESETTING MECHANISM (Plate 34)



Carry Rack Resetting Mechanism (Plate 34)

Carry racks AL are reset on the latter part of the forward stroke through the tension of spring AF as the adding wheels are being meshed with the adding racks. One end of spring AF is hooked on arm AD, which is rigidly fastened to shaft Z. The other end of spring AF is hooked on arm AG, which moves freely on shaft Z. Arm AG is connected to cam arm J with link D. Arm K on main section N rocks cam arm and link J forward: At this time arm X is blocked by arm V which also blocks the complete resetting assembly Z. This causes spring AF to be placed under tension.

It will be noted that when carry racks AL are being reset, the tension of spring AJ on trip arms AO is not effective, which can permit the wide tooth of the adding wheel

(Plate 34)—Continued

to pass by trip arm AO when the latter acts as a stop for the adding wheel during totaling operation.

Tests and Adjustments

Carry racks AL should have about $\frac{1}{32}$ inch lead over pawl AM at the end of the forward stroke. To increase lead of AL over AM, the rear part of cam arm J is lowered.

Test arm X to clear detent V when the adding wheels are meshed into and out of carry racks AL with a .015 inch gauge between lower prong of side plate AB and tie rod AC.

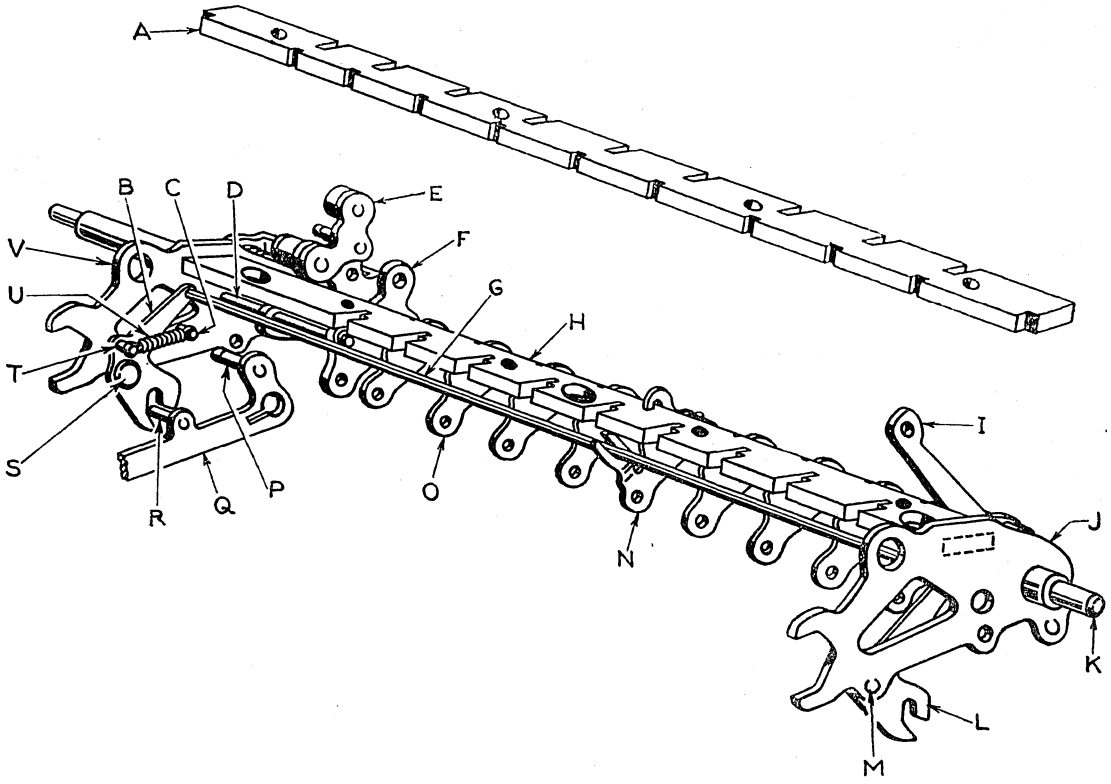
Test arm X to lock under detent V when the adding wheels are meshed with carry racks AL with a .062 gauge between lower prong of side plate AB and tie rod AC.

Adjustment: The curve of detent V is decreased for clearance and increased for hold.

When the adding wheels are being revolved by the adding racks there should be .020 clearance between shaft W and carry racks AL. This clearance will permit the correct advance of AL when a carry is set.

Adjustment: To increase or decrease the clearance between shaft W and carry racks AL, the end of arm X is raised or lowered.

DETENT BAIL "G" (Plate 35)



Detent Bail "G" (Plate 35)

When the adding wheels are being meshed out of or into carry racks and adding racks, the latter are prevented from turning by detent shaft G which is meshed in and out of a tooth space.

When the adding wheels are between the carry racks and the adding racks, detent bail G is in the tooth space. As the adding wheels are moving into mesh with the adding racks or carry racks, detent bail G is moving out of the tooth space to clear the adding wheel teeth.

Detent bail G is carried by levers L and B. The inward and outward movement of bail G is secured by the forks of L and B being meshed with stud R. The movement of bail G in machines of earlier construction is the result of the lower arm of levers L and B trailing on stud R. When the adding wheels are meshed with the carry racks the front surface of the arms on levers L and B contact on stud R. When the adding wheels are meshed with the adding racks the bottom surface of the arms on levers L and B contacts on stud R.

(Plate 35)—Continued

Bail G is guided by the forks of partition plates O and N to insure that bail G will clear the teeth of adding wheels.

Tests and Adjustments

When the adding wheels are in mesh with either adding racks or carry racks there should be $\frac{1}{32}$ inch clearance between bail G and the top of the teeth of the adding wheels.

There should be about .010 inch clearance between shaft bail and the upper prong of the fork on partition plates O and N. This clearance is necessary to allow free movement of bail G on account of bail moving in a curve.

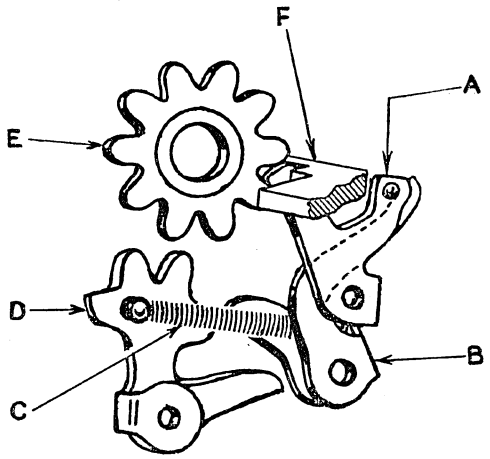
There should be no clearance and no bind between bail G and the bottom prong of the fork on partition plates O and N. No clearance at this point is necessary to prevent a slight back movement of the adding wheel which was set for a carry and thereby reset the carry rack.

Detent Bail "G" During Transferring

The correct mesh of the adding wheels and adding racks when transferring is essential in order to insure non-interference of detent bail G. When the register is being meshed with the adding racks during a transfer operation the adding racks are indexed by the cam of the adding wheels limiting on the carry pawls L (Plate 33). During listing operations the adding racks are indexed by keystem wires and lower shaft supporting sector guide plates. When the difference in listing alignment and total alignment is very noticeable, the meshing of the register wheels can cause the adding wheels to turn sufficiently to bind on detent bail G, which would hold the adding racks, allowing restoring bail to move sector in the slot of the adding rack. When the amount to be transferred has 1's, the register could be disengaged without having accumulated the 1's.

Adjustment: The foot of the carry pawl is slightly raised, reducing the necessary clearance between the cam and pawl to a minimum, so as to even up the listing and totaling alignment of crossfooter as much as possible.

SPACING ADDING WHEEL
(Classes 11 thru 16) (Plate 36)



Spacing Adding Wheel (Classes 11 thru 16) (Plate 36)

Machines having 6 registers should be tested for interference of the wide tooth on the first inactive adding wheel to the right and the adding sectors. Place inactive register in active position and accumulate 2, this will locate the wide tooth next adding sector. Shift this register to inactive position. Operate machine repeating 9's and observe whether there is interference when the adding wheels are held towards the left.

Adjustment: Adding sectors must be carefully aligned, favoring the left half of the adding wheel.

When the adding wheel assembly is being shifted to another register position, the adding wheels about to become active should be slightly in carry racks D, when the adding wheels move into the guide space of bar F.

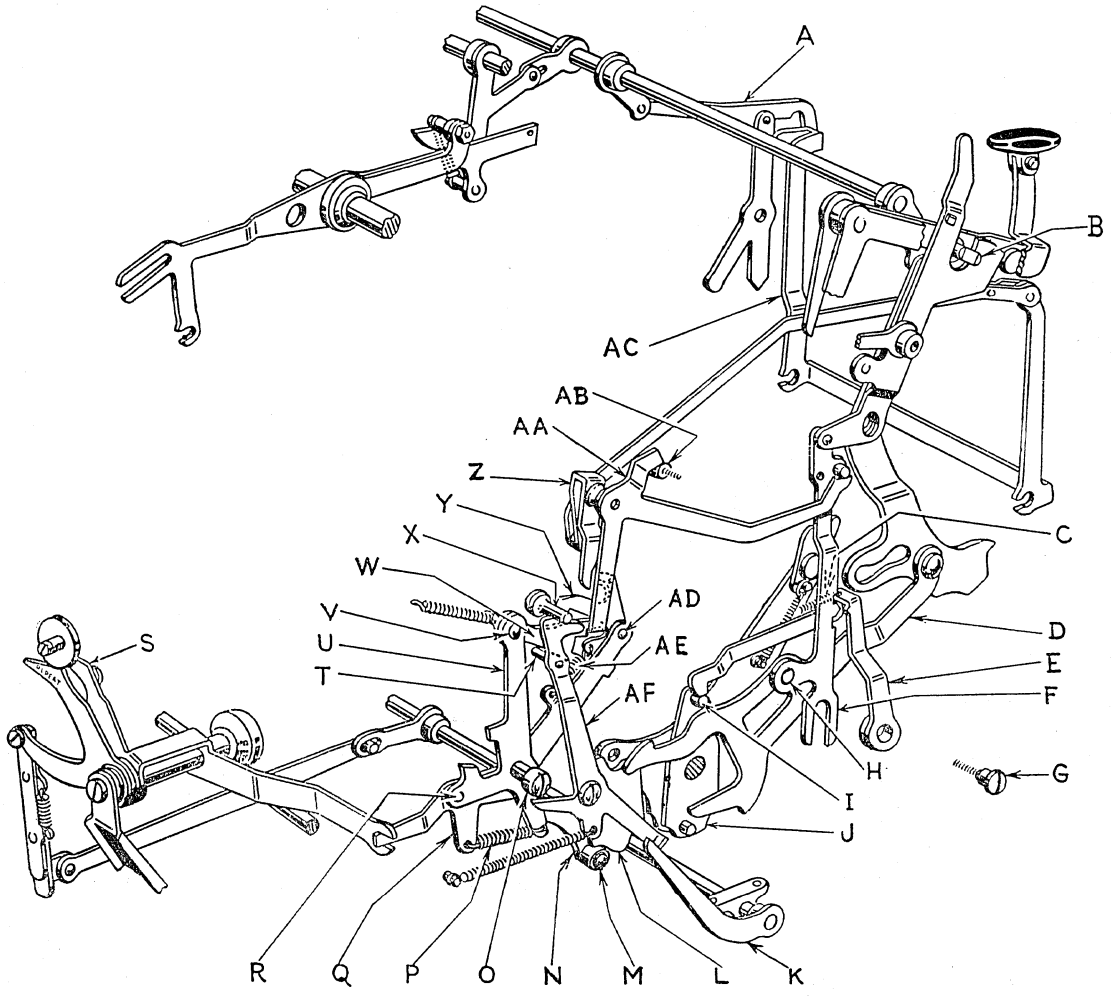
Adjustment: If necessary carry racks D should be slightly bent to meet the adding wheels.

Caution: This adjustment must be done with extreme care in the case of 6 register machines on account of the limited space between the adding wheels which can cause the wide tooth of the next inactive adding wheel to interfere with the carry rack that was adjusted.

Test: Accumulate 6 in the inactive wheel so as to locate the wide tooth at the bottom of the inactive wheel for easy observation.

When the register has been located, there must be no interference of the adding wheel and the right side of cut-out in bar F or interference between adding wheel and trip arm A on the left. The adding wheels can be centralized, however, before doing so all connecting joints between adding wheel assembly and index sector P (Plate 27) must be tested and adjusted for being tight.

AUTOMATIC BALANCE COLUMN INDEXING MECHANISM (Plate 37)



Automatic Balance Column Indexing Mechanism (Plate 37)

The purpose of this mechanism is to automatically index the shifting of the crossfooter from add to subtract when a credit balance occurs.

Normally the crossfooter is in add position, however, when a credit balance takes place, the movement of the negative total lock into the rear pocket of link A, sets the automatic indexing mechanism which causes the machine operation to shift the lower in place of the upper adding wheels of the crossfooter.

This automatic indexing is required on account of the automatic repeat and cycle total operation.

Carriage Control of the Add and Subtract Lever (Plate 37)

Assembly U operates similar to standard construction for shifting the add and subtract lever with the carriage.

When a control roll moves on the subtract lever S, assembly U is rocked, the step of pawl W rocks AA, which in turn rocks the add and subtract lever, raising part D.

Adjustment: When a control roll moves on the subtract lever, spring P should slightly expand to insure complete movement of the add and subtract lever. The subtract lever is bent toward or from the control roll to increase or decrease the expansion of spring.

Automatic Balance Column Indexing Mechanism Controlled by the Negative Total Lock (Plate 37)

When a posting operation results in a credit balance, the negative total lock moves into the rear pocket of link A, which causes

(Plate 37)—Continued

detent arm Z to move rearward out of the path of hook Y. When the carriage tabulates to the cycle (balance) column, a No. 1 roll depresses the repeat lever which rocks detent AF rearward, allowing hook Y to drop over the foot of part AA. During the first cycle operation, cam L rocks lever N (carries hook Y), which in turn rocks part AA, the latter moves the add and subtract lever in subtract position and raises D to engage upper stud I (in J).

Slightly before hook Y has completed its movement, part AA is latched by the upper step of pawl W. The latching of part AA is necessary on account of the add and subtract lever being directly connected with part F. If the add and subtract lever is allowed to return to add position due to part AA being unlatched before the cycle totaling mechanism is set, the interlock projection of the add and subtract lever will be blocked by stud B in the total key which will cause the machine to lock.

Pawl W is released when the carriage moves off the No. 1 roll, at which time the stud T in detent AF raises pawl W to clear the foot of part AA, simultaneously the upper part of detent AF through its contact on stud X (in hook Y) raises hook Y to clear part AA.

Tests and Adjustments (Plate 37)
Assembly U

When part AA is being latched by pawl W, there should be slight clearance between the upper step of W and the rear edge of AA to insure positive hooking.

Adjustment: The upper part of lever U is bent rearward.

Detent AF

When the cycle (balance) column is in printing position (No. 1 roll in repeat lever) with the negative total lock in the rear pocket of link A (credit balance) stud X in Y must be seated on the decline of AF to secure ample hold of hook Y.

Adjustment: The foot of AF is bent toward arm K to seat the stud in hook Y lower. The extent of bending AF is limited by retaining proper seating of the stud in hook Y when a No. 3 roll is on the repeat lever.

Hook Y

When the negative total lock is in the front pocket of link A, there must be clearance between hook Y and the foot of AA to prevent hook Y engaging AA during the cycle operations. The clearance between hook Y and foot of AA must be reduced to a minimum to provide quick engagement of hook Y and foot of AA when the negative total lock moves into the rear pocket of link A.

Clearance between hook Y and AA can be reduced by retarding the upper part of AC from the negative total lock.

When the negative total lock moves into the rear pocket of link A, which allows hook Y to engage AA when the carriage tabulates into the balance column, there should be slight clearance between hook Y and the contact edge of AA. Clearance at this point is reduced by bending the arms of lever N closer. Clearance is increased by spreading the arms of lever N.

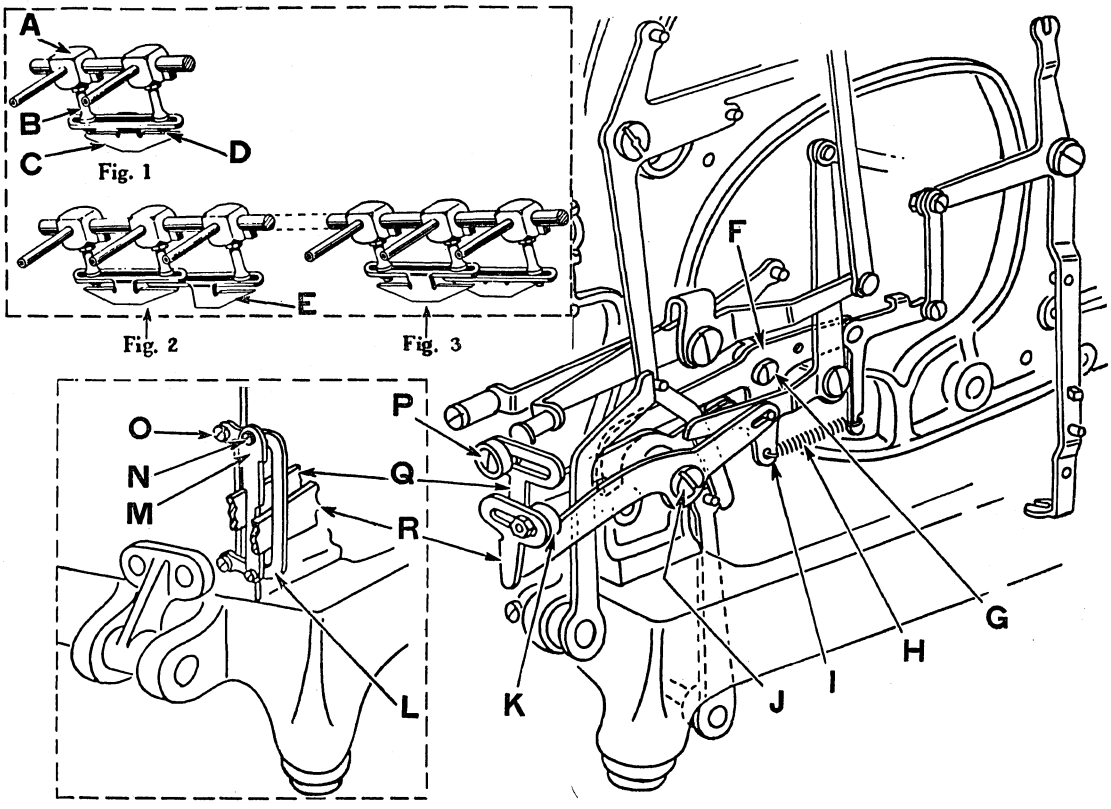
Subtract Lever Interlock "E"
(Plate 37)

The purpose of interlock E is to directly lock the subtract lever during all machine operations and also to protect the indexing mechanism against misoperations.

Sequence and Construction
(Plate 37)

Interlock E swings on screw G. When the machine operation starts interlock E is pulled into one of the two notches in vertical F by spring C, thus locking the subtract lever in add or subtract position.

REGISTER TOTAL INDEXING LINKAGE, CARRIAGE CONTROLLED (EARLY) (Classes 11 thru 16 and 21 thru 30) (Plate 38)



Register Total Indexing Linkage, Carriage Controlled, Early, (Plate 38)

The purpose of this mechanism is to decrease the load on the carriage when shifting the register total indexing lever and when carriage tabulation indexes non-add—non-print.

These mechanisms are controlled by skids which contact on separate levers instead of both mechanisms being operated from the skip lever.

Construction

Levers Q and R pivot on shoulder screw J. The roller on the front arm of lever Q contacts the underside of the rear arm of assembly F which is connected to the register total indexing lever.

Lever R connects with part I (of the non-add—non-print carriage controlled mechanism). The rear ends of levers Q and R are staggered, lever R being longer.

Skid Control

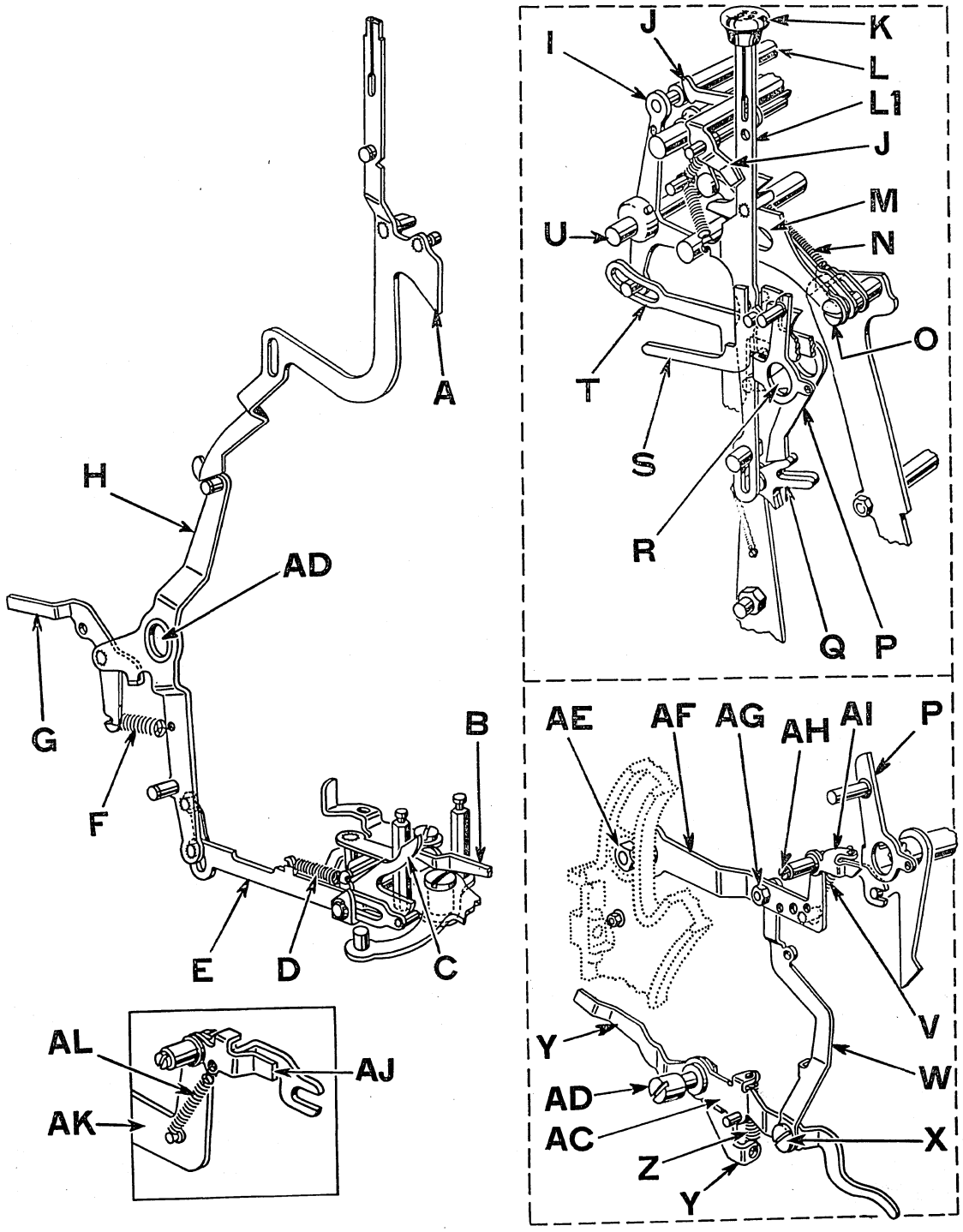
Narrow skid and short post—No. 5 roll.

Narrow skid and long post—No. 3 roll.

Wide skid and long post—No. 1 roll.

Narrow and wide skids are reversible, illustrated by Figure 3, one skid to control adding and printing and the other skid to control the register total indexing lever. For extremely close set-ups, a wing of skid E is removed and the latter fastened under a regular skid, a longer post being used on the end of the cut off skid. (Figure 2.)

NON-ADD CONTROL—CROSSFOOTER AND REGISTER (LATER)
(Classes 21 thru 30) (Plate 39)



Non-add Control—Crossfooter and Register (Later) (Plate 39)

Later machines have individual carriage control levers for non-adding registers and crossfooters, which simplifies register non-adding.

Register Non-add Control: When the stud in link E locates in a pocket of bell-crank C, or when the stud in link E is off a dwell on bell-crank C through a roll on the non-add lever in the back plate, bail B cannot disable register accumulation and the register adds. Bell-cranks C have the pocket in different positions on account of being used in combination with other mechanisms. There are seven styles of bell-cranks C, six styles being shown on Plate 23; the No. 7 style is used for H903 construction.

Register Non-add Key A: When the register non-add key is depressed, part H is rocked, which locates the stud in link E on a dwell of bell-crank C to cause bail B to disable register accumulation.

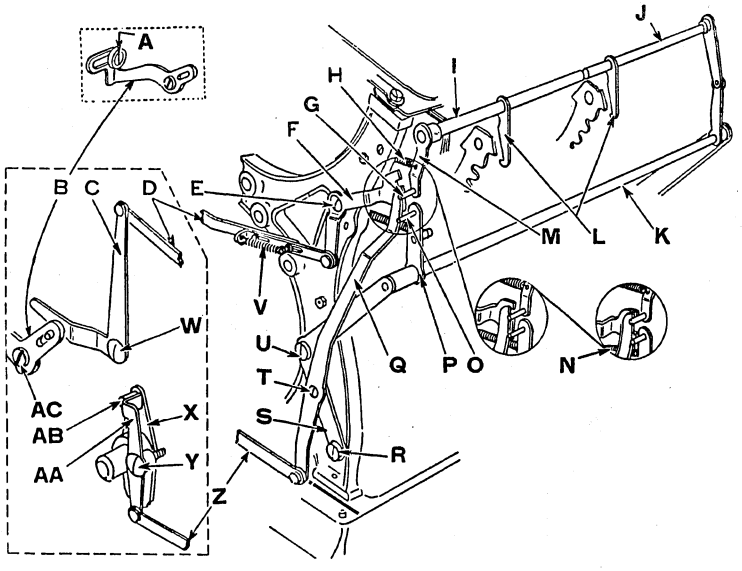
Crossfooter Non-add: When the carriage moves a control roll on the non-add lever on the back plate (Plates 82 and 83 Carriage Instruction Book) lever Y is rocked, which through spring Z rocks lever AC, the latter raises link W and arm AF. The fork of AF swings non-add control P into the path of passby pawl Q to prevent accumulation of the printed amount.

Crossfooter Non-add Key: When keystem K is depressed, the stud in K lowers arm S which in turn lowers arm AF, the fork of the latter swinging part P into the path of passby pawl Q to disable accumulation of the printed amount.

Interlock M: At the beginning of the machine operation, interlock M moves under the angular stud in keystem K, which prevents depressing keystem K during the entire machine operation.

The purpose of part AJ is to prevent depressing the total key when the non-add mechanism is indexed by carriage position. The purpose of part AI is to permit totaling the crossfooter when the non-add mechanism is indexed by carriage position.

NON-ADD—NON-PRINT, CARRIAGE CONTROLLED (Classes 6, 11 thru 16 and 20 thru 30) (Plate 40)



Non-add—Non-print Carriage Controlled (Plate 40)

The purpose of this mechanism is to non-add and non-print in certain columns and permit normal adding and printing in other columns.

Sequence and Construction

Non-adding and non-printing is obtained by blocking the downward movement of the adding racks with hooks L which are carried by and swing with shaft I on the left side and shaft J on the right side. Hooks L have projections which seat in the groove of shafts I and J.

When the machine is in normal position, shafts I and J hold hooks L completely out of the path of the adding racks through arm Q,

(Plate 40)—Continued

blocking studs G and O in arms M and P.

Non-adding and non-printing in the left or the right sides or in either side is controlled by the carriage locating part F in one of three positions.

When the carriage moves skid (Figure 3, Plate 38) on to roller A, arm B rocks bell-crank C which locates the slot of part F in line with stud G. During the machine operation, stud AB moving rearward allows spring H to swing shaft I, stud G entering the slot of part F, which places hook L in the path of the adding racks. When the carriage moves skid (Figure 2, Plate 38) on to lever B, the dwell of part F is located in the path of stud G and O.

During the machine operation, part F blocks both studs G and O, which prevents hooks L moving into the path of the adding racks, permitting printing and adding.

When the carriage moves skid (Figure 1, Plate 38) on to lever B, part F moves upward out of line with stud O, but blocking stud G. During the machine operation, spring N swings shaft J, hooks L moving into the path of the adding racks in the right columns which prevents adding and printing in those columns.

Later machines have link D with spring joint as shown.

Earlier machines have solid link illustrated on Plate 41, part E.

Tests and Adjustments

Hooks L clear adding racks when studs G and O are blocked by F.

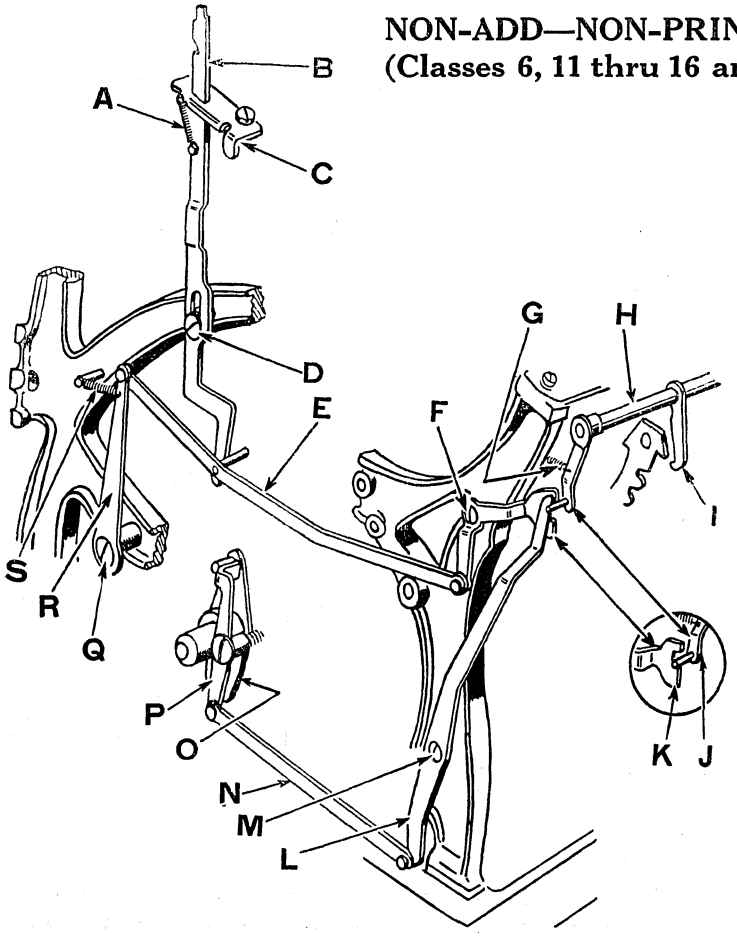
Adjustment: The offset of F is decreased.

Caution: When this adjustment is made, the depth of the slot in F may require deepening. Sufficient hold of hooks L on the adding racks is also necessary.

Adjustment: The slot in part F is ground deeper to secure more hold.

When the machine is normal, arm Q should hold studs clear of part F. Hooks should float freely in the partition plates.

NON-ADD—NON-PRINT, KEY CONTROLLED (Classes 6, 11 thru 16 and 20 thru 30) (Plate 41)



Non-add—Non-print, Key Controlled (Plate 41)

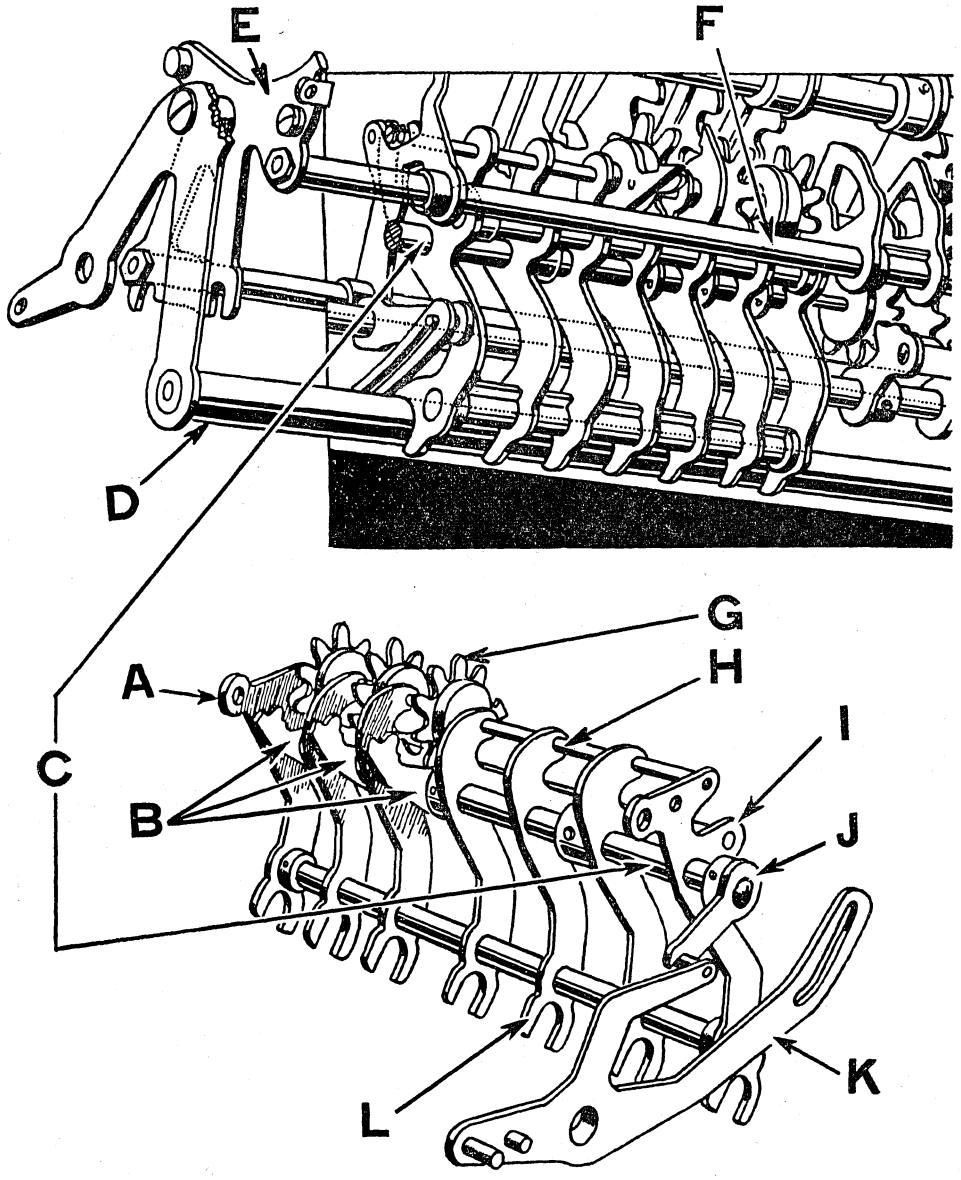
The purpose of this mechanism is to secure non-adding and non-printing in one or more columns when a key is depressed and latched.

Sequence and Construction

When key B is depressed and latched, link E is carried forward, rocking bell-crank K to locate the pocket in line with the stud in arm J.

During the machine operation, the stud in part O contacts on and rocks lever P which in turn rocks lever L to move out of the path of the stud in arm J. Spring G rocks assembly H which locates hooks I to block the downward movement of the adding racks.

CROSSFOOTER SIMULTANEOUS ADDITION AND SUBTRACTION WITH AUTOMATIC COUNT—CARRIAGE CONTROLLED (Classes 11 thru 16 and 20 thru 30) (Plate 42)



Crossfooter Simultaneous Addition and Subtraction With Automatic Count—Carriage Controlled (Plate 42)

This mechanism accumulates the count in both adding and subtracting positions. The count is indexed by the count and normal—carriage controlled mechanism (Plate 69).

Construction

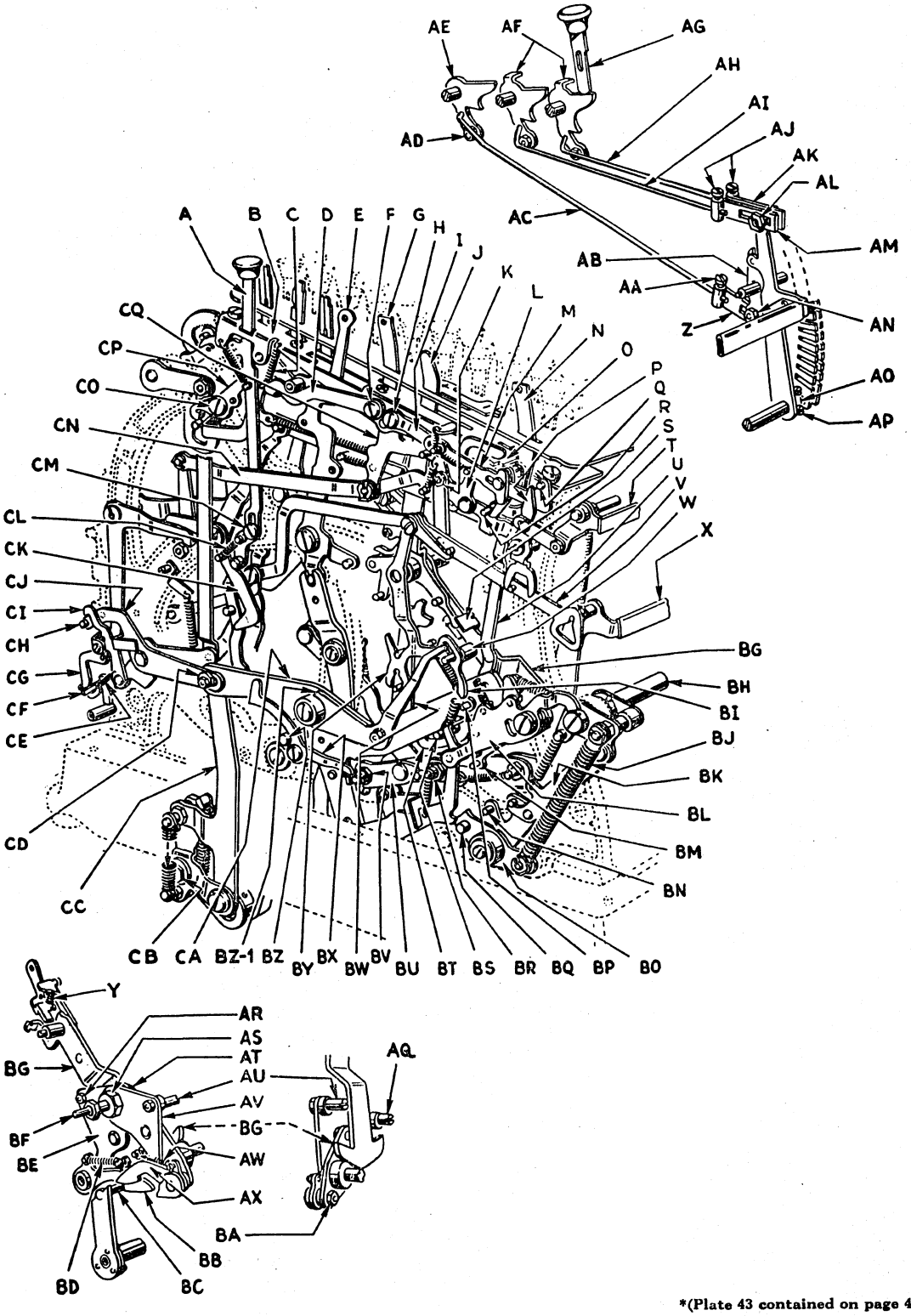
The counting wheels are carried in a frame which is anchored to shaft D by partition plates L.

Detents B are in the rear of the count wheels due to the location of shaft F. Detents B are moved into and out of the wheels by a branch of part K rocking arm J and shaft C.

Tests and Adjustments

The meshing of the wheels and the racks, and the wheels and detents of the complete sections is secured in the usual manner. The meshing of the wheels and the detents is accomplished by bending the upper arm of part K. The meshing of the wheels and the adding racks is accomplished by increasing or decreasing the length of the type sectors.

CROSSFOOTER CONTROL MECHANISM—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 43-1)*



*(Plate 43 contained on page 49)

Crossfooter Control Mechanism—For No Space Stroke Total Bank Posting Machines (Plate 43-1)

Purpose

To eliminate the need of taking a spacing stroke preceding a crossfooter total or sub-total operation.

Operation

At the beginning of each machine operation, arm CC is moved downward by actuation of the drive cam and arm CA is rocked so that its forward projection moves upward. As arm CA rocks, toggle assembly BU, which is attached to arm CA below its pivotal point, is moved forward to disengage the crossfooter; auxiliary shift arm BW, which is also attached to arm CA, is raised; and stud W in tumble arm BG, is contacted by the forward projection of arm CA to raise tumble arm BG.

Later in the forward stroke of each machine operation, roll BZ rocks arm BX to trip toggle BU, thereby permitting the re-engagement of the crossfooter.

Upon tabulation of the carriage into the first check column, counter control lever J is moved to subtract position by a carriage control roll, and the lower projection of the lever contacts flexible connection S of tumble arm BG to rock the tumble arm into alignment with rear stud BG of the crossfooter assembly. Upon operation of the machine with tumble arm AQ so aligned, the upward movement of arm BG together with the disengaging movement of the crossfooter (both of which are actuated, as indicated above, by the rocking of arm CA) result in the tumble arm's contacting stud AQ, thereby tumbling the crossfooter to subtract position. Initial contacting pressure against stud AQ releases latch BB through part BE, and additional contacting pressure pulls the crossfooter to subtract position where it is locked by latch AX.

Tabulation of the carriage out of the last check position results in the movement of counter control lever J to add position and the rocking of tumble arm BG into alignment with forward stud AU of the crossfooter assembly. Upon operation of the machine with tumble arm BG so aligned, latch AX is released and the crossfooter is tumbled to add position where it is locked by latch BB.

Subsequent machine operations following the tumbling of the crossfooter, during which operations the counter control lever remains in either add or subtract position, will have no effect on crossfooter tumbling although tumble arm BG remains in alignment with stud AU or AQ.

Indexing linkage BY is connected to auxiliary shift arm BW and to tumble arm BG, both of which are positioned by linkage BY during specific operations (indicated below) to effect shifting of the counter control lever and tumbling of the crossfooter, respectively, as arm CA is rocked.

When key "DC" (6-14) is depressed, with the counter control lever located in add position, the rearward movement of wire AC rocks bail X, moving arm V forward and positioning indexing linkage BY so that auxiliary shift lever BW is aligned with the rear stud of counter control lever J, and tumble arm BG is aligned with crossfooter stud AQ. Upon operation of the machine with indexing linkage BY so positioned, stud BP contacts spear point BI to complete the shifting of auxiliary shift arm BW, and continued rocking of arm CA shifts counter control lever J, and tumbles the crossfooter, to their respective subtract positions.

When either key "RT" (4-14) or "EC" (5-14) is depressed with the counter control lever in subtract position, bail X is rocked through wire AH or AI, respectively, thereby moving arm V rearward and positioning indexing linkage BY so that auxiliary shift lever BW is aligned with the forward stud of counter control lever J, and tumble arm BG is aligned with crossfooter stud AU. Upon operation of the machine with indexing linkage BY so positioned, counter control lever J and the crossfooter are shifted to their respective add positions.

Depression of the crossfooter total or crossfooter sub-total key lowers linkage I through part O, and rocks part L through the half-round stud in the total key. The rocking of part L during crossfooter total or sub-total operations, raises arm V to disable shifting of the counter control lever and tumbling of the crossfooter, as indexed by character keys in keyboard column 14.

Total or sub-total depression also lowers part BT, through arm U and stud BS, to position the lower arm of CA in the path of stud BQ. As the machine operates, the rocking of arm CA disengages the crossfooter, as in all other machine operations, and the lower arm of CA rocks part BO to expand spring BJ (early in BO's rocking motion) and to trip toggle assembly BK through stud BN (later in BO's rocking motion), thereby releasing expanded spring BJ, the contraction of which pivots shaft assembly BH to reset the carry pawls. (Spring BJ is a pitman spring which serves as a limit for the pivoting of shaft assembly BH in resetting the carry pawls.)

Forward movement of the lower arm of CA during a total or sub-total operation rocks

(Continued)

(Plate 43-1)—Continued

latch BM to release part BL, thereby providing a higher limit for the lower arm of CA to prevent actuation of shaft assembly BH on a succeeding repeat total operation.

During a crossfooter total or sub-total operation in which the larger amount is contained in the inactive wheels, the lowering of part O and linkage I, as the total or sub-total key is depressed, will cause stud Q in linkage I to contact and rock spear point P (the position of which is controlled by the negative total lock), thereby moving arm V either forward or rearward to shift indexing linkage BY, auxiliary shift lever BW, and tumble arm BG to the respective positions required for totaling or sub-totaling the wheels containing the larger amount.

Indexing of the register total lever, to either total or sub-total position, pivots part CQ and rocks part L to raise arm V clear of the stud in the bail X, thereby disabling keyboard indexing of auxiliary shift arm BY and tumbling arm BG. Indexing of the register totaling lever also moves slide M forward on linkage I, thereby preventing actuation of indexing linkage BY by means of linkage I and spear point P upon depression of the total or sub-total key.

Adjustment

In the process of securing the following adjustments, the machine should be operated manually by means of a crank.

1. Operation of the machine with a 1/8 plug gauge inserted into the hole in the left side frame directly above part BL, should result in CA's contacting the gauge (without binding) when arm CA is at its maximum height.

To adjust, turn eccentric bushing CB.

2. When the crossfooter is disengaged to its maximum forward movement (by means of toggle BU) there should be .010″ clearance between the crossfooter end plates and the limit stops in the side frames.

To adjust, turn eccentric bushing BR.

3. Toggle assembly BU should be tripped at the same point in the machine's forward stroke as passby pawl 1-821B (W, Plate 2, Accumulation Symbol List) contacts the forward stud in the crossfooter control assembly (AB, Plate 2).

To adjust, bend the forward arm of part BX.

Note: If toggle assembly BU is tripped too soon during the forward machine stroke, latch AX or BB may fail to lock the crossfooter in its shifted position, thereby causing wrong additions and resulting in incorrect totals.

4. When tumble arm BG is raised to its maximum height by arm CA (in either add or subtract position), there should be minimum play between the hook of arm BG and eccentric stud AU or AQ.

To adjust, turn eccentric stud AU or AQ.

5. Depression of the total key, with the counter control lever in subtract position and the negative total lock in add position, should position spear point BI to the rear of the high point of stud BP; with the counter control lever and the negative total lock in reverse positions, depression of the total key should position spear point BI forward of the high point of stud BP.

To adjust, bend part O up or down.

6. Upon depression of key "RT" (4-14) or "EC" (5-14), with the carriage located in check position (subtract), spear point BI should be positioned forward of the high point of stud BP.

To adjust, reposition links AK or AM on wires AH and AI.

7. Depression of key "DC"(6-14), with the carriage located in deposit position (add), should result in the positioning of spear point BI rearward of the high point on stud BP.

To adjust, reposition link Z on wire AC.

8. The stud in bail X should not bind on the bottom of the cutout in arm V, when the register total indexing lever is shifted to a total or sub-total position.

To adjust, turn eccentric bushing K.

9. The lower arm of part CA should have approximately .010″ clearance over stud BQ when the former is moved forward on a listing operation.

To adjust, bend the forward projection of part BL.

10. There should be approximately .010″ clearance between stud BS and arm BT when the total key is normal; when the total key is depressed, the notch in the lower arm of part CA should have a safe hold on stud BQ.

To adjust, raise or lower the rearward projection of arm BT.

11. Spear point P should have equal clearance forward and rearward of stud Q, with the play taken up in the slot of the linking arm (rearward of the stud when the negative total lock is in a credit position, and forward of the stud when in debit position).

To adjust, weave the left end of bail T.

12. Part O should clear the inside projection of slide M when the register total indexing

(*Plate 43-1*)—*Continued*

lever is shifted to a total or sub-total position.

To adjust, bend the lower forward projection of slide M.

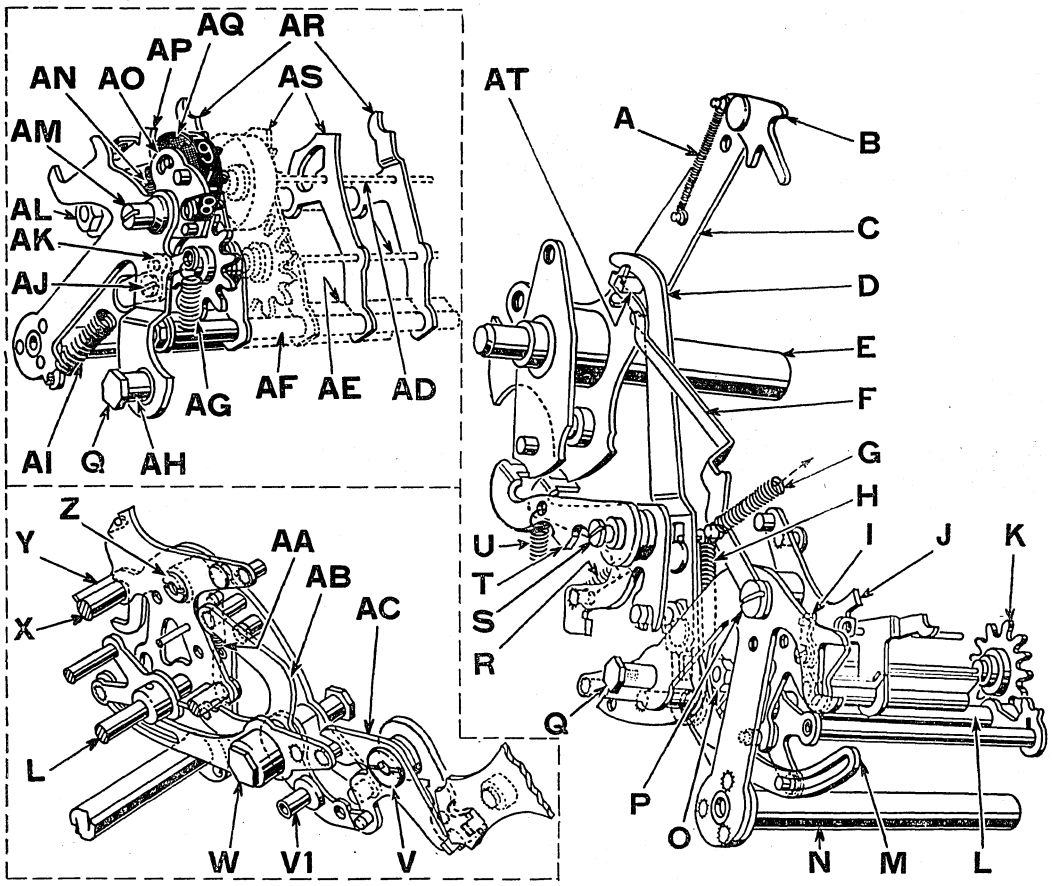
13. There should be slight play between part O and the upper projection of arm I, when the total key is normal.

To adjust, bend the upper projection of arm I.

14. When the machine is normal, there should be approximately 1/16″ clearance between stud W and the forward portion of arm BZ1.

To adjust, raise or lower arm BZ1.

CROSSFOOTER MECHANISM
(Classes 11 thru 16 and 20 thru 30) (Plate 43)



Crossfooter Mechanism (Classes 11 thru 16 and 20 thru 30) (Plate 43)

The crossfooter used in Classes 11 thru 16 and 20 thru 30 is similar to the crossfooter used in Class 6 machines; the latter is carried by a shaft which pivots in the sideframes.

The crossfooter in Classes 11 thru 16 and 20 thru 30 is carried by hanger in assembly N which pivots on the smaller shoulder of W in the left sideframe and on bushing AH in the right sideframe. This design permits the easy removal of the crossfooter, makes the register accessible for adjustment, installation and removal.

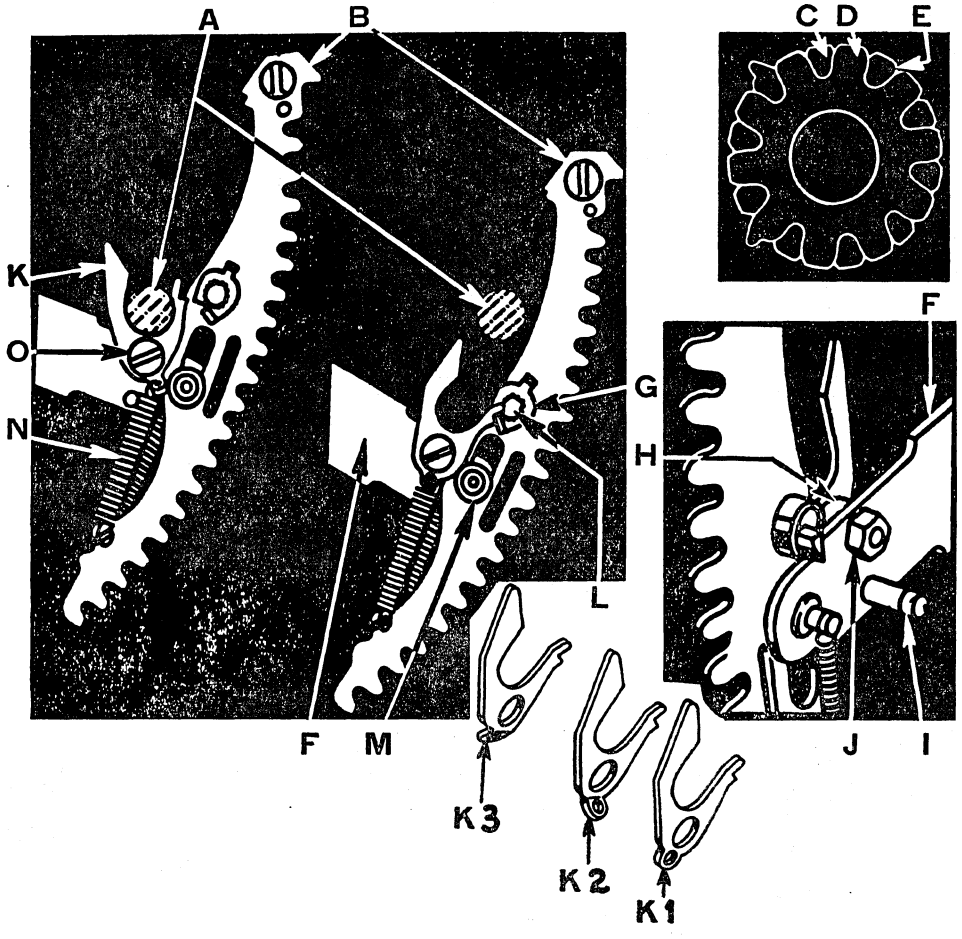
Detent AC

The purpose of detent AC is to lock the crossfooter when out of mesh during the forward stroke, and to lock the crossfooter when in mesh during the return stroke. The adjustments are similar to the detent which locks the accumulator in Class 1 machines, covered on Plate 2. Detent AC, however, is adjusted for non-binding contact on both strokes instead of having a loose point on the forward stroke. The mesh of the adding wheels and adding racks is adjusted by advancing or retarding the projections of AL Plate 16 in assembly N Plate 16 to or from limit rolls in the sideframes.

Reverse Pull in Arm D

The purpose of this mechanism is to mesh the crossfooter when the carriage tabulates from the delayed column (non-add) to the balance column and thereby permit depressing the total key. Arm D swings on stud V1 in crossfooter hanger N. On the latter part of the return stroke, stud AT contacts on the step of arm D and rocks crossfooter hanger N.

INERTIA LATCHES (Classes 21 thru 30) (Plate 44)



Inertia Latches (Classes 21 thru 30) (Plate 44)

The purpose of inertia latches K is to insure positive restoring of adding racks B and thereby eliminate locking and wrong addition due to expansion of springs N, which causes adding racks B to lag behind sectors F.

Latches K pivot on, and are carried by sectors F. On the return stroke, latches K engage projection G, which is riveted to adding rack B, thus pushing it upward. When the adding rack completes accumulation and enters the carry period, latch K contacts on shaft A, which swings it to clear projection G allowing a carry to take place in the usual manner.

When the handle is pulled forward with keys depressed, F's move downward, latches K clear shaft A, spring N locates latch K under projection G. Latches K pivot on shoulder screw O which is fastened to sector with nut J.

There are three styles of latches K: Style No. 1 AR used in right section being flat; Style No. 2A used in column having negative total lock, spring anchor bent toward the right; Style No. 3 AL used in the left section, spring anchor bent toward the left.

Tests and Adjustments

Latch K must move very freely; it must align with projection G and have full hold on G. Latch K should clear riveted end of stud L in columns 1 to 7 inclusive.

Note: Registers must be cleared before making the following test:

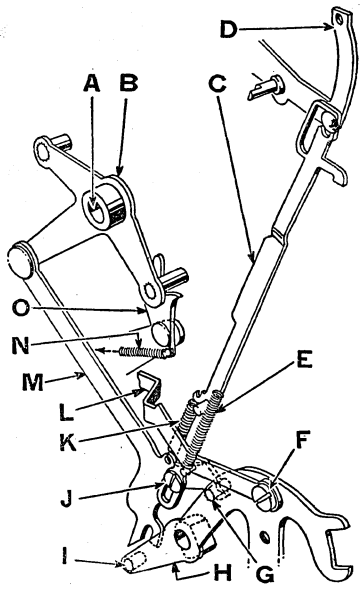
(Plate 44)—Continued

Tests: Set up all ones on the keyboard, pull the handle forward, all latches should seat fully under projection G. Set up all nines on the keyboard, adding in the register only, the crossfooter not yet replaced. Pull handle forward and allow it to restore slowly, holding back on adding racks B. When pinions E can be rotated backward through the adding sector, it indicates that latch K has been released. At this time, if the handle is held, it will be noted that the front edge of the active pinion tooth C should be in line with the rear edge of the teeth on the inactive pinions D, indicated by E.

There may be a slight variation in the releasing of the latches either way, which should not be in excess of 1/32″ to 3/64″ either way when measured at the relative position of the active and inactive pinions.

In the event that parts are off test, it will be necessary to replace latch or adding racks.

CROSSFOOTER TOTAL CONTROL MECHANISM
(Classes 21 thru 30) (Plate 45)



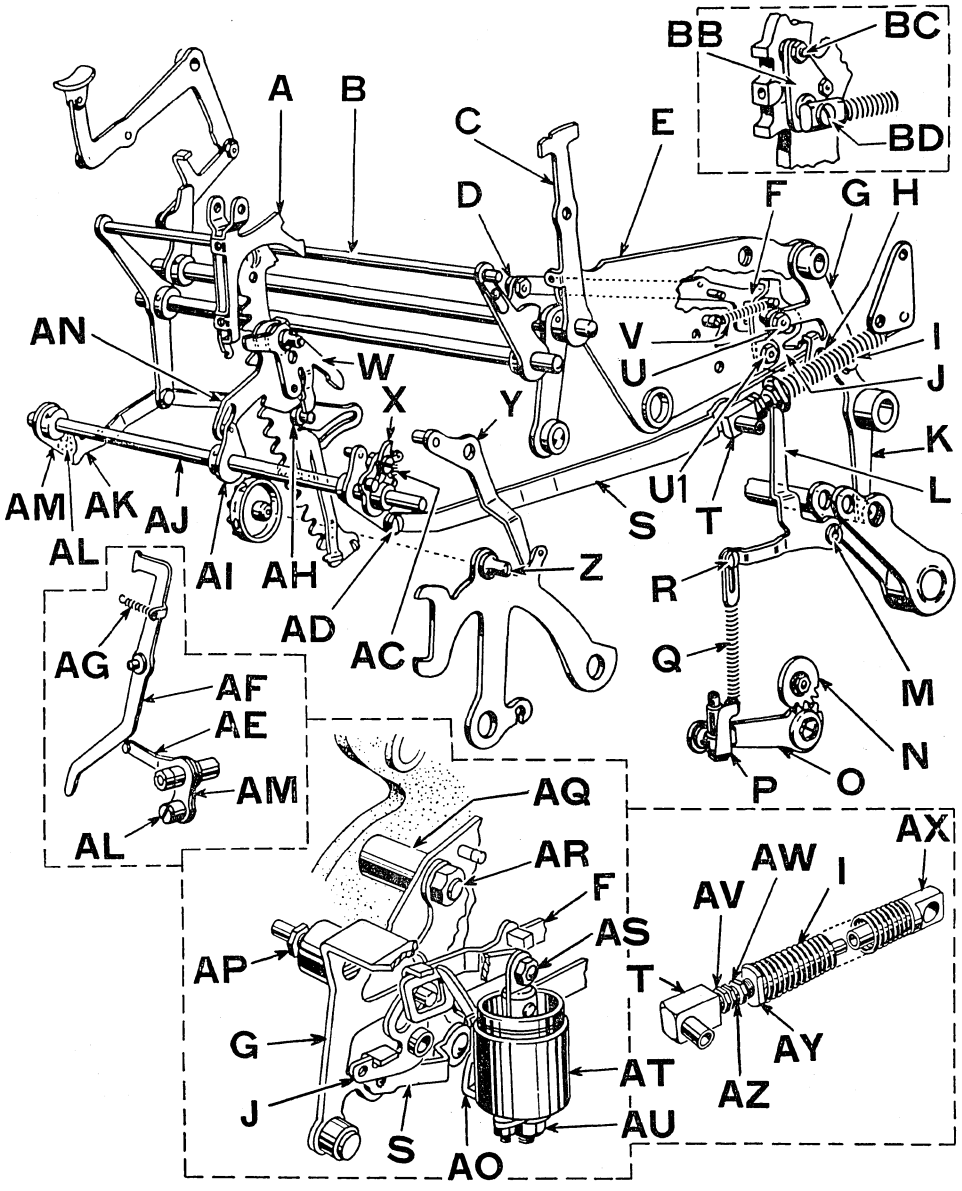
Crossfooter Total Control Mechanism (Classes 21 thru 30) (Plate 45)

This mechanism controls the meshing of the crossfooter with the adding racks and the unmeshing of the crossfooter in the same manner as the total control in Classes 1 and 2 machines.

The purpose of the upper open vertical slot in link C is to permit its disablement when the register total indexing lever is shifted to total or sub-total position.

Depressing total lever D lowers pitman M through link C to disengage the upper pocket from stud G and engage the lower pocket of pitman M with stud I in order to retain the mesh of the crossfooter during the forward stroke and to permit passby pawl O to disengage the crossfooter on the return stroke.

SINGLE STROKE TOTALING MECHANISM
(Classes 20 thru 30) (Plate 46)



Single Stroke Totaling Mechanism (Plate 46)

The purpose of this mechanism is to reset carry pawls, complete the depression of the total key and trip the electric drive when the total key is partially depressed.

When the assembly C is rocked through the depression of the total key, release pawl J is rocked, which trips power arm G.

Release pawl J is connected to assembly C by link F. The other end of link has a step and a rectangular slot. The step of link F contacts on release pawl J. The rear end of the slot in link F is engaged by the stud in power arm G, which carries the link rearward, completes the movement of assembly C and pulls the total key downward.

Power Arm G

The power arm, which is actuated by power spring I, (No. 1 or No. 2), has three branches; the upper one carries a stud which contacts

(*Plate 46*)—*Continued*

in the slot of link F to complete the depression of the total key mechanism.

The middle branch of power arm G has a formed projection, on which release pawl J seats when power spring I is expanded. The middle branch of power arm is also connected with link S by screw H.

The lower branch of power arm G is rocked during the forward stroke by section 100.

When power arm G is released, the rearward movement of link S rocks shaft assembly AJ, which disengages the crossfooter, lowers adding racks which are in carried position, actuates the carry reset mechanism and trips the drive.

Tests and Adjustments

Power arm G should have 1/16″ lead over release pawl J at the end of the forward stroke.

Adjustment: To increase lead, the lower arm of restoring lever K is advanced toward front of machine.

Total Stroke Limit

The symbol index arm is adjusted (power spring I removed) and the machine operated with handle. With index arm properly adjusted and power spring pitman installed, the limit of the total stroke should be simultaneous in the spring pitman and on shaft 600A, however, the spring pitman should be slightly favored on account of the effect of the jar on shaft 600A.

When the total key is depressed (power off) there should not be more than 1/64″ sag between the total key link (1-202225) and shaft 600A; this sag is reduced by adjusting nuts AV and AW. The spring pitmans in earlier machines do not have adjusting nuts.

Link F

In later machines, link F is connected to assembly C with eccentric screw D. The purpose of this eccentric screw is to permit securing the correct amount of resetting movement.

Test: When the total key is depressed arms AI should move to within 1/32″ and not less than 1/64″ of the end in slot of arms AN.

Adjustment: For more movement shorten pitman AZ, then lengthen link F by adjusting eccentric screw D. For less movement lengthen pitman and shorten link.

Disengaging Crossfooter

Passby pawl X rocks lever Y by contacting on roller in lever Y; the lower end of lever Y rocks the crossfooter out of mesh by contacting on screw Z (in sideframe of crossfooter).

Tests and Adjustments

There should be minimum clearance between passby pawl X and roller in lever Y on the return stroke of total operations, in order to prevent passby pawl X moving under roller during a sub-total operation and thereby cause a lock.

Note: When totaling pawl X passes under the roller; when sub-totaling, pawl X does not pass under the roller.

Test: Depress total key and operate machine with handle. As soon as the passby pawl moves under roller in lever Y, hold handle, with spring hook move pawl X upward and note amount of clearance which should be limited to allow pawl X to pass under the roller.

Adjustment: Clearance is reduced by bending lower arm of lever Y forward, i. e., decreasing the clearance between the lower arm of lever Y and screw Z.

Lowering Adding Racks

Cam arms AN swing on the stud in the carry pawls. The lower branch has a cam surface, which contacts on roller AH. The upper branch of cam arm has a cam slot in which the stud in arm AI rides. When the total key is depressed the movement of shaft assembly AJ rocks cam arms AN, which lower the adding racks below the wings of the carry pawls.

Tests and Adjustments

Trip all carry pawls.

Depress total key.

When cam arms AN are holding the adding racks downward, the carry pawl should pass over the stud in the adding racks with spring of carry pawl unhooked. Test each carry pawl, unhooking the springs. When there is no movement of the adding rack, or when the carry pawl fails to pass over roller AH, the carry pawl should be replaced.

Cam arms AN should have flush hold on roller AH, and also clear the partition plates.

The wings of carry pawls W should be central on the stud in adding racks. The upper portion of cam arms AN should have flush hold on the stud in AI.

Resetting Carry Pawls

The stud in arm AM of shaft assembly AJ contacts on the front end of part AK, rocking

(Plate 46)—Continued

the 411B resetting mechanism B, with the same result as when the 411B's are reset by the machine movement.

To insure resetting of carry pawls W, the 411B's must be brought forward beyond upper projections of W as far and as quickly as possible. Part AK provides ample resetting movement, however, machines having earlier part AK should have the following test applied:

With crossfooter clear, reverse subtract lever and operate machine electrically. Depress total key, automatically operating machine. Repeat this test a number of times, and if one or more carry pawls should fail to reset, eccentric screw AL (in arm AM) is turned, which will increase the movement of the reset mechanism. If this adjustment is made, test for non-interference between the offset of part AK and 68113A and also for clearance at the bottom of the slot of part AK and screw stud in 68113A.

Note: Minimum clearance between the racks (which lock the adding wheels) and adding wheels is essential to prevent interference of adding wheel cams on foot of carry pawls when the crossfooter is being meshed.

Test: With 3's, 5's or 7's indexed, handle forward, rock crossfooter section in and out of mesh with slack taken up in wheels; see that the carry pawls are not pushed back by the adding wheel cams.

To insure positive automatic 1 accumulation the clearance between interlock C and the stud in motor trip arm should not exceed .010″. When excessive clearance exists at this point, it is possible to block the full stroke sector when the operator presses or rides the total key, during a skip operation from check to deposit columns. When the full-stroke sector is blocked during a subtract-to-add shift or vice versa, arm 200138B (1012¾) will reset part 1-10912 before the latter can trip the carry pawl.

To reduce clearance between interlock C and stud in motor trip arm, the upper portion of interlock C is bent rearward by placing a screw driver between C and sideframe, then bumping interlock C with brass and hammer. The brass is applied to interlock C slightly above the interlock's upper stud. The above also applies to Classes 6 and 11 thru 16 non-cycle machines.

Arm AE

The function of arm AE is to restore detent AF during totaling operations.

Arm AE is carried by shaft assembly AJ and contacts on detent AF as detents A are being reset.

During listing operations, detent AF is restored by the crossfooter in the regular manner.

The purpose of arm AE is to prevent a lock caused by total key interlock (1-204124L) moving under the stud in the total key when the total key is snapped. In the latter case the total key restores before the crossfooter is meshed, hence, arm AE being actuated by detent A restoring mechanism, moves detent AF from under the stud in the total key, which allows the total key to be pulled downward by the single stroke mechanism.

Test: With machine normal, crossfooter in mesh, tap total key sufficiently to release power spring; during this operation total interlock arm (1-204124L) should clear the stud in the total key.

Adjustment: Arm AE must align with detent AF to provide a full hold.

Test: With crossfooter out of mesh, in add position, arm AE must permit detent AF to contact on stud in the crossfooter, at the same time it should also come as close as possible to detent AF.

With crossfooter out of mesh in subtract position arm AE should contact on detent AF.

Adjustment: Shorten or lengthen arm AE for later or earlier contact on detent AF.

Late machines do not have arm AE or detent AF on account of the fact that the register meshing cam has been set back, which permits taking register totals when the crossfooter is in carried position without taking a spacing stroke.

Drive Trip

When the carry pawl resetting has been completed, part T contacts on bell-crank lever L which raises arm O through spring Q. Arm O is fastened to the regular drive trip by one nut above it and one below, which when raised by arm O, trips the drive.

