Bulletin No. 108
Issue 2
August, 1936

TELETYPE

PRINTING TELEGRAPH SYSTEMS

DESCRIPTION AND ADJUSTMENTS OF THE FIVE UNIT TAPE PERFORATOR

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CORPORATION
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DESCRIPTION OF THE FIVE-UNIT TAPE PERFORATOR

General

The Five-Unit Tape Perforator is a unit of apparatus that is used to prepare perforated tape for automatic telegraph transmission. Combinations of holes are perforated in the tape, which correspond to the key lever depressed. The perforator tape with the code combinations thus recorded may be fed automatically through a tape transmitting device, operating a printer unit at a distant point.

The Five-Unit Tape Perforator is a self-contained magnet (solenoid type) operated, portable unit. It consists essentially of a set of keys and key levers; perforating, tape feeding, and end-of-line indicating mechanisms. The unit is equipped with a power cord and attachment plug. 110 volt D.C. power is required for its operation.

NOTE: In all the figures of this bulletin, fixed pivot points are designated by solid black circles.

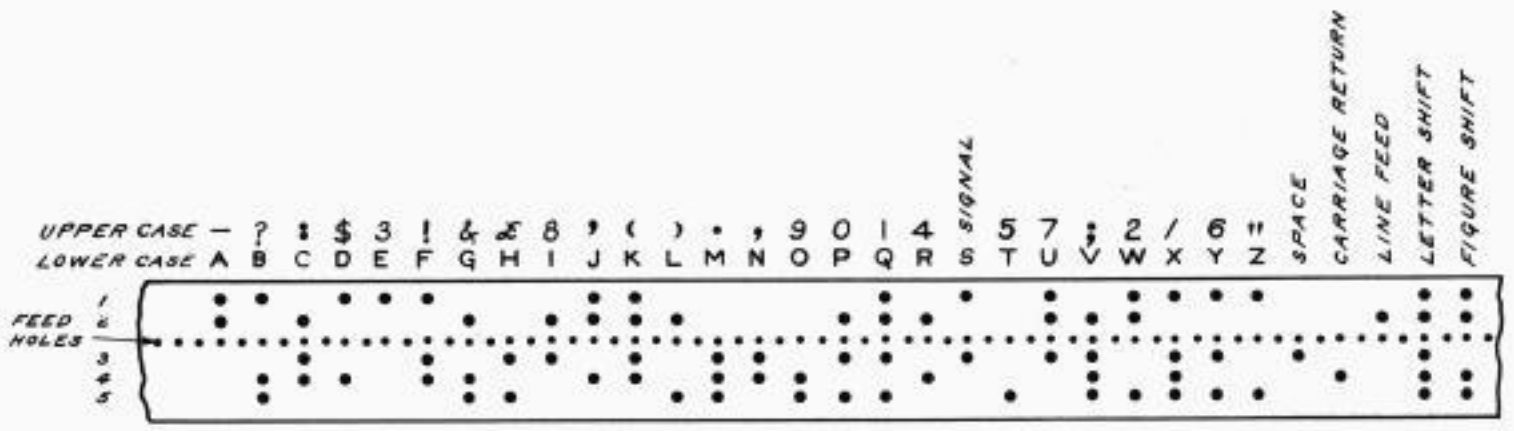

FIGURE 1

Signalling Code

The signalling code used to transmit characters is the "Five-Unit Code," which consists of five selecting impulses used in various combinations of spacing and marking intervals. The large holes in the tape represent marking impulses, whereas the impulse positions on the tape that are not perforated represent spacing impulses. The small holes are feed holes, which are used to feed the tape through the perforator and the transmitting device. Figure 1 shows a specimen of tape with all characters perforated.

Perforating Mechanism

The perforating mechanism (Figure 2) consists essentially of a set of punches for perforating the tape; a pair of punch magnets and a punch hammer for operating the punches; a set of punch bars, bell cranks, loops and combs attached to each key lever (Figure 3), used in selecting the punches. The five punch bars are fitted in guide slots in the punch hammer, just behind the punches and in line with them (Figure 2). The right end of each punch bar is attached to a bell crank and the opposite end of each bell crank engages a notch in a loop extension. Each character or function key lever has a comb with notches arranged so that its particular code combination will be selected and perforated. The combs are cut out in such a manner that the depression of a key will cause the comb to strike the top edge of one or several of the loops, moving them downward (Figure 3).

In addition to the five loops controlling the five punch bars, there is a sixth or power loop (Figure 3) which is operated by the depression of any key. The downward movement of this loop closes the punch contacts (Figure 2), energizing the punch magnet, and thus operating the punch hammer.

The depression of a loop causes the punch bar connected to it to be moved away from a punch so that when the punch hammer is operated by the magnet, the tape

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NOTE: After making a single adjustment, check related adjustments.

will not be perforated at this position; but when a loop is not depressed, the punch bar connected to it will be allowed to remain in the path of a punch and a hole will be perforated. A feed hole is perforated with each forward movement of the punch hammer.

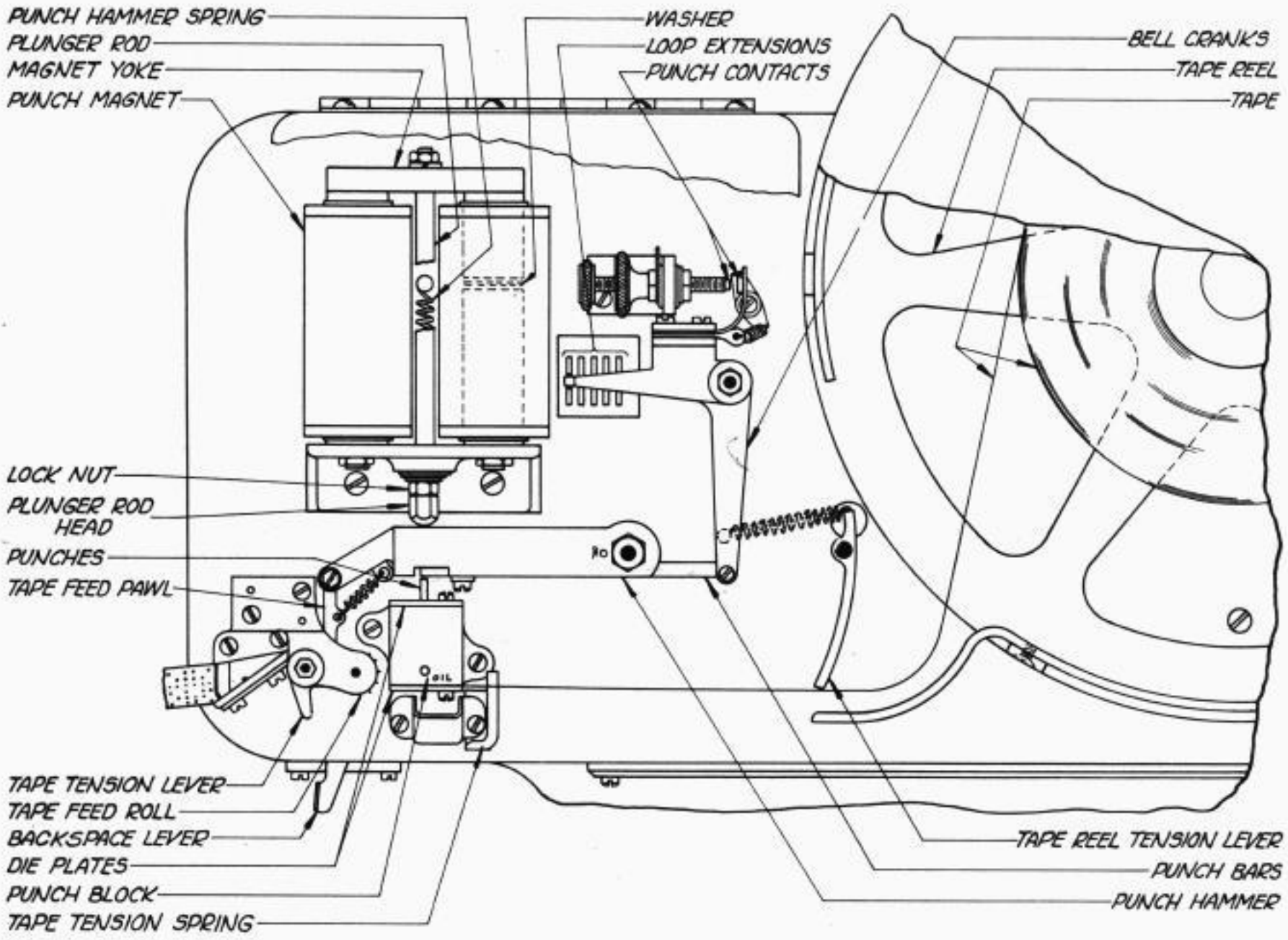

FIGURE 2

For instance, if the "K" key lever is depressed, only the #5 punch bar will be moved away from its punch. All the other punch bars, however, will be driven against their punches, causing the first four impulses to be perforated in the tape (Figure 1).

Tape Feeding Mechanism

The tape feed roll is located to the left of the punches (Figure 2). Spaced at equal intervals around the tape feed roll is a series of projecting feed pins which mesh with the feed holes punched in the tape. A tape tension lever holds the tape against the tape feed roll, keeping the feed holes in the tape in constant mesh with the tape feed roll pins.

During the forward movement of the punch hammer, the tape feed pawl, which is attached to the punch hammer, engages a tooth on the tape feed roll. When the punch hammer moves back, the tape feed roll will revolve, advancing the tape one character space. A star wheel affixed to the lower end of the feed roll and a detent insure equal spacing of the tape (Figure 4).

NOTE: After making a single adjustment, check related adjustments.

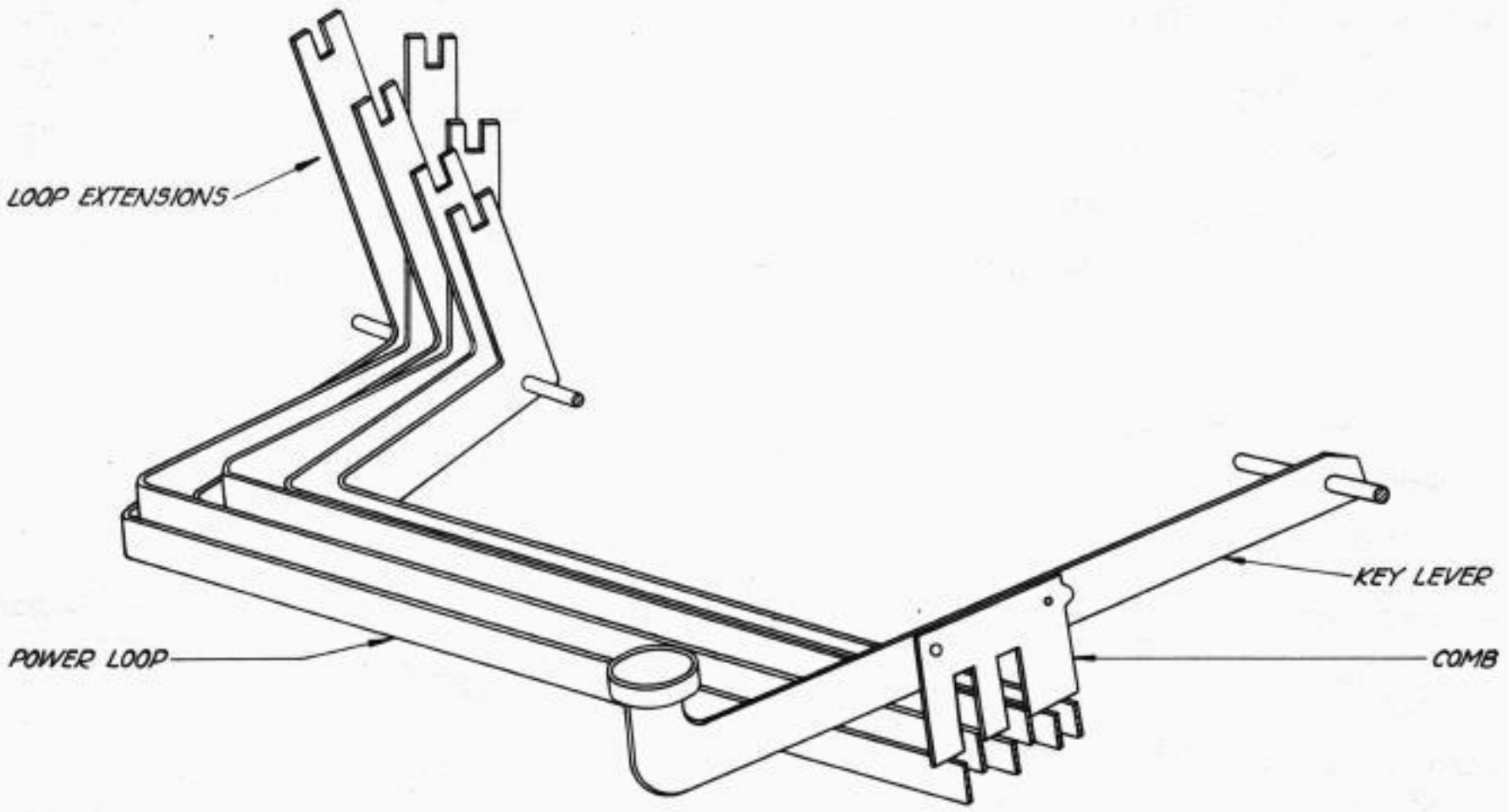

FIGURE 3

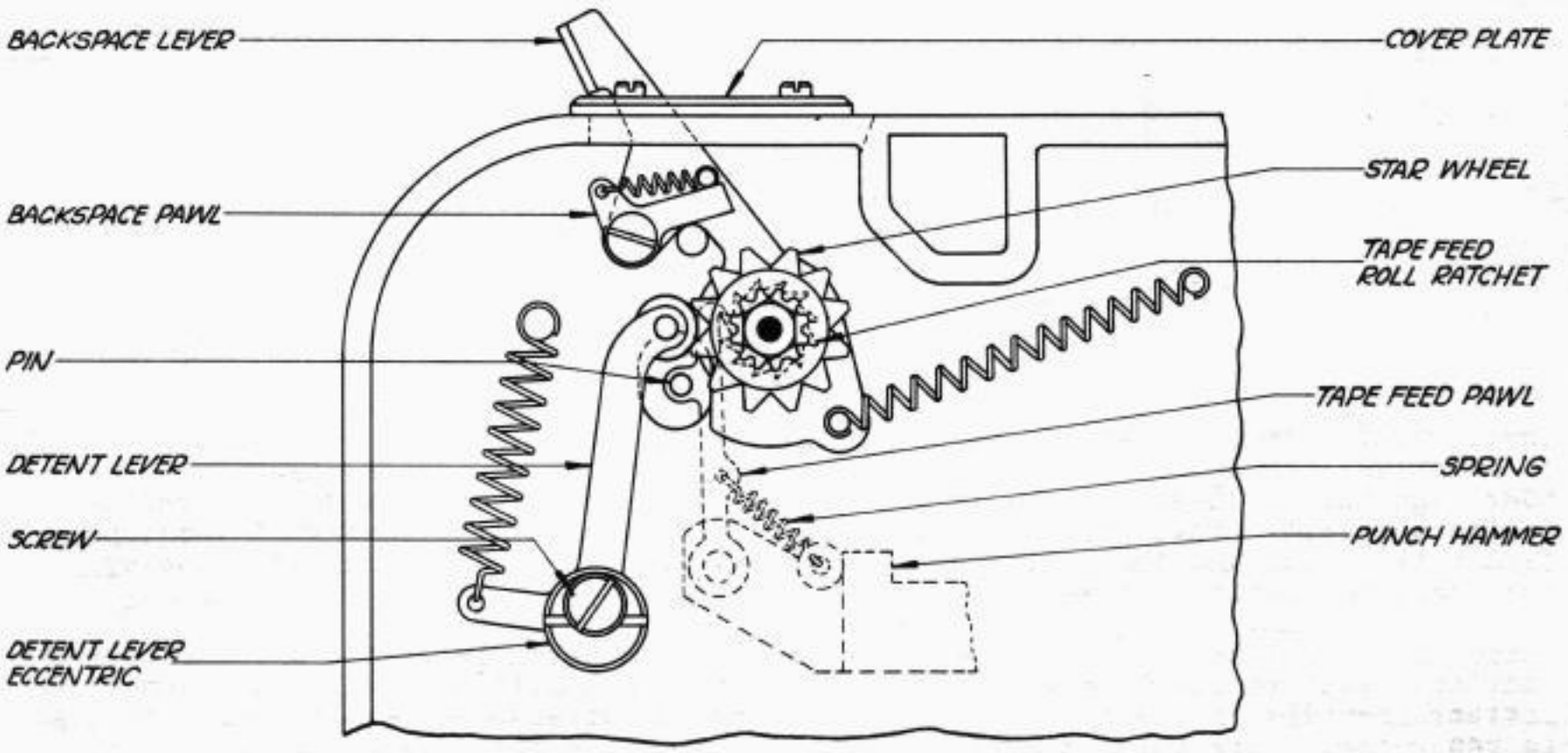

FIGURE 4

End-of-Line Indicating Mechanism

When the number of characters perforated is equivalent to several less than the allowable number in a printed line, a red lamp under the keyboard is lighted by the closing of contacts. These contacts are closed by the action of the indicator gear (Figure 5). This gear meshes, through an idler gear mounted on a lever, with the tape feed roll pinion on the tape feed roll, so that, whenever the tape feed roll moves the tape forward one space, the indicator gear moves one tooth.

