

203

CALL OFFICE INSTALLATIONS

Prepayment and Postpayment Coin-collecting Mechanisms

Maintenance Adjustments

1. General.—This Instruction details the method of adjustment of coin-box mechanisms and associated apparatus, whether situated at a public call-office or at a subscriber's premises. Pars. 7-25 apply only to

prepayment installations and pars. 27 and 28 apply only to postpayment installations. Prepayment and postpayment mechanisms are illustrated in Figs. 1 and 2 respectively.

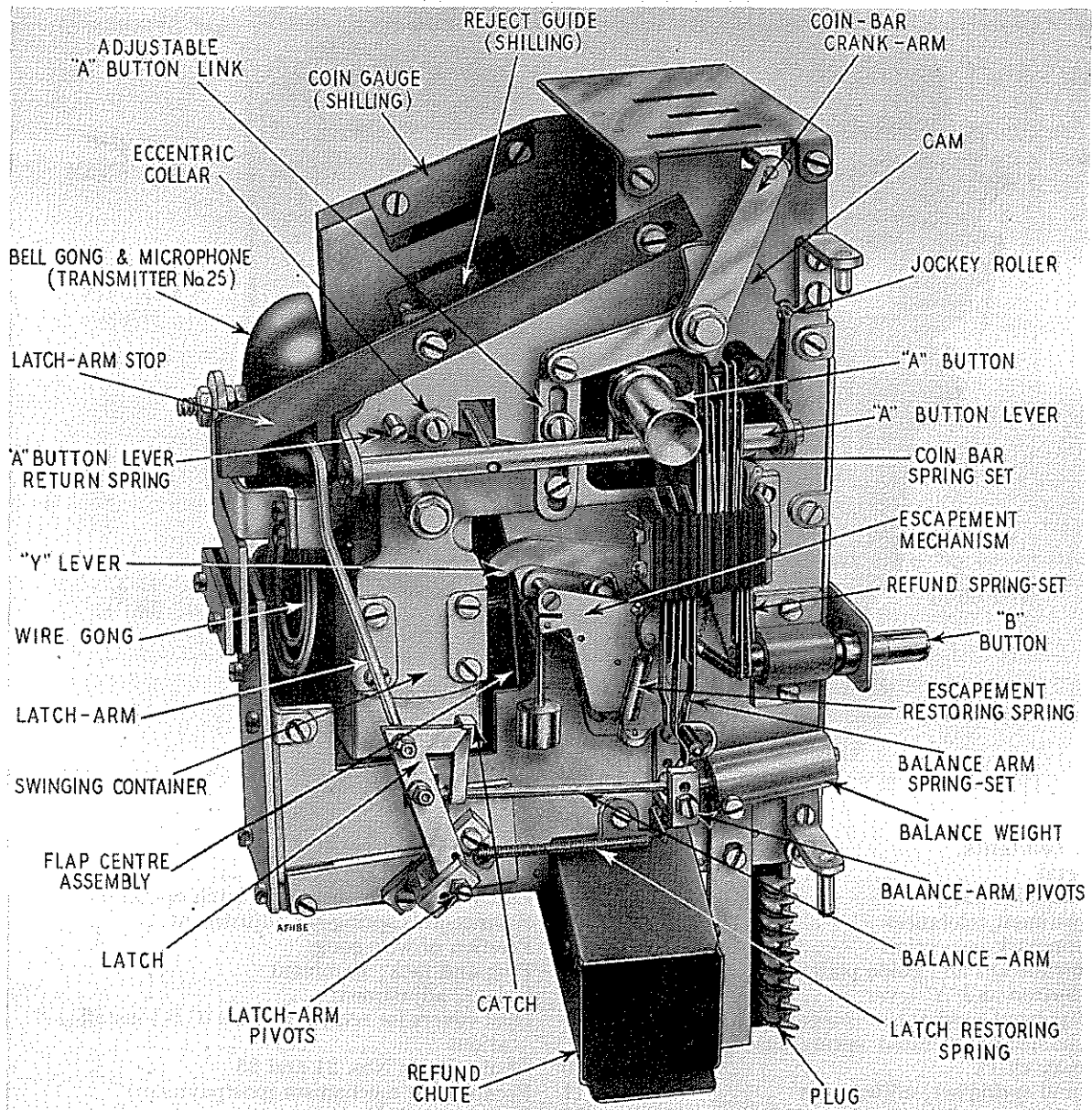


FIG. 1

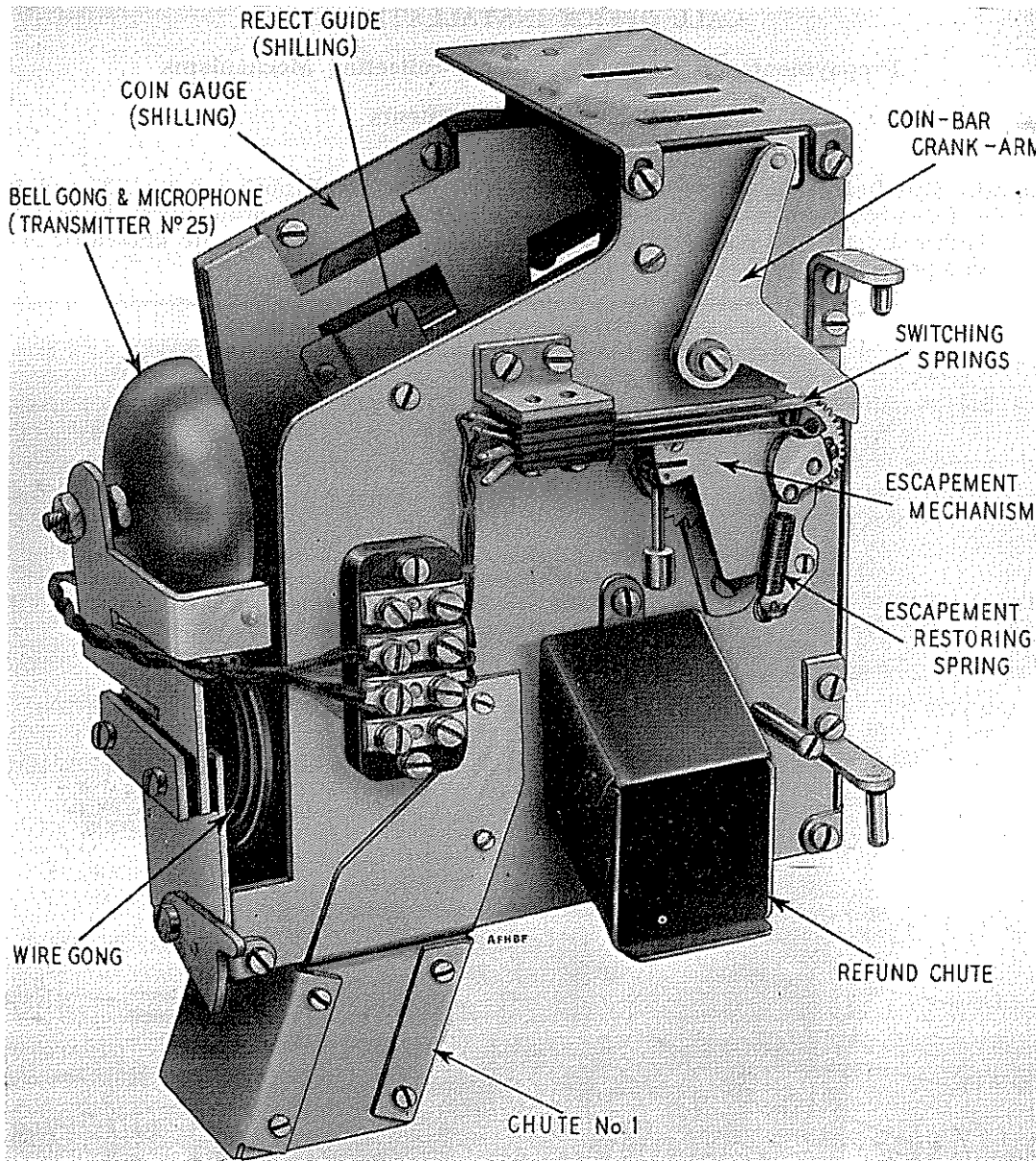


FIG. 2

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3. Replaceable parts.—A list of the mechanism parts which are available for maintenance replacement purposes is given in D 5501 and D 5502.

4. Adjustment tolerances.—‘Test’ and ‘Readjust’ values are included in this Instruction and are defined as follows:—

(a) *‘Test’ values.*—These values represent the safe limits of adjustment within which reliable operation is ensured. A mechanism requires to be readjusted if any of its adjustments is proved to be outside the limits of these specified values.

(b) *‘Readjust’ values.*—These values represent closer limits than those provided by the ‘test’ values. A mechanism adjusted to these values will thus have a greater factor of safety and should not need attention so frequently as would be the case if the limits set by the ‘test’ values were used for readjustment. When readjusting a mechanism, the ‘readjust’ values should always be used.

