INSTRUCTION BOOK No. 25

creed

# model 25—Mk. IV *

## TAPE PUNCH (REPERFORATOR)

maintenance instructions

Creed & Company Limited

INSTRUCTION BOOK No. 25
(3rd. EDITION)

creed

# model 25—Mk. IV ★

## TAPE PUNCH (REPERFORATOR)

maintenance instructions

PRINTED JULY 1962

Creed & Company Limited

TELEGRAPH HOUSE
CROYDON · ENGLAND

Telegraphic address CREDO · TELEX · CROYDON
Telephone MUNICIPAL 2424
Telex 28836

ITT

# CONTENTS

# INTRODUCTION

This third edition of Instruction Book No.25 applies to the Mark IV* 5-track version of Model 25 Standard Tape Punch. The instructions also apply to the 7 and 8-track machines.

The book contains full adjustment, dismantling, assembling and lubrication instructions and circuit diagrams.

For a brief technical description of the Model 25 Tape Punch, which includes specifications of the voltages and lengths of the input signals, reference should be made to Creed Publication 135-004-IE.

The standard version of this machine is fitted with 1000 ohm code- and trip-relay coils, each operated by a 100V. d.c.pulse via a 1000 ohm series resistor.

Customers who use any of the three basic variations of this machine (i.e. 12V. 24V. or 50V. drive) should refer to the table given below, which indicates the resistance of the relay coils and the values of the series resistors appropriate to each of these variations.

| VERSION | CODE - AND TRIP-RELAY RESISTANCE | SERIES RESISTORS |
|---|---|---|
| 12V dc drive | 15 ohms | 15 ohms |
| 24V dc drive | 57 ohms | 56 ohms |
| 50V dc drive | 275 ohms | 270 ohms |
| 100V dc drive. | 1000 ohms | 1000 ohms |

# MAINTENANCE INSTRUCTIONS

## A. AFTER EACH 40 HOURS OF OPERATION

### 1. CLEANING AND LUBRICATION

1.1 Remove the cover as described in Section 1 of the Dismantling and Assembling instructions.

1.2 Clean the machine, removing all visible dust and loose paper chads.

1.3 Lubricate the machine in accordance with the Lubrication Instructions, and remove all surplus oil.

1.4 Perforate a length of tape and check for regularity and length of pitch as specified in Adjustment 9.

## B. AFTER EACH 200 HOURS OF OPERATION

### 2. CLEANING AND LUBRICATION

2.1 Remove the cover as described in Section 1 of the Dismantling and Assembling Instructions.

2.2 Remove the top plate (with the punch block attached) as described in Section 2 of the Dismantling and Assembling Instructions.

2.3 Remove all dust and loose paper chads from the machine.

2.4 Lubricate the machine in accordance with the Lubrication Instructions and remove all surplus oil.

### 3. ADJUSTMENTS

3.1 Inspect the switch blade and springset contacts and, where necessary, clean the contacts using burnisher TA.1030 supplied with the tool kit.

3.2 Check the switch blade and springset tensions as given in Adjustments 3, 4 and 10. Adjust, where necessary, using spring adjuster TA.1031, supplied with the tool kit.

3.3 Replace the top plate and connect the machine to the supply.

3.4 Perforate a length of tape and check for regularity and length of pitch as specified in adjustment 9 of the Adjustment Instructions.

## C. WHEN NECESSARY

### 4. SHARPENING OF PUNCHES

4.1 Remove the punches from the punch block as described in Section 7 of the Dismantling and Assembling Instructions.

4.2 Insert the punches, individually, into a lapping block (TA.1301, supplied with the tool kit) so that the chamfered cutting edges of the punches are parallel with the chamfered side of the block.

4.3 Lock the punches in this position by locating the knurled pin with the recess in the punch and securing both punch and locating pin with the leaf springs. Tighten the leaf spring fixing screws.

4.4 Ensuring first that the punches are free to move against the springs, smooth off the punch cutting edges with a fine carborundum stone.

N.B.: Care should be taken to see that the reduction in the length of the punches is kept to a minimum and that the punches are of uniform length.

4.5 Replace the punches, reading Section 7 of the Dismantling and Assembling Instructions in the reverse order.

4.6 Re-adjust the height of the punch selectors as in adjustment 7 if necessary.

4.7 Perforate a length of tape and check that the feed and code punches produce clear-cut perforations.

SPECIAL NOTE

The Run-out button should not be pressed with the motor power off. This action will result in the detents being tripped, so that when the power is switched on the motor will immediately come under full-load. Under these conditions it is possible that the motor will not start.

# ADJUSTMENT INSTRUCTIONS

## 1. CLUTCH DETENTS (Fig.1)

Check

1.1 With the machine in the rest position and the cam pawl C, Fig.1, engaged with detent D, check that the clearance between the pawl and the cam seating, i.e. dimension 'a', is .002 - .006 in (.05 - .15 mm).

Action

1.2 If this is not so, slacken the locknut of eccentric A and turn the eccentric until the required clearance is obtained. Tighten the locknut.

Check

1.3 Trip the detent and turn the pawl C through 180 degrees so that it is arrested by detent H. Press the pawl away from the detent and check that it has an estimated movement of .002 - .006 in (.05 - .15 mm).

N.B.: This provides an indirect check on the clearance between the pawl and the cam seating, which cannot be directly measured with the pawl in this position.

Action

1.4 If necessary, slacken the locknut of eccentric A again and readjust the eccentric to obtain the required condition, taking care to preserve the adjustment in check 1.1.

N.B.: It should be possible to satisfy checks 1.1 and 1.3 simultaneously, by the adjustment of eccentric A, because the trip magnets have been shimmed underneath, in the factory, to achieve this condition.

Check

1.5 Check that a force of 3-4 oz (85-113 gm) applied at the tip of the pawls, is sufficient to set them back against their seating.

Action

1.6 If this is not so, it will be necessary to renew the circular pawl spring - shown in full black in Fig.1 at PS.

## 2. DETENT ENGAGEMENT AND RETENTION ROLLER (Fig.1)

Check

2.1 With the machine in the rest position and the cam pawl C, Fig.1, arrested by detent D, check that the engagement 'b', between the pawl and the detent, is an estimated .016 - .024 in (.41 - .61 mm), i.e. about a third to a half of the depth of the detent face.

Action

2.2 If this condition is not satisfied, slacken screw E and adjust the position of detent D to give the required engagement. Tighten screw E.

Check

2.3 Trip the detent and rotate the mainshaft by hand until the pawl C engages detent H. Repeat check 2.1 for detent H.

Action

2.4 If this is not correct, slacken screw G and adjust the position of detent H to give the required condition.

Check

2.5 Check that a force of 2.5 kg applied to the pivot of retention roller B will just raise the roller from its cam fall.

Action

2.6 If this is not so, fit a new return spring J.

3. TRIP CHANGE-OVER CONTACTS (Figs.1 and 2)

**Note:** In the absence of special instructions to the contrary, adjust the contacts as follows:-

Check

3.1 With the roller N, Fig.2, in the position shown, check that switch blade H is straight, and that the lug of the blade presses on the buffer block G with a force of 20-25 gm, as measured at the end of the blade.

Action

3.2 If these conditions are not present, 'set' blade H to obtain them.

Check

3.3 Turn the camshaft, by hand, until roller N is in its highest position. Check that the lug of blade H clears the buffer block G by .002 - .006 in (.05 - .15 mm), as estimated by eye.

Action

3.4 If this is not so, slacken screws B and D, remove the switch and change the number of shims P, under the assembly, to achieve the condition. Replace the switch and secure with screws B and D.

Check

3.5 With the roller N in its highest position, check that blade K is straight, and that lug of the blade presses on the buffer block G with a force of 20-25 grams, as measured at the end of the blade.

Action

3.6 If these conditions are not satisfied, 'set' blade K.

Check

3.7 Return the camshaft to the position shown in Fig.2. Check that the lug of blade K is pressed away from the buffer block G by .002 - .006 in (.05 - .15 mm), as estimated by eye. At the same time check that there is some clearance between roller blade M and lifting pin L.

Action

3.8 If this is not so, 'set' blade J.

**N.B.:** It may be necessary to adjust the tip of blade K to preserve the clearance between blade M and lifting pin L.

Check

3.9 With the camshaft still in the position shown in Fig.2, check that roller N presses down on cam O with a force of 40-60 gm, as measured at the end of blade M.

Action

3.10 If this is not so, 'set' blade M to obtain the condition.

Check

3.11 Check that the change-over contacts are just operated when the clutch pawl C, Fig.1, is approaching and is within 1/4 - 1/8 in (6.4 - 3.2 mm), of each trip detent.

N.B.: When the pawl C is approaching the rear trip detent H, the roller blade M, Fig.2, should be rising from the low to the high cam position.

Action

3.12 If these conditions are not present, slacken the grub screw of Cam O, and position the cam to obtain them. Ensuring that roller N is operating centrally on the cam track, tighten the grub screw.

## 4. SYNCHRONISING CONTACTS (Fig.3)

Check

4.1 With the roller AC, Fig.3, in the position shown, check that the switch blade Y is straight and that the lug of the blade presses on the buffer block X with a force of 20-25 gm, as measured at the end of the blade.

Action

4.2 If these conditions are not present, 'set' blade Y to obtain them.

Check

4.3 Turn the camshaft by hand until roller AC is in its highest position. Check that the lug of blade Y clears the buffer block X by .002 - .006 in (.05 - .15 mm), as estimated by eye.

Action

4.4 If this is not so, slacken screws S and U, remove the switch and change the number of shims AE under the assembly to achieve the condition. Replace the switch and secure with screws S and U.

Check

4.5 Return the camshaft to the position shown in Fig.3 and check that roller AC presses down on Cam AD with a force of 40-60 gm, as measured at the end of blade AB.

Action

4.6 If this is not so, 'set' blade AB to obtain the condition.

4.7 When 'make' contacts only are fitted, check that lifting pin AA presses on blade AB with a force of 5-10 gm, as measured at the end of blade Z.

4.8 When 'break' or change-over contacts are fitted, check that the lower buffer blade (not shown in Fig.3) is pressed away from the buffer block X by .002 - .006 in (.05 - .15 mm). At the same time, check that there is some clearance between roller blade AB and lifting pin AA.

Action

4.9 If any of these conditions are not satisfied 'set' blade Z accordingly.

N.B.: When 'break' contacts are fitted, it may be necessary to adjust the tip of the lower buffered blade to preserve the clearance between blade AB and lifting pin AA.

Check

4.10 *On machines with special synchronising contacts,* check that synchronising cam AD, Fig.3, is positioned on the shaft so as to satisfy the conditions required by the instructions provided.

4.11 *On standard machines* (i.e. those for which no special instructions are issued), trip the detent, rotate the camshaft by hand, and check that the contacts operate as soon as possible after cam AD starts to move. Check for both half revolutions of the cam.

Action

4.12 *On machines with special contacts.* If Check 4.10 is not satisfactory, slacken the grub screw which secures cam AD to the shaft, position the cam to satisfy the special instructions, ensuring that it will operate centrally on the follower roller AC, clamp the grub screw, and repeat Check 4.10. Refine if necessary.

4.13 *On standard machines.* If Check 4.11 is not satisfactory, unclamp the cam, and move it to a position more likely to satisfy the required conditions. Tighten the grub screw, after ensuring that the cam operates centrally on the follower roller and repeat Check 4.11. Refine the adjustment if necessary. Operation of the contacts should be checked for both half revolutions of the cam.

## 5. SELECTOR FRAME GUIDE (Fig.4)

N.B.: This adjustment should require attention only when the machine is dismantled, or if screws G, Fig.4, become loose.

Check

5.1 With screws G loose, check whether the frame A has any side play on its pivot R.

Action

5.2 If it has, position block F so that the movement of the selectors B about the centre of the corresponding punches C is as near symmetrical as possible.

5.3 If it has not, move block F, from side to side, and check the amount of play between block F and bush E. Set the block in the centre of this movement.

5.4 Tighten screws G and, operating the machine by hand, check that the frame moves freely in its guide.

## 6. SELECTOR LEVER/PUNCH ENGAGEMENT (Figs.4 and 5)

Check

6.1 Check that, with the armatures of the code magnets in the unoperate position, the tops of the selector levers B, Fig.4, are clear of the corresponding punches C.

6.2 Operate each magnet armature by hand and check, by eye, that the selectors B move inwards until they are centrally under the bottom of the corresponding punches C.

Action

6.3 If either of these checks is not satisfied for any magnet, slacken the corresponding nut A, Fig. 5, turn the eccentric link pivot B until the correct selector action is achieved and clamp in this position with nut A.

N.B.: To obtain the correct selector action, it is essential that the eccentrics of link pivots B should be on the outside of their throw, i.e. towards the magnets.

Check

6.4 Check that the feed hole selector link H, Fig. 4, positions the corresponding selector B centrally under the feed hole punch C.

Action

6.5 If this is not so, slacken the nut securing the eccentric post J and rotate the post until the correct condition is obtained. Tighten the nut.

Check

6.6 Check that spindle E, Fig. 5, lies midway between the front and rear magnet armature extensions D at C.

Action

6.7 If it does not, adjust the position of the right hand pivot block of the spindle to obtain the required condition.

## 7. SELECTOR FRAME AND WITHDRAWING BRACKET HEIGHTS (Fig. 4)

Check

7.1 With the machine in the rest position and the selector frame A, Fig. 4, in its lowest position, operate the selector magnet of the front selector B and lift the front punch C so that it bears against the withdrawing bracket D. The gap between the bottom of the punch and the top of the selector should be .010 - .020 in (.25 - .51 mm).

7.2 Repeat check 7.1 for the rear selector and punch.

7.3 Check that the front and rear punches have just perceptible vertical play.

N.B.: Checks 7.1 to 7.3 provide an approximate indirect method of checking the gap (.008 - .014 in) between the punches and selectors when the punches are in their lowest position, and the gap (.002 - .006 in) between the punches and the punch withdrawing bracket, since 7.1 and 7.2 provide a check on the sum of these gaps and 7.3 provides a check on the second gap.

Action

7.4 If any one of the conditions in 7.1 to 7.3 is not satisfied, slacken screw N. With the punches held down to their fullest extent rotate quadrant O to obtain a clearance, between selectors and punches, of .008 - .014 in (.20 - .36 mm), i.e. dimension 'c'. Note the gap and tighten screw N.

N.B.: If there is insufficient throw on quadrant O, remove screws M and N, draw out the quadrant and replace it on the hexogonal pivot so as to increase the throw. Replace screws M and N and tighten.

7.5 Trip the detent and rotate the camshaft to the opposite pawl position. Repeat 7.4.

7.6 Slacken screws K and L and move the side plates upwards, thus taking the punch withdrawing bracket D to its hightest position. Actuate by hand the two extreme code numbers and insert a feeler gauge between the punches and the selectors of thickness equal to dimension 'c' plus .004 in (.10 mm). Move the side plates down, so pulling the punch withdrawing bracket D on to the punches. Tighten screws K and L, and ensure that a slight backward movement of bracket D is possible when the feeler is removed.

## 8. TAPE FEED LATCH (Fig.7)

**Check**

8.1 Check that the slot between the tines F, Fig.7, of the tape guide is centrally disposed about the feed wheel teeth. Check also, by operating the machine by hand, that the tape runs freely under the tines.

**Action**

8.2 If either of the above checks is not satisfied, remove spring B, slacken nut A and turn eccentric screw R until the latch S is disengaged from frame N, as illustrated (at point T) in the inset to the lower diagram of Fig.7.

8.3 Slacken screws P and insert one or two thicknesses of tape punched with feed holes (according to whether the machine is required to perforate one or two tapes), through the punch block and between the tines F and feed wheel M. Press the tines lightly onto the tape, or tapes, and slide them backwards or forwards until they are positioned concentrically with respect to the rollers, ensuring, at the same time, that the slot between the tines is centrally disposed about the feed wheel teeth. Tighten screws P.

