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.
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BACK SPACE MECHANISM
BACK SPACE MECHANISM

ADJUSTMENTS

This mechanism is very simple and requires very little adjustment. It is necessary as in all parts of the machine to have free moving parts. However, if the Back Space Mechanism should fail to operate, check the following:

See that the Back Space Dog Spring (6-6901) has sufficient tension to keep the Back Space Dog (6-703) clear of the Escapement Wheel. Also see that the Dog (6-703) is free in movement on the Back Space Dog Guide Screw (6-6305).

There are five kinds of Back Space Dogs (6-703), 8 Pitch, 10 Pitch, 12 Pitch, 14 Pitch and 16 Pitch. Check the Dog (6-703) to correspond with the spacing of the machine.

See that the Escapement Body is positioned so that the Fixed Dog holds the Escapement Wheel in such a position that the tooth of the wheel will be fully engaged by the Back Space Dog. The location of the Escapement Body has been described in the text covering the Escapement Mechanism.
CARRIAGE MECHANISM

ADJUSTMENTS

PAPER FEED ROLL MECHANISM

The proper tension on the Paper Feed Roll Front Assembled (10-40460) and Rear Assembled (10-40461) should be such, as to be sufficient to firmly hold a single sheet of paper.

This desired tension is supplied by the Paper Feed Roll Tension Spring (6-6919) which is adjusted by the Paper Feed Roll Adjusting Screw (6-6323) on the rear of the Paper Feed Roll Shaft Bracket Assembled (10-40151).

When the desired tension is accomplished, the Adjusting Screw (6-6323) is locked in position by tightening on Nut (6-6002).

It is very important that the Paper Feed Roll Front (6-3806) and Rear (6-3807) on the Paper Feed Roll Front Assembled (10-40460) and Rear Assembled (10-40461) should roll freely on the Paper Feed Roll Shaft and also that the surface of the Paper Feed Rolls should be clean.

In checking, the Paper Feed Rolls for freedom of movement, see that there is a little play in each Paper Feed Roll, that is, see that the Paper Feed Roll Spacers on the Paper Feed Roll Shafts are not pressing against the Paper Feed Rolls.

If you find this condition to exist, move the Paper Feed Roll Spacers to the right or left on the Paper Feed Roll Shaft as required.

Also see that there is a trifle of oil on the Paper Feed Roll Shafts at the points where the Paper Feed Rolls are located.

Inspect the Paper Feed Roll Release Mechanism and see that the Release is enough to clear twelve sheets of paper.

Also see that there are no binds and see that the lower ends of the Paper Feed Roll Arms Front and Rear rest in the slots in the Paper Feed Roll Release Shaft (6-3665) when the Paper Feed Rolls are against the Platen Roll.

PAPER TROUGH

Next see that the front edge of the Paper Trough (10-40430) is away from the Platen Roll.

The distance not to exceed the thickness of six sheets of paper.

See that there is spring tension on each side of the Paper Trough (10-40430) and that the Paper Trough Springs (10-7036) are in good order.

PAPER FINGERS

Try the Paper Finger Hinge Left Complete (10-40896) and Right Complete (10-40897) on the Paper Finger Rail (10-40934) and see that they slide freely in either direction.

See that the Paper Finger Hinge Left Complete (10-40896) and Right Complete (10-40897) have the proper tension and that no metal is touching on the Platen Roll. The Paper Finger Rolls should rest flat on the Platen Roll and to correct any of these faults simply shape the Paper Fingers to suit.
CARRIAGE MECHANISM

ADJUSTMENTS

PAPER SCALE TAB. STOP RACK & MARGIN STOP RACK & FEED RACK

The graduations on the Paper Scale (6-3654) should agree in point with the Tabulator Stop (10-40679) and the Margin Stop setting.

For example, if the Margin Stop Left (10-40437) is set "10" and the carriage is at the margin, the position on the Type Bar Comb Upper should indicate "10" on the Paper Scale (6-3654).

If not, adjust the Paper Scale Right or Left with the Paper Scale Screws (10-6676), see that the Paper Scale Rolls Complete (6-3643) roll freely, and that the sleeves are oiled, also see that they move freely on the Paper Scale (6-3654) to the right and left.

The Margin Stops Left (10-40437) and Right (10-40438) must move freely from right to left on Margin Stop Rack (10-40788) and see that they lock in the position for which they are set.

The Feed Rack Complete (10-40821) must be properly meshed with the Escapement Shaft Pinion and to make the proper adjustment to do this, simply unfasten the Feed Rack Support Screws (6-6424) and bring the Feed Rack Complete (10-40821) in or out until it meshes properly and freely and tighten the screws.

The Feed Rack Complete (10-40821) should also be adjusted so that when the Margin Stop Left (10-40437) rests against the Margin Release Lever Complete (10-40017), the Margin Release Lever is free to work in and out.

This can be done by adjusting the Feed Rack Adjusting Plate Eccentric (6-3513) by unloosening the Feed Rack Adjust Plate Eccentric Screw (6-6449) and turning the eccentric in the desired direction and tightening the screw.

The adjustments on the Tabulator Stop Rack are very simple.

Just see that the Tabulator Set Lever Complete (10-40684) throws out the Tabulator Stop squarely and upon throwing out a number of stops, one after the other in a bunch, that the Tab. #1 Lever Complete (10-40741) will stop at each and every one. This adjustment is done by loosening the Tabulator Stop Rack Screws Left (10-6666) and Right (10-6667) and making the adjustment on the Tabulator Stop Rack Adjusting Screw and Nut (10-6619N) on the Carriage End Right. (Refer to Tabulator Adjustments).

Test the Carriage Release Levers Left (10-40950) and Right (10-40951) and see that they are free up and down and that they raise the Feed Rack Complete (10-40821). Check the Feed Rack Adjusting Plate Eccentric Screw (6-6449) and the Feed Rack Support Screws (6-6424) to be tight.
PLATEN ROLL & LINE SPACE MECH.
PLATEN ROLL, LINE SPACE MECHANISM

ADJUSTMENTS

In case of trouble with the Line Space and Variable Line Space Mechanism, see that the parts of the mechanism are oiled and that the Variable Line Space Clutch Dogs (6-2221) do not stick in the slots.

Also see that the Variable Line Space Clutch Dog Spring (6-8980) is in good condition and functioning properly.

The Variable Line Space Clutch Dog Cams (6-2220) should be free, in and out and under good spring tension.

Further, see that the teeth of the Variable Line Space Ratchet (6-2163) are in good order and not worn.

When adjusting the Line Space Mechanism and Variable Line Space Mechanism, see that there is no over throw or under throw of the Platen Roll after the Line Space has been completed.

These conditions are a result of the Variable Line Space Ratchet (6-2163) being adjusted either too high or too low.

The position of the rod on the Line Space Ratchet Detent Bracket Complete (10-40839) is correct when the roll on that part is bottoming between the teeth of the ratchet (6-2163) at the time that the Line Space Pawl & Bell Crank Complete (10-40989) has reached its full travel and is limiting on the Line Space Pawl Stop Screw (10-6635).

Adjustment is made with the Line Space Ratchet Detent Bushing (6-22807) on which the Line Space Ratchet Detent Bracket Complete (10-40839) is mounted and the Line Space Pawl Stop Screw (10-6635).

Tighten the Line Space Ratchet Detent Bushing Screw (10-6662) when the adjustment has been correctly made.

The pressure of the roll on the Line Space Ratchet Detent Bracket Complete (10-40839) against the Variable Line Space Ratchet (6-2163) can be adjusted by manipulating the Line Space Ratchet Detent Spring Screw (10-6668) until the proper tension is brought upon the Line Space Pawl Stop Plunger Spring (10-7040) and the desired pressure is brought upon the Platen Roll.
CENTER TIE

ADJUSTMENTS

It is of great importance that the Center Tie be properly seated.
By seated is meant that there should be no play up and down or sideways, and there
should be no tilt of the Center Tie Complete (10-40345).
It should also bottom on the Frame Brace Rear Upper (10-40030).

The seating of the Center Tie Complete (10-40345) is accomplished through the ad-
justment of the Center Tie Retainer Complete (10-40336) Center Tie Retainer Lugs
(10-40337) and the Center Tie Gib Screw and Nut (10-6659N).
First loosen the Center Tie Retainer Screws (10-6615) and the Center Tie Retainer
Lug Screws (10-6615).
See that the bottom of the rear of the Center Tie is flat on the Frame Brace Rear
Upper (10-40030).
If not, back out the Center Tie Gib Screw and Nut (10-6659N) and the Center Tie
Support Screw (6-6502) and Nut (6-6020) until it is.

To seat the Center Tie (10-40345), after the Center Tie Retainer Screws and Center
Tie Retainer Lug Screws (10-6615) have been loosened, first set the Center Tie
Retainer Lug Screws (10-6615) in the Center Tie Retainer Lugs (10-40337) right and
left side. (This is a temporary setting).

Second, set the Center Tie Retainer (10-40336) so as to eliminate end play in the
Center Tie (10-40345). To do this, set the left Center Tie Retainer (10-40336),
looking from the rear, by pressing the Center Tie Retainer (10-40336) to the left
or outward of the machine, and tighten the two Center Tie Retainer Screws (10-6615)
while holding in this position.

Then force out on the right Center Tie Retainer (10-40336) and tighten the two
Center Tie Retainer Screws (10-6615) while holding in this position.

Third, loosen the four Center Tie Retainer Lug Screws (10-6615) that attach the
Center Tie Retainer Lugs (10-40337) to the Center Tie and while in their loose
position, place your finger under the right Center Tie Retainer Lug (10-40337) and
your thumb on top of the Center Tie (10-40345), squeeze together, and hold this
pressure while setting the Center Tie Retainer Lug Screws (10-6615) in the Center
Tie Retainer Lug (10-40337).

Make the same setting on the left Center Tie Retainer Lug (10-40337) and try the
Center Tie for end play up and down movement, and note if it is firmly seated on
the milled surface of the Frame Brace Rear Upper (10-40030) and the Center Tie.
Reset the Center Tie Support Screw (6-6502) and Nut (6-6020) the Rear Cover
(10-40310) to meet the milled seat of the Center Tie and lock screw in this posi-
tion.

If there is up and down play, it will be necessary to reset the Center Tie Retainer
Lugs (10-40337).
If there is end play, it will be necessary to reset the Center Tie Retainer
(10-40336).
Try the Back and Forth movement of the Center Tie to see that there is sufficient
tension on the springs, to pull the Center Tie back when the Pressure Indicator
Lever (10-40304) has been moved to the right.
If the Center Tie does not move back with the Pressure Indicator Lever (10-40304),
it will be necessary to ease up slightly on the Center Tie Retainer (10-40336).

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The forward position on the Center Tie (10-40345) is correct when the Pressure Indicator Lever (10-40304) is at rest against the Universal Bar Bracket Center Screw Right (10-6565) on the Top Plate (10-40315). The distance between the Type Guide and the Platen Roll when properly set is .060". To establish this clearance, use a No. 4 gauge for measuring this distance. To adjust, turn the Pressure Indicator Lever (10-40304) to the right. Place the No. 4 gauge between the Type Guide and the Platen Roll and turn the Pressure Indicator Lever (10-40304) to the left until the forward movement of the Center Tie (10-40345) is such that the No. 4 gauge is just held between the Type Guide and the Platen Roll.

