MECHANICAL INSTRUCTIONS

REMINGTON ELECTRIC TYPEWRITER

Remington Rand
DIVISION OF SPERRY RAND CORPORATION
315 PARK AVENUE SOUTH
NEW YORK 10, N. Y.
FOREWORD

THIS INSTRUCTION BOOK IS INTENDED PRIMARILY FOR MECHANICS; HOWEVER, IT CAN BE STUDIED TO A VERY GOOD ADVANTAGE BY SALESMEN.

THIS BOOK IS NOT AN OPERATOR'S INSTRUCTION BOOK AND SHOULD NOT BE GIVEN TO CUSTOMERS.

THE DRAWINGS CONTAINED IN THIS BOOK SHOULD BE STUDIED IN CONNECTION WITH THE WRITTEN INSTRUCTIONS AND ARE OF GREAT ASSISTANCE IN LEARNING THE FUNCTIONS AND ADJUSTMENTS OF THE VARIOUS MECHANICAL UNITS.

FOR THOSE IN THE FOREIGN FIELD WHO DO NOT READ ENGLISH, A CAREFUL STUDY OF THE DRAWINGS WILL GIVE HELPFUL FUNDAMENTAL INFORMATION.

STUDY ONE UNIT THOROUGHLY BEFORE GOING ON TO ANOTHER TO OBTAIN THE BEST RESULTS, LEARN THE ADJUSTMENTS WHICH PERTAIN TO ONE UNIT FROM THE BOOK, THEN MAKE THEM ON THE MACHINE.
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KEYBOARD COVER PLATE (20)
REMOVE THE FOLLOWING BUTTONS WITH KEYSTEMS BY PULLING FORWARD: SWITCH
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MOVE KEYBOARD COVER PLATE (20) MOUNTING SCREWS (BOTH SIDES) (9 & 11).
LIFT KEYBOARD COVER PLATE FROM MACHINE.

FRAME BASE FRONT (15)
REMOVE THREE MOUNTING SCREWS (12) AND REMOVE.
NOTE: SPACE KEY DOWN STOP (14) AND (16) ARE MOUNTED TO FRAME BASE FRONT.
KEYBOARD PLATE BRACKETS (13) HOLD FRONT OF KEYBOARD PLATE UPWARD.

FRAME BASE (19)
REMOVE FOUR FEET COMPLETE AND FOUR FRAME BASE MOUNTING SCREWS (17).

THE MACHINE PANELS FOR THE ELECTRIC TYPEWRITER ARE MADE OF DIE-CAST ALUMINUM.

THE REAR COVER TRIM STRIP (1) IS A MAIL ORDER PART AND WILL COME NOT FORMED TO CONTOUR
OF REAR PANEL. IT WILL BE ESSENTIAL THAT YOU FORM THE REAR COVER TRIM STRIP TO THE
EXACT CONTOUR OF REAR PANEL BEFORE REMOVING ADHESIVE. OTHERWISE, ENDS WILL HAVE
TENDENCY TO FLARE OUT FROM REAR PANEL.

THE KEYBOARD WINDOWS (C) ARE MADE OF PLEXIGLASS AND ARE SNAPED INTO PLACE IN KEY-
BOARD COVER PLATE.

THE NAME PLATE (23) IS MADE OF PLASTIC MATERIAL AND CAN BE SECURED TO KEYBOARD
COVER PLATE BY APPLYING SOLDERING IRON TO STUDS THAT PROTRUDE THROUGH PLATE.

NOTE: NEW MACHINES FROM THE FACTORY WILL USE TWO SHORT SCREWS HOLDING REAR FEET TO
BASE AND TWO LONG SCREWS TO HOLD FRONT FEET TO BASE.

IF MACHINE IS TO BE MOUNTED WITH DESK FASTENERS, USE FOUR LONG SCREWS AND ADD
COLLAR "F" AS ILLUSTRATED.

IN BACK OF KEYBOARD COVER PLATE AT RIGHT AND LEFT SIDES AT (10) ARE TWO HEXAGON HEAD
SCREWS. THESE SCREWS MAY BE BACKED OUT TO PRESSURE KEYBOARD COVER PLATE TO FRONT
SLIGHTLY TO PREVENT KEY TOPS BINDING WHEN DEPRESSED ON KEYBOARD COVER PLATE.
POWER DRIVE UNIT

POWER IS SUPPLIED BY A SINGLE PHASE MOTOR, AS FOLLOWS:

- 115 VOLTS AC 60 CYCLE 1725 R.P.M.
- 115 VOLTS AC 50 CYCLE 1425 R.P.M.
- 115 VOLTS DC 1725 R.P.M.

TWO MOTOR BELTS (7) ARE USED, ONE FOR REGULAR ELECTRIC AND A DIFFERENT (LONGER) BELT FOR TEN-KEY TAB AND STATESMAN MACHINES; HOWEVER, THE SAME BELT IS USED WITH 60-CYCLE (1725 R.P.M.) AND 50-CYCLE (1425 R.P.M.) MOTORS. THIS IS ACCOMPLISHED BY CHANGING THE SIZE OF INSIDE INTERMEDIATE PULLEY (6) AND MOTOR PULLEY (8) WHICH ARE MARKED WITH THE CORRECT SPEED.

13" AND 17" CARRIAGE MACHINES ARE EQUIPPED WITH A 25 M.H.P. MOTOR. (1/40 HP)

21" AND 27" CARRIAGE MACHINES ARE EQUIPPED WITH A 35 M.H.P. MOTOR. (1/28 HP)

ON ALL MACHINES MOTORS DRIVE POWER ROLL AND ALSO RETURN CARRIAGE. 1/40 HP MOTORS ARE USED FOR 13" AND 17" CARRIAGES ONLY; BUT, SINCE THE CARRIAGES ARE HEAVIER ON 21" AND 27" MACHINES, THEY REQUIRE 1/28 HP MOTOR TO RETURN CARRIAGES PROPERLY.

FOR MOTORS WITH SPEED OTHER THAN ABOVE, SALES ORDERS MUST SPECIFY VOLTAGE AND/OR CYCLES AND THE PROPER PULLEYS AND BELT WILL BE FURNISHED.

THE POWER DRIVE UNIT IS EQUIPPED WITH GILMER PULLEYS AND BELTS. THESE BELTS MUST RUN WITHOUT EXCESS TENSION. THE TEETH OF POWER ROLL PULLEY (12) AND MOTOR PULLEY (8) ARE SPRAYED WITH A COATING OF TEFLON WHICH CAUSES GILMER BELTS TO RUN MORE QUIETLY.

THE MOTOR (27) IS MOUNTED IN RUBBER (1) TO ELIMINATE VIBRATION BEING TRANSMITTED TO MACHINE.

WHEN SWITCH KEY CAP IS DEPRESSED AND SWITCH BELL CRANK (23) OPERATES ARM (24) ON MOTOR SWITCH, IT CLOSES CIRCUIT AND PERMITS CURRENT TO FLOW THROUGH A 2-AMP BUSS TIME LAG FUSE (26) AND THE STARTER RELAY (25) ON TO THE MOTOR.

STARTING RELAY (25)

THIS RELAY HAS TWO PURPOSES, ONE TO START MOTOR IN THE RIGHT DIRECTION. THIS IS ACCOMPLISHED BY CHARGING A COIL IN RELAY. THE OTHER, TO OBTAIN MAXIMUM MOTOR SPEED INSTANTANEOUSLY.

THE SAME RELAY IS USED WITH 50 CYCLE AS 60 CYCLE. TWO DIFFERENT RELAYS ARE REQUIRED--ONE FOR 25 M.H.P. (1/40 HP) AND ONE FOR 35 M.H.P. (1/28 HP) MOTORS.

MOTORS DO NOT HAVE THE STARTING COILS OR SWITCHES BUILT IN; THEREFORE, THE STARTING RELAY ACTUALLY TAKES PLACE OF THE STARTING COILS AND SWITCHES NORMALLY INCLUDED IN A MOTOR. IF THE STARTING RELAY IS NOT FUNCTIONING PROPERLY, MAXIMUM SPEED OF THE MOTOR MAY NOT BE OBTAINED WHICH WOULD CAUSE THE MOTOR TO RUN NOISY AND OVERHEAT. MOTOR SHOULD NOT BE CONSIDERED DEFECTIVE UNTIL THE STARTING RELAY HAS BEEN CHANGED OR CHECKED FOR PROPER FUNCTION. VOLTAGE SHOULD ALSO BE CHECKED.

MOTOR BEARINGS SHOULD BE LUBRICATED WITH TYPEWRITER OIL EACH TIME AN INSPECTION IS MADE WITHOUT FAIL. THIS CAN BE ACCOMPLISHED BY TILTING REAR OF MACHINE UPWARD MAKING OIL RECEPTACLES EASILY ACCESSIBLE.
POWER ROLL

THE COVER OF POWER ROLL (19) IS MADE OF "HYCAR", AND IS VULCANIZED TO ROLL CORE (17). THIS COVER HAS A VERY HIGH RESISTANCE TO ABRASION AND RETAINS RESILIENCY FOR A LONG PERIOD OF TIME. IT IS ALSO OIL AND GREASE RESISTANT; HOWEVER, CARE MUST BE TAKEN TO KEEP OIL AND GREASE OFF POWER ROLL. OTHERWISE, CAMS WOULD SLIP OR SKID WHEN OPERATED.

THE POWER ROLL (19) IS HELD TO POWER ROLL SHAFT (16) BY TWO ALLEN SCREWS (22). WHEN INSTALLING POWER ROLL, TIGHTEN "CUPPED" SCREW ON FLAT (18) OF SHAFT FIRST, THEN TIGHTEN "POINTED" SCREW ON ROUND SURFACE OF SHAFT. THIS PREVENTS POWER ROLL FROM BEING MOUNTED "OFF CENTER" IN RELATION TO POWER ROLL SHAFT. POWER ROLL SHOULD BE FREE TO ROTATE WITH NO END PLAY.

THE SPEED OF POWER ROLL (19) IS 400 R.P.M. PLUS OR MINUS 10 PER CENT DUE TO MOTOR VARIATION OR CURRENT FLUCTUATION. THE POWER ROLL TURNS TOWARD FRONT OF MACHINE (NOTE ARROW) AND IS DRIVEN BY GILMER BELT (7) FROM MOTOR TO INTERMEDIATE PULLEYS (6 AND 10), CONTINUING BY GILMER BELT (9) DIRECT TO POWER ROLL SHAFT PULLEY (12) AS INDICATED IN SKETCH.

PROPER TENSION OF MOTOR DRIVE BELT (7) CAN BE OBTAINED BY LOOSENING 4 MOTOR MOUNTING SUPPORT SCREWS (5) AND MOVING MOTOR TO FRONT OR REAR. ALIGN MOTOR DRIVE PULLEYS.

POWER DRIVE UNIT (REMOVAL)

TO REMOVE MOTOR BRACKET AND MOTOR COMPLETE FROM MACHINE, WITH MACHINE SITTING ON ITS BACK, REMOVE TWO REAR FEET, TAKE OUT FOUR BRACKET MOUNTING SCREWS (4), RUBBER WASHERS (2) AND GROMMETS (3). TILT THE BRACKET DOWNWARD ON LEFT SIDE AND DISENGAGE THE MOTOR BELT FROM ITS PULLEY. WHEN REPLACING THIS UNIT, SWITCH BELL CRANK (23) MUST BE POSITIONED IN BACK OF MOTOR SWITCH OPERATING ARM (24).

REMOVAL OF POWER ROLL AND POWER ROLL SHAFT

1. TURN MANIFOLD (IMPRESSION) CONTROL DIAL TO #1 POSITION.
2. REMOVE CARBON RIBBON CARRIER (RIGHT).
3. REMOVE POWER ROLL GEAR (11).
4. LOOSEN POWER ROLL PULLEY (12).
5. REMOVE CARBON RIBBON TAKE-UP SPOOL.
6. REMOVE CARBON RIBBON INDICATOR.
7. REMOVE RIBBON WIND-OFF ARM.
8. REMOVE CARBON RIBBON DRIVE BELT.
9. REMOVE MANUAL BACK SPACE LEVER, MOUNTING SCREW.
10. MARK TOP PORTION OF POWER ROLL BEARING LEFT (20).
11. REMOVE POWER ROLL SHAFT BEARING BY ITS TWO MOUNTING SCREWS (21).
12. REMOVE POWER ROLL (19) AND POWER ROLL SHAFT (16) AS A UNIT THROUGH LEFT SIDE FRAME.
REPLACE AND ADJUST POWER ROLL (19) AND POWER ROLL SHAFT (16)

1. ASSEMBLE POWER ROLL (19) TO POWER ROLL SHAFT (16).
   A. CUPPED ALLEN SCREW (22) ON FLAT (18) OF SHAFT LOOSE ENOUGH TO ALLOW POWER ROLL (19) TO SLIDE ON SHAFT BUT NOT ROTATE TO ROUND PORTION OF POWER ROLL SHAFT.
   B. POINTED ALLEN SCREW ONLY STARTED IN POWER ROLL.
   C. PLACE NYLON SPACER (15) ON RIGHT END OF POWER ROLL SHAFT (16).

2. PLACE ASSEMBLED UNIT THROUGH RIGHT SIDE FRAME UNTIL 1/2" OF RIGHT END OF POWER ROLL SHAFT (16) IS SHOWING AND LOCATE METAL SPACER (13) AGAINST SHOULDER OF POWER ROLL SHAFT.

3. PLACE POWER ROLL PULLEY (12) ON SHAFT WITH HUB TO RIGHT AND AGAINST METAL SPACER (13).

4. ROTATE POWER ROLL SHAFT UNTIL GROOVE IN SHAFT LINES UP WITH SLOT IN POWER ROLL PULLEY AND INSERT KEY WAY AND TIGHTEN SCREWS IN POWER ROLL PULLEY (12).

5. PLACE POWER ROLL GEAR (11) ON SHAFT WITH HUB TO RIGHT AND AGAINST POWER ROLL PULLEY (12). END OF GEAR SHOULD BE FLUSH WITH END OF SHAFT. IF NOT FLUSH, POWER ROLL PULLEY IS NOT PROPERLY SEATED.

6. REPLACE LEFT POWER ROLL BEARING (20) WITH MARK TO TOP AND TIGHTEN TWO MOUNTING SCREWS (21).

7. FORCE POWER ROLL PULLEY (12) TOWARD LEFT AGAINST OUTSIDE OF RIGHT SIDE FRAME (14) AND MOVE POWER ROLL (19) ON SHAFT TOWARD RIGHT TO REMOVE EXCESS END PLAY IN POWER ROLL (19). THIS ADJUSTMENT CAN BE ACCOMPLISHED THROUGH BOTTOM OF MACHINE. TIGHTEN CUPPED SCREW (22) TO FLAT (18) OF SHAFT FIRST THEN TIGHTEN POINTED SCREW TO ROUND PORTION OF SHAFT.

INSTALL FOLLOWING:

8. CARBON RIBBON CARRIER (RIGHT).
9. MANUAL BACK SPACE LEVER LINK MOUNTING SCREW.
10. RIBBON WIND-OFF ARM.
11. CARBON RIBBON INDICATOR.
12. CARBON RIBBON TAKE-UP SPOOL.
13. CARBON RIBBON DRIVE BELT.
POWER ROLL, POWER ARM CAM CLEARANCE, AND KEY LEVER DIP

POWER ROLL

The cover of Power Roll "B" is made of "Hycar," and is vulcanized to roll core. This cover has a very high resistance to abrasion and retains resiliency for a long period of time. It is also oil and grease resistant; however, care must be taken to keep oil and grease off Power Roll; otherwise, cams would slip or skid when operated. The Power Roll is held to Power Roll shaft by two Allen screws. When installing Power Roll, tighten "cupped screw on flat of shaft first; then tighten "pointed" screw on round surface of shaft. This prevents Power Roll from being mounted "off center" in relation to Power Roll shaft. Power Roll should be free to rotate with no end play.

POWER ARM CAM CLEARANCE

Before adjusting Key Lever Dip, Power Arm Fulcrum Bracket (18) must be adjusted for .007 to .012 clearance between nylon cams (A) and Power Roll (B). (See inset.) Loosen screws (9) located in each end of Power Arm Fulcrum Bracket (18), Ribbon Control Arm Pivot Screw (8), and Power Arm Fulcrum Bracket Eccentric Screw Nut (7) right and left.

Turn high side of eccentric (6) to rear and have nylon cams (A) rest on Power Roll (B). Adjust eccentrics (6) right and left until all nylon cams just clear Power Roll (B). Test by rotating Power Roll forward and backward by hand to see that nylon cams (A) do not move. Tighten eccentric screw nuts (7), ribbon control arm pivot screw (8), and Power Arm Fulcrum Bracket Screws (9) securely when adjustment is completed.

It is preferable to hold cam clearance at .007 rather than .012. Check cams for clearance on regular power arms, (1), (2), and (4). In other words, check cams at both ends and also center of Power Roll. Cams, if set too low, will scuff Power Roll and wear serrations on cams.

Holding cam clearance closer to .007 will permit adjusting Key Lever Upstop (17) and Down Stop (15) higher which is desirable since we have a keyboard cover plate. When Key Lever is depressed, Power Arms must be released before tops of key tops become flush with top of keyboard cover plate.

The .007 to .012 clearance for repeat underscore, carriage return, and repeat space key power arms can be adjusted individually by Power Arm Down Stop Screws (14).

KEY LEVER DIP (UPSTOP)

Loosen four screws (13) and position Key Lever Comb (16) to which Upstop is attached to have type bar trip bell cranks (C) (refer to inset) latch under lower trip (d) of power arms just before key lever limits on upstop (e). Tighten screws (13).

After upstop (e) has been positioned, with motor running, depress key lever and allow to restore slowly and just before key lever limits against upstop (e) the shaded power trip latch (f) should snap under lip (d). This condition should be tested on key levers on both sides of keyboard as well as center. The key lever upstop (e) should not be adjusted any higher than necessary to secure this condition.

KEY LEVER DIP (DOWNSTOP)

Loosen screws (12) and adjust Key Lever Downstop (15) to have Power Arms trip just
BEFORE KEY LEVERS LIMIT ON DOWNSTOP, TIGHTEN SCREWS (12). IF KEY LEVER DOWNSTOP (15) IS SET TOO LOW, POWER TRIP BELL CRANK WILL TRY TO MOVE LOWER TRIP OF POWER ARM BEYOND ITS LIMIT CAUSING THREE UNDESIRABLE CONDITIONS.

1. STARTER (h) (REFER TO INSET) WILL LIMIT ON FLAT (k) OF NYLON CAM (a), CAUSING DELAYED ACTION OF CAM OPERATING.

2. POWER ARM (l) WILL BE LIFTED AWAY FROM POWER ROLL (b).

3. MAY EFFECT KEYTOUCH.

NOTE: IF FOR ANY REASON ADJUSTMENT OF .007 TO .012 CLEARANCE BETWEEN NYLON CAMS (a) AND POWER ROLL (b) IS CHANGED, KEY LEVER DIP ADJUSTMENTS WILL HAVE TO BE CHECKED.

THE KEY LEVER DOWNSTOP SCREWS (10) FOR REPEAT BACKSPACE, REPEAT UNDERSCORE, AND REPEAT SPACE KEY ARE DESIGNED TO ACCOMMODATE COMPRESSION SPRINGS (11) FOR REPEAT OPERATIONS. THE REPEAT KEY LEVER DOWNSTOP SCREWS ARE ADJUSTED SO THAT A SINGLE OPERATION WILL TAKE PLACE JUST AS KEY LEVER CONTACTS SPRING. REPEAT OPERATION TO TAKE PLACE ONLY AFTER TYPIST DEPRESSES KEY LEVER FAR ENOUGH TO COMPRESS SPRING. THE CARRIAGE RETURN KEY LEVER IS PROVIDED WITH REPEAT KEY LEVER DOWN STOP SCREW WITHOUT SPRING. THE SCREW SHOULD BE ADJUSTED FOR A SINGLE LINE SPACE OPERATION ONLY.
TRANSPARENT CARD HOLDERS AND ALIGNING SCALE

THE TRANSPARENT CARD HOLDERS RIGHT (2) AND LEFT (6) HAVE BEEN DESIGNED TO ENABLE THE OPERATOR TO INSERT PAPER WITHOUT RAISING PAPER BAIL. THE TRANSPARENT CARD HOLDERS RIGHT AND LEFT HAVE LOCKING ARMS THAT CAN BE POSITIONED ACCORDING TO THE TYPE OF PAPER OR CARDS BEING INSERTED INTO THE PAPER CARRIAGE. WITH LOCKING ARMS RIGHT (3) AND LEFT (5) POSITIONED TOWARD OUTSIDE OF THE MACHINE, THE TRANSPARENT CARD HOLDERS ARE POSITIONED FORWARD AWAY FROM THE PLATEN. WHEN THE LOCKING ARMS RIGHT (3) AND LEFT (5) ARE IN A VERTICAL POSITION, THE TRANSPARENT CARD HOLDERS WOULD BE IN A NORMAL POSITION YET THEY CAN YIELD FORWARD IF NECESSARY. WITH THE LOCKING ARMS (3) AND (5) SET TOWARD THE CENTER OF MACHINE, THE TRANSPARENT CARD HOLDERS RIGHT (2) AND LEFT (6) ARE HELD IN A NORMAL POSITION AND ARE NOT ALLOWED TO YIELD.

THE ALIGNING SCALE (1) CAN BE ADJUSTED BY FORMING BRACKET (4) TO ALLOW FOR SIX SHEETS OF PAPER BETWEEN THE ALIGNING SCALE (1) AND CYLINDER. TYPE OFF A LINE OF SMALL 111's AND ADJUST THE ALIGNING SCALE FOR HEIGHT SO THAT THERE IS A FINE LINE OF SPACE BETWEEN TOP OF ALIGNING SCALE AND BOTTOM OF PRINTED LINE OF 1111's. AT THE SAME TIME, POSITION ALIGNING SCALE LATERALLY SO THAT THE WHITE LINES ON THE ALIGNING SCALE (1) WILL BE IN LINE WITH THE VERTICAL LINES OF THE PRINTED 1111111's.
POWER ARMS

DESCRIPTION

TYPE BAR POWER ARM - NON-REPEAT - 4-15030
#0 THROUGH #43 (EXCEPT #23)

1. SHORT POWER ARM SUB-LEVER LINK CONTAINING ADJUSTING SCREWS
2. SMALL DIAMETER, NARROW NYLON CAM
3. THE STARTER IS CONNECTED TO LOWER TRIP

NO. 23 - REPEAT TYPE BAR POWER ARM - 4-15031

1. SHORT POWER ARM SUB-LEVER LINK, CONTAINING ADJUSTING SCREWS
2. MEDIUM DIAMETER, NARROW NYLON CAM
3. THE STARTER SNAPS CAM INTO CONTACT WITH POWER ROLL. STARTER IS NOT CONNECTED TO LOWER TRIP BUT A SPRING IS ATTACHED BETWEEN IT AND UPPER TRIP
4. THIS POWER ARM CAN BE USED IN ANY ALPHABET OR NUMERAL POSITION WHEN REPEAT OPERATION IS DESIRED.

NOTE: DISTANCE "A" IS SHORTER ON THE REPEAT ARMS THAN IT IS ON THE NON-REPEAT POWER ARMS. HALF-MOON "B" INDICATES REPEAT POWER ARM.

REPEAT SPACE KEY POWER ARM - 4-12559

1. LONG SUB-LEVER LINK. DOES NOT CONTAIN ADJUSTING SCREWS
2. MEDIUM DIAMETER, WIDE NYLON CAM
3. THE STARTER SNAPS NYLON CAM INTO CONTACT WITH POWER ROLL. STARTER IS NOT CONNECTED TO LOWER TRIP BUT A SPRING IS ATTACHED BETWEEN IT AND UPPER TRIP
TABULATOR POWER ARM-NON-REPEAT - 4-11965

1. LONG SUB-LEVER LINK. DOES NOT CONTAIN ADJUSTING SCREWS
2. SMALL DIAMETER, NARROW NYLON CAM
3. THE STARTER IS CONNECTED TO LOWER TRIP

REPEAT BACKSPACE KEY POWER ARM - 4-12742

1. NO SUB-LEVER LINK
2. LARGE DIAMETER, WIDE NYLON CAM
3. THE STARTER SNAPS NYLON CAM INTO CONTACT WITH POWER ROLL. STARTER IS NOT CONNECTED TO LOWER TRIP BUT A SPRING IS ATTACHED BETWEEN IT AND UPPER TRIP
4. ECCENTRIC PRESSURE ADJUSTMENT ON POWER ARM
5. THIS POWER ARM CAN BE DISTINGUISHED FROM THE CARRIAGE RETURN AND LINE SPACE POWER ARM BY THE CURVED PORTION OF POWER ARM THAT CONTACTS POWER ARM STOP WIRE.

CARRIAGE RETURN AND LINE SPACE POWER ARM 4-13283

THIS POWER ARM IS SIMILAR TO BACK SPACE POWER ARM EXCEPT THAT THE PORTION OF THE POWER ARM WHICH CONTACTS POWER ARM STOP WIRE HAS BEEN REMOVED TO PREVENT ARM FROM LIMITING, PERMITTING INDIVIDUAL ADJUSTMENT FOR CAM CLEARANCE BY USE OF DOWN STOP SCREW.
**Repeat Power Trip Bellcrank - 4-10459**

1. Used with repeat type bar power arms, except #23 repeat underscore

2. Single position wide power trip trigger. The purpose of the wide trigger is to prevent it from camming off lower trip of power arm during repeat operation. This style power trip bellcrank is used where two key levers, next to each other, are to operate repeat power arms in which case, only one of the key levers can have a repeat down stop screw, spring, and nut because of limited space in key lever down stop

3. Heavier power trip spring than used on regular power trip bellcranks

**Repeat Power Trip Bellcrank - 4-12748**

1. Used with repeat back space, repeat space key and repeat carriage return power arms

2. Two position power trip trigger

3. Top of power trip trigger beveled

4. Heavier power trip spring than used on regular power trip bellcranks

5. Lower portion of power trip trigger annealed. This is done to permit forming of carriage return power trip trigger to rear if trigger cams off lower trip of power arm during repeat line space operation
CROSS-OVER MECHANISM

OPERATION

THE CROSS-OVER MECHANISM PERMITS THE RELOCATING OF THE "UNDERSCORE-HYPHEN" AND "&-7" TYPE IN THE TYPE BAR SEGMENT AND STILL MAINTAIN THE SAME KEYBOARD ARRANGE-
MENT. THE "UNDERSCORE-HYPHEN" TYPE IS LOCATED IN THE CENTER OF THE TYPE BAR SEG-
MENT AND IS OPERATED BY THE "UNDERSCORE-HYPHEN" KEY LEVER (2) FROM ITS NORMAL
LOCATION AT RIGHT SIDE OF KEYBOARD. THE "&-7" TYPE IS LOCATED AT THE RIGHT SIDE
OF TYPE BAR SEGMENT AND IS OPERATED BY THE "&-7" KEY LEVER (7) FROM ITS NORMAL
LOCATION AT THE CENTER OF KEYBOARD.

THIS CROSS-OVER FEATURE PERMITS A MORE EVEN LINE OF REPEAT "UNDERSCORE" OR REPEAT
"HYPHENS" AS A TYPE BAR OPERATING FROM THE CENTER OF THE SEGMENT HAS LESS "WHIP"
IN ITS TRAVEL TO THE PLATEN THAN A TYPE BAR FROM SIDES OF SEGMENT.