8.4 Replace spring B and insert an extra thickness of tape punched with feed holes. Adjust eccentric R until, with the tape guide resting on the tape, the latch is just touching the frame, as shown at point T in the lower diagram on Fig.7. Clamp the eccentric with nut A.

8.5 Remove the extra tape, slacken screws P and move the guide towards the frame until the tips of the tines just touch the tape. Ensure that the slot is centrally disposed about the feed wheel teeth and tighten screws P.

## 9. TAPE FEED PITCH (Figs.6 and 7)

**Check**

9.1 With the motor power off, trip the detent and rotate the camshaft by hand. Check:-

(a) that the feed pawl K, Fig.6, feeds the ratchet J forward one tooth.

(b) that the retention roller M retains the feed wheel in the fed position without under-or over-shooting.

(c) that the feed pawl K finally moves back to pick up the next tooth and comes to rest with a slight gap between it and the tooth.

9.2 Switch on the motor power. With the normal number of tapes in the machine, press the Run-out button until about two feet of tape have been perforated with feed holes.

9.3 Examine the feed holes for freedom from jagged edges and for regularity and length of pitch. The nominal pitch is 1/10 in with an accuracy of ± 1/2 feed hole pitch (± .05 in (1.27 mm)) in ten inches of tape. If two tapes are used, it will be necessary to check both tapes as the outer tape will have a slightly greater pitch (approximately 1/2 feed hole pitch ± .05 in (1.27 mm)) in ten inches of tape than the inner tape.

Action

9.4 If any one of these checks is not satisfied, slacken nut N and move the retention lever backwards or forwards by turning eccentric pivot P until the required adjustment is obtained. The feed wheel should be turned anti-clockwise (viewed from the retention lever side of the punch block) to increase the pitch and clockwise to decrease it. Tighten nut N.

9.5 Whenever the retention lever is adjusted it will be necessary to re-adjust the feed rod G. To do this, turn the machine to the rest position and slacken nuts C, S, E and F. Slide rod G in or out until the gap between the pawl K and one of the teeth of ratchet wheel J is a minimum, i.e. the pawl will just clear the next tooth during the feeding operation.

9.6 If the conditions in 9.3 cannot all be satisfied by means of adjustments 9.4 and 9.5, satisfy as many as possible and then slacken screws P, Fig.7. Move the tines backwards or forwards slightly and tighten screws P again. Check another length of tape.

**N.B.:** It may be necessary to repeat adjustments 9.4, 9.5 and 9.6 several times to obtain completely satisfactory results, as the adjustments are, to some extent, inter-dependent.

## 10. CODE MAGNET SPRINGSETS (Figs.8, 12)

**Note:** These adjustments should be made with collar AG, Fig.12 free, so that pressure from compression spring AT does not damp the movement. Conclude by pressing collar AG against spring AT to obtain a force of 5-6 oz (142 - 170 gm) against the selectors, and clamping it there.

Check

10.1 With the code magnets at rest, check that the buffer spring G, Fig.8, of each 'make' contact set is exerting a pressure of 20-25 grams (measured in line with the contacts) against the buffer block H.

10.2 Operate the magnets by hand and check that the buffer spring D of each 'break' contact set is exerting a pressure of 20-25 grams (measured in line with the contacts) against the buffer block H.

Action

10.3 If necessary, re-tension the buffer springs until the correct pressures are obtained.

Check

10.4 With the code magnets at rest, check that the force F to just move each relay armature B is between 15-55 grams, applied at the tip of the armature extension.

Action

10.5 If necessary, re-tension the lever springs E until the required pressure is present.

**N.B.:** Each code magnet has two lever springs, one per springset. Both springs should be adjusted to achieve the correct pressure, so that the load is evenly distributed between them.

Check

10.6 When at rest, there should be a clearance of .020-.022 in (.51- .56 mm) between the magnet pole face and the armature face.

Action

10.7 If this is not so, carefully 'set' the armature to obtain the correct clearance

Check

10.8 Check that the armatures have complete freedom of movement.

Action

10.9 If they do not, locate the friction point and free it.

## 11. TAPE DRAWER LATCH (Fig.9)

Check

11.1 Check that, when the drawers are fully inserted, they are held firmly by the latch F, Fig.9, and that the front plates are drawn flush into the casting recess.

Action

11.2 If these conditions are not satisfied, adjust the latch screw E to obtain them.

## 12. TAPE EXHAUST ALARM (Fig.9)

Check

12.1 Remove the tape reels from the tape drawers and place a 'dummy' exhausted tape reel D, Fig.9, on the boss in the top drawer. (This reel should have about 1/4 in (6.4 mm) layer of tape on it, or whatever thickness is required to be left on the reel when the tape exhaust alarm operates).

12.2 Hold the arm C through the hole in the main base and move it towards the 'dummy' reel. The micro-switch should operate and the neon lamp light just as the roller on the end of the arm C reaches the roll of paper, as shown in the figure.

Action

12.3 If this does not happen, slacken screw B, hold the arm C against the tape reel add adjust quadrant A until the micro-switch just operates. Tighten screw B.

Check

12.4 Transfer the 'dummy' reel to the bottom drawer. With the top drawer open to reveal the lower micro-switch, repeat checks 12.1, 12.2 for the lower switch.

Action

12.5 If necessary, adjust the lower micro-switch as in adjustment 12.3

## 13. TAPE BRAKES

Check

13.1 With the machine operated at run-out speed and then brought to rest, check that the tape reels do not over-run excessively.

13.2 Check also that the tape feed is not restricted by the drag of the brakes.

Action

13.3 If necessary, 'set' the tape brake springs to achieve these conditions.

## THE TAPE MARKER FACILITY

Note: This optional facility allows for the tape to be given an ink mark, automatically applied, at any point, to facilitate easy location. The facility is standard on machines used with verifier equipment, and The Marker is operated by an external source electrical pulse.

### 14. MAGNET ARMATURE CLEARANCE (Fig.23)

Check

14.1 With the marker magnet G, Fig.23, de-energised, check that the clearance between the magnet core face and the armature H is between .020 - .022 in (.51 - .56 mm).

Action

14.2 If it is not, carefully 'set' the tail of armature H until the correct clearance is obtained.

### 15. MAGENT POSITION (Fig.23)

15.1 Press down the 'Run-out' button and turn the cam assembly to the rest position. Press the magnet armature H on to the core face, thus causing trip link L to move latch E out of engagement with marker lever extension A. Check that there is now a clearance of .010 - .015 in (.25 - .33 mm), dimension 'a' (inset 2) between latch E and marker lever extension A.

Action

15.2 If this is not so, slacken four screws J (2 shown at J), and tilt the magnet on its mounting until 'a' is correct.

### 16. UNIT POSITION (Fig.23)

Check

16.1 Depress the 'Run-out' key button, then release it. Turn the cam assembly M until roller C is at its maximum lift position on print cam D. With this condition maintained, check that there is a clearance of .010 - .015 in (.25 - .38 mm) dimension 'b', (inset 2) between marker lever extension A and latch E.

Action

16.2 If this is not so, slacken three screws N, and adjust the position of the unit until the correct clearance is obtained at 'b'. Tighten three screws N.

### 17. LATCH ENGAGEMENT (Fig.23)

Check

17.1 With the camshaft in the rest position, and with marker lever extension A held by latch E, check that there is a clearance of .005 - .010 in (.15 - .25 mm), dimension 'c' (inset 1), between the shoulder of the trip link L and latch E. Check also that latch E engages extension A by not less than .010 in (.25 mm), i.e. dimension 'd'.

Action

17.2 If adjustment is necessary, slacken the nut securing eccentric stop F and adjust the eccentric until correct clearance is achieved. Clamp the eccentric.

18. LATCH RESETTING (Fig.33)

Check

18.1 Hold armature H on to the magnet pole-face, and depress the 'Run-out' button. Turn the cam assembly slowly and check that as cam roller C is at its maximum lift position, eccentric pin B causes trip link L to release latch E, thus allowing it to engage marker lever extension A.

Action

18.2 If this is not so, slacken the nut securing eccentric pin B, and adjust the pin until the correct condition is obtained. Clamp the pin.

**Note:** The position of pin B should be such that trip link L does not foul eccentric stop F.

19. INK PAD POSITION (Fig.23)

Check

19.1 Insert approximately twelve inches of tape into the tape gate. With lever extension A in the latched position, check that ink pad P is held clear of the tape. Operate the marker magnet by hand, depress the 'Run-out' button, and turn the cam assembly until cam roller C is at its minimum lift position on cam D. Now check that the ink pad is making contact with the tape, and that a clear ink mark is obtained.

Action

19.2 If this is not so, retain the mechanism in the position described for Check 19.1 above. Slacken the two screws securing the marker pad bracket Q, and adjust the bracket position to satisfy the Check conditions. Clamp the bracket.

**Note:** Replenish the marker pad, when necessary, with "Ink L119", manufactured by the National Cash Register Co., Ltd.

# DISMANTLING AND ASSEMBLING INSTRUCTIONS

**N.B.:** When the machine has been dismantled in accordance with the instructions which follow, it may be re-assembled by following those instructions in reverse order. Attention should then be given to the Notes relating to re-assembly procedure which are placed in brackets immediately after the dismantling instruction to which they refer.

Should it be necessary to dismantle any part which involves the removal of an Anderton clip, it is essential that a NEW clip be fitted when re-assembling.

## A. TO DISMANTLE INTO UNITS

### 1. COVER AND TAPE DRAWERS

1.1 Disconnect the 3-pin power plug, and remove the 24-way signals plug. Remove the cuttings box by lifting it slightly and drawing it away from the machine cover, taking care not to damage the tape guide frame spring pivot.

1.2 Remove three screws securing the cover. Ease the latter clear of the main base run-out button, taking care not to damage the punch block assembly or cutting chute. Slide the tape drawers from out of the main base.

### 2. TOP PLATE (Figs.10 and 11)

2.1 Remove the screws securing the trip changeover block AF, Fig.10, and gently bend back the cableform to the block so that the latter is clear of the top plate S.

2.2 Unscrew the four screws and spring washers for the top plate, taking care not to lose any shims from under the top plate fixing screws, and making note of their position for re-assembly.

(**N.B.:** When re-assembling, ensure that the selectors F, Fig.11, are properly engaged with the selector links, and that the code magnet armatures are quite free before tightening the top plate fixing screws. If any difficulty is experienced, carry out the following actions:-

(a) With a pin or screwdriver position the punch selectors so that they are all vertical.

(b) Place the rear of the top plate on the rear supporting pillars with the screw holes aligned.

(c) With a pin or screwdriver push all the selector links towards the front of the machine and simulataneously under the front edge of the top plate so that the selectors and selector links engage.

(d) Replace the fixing screws, washers and shims, but before tightening check the freedom of the code magnet armatures.)

### 3. MAINS LEAD (Fig.12)

3.1 Remove the three mains input connections from the motor connection block N, Fig.12, and from the machine base plate U, noting that:-

(a) The black lead goes to terminal 1.

(b) the red lead goes to terminal 2.

(c) the green lead goes to a fixing screw on the machine base plate U.

3.2 Slacken the clip securing the mains lead and remove the lead together with the power plug.

(**N.B.:** When replacing the mains lead, ensure that the clip is square with the side of the main base to allow easy fitting of the cover.)

4. MOTOR (Fig. 13)

4.1 Remove the four motor leads from the motor connection block, noting that:-

(a) the red and green leads go to terminal 3.

(b) the black lead goes to terminal 4.

(c) the white lead goes to terminal 5.

4.2 Turn the machine on to its open side. Unscrew the four fixing screws and withdraw the motor D, Fig. 13. Remove the four supporting pillars E and shims, and finally take out the fixing screws.

(N.B.: When replacing the motor D, rest the machine on its open side. Place the four fixing screws and washers in their holes and place the supporting pillars E and shims on them. Offer up the motor to the screws and tighten them by hand. Finish off with a screwdriver.)

5. BOTTOM PLATE (Fig. 12)

5.1 Remove the two tape-exhaust alarm plugs from their sockets W, Fig. 12.

5.2 Remove the five fixing screws and spring washers from the bottom plate U and lift the plate off the main base.

## B. TO DISMANTLE INDIVIDUAL UNITS

6. TOP PLATE (Figs. 10, 11 and 14)

6.1 Release the tape feed lever spring AB, Fig. 10, from its pivot on the underside of the top plate.

6.2 Remove the locknut and nut from the end of the tape feed rod and slide the rod from its pivot on the tape feed lever Y. The other pair of nuts should not be disturbed if the tape feed rod adjustment is to be preserved.

6.3 Release the two punch withdrawing bracket springs B, Fig. 11 (one shown) and pull the bracket C away from the punches. If necessary, slacken the adjusting plate clamping screw D to release bracket C from the punches.

6.4 Unscrew the three punch block fixing screws, together with their washers, and lift off the block. For dismantling instructions for the punch block, see Section 7.

(**N.B.:** When re-assembling, ensure that the punch withdrawing bracket C is well clear of the punches and that the flat faces of the punches are towards the withdrawing bracket.)

6.5 Unscrew the two frame guide fixing screws and spring washers and remove the frame guide H, Fig. 14.

(**N.B.:** When re-assembling, position the frame guide H as in Section 5 of the Adjustment Instructions.)

6.6 Remove the fixing screws and spring washers for block AC, Fig. 10, and remove the block together with the tape feed lever Y.

6.7 Unscrew the locknut and remove pivot E, Fig. 14, from the vertical arms F.

6.8 Slacken the grubscrew on the outer bearing block P and remove the bearing block. Raise the selector frame B and slide it off pin A.

6.9 Remove the nut and extract pin E, Fig. 11, from the punch selectors M. Remove the selectors together with their spacing washers, and the pivot sleeve.

(**N.B.:** When re-assembling, ensure that there is a spacing washer between each pair of selectors and an end washer at each end. In re-assembling the selectors care must be taken to position them the correct way round and reference should be made to Fig. 11, which shows the positions of the tops of the selectors when the bottoms are in line.)

6.10 Remove the two fixing screws and spring washers for the crank supporting block M, Fig. 14, and remove the block.

6.11 Unscrew the two fixing screws and spring washers for the Run-out button assembly and remove the assembly.

6.12 Release spring L, Fig. 10, from the top plate, unscrew the two fixing screws and spring washers for the retention lever bracket AK and remove the bracket together with the retention lever G and its spring.

6.13 Mark the cam gear Q, the clutch sleeve P and the centre bearing block R so that, when the cam gears are meshed on re-assembly, the correct angular relationship between the clutch sleeve P and the cam shaft U is preserved.

(**N.B.:** When re-assembling, ensure that cam gears Q and P are correctly meshed as determined by the marks that were made when dismantling.)

6.14 Remove the fixing screws for the clutch drive bearing block N and slide the clutch assembly P and O from the centre bearing block R. Remove the clutch sleeve P and shim washer AG.

6.15 Slacken the four screws securing the bearing blocks X and R. Remove the complete assembly, consisting of the bearing blocks and the cam shaft U, with the cams V, AD and AE, gear wheel Q and the crank wheel A attached.

**N.B.:** It is not advisable to dismantle the unit any further, for that would upset the timing of the machine.

## 7. PUNCH BLOCK (Fig. 15)

7.1 Slacken the screws securing the cuttings chute and slide the chute from under them.

7.2 Release the retention lever spring K, Fig. 15, and slide the retention lever E from its pivot G.

7.3 Remove the two punch cover plate fixing screws and remove the cover plate R, followed by the die plate and special die plate F (with chamfered edge).

(**N.B.:** When re-assembling, place the special die plate F on top of the tape guide plate so that the chamfered edge of the die plate gives a wide entry for the tape. Before tightening the fixing screws, ensure that the punches have free vertical movement.)

7.4 Remove the tape guide plate and four die plates. Remove the punches.

(**N.B.:** When re-assembling, replace the punches so that the feed punch is in the fourth hole in the die plate from the tape feed ratchet side of the unit, and the recesses in the punches are towards the bottom of the unit.)

7.5 Remove the tape slide bracket fixing screws, followed by the tape slide AK with roller P, and the unit supporting pillars N.