Mounted on the indicator gear is a pin "A" (Figure 5). When the indicator gear is advanced sixty-five teeth from its starting position, pin "A" will move the lamp contact lever so that its spring contact will touch the lamp contact screw, lighting the lamp.

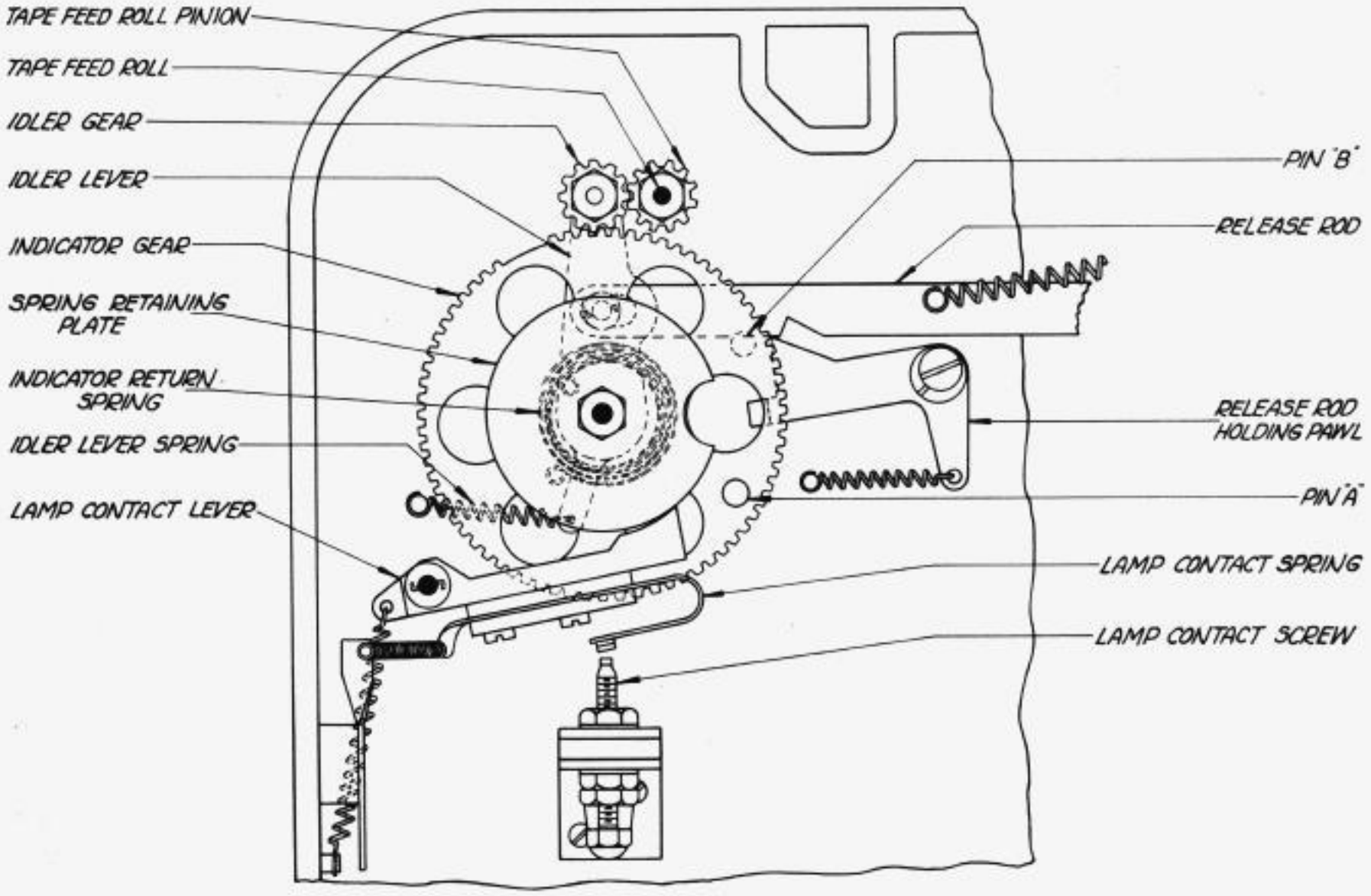

FIGURE 5

The advancing of the indicator gear winds up an indicator return spring, one end of which is attached to the indicator gear. When the operator depresses the "Carriage Return" key, the key lever strikes a bell crank which moves the release rod to the left. This throws the indicator idler gear out of mesh with the tape feed roll pinion and the indicator gear is returned to its starting position by the indicator return spring.

Since the "Carriage Return" key may not be held depressed long enough to allow the indicator gear to completely return to its starting position, a release rod holding pawl is provided to insure that the gears stay out of mesh while the indicator gear is returning. This holding pawl moves into a notch in the release rod when the release rod is in its left-hand position. When the indicator gear is almost returned to its starting position, pin "B" (on the indicator gear) moves the holding pawl out of the notch in the release rod and permits the gears to again mesh.

NOTE: After making a single adjustment, check related adjustments.

Backspace Lever

A backspace lever is provided for moving the tape backwards for the correction of errors (Figure 4). When the backspace lever is being moved from left to right, it engages a pin projecting from the tape feed pawl, and thus moves the tape feed pawl out of mesh with the tape feed roll ratchet. Toward the end of the travel of the backspace lever, the backspace pawl (which is mounted on the backspace lever) is caused to move against a tooth of the star wheel, rotating it backwards one space. The "Letters" key may then be depressed, causing five holes to be perforated over the error. This combination may be passed through the tape transmitting device without printing any character or letter on the receiving printer. However, if a character in the upper case is rubbed out, it will be necessary to strike the shift key again, because the "Letters" combination will unshift the receiving printer.

ADJUSTMENTS OF THE FIVE-UNIT TAPE PERFORATOR

The following adjustments are arranged in a sequence that would be followed if a complete readjustment of the perforator were undertaken. This fact should be kept in mind when a single adjustment is to be made.

The spring tension values given in this bulletin were derived from measurements made with Teletype spring scales. These spring scales are calibrated for use in a vertical "pull" position. When used in any other position, the reading is an indicated value. Therefore, in order to obtain the proper spring value readings, the spring scales which are included in the Teletype printer catalog tool list should be used.

Loop Spring Tension (Figure 6)

With the perforator resting on its right-hand side, hook an 8 oz. scale over each loop approximately at its center, and pull in a direction away from the key levers. It should require from 1 1/2 to 2 ozs. to start the punch bar loops moving away from the key levers and 2 1/2 to 3 ozs. to move the power loop away from the key levers. Adjust the punch bar loop and power loop springs by bending.

Key Lever Spring Adjustment (Figure 6)

The opening between the ends of all key lever springs, excepting the spacer key lever spring, should measure 1 5/8". The "Space" key lever spring should measure 2" across the opening between the ends. Adjust by bending.

Loop Stop Shims Adjustment

When the "BLANK" key lever is fully depressed, there should be from .002" to .030" clearance between the loops and the loop stop. Adjust the position of the loop stop by means of shims. (See Figure 6 for location of parts.)

Release Rod Holding Pawl Eccentric Adjustment (Figure 7)

Rotate the indicator gear approximately 1/4 turn and hold the gear in this position. With the "Carriage Return" key lever depressed and the release rod holding pawl in the notch in the release rod, there should be a clearance of from .004" to .008" between the release rod holding pawl and the holding surface of the notch. To adjust, position the release rod holding pawl eccentric.

Release Rod Holding Pawl Spring Tension

Unhook the release rod holding pawl spring from its post. With the perforator upside down, hook an 8 oz. scale in the spring eye and pull up vertically. From 1 1/4 to 2 1/2 ozs. should be required to extend the spring to 1". Replace the spring.

NOTE: After making a single adjustment, check related adjustments.

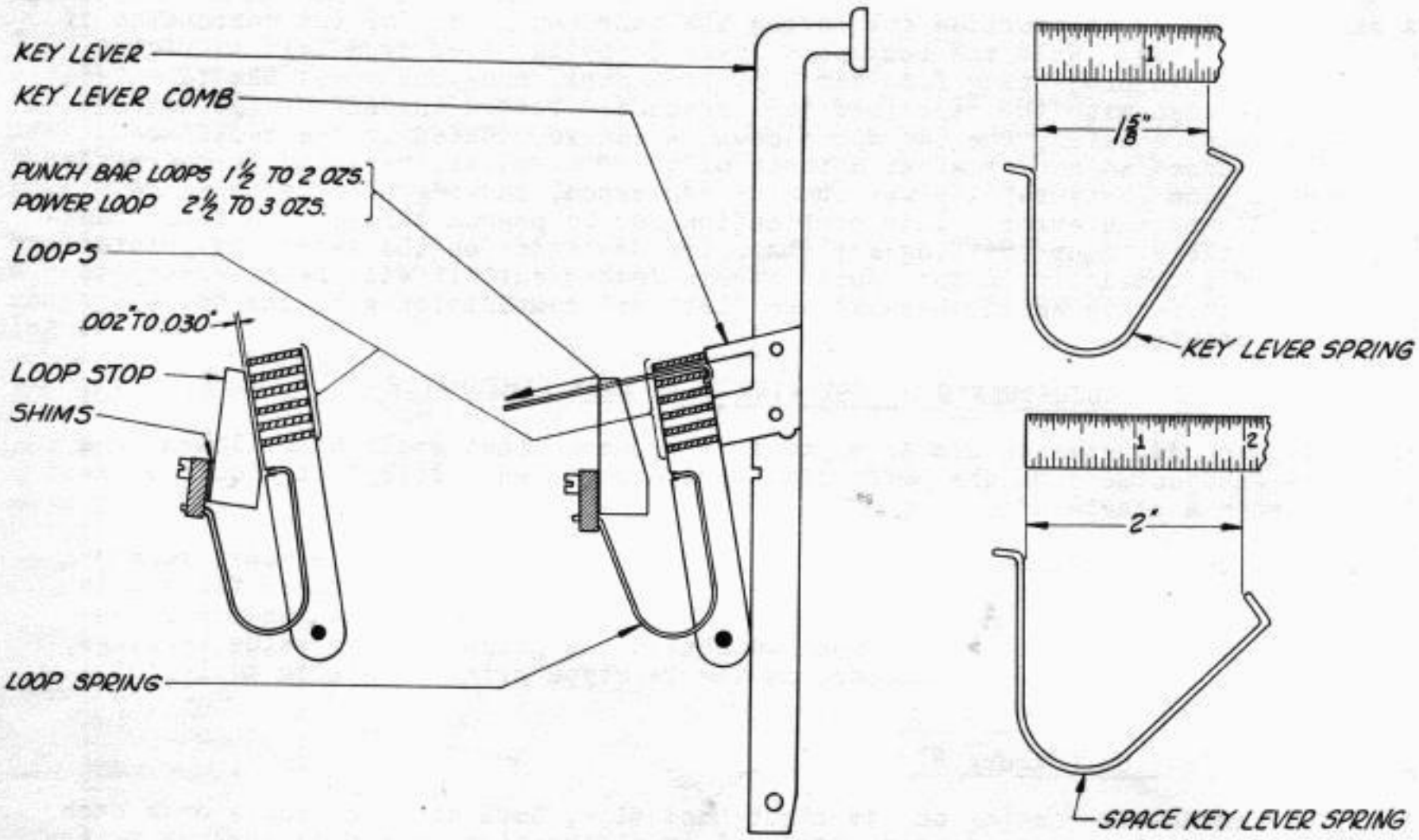

FIGURE 6

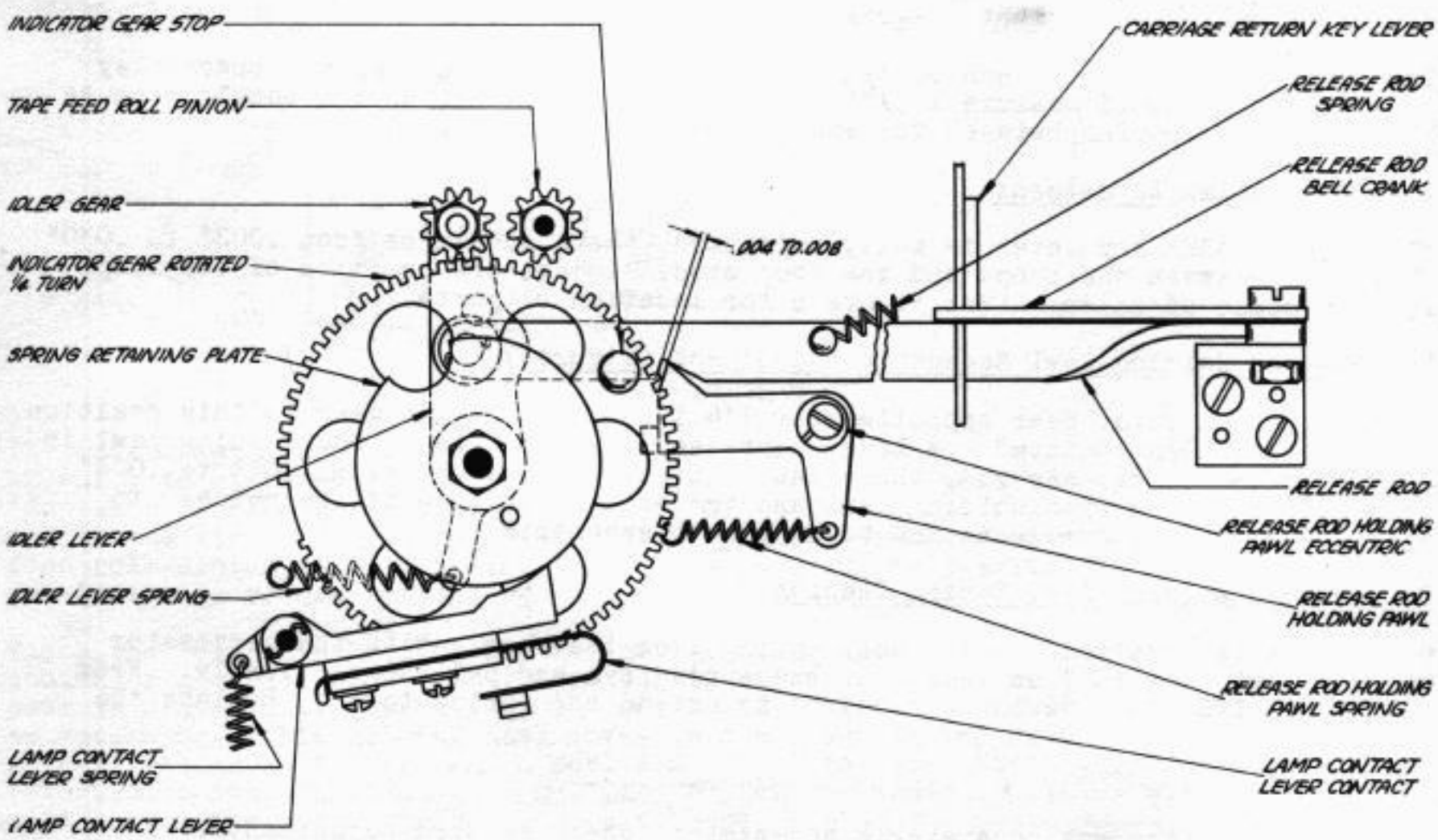

FIGURE 7

Idler Lever Spring Tension

Unhook the release rod spring. With the pin on the indicator gear resting against the end of the lamp contact lever, hook an 8 oz. scale over the release rod bell crank at the "Carriage Return" key lever and pull at right angles to the key levers. It should require from 5 to 8 ozs. to start the idler lever moving. Replace release rod spring.