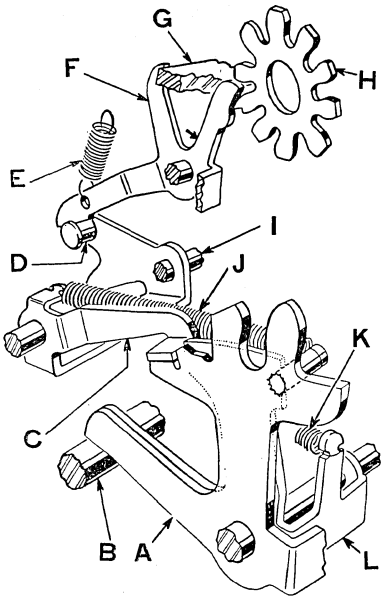
Tests and Adjustments

The drive trip should take place as late as possible.

The vertical arm of bell-crank L is adjusted as follows: Bend vertical arm rearward until drive will not trip, then advance arm 1/64″ at a time until the drive will trip with a carry in every column with a slight forward pressure applied to arm L.

This adjustment delays the trip to the latest possible moment and as the drive is tripped from spring I, it is necessary that these parts move freely.

CARRYING MECHANISM, TEN REGISTER CONSTRUCTION (Plate 47)



Carrying Mechanism, Ten Register Construction (Classes 21 thru 30) (Plate 47)

Ten register construction has ten adding wheels instead of six. The adding wheels, carry pawls and carry racks are considerably thinner for that reason. The carry pawls are tripped by a longer tooth instead of a wide tooth.

Ten register accumulating mechanism functions the same as six register accumulating mechanism. Tests and adjustments special to ten register construction are covered herewith. Tests and adjustments common to ten and six register construction will be found in Plate 32.

Ten register construction having 1 to 10 adding wheels as required is now used in Classes 21 thru 30.

Ten Register Tests and Adjustments

Carry pawls C limit on carry racks A in both normal and carry position. Trip arm F limits on bar G.

The amount of lift of carry pawl C is the difference between the long and the short tooth less the amount of clearance between trip arm F and the short tooth of adding wheel H and also less the amount of clearance between trip arm F and roller D.

There should be .003″ to .004″ clearance between trip pawl F and the short teeth of adding wheel H. To reduce clearance, F is peened at the point indicated by the unlettered arrow.

There should be .005″ to .007″ clearance between trip arm F and roller D (on carry pawl C).

Lack of, or no clearance can result in premature carry. Excessive clearance decreases the lift of C and can result in under carry.

To increase clearance, a screw driver bit is applied between C and shaft I, the arm of C which blocks A and L is held.

The lift of carry pawls C should be tested while adding 9's so as to produce carries in all columns, which permits observing whether or not the springing of the section is affecting the correct lift.

The lift of carry pawl C should also be tested with the delayed carry test: 9's accumulated and 1 added, carry racks A being held and slowly released, one at a time. In this test, the active carry pawl must overcome the tension of the other columns to the left.

When the lift is insufficient to allow auxiliary pawl L to locate under C, or when the carry is sluggish, the clearance between F and D should be checked and if necessary, reduced.

The arm of carry pawl C should locate squarely on carry rack B. If necessary, C should be squared by bending.

Pinions H should slide freely on lock bar G, when interference is present in all columns, lock bar G is raised or lowered, this however, is a Factory adjustment and should not be required in the Field.

Totaling should be tested for pinions H passing by trip arm F, when they do, it is usually due to angle of F where the latter contacts on the long tooth of H. This test is especially necessary for 12 pitch pinions.

Pinions H should align perfectly in cutouts of bar G.

Adjustment: Screw in W (Plate 27) is loosened and the complete wheel assembly turned by holding W and turning complete adding wheel assembly, pushing on lock nuts.

To insure correct alignment of pinion in cutouts of bar G, 9's are accumulated, holding wheel assembly alternately to the right and left.

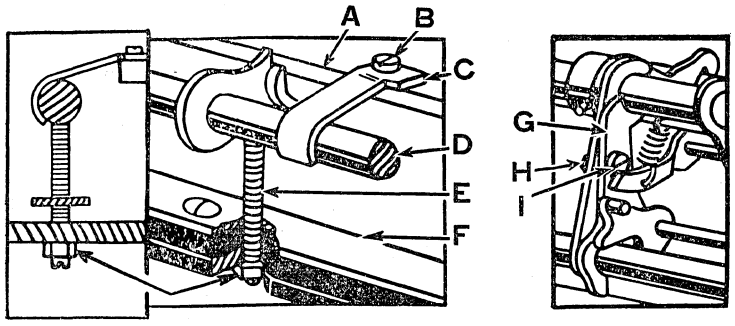
There should be clearance between the long tooth of register wheel and the crossfooter partition plates.

Test: Crossfooter in subtract position. Add 4's in register, handle forward and register meshed in and out.

When there is no clearance stock is removed from partition plates.

No clearance can cause machine lock.

REGISTER SECTION BRACES FOR TEN REGISTER CONSTRUCTION (Plate 48)



Register Section Braces for Ten Register Construction (Plate 48)

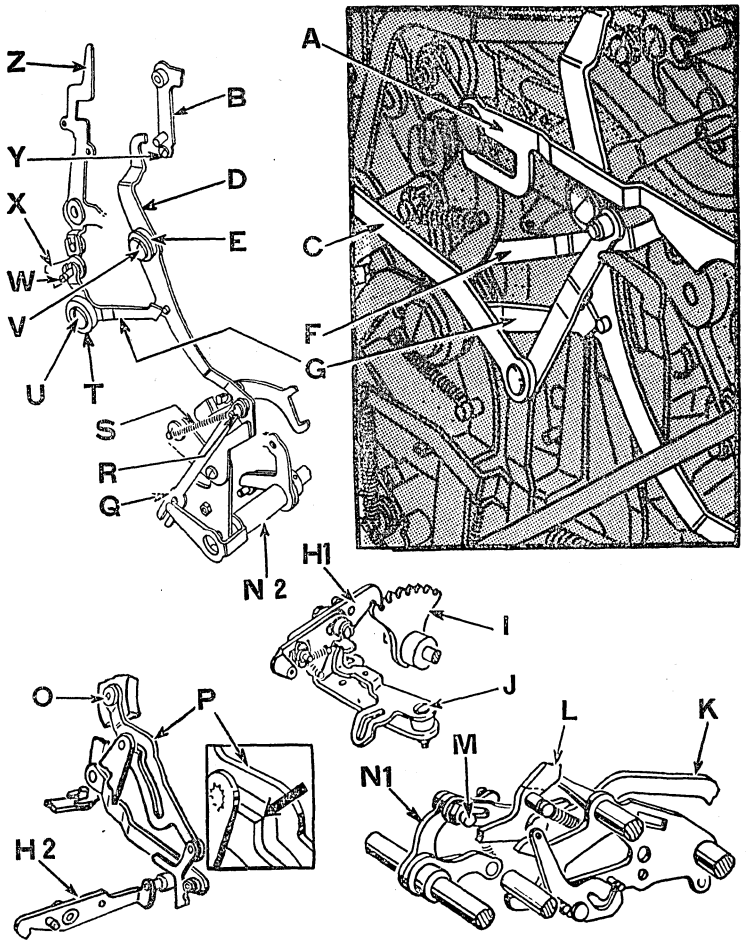
Braces C and G, and threaded post E are used on Style 17 Ten Register Construction.

The purpose of brace C is to hold the center of blade A in rigid position in order to retain the necessary clearance between the 69118A P10 No. 10 and the roller of the 1-69109 No. 10. To install, remove keyboard, remove one screw 7062 from blade A (the fourth hole from left end), place brace as pictured, fasten with screw B.

The purpose of the post is to retain this same clearance between the 69118A P 10 No. 10 and the roller of the 1-69109 No. 10 by eliminating vibration caused by dropping of sectors when transferring from crossfooter to register. To install, fit template to third and fourth holes in base, drill hole in base for post, using 22 drill and $\frac{3}{16}$ x 32 tap. To insure against bowing, adjust post to touch shaft, back post one quarter turn, tighten with 45 nut. A template is furnished upon request to the Service Department.

Brace G which prevents springing action of shaft D, is fastened to partition plate 69115½ No. 10 (one if Style 13, two if Style 17) with screw I and nut H, as pictured. To provide the screw hole it is necessary to drill the partition plate 69115½ No. 10, using a ⅛ drill. Before tightening G, test for free, it should have a slight play so as not to bind the shaft D. This brace insures sufficient lift for carry pawls when a number of carries take place at same time.

REGISTER CONTROL MECHANISM TO PROVIDE SUFFICIENT TIME FOR REGISTER TO POSITION CORRECTLY (Plate 49)



Register Control Mechanism to Provide Sufficient Time for Registers to Position Correctly (Plate 49)

This mechanism delays the seating of aligning detent H1 into segment I in order to provide sufficient time for the selected register to position correctly. This mechanism also causes aligning detent H1 to seat in segment I before the registers are meshed with the adding sectors.

Sequence

When register totaling indexing lever Z is shifted by part X to total or sub-total position, bell-crank G is rocked, its spear head moving upward or downward from the center of the stud in D which allows spring R to pull the hook of lever D over square stud.

During the early portion of the main (100) section movement the secondary (800) section is detained until the operating handle, when in place reaches approximately No. 4 key position, before the machine operation starts which provides sufficient time for selected registers to position.

Lever D is released by carry rack restoring link K through part N2 raising lever D through link Q. When the register total indexing lever is shifted manually and a symbol is to be printed, then the total key is manually depressed which causes part B to swing lever D off square stud to allow the normal machine operation.

Construction

Parts C, F and A are offset to clear parts G and D, these parts replace similar parts not offset. Screw U is special, space collar T is used behind screw U. A washer is used between lever D and the part behind it. Space collar E and a washer are used behind screw V.

The register is removed and part N1 replaced with part N2. When the register is put back in the base, the clearance between arm of part N2 and the base is checked. When there is no clearance, stock is removed from the base. The normal position of bell-crank G should be that its spearhead be in the center of the stud in D.

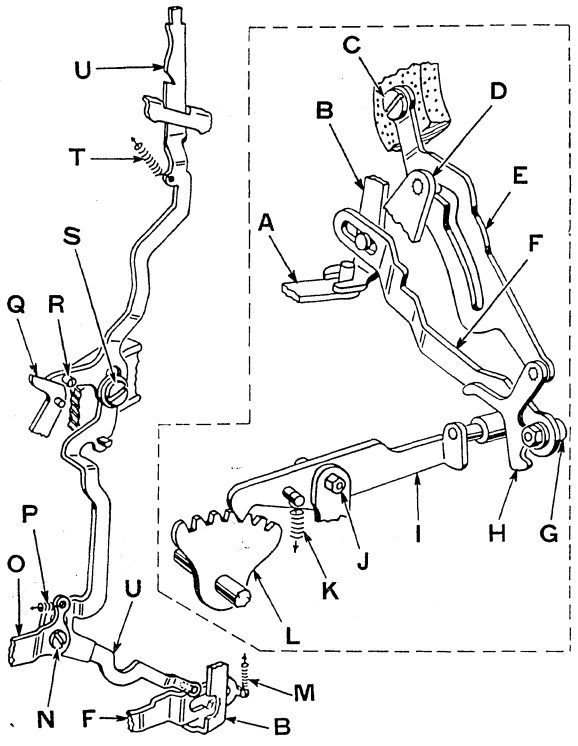
Adjustment: Arm of G is located as required.

All parts must be free and meet with the tests and adjustments as described in Plate 34.

The upper projection of passby pawl L is removed to eliminate resistance due to L camming off stud M when the register is meshed. As a matter of fact there is no further need for passby pawl L since the adoption of springs on the trip pawls.

The cam slot of part P has stock removed where the arrow points. Stock is added to the upper slot in order to cause aligning detent H1 to seat in I before the register is meshed.

REGISTER SHIFT RELEASE MECHANISM WITH DISABLING KEY (Classes 22 thru 30) (Plate 50)



Register Shift Release Mechanism With Disabling Key (Plate 50)

The purpose of this mechanism is to permit selection and totaling of registers without taking spacing strokes.

This mechanism, without disabling key, cannot be used in machines having keyboard selection of registers. When the register totaling indexing lever is moved to total position, lever B through link E and link F, rocks pawl I to clear segment L, which allows the register indexed by the carriage position to locate. At the beginning of the machine operation, the stud in arm D riding in the cam slot of link E raises part F, allowing pawl I to lock segment L.

Disabling Key U

The purpose of disabling key U, when depressed and latched down, is to permit selection and totaling of registers in machines having keyboard selection of registers.

When key U is depressed and latched, link F is swung downward, which locates the stud in lever B in the horizontal slot of F, so that when the register total indexing lever is shifted to total position, link F remains stationary. When key U is released, spring M pulls link F upward, which locates the stud in lever B in the pocket of link F which allows lever B to actuate the register shift mechanism.

Tests and Adjustments

The roller in detent I should be in center of part H, if necessary bracket on which bell-crank AI pivots, (Plate 27) is adjusted. Place register manual lever in forward position. When handle is started and as assembly D moves into the active cam slot of E, part H clears roller in detent I which permits detents I to seat in register segment L, at this time bell-crank AI (Plate 27) should locate slide H (Plate 27) so that K (Plate 27) will clear roller on slide H (Plate 27).

Register Shift From Subtract Mechanism Bar and Carriage Controlled (Plate 51)

The purpose of this mechanism is to advance the next register when the shift bar is depressed. The same result is secured with the subtract lever when the carriage locates a skid on indexing arm AB.

Bar Control—Sequence

When the uppermost bar is depressed, arm L thru link N rocks bail F, which through link D swings part AG to clear the stud in pawl AS in order to allow spring AQ to pull pawl AS to engage one of the square studs in part AT.

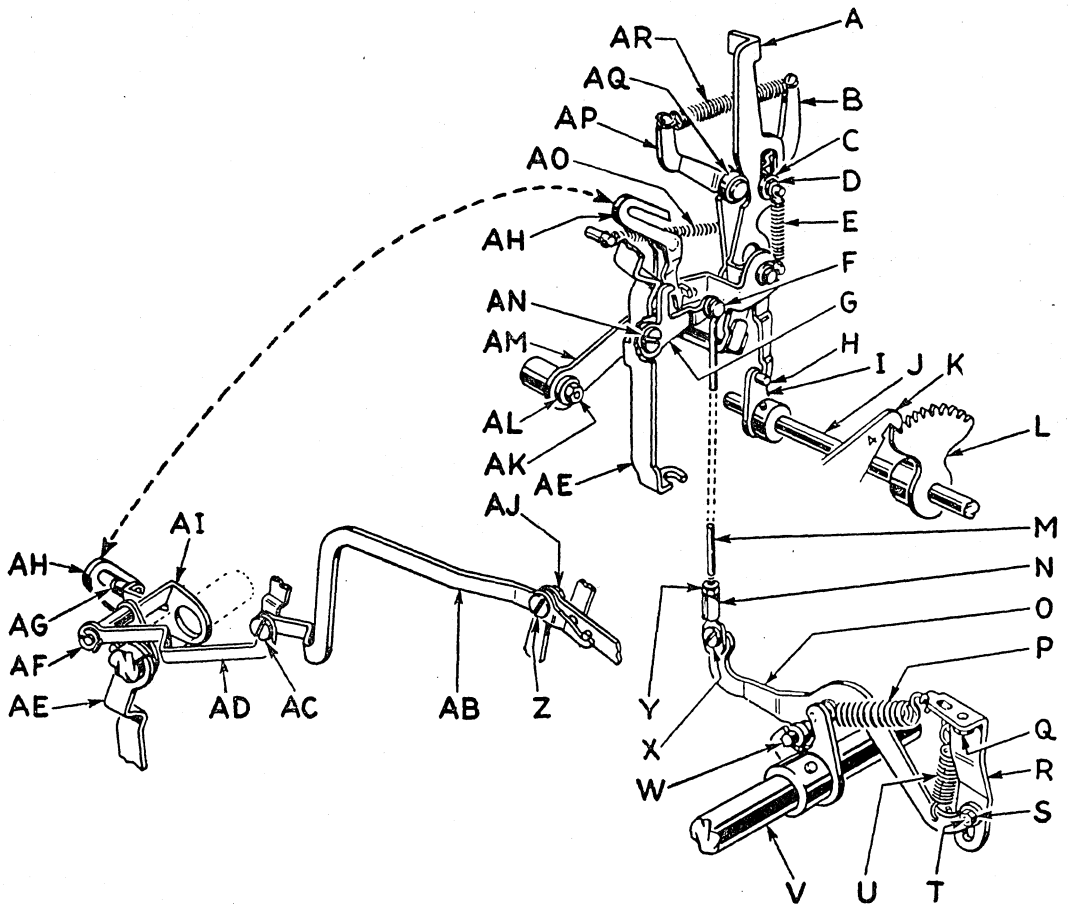
During the machine operation, after the register detent is raised out of the spaces of segment A, arm AY contacts the lower arm of AV, which swings register shift shaft AH to index the next register.

Subtract Lever Control

When a skid contacts roller Z, arm AB moves detent AL off stud in part G, which permits spring I to rock bail F when the subtract lever pulls link J forward. The movement of bail F is explained under bar control.

The illustration shows square studs in every other hole in segment AT, which results in shifting one register from bar or subtract lever control. When square studs are placed in all holes, two registers can be shifted from bar or subtract lever. If desired to obtain carriage control for the shift bar, link N and part G would be spring connected, similar to part P and link J, the spring stud is shown in the illustration. The purpose of detent AL is to retain bail F in normal position and also to prevent the subtract lever shifting registers unless a skid contacts on arm AB.

REGISTER SHIFT FROM SUBTRACT OPERATION—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 50-1)



Register Shift From Subtract Operation —For No Space Stroke Total Bank Posting Machines (Plate 50-1)

Purpose

To accumulate debit and credit amounts in separate registers.

Operation

Shaft V is rotated by the drive mechanism on every machine operation, causing stud W to rock arm O and to lower link M and hook G.

When the counter control lever is located in add position, bellcrank AH is so positioned by linkage AB, AD, bail AI and stud AG, that the lip on its lower arm clears hook G when the machine is operated—thereby allowing the register to remain in the position selected from the register indexing skid.

When the counter control lever is shifted to subtract position, bellcrank AH is rocked by linkage AB, AD, bail AI, and stud AG, to locate the lip of its lower arm under hook G. When the machine is operated with the lip of bellcrank AH so positioned, hook G, through bellcrank AH, lowers arm AM and slide A—thereby rocking lever AP, through the action of the slide's camming surface on roller AQ, to move the lower arm of lever AP away from stud H. Slight rotation of shaft J is thus permitted, and the register is allowed to move one digit to the right. (Example: If the No. 5 register is selected from the register indexing skid add operation, a subtract operation in the same position will select the No. 6 register.)

Adjustment

(The machine should be operated manually by means of a crank, when in the process of making the following tests.)

(Plate 50-1)—Continued

1. When the machine is operated in each carriage position with the counter control lever in add position, detent K should locate centrally in the notches of comb L.

To adjust, raise or lower the control cam which contacts the register indexing skid.

2. When comb L is shifted through the lowering of slide A (subtract operation), detent K should locate centrally in a notch of comb L.

To adjust, turn turnbuckle N to shorten or lengthen link M.

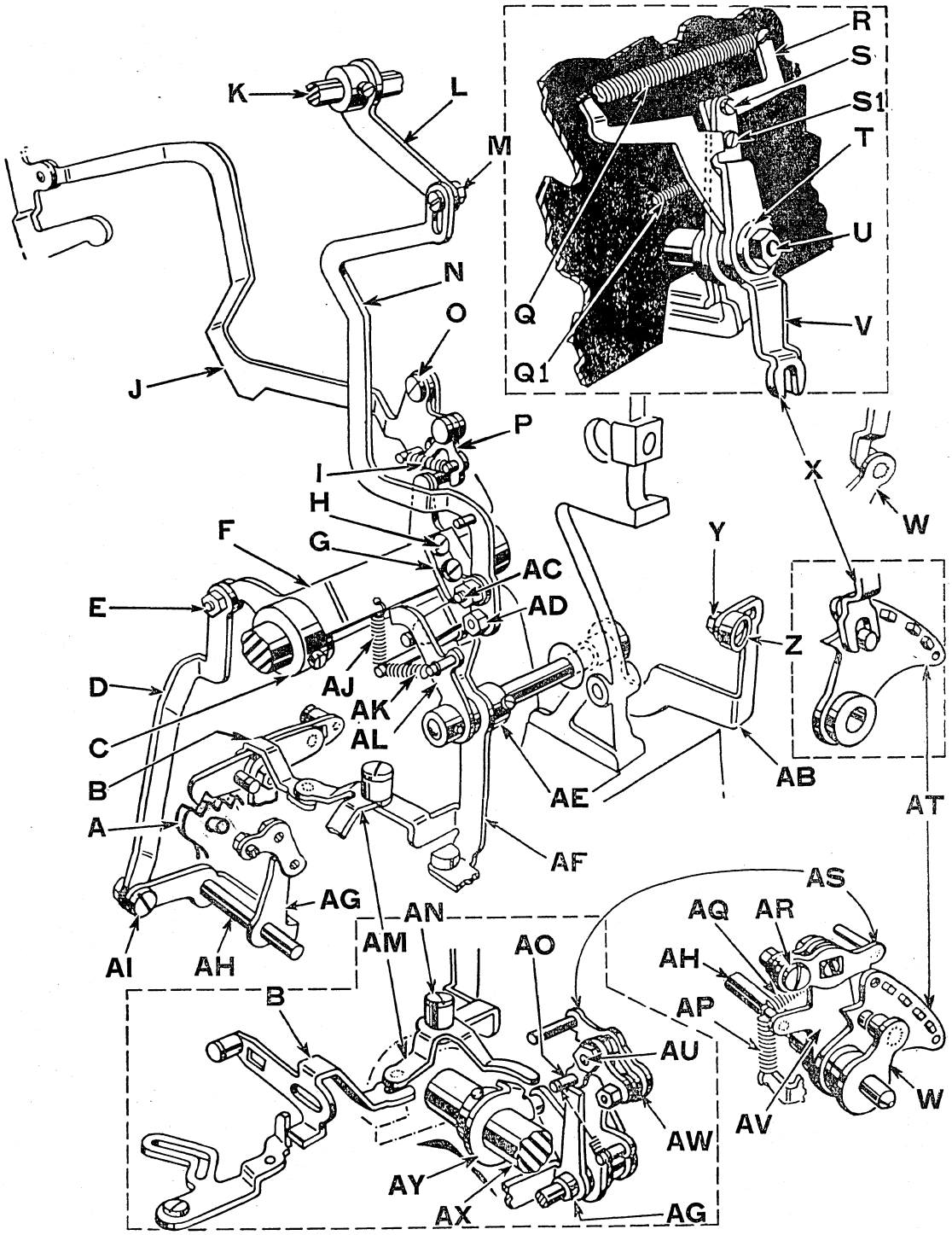
Note: Spring U should not yield when slide A is fully lowered by hook G. When yielding occurs, turnbuckle N should be re-adjusted.

3. When the machine is operated with the counter control lever in subtract position and key 4-14 or 5-14 depressed, there should be slight clearance between hook G and the lip on the lower arm of bellcrank AH; and when the machine is operated with the counter control lever in add position and key 6-14 depressed, the lip of bellcrank AH should have a safe hold under hook G.

To adjust, shorten or lengthen link AD at its offset.

Note: This test should also be made with key 9-18 depressed.

REGISTER SHIFT FROM SUBTRACT MECHANISM BAR AND CARRIAGE CONTROLLED (Classes 22 thru 30) (Plate 51)

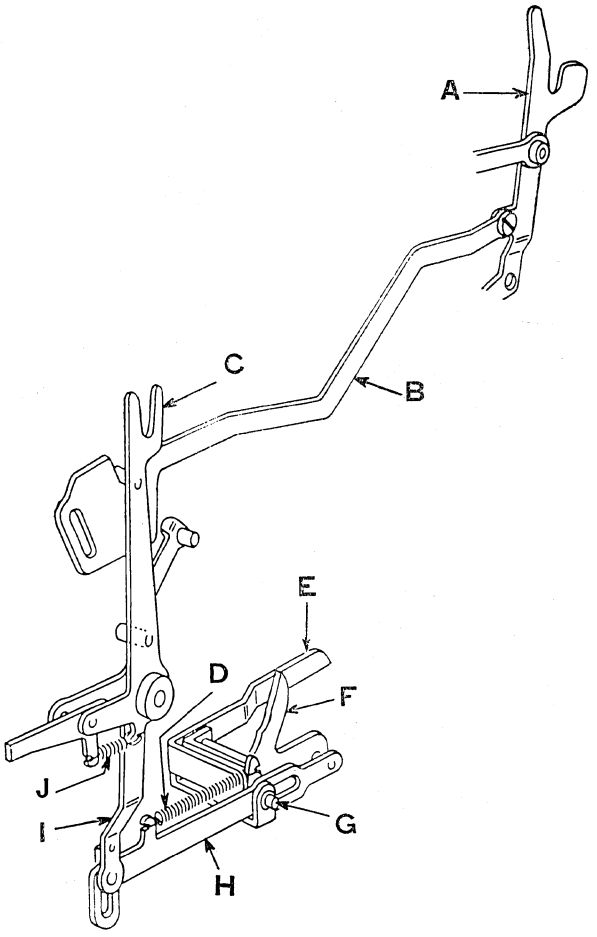


Tests and Adjustments

Pawl AS should move segment AT sufficiently to locate the register detent in the center of the spaces in segment A.

Adjustment: Eccentric screw AU is turned.

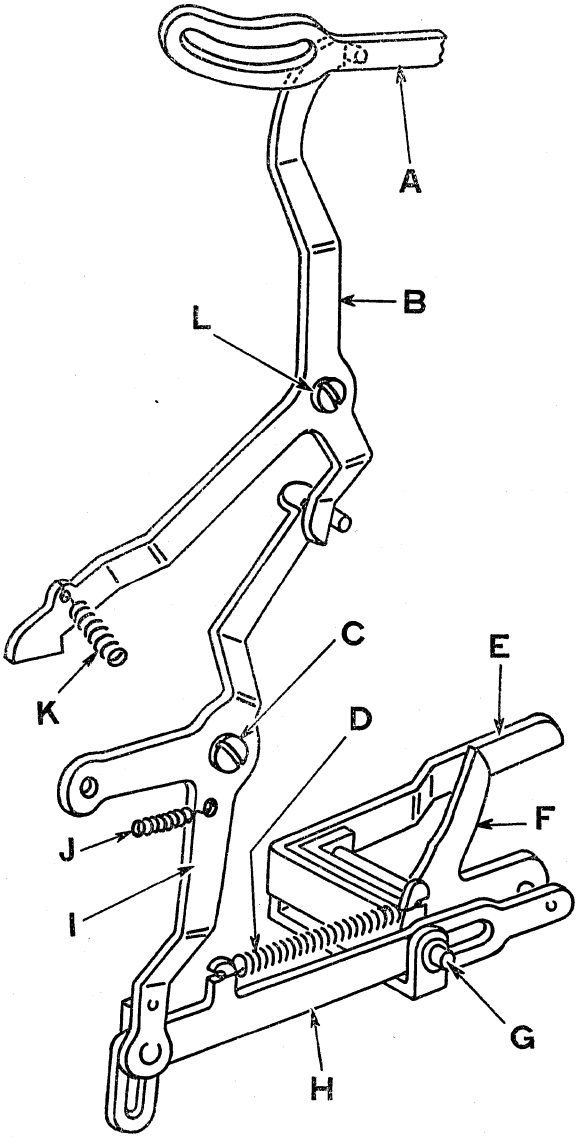
REGISTER NON-ADD FROM SUBTRACT MECHANISM (Classes 11 thru 16 and 21 thru 30) (Plate 52)



Register Non-add From Subtract Mechanism (Classes 11 thru 16, 21 thru 30) (Plate 52)

When a control roll depresses the subtract lever or when the subtract lever is moved to subtract position, part C is rocked which locates assembly H in register non-add position.

REGISTER NON-ADD CONTROLLED BY TOTAL KEYS (Classes 11 thru 16 and 21 thru 30) (Plate 53)



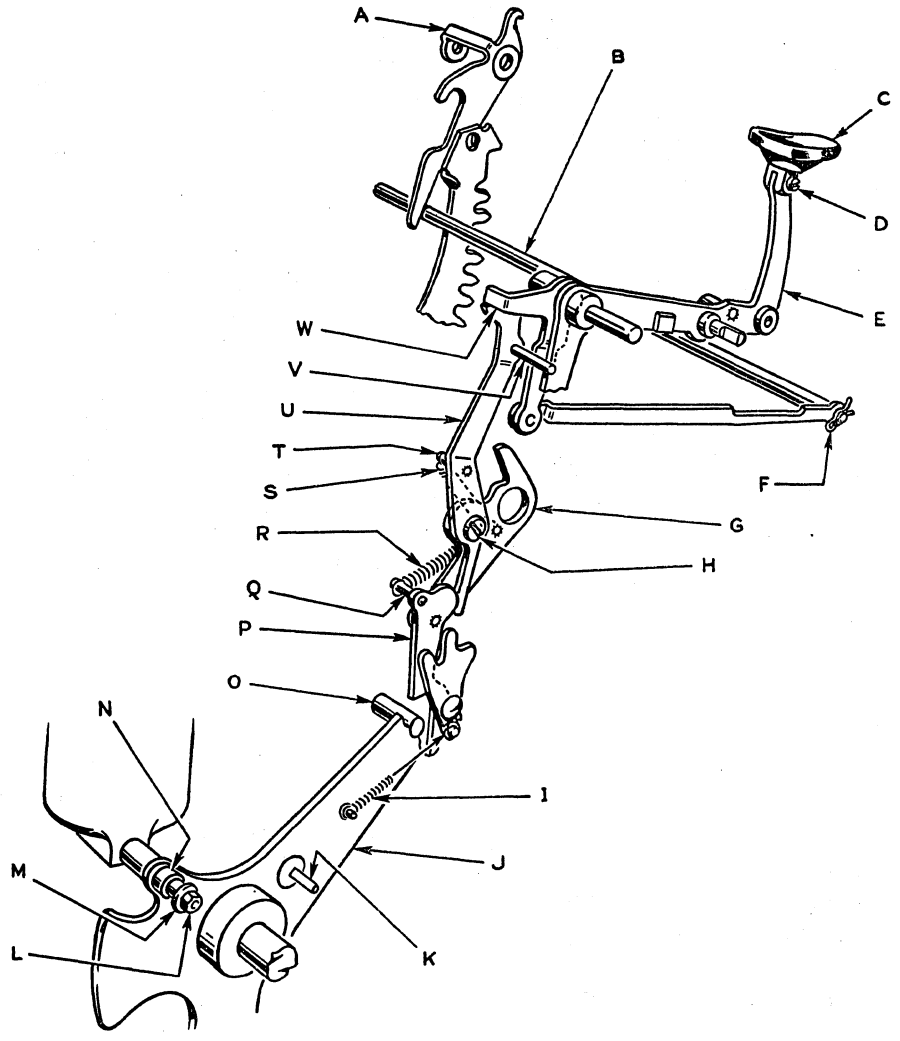
Register Non-add Controlled by Total Keys (Plate 53)

This mechanism indexes the register to non-add when the crossfooter total or sub-total keys are depressed.

Sequence

When sub-total or total keys are depressed, the stud in link A rocks part B which locates assembly H in register non-add position.

SECTOR BAR LOCK—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 54-1)



Sector Bar Lock—For No Space Stroke Total Bank Posting Machines (Plate 54-1)

Purpose

To release the adding rack latches when taking crossfooter or register totals.

Operation

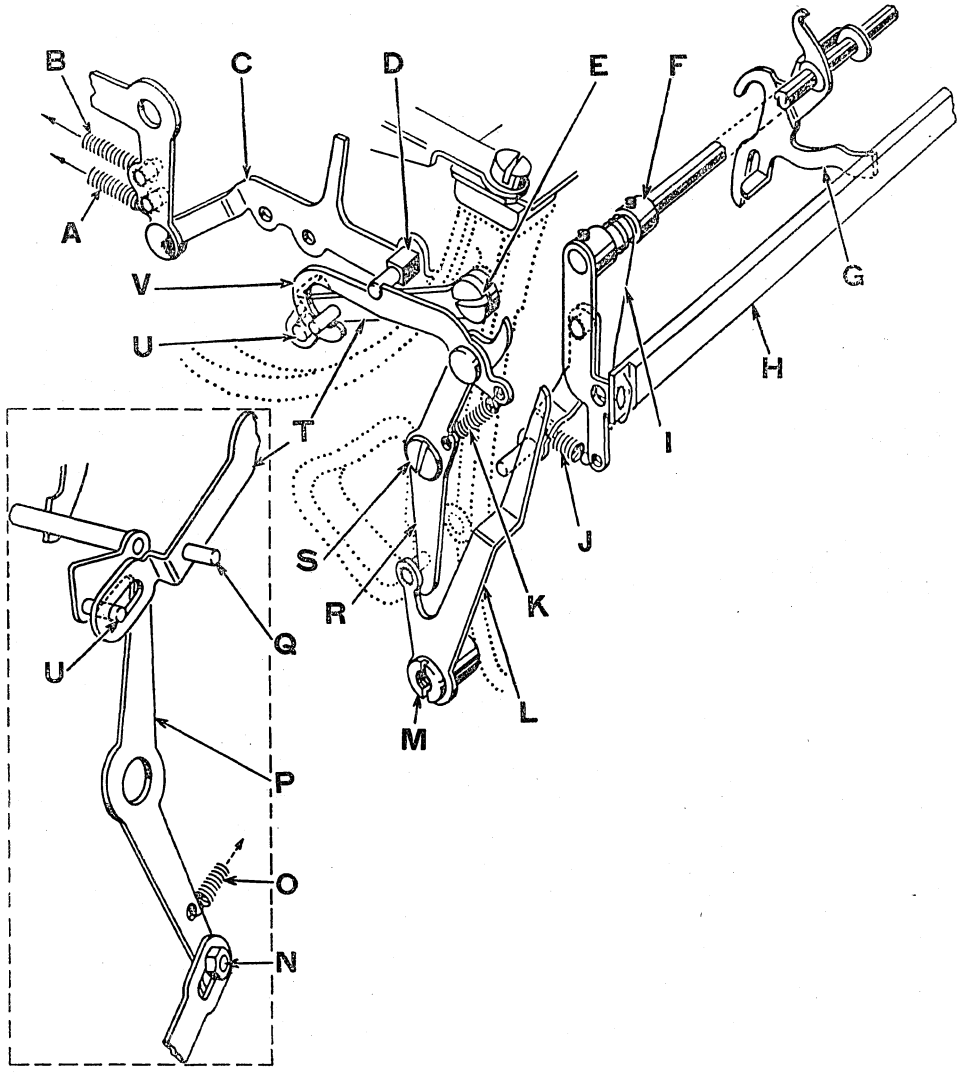
Depression of the total or sub-total key rocks arm U through stud V thus allowing spring R to swing pawl P over stud O. As the machine operates, the rocking of part J (during the early portion of the forward stroke) through stud O and pawl P, raises arm U to rock assembly W which, through shaft B, moves the adding rack latches A rearward to release the adding racks. Later, during the forward machine stroke, stud O is cammed off pawl P which permits the Sector Bar Lock Mechanism and the adding rack latches to restore to normal.

Adjustment

With the total key depressed, pawl P should have a safe hold over stud O.

To adjust, swing stud V forward or rearward by weaving arm U.

REGISTER TOTAL AND SECTOR BAR LOCK FROM REGISTER TOTAL INDEXING LEVER
(Classes 21 thru 30) (Plate 54)



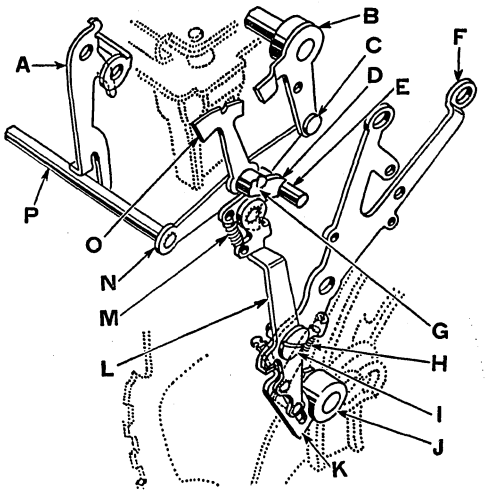
Register Total and Sector Bar Lock From Register Total Indexing Lever (Plate 54)

When the register total indexing lever is moved to total position, stud D pushes link V which rocks levers R and L, swinging bail H to raise adding rack latches G.

Toward the end of the forward stroke, stud U moves lever T downward, which through stud Q, lowers arm V, allowing levers R, L, bail H and latches G to restore, thereby preventing rack bars dropping in columns at cipher position.

This mechanism is used in machines having H1429 mechanism and also for Field machines. This mechanism cannot be used in H903 machines.

SECTOR BAR LOCK MECHANISM (Early) (Plate 55)



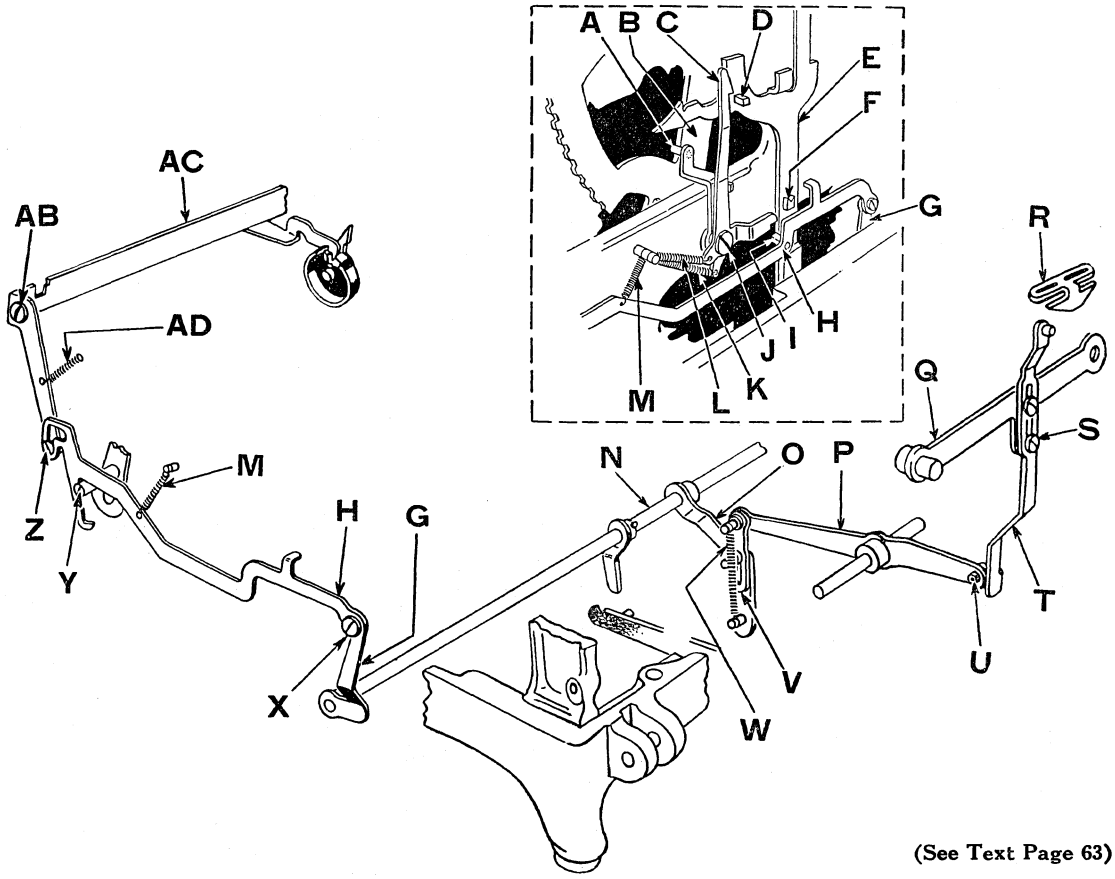
Sector Bar Lock Mechanism (Early) (Plate 55)

This mechanism causes adding rack latches A to restore during the latter part of the forward stroke, in all columns which are in cipher position to the left of the amount during totaling.

When the total key is depressed, stud G contacts and lowers pawl D in line with stud E.

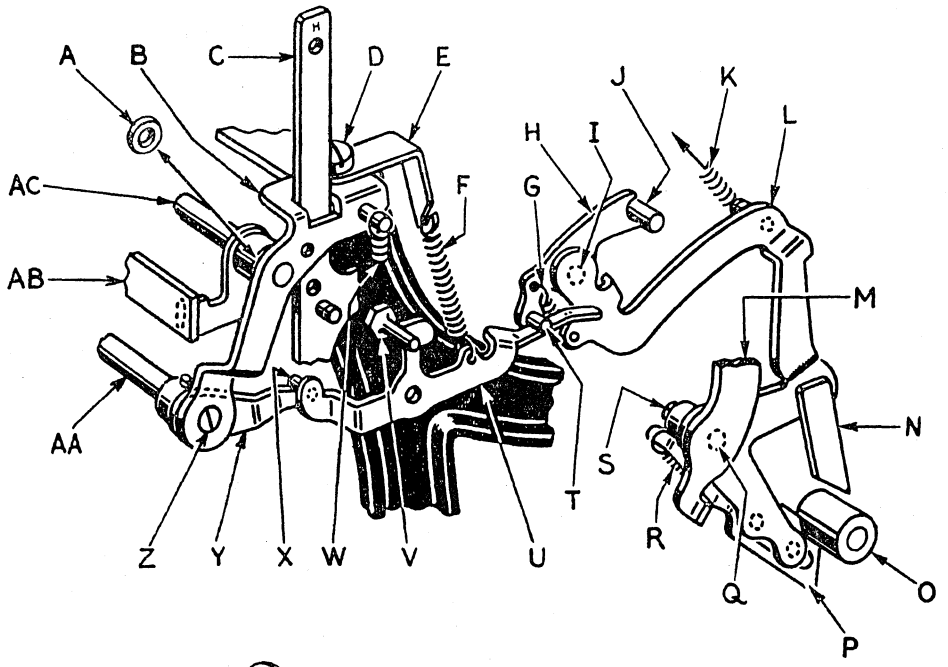
At the beginning of the machine operation, roller J contacts passby pawl K, swings assembly L which through pawl D contacting stud E pulls shaft P rearwards, causing latches A to release all adding racks. As the forward stroke continues, roller J rides off passby pawl K allowing all latches A to drop which allows only the adding racks to drop which were indexed above cipher position.

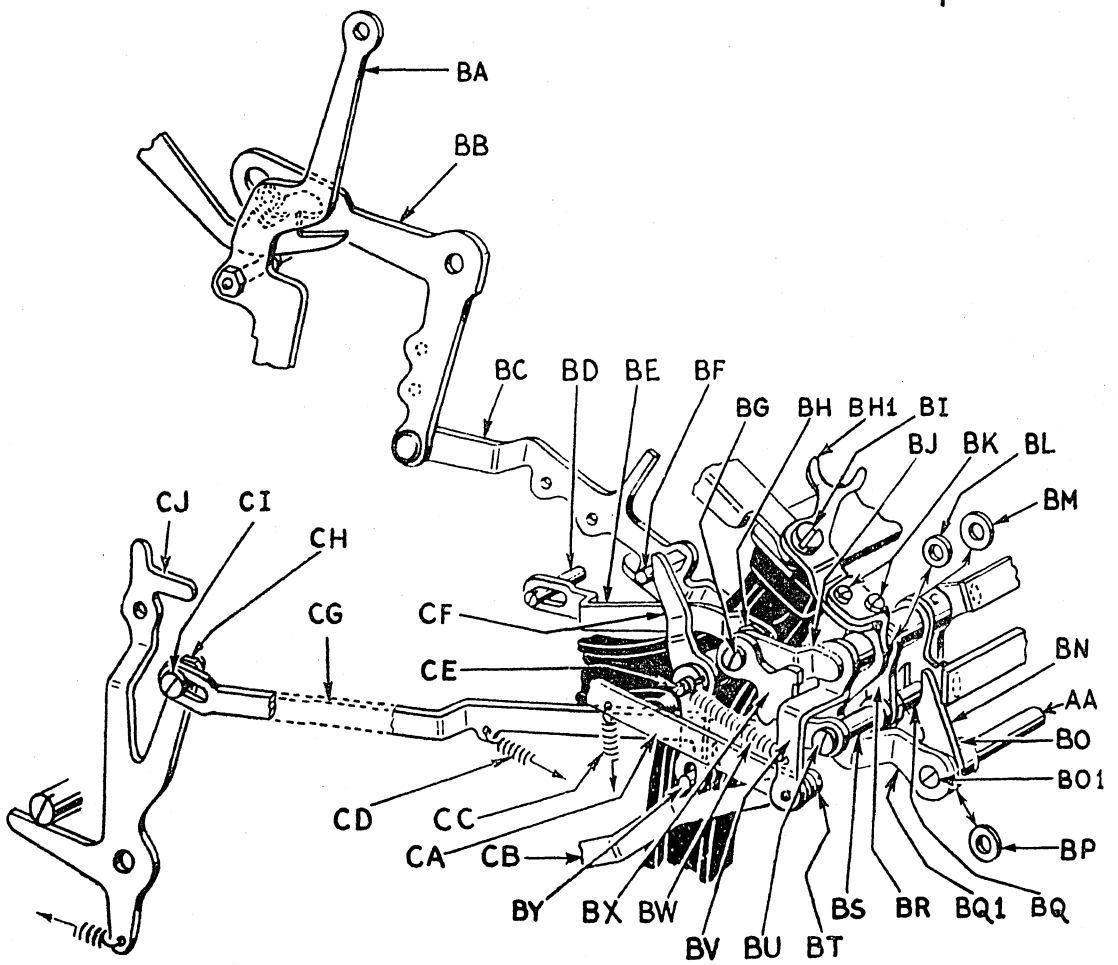
CROSSFOOTER NON-CLEAR MOTOR BAR LOCK NO. 1, EARLY STYLE, CARRIAGE CONTROLLED (Classes 11 thru 16 and 20 thru 30) (Plate 56)



(See Text Page 63)

SECTOR BAR LOCK, IMPROVED (Plate 55-1)





Sector Bar Lock, Improved (Plate 55-1)

Purpose

The improved Sector Bar Lock Mechanism is designed to insure engagement of pawl H with stud J when taking a crossfooter or register total, thus insuring the release of the adding rack latches.

Construction

Part N has been added to arm L to insure the return of arm L to its normal position on the return stroke of the machine. A new link CG is used with this improved mechanism, in place of the link containing an elongated slot in its forward extremity.

Operation

When the Automatic Total or Sub-total Mechanism is indexed from a carriage control roll, and the credit balance control arm CJ is moved rearward on the forward stroke of the machine, link CG, being attached to arm CJ, is moved rearward, swinging assembly BR rearward and camming arm BN downward through stud BQ. Downward movement of arm BN rocks shaft AA, moving arm Y downward, enabling spring F to rock part U to limit against stud V. The rear projection of part U contacts stud T, rocking pawl H into alignment with stud J. Later in the forward stroke, roller O contacts the passby pawl P, rocking arm L and pawl H, and forcing stud J rearward to release the adding rack latches. On the return stroke of the machine, roller O contacts part N and rocks arm L forward to its normal position.

When the register shift lever BA is manually shifted to a total position, the roller in arm BA rocks bell-crank BB and moves arm BC forward. As BC moves forward, stud BF rocks part CF, which, through stud BY, moves link CG rearward to index the release of the adding rack latches (as described above).

Installation

To remove sector bar bail 1A-204129 Style 17 (X, Plate 77, Accumulation Symbol List), loosen the collars on shaft 64001 and weave and break off the right and left arms.

On machines equipped with Counter Dials, the following changes are required:

Part 1-200233½B No. 2 to replace part U.

Part 1-64108 Env. 903 No. 2 to replace part BJ.

On machines equipped with Non-add Non-print Mechanism, the following changes are required:

A longer screw stud 204514A No. 2 to replace stud BS.

A short stud 200470 to replace stud BQ.

Stud 200470 to be reversed when assembled to arm BR, permitting the shifting of assembly BR to the right.

Collar 1-64307 to replace washer BL.

Collar 1-89325 to replace washer A.

Collar 1-64307 to be assembled on shaft 64001 to the left of collar 1-89325.

Adjustments

1. Remove part CF, and test pawl H to have 1/32″ or more clearance over stud J when the sector bar lock is in normal position, and to have a full hold on stud J when indexed on a total operation.

Adjust by turning eccentric screw CI.

2. Replace part CF, and test for slight play between stud BF and part CF when lever BA is in a normal position.

Adjust by bending part CF.

Crossfooter Non-clear Motor Bar Lock No. 1, Early Style—Carriage Controlled (Plate 56)

The purpose of this mechanism is to block the motor bar when the crossfooter is not clear. This mechanism is jointly controlled by the crossfooter and by the carriage. The upper adding wheels in the crossfooter have pockets into which the arms of bail AC can enter when the crossfooter is clear in certain carriage positions.

Bail AC is rocked when the carriage moves skid R on link T. When skid R depresses link T with the crossfooter not clear, the pockets in the adding wheels are not in line, which does not allow complete movement of bail AC, resulting in the projection of part H locating over the angled stud F in part E, which blocks the motor bar.

In order to allow sufficient time for the carry mechanism to completely function, bail AC cannot become active until the machine reaches normal position. At the beginning of the machine operation, when full stroke segment B swings rearward, pawls C and A swing into the path of studs D and I, this blocks parts E and H until segment B is normal, which allows pawls C and A to clear E and H.

Construction

Bail AC is connected to link T by part H, shaft assembly N, spring W, link V and link P. Spring W provides a flexible connection by expanding when skid R depresses link T when any one of the arms of bail AC cannot enter the pockets of the adding wheels, due to the crossfooter not being in cipher position.

When the crossfooter is disengaged from the adding sectors, stud Y moves part H forward, which allows spring AD to rock bail AC, raising the arms of bail AC to clear the adding wheels.

Tests and Adjustments

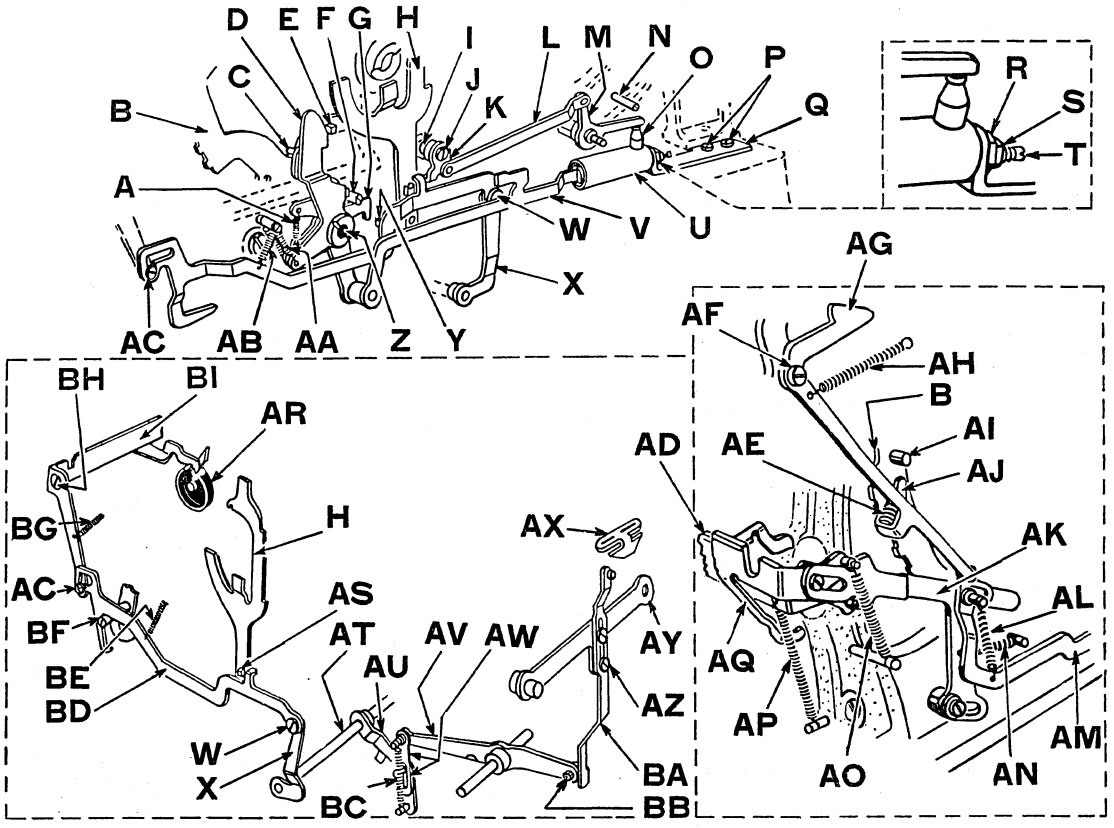
Crossfooter clear and skid R on link T. There should be clearance between interlock H and the front of stud F (in E). To secure clearance, bend arm of bell-crank G forward.

Note: The extent of available clearance is limited by the necessary hold of interlock H on stud F when the crossfooter is not clear.

The arm of bail AC must move freely when the crossfooter is rocked inward and outward. The arms of bail AC should align with the pockets in the dials. Hooks of pawls C and A should hold on their respective studs as long as possible, which is secured by a minimum of clearance between C and A and studs D and I.

Adjustment: The arm of A is bent from segment B for later release of C and A.

CROSSFOOTER NON-CLEAR MOTOR BAR LOCK NO. 2, AIRPOT AND CARRIAGE CONTROLLED (Plate 57)



Crossfooter Non-clear Motor Bar Lock, No. 2, Airpot and Carriage Controlled (Plate 57)

The purpose of this mechanism is to lock the motor bar against depression when the crossfooter is not clear in certain carriage positions.

Single bail construction is effective only when the machine is in add position.

Double bail construction is effective in both add and subtract positions. Adding wheels in double bail machines have in addition to the pocket in space washer for the upper bail, another pocket in the dial for the lower bail.

This mechanism safeguards the carries in any number of columns, the air control being adjustable to provide the correct amount of delay for the number of columns involved. This mechanism is effective only when the carriage moves into the motor bar control column.

Sequence

On the forward stroke of every machine operation, part C follows segment B being pulled by spring AB. Part C through the stud in the foot of C, rocks part G. The rear arm of part G assumes a position in the path of square stud Y on link BD. The foot of part G pulls link and plunger assembly V outward. The movement of part G also permits spring AA to pull detent D over square stud E.

On the return stroke when the carriage tabulates into the non-clear motor bar lock column, skid AX contacts on link assembly BA, which through lever and shaft assembly AT moves link BD forward just sufficiently to allow arm K, link L and bell-crank M to clear valve O which closes to set up air resistance. Link BD is blocked by part G to prevent hooks BI contacting on dials AR or entering pockets before carries are completed.

(Plate 57)—Continued

As the return stroke is nearing completion, segment B restores part C, part G is prevented from following by the resistance of airpot U which causes spring A to expand. The delayed contraction of spring B, due to the air resistance, provides the necessary amount of time for the completion of the carries.

When part G becomes normal, link BD moves forward allowing hooks to enter pockets in dials and clear stud AS when the crossfooter is clear or contact on dials and thereby locate arm of link BD over stud AS to block the motor bar when the crossfooter is not clear. Part G also pushes detent D off the square stud E.

The purpose of detent D is to hold drive control H until the lip on the vertical projection of link BD has arrived at a definite position over stud AS when the rear arm of part G clears stud Y. For that reason detent D should have approximately one-half hold on stud E when part G clears stud Y.

When the crossfooter is disengaged from the adding sectors, stud BF moves link BD downward causing shoulder screw AC to locate in the horizontal pocket of link BD which permits spring BG to rock bail BI, raising the fingers of bail BI to clear the adding wheels.

Machines having double bails AD and AQ have in place of stud BF, stud AI (in segment B) which contacts on passby pawl AJ, rocking part AG to lower part AM to locate the stud in part AK in the horizontal slot of part AM.

The depression of the total key also swings part AG to locate the stud in AK in the horizontal slot of AM.

Tests and Adjustments

Place 9's on all dials in crossfooter and locate carriage so that skid AX is over stud in BA. Align AX for center hold on stud in BA.

Machine normal, depress part H and check all fingers on control bail BI for limiting on hubs of dials. This checks bail for being square and fingers for correct height. Check formed lip on BD for standing center over stud AS.

Adjustment: Bend arm on BD.

Manually return carriage one column so that skid AX clears stud in BA. Remove screw AC and check fingers on control bail for limiting on 205 shaft. Before replacing screw AC, establish a center alignment of vertical slot with screw hole in BD, to insure free up and down action of BD.

Adjustment: Bend lower offset in BA. The normal limit of BA is against screw AZ.

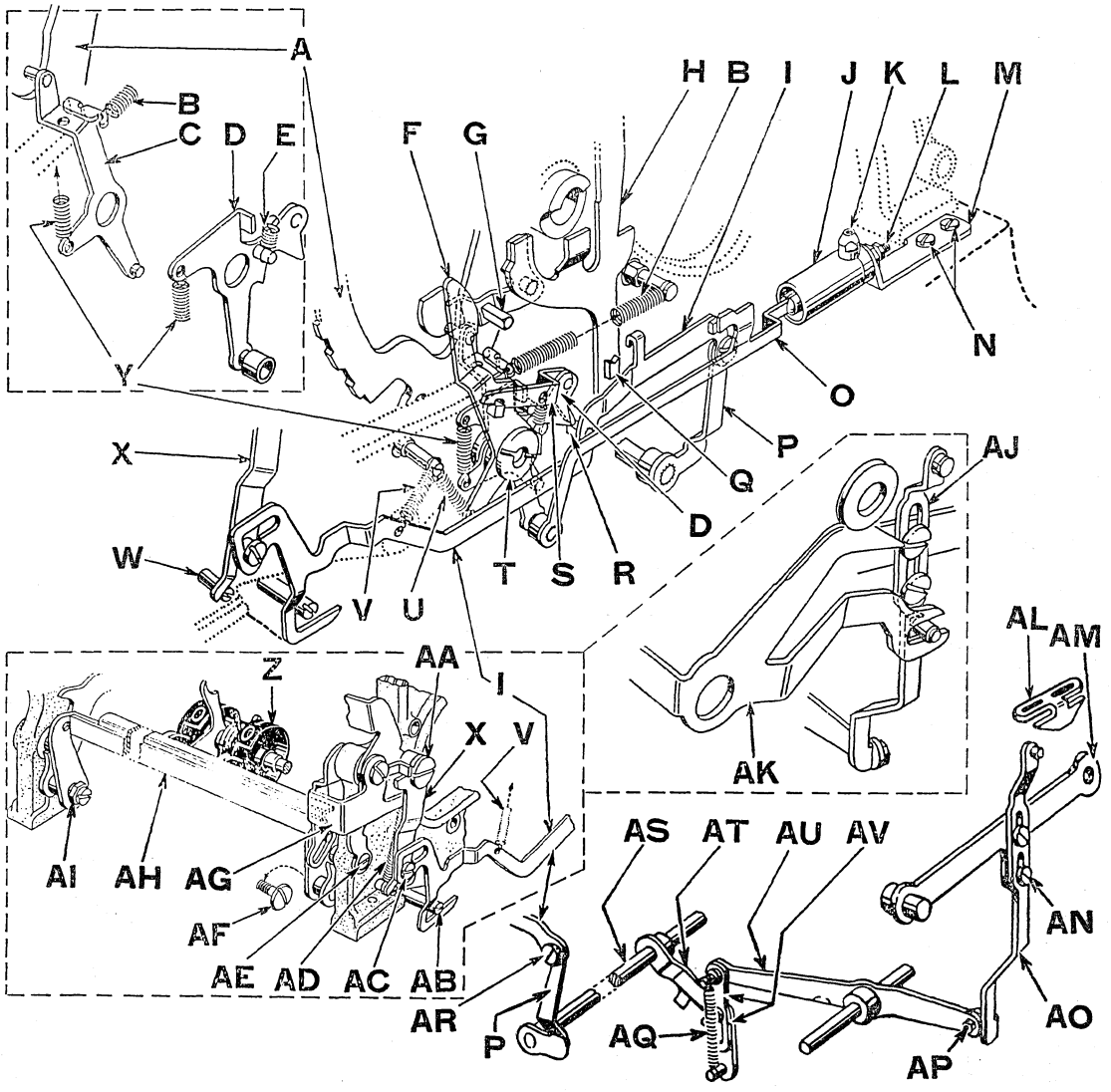
Since the air resistance slows up the machine operation in the control column, for that reason the air resistance should be adjusted to control only the required number of columns.

Test: Produce carry in last columns by adding 9's in all of the required columns and .01.

Test also by subtracting larger from smaller number to leave 1 in last column.

Adjust by turning screw T as required.

CROSSFOOTER NON-CLEAR MOTOR BAR LOCK (Later) CARRIAGE CONTROLLED (For Consumption Column) (Plate 58)



Crossfooter Non-clear Motor Bar Lock (Later) Carriage Controlled (For Consumption Column) (Plate 58)

The purpose of this mechanism is to lock the motor bar against depression in certain carriage positions when the crossfooter is not clear.

This mechanism safeguards the carries in any number of columns, the air control being adjustable to provide the correct amount of delay for the number of columns involved.

The carriage position, which determines when this mechanism is effective, accomplishes its result in a different manner than the mechanism covered by Plate 57, which closed valve O when the carriage tabulated into the motor bar lock column through the projection on link V clearing linkage assembly L and bell-crank M, Plate 57. When early tabulation was discontinued, the carriage movement became too late to make the air control sufficiently effective and for that reason the valve control referred to was discontinued. The late mechanism provides approximately fifteen machine strokes less when the carriage tabulates into the motor bar lock column.

In all carriage positions not indexing the motor bar lock, detent F is pushed off stud G by latch S. However, when the carriage position indexes the motor bar lock, stud R

(*Plate 58*)—*Continued*

swings latch S upward to clear the square stud in detent F, the latch S is then pushed off the stud in F slowly by the lip on part D.

Sequence

On the forward stroke of every machine operation part C follows segment A being pulled by spring B. Part C through the stud in its foot rocks part D which locates in line with square stud R. The foot of part D pulls link and plunger assembly O outward. The movement of part D also permits spring U to pull detent F over square stud G.

On the return stroke, as the carriage tabulates into the motor bar lock column, skid AL pushes link AO downward rocking lever AU, which through slotted link AV and arm AT, rocks shaft assembly AS, link I moving forward and stud R swinging latch S upward off the square stud in detent F.

Link I swings arm X which in turn swings bail AH, its fingers entering the cut-outs in dial Z. When the crossfooter is clear, the vertical porjection on link I moves over and clears the concave block Q on drive trip H.

Now, when the crossfooter is not clear, the fingers of bail AH limit on dial Z which by preventing complete movement of link I, locates the vertical projection of link I over the concave block Q on drive trip H which blocks the motor bar until the mechanism is normalized from key, bar or the carriage moving out of the control column.

When the crossfooter is clear, the motor bar is blocked by detent F, the release of which is delayed by airpot assembly J which causes part D to move slowly in releasing detent F to allow sufficient time for the carrying mechanism to completely function.

The purpose of bail AH is to secure simplified design and also to eliminate close adjustments. Bail AH is effective in both add and subtract positions; this style of bail will be standard with a few exceptions.

Bail AH pivots on the crossfooter hanger and is swung by link I and the cam slot of part AG.

When the crossfooter is disengaged from the adding racks stud AB moves link I downward, resulting in screw AC locating in the horizontal slot of link I which permits spring AD to rock bail AH raising its fingers to clear dials Z.

Tests and Adjustments

The bottom of the slot in AO must limit on screw AN when the motor bar lock is not indexed. A false limit in some portion of the linkage can prevent the correct limit. Latch S must clear stud R when the motor bar lock is not indexed.

With 9's on all dials, carriage is located so that skid AL is central on the stud in AO. When roll controlled, the roll should center on lever AK, machine normal.

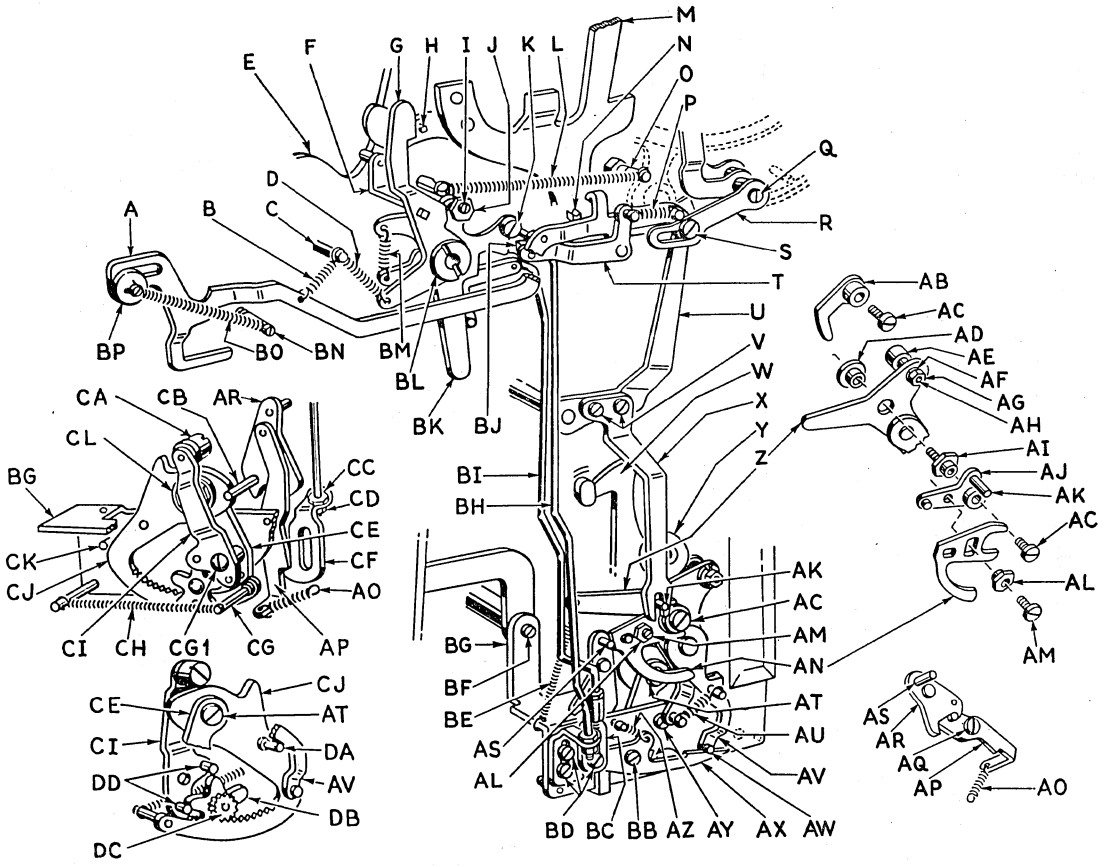
Fingers of bail AH to clear dials Z by 1/16″.

The vertical projection of link I should align with concave block Q on drive trip H; the lip on part I is bent. With amount on the left dials, the projection on link I must also align with concave block Q on drive trip H.

Adjustment: Eccentric AI is turned as required. The air resistance should be adjusted to control only the required number of columns.

Test: Produce carry in the last columns by adding 9's and .01. Test also by subtracting larger from smaller number to leave 1 in the last column. Adjust by turning screw L as required.

TIMING MECHANISM TO DELAY MOTOR BAR RELEASE
(Classes 20 thru 30) (Plate 58-1)



Timing Mechanism to Delay Motor Bar Release (Plate 58-1)

Purpose

The purpose of this mechanism is to delay the tripping of the drive to provide time for the completion of a consecutive carry, and, on machines equipped with the C.F.N.C. Motor Bar Lock Mechanism, to provide a still longer interval of delay in which the positioning of the C.F.N.C. bail in the dial wheels is prevented until the carry is completed.

Operation

When the machine is operated, part F follows segment E rearward through the tension of spring L. This permits hook G to locate over stud H as drive trip link M continues downward. As part F moves rearward, wires BI and BH are lowered, turnbuckle BC permits latch AX to limit on stud AW, and the projection of turnbuckle CF is aligned with the step of latch AP.

The rotation of cam Y (on the end of shaft E, Plate 5, Power Symbol List) rocks arm Z and part AV, and the latter, by contacting stud DA, rocks segment arm CJ forward. As CJ swings forward it rotates gear DC, expands spring CH, and turns the cam of arm CJ clockwise. As the cam moves away from stud CB, latch AP locates over the projection of turnbuckle CF. Stud AS contacts on the upper vertical surface of part AN (as latch AP engages CF), pivoting pawl AR and moving stud CB toward the cam of arm CJ. Latch AX locks the indexing by engaging stud AW.

NEAR THE END of the return stroke, full stroke segment E rocks part F which raises wire BI. Turnbuckle BC rocks latch AX, releasing stud AW and allowing spring CH to restore arm CJ and to rock the cam of arm CJ counter-clockwise.

As arm CJ restores, gear DC is rotated causing CI to oscillate through star wheel DB and pins DD, thereby retarding the restoring speed of arm CJ. As the cam of arm CJ

(Plate 58-1)—Continued

returns to its normal position it contacts stud CB, rocking latch AP and releasing turnbuckle CF and hook G.

DURING A C.F.N.C. operation the C.F.N.C. bail must be held clear of the dial wheels until after the carry is completed. A longer interval of delay is thus necessary with the carriage in C.F.N.C. position, and is made possible by providing a later rocking (as arm CJ restores to normal) of pawl AR and latch AP, and a later release of turnbuckle CF.