THIS CROSS-OVER IS ACCOMPLISHED BY TWO SPECIAL KEY LEVERS (2 & 7) AND TWO SPECIAL
TYPE BAR POWER TRIP BELL CRANKS (1 & 8), WHICH ARE CONNECTED TO POWER TRIP BELL
CRANK BAILS (5 & 6).

ADJUSTMENTS

ADJUST THE REPEAT UNDERSCORE KEY LEVER DOWN STOP SCREW (3) SO THAT SINGLE OPERATION
TAKES PLACE JUST AS THE KEY KEY LEVER (2) CONTACTS REPEAT KEY LEVER DOWN STOP SPRING
(4). THE REPEAT OPERATION TAKES PLACE ONLY AFTER THE OPERATOR DEPRESSES THE KEY
LEVER (2) FAR ENOUGH TO COMPRESS THE SPRING (4).

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IF EITHER THE "UNDERSCORE-HYPHEN" OR "8-7" POWER TRIP BELL CRANKS (1 & 8) FAIL TO RESTORE, BELL CRANK BAILS (5 & 6) WILL HAVE TO BE "JACKED" AS FOLLOWS.

"UNDERSCORE-HYPHEN"

GRIP BELL CRANK BAIL (6) AT POINTS "A" AND "B" WITH PLIERS. HOLD PLIER AT "A" STEADY AND JACK TOWARD FRONT OF MACHINE WITH PLIER AT POINT "B".

"8-7"

GRIP BELL CRANK BAIL (5) AT POINTS "C" AND "D" WITH PLIERS. HOLD PLIERS AT "C" STEADY AND "JACK" TOWARD FRONT OF MACHINE WITH PLIER AT POINT "D".

IF THE "8-7" KEY LEVER (7) LIMITS ON KEY LEVER DOWN STOP BEFORE POWER ARM TRIPS OR THE "UNDERSCORE-HYPHEN" POWER ARM FAILS TO REPEAT WITH REPEAT KEY LEVER DOWN STOP SCREW (3) ADJUSTED AS LOW AS POSSIBLE, BELL CRANK BAIL (5) OR (6) WILL HAVE TO BE JACKED AS FOLLOWS.

"8-7"

GRIP BELL CRANK BAIL (5) AT POINTS "C" AND "D" WITH PLIERS. HOLD PLIERS AT "C" STEADY AND "JACK" TOWARD REAR OF MACHINE WITH PLIER AT POINT "D".

"UNDERSCORE-HYPHEN"

GRIP BELL CRANK BAIL (6) AT POINTS "A" AND "B" WITH PLIERS. HOLD PLIER AT "A" STEADY AND "JACK" TOWARD REAR OF MACHINE AT POINT "B".

NOTE: IF THE KEY LEVER DIP ADJUSTMENTS OR CLEARANCE BETWEEN POWER ARM NYLON CAMS AND POWER ROLL ARE CHANGED FOR ANY REASON, THE CROSS-OVER MECHANISM MUST BE CHECKED.
MOVABLE CARRIAGE

OPERATION

CARRIAGE IS MOUNTED TO CARRIAGE MANIFOLD SPRING BRACKETS "A" AND IS MOVABLE TO MAINTAIN CYLINDER AND ANVIL POSITION FOR DIFFERENT MANIFOLD PACKS THROUGH MANIFOLD CONTROL DIAL "B" MOUNTED TO RIGHT SIDE FRAME FRONT. MAINFOLD CONTROL DIAL "B" HAS MARKINGS FROM #4 TO H. NO. 4 IS NORMAL POSITION OF CARRIAGE FOR ORDINARY CORRESPONDENCE WORK. TURNING MANIFOLD CONTROL DIAL "B" TOWARD "H" INCREASES THE DISTANCE BETWEEN TYPE GUIDE AND CYLINDER PERMITTING HEAVIER MANIFOLD PACKS TO BE INSERTED IN MACHINE AND STILL MAINTAIN CYLINDER AND ANVIL POSITION WHICH IS USEFUL IN REDUCING THE AMOUNT OF EMBOSSGING AND BLURRED LETTERS.

FOR EXAMPLE, IT IS RECOMMENDED, IF AN OPERATOR IS MAKING SIX (6) CARBON COPIES, THAT THE MANIFOLD (CARRIAGE) CONTROL DIAL "B" BE SET AT #6; AND ALSO SET MANIFOLD (IMPRESSION) CONTROL DIAL AT #6. THIS COMBINATION IS USUALLY SATISFACTORY: BUT OTHER CIRCUMSTANCES SUCH AS GRADE OF CYLINDER, WEIGHT OF PAPER, OR CARBON PAPER MUST BE TAKEN INTO CONSIDERATION.

ADJUSTMENTS

1. POSITION CARRIAGE MANIFOLD SHAFT ECCENTRICS (8) RIGHT AND LEFT ON CARRIAGE MANIFOLD SHAFT (6) SO ALLEN SET SCREWS (9) ARE ON FLAT SURFACE WITH HIGH POINTS OF ECCENTRICS (8) FACING UPWARD.

2. WITH CARRIAGE MANIFOLD DIAL "B" AT "H" ADJUST CARRIAGE MANIFOLD PULL WIRE (7) TO HAVE CARRIAGE MANIFOLD BRACKETS "A" LOCATED TO EXTREME REAR POSITION. IN THIS POSITION LARGE SIDE OF ECCENTRICS (8) MUST BE UP.

3. LOOSEN SCREWS (5), AND ADJUST CARRIAGE MANIFOLD SHAFT ECCENTRIC ADJUSTING PLATES (4) WITH MANIFOLD DIAL "B" AT #4 POSITION TO ELIMINATE EXCESS PLAY BETWEEN CARRIAGE MANIFOLD ECCENTRICS (8) AND CARRIAGE MANIFOLD SPRING BRACKETS, "A". TIGHTEN SCREWS (5). MAKE THIS SAME ADJUSTMENT ON BOTH SIDES OF MACHINE.

4. THE PRESSURE OF DETENT SPRING "C" ON MANIFOLD CONTROL DIAL "B" SHOULD BE SUFFICIENT TO HOLD DIAL "B" WHERE IT IS SET. NUT "E" MAY BE LOOSENED AND SCREW "D" TURNED TO INCREASE OR DECREASE DETENT ACTION. TIGHTEN NUT "E".

THE CORRECT LOCATION OF THE CARRIAGE FOR CYLINDER AND ANVIL POSITION CAN BE DETERMINED AS FOLLOWS: HAVE RIGHT MANIFOLD CONTROL DIAL "B" TURNED TO #4 POSITION WITH TWO SHEETS OF PAPER IN CARRIAGE. HOLD TYPE BAR TO CYLINDER. (BE SURE TO HOLD TYPE BAR BELOW ANVIL POSITION.) PLACE STRIP OF PAPER BETWEEN THE TYPE BAR AND ANVIL AND NOTE THE PRESSURE OF TYPE BAR HOLDING STRIP OF PAPER BY PULLING ON PAPER STRIP LIGHTLY. RELEASE THE TYPE BAR AND PLACE STRIP OF PAPER BETWEEN THE RIBBON AND CYLINDER. THEN HOLD TYPE BAR FIRMLY AND NOTE THE AMOUNT OF BITE OR HOLD THE FACE OF TYPE HAS AT THIS POINT BY PULLING ON PAPER STRIP LIGHTLY. (THERE SHOULD BE AN EQUAL BITE OR HOLD AT BOTH THE CYLINDER AND ANVIL POSITIONS.) IF THERE IS BITE AT THE CYLINDER AND NONE AT THE ANVIL, IT INDICATES THAT THE CARRIAGE IS TOO FAR FORWARD. LOOSEN CARRIAGE REAR GUIDE SCREWS (3) AND CARRIAGE RAIL ECCENTRIC SCREWS (1) AND ADJUST THE ECCENTRICS (2) UNTIL THE TYPE BAR HAS SAME BITE AT CYLINDER AND ANVIL POSITIONS AS DESCRIBED. ADJUST BOTH SIDES OF THE CARRIAGE RAILS PARALLEL WITH THE TYPE BAR SEGMENT. TIGHTEN SCREWS (1 AND 3).
REMINGTON ELECTRIC TYPEWRITER
SHIFT CAM MECHANISM

OPERATION

The shift shaft (15) sketch "A" rotates in bearings (8) mounted in right and left typewriter side frames. On right end of shaft are mounted both intermediate pulleys, and the shift cam assembly (3) sketch "C" is mounted on left end just inside of left side frame.

The shift cam ratchet (14) sketch "A" turns with shaft. The shift shaft also passes through bearing of shift cam (19) but does not directly turn it. Shift cam (19) rotates within segment shift crank (20). When cam ratchet pawl (18), which pivots on shift cam (19), engages rotating cam ratchet (14), the shift cam (19) turns with shift shaft (15).

Note: When released, the cam ratchet pawl (18) engages cam ratchet (14). The segment shift crank (20) and shift cam (19) work as a unit and, through segment shift bracket connecting link assembly (15) and segment bracket (18) sketch "B", will raise or lower type bar segment.

When shift key is depressed, both upper (5) and lower (9) sketch "B" release levers operate. The upper release lever is moved upward from shift cam ratchet pawl (4) and the lower release lever (9) will move to an upward position to intercept ratchet pawl (4) on half cycle position. Shift cam ratchet pawl (4), being released by upper lever, will engage shift cam ratchet (11). The rotating shift cam ratchet (11), through shift cam ratchet pawl (4), will turn shift cam (19) sketch "A" within segment shift crank (20); and, as mentioned before, both shift cam and segment shift crank will function as a unit to lower type bar segment into shift position. The type bar segment will continue to be lowered until lower release lever (9) sketch "B" intercepts cam ratchet pawl (4) and releases it from cam ratchet (11).

When shift key is released, both upper and lower release levers will again be operated. The lower release lever (9) sketch "B" will move downward, releasing shift cam ratchet pawl (4), permitting it to engage shift cam ratchet (11) causing cam shift assembly (3) sketch "C" to operate as previously described. The upper release lever (5) sketch "B" will be in a position to intercept shift cam ratchet pawl (4) and disengage it from shift cam ratchet (11) at the time type bar segment reaches its normal upward position.

The shift cam (19) sketch "A" and segment shift crank (20) are designed to operate as a ball clutch (refer to (21)) similar to those in carbon ribbon and ribbon drive mechanism. The purpose of this arrangement is to keep cam ratchet pawl (18) in contact with release levers (5) and (9) sketch "B" to prevent shift cam (19) sketch "A" from backing up which would allow cam ratchet pawl (18) to drag on shift cam ratchet (14) resulting in clicking noise.

The shift cam (19) sketch "A" is eccentric and is made up in two sizes. One is for .262 motion; the other is for .300 motion type. The shift cam back plate (22) is stamped .262 or .300. Actual movement up or down that the shift cam stamped .300 transmits to segment is .320; shift cam stamped .262 will move segment .282. The style of type--i.e., .262 or .300 motion--will determine which style cam is used. Yield spring (12) sketch "B" mechanism of segment shift crank linkage permits adjusting of motion, which will be explained later.
REMOVAL OF SHIFT SHAFT

NOTE: REMOVE MOTOR UNIT COMPLETE.

1. REMOVE NUT (s) AND WASHER (6) SKETCH "A" HOLDING OUTSIDE INTERMEDIATE PULLEY (7) (SMALL) TO RIGHT END OF SHIFT SHAFT.

2. LOOSEN ALLEN SET SCREW (2) SKETCH "C" HOLDING INSIDE INTERMEDIATE PULLEY (6) (LARGE).

3. LOOSEN TWO SCREWS HOLDING COLLAR (24) SKETCH "A" ON RIGHT SIDE OF SHIFT CAM ASSEMBLY.

4. REMOVE YIELD SPRING (12) SKETCH "B" FROM SHIFT CAM ASSEMBLY LINKAGE.

5. REMOVE TWO ALLEN SET SCREWS HOLDING SHIFT CAM RATCHET (14) SKETCH "A" ON LEFT SIDE OF SHIFT CAM ASSEMBLY.

6. REMOVE SHIFT CAM SHAFT (15) BY PULLING TO THE LEFT ON COLLAR (16) ON LEFT END OF SHAFT AS FOLLOWS:

7. PULL SHAFT OUT A LITTLE AND REMOVE INTERMEDIATE PULLEY (7) TOGETHER WITH PULLEY KEY (2) AND METAL WASHER (4) NEXT TO BEARING (8).

8. PULL SHAFT OUT A LITTLE FURTHER AND REMOVE INTERMEDIATE PULLEY (3) AND MOTOR BELT (1).

9. PULL SHIFT SHAFT FURTHER TO LEFT AND REMOVE COLLAR (24) AND NYLON WASHER (23) FROM SHIFT SHAFT NEXT TO SHIFT CAM.

10. CONTINUE TO PULL SHAFT THROUGH SHIFT CAM ASSEMBLY (3) SKETCH "C" AND ALSO SHIFT RATCHET (14) SKETCH "A". REMOVE RATCHET (14) AND REMOVE SHIFT SHAFT FROM THE MACHINE. DO NOT LOSE TENSION WASHER (17) WHICH MUST BE PLACED BETWEEN RATCHET (14) AND SHIFT CAM (19).

11. REMOVE SCREW (6) SKETCH "B", HOLDING RELEASE LEVERS TO LEFT SIDE FRAME.

12. HOLD RELEASE LEVER (5) SKETCH "B" TO LEFT SLIGHTLY AND DISENGAGE SHIFT CAM ASSEMBLY (3) SKETCH "C" COMPLETE FROM STUD (5).

DISASSEMBLING SEGMENT SHIFT CRANK ASSEMBLY (3) SKETCH "C"

1. REMOVE SHIFT CAM BACK PLATE (22) SKETCH "A" AND CAREFULLY SLIP SHIFT CAM ASSEMBLY (19) OUT OF SEGMENT SHIFT CRANK (20) TO KEEP FROM LOSING CLUTCH SPRINGS AND BALLS (21).

2. REMOVE SHIFT CAM RATCHET PAWL STOP PIN (13) FROM CAM SHIFT ASSEMBLY (19).

3. IT IS NOT NECESSARY TO REMOVE SEGMENT SHIFT BALL RETAINER (11) FROM SEGMENT SHIFT BALL CLUTCH PLATE (12) TO TAKE OUT CLUTCH SPRINGS AND CLUTCH BALLS (21). PLACE ASSEMBLY ON A FLAT SURFACE AND LOOSEN THREE SEGMENT SHIFT CRANK SCREWS (10) AND CAREFULLY REMOVE CLUTCH SPRINGS AND CLUTCH BALLS (21). BY REMOVING THREE SEGMENT SHIFT CRANK SCREWS (10), BOTH RETAINER (11) AND BALL CLUTCH PLATE (12) CAN BE REMOVED FROM SEGMENT SHIFT CRANK (20).

REASSEMBLING SEGMENT SHIFT CRANK ASSEMBLY (3) SKETCH "C"

1. PLACE BALL CLUTCH PLATE (12) SKETCH "A" AND BALL RETAINER (11) ON SEGMENT SHIFT
CRANK SO THEIR FLAT SIDES WILL LINE UP WITH FLAT OF SEGMENT SHIFT CRANK (20), AND MOUNT TO SHIFT CRANK BY THREE SEGMENT SHIFT CRANK SCREWS (10).

2. INSERT ONE SEGMENT SHIFT BALL CLUTCH SPRING IN DWELL OF SEGMENT SHIFT BALL CLUTCH PLATE AND THEN PLACE CLUTCH BALL AT END OF SPRING AT SHALLOW END OF DWELL. USE SAME PROCEDURE TO INSTALL THE OTHER CLUTCH SPRINGS AND CLUTCH BALLS.

3. TO PLACE SHIFT CAM ASSEMBLY (19) SKETCH "A" IN SEGMENT SHIFT CRANK (20), TURN SHIFT CAM ASSEMBLY IN SAME DIRECTION AS IT WOULD BE ROTATED BY SHIFT SHAFT AND AT THE SAME TIME GENTLY PRESS SHIFT CAM ASSEMBLY (19) INTO SEGMENT SHIFT CRANK (20).

4. INSERT SHIFT CAM RATCHET PAWL STOP PIN (13) IN ITS HOLE IN SHIFT CAM ASSEMBLY (19) SO GROOVED END EXTENDS BEYOND LEFT SIDE OF SHIFT CAM (19). IMMEDIATELY MOUNT SHIFT CAM BACK PLATE (22) ON SHIFT CAM ASSEMBLY BY TWO PLATE SCREWS (9) TO RETAIN ASSEMBLY WITHIN SEGMENT SHIFT CRANK (20).

REPLACING SHIFT SHAFT

1. HOLD SHIFT CAM ASSEMBLY (3) SKETCH "C" IN YOUR HAND WITH RATCHET PAWL (18) SKETCH "A" FACING UPWARD. HOLD RATCHET PAWL CLEAR OF PIVOT BUSHING AND PLACE TENSION WASHER (17) ON TOP OF PIVOT BUSHING. PLACE RATCHET (14) WITH HUB FACING UPWARD ON TOP OF TENSION WASHER (17). WHILE HOLDING THESE PARTS IN THIS POSITION, SLIP THE ERASER END OF A PENCIL THROUGH THIS ASSEMBLY. WITH PARTS STILL ASSEMBLED ON PENCIL, HOLD RELEASE LEVER (5) SKETCH "B" TO LEFT SLIGHTLY AND ATTACH THE SHIFT CAM ASSEMBLY TO STUD (5) SKETCH "C", LEAVING THE PENCIL STILL IN THE PARTS.

NOTE: TO MAKE THE INSERTION OF THE SHIFT SHAFT EASIER, IT IS BETTER TO PUSH THE SEGMENT DOWN ABOUT 1/4" AND BLOCK IT IN THIS POSITION.

2. INSERT THREADED END OF SHIFT SHAFT (15) SKETCH "A", THROUGH ITS BEARING (8) IN LEFT SIDE FRAME INTO RATCHET (14), TENSION WASHER (17), AND THROUGH SHIFT CAM (19), BEING CAREFUL NOT TO LOSE THE TENSION WASHER (17) WHILE SHAFT IS PUSHING THE PENCIL THROUGH THESE PARTS.

3. PLACE NYLON WASHER (23) ON SHIFT SHAFT NEXT TO SHIFT CAM BACK PLATE (22). PLACE COLLAR (24) NEXT TO NYLON WASHER.

4. HOLD SHIFT CAM MECHANISM FROM SLIDING TO THE RIGHT AND PUSH SHIFT SHAFT (15) ABOUT 3/4 OF THE WAY THROUGH THE MACHINE AND PUT MOTOR BELT (1) AROUND SHAFT. SLIDE SHAFT THROUGH A LITTLE FURTHER AND PUT ON LARGE INTERMEDIATE PULLEY (3) WITH SET SCREW (2) SKETCH "C" IN HUB ON LEFT SIDE. HOLD SHIFT CAM ASSEMBLY PARTS TO LEFT AND PUSH SHIFT SHAFT SO IT PROTRUDES OUTSIDE OF BEARING IN RIGHT SIDE FRAME SLIGHTLY.

5. PUT METAL WASHER (4), SKETCH "A", ON SHAFT NEXT TO BEARING (8). PLACE PULLEY (7), WITH FLANGE OUTWARD, OVER THREADED END OF SHAFT AND PUSH SHAFT TO RIGHT UNTIL COLLAR (16) LIMITS AGAINST BEARING (8) IN LEFT SIDE FRAME.

6. ROTATE SHIFT SHAFT AND INTERMEDIATE PULLEY (7) (SMALL) UNTIL KEY WAY SLOTS ARE ALIGNED AND PUSH KEY (2) INTO PLACE. PLACE WASHER (6) ON THREADED END OF SHIFT SHAFT AND PUT ON NUT (5) TO HOLD IT IN PLACE.

7. TIGHTEN SET SCREW (2) SKETCH "C" IN LARGE INTERMEDIATE PULLEY (3) SKETCH "A" TO FLAT ON SHIFT SHAFT. HOLD THE INTERMEDIATE PULLEY (3) BY HAND AND TIGHTEN NUT (5) ON RIGHT END OF SHIFT SHAFT (15).

8. THE END PLAY IN THE SHIFT SHAFT IS CONTROLLED BY ADJUSTING COLLAR (16) ON LEFT END
OF SHAFT. THE SHIFT SHAFT SHOULD BE HELD TO THE LEFT AND THE COLLAR (16) MOVED TO THE RIGHT AFTER WHICH ITS SCREWS MUST BE TIGHTENED. WE DID NOT REMOVE THIS COLLAR (16) WHEN THE SHIFT SHAFT WAS TAKEN OUT: THEREFORE, IF THE END PLAY IN THE SHIFT SHAFT WAS CORRECT, THIS ADJUSTMENT SHOULD NOT HAVE BEEN DISTURBED. SHIFT SHAFT SHOULD BE FREE TO ROTATE BUT SHOULD NOT HAVE MORE THAN .005 END PLAY BETWEEN ITS RIGHT AND LEFT BEARINGS (8) SKETCH "A".

9. LINE UP THE SHIFT RATCHET (14) WITH THE HOLE IN THE SHIFT SHAFT (15) AND REPLACE THE TWO ALLEN SET SCREWS. THE HOLE IS SLIGHTLY COUNTER-BORED SO THAT THE SET SCREWS WILL ENTER THE HOLE SLIGHTLY WHEN TIGHTENED. REFER TO (4) SKETCH "C".

10. SLIDE COLLAR (24) SKETCH "A" NEXT TO SHIFT CAM ASSEMBLY. PLACE .005 FEELER GAUGE BETWEEN THE COLLAR AND THE NYLON WASHER (23). HOLD THE COLLAR TO THE LEFT AGAINST THE FEELER GAUGE AND TIGHTEN ITS TWO SET SCREWS.

11. REPLACE YIELD SPRING (12) SKETCH "B" ON SHIFT CAM ASSEMBLY LINKAGE.

12. REPLACE RELEASE LEVER SCREW (6) SKETCH "B".

13. INSTALL MOTOR MOUNTING BRACKET COMPLETE AND ALIGN INTERMEDIATE PULLEY (3) SKETCH "A" WITH MOTOR PULLEY AND REPLACE PULLEY BELT.

14. IF THE SEGMENT WAS BLOCKED DOWN FROM NORMAL POSITION WHEN INSTALLING THE SHIFT SHAFT, REMOVE THE BLOCKS.

15. PLACE POWER ROLL PULLEY BELT ON PULLEYS.

SHIFT ADJUSTMENTS

THE SHIFT ADJUSTMENTS ARE SEPARATED INTO TWO CATEGORIES, ONE DEALING WITH THE SHIFT MECHANISM THAT RAISES AND LOWERS TYPE BAR SEGMENT; THE OTHER, WITH POSITIONING TYPE BAR SEGMENT TO OBTAIN "ON FEET" AND "MOTION" OF TYPE. ADJUSTING SHIFT MECHANISM WILL BE EXPLAINED FIRST.

BEFORE ADJUSTING SHIFT POWER TRIP BELL CRANK PULL WIRE (3) SKETCH "B", WHICH IS FIRST ADJUSTMENT IN THE SEQUENCE, TWO PRIMARY SETTINGS MUST BE MADE. THE HIGH POINT OF SHIFT CAM RATCHET LOWER RELEASE LEVER ECCENTRIC (8) MUST BE POSITIONED TOWARD REAR OF MACHINE. OTHERWISE SHIFT CAM ASSEMBLY (3) SKETCH "C" WOULD NOT BE PERMITTED TO TRAVEL FAR ENOUGH, IN WHICH CASE THE SEGMENT WOULD NOT BE HELD MAXIMUM DISTANCE DOWNWARD DURING A SHIFT OPERATION.

BEFORE ATTEMPTING TO ADJUST THE SHIFT MECHANISM, ADJUSTMENTS CONCERNING DIP MUST BE PREVIOUSLY SET AS FOLLOWS:

POSITION KEY LEVER COMB TO THE POINT WHERE THE TYPE BAR TRIP BELL CRANKS LATCH UNDER LOWER TRIP OF POWER ARMS JUST BEFORE THE KEY LEVERS LIMIT ON THE UP STOP.

SET THE KEY LEVER DOWN STOP TO THE POINT WHERE THE POWER ARMS TRIP JUST BEFORE THE KEY LEVERS LIMIT ON THE DOWN STOP.

SHIFT MECHANISM ADJUSTMENTS

1. SET HIGH POINT OF SHIFT CAM RATCHET RELEASE LEVER DOWN STOP (7) SKETCH "B" TO FRONT OF MACHINE. THIS IS ONLY A TEMPORARY ADJUSTMENT.

2. ADJUST SHIFT POWER TRIP BELL CRANK PULL WIRE (3) SO UPPER RELEASE LEVER (5) HAS A .030 HOLD ON RATCHET PAWL (4). ANY TIME THAT THE DIP OR KEY LEVER UP STOP POSITION IS CHANGED, THIS ADJUSTMENT SHOULD BE CHECKED FOR PROPER HOLD OF UPPER LEVER ON RATCHET PAWL.
3. LOOSEN SHIFT CAM RATCHET RELEASE LEVER DOWN STOP SCREW. POSITION SHIFT CAM RATCHET RELEASE LEVER DOWN STOP (7). SKETCH "b" TO LIMIT UPPER RELEASE LEVER (5) AT THE TIME LEVER RELEASES CAM RATCHET PAWL (4). TIGHTEN SCREW. IF STOP (7) IS TOO LOW, SHIFT KEY LEVER WILL BE ABLE TO TRAVEL ITS FULL DISTANCE WITHOUT YIELDING SHIFT LOCK YIELD SPRING (1) MAKING SHIFT KEY LOCK INEFFECTIVE. IF STOP (7) IS TOO HIGH, IT WILL LIMIT UPPER RELEASE LEVER (5) AND PREVENT RELEASING OF CAM RATCHET PAWL (4) WHEN SHIFT KEY IS DEPRESSED.

4. HAVE HIGH POINT OF SHIFT CAM RATCHET LOWER RELEASE LEVER ECCENTRIC (8) TOWARD REAR OF MACHINE. THIS ECCENTRIC CONTROLS AMOUNT OF HOLD LOWER RELEASE LEVER (9) HAS ON SHIFT CAM RATCHET PAWL (4), IN SHIFT POSITION. IF HIGH POINT OF ECCENTRIC IS TOO LOW, WHEN SHIFT KEY IS DEPRESSED, THE SHIFT RATCHET CAM PAWL WILL BY-PASS LOWER RELEASE LEVER AND TYPE BAR SEGMENT WILL BOUNCE. IF HIGH POINT OF ECCENTRIC IS TOO HIGH, WHEN SHIFT KEY IS RELEASED, THE LOWER RELEASE LEVER WILL NOT RELEASE SHIFT CAM RATCHET PAWL: AND TYPE BAR SEGMENT WILL REMAIN IN SHIFT POSITION. LOOSEN SHIFT CAM RATCHET LOWER RELEASE LEVER ECCENTRIC (8) SCREW. ADJUST ECCENTRIC (8) TO HAVE LOWER RELEASE LEVER (9) RELEASE CAM RATCHET PAWL (4) AS QUICKLY AFTER SHIFT KEY LEVER BEGINS TO RAISE AS POSSIBLE: BUT, AT THE SAME TIME, THE LOWER RELEASE LEVER (9) MUST HAVE A POSITIVE HOLD ON SHIFT CAM RATCHET PAWL (4) WHEN SHIFT KEY IS DEPRESSED. TIGHTEN SCREW.

5. ADJUST LEFT SHIFT LOCK PLATE (2) LOW ENOUGH TO SECURELY HOLD SHIFT LOCK LEVER IN LATCHED POSITION. SHIFT LOCK SHOULD RELEASE BY DEPRESSING EITHER THE RIGHT OF LEFT SHIFT KEYS. IF SHIFT LOCK PLATE IS SET TOO HIGH, IT WILL PERMIT SHIFT KEYS TO RESTORE PREMATURELY.