If it is found that the necessary clearance is established between the Type Guide and the Platen Roll before the Pressure Indicator Lever (10-40304) comes to rest against the Universal Bar Bracket Center Screw Right (10-6565), hold the Pressure Indicator Lever (10-40304) firmly and loosen the Pressure Indicator Screw (10-6585) and drop the lever itself down to come to rest on the Screw (10-6566) without moving the Center Tie Adjusting Nut (10-6033), then tighten the Pressure Indicator Screw (10-6585).

If there is too much clearance between the Platen Roll and the Type Guide with Pressure Indicator Lever (10-40304) at rest against the screw (10-6565), loosen the Pressure Indicator Screw (10-6585) while the Pressure Indicator Lever (10-40304) is at rest against the screw (10-6565) and move the lever itself up several notches and tighten the Pressure Indicator Screw (10-6585) while holding in this position. Familiarize yourself with this adjustment before undertaking to make the adjustment in a customer's office.

The purpose of the Center Tie Gib Screw and Nut (10-6659N) is to eliminate any possible side tilt or tip of the Center Tie (10-40345). These screws should be set just deep enough to touch the Center Tie and not cause any pressure on the sides of the Center Tie. This last condition will cause a bind in the Carriage Balancing Shaft. The Center Tie Gib Screw and Nut are used for no other purpose than stated above.

In making the above adjustments, be sure that the Center Tie Stops (10-40289) on the Frame Sides are not limiting the forward movement of the Center Tie (10-40345). After the Center Tie has been set to gauge, there should be about .020" clearance between the stops and the Center Tie.
ESCAPEMENT AND UNIVERSAL BAR

ADJUSTMENTS

It is necessary before attempting to adjust the escapement of the machine, that the Center Tie (10-40345) be seated (as explained in adjustments for Center Tie) and the distance between the Type Guide and Platen Roll, be set to .060" with the Pressure Indicator Lever (10-40304) at rest against the Universal Bar Bracket Center Screw Left (10-6565).

Also that the individual pressure of the Type Actions be adjusted to print lightly on one sheet of paper with the Pressure Indicator Lever (10-40304) set in a vertical position.

With these adjustments checked, try the Universal Bar Shaft (10-40523) for end play. This should be held as close as possible and the adjustment to eliminate end play is made with the Universal Bar Pivot Screws and Nuts (6-6333N). When correct tighten the lock nuts on the Screws (6-6333N) and see that the Universal Bar Shaft is free in its movement.

Now check the horizontal position of the Escapement Body (10-40233). This part (10-40233) should be adjusted with the pivot screws (6-6304N) and (6-6339N) so that the tooth of the Escapement Wheel (6-388) engaged by the Escapement Fixed Dog (10-40248) under carriage tension, is in a position of six o'clock, or at right angle with the horizontal line of the Escapement Body (10-40233). This applies to the 10 Pitch (Pica) machines, on the 12 Pitch (Elite) machines the position of the Escapement Body (10-40233) should be a trifle more to the left so that the Back Space Dog (6-789) will fully engage the tooth of the Escapement Wheel (6-388) when the Back Space Mechanism is operated.

The adjustment for getting the horizontal position of the Escapement Body is made with the Escapement Pivot Screws (6-6304N) (6-6339N).

After the correct position is obtained, see that the Escapement Body (10-40233) has a minimum of end play. Any end play should be taken up with the Escapement Pivot Screw Short (6-6304N). Also see that the up and down movement of the Escapement Body (10-40233) is free. Check the Fixed Dog (10-40248) and the Stepping Dog (10-40235) to be tight but free and not worn. Loose and worn dogs cause skipping. Tighten all lock nuts after adjusted.

When at rest, under spring tension, the Escapement Body Stop Adjusting Screw (6-6309N) should be adjusted so that the upper side of the Escapement Fixed Dog (10-40248) is between .010" and .015" above the upper side of the engaged tooth of the Escapement Wheel (6-388).

If set too low, turn in on the Adjusting Screw (6-6309N) until correct. If high, back out on the Adjusting Screw (6-6309N). Make sure when adjusting that the stepping Dog (10-40235) is clearing the under side of the Escapement Wheel (6-388).

After correct adjustment set the lock nut on the Adjusting Screw (6-6309N).

The tension on the Escapement Body (10-40233) should be about 1/6 of a turn of the Escapement Return Spring (6-6916). Any excess at this point will cause a heavy operating machine.
With all the foregoing adjustments checked, and the necessary corrections made, we now test the machine to see if the Universal Bar (6-22251) is level.

To make the test move a center Type Bar to the Platen Roll by hand and notice at what distance from the Platen Roll the Escapement occurs.

Also notice at what points the Escapement occurs when the Type Bars at the sides of the machine are moved to the Platen Roll.

If the escapement is farther on the Center Bars than those at the sides, it indicates that the Universal Bar (6-22251) is not level, that is, it is higher in the center than at the sides.

In other words, the Universal Bar Links (6-807) are set too far towards the rear of the machine.

Insert four sheets of paper in the machine and with the Pressure Indicator Lever (10-40304) at rest against the Universal Bar Bracket Center Screw Left (10-6565) adjust the Escapement Connection Nut (6-6008) at the end of the Escapement Connection (10-40226) in back of the Escapement Body (10-40233) so that when the Type Bar is moved to the Platen Roll by hand the Escapement will occur just at the time the type touches the paper.

Try for this condition with the center type bars and also with the side type bars.

If the Escapement is not the same on the side bars as the center, it is necessary to reset the Universal Bar (6-22251).

To correct this condition loosen the lock nuts on the Universal Bar Link Front Screws (6-6336) leaving the screw in the Universal Bar Support Center (10-40900) about friction tight so that the Universal Bar Link (6-807) can be moved forward or backward in the slot of the Universal Bar Support Center (10-40900).

If, as explained, the Center Bars escape and the side bars do not, or the Center Bars escape farther from the Platen Roll than those on the sides, the Universal Bar (6-22251) should be lowered in the center.

This is done by bringing the Universal Bar Link (6-807) forward to the front until the escapement occurs at the same distance from the Platen Roll on the side bars as well as those of the center.

If the Escapement is closer on the Center Bars than on the side bars, the Universal Bar Link (6-807) should be set to the rear of the machine.

This, of course, will also move the Universal Bar (6-22251) in that direction.

Adjustment for the leveling of the Universal Bar (6-22251) is done on the center Universal Bar Link (6-807) with the outside Link Screws loose, and after it has been made correct tighten the lock nut on the Universal Bar Link Front Screw (6-6336) in the Bracket (10-40900) and see that the Universal Bar (6-22251) moves freely up and down.

Now lock the nuts on the Screws (6-6336) in the Brackets Left (6-22259) and Right (6-22260).

After each adjustment see that the Universal Bar (6-22251) is free up and down.

Finally with four sheets of paper in the machine and the Pressure Indicator Lever (10-40304) set against the Screw (10-6565), adjust the escapement to occur when the type touches the paper.

This is done as previously explained with the Escapement Connection Nut (6-6008) at the end of the Escapement Connection (10-40226).

Before setting the Escapement Shaft Ball Retainer (6-387) on the Escapement Shaft (6-390), be sure that the motion is properly set.

Lock the carriage in its capital position and set the Retainer (6-387) so that the beveled or rounded surface of the Retainer lines up with the outer surface of the Escapement Wheel (6-388).
ESCAPEMENT AND UNIVERSAL BAR

ADJUSTMENTS (Cont'd)

It is very important that the Retainer be properly set. If it is set too low, the carriage will not always drop back to its rest position after shifting and if set too high, it will interfere with the motion.

An Escapement Shaft Protector (6-3033) is placed directly over the Tabulator Friction Wheel (6-750). This protector is used to prevent sediments of erasings from becoming lodged on the Ball Raceways. These raceways must be kept clean.
MARGIN RELEASE MECH.

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When the mechanism shown in the drawings covering this section has been correctly adjusted, there should be no variation in the point to which the Margin Stop Left (10-40437) has been set.

If there is a variation at the point to which the margin is set, check the following adjustments:

First, see that the gear on the Escapement Shaft (6-390) is meshing properly in the Feed Rack (10-40821).

When correctly adjusted there should be a little movement between the teeth of the Feed Rack (10-40821) and the teeth of the Escapement Shaft Gear (6-390) when the Escapement Shaft (6-390) is being held rigid.

This mesh should be the same at both ends of the Feed Rack (10-40821).

If the mesh is shallow, not deep enough at both ends of the Feed Rack (10-40821), the adjustment is made by loosening the Escapement Shaft Trunnion Stud Nuts (6-6005) and resetting the Escapement Shaft (6-390) gear to proper mesh.

When adjusted to the correct mesh, see that the Escapement Shaft Trunnion Stud (6-7303) Nut (6-6005) are set.

If, for example, the mesh of the Escapement Shaft Gear (6-390) and the Feed Rack (10-40821) is correct on the left end of the Feed Rack (10-40821) and not deep enough on the right, loosen the Feed Rack Support Screws (6-6424) on the Feed Rack Support Right (10-40803) and adjust the Feed Rack Support Right (10-40803) so that the mesh of the Feed Rack (10-40821) will be deeper in the Gear (6-390) at the right and the same as on the left side.

The Feed Rack Support Left (10-40804) and Right (10-40803) are adjusted in and out and this makes it possible to have the mesh of the Feed Rack (10-40821) and the Gear (6-390) the same at both ends.

When the carriage is at the left margin there should be a distance of about .015" between the Margin Stop Left (10-40437) and the Margin Release Lever (10-40017). Too much distance between these parts at the margin will result in the carriage "banking over" or going one space beyond the margin as set.

To correct this, shorten the distance between the Margin Stop Left (10-40437) and the Margin Release Lever (10-40017) by loosening the Feed Rack Adjusting Plate Eccentric Screw (6-6449) and turning the high point of the Feed Rack Eccentric (6-3513) toward the left end of the carriage.

If there is not enough distance between the Margin Stop Left (10-40437) and the Margin Release Lever (10-40017), another case of irregular margin, turn the high point of the Eccentric (6-3513) to the right.

This will increase the distance between the Stop (10-40437) and the Release Lever (10-40017).

Never turn the Eccentric (6-3513) so that the high point will be toward the Feed Rack (10-40821).

When in this position, the Feed Rack (10-40821) will not drop into the Escapement Shaft Gear (6-390).

When adjustment is correct set the Feed Rack Adjusting Plate Eccentric Screw (6-6449).

The Margin Release Lever (10-40017) should be set forward far enough to engage the Margin Stop Left (10-40437) safely and not so far forward as to prevent it from passing in back of the Stop (10-40437) when the carriage is moved to the left of the margin setting.

Adjustment is made by loosening the Margin Release Lever Trunnion Set Screw (6-6355) and adjusting the Lever (10-40017) in or out as required, set the screw after adjustment.
MARGIN RELEASE MECHANISM

ADJUSTMENTS (Cont'd)

The Margin Release Shaft (10-40015) is spotted where the Margin Release Lever Trunnion (6-558) is mounted to it - if back or forward adjustment of the Lever cannot be obtained through the setting of the Trunnion Set Screw (6-6355), the positioning of the Lever can be obtained by bending it.

When the carriage is at the right margin, the Margin Stop Right (10-40438) engages the Margin Release Lever (10-40017) and causes the Lever (10-40017) to pivot on the Margin Release Screw and Nut (6-6304N) and (6-6320) in the Margin Release Lever Trunnion (6-558).

