

**MECHANICAL INSTRUCTIONS**

**FOR**

**REMINGTON MODEL 17**

**Remington Rand Inc.**

**465 Washington Street**

**BUFFALO, NEW YORK**

MECHANICAL INSTRUCTIONS FOR REMINGTON MODEL 17

F O R E W O R D

This instruction book is intended primarily for mechanics, but it can be studied to 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 reading matter 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 pertaining to a unit from the book and then make them on the machine.

# INDEX TO SUBJECTS

NAME OF SUBJECT	TEXT PAGE	PLATE PAGE
Removal and Replacing of Typewriter Unit.....	3-4 .....	5
Back Space Mechanism.....	6 .....	7
Space Key Mechanism.....	8 .....	9
Ribbon Drive Mechanism.....	10-11 .....	13
Ribbon Cover Mechanism.....	14-15 .....	17
Type Action and Touch Regulator.....	18-20 .....	21
Shift Mechanism.....	22-23 .....	25
Escapement and Type Bar Universal Bar.....	26-30 .....	31
Tabulator Mechanism.....	32-33 .....	35
Margin Release, Line Lock and Bell Mechanism.....	36 .....	37
Platen Roll, Line Space Mechanism.....	38 .....	39
Carriage Complete (Method #1) and (Method #2).....	40-45 .....	47
Dismantling Procedure for Cleaning and Overhauling.....	48 .....	
Inspections.....	49-50 .....	

## REMOVING AND REPLACING OF TYPEWRITER UNIT

To remove top cover 2-41090 from the machine set the carriage to the left until the line space lever is not over the top cover. Place fore fingers of both hands at point "A" at rear edges of top cover both sides and pull up gently until the rear of the cover has been released by the top cover detents 2-41091 right and 2-41092 left. Then guide top cover forward slowly until it is clear of the machine. The front of top cover is held into place by the dowel pins at front of the ribbon spool shaft bracket right 2-42349 and left 2-42350.

To remove the rear panel 2-41089 place fingers at top of panel and pull toward the rear until rear cover latches 2-41098 right and 2-41099 left release from their rear cover anchor screws 2-40215 and slide panel downward slightly to remove.

Remove the margin stop rack pull link eccentric screw 2-42714 and nut 2-40409. Remove both the right and left top cover aprons 2-41093 and 2-41094. Take out Platen roll 2-43646. Depress shift lock key. Make certain that the ribbon drive shaft arm assembled 2-46519 is pointing down toward the rear of the machine. See illustration.

Pull forward on both right and left unit latch locks 2-41084 (see illustration) and 2-41085 at the same time raise the front end of keyboard upward, causing the ribbon universal bar 2-42281 (Ribbon Cover Illustration) to clear space bar line lock pawls 2-41128. (Space Bar Illustration)

Note: The typewriter unit is not numbered, therefore, when it is removed from the base the serial number of machine should be scratched on the right side plate. This will prevent from placing the units in the wrong bases.

When the typewriter unit is out of the typewriter frame do not set it upright on work bench because of the parts extending below the typewriter unit side plates. A small board with a cleat on each end can be made to set the typewriter unit on while working on it outside of the typewriter frame. This will also permit operation of shift keys, key levers, etc.

## REPLACING TYPEWRITER UNIT

Guide the typewriter unit back into the machine carefully, make sure that the fork of the ribbon drive shaft arm 2-46519 sets over its stud of ribbon driving gear 2-46516. (See Ribbon Drive Mechanism Sketches) Have shift keys locked down and when unit is in typewriter base far enough pressure may be exerted on the key lever comb at top right and left ends. This pressure should be toward the rear and downward.

If unit does not slide into position, check the tabulator bell crank 2-42413 (tabulator illustration), they may not be down in normal position. Check the side plates of the typewriter unit and see that they are setting all the way down on the typewriter frame. Replace margin stop pull link eccentric 2-42714 and nut 2-40409. Replace platen. Replace both right and left top cover aprons 2-41093 and 2-41094, test line lock and bell mechanism, tabulator, shift keys, back space, space bar and keyboard for operation.

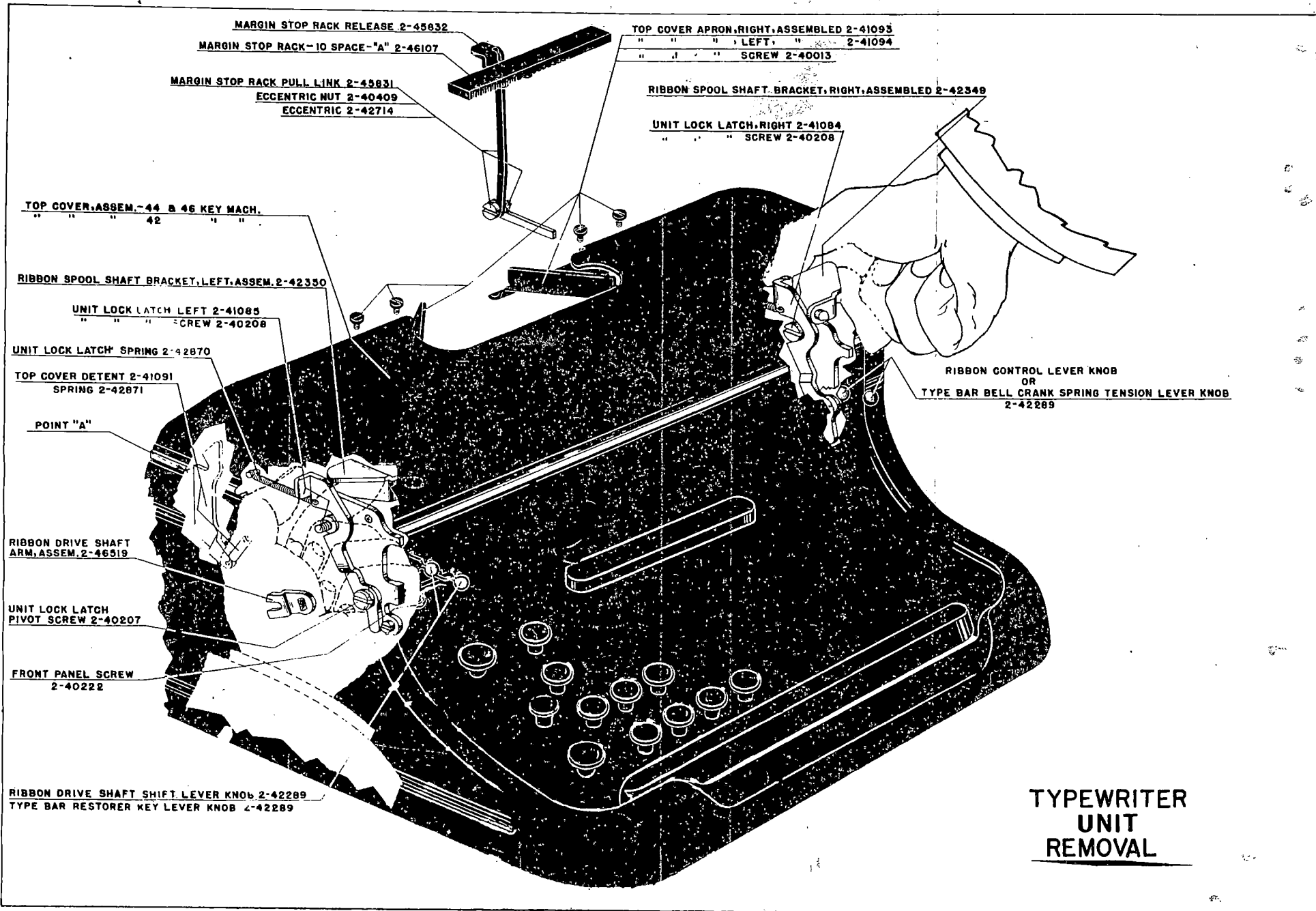
Occasionally when setting the typewriter unit into the base the space bar line lock pawls 2-41128 (space bar illustration) may go up between the wrong key levers, which will cause key levers to bind.

There are certain adjustments in the machine that are more accessible with the typewriter unit removed, however, the majority of them can be made by only removing the panels.

REPLACING TYPEWRITER UNIT Cont'd.

Replace rear panel 2-41089 and top cover 2-41090, after replacing top cover always test the ribbon spool shafts for free. If carriage is sluggish after replacing rear panel, note whether rear panel is pressing against rear carriage rail.

CAUTION: Do not set typewriter on its back without using a felt pad to prevent from marring the finish of the rear panel 2-41089.



## BACK SPACE MECHANISM

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.

If the back space fails to operate check the following:

See that the back space pawl spring 2-40337 has sufficient tension to hold the back space pawl 2-42107 clear of the escapement wheel teeth. Also see that the pawl is free in movement and that the back space key lever roll is in alignment with the back space lever bail 2-42103 as illustrated.

The escapement rocker body should be located so that the loose dog holds the escapement wheel in such a position that the tooth of the escapement wheel will be fully engaged by the back space pawl when back space is operated. The location of the escapement rocker body has been described in the text covering the escapement mechanism.

ESCAPEMENT WHEEL BEARING SCR. 2-40189

ESCAPEMENT WHEEL ASSEM. 8 SPACE 2-42753

" " " " NUT 2-40111

" " " 10 " 2-42755

" " " " LOCK-

" " " 12 " 2-42756

WASHER 2-40958

ESCAPEMENT ROCKER  
BRACKET NUT 2-40411

BACK SPACE PAWL SCREW 2-40022

BACK SPACE LEVER BAIL  
BRACKET 2-42100

BACK SPACE PAWL ASSEM. 8 SPACE 2-42109

SCREW 2-40122

" " " " 10 " 2-42107

SCREW NUT 2-40407

" " " " 12 " 2-42115

BACK SPACE PAWL  
SPRING 2-40337



TABULATOR BLADE,  
LOWER COMB & ESCAPE.  
OPERATING BAIL BRACKET  
ASSEM. 2-42357

BACK SPACE LEVER BAIL 2-42103

SCREW, RIGHT 2-40120

SCREW NUT 2-40407

BACK SPACE LEVER BAIL SPACER, THICK 2-42111

BACK SPACE LEVER BAIL SCREW, LEFT 2-40121

KEY LEVER BRACKET 2-41155

KEY LEVER SPRING ANCHOR  
2-41145

BACK SPACE LEVER SPRING  
2-40331

BACK SPACE LEVER  
PIVOT SCREW 2-40009

BACK SPACE LEVER  
KEY CAP 2-41846

BACK SPACE LEVER ROLL STUD 2-40502

BACK SPACE LEVER ROLL  
2-40954-42 & 46 KEY

2-40938-6 SPACE

2-40852-44 KEY

BACK SPACE LEVER ASSEM.

2-42113-42 & 46 KEY

2-42129-42 & 46 KEY-6 SPACE

2-42135-44 KEY

# BACK SPACE MECHANISM



## SPACE KEY MECHANISM

The space key shaft is supported in the machine by the back space key shaft pivot screws 2-40063 and when the space bar 2-41140 is depressed, it causes the space key shaft arm, to which the space key push link 2-41138 is attached, to move upward. The space key push link roll 2-40856 contacts arm "C" on the escapement rocker body, causing the escapement to take place. When the escapement is complete, the space key spring 2-40340 returns the key to its normal rest position.

### ADJUSTMENTS

First, the space key shaft 2-41130 should be centrally located, free but without end play between pivot screws 2-40063. If there is end play, remove by adjusting pivot screws 2-40063 making sure that the lock nuts 2-40411 are securely tightened after making this adjustment.

The height of the space bar 2-41140 is correct when the bottom of space bar is level with the top of the machine frame front (center). This adjustment is made by forming the space key upstop 2-41143. Refer to illustration sub-view.

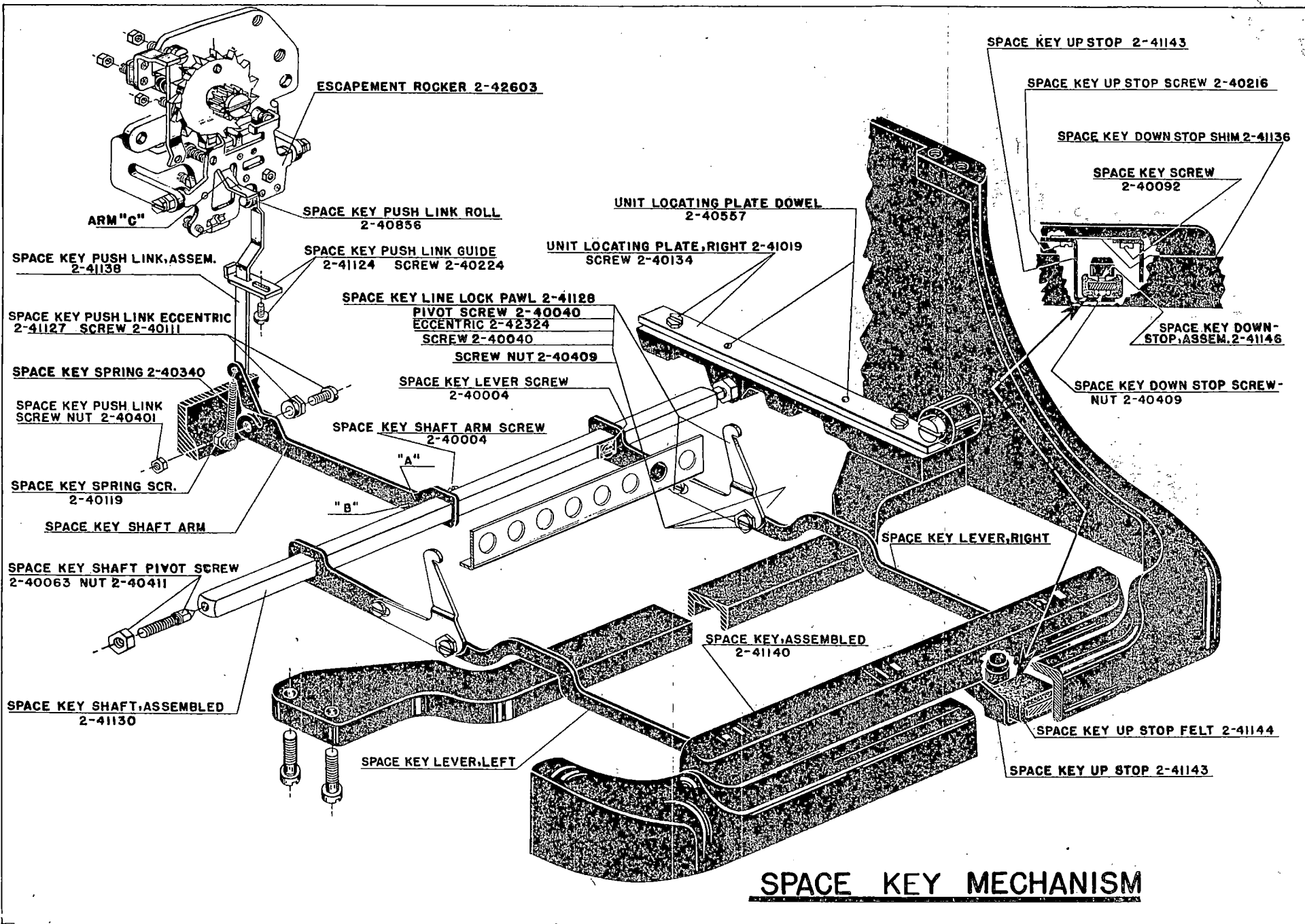
With the space bar 2-41140 depressed, the top of the space bar should be flush with top corner of machine frame (front). This adjustment is made by adjusting the space key down stop screws 2-41146. Refer to illustration sub-view.