NOTE: ADJUSTING SHIFT POWER TRIP BELL CRANK PULL WIRE (3) WILL AFFECT LOWER RELEASE LEVER (9) AS WELL AS THE UPPER RELEASE LEVER (5).

"ON FEET" AND "MOTION" ADJUSTMENTS

THE CAPITAL LETTERS ARE PUT "ON FEET" AND SMALL LETTERS BROUGHT INTO "MOTION".

THE SEGMENT SHIFT BRACKET ADJUSTABLE PLATE (14) SKETCH "b" AND SEGMENT SHIFT BRACKET CONNECTING LINK ECCENTRIC (17) PERMIT TYPE BAR SEGMENT TO BE RAISED OR LOWERED INDEPENDENTLY OF SEGMENT SHIFT CRANK ASSEMBLY (3) SKETCH "c" TO PLACE CAPITAL LETTERS "ON FEET".

THE SEGMENT SHIFT BRACKET CONNECTING LINK (15) SKETCH "b" PIVOTS ON SEGMENT SHIFT BRACKET ADJUSTABLE PLATE (14) WHICH PERMITS TYPE BAR SEGMENT TO BE POSITIONED BY SEGMENT SHIFT STOP SCREW (19) TO PLACE SMALL LETTERS IN "MOTION", EVEN THOUGH SEGMENT SHIFT CRANK ASSEMBLY (3) SKETCH "c" DOES NOT MOVE WHEN TYPE BAR SEGMENT IS RAISED OR LOWERED BY SEGMENT SHIFT STOP SCREW (19) SKETCH "b".

TO BETTER UNDERSTAND THE MECHANISM, PERFORM THE FOLLOWING OPERATIONS BEFORE SETTING "ON FEET" AND "MOTION". WITH SHIFT KEY IN NORMAL POSITION, TURN IN AND OUT ON SEGMENT SHIFT STOP SCREW (19) SKETCH "b". NOTICE THAT SEGMENT SHIFT BRACKET CONNECTING LINK (15) PIVOTS BACKWARD AND FORWARD ON SEGMENT SHIFT BRACKET ADJUSTABLE PLATE (14), ALLOWING TYPE BAR SEGMENT TO BE RAISED AND LOWERED WITHOUT MOVEMENT OF SEGMENT SHIFT CRANK ASSEMBLY (3) SKETCH "c". THE SEGMENT SHIFT BRACKET CONNECTING LINK YIELD SPRING (12) SKETCH "b" TENDS TO HOLD SEGMENT SHIFT BRACKET CONNECTING LINK (15) TOWARD REAR OF MACHINE. THIS CONDITION PLUS TENSION OF SHIFT BALANCING SPRINGS KEEPS TYPE BAR SEGMENT IN CONTACT WITH SEGMENT SHIFT STOP SCREW (19) WHEN TYPING SMALL LETTERS. RUN SEGMENT SHIFT STOP SCREW IN SEVERAL TURNS TO HAVE YIELD SPRING (12) YIELD AND NOTICE POSITION OF SEGMENT SHIFT BRACKET CONNECTING LINK (15) IN RELATION TO SEGMENT SHIFT BRACKET ADJUSTABLE PLATE (14). REMOVE MOTOR CORD FROM WALL PLUG AND TURN MOTOR SWITCH "ON". DEPRESS AND LOCK SHIFT KEY LEVER AND MANUALLY TURN POWER ROLL.
PULLEY. IT WILL BE NOTED, AS TYPE BAR SEGMENT IS LOWERED BY SEGMENT SHIFT CRANK ASSEMBLY (3) SKETCH "C" THAT YIELD SPRING (12) SKETCH "B" PULLS SEGMENT SHIFT BRACKET CONNECTING LINK (15) TO REAR OF MACHINE AND THE ONLY WAY IN WHICH TYPE BAR SEGMENT CAN NOW BE MOVED INDEPENDENTLY OF SEGMENT SHIFT CRANK ASSEMBLY (3) SKETCH "C" IS BY RAISING OR LOWERING SEGMENT SHIFT BRACKET ADJUSTABLE PLATE (14) SKETCH "B" BY TURNING SEGMENT SHIFT BRACKET CONNECTING LINK ECCENTRIC (17). THE HIGH POINT OF SEGMENT SHIFT BRACKET CONNECTING LINK ECCENTRIC (17) SHOULD BE PLACED TO THE REAR OF MACHINE AS A STARTING POINT.

NOTE: CHECK MACHINE FOR CYLINDER AND ANVIL POSITION BEFORE PROCEEDING. IF NOT CORRECT, IT MUST BE ADJUSTED.

"ON FEET" ADJUSTMENTS

1. LOCK SHIFT KEY DOWN.

2. MAKE SEGMENT SHIFT BRACKET CONNECTING LINK SCREWS (TWO) (13) SKETCH "B" JUST FRICTION TIGHT. LOOSEN SEGMENT SHIFT BRACKET CONNECTING LINK ECCENTRIC SCREW (16) AND TURN ECCENTRIC (17) TO PLACE CAPITAL LETTERS "ON FEET".

3. WHILE HOLDING ECCENTRIC (17) IN POSITION TIGHTEN UPPER SEGMENT SHIFT BRACKET CONNECTING LINK SCREW (13). THEN TIGHTEN ECCENTRIC SCREW (16) AND LOWER SEGMENT SHIFT BRACKET CONNECTING LINK SCREW (13).

4. SET IMPRESSION CONTROL DIAL FOR LIGHT IMPRESSION. STRIKE OFF ALPHABET IN CAPS AND CHECK SAMPLE FOR UNIFORM IMPRESSION TOP AND BOTTOM OF CHARACTERS.

"MOTION" ADJUSTMENTS

WITH SEGMENT IN NORMAL POSITION, LOOSEN SEGMENT SHIFT STOP SCREW NUT AND POSITION SCREW (19) SKETCH "B" TO ADJUST SMALL LETTERS IN "MOTION" WITH CAPITAL LETTERS. TIGHTEN NUT AND STRIKE OFF "MOTION" SAMPLE (HHHhHh).

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ESCAPEMENT AND TYPE BAR UNIVERSAL BAR

THE ESCAPEMENT MECHANISM CONSISTS OF AN ESCAPEMENT WHEEL (31) TO WHICH A PINION (30) IS ATTACHED; ESCAPEMENT ROCKER BODY (12) CONTAINING ESCAPEMENT LOOSE DOG (6) AND FIXED DOG (5); AND ESCAPEMENT OPERATING BAIL (23) WITH LINK (22) AND TYPE BAR UNIVERSAL BAR (15).

THE ESCAPEMENT LOOSE DOG (6) CAN MOVE LATERALLY OR VERTICALLY. ITS LATERAL TRAVEL IS CONTROLLED BY SCREW (11) IN ARM (10) WHICH PIVOTS ON SCREW (9). THE AMOUNT OF VERTICAL TRAVEL IS GOVERNED BY LOOSE DOG GUIDE (8). THE SPRING (7) HOLDS LOOSE DOG (6) AGAINST UPPER ARM OF LOOSE DOG GUIDE, AS WELL AS TO THE RIGHT (FACING REAR OF MACHINE) WHEN IT IS NOT IN CONTACT WITH A TOOTH OF ESCAPEMENT WHEEL (31).

WHEN ESCAPEMENT MECHANISM IS IN NORMAL POSITION, ESCAPEMENT LOOSE DOG (6) IS IN CONTACT WITH TOOTH OF ESCAPEMENT WHEEL (31), WHICH, THROUGH THE MESH BETWEEN PINION (30) AND FEED RACK WHICH IS MOUNTED ON CARRIAGE, PREVENTS CARRIAGE FROM MOVING. WHEN TYPE BAR (13) TRAVELS TOWARD CYLINDER, POINT (14) OF TYPE BAR CONTACTS TYPE BAR UNIVERSAL BAR (15) AND MOVES IT TOWARD REAR OF MACHINE. REAR PORTION (20) OF TYPE BAR UNIVERSAL BAR PIVOTS ESCAPEMENT OPERATING BAIL (23) THROUGH ITS STUD (21). ESCAPEMENT ROCKER BODY IS ACTUATED BY ESCAPEMENT LINK (22) WHICH IS CONNECTED TO ESCAPEMENT OPERATING BAIL (23). AS ESCAPEMENT ROCKER PIVOTS, ESCAPEMENT LOOSE DOG (6) IS DISENGAGED FROM TOOTH OF ESCAPEMENT WHEEL (31). PRIOR TO LOOSE DOG RELEASING ESCAPEMENT WHEEL (31), THE FIXED DOG WILL BE IN POSITION TO INTERCEPT TOOTH JUST RELEASED BY LOOSE DOG. THE CARRIAGE, THROUGH SPRING TENSION, WILL MOVE TO THE LEFT UNTIL TOOTH OF ESCAPEMENT WHEEL (31) IS AGAINST FIXED DOG (5).

AS TYPE BAR (13) RETURNS TOWARD REST POSITION, IT ALLOWS TYPE BAR UNIVERSAL BAR (15) AND ESCAPEMENT OPERATING BAIL (23) AND LINK (22) TO RESTORE ENOUGH TO PERMIT ESCAPEMENT ROCKER SPRING (27) TO RETURN ESCAPEMENT ROCKER BODY (12) TO REST POSITION; FIXED DOG (5) WILL RELEASE TOOTH OF ESCAPEMENT WHEEL (31); AND ESCAPEMENT LOOSE DOG (6) WILL INTERCEPT NEXT TOOTH OF ESCAPEMENT WHEEL (31). CARRIAGE WILL TRAVEL TO LEFT UNTIL LOOSE DOG LIMITS AGAINST SCREW (11).

NOTE: THE ESCAPEMENT ROCKER FOR USE WITH MANUAL BACKSPACE MECHANISM HAS THE FIXED DOG GROUND. REFER TO TEXT COVERING MANUAL BACKSPACE ADJUSTMENTS.

REMOVAL OF ESCAPEMENT ROCKER BRACKET (28) COMPLETE WITH ESCAPEMENT

REMOVE RETAINER AND DISCONNECT AIR CONTROL BELL CRANK FROM AIR CONTROL BELL CRANK STUD. LOOSEN THE SCREW FOR THE LINK LOCK ARM (A). REMOVE NUT (32) AND SCREW (34). REMOVE ESCAPEMENT ROCKER BRACKET COMPLETE FROM MACHINE.

DISASSEMBLING AND REASSEMBLING ESCAPEMENT ROCKER BRACKET (28)

REMOVE ESCAPEMENT ROCKER SPRING (27) BY INSERTING SPRING HOOK NEXT TO ESCAPEMENT ROCKER BODY. COMPRESS SPRING BY PULLING ON SPRING HOOK AND AT SAME TIME LOWER FREE END OF SPRING TO PERMIT IT TO FALL AWAY FROM ESCAPEMENT ROCKER SPRING SCREW. LOOSEN LOCK NUT. TURN OUT ON PIVOT SCREW (26) AND REMOVE ESCAPEMENT ROCKER BODY.

REMOVE THE ESCAPEMENT LOOSE DOG SILENCER STOP SCREW (1) AND NUT. REMOVE THE ESCAPEMENT WHEEL (31) BY REMOVING CARRIAGE RETURN AIR CONTROL BELL CRANK ACTUATOR (40) AND SHAFT AS A UNIT. REMOVE ESCAPEMENT WHEEL BEARING SCREW (29), NUT (39), AND WASHER (38).

THE LOOSE DOG SILENCER, (33), SILENCER FRICTION SPRING (35), AND FRICTION SPRING COLLAR (36) ARE LOCATED AT REAR OF ESCAPEMENT WHEEL (31). THE PURPOSE OF LOOSE DOG SILENCER (33) IS TO ELIMINATE NOISE BY HOLDING THE LOOSE DOG CLEAR OF ESCAPEMENT WHEEL TEETH.
As carriage is being returned, therefore, only enough tension should be put on silencer friction spring (35) to obtain this result.

The correct tension can be obtained by loosening two set screws (37) and adjusting collar (36) which is threaded. Care should be taken on this adjustment, making sure that rear side of collar does not extend beyond back edge of escapement wheel hub. Also, see that set screws (37) in collar (36) are tight.

A small amount of typewriter oil should be placed on escapement wheel bearing screw before mounting escapement wheel to bracket.

Mount escapement wheel (31) to escapement rocker bracket with escapement wheel bearing screw (29), washer (38), and nut (39). Escapement wheel must be free to turn on screw but have no noticeable end play.

Replace the loose dog silencer stop screw (1). Make certain that it is through slot of loose dog silencer (33) and not run in far enough to bind escapement wheel. This clearance can be seen by turning the escapement wheel until hole is in line with front end of loose dog silencer stop screw (1).

The escapement loose dog carrying arm screw (9) should be adjusted for minimum amount of play. Test the loose dog for moving freely in loose dog guide both up and down and to the right or left. Check escapement loose dog spring (7) for tension. The correct distance between loose dog (6) and fixed dog (5) is from .063 to .065. This clearance will control safety zone which will be mentioned later. Replace escapement rocker on escapement rocker bracket and insert pivot screw (26). Remove all end play and tighten nut on pivot screw (26). Escapement rocker must be free between its pivot points. Insert escapement rocker spring (27). Adjust limit screw (4) so loose dog is .015-.020 to rear of front edge of escapement wheel tooth. Hold escapement wheel against loose dog causing loose dog (6) to limit against escapement rocker screw and see that face of loose dog, where it contacts teeth of escapement wheel, is flush against teeth. This condition is commonly known as "six o'clock position" and is adjusted by moving escapement rocker pivot screws to right or left. After this condition is obtained, check escapement rocker for free with no end play.

Replace carriage return air control bell crank actuator (40) and shaft. Replace escapement rocker bracket (28) complete with escapement in position and replace nut (32) and screw (34). Place sleeve (24) in notch of rocker body; place lock arm under it; and tighten screw "A".

Adjusting Trip and Safety Zone

Raise the "H" type bar to ribbon. The loose dog should release tooth of escapement wheel as face of type touches ribbon. (This is commonly known as trip of escapement.) Adjust by loosening escapement link nut (25) and adjust escapement link sleeve (24) until trip takes place at ribbon. Lock sleeve (24) with nut (25).

After obtaining trip, hold type bar against cylinder and adjust upper escapement stop screw (3) to allow lower part of escapement rocker body to have slight additional movement forward. The upper escapement stop screw (3) must not limit movement of escapement rocker body.

Next test escapement "Safety Zone". Raise "H" type bar slowly by hand until escapement trip takes place at ribbon. Then allow type bar to restore to front of machine slowly. The second trip of escapement should occur when face of type is 1/2" away from ribbon. If distance is more than 1/2" there is danger of piling one letter on top of another. If less than 1/2", there is danger of skipping letters of a word. This is controlled entirely by clearance between loose dog and fixed dog, which is .063 to .065.
IF ESAPMENT LOOSE DOG CARRYING ARM SCREW (9) IS TOO TIGHT, IT WILL PREVENT LOOSE DOG FROM STEPPING TO RIGHT (FACING REAR OF MACHINE) WHICH WOULD ALSO CAUSE PILING OF ONE LETTER ON TOP OF ANOTHER.

**TYPE BAR UNIVERSAL BAR**

WITH ALL ESAPMENT ADJUSTMENTS MADE, WE WILL NOW TEST TO SEE WHETHER TYPE BAR UNIVERSAL BAR (15) IS CORRECTLY ADJUSTED.

WE WILL ASSUME THAT TYPE BAR UNIVERSAL BAR OSCILLATOR BRACKET SCREWS (17) AND ADJUSTING PLATE SCREWS (19) RIGHT AND LEFT ARE TIGHT, ALSO THAT TYPE BAR UNIVERSAL BAR OSCILLATOR PIVOT SCREWS (18) ARE ADJUSTED TO HAVE NO END PLAY IN SHAFT AND POSITIONED SO THAT TYPE BAR UNIVERSAL BAR GUIDE STUD (16) WILL BE FREE IN GUIDE HOLE OF TYPE BAR SEGMENT. TIGHTEN NUTS ON PIVOT SCREWS (18). TO TEST, RAISE "H" TYPE BAR AND SEE THAT ESAPMENT TAKES PLACE AS TYPE FACE TOUCHES RIBBON, (AS PREVIOUSLY DESCRIBED). THIS BEING CORRECT, WE WILL RAISE BY HAND TYPE BAR #1 AND #42 INDIVIDUALLY TO SEE THAT ESAPMENT TAKES PLACE AS TYPE FACE TOUCHES RIBBON. IF ON ALL THREE TYPE THE ESAPMENT TAKES PLACE AT THE RIBBON, THE UNIVERSAL BAR IS CORRECTLY ADJUSTED.

TO ADJUST TYPE BAR UNIVERSAL BAR USE FOLLOWING PROCEDURE:

**REMOVE CARRIAGE COMPLETE AS FOLLOWS:**

1. SCORE CARRIAGE MANIFOLD SPRING BRACKET IN RELATION TO CARRIAGE LOWER RAIL TO FACILITATE RELOCATING CARRIAGE FOR CYLINDER AND ANVIL POSITION.

2. REMOVE CARRIAGE TAPE FROM CARRIAGE AND HOOK TO STUD LOCATED ON FRAME BACK.

3. REMOVE CARRIAGE RETURN TAPE END FROM CLUTCH SPRING DRUM.

4. DISCONNECT LINE LOCK ACTUATING BELL CRANK PULL WIRE FROM REAR LINE LOCK BELL CRANK.

5. DISCONNECT CARRIAGE RETURN CLUTCH TOGGLE RELEASE LEVER PULL WIRE FROM CLUTCH TOGGLE RELEASE LEVER.

6. REMOVE MARGIN RELEASE LEVER LINK, SCREW, AND NUT.

7. REMOVE CARRIAGE ROLL RAIL LOWER SCREWS AND ECCENTRICS AND LIFT CARRIAGE COMPLETE FROM MACHINE.

**REMOVE FRAME BACK AS FOLLOWS:**

1. REMOVE MOTOR AND MOUNTING BRACKET COMPLETE. REFER TO POWER DRIVE UNIT.

2. DISCONNECT THE FOLLOWING PULL WIRES:

   A. BACK SPACE BAIL PULL WIRE (FROM TOP)
   B. TABULATOR CLEAR KEY PULL WIRE
   C. TABULATOR SET KEY PULL WIRE
   D. SPACE KEY PULL WIRE
   E. TABULATOR BLADE PULL WIRE

REMOVE SCREW FROM AIR CYLINDER PLUNGER. UNHOOK AIR CHECK PLUNGER SPRING. REMOVE AIR CYLINDER MOUNTING SCREWS AND TAKE OFF AIR CYLINDER COMPLETE. REMOVE CARBON RIBBON DRIVE SHAFT RESTORING SPRING FROM CARBON RIBBON DRIVE SHAFT. TAKE OUT THE FIVE FRAME BACK MOUNTING SCREWS AND REMOVE FRAME BACK FROM MACHINE.
REMOVE RIBBON ACTUATOR ARM BRACKET SUPPORT AS FOLLOWS:

1. DISCONNECT RIBBON CONTROL LEVER LINK FROM CONTROL SHAFT ARM.
2. DISCONNECT RIBBON CARRIER PUSH LINK FROM RIBBON LIFT BELL CRANK BRACKET.
3. REMOVE FOUR MOUNTING SCREWS AND REMOVE RIBBON ACTUATOR ARM BRACKET SUPPORT.

EXAMPLE #1 LEVELING TYPE BAR UNIVERSAL BAR (15)

WE WILL ASSUME THAT ESCAPEMENT OF "H" TYPE BAR IS CORRECT BUT ON #1 TYPE BAR ESCAPEMENT TAKES PLACE 1/8" BEFORE IT TOUCHES RIBBON. IT WILL BE NECESSARY IN THIS CASE TO LOOSEN ADJUSTING PLATE SCREWS (19) AND LOCATE LEFT ADJUSTING PLATE TO REAR SLIGHTLY: THIS WILL MAKE THE ESCAPEMENT ON #1 TYPE BAR CLOSER TO RIBBON. AFTER LOCATING LEFT ADJUSTING PLATE, ALWAYS CHECK #42 TYPE BAR FOR TRIP AT RIBBON.

WHEN MOVING LEFT ADJUSTING PLATE TO REAR, ESCAPEMENT ON #42 TYPE BAR WILL OCCUR A LITTLE EARLIER THAN IT DID BEFORE: LIKEWISE, IF LEFT ADJUSTING PLATE HAD BEEN MOVED FORWARD TO MAKE THE ESCAPEMENT ON #1 TYPE BAR OCCUR EARLIER, IT WOULD HAVE CAUSED ESCAPEMENT ON #42 TYPE BAR TO OCCUR LATER. ADJUSTING PLATES ARE PROVIDED AT BOTH ENDS OF TYPE BAR UNIVERSAL BAR OSCILLATOR BRACKET; AND, IF AFTER LOCATING LEFT ADJUSTING PLATE, ESCAPEMENT ON #42 TYPE BAR IS NOT TAKING PLACE AT THE RIBBON, WE WILL FOLLOW SAME PROCEDURE IN LOCATING RIGHT ADJUSTING PLATE.

EXAMPLE #2

WE WILL ASSUME THAT ESCAPEMENT ON TYPE BARS #1 AND #42 IS OCCURRING AT RIBBON AND CENTER TYPE BAR "H" IS OCCURRING TOO LATE. THIS CONDITION CAN BE CORRECTED BY SLIGHTLY LOOSEN two TYPE BAR UNIVERSAL BAR OSCILLATOR BRACKET SCREWS (17) AND MOVING DOWNWARD SLIGHTLY ON TYPE BAR UNIVERSAL BAR OSCILLATOR BRACKET "B".

THE HOLES IN TYPE BAR UNIVERSAL BAR OSCILLATOR BRACKET "B" ARE OVERSIZED FOR THEIR BRACKET MOUNTING SCREWS (17) WHICH MAKES IT POSSIBLE TO LOCATE THIS BRACKET EITHER UP OR DOWN. MOVING BRACKET DOWN WILL CAUSE ESCAPEMENT ON CENTER TYPE BARS TO OCCUR EARLIER AND AT SAME TIME ESCAPEMENT OF END TYPE BARS #1 AND #42 WILL TAKE PLACE LATER: THEREFORE, A VERY SLIGHT MOVEMENT OF OSCILLATOR BRACKET IS NECESSARY. IF ESCAPEMENT ON CENTER TYPE BARS WERE TAKING PLACE BEFORE END TYPE BARS, IT WOULD BE NECESSARY TO MOVE TYPE BAR UNIVERSAL BAR OSCILLATOR BRACKET "B" UP INSTEAD OF DOWN.

SINCE ESCAPEMENT AND CARRIAGE ARE OFF MACHINE, THE FOLLOWING METHOD CAN BE USED TO CHECK FOR PROPER ADJUSTMENT OF UNIVERSAL BAR. HOLD TYPE BAR "H" AGAINST ANVIL ON SEGMENT; AND, WHILE HOLDING IT IN THIS POSITION, Scribe A THIN MARK ON THE TYPE BAR UNIVERSAL BAR GUIDE STUD. THEN HOLD TYPE BARS #1 AND #42 AGAINST THE ANVIL TO SEE THAT THEY MOVE GUIDE STUD SAME DISTANCE, WHICH CAN BE DETERMINED BY REFERRING TO MARK ON GUIDE STUD. AS STATED BEFORE, TYPE BAR UNIVERSAL BAR WILL HAVE TO BE CHECK-ED FOR PROPER ADJUSTMENT AFTER ASSEMBLING MACHINE. THEREFORE, THESE ADJUSTMENTS SHOULD BE MADE VERY CAREFULLY.

INASMUCH AS TYPE BAR SEGMENT CAN BE REMOVED AND WASHED WITHOUT DISTURBING UNIVERSAL BAR ADJUSTMENTS, THE UNIVERSAL BAR SHOULD SELDOM NEED ADJUSTING.

REPLACE RIBBON ACTUATOR ARM BRACKET SUPPORT

REPLACE RIBBON ACTUATOR ARM SUPPORT BRACKET WITH FOUR MOUNTING SCREWS. (MAKE SURE RIBBON CARRIER IS CORRECTLY POSITIONED.) CONNECT RIBBON CARRIER PUSH LINK TO RIBBON CONTROL SHAFT ARM. (REFER TO RIBBON COVER ADJUSTMENTS FOR ADJUSTMENT OF RIBBON CONTROL SHAFT ARM.)
MOUNT FRAME BACK WITH FIVE MOUNTING SCREWS. CONNECT FIVE PULL WIRES, TABULATOR BLADE BELL CRANK, SPACE KEY, TABULATOR SET, TABULATOR CLEAR, AND BACK SPACE. REPLACE AIR CYLINDER WITH TWO MOUNTING SCREWS. CONNECT AIR CONTROL BELL CRANK TO AIR CYLINDER PLUNGER WITH SCREW. REPLACE CARBON RIBBON DRIVE SHAFT SPRING AND AIR CYLINDER PLUNGER SPRING. ATTACH CARRIAGE WITH CARRIAGE RAILS TO MACHINE. SET CARRIAGE RAILS TO THE SCORE MARKS PREVIOUSLY MADE AND SECURE WITH CARRIAGE REAR GUIDE SCREWS, CARRIAGE RAIL ECCENTRICS, AND ECCENTRIC SCREWS. REPLACE MARGIN RELEASE LEVER LINK. CONNECT CARRIAGE RETURN CLUTCH TOGGLE RELEASE LEVER PULL WIRE, LINE LOCK ACTUATING BELL CRANK PULL WIRE, CARRIAGE TAPE, AND CARRIAGE RETURN TAPE.

NOTE: ADJUST CARRIAGE RETURN TENSION SPRING TO HAVE JUST ENOUGH TENSION TOREWIND CARRIAGE RETURN TAPE AT ZERO POSITION OF CARRIAGE.

SYNCHRONIZING ESCAPEMENT

SINCE THE PICA (10 SPACE) ESCAPEMENT WHEEL HAS 15 TEETH AND ITS PINION HAS 15 TEETH AND ELITE (12 SPACE) ESCAPEMENT WHEEL HAS 18 TEETH AND 18 TEETH ON PINION, THE RELATIONSHIP BETWEEN TEETH ON ESCAPEMENT WHEEL AND TEETH ON PINION ON BOTH OF THESE WHEELS REMAINS CONSTANT. THIS MEANS THAT, WHEN THE LETTER SPACING RACK IS MESHED WITH THE PINION, NO SYNCHRONIZATION IS NECESSARY WHEN THE LETTER SPACING RACK IS REMOVED OR WHEN THE ESCAPEMENT PINION IS DISENGAGED FROM THE RACK AND REPLACED.

SYNCHRONIZATION IS MESHING OF FEED RACK TO PINION SO THAT ESCAPEMENT LOOSE DOG WILL ENTER CENTRALLY BETWEEN TWO TEETH OF ESCAPEMENT WHEEL WHEN CARRIAGE IS RETURNED TO LEFT MARGIN AND WHEN TABULATING TO ALL POSITIONS ON CARRIAGE. ALSO CALIBRATIONS ON SCALES WILL LINE UP AS ORIGINALY SET AT FACTORY.