With this pivoting movement the Line Lock Lever on the Margin Release Lever (10-40017) swings backward and through the movement of the Line Lock Bail Pull Wire (6-238) pulls the Line Lock Bail (6-218) under the hooks on the Key Levers and completes the Line Lock.

With the Pressure Indicator Lever (10-40304) at the extreme right and the carriage at the left margin, see that the Key Levers do not strike on the Line Lock Bail (6-218).

If the Key Levers strike on the Bail (6-218), bend the Line Lock Lever on the Margin Release Lever (10-40017) forward to correct this condition.

Now with the Pressure Indicator Lever (10-40304) at "0" position against the Screw (10-6565), try the Line Lock at the Margin Stop Right (10-40438).

When the carriage has moved two spaces following the engagement of the Margin Stop Right (10-40438) with the Margin Release Lever (10-40017) the Key Levers should be fully locked.

If this condition does not exist, bend the Line Lock Lever on the Margin Release Lever (10-40017) to the rear sufficient enough to cause a full lock at this point.

When the Margin Release Key Lever (10-40018) is depressed it raises the extension of the Margin Release Shaft (10-40015).

The Margin Release Lever (10-40017) which is mounted on the Shaft (10-40015) now swings to the rear and makes it possible to move the carriage beyond either right or left Margin Stops.

Inspect these points of the mechanism to see that they are free in their movement. Also see that the Margin Release Lever (10-40017) is tight but free on the pivots of the Trunnion (6-558).
RIBBON FEED MECH.

- RIBBON SPOOL SHAFT, LEFT 6-551
- SPOOL SHAFT GEAR 6-540
- DRIVING SHAFT GEAR 6-302 SCR. 6-6318
- DRIVING GEAR, LEFT 6-310 SCR. 6-6318
- DRIVING SHAFT 10-40207
- SPOOL SHAFT GEAR 6-540 SCR. 6-6340
- DRIVING GEAR 6-310 SCR. 6-6318
- REVERSE CAM 6-336 SCR. 6307
- REVERSE DETENT SCR. 6-6319
- REVERSE DETENT 6-337
- COMB. REAR 6-276
- FEED-SHAFT 10-40199
- WINDING LEVER 10-40217
- SPOOL SHAFT, LEFT 6-551
- RIGHT 6-552
- DRIVE GEAR 10-40201 SCR. 6-6318
- SCR. 6-6340
- SCR. 6-6318
- SCR. 10-6610
- SCR. 6-6318
- SHEET-SHAF T 10-40199
- SHAFT COLLAR 6-539 SCR. 6-6318
- KNOB 10-40210
- CARR. SPR. DRUM TAPE 6-754
- SPR. DRUM BRKT. 10-40277
- RATCHET SCREWS 6-6340
- SHAFT SPR. 10-7032
- REVERSE DETENT SCR. 6-6319
We will assume, for explanation, that the assembly has been made as per chapter "Instructions for Assembling Machine" and has not been adjusted.

It is first necessary to see that the up and down play and the tension of the Ribbon Spool Shafts (6-551 and 6-552) left and right is correct.

Adjustment for the up and down play of the Shafts (6-551 and 6-552) is made by raising and lowering the position of the Ribbon Spool Shaft Gears (6-540). This is done with the tension off of the Shafts (6-551 and 6-552) that is, when the Ribbon Spool Shaft Collars (6-539) are loose on the Shafts (6-551 and 6-552).

To gain the proper adjustment, press down on the Ribbon Spool Shafts (6-551 and 6-552) and set the Ribbon Spool Shaft Gear (6-540) so that there will be about .012" between the top of the Gear (6-540) and the bottom of the boss through which the Ribbon Spool Shaft (6-551 and 6-552) runs.

This .012" is about the thickness of a post card.

The tension on the Ribbon Spool Shafts (6-551 and 6-552) should be just enough to support a full spool of ribbon and the Ribbon Spool Knob Complete (10-40210) without any drop in the Shafts (6-551 and 6-552).

This adjustment is made by raising or lowering the Ribbon Spool Shaft Collars (6-539) so as to compress or release the tension of the Ribbon Spool Shaft Spring (10-7032) which is under it.

After the adjustment is correct, see that the screws are set and that the Ribbon Reverse Plunger and the Ribbon Reverse Tripping Lever in the Shafts (6-551 and 6-552) are free in their movement.

We now come to the adjustment of the gears on the Ribbon Driving Shaft (10-40207). Your attention is called to the Ribbon Driving Gear Right (10-40201) and to the Ribbon Reverse Detent (6-337).

First see that the stud on the arm of the Ribbon Reverse Detent (6-337) is set deep into the slot on the Ribbon Driving Gear Right (10-40201) but not deep enough to bind.

Next, with the Ribbon Reverse Plunger in the Shaft Right (6-552) engaging the Ribbon Reverse Cam (6-336) right at its high point, move the Ribbon Driving Gear Right (10-40201) so that the toggle lever of the Ribbon Reverse Detent (6-337) is just beyond a line of center toward the front of the machine.

Set the screw in the Driving Gear Right (10-40201) to be tight on the Ribbon Driving Shaft (10-40207) after this adjustment has been made. Now try the reverse to the left side, slowly and with the Ribbon Reverse Plunger in the Shaft Left (6-551) engaging the Ribbon Reverse Cam (6-336) left at the position of the high point of the Cam (6-336) the toggle lever of the Reverse Detent (6-337) should be just below a line of center toward the rear of the machine.

Through the aid of a spring on the Reverse Detent (6-337) the Ribbon Driving Shaft (10-40207) is moved its full distance to the left. At this position we adjust the mesh of the Ribbon Driving Gear Left (6-310) to mesh properly with the Ribbon Spool Shaft Gear (6-540). This mesh is gained by moving the Gear (6-310) to the right or left as required and should be set deep enough to obtain positive feed and not deep enough to cause a grinding noise.

When the correct adjustment has been made see that the screw is set.
The position of the Ribbon Driving Shaft Gear (6-302) is left, and is such that it will mesh safely when the Shaft (10-40207) is reversed either right or left. Adjustment of this position is accomplished by moving the Gear (6-302) on the Shaft (10-40207) to the right or left as required. When in the correct position, set the screw.

We now take up the adjustment of the Ribbon Feed Shaft (10-40199) on the Carriage Spring Drum Bracket (10-40277). This shaft has an in and out adjustment which is controlled by the Ratchet Set Screws (6-6340) and its position should be forward far enough so that the gear on the Ribbon Feed Shaft will mesh with the Ribbon Driving Shaft Gear (6-302) without causing any noise and still deep enough to be positive. Adjustment is made by loosening the screws (6-6340) and setting the Ribbon Feed Shaft (10-40199) in or out so that the Gear will mesh properly with the Driving Shaft Gear (6-302).

When the correct position is obtained, set the Screw (6-6340) in the Ribbon Feed Shaft Ratchet so that the Ratchet will be flat on the Spring Drum (10-40277). Now set the Screw (6-6340) in the Back Lash Ratchet. This Ratchet should be set as far forward as possible. When both Screws (6-6340) are set there should be a little space between the Ratchets. If they are too far apart they will cause pressure on the Spring Drum (10-40227) and a sluggish movement of that part will result. See that the Screws (6-6340) are set after the correct adjustments have been made.

The Ribbon Spool Shafts (6-551 and 6-552) are not alike with regard to right and left and when replaced care should be taken that the correct shaft is being used. To determine right spool from the left, note which side of the Ribbon Reverse Tripping Lever on the shafts the ribbon slots are placed. When the Tripping Lever faces you and the slot is to the left side of the lever, this would indicate a left spool. When the slot is on the right side, this would indicate a right spool.
RIBBON VIBRATOR MECHANISM & ALIGNING SCALE

ADJUSTMENTS

First check the Ribbon Vibrator Universal Bar Shaft (10-40180) to be held to a minimum of end play on the Pivot Screws (6-6333N).
See that the Lock Nuts for the Pivot Screws (6-6333N) are tight.
End play in the Ribbon Vibrator Universal Bar Shaft (10-40180) will cause variation in the height of travel of the Ribbon Vibrator (10-40218).
See that the Ribbon Vibrator Universal Bar is level, that is, it is to touch the Key Levers on both the right and left sides of keyboard.

Now with the Bichrome Handle (10-40118) shift the Ribbon Vibrator Universal Bar Link (10-40191) to the right and left over the Ribbon Vibrator Shaft Arm Front (10-40224).
If there is any up and down movement of the Ribbon Vibrator (10-40218) when this is being done, it indicates that the Ribbon Vibrator Universal Bar Link (10-40191) is pulling down on the Ribbon Vibrator Shaft Arm Front (10-40224).
This condition should not exist and adjustment can be made by twisting upward on the extension of the Ribbon Vibrator Universal Bar (10-40180) to which the Ribbon Vibrator Universal Bar Link (10-40191) is attached.
This will raise the Link (10-40191) so that the top of the slot will clear the top of the Shaft Arm Front (10-40224).
This clearance should be just enough so that no up and down movement of the Arm Front (10-40224) will be seen when the Bichrome Handle (10-40118) is shifted to the left and right.
If there is too much clearance the height of the travel of the Vibrator is affected.
Any excess of clearance should be corrected.
This is accomplished by twisting downward on the extension at the right end of the Universal Bar (10-40180) to which the Link (10-40191) is attached.

It is also necessary that the clearance of the Link (10-40191) over the Arm (10-40224) in both left (black) and right (red) position be the same.
If there is more clearance between the top of the Arm Front (10-40224) and the Link (10-40191) when set at the left (black) than in the right (red) position, bend the Ribbon Vibrator Shaft Arm Rear (10-40214) so that the end of the Arm (10-40214) will be a trifle bowed to the left.
This adjustment will have a tendency to raise the Arm Front (10-40224).

If it is found when shifting the Link (10-40191) from the left to the right that the Link (10-40191) is properly set for the black portion and that it rubs against the top of the Arm (10-40224) when shifting to the right, it will be necessary to tilt the end of the Ribbon Universal Bar (10-40180) up slightly.
This adjustment will raise the link.

Next move the Link (10-40191) from right to left and notice if there is the same amount of clearance between the Arm (10-40224) and the Link (10-40191) on both sides.
If it is found that there is a little too much clearance while the link is to the left, again bend the Ribbon Vibrator Shaft Arm Rear (10-40214) so as to raise the Ribbon Vibrator Shaft Arm Front (10-40224).
In no other case is it necessary to bend the Ribbon Vibrator Shaft Arm Rear.
Now see that the height of the Ribbon Vibrator (10-40218) is correct.
Insert a sheet of paper in the machine, make an impression of the underscore.
There should be about 1/32" between the bottom of the underscore and the top of the
ribbon when the Ribbon Vibrator (10-40218) is at rest.
If the ribbon is too high, tip downward on the Ribbon Vibrator Bracket.
If too low, tip up on the Bracket.
Use a pair of long nosed pliers for this purpose.

With all the previous adjustments correct it is now possible to adjust the ribbon
cover.
Set the Bichrome Arm Stop (6-311) so that it allows the Link (10-40191) to travel
the same distance on both sides of the stencil cut out.
The Stop (6-311) can be moved by loosening the two lock nuts on the underside of
the boss on which the Bichrome Arm Stop (6-311) is mounted.
After making the setting, tighten the nuts securely.