5. Preliminary inspection.—Before any adjustments are made, check that all screws and nuts are in place, and that they are all secure, particularly the nut which locks the ‘A’ button spindle on prepayment mechanisms.

★6. Coin runways and guide plates.

(a) *Cleaning.*

(i) *On site.*—The coin runways should be cleaned by means of a Brush, Uniselector, Cleaning moistened with white spirit and then rubbed over with a dry duster to remove any residue.

(ii) *CCB maintenance centres.*—The coin runways should be cleaned in accordance with the method detailed in D 5003.

(b) *Adjustment.*—The penny and sixpenny coin guide plates should be free from burrs and adjusted so that the free end of the plate is in line with the refund slot (see Fig. 3). The shilling guide plate should be free from burrs and the straight portion should be parallel to the coin runway.

The shilling-reject guide plate should be free from burrs and adjusted so that it is parallel to the coin runway throughout its length (see Fig. 4).

Adjust guide plates by bending with Pliers, Adjusting, No. 4.

Renew damaged or badly-distorted guide plates at the CCB maintenance centre, where one exists. Otherwise maintenance-exchange the complete mechanism.

(c) *Non-acceptance of cupro-nickel shillings.*—Cupro-nickel shillings differ slightly in dimensions from silver shillings for which the mechanism coin gauges were originally designed and, occasionally, either fail to go into the coin slot, or if accepted at that stage are rejected by the coin gauge on the runway.