NOW, MACHINES THAT ARE EQUIPPED FOR 6, 8, 9-1/3, 14, AND 16 SPACE USE THE SAME (PICA) PINION WHEEL, BUT THE TEETH ON THE ESCAPEMENT WHEELS WILL BE DIFFERENTLY SPACED AND HAVE A DIFFERENT NUMBER OF TEETH TO CORRESPOND WITH THE SPACING. HOWEVER, THESE TEETH WILL NOT CORRESPOND WITH THE TEETH OF THE PINION. THIS MAKES IT NECESSARY TO SYNCHRONIZE THE FEED RACK WITH THE PINION IN ORDER THAT TABULATIONS, LEFT MARGINS, AND SCALES WILL BE ACCURATE.

THE FOLLOWING METHOD MUST BE USED IF ESCAPEMENT PINION OR FEED RACK BECOMES DISENGAGED FOR ANY REASON. WE ASSUME THAT MARGIN STOP RACK IS PROPERLY ADJUSTED.

SET LEFT MARGIN STOP AT "O" AND HOLD CARRIAGE TO EXTREME LEFT MARGIN. REMOVE SCREW (34), LOOSEN NUT (32), LOWER ESCAPEMENT ROCKER BRACKET (28) UNTIL FEED RACK IS FREE OF PINION WHEEL (30). THEN TURN ESCAPEMENT WHEEL (31) UNTIL SMALL HOLE IN ESCAPEMENT WHEEL LINES UP WITH HOLE IN ESCAPEMENT BRACKET. THEN MESH PINION WITH FEED RACK AND REPLACE SCREW AND TIGHTEN NUT. ZERO ON CARRIAGE SCALE SHOULD BE IN LINE WITH POINTER OF TYPE GUIDE; IF NOT, RESET ESCAPEMENT WHEEL.

THIS METHOD IS USED BY FACTORY FOR SYNCHRONIZING CARRIAGE FEED RACK WITH PINION AND SHOULD BE USED BY ALL FIELD SERVICE TECHNICIANS IF FOR ANY REASON THE FEED RACK OR PINION BECOMES DISENGAGED FROM EACH OTHER, SUCH AS REMOVING ESCAPEMENT OR CARRIAGE AND REPLACING. OTHERWISE, LEFT MARGIN, TABULATION, AND ALL SCALES WILL HAVE TO BE READJUSTED.

NOTE: THE 6, 8, AND 9-1/3 SPACE MACHINES WILL TABULATE TO EACH CALIBRATION ON CARRIAGE SCALES. THE 14 AND 16 SPACE MACHINES WILL TABULATE TO EVEN-NUMBERED CALIBRATIONS ON CARRIAGE SCALE ONLY.
BACK SPACE MECHANISM

OPERATION

WHEN BACK SPACE KEY LEVER (14) IS OPERATED, BACK SPACE POWER TRIP BELL CRANK (11) RELEASES BACK SPACE POWER ARM (10), WHICH OPERATES BACK SPACE BELL CRANK (7). A PULL WIRE IS CONNECTED BETWEEN BELL CRANK AND BACK SPACE BAIL (5). BACK SPACE BAIL PIVOTS IN CARRIAGE SPRING DRUM BRACKET. THIS ACTION DRIVES THE BACK SPACE PAWL (1) UPWARD ENGAGING ESCAPEMENT WHEEL (2) CAUSING SAME TO TURN ONE SPACE BACKWARD. THIS MECHANISM IS VERY SIMPLE IN CONSTRUCTION AND WILL REQUIRE VERY LITTLE ADJUSTING. IT IS NECESSARY, AS IN ALL PARTS OF THE MACHINE, TO HAVE FREE MOVING PARTS.

ADJUSTMENTS

(BEFORE ADJUSTING, CHECK 6 O'CLOCK POSITION OF ESCAPEMENT.) REFER TO ESCAPEMENT MECHANISM. DISCONNECT BACK SPACE BELL CRANK PULL WIRES (6) AND (21). SET HIGH POINT OF BACK SPACE POWER ARM ECCENTRIC (17) TO REAR AS SHOWN ON SKETCH. CHECK BACK SPACE BELL CRANK (7) TO LIMIT ON BACK SPACE DOWN STOP (8) AND TO CLEAR ROLL "A" ON POWER ARM (10) BY A MINIMUM OF .030. WITH BACK SPACE PAWL (1) LIMITING IN ITS DOWNWARD POSITION AND BACK SPACE BELL CRANK (7) LIMITING ON ITS STOP (8), ADJUST PULL WIRE (6) FOR LENGTH TO JUST FIT IN HOLE IN BELL CRANK AS SHOWN ON SKETCH. DEPRESS BACK SPACE KEY, TURN POWER ROLL (9) OVER BY HAND, AND OBSERVE THAT BACK SPACE PAWL (1) MOVES ESCAPEMENT WHEEL (2) ONE FULL SPACE BACKWARDS. ADJUST BACK SPACE POWER ARM ECCENTRIC (17) FOR FINEADJUSTMENT. THERE SHOULD BE A SLIGHT FURTHER MOVEMENT OF BACK SPACE PAWL (1) WHEN HIGH POINT OF NYLON CAM (18) IS IN CONTACT WITH POWER ROLL (9).

THE BACK SPACE REPEAT KEY LEVER DOWN STOP SCREW (12) IS ADJUSTED SO THAT SINGLE ACTION TAKES PLACE JUST AS THE KEY LEVER (14) CONTACTS REPEAT KEY LEVER DOWN STOP SPRING (13). THE REPEAT OPERATION TAKES PLACE ONLY AFTER THE OPERATOR DEPRESSES THE KEY LEVER FAR ENOUGH TO COMPRESS THE SPRING (13).

FRACTIONAL BACK SPACE MECHANISM

THE PURPOSE OF HAVING BOTH FRACTIONAL AND REGULAR BACK SPACE KEY ON THE SAME MACHINE IS TO PERMIT ONE-HALF SPACE POSITIONS OF CARRIAGE TO MAKE CORRECTIONS AND AT SAME TIME HAVE CONVENIENCE OF A SINGLE OR REPEAT BACK SPACE KEY FOR ORDINARY USE.

ADJUSTMENTS

ADJUST FRACTIONAL BACK SPACE BELL CRANK PULL WIRE (21) TO HAVE CARRIAGE BACK SPACE ONE-HALF SPACE AS FRACTIONAL BACK SPACE KEY LEVER (16) LIMITS ON FRACTIONAL BACK SPACE KEY LEVER SCREW ROLLS (D). FOR A FINEADJUSTMENT, IT MAY BE NECESSARY TO POSITION KEY LEVER EXTENSION (20) ON KEY LEVER (19) TO OBTAIN ACCURATE ONE-HALF SPACE MOVEMENT OF CARRIAGE. BACK SPACE KEY LEVER ROLLS (D) MUST TURN FREELY.

MAKING CORRECTIONS: CROWDING

WHEN IT IS NECESSARY TO TYPE IN A WORD THAT CONTAINS ONE MORE LETTER THAN THE ERASED WORD, USE THE FRACTIONAL BACK SPACE KEY. FOR EXAMPLE, TO TYPE KNEW FOR NEW:

A. MOVE THE CARRIAGE TO POSITION "N" WAS FORMERLY TYPED.

B. DEPRESS FRACTIONAL BACK SPACE KEY DOWNWARD TO LIMIT; HOLD IT IN THIS POSITION AND TYPE "K", RELEASE FRACTIONAL BACK SPACE KEY, AND DEPRESS SPACE BAR ONE SPACE. THEN DEPRESS FRACTIONAL BACK SPACE KEY TO LIMIT AND STRIKE LETTER "N". REPEAT THIS OPERATION FOR LETTERS "E" AND "W".
MAKING CORRECTIONS: SPREADING

WHEN IT IS NECESSARY TO TYPE IN A WORD THAT CONTAINS ONE LETTER LESS THAN THE ERASED WORD, USE FRACTIONAL BACK SPACE KEY TO SPREAD THE WORD. FOR EXAMPLE: TO TYPE IN "CENT" FOR "SCENT".

A. MOVE THE CARRIAGE TO THE POSITION OF "s".

B. SPACE ONCE, DEPRESS FRACTIONAL BACK SPACE KEY, HOLDING IT DEPRESSED, AND STRIKE THE LETTER "c". RELEASE FRACTIONAL BACK SPACE KEY.

C. SPACE ONCE. DEPRESS FRACTIONAL BACK SPACE KEY AND STRIKE "e".

D. REPEAT THIS OPERATION FOR "n" AND "t".

NOTE: THE ESCAPEMENT ROCKER FOR USE WITH FRACTIONAL BACK SPACE MECHANISM HAS THE FIXED DOG (4) GROUND. THIS GRIND (3) PREVENTS FIXED DOG COLLIDING WITH TOOTH OF ESCAPEMENT WHEEL AS ESCAPEMENT OPERATES, WHEN FRACTIONAL BACK SPACE KEY IS HELD DEPRESSED. COLLIDING AT THIS POINT COULD RESULT IN LIGHT IMPRESSIONS.
MARGIN RELEASE, LINE LOCK AND BELL
MARGIN RELEASE MECHANISM

OPERATION

WHEN MARGIN RELEASE KEY (18) IS DEPRESSED, THE PULL WIRE (16) MOVES FORWARD OPERATING MARGIN RELEASE BELL CRANK (12) DOWNWARD, CAUSING MARGIN RELEASE LINK (10) TO MOVE DOWNWARD WHICH ROTATES CONTROL SHAFT (4) UNTIL STUD OF STABILIZER (5) CONTACTS TOP OF MARGIN RELEASE LINK GUIDE (8) TO PREVENT CONTROL SHAFT ARM FROM ROTATING BEYOND CARRIAGE END STOPS (7 AND 38).

ADJUSTMENTS

1. ASSUMING STABILIZER COLLAR AND MARGIN STOP RACK ADJUSTMENTS ARE CORRECT, WITH KEYBOARD COVER PLATE ON MACHINE, ADJUST MARGIN RELEASE KEY LEVER PULL WIRE (16) TO HAVE MARGIN RELEASE KEY LEVER (17) JUST CONTACT TOP OF SLOT IN KEYBOARD COVER PLATE.

2. LOOSEN MARGIN RELEASE LEVER LINK GUIDE SCREWS (9). DEPRESS AND HOLD MARGIN RELEASE KEY LEVER IN BOTTOM OF SLOT IN KEYBOARD COVER PLATE AND LOCATE MARGIN RELEASE PULL WIRE LIMIT COLLAR (14) AGAINST REAR OF RIGHT RIBBON SPOOL BRACKET (15) AND TIGHTEN SCREW IN COLLAR (14).

3. WITH MARGIN RELEASE KEY LEVER (17) LIMITING IN BOTTOM OF SLOT OF KEYBOARD COVER PLATE, ADJUST MARGIN RELEASE LINK GUIDE (8) TO JUST TOUCH STUD OF STABILIZER COLLAR (5) AND TIGHTEN MARGIN RELEASE LINK GUIDE SCREWS (9).

LINE LOCK MECHANISM

OPERATION

THE LINE LOCK BAIL (21) IS OPERATED WHEN SWITCH KEY (23) IS MOVED TO "OFF" POSITION, MARGIN STOP (6) OR CARRIAGE END STOP (7) CONTACTING CONTROL SHAFT ARM (41), AND WHEN CARRIAGE RETURN CLUTCH TOGGLE (13) IS OPERATED. WHEN SWITCH KEY (23) IS IN THE UP OR "OFF" POSITION, THE SWITCH BELL CRANK (30) MOVES PULL WIRE (29) TO REAR, ROTATING LINE LOCK BELL CRANK FRONT (24) DOWNWARD WHICH CONTACTS THE STUD (25) ON LINE LOCK BAIL (21) MOVING IT UNDER ALL KEY LEVER LINE LOCK PAWLS (22). THIS ACTION CAUSES ENTIRE KEYBOARD TO REMAIN LOCKED UNTIL SWITCH KEY (23) IS MOVED TO "ON" POSITION.

WHEN CONTROL SHAFT (4) IS OPERATED BY RIGHT MARGIN STOP (6) CONTROL SHAFT MOVES TO LEFT CONTACTING UPPER EXTENSION OF LINE LOCK ACTUATING BELL CRANK (36) WHICH OPERATES PULL WIRE (35) UPWARD CAUSING LINE LOCK BELL CRANK REAR (31) TO OPERATE PULL WIRE (29) WHICH POSITIONS LINE LOCK BAIL (21) SO ONLY ALPHABET, NUMERALS AND SPACE KEY KEYLEVER PAWLS (22) WILL BE INTERCEPTED BY LINE LOCK BAIL (21).

SINCE THE LINE LOCK PAWLS (22) ARE LOCATED FURTHER TO THE REAR ON THE SHIFT, BACK SPACE, AND CARRIAGE RETURN KEYS, THEY SHOULD NOT BE LOCKED AT THIS TIME. TABULATOR KEY WILL NOT BE LOCKED BECAUSE IT HAS NO LINE LOCK PAWL ON ITS KEY LEVER.

WHEN CARRIAGE RETURN KEY (19) IS OPERATED AND CLUTCH IS ENGAGED, THE ENTIRE KEYBOARD EXCEPT TABULATOR KEY REMAINS LOCKED WHILE CARRIAGE IS RETURNING TO LEFT MARGIN. THE CARRIAGE RETURN CLUTCH TOGGLE (13) ACTUATES CARRIAGE RETURN LINE LOCK LEVER (11) WHICH OPERATES LINE LOCK BELL CRANK REAR (31) TO LINE LOCK ENTIRE KEYBOARD. THE LINE LOCK BELL CRANK REAR IS SLOTTED SO PULL WIRE (35) WILL NOT OPERATE LINE LOCK ACTUATING (36) WHEN CLUTCH ENGAGES.
ADJUSTMENTS

(assuming cam clearance, keylever dip, and carriage return control shaft stop collar adjustments are correct, adjust line lock as follows:)

1. Adjust top of line lock bail (21) to clear bottom of line lock pawls (22) by 1/32 of an inch when switch is set to "off" position. Bail must be level. Check for this clearance by testing keys at center and both ends of keyboard. Screws "A" are provided at both ends of bail for this adjustment.

2. Remove excess play in line lock bail by adjusting bail pivot screws (27). Check line lock bell crank front (24) should have a good hold on stud (25) without stud contacting left side frame (26).

3. Form switch bell crank (30) so line lock bail (21) will intercept all line lock pawls (22) when switch is in "off" position.

4. Position line lock bail stop (28) to allow line lock bail (21) a little further movement when switch is "off". (Too much movement in line lock bail when switch is "off" will cause line lock pawls (22) to cam off of line lock bail when switch is in "on" position.)

5. Adjust margin line lock actuating bell crank pull wire (35) to lock alphabet, numerals, and space key when carriage return control shaft stop collar (39) is limiting against left control shaft bracket (37) by margin stop (6) or final carriage end stop (7).

6. With cord not plugged into receptacle, switch (23) in "on" position and clutch manually operated, form carriage return line lock lever (11) to move rear line lock bell crank (31) upward enough to lock entire keyboard. A slight clearance between line lock bail stud (25) and line lock bail stop (28) must be maintained.

BELL MECHANISM

Bell ringer arm (32) is mounted to carriage frame by bell ringer arm pivot screw (2) and is held in place by a retaining ring (3). The bell (34) is eccentric to allow adjustment for bell tone. The bell hammer should clear bell slightly when bell ringer arm (32) is limiting against its stop screw (40). Bell ringer spring bracket (33) can be positioned to supply sufficient tension to ring bell.
BACK PLATE AND RELATED PARTS

CARRIAGE RETURN CONTROL SHAFT

IT IS THROUGH CARRIAGE RETURN CONTROL SHAFT (6) THAT LINE LOCK, AIR CYLINDER (20), CARRIAGE RETURN CLUTCH TOGGLE RELEASE, TABULATOR BLADE RELEASE (25), ESCAPEMENT LOOSE DOG RELEASE (42) AND MARGINS ARE CONTROLLED. THE CONTROL SHAFT (6) MUST BE CORRECTLY POSITIONED BEFORE ADJUSTMENTS PERTAINING TO ABOVE ITEMS CAN BE MADE.

STABILIZER COLLAR (36) ADJUSTMENT

1. REMOVE AIR CYLINDER LINK SCREW (24). UNHOOK LOWER END OF LINE LOCK ACTUATING BELL CRANK PULL WIRE (18); ALSO, UPPER END OF CARRIAGE RETURN CLUTCH TOGGLE RELEASE LEVER PULL WIRE (26).

2. LOOSEN FOLLOWING ON CONTROL SHAFT: CARRIAGE RETURN CONTROL SHAFT STOP COLLARS (9 AND 12), CARRIAGE RETURN ESCAPEMENT LOOSE DOG RELEASE CAM (3), TABULATOR BLADE LATCH RESTORING LEVER CAM (37), AND CARRIAGE RETURN CONTROL SHAFT STABILIZER (36).

3. HOLD LINE LOCK ACTUATING BELL CRANK (13) DOWN AGAINST ITS STOP (17). MOVE CONTROL SHAFT (6) OVER UNTIL IT JUST CONTACTS LINE LOCK ACTUATING BELL CRANK (13). WITH CONTROL SHAFT IN THIS POSITION, TEMPORARILY LOCK CONTROL SHAFT STOP COLLAR (9) AGAINST LEFT CONTROL SHAFT BRACKET (11).

4. POSITION CONTROL SHAFT STABILIZER COLLAR (36) ON SHAFT (6) SO IT JUST CONTACTS BUFFER SPRING (34) WITHOUT COMPressing SPRING (34), AND ITS STUD (35) PASSES THROUGH HOLE IN MARGIN RELEASE LEVER LINK (27). ROTATE CONTROL SHAFT (6) SO THERE IS .015 CLEARANCE BETWEEN REAR OF LEFT MARGIN STOP (8) AND CONTROL SHAFT ARM (1). TIGHTEN STABILIZER COLLAR (36). (IF THERE IS LESS THAN .015 CLEARANCE, IT WILL BE DIFFICULT TO DEPRESS MARGIN STOP (8) WHEN AIR CONTROL KICK-OUT CAM (7) IS OVER CONTROL SHAFT ARM (1). AFTER ADJUSTING STABILIZER COLLAR (36), LOOSEN CONTROL SHAFT STOP COLLAR (9) SCREWS.

NOTE: CONTROL SHAFT ARM (1) IS PINNED TO CONTROL SHAFT.

MARGIN STOP RACK

CARRIAGE END STOPS LEFT (14) AND RIGHT (28) ARE MOUNTED ON ENDS OF MARGIN STOP RACK (40).

RIGHT AND LEFT MARGIN STOPS ARE DIFFERENT DUE TO THE BELL RINGER MOUNTED ON RIGHT MARGIN STOP (39) AND THE AIR CONTROL KICK-OUT CAM (7) MOUNTED ON THE LEFT MARGIN STOP (8).

DIFFERENT MARGIN STOPS ARE USED FOR 6, 9 1/3, 10, 12, AND 14 SPACE MACHINES DESIGNED TO MATCH THE MARGIN STOP RACK (40). 8 AND 16 SPACE MARGIN STOPS ARE THE SAME.

CARRIAGE END STOPS LEFT (14) AND RIGHT (28) ARE USED TO RESTORE CLUTCH MECHANISM OR OPERATE LINE LOCK IN THE EVENT THE MARGIN STOPS ARE BY-PASSED.

ADJUSTMENTS

1. LOCK LEFT MARGIN STOP (8) IN RACK AS close TO CONTROL SHAFT ARM (1) AS POSSIBLE WITHOUT COMpressing STABILIZER SPRING (34).

2. LOOSEN THE FOUR MARGIN STOP RACK MOUNTING SCREWS (15 AND 30) AND ADJUST MARGIN
STOP RACK (40) UNTIL THERE IS .005 CLEARANCE BETWEEN STOP PORTION OF LEFT MARGIN STOP (8) AND CONTROL SHAFT ARM (1) BY ADJUSTING RIGHT AND LEFT ADJUSTING SCREWS (16 AND 29). TIGHTEN LOCK NUTS ON ADJUSTING SCREWS, AND TIGHTEN MOUNTING SCREWS (15 AND 30).

3. MOVE LEFT MARGIN STOP TO ITS EXTREME LEFT POSITION AND MOVE CARRIAGE TO RIGHT UNTIL LEFT MARGIN STOP IS WITHIN .005 OF CONTROL SHAFT ARM (1). (CARRIAGE END STOP (14) MUST BE EVEN WITH STOP PORTION OF MARGIN STOP (8). END STOP (14) CAN BE GROUND IF NECESSARY.)

4. CARRIAGE END STOPS (14 AND 28) MUST BE LOW ENOUGH TO SAFELY CONTACT CONTROL SHAFT ARM (1). FORM END STOP (14 AND 28) SO TOPS OF STOPS ARE EVEN WITH TOP OF CONTROL SHAFT ARM (1).

WHEN MARGIN RELEASE KEY LEVER IS DEPRESSED AND STUD (35) OF STABILIZER (36) CONTACTS TOP OF MARGIN RELEASE LINK GUIDE, CONTROL SHAFT ARM (1) SHOULD NOT ROTATE BEYOND CARRIAGE END STOPS (14 AND 28). REFER TO ADJUSTMENTS UNDER MARGIN RELEASE, LINE LOCK, AND BELL.

CARRIAGE RETURN CONTROL SHAFT STOP COLLAR (9).

THE CARRIAGE RETURN CONTROL SHAFT STOP COLLAR (9) Keeps CONTROL SHAFT (6) FROM MOVING OUT OF RIGHT CONTROL SHAFT BRACKET (33) AND ALSO MAKES IT POSSIBLE TO BACK SPACE AFTER TYPING OR TABULATING INTO RIGHT MARGIN.

ADJUSTMENTS

1. POSITION RIGHT MARGIN STOP (39) TO ITS EXTREME RIGHT, AND ACTUATE ESCAPEMENT ROCKE UNTIL ONLY THE NYLON END STOP (32) OF CONTROL SHAFT (6) IS EXPOSED BEYOND THE LEFT SIDE OF CONTROL SHAFT BRACKET (33) AND STUD (35) OF STABILIZER COLLAR (36) IS STILL SAFE IN HOLE OF MARGIN RELEASE LINK (27).

2. MOVE CONTROL SHAFT (6) TO LEFT (FACING REAR OF MACHINE) SO THERE IS APPROXIMATELY .040 CLEARANCE BETWEEN TOOTH OF ESCAPEMENT WHEEL AND TOOTH OF BACK SPACE PAWL (NOT SHOWN), AND SET CONTROL SHAFT STOP COLLAR (9) TO COMPRESS CONTROL SHAFT STOP CUSHION (10) AGAINST CONTROL SHAFT BRACKET (11). TIGHTEN CONTROL SHAFT STOP COLLAR (9) SCREWS.

NOTE: THE ABOVE CLEARANCE OF .040 CAN VARY ACCORDING TO TYPE OF FEED RACK AND ESCAPEMENT WHEEL USED. THE LOCATION OF STOP COLLAR (9) DEPENDS UPON RELIABLE BACK SPACING OUT OF RIGHT MARGIN AND SHOULD BE POSITIONED SO BACK SPACE PAWL AND ESCAPEMENT WHEEL ARE IN ABOUT THE SAME RELATIONSHIP AS WHEN THE MACHINE IS AWAY FROM RIGHT MARGIN.

CARRIAGE RETURN CLUTCH TOGGLE RELEASE LEVER (31)

WHEN CARRIAGE RETURN KEY IS DEPRESSED AND CLUTCH IS ENGAGED, UPRIGHT PORTION OF CLUTCH TOGGLE RELEASE LEVER (31) IS ROTATED TOWARD NYLON END STOP (32). AS CARRIAGE RETURNS TO LEFT MARGIN, LEFT MARGIN STOP (8) CONTACTS AIR CYLINDER CONTROL BELL CRANK ACTUATOR (2) AND CONTROL SHAFT ARM (1). WHEN CONTROL SHAFT (6) IS DRIVEN TO RIGHT, ROTATING CLUTCH TOGGLE RELEASE LEVER (31) WHICH DIS-ENGAGES CARRIAGE RETURN CLUTCH THROUGH ITS PULL WIRE (26), THE BUFFER SPRING (34) AND AIR CYLINDER (20) ACT AS A SHOCK ABSORBER WHICH RELIEVES STRAIN ON LEFT MARGIN STOP AND RELATED PARTS AND REDUCES NOISE.

ADJUSTMENTS

1. WITH SWITCH OFF, SET CARRIAGE RETURN CLUTCH MANUALLY AND ADJUST CARRIAGE RETURN
CLUTCH TOGGLE RELEASE LEVER PULL WIRE (26) SO THERE IS .010 CLEARANCE BETWEEN CLUTCH TOGGLE RELEASE LEVER (31) AND NYLON END STOP (32). RESTORE CLUTCH TO NORMAL.

NOTE: IF CLUTCH TOGGLE RELEASE LEVER PULL WIRE (26) IS TOO SHORT, CLUTCH WILL NOT FULLY DETENT. IF WIRE (26) IS TOO LONG, CLUTCH WILL NOT DIS-ENGAGE.

CARRIAGE RETURN CONTROL SHAFT SET COLLAR

THE SET COLLAR (12) MOUNTED ON LEFT END OF CONTROL SHAFT (6) IS TO PREVENT OVERTHROW OF CONTROL SHAFT WHEN CARRIAGE IS RETURNED TO LEFT MARGIN SETTING UNDER POWER.

ADJUSTMENTS

WITH CLUTCH TOGGLE RELEASE LEVER (31) OPERATED, MOVE CARRIAGE TO LEFT (FACING REAR OF MACHINE) UNTIL CLUTCH RELEASES, HOLD CARRIAGE, AND LOCATE SET COLLAR (12) WITHIN .005 OF OUTSIDE OF CONTROL SHAFT BRACKET (11) AND TIGHTEN COLLAR SCREWS. THE SET COLLAR (12) MUST NOT LIMIT AGAINST CONTROL SHAFT BRACKET (11) UNTIL AFTER THE CLUTCH IS DIS-ENGAGED. IF SET COLLAR (12) (WHICH ACTS AS AN OVERTHROW LIMIT) IS TOO FAR FROM THE BRACKET (11), IT WILL BE INEFFECTIVE.

ESCAPEMENT LOOSE DOG RELEASE MECHANISM

WHEN CARRIAGE IS MOVED TO THE RIGHT BEYOND LEFT MARGIN STOP SETTING, CARRIAGE RETURN ESCAPEMENT LOOSE DOG RELEASE CAM (3) MOVES TO THE RIGHT WITH CONTROL SHAFT AND DEPRESSES CARRIAGE RETURN LOOSE DOG RELEASE CAM FOLLOWER (4). THE RELEASE CAM FOLLOWER DEPRESSES CARRIAGE RETURN LOOSE DOG RELEASE SLIDE (42). THE LIP AT BOTTOM OF RELEASE SLIDE CONTACTS AND HOLDS LOOSE DOG (41) AWAY FROM TEETH OF ESCAPEMENT WHEEL UNTIL CARRIAGE RETURNS FROM ITS OVERTHROW POSITION TO LEFT MARGIN SETTING.

1. LOOSEN CARRIAGE RETURN ESCAPEMENT LOOSE DOG FOLLOWER ECCENTRIC SCREW (5) AND TURN ECCENTRIC TO HAVE LOOSE DOG RELEASE CAM FOLLOWER (4) CLEAR BOTTOM OF CONTROL SHAFT ARM (1) AND EXTENSION OF LOOSE DOG RELEASE SLIDE (42).

2. SET CARRIAGE RETURN ESCAPEMENT LOOSE DOG RELEASE CAM (3) TO CLEAR LOOSE DOG FOLLOWER BY .025 WITH CONTROL SHAFT IN NORMAL POSITION. TIGHTEN CAM ON SHAFT.