7.6 Release the frame spring AF and the frame latch spring AG.

7.7 Remove the two fixing screws and spring washers for the supporting bracket Z and lift off the bracket together with the frame latch B and latch support AA.

7.8 Remove the two frame guide pivot screws (one shown at C) and withdraw the guide frame AD and the two spacing washers on C.

(**N.B.:** When re-assembling, place the washers of the pivot screws between the frame and bearing blocks S and AH before replacing the pivot screws C.)

7.9 Remove the two stripper spring pivot screws (one shown at A), followed by the stripper spring AC.

7.10 Make a note of the positions of the shims which lie between the bearing blocks and the feed wheel shaft. The feed wheel has been positioned, in the factory, by means of a special gauge, and shimmed as necessary to align with the feed hole punch.

7.11 Withdraw the four securing screws for the two bearing blocks S and AH and lift off the blocks, together with the feed spindle AJ. Slide off the free bearing block and shims.

(**N.B.:** When re-assembling, check the positions of the shims and the freedom of the feed spindle before tightening the fixing screws.)

7.12 Unscrew the two nuts at the end of the feed spindle AJ, followed by the spring washer, washer and collar U. Remove the tape feed plate F, with the tape feed rod AA attached, and the bush T.

(**N.B.:** When re-assembling, ensure first that the pawl spring AF is on its pivot, then replace the tape feed plate V followed by the bush T and lift the spring so that it rests on the ratchet wheel. Replace the collar U, washer, spring washer and two nuts. Finally, lift the spring K and engage it on the lever E.

## 8. BOTTOM PLATE (Figs.1,8 and 12)

8.1 Remove the two fixing screws for the link pillar bracket of bearing AL, Fig.12, located at the punch block end of the bottom plate and underneath the plate.

(**N.B.:** When re-assembling, ensure that the code magnet arms G and S move freely before tightening the fixing screws.)

8.2 Slacken the hexagon-headed clamp screw on the link support Pillar P at the other end of the code magnet assembly.

**Note:** In the case of the Model 25 Mark 4, the link assembly cannot be withdrawn until the fixing screws of relays A and F have been slackened and the relays moved out of engagement with the links. When replacing the relays, slide them towards the links until their armature forks engage with their pins on the links. With the relays friction tight, depress their armatures, in turn, simultaneously with each of the armatures of the three fixed relays. If fouling is noticed, adjust the positions of relays A and F, as required, and when fouling is absent, clamp the relays. (See also Adjustment 6.6).

8.3 Gently withdraw bearing bracket and block AL with the link assembly attached from the code magnets. N.B.: Do not disturb the setting of eccentric post AK.

(**N.B.:** When re-assembling, ease the selector links into position, engaging the link operating pins (E) with their code magnet armatures, and the spindle Q with its bearing in block P.)

8.4 Slacken the fixing screws of bearing block bracket R, and remove bracket and block together.

8.5 Before dismantling the link assembly further, note the relative positions of the links, i.e. the longest link is on the outside.

8.6 Slacken the grubscrew of bush AG until the bush slides freely on spindle Q.

8.7 Holding the selector links in one hand, gently slide spindle Q away from the links, taking care that the washers AJ, compression spring AT, and bush AG and collar AN fall to a safe place as they are released from the spindle.

(**N.B.:** When re-assembling, proceed as follows:-

(a) Pass the spindle Q through the hole at the operating pin (E) end of the longest link.

(b) Pass the same end of the spindle through the corresponding hole of the second longest link, locating the vertical extension of this link inside that of the previous link.

(c) Repeat (b) for the remaining links.

(d) Place the bush AG on the spindle with one of its flat sides facing the connecting rod of the shortest link AS, and the grub screw facing upwards.

(e) Slide the compression spring AT onto the spindle, followed by a spacing washer.

(f) Pass the spindle Q through the remaining holes of the three shortest links AS to AQ, adding a spacing washer after threading each link.

(g) Assemble the fixed link AE so that its lower extension is on the eccentric post side of the assembly. Add a further spacing washer.

(h) Assemble the remaining links, adding a spacer washer after each link.

(i) Slide the collar AN onto the spindle Q.

(j) Slide the support pillar AL bracket R onto the spindle, engaging the eccentric post AK with the fixed link AE. Position the spindle Q in the support pillar P so that the end of the spindle is flush with the outside face of the support pillar. Tighten the hexagon-headed clamp screw.

(k) Move the bush AB along the spindle, against the tension of spring AT to exert a pressure of 5-5½ ozs (142-156 gm) on the selector links. Tighten the grub screw on the top of the bush.)

8.8 The remaining components have soldered connections and should not, normally, need to be dismantled. If this is unavoidable, however, it will be found that each component may be easily removed without disturbing the other components.

(**N.B.:** When re-assembling the machine, check:-

(a) that the same number of shims (part numbers 3886/229 and 3886/230 and/or 3886/232) are replaced under the trip magnets. In cases of difficulty, shim the magnets to achieve the conditions in adjustment 1.

(b) in case of difficulty with (a), the code setting relays may also be shimmed to ensure that the tip C, Fig. 5. of relay armature D is clear of spindle E by at least .015 in (.38 mm).

(c) that the clearance on both trip and code magnets, between armature and pole face, measures .020 - .022 ins (.51 - .56 mm), i.e. dimension 'd', Figs. 1 and 8.)

## 9. REMOVAL OF NEON INDICATORS

9.1 Unsolder the appropriate wires from the inside of the tags on the indicator tag strip, making note of the correct method of re-connection.

# LUBRICATION INSTRUCTIONS

**N.B.:** All machines are properly lubricated before they leave the factory, but it should be remembered that some oil is likely to be lost in transit and in storage. It is, therefore, important to lubricate all new machines before they are put into service.

## AFTER EACH 40 HOURS OF OPERATION

| No. 2 Lubricant | Reference | Fig. |
|---|---|---|
| **A. Oil holes and cups** | | |
| 1. Cam arm lower bearing | AC | 10 |
| 2. Connecting link bearing | K | 11 |
| 3. Fork link bearing | F | 14 |
| 4. L/H tape feed spindle bearing | S | 15 |
| 5. R/H tape feed spindle bearing | AH | 15 |
| **B. Lubricating pads** | | |
| 1. L/H cam shaft bearing | W | 10 |
| 2. R/H cam shaft bearing | T | 10 |
| 3. L/H clutch shaft bearing | T | 10 |
| 4. R/H clutch shaft bearing | M | 10 |
| 5. Push rod pivot | M | 15 |
| **C. Pivots and friction faces** | | |
| 1. Clutch housing bearing | AG | 10 |
| 2. Clutch pawls pivot | AH | 10 |
| 3. Cam roller of changeover contact | B | 10 |
| 4. Cam roller of warning contact | C | 10 |
| 5. Clutch retention lever pivot | G | 10 |
| 6. Clutch retention roller and pivot | F | 10 |
| 7. Frame Bearing Pivot | - | 11 |
| 8. Code selectors pivot | E | 11 |
| 9. Run-Out assembly friction faces and pivot | A | 13 |
| 10. Frame and selectors guide face | H | 14 |
| 11. Crank connecting link pivot | C | 14 |
| 12. Tape feed retention lever pivot | G | 15 |
| 13. Tape feed retention wheel, roller and pivot at | E | 15 |
| 14. Ratchet plate bearing pivot | V | 15 |
| 15. Ratchet wheel, pawl and pivot | Y | 15 |
| 16. Working faces of Ink Marker mechanism (if fitted) | - | 23 |

## AFTER EACH 200 HOURS OF OPERATION

Dismantle and clean the machine. Lubricate all parts as in 'AFTER EACH 40 HOURS OF OPERATION' with the following additions:-

| No. 1 Lubricant | | |
|---|---|---|
| **A. Bearings and pivots** | Reference | Fig. |
| 1. Trip magnet armature pivots | K and M | 12 |
| 2. Code magnet armature pivots | A and O | 12 |
| 3. Code link bearing pivots | Q | 12 |
| 4. Code link ball joint bearings | AS to AO | 12 |
| 5. Link and armature connecting pivots | E | 12 |

| No. 2 Lubricant | Reference | Fig. |
|---|---|---|
| **A. Bearings and pivots** | | |
| 1. Tape guide frame latch pivot | AE | 15 |
| 2. Tape guide frame pivots | C | 15 |
| 3. Stripper spring pivots | A | 15 |
| 4. Pivot of tape slide roller | P | 15 |
| 5. Tape exhaust signal lever bearings | B and C | 16 |
| 6. Tape exhaust signal lever roller pivots | B | 16 |
| 7. Tape roller pivots | L | 16 |
| 8. Tape reel brake pivots | AJ | 18 |
| 9. Tape roller pivot | D | 18 |
| 10. Tape reel pivot | H | 18 |
| **No. 4 Lubricant** | | |
| **A. Gears, cam faces and bearings** | | |
| 1. Paper feed cam | V | 10 |
| 2. Changeover contact cam | AD | 10 |
| 3. Warning contact cam | AE | 10 |
| 4. Cam shaft gears | Q and P | 10 |
| 5. Bearings of motor | D | 13 |
| 6. Motor drive pinions | B | 13 |

CREED LUBRICANTS

The following lubricants are recommended, and may be obtained from Creed & Company Limited.

**No. 1 Lubricant** - Thin oil, such as:-

(a) Shell Clavus oil 17 (formerly Shell oil J.Y.1)

(b) Wakefield Magna R.S. oil.

**No. 2 Lubricant** - Medium oil, such as:-

(a) Shell Talpa oil 30, (formerly Shell oil C.Y.2).

(b) Wakefield Castrol XL.

**No. 4 Lubricant** - Grease, such as:-

(a) Shell Alvania grease 3, (formerly Shell VW)

# CIRCUITS AND CIRCUIT DIAGRAMS

## A. MOTOR CIRCUITS

### GENERAL

The standard Model 25 is fitted with a FRACMO synchronous type motor, reference number 266, which can be supplied to suit mains voltages of 115, 220, 230 Volts A.C.

Other voltages are catered for by the use of a 115 V motor together with a transformer.

The use of 60 c/s supply votages is possible by fitting alternative gears to the machine.

Sufficient starting torque is provided by a phasing capacitor in the motor circuit, the capacity of which is chosen as follows:-

| Supply Voltage | Capacitor Value |
|---|---|
| 115V. 50/60 c/s ..... | 6 uF |
| 220V. 50 c/s ..... | 6 uF |
| 230V. 50 c/s ..... | 5 uF |
| 250V. 50 c/s ..... | 4 uF |

### CIRCUIT DIAGRAM

Figure 20 shows the motor and tape-out alarm circuits of the standard Model 25 Tape Punch, with a schematic diagram inset.

## B. SIGNAL CIRCUITS

### GENERAL

The signal circuit for the 5-unit version of the Model 25 Tape Punch consists of a combined point-to-point and schematic diagram, and a component identification diagram. To enable the former diagram to be used for circuit tracing, the tag numbers have been repeated on it, the point-to-point connections being indicated by 'branching' the lines where necessary.

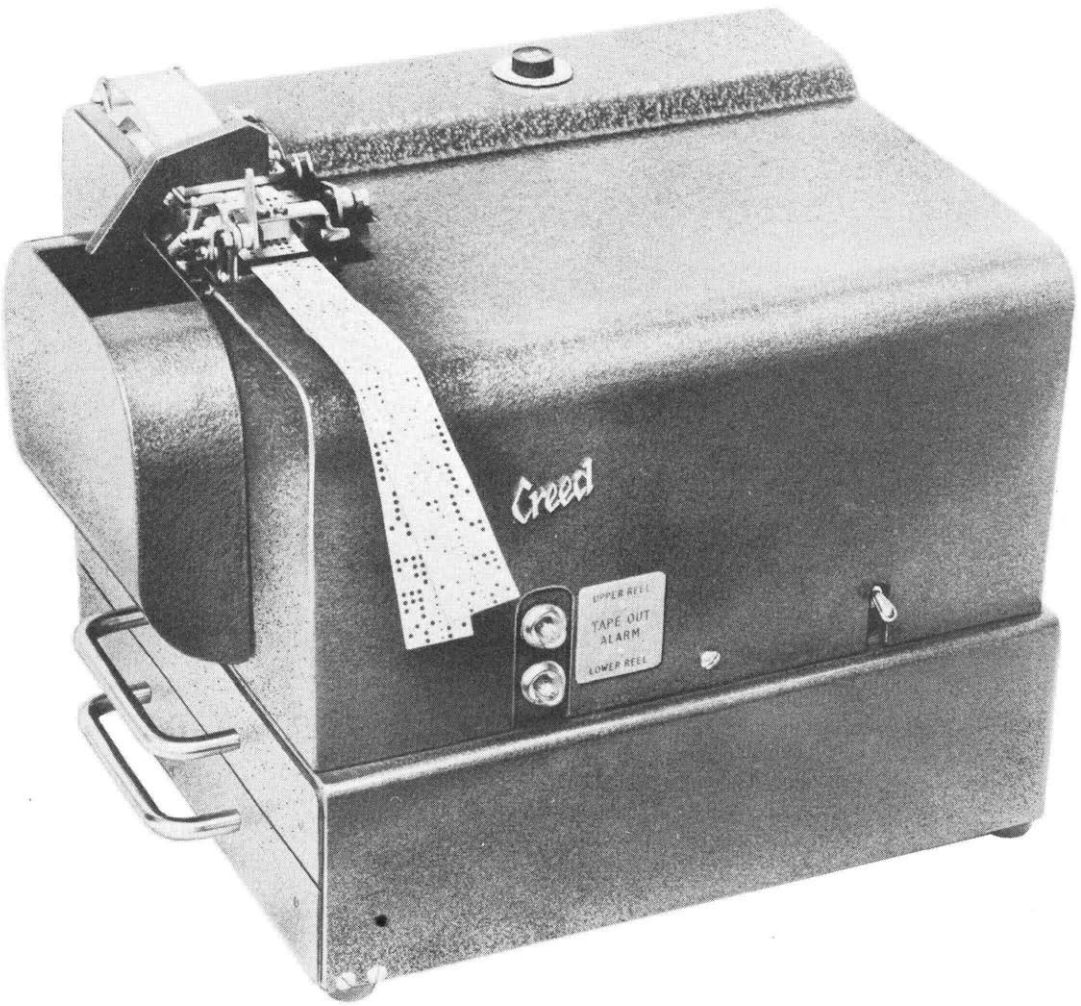
As indicated in Fig.19, the external connections to the signals circuit are made via. a 24-way plug and socket.

The spare leads on pins 2, 4, 6, and 8 of the tag board are included so that extra cam-operated switch contacts may be fitted if required.