Release Rod Spring Tension

With the pin on the indicator gear resting against the end of the lamp contact lever, apply the push end of an 8 oz. scale to the right end of the release rod (through the hole in the casting), and push in line with the release rod. It should require from 2 1/2 to 3 1/2 ozs. to start the release rod moving.

Lamp Contact Lever Spring Tension

Unhook the lamp contact lever spring from its post. With the perforator upside down, hook an 8 oz. scale in the spring eye and pull up vertically. From 6 to 7 1/2 ozs. should be required to extend the spring to 1 7/8". Replace the spring on the spring post.

Tape Tension Lever Spring Tension Adjustment (Figure 8)

Hook an 8 oz. scale over the end of the slotted extension of the tape tension lever and pull at right angles to the lever. It should require from 5 to 5 1/2 ozs. to start the lever moving away from the tape feed roll. To adjust, loosen the tape tension lever shaft lock nut and turn the spring, by rotating the tape tension lever shaft to obtain the required tension.

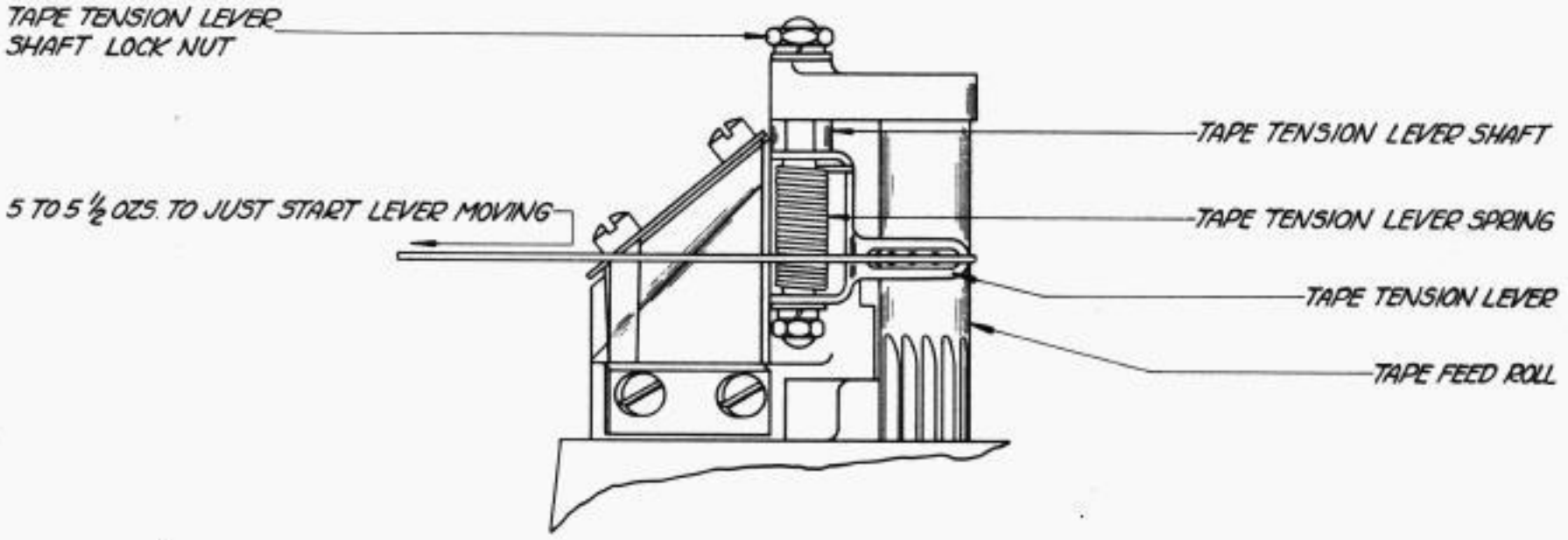

FIGURE 8

Tape Feed Roll Detent Roller Eccentric Preliminary Adjustment (Figures 9 and 10)

With the punch hammer in the operated position, insert the tape feed roll positioning gauge (Catalog No. 73517) into the punch block so that the projection of the gauge stops against the tape feed hole punch. Under this condition a pin of the tape feed roll should line up with the center hole on the gauge. To adjust, remove the indicator gear, and adjust the position of the tape feed roll by means of the detent lever eccentric.

Tape Feed Roll Detent Lever Spring Tension (Figure 10)

Remove the cover plate which covers the opening in the casting for the backspace lever. Operate the backspace lever and insert the push end of a 12 lb. scale

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NOTE: After making a single adjustment, check related adjustments.

through the opening in the casting. Apply the scale to the arm of the detent lever where the spring is hooked as close to the spring as possible, and push parallel to the spring toward the rear of the perforator. It should require from 3 to 4 lbs. to start the lever moving.

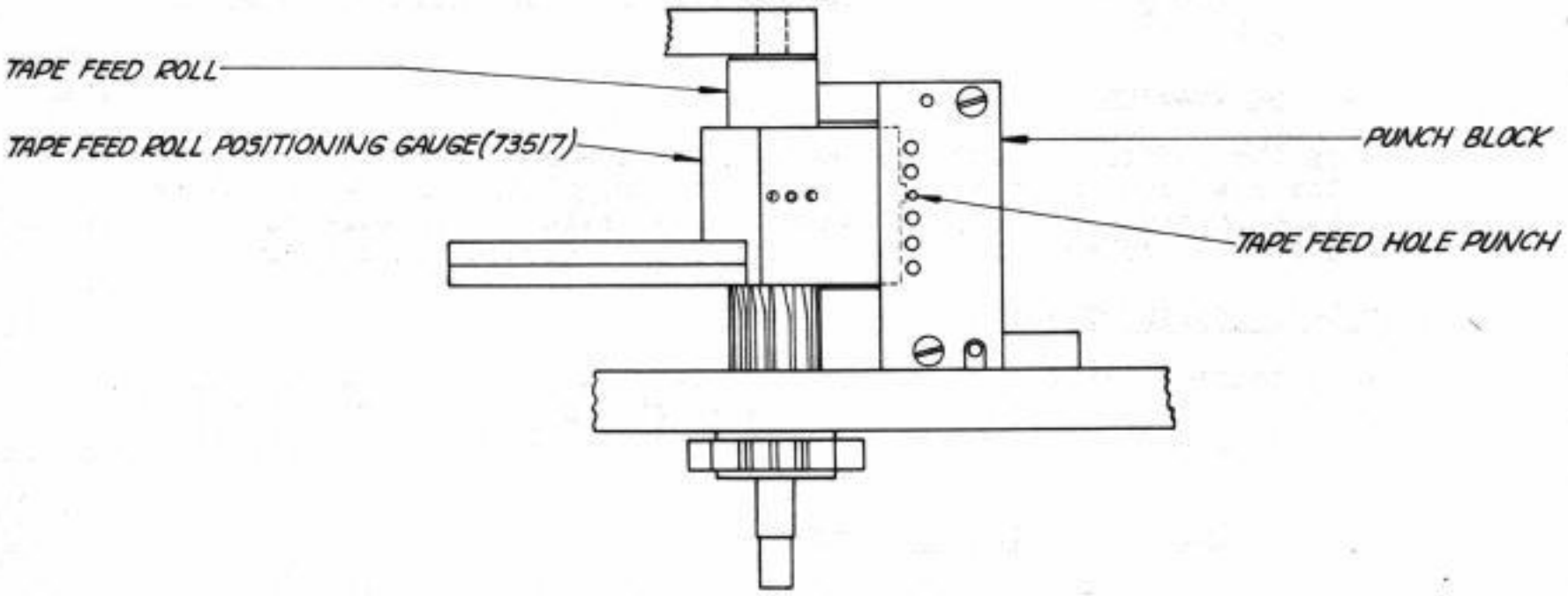


FIGURE 9

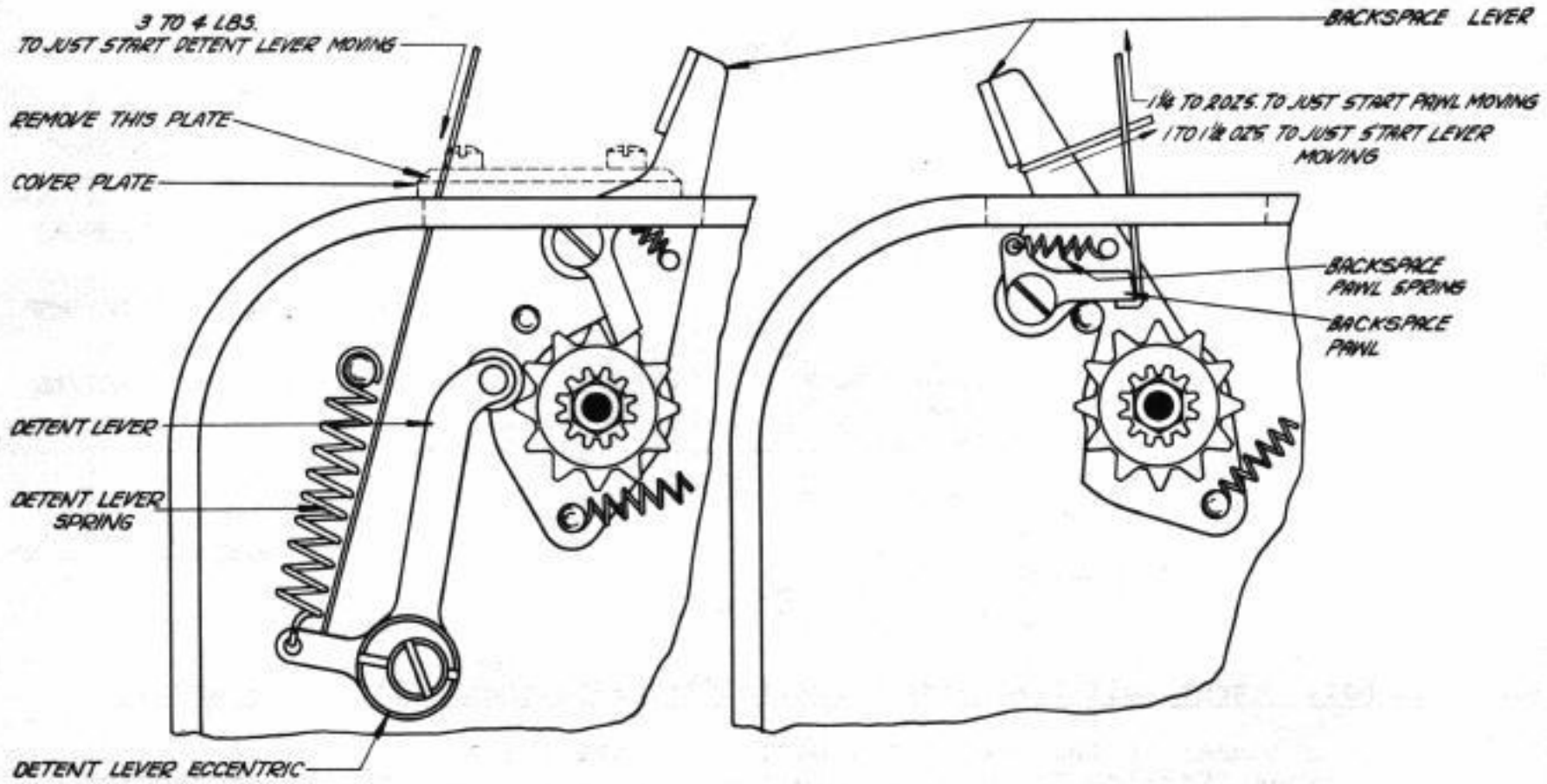


FIGURE 10

FIGURE 11

Backspace Pawl Spring Tension (Figure 11)

Insert an 8 oz. scale through the opening in the casting. Hook the scale over the right end of the backspace pawl and pull towards the front of the perforator at right angles to the pawl. It should require from 1 1/4 to 2 ozs. to start the backspace pawl moving. Replace cover plate.

NOTE: After making a single adjustment, check related adjustments.

Backspace Lever Spring Tension (Figure 11)

Hook an 8 oz. scale over the backspace lever near the cover plate and pull at right angles to the backspace lever. It should require from 1 to 1 1/2 ozs. to start the backspace lever moving.

Tape Feed Pawl Eccentric Adjustment (Figure 12)

When the punch bars are just touching the punches, the tape feed pawl should engage a tooth on the tape feed roll ratchet without overtravel. Adjust the tape feed pawl eccentric to meet this requirement.