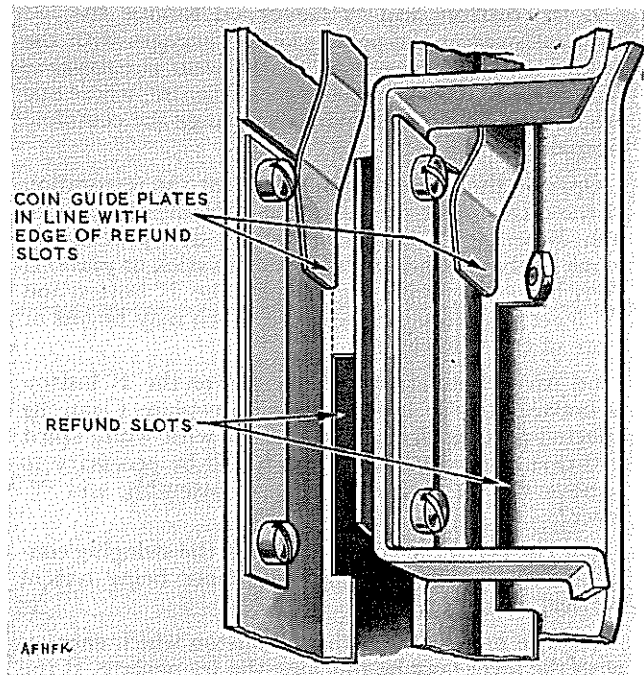


FIG. 3

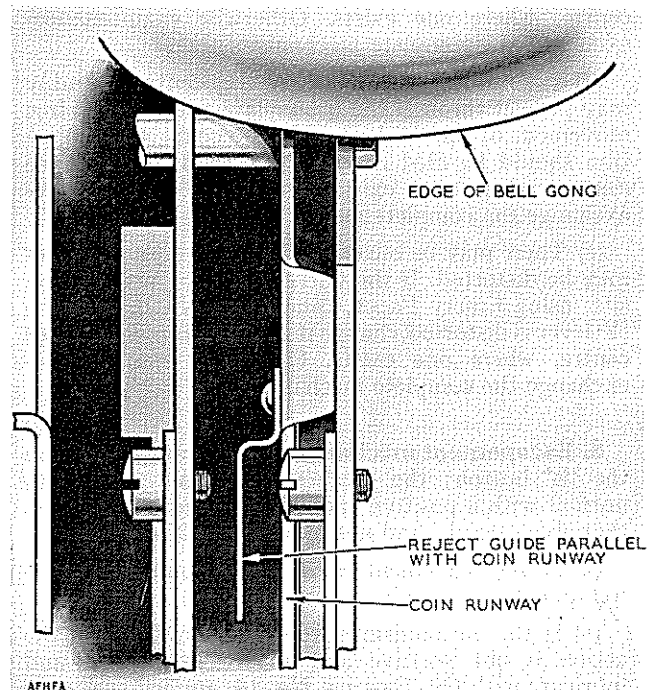


FIG. 4

New and repaired mechanisms are modified to accept cupro-nickel shillings; old mechanisms which persistently reject these coins should be maintenance-exchanged.

7. 'B' button and 'Y' lever.—Examine the 'Y' lever for wear at the point where it engages with the escapement operating lever. If the wear is excessive, change the 'Y' lever at the overhaul centre, where one exists. Otherwise maintenance-exchange the complete mechanism.

Operate the 'B' button and prevent the restoration of the escapement mechanism by holding the pendulum. Move the 'B' button in and out slowly; it should move freely without any tendency to stick or grate. If there is sticking or grating examine the 'B' button and 'Y' lever to determine the cause which may be one or more of the following:—

(a) An accumulation of dirt, either on the 'B' button or between the 'Y' lever and the frameplate. Clean the affected parts with a rag moistened with white spirit and then wipe dry. To do this it will be necessary to remove the 'B' button, spring-set assembly and 'Y' lever.

(b) The tip of the 'Y' lever fouling the swinging container, due to the swinging container being out of vertical. See par. 12.

(c) The projection on the 'B' button which engages with the lever may be touching the frameplate. If the trouble is caused by a small burr which cannot be smoothed-off on site, using Emery Paper, Blue Back, No. 0, change the 'B' button at CCB maintenance centre, where one exists. Otherwise maintenance-exchange the complete mechanism.

(d) The rod which supports the flap centre assembly may project through the frameplate and prevent free movement of the 'Y' lever. If this occurs, the projection should be filed down at the CCB maintenance centre, where one exists. Otherwise maintenance-exchange the complete mechanism.

(e) There may be burrs on the 'Y' lever or the lever may be distorted. If the burrs cannot be removed on site, using Emery Paper, Blue Back, No. 0, or if the 'Y' lever is distorted, change it at the CCB maintenance centre, where one exists. Otherwise maintenance-exchange the complete mechanism.

8. Escapement mechanism.—Operate and release the 'B' button; the escapement should restore to normal with a positive and steady action in not less than five seconds, and not more than 12 seconds.

(a) If the escapement mechanism is found to restore too quickly, change it.

(b) If the mechanism restores too slowly, or if the action is not positive and steady, remove it and lubricate with Oil, Bearing, No. 16, applied sparingly with a Brush, Lubricating, No. 3. Apply the oil to the bearings in the back, and front, of the casework, and to the pawl and its pivot. Replace the escapement mechanism. If the trouble persists after lubrication, change the restoring spring. In fitting the new spring, take care not to stretch it to the extent of permanently

weakening it or to alter the formation of its ends. Also, verify that the spring is not touching the side of the escapement mechanism. If the mechanism fails to restore correctly after a new spring has been fitted, change the escapement mechanism.

9. Replacement of escapement mechanism.—When fitting a new escapement mechanism, check that when the 'B' button is fully depressed, the pawl does not foul the tags or wiring. If fouling occurs, bend the tag and/or wiring clear.

After fitting a new escapement mechanism, check the position of the spring-set assembly in accordance with par. 10 (d) and that the adjustment of the refund spring-set is in accordance with par. 11.

10. Mechanically operated spring-sets; preliminary check.—Before proceeding with the adjustments of individual spring-set units, as detailed in pars. 11, 14 and 20, check the following points:—

(a) The spring should be reasonably straight and free from 'kinks' and the contacts neither worn nor pitted.