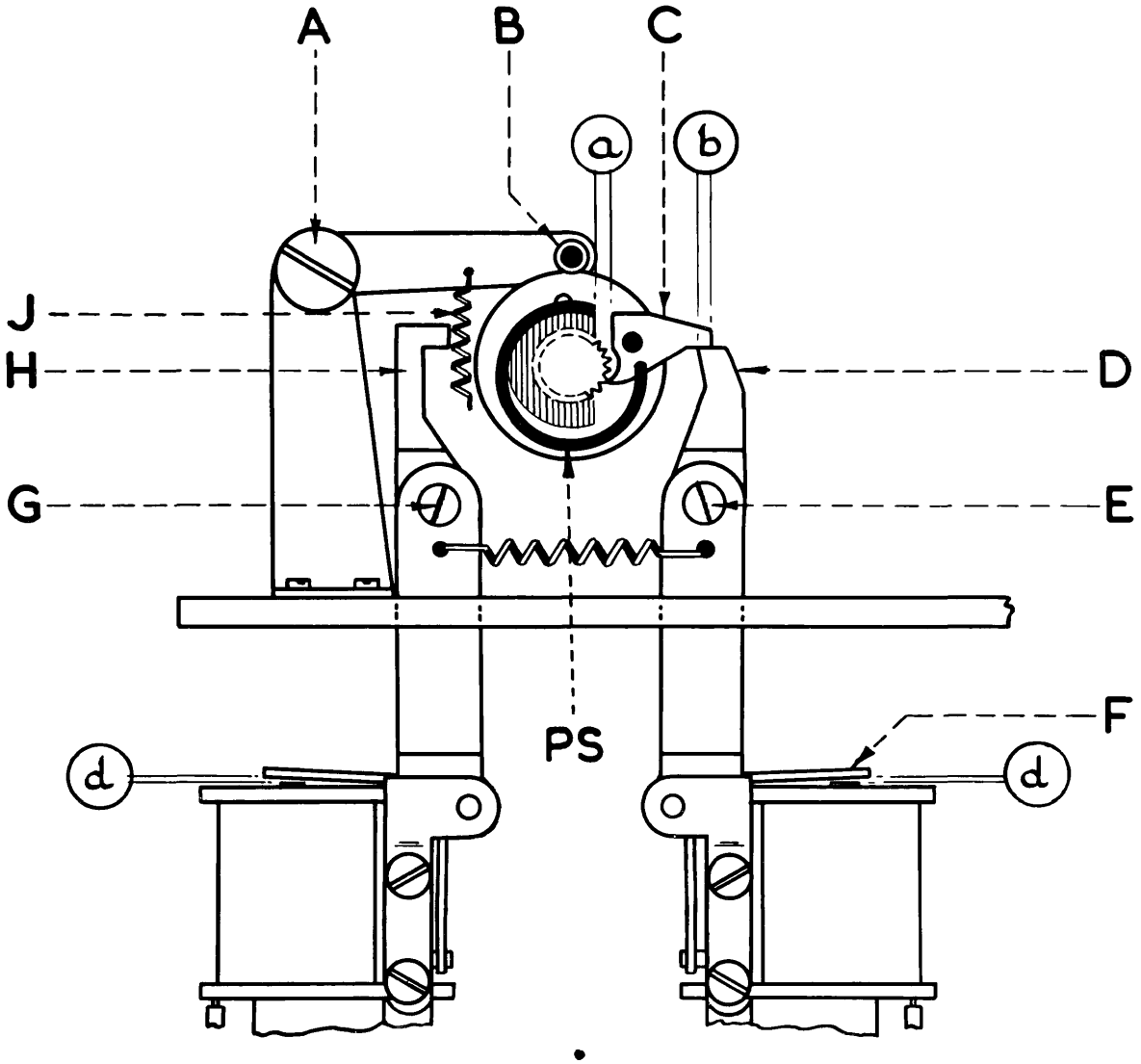
In cases where variations or special facilities have been provided, reference should be made to the appropriate diagram for the machine concerned.

Fig. 21 shows the relay panel layout of the standard 7-unit model, together with the relevant schematic circuit.

Fig. 22 gives similar details for the standard 8-unit model. Note that this diagram is not for use with machines designed to operate in Verifier equipment.




CREED MODEL 25 MARK IV* TAPE PUNCH (REPERFORATOR)

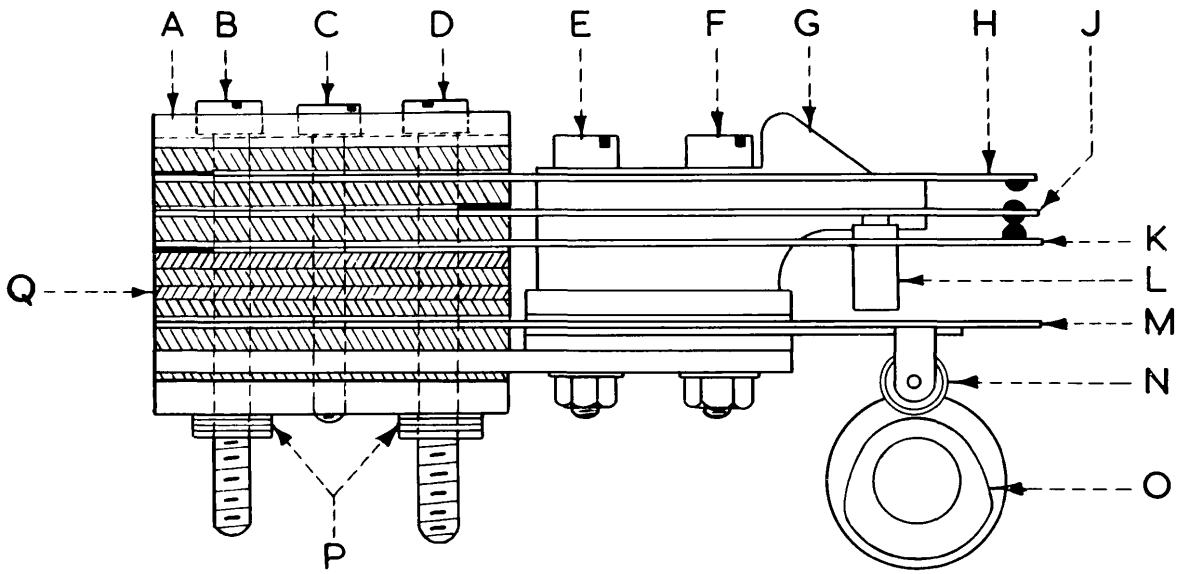



DIMENSIONS

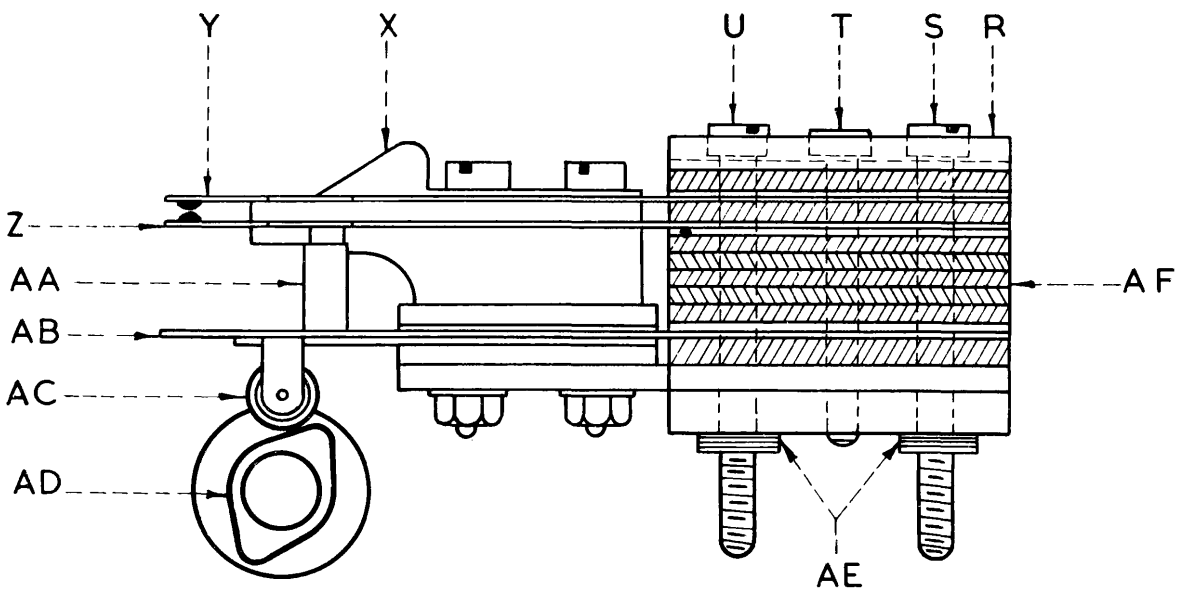
(a) = {·002—·004 in. / ·05 —·10 mm}  (b) = {·016—·024 in. / ·41 —·61 mm}