Shift the Bichrome Handle (10-40118) to the right.
This will position the Ribbon Vibrator Universal Bar Link (10-40191) to the left
(black) on the Ribbon Vibrator Shaft Arm Front (10-40224).
When the Key Lever is depressed with the Link (10-40191) in this position, the
Ribbon Vibrator should raise sufficiently to carry the upper portion of the ribbon
(black) so that all the characters, particularly the percent sign and underscore,
print without mixing the colors or cutting off.

If it is found that the ribbon is not throwing high enough, tilt the Ribbon Vibrator
Bracket (10-40218) downward as previously instructed.
After the black portion of the ribbon has been set to height, bend the Bichrome Arm
(6-333) so that it touches the Arm (10-40224) when the key lever is depressed.
This acts as a black stop.
Move the Link (10-40191) over to the right (red) and when a key lever is depressed
with the Link (10-40191) in this position, the Ribbon Vibrator should raise to its
full height of travel.
Make this test by depressing a key lever and at the same time press to left of the
Ribbon Vibrator Shaft Arm Rear (10-40214).
If the Ribbon Vibrator has further travel, it indicates that the ribbon is not
throwing to its full height.

Adjustment for this condition is provided by bending the arm of the Bichrome Arm
Stop (6-311) to the right, allowing the link (10-40191) to come closer to the base.
If the Ribbon Vibrator is throwing too high, a spongy feeling will be felt when the
key levers are depressed.
To adjust, bend the Bichrome Arm Stop (6-311) slightly to the left.
After making adjustments, always try the long tail characters such as the j, p, q,
y, etc.
If these characters cut off or mix colors, tilt the Ribbon Vibrator Bracket up or
down as may be desired.
ALIGNING SCALE
ADJUSTMENTS

To align the Aligning Scale (10-40735) to the line of writing, strike a full line of small "i's" on the paper across the width of the platen roll. The Aligning Scale (10-40735) should be level with the line of writing with just a very fine line or space between the top of the Scale (10-40735) and the bottom of the written line.

If high on one side, force the Scale (10-40735) down on that side by pressing on the top of the part of the Scale (10-40735) which extends out from the Shift Rail Front (10-40409).

If low, raise the Scale (10-40735) putting pressure on the underside of the extension.

This applies to both right and left sides.

The white lines on the Scale (10-40735) should be in line with the vertical lines of the letter "i".

The side alignment of the Scale (10-40735) is accomplished by forcing the Scale (10-40735) at the point of the extension to the right or left as required.

In doing this see that the opening in the Aligning Scale (10-40735) is directly back of the opening of the Type Guide and that the type does not strike the Scale (10-40735).

The Aligning Scale Finger (10-40219) should be adjusted so that when twelve sheets of paper are inserted into the machine, with the Pressure Indicator at zero, the Scale (10-40735) will just touch the Scale Finger (10-40219).

See that the Ribbon Vibrator (10-40218) is free up and down with twelve sheets of paper in the machine.

The Scale (10-40735) should rest against the Platen Roll without pressure.

If there is pressure on the roll, bend out on the Scale (10-40735).

Bend in on the Scale (10-40735) if it does not rest against the platen roll.
SHIFT MECHANISM

ADJUSTMENTS

It is very important adjusting the Shift Mechanism to hold all pivot and connection adjustments to a minimum of play.

That is, all such adjustments are to be as tight as possible yet still free in their movement.

Any excess of play will show up a poor alignment and shift motion of the machine.

Begin by examining the Shift Key Lever Shaft (10-40024).

There should be as little end play in the Shaft (10-40024) as possible and adjustment to eliminate play is made with the Shift Key Lever Shaft Pivot Screws (6-6373) either right or left.

Next look at the height of the Shift Key Levers (10-40005) right and left as compared with the height of the lower row of Type Action Key Levers.

The Shift Key Levers (10-40005) right and left, when the carriage is in lower case, should be positioned so that the top of the Shift Key is slightly above the top of the lower bank of Type Action Key Levers.

If this condition does not exist, adjustment can be made by loosening the Shift Lever Eccentric Screw (6-6592) and turning the Shift Lever Eccentric (6-162) backward or forward as required until the correct height of the Levers is obtained.

After adjustment set the Locking Screw (6-6592).

When the carriage of the machine is in lower case, it should be locked in that position.

In other words it should not be possible to raise the carriage other than by pressing the Shift Key Lever (10-40005) right or left.

This condition is made possible by having the upper connection of the Shift Toggle Link Long (6-279N) to the Shift Toggle Link Short a little beyond the center line between the Shift Toggle Link Short Pivot on the Balancing Shaft and the Shift Toggle Link Long (6-279N) Pivot on the Frame Side.

This adjustment is accomplished with the Shift Toggle Stop Screw (6-6398).

If the carriage does not lock in the lower case, the Stop Screw (6-6398) is set too high and should be lowered.

If on the other hand, there is up and down movement between the Stop Screw (6-6398) and the Shift Toggle Link Long (6-279N), the Stop Screw (6-6398) should be raised.

To make the test for the proper adjustment take hold of the Shift Rail (10-40409) and try to move it up and down to see if the carriage locks in the lower case and is without up and down play.

After the adjustment has been correctly made, lock the nut on the Stop Screw (6-6398).

As has been said, the up and down play of the Shift Rail (10-40409) when in the lower case, should be held to a minimum.

If there is up and down play of the Shift Rail after the Shift Toggle Stop Screw (6-6398) has been adjusted, it may be that the Carriage Balancing Shaft (10-40458) is loose on the Pivot Screws (6-6391N).

Try the Balancing Shaft (10-40458) for end play.

If there is end play it may be taken up by the adjusting of the Pivot Screws (6-6391N).

After each adjustment of this kind try the shift up and down to see that there is no bind and that the movement is absolutely free.
It is also possible that there is play in the Shift Toggle Link Short. Adjustment for eliminating this play is made with the Shift Toggle Link Short Screw (6-6478). These screws (6-6478) are made with a tapered shoulder which provides a means of taking out the play by turning in on the Screw (6-6478). After adjustment has been made tighten the Lock Nut on the Screw (6-6478) and test for freedom of movement.

Now try the Shift Toggle Link Long (6-279N) on the Shift Toggle Link Long Screw, this also has the tapered shoulder.

If there is play at this point, loosen the locking nut and turn in the screw, after which lock the nut and try for bind and play.

It is now possible after all the previous adjustments have been checked and corrected, to adjust the height of the carriage and then to follow through with the motion adjustment.

Insert one sheet of paper in the machine and with the Pressure Indicator set in a vertical position and the carriage in the lower case, strike the various letters such as the l, k, h, g, y, etc.

If the printing of the letters is light on the top it indicates that the carriage is to be raised.

To raise the position of the carriage loosen the Shift Adjusting Eccentric Screw (6-6472) and turn the high side of the Shift Adjusting Eccentric (6-426) down. This will raise the carriage.

Turn the Eccentric (6-426) only a little at a time and tighten the screws (6-6472) before making a test.

If in making the test the letters show light on the bottom the carriage should be lowered.

To accomplish this do as explained above but turn the Eccentric (6-426) in the opposite direction.

When the printing of the characters is even on top and bottom, set the Shift Adjusting Eccentric Screw (6-6472).

The adjustment of the Shift Motion is made with Carriage Balancing Arm Lever Adjusting Screw & Nut (6-6384N).

When the Screw (6-6384N) is properly set to limit the upward travel of the carriage, the capital letters will be in line with the small ones.

Be sure that the Shift Lever Stop Screw (6-6407) is set low enough not to interfere or stop the travel of the Shift Lever (10-40404) when the motion is being adjusted.

Try the motion by pressing the Shift Key Lever (10-40005) right or left with uniformly light pressure on the Shift Key and striking alternately the capital and small "h".

If the printing shows the capital "H" below the line of the small letter, the carriage is traveling too high.

To overcome this loosen the lock nut on the Screw (6-6384N) and turn in on the Screw (6-6384N).

Now set the lock nut and again try the motion.

If the printing now shows the capital letter above the line of the small letter, the carriage is not traveling high enough and the motion stop Screw (6-6384N) should be backed out.

When adjustment is correct, set the lock nut on the stop Screw (6-6384N).
The Shift Lock Plates Left (10-40399) and Right (10-40400) are mounted to the frame of the machine with two mounting screws in each plate. You will notice that the holes in these plates are elongated. This makes it possible to get an up and down adjustment of the plates so as to insure positive lock.
The Lock Plates Left and Right should be set low enough so that there will be no variation in the up and down alignment of the capital letters when the motion is tried by locking and releasing the Shift Key Lock.
In setting the Shift Lock Plates Left and Right use this test.
Do not set the plates so low that the lock and release are hard in operation. They should also be set about even.
Make the test for this by locking Shift Keys in the upper case position.
Now release the lock by pressing the Shift Key Lever Left.
The lock on the left should release first and the one on the right shortly after.
Make this same test starting with the right Shift Key Lever.
Be sure that the mounting screws are set after adjustment is correct.

The last adjustment is the setting of the Shift Lever Stop Screw (6-6407).
Lock the carriage in the upper case with the Shift Lock Key and turn the Shift Lever Stop Screw (6-6407) until it just touches the underside of the Shift Lever, and then set the lock nut on the Screw (6-6407).
Try the motion.
If the capital letters are printing above the line of the small ones the Stop Screw (6-6407) has been set too high and should be lowered.
When properly adjusted the Shift Lever Stop Screw (6-6407) will have no effect on the motion.
The purpose of this Screw (6-6407) is to prevent any strain on the Carriage Balancing Arm Lever Adjusting Screw (6-6384N) under heavy pressure on the Shift Keys.

If the shift is too heavy, the adjustment is made by turning in on the Shift Balancing Spring Adjusting Screw (6-6465).
If too light, reverse routine of adjustment.
Set these screws so as to allow a light, quick, shifting carriage.
SPACE BAR MECHANISM

- SPACE BAR TRIP ADJ. LINK 10-40153
- WASHER 6-7842 — LOCK NUT 6-6005
- CONNECT NUT 6-6008
- ADJ. LINK SCR. 6-6487
- NUT 6-6002
- SP. BAR LINK SCR. 6-6324
- NUT 6-6002
- SP. BAR SHAFT ARM 10-40146
- SPACE BAR SHAFT 10-40194
- RETURN SPR. 10-6997
- SPR. COLLAR 6-230
- INTERLOCKING LEVER 10-40147
- SPACE BAR CONNECTION 10-40152
- SP. BAR INTERLOCK SCR. 6-6347
- ECCENTRIC 6-162
- NUT 6-6002
- UNIVERSAL BAR BAL. SPR. ANCHOR 10-40198
- SP. BAR SHAFT NUT 6-6014
- PIVOT SCR. & NUT 6-6333 N
- UNIVERSAL BAR ADJ. ARM SPR. 10-7025
- SPACE BAR 6-219
- SPACE BAR UP STOP 6-247
- NUT 6-6002
- DOWN STOP 6-247 — NUT 6-6002

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SPACE BAR MECHANISM

ADJUSTMENTS

First see that the Space Bar Shaft (10-40194) has a minimum of play between the Pivot Screws (6-6333N). If there is any play remove it by adjusting the Pivot Screws (6-6333N) see that the lock nuts are tight after adjustment.

The height of the Space Bar (6-219) is correct when the curved ends of the Bar (6-219) are level with the frame of the machine. Adjustment is made by raising or lowering the Space Bar Up Stops (6-247). If the Space Bar is high it is necessary to raise the Up Stop (6-247) if low, lower the Up Stop (6-247).