The space key push link guide 2-41124 screw hole is elongated to facilitate adjusting the push link to its proper position. It is preferable to have the push link roll 2-40856 located near the front end of arm "C". This position makes the space key operation easier. Unhook the space key spring 2-40340 and test space key mechanism for freedom of movement. The space key push link 2-41138 must be free in its guide 2-41124. When testing the space key mechanism for freedom of movement hold forward on the lower part of the escapement rocker body, noting carefully if any binding exists. If the mechanism seems to be sluggish or binding, check again for freedom as already explained. After this has been done be sure to hook up the space key spring 2-40340.

Adjust the push link eccentric 2-41127 until the escapement takes place when the space bar is within 1/16" of the space key down stop screws 2-41146. If the eccentric does not give enough movement to the push link to get this condition it will be necessary to maul or pein the space key shaft arm at point "A" to lower it, or at point "B" to raise it.

Check the space key line lock pawl pivot screws 2-40040 and nuts 2-40409 to see that they are tight. If these are loose it permits the space key line lock pawls to vibrate, causing a noisy space key operation.

When the space key is depressed against down stop screws 2-41146, the escapement rocker body 2-42603 must not limit against upper rocker body stop screw 2-40100 shown on escapement illustration (rear view).



## RIBBON DRIVE MECHANISM

The drawings covering this mechanism show in detail the assembly of the parts which govern the ribbon drive and reverse. The movement of the parts originate at the carriage spring drum which through the spring drum pinion 2-46509, spring drum pinion shaft 2-46507 and ribbon drive gear 2-46516 drives the ribbon drive shaft arm 2-46519.

On the ribbon drive shaft arm 2-46519 are mounted the ribbon reverse cam left 2-46536 and ribbon reverse cam right 2-46536. The reverse cam left 2-46536 is set between the arms of ribbon drive shaft shift lever 2-46525 as shown on the drawing. The ribbon reverse detent plate 2-46524 controls the right and left positions of the ribbon drive shaft arm 2-46519. When the ribbon driving gear 2-46538 (right) is in mesh with the right ribbon spool shaft pinion 2-42310 the ribbon will wind on to the right spool until the left spool is empty. At this point the ribbon reverse tripping lever raises and allows the left ribbon reverse plunger 2-46521 to engage the ribbon reverse cam left 2-46536. This causes the ribbon drive shaft arm 2-46519 to be shifted to the left which reverses the travel of the ribbon onto the left, or empty spool.

### ADJUSTMENTS

We will assume for explanation that the assembly of the ribbon mechanism has been made according to sketch but not adjusted.

It is first necessary to adjust the up and down play and the tension of the ribbon spool shafts right 2-46532 and left 2-46534. There is one shaft tension spring collar 2-40861 on each shaft. Loosen the set screws 2-40110 in both ribbon spool shaft tension spring collars 2-40861, also loosen set screws 2-40110 in both right and left ribbon spool shaft pinions 2-42310. Place .008 thickness gage between top of ribbon spool shaft space collar 2-40952 and bottom of ribbon spool shaft bracket (right) 2-42329. Hold down on top of ribbon spool shaft right 2-46532 and at same time hold upward on the ribbon spool shaft pinion 2-42310 and tighten its set screw 2-40110. Remove .008 thickness gage and check ribbon spool shaft 2-46532 for play and also free to spin. Repeat this operation and adjust left ribbon spool shaft 2-46534.

Ribbon spool shafts right and left are not interchangeable. When ribbon reverse trip lever is facing you and narrow slot for ribbon is on left side it is the right ribbon spool shaft 2-46532, if the narrow slot for ribbon is on the right side of ribbon reverse trip lever it is the left ribbon spool shaft 2-46534.

The tension of the ribbon spool shafts right 2-46532 and left 2-46534 should be just enough to support the weight of a full spool of ribbon and ribbon winding disc 2-42346 without any drop or sag in shafts. This is adjusted by the ribbon spool shaft tension spring collars 2-40861 which when positioned on the shaft will compress or release the tension of the ribbon spool shaft spring 2-40369. After adjustments are made tighten set screws 2-40110 in collars 2-40861 and see that the ribbon reverse plungers right and left and their tripping levers are free in their movement.

Check screws 2-40214 in both the right and left ribbon reverse cams 2-46536 and see that they are tight and also make certain that the cam surface of these cams are set opposite to each other on shaft. The reason for this is in case an operator should take the ribbon completely off the machine which would permit both ribbon reverse plungers 2-46521 to engage both cams which would lock up the ribbon driving mechanism if used unless set opposite as shown in the illustration.

Next adjust the ribbon reverse detent 2-46524. Loosen the two ribbon reverse detent screws 2-40011 and set screw 2-40110 in right ribbon driving gear 2-46538. Have detent set with toggle to rear as shown in illustration, also have detent stud engaged in slot of the right ribbon driving gear 2-46538. Move the ribbon reverse detent on its shaft until ribbon driving gear right 2-46538 meshes correct with right ribbon spool shaft pinion 2-42310. The gears should be meshed deep enough to insure positive feed and yet have a slight amount of play between the pinion and drive gear at all

ADJUSTMENTS Cont'd.

positions around the pinion. When correct position of detent has been determined, tighten the set screws 2-40011. Next slide the ribbon drive shaft arm 2-46519 to the extreme right and tighten set screw 2-40110 in the right ribbon driving gear 2-46538.

Set the ribbon reverse detent 2-46524 to the front and lift up on the ribbon drive shaft shift lever 2-46525 and position the left ribbon driving gear 2-46537 until its gear is correctly meshed with the ribbon spool shaft pinion 2-42310 and tighten set screw 2-40110.

Remove the typewriter unit from the machine frame and check the spring drum pinion 2-46509 it must be meshed with the carriage spring drum gear deep enough to insure positive drive and yet have a slight amount of play at all points. This adjustment is obtained by the spring drum pinion support adjusting screw 2-40153.

Next loosen the two spring drum pinion shaft support screws 2-40004 and position the spring drum pinion shaft support 2-46508 for proper mesh up of ribbon drive gear pinion 2-46537 with ribbon drive gear 2-46516.

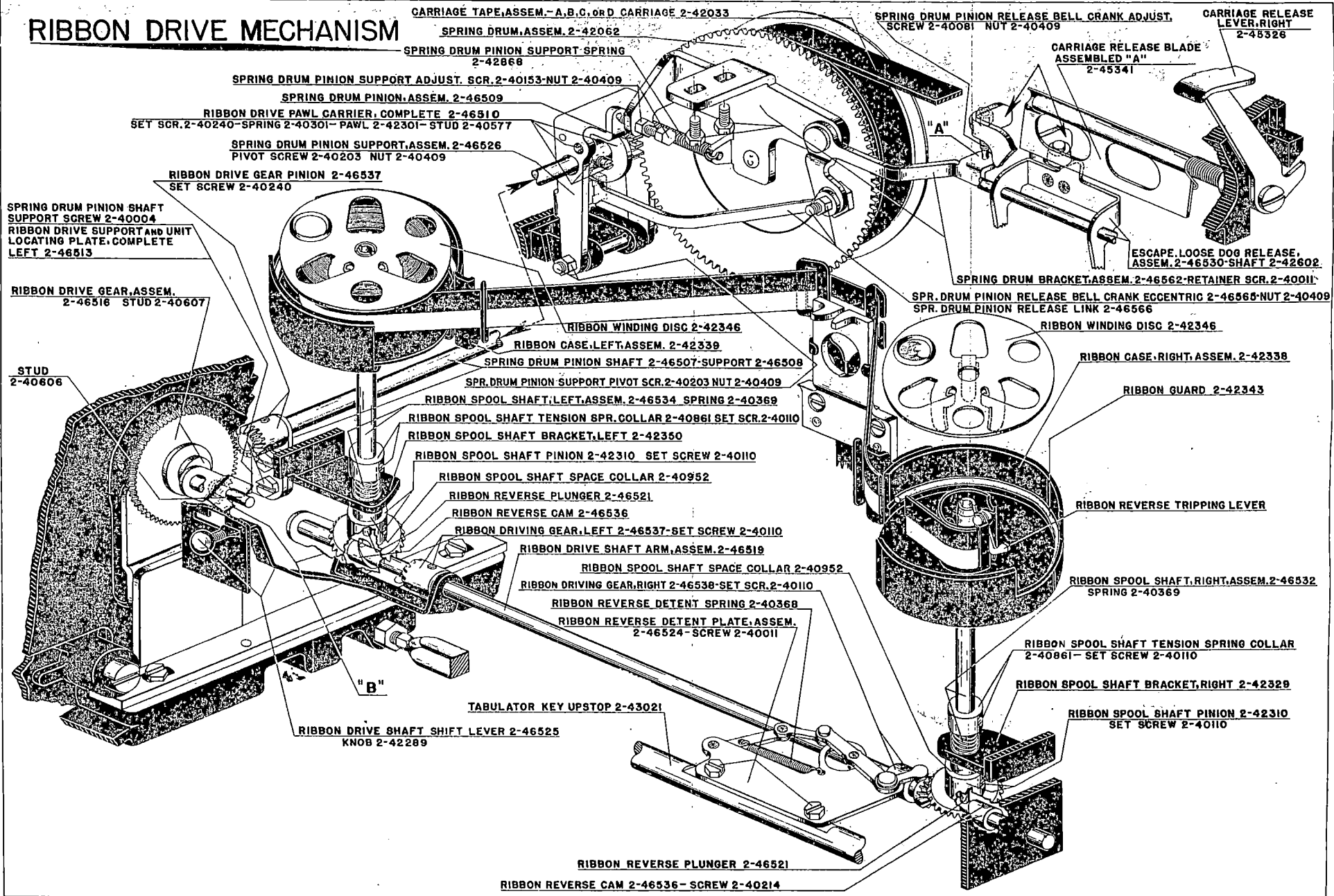
Adjust spring drum pinion release bell crank eccentric 2-46565 until there is .003 clearance between bottom of spring drum pinion release bell crank adjusting screw 2-40081 (Point "A") and top side of lip which it operates. If the condition just described can not be obtained by adjusting eccentric it will be necessary to remove the carriage and adjust screw 2-40081 up or down until eccentric will handle the adjustment. However the eccentric is in the machine for convenience of making this adjustment without having to remove the carriage each time.

If the above adjustments have been made carefully as outlined, when an operator releases either right or left carriage release levers to move carriage to the left or tabulator key is operated the spring drum pinion support 2-46526 with gears should swing clear of the spring drum gear so that ribbon will not travel on these two operations, if ribbon did travel it would take up the slack in same. This slack is necessary for accurate ribbon covering particularly when using the lower half of ribbon:

Make sure when replacing the typewriter unit in the machine that arm "B" is placed over its stud 2-40606 of the ribbon drive gear 2-46516.

**CAUTION:** Do not force the unit into position until this is checked otherwise the stud 2-40606 may be loosened or knocked out. Shift the ribbon drive shaft arm 2-46519 to right and left positions and see that it has a good hold on stud 2-40606. Try ribbon for reversing on both right and left spools near end of writing line. There should be no uneven spacing of letters as reverse takes place.

# RIBBON DRIVE MECHANISM



## RIBBON COVER MECHANISM

In describing the movement of this mechanism, we will assume that all parts are free and that the adjustments are correct. The ribbon universal bar 2-42281 is supported by the ribbon universal bar pivot screws 2-40164 in the base of the machine, under the key levers.

When the key lever is depressed, the ribbon universal bar moves downward and as the universal bar is on a pivot, the arm "A" moves upward, causing the toggle link to move the front lower part of the toggle bell crank "B" upward. This upward movement is transferred to the ribbon actuator arm 2-46569 by the ribbon lift push link 2-42284. The ribbon lift push link stud 2-40571 fits into the slot of the ribbon actuator arm 2-46569 (the lower end of ribbon lift push link 2-42284 is attached to the lower front extension of the toggle bell crank "B" as illustrated).

When the ribbon control lever 2-46568 is in its upward position it will cause the ribbon lift push link stud 2-40571 to be in the front end of the slot "C" in ribbon actuator arm 2-46569; this causes the type to print on the upper half of ribbon. When the ribbon control lever is set to its lower position, it causes the ribbon control shaft lever 2-42285 to move the upper end of the ribbon lift push link 2-42284 to the rear, positioning ribbon lift push link stud 2-40571 to rear-end of slot "C". This causes the type to print on the lower half of the ribbon.

When the ribbon control lever 2-46568 is set at white dot or stencil position, the control shaft will hold the ribbon lift push link in a central position, so that the ribbon lift push link stud 2-40571 will move up and down in slot "C" without operating the ribbon carrier 2-46570. When ribbon universal bar and all parts related to the ribbon cover are in normal position, the ribbon actuator arm 2-46569 limits on ribbon actuator arm stop pin 2-40500.

### ADJUSTMENTS

We will assume that the machine has been adjusted for "on feet" and motion, and that the machine is equipped with a  $\frac{1}{2}$  inch black and red ribbon. (Machines with larger type are equipped with  $\frac{9}{16}$  inch ribbon carrier). The black or upper half of the ribbon is adjusted for cover first.

Check the ribbon universal bar 2-42281 for end play between pivot screws 2-40164. Excess play should be removed by loosening the ribbon universal bar pivot screw nut 2-40407 and tightening the pivot screws 2-40164. Tighten nut when adjustment is completed.

It is important that all play be removed and that the ribbon universal bar is perfectly free. Excess end play in the ribbon universal bar will result in the ribbon not throwing the same distance at all times.

See that the ribbon universal bar 2-42281 is level; this can be tested by depressing key levers z, n and / -- all three type bars travel same distance about  $\frac{1}{2}$  inch before key levers contact ribbon universal bar. This lead can be changed by forming points "D" of key lever clamp 2-41106 toward front or back of machine.

Loosen the ribbon lift toggle screw 2-40066 and set the ribbon lift toggle bell crank eccentric 2-41142 with the big side to bottom. Lock the eccentric in this position with the lift toggle screw 2-40066 and its nut 2-40409. This is a temporary setting and it may be necessary to adjust it again later.

NOTE: There are certain adjustments pertaining to the ribbon covering mechanism that are more accessible with the typewriter unit removed from the base such as adjusting the ribbon control shaft by set screws 2-40110.

## ADJUSTMENTS Cont'd.

Set the ribbon control lever 2-46568 in its stencil position, which is white dot on front panel. Loosen the two ribbon control shaft arm set screws 2-40110 and move the arm "F" until when a key lever is depressed stud 2-40571 will go up directly into center of vertical slot at top of slot "C". The closer this adjustment is made the better other ribbon covering adjustments will come out. While holding arm "F" as described tighten the two ribbon control shaft arm set screws 2-40110.