(d) = {·020—·022 in. / ·51 —·56 mm}

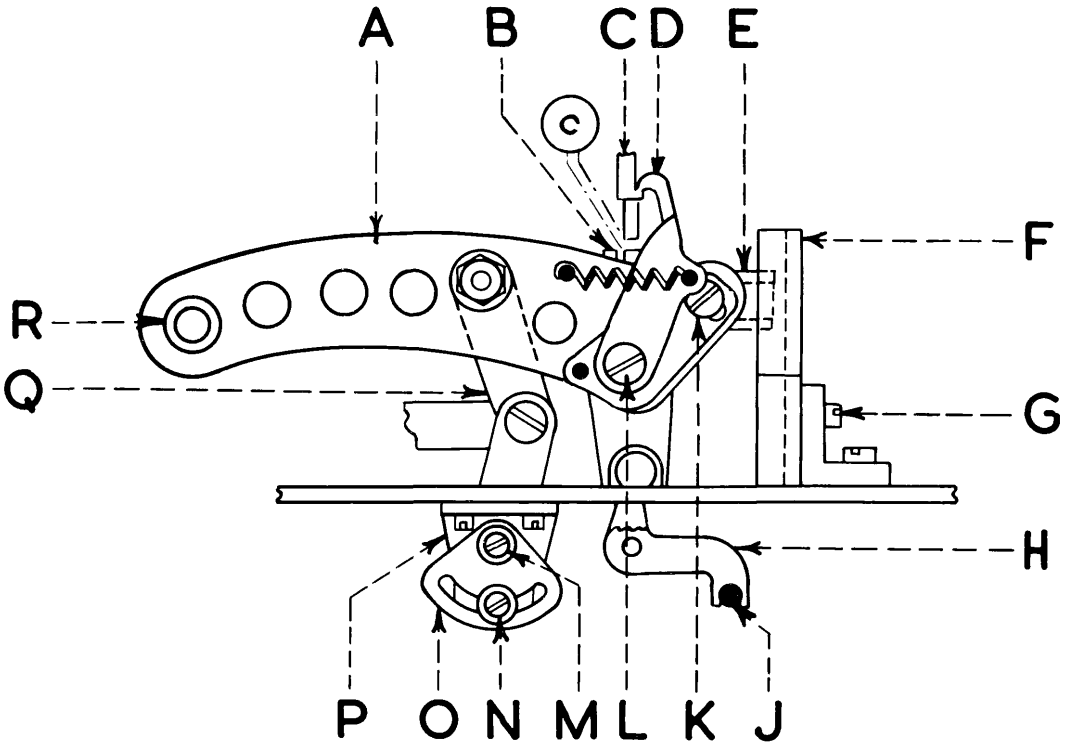
2



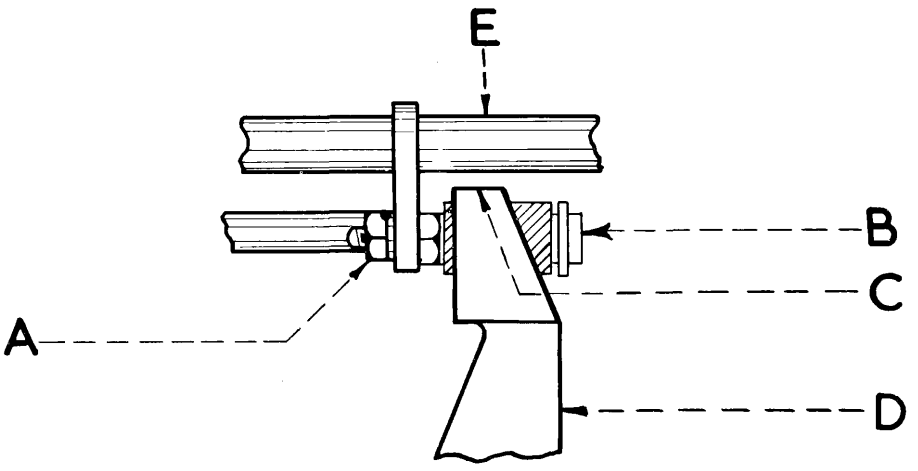

3



4

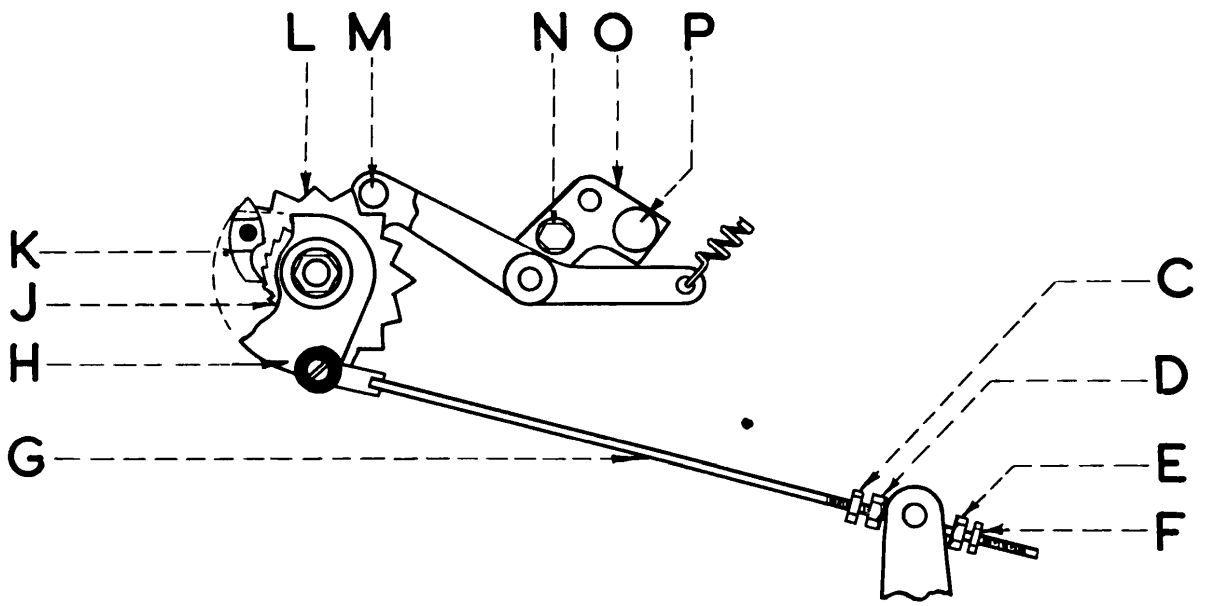



5

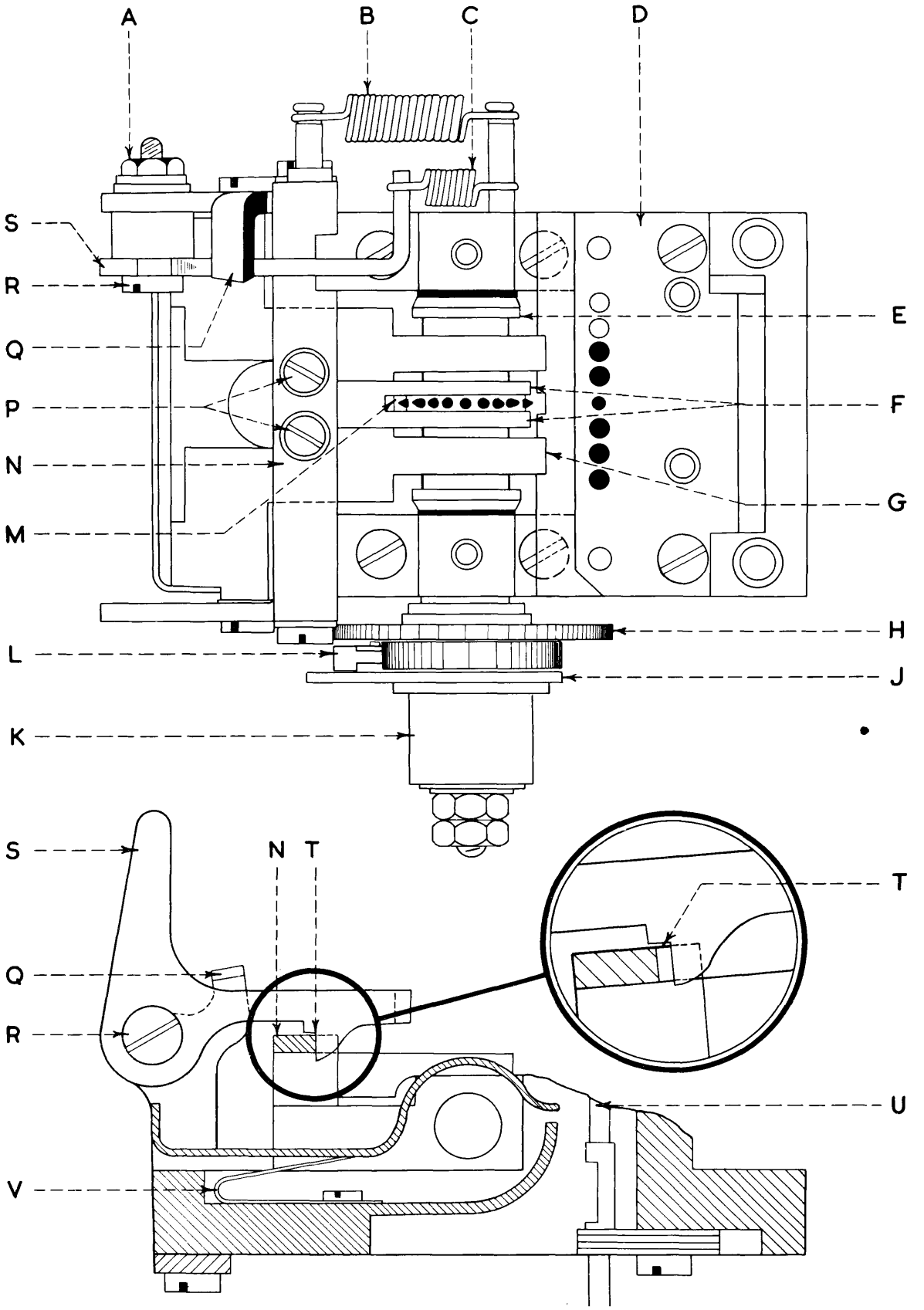


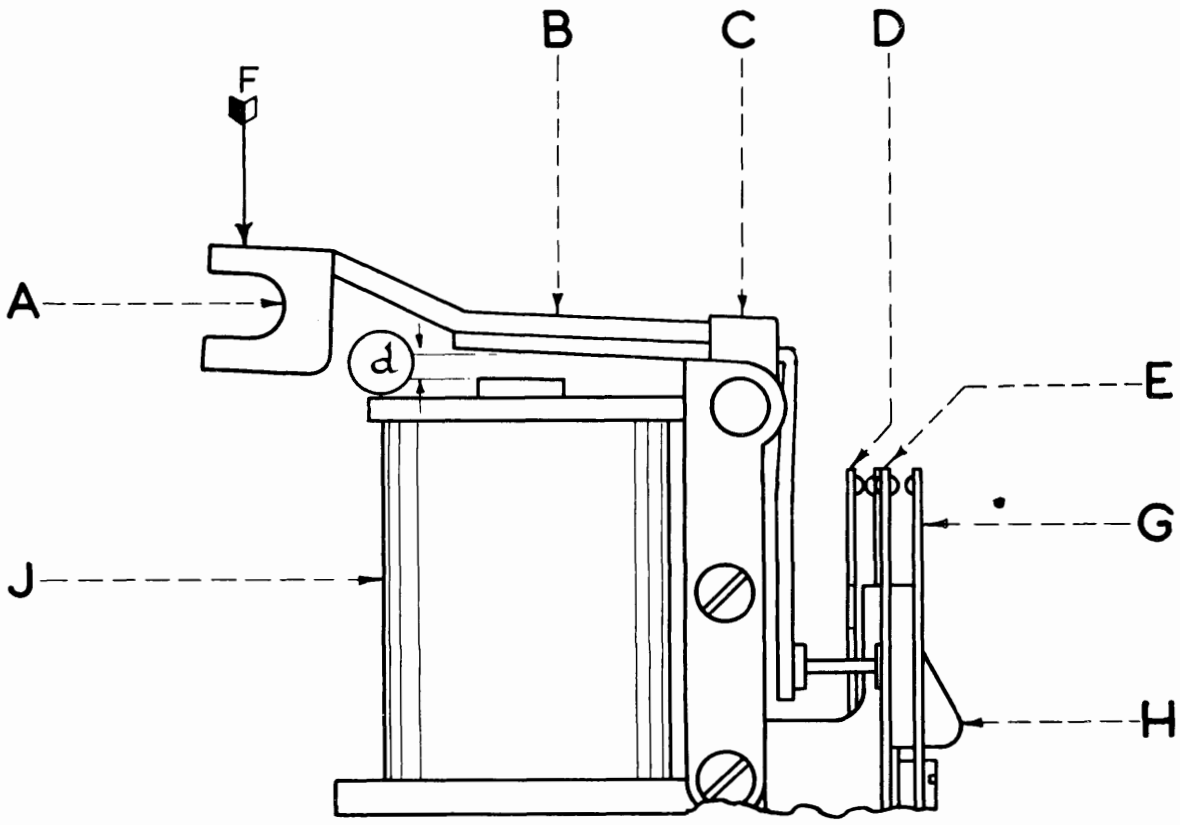

DIMENSIONS

Ⓒ = {·008—·014 in. / ·20 —·36 mm}


L
M
N
O
P
K
J
H
G
C
D
E
F

7

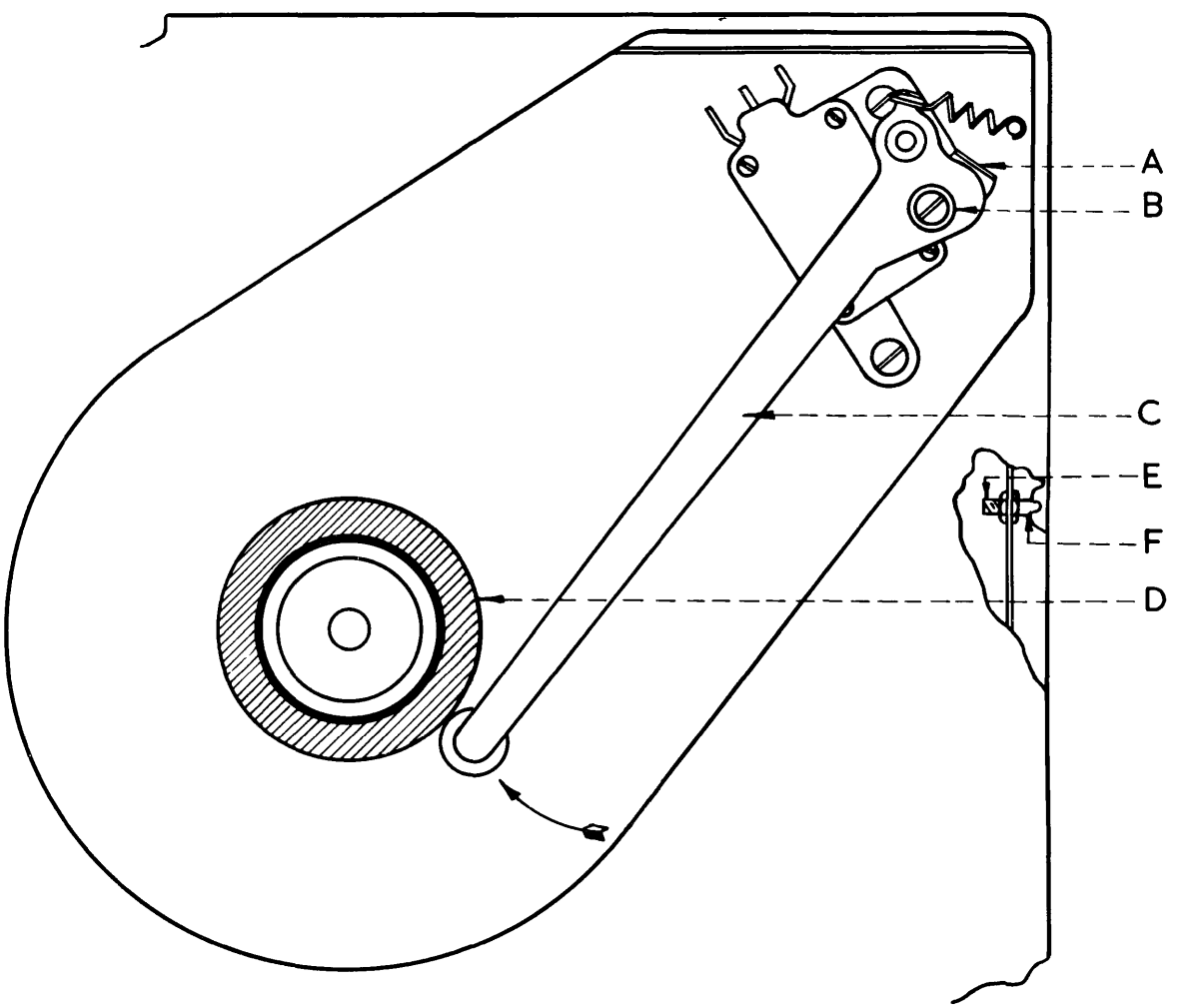


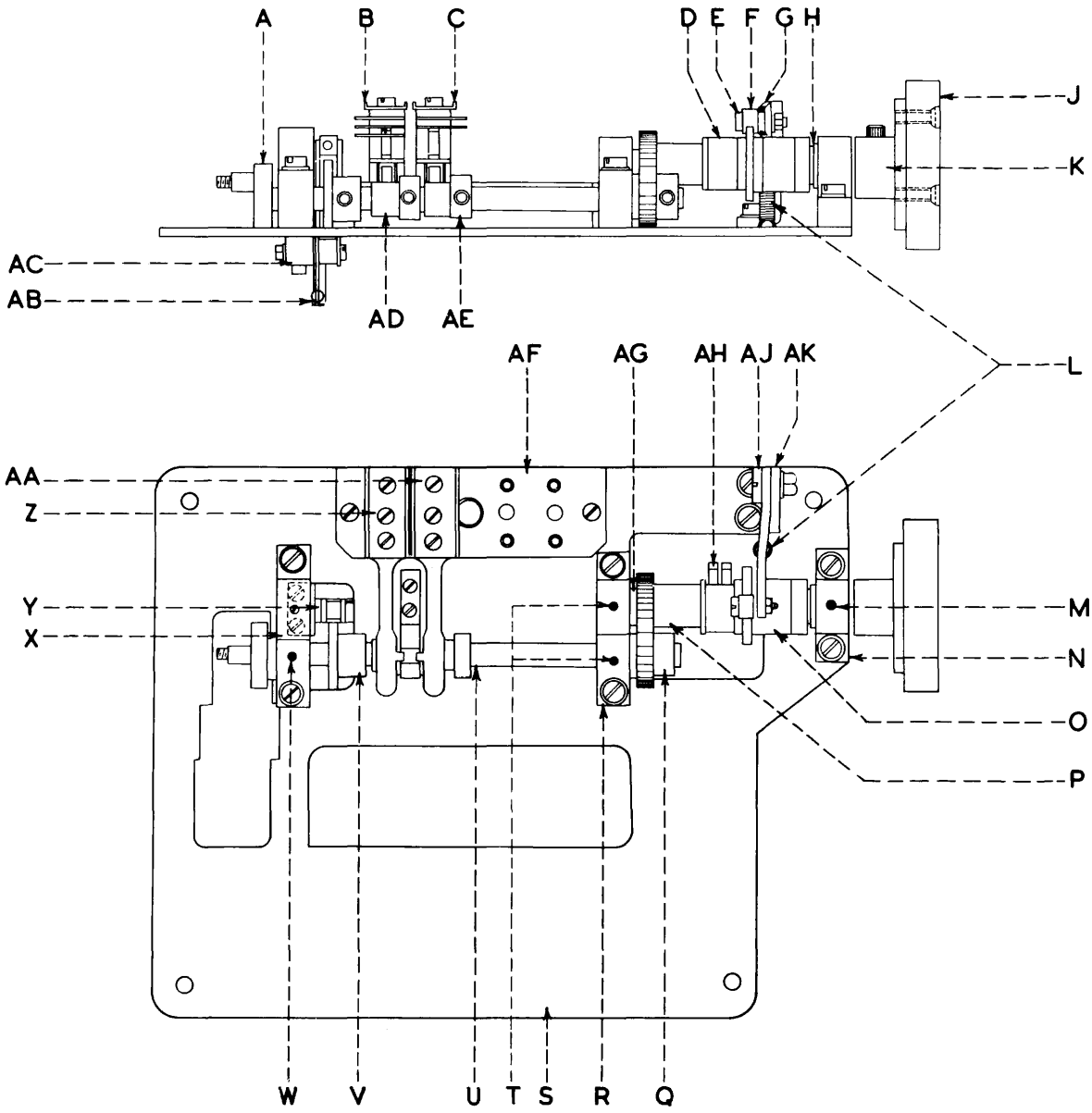


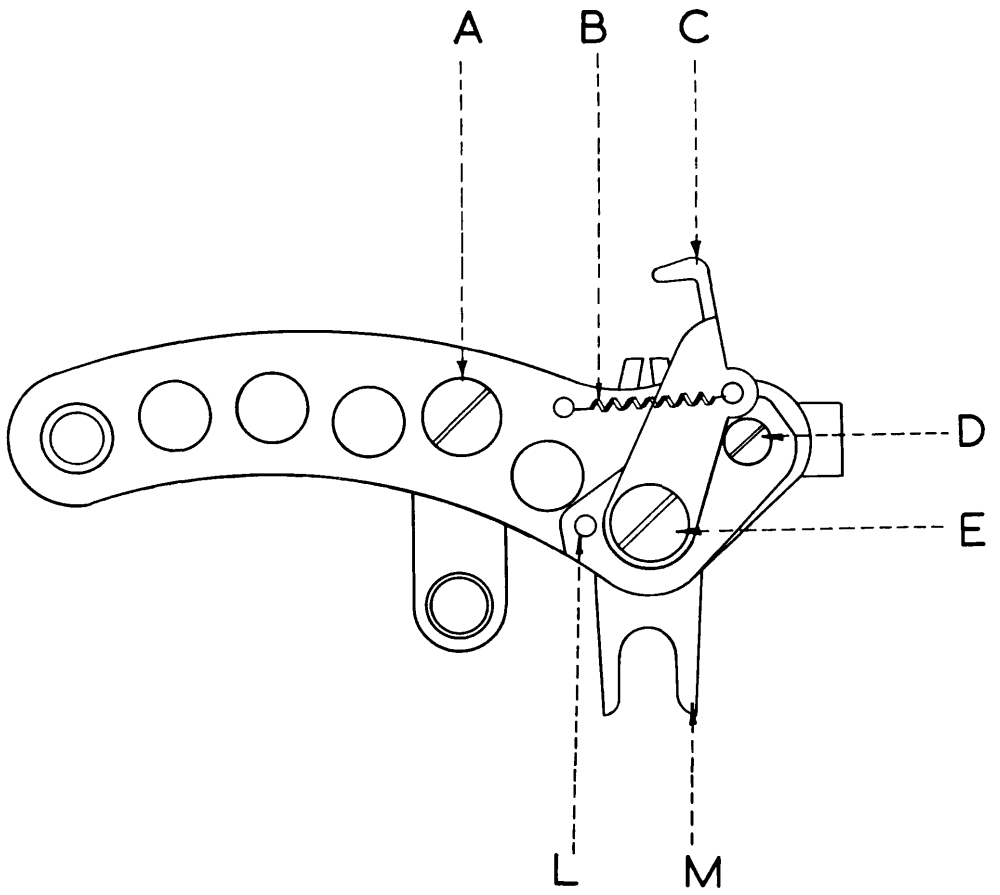

DIMENSIONS