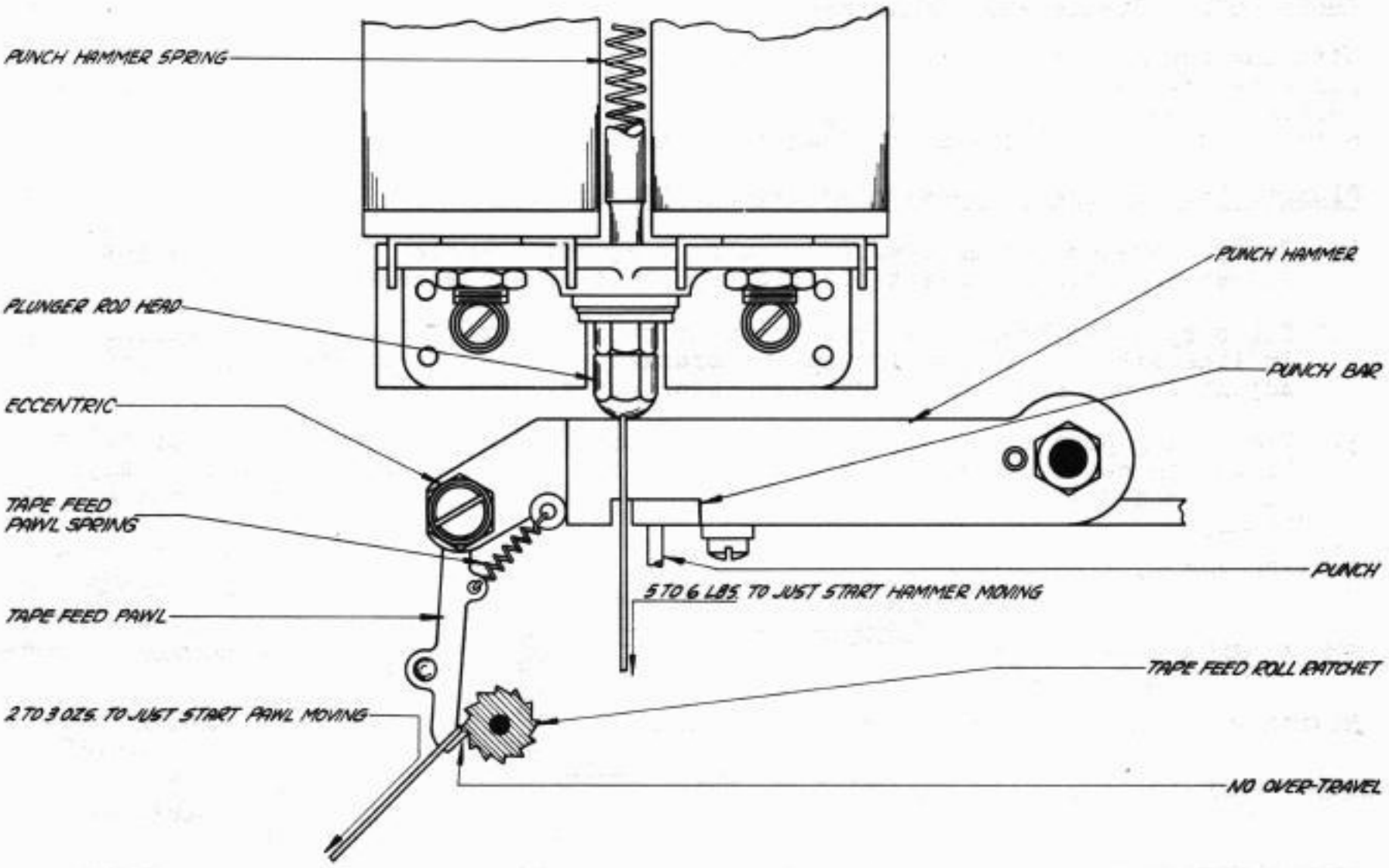


FIGURE 12

Tape Feed Pawl Spring Tension (Figure 12)

Hook an 8 oz. scale in the notch of the tape feed pawl. With the tape feed pawl resting against the tape feed roll, pull the scale parallel to the lower mounting strip of the celluloid tape chute. It should require from 2 to 3 ozs. to start the tape feed pawl moving away from the tape feed roll.

Punch Magnet Contact Screw Adjustment

The punch magnet contact should be adjusted so that the contacts close, with sufficient operating margin when any key lever is depressed. To adjust, depress a key lever and turn the contact screw just enough to make contact. In this manner, depress every key lever and determine which key lever gives the contact spring the least travel. With this key lever depressed, turn the contact screw just enough to close the contacts. Then give the contact screw one full turn additional and tighten the lock nut.

NOTE: After making a single adjustment, check related adjustments.

Plunger Rod Adjustment

Connect the perforator to the proper power supply.

The plunger rod should be adjusted so that all the punches are driven through the tape with proper operating margin. This adjustment may be made as follows: Place a piece of tape in the die. Loosen the lock nut and back the plunger rod head off until perforations in the tape fail when the "Letters" key is depressed. Now advance the plunger rod head slowly until all the perforations are just punched cleanly in the tape. Then give the plunger rod head one-third turn excess and tighten the lock nut against its head. (See Figure 2 for location of parts.)

Punch Hammer Spring Tension (Figure 12)

With the punch hammer in the unoperated position, hook a 12 lb. scale over the punch hammer, just above the plunger rod head, and pull towards the front of the perforator and in line with the punch hammer spring. It should require from 5 to 6 lbs. to start the punch hammer moving.

Plunger Yoke Spring Suspension Adjustment (Figure 13)

1. The suspension spring bracket should be at right angles to the magnet yoke. Adjust the spring bracket position by means of the plunger rod nut.

2. The suspension bracket should be positioned so that the suspension spring is in line with the suspension spring bracket and the end of the plunger rod. Adjust by means of the bracket mounting screw.

3. The spring post should be positioned so that the suspension spring barely lifts the magnet yoke plungers away from the bottom of the solenoids. Adjust the up and down position of the spring post by means of the spring post nut.

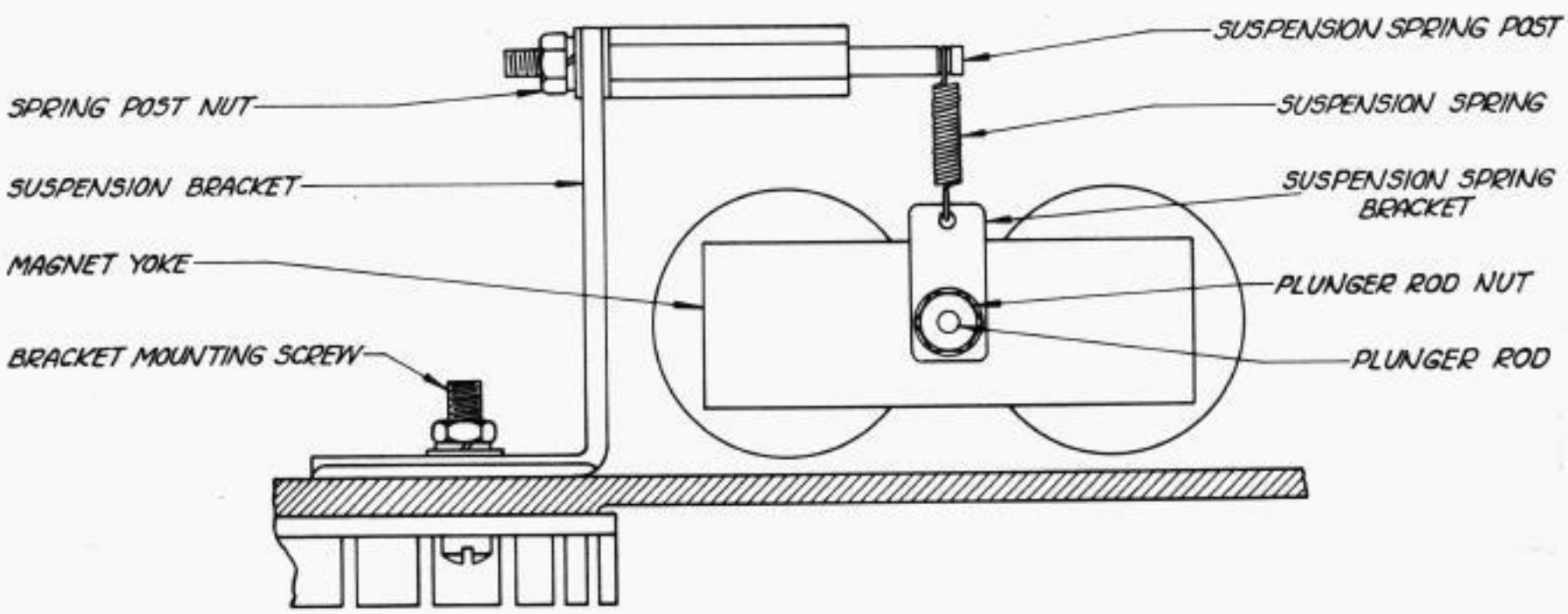


FIGURE 13

Tape Tension Spring Adjustment

The tape tension spring should hold the tape upward firmly against the guide on the die block, without buckling the tape. Check this tension by pressing the edge of the tape against the spring. When the pressure on the tape is released, the spring should return the tape so that it is firmly against the top of the guide. Adjust by bending the tape tension spring. (See Figure 2 for location of parts.)

NOTE: After making a single adjustment, check related adjustments.

Tape Feed Roll Detent Roller Eccentric Final Adjustment (Figure 14)

Refine the tape feed roll detent eccentric adjustment if necessary so that the perforations in the tape meet the standard spacing of ten holes to the inch. This may be checked by perforating a length of tape consisting of a series of nine "Blanks" followed by a "Letters" combination and checking it against the tape gauge (Catalog No. 2215).

NOTE: If this adjustment is changed, recheck the "Tape Feed Pawl Adjustment."

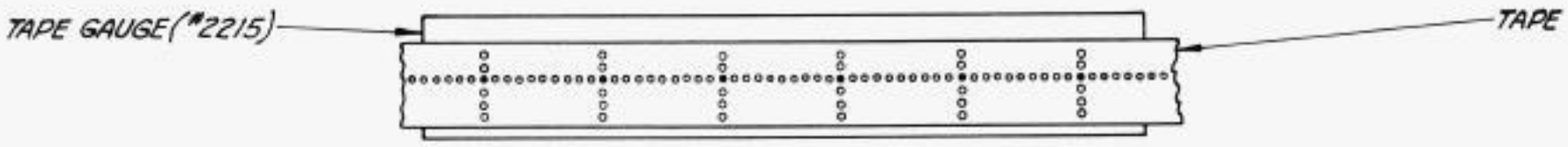


FIGURE 14

Indicator Gear Return Spring Tension Adjustment (Figure 15)

Replace the indicator gear. Rotate the indicator gear as far as it will go in a counterclockwise direction. Loosen the indicator gear shaft retaining nut and rotate the spring retaining plate in a clockwise direction until the spring is wound tight. Then rotate the spring retaining plate one turn in a counter-clockwise direction and tighten the nut.

If the indicator gear return spring is wound too tightly, it will bind and the indicator gear will not return to its initial position when the carriage return key lever is depressed. If the indicator gear return spring is not wound tightly enough, the indicator gear will be slow in returning, and perhaps will not have force enough to disengage the release rod holding pawl out of the notch in the release rod.

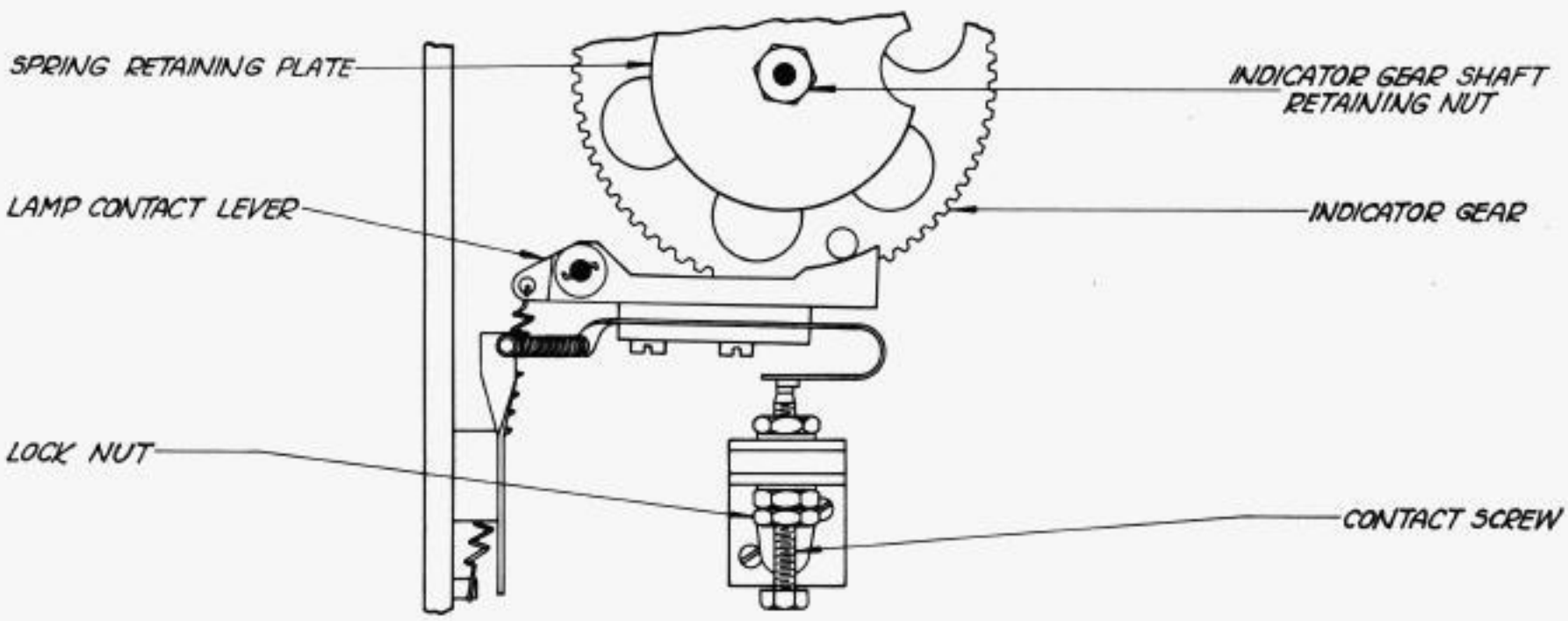


FIGURE 15

NOTE: After making a single adjustment, check related adjustments.

Indicator Lamp Contacts Adjustment (Figure 15)

The indicator lamp should light on the 64th or 65th character perforated. To adjust, return the indicator gear to its starting position (with the pin on the gear resting against the end of the lamp contact lever) by operating the release rod. Now adjust the lamp contact screw so that when a character key lever is operated 65 times, the lamp lights on the 65th character, and give the screw 1/4 turn excess. Recheck this adjustment several times. In operation, the indicator gear is not always fully returned to its starting position; therefore, it is satisfactory if the lamp lights on the 64th or 65th character.

Tape Reel Tension Lever Spring Tension

Loosen the three tape reel assembly mounting screws and remove the tape reel assembly from the perforator. Hook an 8 oz. scale over the tape tension lever at the right angle bend to the rear of the pivot screw and pull toward the right rear corner of the perforator. It should require from 1 1/2 to 2 1/4 ozs. to start the lever moving. Replace the tape reel assembly. (See Figure 2 for location of parts.)

Method of Starting Tape in Perforator

Tear the tape squarely and insert it between the die plates of the punch block. Pull the tape tension lever away from the tape feed roll, and push the tape forward until the end of the tape is in position between the tape feed roll and the tape tension lever. Now press the tape tension lever against the tape feed roll, which will cause the projecting pins in the tape feed roll to grip the tape. Strike the "Blank" key a number of times and the tape will feed forward.

LUBRICATION SPECIFICATION

The oil and grease specified in the supplement furnished with this bulletin should be used to lubricate the perforator.

Unless otherwise specified, one or two drops of oil at each of the places indicated will be sufficient. Use oil for lubrication at all of the places listed below, except where the use of grease is specified.