Set ribbon control lever 2-46568 to top position which is blue dot. Form lower extension "E" making sure that stud in ribbon control lever 2-46568 sets securely in its position in ribbon control lever detent spring 2-42887. Depress the shift lock key and test the black cover by striking off a few capital "HHHHH". They should strike in the center of the black or upper half of ribbon. If the type strikes high on the ribbon, it will be necessary to turn the ribbon lift toggle bell crank eccentric 2-41142 toward the front; after adjusting the eccentric, lock its position with ribbon lift toggle screw 2-40066 and try the cover again with the capital "H". If the type is striking too low on the ribbon, reverse this procedure. Test black covering by typing the alphabet and numerals in both upper and lower cases. The black upstop "G" prevents the ribbon from overthrowing and printing bottom of characters red. No adjusting necessary on this upstop.

Set the ribbon control lever 2-46568 to red dot which is lower half or red ribbon position. Form upper extension "E" making sure that stud in ribbon control lever 2-46568 sets securely in its position in ribbon control lever detent spring 2-42887. Strike off the alphabet and numerals of both upper and lower cases. Form the ribbon actuator arm stop 2-42276 until the ribbon actuator arm 2-46569 almost limits against it when the key lever is depressed. This stop prevents the ribbon from overthrowing and failing to print the bottom of red characters. If the ribbon carrier goes up and does not drop back down it is an indication that the ribbon actuator arm stop 2-42276 is formed too low.

When ribbon control lever 2-46568 is set at white dash (-) on front panel the face of type will strike in center of ribbon, therefore if a solid black ribbon is used the customer can get more wear from the ribbon than was possible with old style construction by using the center of ribbon. There is no adjustment on this. It will be correct if black and red portion of ribbon is covering correctly.

When shifting the ribbon control lever 2-46568 from black to red or visa versa, there should be no movement in the ribbon carrier 2-46570. If the ribbon carrier moves it indicates that the top of stud 2-40571 is rubbing the top of slot "C".

Check the following adjustments in regard to movement in the ribbon carrier 2-46570, when shifting the ribbon control lever: Ribbon universal bar 2-42281 limiting against under sides of key levers, which could be caused by improperly adjusted ribbon lift toggle bell crank eccentric 2-41142 or one of the individual fingers "G" on the ribbon universal bar may be formed higher than necessary or rear side of spring clip on ribbon lift push link 2-42284 interfering with toggle bell crank "B" when set on red. The fingers "G" on the universal bar provide an individual adjustment in case the ribbon carrier does not raise the proper height on a few characters.

The ribbon universal bar, ribbon carrier, ribbon lift push link, etc. are restored to their normal position by the ribbon universal bar spring 2-42886.

Hold the ribbon actuator arm bracket support 2-41954 to the rear when tightening support screws 2-40111. This will prevent the front end of ribbon actuator arm 2-46569 from binding on rear side of segment.

# RIBBON COVER MECHANISM

RIBBON ACTUATOR ARM BRACKET, ASSEM. 2-42200  
SPACER 2-42290 SCREW 2-40011

RIBBON ACTUATOR ARM BRACKET SUPPORT  
2-41954 SCREW 2-40111

RIBBON CONTROL LEVER, COMPLETE 2-46568  
KNOB 2-42289

RIBBON CONTROL LEVER DETENT SPRING  
2-42887 NUT 2-40425 SPACER 2-40955

RIBBON ACTUATOR ARM 2-46569 SPACER 2-40850

RIBBON ACTUATOR ARM SCREW 2-40010  
NUT 2-40408

RIBBON ACTUATOR ARM STOP 2-42276  
SCREW 2-40065 STOP PIN 2-40500

RIBBON LIFT TOGGLE SCREW 2-40066  
BELL CRANK ECCENTRIC 2-41142  
WASHER 2-40881  
SCREW NUT 2-40409

RIBBON LIFT  
PUSH LINK STUD  
2-40571

RIBBON  
CONTROL SHAFT  
ARM, ASSEM. 2-42342  
SET SCREW 2-40110

RIBBON CONTROL  
SHAFT LEVER,  
ASSEM. 2-42285

RIBBON CARRIER, ASSEM.  $\frac{1}{2}$ " 2-46570  
PIN 2-40501

RIBBON CONTROL SHAFT COLLAR 2-40881  
SET SCREW 2-40174

KEY LEVER BRACKET  
2-41155

RIBBON LIFT PUSH LINK, ASSEM. 2-42284

RIBBON UNIVERSAL BAR SPRING 2-42886  
HOOK 2-42283 SCREW 2-40114

FRONT PANEL 2-46861  
SCREW 2-40222

SLOT "C"

"F"

"D"

FINGERS "G"

"B"

"G"

"A"

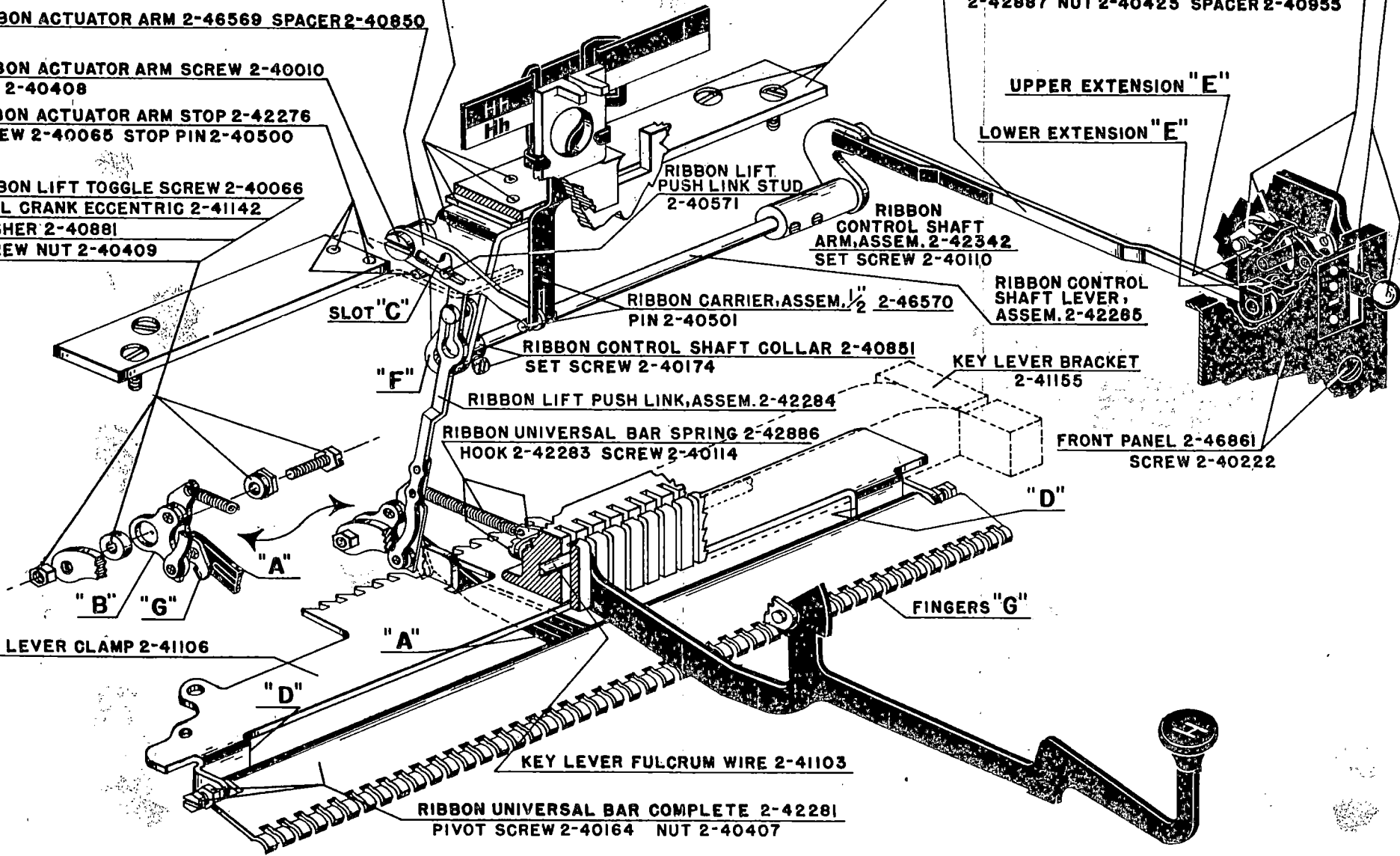
"A"

"D"

KEY LEVER FULCRUM WIRE 2-41103

RIBBON UNIVERSAL BAR COMPLETE 2-42281  
PIVOT SCREW 2-40164 NUT 2-40407

KEY LEVER CLAMP 2-41106





## TYPE ACTION MECHANISM

Freedom of parts in the key lever and type bar connections is most important. When the key lever 2-41222 is depressed it fulcrums on the key lever fulcrum wire 2-41103. The type bar bell crank 2-41622 is made to travel toward front of machine by the type bar bell crank link being positioned over stud "A" on the key lever 2-41222. Since the upper end of the type bar bell crank 2-41622 is connected to the type bar 2-41783 by a type bar link 2-41432, it pivots the type bar 2-41783 on the type bar fulcrum wire 2-41594 and causes the type bar to travel in an arc which ends when the type strikes the platen roll.

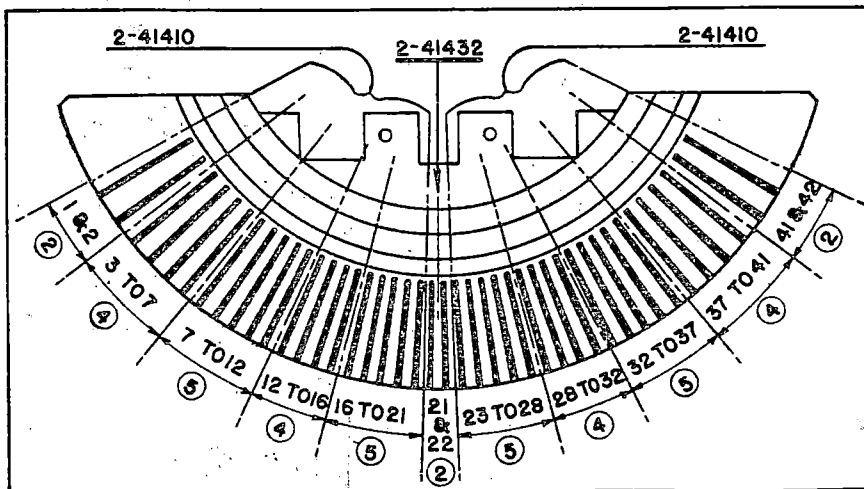
The tension of the following springs aid in the return of key lever and type bar connections to normal position:

- Key lever spring 2-40331
- Type bar bell crank spring 2-40338
- Escapement rocker spring 2-40300 (Escapement illustration)
- Type bar universal bar oscillator spring 2-42862 (Escapement illustration)

Test key levers to see that they move freely in the slots of key lever comb 2-41151. Check to see that the type bar bell crank link does not bind on stud "A" in the key lever 2-41222 and that the type bar link is of the proper form to prevent bind between the type bar bell crank 2-41622 and type bar 2-41783.

After key lever 2-41222 has been struck, the type bar 2-41783 should return to rest position at the type bar cushion 2-43943 without tension of the type bar universal bar or escapement rocker spring 2-40300. (Escapement illustration) Try each type bar for freedom of movement, if sluggish examine points mentioned in the above paragraph, and examine the slots in type bar segment 2-47050 and type bar bell crank bracket 2-43934 to see that they are clean and free of foreign substance.

There are 10 different kinds of type bar links as shown on illustration below:



## TYPE ACTION MECHANISM (Cont.)

Since there are ten different kinds of type bar links, it will be necessary to replace them in their original position after removing type bars and segment for cleaning. One method is to drill forty-two holes in a small board, numbering the holes consecutively from one to forty-two and as the type bar link is removed from the number one type bar, place it in the number one hole of board, etc. The left end of type bar fulcrum wire is copper plated and must be replaced correctly or alignment may be affected.

**CAUTION: DO NOT TIGHTEN FULCRUM WIRE RETAINER SCREWS 2-48010 UNLESS YOU ARE SURE THEY WILL CLEAR ENDS OF FULCRUM WIRE.**

Freedom of links are of the utmost importance, because they not only cause sluggish type bars but will also cause sluggish action to the type bar segment 2-47050 when the shift keys are allowed to restore slowly. Type bar links from sixteen to twenty-one and twenty-three to twenty-eight are both straight, so they should be interchangeable. Use light keystone grease sparingly in holes for connecting links at top of type bar bell cranks - apply type oil to rear ends of connecting links with camel hair brush using care not to get oil in slots of segment. Service Department order type bar links 2-40410 and form them for position to be used, 2-41432 are center links which are ground for clearance.

The type bar restorer 2-41412 is designed in case an operator has a colliding of type bars and they stick near the type bar guide 2-41799 the operator can restore them (without getting hands inky) by pressing downward on the type bar restorer key lever knob 2-42289, which is conveniently located in the upper left front corner of the front panel 2-46861 not shown.

This restorer makes it unnecessary for the operator to touch face of type.

The type bar restorer 2-41412 is supported by pivot screws 2-40057 which are located in the upper rear corner of the right and left ribbon spool brackets. The restorer is held to its forward position by the type bar restorer spring 2-40332 which is attached to the left end of the restorer. The front end of type bar restorer spring 2-40332 is attached to stud as illustrated.

Check restorer in its normal position to see that the front lower part does not limit against the ribbon drive shaft 2-46519 (ribbon drive illustration). The forward limit for type bar restorer is the lower rear edge of type bar restorer key lever 2-41413 at point marked XX on illustration.

## TOUCH REGULATOR

The touch regulator feature makes it possible for operators to adjust the key touch. If type bar bell crank spring tension lever knob 2-42289 is lowered it will cause the type bar bell crank spring anchor 2-43932 on which the type bar bell crank springs 2-40338 are attached, to move towards the rear, thus increasing the tension on the type bar bell crank spring 2-40338, which results in a snappier type bar and key lever action.