When the Space Bar (6-219) is depressed, the first trip of the escapement should be felt when the Space Bar (6-219) is about 1/8 of an inch above the Space Bar Down Stop (6-247) and the second trip or release should occur just before the Space Bar (6-219) touches the Stop (6-247).

The adjustment for this condition is made on the end of the Space Bar Connection (10-40152) where it attaches to the Escapement Body (10-40234) with the Space Bar Connect Nut (6-6008). Adjust this Nut (6-6008) in or out on the Space Bar Connection (10-40152) until the desired tripping is reached. Set the Lock Nut (6-6005) after the adjustment is made.

The Space Bar Interlocking Lever (10-40147) acts as a lock for both the Space Bar and the Type Action Key Levers. Upon depressing the Type Action Key Levers the Space Bar cannot be operated and vice versa when the Space Bar is in operation the Key Levers cannot be depressed. The adjustment necessary for this part is to depress the Type Action Key Lever and bring the Space Bar Interlocking Lever (10-40147) in contact with the Ribbon Vibrator Universal Bar Shaft by loosening the Space Bar Interlocking Screw (6-6347) and adjusting the Space Bar Interlocking Eccentric (6-162) to do so.

When this adjustment is made, set the lock Screw (6-6347). Try out the Space Bar and Key Lever to see if the desired effect of locking is accomplished. There should be just a little play on the contact of the Space Bar Interlocking Lever (10-40147) with the Ribbon Vibrator Universal Bar.

The Space Bar tension is supplied with a coil spring (10-6997) on the Space Bar Shaft (10-40194) and is adjusted with the Space Bar Shaft Spring Collar (6-230). Do not put excessive tension on the Escapement Body (10-40234) as this will cause a heavy action on the Space Bar.
TABULATOR MECHANISM

ADJUSTMENTS

The Tabulator Lever (10-40741) when depressed by the Tabulator Key Lever (10-40678) should clear the Tabulator Stop Rack (10-40687) by about 1/32 of an inch. The adjustment to bring this lever (10-40741) with this limit of the rack (10-40687) is accomplished by turning in on the Tabulator Key Lever Set Screw (10-6578N) until the desired distance is reached. Set the lock nut on the Screw (10-6578N) after the adjustment.

The Tabulator Clear Lever (10-40743) when depressed by the Tabulator Clear Key Lever (10-40765) should be about .015" from the Tabulator Stop Rack (10-40687) when moving the carriage from left to right. This adjustment is made the same as for the Tabulator Lever by turning in on the Tabulator Key Lever Set Screw (10-6578N) the Clear Lever (10-40743) is brought forward. After this distance is set, adjust the Tabulator Clear Lever Stop Screw (10-6638N) so that the Clear Lever (10-40743) will limit against this screw when depressed. After the adjustments are made, see that all the lock nuts on the screws (10-6638N) and (10-6578N) are set.

The Tabulator Clear Lever and the Tabulator Lever are supported on the left side by two Tabulator Lever Support Screws (10-6683N), Tabulator Clear Lever Support (10-40774) and on the right side by the Tabulator Lever Support (10-40781).

These supports and screws should be adjusted to allow the Clear Lever (10-40743) and the Tabulator Lever (10-40741) to move in and out freely with very little side play and as near 90° to the rack (10-40687) as possible.

The adjustment on the Tabulator Stop Rack (10-40687) to allow the Tabulator Lever (10-40741) to go between Stops (10-40679) without pushing stops in, is done by first depressing a continuous number of Tabulator Stops (10-40679) and trying the Tabulator Lever to see if it will go between the Stops (10-40679). If not, the adjustment can be made by loosening the Tabulator Stop Rack Screw Left (10-6666) and Right (10-6667) and adjusting the Tabulator Stop Rack Adjusting Screw (10-6619N). See that the lock nut on the Adjusting Screw (10-6619N) is set after adjustment and also the Rack Screws (10-6686) and (10-6867).

The Tabulator Set Lever (10-40684) when at rest should clear the front of the Tabulator Stop Rack (10-40687) by about 1/16 of an inch when the stops are in. The adjustment to accomplish this is made by the Tabulator Key Lever Set Screw (10-6578N).

The side adjustment to make the Set Lever (10-40684) hit squarely on the Tabulator Stops (10-40679) is done by simply bending the Set Lever (10-40684) until it does so.

The Tabulator Clear Key Lever (10-40765), Tabulator Key Lever (10-40678) and the Tabulator Set Key Lever (10-40766) should be free in their movement on the Tabulator Key Lever Shaft (10-40702) and in the Tabulator Key Lever Comb Lower and Down Stop (10-40143) with no binding action. The adjustments for this is to use a pair of pliers and bend the Key Levers until free in their motion but not loose.

The Tabulator Release Arm should not interfere with the Escapement Fixed Dog (10-40248). Interference will cause a sluggish escapement action. Should there be interference, bend the Tabulator Release Bracket up slightly at point marked "X" on illustration. When properly set, there should be a few thousandths clearance between the Release Arm and the Fixed Dog, yet the tabulation should occur when the Tabulator Bar is depressed before it reached the Tabulator Key Lever Comb Lower Down-Stop Filler (10-40722).

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TYPE ACTION AND KEY LEVERS

ADJUSTMENTS

In order to remove the Key Levers, it is necessary to turn the Key Lever Fulcrum (6-275) so that the flat side of the Key Lever Fulcrum (6-275) is on the upper side. When in this position it is possible to remove the Key Levers (10-40111) out from the rear of the comb. When removing the Key Lever disconnect the Key Lever Spring (6-6902) and the Type Action Pull Link.

After the Key Lever has been replaced, turn the Key Lever Fulcrum (6-275) so that the arm on the fulcrum is in a vertical position downward and the flat side is toward the front of the machine.

To take a Type Action out of the machine, first disconnect the Type Bar Links and the Type Bar Arm Front and the Type Bar Arm Rear. Now lift the Type Bar (6-624) out from the rear of the Type Bar Comb Upper. Next disconnect the two Type Action Pull Links from the Key Levers, then remove the Type Action Hanger Clamp (6-21651) by taking out the Screw (10-6663). At this point drop the Type Bar Arm Rear to the rear and lift the action at the front so that it will be out of its position in the Type Action Segment. Now tip the action further to the rear of the machine and lift it out.

To replace the action have the rear of the action pointing downward and with the Type Action Pull Links also pointing downward, place the action in its position in the machine, making sure that the saddle of the Universal Bar Trip is over the Universal Bar and that the lower rear end of the Action Frame is properly seated in the Type Action Segment and that the front end of the Action Frame is set back of the head of the Type Action Hanger Adjusting Screw (6-6361).

Before putting on the Type Action Hanger Clamp (6-21651) see that the other action has not been disturbed. After the mounting Screw (10-6663) in the Type Action Hanger Clamp (6-21651) has been set, connect the Type Action Pull Links to the Key Levers and put in the Type Bar (6-624) making the necessary connections.

When the Type Action has been removed and replaced it is necessary to readjust the pressure on both actions under the Type Action Hanger Clamp (6-21651) of the action that has been changed. Adjust the pressure with two sheets of thin paper, or one sheet of ordinary bond paper (letterhead) in the machine and have the Pressure Indicator in a vertical position. When adjusting the individual pressure of any action, back the Adjusting Screw (6-6361) out until the type does not print and then turn in on the Screw (6-6361) until properly adjusted. This method provides a stop against the action and prevents from losing pressure.

When the pressure on a machine is properly adjusted or set, all characters should print faint yet uniform on one sheet of ordinary bond paper, or two sheets of light paper. Before undertaking to set the pressure, set the carriage so that there is .060" clearance between the type guide and the cylinder with the Indicator Lever at zero on the dial. With the carriage moved back, to get light pressure, see that all type characters are on feet, meaning carriage set to height and motion properly set. As previously stated, in setting the pressure, the Indicator Lever should be moved in a vertical position or on the fourth graduation line on the front panel.
In adjusting the up and down alignment of the type, each type should enter the Type Guide (6-2070) without striking the Guide (6-2070). In all cases, first see that the upper type enters the guide properly for this reason:

The Type Action Eccentric (6-2025) is used to get the proper entry of the upper type in the Type Guide (6-2070) and when adjusted for this purpose, also changes the up and down alignment of the lower type on the same bar. It can be seen from this that if the up and down alignment of the lower type is adjusted first it will be necessary to re-align that type after the entry of the upper type in the Type Guide (6-2070) has been adjusted.

The up and down adjustment of the lower type does not affect the upper.

When adjusting the up and down alignment, notice whether the upper type is striking the upper or lower part of the Guide (6-2070). If the type is striking the upper part of the Guide (6-2070) the type should be lowered. Do this by loosening the locking Screw (6-6418) on the Eccentric (6-2025) and turning the Eccentric (6-2025) toward the front of the machine. Turn the Eccentric (6-2025) slowly a little at a time until the upper type clears the top of the Guide (6-2070).

If the type is striking the lower part of the Guide (6-2070) turn the Eccentric (6-2025) toward the rear of the machine. When properly adjusted, tighten the locking Screw (6-6418) on the Eccentric (6-2025).

After the upper type has been aligned try the entry of the lower type in the Guide (6-2070). If the type is striking the lower part of the Guide (6-2070) it should be raised. This is done by turning the Eccentric (6-2025) which is on the left side of the action, toward the front of the machine.

If striking the upper part of the Guide (6-2070) lower the type by turning the same Eccentric (6-2025) toward the rear of the machine. After the adjustment set the locking Screw. This up and down adjustment of the lower type does not affect the upper.

The type should also enter the Guide (6-2070) sideways without causing any noise. The type on the Bars (6-624) on the left side of the machine should favor the right side of the Guide (6-2070) and those on the right side should favor the left side of the Guide (6-2070). To obtain the proper entry of the type in the Guide (6-2070) and to eliminate noise caused by the type striking the side of the Guide, bend slightly and by hand the tail of the Type Bar (6-624) in the same direction in which the type is to be moved.

Try all the Type Actions and Type Bars (6-624) to see that they are free in their movement. In case of bind examine the Key Levers, Type Action Pull Links, Type Bar Links and the Type Bar Arm front and rear. Also see that the Type Bar and comb slots are clean. (Never oil the Type Bar Comb Slots).
When replacing a worn or broken Type Guide (6-2070) remove the "B Y" action and use the Gauge No. 1 to get the correct position of the Guide (6-2070). If no gauge is to be had, the Guide (6-2070) may be adjusted provided the machine is in good alignment, by seeing that all of the type enters the Guide properly. The upper type should favor the lower part of the Guide (6-2070) and the lower type favor the upper part. See that the Type enters the Guide sideways, as described in the previous paragraph. When properly adjusted, set the Type Guide Screws.
INSTRUCTIONS FOR DISMANTLING MACHINE

TOP COVER, FRONT PANEL, RIBBON SPOOL KNOBS

Remove Top Cover (10-40610), Front Panel (10-40600) and Ribbon Spool Knobs Complete (10-40210)

CARRIAGE COMPLETE

Remove the Carriage Complete (10-40414).
First, remove the Paper Finger Rail Right End Screw (10-6617) and slide the Paper Finger Hinge Right Complete (10-40897) off the rail.