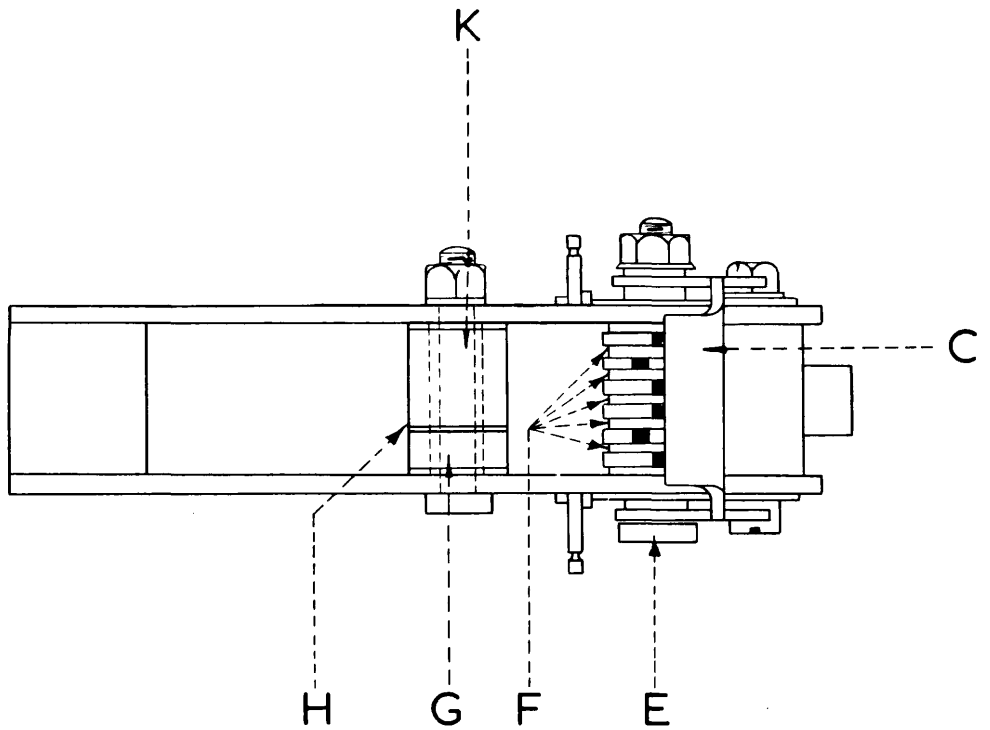
(d) = {·020—·022 in.
·51 —·56 mm

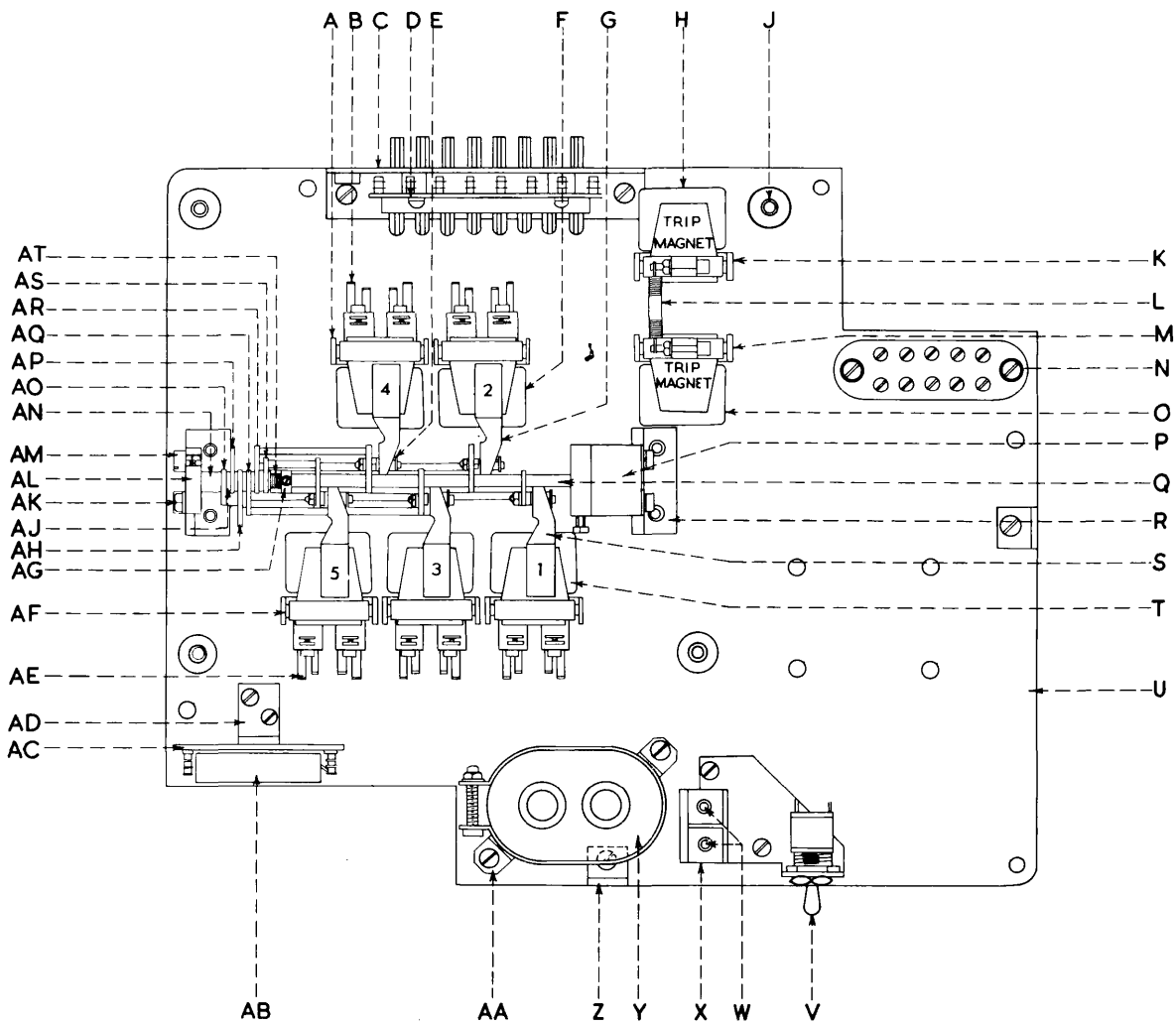
9



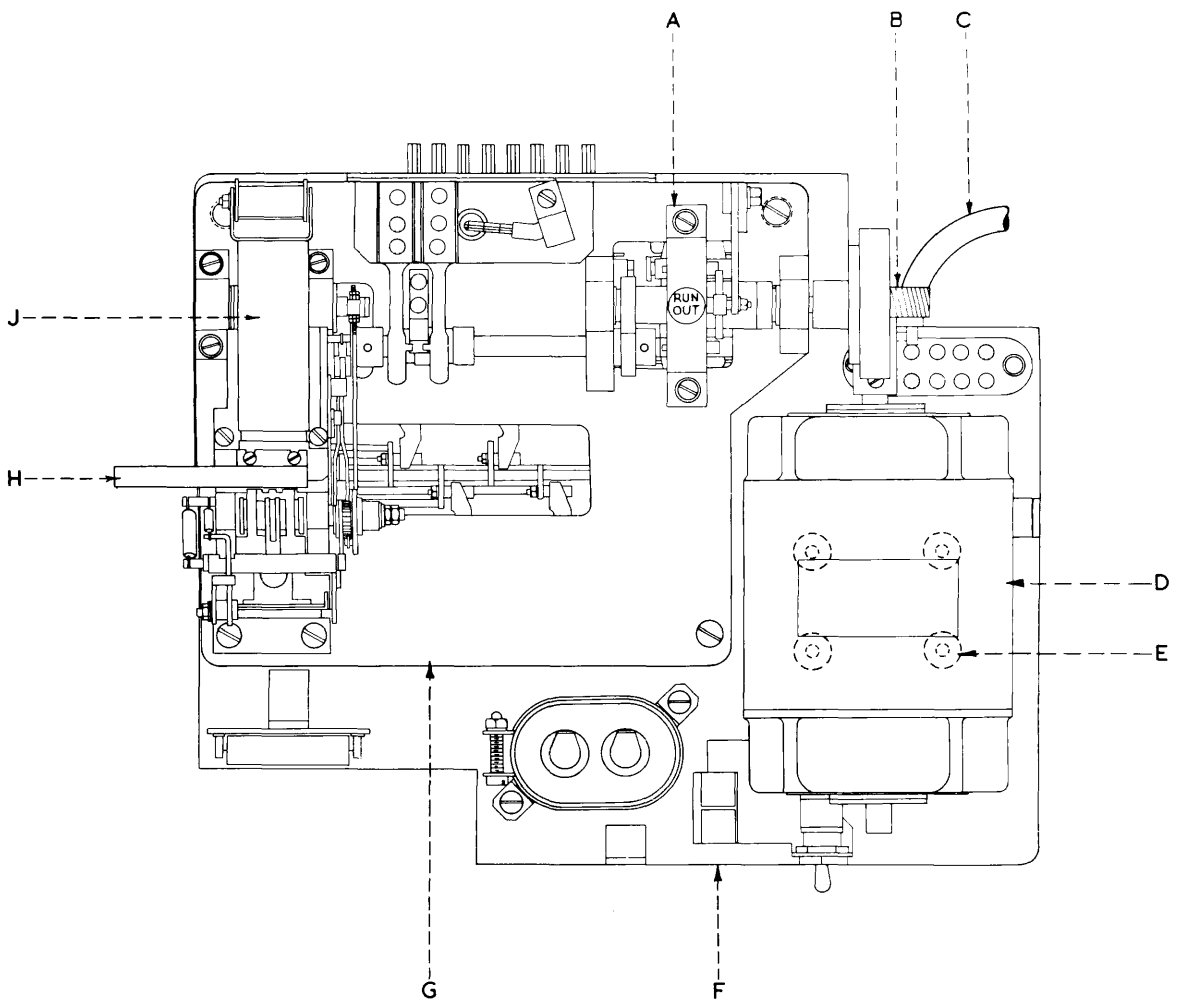

A
B
C
D
E
F
G
H
J
K
AC
AB
AD
AE
L
AF
AG
AH
AJ
AK
AA
Z
Y
X
M
N
O
P
W
V
U
T
S
R
Q

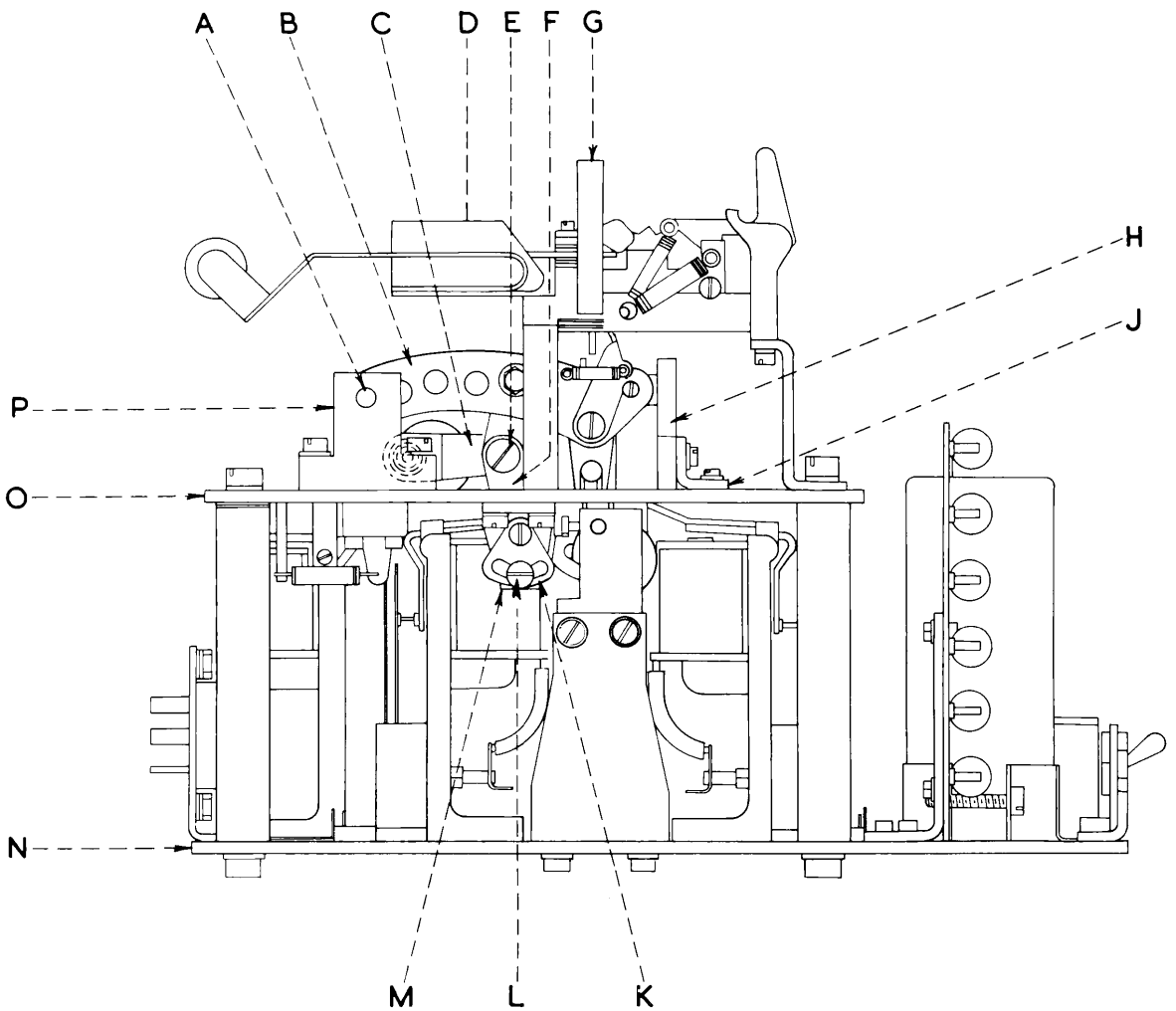

A
B
C
D
E
L
M


K
C
H
G
F
E

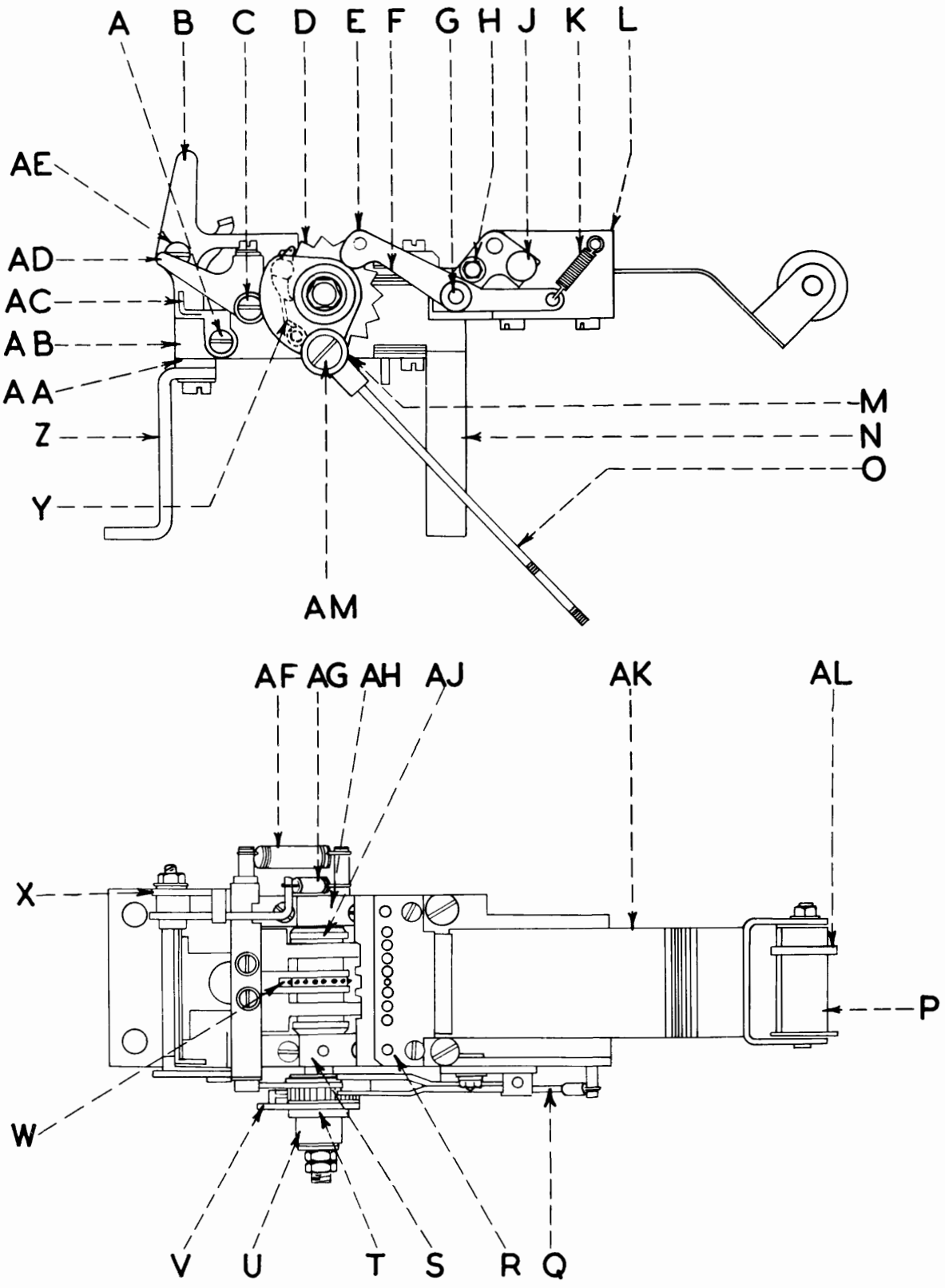

A
B
C
D
E
F
G
H
J
TRIP MAGNET
TRIP MAGNET
4
2
5
3
1
AT
AS
AR
AQ
AP
AO
AN
AM
AL
AK
AJ
AH
AG
AF
AE
AD
AC
K
L
M
N
O
P
Q
R
S
T
U
AB
AA
Z
Y
X
W
V