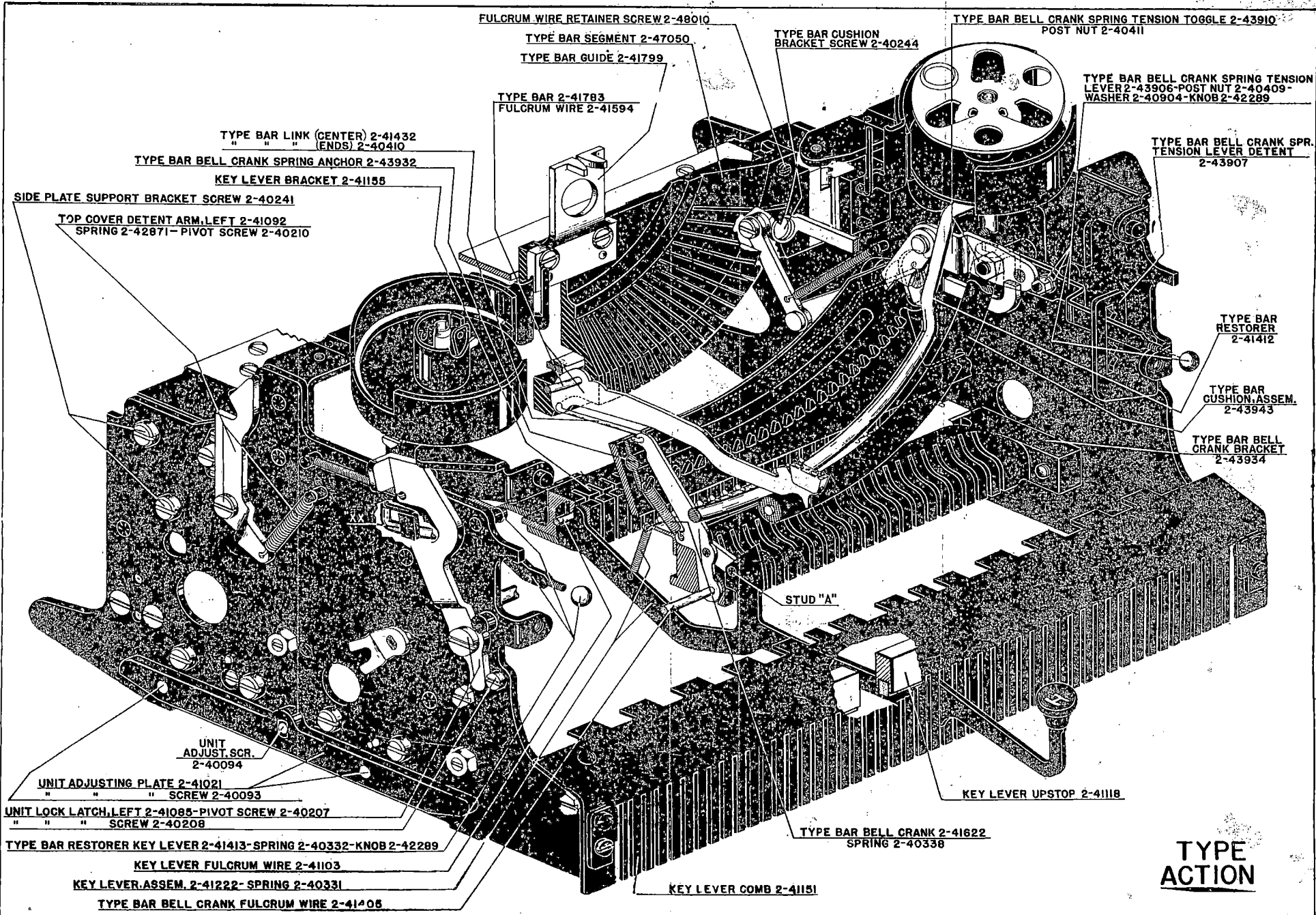
If the type bar bell crank spring tension lever knob 2-42289 which is conveniently located at the upper right corner of the front panel 2-46861 not shown is set to #1 position the key touch will be light but as it is lowered to 2, 3, 4, or 5th positions the key touch will increase slightly and result in a faster operating machine, as mentioned above.

The type bar bell crank spring tension lever 2-43906 must be formed to the right so that rib on same will engage securely the notches of type bar bell crank spring tension lever detent 2-43907.

TOUCH REGULATOR, Cont'd.

The type bar bell crank springs 2-40338 are all of the same tension.

Key levers should limit on up-stop 2-41118. Key lever springs 2-40331 are all of the same tension.



**TYPE ACTION**

## SHIFT MECHANISM

It is very important that in adjusting the shift mechanism to hold all pivot points and connecting adjustments to a minimum of end play, yet still be free in their movement. Any excess play will result in poor alignment and shift motion.

With typewriter unit out of base, check the shift lever shaft 2-41808 for end play between pivot screws, play to be removed from shift lever shaft by pivot screws 2-40002 after loosening the shift lever shaft pivot screw nut 2-40411. Tighten nuts securely after adjustment is completed.

Check the segment shift rocker 2-43800 for end play between its pivot screws. Excess play to be removed by its pivot screw 2-40002 after loosening the shift rocker pivot screw nut 2-40411. Tighten nut securely after adjustment is made. Replace typewriter unit in base.

Loosen the front and rear segment shift stop screw nuts 2-40410 and back out the two segment shift stop screws 2-40019 until they do not limit the movement of type bar segment 2-47050 when shifting.

We will assume that all adjustments of the shift mechanism are out except those mentioned above. It is important that the adjustments are made in order as listed below.

1. Adjust rear shift toggle lever stop screw 2-40163 until shift toggle link "E" and "F" are in a straight line as shown in illustration.
2. Adjust lower shift toggle lever eccentric "C" 2-41849 with large side to rear of machine until lower case letters are on feet top and bottom. Test by striking key lightly to see if type prints same density at both top and bottom.

NOTE: After adjusting lower eccentric "C" make sure that toggle links "E" and "F" are still in a straight line. If not adjust rear shift lever stop screw 2-40163 again. Links "E" and "F" must be straight to prevent segment from bouncing downward after using shift key and to keep segment locked in position.

3. Adjust rear segment shift stop screw 2-40019 until there is no noticeable up and down play in segment when in normal position. Test by trying to move segment up and down by holding to type guide.

NOTE: Do not run screw 2-40019 down any further than to take play out or segment and shift keys will bind and not return to normal position. Be sure to lock rear segment shift stop screw 2-40019 by its nut 2-40410 to retain adjustment.

4. Adjust the front shift toggle lever stop screw 2-40163 until toggle links "A" and "B" are in a straight line when shift keys are depressed. (Not locked by shift lock).
5. Adjust upper eccentric "D" until motion is obtained such as HhHhHhHh.
6. Adjust the front segment shift stop screw 2-40019 until there is no noticeable up and down play in segment when shift keys are depressed.

NOTE: Do not run screw 2-40019 in too far or there will be a bind in shift keys near bottom of their travel. It may be necessary if motion "HhHhH" is off slightly after adjustment #6 is made to go back and make adjustment #5 and then make adjustment #6 a second time.

Check carefully the two shift toggle lever eccentric screws 2-40133 to see that they are tight. If loose, the eccentrics will move, causing motion and "on feet" adjustments to be thrown out.

## SHIFT MECHANISM Cont'd.

The shift key levers right and left should now be adjusted for height. The correct position for them is determined by having shift key tops 1/16 inch above the lower bank of keytops. This adjustment is made by loosening the shift pull wire nut and adjusting the shift pull wire sleeve nut 2-40419 to rear to raise the shift keys or visa versa. After the correct height of shift keys is obtained, lock the shift pull wire sleeve in place with shift pull wire nut 2-40418.

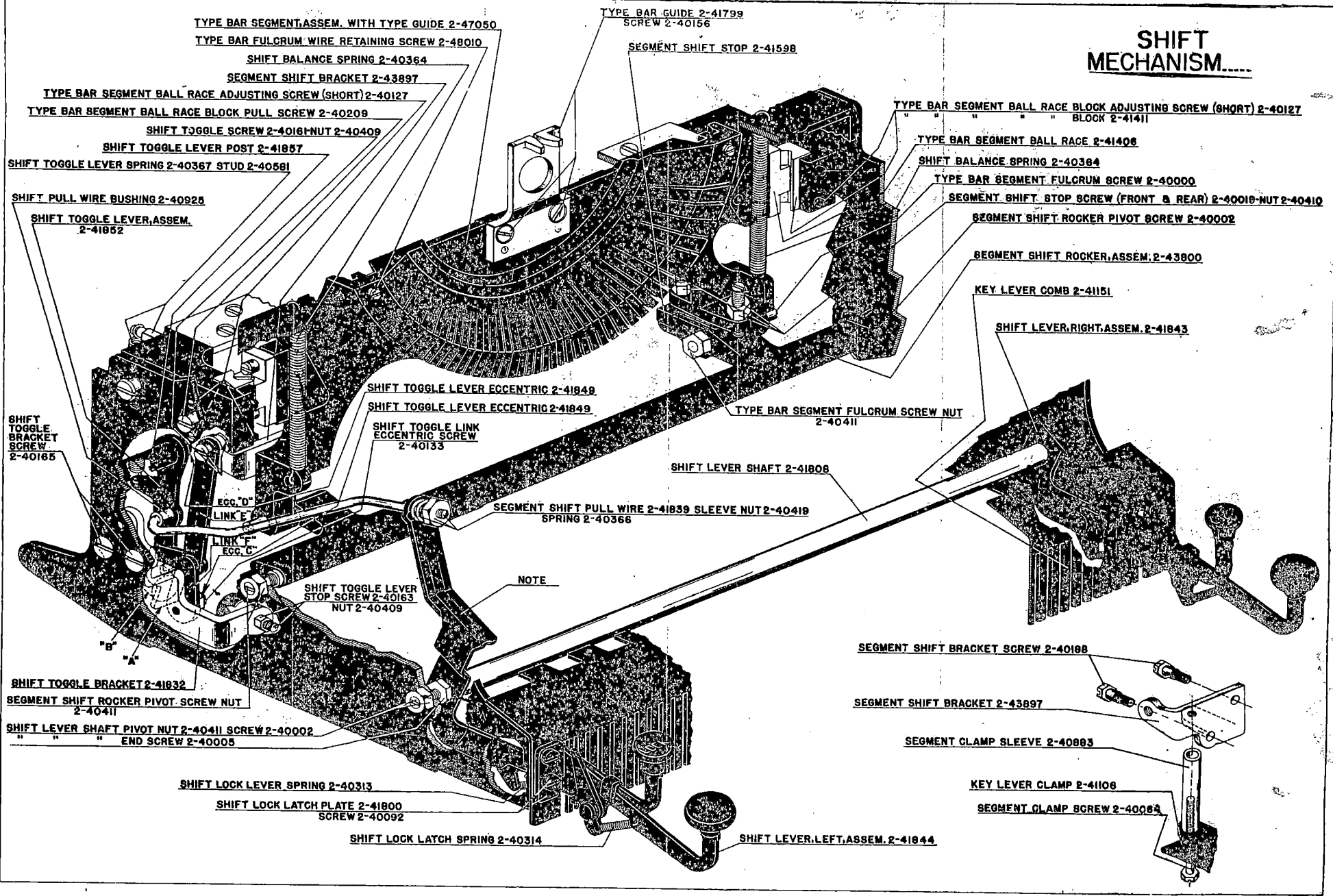
When the above adjustment is completed check the motion "HhHhHh" again and also try segment for being locked in upper position (Normal) as mentioned before. If motion is off or segment is not locked as it should be, check the left shift key lever at point marked "NOTE", as lever may be limiting on the tabulator key shaft if this is the case form the shift lever for clearance at "NOTE" position.

The shift lock latch plates 2-41800 right and left are mounted to the key lever comb 2-41151 with two mounting screws 2-40092 in each lock plate. The holes in these plates are elongated. The shift lock latch plates should be set low enough so there will be no variation in the motion of upper and lower case letters. To be tested by locking right and left shift key locks separately and striking off motion "HhHhHhHhHh".

Shift lock plates must also be set even. Make the test for this by locking both shift lock keys. Now release the locks by depressing the left shift key. The lock on the left should release first and the one on the right should release immediately after. Make this same test but release the locks by depressing the right shift key lever. Tighten the shift lock plate mounting screws 2-40092 after adjustments have been made.

The tension of the shift mechanism is controlled by the two shift balance springs 2-40364 which are hooked to the lower front part of the type bar segment 2-47050. The upper ends of these springs are attached to brackets as illustrated. The shift toggle lever spring 2-40367 helps to restore the shift mechanism and also holds the shift toggle lever 2-41852 in normal position to prevent rebounding of type bar segment 2-47050.

# SHIFT MECHANISM.....



TYPE BAR SEGMENT, ASSEM. WITH TYPE GUIDE 2-47050

TYPE BAR FULCRUM WIRE RETAINING SCREW 2-48010

SHIFT BALANCE SPRING 2-40364

SEGMENT SHIFT BRACKET 2-43897

TYPE BAR SEGMENT BALL RACE ADJUSTING SCREW (SHORT) 2-40127

TYPE BAR SEGMENT BALL RACE BLOCK PULL SCREW 2-40209

SHIFT TOGGLE SCREW 2-40161 NUT 2-40409

SHIFT TOGGLE LEVER POST 2-41857

SHIFT TOGGLE LEVER SPRING 2-40367 STUD 2-40581

SHIFT PULL WIRE BUSHING 2-40926

SHIFT TOGGLE LEVER, ASSEM. 2-41852

TYPE BAR GUIDE 2-41799  
SCREW 2-40156

SEGMENT SHIFT STOP 2-41598

TYPE BAR SEGMENT BALL RACE BLOCK ADJUSTING SCREW (SHORT) 2-40127  
BLOCK 2-41411

TYPE BAR SEGMENT BALL RACE 2-41408

SHIFT BALANCE SPRING 2-40364

TYPE BAR SEGMENT FULCRUM SCREW 2-40000

SEGMENT SHIFT STOP SCREW (FRONT & REAR) 2-40018 NUT 2-40410

SEGMENT SHIFT ROCKER PIVOT SCREW 2-40002

SEGMENT SHIFT ROCKER, ASSEM. 2-43800

KEY LEVER COMB 2-41151

SHIFT LEVER, RIGHT, ASSEM. 2-41843

SHIFT TOGGLE LEVER ECCENTRIC 2-41849

SHIFT TOGGLE LEVER ECCENTRIC 2-41849

SHIFT TOGGLE LINK  
ECCENTRIC SCREW  
2-40133

TYPE BAR SEGMENT FULCRUM SCREW NUT  
2-40411

SHIFT LEVER SHAFT 2-41808

SEGMENT SHIFT PULL WIRE 2-41839 SLEEVE NUT 2-40419  
SPRING 2-40366

SHIFT TOGGLE  
BRACKET  
SCREW  
2-40165

ECC. D  
LINK E  
LINK F  
ECC. C

SHIFT TOGGLE LEVER  
STOP SCREW 2-40163  
NUT 2-40409

NOTE

SHIFT TOGGLE BRACKET 2-41632

SEGMENT SHIFT ROCKER PIVOT SCREW NUT  
2-40411

SHIFT LEVER SHAFT PIVOT NUT 2-40411 SCREW 2-40002  
END SCREW 2-40005

SHIFT LOCK LEVER SPRING 2-40313

SHIFT LOCK LATCH PLATE 2-41800  
SCREW 2-40092

SHIFT LOCK LATCH SPRING 2-40314

SEGMENT SHIFT BRACKET SCREW 2-40188

SEGMENT SHIFT BRACKET 2-43897

SEGMENT CLAMP SLEEVE 2-40883

KEY LEVER CLAMP 2-41108

SEGMENT CLAMP SCREW 2-40063

SHIFT LEVER, LEFT, ASSEM. 2-41844

## ESCAPEMENT & TYPE BAR UNIVERSAL BAR

Loosen the screw 2-40114 for the escapement link lock arm 2-42605 at bottom of escapement rocker 2-42650. Remove nut 2-40411 and screw 2-40122 that holds escapement rocker bracket 2-42690 to frame. Take escapement rocker bracket 2-42690 from machine.