3. LIP OF LOOSE DOG SLIDE (42) MUST CLEAR TOP OF LOOSE DOG WHEN CONTROL SHAFT IS IN NORMAL POSITION BUT NOT BOTTOM LOOSE DOG IN LOOSE DOG GUIDE WHEN SET COLLAR (12) IS AGAINST OUTSIDE OF CONTROL SHAFT BRACKET (11). FORM LIP IF NECESSARY.

4. CARRIAGE RETURN ESCAPEMENT LOOSE DOG RELEASE CAM IS PROPERLY ADJUSTED WHEN LOOSE DOG ENTERS DIRECTLY BETWEEN TWO TEETH OF ESCAPEMENT WHEEL. TO OBSERVE THIS CONDITION, MANUALLY HOLD CARRIAGE IN OVERTHROW POSITION AND WATCH LOOSE DOG AS CARRIAGE IS ALLOWED TO SETTLE SLOWLY AT THE LEFT MARGIN STOP SETTING.

LINE LOCK

ADJUST RIGHT MARGIN LINE LOCK ACTUATING BELL CRANK PULLWIRE (18) TO LOCK ALPHABET KEYS, NUMERAL KEYS, AND SPACE KEY WHEN CONTROL SHAFT STOP COLLAR (9) IS LIMITING AGAINST LEFT CONTROL SHAFT BRACKET (11) BY RIGHT MARGIN STOP (39) OR RIGHT CARRIAGE END STOP (28).

TABULATOR BLADE LATCH RESTORING LEVER (38)

THE TABULATOR BLADE LATCH RESTORING LEVER (38) IS ADJUSTED TO RESTORE TABULATOR BLADE WHEN TABULATOR KEY IS DEPRESSED AT THE TIME CARRIAGE IS ONE OR MORE SPACES AWAY FROM RIGHT MARGIN STOP OR FINAL CARRIAGE END STOP.
1. TYPE INTO RIGHT MARGIN STOP TO LOCK ALPHABET AND NUMERAL KEYS AND SPACE KEY.

2. SET TABULATOR BLADE LATCH RESTORING LEVER CAM (37) ON CONTROL SHAFT (6) SO THERE IS NO PLAY BETWEEN TABULATOR BLADE LATCH RESTORING LEVER (38) AND TABULATOR BLADE LATCH RESTORING BELL CRANK (25). AFTER MAKING THIS ADJUSTMENT, MOVE CARRIAGE AWAY FROM RIGHT MARGIN STOP AND LATCH TABULATOR BLADE MANUALLY WHILE AT SAME TIME PREVENT CARRIAGE FROM MOVING. THERE SHOULD BE SOME PLAY BETWEEN TABULATOR RELEASE LEVER CAM (37) AND TABULATOR BLADE LATCH RESTORING LEVER (38). IF THERE IS NO CLEARANCE, RESET ABOVE ADJUSTMENT. IF THERE IS NO PLAY BETWEEN THESE TWO POINTS, THE TABULATOR BLADE WILL NOT BE PERMITTED TO LATCH.

TABULATE INTO RIGHT MARGIN STOP; BACK SPACE ONE SPACE; TABULATE INTO RIGHT MARGIN STOP - REPEAT THIS OPERATION SEVERAL TIMES. THE TABULATOR BLADE SHOULD RELEASE EACH TIME WHEN TABULATING ONE SPACE INTO RIGHT MARGIN STOP. IF PRECEDING ADJUSTMENTS ARE CORRECT, THIS TEST SHOULD PROVE SATISFACTORY.

AIR CYLINDER (20)

REPLACE AIR CYLINDER LINK SCREW (24). WHEN CARRIAGE IS RETURNED TO RIGHT, THE AIR CYLINDER (20) WILL BE OPERATED, WHEN LEFT MARGIN STOP (8) CONTACTS AIR CONTROL BELL CRANK (2), TO CUSHION OVERTHROW OF CARRIAGE BEYOND LEFT MARGIN STOP SETTING.

IN ORDER TO MAKE IT EASIER FOR OPERATOR TO SET LEFT MARGIN STOP (8) WITHOUT HAVING TO OVERCOME CUSHIONING EFFECT OF AIR CYLINDER, THE LEFT MARGIN STOP (8) WILL OPERATE THE CONTROL SHAFT ARM (1) WHICH WILL CAUSE AIR CONTROL BELL CRANK (2) TO BE CAMMED TO REAR FAR ENOUGH TO PERMIT STOP PORTION OF THE LEFT MARGIN STOP (8) TO BY-PASS AIR CONTROL BELL CRANK (2). THIS ACTION TAKES PLACE ONLY WHEN LEFT MARGIN STOP IS DEPRESSED.

ADJUSTMENTS

(CONTROL SHAFT AND CARRIAGE RETURN ADJUSTMENTS MUST BE CORRECT BEFORE AIR CYLINDER ADJUSTMENTS CAN BE MADE.)

1. WITH MARGIN STOP AT ZERO, MOVE CARRIAGE TO LEFT (FACING REAR OF MACHINE) UNTIL SET COLLAR (12) LIMITS AGAINST CONTROL SHAFT BRACKET (11) AND LOCATE AIR CYLINDER TO RIGHT OR LEFT ON MOUNTING SCREWS (UPPER AND LOWER) (19) SO PLUNGER (23) HAS A MINIMUM OF .010 ADDITIONAL MOVEMENT.

2. THE AIR CYLINDER HAS TWO VENTS (21 AND 22). VENT (21) SHOULD BE ABOUT 1/2 COVERED. VENT (22) SHOULD BE ADJUSTED TO ABSORB SHOCK WHEN CARRIAGE IS RETURNED TO LEFT MARGIN. IF VENT (22) IS CLOSED TOO MUCH, IT MAY RESULT IN UNEVEN LEFT MARGIN OR PREVENT CARRIAGE RETURN MECHANISM FROM RESTORING TO NORMAL. TEST BY RETURNING CARRIAGE FROM SEVERAL DIFFERENT POSITIONS.

3. POSITION AIR CONTROL KICK-OUT CAM (7) TO JUST CLEAR TOP OF CONTROL SHAFT ARM (1) WHEN MARGIN STOP IS NORMAL. CAM PORTION OF KICK-OUT MUST BE DOWN AND ANGLED TO RELEASE AIR CONTROL BELL CRANK (2) WHEN MARGIN STOP IS DEPRESSED.
TABULATOR MECHANISM

OPERATION

DEPRESSING TABULATOR KEY (35) OPERATES POWER TRIP BELLCRANK (36) AND RAISES LOWER TRIP OF POWER ARM WHICH IN TURN PULLS UPPER TRIP AWAY FROM FLAT OF NYLON CAM (33). LOWER TRIP ACTUATES STARTER, WHICH MOVES NYLON CAM INTO CONTACT WITH POWER ROLL (34). AS POWER ARM (32) OPERATES, TABULATOR BLADE SHAFT (22) IS ROTATED BY TABULATOR BLADE LATCH BELLCRANK (28) THROUGH LINK (31) RAISING TABULATOR BLADE (39) IN TABULATOR BLADE COMBS (18). WHEN TABULATOR BLADE (39) IS RAISED TO CORRECT HEIGHT, IT IS PULLED TO RIGHT BY SPRING (37) INTO NOTCH OF TABULATOR BLADE LATCH POST (20). AS TABULATOR BLADE (39) IS RAISED, IT CONTACTS TABULATOR BLADE FRICITION BAIL (5) WHICH DISENGAGES ESCAPEMENT LOOSE DOG (16) FROM ESCAPEMENT WHEEL (15) ALLOWING CARRIAGE TO MOVE TO LEFT UNTIL TABULATOR STOP (8) CONTACTS TABULATOR BLADE. THIS ACTION RELEASES THE TABULATOR BLADE ALLOWING LOOSE DOG (16) TO ENGAGE ESCAPEMENT WHEEL (15) PREVENTING CARRIAGE FROM TABULATING FARTHER.

ADJUSTMENTS

1. LOOSEN SCREW AND POSITION TABULATOR BLADE LATCH BELLCRANK (28) ON SHAFT (22) SO REAR OF BELLCRANK JUST CLEAR FRAME BACK (27). TABULATOR BLADE LATCH RESTORING BELLCRANK (30) MUST OPERATE FREELY WITHOUT END PLAY.

2. LOOSEN NUT (21). ADJUST TABULATOR LATCH POST (20) UPWARD UNTIL IT JUST CONTACTS BOTTOM OF UPPER REAR COMB (18). ADJUST POST (20) DOWNWARD SLOWLY UNTIL THERE IS .010 SIDE MOVEMENT IN TABULATOR STOP BLADE (39). TO TEST, RAISE TABULATOR STOP BLADE BY HAND TO JUST BEFORE LATCHING POINT, AND CHECK FOR THIS CLEARANCE. TIGHTEN NUT (21).

3. MANUALLY LIFT TABULATOR BLADE (39), AND POSITION TABULATOR SET ARM (38) TO HAVE APPROXIMATELY .025 BETWEEN TABULATOR BLADE AND TABULATOR SET ARM. UNLATCH TABULATOR BLADE.

4. ADJUST SCREWS TO POSITION POWER ARM SUB-LEVER LINK STOP "A" TO A CENTER OR NEUTRAL POSITION. THIS IS A TEMPORARY SETTING.

5. ADJUST TABULATOR BLADE LATCH BELLCRANK LINK (31) TO HAVE TABULATOR BLADE (39) JUST LATCH WHEN TABULATOR POWER ARM (32) REACHES ITS MAXIMUM TRAVEL UPWARD WHEN TURNING POWER ROLL (34) SLOWLY BY HAND. (LINK (31) MUST BE CONNECTED TO BELLCRANK WITH ITS CLIP (29) TOWARD INSIDE OF MACHINE.)

NOTE: AFTER TABULATOR LATCH BELLCRANK LINK (31) IS ADJUSTED, TABULATOR BLADE MUST REST ON TABULATOR BLADE LOWER COMB (19). IF NOT, REPOSITION TABULATOR BLADE LATCH BELLCRANK (28) SLIGHTLY ON SHAFT (22).

6. DEPRESS TABULATOR KEY (35) AND TURN POWER ROLL (34) SLOWLY BY HAND TO HAVE TABULATOR BLADE (39) JUST LATCH WHEN TABULATOR POWER ARM (32) REACHES ITS MAXIMUM TRAVEL UPWARD. TO OBTAIN THIS CONDITION, ADJUST SUB-LEVER LINK STOP "A" SCREWS.

7. ADJUST TABULATOR BLADE BELLCRANK OPERATING ARM ECCENTRIC (24) TO HAVE HIGH PART OF ECCENTRIC AT TOP. TIGHTEN ECCENTRIC (24) SCREW.

8. WITH TABULATOR BLADE LATCHED IN UPPER POSITION, MAKE SURE LOOSE DOG IS NOT LIMITING IN BOTTOM OF GUIDE. FORM LIP (6) OF LOOSE DOG RELEASE ARM SO THAT CLEARANCE BETWEEN THE TOP TIP OF LOOSE DOG AND BOTTOM OF TOOTH ON ESCAPEMENT WHEEL IS ABOUT THE SAME AS THE CLEARANCE BETWEEN THE BOTTOM OF THE LOOSE DOG AND THE LIMIT POINT.
OF THE LOOSE DOG GUIDE. NORMALLY, STOP SCREW "B" IS ADJUSTED SO THAT THE TABULATOR FRICTION BAIL IS SETTING LEVEL. LIP (6) OF THE LOOSE DOG RELEASE ARM MUST CLEAR LOOSE DOG IN NORMAL POSITION, YET IT MUST NOT BE HIGH ENOUGH TO INTERFERE WITH ESCAPEMENT WHEEL TEETH.

**TABULATOR STOP RACK (11)**

1. LOOSEN MOUNTING SCREWS "H" AND ADJUST FEED RACK "K" TO MESH WITH ESCAPEMENT PINION (15) AS DEEP AS POSSIBLE WITHOUT BINDING, FULL LENGTH OF WRITING LINE. TIGHTEN SCREWS.

2. WITH TABULATOR STOPS RESTORED, LOOSEN TABULATOR STOP RACK MOUNTING SCREWS (7) AND (12) AND MANUALLY LATCH TABULATOR BLADE (39) AND ADJUST TABULATOR RACK FOR 1/32" CLEARANCE BETWEEN TOP OF BLADE AND BOTTOM OF TABULATOR RACK. CHECK HEIGHT OF TABULATOR RACK AT BOTH ENDS AND CENTER. TIGHTEN SCREWS (7) AND (12).

3. ADJUST TABULATOR STOP RACK (11) LATERALLY FOR CORRECT "DROP". TABULATOR BLADE MUST ENTER CENTRALLY BETWEEN SUCCESSIVE SET STOPS. SET TABULATOR STOP RACK MOUNTING SCREWS (7) AND (12) FRICTION TIGHT. LOOSEN NUT (14) AND TURN ADJUSTING SCREW (13) UNTIL TABULATOR BLADE ENTERS CENTRALLY BETWEEN STOPS. LOCK ADJUSTING SCREW NUT (14) AND TIGHTEN MOUNTING SCREWS (7) AND (12). THIS ADJUSTMENT, WHEN CORRECTLY MADE, WILL ALLOW TYPIST TO TABULATE INTO A STOP, BACKSPACE ONE SPACE, AND TABULATE INTO SAME STOP. RECHECK PREVIOUS ADJUSTMENT.

4. WITH KEYBOARD COVER PLATE ON MACHINE, ADJUST TABULATOR CLEAR KEY PULL WIRE (40) TO FULLY RESTORE STOPS (8) INTO TABULATOR STOP RACK (11). IF PULL WIRE (40) IS ADJUSTED TOO SHORT, IT WILL CAUSE TABULATOR CLEAR BLADE (17) TO REST ABOVE TOPS OF TABULATOR COMBS (18) IN NORMAL POSITION. THIS CONDITION WOULD CAUSE INTERFERENCE RESULTING IN UNEVEN TABULATION AND PILING OF CHARACTERS.

5. SET TABULATOR STOP IN RACK AT 50 ON THE SCALE AND TABULATE INTO THIS POSITION. LOOSEN SCREWS (10) AND ADJUST TABULATOR SET KEY BRACKET (9) UNTIL ARM "C" IS CENTERED OVER TABULATOR STOP (8) WHEN TABULATOR SET KEY IS DEPRESSED. CARE SHOULD BE TAKEN IN MAKING THIS ADJUSTMENT SO THAT ARM "C" IS CENTERED ON STOP THAT IS DEPRESSED AND WILL NOT RUB STOP ON EITHER RIGHT OR LEFT SIDE OF IT. TIGHTEN SCREWS (10). ADJUST TABULATOR SET KEY PULL WIRE (25) TO FULLY DEPRESS TABULATOR STOPS (8). IF PULL WIRE IS TOO SHORT, IT MAY NOT ALLOW ARM "C" TO RESTORE HIGH ENOUGH TO CLEAR STOPS IN TABULATOR RACK.

6. SET CARRIAGE MANIFOLD CONTROL DIAL AT "H" AND FORM CARRIAGE RELEASE BAIL ROLL ARM (3) SO THAT ROLL SLIGHTLY CLEARS CARRIAGE RELEASE BAIL (49) WHEN CARRIAGE RELEASE LEVERS (1) ARE NORMAL. SET CARRIAGE MANIFOLD CONTROL DIAL AT "4" AND CHECK BOTH CARRIAGE RELEASE LEVERS FOR DISSENGAGING LOOSE DOG FROM ESCAPEMENT WHEEL.

7. ADJUSTING SCREWS (2) IN CARRIAGE ENDS (50) LIMIT TRAVEL OF CARRIAGE RELEASE LEVERS (1) TO PREVENT LOOSE DOG (16) LIMITING IN GUIDE. THIS RELIEVES STRAIN AND PREVENTS FORM OF LOOSE DOG RELEASE ARM (6) FROM CHANGING WHICH COULD RESULT IN UNEVEN TABULATION.

8. ADJUST TABULATOR BLADE LATCH RESTORING SCREW (26) TO RESTORE TABULATOR BLADE (39) IF CARRIAGE RETURN CLUTCH IS ENGAGED DURING TABULATION. ENGAGE CLUTCH MANUALLY. LOOSEN NUT AND ADJUST TABULATOR BLADE LATCH RESTORING SCREW (26) TO HAVE .010 CLEARANCE BETWEEN CLUTCH TOGGLE ARM AND SCREW. TIGHTEN NUT AND RELEASE CLUTCH.

9. TABULATOR BLADE LATCH RESTORING LEVER "F" IS ADJUSTED TO RESTORE TABULATOR BLADE WHEN TABULATOR KEY IS DEPRESSED AT TIME CARRIAGE IS ONE OR MORE SPACES FROM RIGHT MARGIN STOP OR CARRIAGE END STOP. REFER TO "BACK PLATE AND RELATED PARTS" FOR ADJUSTMENT.
10. CARBON RIBBON KICK-OUT ARM "d" SHOULD BE POSITIONED ON SHAFT (22) SO THAT CARBON RIBBON DRIVE SHAFT GEAR "e" WILL BE DISENGAGED FROM CARRIAGE SPRING DRUM WHEN TABULATOR BLADE IS LATCHED. REFER TO "CARBON RIBBON ADJUSTMENTS".

CARRIAGE TENSION

IT IS ASSUMED THAT CARRIAGE IS PROPERLY ADJUSTED FOR PLAY BETWEEN CARRIAGE RAILS AND THAT NO BINDS EXIST FOR FULL LENGTH OF WRITING LINE. SET RIGHT MARGIN STOP TO EXTREME RIGHT, HAVE CARRIAGE LOCATED ABOUT 3" AWAY FROM RIGHT MARGIN STOP. AT THIS POSITION, STRIKE ALPHABET KEYS RAPIDLY AND SEE THAT NO PILING OR CROWDING OF LETTERS TAKES PLACE. UNWIND MAIN SPRING SLOWLY UNTIL LETTERS ARE CROWDING EACH OTHER AS YOU TYPE RAPIDLY. WIND MAIN SPRING UP A LITTLE AT A TIME AND REPEAT TYPING TEST AT END OF WRITING LINE. MAIN SPRING SHOULD BE WOUND ONLY TIGHT ENOUGH TO OVERCOME CROWDING OR UNEVEN SPACING BETWEEN LETTERS AT THE END OF THE WRITING LINE, AND YET THERE SHOULD BE SUFFICIENT TENSION SO THAT RIGHT MARGIN STOP WILL OPERATE BELL AND LINE Lock BAIL. AVOID WINDING THE MAIN SPRING HEAVIER THAN NECESSARY TO OVERCOME THESE CONDITIONS. MORE TENSION ON THE CARRIAGE ONLY MAKES IT HEAVIER FOR OPERATOR TO HANDLE WHICH SHOULD BE AVOIDED.

GOVERNOR

THE SPEED OF CARRIAGE IS CONTROLLED BY A CENTRIFUGAL TYPE GOVERNOR CONSISTING OF GOVERNOR SHOE PLATE (45), DRIVE BALL CLUTCH SHAFT (47), AND GOVERNOR HOUSING (46). THE SHOES (42) ARE PINNED (FOUR OR FIVE TOGETHER) AND LOCATED ON PIVOT STUDS (41) OPPOSITE EACH OTHER. SHOES (42) ARE RECESSED TO ACCOMMODATE GOVERNOR SHOE LINING (44). THIS LINING CONTACTS INSIDE SURFACE OF GOVERNOR DRUM (46). SPRINGS (43) ARE CONNECTED BETWEEN THE TWO SETS OF SHOES (42) TO ELIMINATE DRAG WHEN CARRIAGE IS TRAVELING TO LEFT DURING TYPING. WHEN LOWER GOVERNOR SHOES ARE HORIZONTAL, SPRINGS (43) BETWEEN SHOES SHOULD ONLY BE STRONG ENOUGH TO HOLD THEM UPWARD UNTIL THEY BARELY LIMIT AGAINST LOWER EDGE OF UPPER SHOES. IF SPRINGS ARE TOO STRONG, IT WOULD EFFECT THE EFFICIENCY OF GOVERNOR.

THE GOVERNOR SHOE PLATE (45) CONTAINS A BALL CLUTCH THAT OPERATES DRIVE SHAFT (47). THE BALL CLUTCH DRIVES GOVERNOR SHOES ONLY WHEN CARRIAGE IS TRAVELING TO LEFT. WHEN CARRIAGE IS RETURNED TO RIGHT EITHER MANUALLY OR BY CARRIAGE RETURN, CLUTCH DRIVE SHAFT (47) DOES NOT OPERATE SHOES (42) DUE TO BALL CLUTCH. WHEN TABULATING FROM RIGHT TO LEFT, MAIN SPRING DRUM OPERATES DRIVE SHAFT (47) WHICH, IN TURN, THROUGH CLUTCH rotates THE TWO SETS OF SHOES (42) FAST ENOUGH TO CAUSE SHOE LINING (44) TO MOVE OUTWARD AND CONTACT INSIDE OF GOVERNOR DRUM (46). FRICTION OF SHOE LINING AGAINST DRUM RETARDS SPEED WHICH MAIN SPRING CAN UNWIND WHICH CONTROLS SPEED OF CARRIAGE ON TABULATION.

WHEN CARRIAGE RELEASE LEVERS ARE OPERATED AND CARRIAGE IS MOVED TO LEFT FASTER THAN IT WOULD NORMALLY TRAVEL WHEN TABULATING, THE GOVERNOR IS ALSO EFFECTIVE. MOVING CARRIAGE TO LEFT FASTER THAN MACHINE NORMALLY TABULATES COULD CAUSE SLACK IN CARRIAGE DRUM TAPE; THEREFORE, OPERATORS USING LONG LINE CARRIAGES SHOULD BE CAUTIONED AGAINST THIS PRACTICE.

THE 13" AND 17" CARRIAGE MACHINES ARE EQUIPPED WITH GOVERNORS CONTAINING 8 SHOES. THE HEAVIER 21" AND 27" CARRIAGE MACHINES ARE EQUIPPED WITH GOVERNORS CONTAINING 10 SHOES.

THE DRIVE CLUTCH SHAFT (47) PINION SHOULD BE MESHERED AS DEEPLY AS POSSIBLE WITH TEETH OF MAIN SPRING DRUM AND YET HAVE SLIGHT AMOUNT OF PLAY BETWEEN DRIVE CLUTCH SHAFT (47) TEETH AND TEETH OF SPRING DRUM (48). THIS CAN BE ADJUSTED BY LOOSENING SCREWS IN GOVERNOR HOUSING (46) BRACKET, AFTER WHICH THE GOVERNOR MAY BE RAISED OR LOWERED TO SUIT THE CONDITION. FOR BEST RESULTS, GOVERNOR DRUM AND SHOES MUST BE KEPT CLEAN. AFTER CLEANING, USE ONE DROP OF DOW CORNING FLUID ON EACH SET OF SHOE LININGS (44). DRIVE SHAFT (47) BEARING SHOULD BE LUBRICATED SPARINGLY WITH LUBRIPLATE GREASE.
CARRIAGE RETURN CLUTCH MECHANISM

OPERATION

WHEN CARRIAGE RETURN KEY (33) IS DEPRESSED, CARRIAGE RETURN BELL CRANK (39) IS OPERATED BY CARRIAGE RETURN POWER ARM (38). AS CARRIAGE RETURN BELL CRANK IS MOVED FORWARD, CARRIAGE BELL CRANK PULL WIRE (13) CAUSES CLUTCH TOGGLE SHAFT (11) TO ROTATE WHICH STRAIGHTENS OUT TOGGLE (15) CAUSING IT TO PASS CENTER LINE SLIGHTLY, WHICH DETENTS IT IN PLACE. THIS ACTION ALSO CAUSES BOTTOM OF OPERATING ARM (14) TO EXERT PRESSURE ON CLUTCH PLATE PRESSURE SPRING (25) WHICH CAUSES CLUTCH PLATE (23) TO FORCE CLUTCH DISC (20) (WHICH IS KEYED TO SHAFT) AGAINST FRICTION SURFACE OF SPRING DRUM (19) CAUSING SPRING DRUM TO TURN WITH SHAFT (21). THE CARRIAGE IS RETURNED BY TAPE THAT IS ATTACHED TO SPRING DRUM (19). WHEN CARRIAGE IS RETURNED, THE LEFT MARGIN STOP CONTACTS CONTROL SHAFT ARM (1) MOVING CONTROL SHAFT (2) TO THE RIGHT WHICH OPERATES CLUTCH TOGGLE RELEASE LEVER (5) AND, THROUGH ITS PULL WIRE (8), ROTATES SHAFT (11) AND RESTORES CLUTCH TOGGLE (15) TO NORMAL POSITION DISENGAGING CLUTCH.

ADJUSTMENTS

1. ADJUST CARRIAGE RETURN POWER ARM DOWN STOP SCREW (34) TO OBTAIN .007 TO .012 CLEARANCE BETWEEN NYLON CAM (37) AND POWER ROLL (35).
2. BACK OUT TABULATOR BLADE LATCH RESTORING SCREW (7) TO PREVENT INTERFERENCE OF CARRIAGE RETURN CLUTCH TOGGLE (15) MOVEMENT AT POINT 10.
3. SET HIGH POINT OF CARRIAGE RETURN POWER ARM ECCENTRIC (36) TO REAR AS SHOWN IN SKETCH.
4. LOOSEN NUT AND SCREW (16) AND ADJUST CLUTCH OPERATING LEVER ARM ECCENTRIC (17) FOR MAXIMUM CLEARANCE BETWEEN CLUTCH PLATE (23) AND FRICTION DISC (20). TIGHTEN ECCENTRIC SCREW (16) AND NUT. (THIS IS ONLY A TEMPORARY ADJUSTMENT TO PERMIT ACCESS TO CLUTCH PLATE PRESSURE SPRING ADJUSTING NUTS (26).
5. DEPRESS CARRIAGE RETURN KEY (33). ROTATE POWER ROLL (35) MANUALLY UNTIL POWER ARM (38) REACHES MAXIMUM TRAVEL UPWARD AND ADJUST CARRIAGE RETURN BELL CRANK PULL WIRE (13) TO RAISE LOWER JAW (15) TO JUST TOUCH UNDERSIDE OF STUD (12).

NOTE: IF MORE OR LESS THAN 1/2 TURN ON PULL WIRE (13) IS NEEDED TO SECURE THE ABOVE CONDITION, ADJUST ECCENTRIC (36) ON POWER ARM (38).

6. UNHOOK CARRIAGE RETURN TAPE (9) FROM CARRIAGE RETURN SPRING DRUM (19) AND PERMIT SPRING TO UNWIND SLOWLY.
7. TURN OUT ON BEARING THRUST ADJUSTING SCREW (18) UNTIL CARRIAGE RETURN CLUTCH SHAFT (21) CAN BE FORCED TIGHT ENOUGH AGAINST CARRIAGE RETURN SPRING DRUM (19) TO BIND IT. WITH PRESSURE STILL APPLIED TO SHAFT, TURN IN ON BEARING THRUST ADJUSTING SCREW (18) UNTIL CARRIAGE RETURN SPRING DRUM (19) IS FREE.

NOTE: THERE SHOULD BE .006 TO .010 CLEARANCE BETWEEN FRONT OF SPRING DRUM AND SHOULDER OF CARRIAGE RETURN CLUTCH SHAFT AT POINT "A" (SEE INSET) WITH PRESSURE APPLIED TO SHAFT.