(b) The buffered contact springs should lie flat against their buffers. They should not leave the tip of the buffers under a pressure of 20 gm applied at the tip of the spring adjacent to the contact. If this is not so, change the complete spring-set and plug assembly. This does not apply to the later type of balance arm spring-set in which specially shaped buffers are used enabling the contact springs to be tensioned against the tip of the buffers (see Fig. 5). Pliers, Adjusting, No. 1 or 1A should be used for adjusting and tensioning springs.

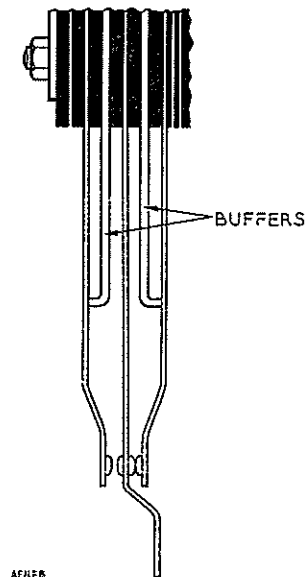


FIG. 5

(c) On twin-contact springs, the contact points should make or break simultaneously. When necessary, adjust the individual contact tongues by means of Adjuster, Spring, No. 2 (see Fig. 6).

(d) The lever springs of the coin bar and refund spring-sets should be at right-angles to the spring-assembly clamping screws. Position the spring-set assembly so that the following requirements are met:—

(i) A clearance of approximately 2 mils exists between spring No. 6 and the coin-bar operating buffer (see Fig. 7).

(ii) The refund spring-set operating lever, when restoring, strikes spring No. 12 at a point between $\frac{1}{32}$ in. and $\frac{1}{8}$ in. from the tip of the spring (see Fig. 7).

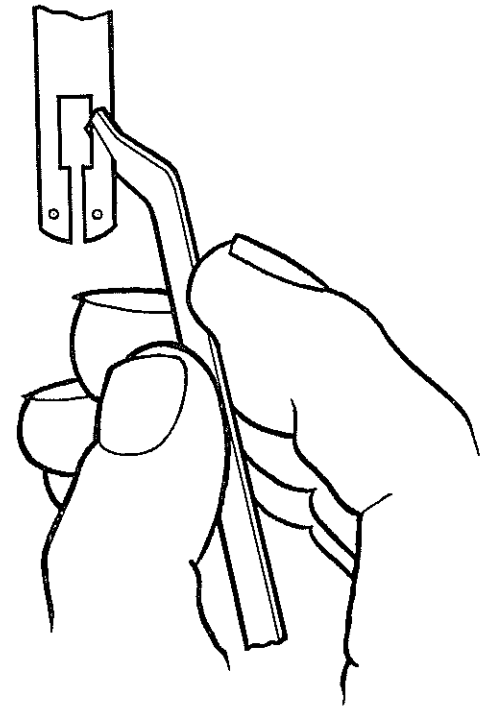


FIG. 6

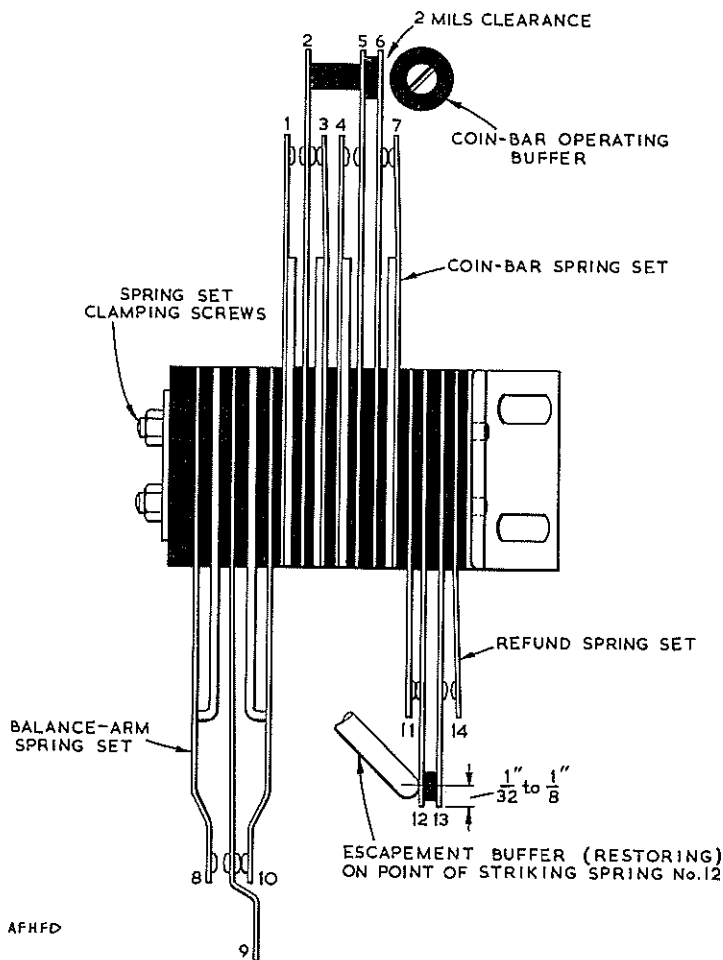


FIG. 7

11. Adjustment of refund spring-set.

(a) With the escapement mechanism normal, position spring No. 11, by setting it from its root, to give a contact clearance between springs Nos. 11 and 12 of 15 ± 2 mils 'readjust', 15 ± 5 mils 'test' [see Fig. 8 (a)].

(b) With the escapement mechanism fully operated, tension springs Nos. 12 and 13 against spring No. 11 with a combined pressure of 25 ± 3 gm 'readjust', 25 ± 5 gm 'test' measured at the tip of spring No. 12 [see Fig. 8 (b)].