There are certain adjustments pertaining to this escapement which should be made when escapement mechanism is out of the machine. Remove one of the escapement rocker pivot screws 2-40164 and take out the escapement rocker 2-42650 complete. (Do not lose the escapement rocker spring 2-40300). Remove the escapement loose dog silencer stop screw 2-40081 and nut 2-40409 from the escapement rocker bracket 2-42690. Remove the escapement wheel 2-42755 by taking out the escapement wheel bearing screw 2-40189, nut 2-40411 and washer 2-40958.

On the rear side of the escapement wheel 2-42755 will be found the loose dog silencer 2-42623, silencer friction spring 2-42606 and friction spring collar 2-40919. The purpose of the loose dog silencer 2-42623 is to eliminate noise by holding the loose dog clear of the escapement wheel teeth as the carriage is being returned, therefore, only enough tension should be put on the silencer friction spring 2-42606 to obtain this result.

The correct tension can be obtained by loosening set screw 2-40115 and adjusting collar 2-40919, which is threaded. Care should be taken on this adjustment, if collar is screwed on too far it will slow down carriage speed and make carriage return heavy. After adjusting the collar make sure that rear side of collar does not extend beyond back edge of escapement wheel 2-42755, also see that set screw 2-40115 in collar is tight.

A small amount of typewriter oil should be placed on escapement wheel bearing screw 2-40189 before mounting escapement wheel to bracket.

Hold escapement wheel 2-42755 on to the escapement rocker bracket 2-42690 by escapement wheel bearing screw 2-40189, and hold its position by washer 2-40953 and nut 2-40411. Escapement wheel must be free to turn on screw but have no noticeable end play. Wheel should also run true.

Replace the loose dog silencer stop screw 2-40081, making sure that it is thru slot of loose dog silencer 2-42623 and not run in far enough to bind rear side of escapement wheel 2-42755. This clearance can be seen by turning the escapement wheel until hole is in line with the front end of loose dog silencer stop screw 2-40081.

The escapement loose dog carrying arm screw 2-40008 should be adjusted for minimum amount of play. Test the loose dog 2-42624 for moving freely in the loose dog guide 2-42630, both up and down and to the right or left, check the escapement loose dog spring 2-40326 for tension. The correct distance between the loose dog and fixed dog is from .043 to .045. This clearance will control the safety zone which will be mentioned later.

Replace the escapement rocker 2-42650 on the escapement rocker bracket 2-42690 and insert pivot screw 2-40164, remove all end play but have escapement rocker free between its pivot points. Insert the escapement rocker spring 2-40300. The escapement rocker spring adjusting screw 2-40101 head should be backed out until it is against the escapement rocker bracket 2-42690. If necessary this screw can be adjusted to put more tension on the escapement rocker. The lower escapement rocker stop screw 2-40100 should be adjusted until the front edge of loose dog is set .015 to .020 to the rear of front edge of escapement wheel tooth. At this point turn the escapement wheel and observe the amount of hold that the loose dog silencer 2-42623 has on rear edge of loose dog. If the loose dog is adjusted too far forward on the escapement wheel teeth the silencer will not be able to engage loose dog correctly, and also, type bars would pick up the escapement universal bar too soon, which affects the key touch.



## ESCAPEMENT & TYPE BAR UNIVERSAL BAR Cont'd.

Hold the escapement wheel 2-42755 against the loose dog, causing loose dog to limit against the escapement rocker and see that the face of the loose dog, where it contacts the teeth of the escapement wheel, are flush against each other. This condition is commonly known as 6 o'clock and is adjusted by moving the escapement rocker pivot screws 2-40164 to the right or left to get the desired results. After this condition is obtained check escapement rocker 2-42650 for free with no end play.

Replace the escapement mechanism complete on the machine, making sure that the hole in lower end of tabulator friction screw arm 2-42412 is placed (as shown in tabulator illustration) on the tabulator friction bail 2-42382. Hold downward on escapement bracket when tightening the escapement rocker bracket screw 2-40122 and nut 2-40411. Failing to do so may change depth of mesh of escapement wheel pinion with letter spacing rack. Place escapement link into position in escapement rocker, retaining it with escapement link lock arm 2-42605, by tightening its screw 2-40114. Push the "H" type bar to the ribbon, the escapement trip should take place as face of type touches ribbon. Adjust by loosening escapement link nut 2-40408 and adjust escapement link sleeve 2-42629 until desired result is obtained. Lock sleeve with nut.

After obtaining trip, hold type bar against cylinder and test lower part of escapement rocker for small additional movement forward. The upper escapement stop screw 2-40100 should not limit movement of escapement rocker 2-42650. Make this test for same condition with space bar depressed against its down stops. If not the same, check carefully the space bar adjustments and if rocker still limits against upper stop screw 2-40100, back it out slightly.

Next, test the escapement safety zone. Raise the "H" type bar slowly by hand until escapement trip takes place at the ribbon, then allow the type bar to restore to front of machine slowly, the second trip of escapement should occur when the face of the type is  $\frac{1}{2}$ " to  $\frac{9}{16}$ " away from the ribbon. This as mentioned before is controlled entirely by distance between loose dog and fixed dog which is .043 to .045. If the distance is more than  $\frac{9}{16}$ " there is danger of the operator piling one letter on top of another. If less than  $\frac{1}{2}$ " there is danger of skipping between letters. If the escapement loose dog carrying arm screw 2-40008 is too tight it will prevent loose dog from stepping to the left, thereby causing machine to pile letters occasionally.

The Pica (10 pitch) escapement has fifteen (15) teeth in the wheel and fifteen (15) teeth in the pinion. Being an even number of teeth in both members, the escapement can be removed and replaced without affecting the setting of the scales and racks.

The Elite (12 pitch) escapement has eighteen (18) teeth in the wheel and fifteen (15) teeth in the pinion. When it is found necessary to remove the escapement unit or carriage from an Elite machine, move the carriage to the left until right carriage end casting limits against carriage end stop screw 2-40290, then mark the escapement wheel so that when the unit is replaced the teeth in the pinion will go into mesh with the teeth in the carriage feed rack in the same position as they were before escapement or carriage was removed from the machine. If the teeth are not positioned as stated it will be found necessary to re-set the margin stop rack, carriage scales and tabulator rack.

### REMINGTON MODEL 17 WITH E, F AND G CARRIAGES ELITE TYPE

#### Setting of Escapement on Machines above J-29000

The above listed machines are sent to the field with the carriages off due to their extreme length and added weight. The factory has received complaints from the field stating that after placing carriages on the machines it was found necessary to readjust the margin stop rack, tabulator drop, tabulator set bracket, etc. To overcome these complaints, place the carriages on the machines and remove the escapement complete.

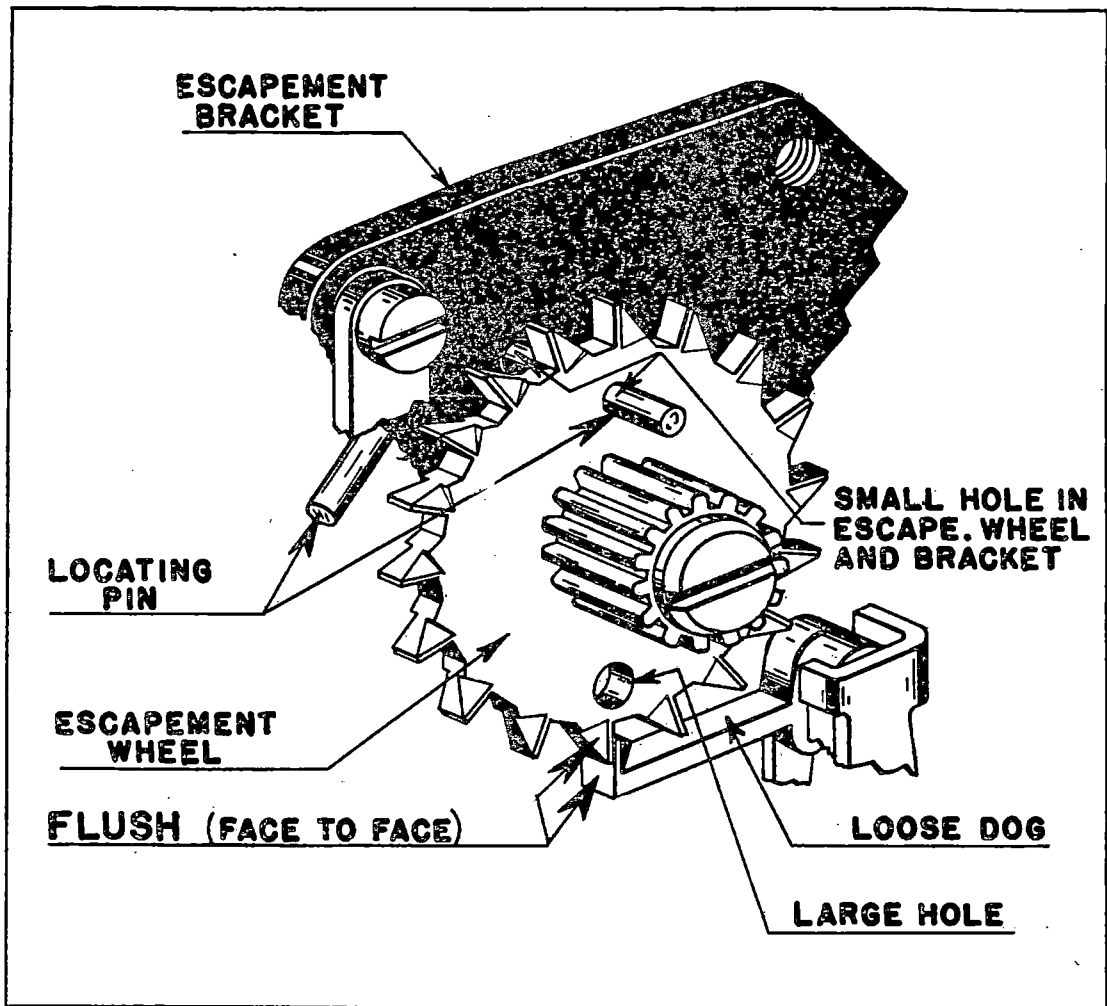
## ESCAPEMENT & TYPE BAR UNIVERSAL BAR Cont'd.

There are two holes in the escapement wheel and when the escapement rocker body is set for 6 o'clock position the tooth on the escapement wheel directly below the largest of the two holes is placed against the loose dog. While holding this tooth firmly against the loose dog, the rocker body is set to the right or left until the face of the tooth on escapement wheel and face of loose dog are flush with each other. When checking for this condition, care must be taken to see that the small hole of the escapement wheel is in direct line with the small hole in escapement bracket. It must be close enough so that a locating pin (which can be made from a finishing nail about 3/32" diameter or any round stock that is .098 to .100 in diameter) can be inserted through the escapement bracket hole and on into the hole of escapement wheel. It should be inserted until it is flush with the front edge of the escapement wheel. In the illustration it protrudes in order to see it more clearly.

Leave the locating pin in the holes as just explained. Hold down on the margin release key and push the carriage to the left (looking at machine from rear) until the carriage end plate limits against its limit screw. Hold the carriage against this screw and insert the escapement to position at rear of machine. After the escapement has been mounted remove the locating pin and check the scale at front of machine. It should be at "0" position on the scale unless the rocker body was operated while putting the escapement into place. If so return the carriage to "0" position on scale and see that the holes for locating pin line up.

The reason for the pin is to definitely hold the escapement wheel at a fixed position so that the proper tooth of the pinion will mesh up with the proper tooth of the letter spacing rack. This in turn will bring the machine back to the original factory settings.

The adjustments listed above are followed by the factory on all length carriages of both Pica and Elite machines. On the Pica escapement wheels there are 15 teeth on the escapement wheel and 15 teeth on the pinion. On Elite machines there are 15 teeth on the pinion and 18 teeth on the escapement wheel. This is why we have to watch the settings on the Elite machines because it is impossible to have the same relationship between the teeth on the pinion and the teeth on the escapement wheel all the way around.



#### TYPE BAR UNIVERSAL BAR

With all the escapement adjustments made, we will now test the machine, to see if the type bar universal bar 2-41647 is correctly adjusted.

We will assume that the type bar universal bar oscillator bracket screws 2-40128 are tight, also that the adjusting plate pivot screws 2-40004 and adjusting plate screws 2-40133 are tight and that the universal bar oscillator pivot screws 2-40060 have been adjusted for free but no end play in the type bar universal bar oscillator 2-41428, and adjusted in such a position that the type bar universal bar guide stud will be free in guide hole of type bar segment. The type bar universal bar oscillator spring 2-42862 gives the oscillator sufficient tension to hold the type bar universal bar to its forward position.

To test, raise the type bar "H" and see that the escapement takes place as face of type touches ribbon, (as previously instructed). This being correct we will raise by hand type bars #1 and #42, to see that the escapement takes place as face of type touches ribbon. If all three type bars escape at the ribbon the universal bar is correctly adjusted.

TYPE BAR UNIVERSAL BAR Cont'd.

Example #1: We will assume that the escapement on the "H" type bar is correct, but on the #1 type bar the escapement takes place 1/8" before it touches the ribbon. It will be necessary in this case to loosen the adjusting plate screw 2-40133 and locate the left adjusting plate 2-43945 to the rear slightly; this will make the escapement on the #1 type bar closer to the ribbon. After locating the left adjusting plate, always check the #42 type bar.

When moving the left adjusting plate to the rear the escapement on the #42 type bar will occur a little sooner than it did before, likewise, if the left adjusting plate had been moved forward to make the escapement on the #1 type bar escape sooner, it would have caused the escapement on the #42 type bar to escape later. Adjusting plates 2-43945 are provided at both ends of the type bar universal bar oscillator bracket 2-43944 and if the escapement on the #42 type bar is not taking place at the ribbon after locating the left adjusting plate we will follow the same procedure in locating the right adjusting plate 2-43945.

Example #2: We will assume that the escapement on type bars #1 and #42 are escaping at the ribbon and that the center type bar "H" is escaping too late. This condition can be corrected by slightly loosening the two type bar universal bar oscillator bracket screws 2-40128 (typewriter unit out of base) and moving downward slightly the type bar universal bar oscillator bracket.