A. Locations on the Bottom of the Perforator

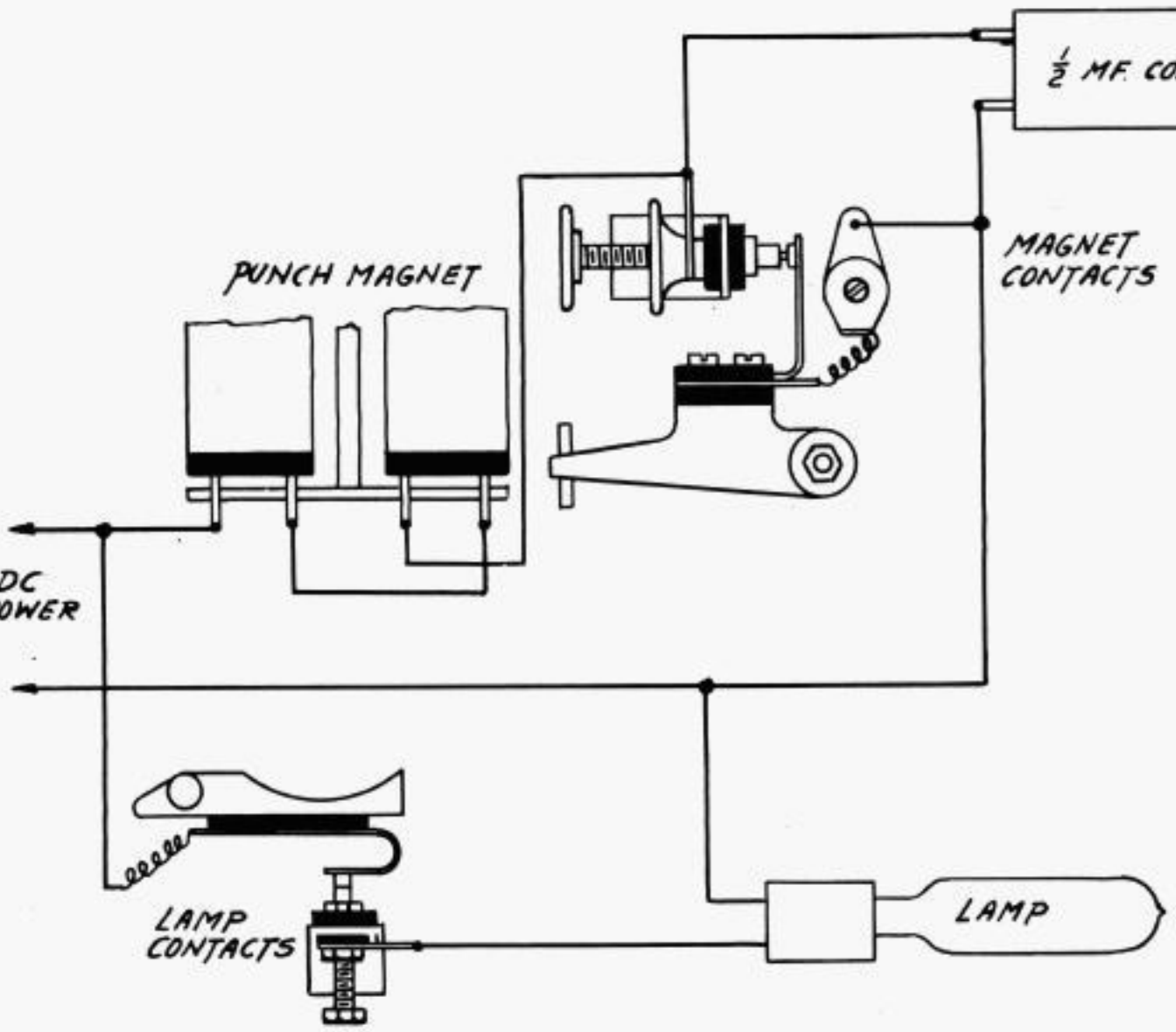
1. Key levers - key lever shaft and rear comb slots.
2. Loops - bearings.
3. Backspace lever - pivot and at pawl bearing screw.
4. Tape feed roll star wheel and pinion.
5. Tape feed roll detent - roller, and bearing screw.
6. Lamp contact lever pivot.
7. Release rod - bearings.
8. Release rod bell crank - pivot and at point of contact with key lever.
9. Release rod holding pawl pivot and point of contact with release rod.
10. Indicator gear return spring.
11. Idler lever - pivot and idler gear.
12. All helical tension spring loops.

NOTE: After making a single adjustment, check related adjustments.

B. Locations on the Top of the Perforator

1. Tape feed roll - bearings, ratchet teeth.
2. Tape tension lever bearing.
3. Punch block - oil hole, punches, guide pins.
4. Tape feed pawl - pivot, and spring loops.
5. Punch hammer oil hole.
6. Punch bars - retaining slots in punch hammer, and pivots on bell cranks.
7. Bell cranks - bearings and at points of engagement with loop extensions.
8. Punch magnet plunger rod - at magnet bracket.
9. Punch hammer spring front loop.
10. Punch magnet yoke - at ends of solenoid (one drop only; avoid excess).
11. Tape reel tension lever pivot.
12. Tape reel hub oil hole.
13. Key lever front comb slots.
14. Space bar loop - bearings and at point of engagement with its key lever.
15. Magnet yoke suspension spring loops.

REVISIONS



TELETYPE CORPORATION

W. D. 1605

MARCH 13, 1926

THEORETICAL WIRING DIAGRAM 5 UNIT TAPE PERFORATOR

DRAWN } T.P.M.
TRACED }
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ENG'RD. H.W.H.
APPROVED

Teletype Corporation
Chicago, Illinois, U.S.A.

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Issue 1, Page 1
August, 1945

ADDITION AND CORRECTION
BULLETIN 141 (ISSUE 3)
DESCRIPTION AND ADJUSTMENTS TRANSMITTER-DISTRIBUTOR
MODEL 14

DESCRIPTION

On Transmitter-Distributors equipped with end-of-tape stop mechanism which were operated with spliced chadless tape, failures were encountered when the unit was equipped with the 97445 RETAINER LID (Figure 1) and the 97468 TAPE GUIDE PLATE (Figure 2).

To remedy this condition the 111628 RETAINER LID (Figure 3) was designed so that the portion of the lid which holds the tape in the guide plate was widened to fully cover the tape and the tape pin clearance hole was decreased in size to reduce the possibility of the tape catching in the hole.

The 111627 TAPE GUIDE PLATE (Figure 4) was designed so that a portion of the shoulder was removed to give clearance for the 111628 RETAINER LID and the diameter of the hole for the tape contact pin was increased to give clearance for adjustment. The top edges of the slot in the plate for the five sensing pins were beveled to eliminate the possibility of tape catching on the edges of the slot.

All new standard equipment will have the 111628 retainer lid and 111627 tape guide plate.

OPERABLE COMBINATIONS

1. The 97445 RETAINER LID and 97468 TAPE GUIDE PLATE can be used together but, it is not recommended when spliced chadless tape is to be used.

2. The 111628 RETAINER LID and 111627 TAPE GUIDE PLATE can be used together for either regular, chadless or spliced chadless tape.

3. The 97445 RETAINER LID and 111627 TAPE GUIDE PLATE can be used together but, it is not recommended when spliced chadless tape is to be used.

4. The 111628 RETAINER LID and 97468 TAPE GUIDE PLATE cannot be used together.

ADJUSTMENTS

PAGE 14

END-OF-TAPE STOP CONTACT PIN GUIDE ADJUSTMENT

Combination 1 can be adjusted using the standard adjustment requirement now in the bulletin.

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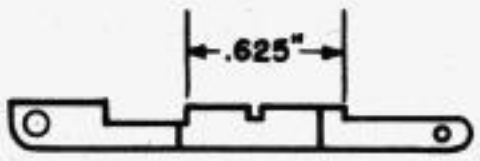
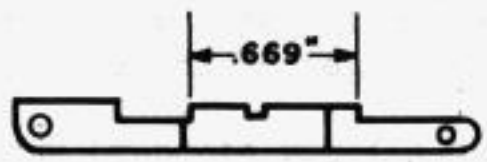
Combination 2 requires that the standard adjustment be changed to read as follows:

The end-of-tape stop contact pin should be centrally located in the contact pin guide clearance hole in the retainer lid. Gauge by eye. To adjust, loosen the stop contact pin guide mounting screws and positicn the guide. Locate the feed wheel shaft bearings so that the feed wheel shaft is free with not over .002" end play before tightening the mounting screws.

Combination 3 requires that the standard adjustment be changed to read as follows:

There should be .010" to .020" clearance between the end-of-tape stop contact pin and the side of a straight edge which is placed on the front shoulder of the tape guide so that it lines up with the inner edge of the shoulder. To adjust, loosen the stop pin guide mounting screws and position the guide. Locate the feed wheel shaft bearings so that the feed wheel shaft is free with not over .002" end play before tightening the mounting screws.





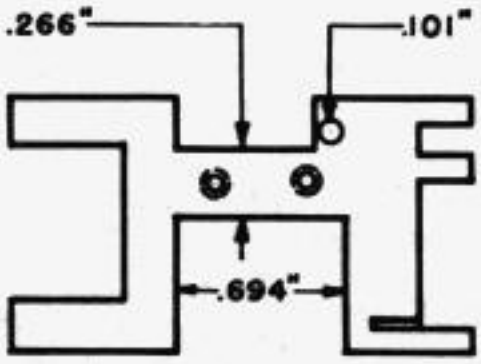


FIGURE 1

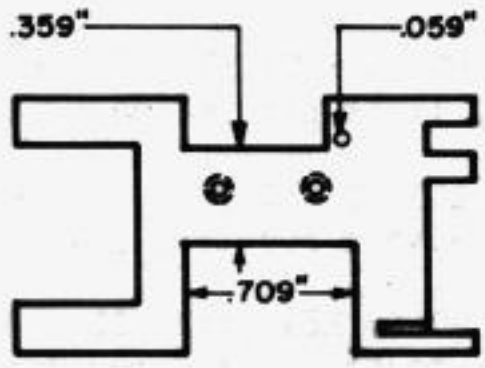


FIGURE 3

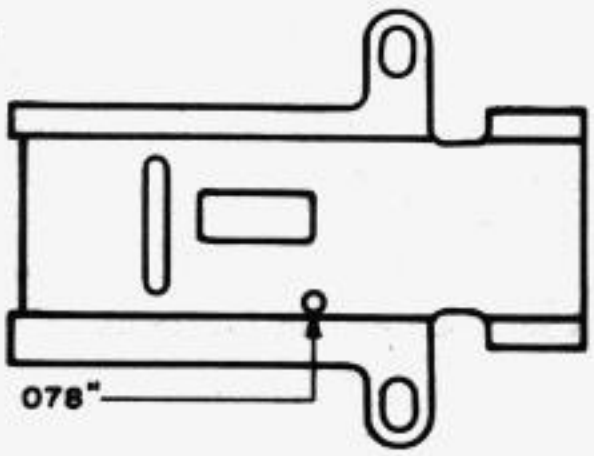


FIGURE 2

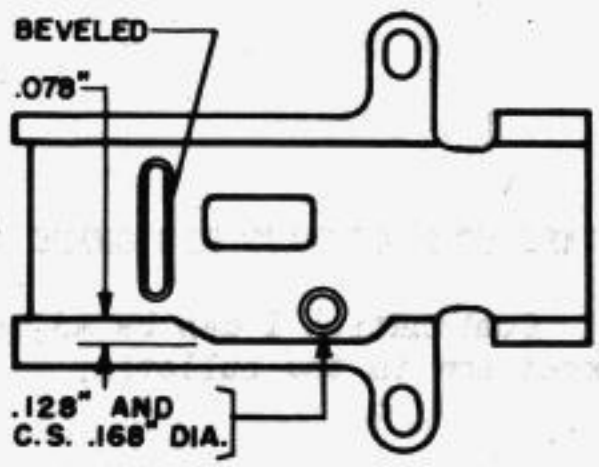


FIGURE 4

Teletype Corporation
Chicago, Illinois, U.S.A.

CHANGES IN LUBRICATION SPECIFICATIONS WHICH APPLY TO ALL TELETYPE APPARATUS

The following lubricants have been standardized for use on all types of Teletype apparatus. These lubricants supersede those referred to in preceding Teletype specifications. The lubricants can be ordered from Teletype as follows:

88970	1 Qt. of KS-7470 Oil
88971	1 Gal. of KS-7470 Oil
88973	1 Lb. of KS-7471 Grease
*88975	KS-8319 Grease Gun
*97116	4-oz Tube of KS-7471 Grease

The above grease is recommended instead of oil for lubricating motors equipped with ball bearings. The 88975 grease gun should be used for injecting grease into the bearings of Teletype ball bearing motors. The gun may be used also for applying grease to other parts of the apparatus and no other grease container need be carried. If this grease gun is not available, the oil listed in the foregoing should be substituted for lubricating ball bearing motors.

*Instructions for Filling the Grease Gun

1. Unscrew the lubricant tube from the cap casting of the grease gun.

2. Insert fresh lubricant through the open end of the tube with the fingers. Apply gradually to eliminate air pockets.

3. Tamp the lubricant down solidly in the tube by pounding the closed end solidly against the palm of the hand. Continue to add lubricant until the tube is completely filled and the metal follower rests against the perforated tube cover.

4. Fill the cap casting with lubricant flush to the bottom side of the tube threads.

5. Screw the lubricant tube into the cap casting part way only. Then insert a pencil or rod through the perforated tube cover and exert pressure against the metal follower so as to expel any entrapped air past the tube threads. When lubricant begins to ooze through the threads, tighten the lubricant tube securely in the cap casting.

6. Operate the handle back and forth for several strokes or until lubricant is pumped from the nozzle. The gun is then ready for use. If the lubricant does not flow from the nozzle in a solid stream, it is an indication that all air has not been expelled from the lubricant tube. Invert the gun and pound the cap casting end against the palm of the hand to jar the lubricant into the pump cylinder.

*Instructions for Lubricating Motor Ball Bearings

The motor bearings are packed with grease before the motor leaves the factory and under ordinary operating conditions need no additional lubrication for approximately two months. At the regular lubricating intervals one or two strokes of the plunger of the gun should apply sufficient grease to each bearing. To lubricate, press the nozzle of the gun against the ball oiler and force the grease into the hole by pushing on the plunger of the gun. Care should be taken that the bearings are not overloaded. Overloading will result in the grease oozing out of the end castings and being forced into the motor or being thrown on other parts of the mechanism. After lubricating, the motor should be run for a few minutes and then any excess grease that has been forced out of the ends of the castings should be wiped off. Each time that the gun is used for lubricating a motor bearing, the plunger should first be depressed slightly to make sure that grease will be delivered.

*Indicates change

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Teletype Corporation
Chicago, Illinois, U.S.A.

EE-464
Issue 1
August, 1943

CHANGES IN BULLETIN 141 (ISSUE 3)
DESCRIPTION AND ADJUSTMENTS
TRANSMITTER-DISTRIBUTOR

The following changes apply to the Model 14 Transmitter-Distributor equipped with the 77079 tape stop assembly.

Page 10

Tight-Tape-Stop or Auto-Stop Mechanism

Add the following note below "a".

Note: For installations where the transmitter-distributor operates at a faster speed than the unit preparing the tape, adjust as follows:

When the contacts are held closed by the contact operating post the bottom of the tight-tape stop lever should be approximately one inch below the normal horizontal position and the tight tape stop shaft should protrude approximately 1/16" beyond the clamp (Fig. 24A). Make the adjustments simultaneously by positioning the clamp.

* * *

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Teletype Corporation
Chicago, Illinois, U.S.A.

EE-475
Issue 1
November, 1943

CHANGES IN BULLETIN 141 (ISSUE 3) DESCRIPTION AND ADJUSTMENTS TRANSMITTER-DISTRIBUTOR (MODEL 14)

The following changes apply to the Model 14 Transmitter-Distributor equipped with the 105721 tape rod.

Page 10

Tight-Tape Stop or Auto-Stop Mechanism

Change the second sentence to read as follows: There are four types of this mechanism in use, however.

Page 11

Add the following item after fourth paragraph of Item C:

Item D: Adjust the Type Shown in Figure 24-C to Meet the Following Requirements:

(a) The loop of the tape stop rod should be positioned to the right and down (when viewing the machine from the transmitter end) so that it will make an angle of approximately 45 degrees with the horizontal plane. (Figure 24-C.) Adjust by means of the set screw and lock nut in the tape rod clamp.

(b) When the contacts are held closed by the contact operating post, the distance between the top surface of the tape transmitter top plate and the middle of the bend in the tape stop rod should be 1-3/4" plus or minus 1/16". (Figure 24-D.) The tight-tape stop shaft should protrude approximately 1/16" beyond the tape rod clamp.