(c) Position spring No. 14, by setting it from its root, to give a contact clearance between springs Nos. 13 and 14 of 15 ± 2 mils 'readjust', 15 ± 5 mils 'test' [see Fig. 8 (c)].

(d) Allow the escapement mechanism to restore to normal and check that there is a slight 'follow' between springs Nos. 13 and 14.

(e) Re-check the clearance between springs Nos. 11 and 12 specified in (a) and make any necessary correction by re-positioning spring No. 11.

Failure to do so is usually due to one of the following causes:—

(a) *Faulty restoring spring.*—The 'A' button lever-return spring and its two stops should position the container in the correct position (see Fig. 9). If the spring is weak or if the shape of the spring does not position the container correctly, change it.

An eccentric collar is available and, when fitted in place of one of the stops, affords slight adjustment in the position of the container, to compensate for minor variations in the shape of restoring springs. On mechanisms not already equipped with the collar, the item should be provided when fitting a new spring. The collar may be fitted in either the left-hand or right-hand position to give the optimum control of the container and should be rotated to the required position and then locked by tightening the securing screw.

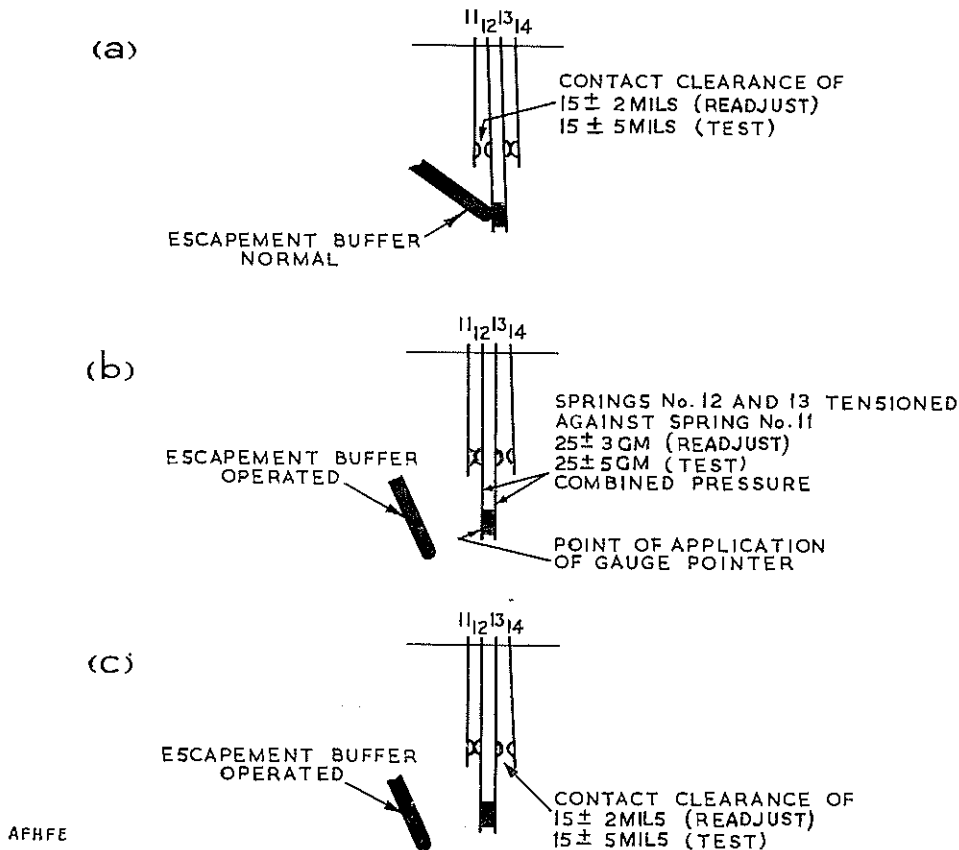


FIG. 8

12. Swinging container.—The swinging container must hang vertically, otherwise the balance arm will not lie centrally underneath it. Check that, when the 'A' and 'B' buttons are operated, in turn, the swinging container returns to the correct position.

(b) *Balance-arm spade-end fouling swinging container.*—This can occur in a number of ways and is best checked by observing the mechanism from beneath (see Fig. 10). A final check, however, should be made with the mechanism in the normal position.

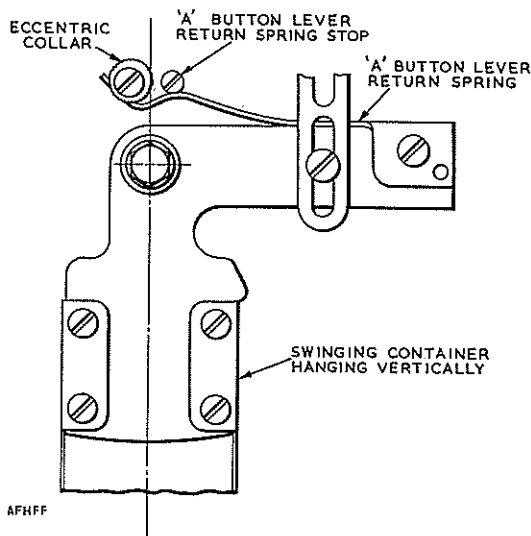


FIG. 9

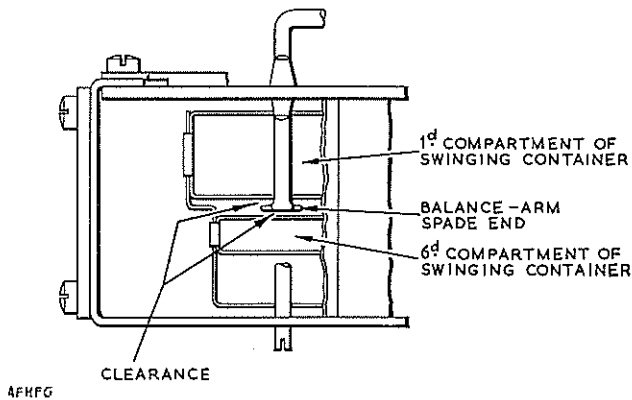


FIG. 10

(i) If the sides of the swinging container are bent, straighten if possible, using Pliers, Adjusting, No. 4.