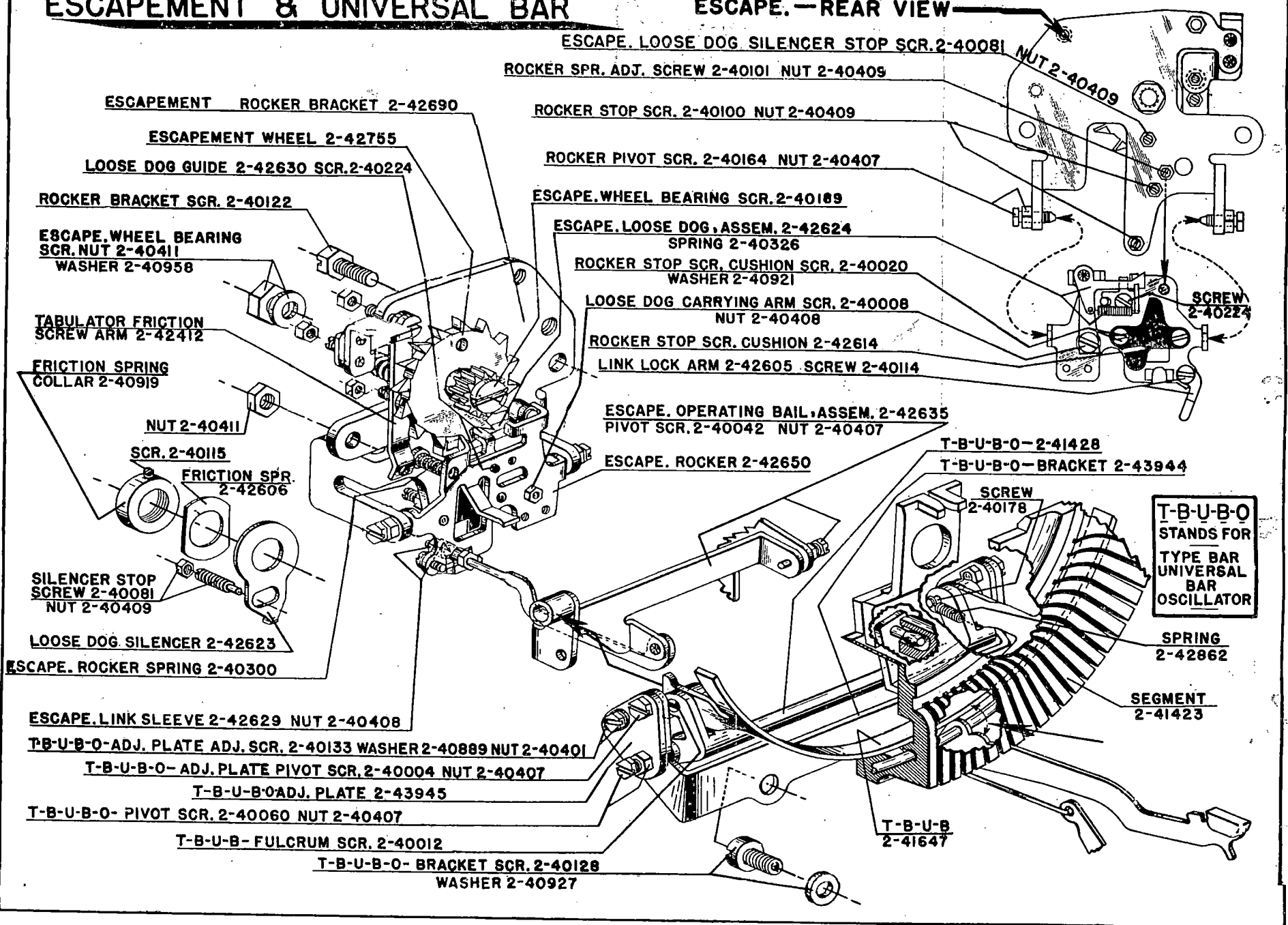
The holes in the type bar universal bar oscillator bracket 2-43944 are over-sized for their bracket mounting screws 2-40128, which makes it possible to locate this bracket either up or down. Moving the bracket down will cause the escapement on the center type bars to occur sooner and at the same time the escapement on the end type bars #1 and #42 will take place later, therefore, a very slight movement of the oscillator bracket 2-43944 is necessary. If the escapement on the center type bar was taking place before the end type bars, it would have been necessary to move the type bar universal bar oscillator bracket up instead of down.

The type bar universal bar will have to be checked for proper adjustment with the typewriter unit in the base, but in case the unit is removed from the base for convenience of adjusting the universal bar, it is well to hold the type bar "H" against the anvil on the segment and while holding it in this position make a mark on the type bar universal bar guide stud and then hold type bars #1 and #42 against the anvil to see that they throw the guide stud the same distance, which can be determined by referring to the mark on the guide stud. As stated before, the type bar universal bar would have to be checked for proper adjustment with the typewriter unit in the base.

Inasmuch as the type bar segment can be removed and washed without disturbing the universal bar, it should seldom need adjusting.

# ESCAPEMENT & UNIVERSAL BAR

## ESCAPE.—REAR VIEW



## TABULATOR MECHANISM

The depressing of the tabulator key bar 2-42415, through connecting link 2-42440 causes the rear end of tabulator bell crank 2-42414 (left) to move upward. The tabulator bell crank adjusting screw 2-40118 contacts the bottom of the tabulator stop blade 2-42501, and as the tabulator blade moves upward it carries the tabulator friction bail 2-42382, which transmits a downward movement to lip "B" on the escapement loose dog release 2-46530, which lowers the escapement loose dog 2-42624 out of the escapement wheel 2-42755, permitting the carriage to tabulate until tabulator stop 2-47500 (which is depressed) limits against the top of tabulator stop blade 2-42401, stopping the carriage.

When the tabulator bar is released the escapement loose dog 2-42624 is allowed to re-store into the escapement wheel 2-42755, before the tabulator stop blade 2-42501 clears the tabulator stop, thus preventing the carriage from tabulating further.

The speed of the carriage on tabulation is controlled by friction type brake. The tabulator friction screw arm 2-42412 has a brass friction screw 2-40044 in it, near the center, with the flat headed portion of the screw facing rear side of escapement wheel. The movement of the friction screw arm is controlled by the tabulator friction bail 2-42382, as shown on illustration. The amount of brake or friction is controlled by the tabulator friction spring 2-42867 and friction spring screw 2-40101.

When the tabulator set key 2-42359 is operated the tabulator stop directly above the clear key will be depressed, therefore, it may be cleared out again in case of error by depressing the tabulator clear key 2-42360.

The tabulator stops may be restored by depressing the clear key and moving the carriage to the right.

## ADJUSTMENTS

The tabulator key bar 2-42415, (or tabulator keys on ten key machine) tabulator clear key 2-42360 and tabulator set key 2-42359 limit against the tabulator key upstop 2-43021.

When the above keys are in position as described, adjust the screw 2-40118 in the tabulator bell cranks (right 2-42413 and left 2-42414) until the screws just clear the tabulator stop clear blade 2-42431, tabulator stop blade 2-42501 and tabulator stop set blade 2-42356. When the tabulator key bar 2-42415 or tabulator stop clear key are depressed the tabulator blades limit at point "X", shown on illustration. Tabulator key bar 2-42415 or tabulator clear key 2-42360 are depressed separately, the tops of the tabulator stop blade 2-42501 and the tabulator stop clear blade 2-42431 should clear stops in tabulator stop rack 2-47631 about 1/32".

If this condition does not exist and tabulator blades are limiting at point "X" shown on illustration; then loosen the two tabulator stop rack mounting screws 2-40016 and hold tabulator stop rack up to position and tighten screws. Depress set key 2-42359 and set up a continuous number of tabulator stops 2-47500 in tabulator rack. Depress the tabulator key bar 2-42415 slowly and observe whether the tabulator stop blade 2-42501 comes up centrally between two tabulator stops 2-47500. This adjustment is obtained by loosening the two tabulator rack mounting screws 2-40016 and screwing in or out of the tabulator stop rack adjusting screw 2-40088. Be sure that the right end of tabulator stop rack is against this adjusting screw and that the two tabulator stop rack screws 2-40016 are tight and lock nut for adjusting screw 2-40088 is set when adjustment is completed.

After locating the tabulator stop rack 2-47631, we will set the tabulator stop set arm bracket 2-45475. Lip "A" on top of the tabulator set arm bracket must contact the tops of tabulator stops 2-47500 centrally, and should not set up more than one stop at a time. To adjust, loosen the two tabulator set arm bracket screws 2-40159 and locate set bracket to right or left as desired. Tighten the two tabulator set arm bracket

## ADJUSTMENTS Cont'd.

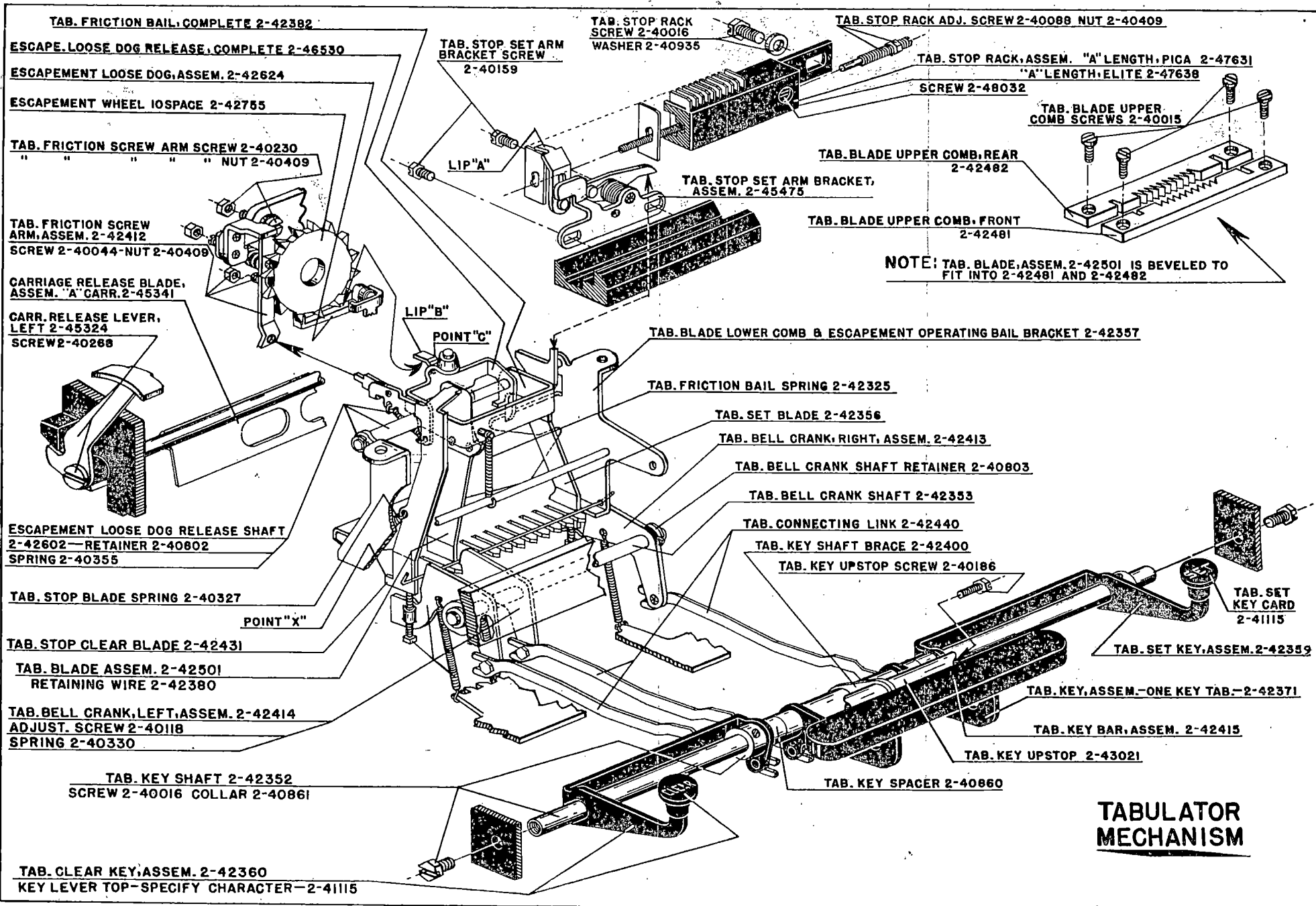
screws 2-40159.

When tabulator set key is operated and tabulator stop set blade limits at point "X" but the tabulator stops are not fully depressed, it indicates that lip "A" should be formed down slightly. Do not form lip "A" too low as it may rub on the tops of tabulator stops.

Tabulator key bar 2-42415 depressed, loose dog 2-42624 should clear escapement wheel, adjust by forming loose dog release 2-46530 at point "C". Lip "B" on escapement loose dog release should not limit and prevent loose dog 2-42624 from coming to correct height.

Adjust tabulator friction arm support mounting screw 2-40230 and brass friction screw 2-40044, so that head of brass friction screw will contact rear side of escapement wheel flush when tabulator bar 2-42415 is depressed. Tabulator friction bail 2-42382 when in normal position must hold brass friction screw clear of escapement wheel. Adjust by forming the lower end of tabulator friction screw arm 2-42412 toward front of machine. Brass friction screw must clear the escapement wheel 2-42755 slightly, otherwise it would cause a sluggish moving carriage when operator is typing. If brass friction screw clears escapement wheel too much, it may not move forward and engage escapement wheel when tabulating.

In case tabulator stop blade hangs on tabulator stop 2-47500 and does not restore, loosen nut 2-40409 on tabulator friction arm support screw 2-40230 and back screw toward front of machine slightly - this will relieve pressure and allow tabulator blade to restore. Lock nut 2-40409 after adjustment is completed and check tabulator brake adjustments.



**TABULATOR MECHANISM**



## MARGIN RELEASE, LINE LOCK AND BELL MECHANISM

Assuming that the letter spacing rack 2-45968 has been adjusted for proper depth of mesh with the escapement wheel pinion (refer to carriage adjustments) and that the escapement rocker has been set for 6 o'clock position (refer to escapement adjustments). Set the margin stop 2-45823 for left margin at 10, return the carriage to the right until margin stop lever limits against the margin stop.

When the carriage is at the left margin, there should be a distance of .060 between the margin stop 2-45823 and the margin stop lever, too much clearance between these parts at the margin will result in the carriage "banking over" or going one space beyond the margin, as set. To adjust, shorten the distance between the margin stop and the margin stop lever by loosening lock nut 2-40465 and backing out on the left margin stop rack pivot screw 2-40259 and loosening lock nut 2-40465 for the right margin stop rack pivot screw and run it in to remove end play.

Margin stop rack 2-46107 must be free to pivot on these screws but without end play. Lock nuts 2-40465 to be tight when adjustment is completed. If there is not enough distance between the margin stop 2-45823 and the margin stop lever the result would be irregular margin, also it would not be possible to back space into the first space of left margin. In this case we would adjust the margin stop rack 2-46107 to the right by its pivot screws.

Move the carriage until 20 on the carriage scale 2-46100 is in line with the indicator on type guide. At this point press to the right the margin stop lever until it limits on its bracket, while holding it in this position, see that the line lock trip bail 2-45153 just clears its stop screw 2-40172 slightly. Line lock trip bail must be free on its pivot screws 2-40248. Loosen nut 2-40409 for the line lock bell crank throw in lever screw 2-40153 and back this screw out 5 or 6 turns. Loosen nut 2-40409 on the line lock bell crank eccentric 2-42714 and adjust this eccentric until it will hold the line lock trip bail 2-45153 to its highest position and hold the eccentric to this adjustment by its lock nut 2-40409; next set the margin stop 2-45821 at 75 and adjust margin stop rack pull link eccentric 2-42714 until the bell rings only once.