8. LOOSEN SCREWS (30) AND ADJUST CLUTCH SHAFT BEARING FRONT BRACKET (31) FOR .010 TO .015 END PLAY IN CARRIAGE RETURN CLUTCH SHAFT (21).
9. LOOSEN SCREW AND POSITION CLUTCH SHAFT GEAR (28) TO CENTER LINE OF POWER ROLL GEAR (27). TIGHTEN SCREW. USE SHIMS (29) .003 TO .010 THICK BETWEEN CLUTCH
SHAFT BEARING BRACKET (31) AND MACHINE BASE TO MESH POWER ROLL SHAFT GEAR (27) WITH CARRIAGE RETURN CLUTCH SHAFT GEAR (28) AS DEEP AS POSSIBLE WITHOUT BINDING.

10. UNHOOK CARRIAGE RETURN TAPE (9) AND ADJUST THE CARRIAGE RETURN TENSION SPRING FOR MINIMUM TENSION BY TURNING SPRING DRUM (19) COUNTER CLOCKWISE WITH THE CARRIAGE AT ZERO POSITION. ONLY ENOUGH TENSION IS REQUIRED TO REMOVE SLACK FROM CARRIAGE RETURN TAPE AT ZERO POSITION. Hook up CARRIAGE RETURN TAPE (9) AND TEST.

11. BACK OUT ON CLUTCH PRESSURE SPRING ADJUSTING NUTS (26) UNTIL OUTER NUT IS FLUSH WITH THREADED END OF CLUTCH PLATE PRESSURE SPRING ADJUSTING BUSHING (22).

12. POSITION CARRIAGE SO NOTCH (24) IN CLUTCH PLATE (23) IS VISIBLE AND MAKE CERTAIN THAT FINGER OF CLUTCH PRESSURE SPRING (25) IS IN NOTCH.

13. TURN REAR CLUTCH PRESSURE SPRING ADJUSTING NUT (26) SO CLUTCH PRESSURE SPRING (25) HAS SUFFICIENT TENSION TO PREVENT FINGER FROM CAMMING OUT OF NOTCH IN CLUTCH PLATE (23). TIGHTEN FRONT NUT TO LOCK REAR NUT (26). (THIS IS TEMPORARY ADJUSTMENT.)

14. LOOSEN ECCENTRIC SCREW (16). ADJUST CLUTCH OPERATING LEVER ARM ECCENTRIC (17) FOR .010 TO .015 CLEARANCE BETWEEN CLUTCH PLATE (23) AND FRICTION DISC (20). TIGHTEN ECCENTRIC SCREW (16) AND NUT.

15. SET CARRIAGE RETURN CLUTCH TOGGLE MANUALLY IN ITS UPWARD POSITION, UNTIL LOWER JAW (15) LIMITS AGAINST BOTTOM OF STUD (12). ADJUST CARRIAGE RETURN CLUTCH TOGGLE RELEASE LEVER PULL WIRE (8) TO HAVE .010 TO .015 CLEARANCE BETWEEN CLUTCH TOGGLE RELEASE LEVER (5) AND NYLON SHAFT END STOP (4).

16. NOTE: WE ARE ASSUMING THAT MARGIN STOP RACK (NOT SHOWN) HAS BEEN PROPERLY ADJUSTED AS DESCRIBED UNDER TEXT COVERING BACK PLATE AND RELATED PARTS.

17. HOLD CARRIAGE TO PREVENT IT FROM TRAVELING TO THE RIGHT, AND DEPRESS CARRIAGE RETURN KEY, AND ALLOW CARRIAGE TO TRAVEL TO RIGHT SLOWLY UNTIL CLUTCH DISENGAGES. IF THE CLUTCH FAILS TO DISENGAGE AFTER RELEASING CARRIAGE, CLUTCH PLATE PRESSURE SPRING (25) MAY NOT BE EXERTING ENOUGH FORCE AGAINST CLUTCH PLATE (23) AND FRICTION DISC (20). IF SO, CLUTCH PLATE PRESSURE SPRING NUT (26) MAY HAVE TO BE TIGHTENED SLIGHTLY MORE AND LOCKED BY FRONT LOCK NUT. CARE MUST BE EXERCISED IN ADJUSTING PRESSURE AT THIS POINT; OTHERWISE, THE CLUTCH WOULD NOT SLIP RESULTING IN A STALLED MOTOR WHICH, IN TURN, COULD CAUSE A BURNED OUT FUSE. ALSO, IF RELEASE LEVER PULL WIRE (8) IS TOO LONG, CLUTCH MAY FAIL TO DISENGAGE. THERE SHOULD BE A SLIGHT SLIPPAGE OF CLUTCH AT TIME CARRIAGE BEGINS TO RETURN. CLUTCH BEING ADJUSTED TOO TIGHTLY WILL RESULT IN HARSH PICK UP, SAVAGE OPERATION OF THE LINE SPACE PAWL MECHANISM AND UNNECESSARY STRAIN ON CARRIAGE RETURN AND LINE SPACE TAPES.

18. ADJUST KEY LEVER DOWN STOP SCREW (32) FOR SINGLE OPERATION ONLY OF CARRIAGE RETURN POWER ARM (39). IT IS RECOMMENDED THAT WE DO NOT ADJUST CARRIAGE RETURN POWER ARM FOR REPEAT OPERATION UNLESS ABSOLUTELY NECESSARY. THIS WILL RESULT IN A QUIETER OPERATING MACHINE.

19. ENGAGE CLUTCH TOGGLE MANUALLY. LOOSEN NUT AND ADJUST TABULATOR BLADE LATCH RESTORING SCREW (7) TO HAVE .010 CLEARANCE BETWEEN CLUTCH TOGGLE ARM (10) AND SCREW (7). TIGHTEN NUT AND RELEASE CLUTCH.
THE TABULATOR BLADE LATCH RESTORING BELL CRANK (6) SERVES DUAL PURPOSE

1. IF CARRIAGE IS TABULATING AND CARRIAGE RETURN KEY IS OPERATED, ARM (10) WILL CONTACT SCREW (7) WHICH WILL STOP TABULATION AND RESTORE TABULATOR BLADE AND RELATED PARTS TO NORMAL POSITION.

2. IF CARRIAGE IS RETURNING AND TABULATOR KEY IS DEPRESSED, SCREW (7) WILL CONTACT ARM (10) DISENGAGING CARRIAGE RETURN CLUTCH ALLOWING THESE PARTS TO RETURN TO NORMAL POSITION.

IT WILL BE NOTED THAT LEFT END OF CARRIAGE RETURN TAPE (9) IS ATTACHED TO ARM (42). ATTACHED ALSO TO ARM (42) IS CARRIAGE RETURN TAPE SHORT (41) WHICH IS ATTACHED TO LINE SPACE LEVER (40). THEREFORE, CARRIAGE RETURN CLUTCH IS NOT ONLY RESPONSIBLE FOR RETURNING THE CARRIAGE BUT IS ALSO RESPONSIBLE FOR OPERATING THE LINE SPACE MECHANISM. THE LINE SPACE MECHANISM ADJUSTMENTS WILL BE COVERED UNDER THE SUBJECT OF CARRIAGE AND LINE SPACE MECHANISM.

THE CARRIAGE RETURN TAPE TAKE-UP ARM ASSEMBLY (8) REDUCES BACK-LASH IN CARRIAGE RETURN TAPES WHICH WILL PREVENT LINE SPACE PAWL FROM CREEPING FORWARD DURING CARRIAGE RETURN OPERATION, WHICH COULD CAUSE DOUBLE LINE SPACING AND ALSO FRAYING OF CARRIAGE RETURN TAPES.

CARRIAGE RETURN TAPE SHOULD BE THREADED IN TAPE TAKE-UP ARM ASSEMBLY AS SHOWN IN SKETCH.
PLATE 13
RIBBON DRIVE AND REVERSE MECHANISM
RIBBON DRIVE AND REVERSE MECHANISM

OPERATION

THE DRAWINGS COVERING THIS MECHANISM SHOW IN DETAIL THE ASSEMBLY OF PARTS THAT GOVERN RIBBON DRIVE AND REVERSE. THE MOVEMENT OF PARTS ORIGINATE AT TYPE BAR BELL CRANK (13) WHICH CONTACTS RIBBON UNIVERSAL BAR (12) WHICH LIFTS RIBBON UNIVERSAL BAR UPWARD. RIBBON FEED PAWL ARM ACTUATOR (22) IS MOUNTED ON LEFT END OF RIBBON UNIVERSAL BAR SHAFT (21) AND OPERATES RIBBON FEED PAWL ARM (22) AND ITS PAWL (23) OPERATES RIBBON DRIVE RATCHET (19). THE RIBBON RETAINING PAWL (24) PREVENTS THE RIBBON DRIVE RATCHET (19) FROM TURNING BACKWARD.

THE RIGHT AND LEFT RIBBON REVERSE CAMS (6) ARE MOUNTED ON RIBBON DRIVE SHAFT (14). THE RIBBON REVERSE DETENT PLATE (17) CONTROLS RIGHT AND LEFT POSITIONS OF RIBBON DRIVE SHAFT (14). WHEN RIBBON DRIVING GEAR LEFT (18) IS IN MESH WITH LEFT RIBBON SPOOL SHAFT GEAR (7), RIBBON WILL WIND ON LEFT SPOOL (25) UNTIL RIGHT SPOOL (3) IS EMPTY. AT THIS POINT, RIBBON REVERSE TRIPPING LEVER (2) RAISES AND ALLOWS RIGHT RIBBON REVERSE PLUNGER (5) TO DROP AND ENGAGE RIGHT RIBBON REVERSE CAM (6) WHICH CAUSES RIBBON DRIVE SHAFT (14) TO SHIFT TO RIGHT REVERSING TRAVEL OF RIBBON ONTO RIGHT OR EMPTY SPOOL (3). SAME CONDITION APPLIES WHEN LEFT SPOOL IS EMPTY. THE RIBBON UNIVERSAL BAR RETURN SPRING (20) IS RESPONSIBLE FOR DRIVING AND REVERSING OF RIBBON.

ADJUSTMENTS

CHECK RIBBON UNIVERSAL BAR SHAFT (21) FOR MINIMUM END PLAY AND ALIGNMENT OF RIBBON UNIVERSAL BAR WITH REAR EXTENSION OF TYPE BAR BELLCRANKS (13). LOOSEN RIBBON UNIVERSAL BAR (21) PIVOT SCREW NUTS AND ADJUST PIVOT SCREWS TO REMOVE EXCESS PLAY AND ALSO ALIGN FINGERS OF RIBBON UNIVERSAL BAR (12) WITH REAR EXTENSIONS OF TYPE BAR BELLCRANKS (13). TIGHTEN NUTS WHEN ADJUSTMENT IS COMPLETED.

POSITION RIGHT RIBBON SPOOL SHAFT GEAR (A) (SEE INSET) ON RIGHT RIBBON SPOOL SHAFT (F) TO HAVE .008 CLEARANCE BETWEEN TOP OF RIBBON SPOOL SHAFT SPACE COLLAR (B) AND BOTTOM OF RIBBON SPOOL SHAFT BRACKET (C). REPEAT SAME ADJUSTMENT FOR LEFT RIBBON SPOOL SHAFT.

THE RIBBON SPOOL SHAFT SPRING (D) SHOULD BE COMPRESSED JUST ENOUGH BY POSITIONING RIBBON SPOOL SHAFT TENSION SPRING RETAINER (E) ON RIBBON SPOOL SHAFT (F), TO SUPPORT WEIGHT OF A FULL SPOOL OF RIBBON AND RIBBON WINDING DISC (1). TOO MUCH TENSION CAN CAUSE POOR RIBBON COVER AND NOT ENOUGH TENSION WILL ALLOW RIBBON TO WIND TOO LOOSELY ON SPOOLS.

CHECK SCREWS IN BOTH RIGHT AND LEFT RIBBON REVERSE CAMS (6) FOR TIGHT. ALSO MAKE CERTAIN THAT HIGH POINTS OF CAMS ARE SET ON OPPOSITE SIDES OF RIBBON DRIVE SHAFT (14), AS SHOWN IN SKETCH; IN CASE THESE CAMS (6) ARE NOT SET OPPOSITE AND OPERATOR SHOULD REMOVE RIBBON COMPLETELY FROM MACHINE, IT WOULD PERMIT BOTH RIBBON REVERSE PLUNGERS TO ENGAGE BOTH CAMS SIMULTANEOUSLY WHICH WOULD LOCK UP THE RIBBON DRIVING MECHANISM.

LOOSEN SET SCREW IN RIBBON REVERSE DETENT COLLAR (15). HAVE STUD OF RIBBON CONTROL LEVER (16) IN GROOVE OF RIBBON REVERSE DETENT COLLAR (15), POSITION RIBBON DRIVE SHAFT (14) SO THAT RIGHT RIBBON SPOOL SHAFT PLUNGER (5) WILL JUST CLEAR HIGH POINT OF RIBBON REVERSE CAM (6) WITH RIBBON CONTROL LEVER (16) TO LEFT. TIGHTEN SCREW IN RIBBON REVERSE DETENT COLLAR (15). MOVE RIBBON CONTROL LEVER (16) TO RIGHT AND TEST LEFT RIBBON SPOOL SHAFT PLUNGER (5) WITH LEFT RIBBON REVERSE CAM (6) FOR SAME CONDITION. (THIS
CLEARANCE SHOULD BE EQUAL ON BOTH RIBBON SPOOL PLUNGERS.) FOR FINER ADJUSTMENT LOOSEN RIBBON REVERSE DETENT PLATE (17) MOUNTING SCREWS AND MOVE PLATE TO RIGHT OR LEFT SLIGHTLY, TIGHTEN SCREWS. MOVE RIBBON CONTROL LEVER (16) TO RIGHT AND LEFT, AND NOTE THAT RIBBON DRIVE RATCHET (19) IS POSITIONED ON SHAFT SO THAT RIBBON FEED PAWL (23) AND RIBBON RETAINING PAWL (24) HAVE A GOOD HOLD ON RIBBON DRIVE RATCHET (19) IN BOTH POSITIONS. RIBBON FEED PAWL ACTUATOR (22) MAY ALSO BE ADJUSTED TO RIGHT OR LEFT FOR THIS CONDITION.

MOVE RIBBON CONTROL LEVER (16) TO LEFT AND POSITION RIGHT RIBBON DRIVE GEAR (8) ON DRIVE SHAFT (14) FOR PROPER MESH WITH RIGHT RIBBON SPOOL SHAFT GEAR (7). THE GEARS SHOULD MESH DEEP ENOUGH TO INSURE POSITIVE FEED AND YET HAVE SLIGHT AMOUNT OF PLAY BETWEEN RIBBON SPOOL SHAFT GEAR (7) AND RIBBON DRIVE GEAR (8) AT ALL POSITIONS.

WHEN CORRECT POSITION HAS BEEN DETERMINED, TIGHTEN SET SCREW IN RIGHT RIBBON DRIVE GEAR (8). MOVE RIBBON CONTROL LEVER (16) TO RIGHT AND CORRECTLY MESH LEFT RIBBON DRIVE GEAR (18) WITH LEFT RIBBON SPOOL SHAFT GEAR (7) AND TIGHTEN SET SCREW.

THE PURPOSE OF RIBBON WIND-OFF MECHANISM IS TO REWIND RIBBON ONTO RIGHT OR LEFT SPOOL AUTOMATICALLY; THEREBY, MAKING IT UNNECESSARY FOR TYPIST TO PERFORM THIS OPERATION MANUALLY WHEN REPLACING RIBBON.

WHEN THE TOP OF RIBBON WIND-OFF ARM "H" IS PRESSED FORWARD, IT CAUSES ROLL "K" TO ENGAGE RIBBON WIND-OFF POWER PULLEY "L" AND RIBBON DRIVE SHAFT WIND-OFF PULLEY "M" WHICH ROTATES RIBBON REVERSE SHAFT TO WIND RIBBON ON SPOOL. FLAT SPRING "N" HOLDS ROLL "K" IN A NEUTRAL POSITION, CLEARING DRIVE ROLL "L" AND RIBBON WIND-OFF PULLEY "M". RIBBON DRIVE SHAFT WIND-OFF PULLEY "M" MUST BE POSITIONED ON SHAFT SO IT WILL ALIGN WITH ROLL "K". TEST WITH RIBBON WINDING ON BOTH RIGHT AND LEFT SPOOLS.
SPACE KEY MECHANISM

OPERATION

DEPRESS SPACE BAR (23) WHICH OPERATES SPACE KEY (12) AT RIGHT END OF SPACE KEY THERE IS A SLOTTED EXTENSION (17) FOR SPACE KEY OPERATING LEVER (16). SPACE KEY OPERATING LEVER STUD (11) CONTACTS SPACE KEY POWER TRIP BELL CRANK (10) AND RELEASES SPACE KEY POWER ARM (7). AS POWER ARM (7) MOVES UPWARD, SPACE KEY BELL CRANK (5) PULLS SPACE KEY PULL WIRE (4) FORWARD. SPACE SHAFT OPERATING LEVER (1) PIVOTS AND ARM (27) ON LEFT END OF SPACE SHAFT (26) CONTACTS ARM (28) ON ESCAPEMENT ROCKER BODY (29) CAUSING THE ESCAPEMENT TO OPERATE. FOR REPEAT OPERATION, DEPRESS SPACE BAR (23) TO COMPRESS REPEAT SPACE KEY DOWN STOP SPRING (18).

ADJUSTMENTS

1. ADJUST SPACE KEY SHAFT BY PIVOT SCREWS (15) TO CENTER SHAFT. REMOVE END PLAY, AND AT SAME TIME CHECK SPACE KEY OPERATING LEVER (16) FOR FREEDOM IN KEY LEVER COMB (24) AND EXTENSION (17) OF SPACE KEY. THE HEIGHT OF SPACE KEY IS GOVERNED BY THE KEY LEVER UP STOP (25) WHICH LIMITS SPACE KEY OPERATING LEVER (16). (THIS IS ADJUSTED FOR ALL KEY LEVERS). REFER TO KEY LEVER DIP ADJUSTMENTS. ADJUST REPEAT SPACE KEY POWER ARM DOWN STOP SCREW (14) TO HAVE .007 TO .012 CLEARANCE (PREFERABLY .007) BETWEEN NYLON CAM (6) AND POWER ROLL (3). POSITION SPACE KEY POWER ARM SUB LEVER LINK STOP (9) TO NEUTRAL POSITION.

2. LOosen TWO SCREWS (2) IN SPACE SHAFT OPERATING LEVER (1). ADJUST SPACE KEY PULL WIRE (4) TO LOCATE SPACE SHAFT OPERATING LEVER (1) 1/4" FROM FRAME BACK. ADJUST SPACE KEY SHAFT (26) TO HAVE ARM (27) JUST TRIP ESCAPEMENT AS FOLLOWS.

3. DEPRESS SPACE BAR (23). TURN POWER ROLL (3) OVER SLOWLY BY HAND. WHEN POWER ARM (7) REACHES ITS MAXIMUM TRAVEL UPWARD, TRIP OF ESCAPEMENT SHOULD OCCUR. WITH POWER ARM (7) STILL AT THIS POSITION, CHECK ESCAPEMENT ROCKER BODY (29) FOR SLIGHT ADDITIONAL MOVEMENT. IF THIS CONDITION DOES NOT EXIST, RELOCATE SPACE KEY SHAFT (26) IN SPACE SHAFT OPERATING LEVER (1). FOR FINER ADJUSTMENT OF ESCAPEMENT-TRIP, ADJUST SPACE KEY POWER ARM SUB-LEVER LINK STOP (9).

4. TURN OUT ON REPEAT SPACE KEY OPERATING LEVER DOWN STOP SCREW (13) UNTIL SPRING (18) DOES NOT LIMIT FULL MOVEMENT OF SPACE KEY OPERATING LEVER (16).

5. FORM UP STOPS (20) AND (22) SO TOP OF SPACE BAR (23) IS 3/16" BELOW TOPS OF THE LOWEST BANK OF KEY TOPS.

6. ADJUST SPACE KEY DOWN STOPS (19) AND (21) SO WHEN SPACE BAR (23) IS DEPRESSED AND SPACE KEY (12) LIMITS AGAINST THE STOPS, THE TOP OF SPACE BAR WILL BE 7/16" BELOW TOPS OF THE LOWEST BANK OF KEY TOPS.

7. DEPRESS SPACE BAR (23) SLOWLY. TRIP OF SPACE KEY SHOULD TAKE PLACE WHEN SPACE KEY (12) IS 1/16" AWAY FROM SPACE KEY DOWN STOPS (19) AND (21). TO OBTAIN THIS CONDITION, FORM EXTENSION (17) UP OR DOWN.

AFTER MAKING THIS ADJUSTMENT, BE SURE THAT SPACE KEY OPERATING LEVER (16) DOES NOT BIND IN SLOT OF EXTENSION (17).

8. DEPRESS SPACE BAR (23) AT POINT DIRECTLY ABOVE SPACE KEY DOWN STOP (21) AND ADJUST REPEAT SPACE KEY OPERATING LEVER DOWN STOP SCREW (13) TO HAVE SPACE KEY OPERATING LEVER (16) JUST CONTACT SPRING (18) AS SPACE KEY TRIP TAKES PLACE.

THE SPACE KEY OPERATING LEVER DOWN STOP SCREW (13) IS PROPERLY ADJUSTED WHEN ONLY A SINGLE OPERATION CAN TAKE PLACE AT LEFT END OF SPACE BAR (23).

9. DEPRESS SPACE BAR (23), AT RIGHT END, SO SPACE KEY (12) LIMITS ON SPACE KEY DOWN STOP SCREW (19). ADJUST SPACE KEY DOWN STOP SCREW (19) TO HAVE SPACE KEY OPERATING LEVER (16) COMPRESS SPRING (18) JUST ENOUGH TO PERMIT REPEAT OPERATION.

NOTE: THE SPACE KEY DOWN STOPS (19) AND (21) SHOULD NOT BE SET LOWER THAN NECESSARY AS SPACE BAR (23) WOULD STRIKE FRONT PANEL CAUSING NOISY OPERATION. ALSO REPEAT SPACE OPERATION SHOULD OCCUR BEFORE SPACE BAR IS LOWER THAN TOP EDGE OF FRONT PANEL.
RIBBON COVER MECHANISM

RIBBON COVER (DEFINITION)

NORMALLY MACHINES ARE EQUIPPED WITH 1/2" WIDTH RIBBON, EITHER BLACK OR BLACK AND RED. THIS MEANS THAT, ON A BLACK AND RED RIBBON, YOU WILL HAVE 1/4" WIDTH OF BLACK RIBBON AND 1/4" WIDTH OF RED RIBBON.

WHEN BLACK AND RED RIBBONS ARE USED ON MACHINE AND RIBBON CONTROL WHEEL (11) IS SET FOR BLACK OR TOP HALF OF RIBBON, WITH SHIFT KEY NORMAL (NOT DEPRESSED), TYPE ENTIRE ALPHABET AND NUMERALS. DEPRESS SHIFT LOCK, AND TYPE ENTIRE ALPHABET IN CAPITAL LETTERS AND CHARACTERS ABOVE FIGURES. MOVE RIBBON CONTROL WHEEL (11) TO RED POSITION AND REPEAT THIS TEST. WHEN COMPLETED, CHECK ALL PRINTWORK. IF ADJUSTMENTS ARE PROPERLY MADE, THE COMPLETE TYPE SHOULD PRINT DISTINCTLY.

FOR INSTANCE, IF ON BLACK, RIBBON IS NOT DRIVEN TO PROPER HEIGHT BY EACH CHARACTER, THE TOP OF TYPE MAY FAIL TO PRINT. ON THE OTHER HAND, IF RIBBON IS DRIVEN TOO HIGH, BOTTOM OF BLACK CHARACTER MAY PRINT IN RED. THIS IS CALLED BLEEDING.

LIKEWISE, IF RIBBON IS SET FOR RED AND IS NOT DRIVEN PROPER HEIGHT, TOPS OF LETTERS WOULD PRINT IN BLACK. IF THROWING TOO HIGH, BOTTOM OF LETTERS MAY FAIL TO PRINT. THIS WILL NOT OCCUR IF RIBBON IS PROPERLY ADJUSTED.

OPERATION

IN DESCRIBING THE MOVEMENT OF THIS MECHANISM, WE WILL ASSUME THAT ALL PARTS ARE FREE AND ADJUSTMENTS ARE CORRECT. THE RIBBON UNIVERSAL BAR (15) IS SUPPORTED BY THE RIBBON UNIVERSAL BAR SHAFT (10) WHICH PIVOTS ON TWO SCREWS (18) LEFT AND RIGHT. WHEN KEY LEVER (12) IS DEPRESSED, TYPE BAR POWER TRIP BELL CRANK (13) RELEASES STARTER "d" WHICH CAUSES NYLON CAM (8) TO ENGAGE POWER ROLL (14). AS POWER ARM (9) IS RAISED BY NYLON CAM (8), TYPE BAR BELL CRANK (7) MOVES FORWARD AND LOWER REAR EXTENSION "c" RAISES RIBBON UNIVERSAL BAR (15). THE ARM (19) IS CONNECTED TO RIBBON LIFT BELL CRANK (22), WHICH CAUSES RIBBON LIFT PUSH LINK (25) TO RAISE. STUD (28) AT TOP OF RIBBON LIFT PUSH LINK (25) RIDES IN SLOT "A" OF RIBBON ACTUATOR (30) AND CAUSES RIBBON CARRIER (33) TO RAISE.

RIBBON CONTROL WHEEL (11) HAS FOUR POSITIONS. WHEN TURNED ALL THE WAY FORWARD, FOR THE FIRST POSITION, TYPE WILL STRIKE ON UPPER HALF OR BLACK PORTION OF RIBBON, AND BLACK LINE WILL SHOW IN CENTER OF PLEXIGLASS WINDOW IN KEYBOARD PLATE. AT THIS POSITION, STUD (28) IS ALL THE WAY FORWARD IN SLOT "A" OF RIBBON ACTUATOR (30). NOTE SKETCH "F".

MOVE RIBBON CONTROL WHEEL (11) REARWARD TO SECOND OR STENCIL POSITION. THE WHITE DOTS WILL SHOW IN PLEXIGLASS WINDOW OF KEYBOARD PLATE. STUD (28) IS THEN LOCATED AS SHOWN IN ILLUSTRATION. ALTHOUGH RIBBON LIFT PUSH LINK (25) IS OPERATED, STUD (28) MOVES UPWARD IN VERTICAL OPENING OF SLOT "A", SO IT WILL NOT RAISE RIBBON CARRIER (33) WHEN CUTTING STENCILS.

MOVE RIBBON CONTROL WHEEL (11) REARWARD TO THIRD POSITION. STUD (28) IS NOW IN CENTER OF SLOT "A" AS INDICATED BY "b". IN THIS POSITION, TYPE STRIKES IN CENTER OF RIBBON AND WHITE LINE WILL SHOW IN PLEXIGLASS WINDOW OF KEYBOARD PLATE. THEREFORE, IF MACHINE IS EQUIPPED WITH ALL BLACK RIBBON, IT IS POSSIBLE TO USE TOP HALFW, CENTER, AND LOWER HALF OF RIBBON.

MOVE RIBBON CONTROL WHEEL (11) TO ITS FOURTH OR EXTREME REAR POSITION. THE STUD (28) WILL NOW BE LOCATED AT REAR OF SLOT "A", AND TYPE WILL STRIKE LOWER OR RED PORTION OF
RIBBON: AND RED WILL SHOW IN PLEXIGLASS WINDOW OF KEYBOARD PLATE.

RIBBON UNIVERSAL BAR RETURN SPRING (17) RESTORES PARTS TO NORMAL AND IS ALSO RESPONSIBLE FOR DRIVING AND REVERSING RIBBON.