(c) For adjustments of clearances between contact points and between the right contact spring insulator and the tight-tape stop mechanism bracket, refer to paragraph (b) of Item A.

* * *

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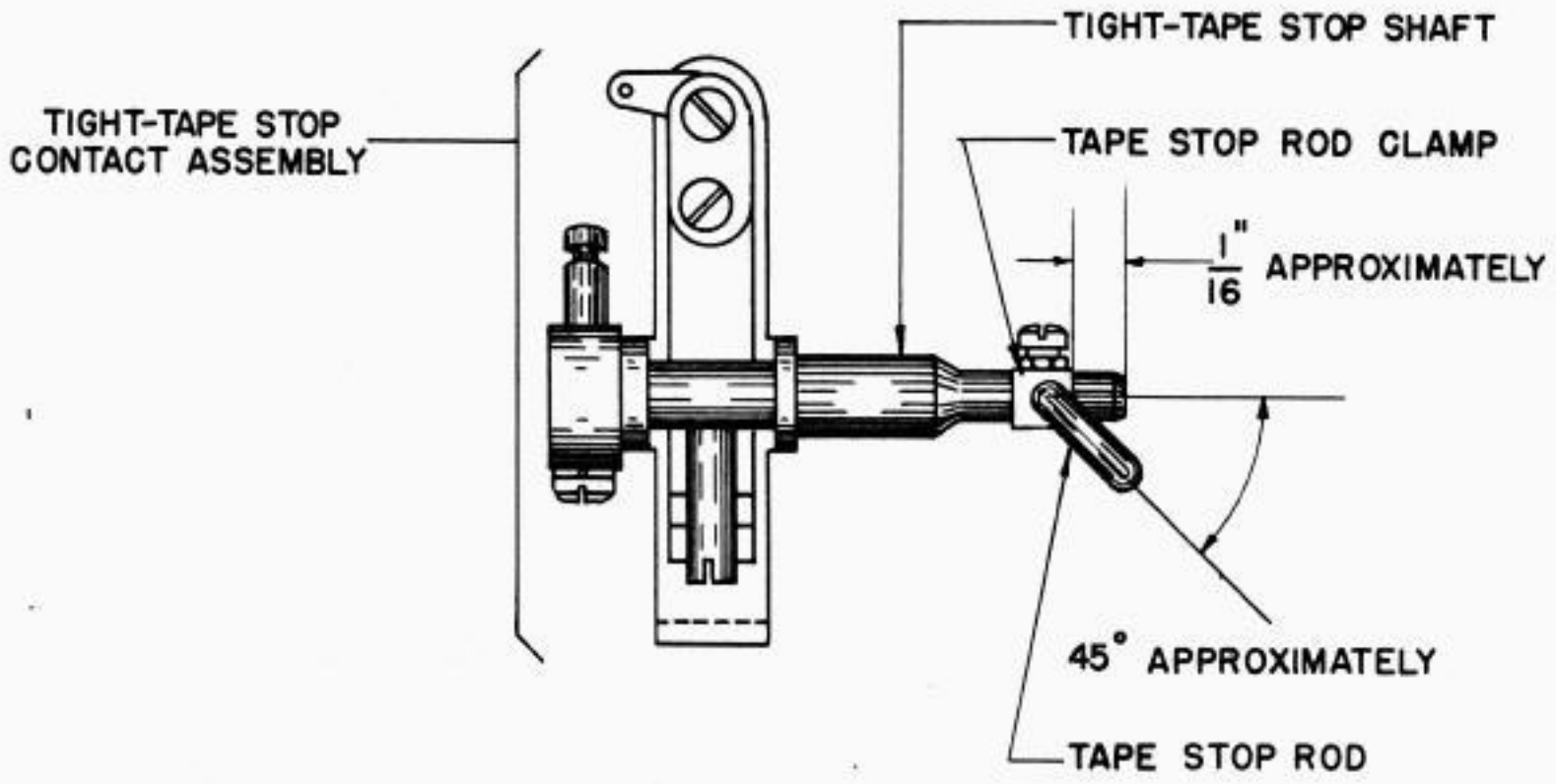

FIGURE 24 C

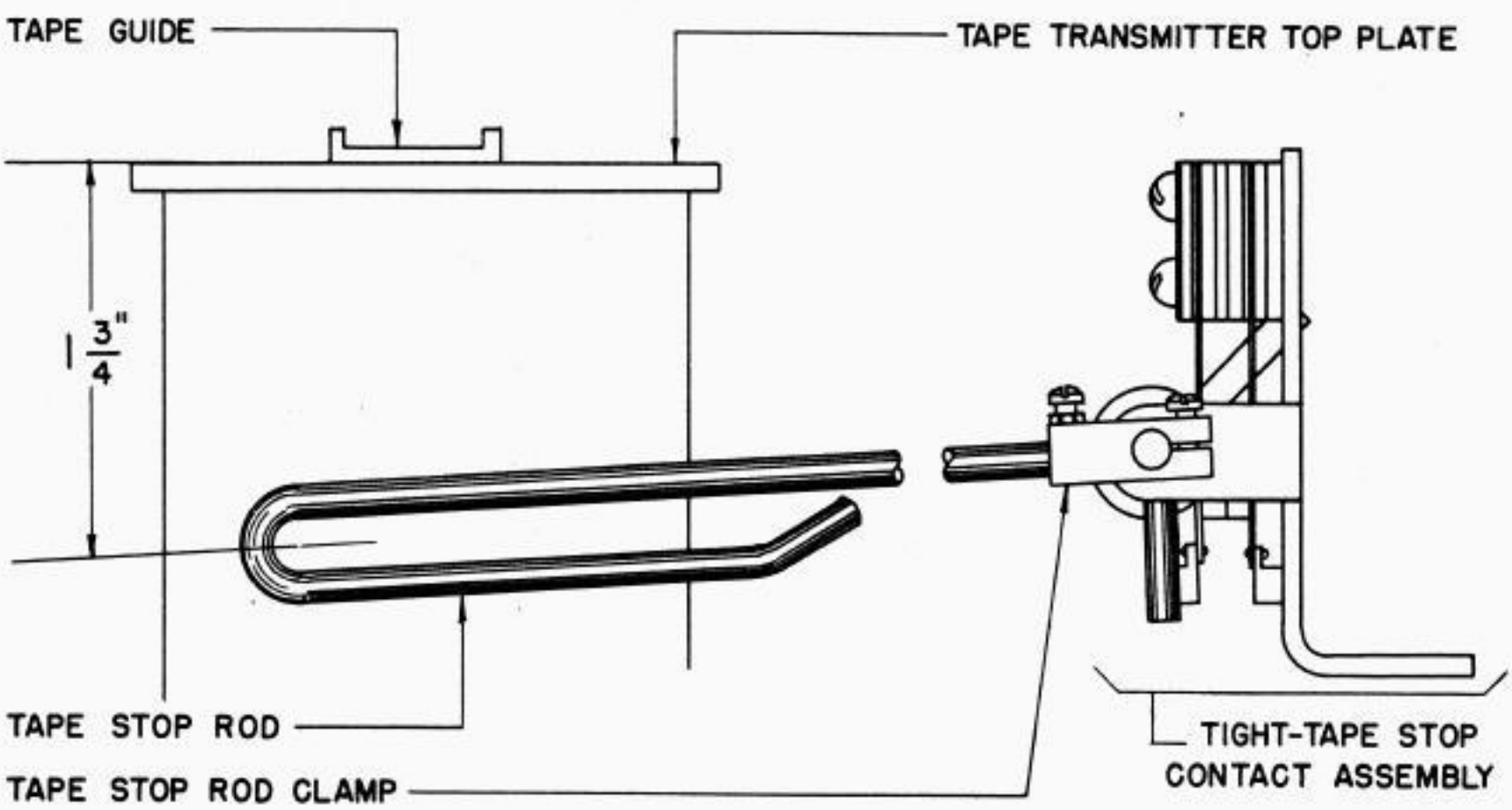

FIGURE 24 D

Teletype Corporation
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ADJUSTMENTS OF THE BREAK-LOCK MECHANISM ON TELETYPE MODEL 14 TRANSMITTER DISTRIBUTOR

To be used in conjunction with Bulletin No. 141 - DESCRIPTION AND ADJUSTMENTS - TRANSMITTER DISTRIBUTOR.

For transmitter distributors equipped with break-lock mechanism, which provides means for stopping transmission in response to a break signal which may be transmitted from receiving stations, or when steady signal line current has decreased to some predetermined value; add the following adjustments directly following Section (b) of BRAIDED BRUSH ADJUSTMENT - HIGH BRUSH ARM (Figure 29):

MOUNTING PLATE ADJUSTMENT (Figure 1)

With the distributor brush arm in the stop position, the end of the shunt contact lever should rest on its cam 1/32" (plus or minus 1/64") from the edge of its notch in the cam. To adjust, unhook the contact pawl spring from its spring post and position the mounting plate by means of its elongated holes. Rehook the spring.

MAGNET BRACKET ADJUSTMENT (Figure 1)

(1) With the armature held against the core of the magnet, both faces of the core should be flush against the armature.

(2) With the armature lever held against the high part of its cam by its spring, there should be .002" to .003" clearance between the magnet core faces and the armature.

To adjust for the first requirement, bend the magnet bracket at a point near the mounting plate. To adjust for the second requirement, position the magnet bracket by means of its enlarged mounting holes.

MAGNET CORE ADJUSTMENT

With the armature in its attracted position, the magnet core should be approximately equidistant from the ends and sides of the armature. To adjust, position the magnet core by means of the enlarged holes in the magnet bracket. Recheck the MAGNET BRACKET ADJUSTMENT. See Figure 1.

SHUNT CONTACT ADJUSTMENT (Figure 2)

Remove the shunt contact bracket from the mounting plate. Hook an 8 oz. scale to the insulator on the long contact spring and pull at right angles to the insulator. It should require 1 to 2 ozs. to separate the contact points. To adjust, bend the long contact spring. Replace the bracket.

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SHUNT CONTACT BRACKET ADJUSTMENT (Figure 1)

(1) With the shunt contact lever on the high part of its cam, there should be some clearance not over .003", between the post on the shunt contact lever and the insulator on the long shunt contact spring.

(2) Rotate the motor shaft by hand until the shunt contact lever just falls into the indent in its cam. With the contact pawl kept in the unlatched position, the shunt contact lever post should exert pressure on the insulator of the long contact spring and provide a contact gap of .010" to .020". To adjust for both requirements, position the shunt contact bracket by means of the enlarged mounting holes.

PUSH ROD LOCK ADJUSTMENT (Figure 3)

(1) With the stop pin of the push rod resting against its lock (in the unlocked position) the end of the push rod should rest in the bearing in the mounting plate and should not extend more than 1/32" beyond it.

(2) With the push rod in the disabled position, the contact lever should be disengaged from its cam. To adjust for both requirements, position the push rod lock by means of its elongated mounting holes.

BREAK CONTACT ADJUSTMENT

(1) With the contact pawl in the unlatched position and the push rod in its disabled position, initially tension the long BREAK contact spring against its short contact spring. Under this condition, there should be some clearance not over .003" between the insulator on the long BREAK contact spring and the stud on the contact pawl. See Figure 1. To adjust, bend the short BREAK contact spring.

(2) With the contact pawl in the unlatched position, hold the insulator on the long MAKE contact spring away from the insulator on the long BREAK contact spring. Under this condition hook an 8 oz. scale to the insulator on the long BREAK contact spring and pull at right angles to the spring. It should require 1 to 2 ozs. to separate the contacts and both contacts should break approximately simultaneously. See Figure 4. To adjust, bend the long BREAK contact spring. Recheck requirement (1).

MAKE CONTACT ADJUSTMENT

(1) With the contact pawl in the unlatched position, the insulator on the long MAKE contact spring should just make contact with the insulator on the long BREAK contact spring. See Figure 1. To adjust, bend the long MAKE contact spring.

(2) With the contact pawl in the unlatched position, initially tension the short MAKE contact spring against its stiffener. Under this condition the MAKE contact gap should be from .010" to .015". To adjust, bend the stiffener.

NOTE: It will be necessary to remove the 111456 cam while checking the following requirement:

(3) With the contact pawl in the latched position, and the armature held against the magnet core, hook an 8 oz. scale to each prong of the bifurcated short MAKE contact spring, at a point next to its contact, and pull at right angles to the spring. It should require a pull of 1 to 2 ozs. to break contact on each prong of the bifurcated spring. To adjust, bend the short MAKE contact spring. Recheck requirement (2). Replace the cam.

CONTACT PAWL SPRING TENSION

Unhook the contact pawl spring from the contact pawl, and its spring post and attach the loop of one end to some convenient object. With an 8 oz. scale hooked to the free loop it should require a pull of 3-1/2 to 4 ozs. to extend the spring to a length of 1-1/32", when pulling horizontally. See Figure 1. Replace the spring.

SHUNT CONTACT LEVER SPRING TENSION

With the shunt contact lever on the high part of its cam, hook an 8 oz. scale to the lever (just under the point of engagement of the shunt contact lever with the cam) and pull in a direction parallel to the side of the base casting. See Figure 1. It should require 6 to 8 ozs. to start the shunt contact lever moving away from the cam.

ARMATURE LEVER SPRING TENSION

Unhook the armature lever spring from the armature lever and hook a 2 lb. scale through the free loop. It should require a pull of 11 to 13 ozs. to extend the spring to a length of 1-1/2", when pulling horizontally. See Figure 1. Rehook the spring.

ARMATURE LEVER SPRING ADJUSTMENT

(1) The armature lever spring tension is set at the factory for use on .060 ampere, signal line circuits, with the break-lock mechanism operating so as to stop transmission if the signal line current is reduced to .020 ampere or less.

(2) The spring setting and operation of the break-lock mechanism must be checked by operating the transmitter distributor with its signal circuit in series with a local test (or comparable) circuit consisting of a source of 115 volts D. C., a milliameter, a variable resistor of approximately 6000 ohms and a jack, all in series. Adjust the resistor so that .020 ampere flows through the test circuit. Start the transmitter distributor in operation. If the

transmitter distributor is equipped with an end-of-tape stop feature, it will be necessary to short-circuit the associated contact or to run tape through the transmitter. The break-lock mechanism should operate and stop transmission within two revolutions of the distributor after each restarting with the push rod. When properly adjusted, the break-lock mechanism should stop transmission when the signal line current is .020 ampere or less, but should not stop transmission at any time when the steady current is .025 to .030 ampere. To adjust, loosen the two nuts which lock the armature lever spring stud and position the stud. See Figure 1.

If it is desired to use the break-lock mechanism on .020 ampere line circuits, the armature lever spring tension should be adjusted to such a value as to cause the mechanism to operate and stop transmission if the signal line current is reduced to some value below .020 amperes. A procedure similar to that outlined in Requirement 2 above should be followed.

LUBRICATION

1. Armature lever pivot points - oil
2. Contact lever pivot points - oil
3. Contact pawl at intersection with armature lever and with its guide and mounting plate bracket - oil
4. Cam - grease
5. Push rod at bearing points - oil
6. Springs - oil both loops

In lubricating the mechanism, care should be taken to see that oil does not lodge between the core faces and the armature or between contact points.