(ii) Excessive side-play in balance arm.—Check that the balance-arm pivots are adjusted in accordance with par. 15, i.e. that there is a minimum of side-play in the arm.

(iii) Balance arm bent.—If the amount of correction required is very small, the arm may be bent in position, taking care that the arm is not twisted and that no undue strain is placed on the pivots. Otherwise remove it and bend by hand.

(c) Friction between the 'A' button and its spindle, or the levers operated by the 'A' button.—Where this is found apply a smear of petroleum jelly to the parts concerned.

13. 'A' and 'B' button actions.—The elements of 'A' and 'B' button action are illustrated in Figs. 11 and 12.

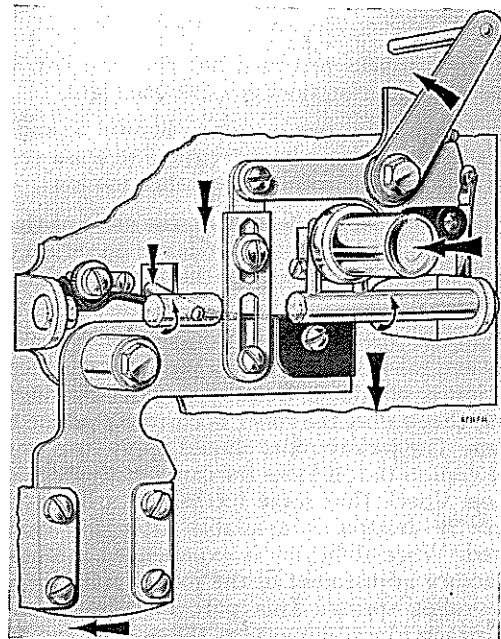


FIG. 11.—'A' BUTTON ACTION

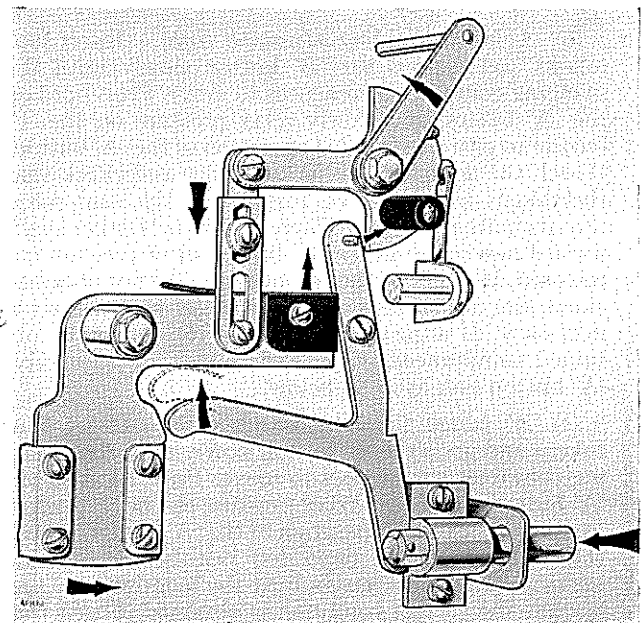


FIG. 12.—'B' BUTTON ACTION

(a) 'B' button action.—Insert four tokens; operate the 'B' button very slowly and watch the action of the coin bar. Ideally, the coin bar should return to normal simultaneously with the return of the last token. This

is a very critical requirement and in practice it is permissible for the coin bar to restore either *just* before, or *just* after the last token is returned, provided none of the following occur under slow operation of the 'B' button.

(i) All tokens returned but the coin bar left in the operated position (jockey roller too high).

(ii) The coin bar restores before a sufficient number of tokens have been returned to allow restoration of the balance arm (jockey roller too low).

(iii) The jockey roller left on the crest of the cam if pressure on the 'B' button is relaxed on return of the last token (usually caused by the jockey roller being slightly high).

To adjust the jockey roller, loosen its securing screws and raise or lower it to a position where correct operation is obtained. Before re-tightening the fixing screws, check that the roller is correctly aligned with the cam. The jockey roller should apply firm pressure on the cam so that it locks the cam positively in either position. Check that some further inward movement of the 'B' button is available after the cam has restored. When difficulty is experienced in obtaining satisfactory adjustment of the jockey roller fit a new jockey-roller spring. This part includes a backing piece which gives support to the spring and should always be fitted. If satisfactory adjustment cannot be obtained with the new jockey-roller spring then maintenance-exchange the complete mechanism.

(b) 'A' button (without adjustable link).—Insert four tokens and depress the 'B' button slowly until the swinging container commences to move. Press hard on the 'A' button and slowly relax pressure on the 'B' button to give a controlled operation of the 'A' button. Watch the action of the jockey roller and check that the tokens are deposited just before the cam snaps into its normal position. There should be further slight inward movement of the 'A' button after the cam has restored. If either of these conditions are not obtained check the adjustment specified in (a) and correct if necessary. If adjustments (a) and (b) cannot be obtained simultaneously, fit and adjust an adjustable 'A' button link as in (c) below.