If the bell rings twice it indicates that point "A" on margin stop is setting too high, therefore the margin stop rack eccentric 2-42714 will have to be adjusted with the large side further to the top, if the eccentric is all the way to the top and the margin stop is not low enough it will be necessary to form the margin stop rack link bracket 2-45832 slightly lower.

After adjusting the margin stop rack for the bell to ring correctly, adjust the line lock bell crank throw in lever screw 2-40153 until it will cause the line lock universal bar 2-42706 to lock all of the key levers, and space bar at 5 or 6 spaces (elite will have 7 or 8) after the bell rings. After this adjustment is made, be sure that the nut 2-40409 on the line lock bell crank throw in lever screw 2-40153 is tight. The line lock universal bar 2-42706 must be free on its pivot screws 2-40023. The lip on the bottom of the line lock universal bar will normally clear the key levers as they are depressed 1/16". This clearance is controlled by the line lock universal bar pull wire sleeve 2-40420 and nut 2-40408. If trouble is experienced in adjusting bell and line lock, check the following: Line lock trip bail 2-45153 must be level and the tension of bell ringer toggle spring 2-40362 and margin stop lever return spring 2-40398 are important.

When the margin stop lever is to the right of the margin stop 2-45823, (i. e. making notations outside of the left margin) as the margin stop lever engages the bevel on the underside of the margin stop 2-45823 the margin stop lever should not yield to the right far enough to cause the line lock universal bar to lock the key levers or ring the bell. The above condition can be obtained by stoning off any burrs from that part of the margin stop lever that engages the margin stop, also remove the margin stop and buff the underside of it to a smooth finish. If after doing this you have still not accomplished the desired results it is then a matter of balancing up the spring tension of the margin stop lever return spring 2-40398 and margin release bell crank spring 2-40363. If margin release bell crank spring 2-40363 is too weak it will permit uneven margins due to the margin stop rack vibrating upward when carriage is slammed back against it.



## PLATEN ROLL, LINE SPACE MECHANISM

In case of trouble with the variable line space mechanism, see that the parts of the mechanism are lubricated and that the variable line space clutch dogs 2-45093 do not stick in their slots. Also see that the variable line space clutch dog springs 2-42866 are in good condition and functioning properly.

The variable line space clutch dog cams 2-45069 should be free in their movement and under good spring tension, also see that the teeth of the variable line space ratchet (2-45040-30 tooth) are in good shape and not worn.

When adjusting the line space mechanism, see that there is no over throw or under throw of the Platen Roll after the line space has been completed. To prevent this condition the position of the roll on the line space ratchet detent arm (30-tooth ratchet) 2-45126 is correct when the roll is setting between two teeth of the ratchet 2-45040 at the time that the line space lever 2-45137 has reached its full travel to the right and the line space pawl is limiting on the variable line space ratchet 2-45040.

Adjustment is made with the ratchet detent arm bearing eccentric 2-40993 on which the line space ratchet detent arm 2-45126 is mounted. Tighten the line space ratchet detent arm bearing screw 2-40294 when the adjustment has been properly made.

The pressure of the roll on the line space ratchet detent arm 2-45126 against the variable line space ratchet 2-45040 can be adjusted by the line space detent spring anchor eccentric 2-40994 which will locate the line space detent spring anchor plate 2-45125 to front or rear until the desired pressure is obtained.

Platen roll to turn freely with no noticeable end play, end play is controlled by the right platen thumb wheel 2-45057 which is locked to position by platen thumb wheel locking screw 2-45054 after adjustment is made.

When the left platen thumb wheel 2-43359 is tight, the variable line space knob 2-43357 must have end play, test with the variable set in various positions. No end play in this part would indicate that the left ends of the variable line space clutch dog cams 2-45069 are limiting on right end of variable line space plunger 2-43356 which would not permit the variable line space clutch dog cams 2-45069 to force the variable line space clutch dogs 2-45093 into the ratchet teeth securely, which is necessary to obtain even spacing between lines.

LINE SPACE GAUGE, 30 TOOTH RATCHET 2-45128  
SCREW 2-40205

PLATEN LOCK ADJ. SCREW 2-40265  
NUT 2-40466

PLATEN LOCK, ASSEM.  
RT. 2-45468 LEFT 2-45467

SCR., LEFT  
2-40262

SCR. 2-40272

LINE SPACE REGULATOR DETENT 2-45127  
SPACER WASHER 2-40996 SPR. 2-40391

KNOB 2-43357

PLUNGER SPR. 2-42874

PLATEN THUMB WHEEL, LEFT, ASSEM. 2-43359

PLUNGER 2-43358

PLATEN ROLL 2-43646 "A" GRADE No. 2  
SEE PARTS CATALOGUE

LINE SPACE REGULATOR, 30 TOOTH - 2-45133  
SCREW 2-40252

LINE SPACE PAWL SPR. 2-40391

LINE SPACE PAWL ARM, ASSEM. 2-45138 BEARING SCR. 2-40291  
SPRING 2-40390 NUT 2-40428 WASHER 2-40904

LINE SPACE LINK SCR. 2-40253 NUT 2-40421

LINE SPACE LEVER 2-45137 SCR. 2-40269 NUT 2-40422 WASHER 2-40933

VARIABLE LINE SPACE CLUTCH DOG CAM 2-45089 SPR. 2-42866

VARIABLE LINE SPACE CLUTCH DOG 2-45093 SPR. 2-40384

COVER 2-45036 SCR. 2-40071

VARIABLE LINE SPACE  
RATCHET 30 TOOTH 2-45040

PLATEN ROLL BUSHING, LEFT, 2-40986  
SPR., LEFT 2-40324

PLATEN THUMB WHEEL, RIGHT,  
ASSEM. 2-45057  
LOCKING SCR. 2-45054

PLATEN ROLL BUSHING, RIGHT, 2-40986 SPR., RIGHT, 2-40303

LINE SPACE RATCHET DETENT RELEASE LEVER 2-45131 SPR. WASHER 2-40997

PLATEN LOCK LEVER BEARING SCR., LEFT 2-40262

LINE SPACE RATCHET  
DETENT SPR. ANCHOR  
2-45126

LINE SPACE DETENT SPR. ANCHOR SCR  
2-40167

ECCENTRIC 2-40994  
SCR. 2-40166

TO RATCHET  
DETENT ARM  
SPRING 2-40392

PAPER BAIL ARM SPR. 2-40371 A, B, & C

TO LINE SPACE  
PAWL ARM  
SPR. 2-40390

## PLATEN & LINE SPACE MECHANISM

## REMOVING CARRIAGE COMPLETE--METHOD #1

Remove rear panel 2-41089. Unhook carriage tape 2-42033 by loosening its screw 2-40267 and attach to carriage tape screw 2-40119 in machine frame. Take out upper margin stop rack pull link screw 2-40177 and nut 2-40408 (margin release illustration). Note: When it is known that carriage only is to be removed, always take out the upper margin stop rack pull link screw 2-40177 and nut 2-40408, as this makes it unnecessary to adjust the eccentric screw 2-42714 at the lower end of the margin stop rack pull link 2-45831.

CAUTION: Make a mark (pencil mark will do) on the typewriter frame at the bottom of the front carriage rail on each side. The purpose of this mark is to facilitate the relocating of carriage to its proper position, which is determined by cylinder and anvil position.

Move carriage to the right, take out screw 2-40043 holding the adjusting eccentric 2-44516 and carriage rail to the left side of the typewriter frame; also remove carriage rail mounting screw 2-40155. Move carriage to the left and repeat this operation on the right side of carriage rail. Lift the carriage complete, as a unit from the machine. Note if there are any shims between bottom of carriage rails and top of typewriter frame.

Remove carriage from carriage rails as follows:

Take off tabulator stop set arm bracket 2-45475 (tabulator illustration) by removing two screws 2-40159. Take out the two carriage end stop screws 2-40290 and slide the carriage complete out of the carriage rails to the right. Remove one margin stop rack support pivot screw 2-40259 and nut 2-40465 (margin release illustration) and remove margin stop rack 2-46107.

Replace carriage to carriage rails as follows:

From the right side, slide carriage into central position on rails (carriage trucks 2-45371 out). Put in both carriage end stop screws 2-40290. With the carriage set at the extreme left side, with right carriage end casting limiting against its stop screw 2-40290, insert the lower front carriage truck 2-45371 from left end of carriage and see that the roll on left end of truck is just inside of carriage rails. Next, with upper carriage truck rack screws 2-40185 loose, insert the upper rear carriage truck to its position. Without moving the carriage, look at both (right and left) ends of carriage truck rolls to see that they are within the carriage rails, if so, tighten screws in carriage truck rack 2-45420.

Note: It has been customary to move the carriage from one end of the writing line to the other and observe if the carriage trucks are centrally located. However, it does not apply to the Model 17 carriage. Replace the tabulator stop set arm bracket 2-45475 (tabulator illustration). The holes of this bracket are elongated; its location cannot be determined at this time.

Attach the carriage with carriage rails to the machine; set the carriage rails to the pencil mark previously made and put in the two carriage rear mounting screws 2-40155, holding carriage rails to the typewriter frame. Drop the carriage rail eccentrics 2-44516 in their slots of carriage rails, turn these eccentrics until the screw hole in base lines up with the hole in the eccentric and put screws 2-40043 in these eccentrics to hold them in place.

The correct location of the carriage can be determined as follows: In making this test have one sheet of paper in the carriage, press down firmly on the key lever, placing strip of paper between the type bar and anvil and note the pressure of type bar holding strip of paper. Release the type bar and place strip of paper between the ribbon and paper in carriage, then depress the key lever firmly and note the amount of bite or hold that the face of type has at this point. 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 the carriage rear mounting screws 2-40155 and also the carriage rail eccentric screws

## REMOVING CARRIAGE COMPLETE--METHOD #1, Cont'd.

2-40043 and adjust the eccentrics 2-44516 until the carriage does have cylinder and anvil position, as described. Adjust both sides of the carriage to the front or rear simultaneously, keeping the carriage rails parallel with the type bar segment.

**CAUTION:** If the machine is to do neat work it is imperative that the cylinder and anvil position is adjusted correctly. If the carriage is located too far to the rear it will result in light print work and poor carbon copies, if the carriage is too far to the front the result will be blurred print work.

After the carriage has been properly located for cylinder and anvil position, replace the margin stop rack 2-46107, pivot screw 2-40259 and nut 2-40465, margin stop rack to be free on pivot screws with no end play, replace the upper margin stop rack link screw 2-40177 and nut 2-40408. (Margin Release Illustration)

Have carriage centrally located and hold forward on paper table, and while in this position depress the set key and look down in front of the margin stop lever bracket 2-45848, (margin release illustration) and observe whether lip "A" of the tabulator stop set arm bracket 2-45475 is striking centrally on tabulator stops 2-47500 (tabulator illustration). If not, the tabulator stop set arm bracket can be moved to the right or left, since the holes for the bracket mounting screws are elongated. Be sure the tabulator stop set arm bracket screws 2-40159 are tight after adjustment is made.

If the carriage has play between the carriage rails this condition can be corrected by loosening the four upper rear carriage rail screws 2-40250. The holes for these screws are over sized and rear carriage rail 2-45379 may be moved toward the front rail until the play is removed, the screws 2-40250 can then be tightened. After adjusting the rear carriage rail 2-45379 to remove play, see that the carriage runs free full length of writing line without play or binds. Note: If the rear carriage rail was loosened up very much the carriage trucks 2-45371 may be out of position. To test, move carriage to the left until the right carriage end casting limits against the carriage end stop screw 2-40290 and while in this position look at both the right and left ends of the carriage trucks 2-45371 to see that both ends are inside carriage rails.

## REMOVING TABULATOR STOPS AND TABULATOR STOP RACK

By having the carriage to the right or left side, the tabulator stops 2-47500 (tabulator illustration) can be removed or replaced from the bottom of tabulator stop rack 2-47631, except a few in center of rack. The tabulator stop rack 2-47631 can be removed from carriage as follows: First depress clear key and restore all tabulator stops 2-47500, then take out the right tabulator stop rack screw 2-40016 and washer 2-40935. Move carriage to left as far as it will go and remove the left tabulator stop rack screw 2-40016 and washer 2-40935 -- lower left end of tabulator stop rack clear of left carriage end casting and take out.

Reverse the procedure in replacing tabulator stop rack 2-47631, making sure that right end is against the tabulator stop rack adjusting screw 2-40088 -- for adjustment of this screw refer to tabulator instructions.

## PLATEN

Release the right platen lock 2-45468 and left platen lock 2-45467 and lift platen complete 2-43646 out of carriage.

Remove paper trough 2-45639 by lifting its studs clear of the paper trough support brackets.

Lift out rear paper feed roll 2-46483 and front paper feed roll 2-46482.

## PLATEN, Cont'd.

Remove paper feed roll release shaft 2-45211 by loosening set screw 2-40110 in collar 2-40911 and remove collar. Have feed roll release lever 2-45200 in released position and pull feed roll release shaft 2-45211 out to the right. Replace this shaft and hold in position by its collar 2-40911. Make sure feed roll release lever link is over stud in feed roll release shaft 2-45211.

Take off the margin stop lever bracket 2-45848 (margin release illustration) by taking out the margin stop lever bracket screw (right) 2-40175 and margin stop lever spring screw (left) 2-40261. Do not lose the margin stop lever return spring 2-40398. Replace this bracket and hook up the margin stop lever spring 2-40398.

### REMOVING AND REPLACING OF PAPER TABLE COMPLETE

With paper feed roll release lever 2-45200 forward and right carriage release lever depressed, take out the upper right paper table support screw 2-40079. Lift up on right paper table support 2-45560 and remove paper table complete with aprings attached. Do not lose end play washers 2-40936 (if any) on the paper table pivot bearings.

After replacing paper table, place loose ends of paper table springs in back of the lip on upper ends of the right and left paper table supports. Make sure that screws 2-40137, holding left paper table support 2-45559, are tight -- when writing on machine check all points of paper table for noise.

### REMOVE PAPER SCALE (BAIL)

Remove four screws 2-40170, two in each of the right and left paper scale arm shaft brackets (right 2-46265 and left 2-46264). Remove these brackets. Remove both paper scale arm springs 2-40371. Take out paper scale arm detent screw 2-40285. Remove the right carriage scale screw 2-40280 and work the paper scale arm shaft assembled 2-46266 upward and out of carriage. (Note both screws could be removed from the carriage scale but this would make it necessary to readjust it). Replace the paper scale (bail) by reversing these instructions. Paper fingers may be put on in place of bail when requested. Paper fingers and bail both cannot be used.

Replace front paper feed roll 2-46482.

Replace rear paper feed roll 2-46483.

Make sure that feed rolls turn freely on shaft.

Replace the paper trough 2-45639.

## CARRIAGE REMOVAL--METHOD #2

Remove rear panel 2-41089. Unhook carriage tape 2-42033 and hook it to carriage tape screw 2-40119. Loosen left margin stop rack pivot screw nut 2-40465 and take out margin stop rack pivot screw 2-40259. Drop margin stop rack 2-46107 back out of the way. Remove the two carriage end stop screws 2-40290 and also remove rear carriage rail 2-45379 by taking out the four carriage rail screws 2-40250. Slide carriage to left end of writing line (viewed from rear) and remove carriage from carriage bed rails, being careful not to bend lip "A" of the tabulator stop set bracket 2-45475.