Second, unhook the Carriage Spring Drum Tape Complete (6-754) from the fastener on carriage and attach same to Carriage Spring Drum Detent Pawl on Carriage Spring Drum Bracket Complete (10-40277) so as to prevent the spring drum from unwinding.

Third, remove Carriage Retainer Complete (10-40454), Carriage Retainer Gib Plate (6-874), Carriage Retainer Gib (6-873), Carriage Retainer Screw (6-6479), Carriage Retainer Plate (6-712), Carriage Retainer Screw Nut (6-5019) and Carriage Retainer Screw Washer (6-7839).

Move the Pressure Indicator Lever Complete (10-40304) over to the right as far as it will go.
Lock the carriage in its shift position and slide the carriage out of its rails to the right from the rear of the machine.

SHIFT RAIL COMPLETE

Unhook the Shift Balancing Springs Complete (6-6938) from the Shift Balancing Spring Arm (10-40429).
Disconnect the Ribbon Vibrator Shaft Arm Rear (10-40214) from the Ribbon Vibrator Bracket Complete (10-40218) by removing the Ribbon Vibrator Link Right Screw (10-6601) and Nut (6-6905).
Remove the Escapement Shaft Ball Retainer (6-387) on the Escapement Shaft Complete (6-390).
Remove Shift Lever Complete (10-40404) from the Carriage Balancing Shaft Complete (10-40458).
Back out the Carriage Balancing Shaft Pivot Screws (6-6391N).
Disconnect and remove the Tab. Set Lever Fulcrum Pin (10-6121).
Now the Shift Rail Complete (10-40409) can be lifted out of the machine.

REAR COVER

Disconnect the Center Tie Adjusting Spring Right Complete (6-6928) from the Rear Cover (10-40310), the Bell Ringer Spring (10-7003) from the Bell Ringer Complete (10-40319) and the Center Tie Adjusting Spring Left Complete (6-6907) from the rear cover.
Remove the Rear Cover Screws (10-6643) and the rear cover can be taken off the machine.
At this point also remove the Tab. Connecting Link Comb (10-40512) Assembly by removing two Tab. Connecting Link Comb Bracket Screws (6-6388) which attach to the Frame Brace Rear Lower.
INSTRUCTIONS FOR DISMANTLING MACHINE (Cont'd)

CARRIAGE SPRING DRUM BRACKET

To remove the Carriage Spring Drum Bracket Complete (10-40277) remove the Carriage Spring Drum Tape Complete (6-754) and release the tension on the Carriage Spring inside of the Carriage Spring Drum.

Turn the machine over on its side and take out the Carriage Spring Drum Bracket Screw (6-6376) and lift the Carriage Spring Drum Bracket Complete out of the machine.

BELL

To remove the Bell (6-835) take out the Bell Screw (10-6586) and the Bell and the Bell Post (10-40315) can be taken out of the machine.

CENTER TIE

Disconnect the Center Tie Adjusting Link Complete (10-40324) from the Center Tie Complete (10-40345) by removing the Center Tie Adjusting Link Pin (6-6100) and two Center Tie Adjusting Link Pin Nuts (6-6002).

Disconnect the Line Lock Bail Pull Wire (6-238) from the Margin Release Lever Complete (10-40017).

Back out the two Center Tie Gib Screw and Nut (10-6659N) on each Frame Side Lugs and then remove the Center Tie from the machine.

TYPE GUIDE

To remove the Type Guide (6-2070) just remove the Type Guide Screws (6-6326).

ESCAPEMENT COMPLETE

To remove the Escapement Complete (10-40237) disconnect the Back Space Dog (6-703) by disconnecting Back Space Dog Spring (6-6901) from the Back Space Dog Spring Screw (6-6341).

Take out the Back Space Dog Guide Screw (6-6305) on the Escapement Bracket and now remove the Back Space Dog Screw (6-6368) and Back Space Dog Screw Nut (6-6005) on the Back Space Bell Crank (10-40008) and the Back Space Dog will come out of the machine.

Next step is to remove the Escapement Connection (10-40226) by removing the Escapement Connection Lock Nut (6-6005), Escapement Connection Nut (6-6008) and the Escapement Trip Adjusting Link Washer (6-7842) and then remove the Escapement Connection from the Universal Bar Adjusting Arm Complete (10-40528).

Now remove the Space Bar Connection from the Escapement by removing the Space Bar Connection Lock Nut (6-6005), Space Bar Connection Nut (6-6008) and the Space Bar Trip Adjusting Link Washer (6-7842).

Finally disconnect the Tab. Escapement Release Arm Spring (10-7017) from the Tab. Universal Bar Spring Anchor (10-40729) on the Frame Brace Rear Lower (10-40031) and then remove the Escapement Bracket Screws (6-6416) and the Escapement will come out of the machine.
INSTRUCTIONS FOR DISMANTLING MACHINE (Cont'd)

TABULATOR KEY LEVERS

To remove the Tabulator Key Lever Assembled (10-40678), Tabulator Clear Key Lever Complete (10-40765), Tabulator Set Key Lever Complete (10-40766), remove the Tabulator Key Lever Comb Lower Down Stop Filler (10-40722) on the Tabulator Key Lever Comb Lower and Down Stop Complete (10-40148).

Remove the Tabulator Key Lever Shaft Screws (6-6343) on the Frame Brace Rear Lower (10-40031) and the Tabulator Key Lever Shaft (10-40702) can be slipped out of the Frame Brace Rear Lower and when this shaft comes out, the Space Bar Interlocking Lever-Spacer Long (10-40149) will drop out.

Now the Tabulator Key Levers are ready to be taken out of the machine, this is done by simply bringing each lever forward and working it out of the machine between the Space Bar and the Key Levers.

SPACE BAR MECHANISM

In order to remove the Space Bar Lever Complete (10-40142), first release the tension on the Space Bar Shaft Return Spring (10-6997) by releasing the Space Bar Shaft Spring Collar Complete (6-230) which can be done by unloosening the Space Bar Shaft Spring Collar Screw (6-6355).

Now disconnect the Universal Bar Adjusting Arm Spring (10-7025) from the Universal Bar Balancing Spring Anchor (10-40198) on the Space Bar Shaft (10-40194). Back up one of the Shift Key Lever Shaft Pivot Screw (6-6373) so that the Shift Key Lever Shaft (10-40024) will drop back enough to be able to unhook the Space Bar Shaft Return Spring.

Loosen both Space Bar Shaft Pivot Screw and Nut (6-6355N) on the Frame Brace Front (10-40029) and remove the complete Space Bar Mechanism from the machine.

TYPE ACTION COMPLETE

Turn the machine around to the front, take off the Type Bar Comb Upper (10-40511) disconnect all the Type Bar Completes (6-624) and remove from the machine.

Now disconnect all the Type Action Pull Links from the Key Levers.

Remove all Type Action Hanger Clamps (6-21651), Top Cover Suspension Bracket Complete (10-40612) from the Top Plate Complete (10-40315) by removing the Type Action Hanger Clamp Screws (10-6663) and the Type Action Hanger Clamp Screw Center (6-6338).

Now the Type Action Complete (6-21652) is in position to be removed from the machine and can be lifted out one at a time.

RIBBON SPOOL SHAFTS

To remove the Ribbon Spool Shaft Left Complete (6-551) and the Ribbon Spool Shaft Right Complete (6-552) by loosening the Ribbon Spool Shaft Gear Screw (6-6340), Ribbon Spool Shaft Collar Screw (6-6318) and the Ribbon Spool Shafts Left and Right can be slipped out of the Top Plate Complete (10-40315) and while doing this the Ribbon Spool Shaft Gear (6-540), Ribbon Spool Shaft Spring (10-7082) and the Ribbon Spool Shaft Collar (6-539) will drop out of the machine.
INSTRUCTIONS FOR DISMANTLING MACHINE (Cont'd)

TOP PLATE COMPLETE

To remove the Top Plate Complete (10-40315), slip the Ribbon Vibrator Universal Bar Link (10-40191) off the Ribbon Vibrator Shaft Arm Front.
Disconnect the Ribbon Vibrator Shaft Return Spring (6-6910) off the Ribbon Vibrator Shaft (10-40122).
Remove two Center Tie Retainer Strap Screws (6-6412) from the Frame Brace Rear Upper (10-40030) and take out six Top Plate Screws (6-6375) and lift out of the Top Plate Complete from the machine.

RIBBON DRIVING SHAFT MECHANISM & RIBBON REVERSE MECHANISM

In order to remove the Ribbon Driving Shaft Complete (10-40207), first loosen the Ribbon Driving Gear Screws (6-5318) and the Ribbon Driving Shaft Gear Screw (6-6318) second remove the Ribbon Reverse Cam Screws (6-6307) and then slip the Ribbon Driving Shaft out of the machine.

While doing this, the Ribbon Driving Gear Left (6-310), Ribbon Driving Shaft Gear (6-302), the Ribbon Driving Gear Right (10-40201) and the Ribbon Reverse Cams (6-336) will drop out of the machine.

Next remove the Ribbon Reverse Detent Complete (6-337) by removing the two Ribbon Reverse Detent Screws (6-6319).

LINE LOCK BAIL MECHANISM

To remove the Line Lock Bail (6-218) simply loosen the Line Lock Bail Pivot Bearing Set Screws (6-6340) on the Frame Brace Front (10-40029) and back out the Line Lock Bail Pivot Bearings (10-40104) until the Line Lock Bail slips freely out of the machine.

KEY LEVERS

To remove the Key Levers first, second, third and fourth Banks (10-40111)(10-40112) (10-40113) (10-40114), first remove the Tabulator Key Lever Comb Upper (10-40767) and the Back Space Key Lever Guide Complete (10-40022) from the machine. Now remove the two Touch Adjusting Screw Nuts (6-6002) in order to release the tension on the Key Lever Springs (6-6902).

 Disconnect all the Key Lever Springs from the Key Levers and remove same attached to the Key Lever Spring Plate (6-215) from the machine.
Back out the Shift Key Lever Shaft (10-40024) a sufficient amount to remove the Touch Adjusting Screw (10-6563).

Next step is to turn the Key Lever Fulcrum (6-275) to the front of the machine so as to release the Key Levers and now the Key Levers can be removed from the machine.

BACK SPACE KEY LEVER

To remove the Back Space Key Lever (10-40010) by removing the Back Space Key Lever Screw (6-6390), Back Space Key Lever Screw Bushing (6-129) and Back Space Key Lever Spacer Washer (10-7873) and unhooking the Back Space Link (6-113) from the Back Space Bell Crank (10-40008).
INSTRUCTIONS FOR DISMANTLING MACHINE (Cont'd)

MARGIN RELEASE KEY LEVER

The Margin Release Key Lever (10-40018) can be removed from the machine by removing the Margin Release Key Lever Screw (6-6390), Margin Release Key Lever Screw Bushing (10-40023) and the Margin Release Key Lever Spacer Washer (10-7873).

SHIFT KEY LEVER MECHANISM

To remove the Shift Key Lever Shaft (10-40024) and Shift Key Levers (10-40005), disconnect the Shift Lever Complete (10-40404) from the Shift Key Lever Shaft by removing the Shift Spring Link Screw (6-6330) from the Shift Key Lever Shaft. Now the Shift Key Lever Shaft and Shift Key Levers can be removed from the machine as the Shift Key Lever Shaft Pivot Screw (6-6373) was backed out in previous operation for removing the Space Bar Mechanism. Now remove the Shift Lever Complete (10-40404) and the Shift Toggle Link Long as a unit by removing the Shift Lever Screw (6-6592), Shift Lever Eccentric (6-162) and backing out the Shift Toggle Link Long Screw (6-6477) which screws to the Frame Side Lug.