As the carriage tabulates into C.F.N.C. position, assembly U moves arm A forward until stud BJ limits against part BK, and the lower portion of arm X moves rearward to swing part AN in a clockwise direction. With part AN so positioned stud AS is located farther rearward (than when limited by the upper vertical surface of part AN), and stud CB is positioned farther forward where it is acted upon by the cam of arm CJ at a later instant in arm CJ's restoring travel. When stud CB is contacted by the cam of arm CJ, latch AP releases turnbuckle CF, and allows part BK to move upward and arm A to position itself before hook G leaves stud H.

Installation

This mechanism (which may be used only in conjunction with Type 6A Motors with 19 to 1 gear ratio) may be installed on early machines in the Field by observing the following outline which is offered as a guide:

1. Approximately 3/32″ stock should be removed from the front edge of the hole in the base to provide clearance for wires BI and BH.

2. The hole in the condenser bracket should be elongated to permit rearward movement of the condenser for necessary clearance with arm CJ.

3. Stock should be removed from the lower binding post of the main switch point if necessary, for clearance with cam Y.

4. On machines having the C.F.N.C. Mechanism, part U must be drilled and tapped to permit the installation of arm X.

Method: Locate the carriage in other than C.F.N.C. position, hold part X in a vertical position on part U, and center punch the holes, drill (No. 45 drill), and tap (.103 x 48 tap).

5. Part U includes three styles: first shown as AS (Plate 58, Accumulation Symbol List), the second as AN (Plate 59), and the third is shown under print H Env. 2038 dated 12-22-42.

6. Machines not equipped with C.F.N.C. Motor Bar Lock Mechanism do not require parts AJ, AN, AL or AM. Parts AB and AC are used in place of assembly AN and serve as a limit for stud AS.

Adjustment

1. With the carriage in other than C.F.N.C. position, and with screws BD in turnbuckles BC and CF removed (to avoid false limits), stud BJ should clear under parts BK by 1/64″ (when arm A is moved forward manually).

To adjust, bend part F toward or away from segment E.

2. With the dial wheels clear and the carriage located in C.F.N.C. position, part BK should release stud BJ (to permit the forward movement of arm A) slightly before hook G releases stud H.

Method: With screws BD in turnbuckles BC and CF removed, clear the dial wheels; manually hold the point of part BK in the path of stud BJ; locate the carriage in C.F.N.C. position; latch hook G over stud H; slowly release part BK; and observe for forward movement of arm A slightly before hook leaves stud H.

To adjust, loosen screw I and turn eccentric nut J.

After making the above adjustment, hook G should clear stud H with the play in link M held forward.

3. Turnbuckle CF should have a snug up and down fit (without bind) on the shoulder of the lower screw BD.

To adjust, loosen nut CD and turn bushing CC up or down.

4. With turnbuckle BC in normal position, the latch projection of AX should be held clear of stud AW (when arm AV is moved forward manually).

To adjust, turn turnbuckle BC.

5. When the carriage is located in other than C.F.N.C. position, stud AS should locate at the center of the upper vertical surface of part AN.

To adjust, loosen screws V and shift arm X as required.

6. Link R should prevent the overthrow of part AN when the C.F.N.C. Mechanism is being actuated.

7. That portion of the surface of arm AV which contacts stud DA should be lubricated.

8. With the carriage located in other than C.F.N.C. position, the "Timing Mechanism, etc.," should reduce the unrestricted machine

(Plate 58-1)—Continued

speed to a degree dependent upon the maximum number of continuous carry columns in either the crossfooter and/or the register.

Method

(a) Operate the machine for 5 minutes with hook G disabled.

(b) Test the unrestricted machine speed (with hook G disabled).

(c) Determine from the following chart the amount of reduction required.

(d) Test for proper delay in timing, with hook G active and with the carriage located in other than C.F.N.C. position.

To adjust, loosen screw AM, and turn eccentric nut AL.

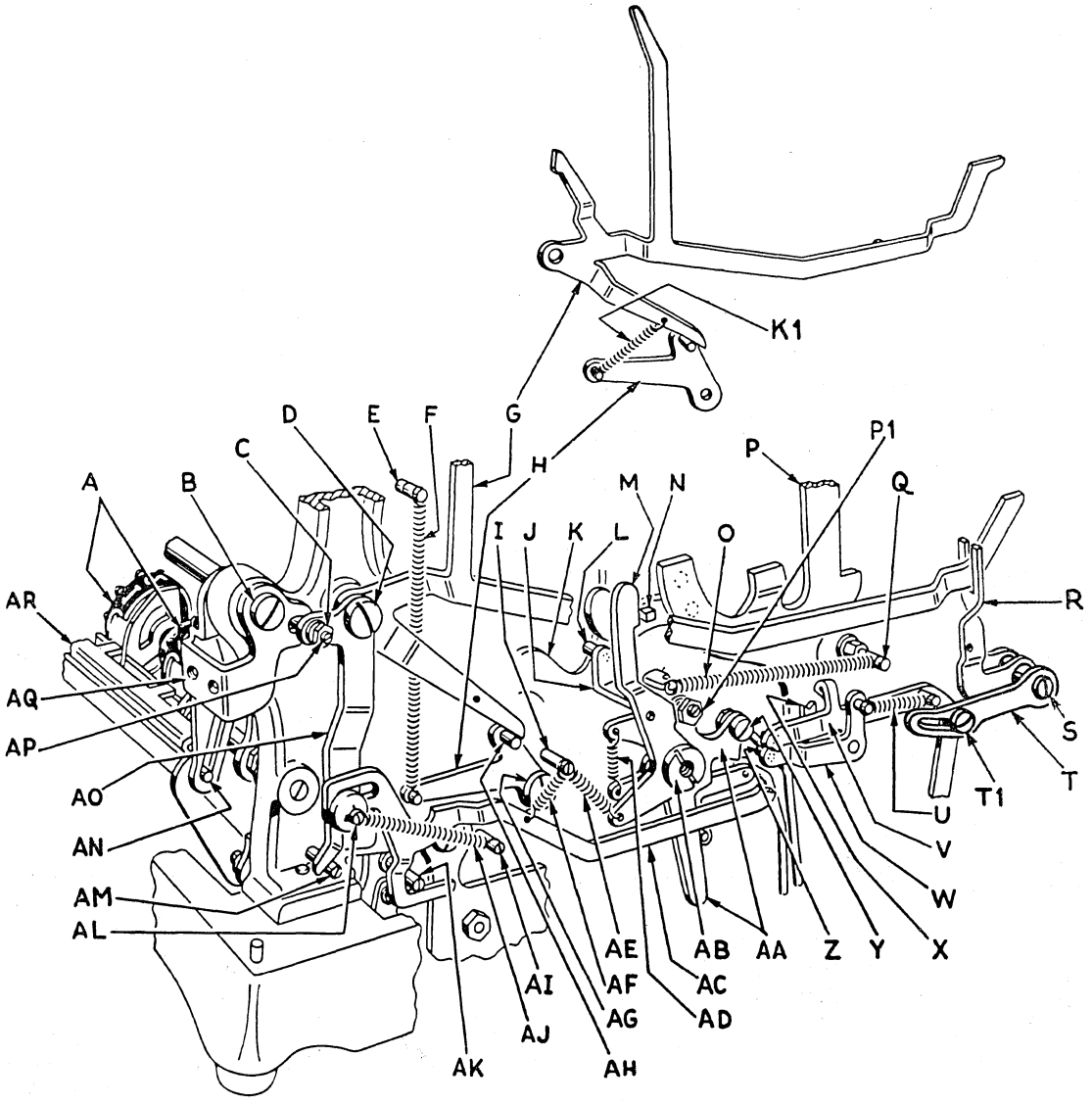
9. When the carriage is located in a C.F.N.C. position and stud AS is located on the lower arm of part AN, the restricted machine speed should be reduced by 10 additional operations per minute.

Note: The design of part AN is such as will assure this additional reduction, no adjustment being required.

REDUCTION IN OPERATIONS PER MINUTE FOR VARIOUS NUMBERS OF CONTINUOUS CARRY COLUMNS

Unrestricted Machine Speed Opers. Per Minute	Reduction in Operations Per Minute						
	8 Col.	9 Col.	10 Col.	11 Col.	12 Col.	13 Col.	14 Col.
98 to 102	−12	−13	−14	−15	−16	−17	−18
93 to 97	−10	−11	−12	−13	−14	−15	−16
88 to 92	−9	−9	−10	−11	−12	−13	−14
83 to 87	−8	−8	−9	−9	−10	−11	−12
78 to 82	−7	−7	−8	−8	−9	−9	−10

LOCK TO PREVENT MACHINE OPERATION CROSSFOOTER NON-CLEAR, CARRIAGE CONTROLLED. DISABLED FROM TOTAL, SUB-TOTAL OR MOTOR BARS (Classes 20 thru 30) (Plate 58-2)



Lock to Prevent Machine Operation Crossfooter Non-clear, Carriage Controlled. Disabled from Total, Sub-total or Motor Bars (Classes 20 thru 30) (Plate 58-2)

Purpose

This mechanism prevents the tripping of the motor bar link (P) in predetermined carriage positions when the crossfooter is not clear. Its operation, which is indexed by the carriage and controlled by the crossfooter, is delayed by the Timing Mechanism to Delay Motor Bar Release, etc., (Plate 58-1) to prevent the trapping of carries.

Operation

During the forward stroke of every machine operation segment K is moved rearward, part J is rocked rearward by spring O, and pawl AA is rocked downward so that its upper vertical surface assumes a position in the path of stud *Z* in bell-crank W.

DURING THE return stroke of a machine operation in which the carriage tabulates into a C.F.N.C. position, a skid or control roll contacts the link (AJ or AO, Plate 58, Accumulation Symbol List) and moves arm AC forward to limit against the upper vertical surface of AA (limited by stud Z). When

(*Plate 58-2*)—*Continued*

pawl AA is released by the Timing Mechanism, etc., (Plate 58-1), after segment K restores part J through stud L at the end of the return stroke, arm AC continues its forward movement, rocking arm AO and part AQ, and camming bail AR rearward through stud AN.

IF THE CROSSFOOTER is clear when bail AR is cammed rearward, the cut-out areas of dial wheels A will allow full rearward movement of bail AR and full forward travel of arm AC, thus causing detent V to clear stud X on motor bar link P, and allowing depression of the motor bar.

THE CROSSFOOTER not being clear, when bail AR is cammed rearward, will limit the rearward movement of bail AR and the forward travel of arm AC, causing detent V to locate in the path of stud X to prevent the tripping of motor bar link P.

DISENGAGING the crossfooter from the adding racks causes stud AK to force arm AC downward, locating the hub in arm AO in the horizontal slot of arm AC, and allowing spring AJ to rock bail AR forward (through AO and AQ) out of contact with the dial wheels. This disabling of bail AR prevents the machine from locking should the crossfooter be tumbled in a C.F.N.C. motor bar lock position.

DISABLING of this mechanism to allow operation of the machine in C.F.N.C. motor bar lock position (though the dial wheels are not clear), may be effected in various ways by means of arm G.

Depression of the total or sub-total key will cause the stud (AD, Plate 67, Accumulation Symbol List) to contact the upright projection of arm G, rocking arm G, lever H, and arm AC downward. Downward movement of arm AC will cause the hub in arm AO to be located in the horizontal slot of arm AC, allowing AC to complete its forward travel and detent V to clear the stud in the motor bar link P.

Depression of the upper or uppermost bars may (if the studs in their lower extremities are retained) rock arm G to allow machine operation (as explained in the preceding paragraph).

Arm G may contain a forward upright projection, to provide disabling of the mechanism through depression of the lower bar.

Adjustment

1. With the crossfooter clear and the carriage located in a C.F.N.C. motor bar lock position, arm AC should locate in full forward position and stud Z should limit in the pocket of pawl AA without breaking the yielding connection (AV, Plate 58, Accumulation Symbol List).

To adjust, bend the link (AO, Plate 58) at its lower offset.

With the carriage located in other than C.F.N.C. position, pawl AA, when manually held downward, should clear stud Z by at least 1/32".

2. With the crossfooter clear, the carriage located in a C.F.N.C. position, and motor bar link P located in upper tripped position; detent V should have slight forward clearance from stud X.

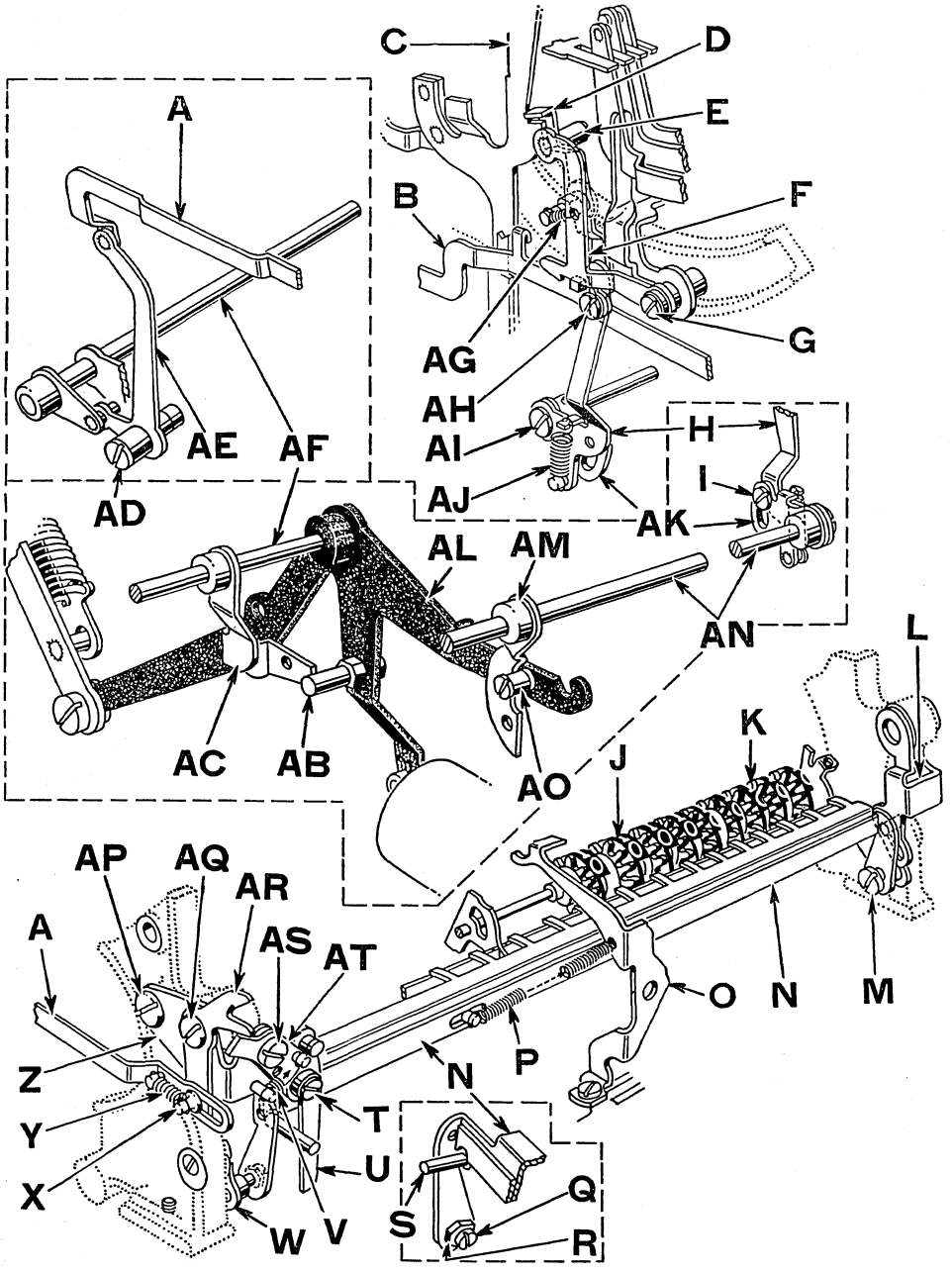
To adjust, bend link P.

3. With the carriage in other than C.F.N.C. position, the shoulder of screw AL should clear the forward surface of the vertical slot in arm AC.

To adjust, bend the lower extremity of arm AO.

CROSSFOOTER NON-CLEAR MOTOR BAR LOCK WITH CARRIAGE OPEN IN CONJUNCTION WITH CROSSFOOTER NON-CLEAR LOCK CARRIAGE CONTROLLED

(For Consumption and Amount Columns) (Plate 59)



Crossfooter Non-clear Motor Bar Lock With Carriage Open in Conjunction With Crossfooter Non-clear Lock —Carriage Controlled (For Consumption and Amount Cols.) (Classes 20 thru 30) (Plate 59)

The purpose of this mechanism is to warn the operator that the last bill is incorrect due to not having been totaled, by locking all motor bars when the carriage opens. This mechanism eliminates all detent locking mechanisms which function indirectly and do not lock all motor bars.

Sequence: When the carriage opens, stud AB contacting arm AC, causes shaft assembly AF to rock arm AE which, through link A and spring Y, rocks bell-crank AR to swing cam AT upward, to rock lever U. The lower arm of lever U contacts stud S to slide bail N toward the left.

Roller AO idles downward in curved arm AM, when it contacts the front face of AM. Shaft assembly AN is rocked and through arm AK, spring AJ and arm H, link B is moved forward to index the non-clear motor bar lock mechanism which is covered in Plate 58.

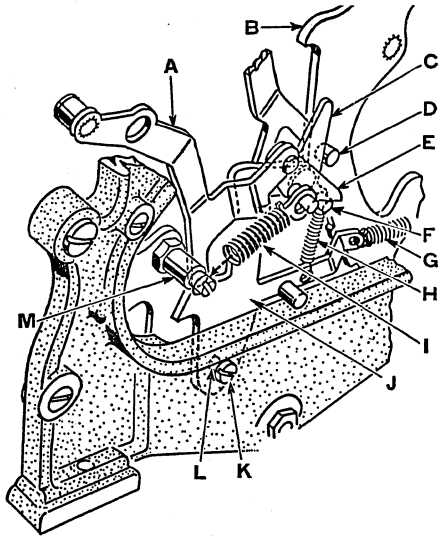
Adding wheels having half width dials are used in the amount columns, in order to permit the fingers of bail N to more inward without blocking the motor bar, in the consumption column.

If through error, one of the motor bars is used, resulting in leaving the amount on the dials, the carriage opening having shifted bail N to the left, has located its fingers out of line with the pocket in the dials, and thereby locking the motor bar in the usual manner. The purpose of detent F is to block the movement of link B when the carriage moves skid AK over part AO, Plate 58.

When the carriage is between stops, detent D moving over the step in drive control C, allows spring AG to swing the hook of detent F over the square stud in link B which prevents the fingers of bail N moving inward and block the sliding movement of bail N when the carriage is being opened.

Owing to the fact that the flexible spring connection shown on Plate 58 is to the left of arm AM, arms H and AK are connected by spring AJ which expands when the fingers of bail N contact on the dials.

BOOSTER FOR MESHING CROSSFOOTER IN NON-ADD POSITIONS (Classes 20 thru 30) (Plate 60)



Booster for Meshing Crossfooter in Non-add Positions (Classes 20 thru 30) (Plate 60)

This mechanism was designed for use in conjunction with Crossfooter Non-clear Motor Bar Lock with carriage open (Plate 59).

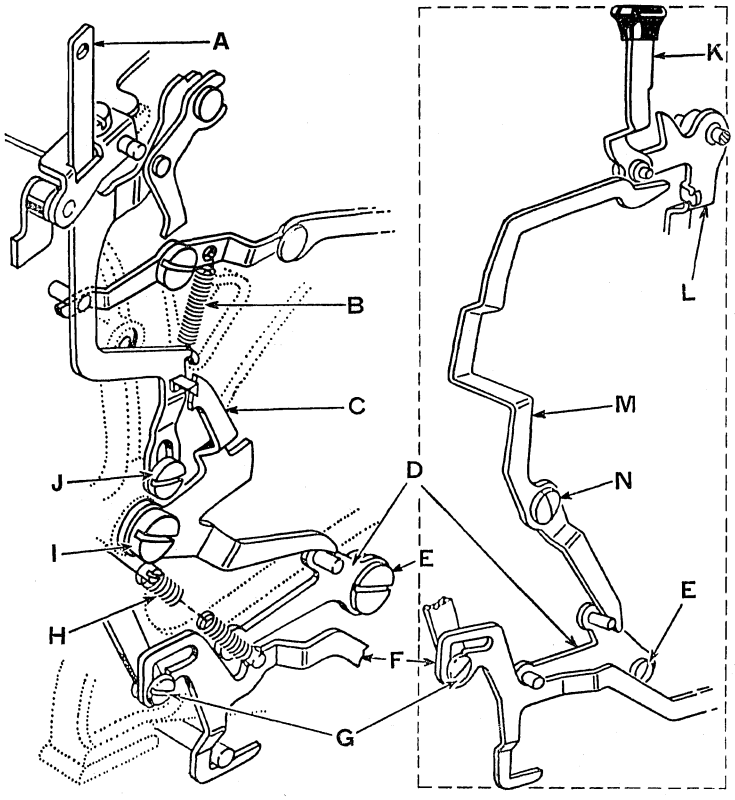
The purpose of this mechanism is to provide a quicker and more positive action to mesh the crossfooter when the non-add function is being completed.

Sequence: During the return stroke, stud D (in full stroke sector B) swings part C, stud F in the latter swings arm E, spring I, being hooked to the stud in arm E, is placed under tension, since the crossfooter is locked out by section 800.

When the crossfooter is released by section 800 the reverse pull in arm pulls the crossfooter in on the left side. Spring I, through part A contacting stud M, pulls the crossfooter in on the right side. The combined pull on the left and right sides results in lighter and quicker meshing to insure complete carrying of the automatic one operation when the subtract mechanism is indexed. A lighter spring (1-209800 Env. 1792) is used on the reverse pull in arm.

The purpose of eccentric L is to reduce the clearance between J and stud M.

CROSSFOOTER NON-CLEAR MOTOR BAR LOCK DISABLED BY LOWER BAR AND KEY
(Classes 20 thru 30) (Plate 61)



Crossfooter Non-clear Motor Bar Lock Disabled by Lower Bar and Key (Classes 20 thru 30) (Plate 61)

When the motor bar is locked on account of the crossfooter not being clear, the motor bar can be disabled by depressing motor bar A and by depressing key K depending on which of the two disabling mechanisms are in the machine.

In either case bell-crank D lowers link F, which by locating screw G in its horizontal, allows the projection on link F to clear the drive trip control which permits normal motor bar operation.

Crossfooter Non-clear Total Key Lock, Add and Subtract Position Airpot and Carriage Controlled (Plate 62)

The purpose of this mechanism is to block the total key in the proof column when the crossfooter is not clear.

The airpot control is the same as that covered in Plate 57. These instructions cover the total lock mechanism only.

When the carriage moves skid AC onto assembly AF, part R moves forward through parts Y, Z, AA, AB, AI. The spearhead of part P spreads the rear arms of bails B and G permitting the hooks of bails B or G to enter the pockets of adding wheel L, depending on the position of the subtract lever.

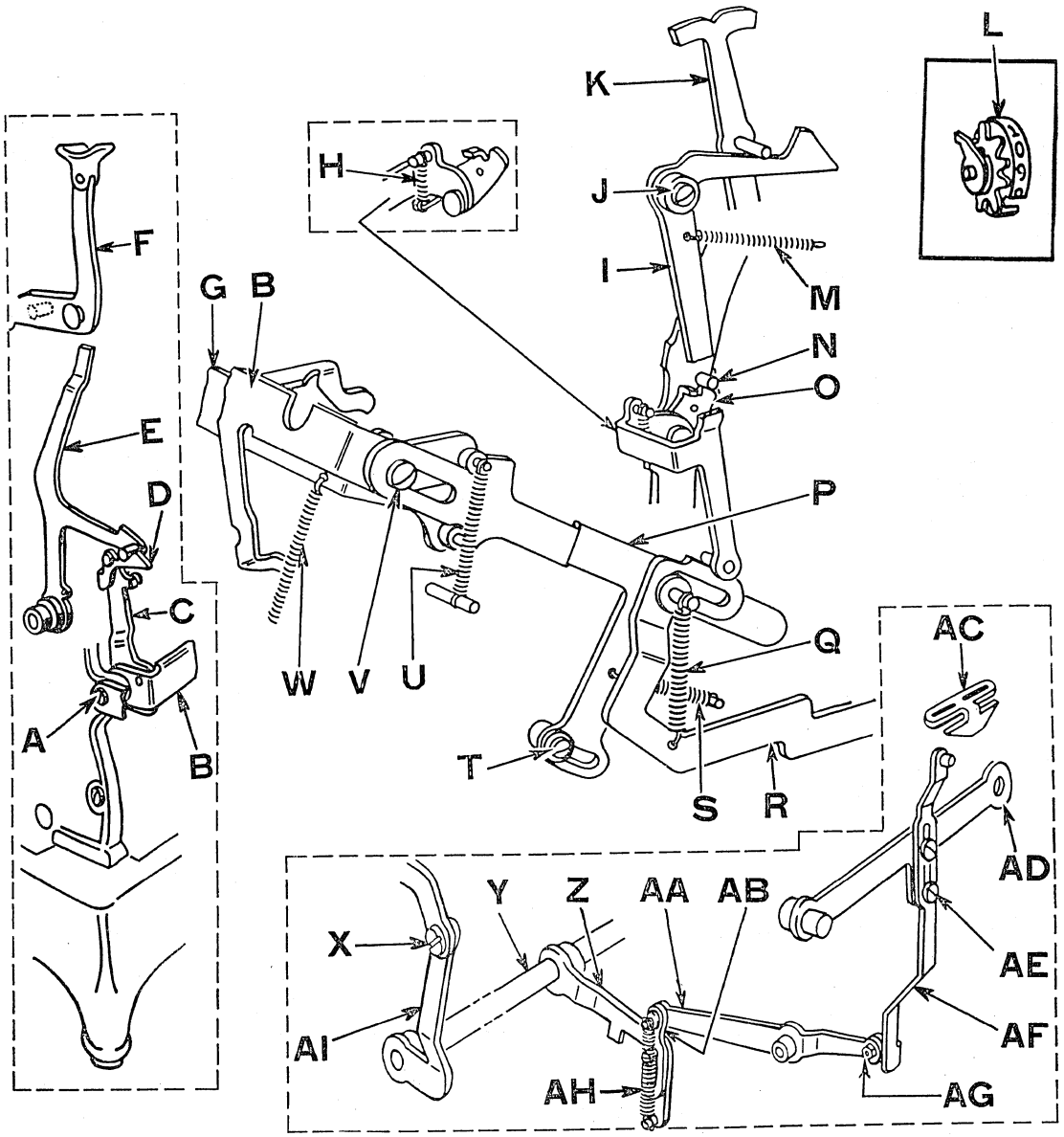
When the crossfooter is clear, the high point of passby pawl D moves off and beyond the stud in part E, which permits the total key to be depressed.

When total key F is depressed, the stud in part K rocks part I which lowers part R to locate the shoulder screw in part P, in the horizontal slot of R which allows parts B, P, G and C to restore to normal position.

When the crossfooter is not clear, then the hooks of B and G can not enter the pockets of adding wheel L, which prevents the complete movement of part E causing the latter to block the total key.

When the total key is locked, it is released by a spacing stroke as follows: Stud N contacts on passby pawl P which rocks part W, the latter lowers part M to locate the shoulder of the screw in part O in the horizontal slot in part M which allows O to move to normal position and permits passby pawl D to clear part E and the latter to move out of the path of the stud in the total key.

CROSSFOOTER NON-CLEAR TOTAL KEY LOCK, ADD AND SUBTRACT POSITION AIRPOT AND CARRIAGE CONTROLLED
(Plate 62)



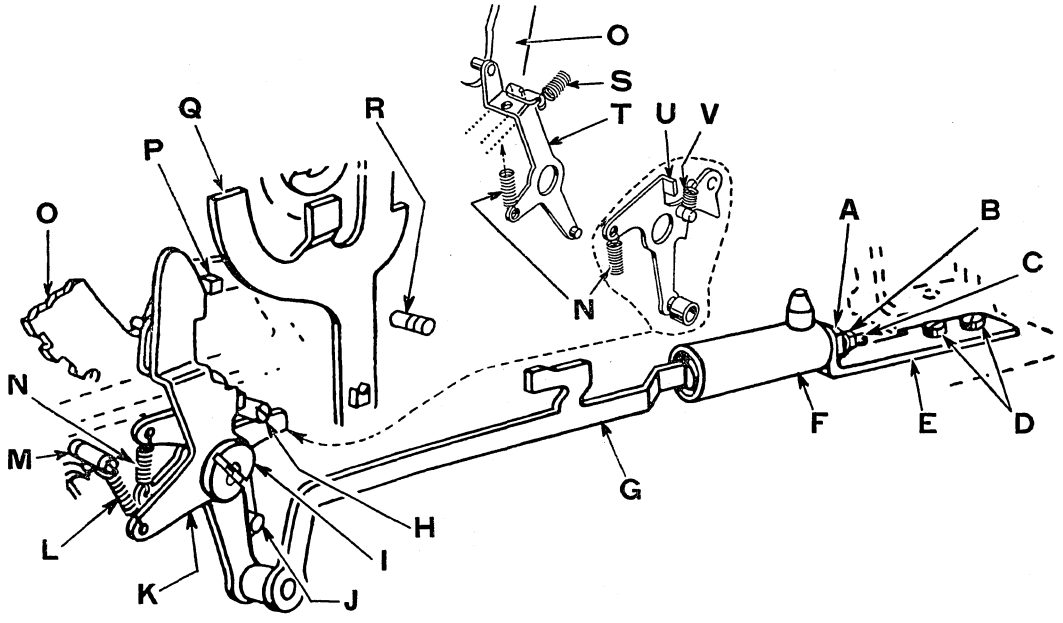
Tests and Adjustments

To prevent a lock taking place when the crossfooter is disengaged during the total operation, the following test is made: When the total key is depressed with crossfooter clear, part O should release part M before the total power spring is released.

Adjustment: The cam surface of part W is advanced toward the stud in V to secure earlier release of part M. When the crossfooter is clear, part E should clear the stud in total key F. When the crossfooter is not clear, part E should be in the path of the stud in total key F.

Weave bails B and G.

CARRY TIMING MECHANISM FOR TOTALS, AIRPOT CONTROLLED (Classes 21 thru 30) (Plate 63)



Carry Timing Mechanism for Totals, Airpot Controlled (Plate 63)

The purpose of this mechanism is to prevent a succeeding motor bar depression until a sufficient time elapse has expired, in order to allow the completion of consecutive carries. This mechanism with slight modifications is used in connection with crossfooter non-clear motor bar lock mechanism.

Sequence

On the forward stroke of each machine operation, part T is pulled by spring S to follow full stroke sector O. Part U through stud J is rocked, to pull plunger assembly G outward. Spring L swings part K over stud P, thus blocking the motor bar.

On the return stroke, sector O swings part T backward, which places spring N under tension, due to the resistance set up by airpot F. Part U gradually follows up, its projection finally contracting part K, swinging it off stud P, which allows the drive to be tripped.

Tests and Adjustments

All parts to be free and in correct alignment. Eyes of spring N should be aligned.

No carries should be trapped, when the crossfooter is tumbled to add and subtract position with machine in non-add position. Furthermore, no carries should be trapped in machines having greater register capacity when 9 is added and all 9's adding repeated. Also, no carries should be trapped with the carriage in a register add position followed by a register shift together with a register total. The latter condition is necessary on account of detent 11A-60137B being raised earlier during an Env. 1429 operation in which the amount of time is shortened for a consecutive carry to complete.

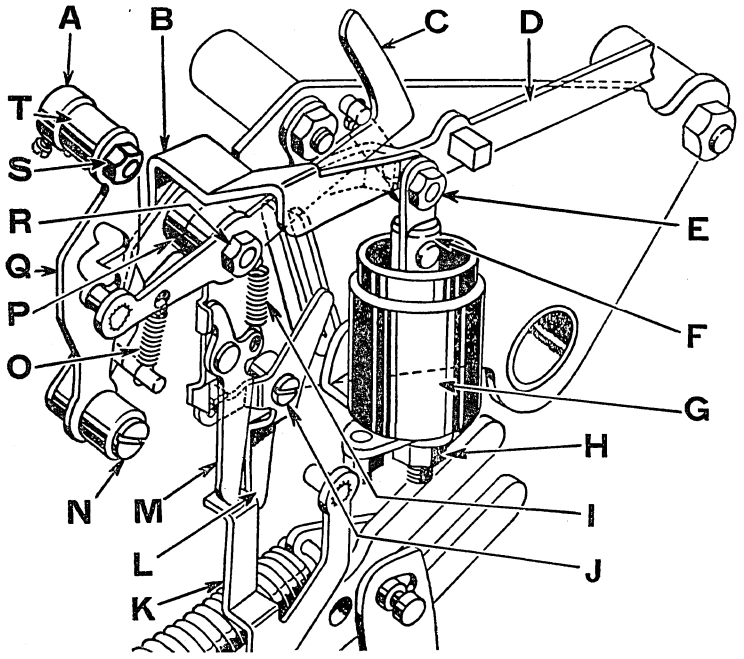
Adjustment: Screw C is adjusted to secure the correct amount of time.

Part K should have full hold on square stud P. With machine normal and trip link Q lowered, there should be just rubbing clearance with stud P.

Adjustment: Part K is bent.

Machine is operated, latch K is held on stud P, sufficient pressure applied to see that spring N through part U can cam latch K off stud P as on a slow machine operation.

CARRY TIMING MECHANISM—ESCAPEMENT ARM CONTROLLED (Bank Posting Machines) (Plate 64)



Carry Timing Mechanism—Escapement Arm Controlled (Bank Posting Machines) (Plate 64)

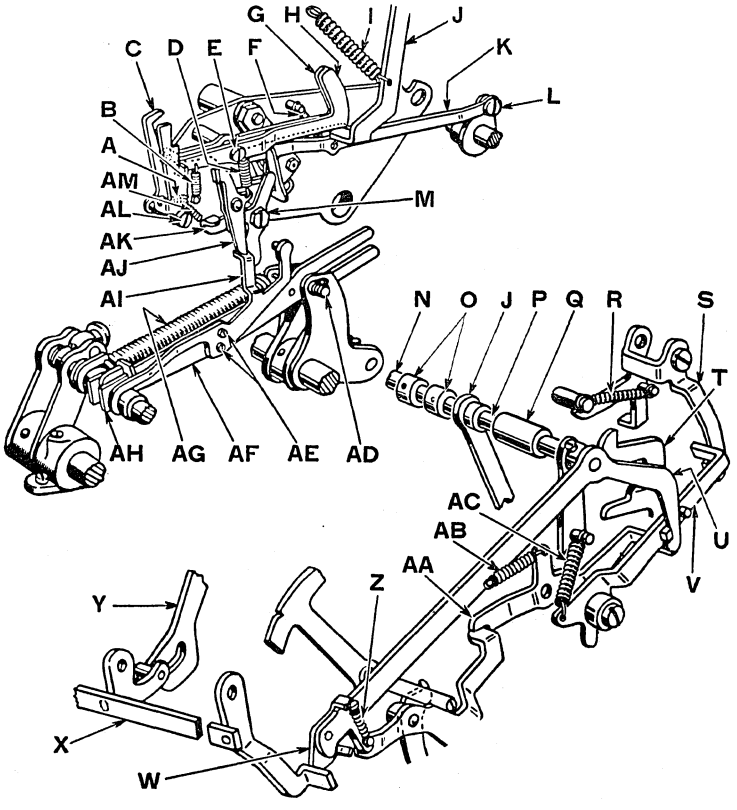
The purpose of the escapement arm control is to provide the maximum amount of time for the carrying mechanism to complete its function before the release of the total key.

When the machine starts on the forward stroke, arm C is swung upward by the forward arm of part K; in that position arm C is held by latch L.

As the machine is completing the return stroke, latch L is tripped by the rear arm of part K, which permits spring O to swing arm C to its lower position. However, the velocity of arm C is arrested by the escapement effect of being compelled to move backward and forward in the pockets of the slot in escapement arm Q before it reaches normal position.

More time to insure completion of all carries can be secured by using additional weights A.

CARRY TIMING AND NEGATIVE TOTAL LOCK MECHANISMS TO CONTROL RELEASE OF AUTOMATIC TOTAL MECHANISM (Bank Posting Machines) (Plate 65)



Carry Timing and Negative Total Lock Mechanisms to Control Release of Automatic Total Mechanism (Bank Posting Machine) (Plate 65)

The purpose of this mechanism is to delay the automatic totaling mechanism when an overdraft is present, until the subtract lever is pulled to subtract position and a spacing stroke is taken.

Timing Control

When arm AI swings timing arms G and H downward, arm J of shaft assembly P, swings the latter, resulting in arm U locating in the path of the square stud in arm V, which prevents tripping of the automatic totaling mechanism until timing arms G and H restore to normal, which allows shaft assembly P to restore and the automatic total mechanism to function.

When credits exceed debits, forked link Y rocks bail assembly X, locating its arm under passby pawl W, (the latter pivoting on part U), preventing the release of the automatic total mechanism. In single total machines the subtract lever is pulled to subtract position, a spacing stroke taken and the total key depressed. In double total machines the subtract lever is pulled to subtract position, a spacing stroke taken and key O (Plate 68) depressed, which releases latch D (Plate 68), to trip the motor and drive and printing the O. D.

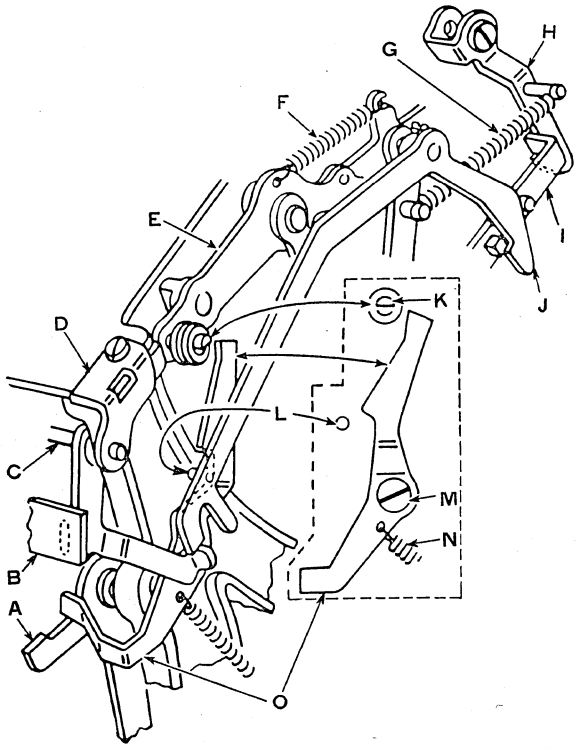
The purpose of flexible pawl W is to prevent tripping the negative total lock when the subtract lever is moving from add to subtract and vice versa.

Tests and Adjustments

When the negative total lock is in forward or rearward position, bail X should clear pawl W.

Adjustment: The arm of X is bent to clear W in both positions.

CARRY TIMING MECHANISM FOR AUTOMATIC ONE (Bank Posting Machines Having 10 or More Continuous Columns) (Plate 66)



Carry Timing Mechanism (Plate 66)

The purpose of this mechanism is to allow sufficient time for the automatic one carry during the machine operation immediately following the shifting of the subtract lever to subtract position or vice versa. This mechanism is used in machines having ten or more adding columns.

Sequence

When the automatic one is tripped, the movement of carry pawl A permits spring N to swing detent O under stud K, which blocks motor bar depression.

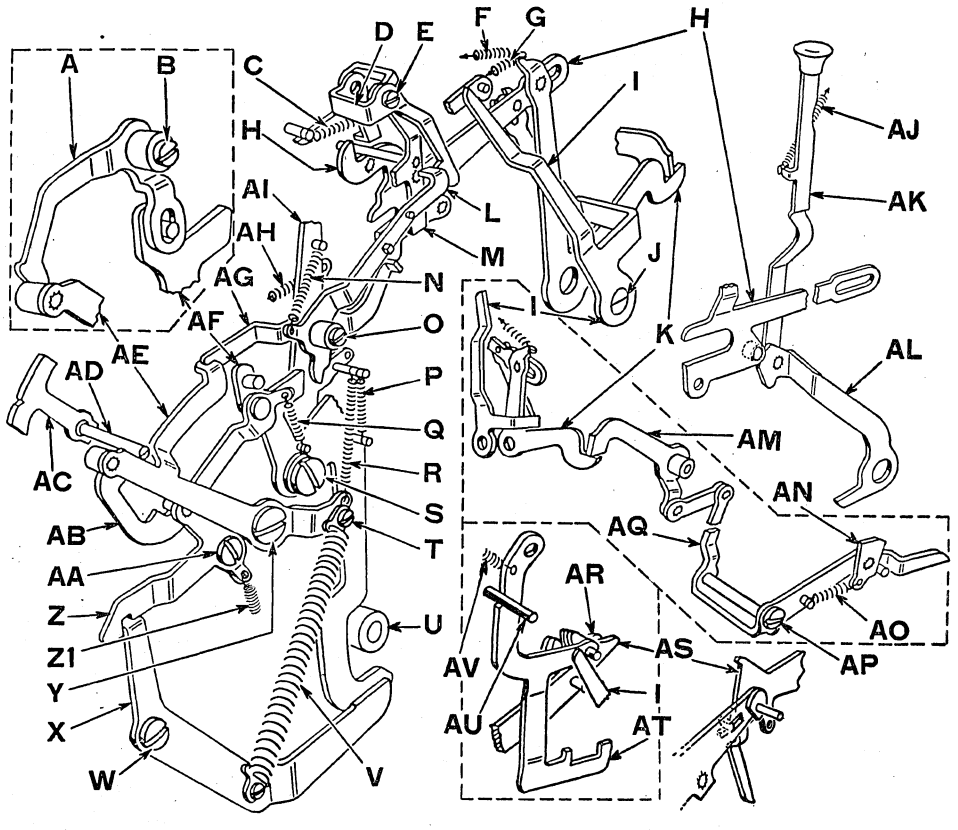
Detent O remains under stud K until the carry timing mechanism releases timing arm J, stud L moving detent O to clear stud K which permits the depression of the motor bar.

Tests and Adjustments

Machine Normal: Vertical arm of detent O to clear stud K when timing arm J is released.

Adjustment: Bend long arm of J.

AUTOMATIC CROSSFOOTER TOTAL AND SUB-TOTAL MECHANISM CARRIAGE CONTROLLED (Bank Posting Machines) (Plate 67)



Automatic Crossfooter Total and Sub-total Mechanism—Carriage Controlled (Bank Posting Machines) (Plate 67)

The purpose of this mechanism is to control the single stroke totaling mechanism through the automatic repeat mechanism. Machines not having Selective Operation Control (S. O. C.) have a No. 5 roll in the deposit column to pull detent M off the drive control to secure an automatic machine operation for the total column when the skip key is used. (***Note:*** Skip Key mechanism covered in Keyboard Instruction Book.)

The depression of the skip key swings part AT rearward sufficiently to allow short pawl AR to drop, which restores the keys, but holds long pawl AS to prevent restoring the depressed motor bar.

Late machines have passby pawl with upper and lower pockets, the latter exert a positive and light toggle effect instead of a hard cam action of passby pawls on the key restoring assembly, which permits the use of lighter base springs. Normally the upper pocket is active.

No. 12 and No. 5 rolls index the lower pocket to release the key set-up but holds the drive for repeat operations. No. 1 roll prevents engaging either pocket and holds keys and drive set-up.

A No. 3 roll in the balance column contacts passby pawl AN, which moves repeat slide H rearward to swing latch D, releasing arm L, which rocks latch AG, releasing driver AE; the latter is actuated by power spring V. Driver AE contacts on long stud AD to index the single stroke totaling mechanism (covered in this book under its title). As arm AC is moving rearward, arm AB (pivots on AF) follows, its pocket locating in line with the stud in fulcrum latch Z.

During the machine operation arm AB raises fulcrum latch Z, causing part X to idle in order to allow the single stroke totaling

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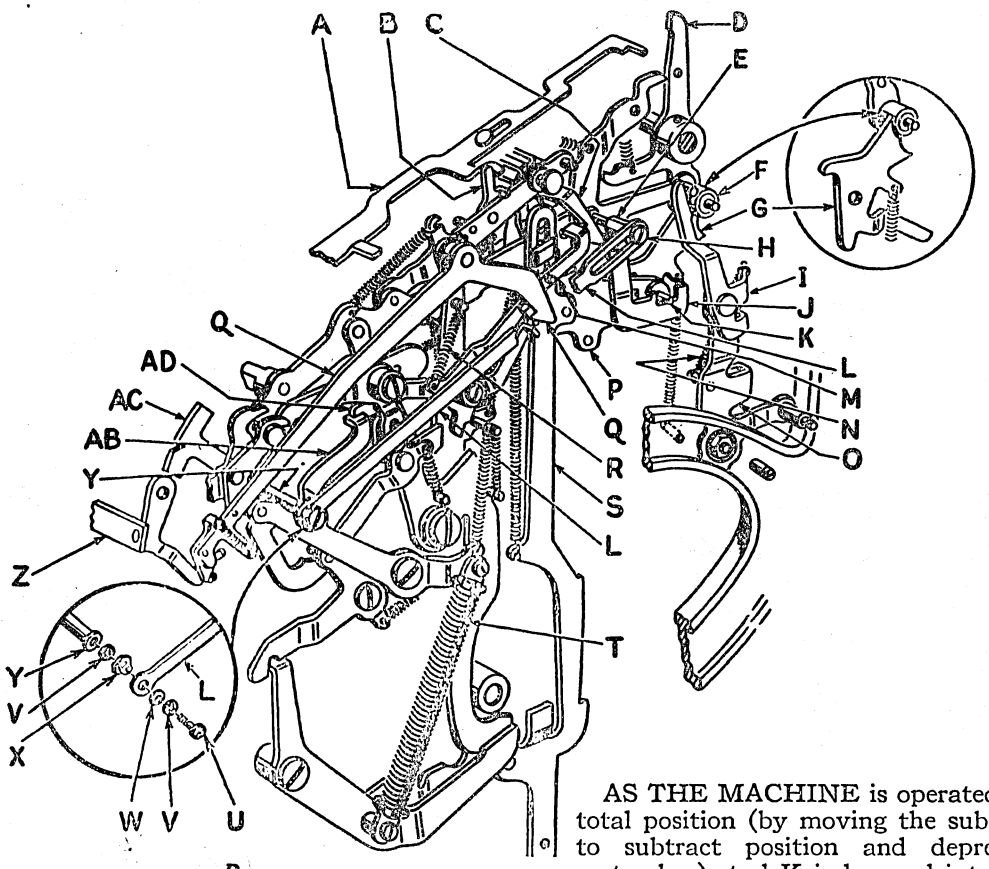
MOTOR BAR RELEASE MECHANISM
(For Overdraft Operation—Bank Posting Machines) (Plate 68-1)



Purpose

This mechanism provides a means for normalizing the repeat of machine operation, when an overdraft occurs in a repeat total position on Bank Posting Machines, and eliminates the need for the O.D. Key (M, Plate 68, Accumulation Symbol List)—thus insuring a positive and faster operation.

Operation

When an overdraft occurs in the machine before tabulation of the carriage into a repeat total position, bail Z moves rearward to block arm Q and to retain the latter's rear hooked portion in the path of the square stud in release arm M. Upon tabulation of the carriage into repeat total position, latch C is moved rearward by a repeat roll, and release arm M is prevented from tripping the Automatic Total Mechanism by arm Q. Arm AC, which is thus allowed to remain forward, holds part J in normal position through stud Y, link L, and stud E; and the yielding connection in arm O permits its upper portion to remain forward (held by the stud in part J) as the repeat roll rocks its lower portion rearward.

AS THE MACHINE is operated in repeat total position (by moving the subtract lever to subtract position and depressing the motor bar) stud K is lowered into the lower step of part J, causing passby pawl G to release the motor bar through roller F, assembly D, slide A, and latch B (to normalize the repeat of machine operation); and bail Z rocks forward (as the crossfooter tumbles) to release arm Q and arm M to effect the first total operation. As arm AC moves rearward during the first total operation (motivated by spring T of the Automatic Total Mechanism), stud Y and link L move rearward to permit the rearward positioning of part J through the spring connection in arm O. The lowering of stud K (during the first total operation) onto the higher step of part J prevents the release of the motor bar, thus enabling motor bar link S to effect the second total operation.

Adjustment

The rearward end of the slot in link L should contact but not bind on the shoulder of stud E, when the machine is normal and the carriage is located in any position other than repeat.

To adjust, loosen screw U and turn eccentric bushing X.

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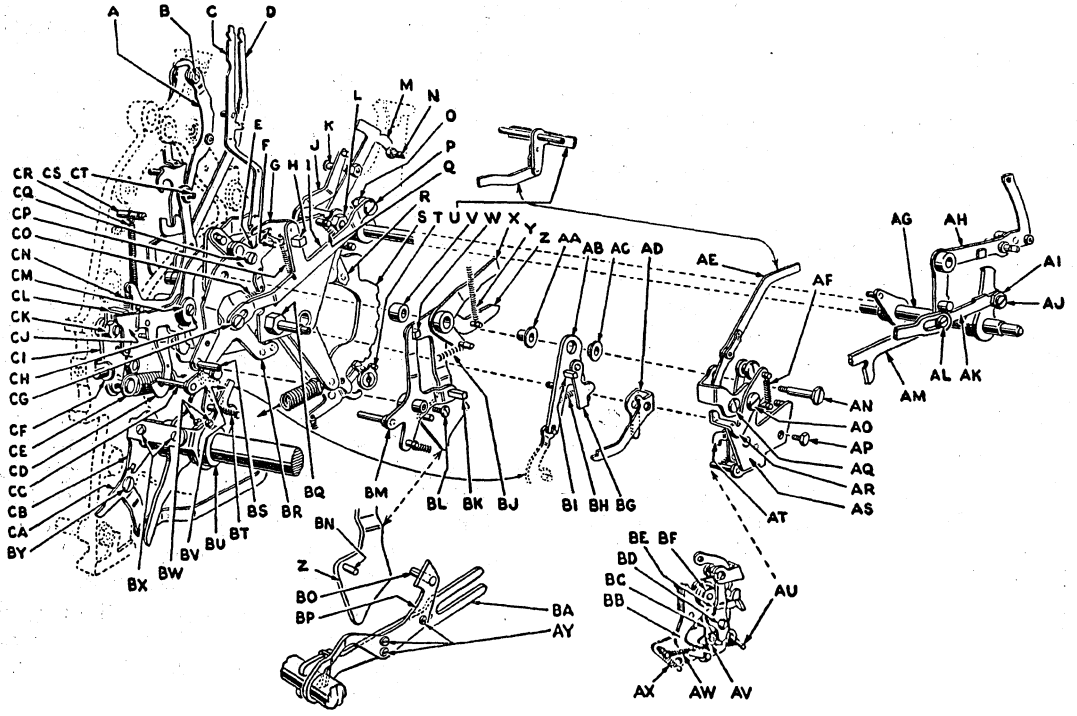
AUTOMATIC CROSSFOOTER TOTAL AND SUB-TOTAL MECHANISM, CARRIAGE CONTROLLED—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 67-1)



Automatic Crossfooter Total and Sub-Total Mechanism, Carriage Controlled—For No Space Stroke Total Bank Posting Machines (Plate 67-1)

Purpose

This mechanism permits the taking of an automatic total when there is a plus amount in the crossfooter, and the taking of a manual total when the crossfooter contains either—a plus ***or*** minus amount.

Operation

AN AUTOMATIC TOTAL of a plus balance results when arm CJ is lowered by the locating of a control roll on the repeat cam. The lowering of arm CJ rocks part CD through spring CN, lowering the hooked portion of part CD to clear stud CC, thereby allowing spring BT to rock part BM. As BM rocks, its upper projection moves rearward to clear stud W, allowing spring Y to rock part Z which contacts lower stud F to trip toggle E. When toggle E is tripped, spring CE rocks part BR which, by means of link I, rotates shaft AG to lower the total key AH.

WHEN A MANUAL TOTAL is taken, shaft AG is rotated with the depression of the total or sub-total key, and link I and pawl G are moved rearward, the latter contacting upper stud F to trip toggle E. Tripping of the toggle allows spring CE to rock part BR, thereby pulling link I rearward to complete the rotation of shaft AG and the depression of the total or sub-total key.

INTERLOCKS BG, X, AR, and AT are designed to safeguard the functioning of the Automatic Total Mechanism, by preventing (1) automatic and manual totals when the stops of the carriage control bar are off the stop block, (2) automatic totals when the crossfooter contains a minus balance, and (3) operation of motor bars and functioning of the total mechanism during machine operations.

INTERLOCKS BG and X are moved into blocking alignment with square studs BK and H, respectively, when the carriage stops are off the stop block, and during machine operations, to prevent functioning of the total mechanism.

As a carriage stop moves off the stop block in the process of tabulation, bellcrank CA is

(Plate 67 Text Continued on Page 77)
Printed in U. S. America 4-17-50
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(Plate 67-1)—Continued

released and spring BT rocks arm BV and part AB rearward. Rearward movement of part AB positions interlock BG over square stud BK, to prevent the functioning of the automatic total mechanism, and interlock X is lowered into the path of square stud H by spring BJ, to prevent manual depression of the total and sub-total keys.

Interlocks BG and X are also activated, during machine operations, by part BP and bellcrank Z, to prevent functioning of the total mechanism. Rearward movement of part BP on the forward stroke of a machine operation rocks bellcrank Z, through stud BO, and arm BV, through stud BN, to position part AB rearward and to align interlocks BG and X with their respective square studs (to prevent automatic and manual totals).

Rearward movement of part BP, bellcrank Z, and arm BV also rocks bail CB and bellcrank CA during machine operations to prevent manipulation of the motor bars.

INTERLOCK AR is moved into blocking alignment with square stud BI on the forward stroke of each machine operation, to maintain the rearward location of part AB and the blocking effects of interlocks BG and X (which see above) until the end of the return stroke.

Interlock AR is rocked into alignment with stud BI on the forward machine stroke by the rearward movement of part BP, a camming surface of which contacts stud AU to force segment BB (of the interval timing mechanism) rearward, where it is engaged by latch AD, and to rock interlock AR into alignment with stud BI by means of spring AF.

Near the end of the return stroke, stud BO rocks latch AD to release stud AU, allowing segment arm BB and interlock AR to restore to their normal positions.

INTERLOCK AT is maintained in blocking alignment with square stud BK when the crossfooter contains a minus balance (overdraft), to prevent the automatic functioning of the total mechanism.

As the negative total lock shifts into minus position, bail U actuates link AE and interlock AT is positioned over stud BK, thereby holding part BM and bellcrank Z in their normal positions. Since interlock X is not affected by the negative total lock, the total keys are not blocked against depression and manual totals of such minus balances may be taken.

Adjustment

1. The total key should be adjusted to the following conditions:

(a) With spring CE unhooked, the total key depressed, and arm M manually held rearward so that the projection of link AM limits against the shaft of the 600 section, the roller in the lower portion of arm M should locate with minimum clearance, during manual (handle) machine operation, on the forward vertical surface of cam R.

To adjust, turn eccentric bushing AI.

Note: With the total key normal the roller should also have clearance on the rearward side of cam R.

(b) With spring CE hooked up and the total key depressed, there should be approximately .010″ clearance between the projection of link AM and the shaft of the 600 section. (This clearance will cause slight movement of arm M when the machine is operated.)

To adjust, turn eccentric screw P.

2. Interlock BG should have slight clearance over square stud BK when the stops are moved off the stop block with the machine normal.

To adjust, swing stud CC forward or rearward by weaving part BM.

3. Stud AU should have slight latching lead on latch AD when the machine is locked in half cycle position by toggle lock 120B Style 9 (U, Plate 85-1, Power Symbol List).

Note: If stud AU does not have latching lead, replace the interval timing mechanism.

4. Interlock AR should have slight latching lead on stud BI near the extreme end of the forward machine stroke.

To adjust, bend interlock AR.

5. The projection of the slide (AJ, Plate 85-1, D, Ledger End Lock) should have minimum clearance over the projection of assembly CA when the machine is normal and the stops are moved off the stop block.

To adjust, raise or lower the projection of the slide (AJ, Plate 71-1, Ledger End Lock).

mechanism to restore. Long stud AD restores driver AE, latch AG and lever L. Also during the machine operation roller U contacting on the lower arm of part X pushes it downward, placing spring V under tension, which allows fulcrum latch Z to drop over the vertical arm of part X.

Machines with the S. O. C. feature have a No. 12 roll in the deposit column to provide automatic machine operation in the sub-total column when the skip bar is used. A No. 1 roll is in the sub-total column and a No. 12 roll between the sub-total and total columns. With the S. O. C. feature in No. 1 position, a repeat total is secured through the No. 1 roll pulling repeat slide H rearward to index part AT to block both passby pawls AS and AR to prevent restoring the motor and drive trip and also to trip the automatic total mechanism, the latter tripping the motor and drive mechanism.

The No. 12 roll between the sub-total and total columns pulls detent M off the drive control to secure the automatic machine operation for the total column.

In position two of the S. O. C. feature, a single total is secured by the No. 1 roll passing over the repeat lever to release the motor and drive and to release the automatic total mechanism.

Tests and Adjustments

When any one of the different style repeat rolls depresses repeat slide H, there should be 1/32″ clearance between D and L.

Adjustment: Repeat lever AQ is adjusted to secure the required clearance when all styles of rollers are considered, however, if one or two styles of rollers do not provide the necessary amount of clearance, the S. O. C. gears are remeshed to equalize the roll effect.

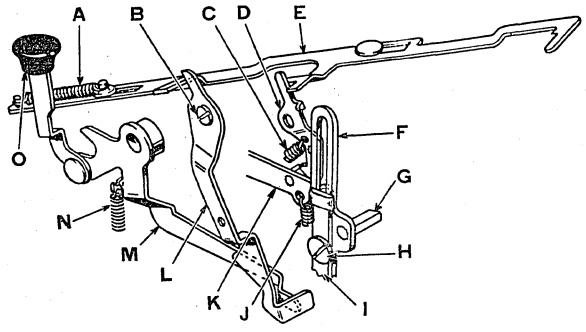
With a No. 5 or a No. 12 roll on the repeat lever, the arm of part I should just contact the stud in repeat slide H.

Adjustment: Bend arm of I as required.

Disabling Key AK

When key AK is depressed, arm AL is swung downward in front of the stud in repeat slide H to block its movement when a control roll contacts repeat lever AQ.

KEY TO RELEASE REPEAT LATCH (Bank Posting Machines) (Plate 68)

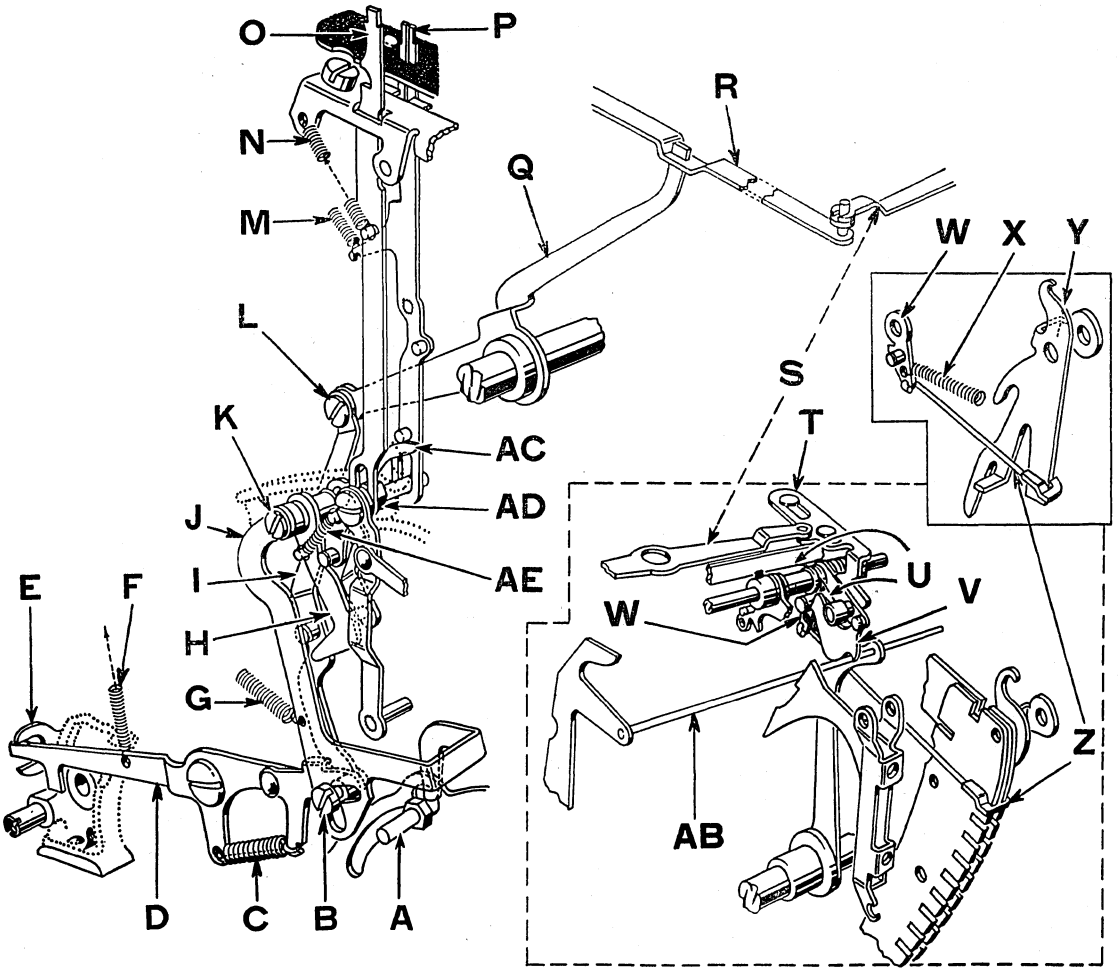


Key to Release Repeat Latch (Bank Posting Machines) (Plate 68)

The purpose of this key is to release the repeat latch when an overdraft occurs in a machine having a repeat total set-up. When the machine comes to a stop in the balance column, indicating O. D. key O is depressed which rocks repeat latch D through intermediate L and slide E releasing trip arm K. Part F is allowed to restore due to spring J contracting.

The subtract lever is now pulled to subtract position, motor bar depressed for spacing stroke which again sets up the repeat; now, when key O is depressed the automatic total operation takes place resulting in printing the O.D.

COUNT AND NORMAL INDEXED FROM KEYBOARD—CARRIAGE CONTROLLED (Plate 69)



Count and Normal Indexed From Keyboard—Carriage Controlled (Plate 69)

The purpose of this mechanism is to count each listed amount that is added in selected carriage positions.

Sequence

When carriage locates control roll on lever E, lever assembly D through spring C pulls link I downward rocking lever Q which through link R, lever S, and slide T swings part V in line with shaft AB. When any listing key is depressed shaft AB through part V swings bell-crank W rearward to pull limit wire Z inward and to swing adding rack latch Y rearward.

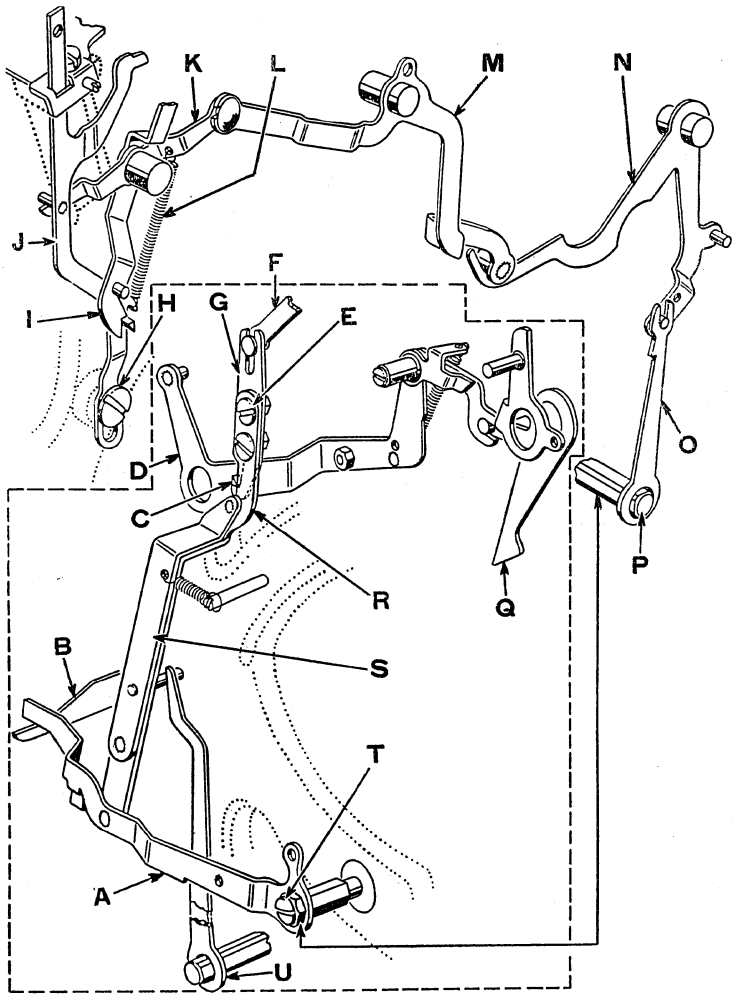
Disabling Controls

Machine Operation: At the beginning of the machine operation, stud A moving downward and rearward, allow spring G to pull interlock J rearward, its horizontal slot blocking shoulder screw B which prevents carriage control indexing due to the carriage tabulating into the control column when count column keys are used for listing. As the machine is completing the return stroke, stud A moving upward swings interlock J to normal position which locates shoulder screw B in the vertical slot of interlock J to permit carriage control count indexing.

Non-add Key P: When non-add key P is depressed, the stud in P swings intermediate arm AC to swing hook of arm H under the roller on link I blocking link I to prevent carriage control indexing.

Normalizing Key O: When key O is depressed and latched, its roller swings arm H to block link I.

CROSSFOOTER ADD FROM LOWER BAR
(Classes 11 thru 16 and 21 thru 30) (Plate 70)



Crossfooter Add From Lower Bar (Plate 70)

The purpose of this mechanism is to normalize the carriage indexed non-add mechanism.

Sequence

Lower bar J depressed, rocks shaft assembly P through levers K, M and N. The left arm of shaft assembly P swings link assembly R to locate hook G under stud C.

When the carriage moves a control roll on non-add lever B, arm A raises non-add control Q through link R and assembly D.

Tests and Adjustments

When assembly D is raised by link assembly R, part Q should clear passby pawl 1-821 (not shown).

Adjustment: Screws E are loosened and hook G located as required.

CROSSFOOTER ADD—REGISTER NON-ADD FROM UPPER BAR (Classes 11 thru 16 and 21 thru 30) (Plate 71)

Crossfooter Add—Register Non-add From Upper Bar (Plate 71)

The purpose of this mechanism is to add in the crossfooter when the carriage has indexed the crossfooter non-add mechanism. This mechanism also indexes the register to non-add. When the upper bar is depressed, shaft G is rocked, arm F rocks assembly D to swing non-add control H to allow accumulation to take place.

Arm F also raises link D to rock assembly I which through link K indexes part J to non-add position.

Carriage and Crossfooter Controls (Plate 74)

All machines manufactured before April 1st, 1940, have this mechanism indexed directly by the carriage. A control roll on the carriage, contacting lever AX, rocks lever AZ and through spring BB swings lever AY, similar to AI. Machines manufactured since April 1st, 1940, have this mechanism indexed jointly by the carriage and the drive, in this mechanism lever AI is swung by the drive mechanism (Plate 82) through pawl AG.

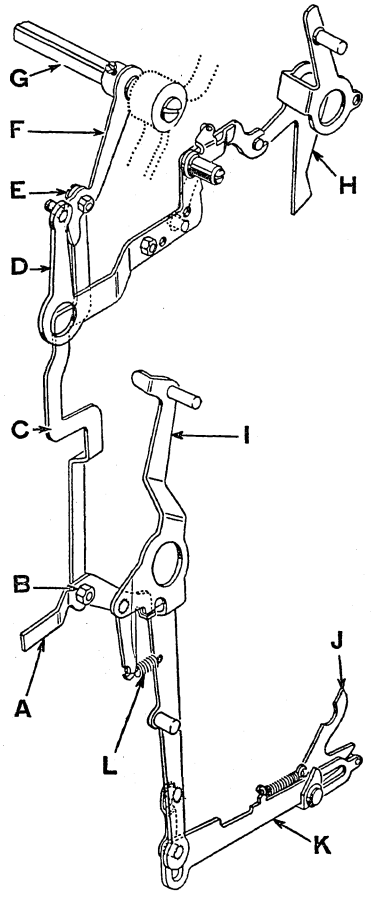
Pawl AG is indexed when a control roll on the carriage depresses lever AE, rocking lever AD, which contacts the stud in pawl AG indexing its upper or lower step according to No. 1 or No. 3 rollers on lever AE. Pawl AG swings on lever AM which through spring AK swings lever AI.

Lever AI moves part AB rearward, which allows spring T to swing part X to index AW to total or sub-total position.

Total: Control roll No. 3 on levers AE or AX allows pawl AW to remain in the path of stud AQ. The crossfooter is disengaged at the beginning of the return stroke by stud AQ contacting on AW, which causes arm AN to push arm AO, disengaging the crossfooter.

Sub-total: Control No. 1 on lever AE or AX allows pawl AW to move out of the range of stud AQ, which allows the crossfooter to remain in mesh with the adding racks. Disabling key A when depressed and latched down blocks the movement of assembly AI, causing spring AX to expand.

Interlock S: The purpose of interlock S is to prevent a machine lock caused by releasing disabling key A on the forward stroke, due to pass by pawl E trying to engage the crossfooter at the same time that stud AQ is trying to disengage the crossfooter. Interlock S holds part AB forward during the entire machine operation, preventing the carriage control total and sub-total mechanism from becoming active.