(c) 'A' button (with adjustable link).—Insert four tokens and press the 'B' button slowly until the swinging container commences to move. Press hard on the 'A' button and slowly relax pressure on the 'B' button to give a controlled operation of the 'A' button. Check that the tokens are deposited just before the cam restores and if necessary adjust the length of the link so that the correct condition is obtained. Check that the locking screw is tight and that the spring washer is in position under the locking screw. Check that some further inward movement of the 'A' button is available after the cam has restored. If this does not occur, the cause is usually excessive wear in the linkages and the complete mechanism should be maintenance-exchanged.

14. Adjustment of coin-bar spring-set.—With the coin bar in the unoperated position make the following adjustments:—

(a) Adjust buffer springs to be vertical [see Fig. 13 (a)].

(b) With springs Nos. 2 and 7 held clear, tension springs 5 and 6 against the operating buffer to give a combined pressure of 25 ± 3 gm (readjust), 25 ± 5 gm (test), measured at the tip of spring No. 6 [see Fig. 13 (b)].

(c) With spring No. 2 held clear, adjust spring No. 7, by setting it from a point just above its buffer, so that it lifts spring No. 6 clear of the operating buffer by approx. 2 mils [see Fig. 13 (c)].

(d) With spring No. 3 held clear, tension spring No. 2 against the collet of spring No. 5 to a pressure of 25 ± 3 gm (readjust), 25 ± 5 gm (test), [see Fig. 13 (d)].

(e) Adjust spring No. 3 so that it lifts spring No. 2 clear of the collet by approx. 2 mils [see Fig. 13 (e)].

(f) Set springs Nos. 1 and 4 at a point just above their buffers, to give a contact clearance between springs 1 and 2, and 4 and 5, respectively, of 10 mils minimum [see Fig. 13 (e)].

(g) Operate and restore the cam and check that there is reasonable 'follow' on all 'make' and 'break' contact units.

15. Balance-arm pivot.—Check that the pivot allows the balance arm to move freely with a minimum of side play. Change worn pivot screws. Check that the balance arm does not foul any part of the mechanism over its range of movement. The parts which are most likely to foul are the spade-end which may foul the swinging container, and the balance weight which may foul the screw heads near to it. To check this, hold the latch arm clear of the catch, and move the balance arm slowly up and down by holding it just to the left of the pivot with finger and thumb. This test should be made first with gentle pressure towards the mechanism and then with a gentle pull away from it. If the balance weight fouls, bend it clear. If the spade-end rubs against the swinging container, check the amount of side play in the pivot. The side play should be as small as possible consistent with free movement of the balance arm, but, if considered to be excessive, readjust the pivot as follows:—

(a) Loosen the locking nut, using Spanner, Flat, BA4-6.

(b) Hold the balance arm down by hand (the latch arm being held clear), and advance the pivot screw so that, when the balance arm is released, friction at the pivot just, but only just, holds it down.

(c) Tighten the locking nut, taking care that the pivot screw is not rotated further.

(d) Give the head of the screw a sharp tap with a screwdriver handle. This will bed-in the bearings and allow the balance arm to return to its normal position.