ADJUSTMENTS

WE WILL ASSUME THAT MACHINE HAS BEEN ADJUSTED FOR "ON FEET", "MOTION", AND THAT IT IS EQUIPPED WITH A 1/2" BLACK AND RED RIBBON. MACHINES WITH LARGER TYPE ARE EQUIPPED WITH A 9/16" RIBBON CARRIER, HOWEVER, ADJUSTMENTS ARE SAME AS DESCRIBED BELOW.

TEST RIBBON UNIVERSAL BAR FOR LEVEL BY LIFTING TYPE BARS "z", "h", AND "p" - ALL THREE TYPE BARS SHOULD TRAVEL SAME DISTANCE BEFORE RIBBON STARTS TO MOVE. POSITION RIBBON UNIVERSAL BAR BRACKET TO LEVEL.

CHECK RIBBON UNIVERSAL BAR SHAFT FOR END PLAY BETWEEN PIVOT SCREWS. EXCESS PLAY SHOULD BE REMOVED BY LOOSENING NUTS AND ADJUSTING PIVOT SCREWS (18) HOLDING INDIVIDUAL FINGERS OF UNIVERSAL BAR AS NEAR CENTER ON TYPE BAR BELL CRANK AS POSSIBLE.

LOOSEN TWO SCREWS (27) AND POSITION RIBBON LIFT BELL CRANK BRACKET (26) SO SCREWS ARE IN CENTER OF SLOTTED HOLES AND TIGHTEN TWO SCREWS (27). CHECK LINKAGE FOR FREE.

SET RIBBON CONTROL WHEEL TO STENCIL POSITION AS INDICATED IN SKETCH. LOOSEN SCREWS (5) IN RIBBON CONTROL SHAFT ARM (4), TURN SHAFT (3) UNTIL STUD (28) WILL ENTER DIRECTLY IN THE CENTER OF VERTICAL SLOT OF SLOT "A" WHEN A TYPE BAR IS RAISED TO CYLINDER. WHILE HOLDING SHAFT (3) AS DESCRIBED, TIGHTEN SCREWS (5). THIS INITIAL ADJUSTMENT MUST BE EXACT TO OBTAIN THE REMAINING RIBBON COVER ADJUSTMENTS.

TO TEST RIBBON CARRIER (33) FOR FLICKER, MOVE RIBBON CONTROL WHEEL (11) FROM BLACK TO RED POSITION AND VICE VERSA AND OBSERVE MOVEMENT IN RIBBON CARRIER (33). IF NECESSARY, FORM RIBBON ACTUATOR DOWN STOP STUD (29) TO REMOVE EXCESS AMOUNT OF FLICKER OF RIBBON CARRIER. WITH SHIFT LOCK KEY DEPRESSED AND RIBBON CONTROL WHEEL (11) IN BLACK POSITION, LOOSEN RIBBON LIFT BELL CRANK ADJUSTING NUT AND SCREW (21) AND POSITION RIBBON LIFT BELL CRANK ACTUATOR ARM (20) TO HAVE TOP OF RIBBON 1/32 OF AN INCH ABOVE TOP OF TYPE BAR WHEN RAISED TO CYLINDER. TIGHTEN SCREW (21) AND NUT.

IF RIBBON THROWS TOO HIGH OR LOW ON BOTH BLACK AND RED, THE RIBBON LIFT BELL CRANK ACTUATOR ARM (20) WILL HAVE TO BE REPOSITIONED ON ARM (22). RAISE ARM (20) TO THROW RIBBON HIGHER OR LOWER ARM (20) IF THROWING TOO HIGH.

WITH RIBBON CONTROL WHEEL (11) SET FOR BLACK, HOLD TYPE BAR TO CYLINDER; AND ADJUST BLACK UPSTOP SCREW (32) FOR VERY SLIGHT ADDITIONAL MOVEMENT IN THE RIBBON UNIVERSAL BAR (15).

TURN RIBBON CONTROL WHEEL (11) TO RED, HOLD TYPE BAR TO CYLINDER, ADJUST RED ACTUATOR ARM UPSTOP (2) FORWARD TO OBTAIN THE SAME CONDITION AS DESCRIBED FOR BLACK UPSTOP.
NOTE: WITH REFERENCE TO BLACK AND RED UPSTOPS, THE PURPOSE OF THESE STOPS IS TO PREVENT OVERTHROW OF RIBBON. OVERTHROW IN BLACK COULD CAUSE BOTTOM OF BLACK LETTERS TO PRINT RED -- OVERTHROW ON RED WOULD CAUSE BOTTOM OF LETTERS TO FAIL TO PRINT. CARE MUST BE TAKEN NOT TO SET BLACK OR RED UPSTOPS LOWER THAN NECESSARY. RIBBON UNIVERSAL BAR YIELD SPRING (16) PERMITS SLIGHT FURTHER MOVEMENT OF UNIVERSAL BAR TO PREVENT SNUBBING AT THIS POINT WHICH WILL CAUSE LIGHT IMPRESSIONS.

IT WILL BE NOTICED ON SKETCH THAT WASHERS "e" ARE USED BETWEEN UNIVERSAL BAR AND ITS SHAFT ON THE TWO CENTER SCREWS ONLY. WASHER 2-40904 IS .020 THICK AND IS USED ON THE Remington Statesman. WASHER 2-40978 IS .010 THICK AND IS USED ON THE REGULAR Remington Electric Typewriter. THE PURPOSE OF USING THESE WASHERS IS TO RETAIN EQUAL THROW OF RIBBON VIBRATOR ON CENTER AS WELL AS END TYPE BAR BELL CRANKS.

WHEN RIBBON COVER IS COMPLETELY ADJUSTED, IF THERE ARE ONE OR TWO LETTERS OR FRACTIONS THAT DO NOT PROPERLY COVER, THEY CAN BE ADJUSTED BY INDIVIDUAL FINGERS ON RIBBON UNIVERSAL BAR (15).
LINE SPACE AND CARRIAGE MECHANISM

TO REMOVE CARRIAGE COVER PANELS

CARRIAGE REAR COVER (4): REMOVE MOUNTING SCREWS LEFT AND RIGHT (12).

CARRIAGE END COVERS (11) AND (41): RAISE CARRIAGE UPPER END COVERS, RIGHT (13) AND LEFT (42). RELEASE CYLINDER LOCKS RIGHT AND LEFT (54) AND REMOVE CYLINDER (25). REMOVE MOUNTING SCREWS (40) AND TAKE OFF COVERS.

PAPER TABLE (62): LOOSEN MOUNTING NUTS (47) LOCATED ON UNDERSIDE OF PAPER TABLE (62) AND SLIDE TABLE OUT OF MOUNTING BRACKETS.

ERASING PLATE (1): LOOSEN ALLEN SCREWS AND REMOVE ERASING PLATE SPRING STUDS (2) AND (46). REVERSE PROCEDURE AND REPLACE PARTS REMOVED.

LINE SPACING AND CARRIAGE

VARIABLE LINE SPACING

TO OBTAIN CORRECT LINE SPACING, IT IS IMPORTANT TO CHECK CYLINDER (25) AND FEED ROLLS (20). A GLAZED, SHINY CYLINDER OR FEED ROLLS WILL NOT FEED PAPER ACCURATELY EVEN THOUGH LINE SPACE ADJUSTMENTS ARE CORRECTLY MADE.

WHEN LEFT CYLINDER KNOB (31) IS TIGHT, THE VARIABLE LINE SPACE PLUNGER (32) MUST HAVE A SLIGHT AMOUNT OF END PLAY. TEST WITH VARIABLE SET AT VARIOUS POSITIONS. IF THERE IS NO END PLAY IN PLUNGER (32) CLUTCH DOG CAM SPRINGS (26) WOULD NOT FORCE CLUTCH CAMS (27) INTO CLUTCH DOGS (28), PREVENTING CLUTCH DOGS FROM ENGAGING INTERNAL TEETH (29) OF RATCHET SECURELY. THIS ACTION IS NECESSARY TO OBTAIN EVEN SPACING BETWEEN LINES.

CYLINDER

WITH CYLINDER (25) IN POSITION, RAISE PAPER BAIL (35) AND PULL FEED ROLL RELEASE LEVER (9) TO FRONT. SPIN CYLINDER, CHECK BUSHINGS (23) AND (30) FOR FREEDOM WITHOUT END PLAY. END PLAY IN CYLINDER IS REMOVED BY LOOSENING SCREW (21) IN RIGHT CYLINDER KNOB (22). TURN IN ON RIGHT CYLINDER KNOB (22) UNTIL THERE IS NO END PLAY IN CYLINDER (25) BUT STILL FREE TO SPIN, TIGHTEN SCREW (21) IN KNOB (22) TO RETAIN ADJUSTMENT.

CHECK CYLINDER FOR UP AND DOWN PLAY IN BUSHINGS (23) AND (30). IF EXCESS PLAY REPLACE BUSHINGS OR CYLINDER. CHECK CYLINDER BUSHINGS (23) AND (30) FOR UP AND DOWN PLAY IN CARRIAGE END FRAMES (15) AND (39). UP AND DOWN PLAY AT EITHER END CAN BE CORRECTED BY LOOSENING NUT (56) AND ADJUSTING SCREW (55) IN CYLINDER LOCK (54). TIGHTEN NUT (56) AFTER MAKING ADJUSTMENT. WE CANNOT STRESS TOO MUCH THE IMPORTANCE OF THE ABOVE ADJUSTMENTS. END PLAY RESULTS IN POOR ALIGNMENT SIDE WAYS WHILE UP AND DOWN PLAY WILL PRODUCE POOR PRINT WORK BY PREVENTING TYPE FROM STRIKING ACCURATELY ON CENTER LINE OF CYLINDER.

NOTE: - CARRIAGE MUST BE FREE FULL LENGTH OF WRITING LINE YET NO NOTICEABLE PLAY BETWEEN CARRIAGE RAILS "A" AND "B". LOOSEN SCREWS "C" AND ADJUST REAR RAIL "A" FOR THIS CONDITION. TIGHTEN SCREWS "C".

ENDS OF CARRIAGE ROLL RETAINERS "D", UPPER AND LOWER, SHOULD BE SAFELY WITHIN CARRIAGE RAILS "A" AND "B" WHEN CARRIAGE IS LIMITING AGAINST RIGHT OR LEFT FINAL END STOPs. IF NOT, LOOSEN SCREWS "C", RELOCATE RETAINERS, AND READJUST CARRIAGE RAILS.
LINE SPACE DETENT

IF FOREGOING ADJUSTMENTS ARE CORRECT, WE ARE NOW READY TO ADJUST THE LINE SPACE MECHANISM. WITH PAPER BAIL (35) RAISED, FEED ROLL RELEASE LEVER (9) PULLED FORWARD AND LINE SPACE REGULATOR (59) SET TO REAR, PULL CARRIAGE RETURN TAPE, LONG, SLOWLY CAUSING CARRIAGE RETURN TAPE, SHORT (TAPES NOT SHOWN) TO MOVE CARRIAGE RETURN TAPE TO RIGHT LIMITING LINE SPACE LEVER (51). AT THIS POINT, TRY TURNING CYLINDER (25) TO FRONT OR REAR. IT SHOULD BE LOCKED SECURELY IN PLACE. IF RATCHET (58) IS NOT LOCKED SECURELY BY PAWL (60), ADJUST ECCENTRIC (52) TO RAISE REAR ARM (53) OF LINE SPACE LEVER (51).

IF ECCENTRIC (52) FAILS TO RAISE REAR ARM (53) HIGH ENOUGH TO SECURELY LOCK PAWL (60) INTO RATCHET (58) IT IS AN INDICATION THAT CARRIAGE RETURN TAPE, SHORT, IS STRETCHED AND SHOULD BE REPLACED.

WITH LINE SPACE PAWL (60) SECURELY LOCKED INTO RATCHET (58) ADJUST ECCENTRIC (48) UNTIL DETENT ROLL (49) IS DEFINITELY RESTING BETWEEN TWO TEETH OF CYLINDER RATCHET. THIS IS AN IMPORTANT ADJUSTMENT TO ELIMINATE UNEVEN SPACING BETWEEN LINES. THE SOLE PURPOSE OF DETENT ROLL (49) IS TO HOLD RATCHET IN POSITION THAT LINE SPACE LEVER (51) PUTS IT.

THE FINAL TEST TO SEE IF RATCHET DETENT ROLL (49) IS PROPERLY SET BY ITS ECCENTRIC IS TO OPERATE LINE SPACE LEVER (51) TO ITS LIMIT AND RELEASE SAME SLOWLY OBSERVING AT SAME TIME WHETHER CYLINDER RATCHET CREEPS TO FRONT OR REAR OF MACHINE SLIGHTLY. IF IT DOES, READJUST ECCENTRIC (48) UNTIL CORRECTED.

TEST MACHINE UNDER POWER WITH LINE SPACE REGULATOR (59) SET AT SINGLE, DOUBLE, AND TRIPLE SPACING.

CYLINDER, TOO HARD TO TURN

CHECK THE FOLLOWING:

WITH PAPER BAIL RAISED, FEED ROLL RELEASE LEVER (9) TO FRONT, AND RATCHET RELEASE LEVER (57) TO FRONT, CYLINDER SHOULD SPIN FREELY.

(1) PLATEN BUSHINGS (23) AND (30) SHOULD BE LUBRICATED VERY LIGHTLY.
(2) PLATEN BUSHINGS MUST NOT TURN WITH CYLINDER SHAFT (24).
(3) CHECK CYLINDER FOR BENT SHAFT.
(4) CHECK RIGHT CYLINDER KNOB (22) FOR PROPER ADJUSTMENT.

REMOVE CYLINDER AND PAPER TROUGH (3)

(1) CHECK FRONT AND REAR FEED ROLL SHAFTS (33) FOR FREEDOM, GROOVES TO DROP INTO PLACE IN FEED ROLL HANGERS.
(2) FEED ROLL SHAFTS (33) SHOULD NOT TURN IN HANGERS.
(3) LUBRICATE ENDS OF FEED ROLL SHAFTS (33) SPARINGLY WITH TYPEWRITER OIL.
(4) FEED ROLLS SHOULD SPIN FREELY ON FEED ROLL SHAFTS (33).
(5) REPLACE PAPER TROUGH (3) MAKING SURE STUDS ON BOTTOM OF TROUGH ARE POSITIONED IN HOLES OF HANGERS (19) AND (36).

REPLACE CYLINDER (25), MOVE FEED ROLL RELEASE LEVER (9) TO REAR. POSITION RATCHET DETENT RELEASE LEVER (57) TO REAR WHICH WILL PERMIT RATCHET DETENT ROLL (49) TO ENGAGE RATCHET (58).
BAIL ROLLS (34) SHOULD TURN FREELY, AND HAVE EQUAL PRESSURE.

IF CYLINDER STILL TURNS TOO HARD SPRING (50) MAY BE WEAKENED SLIGHTLY. NEW RATCHET DETENT SPRINGS (50) SHOULD BE CARRIED IN TOOL KITS AT ALL TIMES.

FEED ROLL PRESSURE

HAVING PREVIOUSLY ADJUSTED AND CHECKED CYLINDER (25), FEED ROLLS (20), LINE SPACE AND VARIABLE MECHANISMS, WE ARE NOW READY TO CHECK FRONT AND REAR FEED ROLLS (20) FOR PRESSURE.

USE TWO STRIPS OF PAPER 1" WIDE. PLACE EACH STRIP BETWEEN CYLINDER AND OUTSIDE ROLLS OF FRONT FEED ROLL. DO NOT INSERT PAPER STRIPS FAR ENOUGH FOR REAR FEED ROLLS TO GRIP THEM. NOW, WITHOUT TURNING CYLINDER, PULL ON EACH STRIP ALTERNATELY TO SEE THAT FRONT FEED ROLL HAS A FIRM EVEN TENSION AT BOTH ENDS. EVEN PRESSURE CAN BE OBTAINED BY ADJUSTING FRONT FEED ROLL TENSION SPRING SCREWS (?).

ADJUST REAR FEED ROLL TENSION SPRING SCREWS (6) AND MAKE THIS SAME TEST BY INSERTING STRIPS OF PAPER BETWEEN REAR FEED ROLL AND CYLINDER. THE PRESSURE SHOULD BE EQUAL AND FIRM AT BOTH ENDS.

IF FRONT OR REAR FEED ROLLS (20) DO NOT RELEASE, CHECK FLATS ON FEED ROLL RELEASE LEVER SHAFT (18) AT POINT WHERE FEED ROLL HANGERS CONTACT SAME.

PAPER BAIL ROLLS (34)

TEST BAIL ROLLS (34) AT SEVERAL POSITIONS FOR EVEN PRESSURE ON CYLINDER (25). BAIL ARMS (10) AND (43) MAY BE FORMED TO SECURE EVEN PRESSURE.

CARRIAGE SCALE (17)

THIS IS THE SCALE THAT IS MOUNTED ON CARRIAGE IMMEDIATELY BEHIND TYPE GUIDE.

ASSUMING THAT THE .005 CLEARANCE BETWEEN LEFT MARGIN STOP AND CONTROL SHAFT ARM IS CORRECT, AS DESCRIBED UNDER SUBJECT OF "MARGIN STOP RACK" UNDER "BACK PLATE AND RELATED PARTS", WE CAN ADJUST CARRIAGE SCALE (17). WITH LEFT MARGIN STOP (45) ENGAGED IN MARGIN STOP RACK (44) AT THE EXTREME LEFT POSITION, MOVE CARRIAGE TO RIGHT UNTIL MARGIN STOP LIMITS MOVEMENT, THEN LOOSEN MOUNTING SCREWS (16) AND (38) AND ADJUST CARRIAGE SCALE (17) UNTIL VERTICAL LINE BELOW ZERO IS IN LINE WITH POINTER OF TYPE GUIDE. TIGHTEN THE SCALE MOUNTING SCREWS. THE UPPER HALF OF CARRIAGE SCALE IS MARKED (ZERO) IN CENTER, GRADUATING TO A HIGHER NUMBER AT RIGHT AND LEFT ENDS.

PAPER BAIL SCALES (35)

POSITION CARRIAGE SO ZERO (RED FIGURES) OF CARRIAGE SCALE (17) IS IN LINE WITH POINTER ON TYPE GUIDE. INSERT PAPER IN CARRIAGE AND PLACE PENCIL IN SLOT AT TOP OF TYPE GUIDE HAVING POINT OF PENCIL AGAINST PAPER AND ROTATE CYLINDER (25). THE VERTICAL MARK ON PAPER SHOULD BE IN LINE WITH ZERO ON PAPER BAIL SCALE (35). IF NOT, LOOSEN SCREWS (14) AND (37) AT EACH END OF PAPER BAIL SCALE (35) AND ADJUST FOR THIS CONDITION. IF ELONGATED HOLES DO NOT PERMIT PROPER ADJUSTMENT, PAPER BAIL ARMS (10) AND (43) MAY BE FORMED SLIGHTLY.

PAPER TABLE (62)

PLACE A SHEET OF 8½" X 11" PAPER IN CARRIAGE AND TURN IT THROUGH UNTIL BOTH ENDS OF PAPER MEET. PULL FEED ROLL RELEASE LEVER (9) FORWARD AND ADJUST TOP EDGES AND CORNERS OF PAPER TO PERFECT ALIGNMENT. RELEASE FEED ROLL RELEASE LEVER (9). AT
THIS POINT THE GRADUATION MARKS ON SCALE OF PAPER TABLE (62) MUST CORRESPOND WITH UPPER HALF OF CARRIAGE SCALE (17) AND BAIL SCALE (35). IF NOT, LOOSEN TWO NUTS (47) ON UNDER SIDE OF PAPER TABLE (62) AND ADJUST FOR THIS CONDITION.

**MARGIN STOP SCALE**

THE GRADUATIONS ON PAPER TABLE (62) ARE USED WHEN SETTING MARGIN STOPS. IF THE VERTICAL WHITE LINE ON LEFT MARGIN STOP (45) IS SET AT 50 ON PAPER TABLE (62) AND CARRIAGE IS MOVED TO RIGHT UNTIL MARGIN STOP LIMITS MOVEMENT, THEN 50 ON UPPER HALF OF CARRIAGE SCALE (17) SHOULD BE IN LINE WITH POINTER IN TYPE GUIDE. CHECK RIGHT MARGIN STOP SETTINGS FOR SIMILAR CONDITION.

**PAGE END GAUGE**

THE PAGE END GAUGE (64) IS DESIGNED FOR CONVENIENCE OF TYPIST IN KNOWING AT A GLANCE THE EXACT NUMBER OF LINES REMAINING AT BOTTOM OF PAGE BEING TYPED.

**EXAMPLE:**

1. INSERT SHEET OF PAPER IN CARRIAGE AND ALIGN TOP OF PAPER WITH TOP OF ALIGNING SCALE.

2. SET PAGE END GAUGE SCALE (63) TO MEET BOTTOM EDGE OF PAPER.

3. AS TOP OF PAPER MOVES UP, SCALE MARKING ON PAGE END GAUGE SCALE (63) WILL DENOTE NUMBER OF LINE SPACES LEFT ON PAGE.

4. NUMBER 6 ON SCALE DENOTES THAT THERE ARE SIX LINE SPACES LEFT ON PAGE AND THAT PAPER IS READY TO LEAVE FRONT FEED ROLLS, AFTER WHICH PAPER WILL ONLY BE HELD BY PAPER BAIL ROLLS (34). GRADUATIONS ON "PAGE END GAUGE SCALE" ARE AVAILABLE FOR STANDARD LINE SPACING MACHINES ONLY.
CARBON RIBBON MECHANISM

OPERATION

THE CARBON RIBBON DRIVE PINION (37) ENGAGES GEAR OF MAIN SPRING DRUM TO DRIVE CARBON RIBBON MECHANISM ONLY WHEN CARRIAGE MOVES TO LEFT. A BALL CLUTCH ASSEMBLY (35) PERMITS CARRIAGE TO BE RETURNED WITHOUT ROTATING DRIVE SHAFT (38). GEAR (16) MESHES WITH PINION GEAR (17) TO OPERATE DRIVE ROLL (29). PRESSURE APPLIED BY TENSION ASSEMBLY (33) ON DRIVE ROLL (29) CAUSES CARBON RIBBON TO FEED THROUGH RIBBON CARRIER (1) FROM CARBON RIBBON SPOOL (8).

ADJUSTMENTS

1. ASSUMING TABULATION AND CARRIAGE RELEASE LEVER ADJUSTMENTS ARE CORRECT, LATCH TABULATOR BLADE MANUALLY AND POSITION CARBON RIBBON KICK-OUT ARM (2) TO DISENGAGE PINION (37) FROM SPRING DRUM GEAR.

2. WITH TABULATOR BLADE STILL LATCHED, LOOSEN NUT AND ADJUST PINION RELEASE BELL CRANK ADJUSTING SCREW (3) TO JUST CONTACT RELEASE ARM (4). TIGHTEN NUT AND RELEASE TABULATOR BLADE. THIS ADJUSTMENT WILL CAUSE PINION (37) TO BE RELEASED FROM SPRING DRUM GEAR WHEN CARRIAGE RELEASE LEVERS ARE DEPRESSED. NOTE: IF CYLINDER AND ANVIL OR MOVEABLE CARRIAGE ADJUSTMENTS ARE CHANGED, THE CARBON RIBBON MECHANISM MUST BE CHECKED FOR PINION (37) DISENGAGING FROM CARRIAGE SPRING DRUM GEAR WHEN CARRIAGE RELEASE LEVERS ARE DEPRESSED.

3. THE TAPE DRIVE SHAFT GEAR (16) AND TAPE DRIVE ROLL PINION (17) MUST MESH AS DEEPLY AS POSSIBLE AND STILL BE FREE TO FEED IN ALL POSITIONS.

4. PLAY IN DRIVE SHAFT (38) SHOULD BE HELD TO A MINIMUM BY DRIVE SHAFT COLLAR (15) TO PREVENT GEARS (16) AND (17) FROM LOCKING WHEN PINION (37) IS DISENGAGED FROM CARRIAGE SPRING DRUM GEAR WHEN TABULATOR BLADE IS LATCHED AND RELEASED OR CARRIAGE RELEASE LEVERS ARE DEPRESSED AND RELEASED.

5. TENSION ROLL (32) ASSEMBLY (33) MUST BE ADJUSTED TO TAPE DRIVE ROLL (29) TO INSURE PROPER FEED AND PREVENT "CREEPING" OF CARBON RIBBON. TENSION ROLL POST (34) PERMITS SLIGHT VERTICAL ADJUSTMENT SO FLANGES ON TENSION ROLL ASSEMBLY ARE IN CORRECT RELATION TO TAPE DRIVE ROLL (29). LOOSEN ALLEN SET SCREW IN POST COLLAR (36) AND ADJUST POST TO OBTAIN PROPER HEIGHT AND TENSION. THEN TIGHTEN SET SCREW IN POST COLLAR (36).

TAKE-UP SPOOL DRIVE MECHANISM

OPERATION

THE PURPOSE OF TAKE-UP SPOOL (26) IS TO REWIND USED PORTION OF CARBON RIBBON AND IS OPERATED BY NEOPRENE DRIVING BELT (18) TURNED BY COMBINATION PULLEY AND FRICTION CLUTCH (20) ON LEFT END OF POWER ROLL, MOUNTED BY SCREW (19) WHICH IS LEFT HAND THREAD.

ADJUSTMENTS

1. LOOSEN TWO SCREWS AND ADJUST CARBON RIBBON TAKE-UP SPOOL BRACKET (25) TO HAVE TEETH (24) OF TAKE-UP SPOOL MESH DEEPLY AS POSSIBLE WITHOUT BINDING TAKE-UP SPOOL DRIVE GEAR (22). TIGHTEN BRACKET SCREWS FRICTION TIGHT.

2. WITH TAKE-UP SPOOL LOCATED IN BOTTOM OF BRACKET (25), ADJUST TAKE-UP SPOOL RETAINING SPRING (23) SO TAKE-UP SPOOL DETENTS IN BOTTOM OF SPOOL BRACKET FIRMLY TO HOLD GEARS (22) AND (24) IN MESH. TIGHTEN BRACKET SCREWS.
3. Apply only enough tension to power pulley spring washer (21) to drive take-up spool and rewind used carbon ribbon tape. 

   **Note:** Excess tension would over-power carbon ribbon adjustments previously made. Too little tension will fail to wind take-up spool.

**Take-up Spool Stop Lever (27)**

When carbon ribbon is being used the normal position of the take-up spool stop lever (27) is to the right. The purpose of the carbon ribbon take-up spool stop lever (27) is to prevent carbon ribbon take-up spool (26) from driving when either a stencil is to be cut or a fabric ribbon is used. This action takes place when stop lever (27) is to the left, engaging stop (28) on take-up spool (26).

To prepare machine for cutting stencils, use following procedure:

1. Position take-up spool stop lever (27) to left.

2. Detent guide post (31) to front of machine.

3. Set ribbon control wheel to have white dots show in window of keyboard plate.

   **Note:** To use carbon ribbon reverse procedure.

Procedure for using fabric ribbon:

1. Remove carbon ribbon from carrier (1) and place at "rest position", behind and below carrier.

2. Position take-up spool stop lever (27) to left.

3. Detent guide post (31) to front of machine.

4. Place fabric ribbon in carrier and onto right ribbon spool. (We are assuming there is a cloth ribbon on left spool.)

   **Note:** To use carbon ribbon, reverse procedure and place fabric ribbon "at rest".

**Operation**

The carbon ribbon guide post collar (30) has a flat surface which is located to rear when carbon ribbon is in use. When using a fabric ribbon or cutting a stencil, guide post (31) is located toward front of machine to cam tension roll (32) of assembly (33) away from carbon ribbon drive roll (29).