Interlock I: The purpose of interlock I is to prevent the crossfooter bouncing in mesh at the beginning of forward listing and spacing strokes. Detent I is swung into the path of stud N by spring J and driven back to clear stud N by stud F when the carry pawls are reset to permit the pull-in arm to mesh the crossfooter, carriage in totaling position.

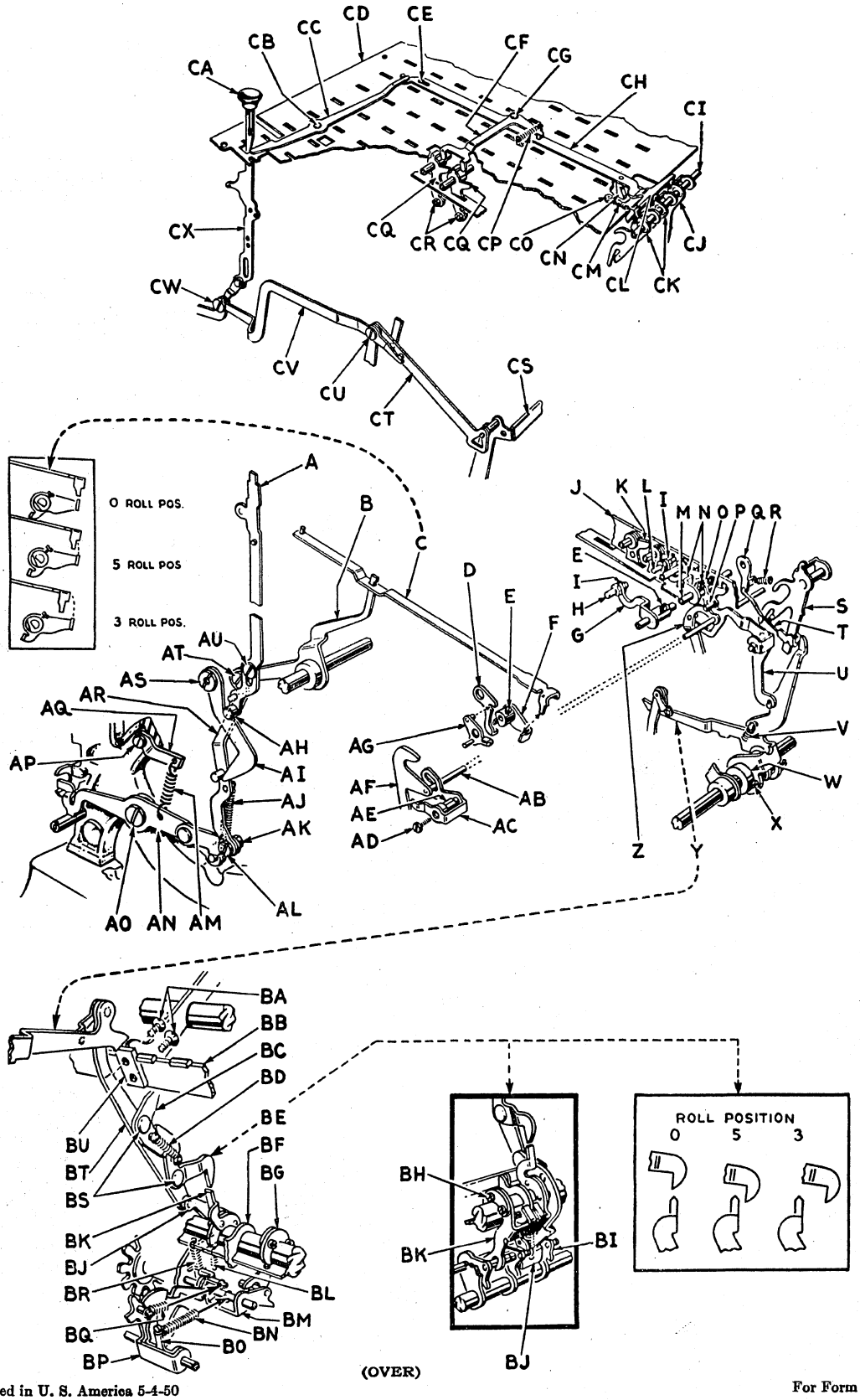
Check: Pawl AG for safe hold on first step of stud AJ in AK Plate 82. Operate machine from motor twirler to position AI contacting C but not to move Q Plate 84.

Adjustment: Eccentric AH is turned. Check for locating roll in AL Plate 75 under link G Plate 75.

Adjustment: Eccentric D is turned. Part AB to travel far enough to allow X to obtain full downward movement. ***Adjustment:*** Eccentric AC:

Now locate carriage in automatic sub-total position. Recheck AG for hold and clearance of stud in AK, Plate 82. Recheck C to give Q, Plate 84, full upward travel. Recheck AB to raise and disable total pawl AW. If test No. 1 was properly made these tests should

AUTOMATIC COUNT—CROSSFOOTER AND REGISTER
(For Style 30 17 07 Machines) (Plate 69-1)



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Automatic Count—Crossfooter and Register (For Style 30 17 07 Machines) (Plate 69-1)

Purpose

This mechanism permits an automatic count of items in the register only, or in the crossfooter and register, and provides a means of adjusting the count of check items whenever posted checks are returned.

Operation

The Automatic Count Mechanism is controlled by the carriage and keyboard to maintain a count of old balances, checks, and deposits.

Whenever the count control cam is not actuated by a carriage control roll (O roll), lever AN is held in its normal position by spring AM, and link AR is positioned upward to hold slide C forward through bellcrank B. Slide C, when in its forward position, blocks rotation of shaft assembly M, by means of the alignment of its forward projection with the lip of part F, thereby preventing actuation of bellcrank U when, upon depression of keys in the keyboard, shaft AB and its retaining arm Z move rearward.

When the count control cam is actuated by a 5-roll, lever AN is rocked against the tension of spring AM, link AR is lowered slightly, and bellcrank B positions slide C rearward so that the step in its forward projection is aligned with the lip of part F. With the notch of slide C so aligned, part F and shaft M are permitted slight rotating movement when keys in the keyboard are depressed and the stud in arm Z moves rearward (with the rearward movement of shaft AB) to clear the lower rear projection of bellcrank U. Since a slot in the upper rear projection of bellcrank U is engaged with a stud in part N of shaft assembly M, the shaft's slight rotating movement (permitted by the step in slide C) allows spring V to rock bellcranks Y and U (when the latter is cleared by the stud in arm Z). The rocking motion of bellcranks Y and U, resulting from depression of keys in the keyboard when a 5-roll is in contact with the count control cam, lowers arm BT to engage hook BE with bail assembly BK upon machine operation, but does not result in actuation of linkage T or adding rack latch S.

Failure to actuate linkage T and latch S prevents an automatic count in the crossfooter; and the lowering of arm BT to engage hook BE with bail assembly BK on the return stroke of the machine operation—through the upward movement of bail BB, the rocking of parts BC and hook BE, and the movement of bail assembly BK and latch assembly BM—results in the tripping of a carry and the counting of one in the active register.

When the count control cam is actuated by a 3-roll, slide C is positioned farther rearward, with its forward projection clearing the lip of part F. With slide C so positioned, shaft assembly M is permitted greater rotating movement when keys in the keyboard are depressed and the stud in arm Z clears bellcrank U. Greater rotating movement of shaft assembly M permits spring V to rock bellcranks Y and U a greater distance, thereby actuating linkage T and adding rack latch S to release the adding rack and to count one in both the crossfooter and register. (Arm BT is ineffective in producing the register count when the count control cam is actuated by a 3-roll, since its additional degree of travel causes hook BE to be pivoted out of contact with bail assembly BK).

The Automatic Count Mechanism is restored to normal near the end of each machine operation, when bail BB contacts the rearward arm of bellcrank Y, thereby restoring arm BT, bellcranks Y and U, and shaft assembly M to their respective normal positions.

DISABLING of the Automatic Count Mechanism is accomplished through depression of the following keys: 1-17 (B—Non-Count), 9-19 (A—Non-Count), 4-14 (RT), 5-14 (EC), and all keys in the three count columns.

Key 1-17 (B—Non-Count) is of the latch-down type; its depression pivots parts AG and D to block rotation of part F (and shaft assembly M) through a lip in D's lower projection.

Key 9-19 (A—Non-Count) serves to nullify the effects of a 5- or 3-roll on the count control cam; its depression raises link AR, through hook AI, pivoting bellcrank B and restoring slide C to its forward blocking position.

Keys 4-14 (RT) and 5-14 (EC) each provide a means of disabling the automatic count, and of adjusting the accumulated count of check items in the crossfooter and register. Upon depression of key 4-14 or 5-14, arm CF is rocked by its respective bellcrank CQ and slide CH is moved forward to release the adding racks in the three count columns and to block the rotation of shaft assembly M through lug CN and square stud P. Release of the adding racks in the three count columns results in the subtraction of 1 in the crossfooter count, and in the entering of the complement of 1 in the "add" check register. At the end of the day, the total number of posted checks in the "subtract" check register may thus be adjusted in keeping with the accumu-

(continued)

(*Plate 69-1*)—*Continued*

lated complement of the total number of checks in the "add" check register.

When key 4-14 or 5-14 is used for symbol designation only, and not as a means of adjusting the accumulated count of items in the crossfooter and register, key 9-18 (Desc. Only) is depressed concurrently with key 4-14 or 5-14. Depression of key 9-18 results in the following: (1) the rocking of lever CC and the restoration of slide CH to its normal rearward position—thereby preventing the release of the adding racks in the three count columns; and (2) disabling the shifting of the counter control lever and tumbling of the crossfooter both of which are normally indexed when key 4-14 or 5-14 is depressed with the carriage located in check position.

Crossfooter tumbling, and shifting of the counter control lever are disabled by means of linkage CV and CT which are rocked upon depression of key 9-18 to release the stud in bail CS.

Depression of keys in the three count columns results in disabling the automatic count feature by means of slide J and studs H or L in the count column in which keys are depressed. As slide J is moved rearward by part K the slot in slide J is moved out of alignment with studs H and L, causing the studs to block the rotation of shaft assembly M by its limiting on the top side of slide J.

Adjustment

1. The count indexing slide C should be adjusted in the following manner:

(a) ***No Roll.*** With arm AN limiting on the stud in the left side frame, slide C should have minimum play in the forward end of the slots in the keyboard.

To adjust, shorten or lengthen link AR at its offset.

(b) ***No. 5 Roll.*** The step of the projection on slide C should align with the lip of part F.

(c) ***No. 3 Roll.*** The projection of slide C should move rearward sufficiently to clear the lip of part F.

To adjust, raise or lower the count control cam.

2. When slide C is indexed by a control roll, and shaft AB is moved rearward through the depression of a key, the Register Count Mechanism should be indexed as follows:

(a) ***No Roll*** (no register count). Pawl BE should be located slightly forward of the projection on assembly BK, and should miss the projection when actuated during the return stroke of the machine operation.

(b) ***No. 5 Roll*** (automatic register count). Pawl BE should locate slightly to the rear of the projection on assembly BK, and should rock the assembly sufficiently to trip a carry in the register when actuated during the return stroke of the machine. ***Note:*** The carry pawl latch should raise approximately 1/64" above the carry rack.

(c) ***No. 3 Roll*** (no register count). Pawl BE locates farther to the rear of the projection on assembly BK, so that its actuation during the return stroke of the machine does not rock assembly BK.

To adjust, raise or lower the rearward arm of bellcrank Y.

Note: There must be slight clearance between the projection of slide C and the lip of part F when the machine is normal. To check, manually move slide C rearward, pull the handle slightly forward, then restore the handle slowly and check for full restoration of slide C.

3. When slide C is indexed to a No. 5 or No. 3 roll position with shaft AB in its normal position (no keys depressed), pawl BE should locate slightly forward of the projection on assembly BK; and should miss the projection when actuated during the return stroke of the machine.

To adjust, bend the lower rearward projection of bell crank U, toward or away from the stud in arm Z.

Note: There must be slight play between the lower projection of bellcrank U and the stud in arm Z when the machine is normal.

4. When the machine is operated, with slide C located in a No. 5 roll position and with shaft AB moved rearward (keys depressed), there should be slight clearance between the plate on wire T and the upper arm of bellcrank Y when the latter is moved to its maximum rearward position.

To adjust, bend the upper arm of bellcrank Y.

5. The stud in bail CS should not bind in the bottom of the cutout in arm CT when key CX (9-18) is depressed.

To adjust, raise or lower the forward projection of arm CV.

6. The forward end of slide CH should be squared with the adding rack latches CK and CJ.

To adjust, weave the forward end of slide CH.

7. Slide CH, when moved forward by the depression of keys 4-14 or 5-14, should rock adding rack latch CK and CJ sufficiently to release the adding racks.

(*Plate 69-1*)—*Continued*

To adjust, bend the projections of arm CF which contact bell cranks CQ.

8. The depression of key 9-18, with key 4-14 or 5-14 indexed, should restore slide CH sufficiently to permit the adding rack latches CK and CJ to have a safe hold on the adding sectors.

To adjust, bend arm CC.

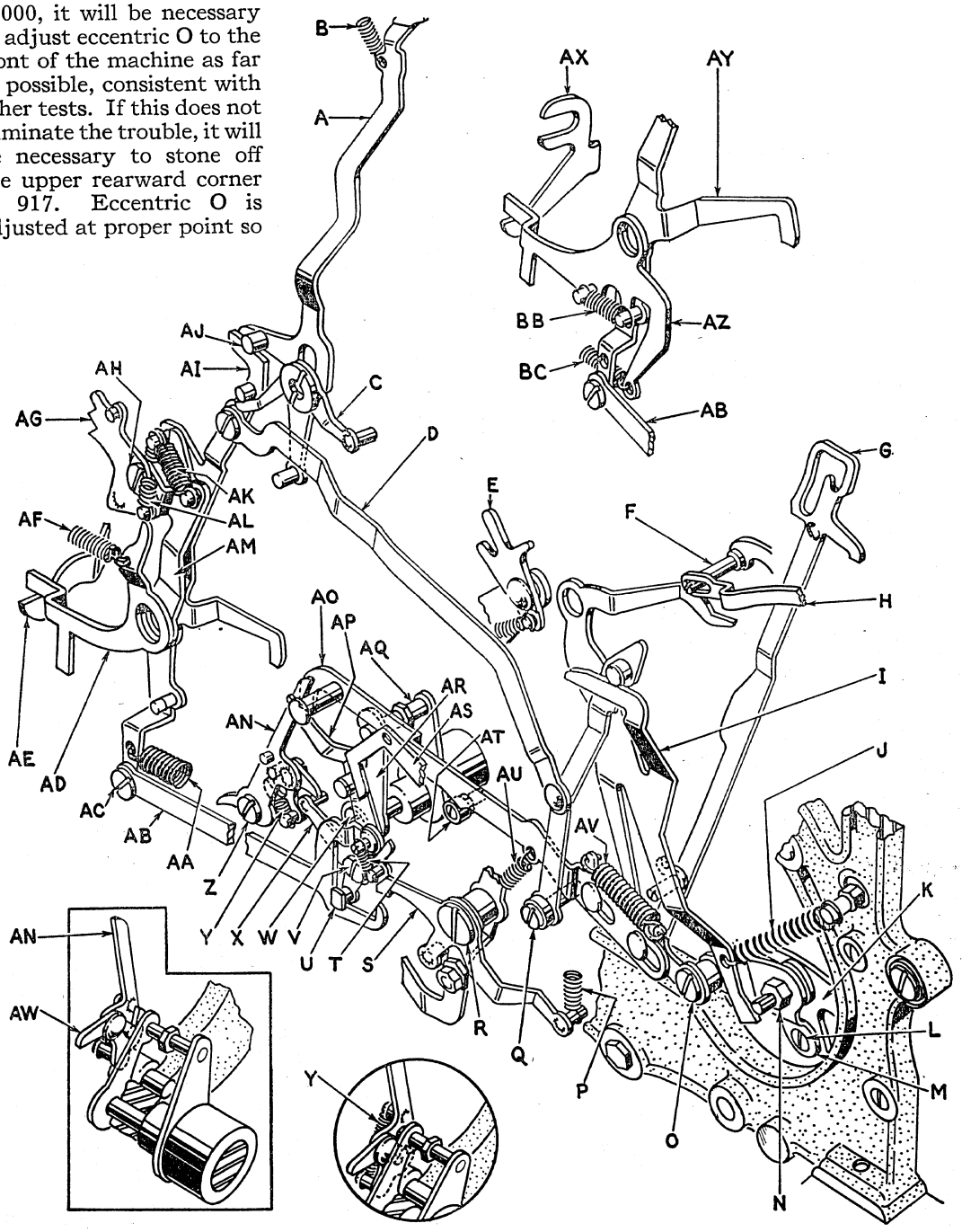
CARRIAGE AND CROSSFOOTER CONTROLS
(Classes 21 thru 30 with H903 Mechanism) (Plate 74)

(Plates 72 and 73 in Symbol Book only)

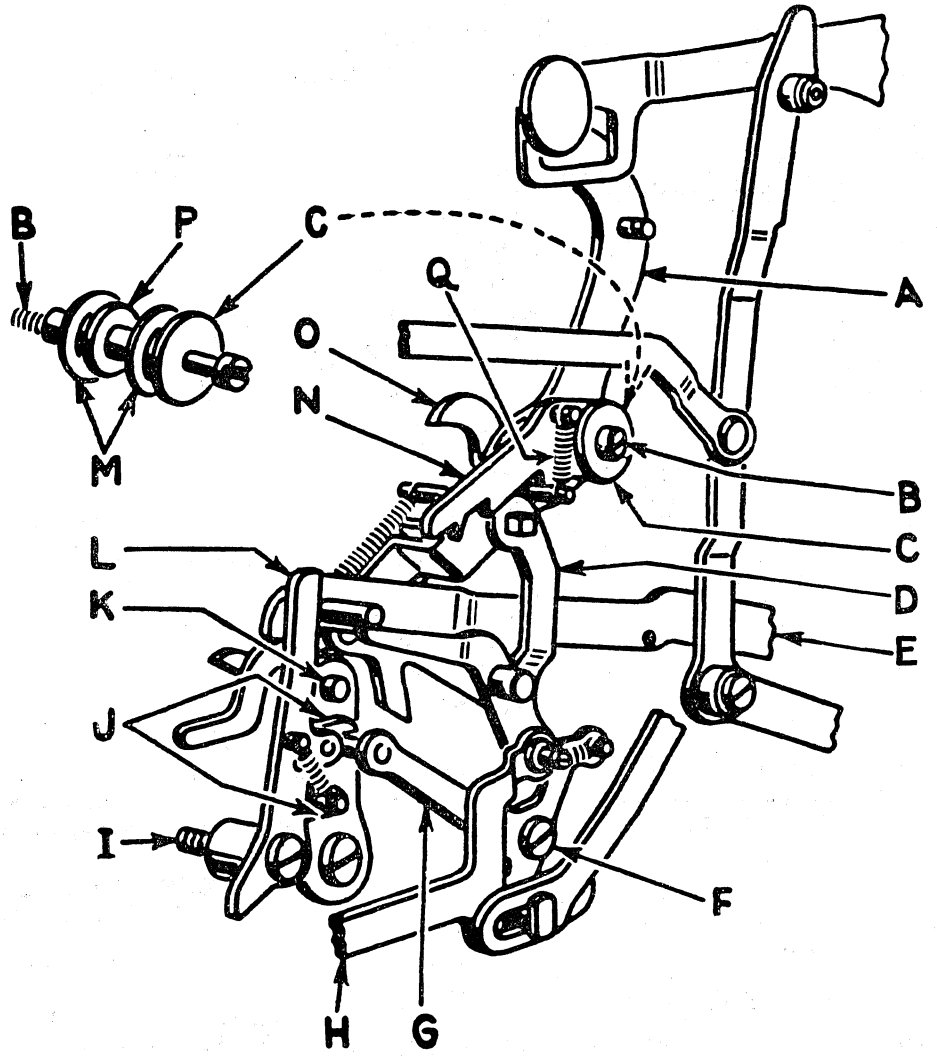
be O.K. Locate carriage off control roll, arm AD should raise pawl AG but not engage its first step with the stud in AK, Plate 82.

Adjustment: File boss on sideframe.

If machine locks on forward stroke caused by 917 not camming out of the path of 11-68000, it will be necessary to adjust eccentric O to the front of the machine as far as possible, consistent with other tests. If this does not eliminate the trouble, it will be necessary to stone off the upper rearward corner of 917. Eccentric O is adjusted at proper point so that crossfooter will not pull in against passby pawl E, holding crossfooter out at the same time. Adjust eccentric O at highest point possible consistent with previous test so that the nose of AO will be pitched downward for safer and firmer hold at this point.



CROSSFOOTER TOTALS, CARRIAGE CONTROLLED INDEXING DETENT (Plate 74-1)



Crossfooter Totals, Carriage Controlled Indexing Detent (Plate 74-1)

The purpose of this mechanism is to hold the crossfooter total and sub-total mechanism indexed when operating the machine on the multiple print half stroke, and also on the regular operation.

Sequence

During the machine operation, when the crossfooter totaling mechanism is indexed by the crank, the lowering of arm O permits detent N to position itself over square stud in arm D to latch the mechanism in its active position. Without this detent, pawl J would change its position in relation to stud K, since the crank would arrive in its home position before the machine would be released on the half stroke operation, to allow stud K to contact pawl J on a total operation.

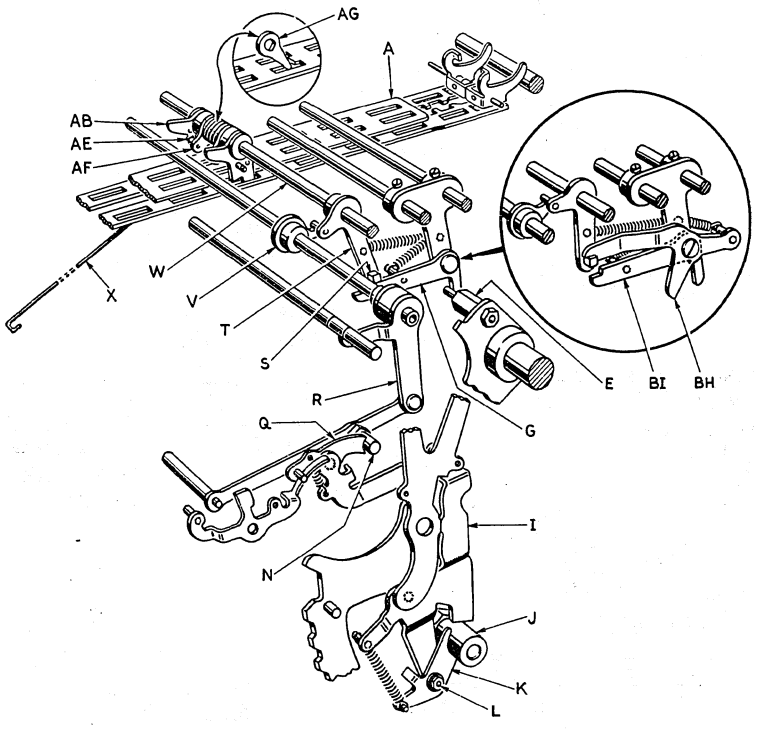
Detent N has been made standard on all automatic crossfooter totaling carriage controlled machines, because of the change on the cam surface of arm G (Plate 41, Carriage Symbol List) to prevent the bending of arm G on a hand operation. With stock removed from arm G (Plate 41) pawl J would be similarly affected since the cam portion of arm G (Plate 41) serves as a detent for the crossfooter totaling mechanism.

Tests and Adjustments

Stud in arm D should have 1/16″ lead over detent N.

The eccentric in link H is adjusted.

CROSSFOOTER TOTALS WITH KEYS ON KEYBOARD DEPRESSED (IMPROVED) (Classes 21 thru 30 with H903) (Plate 74-2)



Crossfooter Totals With Keys on Keyboard Depressed (Improved) (Plate 74-2)

Purpose

This mechanism affords a means for securing crossfooter totals (H903) with keys on the keyboard depressed.

Operation

Depression of a key on the keyboard rocks bellcrank AB, which, through spring AE and bellcrank AF, moves slide A and wire X rearward.

ON A TOTAL OPERATION, pawl Q is rocked into the path of stud N by the sector bar lock. Roller J, moving downward, contacts pawl K, rocking part I, which, through pawl Q, stud N, and arm R, raises pawl V. The latter actuates arm T, shaft W, and pawl AG to move slides A forward. With keys depressed on the keyboard, the forward movement of slides A rocks bellcrank AF, expanding springs AE (yielding connections), and moving wires X forward to clear the adding racks.

LATCH G retains the lower portion of arm T in its forward position during a total operation to hold the wires X out of the path of the adding racks. On the return stroke of the total operation, stud E releases latch G from stud S, permitting springs AE to reposition wires X rearward.

AUXILIARY LATCH BH is used on machines equipped with "Register Control Mechanism to Provide Sufficient Time for Register to Position" (Plate 49, Accumulation Instruction Book). In such machines, stud E (in the 600 section) holds latch BI in an inactive position during the time roller J is camming off pawl K. During this portion of the operation, arm T is held forward by the auxiliary latch BH which has been lowered into the path of stud S. As the machine continues on the forward stroke, stud E moves forward. Thus, latch BI is raised, and latch BH is cammed off stud S, which then recedes and limits on latch BI.

Adjustment

1. With the machine in normal position, there should be a minimum of clearance between roller J and pawl K.

To adjust, turn eccentric screw L.

2. Latch G should release stud S as late as possible on the return stroke of the machine operation.

To adjust, turn eccentric stud E.

Crossfooter Total and Sub-total Mechanism—Positive and Negative—Carriage Controlled (Improved) Style No. 2 (H903) (Plate 74-3)

Purpose

The purpose of this mechanism is to provide a means for securing automatic totals and/or sub-totals of the crossfooter in Classes 20-30 Machines.

Operation

PARTIAL INDEXING of this mechanism results from a control roll being positioned onto lever BL, which, through lever BK and spring BQ, swings pawl BO downward. With the carriage located in a total position, the lower notch of pawl BO is aligned with the stud in bellcrank BN; and, with the carriage located in a sub-total position, the upper notch of pawl BO is so aligned.

COMPLETION OF THE INDEXING of the Total Mechanism, with a positive amount in the crossfooter and a total partially indexed, is accomplished at the beginning of the forward stroke of a machine operation.

As the machine operates, the turning of the drive lowers link BE, rocking bellcrank BN. The stud in the upper portion of the bellcrank moves pawl BO and part BM forward, causing spring BR to rock lever BV, lowering its forward arm, which, by actuating part BJ, moves link BS rearward to index the sector bar lock (as explained in Plate 55-1, Accumulation Instruction Book). The lower arm of lever BV (being moved rearward) moves link BI, rocking part AY rearward. The latter allows the hook of pull-in arm BH to be lowered into the path of stud AZ, and allows part AU to be moved downward to position the upper end of the vertical slot in link AR over stud AT.

THE CARRY PAWLS are reset during the early portion of the forward stroke of a total operation. The crossfooter is disengaged from the adding racks by the passby pawl 1-821B (G, Plate 85), permitting the adding racks (Z, Plate 74-5) to be lowered to their normal position where they are limited by the hooks (X, Plate 74-5). As the machine continues the forward stroke, passby pawl Y actuates levers X and V, and shaft T, moving latches U forward to allow the carry pawls in carry position to reset.

THE CROSSFOOTER IS RE-ENGAGED with the adding racks by pull-in arm BH which is moved rearward by stud AZ.

THE HOOKS (X, Plate 74-5) are released from the adding racks through the continued rearward movement of stud AZ. The latter actuates lever AF, link R, and arm AC to swing the hooks forward, allowing the adding racks to be lowered and the crossfooter to be totaled.

Link AE, being moved forward with arm AC, allows stud AX to follow, permitting passby pawl BC to swing rearward to its total position (with its spring stud limiting against part BG).

THE CROSSFOOTER IS DISENGAGED from the adding racks during the early portion of the return stroke of a crossfooter total operation. Stud AZ, through passby pawl BC and arm BG, drives arm BH forward to disengage the crossfooter which remains in the disengaged position until the end of the return stroke.

THE CROSSFOOTER NON-ADD MECHANISM is indexed on the forward stroke of the crossfooter total operation. The roller (BQ, Plate 74-5) actuates the cam (BO, Plate 74-5) to move link AW forward. The latter rocks lever AS, which, through link AR and lever J, rocks part D. The upper arm of part D, being lowered, indexes the Crossfooter Non-add Mechanism. When thus indexed, the Non-add Mechanism prevents a machine lock which would result from the passby pawl 1-821B (G, Plate 85) attempting to engage the crossfooter with the adding racks at the same time that arm BG is driving arm BH forward to disengage the crossfooter.

SYMBOL INDEXING, during a total operation, is accomplished through the rocking part D which swings slide H rearward. A roll on the upper portion of slide H swings arm G rearward to locate the symbol designator in its total position.

The roll on slide H, being located in a higher position during a sub-total operation, moves arm G further rearward to locate the symbol designator in its sub-total position.

RIBBON SHIFTING is controlled through the counter control lever (O.C.K. No. 54), which, when moved to subtract position, allows hook B to be lowered onto stud A. Link BY, being moved rearward with part D during a total or sub-total operation, rocks part CB, which, through stud A, moves hook B rearward to raise the Ribbon Mechanism.

THE REPEAT MECHANISM IS INDEXED (as described in Plate 13-1, Keyboard Instruction Book) in a total or sub-total position when a spacing stroke may be required to tumble the crossfooter, and/or when a repeat of machine operations following a total or sub-total operation is desired.

THE REPEAT MECHANISM IS DISABLED (Carriage Controlled) on a crossfooter total or sub-total operation when no

(Plate 74-3)—Continued

repeat is required after specified total or sub-total operations. A No. 1 or No. 3 control roll is located on the register non-add lever, which raises link BW, positioning pawl BZ in line with stud CA. As the machine operates, link BY, through part CB, pawl BZ, and stud CA, rocks assembly CC—permitting the upper pocket of passby pawl 623 No. 4 (Y, Plate 13-1) to be positioned so as to engage the roll on the lower right arm of assembly CC. The passby pawl, when thus positioned, rocks assembly CC sufficiently (on the return stroke of the machine operation) to release the motor bar.

When no repeat is required after any total or sub-total operation, the Repeat Mechanism is disabled through part BZ, which is held in its raised position by a spring (not shown) to engage stud CA on each total or sub-total operation.

INDEXING OF A SUB-TOTAL OPERATION results from the position of pawl BO, which causes link BI to be moved further rearward. The hook on the forward portion of link BI rocks part BB, which, through a stud in its upper portion, holds passby pawl BC in a disabled position. The crossfooter is thus allowed to remain engaged with the adding racks during the return stroke of the machine operation.

INTERLOCK P prevents shifting of the counter control lever and the register total indexing lever during the machine operation. Stud AZ, being moved away from the lower arm of part K, during the forward stroke of the machine operation, allows spring Z to rock interlock P. A cutout in the rearward portion of the interlock is lowered over the square stud in the register total indexing lever O; and, the projection on the forward portion of interlock P is raised into the path of the square stud in the counter control lever.

INTERLOCK AH prevents the crossfooter from bouncing and re-engaging the adding racks during the early portion of the forward stroke of a listing operation. Stud S is moved forward, allowing spring AJ to swing interlock AH forward to position its lower arm over stud AK.

On a total or sub-total operation interlock AH is disabled by a roll on the upper portion of arm AG which is positioned over the upper arm of the interlock, preventing the same from moving forward.

DISABLING of the Total Mechanism is accomplished through the blocking of lever BV, which, when held in normal position, causes spring BR (A yielding connection) to be expanded as the machine is operated in a total position.

Key F, when depressed, lowers stud BX into the path of lever BV to hold the lever in its normal position.

The hook on part AQ serves as a safeguard to prevent a machine lock in the event key F is released during a listing operation in a total position. Lever AS, being rocked during the forward stroke, allows spring AN to rock part AO, which, through stud AP, rocks part AQ, lowering its hook into the path of the hook on link BI to hold the link and lever BV in normal position. In the event that key F were released during the machine operation, and the hook on part AQ failed to retain link BI in its normal position, the vertical slot of link AR would not be coupled with stud AT to index the Crossfooter Non-add Mechanism, and, pawl BC would be indexed in its total position. Consequently, a machine lock would result since arm BG would be attempting to disengage the crossfooter from the adding racks at the time pawl 1-821B were attempting to engage the same.

Register shift lever O, when shifted to register total or sub-total position, actuates lever BA which rocks part AQ. The hook on the rearward portion of part AQ, being lowered into the path of the hook on link BI, holds the latter and lever BV in normal position.

Adjustment

In the process of making the following tests, the machine should be operated manually by means of a crank.

1. The high point of eccentric screw BF should be set in a central position; i. e., toward the front or rear of the machine.

Note: The eccentric screw is provided to afford a means for adjusting the throw of the register total indexing lever in machines equipped with "Register Total Indexing Lever, Indexed by Carriage and Shifted by Drive Mechanism" (Plate 81, Accumulation Instruction Book). The throw of the register total indexing lever should be sufficient to permit the same to be latched in a total or sub-total position.

2. On the forward stroke of a total operation, square stud AI should be moved rearward sufficiently to have slight lead beyond the first step of latch I.

To adjust, turn eccentric screw BP.

Note: The eight-point Printing Control, if active in a total position should be indexed when adjusting the above.

3. With the carriage located in a total position, the lower notch of pawl BO should be aligned with the stud in lever BN; and, with the carriage located in a sub-total posi-

(Plate 74-3)—Continued

tion, the upper notch of pawl BO should be so aligned.

To adjust, raise or lower lever BL as required.

4. When stud AI is moved rearward sufficiently to latch on the first step of latch I during a total operation, the upper end of the vertical slot in link AR should limit on the shoulder of stud AT, and the hook on the rearward portion of arm BH should have a full hold on stud AZ.

To adjust link AR, bend its upper projection.

To adjust arm BH for a full hold on stud AZ, bend the rearward arm of part AY.

5. On a total or sub-total operation the upper arm of part D should index the Crossfooter Non-add Mechanism without binding the same in its lowered position.

To adjust, raise or lower the upper arm of part D.

6. The hook on the rearward portion of part AQ should have slight clearance over the hook of link BI when the latter is being moved rearward during a total operation.

To adjust, turn eccentric stud AP.

7. Spring AM should be slightly expanded when arm BH starts to re-engage the crossfooter with the adding racks during a total operation.

To adjust, turn eccentric screw AL, keeping the high point of its eccentric upward.

8. On the return stroke of a total operation, part BG should move the crossfooter forward to its limit without cramping arm BH.

To adjust, bend the upper arm of part BG forward or rearward as required.

9. With the machine in normal position, the forward vertical surface of the hooks (X, Plate 74-5) should be aligned flush with the vertical surface of the guide plates (W, Plate 74-5).

To adjust, raise or lower limit plate AB.

10. On a total operation, the spring stud in pawl BC should swing rearward and limit on arm BG; and, during a spacing stroke, the forward movement of stud AX (being limited by link AE) should hold pawl BC in a raised position to allow stud AZ to clear over the pawl on the return stroke.

To adjust, shorten or lengthen link AE by bending at its offset.

Note: With the machine in normal position, there should be approximately 1/32″ clearance between stud AX and the forward end of the slot of link AE.

11. With the machine in normal position, lever AF should be positioned to prevent a bind between stud N and the vertical slot of link R. The latter should be free to drop with spring AD unhooked.

To adjust, turn eccentric bushing L.

12. With 9s in the crossfooter, and the machine operated in a total position, the adding wheels should be rotated 1 to 1½ digits when the adding racks (Z, Plate 74-5), being released from the hooks (X, Plate 74-5), drop and are limited by bail 617A (U, Plate 1).

To adjust, bend the lower portion of lever AF toward or away from stud AZ.

Note: The minimum of 1 digit of travel is necessary to provide sufficient time for the carry pawls in carry position to reset during a fast machine operation; and, over 1½ digits of travel may result in a scattered print of totaled amounts.

13. During the forward stroke of the machine operation, latches U should move forward sufficiently to clear the upper projection of the carry pawls by a minimum of 1/32″.

To adjust, turn eccentric bushing W.

14. The stud in passby pawl Y should relocate in the pocket of lever X with a minimum of clearance when the machine returns to normal position on every machine operation.

To adjust, turn eccentric bushing AA.

15. With the machine in normal position, the square stud in the counter control lever (when the latter is moved forward) should clear over the projection on the forward portion of interlock P by approximately 1/32″.

To adjust, bend the lip on the lower extremity of link Q up or down.

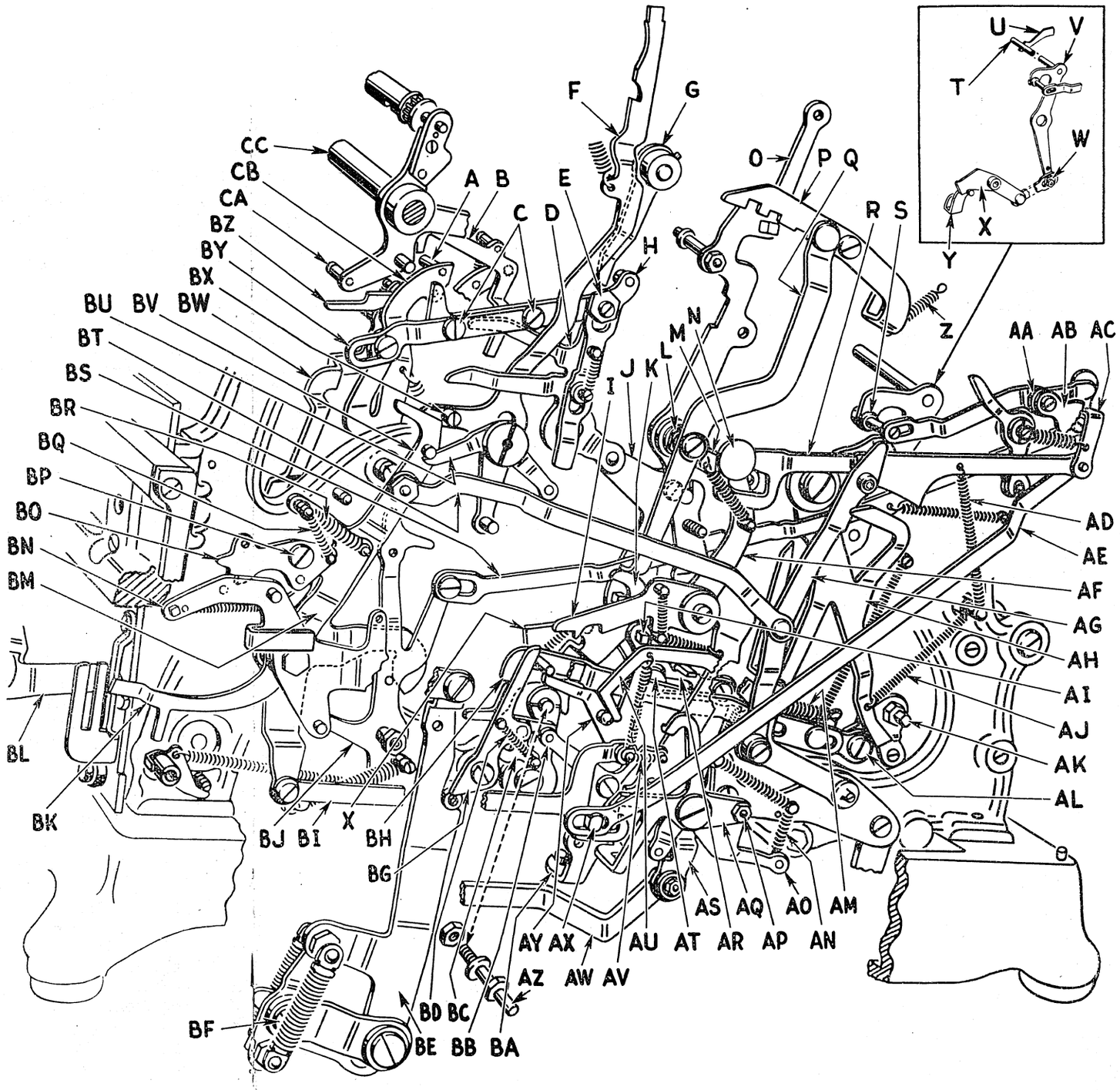
16. Slide H should remain in its lowered position on a total operation, and should raise to its limit on a sub-total operation.

To adjust, bend the rearward arm of bellcrank BU up or down.

17. The stud in the symbol sector should have a full hold on the proper step of the symbol designator when the latter is indexed on a total or sub-total operation.

To adjust, turn eccentric bushing E.

CROSSFOOTER TOTAL AND SUB-TOTAL MECHANISM (POSITIVE AND NEGATIVE) CARRIAGE CONTROLLED (IMPROVED) STYLE NO. 2 (H903) (Plate 74-3)



(Plate 74-3)—Continued

18. On a total operation with pawl BZ raised into the path of stud CA (repeat disabling), the rearward movement of part CB should rock assembly CC sufficiently to allow the upper pocket of pawl 623 No. 4 (Y, Plate 13-1, Keyboard Symbol List) to locate on the roll in the lower right arm of assembly CC.

To adjust, loosen screws C and move link BY forward or rearward as required.

19. With the machine in a normal position and key F depressed, there should be a minimum of clearance between the vertical surface of lever BV and stud BX.

To adjust, turn eccentric stud BX.

20. With slight pressure applied upward on the crossfooter during the forward stroke of a listing operation, the lower forward arm of interlock AH (when moved forward) should clear stud AK by approximately .010″, and, when in its forward position, should have full hold over the same.

Note: The upper flat surface of stud AK should be parallel with the lower surface of interlock AH.

To adjust, shorten or lengthen the offset in the lower arm of interlock AH to secure the .010″ clearance, and raise or lower the uppermost arm of the interlock for the full hold over stud AK.

21. On the forward stroke of a total or sub-total operation, the lower arm of interlock AH should be held rearward to clear stud AK.

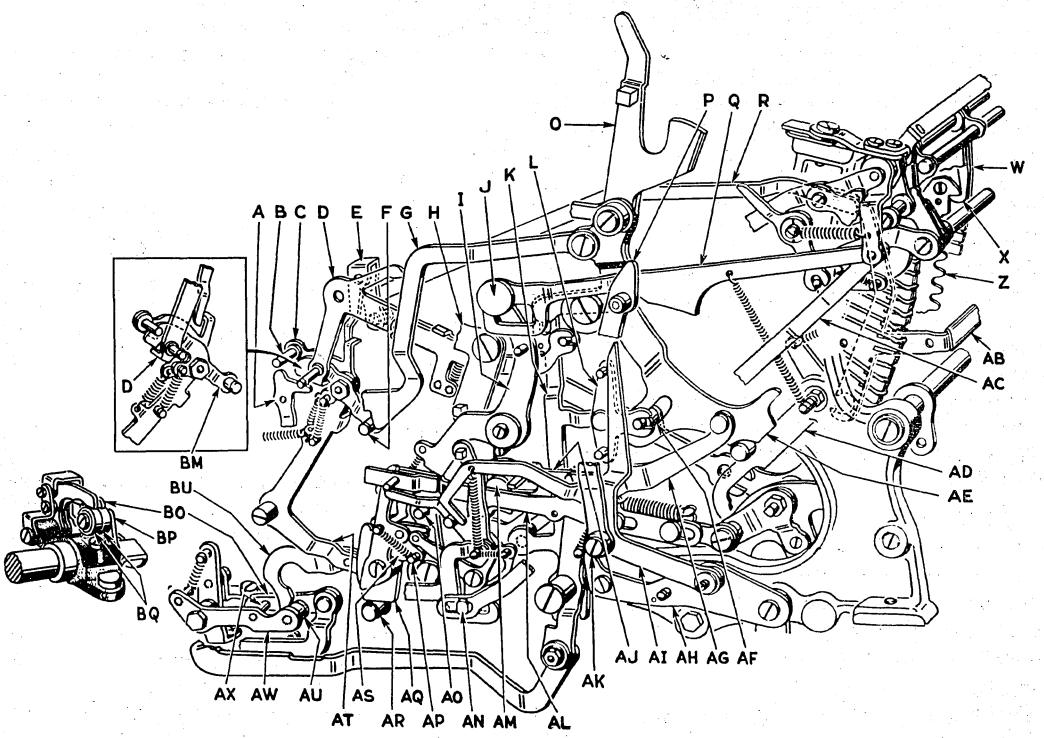
To adjust, bend the upper arm of interlock AH which contacts the roll in arm AG.

22. On machines equipped with an eight-point printing control locking arm (AP, Plate 13-1, Printing Symbol List) and an assembly (AI, Plate 13-1) of three roll construction, the spring stud in passby pawl BC should limit against part BG when stud AI recedes and limits on the first step of latch I at the end of the forward stroke of a total operation.

To adjust, bend arm BB.

SPACING STROKE MECHANISM (IMPROVED)
(Classes 21 thru 30 with H903) (Plate 74-5)

(PLATE 74-4 IN SYMBOL LIST ONLY)



Spacing Stroke Mechanism (Improved) (Classes 21 thru 30 With H903) (Plate 74-5)

Purpose

The purpose of this mechanism is to automatically index a spacing stroke to tumble the crossfooter when the machine is operated in a total or sub-total position with the crossfooter in add position and a negative amount in the subtract wheels; or, with the crossfooter in subtract position and a positive amount in the add wheels.

Operation

WITH THE CROSSFOOTER IN ADD POSITION, and a negative amount in the lower (subtract) wheels, the Spacing Stroke Mechanism is automatically indexed to tumble the crossfooter to subtract position when the machine is operated in a total or sub-total position.

The negative total lock, through bail AB and link R, holds arm E rearward, allowing hook C to be lowered until limited by stud B contacting on the upper projection of part A. As the machine is operated, the indexing of the total mechanism moves part A rearward, allowing hook C to be lowered into the path of the lip of bellcrank D. The rocking of arm BP raises arm AW, which, through roller AU and arm BU, rocks bellcrank AT. Cam AQ, which is also being lowered, contacts roller AR to cam the lower arm of bellcrank AT further rearward. Hook C, being moved forward by bellcrank AT, rocks bellcrank D. The forward arm of the latter raises link K which shifts the counter control lever O to subtract position; and, through a stud in its lower extremity, raises arm AG to index the Crossfooter Tumbling Mechanism. Part L is also rocked from the raising of link K, moving the stud in its upper portion forward to raise part AI.

The rearward arm of part AI, being raised, allows link AJ to follow and locate its horizontal slot in line with stud AM. Thus, the latter is allowed to idle in the horizontal slot of link AJ, disabling the indexing of the Ribbon Shifting, Repeat Disabling, Crossfooter Non-add, and Symbol Printing Mecha-

(Plate 74-5)—Continued

nisms. An eccentric stud in the lower portion of part AI raises pulling arm AL to clear stud AO, preventing the pulling arm from re-engaging the crossfooter with the adding racks. The roller on the upper portion of arm P, which is also raised by part AI, raises link Q, locating the horizontal slot of the latter in line with stud J. The latter idles in the horizontal slot of the link, allowing the hooks X to remain in their normal position to prevent the adding racks from being lowered. Link AC, also remaining in its normal position, limits the travel of stud AN to disable the indexing of passby pawl AS.

As the machine continues on the forward stroke, arm AG is moved rearward to tumble the crossfooter (explained in Plate 18, Accumulation Instruction Book). Roller AF, being moved to the upper end of the enclosed cam in arm AE (when the crossfooter is tumbled) causes the studs in part L to assume a vertical position, allowing the total mechanism to be indexed on the following operation.

WITH THE CROSSFOOTER IN SUBTRACT POSITION, and a positive amount in the upper (add) wheels, the Spacing Stroke Mechanism is automatically indexed to tumble the crossfooter to add position when the machine is operated in a total or sub-total position.

The negative total lock, through bail AB, link R, and arm E, holds hook C in its raised (inactive) position. Link K, which has assumed its normal position, allows the counter control lever to locate in add position, and permits arm AG to be lowered to index the Crossfooter Tumbling Mechanism. Roll AF, being in the upper portion of the enclosed cam of arm AE, and link K, being in its lowered position, causes the stud in the lower portion of part L to be held forward. The latter holds part AI in a raised position to disable the Total Mechanism in the same manner as explained in paragraphs 3 and 4. The machine is thus indexed to take a spacing stroke to tumble the crossfooter to add position.

Adjustment

1. On a debit total operation, hooks BM and C should have slight clearance over the lip of bellcrank D.

To adjust hook C, weave bail AB; and, to adjust hook BM, raise or lower stud F by tipping the forward arm of hook BM.

2. On a listing operation with the crossfooter in add position and the negative total lock in negative position, part A should retain hook C in a raised position until the latter clears over the lip of the bellcrank D; and, on a credit total operation, part A (being moved rearward) should allow hook C to drop and have full hold on the lip of bellcrank D.

To adjust, bend the upper portion of part A forward or rearward.

Note: If necessary, raise or lower hook C by tipping stud B.

3. As a spacing stroke is being indexed to tumble the crossfooter, the active stud in part L should rock part AI sufficiently to allow the horizontal slots of links AJ and Q to align with studs AM and J respectively.

To adjust, with the lower stud in part L active, swing the upper arm of part AI forward or rearward by bending at its offset; and, with the upper stud in part L active, tip the upper arm of part AI as required.

4. Pulling arm AL should be held in a raised position to clear stud AO during a spacing stroke.

To adjust, loosen screw AK and turn the eccentric shoulder nut located on screw AK.

5. With roller AR located on the rearward vertical surface of cam AQ, there should be slight clearance between roller AU and the high portion of the camming surface of arm BU.

To adjust, bend the lower portion of arm BU toward or away from roller AU.

Mr M R Lovejoy
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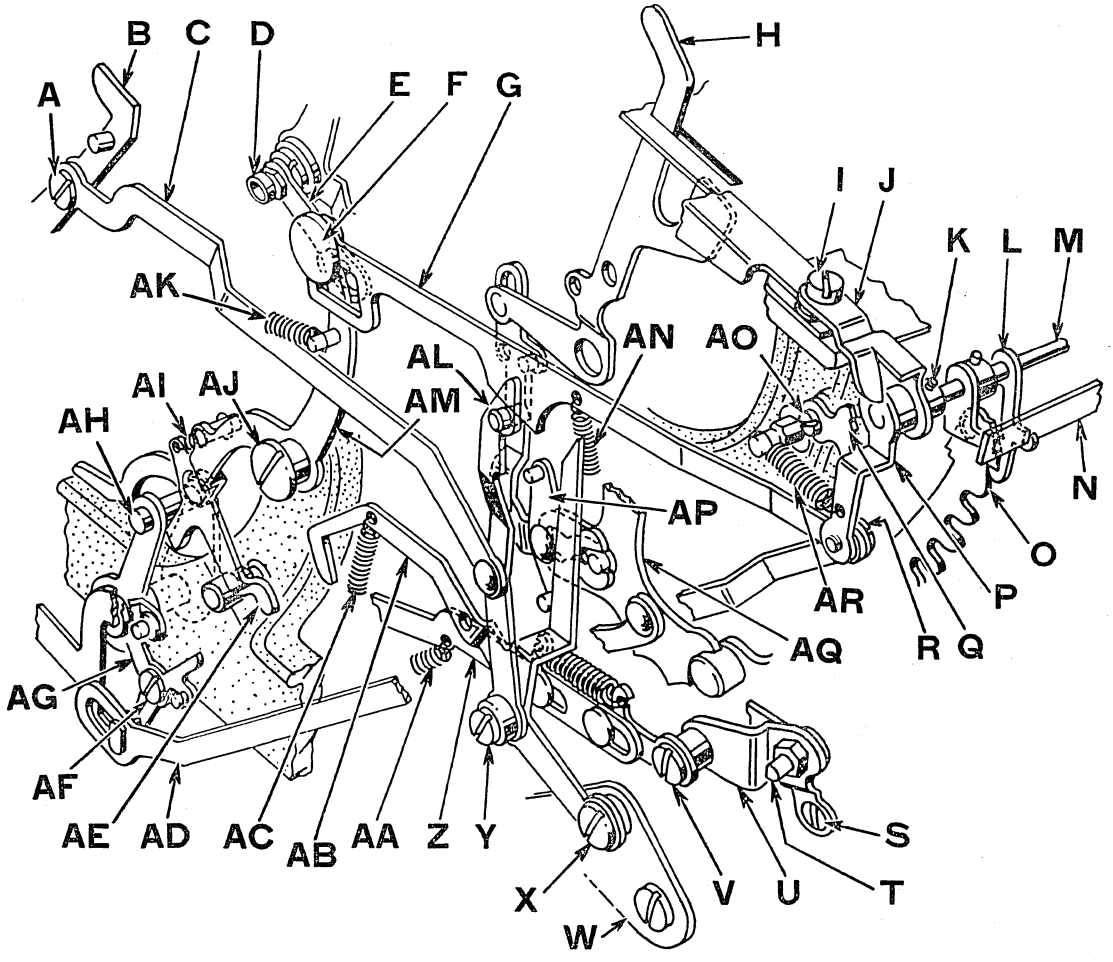
For Form 3756

SPACING STROKE CONTROLLED FROM SUBTRACT SHIFT MECHANISM
(Classes 21 thru 30 with H903 Mechanism) (Plate 75)



Spacing Stroke Controlled From Subtract Shift Mechanism (Plate 75)

At the beginning of the machine operation immediately following the shifting of the subtract lever to subtract position and also when a credit balance occurs, the necessary spacing stroke is secured as follows:

The upper stud in part AP contacts the vertical arm of AB, raising it, which carries link AL upward to raise link G to locate its horizontal slot in line with stud F, which causes stud F to idle in the slot of G, allowing hooks L to hold adding racks O in normal position. Accumulator meshing is disabled by shoulder screw Y raising arm Z above stud AH.

Crossfooter total and sub-total carriage control is disabled by link AD blocking AB, Plate 74, the latter in turn holds AW, Plate 74, in neutral position.

Link AD is not used in machines which do not feed the paper during totaling on account of a control roll being on the non-add lever, which disables passby pawl E, Plate 74. A control roll can not be placed on the non-add lever in machines which feed the paper during totaling, for that reason link AD is used.

Total symbol, ribbon shift, non-add and repeat release mechanism are held inactive by disabling actuating arm P, Plate 76, due to the horizontal arm of AB being raised which permits spring AR, Plate 76, to raise part AO, Plate 76, locating its horizontal slot in line with stud AP, Plate 76.

(*Plate 75*)—*Continued*

Tests and Adjustments

The purpose of arm E is to prevent binding of link G on stud F, by limiting part AM with the stud in AM in the slot of link G against arm E. The position of part AM is secured by turning eccentric D.

The purpose of limit arm Q is to permit adjusting hooks L to clear adding racks O during their upward movement of the carries.

Adding Rack Control

The purpose of hooks L is to hold adding racks O during the early part of the forward stroke when the crossfooter is disengaged to allow the carry pawls to reset. Hooks L are in blocking position when the machine is normal and are raised to clear the adding racks by stud AH rocking part AM, link G swinging shaft assembly M shortly after latches (H, Plate 76) are raised. Hooks L are held inactive by latch AE during the remainder of the forward stroke and the greater part of the return stroke. As the return stroke is nearing completion, stud AH contacts on and raises latch AE off roller on sideframe which allows hooks L to assume a blocking position for the next machine operation.

Tests and Adjustments

Set P so that rack O has minimum clearance with hook L and detents H, Plate 76, released and set Q to maintain this position of P.

Latch AE should have 1/64″ lead over roller on sideframe.

Adjustment: The lower offset in AM is increased to shorten AM.

Cipher and 9 Test or Timing of Hooks L

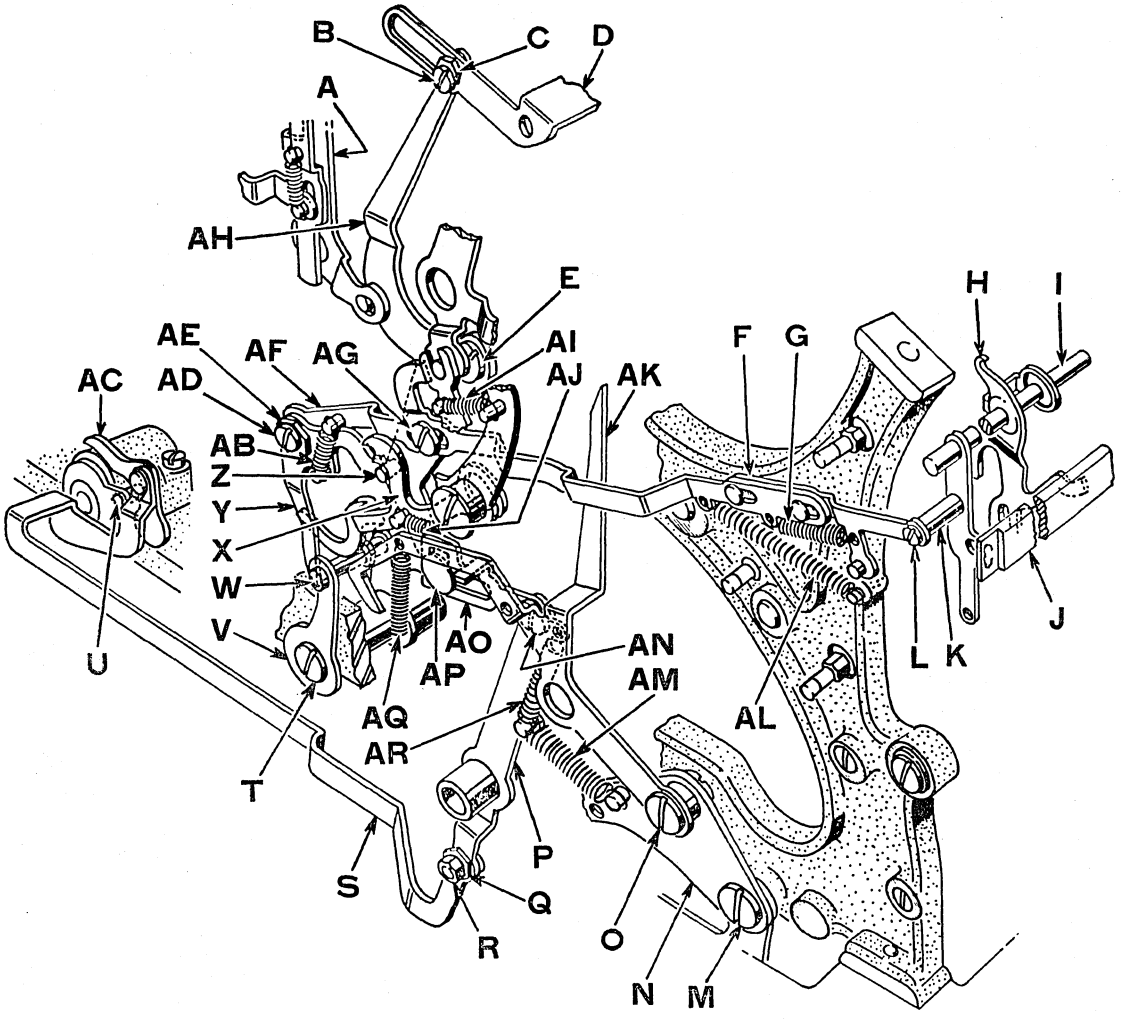
Place machine in sub-total position and operate. Hooks L should not release until the adding wheel cams (924) are safely over upper feet of carry pawls (413).

Adjustment: Bend lower offset in AM upward for later, and downward for earlier release.

Particular attention should be given for the passing of the adding wheel cam (924) over the negative total carry pawl (10413L); if any movement is noticed, the clearance between 924 and 10413L should be checked, it should be 1/32″ and spring 10480¼ should be strengthened. If necessary, the upper foot of 10413L can be lengthened .005″ by peening.

When these tests and adjustments have been made, 9's should be sub-totaled. Adding racks should release as soon as possible after the adding wheels are meshed with the adding sectors. Delayed release will cause a scatter effect. Premature release will cause 924's to drive carry pawls rearward.

SECTOR BAR LOCK (EARLY) AND OTHER CONTROLS ACTUATED FROM MAIN (100) SECTION
(Classes 21 thru 30 with H903 Mechanism) (Plate 76)



Sector Bar Lock (Early) and Other Controls Actuated From the Main (100) Section (Plate 76)

The reason for actuating these mechanisms from the main (100) section is to reduce the load on stud W and the secondary spring (181) action.

The roller of arm U contacting AC through link S rocks lever P. Part AO pivots on lever P, its vertical slot contacting stud AP rocks assembly AH, stud Z in the latter rocks bell-crank Y which through link AF raises latches H. Before the end of the forward stroke, stud W contacts on and swings Y off stud Z, which causes link AF and latches H to restore. Assembly AH rocks A which indexes the total symbol, etc., mechanisms covered by Plate 84.

Tests and Adjustments

Check parts for alignment, free movement and no bind against new offset in carry rack resetting link. Part AO must be positively free with its vertical and horizontal slot on flanged stud AP.

Check link S for bind against carry rack resetting link (D, Plate 34) in automatic total position, with register adding so as to produce carries.

At the beginning of return stroke, resetting link (D, Plate 34) should start to restore and at this time adding racks should lay against

(*Plate 76*)—*Continued*

carry pawls so that when initial carry occurs, adding racks are allowed to drop under carry pawls.

With machine in auto totaling position (on No. 3 roll) check, when AO, Plate 74, has dropped, that spring tension is sufficient to overcome spring on AO, Plate 76, and pulls it to full depth of vertical slot.

Start forward stroke and check dwell on AO, Plate 74, pull off lip of AO, Plate 76, so that hook on AO, Plate 74, may drop over stud W soon enough for a full hold. Continue forward stroke and check when on dwell of AC that latch X drops over stud Z with .010″ to .015″ lead and no more because it is desirable to have as much clearance as possible between stud AP and front edge of vertical slot in AO, Plate 76.

Adjustment: Turn eccentrics Q and AN and then check AO for free movement, the reason for this adjustment is to facilitate the latching and unlatching of AO.

At the end of the forward stroke AC should have slight play over the screw in S.

Adjustment: Remove slight stock from the bottom of register carry resetting link where it contacts on roller U at the end of forward stroke.

It is necessary to strengthen spring on shift lever to overcome extra weight of spring on AO, Plate 74. Shift lever must be absolutely free on all styles.

For Code 903 and Code 1429, register meshing cam A, Plate 21, is set back one tooth of adding racks to permit register total to be taken with carry in crossfooter.

Test: Create carry in last adding bank in lower wheels.

Move register total indexing lever to totaling position. Operate machine. Now note that adding racks restore to normal position before the register is cammed in by the register meshing cam (A, Plate 21); this allows the square stud in the adding racks to be below hook on adding rack guide, preventing loss of carry or possible lock.

With a complete carry in crossfooter, total key interlock (F, Plate 42, Keyboard Book) is bent upward to clear square stud H (Plate 42, Keyboard Book). The only time that F, Plate 42, Keyboard Book, is active is when a key is depressed.

There should be minimum clearance between stud Z and lever Y in order to secure immediate pick up and sufficient movement of latches H.

Adjustment: Clearance is reduced by turning eccentric AE.

There should also be clearance between J and H when latches H are normal.

Adjustment: The curved arm of AF which limits on screw in AH is bent.

Y should not bind on the stud in AM, Plate 75, when machine is near end of forward stroke (total operation).

Adjustment: Stock is removed from Y.

Tail of Y to clear sideframe, if necessary remove stock from tail of Y.

Adding Rack Latch H Release

The release of latch H should be in advance of hooks L. (Plate 75.)

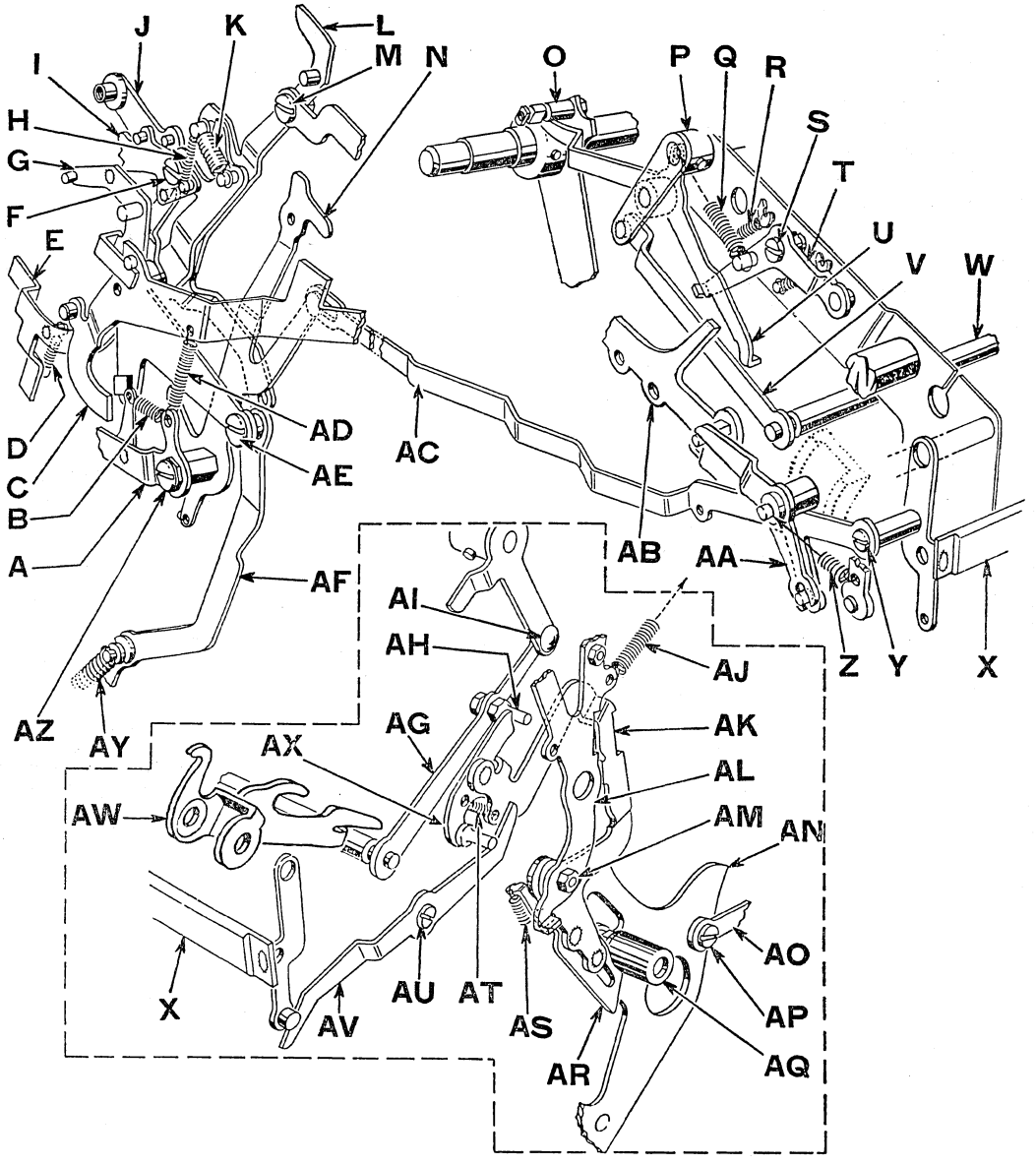
Adjustment: Bend arm of part AF to or from limit stud in AH. Also bail J must not limit latches H. Look for bail J contacting on back of hooks L. If this condition exists, remove stock from back of hook L.

The reason for advance release of latches H is because hooks L, Plate 75, are 1/64″ higher than latches H, resulting in racks being held higher when the adding wheels are meshed which insures that adding wheel cams will clear the feet of carry pawls.

Note: Parts referred to on other than the plate number at the head of the subject, specify that plate number.

SECTOR BAR LOCK MECHANISM AND PRIMARY OPERATING SECTION TO RELEASE ADDING RACKS

(Classes 21 thru 30 with H903 Mechanism) (Plate 77)



Sector Bar Lock Mechanism and Primary Operating Section to Release Adding Racks (Plate 77)

The purpose of this mechanism is to insure definite release of the adding racks before the non-add hooks are released when the crossfooter is meshed. This mechanism also serves as a sector bar lock for both crossfooter and register totals.

Sequence

Crossfooter Control: When the carriage indexes the automatic total and sub-total mechanism, arm E tilts pawl I into the path of the stud in part G. At the beginning of the machine operation, part G swings assembly L, its arm swinging credit balance control N rearward; the latter through link AC rocks bail X, which in turn rocks lever AV to tilt pawl AX in line with stud AH.

Register Control: When the register total indexing lever is placed in total position, part AB rocks lever AA which through link AC rocks bail X to rock lever AV tilting pawl AX in line with stud AH. At the beginning of the machine operation, roller AQ contacting on passby pawl AR swings assembly AK, which through pawl AX pulls shaft assembly P rearward, shaft W raising all adding rack latches AW.

When roller AQ rolls off passby pawl AR, assembly AK restores to normal. The necessary time period for holding the adding rack latches raised, is secured by pawl lever U latching on the step of part T, which holds shaft W rearward. Adding rack latches AW are released when shoulder stud O contacts on pawl lever U, which allows assembly P and latches AW to restore.

This mechanism will replace the sector bar lock mechanism covered by Plate 76.