RIBBON VIBRATOR UNIVERSAL BAR MECHANISM & BICHROME PARTS

Remove the Ribbon Vibrator Universal Bar Link (10-40191) by disconnecting the Ribbon Vibrator Link Spring (10-7025) from the Bichrome Arm Complete (6-333) and removing the Ribbon Vibrator Universal Bar Link Screw (6-6409) and Nut (6-6005) from the Ribbon Vibrator Universal Bar Shaft Complete (10-40180).

To remove the Bichrome Arm Complete (6-333) with Bichrome Arm Handle Complete (10-40118) attached, just remove the Bichrome Detent Spring (6-6905) and the Bichrome Arm Screw (6-6345) and Nut (6-6005).

Remove Bichrome Arm Stop (6-311) by removing the Bichrome Arm Stop Screw (10-6614) and Washer (6-7839). Remove the Ribbon Vibrator Universal Bar Shaft Complete (10-40180) by just backing up on the Ribbon Vibrator Universal Bar Shaft Pivot Screw and Nut (6-6333N).

The machine has been completely dismantled.

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INSTRUCTIONS FOR ASSEMBLING MACHINE

BICHROME PARTS

Assemble Bichrome Arm Stop (6-311) to the Frame Side Right with Bichrome Arm Stop Screw (10-6614) and Washer (6-7839), assemble Bichrome Arm Complete (6-333) and the Bichrome Arm Handle Complete (10-40118) assembly to the Frame Side Right with the Bichrome Arm Screw (6-6345) and Nut (6-6002).

Attach the Bichrome Detent Spring (6-6905) to the Bichrome Arm Complete and the Bichrome Arm Stop Screw.

RIBBON VIBRATOR UNIVERSAL BAR SHAFT MECHANISM

Assemble to the Ribbon Vibrator Universal Bar Shaft Complete (10-40180) the Ribbon Vibrator Universal Bar Link (10-40191) with the Ribbon Vibrator Universal Bar Link Screw (6-6409) and Nut (6-6005) and place the complete assembly into machine.

Tighten the Ribbon Vibrator Universal Bar Shaft Pivot Screw and Nut (6-6333N) so that there will be freedom of motion but no play.

Attach the Ribbon Vibrator Universal Bar Link Spring (10-7025) to the Ribbon Vibrator Universal Bar Link and the Bichrome Arm Complete.

SHIFT MECHANISM AND SPACE BAR MECHANISM

Assemble Shift Lever Complete (10-40404) and Shift Toggle Link Long (6-279N) assembly to the Frame Side Left with the Shift Lever Eccentric (6-162) and the Shift Lever Screw (6-6592) and the Shift Toggle Link Long Screw (6-6477) which is attached to the Shift Toggle Link Long.

Tighten all the screws but allow freedom of motion with no play.

Put the Touch Adjusting Screw (10-6563) into the Frame Brace Front with two Nuts (6-6002).

Now place the Shift Key Lever Shaft (10-40024) and the Shift Key Lever (10-40005) assembly into the machine with the ends of Shift Key Lever Shaft greased.

Grease ends of the Space Bar Shaft (10-40194) on the Space Bar Mechanism.

Place the entire assembly into the machine, hooking the Space Bar Shaft Return (10-6997) on the Frame Brace Front.

Tighten the Space Bar Shaft Pivot Screw and Nut (6-6333N) so that there is freedom of motion but no play.

Adjust the Space Bar Shaft Return Spring for tension to keep Space Bar up and tighten the Space Bar Shaft Spring Collar Screw (6-6355) in the Space Bar Shaft Spring Collar Complete (6-230) when this desired tension on spring is reached.

Now tighten the Shift Key Lever Shaft (10-40024) in position by adjusting the Shift Key Lever Shaft Pivot Screws (6-6373) and Nuts (6-6003).

Place an elastic band on the rear of the Space Bar Mechanism to hold them out of place on the frame.

BACK SPACE KEY LEVER

Grease the Back Space Key Lever (10-40010) at the pivot hole and assemble to the Back Space Bell Crank (10-40006) with the Back Space Link (6-113).

Assemble the Back Space Key Lever to the Frame Side Left with the Back Space Key Lever Spacer Washer (10-7873), Back Space Key Lever Screw Bushing (6-129) and the Back Space Key Lever Screw (6-6390).

Tighten screw with freedom of action but no play.
INSTRUCTIONS FOR ASSEMBLING MACHINE (Cont'd)

MARGIN RELEASE KEY LEVER

Grease the Margin Release Key Lever (10-40018) at the pivot hole and assemble the Key Lever to the Frame Side Right with the Margin Release Key Lever Spacer Washer (10-7873), Margin Release Key Lever Bushing (6-129) and the Margin Release Key Lever Screw (6-6390).

Tighten screw so as to have freedom of motion and no play.

RIBBON DRIVE SHAFT MECHANISM

Assemble the Ribbon Driving Shaft Complete (10-40207) into machine and at the same time while pushing the drive shaft through the machine place the Ribbon Reverse Cam (6-336), Ribbon Driving Gear Right (10-40201), Ribbon Driving Shaft Gear (6-302) and the Ribbon Driving Gear Left (6-310) in position on shaft.

Set the Ribbon Reverse Cams Screws (6-6307) in place and tighten.

Assemble the Ribbon Reverse Detent Complete (6-337) in place with the Ribbon Reverse Detent Screws (6-6319) and at the same time set the Reverse Detent Lever on the Ribbon Reverse Detent Complete into the Ribbon Driving Gear Right.

KEY LEVERS AND LINE LOCK BAIL MECHANISM

Grease the slots in the Comb Rear (6-276) and assemble the Key Lever Fulcrum (6-275) so that the position of same is towards the front.

Assemble the 42 levers in their proper position and turn Key Lever Fulcrum to lock levers in position.

Gauge and free up all the Key Levers.

Place the Line Lock Bail (6-218) into machine and set the Line Lock Bail Pivot Bearings so that there is no play in the Line Lock Bail but that there is freedom of motion.

Lock Pivot Bearing in place by set Screws (6-6340) on Frame Brace Front.

Assemble the Key Lever Spring Plate (6-215), with the Key Lever Springs (6-6902) attached, to the Touch Adjusting Screw (10-6563) and hook up springs to the Key Levers.

Test and free up all tight Key Levers.

TOP PLATE COMPLETE

Assemble Top Plate Complete (10-40315) just as it was dismantled from the machine in Article 14 on Dismantling of Machine with six Top Plate Screws (6-6375) and two Center Tie Retainer Strap Screws (6-6412).

Tighten eight screws.

Hook up the Ribbon Vibrator Universal Bar Link (10-40191) to the Ribbon Vibrator Shaft Arm Front (10-40224) on the Top Plate and also hook up the Ribbon Vibrator Shaft Return Spring (6-6310) to the Ribbon Vibrator Shaft (10-40122) and the Margin Release Key Lever (10-40018).
INSTRUCTIONS FOR ASSEMBLING MACHINE (Cont'd)

RIBBON SPOOL SHAFTS

Oil spools and shafts.
Place the Ribbon Spool Shaft Left Complete (6-551) and Right Complete (6-552) into the Top Plate Complete (10-40315) and while doing so place the Ribbon Spool Shaft Collar (6-539), Ribbon Spool Shaft Spring (10-7032) and the Ribbon Spool Shaft Gear (6-540) in their proper position on the shaft.

Gauge the Ribbon Spool Shafts by tightening the Ribbon Spool Shaft Gear Screw (6-6340) and using gauge under Ribbon Spool Disc. Adjust the spools for proper tension with gauge and tightening Ribbon Spool Shaft Collar Screw (6-6318) after proper tension is placed on Ribbon Spool Shaft Collar Spring (10-7032). Test spools to have a free running fit and proper up and down play.

Now set the Ribbon Driving Gear Right (10-40201) to properly mesh with the Ribbon Spool Shaft Gear (6-540) on the Ribbon Spool Shaft Right Complete (6-552) and tighten Ribbon Driving Gear Screw (6-6318).

Now Detent Ribbon Driving Shaft Complete (10-40207) to the left and set the Ribbon Driving Gear Left (6-310) to properly mesh with the Ribbon Spool Shaft Gear (6-540) on the Ribbon Spool Shaft Left Complete (6-551).

Test Ribbon Spool Mechanism, Ribbon Reverse Detent Mechanism and Ribbon Drive Shaft Mechanism for free winding and proper reverse action.

ESCAPEMENT MECHANISM

Grease the Escapement Complete (10-40237) and assemble to the Frame Brace Rear Upper with two Escapement Bracket Screws (6-6416).
Assemble the Back Space Dog (6-703) to the Escapement Bracket (6-724) on the Escapement Complete with the Back Space Dog Guide Screw (6-6305) and then attach the Back Space Dog to the Back Space Bell Crank (10-40008) with the Back Space Dog Screw (6-6368) and Nut (6-6005).

Hook up the Back Space Dog Spring (6-6901) to the Back Space Dog and the Back Space Dog Spring Screw (6-6341).
Test the Back Space Mechanism for freedom of action.
Attach the Space Bar Connection (10-40152) to the Escapement Body (10-40233) with the Space Bar Trip Adjusting Link Washer (6-7842), Space Bar Connection Nut (6-6008) and Space Bar Connection Lock Nut (6-6005).
Test out the Space Bar Mechanism.

Hook up the Escapement Connection (10-40226), to the Universal Bar Adjusting Arm Complete (10-40526) and attach to the Escapement Body (10-40233) with the Escapement Trip Adjusting Link Washer (6-7842), Escapement Connection Nut (6-6008) and Escapement Connection Lock Nut (6-6005).
The adjustment for the Escapement and Space Bar Mechanism will come later in the assembly of the machine.

Now hook up the Universal Bar Adjustment Arm Spring (10-7025) to the Universal Bar Balancing Spring Anchor (10-40198) on the Space Bar Shaft (10-40194) and to the Universal Bar Adjustment Arm Complete (10-40526).
INSTRUCTIONS FOR ASSEMBLING MACHINE (Cont'd)

CARRIAGE SPRING DRUM MECHANISM AND CENTER TIE ASSEMBLY

Grease the Carriage Spring Drum Bracket Seat and the Center Tie Seat on the Frame Brace Rear Upper.
Assemble the Carriage Spring Drum Bracket Complete (10-40277) to the Frame Brace Rear Upper with Carriage Spring Drum Bracket Screw (6-6376).
Tighten the Ribbon Driving Shaft Gear Screw (6-6318) placing the Ribbon Driving Shaft Gear in position so that upon detenting Ribbon Drive Shaft Complete (10-40207) this gear will always engage the Ribbon Feed Shaft Gear on the Carriage Spring Drum Bracket.
Test out the detent mechanism for proper reverse action and winding action of the Ribbon Drive Shaft Gears by using Carriage Spring Drum.
Assemble the Center Tie Complete (10-40345) assembly to the machine and test its freedom on the seats.
Hook up the Line Lock Bail Pull Wire (6-238) to the Margin Release Lever Complete (10-40017).
Hook up the Center Tie Adjusting Link Complete (10-40324) to the Center Tie Complete (10-40345) by means of the Center Tie Adjusting Link Pin (6-6100) and two Nuts (6-6002).
Gauge Center Tie Gib Screws and Nuts (10-6659N) from freedom of action and no play.