* * *

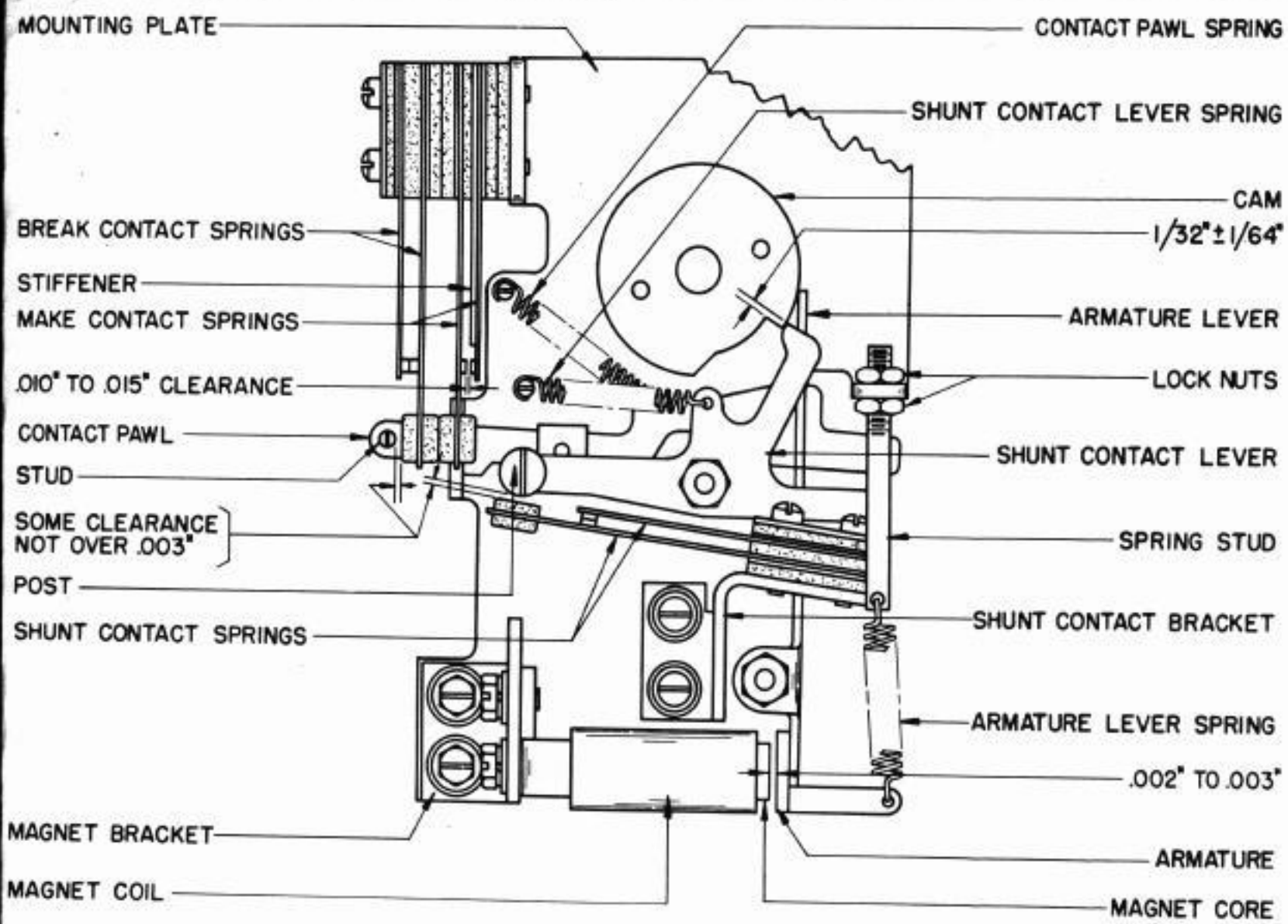

FIGURE 1

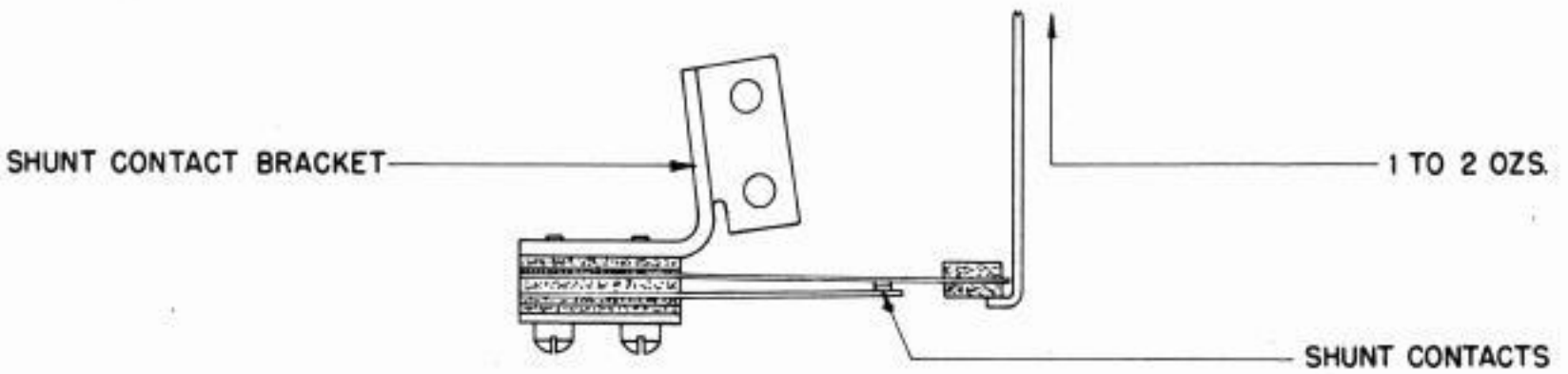

FIGURE 2

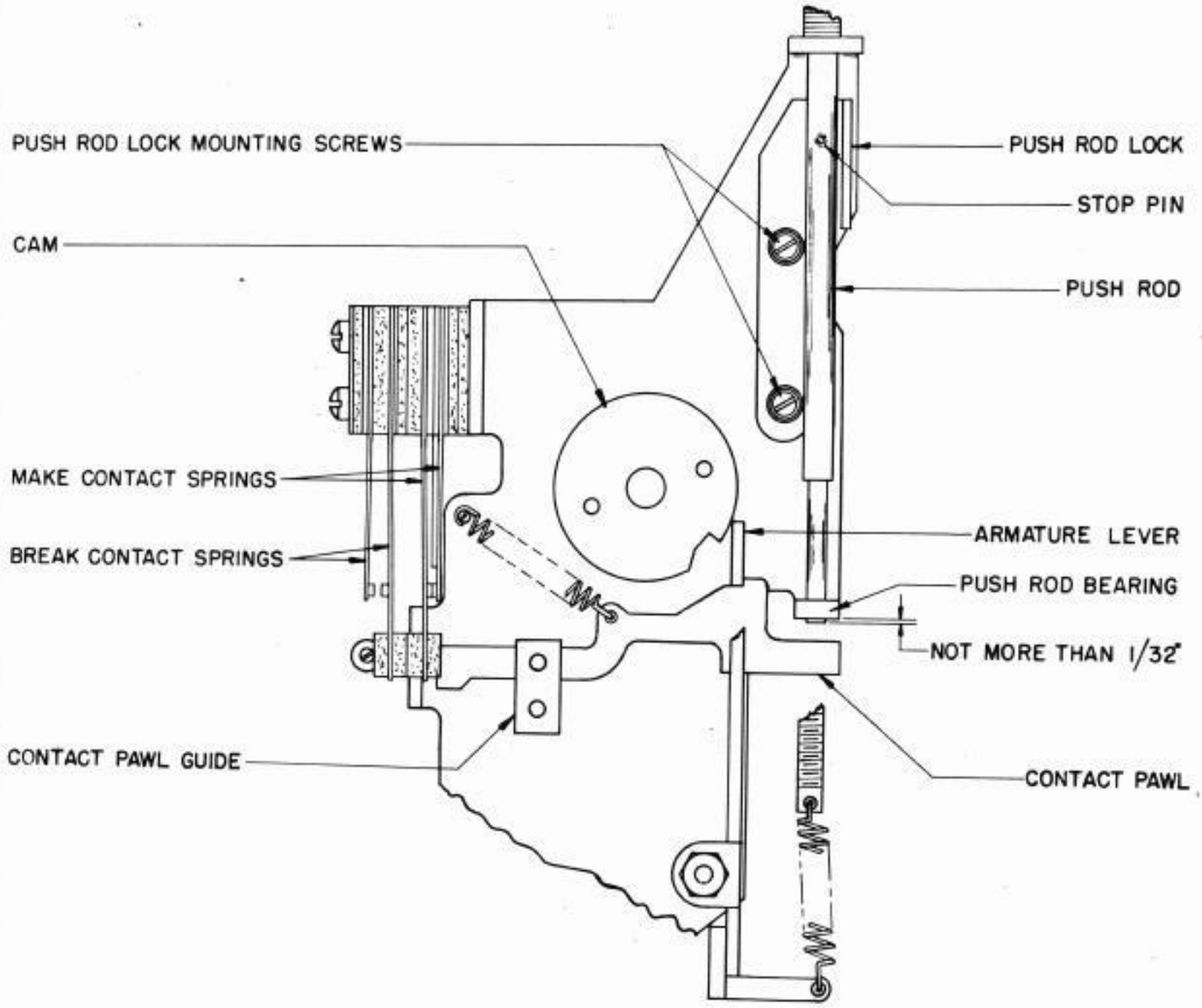

FIGURE 3

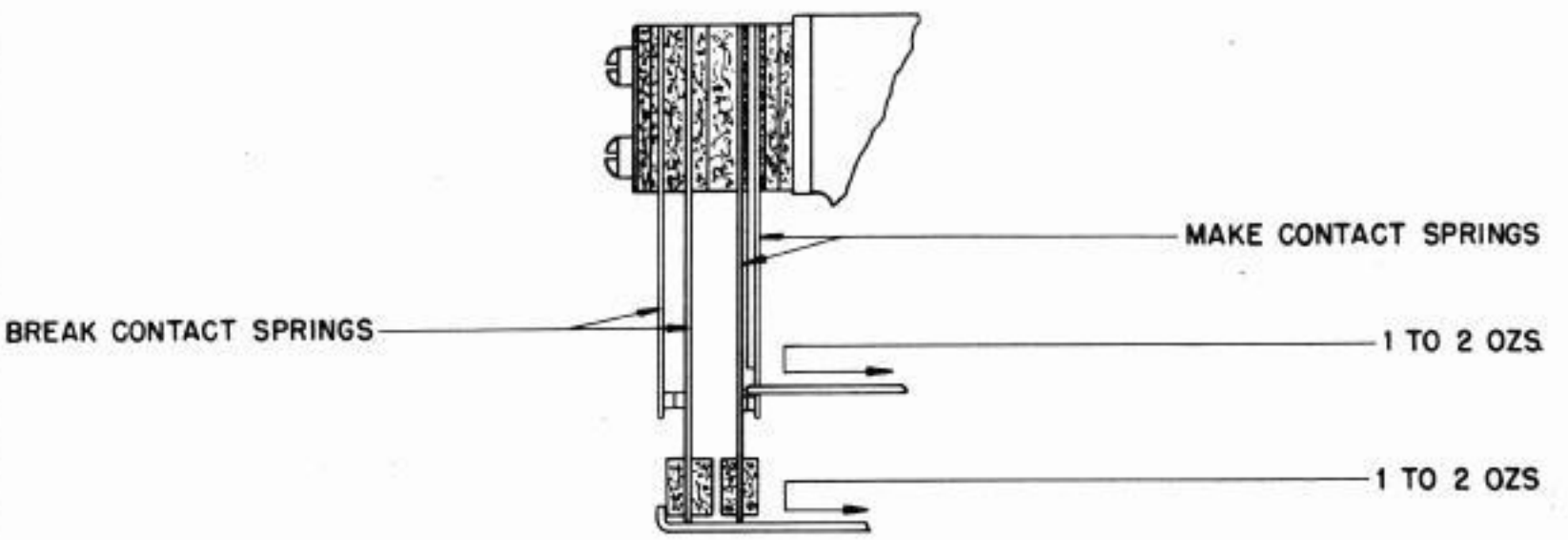

FIGURE 4

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CHANGES IN PARTS BULLETINS

1052 (Issue 1)	1080 (Issue 1)	1090 (Issue 2)
1064 (Issue 1)	1082 (Issue 2)	1108 (Issue 1)
1067 (Issue 2)	1088 (Issue 2)	1117 (Issue 2)

On the perforators, reperforators, perforator transmitters and reperforator transmitters referred to in the above bulletins, the 122-577 feed roll (straight feed hole) has been replaced by a 110682 feed roll (straight feed hole).

The 122-359 feed roll (advance feed hole) has been replaced by a 110683 feed roll (advance feed hole).

The new feed rolls are designed to eliminate the use of the 81598 bushing.

110682 is equivalent to 122-577 plus 81598

110683 is equivalent to 122-359 plus 81598

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CHICAGO, ILLINOIS, U.S.A.

EE-525
ISSUE 1
JANUARY, 1946

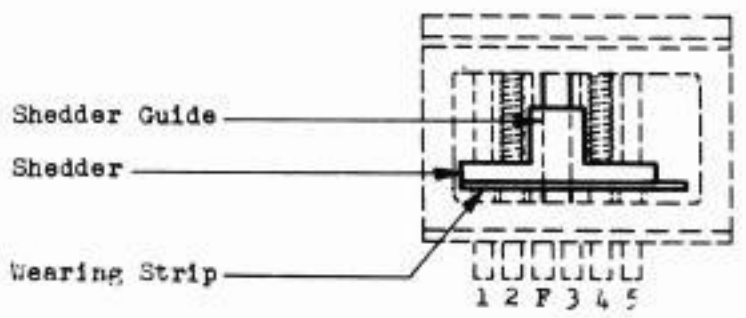
CHANGES AND ADDITIONS TO PARTS BULLETINS

1001	Issue 1	1067	Issue 2	1090	Issue 2
1012	Issue 2	1080	Issue 1	1093	Issue 1
1038	Issue 2	1082	Issue 2	1100	Issue 2
1052	Issue 1	1088	Issue 2	1117	Issue 2
1064	Issue 2	1089	Issue 1		

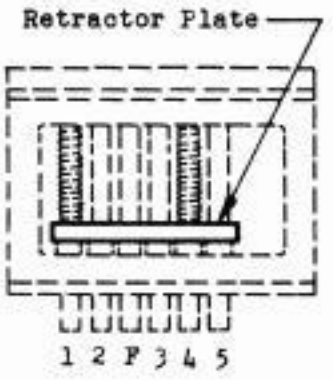
The punch block assemblies shown in the above bulletins have been redesigned and assigned new assembly numbers. Old style punch block assemblies are no longer furnished. On orders for old style blocks, new style assemblies which are fully interchangeable with the old style will be furnished.

The sketches below illustrate the difference between the old and new style assemblies, and it should be noted that the shedder and wearing strip are replaced by a retractor plate, and the shedder guides are not used. The shedder and wearing strip are no longer being furnished. When it is desired to replace a shedder or wearing strip, a retractor plate should be ordered instead.

The chart below may be used to determine the new style punch block assembly number which replaces an old style, and which retractor plate must be ordered to replace the old style shedder, and/or wearing strip.