# 13

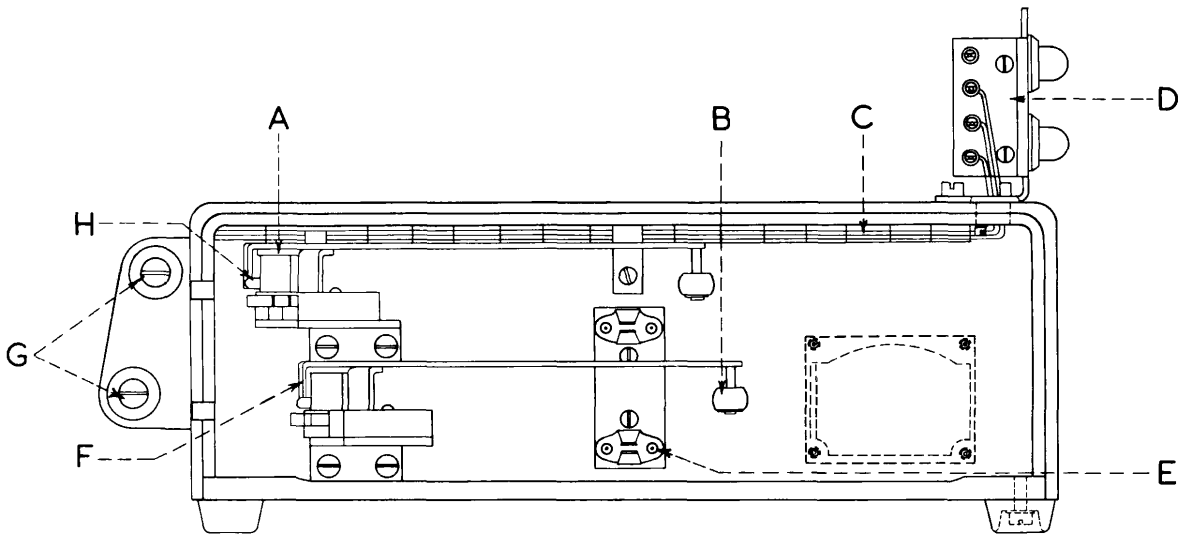



A
B
C
D
E
F
G
H
J
P
O
N
M
L
K

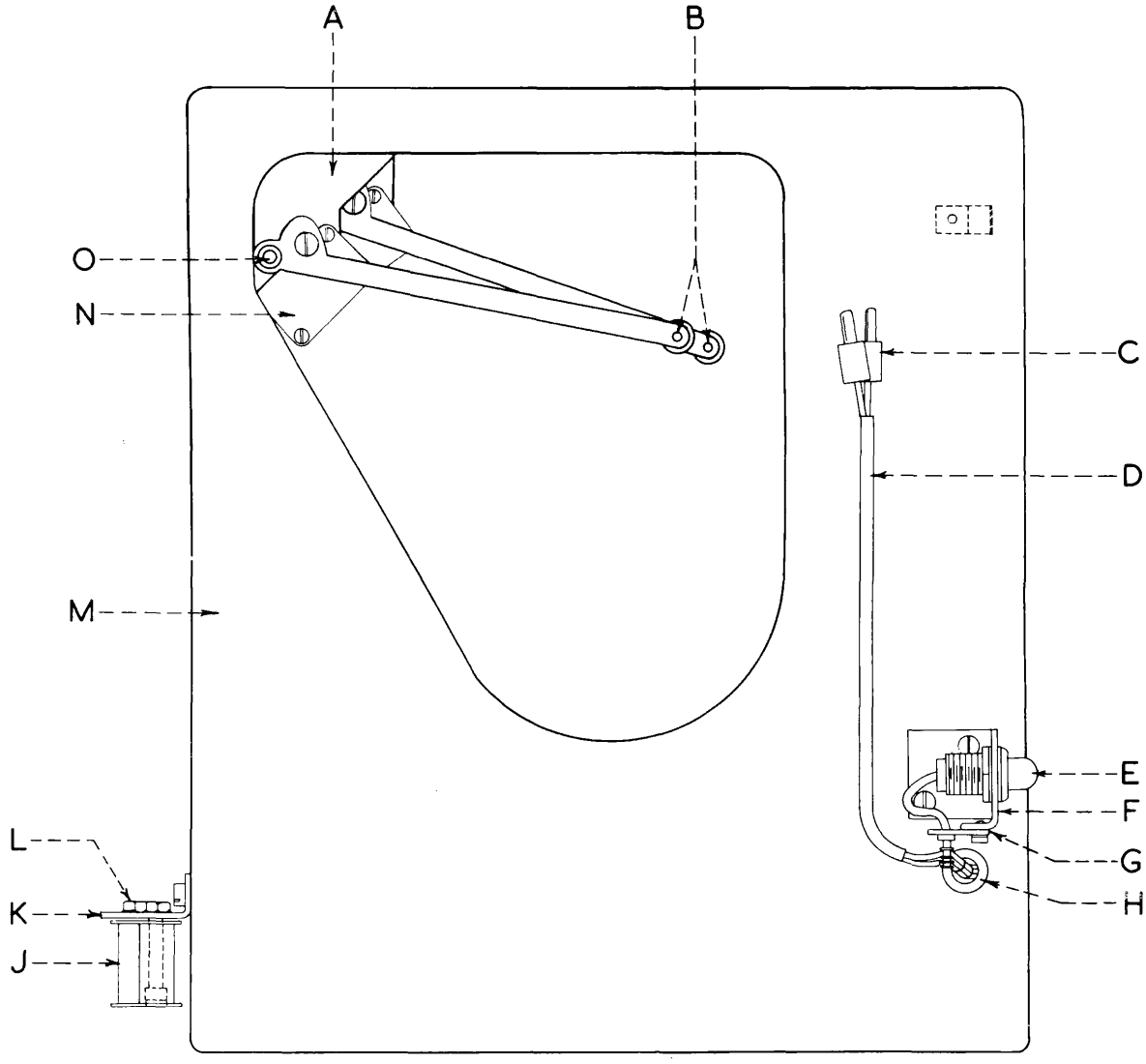
15



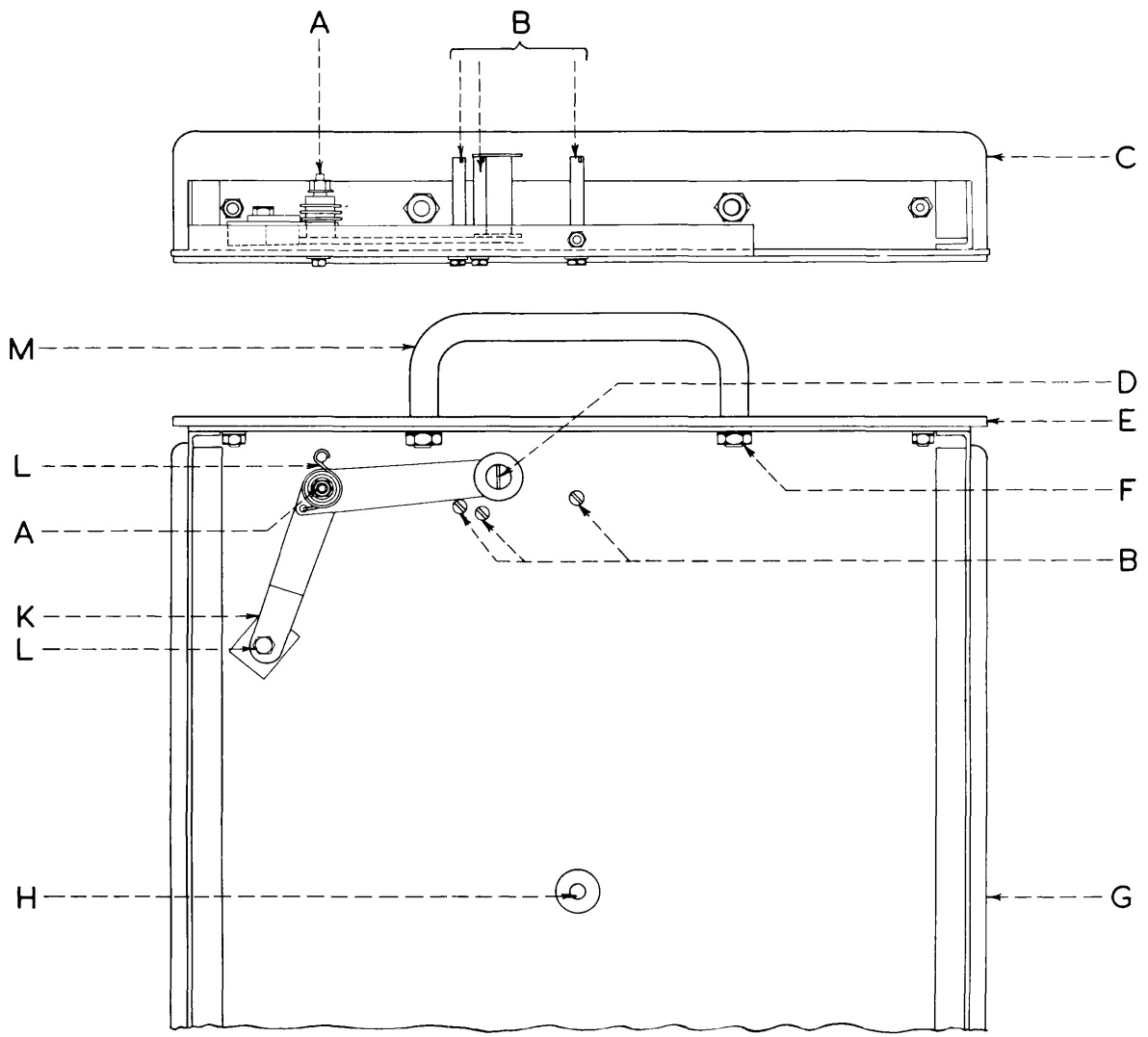
16

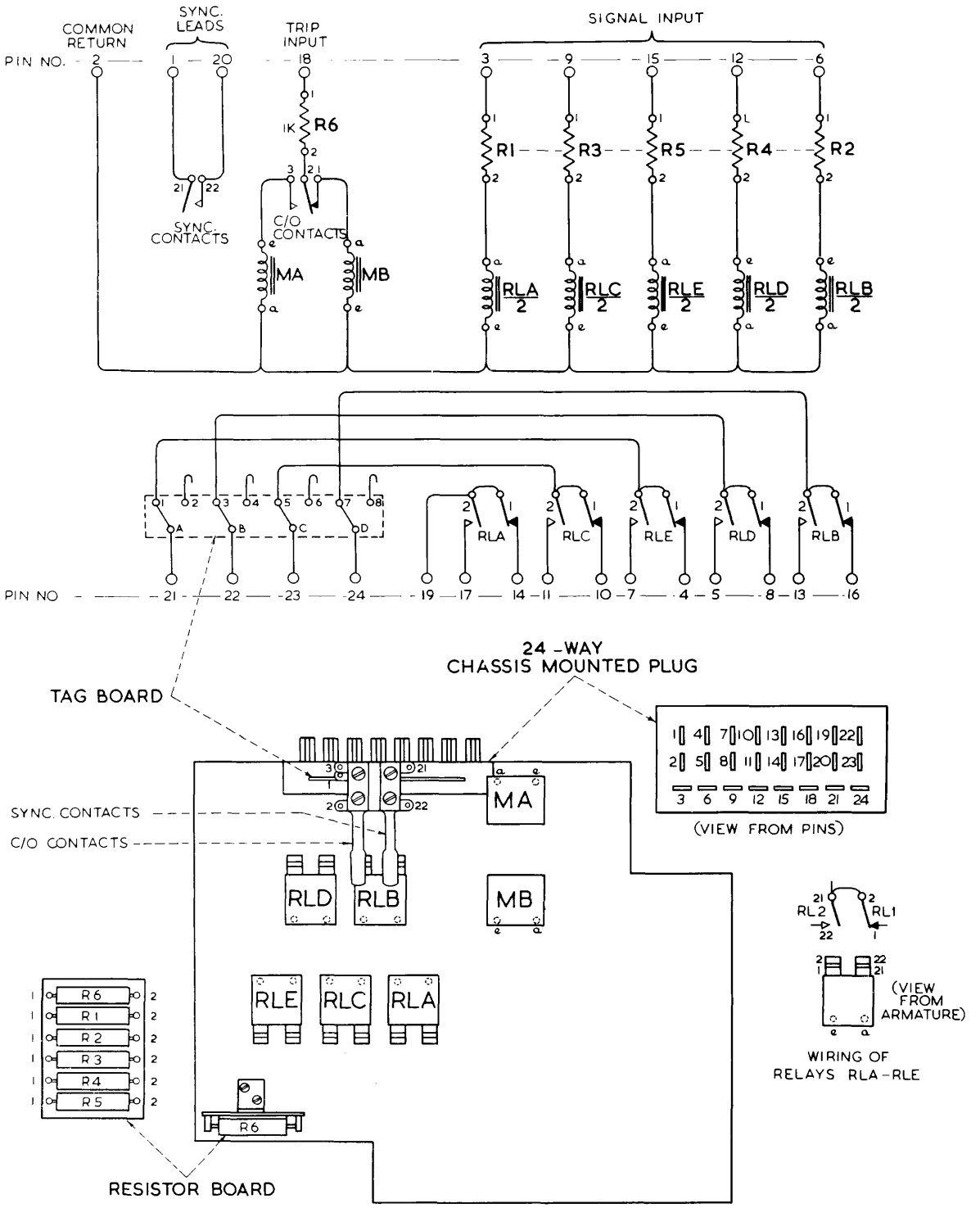



17



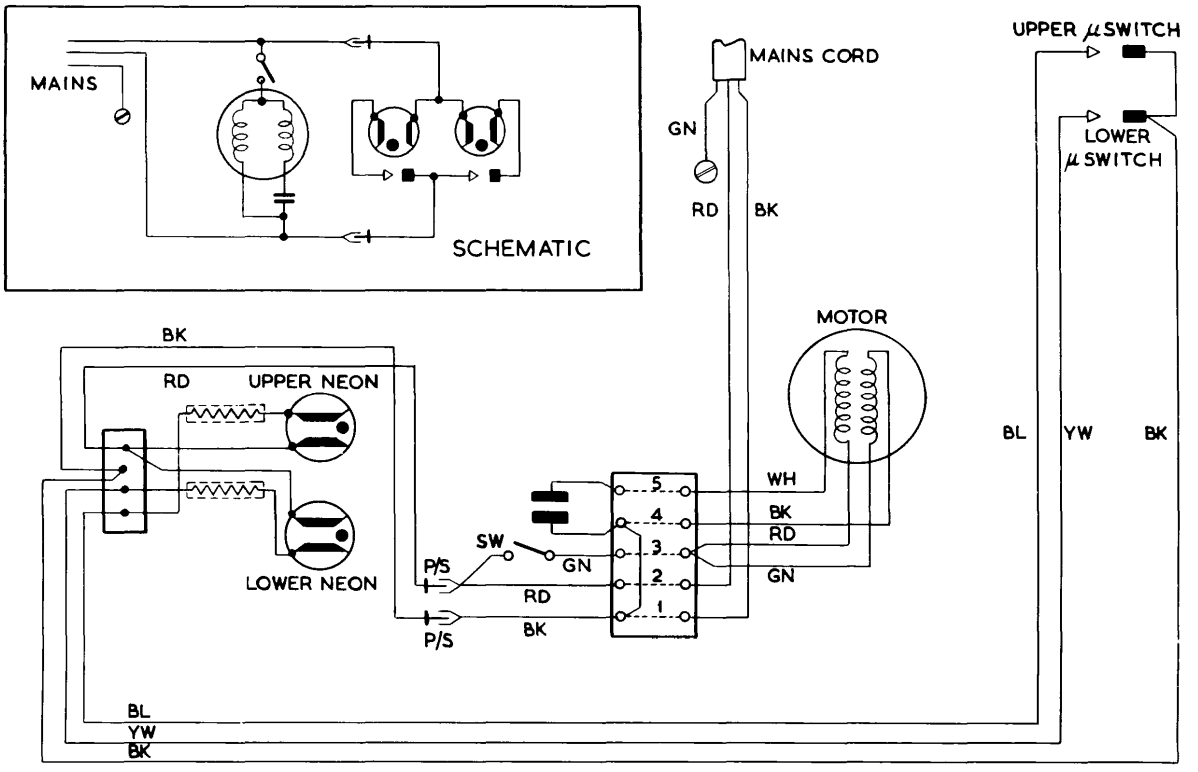
# 18





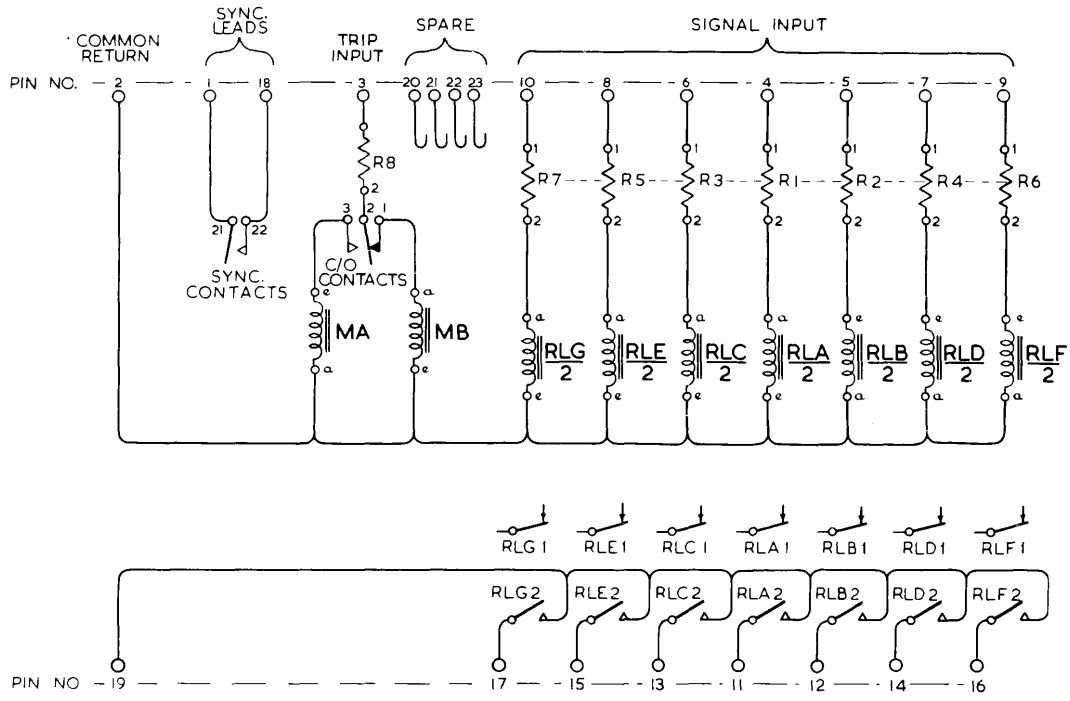

MODEL 25 Mk IV (5-UNIT) SIGNAL CIRCUIT

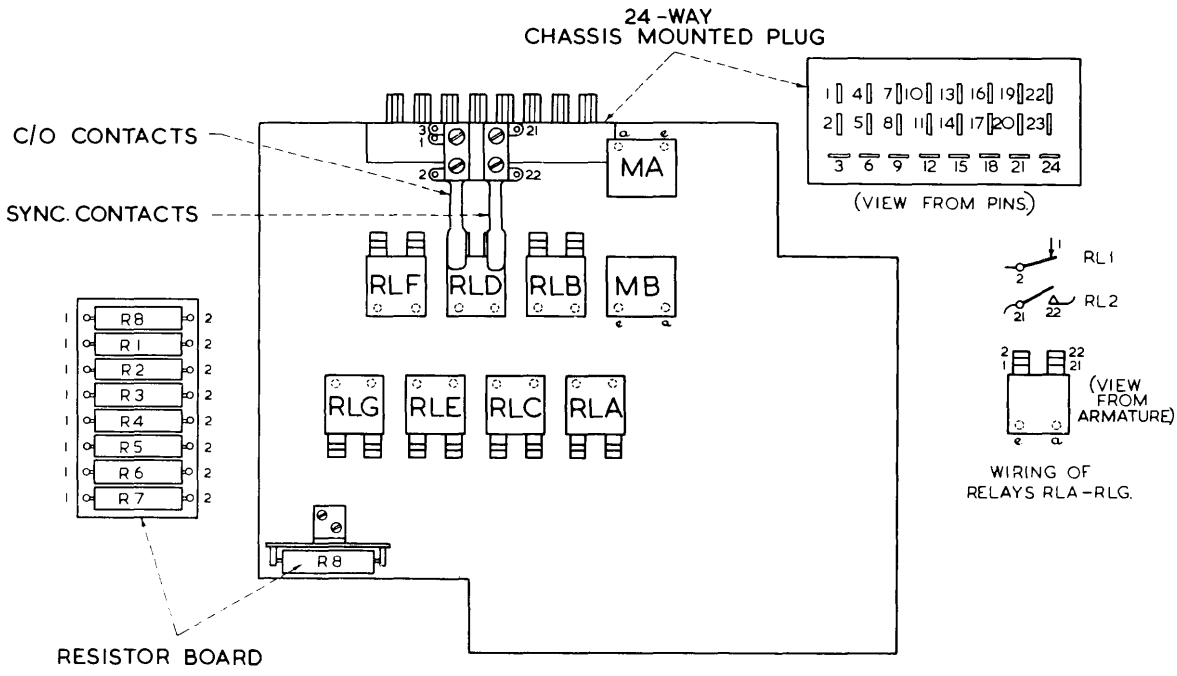
# 20




Note : Numbers on the relay armatures indicate the track on the tape related to each relay. They are for the Standard Model 25 Mark IV* only.

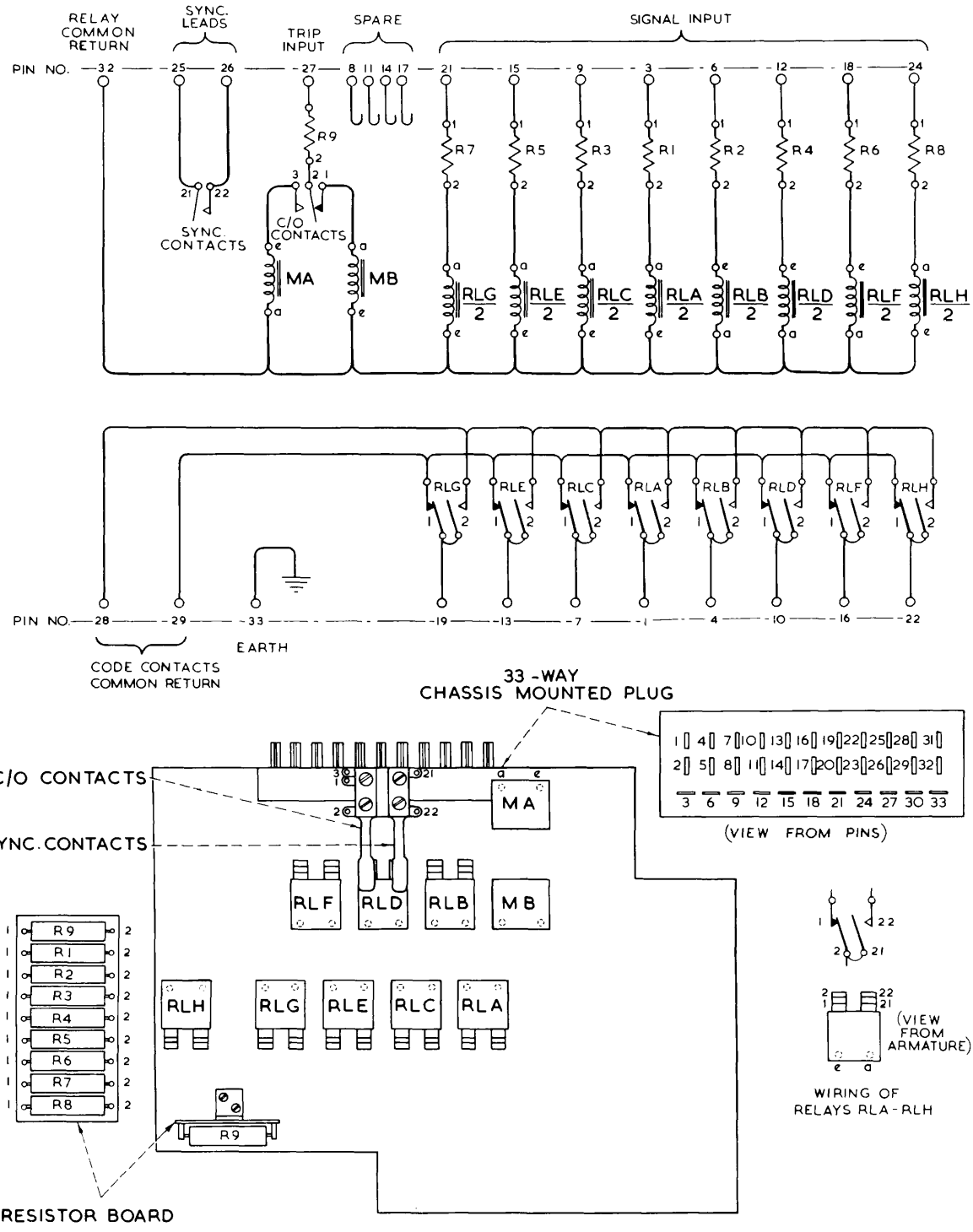