INSPECTION OF PREVIOUS OPERATION

Inspect the following:
1. Space Bar Mechanism and free up.
2. Bichrome Mechanism.
4. Key Levers.
5. Ribbon Mechanism.

TYPE GUIDE

Assemble Type Guide (6-2070) to Top Plate Complete (10-40315) with three screws (6-6326).
Gauge the Type Guide for vertical alignment and line it up perpendicular to machine.
Place the Type Bar Comb Upper (10-40511) just in its proper position on the Top Plate and line up the Type Guide with this by using a gauge made for this purpose.

REAR COVER

Assemble the Tabulator Connecting Link Comb (10-40512) assembly to the Frame Brace Rear Lower with two Tabulator Connecting Link Comb Bracket Screws (6-6338) at the same time inserting the Tabulator Clear Lever Complete (10-40743), Tabulator #1 Lever Complete (10-40741) and Tabulator Set Lever Complete (10-40684) in the proper slots in the comb.
Assemble the Rear Cover (10-40310) to the machine with six Rear Cover Screws (10-6643).
Hold the Center Tie in its proper place and adjust the Center Tie Retainer (10-40336) and the Center Tie Retainer Lug (10-40337).
Attach the Center Tie Adjusting Spring Left Complete (6-6907) and Right Complete (6-6938) to the Rear Cover and the Center Tie Adjusting Spring Screw Long (6-6403) on the Center Tie (10-40345) and attach the Bell Ringer Spring (10-7003) to the Bell Ringer Complete (10-40319).
Adjust the Center Tie stops (10-40289) on each Frame Side for proper travel of the Center Tie.

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INSTRUCTIONS FOR ASSEMBLING MACHINE (Cont'd)

TYPE ACTION COMPLETE

Grease the Type Bar Comb Upper (10-40511) slots, the Type Action Hanger slots in Top Plate (10-40315) and in the Type Action Segment in the Top Plate.
Insert Type Action Complete (6-21652) into machine one at a time and after all the actions are in position assemble Type Action Hanger Clamp (6-21651) Top Cover Suspension Bracket Complete (10-40612) with Type Action Hanger Clamp Screws (10-6663) and Type Action Hanger Clamp Screw Center (6-6338).
Hook up all the Type Action Pull Wires to the Key Levers.
Now assemble the Type Bar Comb Upper (10-40511) to the Top Plate Complete (10-40315) with four Type Bar Comb Upper Screws (10-6609).

Assemble the Type Bar Complete (6-624) to the Type Action Complete (6-21652) by feeding into the machine from rear to front.
First, hook the Type Bar Arm Rear on the Type Bar to the Type Action Bell Crank on the Type Action Complete and feeding the Type Bar through the slot in the Type Bar Comb Upper and then hooking the Type Bar to the Type Action parts.
Free all the action so that it does not hang and see that each Type Bar strikes in the center of the Type Guide by adjusting Type Action Eccentric on the Type Action Complete.
Tighten adjustment and eccentric.

KEYBOARD

Straighten two end keys on bottom row to gauge and place leveling board on bottom row of keys and adjust all key levers to same height.
Repeat this operation for each bank until all key levers are uniform in height.
This is done by using a bender and bending the key levers to come to gauge height.
Now see that the proper space exist between each key lever in each row by using a gauge and pliers.

INSPECTION OF TYPE ACTION

Inspect all Type Action Screws.
See that Type Bars hit within guide.
See that action breaks properly.
Inspect Keyboard and Key Levers.
Inspect for wrong action.
Inspect for proper key play.
Set and tighten Center Tie Gib to eliminate play.
Center Type Bar Arms in Type Action and free dip action.

TABULATOR KEY LEVER MECHANISM

Assemble Tabulator Key Lever Comb Upper (10-40767) and the Back Space Key Lever Guide Complete (10-40022) to the Frame Sides with two Tabulator Key Lever Comb Upper Screws (6-6343).
Place the Tabulator Clear Key Lever Complete (10-40765), Tabulator Key Lever Assembled (10-40678), Tabulator Set Lever Complete (10-40766) into the machine by working the levers between the Space Bar and Key Levers.
Insert the Tabulator Key Lever Shaft (10-40702) into the Frame Brace Rear Lower from the right side of the machine and work into the bushings of the Key Levers.
CARRIAGE MOUNTING

- MARGIN RAIL
- CARRIAGE ROLL RETAINER
- CARRIAGE BED RAIL
- CARRIAGE
- CARRIAGE RAIL
- CARRIAGE RETAINER SCREW
- CARRIAGE RET GIB PLATE
- CARRIAGE RETAINER GIB
- CARRIAGE RETAINER-COMPLETE
- CENTER TIE
- CARRIAGE RETAINER PLATE
- CARR. RET. SCR. NUT
- CARR. RET. SCR. WASHER

SHIFT RAILS
CARRIAGE RETAINER SCREW
6-6479
6-874
6-873
6-712
6-6019
6-7839
INSTRUCTIONS FOR ASSEMBLING MACHINE (Cont'd)

TABULATOR KEY LEVER MECHANISM (Cont'd)

At the same time attach the Space Bar Interlocking Lever (10-40147) and insert the Space Bar Interlocking Lever Spacer Long (10-40149) on to the shaft.

After the shaft has been inserted lock in position with two Tabulator Key Lever Shaft Screws (6-6843).

Attach the Tabulator Escapement Release Arm Spring (10-7017) on the escapement with the Tabulator Universal Bar Spring Anchor (10-40729) to the Frame Brace Rear Lower. Place the Tabulator Key Lever Comb Lower Down Stop Filler (10-40722) into the Tabulator Key Lever Comb Lower and Down Stop Complete (10-40143) and bend the ends over to retain it in place.

Finally free up all the Tabulator Key Levers.

SHIFT RAIL COMPLETE

To assemble the Shift Rail Complete (10-40409) assembly simply drop it in position and attach the Carriage Balancing Shaft Complete (10-40458) to the Center Tie Complete (10-40345) with the Carriage Balancing Shaft Pivot Screw and Nut (6-6391N).

Tighten these pivot screws so that there is freedom of action with no side play.

Connect the Shift Lever Mechanism, which has been previously attached to machine, to the Carriage Balancing Shaft by means of the Shift Toggle Link Short Screw (6-6478) and Nut (6-6019).

Connect the Tabulator Set Lever Complete (10-40684) to the Tabulator Set Lever Bracket (10-40708) with the Tabulator Set Lever Fulcrum Pin (10-6121).

Lock this in position by means of Tabulator Set Lever Fulcrum Pin Clip Left (10-40520) and Right (10-40620).

Hook up the Shift Balancing Spring Complete (6-6938) to the Shift Balancing Spring Arms (10-40429).

Attach the Ribbon Vibrator Bracket Complete (10-40218) to the Ribbon Vibrator Shaft Arm Rear (10-40214) by means of the Ribbon Vibrator Link Right Screw (6-6601) and Nut (6-6005).

Replace the Escapement Shaft Ball Retainer (6-387) on to the Escapement Shaft Complete (6-390) with a Escapement Shaft Ball Retainer Screw (6-6301).

CARRIAGE COMPLETE

Grease the Carriage Roll Retainer (6-22121).

Lock the Shift Mechanism in shift position and turn Pressure Indicator Lever Complete (10-40304) as far to the right as it will go.

Now insert the Carriage Complete (10-40414) with the Paper Finger Rail End Screw Right (10-6617) and the Paper Finger Hinge Right Complete (10-40897) still out of the Carriage Assembly into the machine from right to left looking at the rear of the machine as shown in illustration.

Insert the Paper Finger Hinge Right Complete and replace the Paper Finger Rail End Screw (10-6617) back on the carriage.

Attach the Carriage Retainer Complete (10-40454) to the Carriage Rail (10-40448) and the Center Tie Complete (10-40345) with the Carriage Retainer Gib (6-873), Carriage Retainer Gib Plate (6-874), Carriage Retainer Screw (6-6479), Carriage Retainer Plate (6-712), Carriage Retainer Screw Washer (6-7839), Carriage Retainer Screw Nut (6-6019).

Attach the Carriage Spring Drum Tape Complete (6-754) to the Carriage Spring Drum Bracket Complete (10-40277) and thread through the Carriage Spring Drum Tape Roll Bracket Complete (10-40237) and attach to Carriage Spring Drum Tape Roll Fastener (10-40346) on the Carriage.

Tighten tension on Carriage Spring Drum for proper running of Carriage.

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ADJUST SHIFT MECHANISM

See Adjustments on Shift Mechanism.

ADJUSTMENT TO CARRIAGE

Adjust Carriage Retainer Mechanism so that the Carriage Rail (10-40448) rides flat and free on Center Tie and then tighten Carriage Retainer Screw Nut (6-6019). Check Carriage for free running fit. Adjust if necessary.

ADJUST SPACE BAR MECHANISM

See Adjustments on Space Bar Mechanism.

BELL

Assemble the Bell (6-835) with Bell Post (10-40316) and Bell Screw (10-6586). Test out for proper striking of Bell Ringer Complete (10-40319).

GENERAL ADJUSTMENT

Tabulator Mechanism.
Space Bar Mechanism.
Shift Mechanism.
Margin Release Mechanism.
Back Space Mechanism.
Carriage for proper mesh, tension, etc.
Carriage Spring Drum.
Ribbon Spools and Ribbon Reverse Mechanism.
Escapement.
Bichrome Mechanism for function and color.

ALIGNMENT OF TYPE ACTION COMPLETE

See Adjustments of Type Action and Key Lever.

FRONT PANEL, TOP COVER AND RIBBON SPOOL KNOBS COMPLETE

Insert Front Panel (10-40600) on machine with four Front Panel Screws (10-6651). Assemble Top Cover (10-40610) to Top Plate with two Top Cover Screws (10-6575) and four Top Cover Rubber Washers (6-7858). Place Ribbon Spool Knobs Complete (10-40210) on Ribbon Spool Shafts.
1. Test ribbon reverse, right and left spools.

2. See that the center tie is seated.

3. See that all shift bearings are set so as to eliminate end play and noise.

4. See that indicator lever is in vertical position and see that carriage is set to height - (all type on feet). See that platen roll is parallel - the same amount of pressure on both sides of writing line - see that the pressure on all type shows up uniform.

5. Set the motion.

6. Set the escapement - see that it is set to height and that the dogs are tight yet free. Also note that the escapement shaft gear meshes properly in the feed ratchet.

7. Test tabulator.

8. Test back-spacer.

9. See that all type bars are free in their slots in the comb.

10. Check alignment. See that all type bars enter guide without causing noise and that they are set so that the type on the right side of the machine have a tendency to lead to the left side of the type guide and that the type on the left side lead to the right side of the type guide. Be sure that all type are on feet.

11. See that the aligning scale is properly set.

12. Check machine generally for noise.

13. See that the ribbon covers properly.

14. See that the space bar mechanism operates properly.

15. Oil all movable parts with the exception of type bars.

16. Test line lock. See that it locks with indicator at zero and that it does not interfere with key levers when dial lever is moved to extreme right.

17. Tighten screws.

18. See that paper fingers are formed properly to cylinder.

19. Check line space mechanism. See that platen is spaced properly on one, two and three spaces.

20. Test tabulator set and clear keys.

21. Test margin release.

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