OLD STYLE PUNCH BLOCK
(Spring on punches 2 & 4)



NEW STYLE PUNCH BLOCK
(Spring on punches 1 & 4)

Old Style Assembly Number	Apparatus Used On	Type of Punch Block			Shedder	Wearing Strip	New Style Assembly Number	Retractor Plate
		Number of Code Punch Holes	Type of Feed Hole	Grinding on Punches				
122-384	Perf. & nontyp. Reperf. (5 mag.)	5	Advanced	Cup Ground	122-367	122-368	112640	110902
122-575	Perf. & nontyp. Reperf. (5 mag.)	5	Straight	Cup Ground	122-367	122-574	111019	110901
77987	Perforator	6	Straight	Cup Ground	75121	77986	112642	110903
81510	Perforator	6	Advanced	Cup Ground	75121	75120	112643	110904
81792	Perf. Trans.	5	Straight	Cup Ground	75121	77986	111020	110901
85356	Nontyp. Reperf.	6	Advanced	V Notch	75121	75120	112645	110904
86113	Nontyp. Reperf.	5	Straight	V Notch	75121	77986	111021	110901
89504	Perf. Trans.	5	Straight	Cup Ground	75121	77986	111022	110901
91114	Perf. Trans.	5	Advanced	Cup Ground	75121	75120	112646	110902
94904	Perforator	7	Advanced	Cup Ground	94948	94950	112647	110905
95451	Typ. Reperf.	5	Straight	Cup Ground	122-367	122-574	111023	110901
97472	Nontyp. Reperf.	5	Advanced	V Notch	75121	75120	112648	110902
102790	Typ. Reperf.	5	Straight	Cup Ground	122-367	122-574	111024	110901
104573	Typ. Reperf.	5	Advanced	Cup Ground	122-367	122-368	112649	110902

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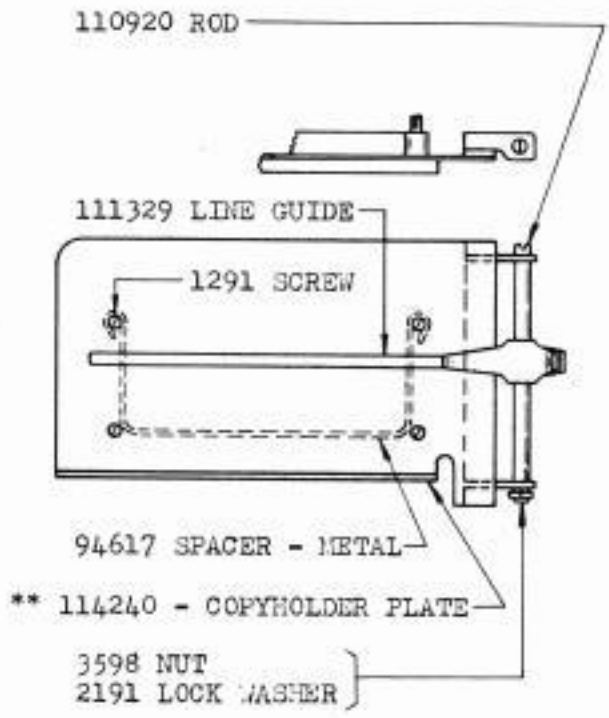
CHANGES AND ADDITIONS
TO PARTS BULLETINS

1025	ISSUE 3	1037	ISSUE 4	1082	ISSUE 2	1110	ISSUE 2
1028	ISSUE 2	1048	ISSUE 2	1088	ISSUE 2	1114	ISSUE 1
1030	ISSUE 2	1063	ISSUE 2	1090	ISSUE 2	1117	ISSUE 2
1031	ISSUE 3	1067	ISSUE 2	1094	ISSUE 2		

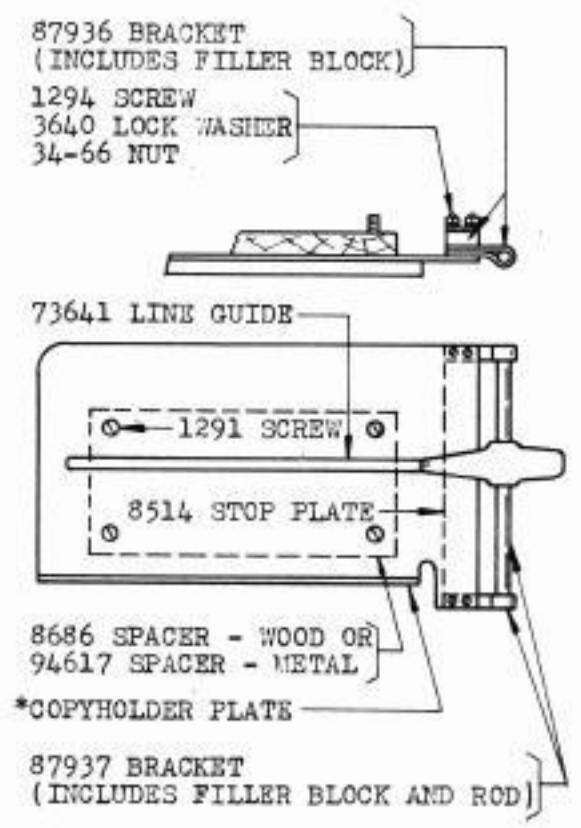
THE 6" COPYHOLDER ASSEMBLIES SHOWN IN THE ABOVE BULLETINS HAVE BEEN REDESIGNED AND ASSIGNED NEW ASSEMBLY NUMBERS. THE SKETCHES BELOW ILLUSTRATE THE DIFFERENCE BETWEEN THE NEW AND OLD ASSEMBLIES, WHICH ARE INTERCHANGEABLE, AND THE CHART LISTS THE NEW AND OLD ASSEMBLY NUMBERS.

THE 8686 SPACER (WOOD) IS NO LONGER AVAILABLE, 94617 SPACER (METAL) WILL BE FURNISHED INSTEAD.

THE 73641 LINE GUIDE HAS BEEN REPLACED BY 111329 LINE GUIDE, WHICH HAS THE CLIP HANDLE BENT FORWARD TO FACILITATE OPERATING THE GUIDE FROM THE FRONT RATHER THAN FROM THE SIDE.



NEW STYLE 6" COPYHOLDER (ASSEM.)



OLD STYLE 6" COPYHOLDER (ASSEM.)

NEW ASSEMBLY		FINISH		OLD ASSEMBLY	
NUMBER	SPACER	COLOR	SUFFIX	NUMBER	SPACER
115700AA	METAL	BLACK WRINKLE	AA	91752	WOOD
115700AB	METAL	GRAY GREEN WRINKLE	AB	—	METAL
115700AC	METAL	LIGHT BROWN WRINKLE	AC	101868	WOOD
115700AD	METAL	DARK BROWN WRINKLE	AD	113419	METAL
115700BA	METAL	BLACK HIGH GLOSS	BA	74833	WOOD
115700BA	METAL	BLACK HIGH GLOSS	BA	101276	METAL
115700BC	METAL	OLIVE GREEN	BC	80888	WOOD
115700CA	METAL	WALNUT	CA	74832	WOOD
115700CA	METAL	WALNUT	CA	101275	METAL
115700CB	METAL	MAHOGANY	CB	81881	WOOD
115700CB	METAL	MAHOGANY	CB	***84922	WOOD
115700CB	METAL	MAHOGANY	CB	101277	METAL

* THE OLD STYLE COPYHOLDER PLATE IS NO LONGER AVAILABLE. WHEN IT BECOMES NECESSARY TO REPLACE AN OLD STYLE COPYHOLDER PLATE A NEW STYLE COPYHOLDER PLATE ALONG WITH ONE 110920 ROD, ONE 2191 LOCK WASHER AND ONE 3598 NUT SHOULD BE ORDERED INSTEAD.

** ON ORDERS FOR NEW STYLE COPYHOLDER PLATES, CUSTOMER MUST INDICATE THE COLOR OF FINISH DESIRED BY ADDING A TWO-LETTER SUFFIX TO THE COPYHOLDER PLATE PART NUMBER. FOR EXAMPLE: ORDER "114240CA COPYHOLDER PLATE" WHEN A WALNUT FINISH COPYHOLDER PLATE IS DESIRED. (SEE "FINISH" COLUMN IN CHART ABOVE FOR FINISHES AND THEIR RESPECTIVE SUFFIXES.

*** THE 84922 COPYHOLDER ASSEMBLY (USED ON WHEATSTONE PERFORATOR COVER - WOOD) WAS LIKE 81881 COPYHOLDER ASSEMBLY, EXCEPT HAVING LONGER MOUNTING SCREWS. IN THE FUTURE, A STANDARD COPYHOLDER ASSEMBLY WILL BE FURNISHED IN PLACE OF 84922, AND THE LONGER MOUNTING SCREWS WILL BE INCLUDED WITH THE WHEATSTONE PERFORATOR COVER.

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Teletype Corporation
Chicago, Illinois, U.S.A.

CHANGES IN LUBRICATION SPECIFICATIONS WHICH APPLY TO ALL TELETYPE APPARATUS

The following lubricants have been standardized for use on all types of Teletype apparatus. These lubricants supersede those referred to in preceding Teletype specifications. The lubricants can be ordered from Teletype as follows:

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88971	1 Gal. of KS-7470 Oil
88973	1 Lb. of KS-7471 Grease
*88975	KS-8319 Grease Gun
*97116	4-oz Tube of KS-7471 Grease

The above grease is recommended instead of oil for lubricating motors equipped with ball bearings. The 88975 grease gun should be used for injecting grease into the bearings of Teletype ball bearing motors. The gun may be used also for applying grease to other parts of the apparatus and no other grease container need be carried. If this grease gun is not available, the oil listed in the foregoing should be substituted for lubricating ball bearing motors.

*Instructions for Filling the Grease Gun

1. Unscrew the lubricant tube from the cap casting of the grease gun.

2. Insert fresh lubricant through the open end of the tube with the fingers. Apply gradually to eliminate air pockets.

3. Tamp the lubricant down solidly in the tube by pounding the closed end solidly against the palm of the hand. Continue to add lubricant until the tube is completely filled and the metal follower rests against the perforated tube cover.

4. Fill the cap casting with lubricant flush to the bottom side of the tube threads.

5. Screw the lubricant tube into the cap casting part way only. Then insert a pencil or rod through the perforated tube cover and exert pressure against the metal follower so as to expel any entrapped air past the tube threads. When lubricant begins to ooze through the threads, tighten the lubricant tube securely in the cap casting.

6. Operate the handle back and forth for several strokes or until lubricant is pumped from the nozzle. The gun is then ready for use. If the lubricant does not flow from the nozzle in a solid stream, it is an indication that all air has not been expelled from the lubricant tube. Invert the gun and pound the cap casting end against the palm of the hand to jar the lubricant into the pump cylinder.

*Instructions for Lubricating Motor Ball Bearings

The motor bearings are packed with grease before the motor leaves the factory and under ordinary operating conditions need no additional lubrication for approximately two months. At the regular lubricating intervals one or two strokes of the plunger of the gun should apply sufficient grease to each bearing. To lubricate, press the nozzle of the gun against the ball oiler and force the grease into the hole by pushing on the plunger of the gun. Care should be taken that the bearings are not overloaded. Overloading will result in the grease oozing out of the end castings and being forced into the motor or being thrown on other parts of the mechanism. After lubricating, the motor should be run for a few minutes and then any excess grease that has been forced out of the ends of the castings should be wiped off. Each time that the gun is used for lubricating a motor bearing, the plunger should first be depressed slightly to make sure that grease will be delivered.

*Indicates change

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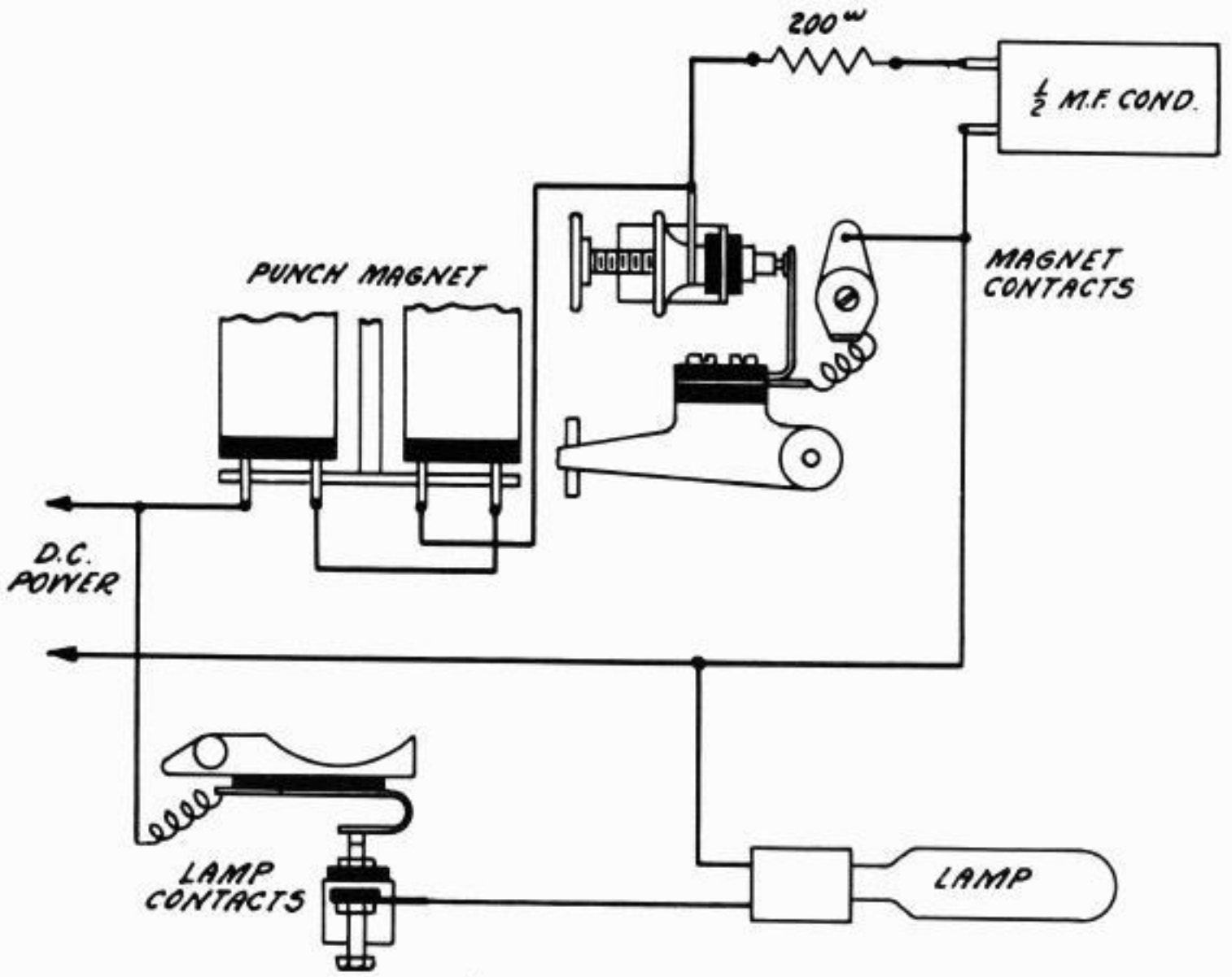
CHANGE IN BULLETIN 108 (ISSUE 2) DESCRIPTION AND ADJUSTMENTS OF THE FIVE-UNIT PERFORATOR

For perforators having a 200 ohm resistance, connected in series with the condenser across the punch magnet contacts, substitute the following theoretical wiring diagram for W.D. 1605 shown in Bulletin 108, Issue 2.



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CHANGES IN BULLETIN 108 (ISSUE 2) DESCRIPTION AND ADJUSTMENTS OF THE FIVE-UNIT PERFORATOR

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* Release Rod Spring Tension

Change this adjustment to read 1 to 3-1/2 ozs. instead of 2-1/2 to 3-1/2 ozs., and add the following note:

NOTE: While taking this tension, hold the idler gear away from the feed roll pinion just enough to disengage the two.

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Add the following adjustment after "Punch Hammer Spring Tension (Figure 12)":

Bell Crank Adjustment

NOTE: This adjustment applies to those bell cranks which have had their longer arm cut away to form a neck.

The end of each punch bar should be in alignment with the left edge of its corresponding punch when no key levers are depressed.

Adjust by bending the neck of the bell cranks to the left or right.

NOTE: This bending may be done with long nose pliers, the loops being held up in their unoperated positions.

*Indicates addition.

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