### TO REPLACE CARRIAGE

With carriage roll retainers 2-45371 out of rails, set the carriage into rails, making sure that lip "A" on the stop set arm bracket 2-45475 (tabulator illustration) is directly over tabulator stops 2-47500 on stop rack and that carriage front rail is positioned under the lower carriage rail cover 2-45433.

Replace upper carriage rail, leaving the four carriage rail screws 2-40250 loose, and place end stop screws 2-40290 in their positions.

Move carriage to extreme right (viewed from rear) until right carriage end casting limits against carriage end stop screw 2-40290, and insert front carriage roll retainer 2-45371 between carriage rails until both ends of carriage roll retainer are inside rails. Before replacing rear upper carriage roll retainer, loosen the screws 2-40185 in carriage roll retainer rack 2-45348. Replace upper carriage roll retainer 2-45371 with both ends inside of carriage rail.

Tighten the carriage roll retainer rack screws 2-40185.

Set carriage with right carriage end casting limiting against stop screw 2-40290. With light pressure downward on left end of rear carriage rail 2-45379, tighten left carriage rail screw 2-40250.

Set carriage with left carriage end casting limiting against its stop screw 2-40290. With light pressure downward on right end of rear carriage rail 2-45379 tighten right carriage rail screw 2-40250. Carriage still in this position, use light pressure downward on center of rear carriage rail 2-45379 and tighten the two center rear carriage rail mounting screws 2-40250.

Test carriage for free full length of writing line with no play or binds allowed. When in doubt about free running carriage remove escapement complete and test.

Replace margin stop rack 2-46107 pivot screw 2-40259 and lock nut 2-40465. No end play allowed in margin stop rack but must be free to pivot on screws 2-40259. Hook up carriage tape 2-42033. Replace rear panel 2-41089.

Replace platen complete 2-43646 and hold in place with right platen lock 2-45468 and left platen lock 2-45467. Note: The platen lock adjusting screws 2-40265 should be adjusted so there is a slight detent action as the platen lock lever is pressed down. Make sure that the platen lock adjusting screw nut 2-40466 is tight. Use oil sparingly on the platen roll bushings 2-40985 and 2-40986 to prevent bushings from freezing to platen shaft.

Check the paper feed roll tension by placing small strip of paper between platen and each end of feed roll (rear) and without turning platen, pull it out. The tension should be even--if not, adjusting screw 2-40279 is provided at rear ends of each paper feed roll arm spring 2-42889--turn in on screws to increase tension and back out on them to decrease tension.



## TO REPLACE CARRIAGE, Cont'd.

Carriage feed rack 2-45958 is adjustable, up and down only (not side ways). Move carriage to the right (end of writing line) and loosen feed rack screws 2-40133 holding left end of feed rack and adjust feed rack up or down for a small amount of play between the teeth of feed rack and escapement wheel pinion. Tighten the two screws when adjustment is made. Move carriage over to left (end of writing line) and repeat the same adjustments on left side of carriage. Care must be taken in this adjustment, if feed rack is set too deep in pinion wheel it will cause a sluggish operating carriage and piling of letters.

### ALIGNING SCALE AND CARD FINGERS

The lower aligning scale bracket 2-45601 is mounted to the carriage rail with screws 2-40170. The upper aligning scale bracket assembled 2-45610 (with card tension fingers attached) are held to the lower bracket by screws 2-40170. The aligning scale 2-45606 is attached to the upper aligning scale bracket by two screws 2-40277 and two washers 2-40998.

To align the scale to the line of writing, write a full line of small (i's) on the paper across the width of the platen roll. The aligning scale should be level with the line of writing just a very fine line or space between the top of the scale 2-45606 and the bottom of the written line. If high on one side, loosen screw 2-40277 on the high side and adjust the scale downward slightly. If low, raise the scale in the same manner. This applies to both right and left sides. Note: Some side adjustment can be made at this point, if both mounting screws for aligning scale is loose. See adjustment following.

The white lines on the scale should be in line with the vertical lines of the letter (i). The side alignment of the scale is obtained by loosening the two screws holding the upper aligning scale bracket 2-45610 to the lower aligning scale bracket 2-45601. The upper holes in the lower aligning scale bracket are elongated and after the screws are loosened the upper scale bracket along with the aligning scale, may be moved to the right or left to get the desired result.

The aligning scale should be just far enough away from the platen that six sheets of paper can be inserted between the aligning scale and platen, and also card tension fingers when up. To obtain this condition, form the upper aligning scale bracket 2-40998. After making this adjustment check the right carriage scale screw 2-40280, to see that it does not interfere with the rear side of the upper aligning scale bracket as it passes bracket.

## ADJUSTMENT CARRIAGE SCALES, PAPER SCALE AND PAPER TABLE SCALE

Adjusting of carriage scales should not be attempted until all adjustments pertaining to escapement and carriage feed rack have been made.

Set carriage until cipher on carriage scale 2-46100 is in line with indicator on type guide, if cipher does not align perfectly, loosen screws in ends of carriage scale 2-46100 and adjust scale.

Adjust the margin stop rack pivot screws 2-40259 until margin stop rack 2-46107 is centrally located between margin stop rack supports, with very slight amount of end play--yet free on its pivot screws.

Set margin stop 2-45823 at cipher position on margin stop rack 2-46107, return carriage to right until margin stop lever limits against margin stop 2-45823.

The margin stop lever should clear the margin stop at this point .060" (use .060" noiseless gage). Adjust for this clearance by margin stop rack pivot screws 2-40259. Note: This clearance is necessary, otherwise operator could not back space into first space of left margin. Another test for this is: Set carriage at zero, margin stop at zero, strike space bar once, hold back space key lever all the way down and strike margin release lever several times slowly and note whether margin stop binds against margin stop lever--should just clear. Margin stop rack 2-46107 must be set as described, otherwise irregular margins will result.

Slide paper guide 2-46298 to left as far as it will go. Place sheet of paper in carriage and have left edge of paper in line with the cipher mark on carriage scale 2-46100. Note: The edge of paper will also align with cipher on the paper scale 2-46114--if not, this scale should be set accordingly. With sheet of paper still set in carriage at the cipher position, slide the paper guide 2-46298 to left edge of paper. At this point, note where pointer on paper guide is pointing to on paper table scale, left 2-46121. It should be pointing at cipher also, if not, loosen screw 2-40278 holding left end of paper table scale and slide it until cipher is in line with pointer on paper guide.

The setting of right paper table scale 2-46122 is: Insert sheet of paper in carriage, having right side of it in line with 80 on both the carriage scale 2-46100 and the paper scale 2-46114. Loosen screw 2-40278 in right end of right paper table scale 2-46122 and set point 80 of scale in line with right edge of paper. This scale is to assist operator in locating center of sheet when making headings, etc.

# CARRIAGE

ALIGNING SCALE  
&  
CARD FINGERS

PAPER TROUGH "A" 2-45639

CARR. ROLL RETAINER 2-45371  
" " " RACK 2-45348  
" " " SCREW 2-40183

PAPER TROUGH SUPPORT BRACKET 2-46342  
SPRING 2-42860 SCREW 2-40169

PAPER FEED ROLL SPRING ASSEM. 2-42889  
" " " ARM, ADJ. SCREW 2-40279  
SPR.

CARR. SPR. DRUM TAPE SCR. 2-40267

CARR. TAPE ASSEM. 2-42033  
FOR A, B, C, B D

FEED ROLL RELEASE LEVER 2-45200

CARRIAGE  
SPRING  
DRUM  
TAPE  
HOOK  
2-45431

PAPER TABLE SCREW 2-40278 WASHER 2-40953

PAPER TABLE SUPPORT RUBBER 2-45587

2-40256

PLATEN LOCK, COMPLETE, LEFT,  
2-45467 ADJ. SCR. 2-40265 NUT 2-40466

MARGIN STOP, LEFT, COMPLETE,  
2-45821

FEED RACK - "A" CARR. 2-45968  
SCR. 2-40229 ECCENTRIC 2-45362

FEED RACK SCR. 2-40133

CARR. ROLL RAIL "A"  
UPPER. 2-45379  
SCR. 2-40250

CARR. ROLL  
RAIL LOWER  
GUIDE SCREW  
2-40155

PLATEN LOCK  
RIVET 2-40684

CARR. ROLL RAIL,  
LOWER, ECCENTRIC 2-44516  
SCREW 2-40043

LINE SPACE RATCHET DETENT ARM BEARING  
SCREW 2-40294 - NUT 2-40422

LINE SPACE PAWL ARM BEARING SCREW 2-40291  
NUT 2-40428 WASHER 2-40904

CARRIAGE END CASTING, LEFT

CARR. SCALE IOSP. 2-46100  
SCR. LEFT 2-40092

PAPER FEED ROLL  
RELEASE SHAFT COLLAR  
2-40911 SCR. 2-40110

LINE SPACE LEVER 2-45137

PAPER FEED ROLL ARM, FRONT, LEFT, ASSEM. 2-46327  
" " " SPRING, ASSEM. 2-42889

ALIGNING SCALE IOSP. 2-45606 SCR. 2-40277 WASHER 2-40998

ALIGNING  
SCALE  
BRACKET,  
UPPER,  
ASSEM.  
2-45610

PAPER FEED ROLL, COMPLETE,  
- BLACK RUBBER - 2-45324

CARR. RAIL LOWER COVER 2-45433

PAPER SCALE ARM SHAFT, ASSEM.  
2-46266

PAPER SCALE ARM RIGHT  
SPR. SCREW 2-40276  
SPR. 2-40371

CARR. END  
CASTING, RIGHT

PAPER SCALE ARM,  
LEFT, 2-40678 -  
RIGHT, 2-40679  
SPR. 2-40376

STUD 2-40662  
A, B, C, CARR.

PAPER  
SCALE ARM  
DETENT  
PIVOT SCR.  
2-40286

PAPER SCALE  
I O - SPACE 2-46114  
SCREW 2-40283

PAPER SCALE ARM DETENT  
2-45680 - SPR. 2-40382  
SCREW 2-40283

PLATEN LOCK, COMPLETE, RIGHT 2-45468

PAPER TABLE SUPPORT, RIGHT  
2-45560 SCREW 2-40079

CARRIAGE  
SPRING  
DRUM  
TAPE  
HOOK  
2-45431

RAND

Union

Union

Union

Union

Union

Union

Union

Union

Union

## DISMANTLING PROCEDURE FOR CLEANING AND OVERHAULING

Remove carriage, method #2 recommended, remove rubber.  
Remove typewriter unit complete.  
Remove ribbon winding disc 2-42346 and ribbon.

Remove lever knobs 2-42289, panel screws 2-40222 and take off front panel 2-46861 (type action illustration). Do not lose rubber silencer washer 2-40892 between front panel and typewriter frames.

Remove two type bar fulcrum wire retaining screws.  
Remove type bar fulcrum wire slowly and keep type bar links in order, as explained in instructions.

Note: Order Type bar links 2-41410, which are straight, these can be formed to suit the position in which they are to be used, 2-41432 is the number for type bars twenty-one and twenty-two which are ground for clearance.

Remove two screws 2-40244 holding type bar cushion 2-43943 to segment and remove type bar cushion complete.  
Remove four screws 2-40111 holding ribbon actuator arm bracket support 2-41954 (ribbon cover illustration) to machine.

Unhook lower end of ribbon lift push link 2-42284 from toggle bell crank (ribbon cover illustration).

Unhook spring clip at rear end of ribbon control lever link 2-46568 from the ribbon control shaft arm 2-42342.

Lift the ribbon actuator arm bracket support complete with ribbon control shaft, ribbon lift push link and ribbon carrier, from machine.

Remove screw 2-40000 and nut 2-40411 (shift mechanism illustration), holding left end of segment to segment shift rocker. Repeat this operation on the right side.

Unhook the two segment shift balance springs 2-40364 (shift mechanism illustration) at upper ends.

Remove two segment shift bracket screws 2-40188, holding bracket to segment.  
Remove type bar segment 2-47050 complete with type bar universal bar assembled. Do not lose the segment ball bearings 2-40477 when removing segment.  
Use care in handling the type bar segment, as universal bar adjustments may be thrown out.

After machine has been washed, reassemble by reversing these instructions.

Note: A key lever can be removed from the machine as follows: Unhook type bar bell crank link from stud in key lever, unhook key lever spring (upper end). Loosen screws in key lever clamp, holding rear end of key levers in position. Slide rear end of key lever downward until it clears its fulcrum wire 2-41103 (type action illustration) and remove key lever.

A type bar bell crank can be removed as follows: Unhook type bar bell crank link from stud on key lever. Unhook upper end of type bar bell crank spring 2-40338 (upper end). Loosen the five screws for type bar bell crank fulcrum wire clamp and use follow up wire to the bell crank that is to be taken out.

## INSPECTIONS

### Carriage

Carriage, free full length of writing line with no play in rails.

Platen for condition and end play.

Test front and rear feed rolls for pressure (both ends) and condition.

Try line space mechanism for under-throw or over-throw of platen.

Test one, two and three line spacing and platen detent for proper tension.

Test both variables, platen locks and paper release.

Paper bail functioning properly.

Line gage for height and clear platen (six sheets), also try card finger attachment.

Paper guide to stay into position, where set.

See that carriage roll retaining racks will not permit carriage roll retainers to creep.

Carriage feed racks set to escapement wheel pinion correctly.

Carriage release levers functioning properly.

Correct carriage tension.

### Typewriter Unit

(Segment)

Hold shift key down, test capital letters for on feet, segment to be locked with no vertical play.

Test motion HhHhHh. No vertical play in segment when normal. Segment to be locked in both upper and lower cases. No bite or binding in shift keys at top or bottom of travel.

Segment to shift freely, no horizontal play allowed.

Shift keys set to correct height, shift lock plates (two) set correct.

Test machine for cylinder and anvil position.

(Tabulator)

Test tabulator blade, clear key and set key for proper travel.

Test tabulator drop, approximately a full space. Test tabulator blade for entering between two stops.

Tabulator set bracket for correct position.

Try tabulator brake for short and long jumps.

Tabulator rack and front carriage scale to agree.

(Ribbon Mechanism)

Strike off keyboard of both upper and lower case on both black and red ribbon, test ribbon for cover, also stencil position.

Test ribbon for reversing at both ends, right and left spools.

Set ribbon drive shaft shift lever to central position and try winding spools.

(Escapement Mechanism)

Test trip at ribbon on type bars one, twenty-one and forty-two.

Test escapement safety zone 1/2" to 9/16".

Inspect loose dog silencer mechanism.

Check position of upper and lower escapement rocker body stop screws.

(Miscellaneous)

Try touch regulator, type bar restoring feature and back spacer .

Test margin release, line lock and bell mechanism.

Check space bar adjustments, height, depth and trip.

Inspect machine in general for appearance of nickel, japanning, stencils, etc.

Try machine for alignment of both upper and lower cases.

Keyboard, numerals, type spacing and carriage width to agree with machine order.