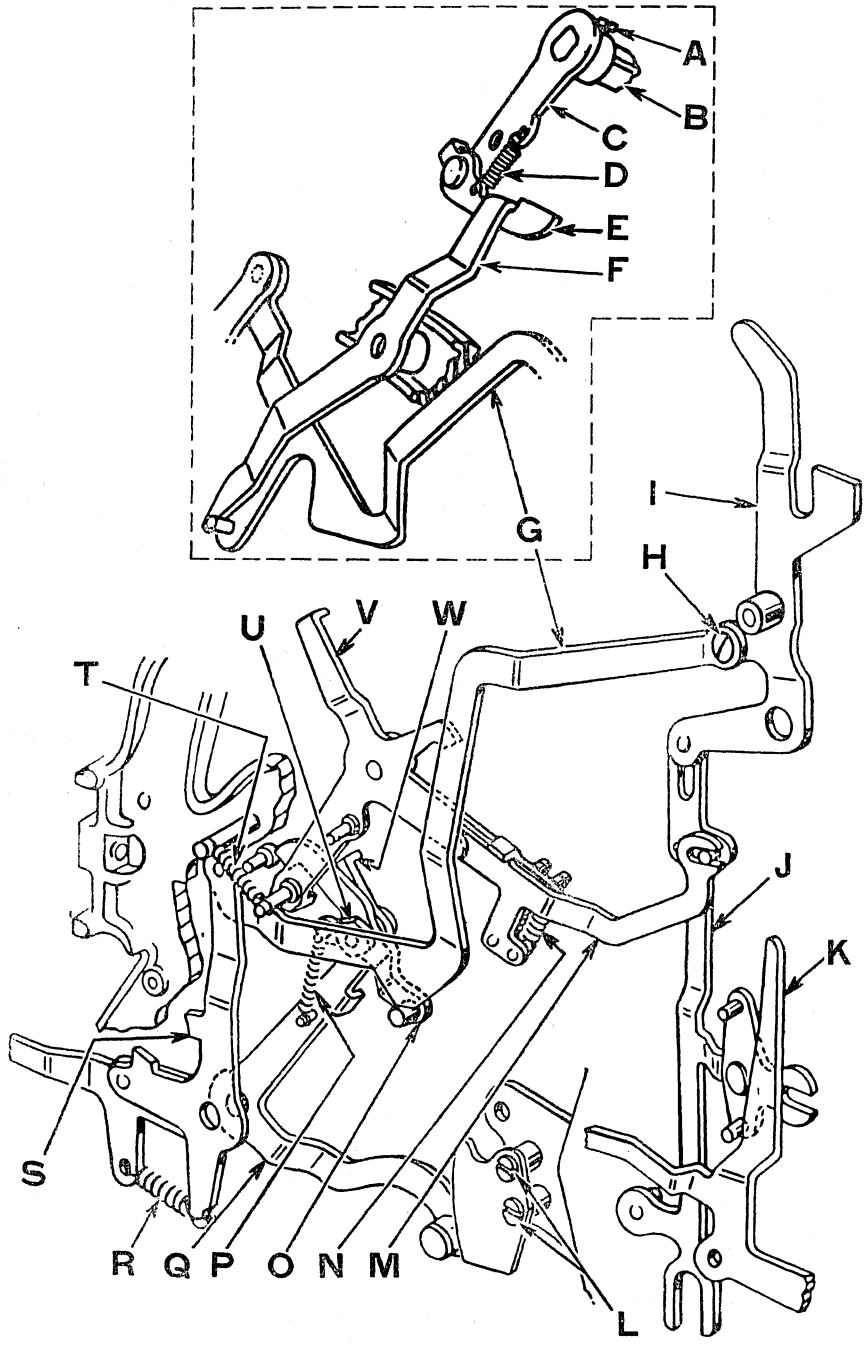
Tests and Adjustments

Pawl AX should have full hold on stud AH when it is indexed by machine operation.

Adjustment: Lever AV is bent.

SUBTRACT MECHANISM JOINTLY INDEXED FROM SUBTRACT LEVER, CREDIT BALANCE, UPPERMOST BAR, CARRIAGE AND MACHINE OPERATION

(Classes 21 thru 30 with H903 Mechanism) (Plate 78)



Subtract Mechanism Jointly Indexed From Subtract Lever, Credit Balance, Uppermost Bar, Carriage and Machine Operation (Plate 78)

The purpose of this mechanism is to reduce the load on the carriage.

Subtract Lever Control

When lever I is pulled to subtract position or vice versa, the cam on part G clears the stud in hook lever O which permits spring P to pull O over the step of assembly V. The machine operation rocks part Q which through hook lever O, rocks assembly V, the latter raises part J to index the subtract shift mechanism.

Carriage Control

The control roll on the subtract lever rocks assembly S which pulls part G to allow hook lever O to locate over the step of assembly V. The operation completes the indexing as explained under subtract lever control.

Credit Balance Control

When a credit balance takes place, hook W drops over the step of assembly V, the machine operation completing the indexing.

Construction

Assembly V now has two springs N which permits the use of a much weaker spring for part 1-60118 No. 2 to insure easier tabulation on close stops. The double spring design also provides more positive movement to the subtract position of the shift lever, especially with thin lever (1410) construction.

The double spring design of V insures positive indexing of the shift lever on credit totals. If springs are too weak, machine will total on spacing stroke, and if too strong, will lock machine on forward stroke when operator holds the shift lever too long in the add position with a credit amount in the crossfooter going into totaling position.

Upper Subtract Bars Control

When upper bars are depressed, arm C through lever F contacting on stud in G, moves the latter to index the subtracting mechanism as explained under subtract lever control.

Tests and Adjustments

Machine Normal: Dwell on G should hook O for 1/32″ clearance over the lip of V.

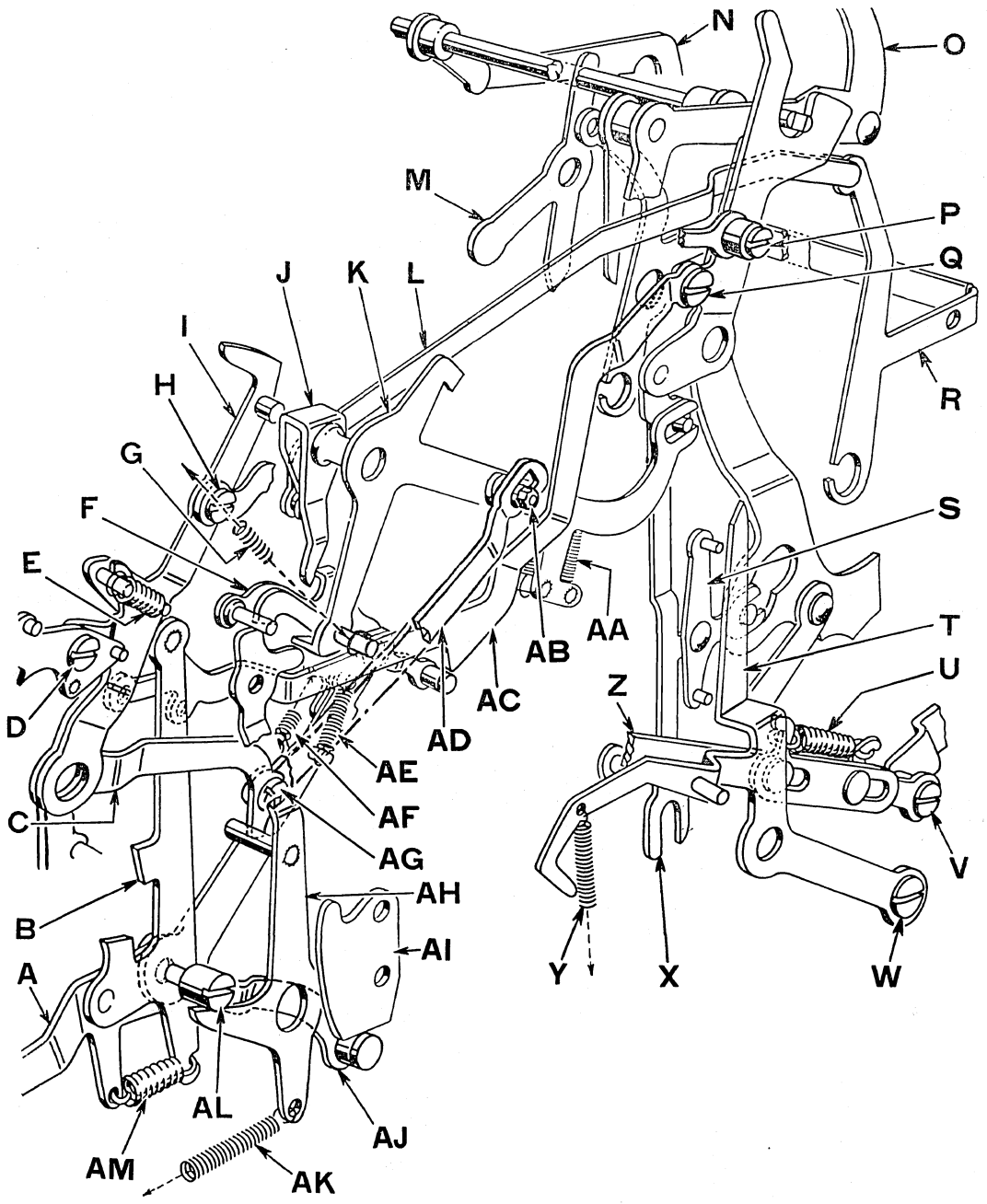
Adjustment: Lengthen central offset in G.

Manually pull subtract lever to subtract position. Hook O should drop over lip of V with 1/32″ clearance.

Adjustment: Bend rear end of V.

Note: All of the later H903 machines are equipped with parts G regardless whether of thin (1410) lever construction.

CREDIT BALANCE INDEXING MECHANISM
(Classes 21 thru 30 with H903 Mechanism) (Plate 79)



Credit Balance Indexing Mechanism (Plate 79)

This mechanism functions through the indexed type of subtract mechanism covered by Plate 78 instead of the direct type of subtract mechanism.

When a credit balance occurs, negative total spear point M moves into the rear pocket of link N, causing link L to pull arm J away from pawl F. When the carriage tabulates into the balance column, the arm of part I cams detent AH rearward to allow pawl F to engage the lip of K. Immediately at the beginning of the machine operation, cam plate AI rocks assembly AJ, which through pawl F and part K indexes the subtract mechanism.

The purpose of link AD is to change the indexed crossfooter sub-total to total. Link AD is actuated by the negative total lock mechanism. The movement of part K, through link AD rocks assembly I to total position. Link AD is used only when the F. O. specifies "Crossfooter Sub-totals Carriage Controlled Change to Crossfooter Totals Carriage Controlled Actuated From Negative Total Lock."

Tests and Adjustments

Bail R should have minimum play up and down and end play. Spear point M should have full movement over the stud in add or subtract position.

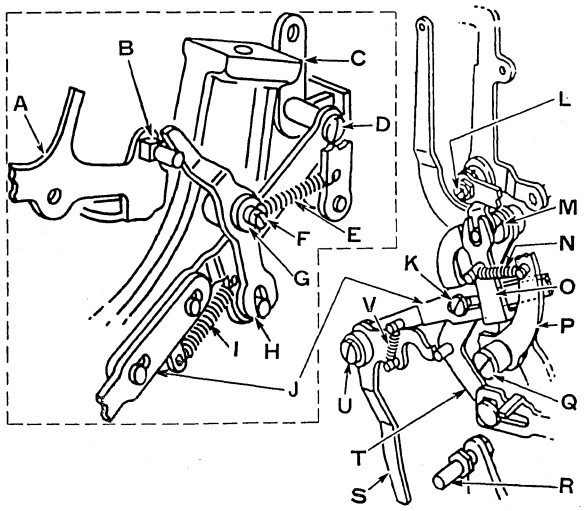
Check clearance for upper foot of negative total lock from collar on shaft, negative total in add position. Part J should hold hook of F for 1/32" clearance over K.

Adjustment: Weave bail R (negative position).

Locate No. 3 roll on totaling position. Arm of I should be adjusted to locate AH sufficiently rearward to allow hook on F to engage lip on K for full hold. Check side hold of F on K.

REGISTER TO TOTAL AND SUB-TOTAL FROM REGISTER TOTAL INDEXING LEVER

(Classes 21 thru 30 with H903 Mechanism) (Plate 80)



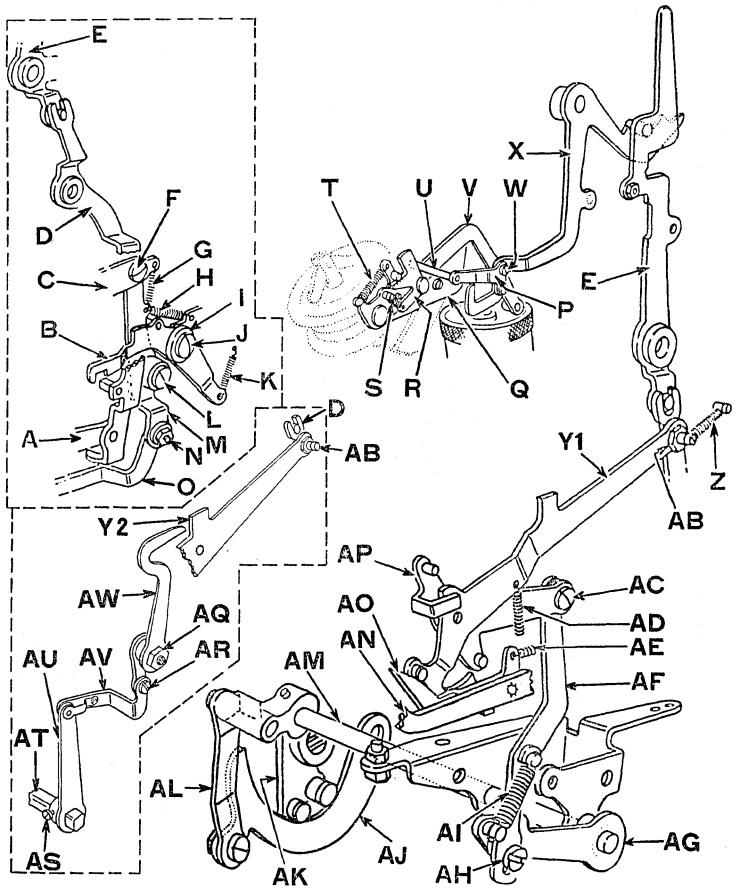
Register to Total and Sub-total From Register Total Indexing Lever (Plate 80)

The purpose of this mechanism is to raise latches H, Plate 76, in machines having the register total indexing lever indexed by carriage and shifted by the drive mechanism (Plate 81).

This mechanism raises latches H, Plate 76, by actuating the sector bar lock mechanism.

When the register total indexing lever moves to sub-total position, stud B in link A rocks lever H which pulls link assembly J rearward rocking bail assembly C to raise latches H (Plate 76).

REGISTER TOTAL INDEXING LEVER INDEXED BY CARRIAGE AND SHIFTED BY DRIVE MECHANISM
(Classes 21 thru 30 with H903 Mechanism) (Plate 81)



Register Total Indexing Lever Indexed by Carriage, Shifted by Drive Mechanism (Plate 81)

This mechanism being jointly indexed by the carriage and the drive mechanism reduces the load on the carriage and thereby secures easier tabulation.

Sequence

When the carriage moves a No. 3 control on register lever in the backplate, part AO through spring AE (connecting AO and AN) and part AN raises the foot of part Y1 in the path of the lower stud in part AP.

When the drive operation starts, arm AK through roller rocks part AJ which through link AL rocks shaft assembly AM. The arm of shaft assembly AM through spring AI and link AF rocks arm AP which swings lever E to total position through part Y1.

With a No. 1 roll on the register lever, part AN raises part Y1 in line with the upper stud in arm AP.

During the drive operation arm AP moves part Y1 in opposite direction which locates lever E in register sub-total position.

Lever E is latched in total or sub-total position by part X. Register total indexing lever E is allowed to restore at the end of the return stroke. The upward movement of the dashpot rocks assembly V, passby pawl R contacting on stud U. Register total indexing lever E is locked during machine operation by latch B. When the total mechanism is indexed by the carriage, part D clears latch B which permits spring K to swing B to latch on the square stud in D thus locking lever E.

When part Y2 has been indexed to sub-total position in H903 machines, it is normalized by the depression of the uppermost bar which rocks part AW through shaft AT, arm AU and link AV. Part AW contacts on the roller on stud in Y2, pulling part Y2 to neutral position. H903 machines which are equipped with this feature have the register total indexing lever locked during the machine operation by the mechanism shown on Plate 53 in the Keyboard Instruction Book.

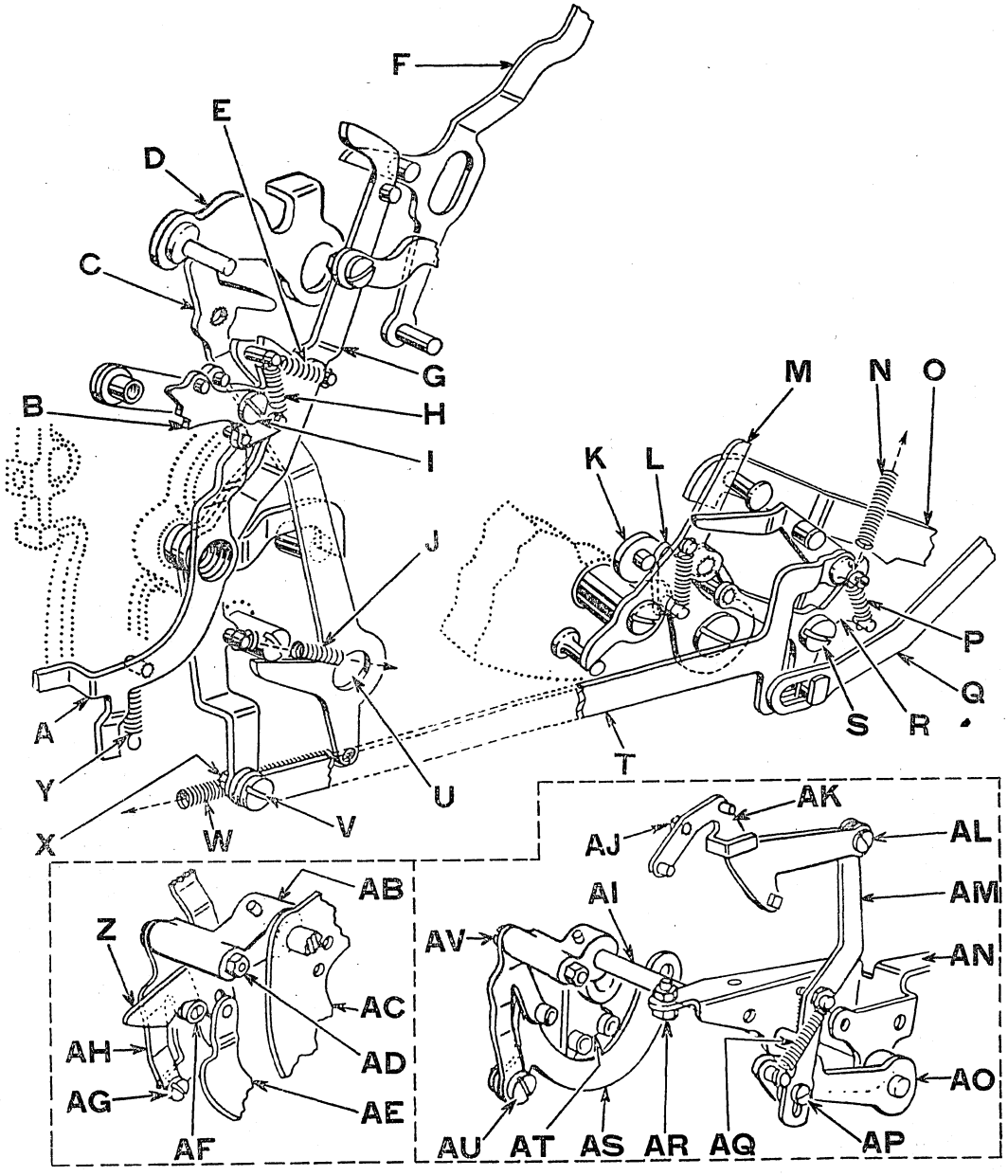
Tests and Adjustments

To increase the lift of part Y1, the eccentric in AN (not shown) is turned.

To equalize the clearance between Y1 and the upper and lower studs in AP, eccentric AB is turned.

CROSSFOOTER TOTAL AND SUB-TOTAL, CARRIAGE CONTROLLED, INDEXED FROM CARRIAGE AND DRIVE TO SECURE EASY TABULATION

(Classes 21 thru 30 with H903 Mechanism) (Plate 82)



Crossfooter Total and Sub-total, Carriage Controlled, Indexed From Carriage and Drive to Secure Easy Tabulation (Plate 82)

The purpose of this mechanism is to reduce the load on the carriage. This mechanism indexes the crossfooter total mechanism and shifts the register total indexing lever.

This subject covers the crossfooter control; the register indexing control being covered by Plate 81.

Sequence

A control roll on the carriage contacting the lever in the backplate rocks lever A, which permits spring H to swing pawl B into

(Plate 82)—Continued

the path of square stud AJ in part AK. Pawl B has two steps, the lower one for indexing crossfooter total, the upper for indexing crossfooter sub-total.

During the machine operation, drive arm assembly AT through its rollers, swings part AS downward, link AH rocks shaft assembly AI, which through link AM rocks part AK. Square stud AJ contacting on one of the steps of pawl B rocks G through spring E, which indexes the crossfooter total and sub-total mechanism.

The total and sub-total mechanism is prevented from returning to normal when drive arm AT completes its movement by the arm on part *Z*.

Tests and Adjustments

There should be minimum play between stud in normalizing lever F and part G.

Adjustment: Eccentric V is turned.

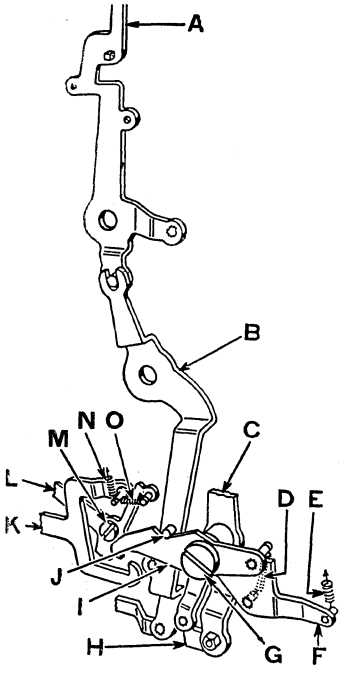
When automatic total is indexed, arm of G should immediately move credit balance control C rearward.

Adjustment: Arm on G is bent.

Operate machine with motor twirler, turning twirler sufficiently to raise stud AJ to full height, hold and check the following: Vertical arm of R should limit on spring stud in part T and spring stud in passby pawl L should limit on M. Pawl B to have half hold on square stud AJ.

Adjustment: Eccentric I is turned.

REGISTER TOTAL INDEXING LEVER AND MACHINE OPERATION TO DISABLE CROSSFOOTER AND REGISTER TOTAL AND SUB-TOTAL MECHANISM CARRIAGE CONTROLLED (Classes 21 thru 30 with H903 Mechanism) (Plate 83)



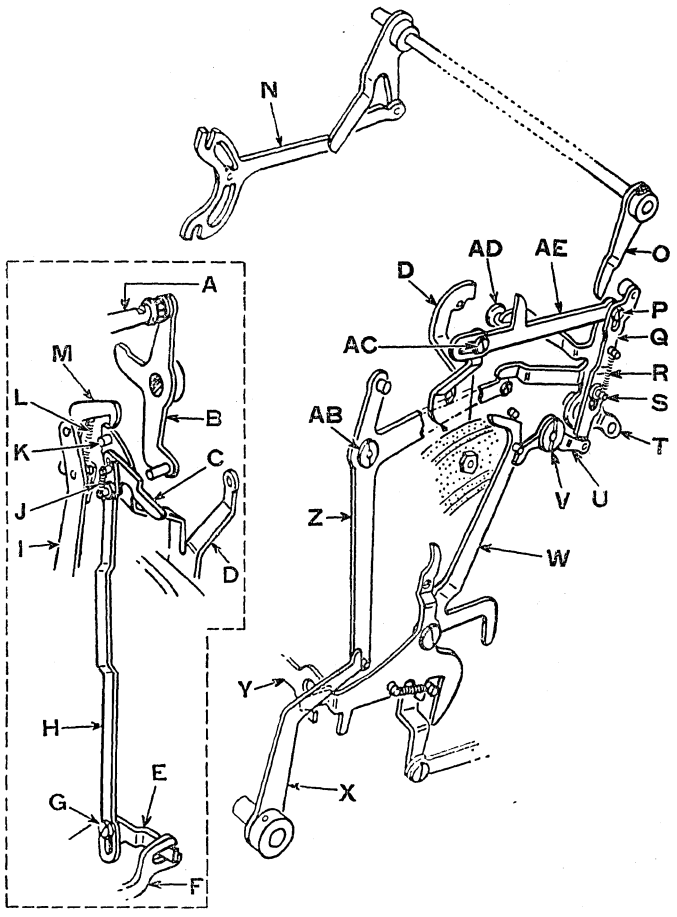
Register Total Indexing Lever and Machine Operation to Disable Crossfooter and Register Total and Sub-total Mechanism Carriage Controlled (Plate 83)

The purpose of this mechanism is to prevent locking by blocking the crossfooter total and sub-total mechanism when register total or other mechanisms are operated.

When the register total indexing lever is shifted to total position, stud J swings latch I over the hook on part K, which prevents indexing of the crossfooter total and sub-total mechanism from carriage control by expanding spring AK (Plate 74). At the beginning of the machine operation, disabling key A (Plate 74) (latched down) the rearward movement of the foot of part C which allows spring E to pull part F and latch I over the hook of part K which blocks the crossfooter total and sub-total mechanism in the event that disabling key A (Plate 74) is released.

When the crossfooter total and sub-total mechanism is indexed by the carriage before the machine operation takes place, part K is moved rearward beyond the range of latch I.

TOTAL SYMBOL, RIBBON SHIFT, NON-ADD AND REPEAT RELEASE MECHANISMS
(Classes 21 thru 30 with H903 Machines) (Plate 84)



Total Symbol, Ribbon Shift, Non-add and Repeat Release Mechanisms (Plate 84)

The above mentioned mechanisms are indexed by part T which is rocked by the main operating section through part AH (Plate 76).

Total Symbol: Slide Q, its roller contacting arm O, moves part N to index the total symbol.

Control roll No. 1 on lever Y raises slide Q to index subtotal.

Control roll No. 3 causes slide Q to assume a lower contact on arm O which indexes the total symbol.

Non-add: The upper arm of part T contacting non-add control mechanism AD disables passby pawl E, Plate 74.

Red Ribbon Control: When the subtract lever is shifted to subtract position, hook M swings over stud K. The movement of arm D raises the ribbon; this subject is covered under Plate 38 in "Printing" Instruction Book.

Repeat Release in Total Column: When the carriage moves into the total column, a roll on register non-add lever F through link H swings part C into the path of the stud in part B.

The movement of part D rocks part B and key restoring shaft A which releases the drive control.

Tests and Adjustments

No. 3 roll on AX or AE (Plate 74). U should not move Q. To adjust, stud in U is raised or lowered.

On the forward stroke, Q should drive O sufficiently to cause the stud in symbol sector to cam off the non-add step of the symbol indexing sector.

Adjustment: Stock is removed from arm O or peened.

Link AE should operate non-add mechanism on the forward stroke without causing bind on the parts involved.

Adjustment: Upper arm of T is raised or lowered.

Lower arm of T used for indexing carriage opening, early carriage return, etc.

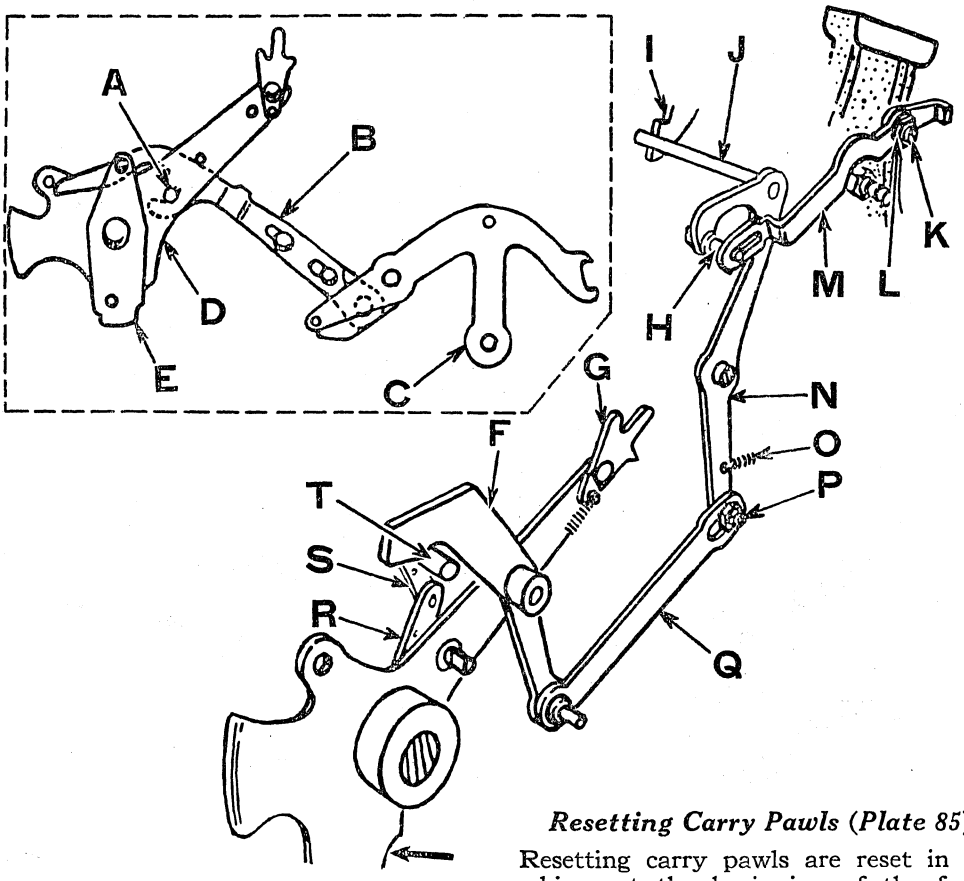
Link AE must be driven sufficiently to raise ribbon for credit totals and also through pawl M, to drive key restoring mechanism sufficiently to drop both 623's.

Adjustment: Eccentric AC is turned.

When automatic totals are repeated, pawl C should have resetting clearance over stud K.

Adjustment: Eccentric AC is turned.

REVERSE PULL-IN AND CARRY PAWL RESETTING MECHANISMS
(Classes 21 thru 30 with H903 Mechanism) (Plate 85)



Reverse Pull-in Mechanisms (Plate 85)

Reverse pull-in arm B used in H903 machines has a step which engages stud A to pull the crossfooter in earlier to insure complete carries when the automatic one is released.

At the end of the forward stroke, the dashpot shaft raises arm B, which causes stud A to seat in the pocket when the machine is normal.

Arm B should move freely, clear R and dashpot. Arm B should be aligned with the hexagon stud in R. The spring on B should slightly expand when the handle is slightly rocked, when no expansion is present, arm B is peened at rear of offset, .005″ to .010″.

With crossfooter in crossfooter non-add subtract position, amount is listed in last adding banks. The adding sectors should be safely in normal position before crossfooter comes into mesh.

Adjustment: The lip of 917 is bumped.

On the return stroke, the crossfooter should be cammed into mesh when leaving part 917, the rear end of B limiting on dashpot should be adjusted to release from first step as soon as crossfooter comes into mesh.

Resetting Carry Pawls (Plate 85)

Resetting carry pawls are reset in H903 machines at the beginning of the forward stroke.

When the machine is normal, stud T is located in the pocket of lever F; during the early part of the forward stroke, flipper S straightens out, rocking lever F, which through link Q, lever N, stud H and shaft J swings detents I forward.

Note: In order to allow the crossfooter to be meshed with the adding racks after the carry pawls are reset and not cause a lock, stock has been removed from the portion of D where the arrow points.

Tests and Adjustments

Carry pawls in carried position, handle is pulled forward opposite No. 8 keys, detents I should reset at this point.

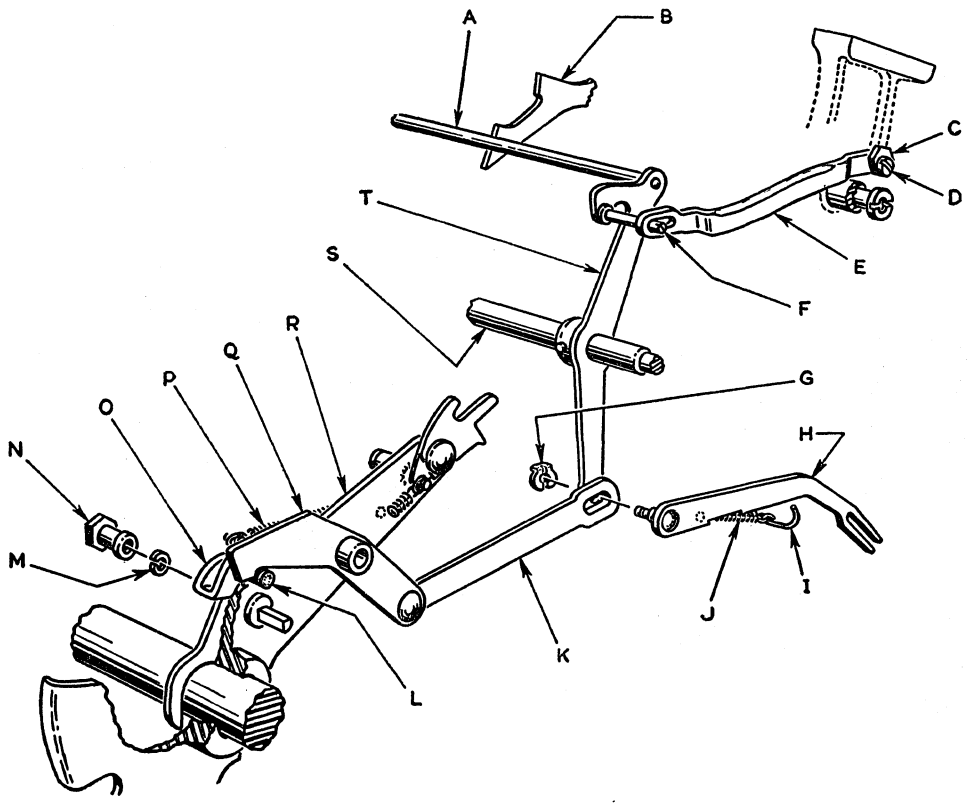
Adjustment: Loosen screw P, turn eccentric as required.

Check part S for 1/32″ excess lead in pocket of F, machine in normal position.

Adjustment: Eccentric L is turned as required.

Check lever F for free movement and hold on roller of S.

CARRY PAWL RESETTING MECHANISM—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 85-1)



Carry Pawl Resetting Mechanism—For No Space Stroke Total Bank Posting Machines (Plate 85-1)

Purpose

To permit the resetting of carry pawls early in the forward machine stroke.

Operation

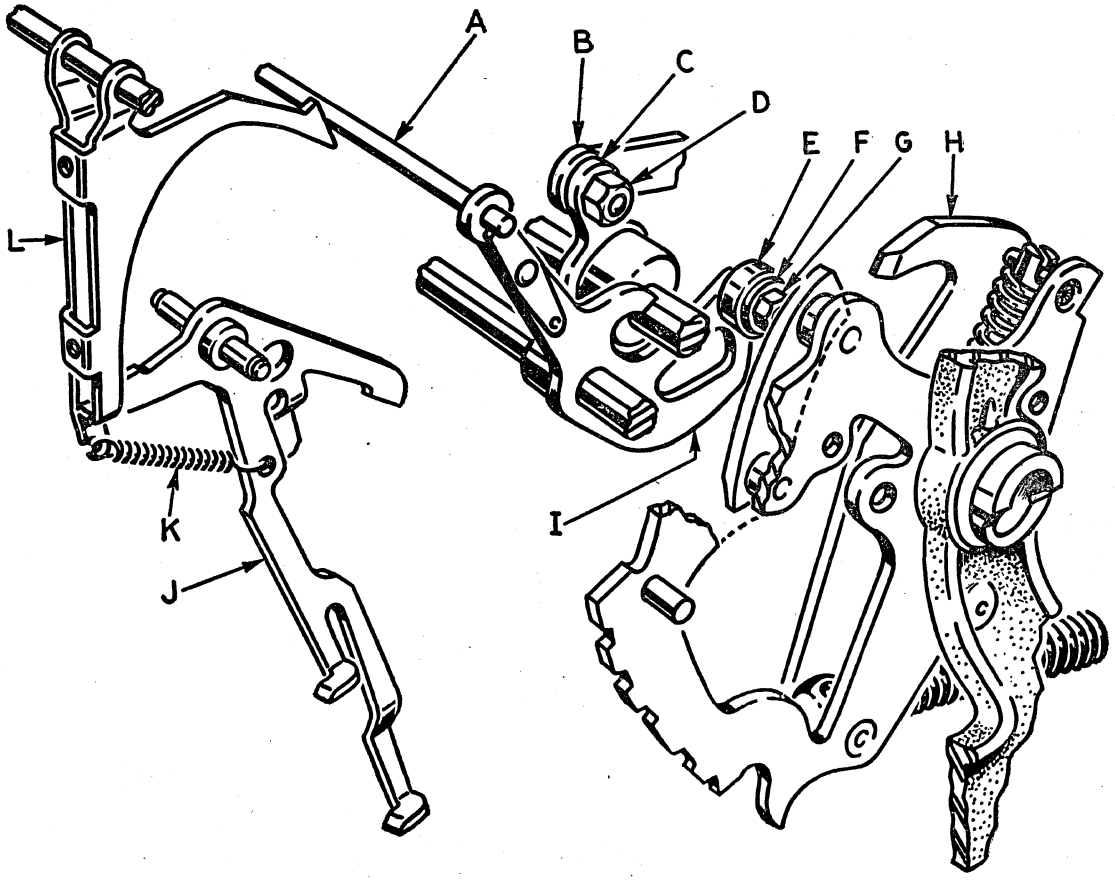
Toggle O is rocked by part R early in the forward machine stroke, causing latches B to move forward through stud L, arm Q, link K, lever T, and shaft A, to permit the resetting of the carry pawls. Later in the forward machine stroke, as toggle O moves over center, arm Q and latches B are allowed to restore to their normal positions.

Adjustment

Stud L should relocate and have 1/32″ excess lead in the pocket of arm Q when the machine is normal.

To adjust, turn eccentric bushing C.

CARRY PAWL RESETTING MECHANISM, IMPROVED (Plate 85-2)



Carry Pawl Resetting Mechanism, Improved (Plate 85-2)

Purpose

To assure a more positive reset of the cross-footer carry pawls.

Operation

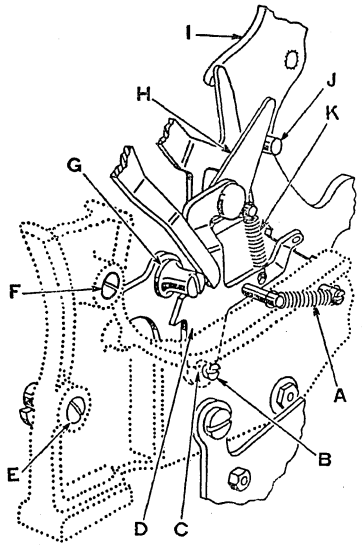
During the forward machine stroke, cam H contacts roller E, rocking part I. The latter, through shaft A, swings latches L forward to permit the carry pawls J to reset through the tension of springs K.

Mr M R Lovejoy
Buffalo N Y Branch 10-5

DETENT TO HOLD CROSSFOOTER IN MESH UNTIL THE RETURN STROKE IS COMPLETED

(Classes 21 thru 30 with H903 Mechanism) (Plate 86)

(For H903 Machines of 10 or more columns adding capacity)



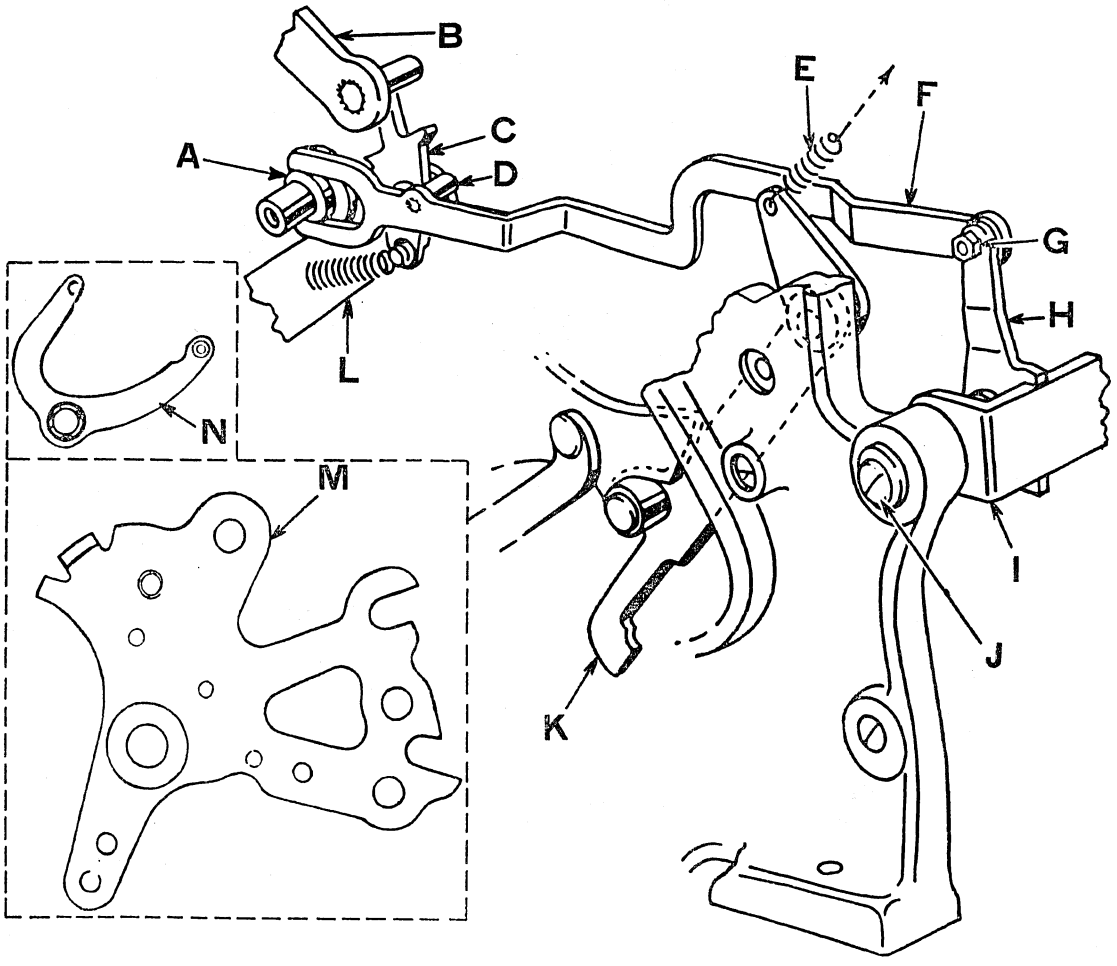
Detent to Hold Crossfooter in Mesh Until the Return Stroke is Completed (Plate 86)

The purpose of this detent is to prevent loss of carries due to pressure of the carry pawls backing out the crossfooter. At the beginning of and throughout the return stroke stud J contacts on passby pawl H and swings the other member D under stud G which holds the crossfooter in position until stud J moves off passby pawl H, which allows spring A to pull D from stud G.

Member D pivots on bushing C which is held by screw B.

To install the detent assembly the side frame is drilled using template (Kit 400 No. 4) located on the side frame in screws E and F positions, these screws are removed, the pilot stud in the detent seats in F screw hole. The template is fastened with screw E. The hole is drilled with a No. 31 drill and .125 reamer. The side frame is faced off for screw B with .250 tool having a ⅛ pilot.

CROSSFOOTER MESHING PAWL DISABLED BY SAFEGUARD SYMBOL MECHANISM
(Classes 21 thru 30 with H903 Mechanism) (Plate 87)



Crossfooter Meshing Pawl Disabled by Safeguard Symbol Mechanism (Plate 87)

The purpose of this mechanism is to prevent over addition due to hard and hestitating crossfooter mesh when the carriage has indexed the safeguard symbol printing mechanism in combination with the carriage controlled total mechanism.

Sequence

Safeguard bail I through arm H and link F tilts passby pawl C below the stud in part B, which disables crossfooter meshing and thereby prevents pulling off safeguard hooks from the studs in the adding racks and pushing them back.

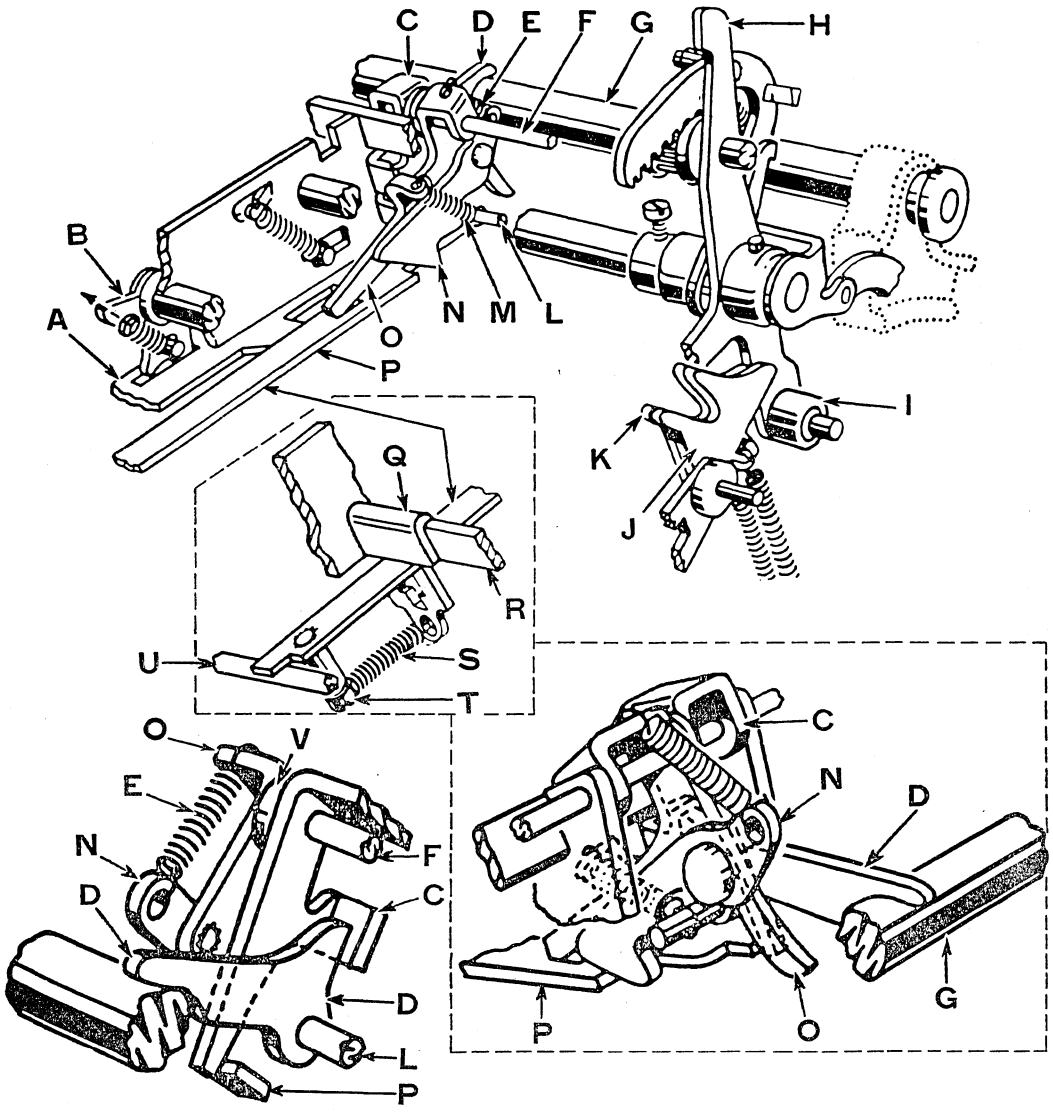
Tests and Adjustments

Passby pawl C should not be tilted more than actually required to clear the stud in B.

Adjustment: Eccentric G is turned.

INTERLOCK TO PREVENT DEPRESSION OF KEYS ON KEYBOARD DURING AN OPERATION BEFORE TAKING AUTOMATIC CROSSFOOTER TOTALS, CARRIAGE CONTROLLED

(Classes 22 thru 30 with H903 Mechanism) (Plate 88)



Interlock to Prevent Depression of Keys on Keyboard During an Operation Before Taking Automatic Crossfooter Totals (Cge. Controlled) (Plate 88)

This mechanism prevents the printing of an incorrect total by keyboard manipulation, when the regular keyboard lock is disabled by such misoperation; the regular keyboard lock being released by the dropping of the short 623. There are two sets of this mechanism used in a machine to prevent weave of the 402 B shaft and thereby lose the effectiveness of the lock.

Sequence

On the return stroke, part K contacts roller I, rocking shaft G which contacts and raises pawl D, its forward end rocking part C. This moves slide P with stud T forward, contacting against shaft U and restoring the keys through parts A and B, should the operator ride them. Latch O drops in and locks slide P in a forward position. The keys are then blocked against depression.

(Plate 88)—Continued

Slide P remains latched until the last repeat print operation, when pawl J is released and restores, rocking shaft G, which contacts and raises latch O out of slot in slide P. Part N which is riveted onto O, latches over shaft L, retaining O in a raised position. This permits slide P to restore under the tension of spring S. The cut-out in slide P contacts against pawl N, camming same off of shaft L permitting O to rest on slide P.

Tests and Adjustments

Slide P should have approximately .015 lead over latch O, both latches dropping in simultaneously.

The lip on part C is adjusted to obtain this.

Pawl N should latch in over shaft L and retain O in a raised position over slide P. The tension of spring E must not be too strong as it may result in the latching up of pawl N when the short 623 restores, and rocks shaft G.

Pawl N should have a full hold on step of slide P and should not be released until cut-out in slide P is safely past end of latch O.

With both slides P latched, and nines accumulated in the crossfooter, the carriage is then placed in a total position and the machine operated. Pressure is exerted on each row of keys from one to eight observing the clearance between the individual 270 wires and 610's as they pass one another.

The position of stud T in slide P is so placed to give this clearance, however, should it become necessary to replace the 270 wires, it must be checked.

Latch O must align centrally with the slot in slide P.

When installing this mechanism in the field, stock must be removed from the 411's at the point of contact with shaft U, in order to relieve a possible bind between shaft G and pawl D, when the short 623 (K) restores, with carries in the crossfooter. With the 411's tripped off there should be no outward movement when slide P is actuated by pawl K.

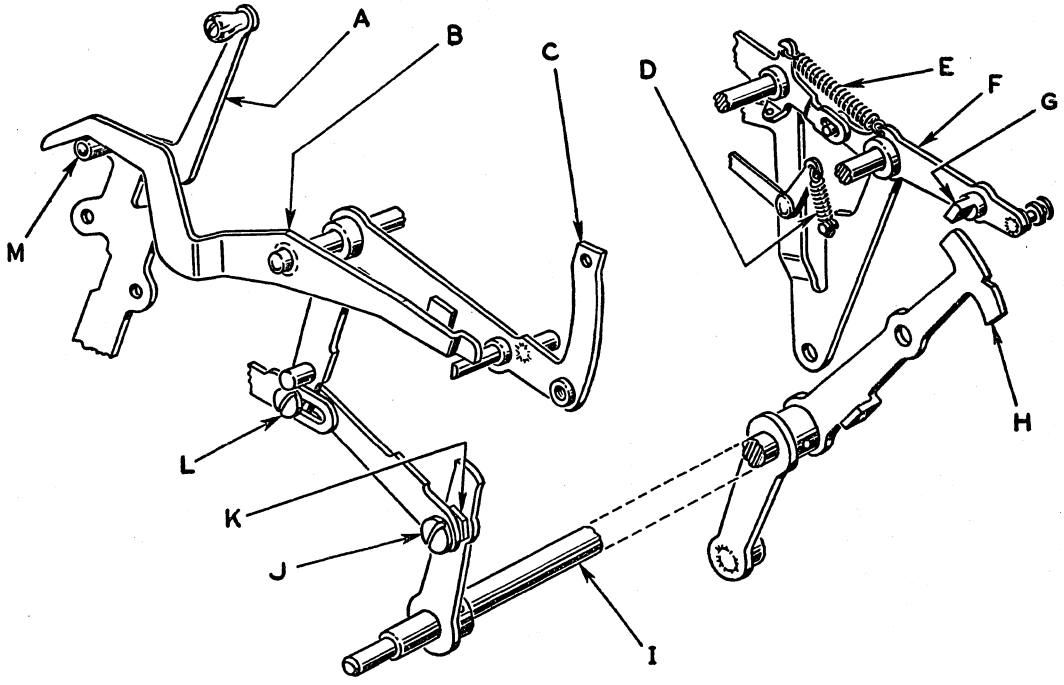
All of the play in the error keystem must be removed by bending its lower projection rearward.

Guide Q must be placed so that the spring hole is to the rear of the tie strip.

The use of this mechanism necessitates the complete depression of the error keystem when correcting keyboard set ups. Failure to do so results in a locked keyboard, requiring a second complete depression of the error key.

Check the adjustment of the 64101 interlock to avoid the possibility of blocking the operation of the manual lever during an automatic register total operation when riding the numeral keys. With keys depressed on the keyboard the 64101 should have from .030 to .035 hold on the 62511 stud. This will provide the necessary clearance when carries are set up in the crossfooter.

INTERLOCK TO PREVENT INDEXING OF MOTOR BARS CONTROLLED THROUGH THE REGISTER TOTAL INDEXING LEVER—FOR NO SPACE STROKE TOTAL BANK POSTING MACHINES (Plate 88-1)



Interlock to Prevent Indexing of Motor Bars Controlled Through the Register Total Indexing Lever—For No Space Stroke Total Bank Posting Machines (Plate 88-1)

Operation

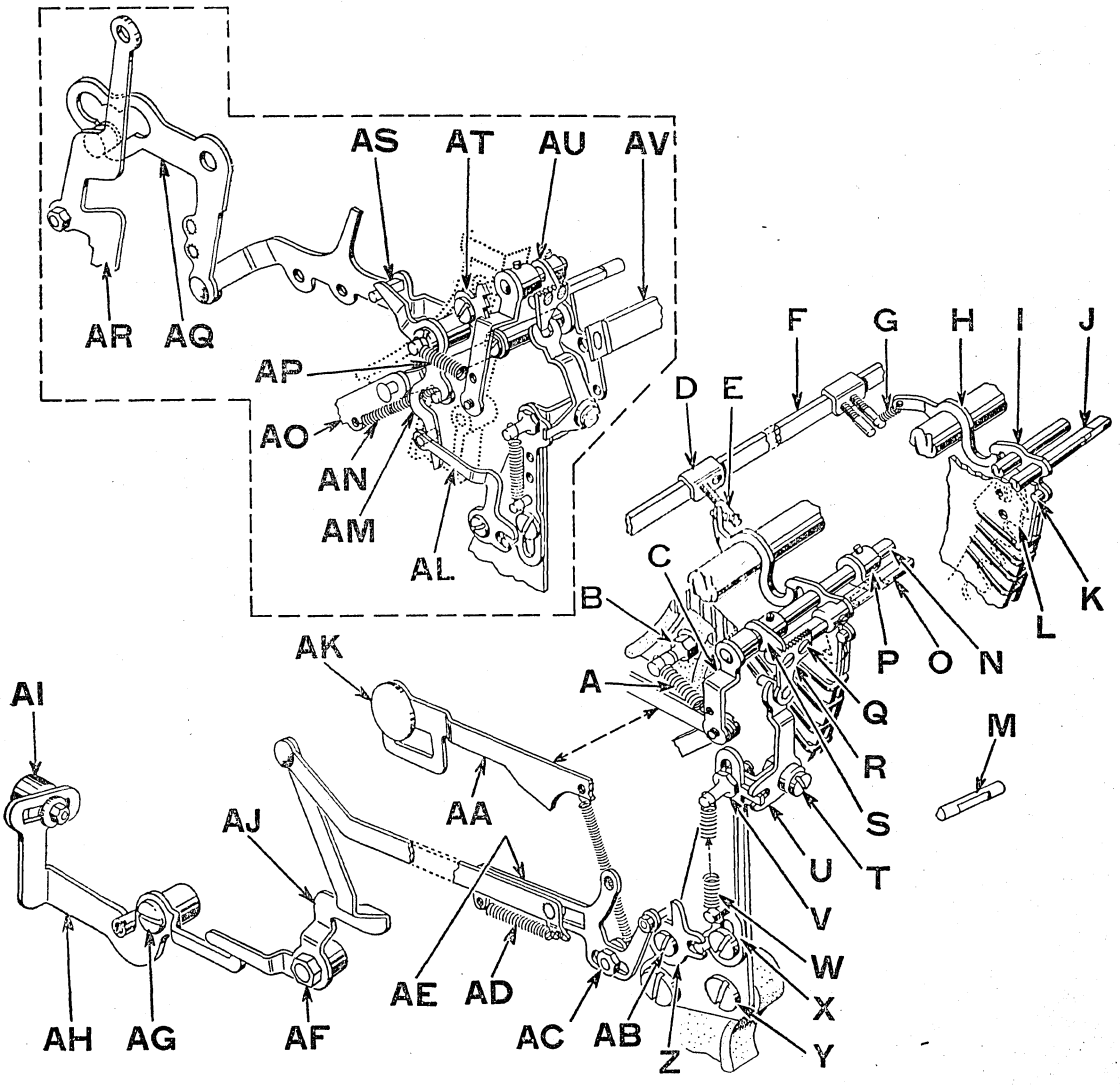
When register total indexing lever A is shifted to total or sub-total position, roller M rocks lever B to partially lower total key C, thereby swinging arm H under stud G to block depression of the motor bars. The blocking of the motor bars in this manner serves to insure the operator's depression of the total or sub-total key when taking register totals.

Adjustment

Arm H should have a safe hold under stud G when register total indexing lever A is shifted to total or sub-total position; and roller M should have clearance under lever B when the register total indexing lever is in its normal position.

To adjust, bend lever B.

ADDING AND PRINTING—CARRIAGE AND REGISTER TOTAL INDEXING LEVER CONTROLLED
(Classes 21 thru 30 with H903 Mechanisms) (Plate 89)



Adding and Printing—Carriage Controlled (Plate 89)

This mechanism is similar to the standard adding and printing control, however, it is modified to permit the adding rack control essential to Env. 903 construction.

In some machines only a portion of the columns are controlled to add or non-add; in these machines shaft J is cut straight through without the ends contacting. In other machines groups of columns alternate adding and non-adding; in these machines shaft J is dovetailed to permit hooks I on the shaft portion to move out and others to remain under adding racks L. Alternating adding and non-adding is secured by different size control rolls.

Hooks I are restored by springs G swinging levers H, the latter contact on the horizontal arms of hooks I. Levers H are used on each end of sections of shaft J.

Hooks I are free on shaft N and are carried in and out by arms P which are pinned on shaft N. Arms P contact on shaft J, the latter passing through hooks I. Shaft J (or

(Plate 89)—Continued

O) is split in two parts, one part has cut-outs M, which clear arms P. The cut-outs are indexed by carriage control to locate in line with arms P so that when shaft N is turned, arms P push that portion of shaft J having no cut-outs moving hooks I outward. Arms P in line with the cut-outs cannot contact shaft J and for that reason the hooks remain under adding racks preventing printing and adding.

Sequence

A skid contacting on roller AI rocks lever AH, the latter through assembly AJ, bell-crank Z, slide X rocks forked bell-crank U which pulls shaft J toward the left by its fork meshing with pin on R. During the machine operation, stud AK pushes link AA and arm C forward which swings hooks I to clear adding racks L.

Register Total Indexing Lever to Control Adding and Printing and Totaling

The purpose of this mechanism is to normalize or index adding and printing mechanism independently of the carriage control.

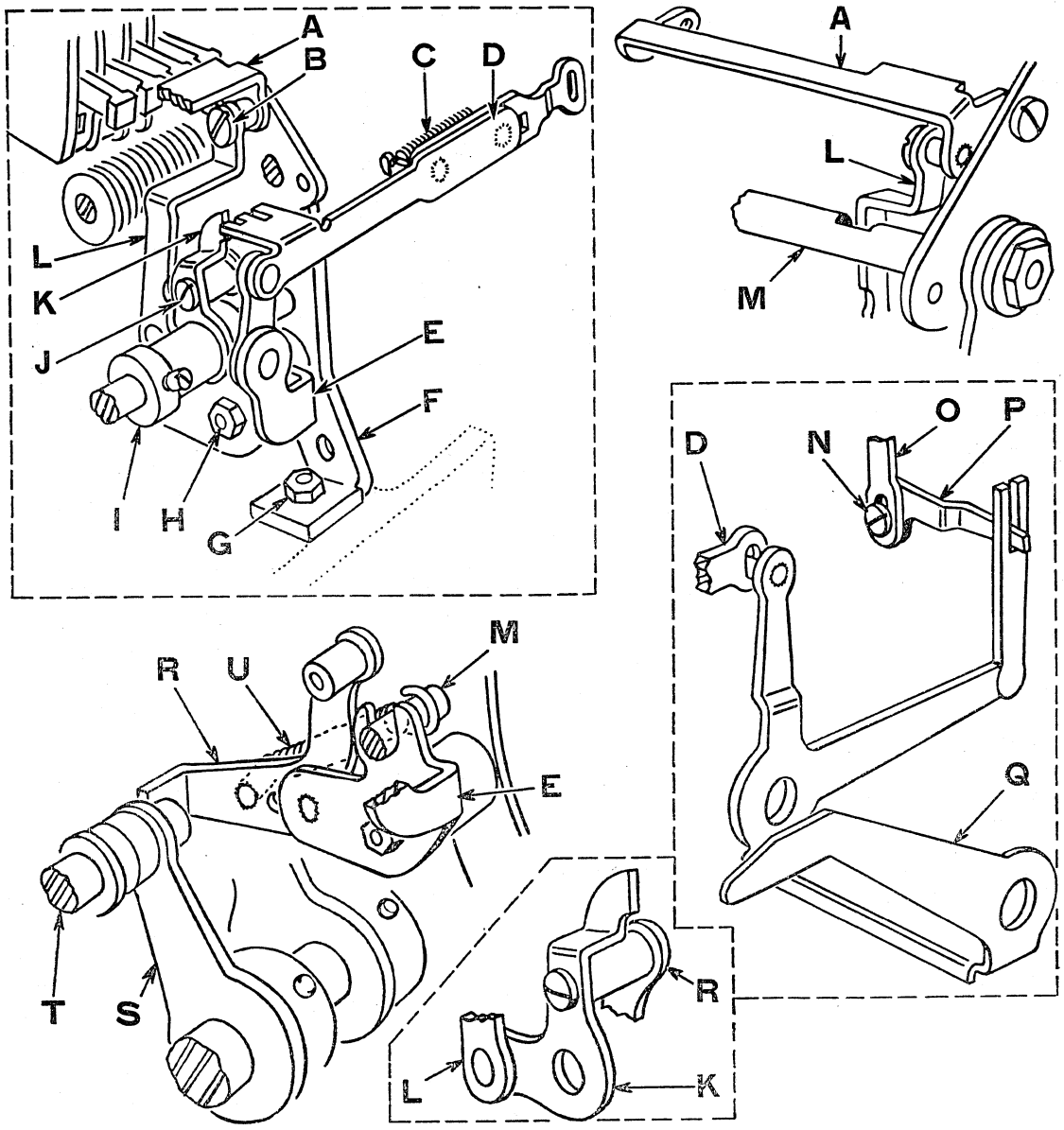
When register total indexing lever AR is moved to total position, cam linkage AQ, through stud AS rocks lever AM, which indexes adding or non-adding through bell-crank AL, slide X and bell-crank U shifting shaft J. Lever AM also raises the adding rack release latches H (Plate 76).

Tests and Adjustments

Segment AT is set to allow passing clearance for adding rack L indicated by play between L and I. Cut-outs in shaft J are aligned to arm P by bending front arm of lever AH.

Knife AU should have minimum clearance from pockets in R when the machine is normal.

ADDING AND PRINTING MECHANISM CARRIAGE CONTROLLED
(for Early H903 Machines) (Plate 90)



Adding and Printing Mechanism Carriage Controlled (for early H903 Machines) (Plate 90)

The purpose of this mechanism is to prevent printing and adding in machines having carriage controlled totaling and subtotaling.

(Plate 90)—Continued

Sequence

When the carriage moves a control roll on part Q, flexible part D is moved locating its deeper slot in line with part K.

During the machine operation as shaft T of the main section moves rearward, permitting spring U to pull part R rearward rocking part L which swings bail A over the type to block the upward movement of the type sectors, thereby preventing printing and adding.

When the control roll is off part Q, the short slot of part D is in line with part K. During the machine operation part K enters the short slot which locks part D.

Tests and Adjustments

Bail A should have about 1/32″ hold on the top of the 9 type to insure that bail A will be cammed backward in the event that bail A should locate under the 9 type.

Adjustment: The offset in part L is increased or decreased as required.

BRACE FOR STUD 68503AY
(Classes 21 thru 30 with H903 Mechanism) (Plate 91)

Brace for Stud 68503AY (Classes 21 thru 30 with H903 Mechanism) (Plate 91)

Machines having the H903 mechanism include brace 68119, on the end of the 800 shaft to support both sides of stud 68503A No. 2 and insure retention of the stud alignment.

This brace cannot be installed on prior H903 machines; these require brace E as illustrated. To install:

Replace 68503A stud with B, which is 1/16″ longer. For this stud the 800 section will have to be drilled (No. 19) and tapped 3/16 x 40 if it does not have a 3/16 x 40 thread.

Center and drill a .136 (No. 29 drill) pilot hole in left end of the 800 shaft.

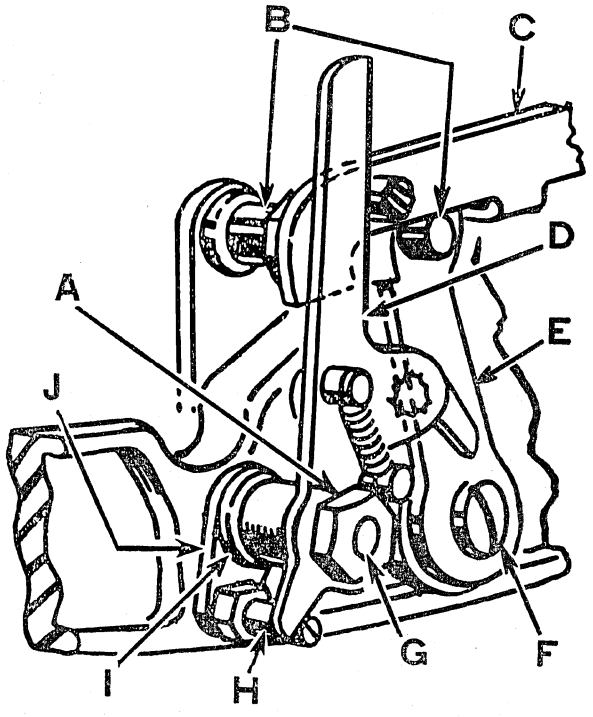
Face off 800 shaft to within 1/32″ of side frame with a 3/8 counterboring tool.

Counterbore 800 shaft slightly more than 1/64″ deep with a 9/32″ counterbore.

Tap out hole with 5/32 x 40 tap.

Place brace E in position, tighten screw F, then with a countersunk punch, tap brace until 800 shaft is marked deep enough to locate the corrugating tool. The brace should then be removed and the corrugating finished with the tool. This is very important as the relationship between the corrugating on the shaft and the stud must be exactly the same as the brace being installed, otherwise, it will not line up with the stud.

Parts 1-200131½ and 200623 are replaced by G, H, D, J, and A. When assembling



these parts, place washer 3826½ Spec. between small plate J and arm D that actuates C. These parts are shown in the assembly on Plate 79.

The pull-in-arm 1-209131A is replaced by C on early Style H903 only.

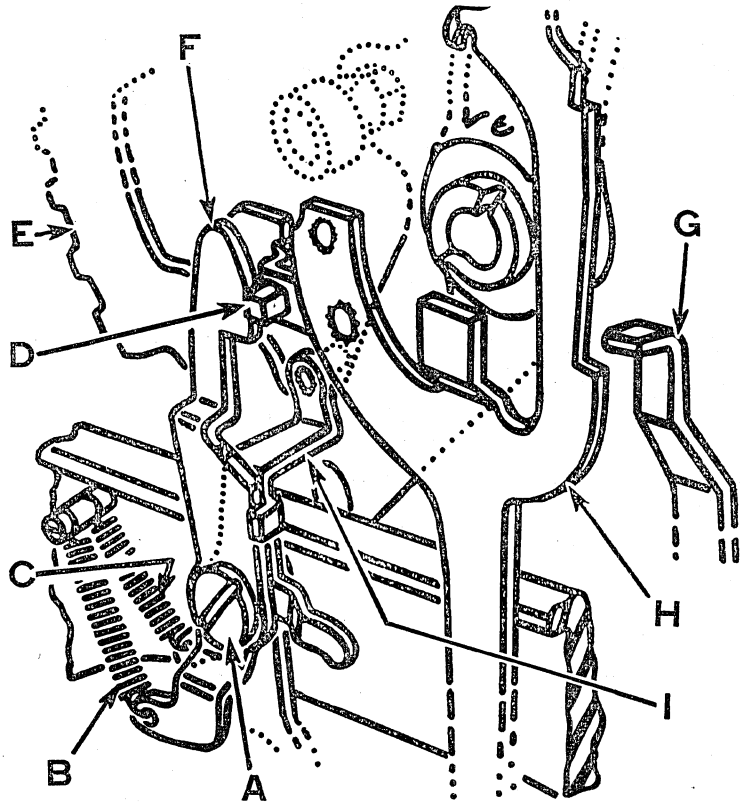
MECHANISM TO DELAY CLUTCH RELEASE FOR CARRIAGE CONTROLLED TOTAL OPERATION
(Classes 21 thru 30 with H903 Mechanism) (Plate 92)

Mechanism to Delay Clutch Release for Carriage Controlled Total Operation (Plate 92)

The purpose of this mechanism is to delay the drive operation when the carriage tabulates into the next column, in order to insure completion of the carries.