**Adjustments**

1. With flat surface of guide post collar (30) to rear, loosen Allen set screw and locate guide post (31) so guide portion of post is in line with flat surface of collar (30), and top of guide post is even with top of drive roll (29). Tighten set screw. Guide post should not interfere with movement of carriage or guide roll (32).

**To Discard Used Carbon Ribbon**

1. Move carriage to zero (lower half of carriage scale).

2. Place guide post (31) to rear.

3. Move take-up stop lever (27) to right.
4. RAISE TAKE-UP SPOOL (26) UP AND OUT OF BRACKET (25).

5. REMOVE TAKE-UP SPOOL RIBBON RETAINER "A" FROM TAKE-UP SPOOL (26) AND DISCARD USED RIBBON.

6. REASSEMBLE CARBON RIBBON RETAINER "A" TO TAKE-UP SPOOL (26).

7. REPLACE TAKE-UP SPOOL (26) IN BRACKET (25).

8. LOOP RIBBON TOWARD FRONT AND SLIDE ONTO STUD ON TAKE-UP SPOOL.

9. LOCATE GUIDE POST (31) TO NORMAL POSITION.

CARBON RIBBON INDICATOR

OPERATION

THE PURPOSE OF THE CARBON RIBBON INDICATOR (12) IS TO PROVIDE A VISIBLE MEANS OF INDICATING WHEN CARBON RIBBON TAKE-UP SPOOL (26) IS FULL AND USED CARBON RIBBON SHOULD BE DISCARDED. THE INDICATOR PIVOTS ON CARBON RIBBON INDICATOR SHAFT (11) AND IS VISIBLE THROUGH WINDOW IN KEYBOARD COVER PLATE. WHEN CARBON RIBBON TAKE-UP SPOOL (26) IS NOT FULL, WHITE PORTION OF INDICATOR (12) SHOWS IN WINDOW. WHEN CARBON RIBBON TAKE-UP SPOOL (26) IS FULL, RIBBON CONTACTS Rear OF CARBON RIBBON LEVER (14) ROTATING INDICATOR (12) SO RED PORTION APPEARS IN WINDOW OF KEYBOARD COVER PLATE.

ADJUSTMENTS

1. INDICATOR LEVER (14) MUST PIVOT FREELY ON STUD (13). LEVER IS COUNTER-BALANCED SO REAR OF LEVER WILL MAINTAIN CONTACT WITH RIBBON JUST BEFORE TAKE-UP SPOOL REACHES CAPACITY.

2. FORM REAR POSITION OF INDICATOR LEVER (14) TO HAVE RED PORTION OF INDICATOR (12) EXPOSED IN WINDOW JUST BEFORE TAKE-UP SPOOL (26) IS FILLED TO CAPACITY.

CARBON RIBBON HOLDER

THE RIGHT CARBON RIBBON SPOOL RETAINER (8) IS A RECEPTACLE FOR NEW RIBBON AND SHOULD ALLOW RIBBON TO UNWIND FREELY.

TO INSTALL NEW CARBON RIBBON, LIFT OUT SPOOL (8) AND SLIP NEW SPOOL OF CARBON RIBBON (5) ONTO SPINDLE (7) SO THAT RIBBON FEEDS FROM THE BACK OF THE SPOOL AS INDICATED BY SKETCH. RETURN THE SPOOL TO POSITION BY PLACING SHAFT (6) IN SLOT (9) OF CARBON RIBBON CARRIER (10). INSERT "B" IS REMOVED IF RIBBON IS TO BE ON OLD STYLE REMINGTON ELECTRIC TYPewriters.
FIG. 2
TOOL FOR "TYPE ON PLATEN" "TYPE BAR OFF ANVIL"

FIG. 3
TOOL FOR "TYPE OFF PLATEN" "TYPE BAR ON ANVIL"

FIG. 4
TOOL FOR "OFF SETTING TYPE"

FIG. 5

FIG. 6

FIG. 7

NnN
HhH Yy

Fig. 1

UNIVERSAL TYPE SOLDERING GAGE ST-40173

PLATE 18
TYPE ALIGNMENT
TYPE ALIGNMENT

TO ALIGN A TYPE, THERE ARE SO MANY DIFFERENT WAYS THAT THIS WORK CAN BE DONE, THAT THEY WOULD BE TOO NUMEROUS TO WRITE ABOUT, BUT AN ATTEMPT WILL BE MADE TO GIVE FUNDAMENTAL DESCRIPTIONS OF GENERAL ALIGNMENT AND HOW TO INSTALL A NEW TYPE BAR GUIDE, HOW TO SOLDER ON A TYPE AND HOW TO ALIGN TYPE WITH REST OF CHARACTERS. THERE ARE RIGHT AND LEFT TYPE BARS THAT CAN BE ORDERED FROM THE FACTORY FOR REPAIRS. THESE TYPE BARS WILL HAVE A "START OF A BEND" TO INDICATE A RIGHT OR LEFT BAR, WHERE THEY ENTER THE TYPE BAR GUIDE BUT THIS "BEND" WILL HAVE TO BE COMPLETED BY TECHNICIAN TO SUIT TYPE BAR'S LOCATION IN SEGMENT.

GENERAL ALIGNMENT

PRIOR TO ALIGNING TYPE, THE LETTER USED, WHICH IS THE "h", MUST BE IN GOOD ALIGNMENT AND MEET THE FOLLOWING CONDITIONS:

1. BOTH CAPITAL AND SMALL LETTERS "ON FEET".

2. BOTH CAPITAL AND SMALL LETTERS HAVE PROPER "CYLINDER AND ANVIL".

3. BOTH LETTERS PERPENDICULAR AND SMALL LETTER "h" CENTERED BETWEEN CAPITAL "H" AS ILLUSTRATED IN FIGURE 7.

4. USE THE LETTERS "H" AND "h" TO ALIGN AND CENTER OTHER CHARACTERS BY CHECKING EACH, AS "HAH", "hah"; "HBH", "hbh"; "HCH", "hch"; ETC.

THE INSTRUCTIONS UNDER SUBJECT OF INSTALLING NEW TYPE DESCRIBE HOW TO ALIGN AND CENTER TYPE.

5. IF A TYPE BAR STICKS AFTER BEING ALIGNED, IT INDICATES THAT FIN OF TYPE BAR IS NOT IN LINE WITH SLOT IN TYPE GUIDE. IT IS PERMISSIBLE TO FORM FIN TO CONFORM TO SLOT OF TYPE GUIDE. NEVER FILE FIN TO FREE TYPE BAR IN GUIDE.

TYPE GUIDE

OCCASIONALLY A TYPE BAR GUIDE MUST BE REPLACED BECAUSE IT IS WORN OR BROKEN. ASSUMING THAT THE TYPE IS IN GOOD ALIGNMENT, STRIKE OFF THE COMBINATION "eo" AND "oe". THE DISTANCE BETWEEN THE "e" AND "o" IN EITHER COMBINATION SHOULD BE THE SAME. IF THIS DISTANCE VARIES NOTICEABLY, THEN TYPE GUIDE IS WORN AND SHOULD BE REPLACED.

TO INSTALL NEW TYPE GUIDE USE FOLLOWING PROCEDURE:

1. REMOVE TWO TYPE GUIDE MOUNTING SCREWS, CAREFULLY REMOVE TYPE GUIDE AND DOWELS BY USING A SCREW DRIVER AS A WEDGE BETWEEN GUIDE AND TYPE BAR SEGMENT.

2. PLACE DOWELS IN THEIR HOLES IN NEW TYPE GUIDE AND MOUNT GUIDE TO TYPE BAR SEGMENT WITH DOWELS AND MOUNTING SCREWS. DOWELS SHOULD BE DRIVEN INTO SEGMENT SO THEY ARE FLUSH WITH FRONT OF GUIDE AND SCREWS MADE FRICTION TIGHT.

3. TYPE THE COMBINATION "qp". IF "q" IS HIGHER THAN "p", TYPE GUIDE IS TOO FAR TO LEFT AND MUST BE LOCATED SLIGHTLY TO RIGHT. GENTLY TAP GUIDE TO RIGHT. MAKE SAME TEST. IF "q" IS LOWER THAN "p", TYPE GUIDE IS TOO FAR TO THE RIGHT AND MUST BE POSITIONED SLIGHTLY TO THE LEFT. WHEN BOTTOM OF "q" AND "p" ARE EVEN WITH EACH OTHER, TYPE GUIDE IS PROPERLY POSITIONED. TIGHTEN SCREWS IN TYPE GUIDE SECURELY.

SOLDERING TYPE ON TYPE BARS

FOR EXAMPLE WE WILL ASSUME THAT TYPE BAR FOR LETTER "r" MUST BE REPLACED. SELECT
THE PROPER TYPE BAR. REMOVE THE OLD TYPE BAR.

NOTE: SELECT A TYPE BAR THAT WILL FIT SNUGLY IN SLOT OF TYPE BAR SEGMENT AND SEE THAT IT WILL RETURN FREELY TO REST POSITION. THIS IS DETERMINED BY TYPE BAR SWINGING ON ITS FULCRUM WIRE. IF BAR IS TOO LOOSE IN SLOT, GOOD ALIGNMENT CANNOT BE PROCURED.

AS ILLUSTRATED IN FIGURE 5, WITH THREE PRONG PLIERS ST-40809 BEND THIS TYPE BAR UNTIL IT WILL ENTER ITS SLOT IN TYPE BAR GUIDE. AT THE SAME TIME, IT WILL BE NECESSARY TO BEND THIS BAR INTO PROPER ANGLE TO ENTER GUIDE WITH A PAIR OF TOOLS ST-962.92, AS INDICATED IN FIGURE 5, USING NARROW SLOTS OF THESE TOOLS. THE "FIN" OF TYPE BAR MUST ENTER STRAIGHT IN TYPE BAR GUIDE WHICH IS ACCOMPLISHED BY HOLDING TYPE BAR STEADY IN NARROW SLOT OF LOWER TOOL ST-962.92, FIGURE 5, AND TWIST THIS BAR INTO SHAPE WITH NARROW SLOT OF OTHER TOOL ST-962.92. WHEN THIS TYPE BAR IS PERFECTLY FORMED AND WORKING NICELY IN AND OUT OF TYPE BAR GUIDE AND IS A GOOD FIT IN SLOT OF SEGMENT, THEN IT IS READY TO RECEIVE ITS TYPE. REMOVE THIS BAR TO DO THIS WORK.

NOTE: THE PURPOSE OF THREE PRONG PLIERS ST-40809 IS TO FORM TYPE BAR TO PROPERLY ENTER TYPE GUIDE. CENTER TYPE BARS SHOULD ENTER TYPE GUIDE CENTRALLY. TYPE BARS ON RIGHT SIDE OF SEGMENT SHOULD SLIGHTLY FAVOR LEFT SIDE OF GUIDE BUT NOT CONTACT ENOUGH TO BIND OR INFLUENCE HEIGHT OF CHARACTER ON WRITING LINE BY BOUNCING OFF TYPE GUIDE. TYPE BARS ON LEFT SIDE OF SEGMENT SHOULD SLIGHTLY FAVOR RIGHT SIDE OF TYPE GUIDE BUT NOT CONTACT ENOUGH TO BIND OR INFLUENCE HEIGHT OF CHARACTER ON WRITING LINE BY BOUNCING OFF TYPE GUIDE.

A. TO CORRECT A TYPE BAR THAT IS NOT ENTERING TYPE GUIDE PROPERLY, ACTUATE TYPE BAR BELL CRANK WITH SPRING HOOK. IF TYPE BAR IS CONTACTING RIGHT SIDE OF TYPE GUIDE, PLACE THREE PRONG PLIERS ON TYPE BAR WITH TWO PRONGS ON RIGHT SIDE OF TYPE BAR AND ONE PRONG ON LEFT SIDE WHEN HOLDING TYPE BAR TO PLATEN. MAKE SURE PLIERS ARE CLOSE TO BUT NOT CONTACTING FIN THAT ENTERS TYPE GUIDE AND PLIERS ARE IN LINE WITH TYPE BAR. THIS WILL FORM TYPE BAR TO LEFT.

B. IF TYPE BAR IS CONTACTING LEFT SIDE OF TYPE GUIDE, PLACE THREE PRONG PLIERS ON TYPE BAR WITH TWO PRONGS ON LEFT SIDE OF TYPE BAR AND ONE PRONG ON RIGHT SIDE WHEN HOLDING TYPE BAR TO PLATEN. MAKE SURE PLIERS ARE CLOSE TO BUT NOT-contacting FIN THAT ENTERS TYPE GUIDE AND PLIERS ARE IN LINE WITH TYPE BAR. THIS WILL FORM TYPE BAR TO RIGHT.

CAUTION: EXTREME MOVEMENT WILL CAUSE TYPE FIN TO STICK IN TYPE GUIDE.

EXAMPLE #1:
A TYPE BAR FROM RIGHT SIDE OF SEGMENT IS CONTACTING RIGHT SIDE OF TYPE GUIDE. (CHARACTER IS PRINTING LOW ON WRITING LINE) CORRECTED BY USING "A".

EXAMPLE #2:
A TYPE BAR FROM RIGHT SIDE OF SEGMENT IS CONTACTING LEFT SIDE OF TYPE GUIDE. (CHARACTER IS PRINTING HIGH ON WRITING LINE) CORRECTED BY USING "B".

EXAMPLE #3:
A TYPE BAR FROM LEFT SIDE OF SEGMENT IS CONTACTING RIGHT SIDE OF TYPE GUIDE. (CHARACTER IS PRINTING HIGH ON WRITING LINE) CORRECTED BY USING "A".

THE BOTTOM OF CAPITAL AND SMALL "R'S" MUST COME IN ALIGNMENT THE SAME AS FOR INSTANCE, THE "NnN", FIGURE 7, BUT AS THIS NEW TYPE BAR HAS NEVER BEEN GAUGED FOR THE SETTING
OF ITS TYPE, IT WILL BE NECESSARY TO SELECT A TYPE BAR OUT OF THE SAME MACHINE WHOSE
TYPE IS IN PERFECT ALIGNMENT AND THIS BAR, WITH ITS ALIGNED TYPE, SHOULD BE OF ONE
NEXT TO THE ONE THAT IS BEING REPLACED; AND IN THIS CASE, WE WILL SELECT THE "F" BAR.

IN TYPE SOLDERING FIXTURE ST-40173 FIGURE 1 AND AS ILLUSTRATED, INSERT PERFECT "FF".
THE PIN "A" ACTS AS TYPE BAR FULCRUM WIRE. THE SCREW "B" IS ANVIL POSITION AND PLATE
"C" SERVES AS PLATEN.

SINCE THIS Fixture IS UNIVERSAL, (USED ON SEVERAL MAKES OF MACHINES), PLATE "L" IS AD-
JUSTABLE AS WELL AS POSITION OF THE FULCRUM PIN "A". PIN "A" MAY BE LOCATED AT FIVE
DIFFERENT POSITIONS IN PLATE "L" DEPENDING UPON THE LENGTH OF THE TYPE BARS SINCE THE
FIN OF TYPE BAR MUST CONFORM TO SLOT "E" OF FIXTURE.

TO FIT TYPE BAR INTO FIXTURE, USE FOLLOWING PROCEDURE

1. RAISE PIN "A" OUT OF HOLE IN PLATE "L" BY LEVER.

2. PLACE END OF PIN "A" IN FULCRUM WIRE HOLE OF TYPE BAR.

3. PIVOT PIN UNIT UNTIL PIN "A" IS LOCATED AT HOLE #2 IN PLATE "L".
   RELEASE PIN LEVER AND MAKE CERTAIN THAT IT IS SECURELY LOCATED IN HOLE #2.

4. PIVOT TYPE BAR ON PIN "A" UNTIL SURFACE OF TYPE IS FACING TOWARD PLATE "C". LOOSEN
   SCREW "D" AND TURN FIXTURE END UNTIL SLOT "E" LINES UP WITH FIN OF TYPE BAR. TIGHTEN
   SCREW "D" WITHOUT MOVING FIXTURE END.

5. LOOSEN SCREW "F" AND LOWER PLATE "C" UNTIL IT IS AGAINST FIXTURE END. THEN TIGHTEN
   SCREW "F"

6. PLACE PRESSURE UPON TYPE BAR AND LOWER SCREW "B" BY TURNING NUT "M" UNTIL IT DOES
   NOT CONTACT TYPE BAR.

7. LOOSEN SCREW "G" AND POSITION PLATE "L" SO FIN OF TYPE BAR IS 3/4 IN SLOT "E" AND
   THERE IS A CLEARANCE BETWEEN BOTTOM OF TYPE AND FIXTURE. THIS WILL PERMIT PO-
   SITIONING PLATE "C" TOWARD OR AWAY FROM BOTTOM OF TYPE.

8. ADJUST SCREW "B" THROUGH NUT "M" UNTIL REAR OF TYPE BAR FIN IS EVEN WITH TOP OF
   FIXTURE AT SLOT "E". LOCK SCREW "B" IN POSITION WITH ITS LOCK SCREW, WHICH IS LO-
   CATED ON SIDE NOT SHOWN IN ILLUSTRATION.

9. HEIGHT AND SPRING TENSION OF CLAMP "J" IS ADJUSTED BY KNOB "H". TURN KNOB "H" UNTIL
   CLAMP "J" CAN BE RAISED HIGH ENOUGH TO BE PLACED OVER TYPE BAR. SEE SKETCH.

10. AFTER PLACING CLAMP OVER TYPE BAR, LOOSEN SCREW "F" AND SET PLATE "C" TO HAVE RIDGE
    "K" CONTACT BOTTOM OF SMALL LETTER "F" AND SURFACES OF BOTH SMALL AND CAPITAL
    LETTERS LAY FLAT ON PLATE "C". TIGHTEN SCREW "F" WITHOUT LOSING EITHER OF THE TWO
    CONDITIONS.

11. REMOVE "SET-UP TYPE BAR 'F'" BY RELEASING CLAMP "J" AND FULCRUM PIN "A".

12. "TIN" BOTH HEAD OF TYPE BAR AND SLOT OF TYPE BY USING WIRE SOLDER AND FLUX. APPLY
    ONLY ENOUGH HEAT TO THESE PARTS TO HAVE SOLDER FLOW EVENLY. A SHINY, CLEAN SUR-
    FACE INDICATES PART IS CORRECTLY "TINNED".

13. FIT LETTER "R" TYPE BAR AND TYPE INTO FIXTURE BY REPEATING STEPS 1, 2, AND 3. MAKE
    CERTAIN THAT FIN OF TYPE BAR IS IN SLOT "E" AND TYPE IS CORRECTLY SET ON PLATE "C"
    WITH BOTTOM OF SMALL "R" AGAINST RIDGE "K". USE JUST ENOUGH SOLDER TO FILL SLOT OF
    TYPE; EXCESS SOLDER WILL RESULT IN FILLING CHARACTER AND NECESSITATE REPLACING
TYPE.

NOTE: IF TYPE HAPPENS TO BE A CHARACTER SUCH AS THE "Y", THEN SELECT A TYPE THAT CONFORMS TO IT, AS G, J, P, OR Q.

ALIGNMENT AND CYLINDER AND ANVIL

WHEN A TYPE HAS BEEN SOLDERED TO A TYPE BAR, REPLACE THIS AND OTHER TYPE BARS THAT WERE REMOVED. IT IS CUSTOMARY TO USE "H" IN CHECKING TYPE ALIGNMENT. TEST "R" TYPE THAT WAS JUST RESOLDERED TO SEE THAT IT IS IN ALIGNMENT BY PRINTING ON PAPER; "HRH" AND "HRH". IF THIS "R" IS EXTREMELY TOO LOW OR TOO HIGH WITH THE H'S, THEN THE GAUGING OF THIS "R" TYPE WITH THE FIXTURE ST-40173 WAS NOT FINE ENOUGH AND WILL HAVE TO BE DONE ALL OVER AGAIN. IF "R" HAPPENS TO BE IN GOOD ALIGNMENT AS FAR AS BOTTOM OF THESE CHARACTERS ARE CONCERNED; PLACE 2 SHEETS OF PAPER IN MACHINE, THEN TEST CYLINDER AND ANVIL POSITION BY LIGHTLY PRESSING "R" TYPE BAR AGAINST ANVIL (DO NOT HAVE FINGER ABOVE ANVIL POSITION). PLACE A STRIP OF PAPER BETWEEN TYPE BAR AT ANVIL POSITION AND NOTE THE PRESSURE OF TYPE BAR ON STRIP OF PAPER. RELEASE TYPE BAR AND PLACE STRIP OF PAPER BETWEEN THE RIBBON THE THE 2 SHEETS OF PAPER IN CARRIAGE, THEN LIGHTLY PRESS TYPE BAR WITH FINGER AT ANVIL POSITION (DO NOT HAVE FINGER ABOVE ANVIL POSITION) AND NOTE AMOUNT OF BITE OR HOLD THAT FACE OF TYPE HAS AT CYLINDER POSITION. THERE SHOULD BE EQUAL BITE OR HOLD AT BOTH CYLINDER AND ANVIL POSITIONS.

THE TYPE CAN BE RAISED OR LOWERED AND AT SAME TIME OBTAIN "CYLINDER AND ANVIL" BY USING ROLLER ST-40120, SHOWN IN FIGURES 2 AND 3.

1. TO GAIN MORE "CYLINDER", POSITION ROLLERS OF ST-40120, AS SHOWN IN FIGURE 2, BUT AS LOW AS POSSIBLE ON TYPE BAR.

2. TO OBTAIN MORE "ANVIL", POSITION ROLLERS OF ST-40120 AS SHOWN IN FIGURE 3, BUT AS LOW AS POSSIBLE ON TYPE BAR.

NOTE: NORMALLY, IN EITHER CASE, HEIGHT OF TYPE WILL NOT BE DISTURBED UNLESS TYPEBAR HAS BEEN EXCESSIVELY FORMED.

3. TO LOWER TYPE, POSITION ROLLERS OF ST-40120 AS SHOWN IN FIGURE 2 BUT AS HIGH AS POSSIBLE ON TYPE BAR.

4. TO RAISE TYPE, POSITION ROLLERS OF ST-40120 AS SHOWN IN FIGURE 3 BUT AS HIGH AS POSSIBLE ON TYPE BAR.

NOTE: WHEN RAISING OR LOWERING TYPE BY USE OF TOOL ST-40120, "CYLINDER AND ANVIL" WILL BE DISTURBED, DEPENDING UPON AMOUNT OF FORMING.

THE TYPE CAN ALSO BE RAISED AND LOWERED OR PLACED "ON FEET" BY USING PLIERS ST-40087 WITH INTERCHANGEABLE JAWS "v" AND "w", FIGURE 6.

NOTE: IT IS RECOMMENDED THAT PEENING BE RESORTED TO ONLY WHEN ABSOLUTELY NECESSARY.

1. IF TYPE NEEDS TO BE RAISED, NIP TYPE BAR AT "Q", USING JAWS "v".

2. IF TYPE NEEDS TO BE LOWERED, NIP TYPE AT "p".

NOTE: CHECK "CYLINDER AND ANVIL" AFTER ADJUSTING HEIGHT OF TYPE.

3. IF THE SMALL LETTER IS LIGHT AT ITS LOWER PART, NIP TYPE AT "t" WITH JAWS "w".

4. IF TOP OF SMALL LETTER IS LIGHT, NIP TYPE AT "s" AND AT THE SAME ANGLE AS ILLUSTRATED.
5. IF LOWER PART OF CAPITAL LETTER IS LIGHT, NIP AT "s", BUT IN THIS CASE REVERSE ANGLE FROM THAT IN ITEM #4.

6. IF TOP PART OF CAPITAL LETTER IS LIGHT, NIP TYPE AT "r".

7. IF A PARTICULAR TYPE IS SLIGHTLY SHORT IN "MOTION", THAT IS, THE SMALL LETTER IS HIGHER IN COMPARISON TO ITS CAPITAL LETTER, NIP THE TYPE HALF-WAY BETWEEN THE TWO CHARACTERS. HOLD PLIERS ST-40087 SO PEN MARK IN SIDES OF TYPE WILL BE HORIZONTAL INSTEAD OF VERTICAL.

NOTE: ADJUST SCREW "x" OF PLIERS ST-40087 TO ALLOW DEEP ENOUGH PEN MARK TO GAIN CONDITION NEEDED WITHOUT CUTTING THROUGH TYPE OR TYPE BAR.

USE THE FOLLOWING PROCEDURE FOR PLACING TYPE "ON FEET", LIGHT ON LEFT OR RIGHT SIDES:

1. IF LEFT SIDE OF BOTH CAPITAL AND SMALL LETTERS IS LIGHT, HOLD TYPE BAR STEADY WITH THE LOWER TOOL ST-96292, FIGURE 5, AND TWIST TYPE IN PROPER DIRECTION WITH TOOL ST-96276.

2. IF RIGHT SIDE OF BOTH CAPITAL AND SMALL LETTERS IS LIGHT, REVERSE OPERATION OF TOOL ST-96276 AS SPECIFIED IN ITEM #1.

3. IF LEFT SIDE OF SMALL LETTER IS LIGHT AND CAPITAL LETTER IS "ON FEET", HOLD TYPE BAR STEADY WITH THE LOWER TOOL ST-96292 AND TWIST TYPE IN PROPER DIRECTION WITH TOOL ST-96276. THIS WILL PLACE SMALL LETTER "ON FEET" BUT TEND TO THROW CAPITAL LETTER "OFF FEET" ON RIGHT SIDE. USE LARGE SLOT OF TOOL ST-96272 AND PLACE ON TYPE CENTRALLY BETWEEN SMALL AND CAPITAL LETTERS. WHILE HOLDING TYPE STEADY, TWIST UPPER PORTION OF TYPE WITH TOOL ST-96276 TO PLACE CAPITAL LETTER "ON FEET".

4. IF RIGHT SIDE OF SMALL LETTER IS LIGHT, REVERSE OPERATIONS IN ITEM #3.

5. IF CAPITAL LETTER IS LIGHT ON EITHER LEFT OR RIGHT SIDE, USE LARGE SLOT OF TOOL ST-96292 AND PLACE CENTRALLY ON TYPE BETWEEN SMALL AND CAPITAL LETTERS. WHILE HOLDING TYPE STEADY, TWIST UPPER PORTION OF TYPE WITH TOOL ST-96276 TO PLACE CAPITAL LETTER "ON FEET".

NOTE: AFTER PLACING EITHER SMALL LETTERS OR CAPITALS "ON FEET" INDIVIDUALLY BY TWISTING TYPE, CHECK TYPE TO MAKE CERTAIN THAT SOLDERED JOINT IS NOT FRACTURED.

CENTERING TYPE

WRITE A SERIES OF "HRHRHRHRH". IF THE LETTER "r" IS TO ONE SIDE OR THE OTHER, NOT CENTERED BETWEEN THE "h's", THE SMALL "r" WILL HAVE TO BE OFF SET BY USING TOOL ST-40308, FIGURE 4. THE TOOL AS ILLUSTRATED WOULD MOVE TYPE TOWARDS RIGHT BY JAW "M" WHILE TYPE BAR IS HELD IN SLOT OF JAW "N" WHICH REPRESENTS TYPE BAR GUIDE POSITION.

IF TYPE IS TO BE MOVED TO LEFT, TURN TOOL ST-40308 AROUND.

AFTER CENTERING SMALL "r", WRITE A SERIES OF "HRHRHRHRH". THE CAPITAL "R's" SHOULD BE CENTERED BETWEEN THE "H's". TO CENTER CAPITAL LETTER, USE TWO TOOLS ST-96292 AS ILLUSTRATED IN FIGURE 5 AND TILT TYPE TO RIGHT OR LEFT.