MOTOR AND TAPE OUT ALARM CIRCUIT



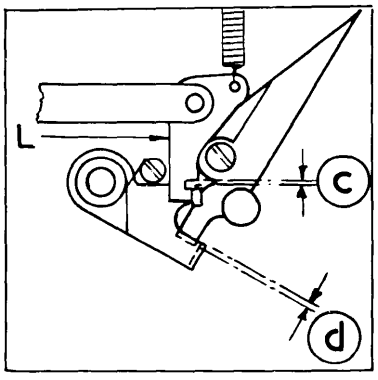

Note : This circuit is for use with the Standard Model 25 Mark IV* 7-track machine.

MODEL 25-Mk IV (7-UNIT) SIGNAL CIRCUIT

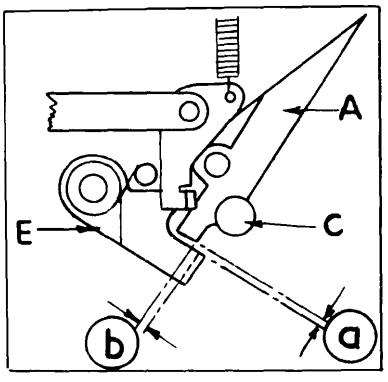



Note : This circuit is for use with the Standard Model 25 Mark IV* 8-unit machine. It does not apply to machines designed for use with Verifier equipment.

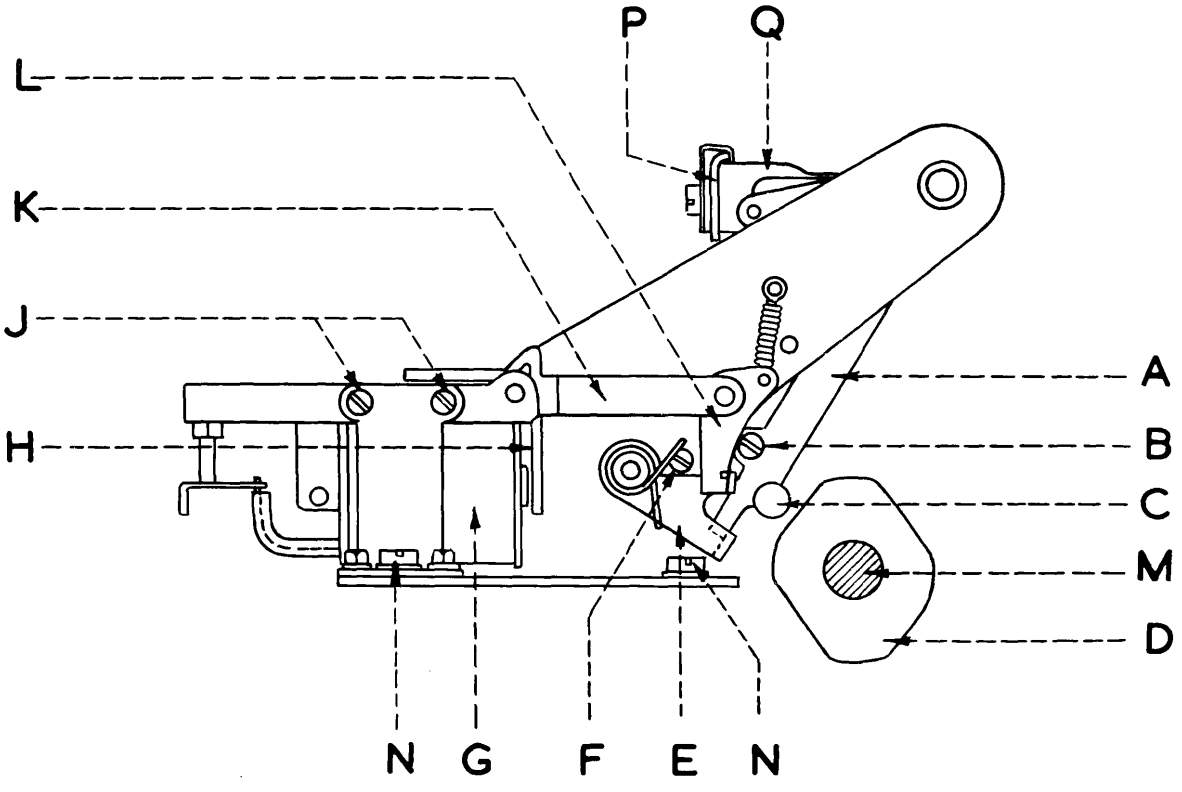
MODEL 25-Mk IV-(8-UNIT) SIGNAL CIRCUIT




INSET 1




INSET 2




MODEL 25 TAPE PUNCH-TAPE MARKER


creed