When segment E moves rearward, release arm I follows, which allows spring B to swing detent F over square stud D to block upward movement of H.

On the return stroke, H is prevented moving upward until segment E through release arm I removes detent F off stud D. The tension of spring B causes detent F to retard the upward movement of H.



Counters—Dial Control Mechanisms (Plate 93)

The purpose of these mechanisms is to index and actuate item counters and to prevent counting when no adding keys are set up on the keyboard.

Indexing Item Counters

Item counters are held inoperative in two ways by segments AB and detents G which block the downward movement of slide AC.

When more than one item counter is used, the active one is selected by imparting a differential movement to segments AB in order to align a cut-out of segment AB in the path of stud AA which allows spring AD to move slide AC downward to index the item counter.

Segments AB are controlled to select item counters from the following sources:

Carriage—to count listed amounts.

Register selection keys to count items added in registers and other keys not used for adding.

Carriage opening mechanism.

Carriage return mechanism.

Total and sub-total keys.

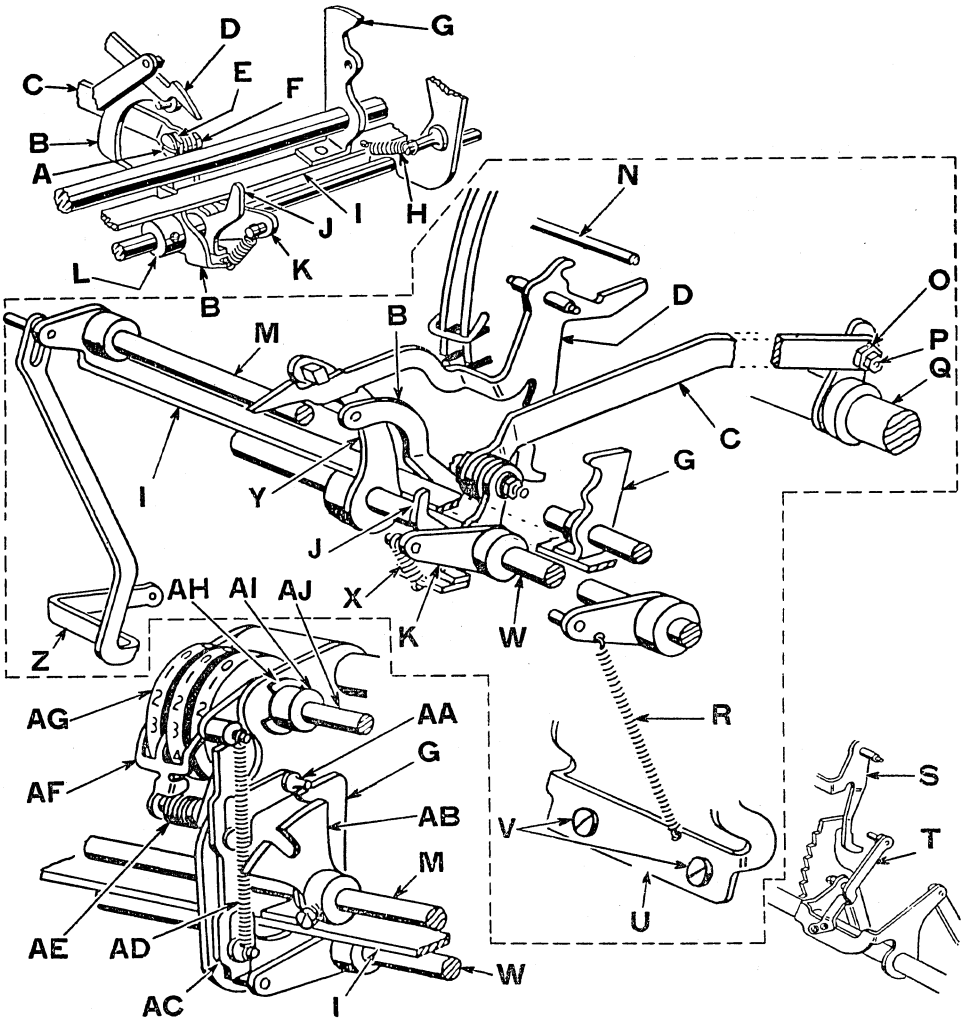
Detent G

Detents G are used to block slide AC when amounts are non-added in registers, in some cases detents G are used for the opposite effect.

Keyboard Control

Item counter operation without items set up on the keyboard is prevented by blocking actuating shaft W. When the machine is operated with the item counter indexed with no item set up on the keyboard, shaft N will block actuating shaft W through part D holding arm Y. However, when an item is set up on the keyboard, shaft N moving rearward allows part D to clear the square stud in arm Y so that spring R can rock shaft assembly W and spring AD can pull slide AC downward to locate pawl AF below the next ratchet tooth of AG. This control through

COUNTERS—DIAL CONTROL MECHANISMS
(Classes 20 thru 30, Style 17) (Plate 93)



shaft N superseded the previous method of using detents G connected with a link to shaft N. The purpose of the new control is to prevent increasing the key depression.

Actuating Item Counters

On the forward stroke assembly Q through link C rocks part J which permits spring R to rock actuating shaft assembly W which allows spring AD to pull slide AC downward locating pawl AF below the next item counter ratchet tooth.

Note: Shaft assembly W in register machines is held up until registers are meshed. This control is covered by Plate 99.

On the return stroke the lug on part J contacts on arm K restoring shaft assembly W which raises slide AD causing pawl AF to turn item counter dial AG.

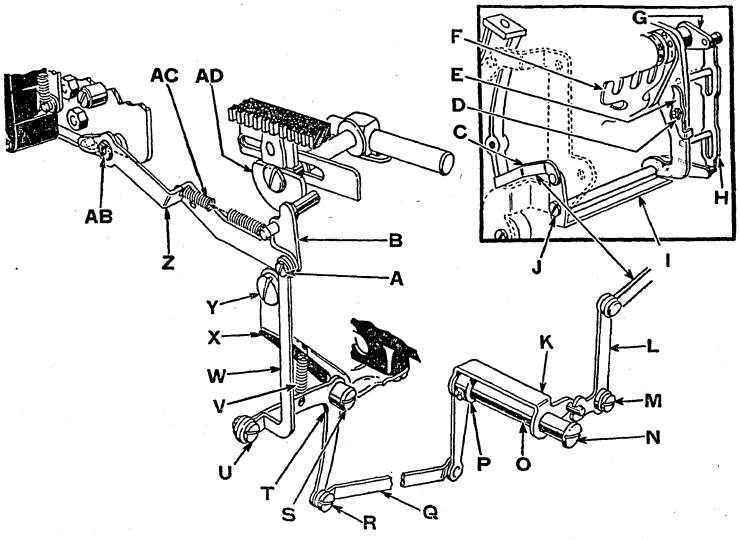
The purpose of arm B is to raise the front of part D in order for D to clear shaft N.

Tests and Adjustments

The correct amount of actuating movement is secured by turning eccentrics O or E or turning both. Segments AB when indexed should have the cut-outs align to clear stud AA.

The set screws in AB are loosened and AA located as required.

COUNTERS—DIAL ADVANCED FROM CARRIAGE RETURNS (Classes 11 thru 16, 20 thru 30) (without Multiple Skip Return) (Plate 94)



Counters—Dial Advanced From Carriage Returns (Classes 11 thru 16 and 20 thru 30) (Without Multiple Skip Return) (Plate 94)

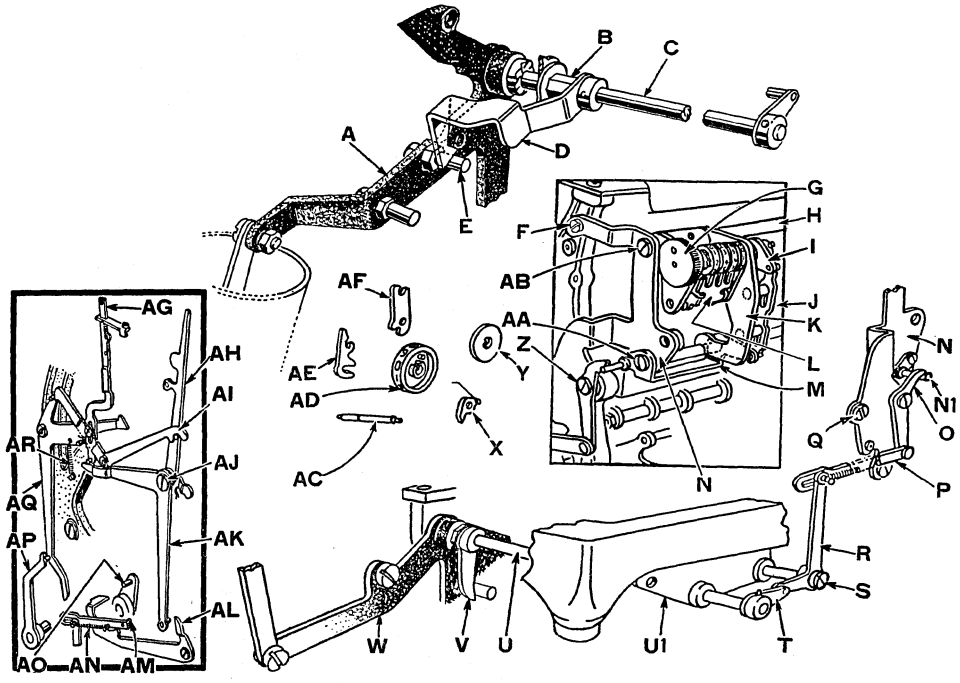
This mechanism actuates the counter when the carriage is returned to the first position as the M. R. C. clutch is disengaged.

The carriage tabulation moves skid AD over passby pawl B and engages the M. R. C. clutch. When the carriage is being returned, skid AD contacting the stud in B swings lever Z downward, which through link W, bell-crank T, link Q, bell-cranks K, L and link C, rocks bail I to raise slotted link H, which swings pawl arm G upwards, pawl F turning the counter dial.

Tests and Adjustments

The purpose of limit stop E is to prevent the counter operating pawl engaging more than one tooth. Limit stop E is adjusted by turning eccentric nut D. The upward movement of assembly H should not be so great as to cause detent X (Plate 95) to have excessive lead.

COUNTERS—DIAL ADVANCED FROM CARRIAGE OPENINGS—DISABLING KEY (Plate 95)



Counters—Dial Advanced From Carriage Openings—Disabling Key (Plate 95)

This counter is actuated by the carriage opening mechanism and disabled by key AG.

Sequence: When the carriage opens, arm D or arm V is raised, which turns shaft C or shaft U and through arm T, bell-crank R, link P and lever O, bail M is swung to raise link J which actuates the counter through arm I.

When disabling key AG is depressed, bell-crank AK swings lever AL to latch on stud AM and thereby blocks link P. Arm D is used instead of arm V in machines having multiple skip and return mechanism.

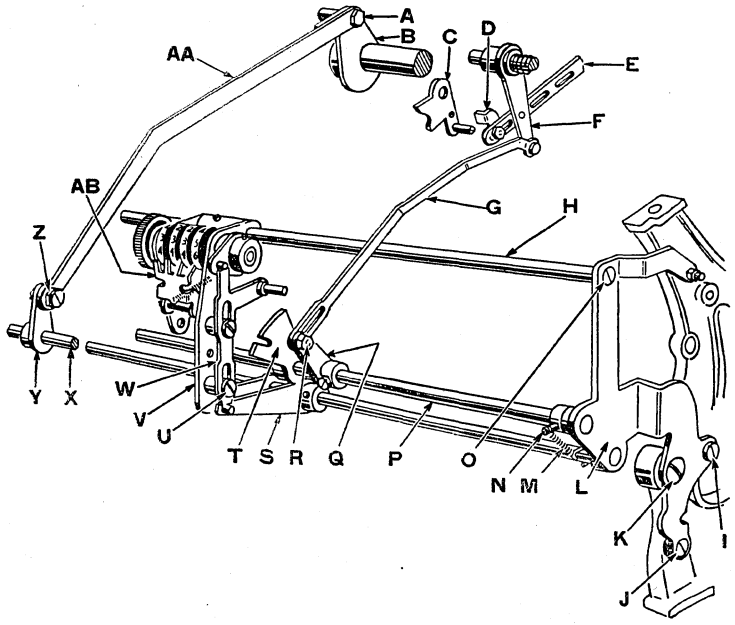
Tests and Adjustments

All play between arm V or D and bail M should be reduced to minimum in order to secure sufficient driving movement.

Pawl L should have slight lead over the next tooth. Detent X should click slightly before part J comes to rest.

Adjustment: Eccentric screw E is turned.

COUNTERS—DIAL ADVANCED FROM SELECTED KEY (Plate 96)



Counters—Dial Advanced From Selected Key (Plate 96)

The purpose of this mechanism is to index the counter when a certain key in a column is depressed.

Sequence and Construction

The counters are actuated by machine operation when the selected key has been depressed. When the selected key is depressed, key lever C is swung, which by contacting on part D, moves slide E rearward. Arm F (on E) through link G, rocks shaft assembly P to locate the slot in segment T in line with the stud in part W.

During the machine operation, link AA swings arms Y and S, part W follows. On the return stroke, arm S raises part W to actuate the counter.

Note: Slide E has a series of slots for part D which permits the counters to be indexed from any key in the column.

One or more counters controlled from an equal number of keys in the same column can be had. When one or more keys in one column are used, an equal number of parts D are used.

When more than one counter is used, an equal number of segments T are used, however, the slots in the segments are in different positions.

Tests and Adjustments

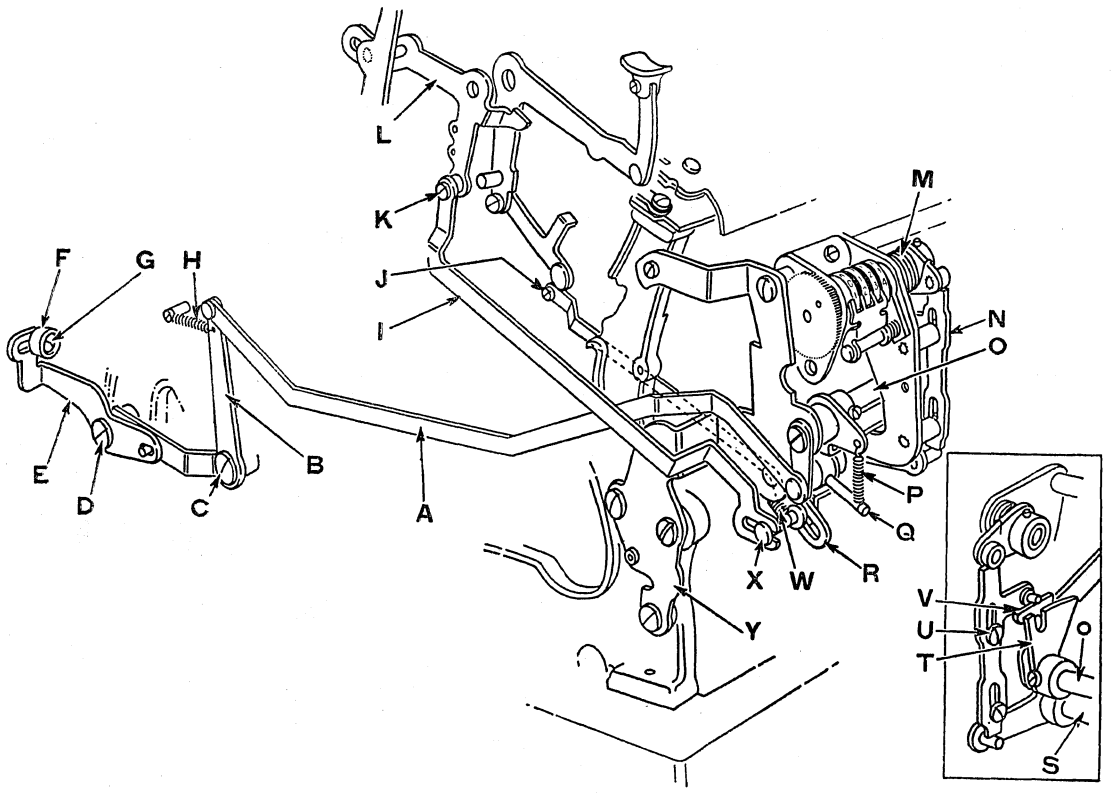
The correct lift of the counter arm is secured by turning eccentric Z.

Part D of the first key is set 1/32″ from the end of the slot in E. The key is depressed and the slot in segment T aligned with the stud in part W by loosening the screw in arm Q and locating segment T. For other keys, part D is located by loosening the screw and shifting part D.

Eccentric bushing Z is turned to secure correct movement of the counter operating pawl indicated as follows:

The pawl AB should have slight lead over next tooth on downward stroke. Detent X (Plate 95) should click slightly before part W is at rest.

COUNTERS—DIAL ADVANCED FROM TOTAL AND SUB-TOTAL—CARRIAGE CONTROLLED (Plate 97)



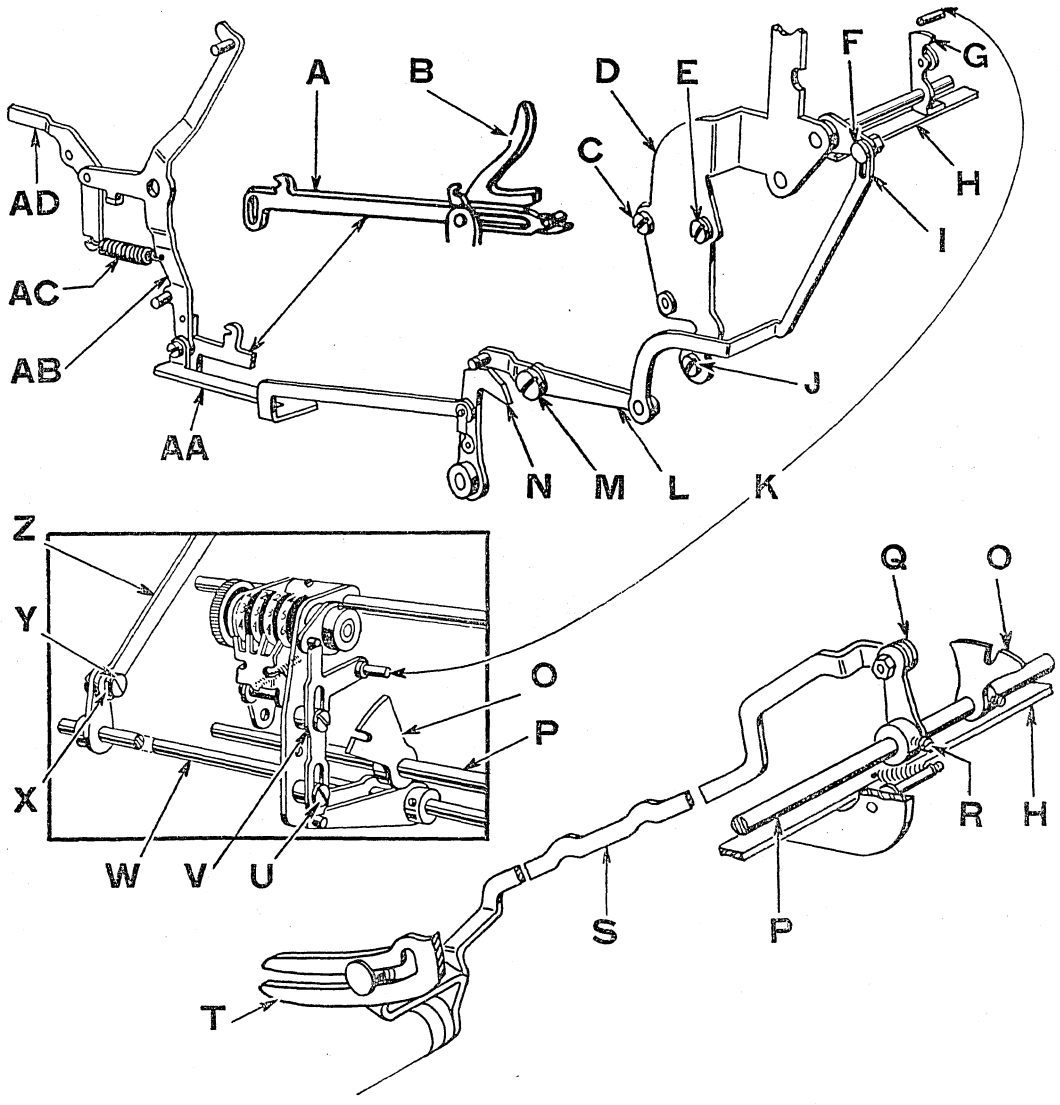
Counters—Dial Advanced From Total and Sub-total—Carriage Controlled (Plate 97)

When the carriage moves a skid on F, lever E through links B and A rocks shaft assembly O which locates the slot in segment T in line with the stud in part N. Now, when either total key is depressed, link R swings part V to clear the stud in part N.

During the machine operation the movement of shaft assembly S allows spring M to index the counter pawl assembly. On the return stroke, shaft assembly S actuates the counter to count one.

When the register total indexing lever is moved to total position, bell-crank L through link I blocks part V when the total key is depressed, spring W expands, part V remaining inactive.

COUNTERS—DIAL COUNTS ITEMS ADDED IN REGISTERS (Plate 98)



Counters—Dial Counts Items Added in Registers (Plate 98)

The purpose of this mechanism is to index item counters from selected register positions.

When registers are selected from keyboard or carriage, link S swings shaft assembly P to move segments O locating the slots of segments O in line with studs K.

On the forward stroke of the machine operation (item set up on keyboard), link Z swings shaft assembly W to allow slide V to move downward. On the return stroke, the arm on shaft assembly W raises slide V to actuate the item counters. When the machine is operated without items set up on the keyboard, the item counters are disabled; this is covered in detail by Plate 93.

Non-add Control

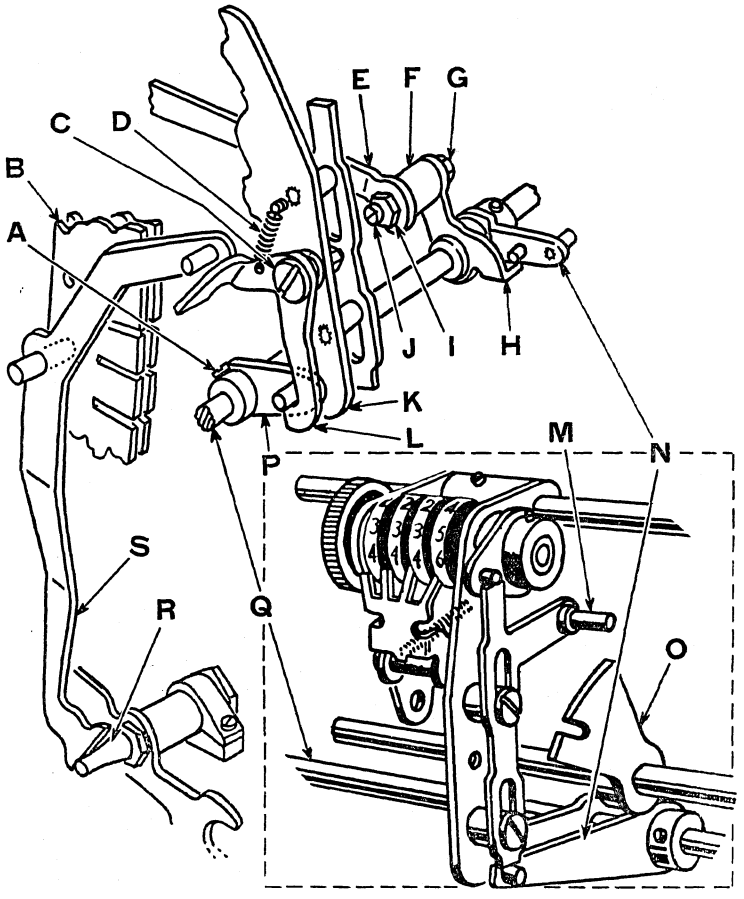
When the carriage moves a control roll on the non-add lever, part AB pulls link AA and cam arm N rearward. Lever and link assembly L swings bail H to locate its arm in the path of stud K, which disables the item counter.

Tests and Adjustments

When segments O are indexed by register position, the slots should correctly align with studs K.

The set screw in O is loosened and O located as required. Eccentric bushing X is turned to secure the correct movement of the item counter operating pawl.

COUNTERS—DIAL OPERATION DELAYED UNTIL REGISTERS ARE MESHED (Plate 99)



Counters—Dial Operation Delayed Until Registers Are Meshed (Plate 99)

The purpose of this mechanism is to insure that the count will not take place until the selected register has been indexed and meshed.

When the register is disengaged from the adding sectors lever S allows spring D to swing the hook of bell-crank lever L under the stud in arm P which prevents assembly M moving downward into the slot of index segment O.

When the register is meshed with the adding sectors, stud R rocks lever S the latter swings bell-crank lever L to clear the stud in arm P which allows the normal indexing and operation of the item counters.

The mechanism is used in machines having keyboard selection of registers.

Tests and Adjustments

It is desirable to have bell-crank lever L release the stud in arm P as late as possible, to insure that segments O are completely indexed.

When the register is disengaged from the adding sectors there should be clearance between the stud in S and L.

When the register is meshed, bell-crank lever L should just clear P.

Adjustment: Lever S is bent toward or from R.

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CLASSES 1, 2, 6, 11 thru 16 and 20 thru 30 POWER

Instruction Book

August, 1941

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*To*_____

*Of*_____

Property of and to be returned to

BURROUGHS ADDING MACHINE COMPANY

DETROIT, MICHIGAN

POWER

FOREWORD

The design, construction, functioning and adjusting of hand and electric drive mechanisms, including mechanisms classified under the subdivision of drive, are the subjects treated in this instruction book.

Control and timing, as applied to the driving mechanisms to insure durability and accuracy are given due consideration.

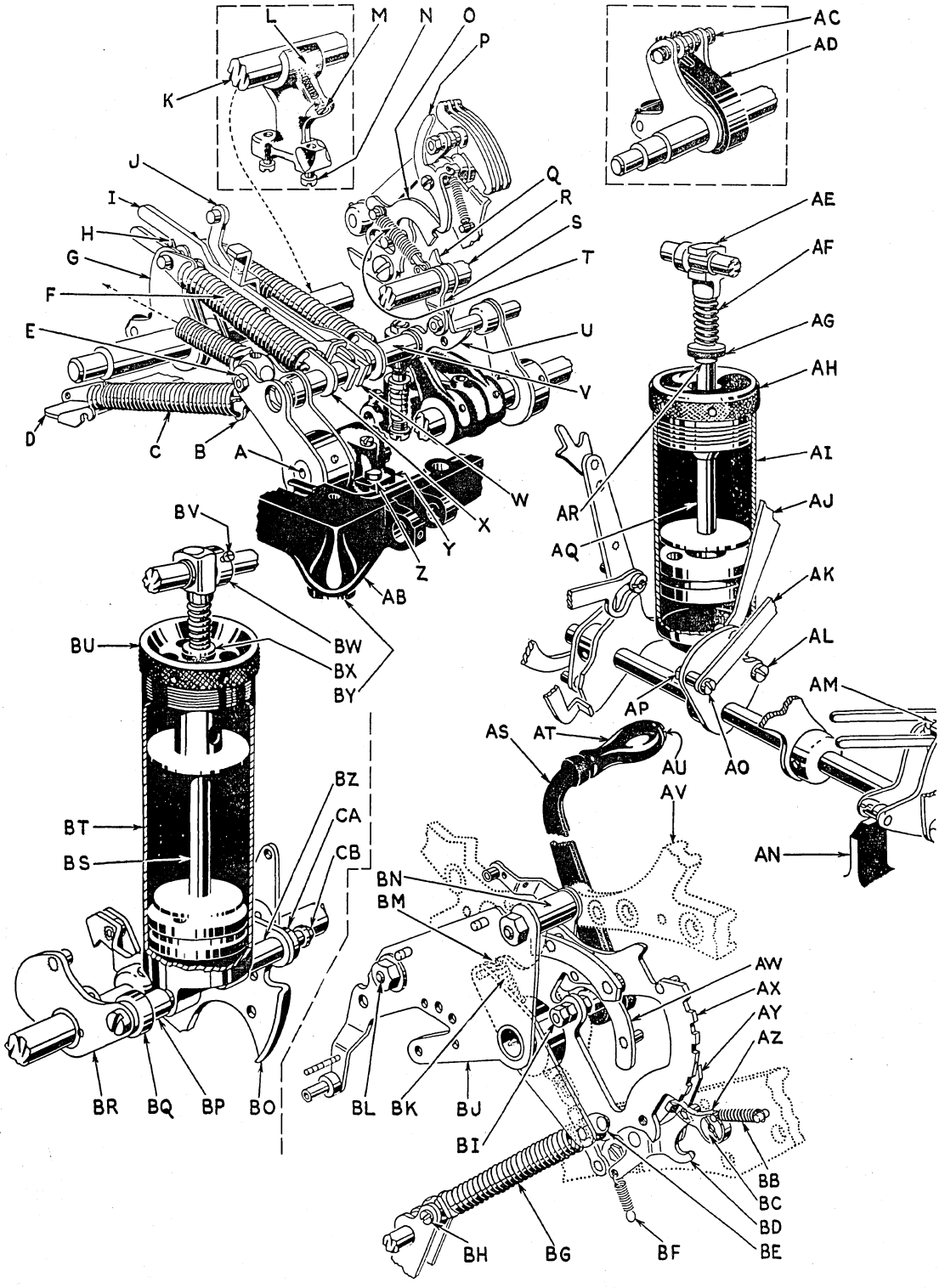
The constantly running motors, alternating and direct current, used in the earlier machines, the Type 2 start and stop motor used in the later machines, the Type 6 and the Type 6A motors which are used in the latest machines are covered including governing mechanism for controlling the speed of Type 6A motors.

The motor returned carriage mechanism, its speed reduction mechanism, the early and late control to space and return the carriage are also subjects of this book.

INDEX OF MECHANISMS

Description	Plate No.
Alternating Current Motor	11
Ball Bearing Drive Mechanism and Motor Brush Assembly (Types 6 and 6A Motors)	6
Brushes and Brush Holder (Improved) for Types 2, 6 and 6A Motors	6–1
Clutch and Drive Mechanism	9
Direct Current Motor	10
Early Carriage Return Disabled from Carriage Normal Key (Upper Left); and Skip Tabulation from Upper Shaft (on Right) (Classes 20 thru 30)	23
Early Carriage Return from MRC Rack, Upper and Lower Bars (Classes 20 thru 30)	21
Early Carriage Return from Total Keys (Classes 20 thru 30 and H903)	22
Machine Drive to Control Printing, Carriage Tabulation and Carriage Return Mechanism (Classes 20 thru 30)	26
MRC Clutch Mechanism (Improved) (Classes 20-30)	19–1
MRC Clutch Unit Used in Early Style Multiple Skip and Return Machines	17
MRC Feed Mechanism	18
MRC Governor (Later) and Friction Assemblies (Later)	16
MRC Space and Non-space Mechanism Indexed Jointly by Carriage and by Multiple Skip and Return Mechanism	25
MRC Unit	15
MRC Unit Plate Assembly	19
Operating Bar and Switch Control Mechanisms	13
Primary and Secondary Operating Sections	1
Reverse MRC Clutch Tripping Mechanism	20
Selective Column Return	20
Skip Tabulation from Bar and Shaft in Base and also from Carriage (Classes 20 thru 30)	24
Springs 885 Nos. 3 and 4 (How to Install)	29
Time Switch for A. C. and D. C. Motors	12
Type 6 Motor with Earlier Drive	5
Type 6A Motor and Drive with Centrifugal Governor (Left)	4
Wiring Diagrams	14

PRIMARY AND SECONDARY OPERATING SECTIONS (Plate 1)



Primary and Secondary Operating Sections (Plate 1)

The primary operating section actuates the carriage feeding and the late ribbon mechanism during the forward stroke and actuates the entire machine on the return stroke through the tension of main springs C which are placed under tension on the forward stroke.

The power (manual or motor) is applied to the main section and with the exception of the carriage and ribbon mechanism, the balance of mechanisms are actuated on the forward stroke through springs F pulling the secondary section. The speed of the secondary section is controlled by dashpots AI or BT and the time period of the forward stroke controlled by the toggle mechanism U. The secondary section is also the basis of the timing control due to its limiting on post AN which limits the entire machine and establishes a definite position from which to start and stop. Springs C of the primary section, and springs F of the secondary section vary in tension and are distinguished by number. Springs C must have sufficient time to release the toggle under all circumstances. Springs F must have sufficient tension to allow the machine to restore completely.

The standard spring chart (Plate 2, Power Symbol Book), specifies the correct style of springs as required by the machines under consideration.

Timing Control

The speed of the forward stroke is controlled in order to provide sufficient time for indexing the adding racks and for the printing to take place before the return stroke begins. Excessive or manual jerk will cause springs C to expand, a gradual follow-up of the secondary mechanism being maintained by dashpot AI or BT.

The return stroke is held up by toggle U which is released by latch P and hammer O contacting toggle number Q.

Dashpot

The dashpot consists of cylinder AI partially filled with oil and plunger AQ. On the forward stroke cylinder AI moves downward, and moves upward on the return stroke. Plunger AQ is stationary, hanging on shaft. The resistance set up by the oil flowing through the holes in the plunger insures a constant speed. The size of the holes in the plunger determines the speed; larger, less resistance increasing the speed; and smaller, increasing the resistance and reducing the speed.

The tension of the main and the secondary springs is also a factor. Increased tension of these springs overcomes the resistance of the oil flow, thereby increasing the operating speed. Dashpot BT is the late style and is now standard. Dashpot AI is the earlier style.

Timing Adjustment

The register should mesh with the adding racks before the hammers are released. To delay or advance the hammer release, the lower arm of lever AJ is retarded from, or advanced to stud in BR.

When toggle is released there should be about 1/32″ clearance between latch P and hammer O.

Adjustment: Upper arm of latch P is bent.

The purpose of spring pitman BG is to prevent straining of the main section in the event that full stroke pawl AZ is blocked through a juggle or otherwise which would cause its spring to expand and allow the drive to operate the main section.

General Information

Burroughs machines are operated by electric motors in conjunction with speed reduction mechanism and a clutch.

The speed reduction mechanism consists of a worm shaft directly connected to the motor and a worm wheel. The power is applied to the machine through a clutch; one member of the latter is carried by a worm wheel; the other member is directly connected to the machine. The two members of the clutch are coupled together by a clutch dog when the clutch is tripped by the motor bar.

The early machines were driven by constantly running motors; in these machines the worm wheel and its clutch member were rotating as long as the switch was closed. In order to prevent motors running for long time periods when the machines were not being used, the automatic cut-off device was adopted which would stop the motor within a few minutes, however, during machine usage the motor operated constantly.

Types 2, 6 and 6A motors operate only when the motor bar is depressed, which also trips the clutch.

Motor Range Chart

MOTOR TYPE 2-6-6A	A. C. RANGE	D. C. RANGE
32V		32V
50V	50-60 Volts 25-85 Cycles	50V
	50-60 Volts 25-100 Cycles	50V
110V	85-125 Volts 25-85 Cycles	85-125V
	85-125 Volts 25-100 Cycles	85-125V
150V	130-160 Volts 25-85 Cycles	130-160V
	130-160 Volts 25-100 Cycles	130-160V
220V	175-260 Volts 25-85 Cycles	175-260V
	175-230 Volts 25-100 Cycles	175-230V
	235-260 Volts 25-100 Cycles	235-260V
	235-285 Volts 25-100 Cycles	235-285V
110V-100 Cy	Special	
220V-100 Cy	Special	

Burroughs Types 2, 6 and 6A Motors

Burroughs Types 2, 6 and 6A motors can be operated either on direct or on alternating current. Furthermore, they are adaptable to different voltages of direct current and also to different voltages and cycles of alternating currents.

These motors have what are technically termed, series characteristics, they are very similar to a series wound direct current motor; the latter motors have no definite speed. At no load the speed is comparatively high, which reduces as the load increases. Where maximum power and controlled speed are essential, a governor is used.

Type 2 was the original motor and has been superseded by Type 6 motor.

Type 6A motor is more powerful than the Type 6 motor and its speed is controlled by means of a governor.

Type 6A is used on machines having multiple skip and return mechanism, multiple print, commercial machines in general and bank posting machines where the selective return is 1¼″ or less from the first position. The purpose of the governor in regard to the multiple skip and return mechanism is to prevent overthrow of the carriage return mechanism when the carriage is being returned to one of several closely located stops.

Lubricating of Motors

With the exception of 6A motors, all motors have a grease cup with wick and spring for feeding the grease to the shaft. The grease cups are shown on the drawings of the different motors. Type 6A motor has ball bearings, the latter are packed in grease which requires attention only in long intervals. When this attention is necessary, roller bearing grease only is to be used, and can be applied to the bearing through the small hole in the motor end plate.

Motor Speed Governor Assembly (Plate 4)

The purpose of the governor is to prevent overthrow of the multiple skip and return mechanism when the carriage is being returned to one of several closely located stops.

Two resistance coils T connected in series and connected across the governor contact points P and S. Their purpose is to prevent overheating of the contact points by absorbing the shock from the condenser discharge when the points close and also to reduce interference to radio reception.

Sequence

When the motor is running, the centrifugal force of the revolving worm shaft causes the weight levers of revolving member AH to swing outward. The lower arms of the weight levers push pin BH against the foot of switch arm AF, separating the switch point on AF from the switch point on S, which cuts off the current and thereby halts the increase of the motor speed. As the speed of the motor reduces below a predetermined speed, the weight levers of AH swing back, which allows the switch points to contact and the motor to operate.

To insure clean contact and prevent burning of the switch points, part S receives an oscillating movement as follows:

The nut on B contacts and swings arm J at each revolution; blade M advances ratchet assembly N one point, which causes eccentric N to impart an oscillating movement to switch arm S.

The speed of the motor is controlled by increasing or decreasing the tension of spring AG, which is accomplished by turning screw AB counterclockwise for reduced speed or turning it clockwise for increased speed.

Tests and Adjustments for Governor Motor

Adjust breaker points controlled by governor for full even contact by bending blank P.

See that blade M contacts on ratchet N and moves S on each machine operation for a wiping effect.

Adjust screw AD to have not more than .008″ or less than .004″ clearance of pin BH holding governor in a normal position.

Speed Regulation of Type 6A Motors (Plate 4)

Machines having multiple skip and return, multiple print or where the stop ahead of the stop returned is less than 1¼″, in order to prevent the carriage overthrowing to the stop ahead, are equipped with speed controlled motors.

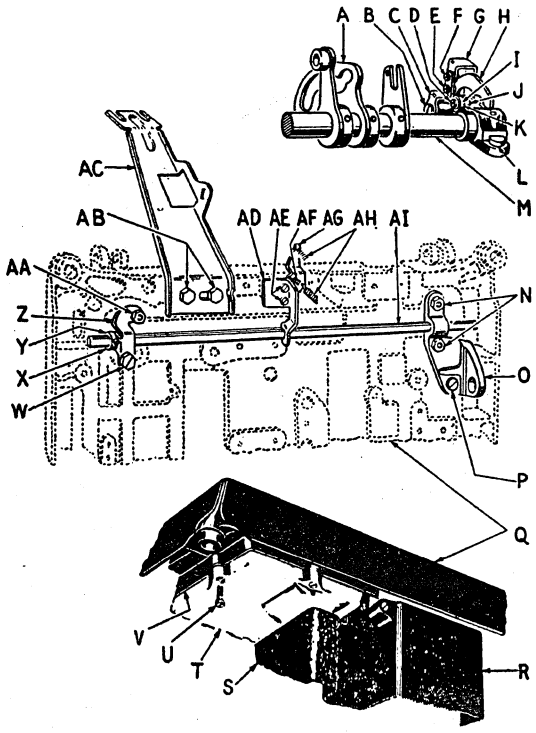
The motor brushes are set so that the brush holder retaining screw will be approximately in the center of the slot. The handle is placed in the machine, pulling it all the way forward, the clutch is tripped manually, and the number of crank revolutions counted with the governor active.

When the gear ratio is 14.75 to 1, the correct number of crank revolutions is 166 per minute, insuring a motor speed of 2450. The speed is secured by turning screw Q clockwise to increase the speed and counterclockwise to decrease.

With the 19 to 1 gear ratio, the number of crank revolutions is 124 to secure a motor speed of 2450.

After obtaining the correct number of crank revolutions, remove handle, depress

WIDE BASE CONSTRUCTION (Plate 1-1)



Wide Base Construction (Plate 1-1)

The new wide base casting Q, together with the new 22 to 1 gear ratio drive, has necessitated the redesigning of the following parts:

1. ***Bracket O*** for the H903 operating mechanism is now a casting which affords a more rigid support.

2. ***Brackets Z, AD, and AG*** have been redesigned due to the new, heavier base casting.

3. ***The Carriage Opening Limit*** has been left off the M.R.C. brace AC as it is no longer needed with the new toggle-action, carriage opening and closing mechanism.

4. ***The Drive Housings R and S*** have been modified for the new base design.

5. ***An Increased Number of Screws,*** securing the register cover plate T to the base, provides a more rigid construction and a better oil seal.

6. ***The Contour of Cam A*** has been changed to rectify the difference in timing due to the new 22 to 1 gear ratio drive.

7. ***The Register Carry Resetting Roll*** on assembly M has been replaced by ball bearing rolls I to reduce wear on cam H.

8. ***The Contour of Cam H*** has been altered because of the increased diameter of rolls I, and to rectify the difference in timing due to the new 22 to 1 gear ratio drive.

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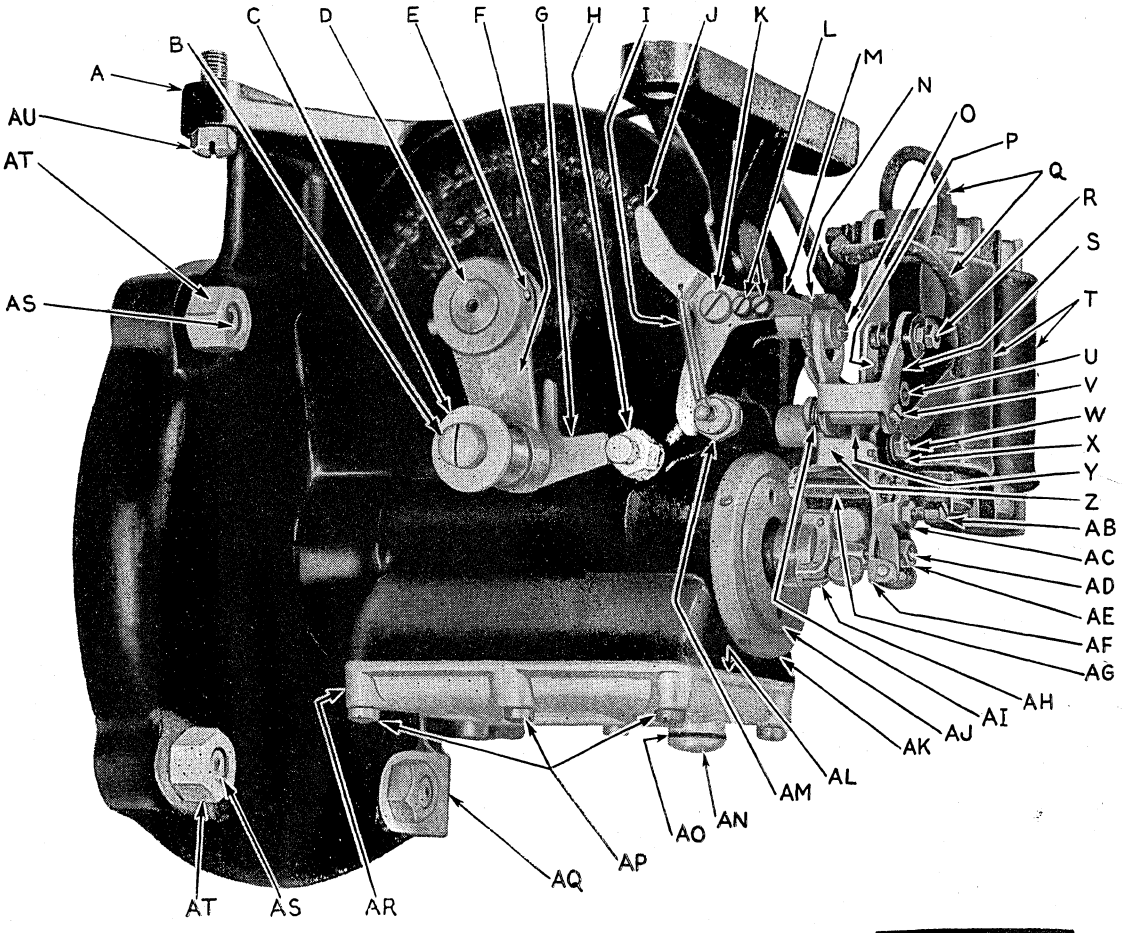
TYPE 6A MOTOR AND DRIVE WITH CENTRIFUGAL GOVERNOR (LEFT) (Plate 4)

(Plates 2 and 3 in Symbol Book only)

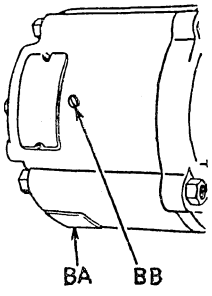


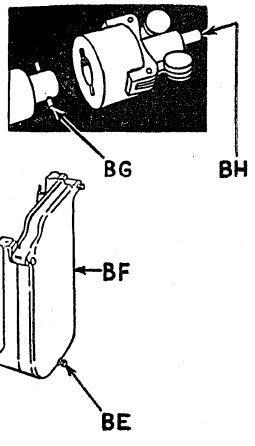
motor bar to obtain a full return of the carriage, at the same time observing whether the contact points on the governor are active.

Arcing at the contact points is proof that the governor is functioning.

Operate the machine and under full load observe the contact points. If active on each machine operation gradually retard the motor brushes until the governor is inactive. Then advance the brushes approximately 1/8" which will increase the speed for the correct machine operation.

Note: Brushes are advanced by moving them against the rotation of the armature.





Speed Regulation of Types 2 and 6 Motors (Plate 4)

The motors under the above heading, having no governors, have the speed based upon the carriage return speed. The test is made

TYPE 6 MOTOR WITH EARLIER DRIVE (Plate 5)

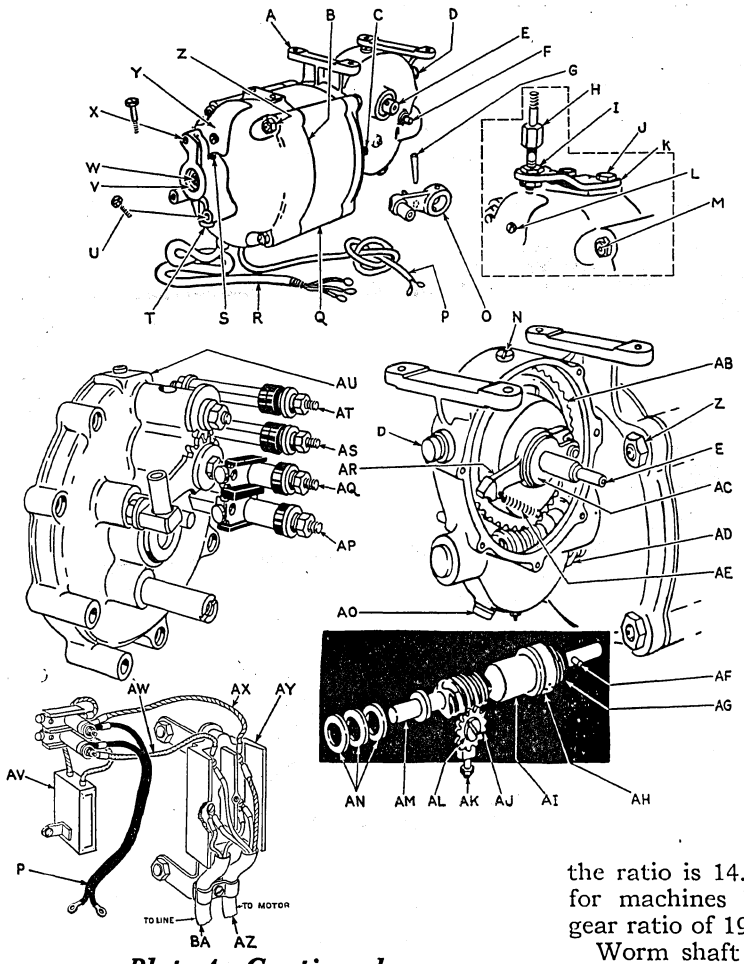


Plate 4—Continued

by setting the trip pawl on the MRC rack four spaces from the end (toward the dashpot side of the machine). Also withdrawing the plunger in the stop bar and placing it into the rear of the fork, which will cause the carriage to tabulate and return, when the motor is caused to continuously rotate.

In the aforementioned machines, the motor brushes are shifted, anti-clockwise to increase speed and clockwise to reduce speed, to give a 12″ carriage from 42 to 46 cycles and an 18″ carriage 32 to 36 cycles per minute.

Before making these tests, the carriage raceways and other affected parts should be thoroughly cleaned, oiled or vaselined. The barrel spring should be wound sufficiently to fully seat the carriage with the maximum number of controls active.

The carriage governor should be checked for condition.

Drive Mechanism (Early) for Type 6 Motor (Plate 5)

Worm shaft AM and worm wheel AB are used to reduce the speed of the motor. In constantly running motors the gear ratio is approximately 7½ to 1. Type 2 motors use the ratio of 13-1. For Types 6 and 6A motors, the ratio is 14.75 and Type 6A motors used for machines having multiple print, use a gear ratio of 19 to 1.

Worm shaft AM revolves in bronze bearings; three thrust washers AN are used between the shoulders of the worm shaft and the end bearing.

Note: In the still earlier drives, one thrust washer was used.

Drive housing A formerly used a ball bearing washer between outside washers AN, the ball bearing washer has been discontinued and in its place another washer AN is used.

In the earliest machines cotton packing was used between bearing AI and nut AG, later, metallic packing was adopted which is now the only packing supplied.

Lubrication: The earliest gear housing holds about 1 oz. of oil. During inspections, the amount of oil in the drive should be checked; if necessary, oil added.

Beginning with Type 6 motors, drive casting A was used, the latter has an oil well and splash gear. Bearing AI and packing AH are larger in diameter.

All machines are now being equipped with ball bearing drives. Type 6A motors also have ball bearings.

TYPE 6A MOTOR AND DRIVE WITH 22 TO 1 GEAR RATIO CLASSES 20-30 WITH WIDE BASE CONSTRUCTION (Plate 5-1)

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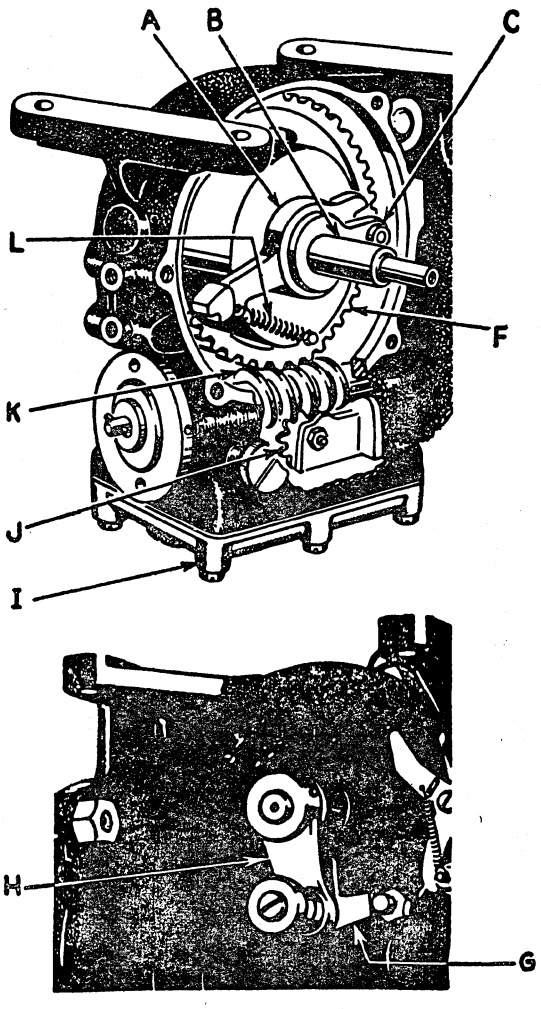
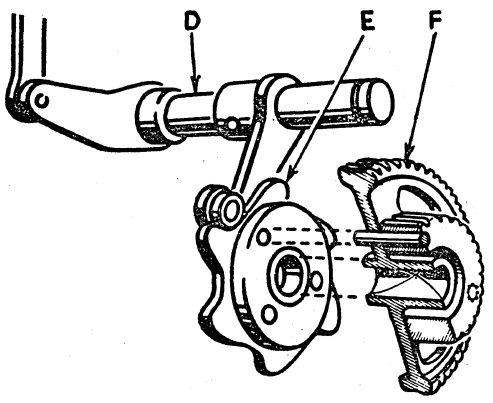




Type 6A Motor and Drive With 22 to 1 Gear Ratio Classes 20-30 With Wide Base Construction (Plate 5-1)

Purpose

The use of a 22 to 1 gear ratio assures a more even machine operation by reducing the strain on the drive mechanism and by minimizing the expansion of the 1-181 springs.

Construction

1. Worm shaft K and worm gear F are designed to provide a 22 to 1 gear ratio.

2. Oil splash gear J is changed to conform to the new worm shaft.

3. Crank arm H is positioned to more evenly distribute the initial load on the drive.

4. Pass-by pawl G is shortened to compensate for the new positioning of crank arm H.

5. Cam assembly E (in machines having the Single Stroke Multiple Print Mechanism) has six lobes instead of the five contained in drives having a 19 to 1 ratio.

Note: This construction is included in machines of current manufacture and cannot be installed in machines already in the field.

Type 1 Alternating Current Motor—Classes 1, 2 and 6 Machines (Plate 5-2)

Construction

This improved A.C. constant running motor now replaces the A.C. motor (Plate 11, Power Symbol List) which was formerly used on Classes 1, 2, and 6 Machines. It may also replace a D.C. constant running motor on these machines when a conversion to A.C. operation becomes necessary.

Capacitor Y, which is attached to the improved motor to reduce the starting current, is installed between the main line and the starting coils by means of knife terminals AC, and should only be replaced with a capacitor of the same rating (as specified on the underside of its cover).

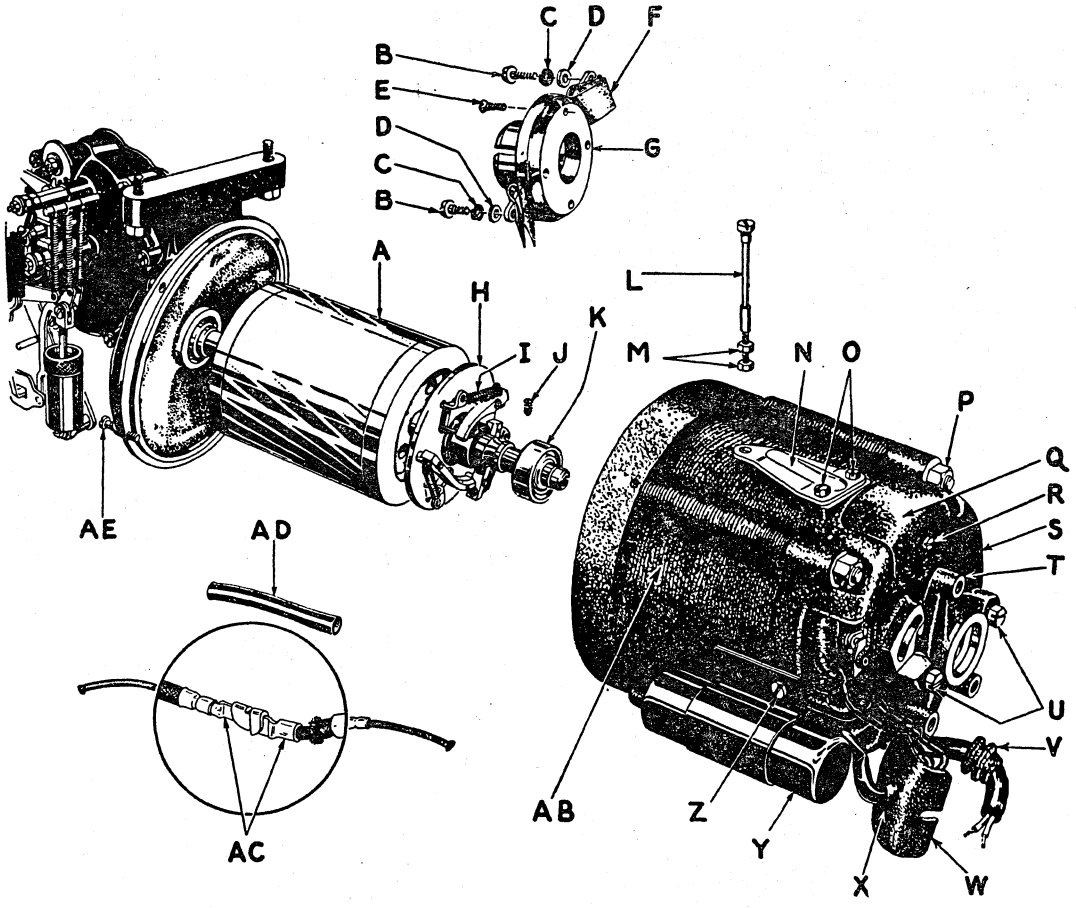
Installation

The following procedure is offered as a means of facilitating the replacement of an earlier motor with a Type 1 A.C. motor.

A. Removal of Old Motor:

1. Remove the machine case.
2. Remove the drive cover.
3. Remove the M.R.C. unit (if the machine is so equipped).

TYPE 1 ALTERNATING CURRENT MOTOR CLASSES 1, 2 AND 6 MACHINES (Plate 5-2)



4. Disconnect the motor cable wires from the terminal block.

5. Remove screws AE (4) which hold the motor to the drive.

6. Remove the old strain bolt from the motor housing.

7. Remove the motor housing and rotor.

8. Remove the old strain bolt from the machine base.

B. Installation of New Motor:

1. Install strain bolt L in the machine base.

2. Attach bracket N to strain bolt L.

3. Install new rotor A onto the drive assembly, properly seating the pin in the drive shaft into the slots provided in the rotor shaft.

4. Install new motor housing AB, attaching bracket N to the motor housing (using 2 screws O), and anchoring the motor housing to the drive assembly (using 4 screws AE).

Note: Exercise care, when installing motor housing AB, to insure the proper seating of the starting switch fingers (on starting switch H) on the commutator ring.

5. Adjust nuts M on the strain bolt.

6. Test the end play of the rotor.

7. Connect the motor cable wires to the terminal block.

8. Replace the drive cover.

9. Install the M.R.C. unit (on machines so equipped), and perform the following adjustments:

   (A) Adjust the mesh of the M.R.C. rack and gear.

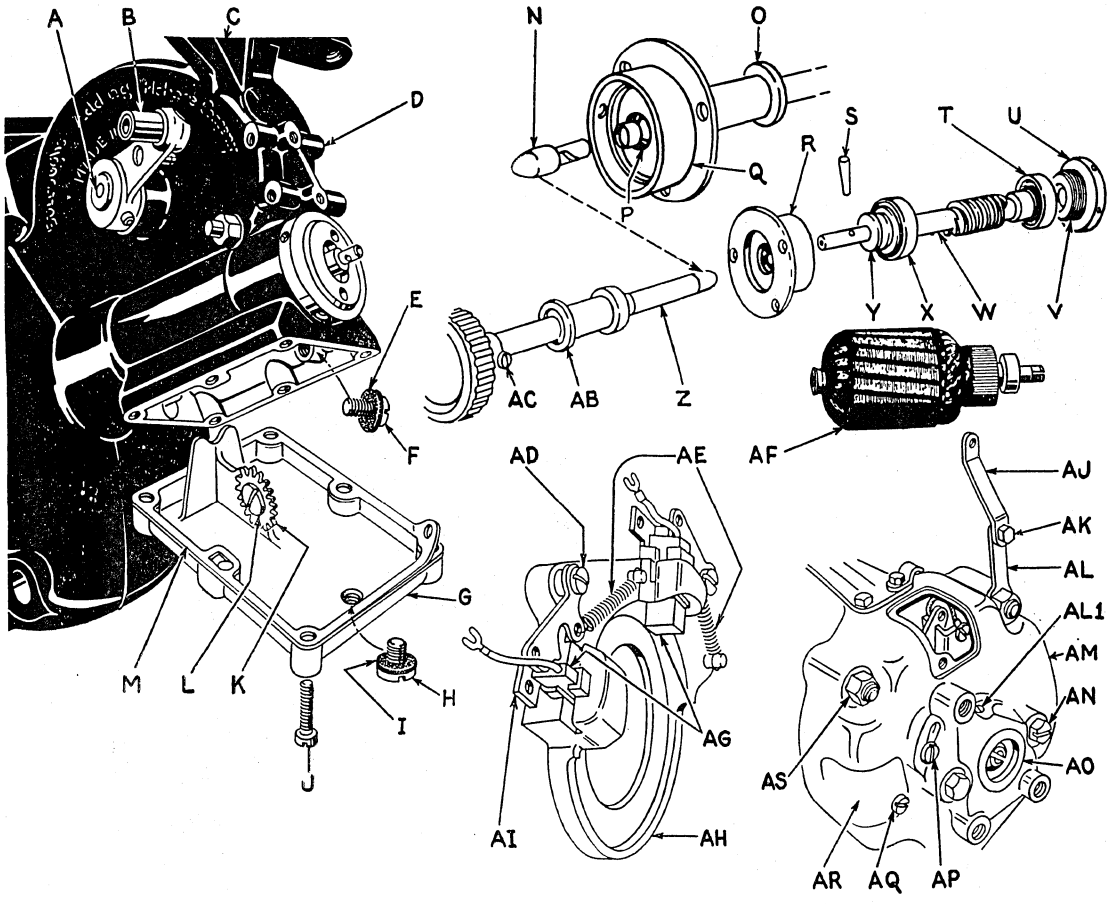
   (B) Square the M.R.C. unit plate with the M.R.C. rack.

   (C) Adjust the M.R.C. unit for proper height.

   (D) Adjust the M.R.C. unit to lie parallel with the M.R.C. rack.

10. Replace the machine case.

BALL BEARING DRIVE MECHANISM AND MOTOR BRUSH ASSEMBLY
(Types 6 and 6A Motors) (Plate 6)



Ball Bearing Drive (Plate 6)

The worm shaft W, in the latest style drive, revolves in ball bearings of aluminum casting C. This new drive replaces drive casting A, Plate 5.

The aluminum casting, because of its lightness and kind of metal, does not permit the removal of parts in the same manner that parts are removed from the cast iron housings.

To remove cover D, the face of which has been shellacked, tap lightly to free from housing C. Do not use a chisel or other sharp tools to pry the cover, as marring of the housing would result in oil leakage; or shaft A could be forced out of alignment causing it to bind; or the holes for cover screws may close.

Removal of oil seal assembly R, which is also shellacked to the housing, should be made by removing the large lock nut U and adjusting screw V, then tapping the end of shaft W lightly until R is free.

Removal of shaft W and ball bearing assemblies from the drive can be made without removing the clutch assembly or the bronze gear, provided oil splasher assembly G is first removed.

To replace R, oil seal P must be well oil-soaked before forcing onto Kit Z; remove N and place Kit against end of shaft W and slowly force seal R into position, using slide AB. Seal P must be cone-shaped with the small end toward the inside of drive.

For correct end play of shaft W, first take up all end play with screw V, which is then backed $\frac{1}{4}$ turn and locked with lock nut U. Use Kit $22\frac{5}{8}$ and Kit $23\frac{5}{8}$ for this adjustment.

Oil seal assembly R, cover D and splasher assembly G must be shellacked before reassembling, to prevent oil leaks. When replacing plate G, gear K must be toward the motor.

To insure the correct amount of oil being

(Plate 6)—Continued

used, an oil level hole has been added, located beneath cover D. The proper procedure is to remove drain screw H, and screw F from oil level hole and drain old oil from drive.

Replace screw H, and refill with Kit 165½A until oil reaches bottom of oil level hole. Over this level, oil will leak into the motor and to the floor.

For drives without the oil level hole, drain all oil out and refill with Kit 165½A not to exceed one ounce.

For separating motor from drive, use Kit 26¾A, with Kit 587-1 for handle. On three of the 20747 nuts, and for the upper right hand nut, use Kit 22¾.

Note: Kit Z not furnished generally; when required, advise the Service Department.

Brush Holder Assembly (Plate 6)

The brush holder assembly consists of molded plastic AH. Brushes AG slide in brass guides which are set in the plastic. The brushes are pushed against the commutator by levers AI and springs AE and AF. The brush holder assembly is held to the cover by screw AP which passes through an elongated hole to permit shifting brushes in order to adjust the speed of the motor.

Brush holder AH illustrated on Plate 6 has the large center opening and is used on 6A motors only.

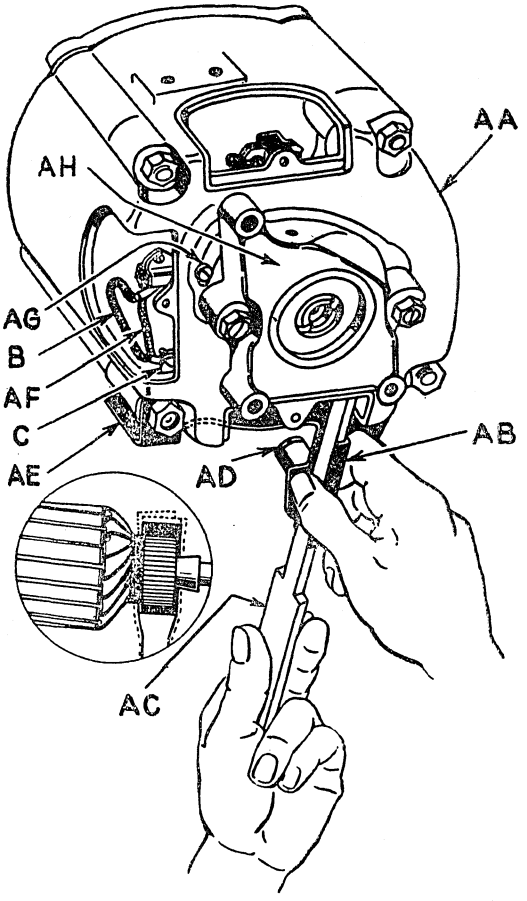
The same style brush holder having the smaller center hole is used on Types 2 and 6 motors and is to be used when a replacement is required for all previous brush holders on Types 2 and 6 motors.

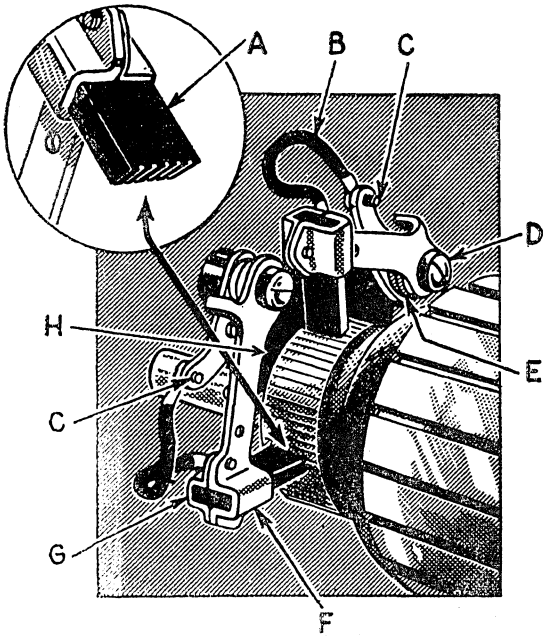
The late style brushes are not to be used to replace the old style brushes.

To increase the speed of the motor, screw AP is loosened and the brush holder assembly slightly shifted anti-clockwise.

To decrease the speed of the motor, the brush holder is shifted clockwise.

BRUSHES AND BRUSH HOLDER (IMPROVED) FOR TYPES 2, 6 AND 6A MOTORS (Plate 6-1)





Brushes and Brush Holder (Improved) For Types 2, 6 and 6A Motors (Plate 6-1)

The improved metal brush holder H is designed to overcome breakage and insure a more uniform contact of the brush A on the commutator, eliminating excessive sparking and burning of the brushes and commutator surface.

Brushes are grooved at their contact surface to permit quick "Pressure Seating" and should be set flush with top of brush holder arm F. Arm F through its lip is prevented from contacting the commutator surface when the brushes are worn down. Arm F is equipped with a bakelite bearing at the pivot stud and the latter is set in bakelite at the brush holder plate. The purpose of this is to prevent arcing at the pivot stud and to insulate the plate.

When installing the improved brush holder, the procedure described below, must be adhered to in order to obtain maximum benefits. The life of the brushes is dependent upon a clean, cylindrical and true running commutator surface. Brushes should be examined at frequent intervals to determine the extent of their wear, and replaced before the supporting arm F nears its limit on the brush holder assembly. This will prevent the commutator surface becoming burned when the brushes are worn down. Whenever brushes are replaced, the commutator surface should always be examined and refinished if necessary.

(Plate 6-1)—Continued

Installation Procedure

Disconnect wall cord.

Remove the old style brush holder by breaking and removing the broken portions through the openings in motor end cap AA. (Motor end cap must be removed on motors with small openings.)

Resurfacing Commutator

Examine the commutator surface, and if not excessively worn or burned, resurface in the following manner:

Install new brush holder through opening on left side of motor; it will readily slip into position by holding up the brush arms. DO NOT FORCE IT. Secure it in position by screw AG, and then connect field wires AF to terminal screws C.

Mount guide bracket AE as illustrated, and run motor.

Insert paddle AC in channel of guide bracket, using the coarse abrasive first on the commutator surface. Apply some pressure on the paddle with a slight lateral movement to prevent grooving of commutator. Examine the surface frequently to note progress. When the commutator surface is free of burned spots, use the fine abrasive for final depressing.

Cleaning Motor

Remove brush holder.

Clean grooved face of brush, inside of stator, and motor end cap with brush Kit 157. Wipe off commutator thoroughly with a clean, dry cloth.

It is very important that the motor be free of abrasive, carbon, and copper particles.

Brush Seating

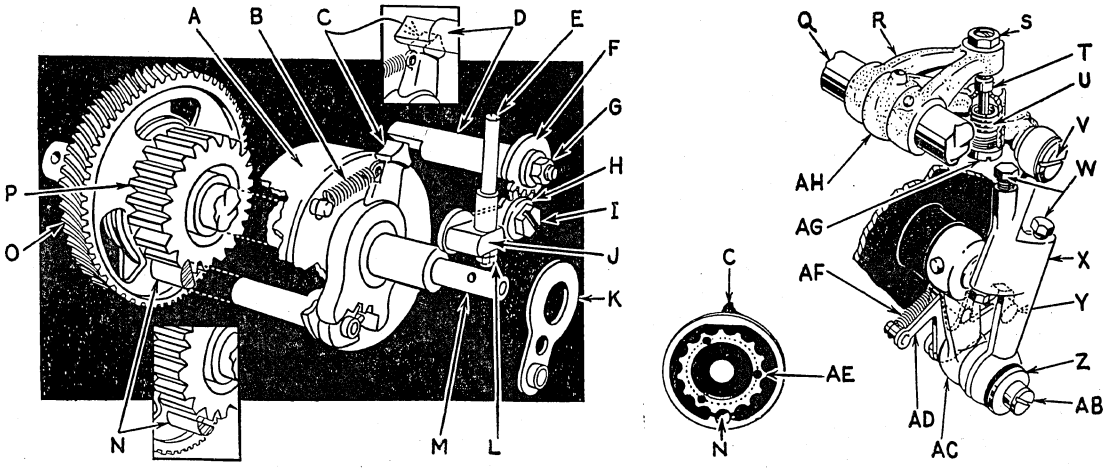
Reinstall new brush holder.

To seat brushes, run motor, applying pressure on the top of each brush alternately for approximately one minute. After once seating, do not loosen screws which hold the brushes in the arms. To do so, would result in losing the correct contact relation between the brush and the commutator.

When the abrasive on the paddle is worn down, the paddle should be returned to the Factory with other salvage parts. Since a special abrasive is used on the paddles, it should not be replaced in the Field.

CLUTCH AND DRIVE MECHANISM (Plate 9)

(Plates 7 and 8 in Symbol Book only)



Clutch and Drive Mechanism (Plate 9)

One clutch member, cylinder P, has slots around its outer circumference, it is fastened to the worm wheel O, the latter is driven directly by the motor through worm shaft W, Plate 6. The other clutch member, drum A, is directly connected to the machine. When the motor bar is depressed, the two clutch members are coupled together by clutch dog N entering one of the slots in cylinder P.

Clutch dog N is semi-circular, when the clutch is disengaged, the flat side is parallel with cylinder P (shown in lower insert). The position of clutch dog N is secured by gear lever C, which pivots on the outside shoulder of drum A.

The toothed end of C meshes with the teeth of clutch dog N. When the clutch trip mechanism is normal, gear lever C is blocked by shaft D (shown in upper insert), which is also semi-circular; its round portion contacting the curved pocket of gear lever C.

When the motor bar is depressed, link E raises geared arm J, which turns shaft D through geared disk F, the latter has a half round hole which seats on the half round end of shaft D. When released through the motor bar, gear lever C is swung by spring B to clear gear lever C which seats the round portion of clutch dog N in one of the spaces of cylinder P. The purpose of support K is to prevent clutch dog wear of the bearing in drum A.

The spaces in cylinder P are more numerous and fit the clutch dog with minimum play, having a locking effect which prevents the machine running ahead of the drive and indexing the carriage return mechanism too soon; this new design is known as the locked pin design. Drum AE has fewer and larger spaces, the clutch dog having more clearance.

When the clutch is normal, it is limited by passby pawl AD. When clutch lever C contacts shaft E, thereby releasing clutch dog N, spring B is placed under tension by the momentum of the clutch unit. The tension of spring B is maintained by passby pawl AD. Without passby pawl AD, the clutch unit would cause a noisy vibration. There are four lengths of passby pawl AD, numbers 1 to 4, however, the number 4 is standard at the Factory now.

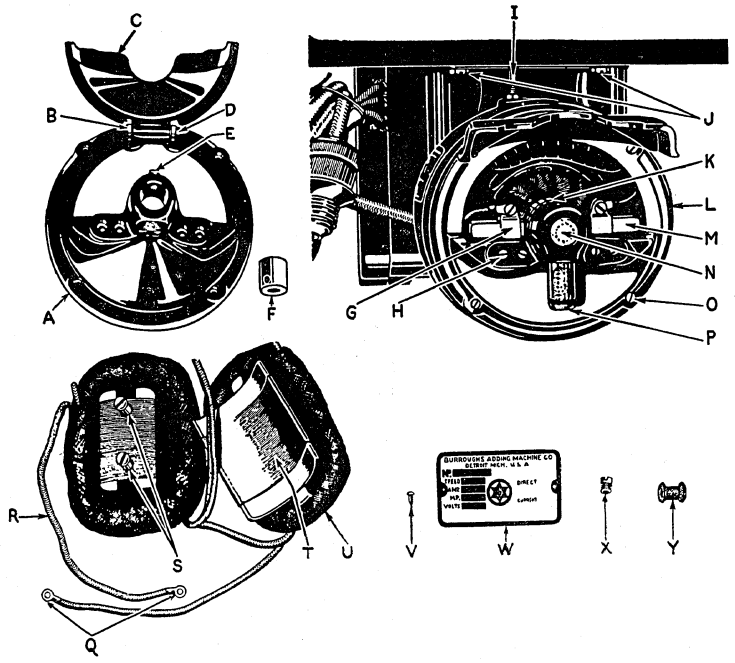
Main Operating Section Q

Pitman X connects drive arm AC to buffer arm AH on the main operating section. Arm AH has plunger T and spring U, which by providing a cushion contact, permits adjusting screw S in yoke R to be set to insure full stroke without knock.

To adjust stroke, pull handle to forward position, hold and adjust screw S to contact plunger T when the clutch is tripped and drive arm AC raises pitman X to its highest position. This adjustment can be tested by watching for a slight movement of the secondary section (813A) when drive arm AC is passing over center.

When the adjustment is completed, lock screw S is held with screw driver and lock nut tightened.

DIRECT CURRENT MOTOR (Plate 10)



Motors

Before the Type 2 motor was adopted, two kinds of motors were used, i. e., Direct and Alternating motors.

Direct current motors differ only as to voltage viz.: 110, 220, etc.

Alternating current motors differ not only in voltage, but they also differ in cycles, viz.: 25, 40, 60, etc.

Care of D. C. Motors (Plate 10)

At each machine inspection, the commutator should be cleaned with 00 sandpaper. Emery cloth or emery paper must not be used. The grease cups should be kept filled and occasionally the end of the wick trimmed if it should become hard, which would prevent lubrication reaching the shaft.

Brush holders should be kept free from dirt and grease. Oil soaked insulator washers between the brush holders and the end casting should be replaced, because grease mixed with carbon can cause a short circuit and/or a ground.

Alternating Current Motors (Plate 11)

The A. C. Motors used for Burroughs machines are of the Induction type. The current is supplied only to stationary part called a Stator. The revolving member is called a Rotor. This rotor is an assembly of laminated sheet iron and copper bars. The copper bars are connected together by having both ends embedded in flat copper rings. The effect of the windings in the stator produces a constantly revolving polarity and also induces a current in the rotor of opposite polarity, which causes the rotor to revolve. Currents of different cycles produce different results, therefore motors used must be adapted to the current as to cycles in addition to the correct voltage.

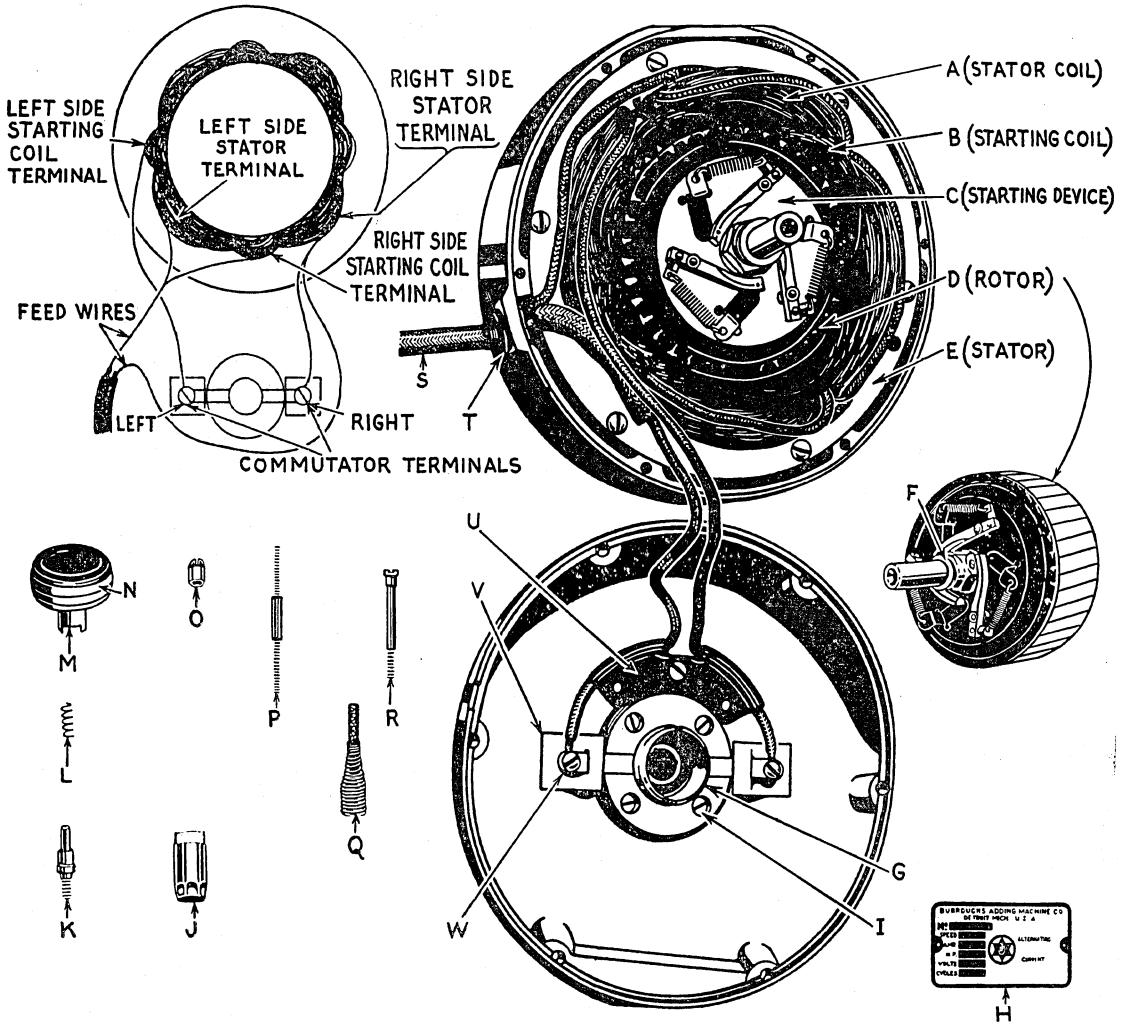
Motors of this type are not self-starting and for that reason a number of supplementary coils are spaced between the regular stator coils. These extra coils are only in use until the motor attains its full speed when they are disconnected automatically by a starting device.

A. C. Starters (Plate 11)

A starter is a device having one or more levers which swing on pivots. These levers are under spring tension, so that when a motor is not running the springs cause the levers to rest on a lug or on a commutator, according to the design of the starter. When the levers are at rest they complete the circuit of the starting coils, so that when the current is switched on the motor will start. As soon as the motor attains its full speed the centrifugal force overcomes the spring tension, throwing the

ALTERNATING CURRENT MOTOR (Plate 11)

DIAGRAM SHOWING WIRE CONNECTIONS TO COILS



levers outward and thereby cutting off the current of the starting coils.

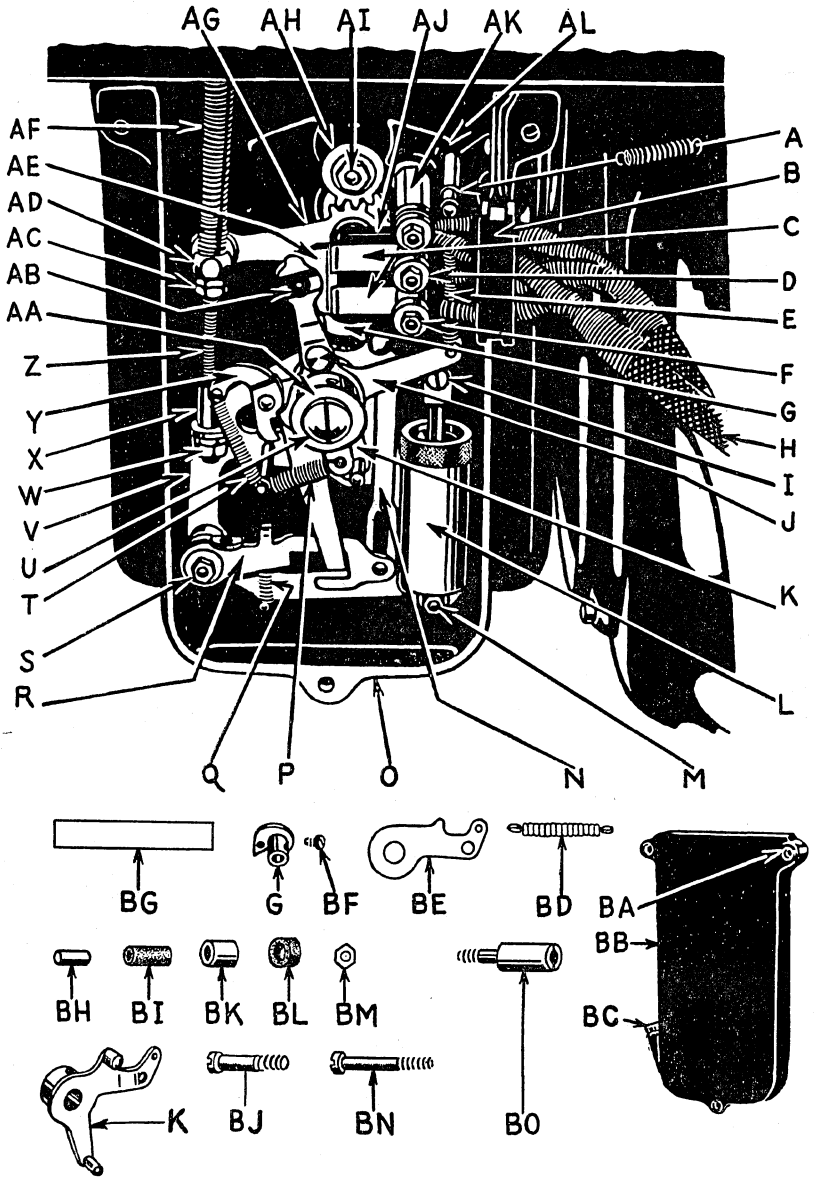
The connections of commutators, starting coils and feed wire are practically the same for all starters. Facing the starter end one of the feed wires is connected to the right side stator terminal and one of the commutator terminals. The other feed wire is connected to the right side starting coil terminals and the left side stator terminal. The left side starting coil terminal and the other commutator terminal are also connected together.

If for any reason the levers fail to seat when the motor is not running, then the motor will fail to start when the current is switched on.

On the other hand if the current in the starting coils fails to be cut off immediately, when the motor has attained its full speed, it will cause the motor to heat up and could cause it to burn out.

The springs on the levers control the throw out. A strong spring will delay the action of the levers. If the coils remain in circuit the starting coil terminals should be examined.

TIME SWITCH FOR A. C. AND D. C. MOTORS (Plate 12)



The Automatic Cut-off (Plate 12)

The automatic cut-off is a device used in connection with A. C. and D. C. motors which automatically breaks the circuit when the machine is not in operation. It also permits the operator to apply the current by depressing the operating bar when printing a clear signal or after depressing an amount on the keyboard.

When the operating bar is depressed latch Y releases switch lever J, which carries the contacts AE. Spring P then exerts a pull on the switch lever seating blade AE into copper contacts C, thereby closing the circuit and causing the machine to operate.

The automatic cut-off mechanism is operated by cam G and controlled by dashpot L. Cam G lowers bell-crank lever K which swings on stud U. This lever depresses the dashpot plunger and link N. It also moves cut-off lever J to reset latch Y and cut-off pawl R.

As spring A pulls the dashpot plunger back to its normal position, by raising lever K which also raises link N high enough to release cut-off pawl R. Spring E then exerts a pull on lever J thereby breaking the circuit.

When the machine is operated continuously revolving cam G does not permit link N to raise high enough to release cut-off pawl R.

Dashpot L (Plate 12)

Dashpot L contains a piston that has a number of portholes, through which the oil flows freely, when the piston is depressed. The piston is provided with a valve which automatically closes these portholes, which retards the return stroke of the piston, which is then actuated by spring A. The seepage or passing of the oil around the piston regulates the time of the cut-off.

The timing of the cut-off varies from 1 to 8 minutes. In certain classes of machines where several operations are made with one depression of the operating bar, the time for the automatic cut-off to operate is extended to the maximum.

It will be readily understood that the timing of the cut-off does not require any mechanical adjustment. Should, however, the cut-off take place at the wrong time, the under-surface of the valve should be examined and thoroughly cleaned of any foreign substances with gasoline.

Examine the free action of the piston in the following manner: wash the pot and piston and see if the piston will drop to the bottom of the pot by its own weight.

Part N must be so aligned that the piston will travel centrally in order to prevent possible binding of the piston.

If the cut-off takes place in less than one minute it will cause the starting coils in an A. C. motor to be in constant use, which will result in unnecessary heating of the motor. Since it requires considerably more current to start a motor than it does to keep it in operation it is desirable to have the cut-off take place at the proper time.

How to Connect a Motor to a Drive

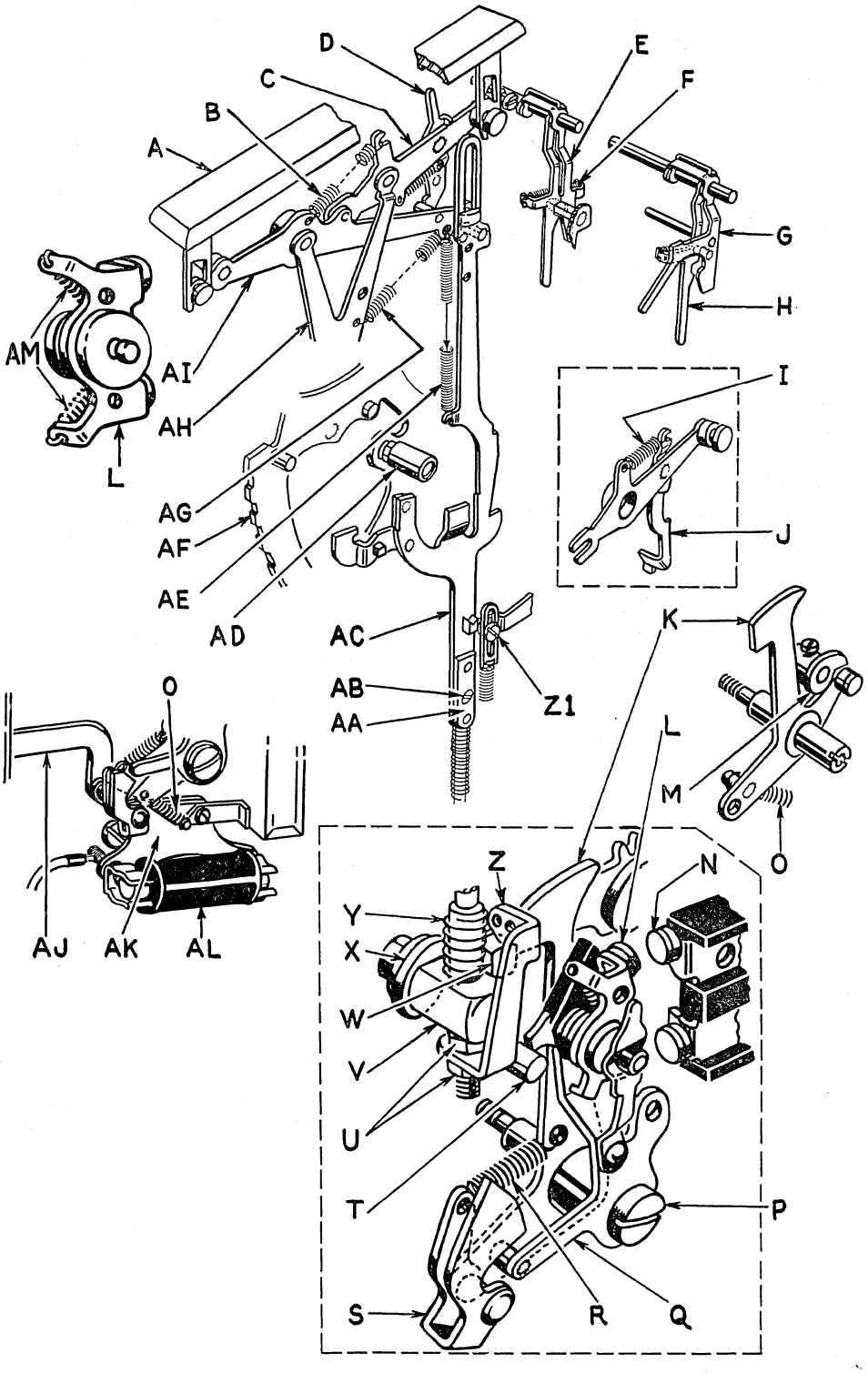
Attach the motor to the drive by removing the revolving member of the motor and sliding the hollow end on the drive shaft. Before removing the armature, lift the brush feed arms (AI, Plate 6) and withdraw the brushes sufficiently to allow the brush feed arms to contact the side of the brush to hold the brush and prevent its falling. The hole and slot should fit the shaft and pin snugly, it should also be oiled so as to facilitate its removal in the event that this is necessary.

Unscrew the oil cup in the motor housing and slide the housing over armature or rotor, so that the motor housing will seat on the shoulder of drive casting and the shaft of the armature will pass through the end bearing of the motor housing. Fasten the motor to the drive housing with bolts AS and nuts AT (Plate 4) on the dashpot side of the machine and thin nuts between condenser bracket and the motor housing on the opposite side. Try armature for end play; there should be at least 1/64″ and not more than 1/32″ play between the end bearing and the shoulder on the shaft. This end play can be regulated by adding or removing fibre space washers. Fill the oil cup with grease and see that the wick contacts the shaft.

Place strain bolt in the hole of the plate, one nut above and another nut below; with nuts loose, thread the strain bolt in base to just below the top of the base. With nuts tight, adjust strain bolt and nuts to support motor with just enough bind to take the weight of the motor.

Caution: Excessive bind of the strain bolt will distrub the alignment of the motor bearings.

OPERATING BAR AND SWITCH CONTROL MECHANISM (Plate 13)



Operating Bar and Switch Control Mechanisms (Plate 13)
Drive Trip

When motor bar A is depressed, lever AI through spring AE raises pitman AC, which rocks lever X to trip the clutch; the latter is covered in detail in connection with Plate 9.

Detents H and E or H and G hold AC in raised position to prevent AC restoring by dropping, which would permit depressing the total keys after the machine operation has been started.

When lever AI is rocked its square stud blocks the total keys against depression; shown under subject "Interlocks" Keyboard Instruction Book.

Depression of motor bar A also causes latch D to hook under the stud in the rear arm of lever AI. Latch D is a part of the repeat machine operation mechanism; this subject is covered in detail under Plate 13 in the Keyboard Instruction Book. In Class 6 and Bank Posting machines, detent G is used in combination with detent H to prevent repeated machine operations by compelling the release of the motor bar.

During the machine operation, detent J is used to latch lever AI in Class 6 machines.

On the forward stroke, roll AD carries pitman AC downward, placing spring AE under tension in machines having latch D and restoring AC in machines not having latch D.

Part Z is a part of the single stroke totaling mechanism, which is covered under its own heading in connection with Plate 40 in the Accumulation Instruction Book. When the upward movement of lever X trips the drive, square stud W clears part K, which allows spring O to swing the latter, which closes the switch slightly after the drive has been tripped. The lower left arm of part K carries control dog S, the latter pivots on K and is pulled against the roller on switch lever Q by spring R. When motor bar A is depressed, the resulting movement of part K causes the angled corner of S to pass over the roller in switch lever Q, causing a rapid movement of switch lever Q, which results in tungsten point assembly L contacting stationary points N, closing the circuit and causing the motor to operate.

When part K has completed its movement, its right arm is upward and in the path of resetting cam M. The operation of the motor causes cam M to restore part K by contacting on the roller in right arm of K.

The cut-off is timed and operated by control dog S, similar to the tripping switch lever Q; i. e., until switch lever Q passes over center of the roller in the right arm of K, control dog S holds the points together, however, when S passes over the center of the roller in the left arm of K, spring R exerts a pull and causes switch lever Q to snap to its normal position separating the tungsten points and limiting against stud T. The downward movement of pitman AC lowers arm X, which locates stud W in front of K, thus locking the switch out of action until the motor bar is depressed.

Tungsten point assembly L has an elongated hole, and two springs AM, one end of each spring joined by a wire, the other ends of the springs are hooked through holes in the upper and lower horn of L, which gives the latter a floating and wiping contact when the switch is closed.

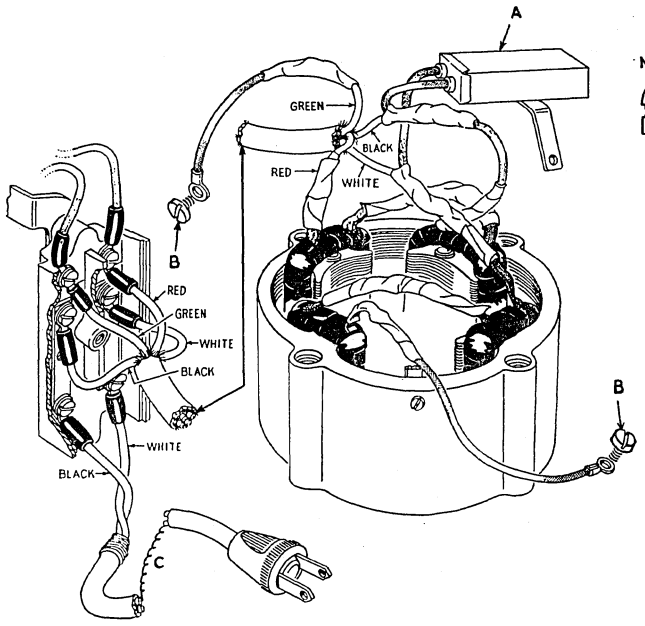
Adjustments

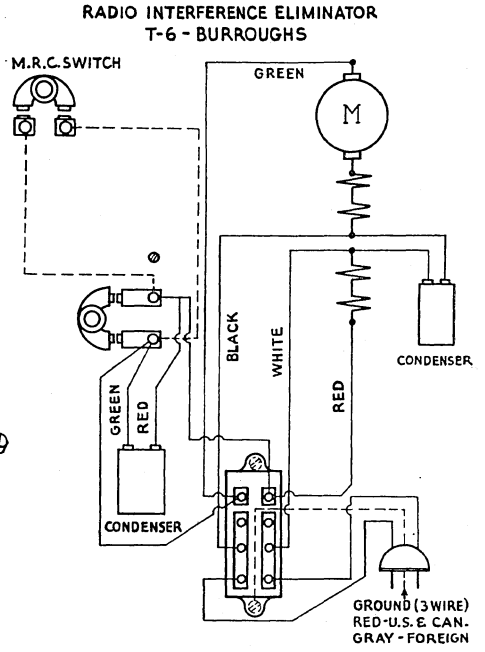
The clutch trip should take place with a clearance of .010″ between pitman AC and roller AD, which results in clutch tripping slightly before the closing of the switch.

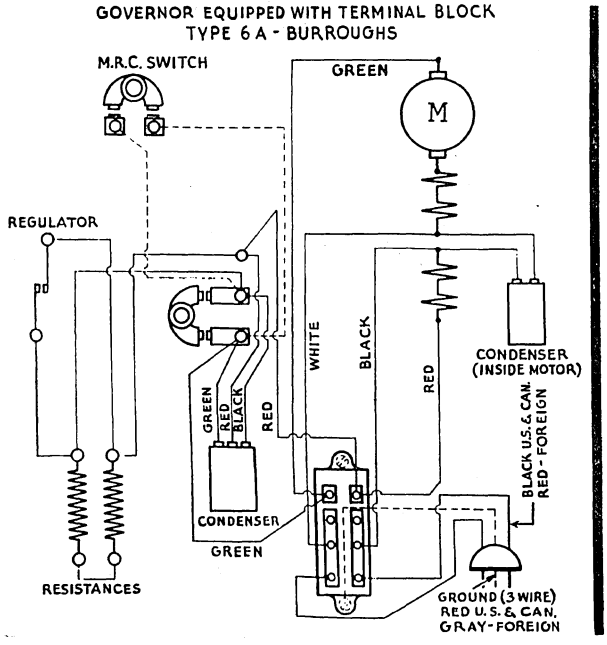
This is made by holding a .010″ gauge between AC and AD. No clutch trip should occur when a .015″ gauge is held between AC and AD.

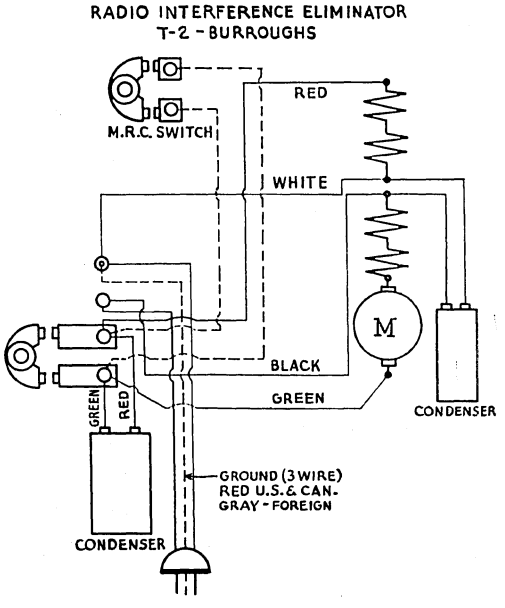
Resistance coil AL is required for machines having the Reflector and Light feature when used for circuits above 110 volts. Resistance coil AL is carried by assembly AK; the latter is fastened to brace AJ from which the stud for spring O is removed; this stud is in AK.

WIRING DIAGRAMS FOR TYPES 2, 6 AND 6A MOTORS (Plate 14)









Condenser (Plate 14)

The purpose of the condenser is to prevent pitting or burning of the tungsten points by absorbing the spark or arc which takes place between the switch contacts when the circuit is broken.

Condensers are also used to check radio interference. Types 2, 6 and 6A motors have a condenser fastened to the inside of the field with a screw. This condenser is shown removed on Plate 14 together with the wiring diagrams of Types 2, 6 and 6A motors. As will be observed in the wiring diagrams in Types 2 and 6 motors, one condenser is placed across the motor switch contacts and the other one is placed across the field circuit.

Type 6A have, in addition, one condenser lead to one of the governor contacts.

When the contacts spark excessively, the condenser can be tested as follows: (Have switch open:) Apply the terminals of a Burroughs test lamp to the strips that carry the tungsten points. When the lamp fails to light and the sparking is excessive, test condenser for holding the charge. Disconnect the condenser leads, touch the condenser connections with the test lamp points, then bring the two condenser points together; when a spark appears or a slight cracking noise is heard when the condenser is held near the ear, the condenser is O.K. When there is no spark or cracking noise the condenser should be replaced.

If the lamp lights, the condenser is broken down and should be replaced. A broken down condenser causes the motor to continue running.

It is also advisable to test the condenser terminals for being grounded with the condenser case. The test lamp is applied to one of the condenser leads and the condenser case. The same test is made with the other lead. If the test lamp lights the condenser should be replaced.

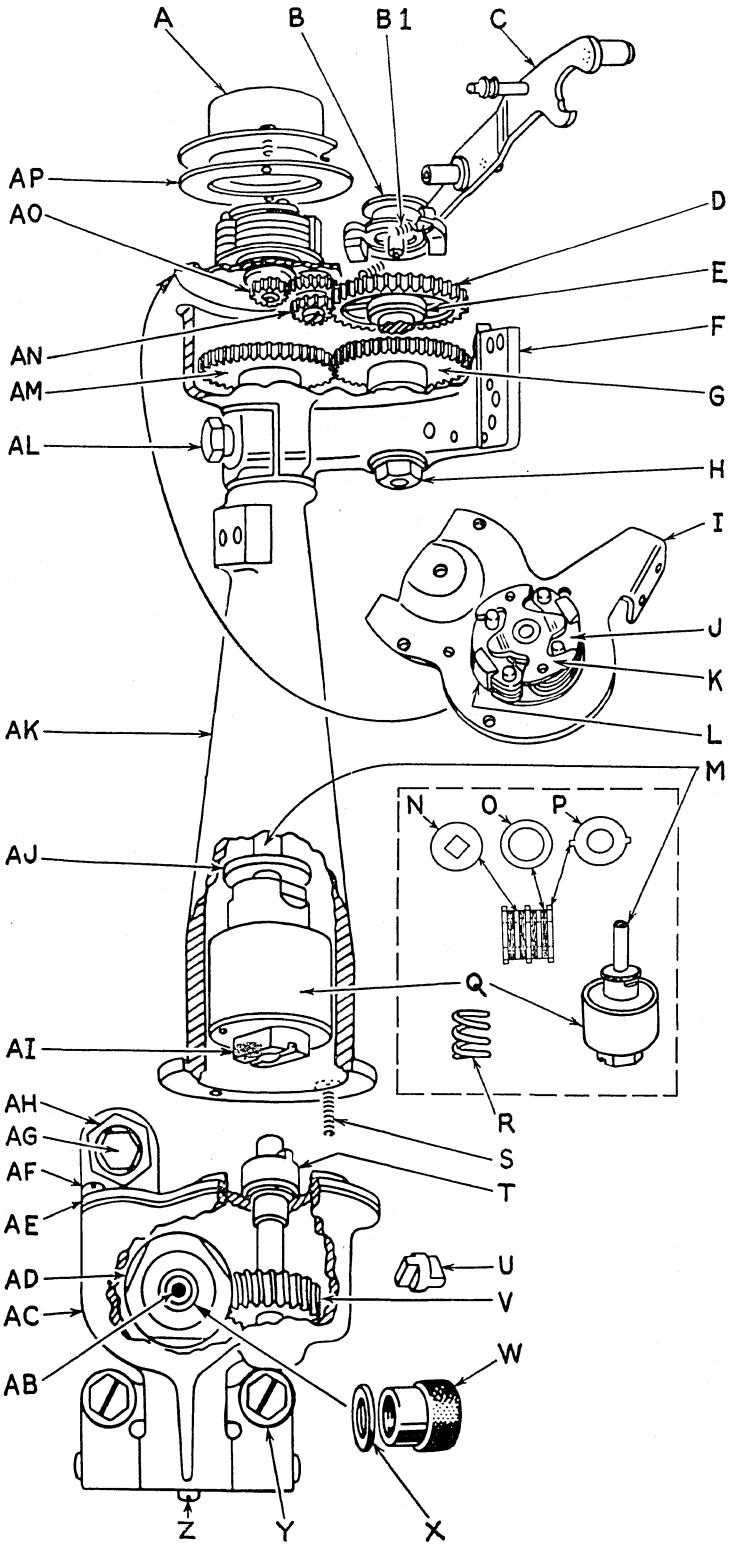
Electrical Tests

When a bare wire (damaged insulation) contacts on the motor housing, so as to permit the current to flow through the housing and the machine, it is called a ground.

From a safety standpoint all generators have one of the wires grounded. For that reason when a motor is grounded, a person touching the machine and a radiator or a pipe can receive an electrical shock. In some cases the ground is the result of brush carbon in oil on brush holders.

To test motor for grounding, disconnect the plug and close both switches. Apply one wire of test lamp to one side of plug and the other wire of test lamp to motor housing. No ground is indicated when the test lamp fails to light.

MRC UNIT (Plate 15)



Motor Returned Carriage Mechanism (Plates 15 thru 20)

The operation of the power unit is controlled through a clutch which is directed from various sources; these are covered under their own headings.

The clutch is positive, however, flexible application is secured through a friction drive assembly which is located between the reduction gearing and the clutch driving gear. The friction assembly permits the motor to turn, in the event that the carriage mechanism were blocked, thus protecting the motor and also the carriage mechanism.

A centrifugal governor is part of this mechanism being geared to the carriage rack, however, the governor is active only during carriage tabulation and not when the carriage is being returned.

MRC Unit (Plate 15)

There are two styles of friction assembly now being used: The earlier (Plate 15) which is smaller, is still used for 12″ carriage machines without multiple skip-return or multiple print; whereas the later and larger friction assembly (Plate 16) is used for the larger carries. The later style will eventually be used for all carriages.

The earlier friction assembly consists of a number of non-turning disks P, anchored by lugs seating in the long slot of pot Q, and a number of square holed disks N anchored to the square portion of drive shaft M. Molded friction disks O are between the non-turning disks P and the revolving disks N, the pressure to hold the metal disks against molded disks O is supplied by spring R. The friction assembly is connected to the drive shaft through worm AD, worm wheel V and shaft T.

Drive shaft M is revolved by frictional contact of molded disks O between disks P and N. The earlier style friction assembly uses four molded disks O, three steel disks P and two steel disks N. The tension of spring R is not adjustable in the earlier style friction assembly, due to cap Q being screwed down tight. To increase the tension on the disks, a stronger spring is used or one or two disks N added.

The metal disks used in the earlier style, (Plate 15) are different than the ones in the late friction assembly, (Plate 16), having smaller holes.

Drive shaft M carries gear AM, which revolves lower clutch member gear G, the latter having six ratchet projections which are engaged by two similar projections on upper clutch member B, the ratchet projections of the upper member pass through two openings in rack drive gear D.

When clutch lever C is rocked from any one of the MRC mechanisms, upper clutch member B is lowered to be engaged by the lower clutch member G resulting in the carriage drive gear D moving the rack and returning the carriage.

Universal joint U connects worm shaft AB and the armature shaft. The flat projections which are at right angles to each other seat in slots of the armature shaft and the slot in worm shaft AB.

Tests and Adjustments (Plate 15)

In order to insure that the carriage will stop in the right column, it is essential to have the clutch control timed correctly. When the returning carriage reaches the selected column, upper clutch member B should be disengaged and clear the teeth of lower member G, before the MRC trip mechanism is latched. When there is insufficient clearance, it is indicated by the clutch engaging when clutch lever is raised, left end (dashpot side of machine), motor running.

Adjustment: Clutch lever C is raised or lowered as required.

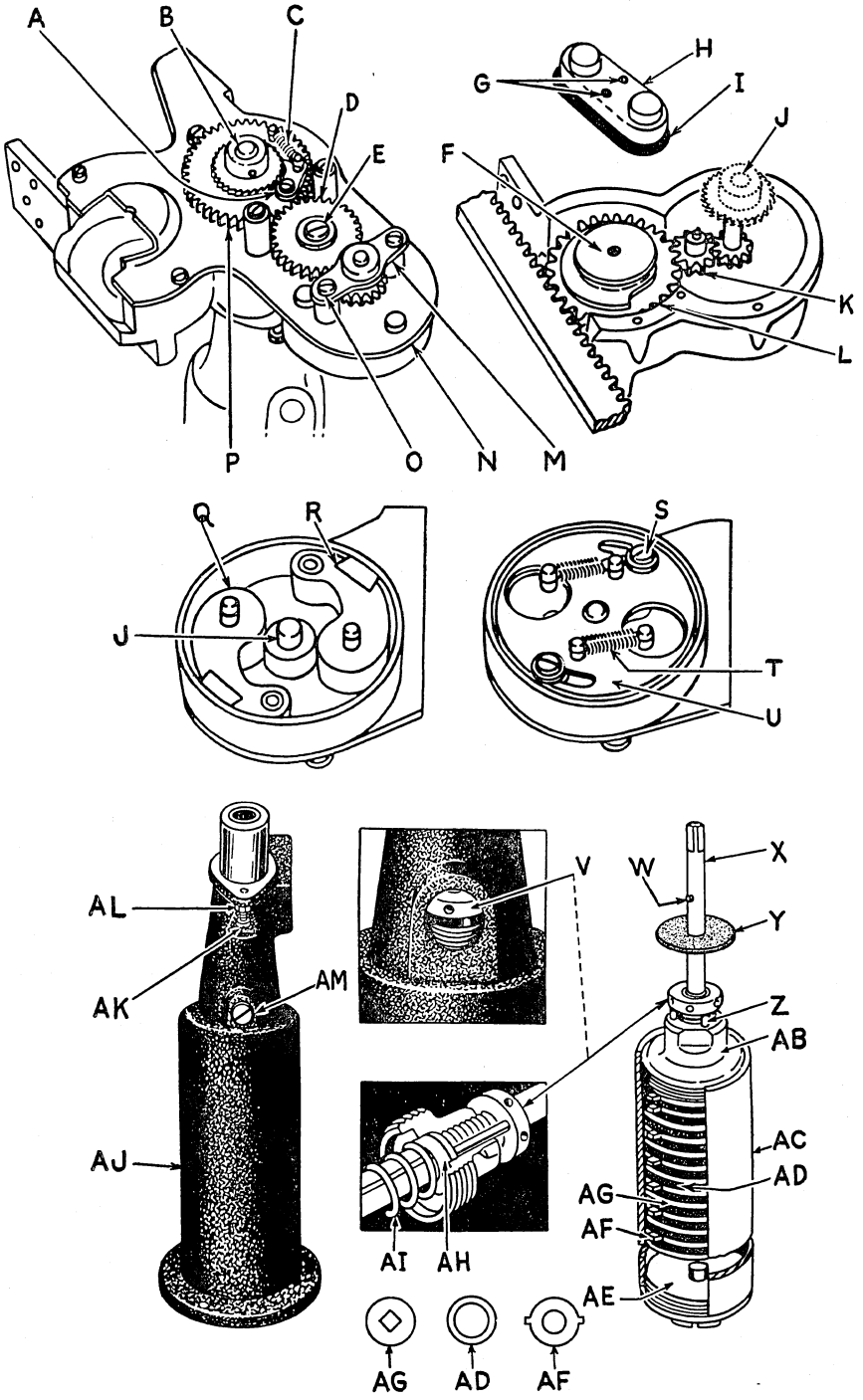
MRC Governor, Early (Plate 15)

The purpose of the governor is to prevent carriage damage, due to the carriage coming to a sudden stop, when it is permitted to build up speed, on long jumps during skip or/and regular tabulation.

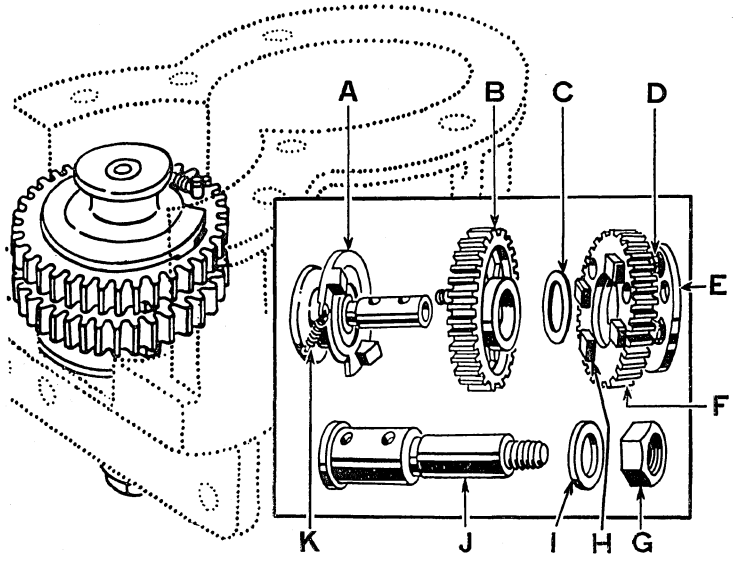
The governor controls the speed of the carriage through centrifugal force which causes weight arms J to swing outward, fibre inserts L contacting on the inside surface of drum cap A.

Weight arms J are revolved by gears AO, AN and D. The early style governor is being used only for 12″ carriages not having multiple skip and return mechanism.

MRC GOVERNOR LATER AND FRICTION ASSEMBLIES (LATER)
(Plate 16)



MRC CLUTCH UNIT USED IN EARLY STYLE MULTIPLE SKIP AND RETURN MACHINES (Plate 17)



MRC Governor (Later) and Friction Assemblies (Later) (Plate 16)

The purpose of this friction assembly is to provide a smoother and easier pickup when the clutch is engaged. The later style friction assembly uses 25 molded disks AD, 14 non-turning AF, and 12 revolving disks AG.

Spring AI contacts on the top disk and is held against that disk by nut V contacting on pins Z, which in turn contact washer AH. To adjust the tension on the disks, screw AM is removed and nut V turned by inserting a punch in one of the three holes in nut V and prying against the bottle.

MRC Governor (Later) (Plate 16)

The purpose of the later governor is to provide a more uniform control of carriage tabulation. This governor is only active during carriage tabulation, since ratchet B idles by pawl A during carriage return. The governor action is not suddenly arrested upon completion of the carriage tabulation since the gears can overrun, there being a gradual slowing down of the governor assembly. Weight arms Q are inverted, and for that reason are free from dust and dirt. With the exception of putting grease on bearing post of gear K, no other oiling is required, the other bearings being made of oilite material. A quicker get away of the carriage is obtained, there being no governor action until the centrifugal force overcomes the tension of springs T.

The friction of the governor is adjustable, by loosening screws S and moving disk U which changes the tension of springs T.

Note: Springs T must be connected as illustrated, pulling from outer end of weight arm Q to pivot end of the opposite weight arm Q.

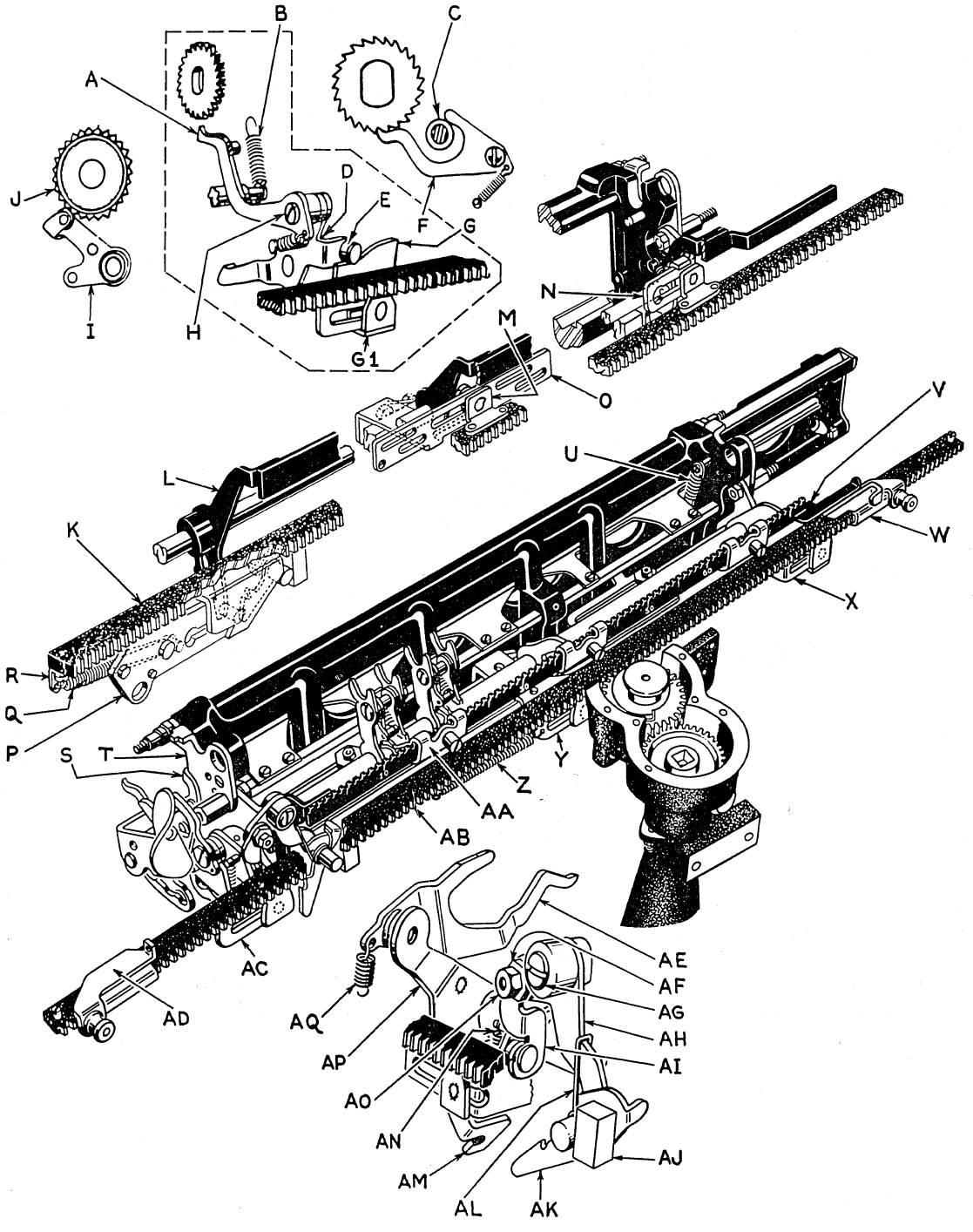
MRC Clutch Unit Used in Early Style Multiple Skip and Return Machines (Plate 17)

The purpose of this mechanism is to prevent damage to carriage return mechanism connecting parts when the teeth of upper clutch member A and lower clutch member F mesh point to point. Teeth H float in gear F and disk E, held upward by spring D.

When the clutch teeth of A and F come together point to point, clutch teeth H move downward and upward to correctly engage teeth of A. This mechanism is discarded but required for repairs.

In the late machines the same result is secured by pulling the clutch lever through a spring connection.

MRC FEED MECHANISM (Plate 18)



MRC Feed Mechanism (Plate 18)

When the MRC clutch is engaged, rack AB actuates the feed mechanism by moving in the slots of hangers AC, Y and X; rack AB is held in normal position by spring Z.

The rack movement is applied by block AJ contacting the stud in bell-crank AH which rocks feed pawl AE through intermediate part AP and link AI. Feed pawl AE engages ratchet wheel J and turns it one space. Feed pawl AE has a projection which limits on C, the purpose of the projection on AE is to prevent double spacing.

Tests and Adjustments

When rack AB is manually moved to limit the feed pawl on C, there should be no backlash of the platen which could be felt with the twirler.

When backlash is present it is reduced by turning eccentric AF. When making this adjustment there must be clearance between the projection on the feed pawl and C; when there is no clearance it is secured by bumping the projection with the rack held in feeding position.

The correct tension of spring AQ is important, it must be sufficiently strong to hold the feed pawl to insure positive spacing.

When rack AB is held in active position, detent I should exert sufficient resistance on pawl AE.

Test: When rack is pushed into its active feeding position, the proper resistance can be determined by applying a twist to the platen in feed direction.

Adjustment: The stud in detent I is advanced to or retarded from the pawl in order to increase or decrease the resistance.

Feed Cam G

Early machines have the feed mechanism actuated by cam G through assembly D.

There should be not less than 1/32″ clearance between pawl A and the ratchet wheel when the carriage is at rest.

Adjustment: To secure more clearance the lip on D is bent. Since this adjustment reduces the play between cam G and roll E, the bending is limited to 1/64″ play between roll E and cam G.

During an MRC spacing operation, pawl A must receive a complete driving movement.

Test: When rack AB is completely moved by hand, there should be no play between the pawl and the ratchet.

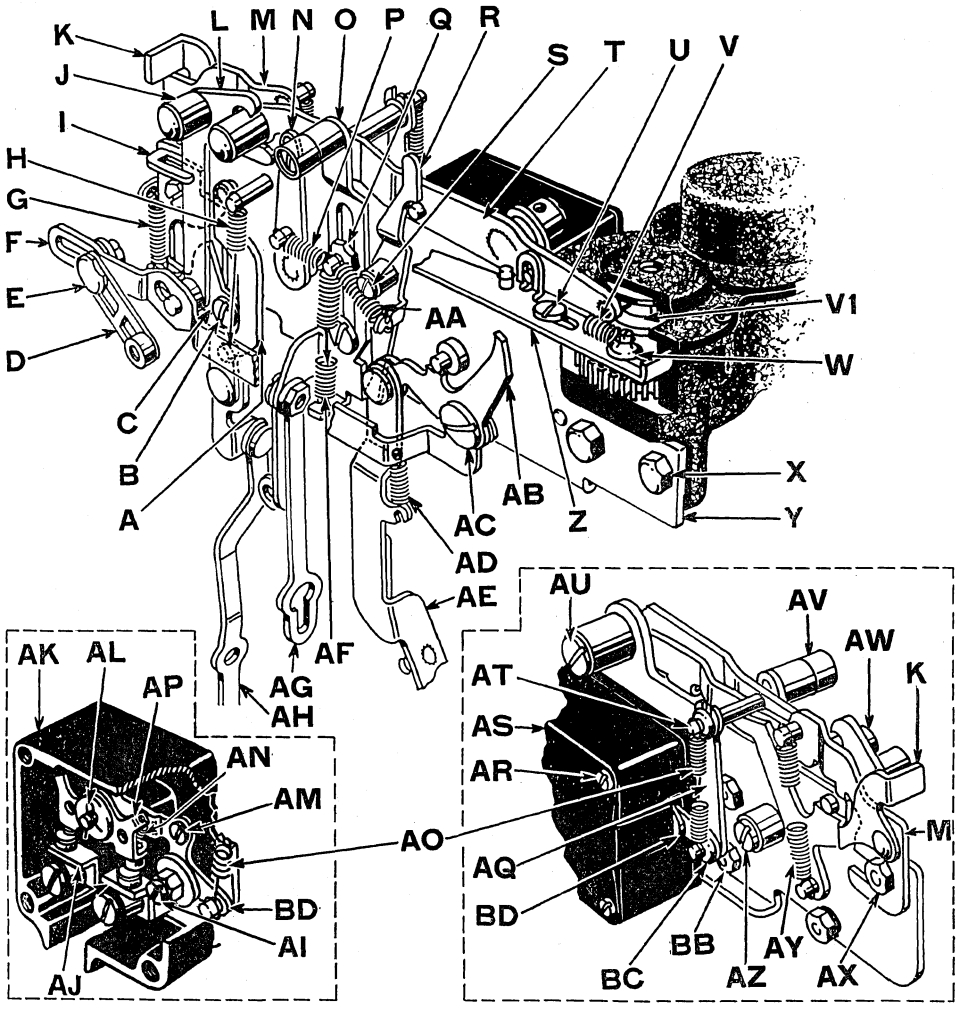
Adjustment: To reduce excessive play, cam G is removed and held in a vise so that the high part of the cam can be adjusted higher without raising the low part. This adjustment increases the driving movement of pawl A when rack AB is active, and retains the required clearance when the rack is normal.

Rack Bar Lock

The purpose of latch AK is to limit the MRC feed pawl to one operation when the MRC clutch is tripped. Latch AK pivots on bell-crank AH. Latch AK has two steps, one of which engages the corner of hanger AC when the MRC mechanism moves rack AB to actuate the feed pawl.

Latch AK holds rack AB preventing its return movement until the clutch is released, at which time part AM moves against latch AK disengaging it from hanger AC.

MRC UNIT PLATE ASSEMBLY (Plate 19)



MRC Unit Plate Assembly (Plate 19)

The motor is controlled to operate the MRC mechanism by a separate switch. The switch is carried by plate Y and connects with clutch lever T through link AQ and spring AO. When the clutch is engaged, spring AO rocks assembly BD, which closes the switch by bringing the contact points together.

When the clutch is disengaged, link AQ reverses the movement of assembly BD, which opens the switch by separating the contact points. The upper moving points are fastened to part AP, which floats on the stud in assembly BD. Two springs AN, hooked from the horns of AP, are connected by a wire which lies in the recess of the collar behind part AP, which causes springs AN to pull and hold part AP with the contact points downward. When the closing of the switch brings the contact points together, the spring pressure produces a wiping effect of the upper and lower contact points.

Tests and Adjustments

To insure that the MRC clutch can be tripped and the carriage returned under all conditions, the motor must be running when the clutch members are point to point.

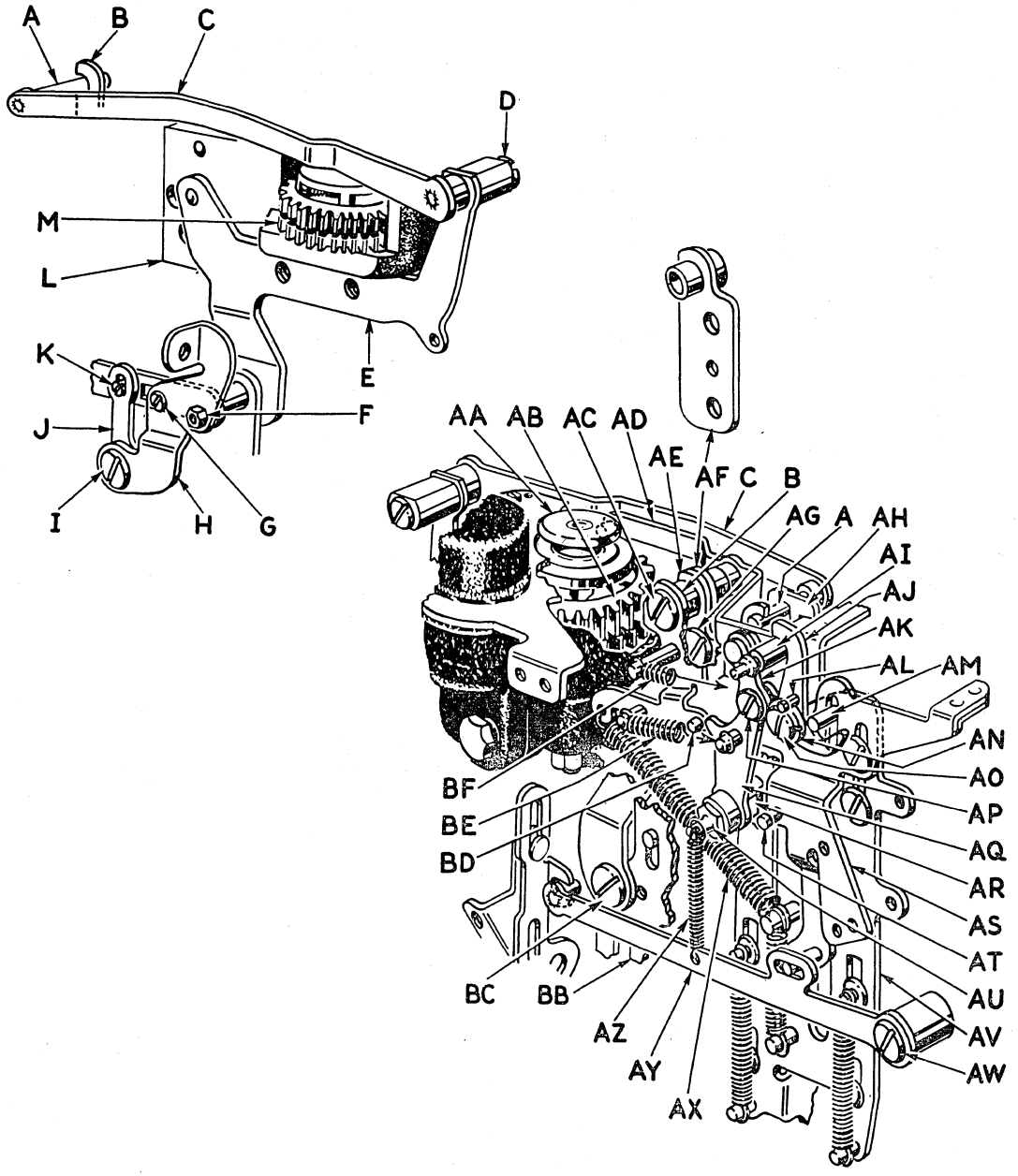
Test for motor running: When slight pressure is applied to lever T at the clutch end, the motor should run. When the motor fails to run, screw AM is loosened and the brush holder shifted as required.

When pressure on lever T is increased, the clutch members should vibrate (rattle), if not, they do not have correct hold.

Adjustment: Lever T is removed and the clutch end lowered.

Note: This adjustment is limited to retain clearance between the clutch members when the clutch is normal.

MRC CLUTCH MECHANISM (IMPROVED) (Classes 20-30) (Plate 19-1)



MRC Clutch Mechanism (Improved) (Classes 20-30) (Plate 19-1)

Purpose

This mechanism insures the positive engagement and disengagement of clutch member AA and gear AB during carriage return operations, eliminating the possibility of imperfect indexing and premature releasing of the carriage return clutch.

Construction

In addition to the introduction of various new parts, the development of this improved mechanism entailed the redesign of several previously used parts, as indicated in the following:

Support E now contains a lower extension which secures the position of the unit plate (BB).

(Plate 19-1)—Continued

Gear AB is now of greater thickness to provide a full hold on the MRC rack when the height of the unit is adjusted.

Shim AF now contains a bushing (2 hubs) which permit the installation of the mechanism without changing the unit plate.

Arm AD now contains link AK which is attached to arm AQ to act as a toggle.

Operation

As return latch AH is lowered and latched down, during the indexing of a carriage return, stud A, being engaged with the notch in the upper projection of part B, swings and holds part B to the right and places springs BF, BE, and AX under increased tension.

Latch AJ holds arm AD and clutch member AA in disengaged position until stud AM contacts and rocks latch AJ. When AJ is rocked, stud AI is released and spring BE pulls arm AQ to the right to limit against stud BD. As arm AQ is pulled to the right the toggle action of arm AQ and link AK rocks arm AD to lower member AA into engagement with gear M, thus indexing a carriage return.

Arm AQ and link AK, being on center (in perfect alignment), prevent the disengagement of the clutch during the carriage's return.

When a shut-off roll on the carriage releases latch AH, during a carriage return, spring AX is allowed to raise stud A and to swing part B to the left. As B moves to the left, stud BD contacts the camming surface of arm AQ to break the toggle formed by arm AQ and link AK. Arm AD is thus rocked and clutch member AA is raised out of engagement with gear M to terminate the carriage return.

Installation

The following outline is offered as a guide for installing the above mechanism in the Field.

1. Remove the Multiple Skip and Return Unit.

2. Refer to Plate 37-1, Carriage Symbol List Supplement, and remove the parts therein pictured which bear the following letters: AE, Z, AC, V, and the support which is attached to the unit casting by screws AH.

3. Refer to Plate 37-2, Carriage Symbol List Supplement, and remove the parts bearing the following letters: I, BA, BE, and BH.

4. Remove the following:
   (a) The shim which is located between casting L and the unit plate.
   (b) The bushing in projection AE of the unit plate. (Check projection for being straight after the bushing has been removed.)
   (c) The screw which was formerly used in the position now taken by nut F.

5. Install the following parts:
   (a) Shim AF (do not tighten screws AG).
   (b) Part E, screw BC, and nut F.

6. Tighten screws AG.

7. Install the following parts:
   (a) Arm AD, part B, and screw AC.
   (b) Post AR, part AQ, and screw AU.
   (c) Latch AJ, eccentric bushing AN, and screw AO.
   (d) Arm C. (Stud A in arm C, should be located in the pocket of the arm in part B.)

8. Connect link AK with part AQ, using shoulder screw AP.

9. Install springs AX and BE.

10. Spring BF should be hooked up to stud AL.

11. On machines equipped with pressure roll non-opening controlled from a skip or return latch, screw 83639 is used in place of screw AO and acts as a spring anchor for spring 705828 which is hooked up to stud AT.

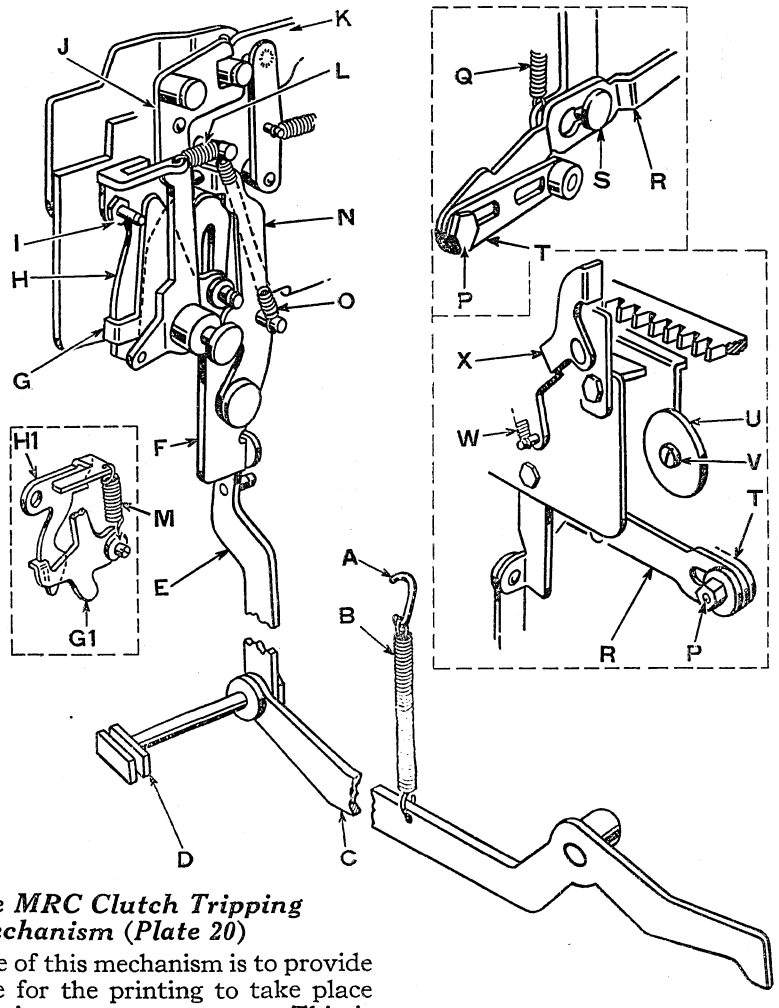
12. Spring AZ is used in place of spring 705828 on machines equipped with carriage opening controlled from a skip or return latch.

Adjustment

Adjustment: Latch AJ should have slight clearance over stud AI when the return clutch is in disengaged position.

To adjust, loosen screw AO and turn eccentric bushing AN as required.

REVERSE MRC CLUTCH TRIPPING MECHANISM AND SELECTIVE COLUMN RETURN (Plate 20)



Reverse MRC Clutch Tripping Mechanism (Plate 20)

The purpose of this mechanism is to provide sufficient time for the printing to take place before the carriage starts to return. This is accomplished by tripping the MRC clutch on the return of pawl N instead of on the downward stroke of pawl N.

Sequence

When the return bar is depressed, assembly E is pulled downward, locating pawl N under latch H. When assembly E moves upward, pawl N trips latch H, part J moving upward, which rocks clutch lever Q to trip the MRC clutch.

When the return bar is used with roll U on the stud in arm T, the rounded arm on pawl N contacts on a similar rounded surface of part J, causing pawl N to swing from under latch H which prevents tripping latch H, but allows the carriage to tabulate to the next column.

This mechanism can only be used in connection with the early carriage return mechanism.

Tests and Adjustments

When roller U is seated on the stud in arm T, there should be minimum play between U and the stud. When latch H is being reset, part G should have lead past latch H.

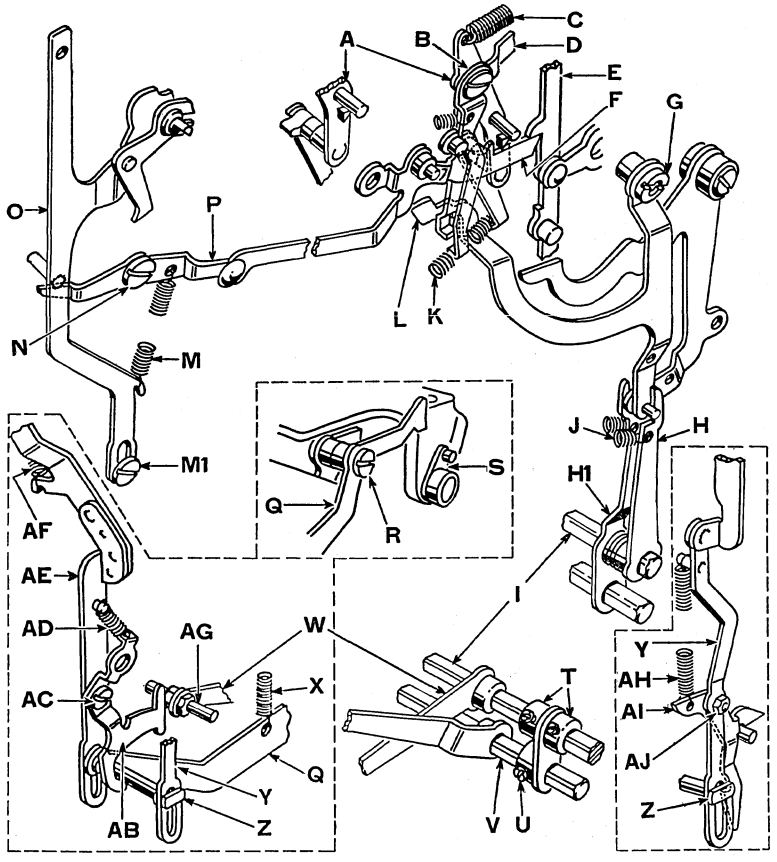
Arm T is raised or lowered. To facilitate roll adjustment, arm T is slotted.

Selective Column Return Mechanism (Plate 20)

This mechanism permits the return of the carriage to one of any selected positions, instead of only to the second column. When the returning carriage causes roll U to contact the roll on link T, assembly E is pulled downward which tilts clutch lever K disengaging the clutch.

Link T is adjustable for height and its slots permit its being located in the required positions.

EARLY CARRIAGE RETURN FROM MRC RACK, UPPER AND LOWER BARS (Classes 20 thru 30) (Plate 21)



Early Carriage Return from MRC Rack, Upper and Lower Bars (Classes 20 thru 30) (Plate 21)

This mechanism is indexed by the depression of lower and upper bars and the MRC rack; the indexing is completed by the drive or main (100) section.

In this mechanism, the clutch is engaged after printing in the balance column, whereas in the old style MRC the clutch is engaged when the carriage tabulates from the balance into another column.

Depressing lower bar O through intermediate P, rocks control lever F which causes the step on F to clear the angular stud in part A. Springs C and K drive A, which contacting on L rocks the latter. Part L in turn rocks shaft I through arm H. Arm W swings latch AB under stud *Z*. During the machine operation arm S rocks lever Q which pulls link Y downward and through part A, (Plate 19) trips latch I, (Plate 19) allowing part L, (Plate 19) to move upward rocking clutch lever T, (Plate 19) to lower upper clutch member VI, (Plate 19) to engage the lower clutch member.

When upper bar E is depressed, control lever F is lowered to allow part A to index the return mechanism in the same manner as the lower bar.

When the trip pawl on the MRC rack, or the pawl on the carriage moves slide Z, (Plate 19) the ear of the latter (not shown) locates in the path of bell-crank AB, (Plate 19). During the machine operation, arm S rocks lever Q which pulls link Y downward and through part A, (Plate 19) trips latch I, (Plate 19) allowing part L, (Plate 19) to move upward rocking clutch lever T, (Plate 19) to lower upper clutch member VI, (Plate 19) to engage the lower clutch member.

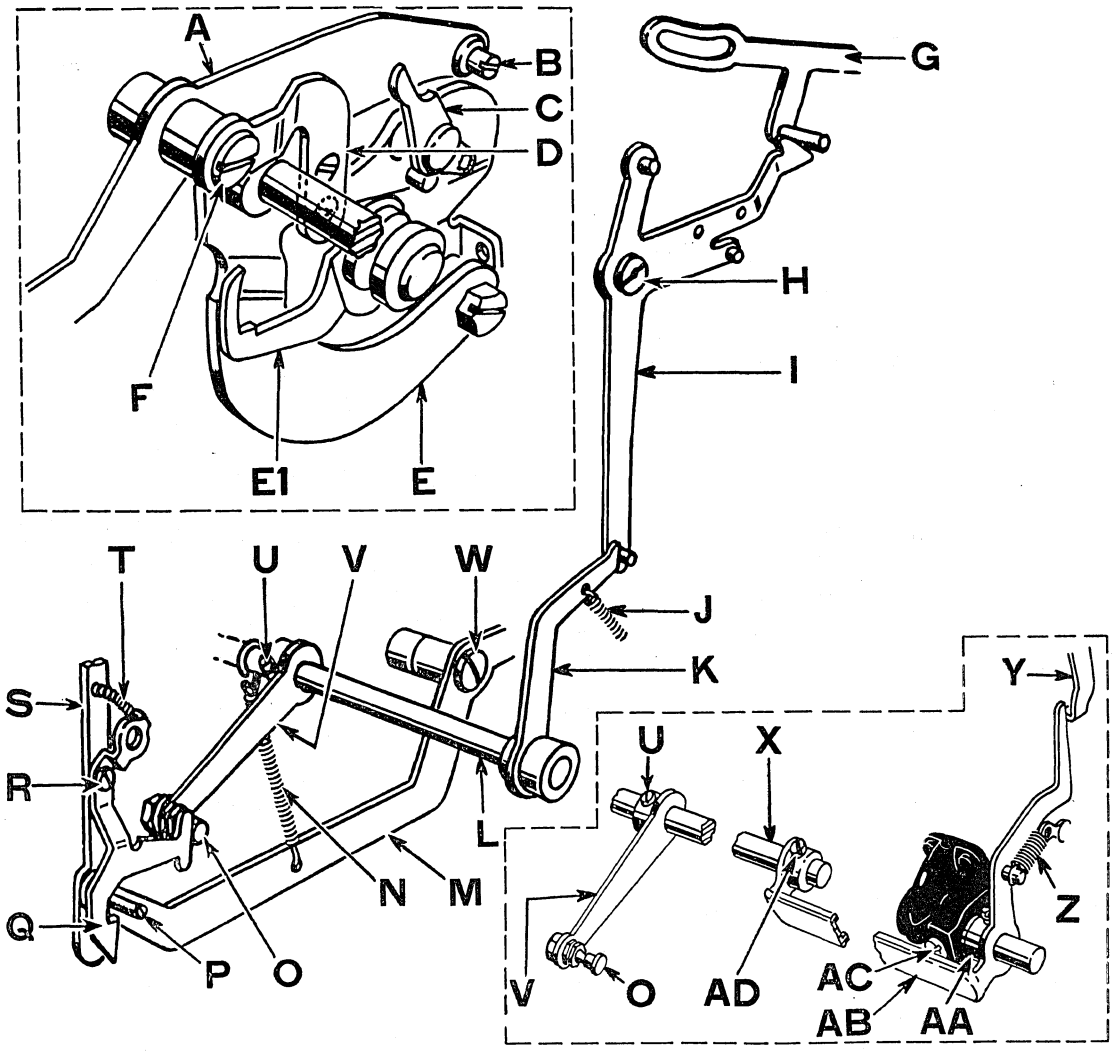
Tests and Adjustments

With the return bar depressed and the motor turned manually, lever Q should trip latch I, (Plate 19) with lead when arm S is at its high point.

Adjustment: Lever Q is bent.

There should be .005″ clearance between slide Z, (Plate 19) and the trip pawl on rack or carriage.

EARLY CARRIAGE RETURN FROM TOTAL KEYS
(Classes 20 thru 30 and H903) (Plate 22)



Early Carriage Return from Total Keys (Classes 20 thru 30 and H903 Machines) (Plate 22)

Depression of the total key through link G rocks bell-crank I; the latter contacting on arm K rocks shaft L, and arm V clears latch Q. Spring T pulls latch Q under stud P. During the machine operation lever M, contacting latch Q pulls link S downward, which through part A, (Plate 19) trips latch I, (Plate 19) allowing spring G, (Plate 19) to carry part L, (Plate 19) upward, the latter rocks clutch lever T, (Plate 19) which lowers the upper clutch member to engage the lower clutch member.

In machines having carriage controlled crossfooter total and sub-total mechanism, part Y rocks bail AB, which rocks shaft L and arm V to allow latch Q to locate under stud P.

During the machine operation the main (100) section, through pawl C contacting stud B, rocks lever A pulling down latch Q with the same results as when lever M pulls down latch Q. Plate 41 in Instruction Book on Carries, explains in detail the main (100) section control.

Tests and Adjustments

Total key normal, latch Q should clear stud P.

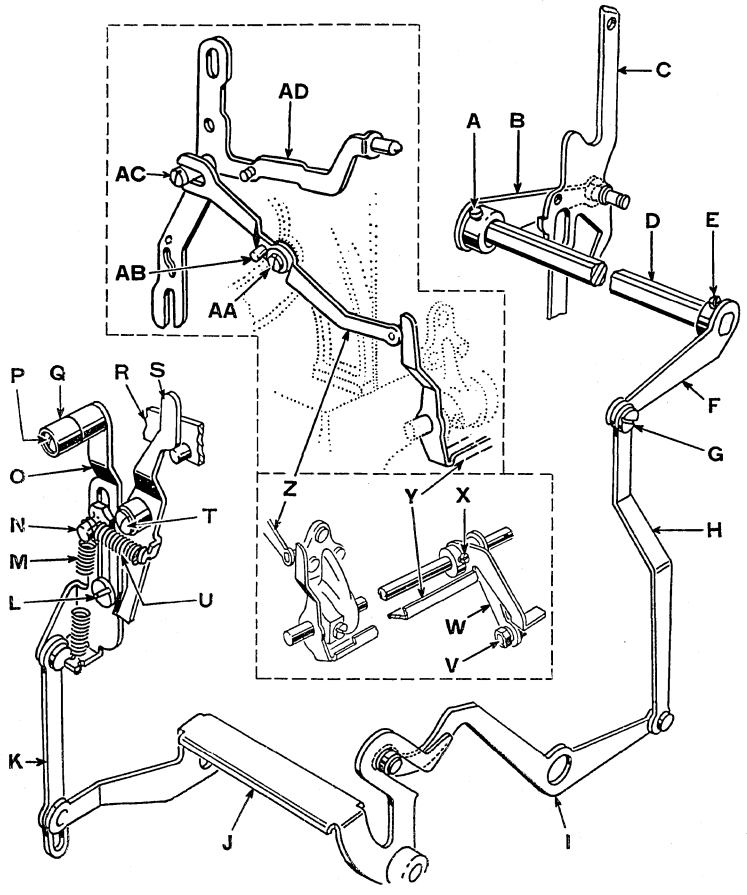
Adjustment: Set screw U is loosened and arm V located as required.

Total key depressed, arm V should permit latch Q to have full hold on stud P.

Adjustment: Arms I or Y are bent.

EARLY CARRIAGE RETURN DISABLED FROM CARRIAGE NORMAL KEY (UPPER LEFT); AND SKIP TABULATION FROM UPPER SHAFT (ON RIGHT)

(Classes 20 thru 30) (Plate 23)



Early Carriage Return Disabled from Carriage Normal Key (Classes 20 thru 30) (Plate 23)

When the carriage normal key is depressed, part AD moving downward rocks lever Z, which in turn rocks bail Y. Arm of bail Y lowers arm W, which prevents latch AB, (Plate 21) from swinging under stud Z, (Plate 21) and thereby prevents carriage return from total keys.

Bank posting machines which either return the carriage or space the carriage, have stud AB in lever Z. Stud AB blocks part L, (Plate 21) which prevents latch AI, (Plate 21) moving under stud Z and thereby prevents carriage return from return bars.

Tests and Adjustments

When the carriage normal key is depressed and latched down, latch AB, (Plate 21) should clear stud Z, (Plate 21). Bail Y is adjusted to push latch AB, (Plate 21) further.

Skip Tabulation from Upper Bars and Upper Shaft

When upper bar C is depressed, shaft D through arms B and F, link H and bell-crank I rock bail J, which through link K pulls skip slide O downward, which is latched in this position by latch S.

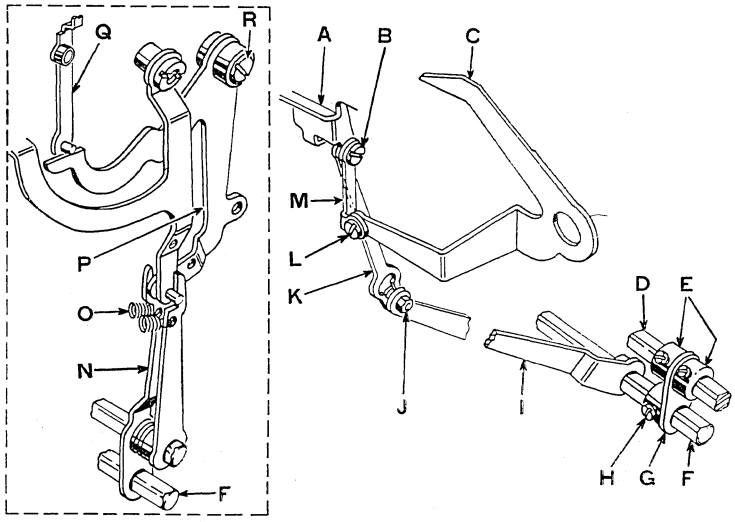
The downward movement of slide O permits the skip bail to follow, which holds the stop bar above the stop block until latch S is released. Skip tabulation is covered by Plate 14, Carriage Instruction Book.

Tests and Adjustments

When bar C is depressed, latch K should have slight lead.

Adjustment: Weave bail J.

SKIP TABULATION FROM BAR AND SHAFT IN BASE AND ALSO FROM CARRIAGE (Classes 20 thru 30) (Plate 24)



Skip Tabulation from Bar and Shaft in Base and Also from Carriage (Classes 20 thru 30) (Plate 24)

When bar Q is depressed, bell-crank P through arm N rocks shaft F. Arm I, through link K, pulls down skip slide O, (Plate 23) slide O, (Plate 23) is latched by latch S, (Plate 23).

When a control roll contacts lever C, link M pulls down skip slide O, (Plate 23) which is latched by latch S, (Plate 23). The downward movement of skip slide P, (Plate 14, Carriage Instruction Book) allows bail N, (Plate 14 same book) to hold the stop bar in raised position until released by carriage position.

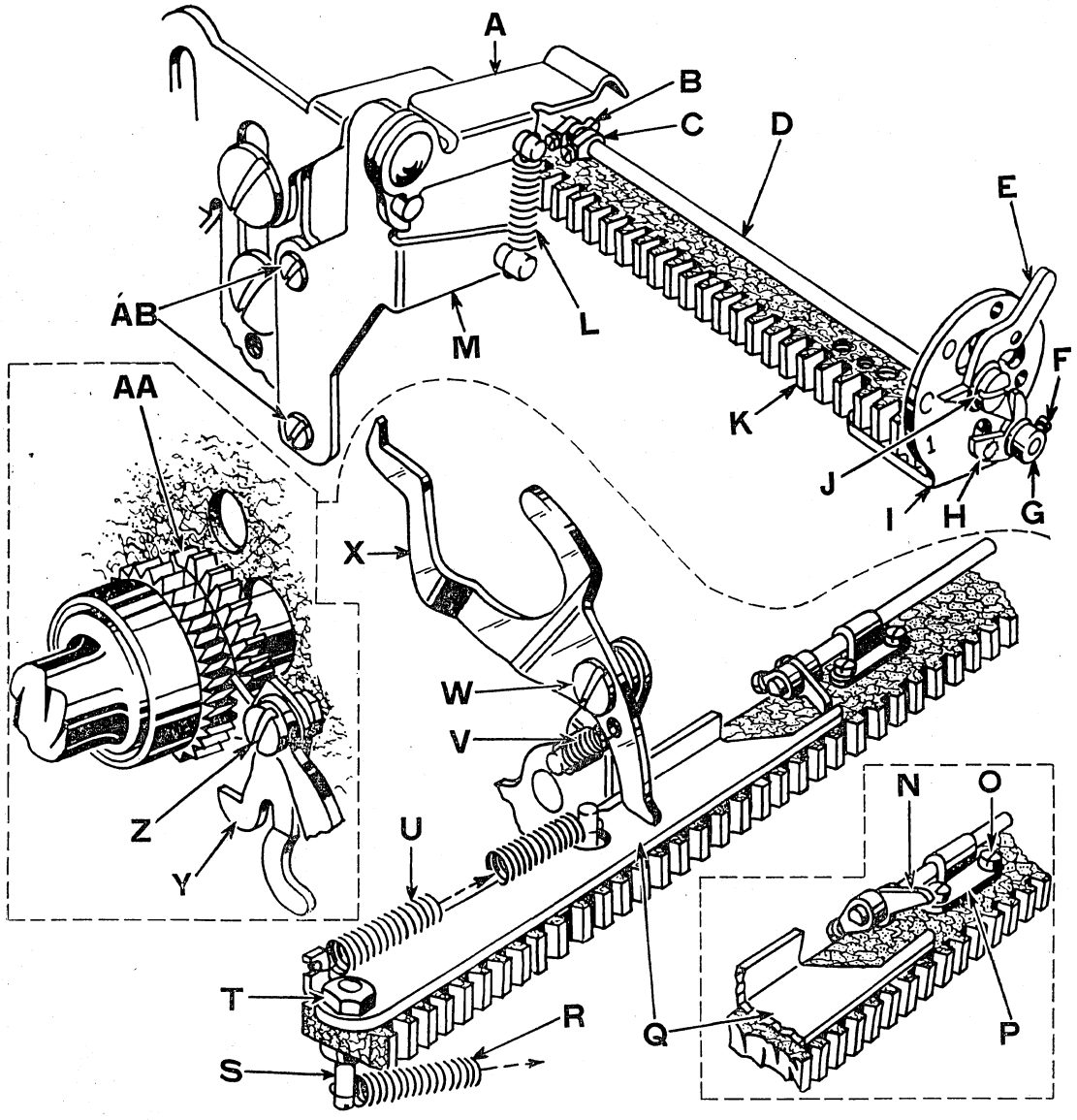
MRC Space and Non-space Mechanism Indexed Jointly by Carriage and by Multiple Skip and Return Mechanism (Plate 25)

Non-spacing is accomplished by disabling MRC space pawl X. Non-spacing, carriage control or spacing is selected by setting indicator E in upper, central or lower pocket of plate I. The illustration shows indicator E in central pocket for carriage control. MRC pawl X is disabled by being tilted when moving over the ledge of part Q when the latter is blocked by arm N during rack K movement.

Spacing Carriage Control: When indicator E is set in central pocket in plate I as shown in sketch, the front arm of dog B is inclined, the carriage position locating dog B under arm A. During the drive operation slide M, on which arm A pivots, pulls the latter downward which rocks shaft D raising arm N to clear part Q. Part A is connected to part M with spring L; the latter expands when shaft D limits through fork H.

When the carriage return mechanism becomes active, rack K movement actuates space pawl X, part Q swings forward with space pawl X without tilting X, permitting X to engage ratchet AA and space the platen.

MRC SPACE AND NON-SPACE MECHANISM INDEXED JOINTLY BY CARRIAGE AND BY MULTIPLE SKIP AND RETURN MECHANISM (Classes 11 thru 16, 20 thru 30) (Plate 25)



(Plate 25)—Continued

When part A is not located over dog B, arm N blocks part Q so that when rack K actuates space pawl X, its foot contacting on the ledge of part Q, tilts X preventing it from engaging ratchet AA to space the platen.

Non-spacing Carriage Control: Dog B is inclined in the rear so that part A rocks shaft in the opposite direction, moving arm N to block part Q to disable space pawl X during rack K operation.

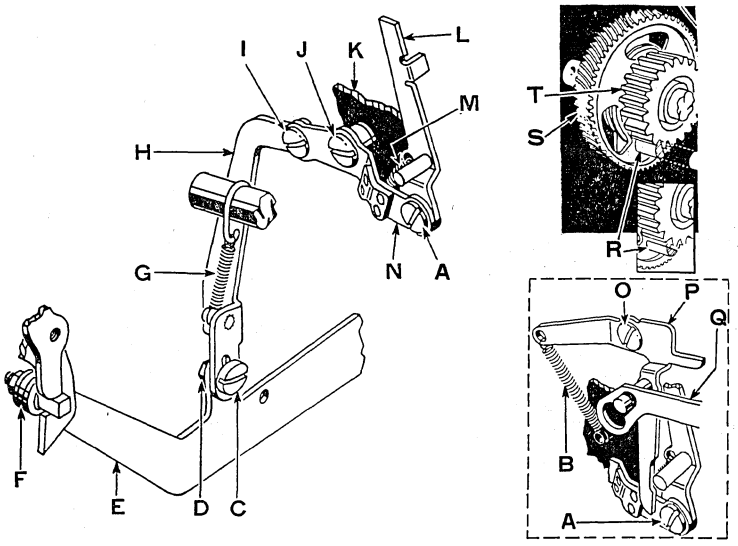
Manual Space Control: Indicator E is set in the lower pocket of plate I which tilts arm N to clear part Q.

Manual Non-space Control: Indicator E is set in the upper pocket of plate I which locates arm N to block part Q.

Tests and Adjustments

All parts to move freely. Space pawl X to have no backlash when rack K is moved manually to its limit.

MACHINE DRIVE TO CONTROL PRINTING, CARRIAGE TABULATION AND CARRIAGE RETURN MECHANISM (Classes 20 thru 30) (Plate 26)



Machine Drive to Control Printing, Carriage Tabulation and Carriage Return Mechanism (Classes 20 thru 30) (Plate 26)

The purpose of this mechanism is to coordinate tabulation carriage return. The return and tabulation take place simultaneously in order to prevent tabulating off the return stop thereby losing the return.

Lift pawl L pivots on lever H, which is raised and lowered by return actuating arm E. Lift pawl L is controlled from the same sources as heretofore.

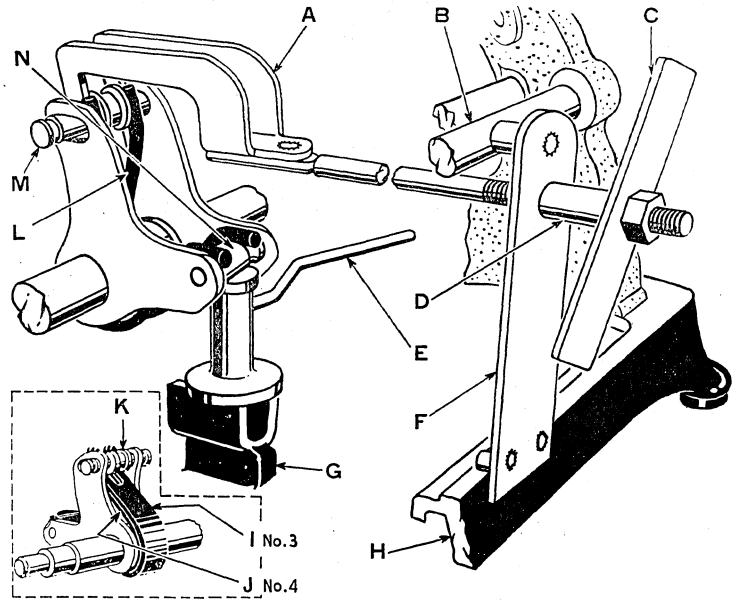
Tests and Adjustments

Lift pawl L is adjusted to raise the stops 3/32″ above the stop block by turning eccentric C.

Note: This mechanism can be used only in machines having the 19-1 gear ratio.

SPRINGS 885 NOS. 3 AND 4—HOW TO INSTALL (Plate 29)

(Plates 27 and 28 in Symbol Book only)



Springs 885 Nos. 3 and 4—How to Install (Plate 29)

Disconnect power and remove case, and if convenient, remove the crossfooter.

Unhook top eyes of 1-181 springs from shaft M in 800 section.

Beginning with machine normal, insert anchor tool E (Kit 150½) through the 311, slowly pull handle forward enough to allow anchor tool to rest in bottom of base and under N.

Remove third 413. Place head of removal tool A (Kit 1-150B) through from front, prongs pointing sideways. Give ¼ turn so prongs will point downward, push tool until prongs rest over top of springs L.

Place heavy blank F with studs on edge of base and single stud on carry restoring shaft B. Tighten tool thus closing spring L, relieving pressure on shaft M. Remove shaft M. ***Do not*** remove 119.

Loosen tool and remove springs L.

Replace shaft M (851) and roller (834) with the later shaft (851 No. 2) and roller K (208334).

Hold both new springs J and I in place; No. 4 (J) the shorter, fits inside the No. 3 (I), and place tool A as noted above.

Tighten tool to close the springs and replace shaft M.

Remove tool; replace 413 and hook up 181's.

Release 800 section and test.

Mr M R Lovejoy
Buffalo N Y Branch 10-5

Printed in U. S. America

Form 3757—6M-9-47-Service (D2918)

BURROUGHS

SERIES H

ADDING-BOOKKEEPING-ACCOUNTING MACHINES

INSTRUCTION BOOK

CORRECTION INDEX

Printed in U.S. America 10-1-57

For Form 3757

#124

Supplement Pages for Series H Instruction Book Form 3757.

The attached Series H Correction Index cover page 33, and Correction Index - Mecanograms 1001 thru 1005 are revisions of Mecanograms that have current general value. All prior Series H Mecanograms are hereby cancelled. Place these pages after page 32 of the Power Instruction Book, Form 3757.

Printed in U.S. America 11-13-57 Service Division

PREVENTIVE MAINTENANCE GUIDE

Series H Simplex and Duplex Machines

Preventive Maintenance and Lubrication Procedure

Each Preventive Maintenance Attention is to include thorough cleaning, lubricating, replacement of worn parts, installation of Correction Index improved parts and correct adjustment of the machine to insure correct function and smooth operation of all mechanisms.

It is very important that all Correction Index parts be installed at the time of the Preventive Maintenance Attention if a satisfactory program of service to customers is to be maintained.

Preventive Maintenance Attentions are to be rendered to all Series H Machines at regularly spaced intervals and the following plan should be followed:

1. Inquire whether the machine has been performing satisfactorily and if the operator has observed any peculiarities in the operation that require correction. Have the operator demonstrate any specific complaint.
2. Check with the operator to determine whether the machine has continuous locked in totals. After the attention is completed, make sure they are re-entered correctly.
3. Make an operating test run of the machine, using all amount, character, date and operation control keys and all motor bars. Observe any peculiarities of operation with respect to speed, sound, carriage action, paper feed, printing or operating results.

NOTE: Each of the following steps should first be preceded by the removal of dust and old lubricants. The following approved lubricants and cleaning agents are to be used when performing the Preventive Maintenance Attention, as outlined for each section.

A. Machine Oil S131A
B. Clutch Case Oil S165 1/2B
C. Machine Grease S167 1/4A
D. Platen Restorer S3
E. Case Cleaner and Polish S11
F. Solvent S131 3/4

Excessive amounts of oil or grease must not be used and all exposed surfaces should be carefully wiped of superfluous oil or grease accumulations to avoid soiling the hands or clothing of the operator.

4. Examine platen and pressure rolls for condition and gripping of paper forms. Examine the bearings of these parts for wear. Oil the bearings lightly with oil S131A. Clean the platen and pressure rolls with restorer S3.
5. Examine space wheel, space detent, space pawl and linkages for condition and for correct latching and driving action. Oil bearing surfaces lightly with oil S131A.
6. Examine carriage raceways, bearings and bearing retainers for smooth action and minimum play. Lubricate lightly with oil S131A.
7. Test keystems for free action and condition. Replace damaged or disfigured keytops. Oil the keystems individually with S131A oil and wipe away all traces of excess.
8. Test interlocking action between listing and result keys. Also, locking against depression or release of keys during machine operations.
9. Test transfer total key and its adjustment to clear the upper pinions and add the same amount in the lower pinions. Use oil S131A.
10. Test key latches (228's) for free action, latching of lock strips and release of keys at the end of the return stroke. Use oil S131A.
11. Hammers should align with type in fired position. Type should be free and type springs have correct length.
12. Examine hammer drivers and driver springs for condition. Eyes of springs may be tested by passing a spring hook or screw driver across the group with

enough pressure to flex the springs slightly. Oil with S131A.

13. Test vertical and horizontal ribbon feeding and reverse action and examine feed pawls and linkages for condition. Apply S131A to feed pawl bearings and grease S167 1/4A to sliding contacts.
14. Test the machine timing sequence and check the dash pot for correct oil level. Replenish with S131A.
15. Test tight and loose points of the accumulator detents and effectivness of the pinion detent bail. Oil all accumulator parts with S131A.
16. Examine adding racks (610's), rack latches (415's), carry pawls (1-413's) and carry pawl latches (411's) for condition and correct adjustment. Test for single and relay carries. Oil with S131A.
17. Remove carbon dust accumulations from the motor. Examine the brush holder for condition and the brushes for degree of depletion. If there is doubt that the brushes will last until the next Preventive Maintenance Attention, the brushes should be replaced and the new brushes fitted to the commutator for efficient current conduction.
18. Examine the commutator surface for being clean and without ridges or grooves. If at all questionable replace the armature or turn down the commutator surface.
19. Examine switch contacts for condition and all terminals for being tight. Check insulators and conductor cords for being sound.
20. Replenish the oil supply in the drive gear housing with clutch case oil S165 1/2B to the correct level. If the oil appears contaminated, the gear housing should be flushed with solvent S131 3/4 and a new supply of oil S165 1/2B furnished.
21. Check the entire machine for loose screws and nuts, for worn parts and for fractured springs. Lubricate all bearings with oil S131A and sliding contacts with grease.
22. Operate the machine to be sure the peculiarities pointed out by the operator or observed during the test run have been corrected.
23. Clean and replace the case. Use cleaner and polish S11.
24. Re-run the operating test of the machine to assure a complete and effective attention. Show this tape to the customer.
25. Have the operator test the machine while you are engaged in making out the attention report.

PREVENTIVE MAINTENANCE GUIDE

Series H - Register Construction

Preventive Maintenance and Lubrication Procedure

Each Preventive Maintenance Attention is to include correct cleaning, lubricating, replacement of worn parts, and correct adjusting of the machine to ensure correct function and ease of operation of all mechanisms. Where applicable, improvements published in Correction Index releases should be incorporated in the machine during the attention.

Perform Preventive Maintenance procedure for Series H - Simplex and Duplex machines with the following additions or exceptions:

1. Examine the form guides , limits and chutes for ease of form insertion and correct locating of the form in relation to the carriage stop positions.
2. Check the form ejector mechanism (when incorporated) for condition of parts and for correct form ejection and stacking. Clean ejector rolls with restorer S3 and lubricate all bearings with S131A.
3. Examine all rolls and stops in the control bar assemblies for condition. Lubricate rolls lightly with S131A.
4. Examine skip and return mechanism for condition, alignment and correct adjustment. Verify effectiveness of carriage governor assembly. Lubricate lightly with S131A. Do not lubricate governor brake surfaces.
5. Check tabulator mechanism including the spring barrel and draw band. Lubricate the tabulator lift pawl, feed slides and stop block with S131A.
6. Test carriage opening mechanism for smooth and full opening and positive closing. Lubricate sliding contacts and opening cam with grease S167 1/4A.
7. Examine keyboard selection of registers mechanism for condition and positive action. All bearings should be lubricated lightly with S131A.
8. Examine enforced use of keys mechanism for free action and condition. Pay particular attention to spring balance. Lubricate with S131A.
9. Examine motor bars and linkages for condition, free action, latching and releasing. Lubricate with S131A.
10. Check the hammer block mechanism for condition and positive position selecting. Lubricate with S131A.
11. Examine rotary numbering and dating devices for condition. When necessary remove dials and disolve ink accumulations with solvent S131 3/4. Then relubricate all surfaces with S131A.
12. Examine crossfooter tumbling mechanism in particular for full tumble, detenting action and latching in both positions. Use S131A.
13. Examine register assembly including, air pot control, free action of register cob, alignment of carry pawls and latches, release and reset of carry pawls, timing of sissors action. Lubricate lightly with S131A.
14. Check controlling action of motor governor and reset if necessary.
15. Check tension of MRC clutch for return of carriage . Reset if necessary for correct tension.
16. Check MRC gear box for correct oil level and if necessary add Oil S165 1/2B to correct level.
17. In general, all closed bearings require Oil S131A and open sliding contacts require grease S167 1/4A. An exception is made on open slides where very light action in needed when Oil S131A is used.

CORRECTION INDEX

I

CONDITION: Year dates have expired in the Quick Set Rotary Calender Feature.

CORRECTION: Install single piece type 75118 No. 13 (specify year) as required, in type wheel assembly BD (Plate 36, Printing Symbol Book). Selection of the type position can be done by one of the following methods:

1. Align the new type, such as '60, with the engraved year '50 on dial AW; '61 with '51, etc., using the first digit in the year engraved in the dial to identify the type position.
2. Letter the years, which coincide with the type being installed in assembly BD, on a strip of heavy paper and then cement the strip on dial AW, to collate with the type locations in assembly BD.
3. Scribe the new year dates in the unused portion of dial AW and install the new type in assembly BD to collate with the scribed dates.

NOTE: The sharpened end of round file Kit 244 can be used for scribing.

CORRECTION INDEX —MECANOGRAM —

CONDITION: Wrong skips and returns, erratic accumulation and scattered printing in No Space Stroke Total machines.

CAUSE: Excessive machine speed.

CORRECTION: Reduce speed to the following limits:

Motor speed - 2450 r.p.m.
Unrestricted machine speed (timer inactive) - 103 to 105 opeations per minute.
Restricted machine speed (timer active) - 81 to 83 operations per minute.

Note: Springs 986 (light), 981 1/4 (medium) and 780 5/8 (heavy) - AW, Plate 67-1, Accumulation Symbol Book - are available to increase or decrease the restricted speed. The light spring produces the longest interval of time.

CONDITION: Cam AS (Plate 62-1, Keyboard Symbol Book) broken in No Space Stroke Total machine.

CAUSE: Auxiliary motor bar 101 or 103 inadvertently depressed when installing the machine case with the power turned on.

CORRECTION: Install cam 12024 3/4B No. 5. Always disconnect the wall cord when installing the machine case.

CONDITION: Short stroking.

CAUSE: Screw S (Plate 9, Power Symbol Book) in yoke R adjusted to permit full restoring of the machine, which caused insufficient throw by plunger T during the forward stroke of the machine to latch toggle U (Plate 1, Power).

CORRECTION: Adjust screw S (Plate 9, Power) in yoke R as follows:

With the machine normal, turn eccentric AH (Plate 65, Accumulation Symbol Book) to give 1/16" passing clearance between the full stroke pawl and the lower step in cam Q (Plate 18 Accumulation).
With the handle held all the way forward and the motor turned manually (by means of the crank) until buffer arm AH (Plate 9, Power) has reached its maximum point of throw, turn the adjusting screw in yoke R until only minimum play of the handle is permitted with spring U compressed. At this point, secure the screw by tightening nut S.

Printed in U. S. America 10-1-57 For Form 3757

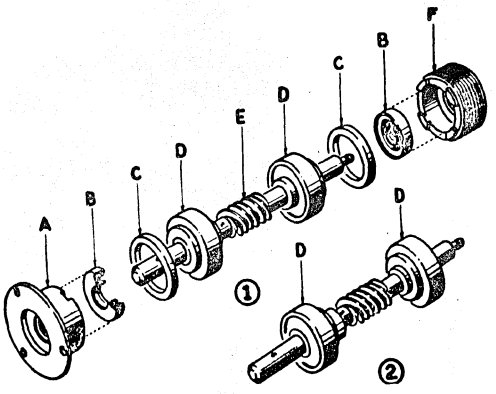
CORRECTION INDEX —MECANOGRAM—

As a further test, with the handle still in the machine and starting from normal position, trip the drive (power off) and operate the machine with the motor crank. The machine should restore to normal without locking on the full stroke pawl or the toggle.

Note: In machines prior to Serial No. B237436 (approximately), if plunger T prevents full restoring of the machine after the screw in yoke R has been adjusted for forward throw, an earlier normal limit for plunger T may be obtained by inserting washer 510 1/2 in arm AH ahead of the plunger.

CONDITION: Machine leaks oil.

CAUSE: Leather washers P (Plate 6, Power Symbol Book) in oil seals R and V are worn and permit oil to leak out of the drive gear case.



CORRECTION: Install seal assemblies A (1-3639 1/2B) and F (1-3639B No. 2) illustrated, which contain "Neoprene" seals. When bearing assemblies D are assembled as shown in illustration No. 1, space collars C (71399Z) are also required. When assembled as shown in illustration No. 2, only the seal assemblies are required.

Seal assemblies R and V (Plate 6) may be repaired by driving out the old seal and pressing in Neoprene seal B (1-3691 3/4A) using the old seal as a driver to avoid damage to the new seal.

CONDITION: Noisy drive.

CAUSE: Excessive end play in armature assembly.

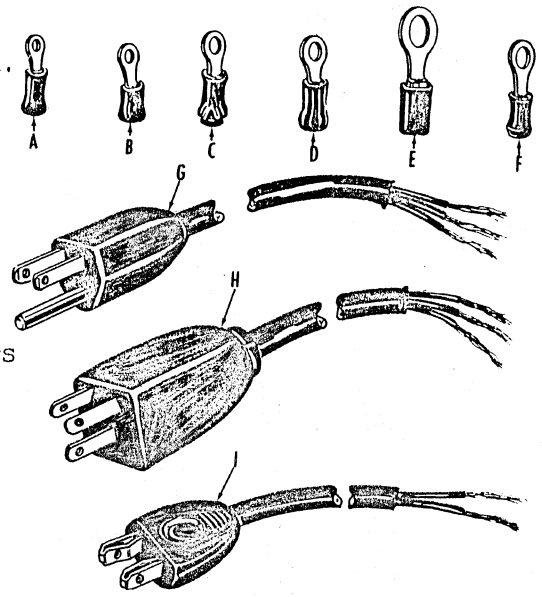
CORRECTION: Reduce play to not less than .005" or more than .010" using space washers 4615 1/2 (.020" thickness) and 4615 1/2 No. 2 (.010" thickness) between the ball bearing assembly and the motor end cap.

CORRECTION INDEX —MECANOGRAM—

CONDITION: Machine will not operate.

CAUSE: Non-detachable wall cord broken.

CORRECTION: Install new wall cord. Henceforth, non-detachable replacement cords with molded wall connector plugs but without terminal connectors will be furnished for Field use. A cord and terminals should be selected from the following list, and the terminals crimped to the wires with pliers or a hammer.



A. 24A No. 14 Terminal connector, .093" dia hole.
B. 24A No. 7 Terminal connector, .119" dia. hole.
C. 24A No. 10 Terminal connector, .145" dia. hole.
D. 24A No. 6 Terminal connector, .171" dia.hole
E. 24A No. 4 Terminal connector, .390" dia. hole.
F. 24A No. 3 Terminal connector, .228" dia. hole
G. 1Z-81997 3/4C Three conductor cord with round ground prong.
H. 11Z-81997 3/4B Three conductor cord with flat ground prong.
I. 1Z-3697 1/2C Two conductor cord.

Printed in U.S. America 10-1-57 For Form 3757

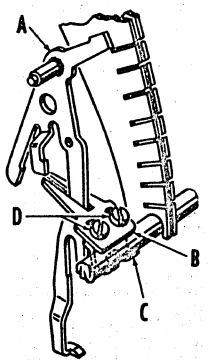
CORRECTION INDEX — MECANOGRAM —

CONDITION: Failure to select registers.

CAUSE: Roller B (Plate 27, Accumulation Symbol Book) missing or worn.

CORRECTION: Install roller 60315C No. 2 using screw 60573AZ and nut 46. If the nut does not clear gear AA (Plate 54, Carriage Symbol Book) when the No. 10 register is active, use nut 46 1/4 and grind off excess threads of screw 60573AZ.

CONDITION: Wrong crossfooter carries and nines instead of accumulated amounts when totaling.



CAUSE: Bearing surfaces in the sector guides for carry pawl A are worn.

CORRECTION: Install guide B (419 1/8Z) clip C (419 No. 1) and two screws D (952 3/4) as shown. Position guide B to provide alignment of the carry pawl with the carry cams of the accumulating pinions and to retain free action of the carry pawl.

CONDITION: Credit balance interlock S (Plate 62-1, Keyboard Symbol Book) is not operative, with a minus amount in the crossfooter, against motor bars 101 and 102.

CAUSE: Machine had been operated manually (with handle) with a minus amount in the crossfooter, without first releasing interlock S, thereby stretching link G.

CORRECTION: Replace link G (201152). Always release interlock S before operating the machine with the handle when there is a minus accumulation in the crossfooter.

CONDITION: Accidental carries in the crossfooter in No Space Stroke Total machines.

CAUSE: Test for crank speed had been made with machine in crossfooter add position. When the handle is held forward with the machine in an add crossfooter position, the pull-in arm (similar to F, Plate 43, Accumulation Symbol Book) is positioned to lock the crossfooter in mesh with the adding racks. In this position when the motor operates the drive, the crossfooter is driven out of mesh placing a heavy strain on the pull-in arm, and resulting in a lengthened arm.

CORRECTION INDEX — MECANOGRAM —

CORRECTION: Replace pull-in arm 1-10920 1/4 No. 2. Make all tests for crank speed in a crossfooter non-add position.

CONDITION: Failure to total and sub-total.

CAUSE: Threads in left side frame for limit screw BG (Plate 74-4, Accumulation Symbol Book) are stripped.

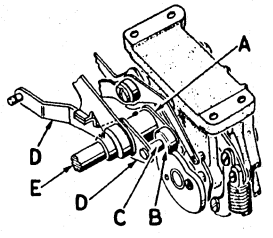
CORRECTION: Clear the threaded hole with drill Kit 260 No. 29 and retap with Kit 270 No. 3 (5/32 x 40), then install repair screw 200627Z No. 2 and lock washer 1097 13/16. When replacing screw BG, also install arm 1-200131 1/2A.

CONDITION: Over accumulation.

CAUSE: Limit extension of arm AR (Plate 43, Accumulation Symbol Book) broken, permitting enough excessive movement of the accumulator assembly to trip off carry pawls in one or more columns.

CORRECTION: Install assembly 21-69000 Style 17 in No Space Stroke Total machines, or 31Z-69000 (Specify Machine Style and Serial Number) in other machines.

CONDITION: Failure to total automatically.



CAUSE: Arm A which supports ball bearing roller B, broken.

CORRECTION: Install improved shaft assembly E (1A-200006B Style 17) which contains extended arm D and shaft C to provide additional support for the roller.

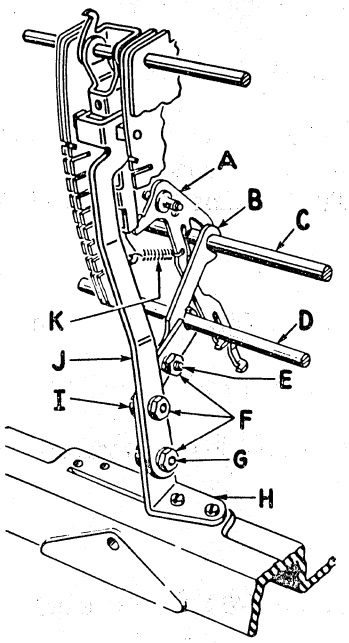
CONDITION: Automatic count in the register of a No Space Stroke Total machine in a normally "No Count" position.

CAUSE: Slide C (Plate 69-1, Accumulation Symbol Book) fails to restore following a count operation, because the combined thrust of all 680 springs (machine at normal) distorts the keyboard plates, binding the slide.

264 3/8

CORRECTION INDEX —MECANOGRAM—

CORRECTION: Install brace J (1-223 1/8) illustrated, which also requires eccentric screw G ~~(264 3/4)~~, eccentric screw I (264 7/8 No.2), eccentric screw E (264 7/8), nuts F (47) and lock washers X275-6.



PROCEDURE: To assure printing alignment, stabilized positioning of accumulator parts and full restoring of the Count Mechanism.

1. Assemble brace H so that it fits up against the under side of shaft D without a bind. To adjust, remove brace H and shorten or lengthen it by bumping the forward or rearward edge.

2. With the handle at the first stop, release all adding racks.

3. Trip off all carry pawls A, except the one nearest brace H.

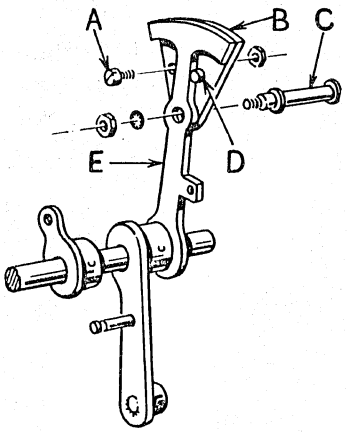
4. Assemble brace B as shown, with its rear pocket over shaft C and its lower edge resting on shaft D.

5. Assemble brace J as shown, with the trunnions at its upper end pocketed in the scoring holes of guides 210 and 211.

6. Adjust lower eccentric screw G downward to remove all play from brace J without distorting the keyboard assembly downward. The effectiveness of brace J depends on this adjustment.

7. Adjust eccentric screws E and I to have minimum rearward movement of pawl A. This ensures shaft C against bowing from the combined tension of springs K.

CONDITION: Loss of second total of a double balance operation, - early bank machines.



CAUSE: Hammer Y (Plate 29-1, Keyboard Symbol Book) worn by repeated contact with square stud Z in motor bar lever AE.

CORRECTION: Install repair plate B (1-205215 Z No.2) eccentric screw A (404586) and screw post C (205533Z No.5) as illustrated. When assembled, tighten eccentric screw A before tightening screw C.

Accumulation

CORRECTION INDEX —MECANOGRAM—

CONDITION: Wrong register accumulation.

CAUSE: Register frame assembly worn.

CORRECTION: Install assembly 1Z-69002 Style 13 or 17 No. 10 which contains detent contact arm B5 (Plate 29, Accumulation Symbol Book). Specify machine style and serial number when ordering.

CONDITION: Erratic accumulated amounts in No Space Stroke Total Machines.

CAUSE: Taper pins in pinion divider plates of crossfooter frame are sheared.

CORRECTION: Install oversize taper pins 82501Z (.068") using broach Kit 277 No. 3.

CONDITION: Carry pawls not resetting after a carry.

CAUSE: 1. Clip G (illustration, Cause 2) worn or broken, permitting shaft to lose position.

CORRECTION: 1. Install set collar 1-73375 on shaft B to the left of the central bearing. The collar should not interfere with adjacent parts.

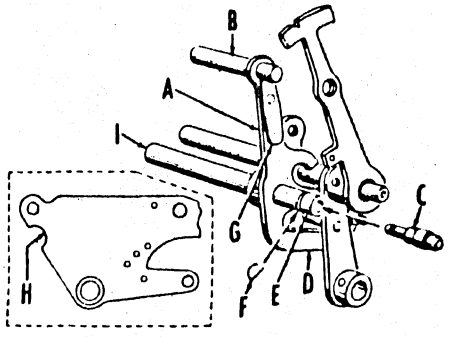
* * * *

CAUSE: 2. Bearings worn for shaft B.

CORRECTION: 2. Install repair assembly A which does not require removal of a machine side frame.

PROCEDURE:

Note: To avoid damage to spring F, do not insert trunnion pins C into shaft I until the shaft is in the machine.



1. Remove the keyboard. Remove shaft B. Remove index wires Nos. 4 through 8 in column one. Move the subtract lever to subtract position and advance the machine to the last step of the forward stroke. Drop all sectors to nine position. Remove the motor bar attachments from the front outside area of the right side frame to provide an opening for inserting the repair assembly.

2. Disconnect links K and H (Plate 85-1, Accumulation Symbol Book) from the lower left extension of the worn assembly, and break the extension

away from its hub. Cut the shaft of the worn assembly in two with a hacksaw blade, and remove the pieces.

3. In early machines, cut a notch in the full stroke segment retaining plate to the approximate outline shown at H (illustrated) for clearance of the repair assembly when it is being installed. Half - round file Kit 243 may be used.

4. Remove the left arm from the repair assembly. The taper pin in the arm is lightly driven for easy removal. Install the repair assembly through the right side of the machine, and in the process, reassemble the left arm (previously removed) on the assembly as it nears its working location. Position stud E through the opening in arm D.

5. When the repair assembly is in working location, replace the taper pin in the hub of the left arm. Support the hub and set the pin firmly. Insert a trunnion pin C into each end of the repair assembly after the taper pin has been set in the left hub. Reassemble the machine.

Parts required are as follows:

A.	21AZ-209004	Style 17	Reset assembly, standard construction.
	or		
	31AZ-209004	Style 17	Reset assembly, with permanent split between columns 7 and 8.
C.	209516Z (2 required)		Trunnion pin for repair assembly.

CONDITION: Repeat of transfer totals.

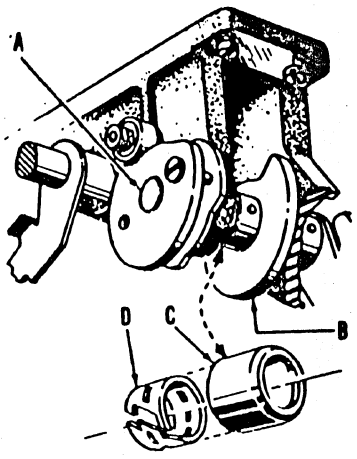
CAUSE: Lever K (Plate 14, Accumulation Symbol Book) does not prevent repeat machine operations following transfer total operation.

CORRECTION: Install lever 200138 No. 2, with a lower extension illustrated as O (Plate 45, Keyboard), using shoulder screw 200517 No. 2.

CORRECTION INDEX —MECANOGRAM —

CONDITION: Failure to total automatically - No Space Stroke Total Machines.

CAUSE: 1. Insufficient movement of arm CA (Plate 43-1, Accumulation Instruction Book) to meet the plug gauge test (Adjustment No. 1) - caused by worn bushings for shaft A (illustrated).



CORRECTION: 1. Install bearing retainers C (201307B) and bearing inserts D (201307 1/2), two each required. The tapered ends of the retainers, with the inside retaining rims, should be positioned toward central cam B so that the bearing inserts will be held in the desired locations.

* * * *

CAUSE: 2. Bearing for shaft assembly J (Plate 54-1, Accumulation Symbol Book) in the left machine side frame is worn and the machine does not meet the plug gauge test.

CORRECTION: 2. Install a new bearing 35 No. 17 without removing the left side frame as follows:

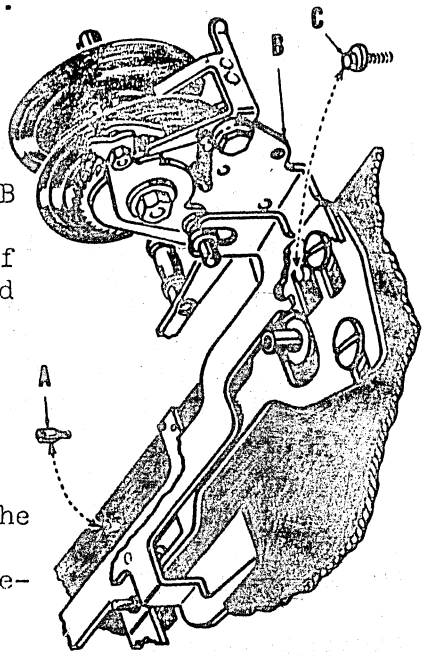
1. Remove driving arm BZ (Plate 43-1, Accumulation).

2. Drill a series of closely placed holes, using drill Kit 260-44, in and circling the worn bearing. Drill only far enough to break through the inner end of the bearing. Use care to avoid scarring the bearing surface of the shaft or the contact surface of the side frame for the bearing. (Note: The depth to be drilled may be gauged by locating collar 1-16841 1/2 on the drill shank to act as a depth limit, or the drill may be marked with touch up paint.) Using holder 1-Kit 96B-1 and a chisel sharpened tip Kit 96B-7 or Kit 96B-8, break the worn bearing into pieces small enough to be easily removed from the side frame. Clean casting and shaft surfaces of all foreign substances.

3. Install washer 68115 on the shaft to provide a smooth thrust surface for the replacement bearing. Saturate replacement bearing 35 No. 17 with oil S131A. Tap the replacement bearing into the side frame while supporting the inside of the frame with an extended screw driver. When the bearing is correctly positioned, there should be approximately .010" end play in the shaft assembly. (Note: A driving block, for tapping the bearing into position, may be made from the core of a paper roll by wrapping the core with friction tape to prevent its being split during use). Replace driving arm BZ (Plate 43-1) and make any needed compensating adjustments to the totaling mechanism.

CORRECTION INDEX - MECANOGRAM -

CONDITION: Partial printing of amounts in black when the ribbon shift mechanism is normal, or red when it is shifted.



CAUSE: Normal or shifted limits for the ribbon shifting mechanism are off test.

CORRECTION: Adjust eccentric screws C (12057 1/16) to raise the normal position of bracket B to position the black portion of the ribbon so printing will be aprroximately in the center of the black area of the ribbon. The threaded end of screw C has a screw driver slot easily reached for adjustment by moving the carriage to either side.

Adjust eccentric screw A (705554) to limit the shifting mechanism so printing will be approximately in the center of the red area of the ribbon for minus items. The threaded end of screw A should not interfere with the ribbon reversing operation and eccentrics C should not prevent full shifting of bracket B.

CONDITION: Wrong printing.

CAUSE: Screw Z (Plate 5, Printing Symbol Book) loose or broken - in machines prior to Serial No. A996775.

CORRECTION: Install improved screw 10752 1/2B and one of the following shoulder nuts:

309A Fte. 202, used with single detent control
10739 1/2, used with double detent control
705369, used with single detent control - Multiple Print Machines.
701509 No. 2, used with double detent control - Multiple Print Machines.

It may be necessary to shorten the threaded end of screw 10752 1/2B approximately 1/32" to 1/8" for full seating of the screw shoulder.

CONDITION: Various printing positions will not select.

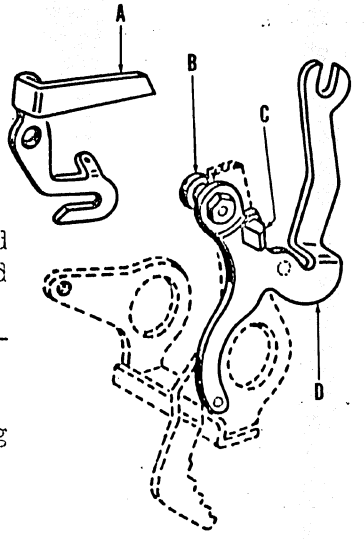
CAUSE: Selecting arm C (Plate 6-1, Printing Symbol Book) is broken.

CORRECTION: Install illustrated repair parts as follow:

CORRECTION INDEX - MECANOGRAM -

For No Space Stroke Total machines:

A. 207104Z, bell crank; replaces AP (Plate 6-3 Printing.
B. 200537 1/4Z, eccentric screw.
D. 1-200237 1/2Z, repair arm.



Commercial machines do not require part A or stud C in repair arm D, and the stud should be removed to avoid possible interference with adjacent parts. Early Class 20 and 30 machines which contain bail N (Plate 44, Printing) require repair arm 1-200237 1/2Z No. 2 and eccentric screw 200537 1/4Z No. 2 (AA and AE, Plate 6-1, Printing Symbol List.

CONDITION: Failure to select the correct printing arrangement.

CAUSE: Tooth broken from camshaft M (Plate 6, Printing Symbol Book), slide O (Plate 6) broken, or arm C (Plate 6-1) broken because of severe action of the hammer block mechanism when returning from a No. 1 control roll position.

When roll K (Plate 81-1, Carriage Symbol Book) leaves the high dwell of cam X during a return stroke, tension of spring M (Plate 6-1, Printing) causes screw O to strike sharply against the upper end of the slot in turnbuckle N. Shock of the blow travels through rod R, arm C and slide B to the hammer block cam shaft and may result in breaking of parts when repeated often enough.

CORRECTION: Install the following improved parts: Turnbuckle N (200236 1/2) is lengthened and rod R (200700) contains more threads to permit correct adjusting. Slides B (1- or 21-10720 No. 1) have stock removed from the forward end of the rear slot to assure limiting of the high step of arm C on the lip of lever E instead of in the slot in rack B when a No. 1 roll is positioned on lever F. Lighter spring 12386 replaces spring M. Eccentric 200340 1/2 and screw 203524 No. 2 replace screw and collar D.

TESTS AND ADJUSTMENTS: Reference, Plate 6-1, Printing Symbol Book.

1. With no roll on lever F, latch E should restore to a flush position without binding against the forward edge of the lower step of arm C. Lever F should clear the space collars on the control roll hangers that do not have hammer block rolls active.
   To adjust, turn eccentric D.

CORRECTION INDEX —MECANOGRAM—

2. Latch E should have flush hold on its respective step of arm C when indexed from each size control roll.
To adjust, raise or lower the rearward arm of lever F.

3. With the machine normal, the shoulder of screw O should have slight clearance of the lower end of the slot in turnbuckle N.
To adjust, turn the turnbuckle until the screw just fits in the lower end of the slot. Then turn the turnbuckle back one turn and tighten the locknut.

4. With arm C at the high point of its arc of travel, it should not bind against the underside of stud A.
To lower the upper extension of arm C, increase the upper offset. (Do Not bend the arm at the top).

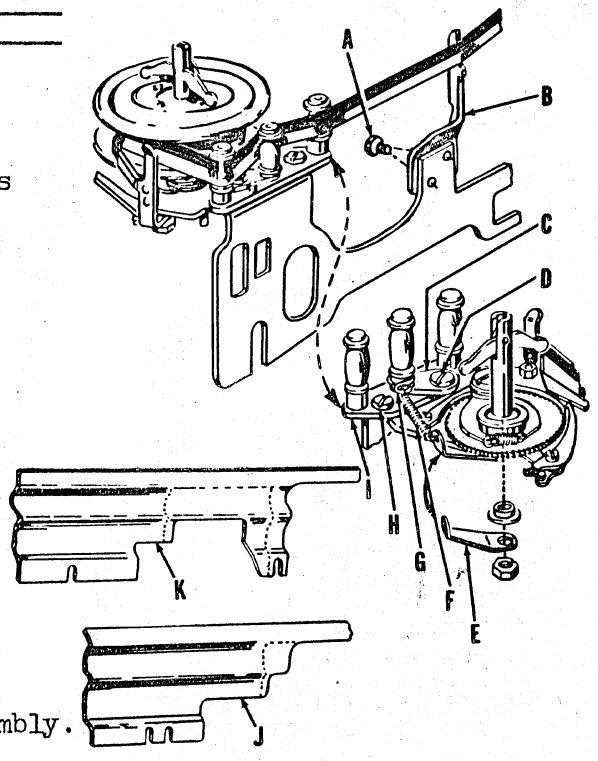
Note: The upper fork of arm C should have a full hold on stud A and align freely with it.

CONDITION: Faulty printing alignment, wrong addition and machine lock ups.

CAUSE: Crossfeed ribbon shown in Plates 38 and 38-1, Printing Symbol Book, becomes slack and interferes with sector indexing.

CORRECTION: Install idler and guide roll arrangement illustrated. Parts required are:

A.	74533 (2 required)	Screw
B.	205118 1/2 AR No.1	Guide
C.	1-205102 3/4	Idler roll assembly
D.	99579	Shoulder screw
E.	20 No. 101	Anchor
F.	3480 1/2	Spring
G.	20 No.85	Anchor
I.	1-205102R No. 8	Guide roll assembly.



The mechanism shown in Plate 38 also requires screw 3256 1/16 and nut 46 1/4 in place of screw H. Guide B cannot be used on slide plate B (Plate 38).

Before installing the parts in the mechanism shown in Plate 38-1, remove brackets F and D and trim line finder J or K, illustrated, as shown by the dotted lines.

Printed in U. S. of America 10-1-57 For Form 3757

CORRECTION INDEX —MECANOGRAM—

Before installing the parts in the mechanism shown in Plate 38, remove guide D and roll AF and the post from the right end of slide plate B and trim line finder J or K, illustrated, as shown by the dotted lines.

After the new parts are installed, a new ribbon installation guide, Form 3080 should be glued to the under side of ribbon cover M (Plate 30, Power Symbol Book).

CONDITION: Printing is light at times.

CAUSE: The ribbon is not feeding because of wear of the feed pawl, brought about by poor alignment between the pawl and the ratchet wheel.

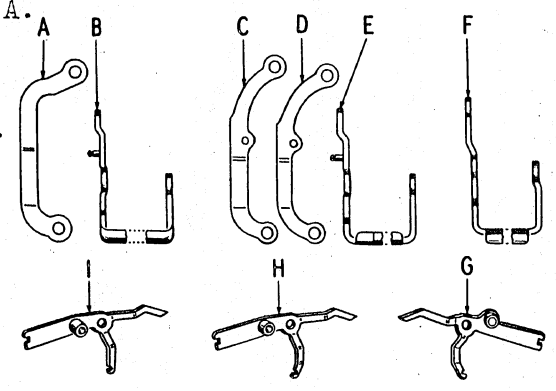
CORRECTION: Install washer 75210 under bushing AA (Plate 38-1, Printing Symbol Book) to align the feed pawl with the ratchet wheel. Use longer screw 703590 to retain the pawl and to compensate for the thickness of the washer.

CONDITION: Wrong printing results.

CAUSE: Hammer block bail or bail control arm worn or broken.

CORRECTION: Prehardened bails and bail control arms that can be ground to suit requirements are available as follows:

B. 1-10718 EZ No.3 Styles 13, 17 Inner bail, for machines containing link A.
E. 10718 DZ No.3 Styles 13, 17 Inner bail, for machines containing link C or D.
F. 10718 DZ No.2 Styles 13, 17. Outer bail.
G. 11-10712 3/4BZ No. 2. Control arm for inner bail.
H. 11-10712 3/4BZ No. 2 Control arm for outer bail.
I. 1-10712 3/4 CZ No. 1 Control arm for single bail construction.



The bail or control arm to be replaced may be used as a template for scribing the desired outline on the replacement part. Care should be used when grinding the bail or arm to avoid excessive heating which may result in loss of hardening.

CORRECTION INDEX — MECANOGRAM —

CONDITION: Date keys release when date repeat is indexed.

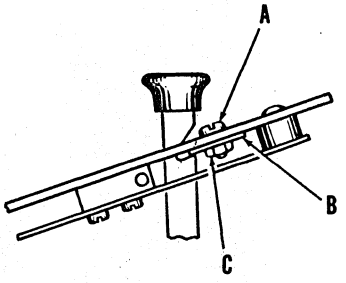
CAUSE: Gear Q (Plate 7, Keyboard Symbol Book) broken.

CORRECTION: Install gear 10233 in shaft X.

CONDITION: Non-tabulate key, in No Space Stroke Total machines, will not remain latched.

CAUSE: Upper keyboard plate worn at latching contact.

CORRECTION: Install hardened washer B (62132Z). The washer may be used as a template to drill a hole, with drill Kit 260-31, through the upper keyboard plate. Retain the washer with screw A (7356 1/2) and nut C (46 1/4).



Printed in U.S. America 10-1-57 For Form 3757

CORRECTION INDEX —MECANOGRAM—

CONDITION: Carriage does not tabulate.

CAUSE: Insufficient lift of tabulator pawl against the tabulator stops.

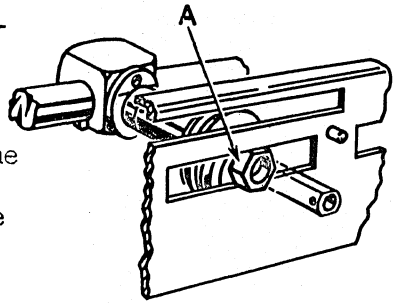
CORRECTION: Use No. 1, or No. 2, following, or both.

1. Replace rivet holding roller in front end of AV (Plate 4, Printing Symbol Book) with eccentric screw 10763 1/2, roller 749, lock washer X275-5 and nut 46.

2. Replace shoulder screw in pawl F (Plate 14, Carriage Symbol Book) with eccentric bushing FX57-2 and screw 71541.

CONDITION: Geared and manual control roll hangers will hold adjustment.

CAUSE: Outer ends of the hangers are not supported against pressure from control levers.



CORRECTION: Adjust the hanger, then install eccentric collar A to take up play between the hanger and the upper edge of the slot in the register control skid. Collars are available as follows:

10049 1/4 No. 1	.150" thickness
10049 1/4 No. 2	.100" thickness
10049 1/4 No. 3	.073" thickness

CONDITION: Erratic spacing of platen and misaligned printing.

CAUSE: Opening and closing limits in carriage end plates AO and Z (Plate 61-1, Carriage Symbol Book) broken.

CORRECTION: Install carriage end plates 1-117R Fte 213 No. 2Z and 1-117 L Fte. 213 No. 2Z which have been line reamed.

STANDARD MACHINE SPEEDS

(ALL SERIES)

In machines of "Increased Speed Construction," (Series H) the lower end of springs Y (Plate 1, Accumulation Symbol List) on the adding sectors are attached to a strip, mounted near the machine base. In machines "Not Increased Speed Construction," the strip is mounted on posts which retain the strip in a higher position.

	Columns	MACHINE OPERATIONS PER MINUTE Based on a 5 Min. Run	
		Hand	Electric
SERIES H—CLASS 1			
	7 & 9	120-125	116-120
	11	110-115	106-110
	13	105-110	100-104
	15	95-100	90-92
	17	93-98	88-90
SERIES H—CLASS 2			
Increased Speed Construction:	9	125-130	125-130
	11	120-125	120-125
	13	115-120	115-120
	15	105-110	105-110
	17	105-110	105-110
Not Increased Speed Construction, or with ACT or Shuttle Carriage:	9	115-120	114-118
	11	110-115	103-107
	13	105-110	100-104
	15	95-100	90-92
	17	90-95	85-87
SERIES H—CLASS 6			
Increased Speed Construction:	9	125-130	125-130
	11	120-125	120-125
	13	115-120	115-120
	15	105-110	105-110
9 Col. or less adding capacity	17		105-110
10 Col. or more adding capacity	17		78-84
Not Increased Speed Construction:	9	110-115	106-110
	11	105-110	102-106
	13	100-105	96-100
	15	95-100	88-90
9 Col. or less adding capacity	17		84-86
10 Col. or more adding capacity	17		70-72
SERIES H—CLASSES 11-16, 20-30			
The speeds of Classes 11-16 and 20-30 Machines are determined on continuous listing operations with the Crossfooter and Register Sections active, and the detents (G and H, Plate 13, Power Symbol List) disabled. In machines equipped with "Timing Mechanism to Delay Motor Bar Release (Plate 58-1, Accumulation Instruction Book) the operations are counted with the timer disabled.			
Increased Speed Construction:	13		115-120
9 Col. or less adding capacity	17		105-110
10 Col. or more adding capacity, without Repeat Timer (Plate 58-1, Accumulation Instruction Book)	17		78-84
10 Col. or more adding capacity, with Repeat Timer and H903	13 or 17		90-95
No Space Stroke Total Bank Machines	14 or 17		100-105
Not Increased Speed Construction:	13	100-105	96-100
12 Col. or less adding capacity	17		84-86
12 to 14 Col. adding capacity	17		70-72
SERIES H—CLASS 20—NO REGISTER			
Increased Speed Construction:	13		125-130
Not Increased Speed Construction:	13		96-100

	Columns	MACHINE OPERATIONS PER MINUTE Based on a 5 Min. Run	
		Hand	Electric
SERIES C			
All Electric Styles, 120 R.P.M. of driving ratchets			
SERIES F			
F50, F100, F200, F400 (Carriage Controls Disabled)			104-110
F300, F500 (Carriage Controls Disabled) Selecting Register No. 1			104-110
SERIES J			
All Styles			145-151
SERIES K			
All Styles—Motor Speed, 1725 R.P.M.			
SERIES M			
All Styles			125-135
SERIES P200, P400, P600 AND CLASSES 8, 9, 10			
Electric—			
Controlled Speed Motor			115-130
Without Controlled Speed Motor			115-125
Hand—			
All Styles		125-145	
SERIES T			
All Styles—Motor Speed, 3750 to 3900 R.P.M.			
SERIES V—CLASS 3			
Narrow Construction	5	155-165	
	7	155-165	
Wide Construction	7	135-145	135-145
	9 & 10	135-145	135-145
SERIES V—CLASSES 4, 4D, 41			
Classes 4 and 4D	8 & 10	135-145	135-145
Class 41	8 & 10	125-135	125-135

RESISTANCE COIL CHART

All Classes

The resistance coil values indicated in the following chart have been found, through extensive tests, to be best suited for use with the specified line voltages. This information supersedes all resistance coil specifications previously set forth in Charts, Mecanograms, Prints, Symbol Lists, or Instruction Books.

The resistance value in ohms is marked on each coil.

MOTOR TYPE	SYMBOL	LINE VOLTAGE	OHMS	REQUIRED
Type 3 (Series "P" Machines)	1B-200911 (Specify Resistance)	110 150 220 250	250 465 1000 1460	1 1 1 1
Types 5A-B-C (Series "C" and "T" Machines)	1B-200911 (Specify Resistance)	110 150 220 250 285	250 465 1000 1460 1940	1 1 1 1 1
Type 6 (Single Coil Bracket) (Series "M" Machines)	1B-200911 (Specify Resistance)	110 150 220–250	250 465 1000	1 1 1
Types 6 and 6A (Double Coil Bracket) (Series "H" and "M" Machines)	1B-200911 (Specify Resistance)	110 150 220 250	65 140 250 300	2 2 2 2
Overdraft Lights and Aligning Lights	1B-200911 (Specify Resistance)	110 125 150 200–210 220–235 240–260 265–275	— 300 700 1000 1460 1940 2150	None 1 per bulb 1 per bulb 1 per bulb 1 per bulb 1 per bulb 1 per bulb

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Form 2990

BURROUGHS KEYTOP COLOR CHART

Foreword: Colors used in Burroughs keytops are herein illustrated for the facilitation of keytop ordering. Although specific keytop symbol numbers and corresponding color combinations are determinable from charts contained in the various symbol lists, the similarity between colors available in the same symbol number may prevent color identification by descriptive means alone. When such is the case, the replacement of individual keytops will require a comparison of the desired keytop color with the color reproduced on this chart.

Replacement of all keytops in a given column, for the purpose of color change, may also require reference to this chart subsequent to the determination of symbol numbers and available color combinations.

Since gloss-free color samples have been used in the preparation of the chart, **all keytops should be thoroughly cleaned before attempting comparisons.**

GRAY 207

GRAY 204

TAN 102

TAN 104

BROWN 100

BROWN 105

BROWN 114

BROWN 108

RED 401

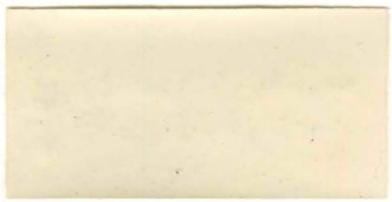
RED 402

(OVER)

PRINTED IN U. S. AMERICA 12-50 FORM 2902

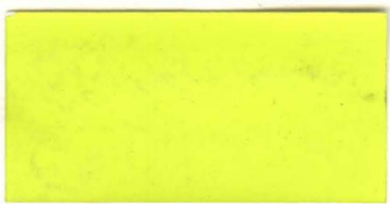
WHITE 900

IVORY 301



IVORY 302

GRAY 200



YELLOW 501

BLUE 700

BLACK 800