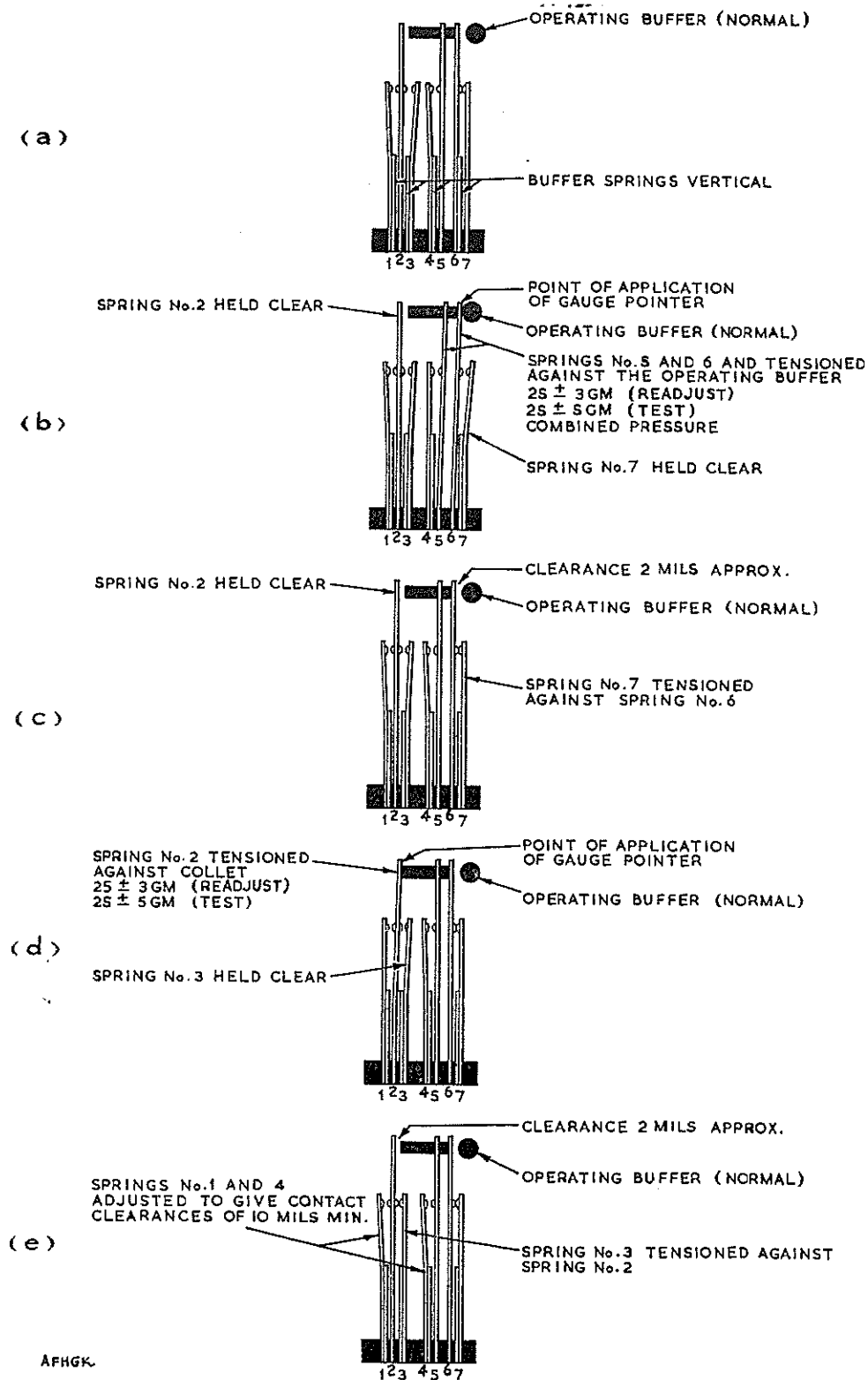


FIG. 13

Check that it can move without noticeable friction at the pivot, by lightly pressing the arm down and allowing it to return, once or twice.

Lubricate the pivot with Graphite, Colloidal in Oil applied sparingly with a Brush, Lubricating, No. 3.

16. Adjustment of latch-arm pivot.—The method of adjusting the latch-arm pivot is the same as that described for the balance-arm pivot in par. 15.

17. Latch operation.—Loosen the two screws securing the latch-mounting plate and adjust the height of the latch so that there is 5 - 10 mils clearance between the catch and the latch, when both arms are normal (see Fig. 14). Tighten the two latch-mounting plate securing screws.

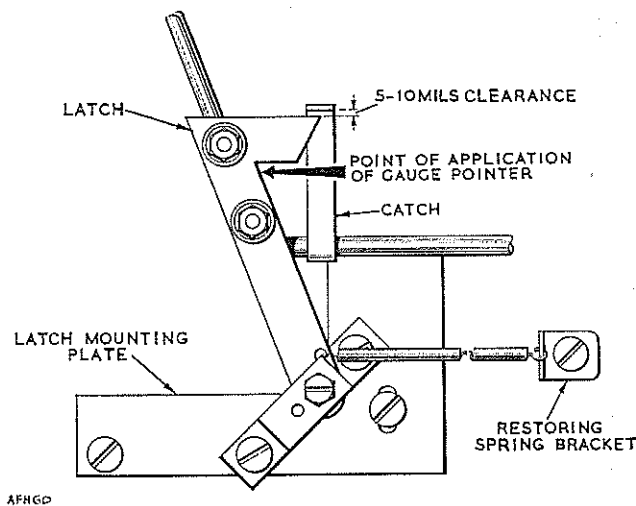


FIG. 14

★18. Adjustment of latch arm.—

(a) Check the upper portion of the latch arm for the following, making bending adjustments to correct, where necessary. If the amount of bending required is considerable, remove the latch arm to bend it. Avoid straining the pivots (see Fig. 15).

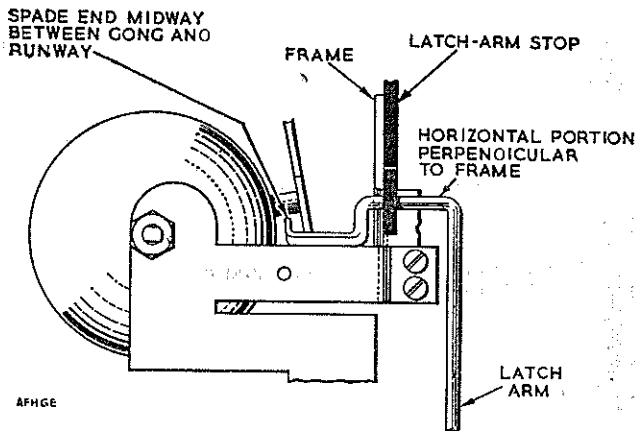


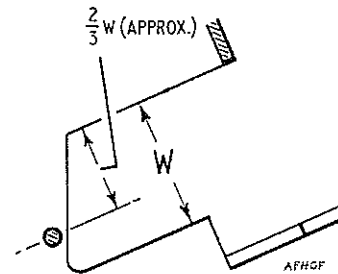
FIG. 15

(i) The top horizontal lengths should be at right-angles to the mechanism front plate, viewing from the gong-end and looking towards the coin guides.

If adjustment is necessary, read sub-par. (ii) first, as both adjustments can be made together.

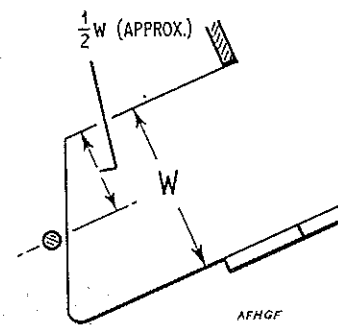
(ii) The spade-end of the latch arm should lie centrally between the bell gong and the slope of the penny runway. If it does not, first check that the latch-arm pivots are not slack. If the pivot is satisfactory, remove the latch arm and carefully bend it to move the spade-end in the direction required. If bending of the upper part of the latch arm is required under (i), this should be done at the same time.

(b) The length of the latch arm should be such that the upper horizontal portion of the arm, which is struck by the falling coin, is two-thirds of the way down the edge of the sloping face of the penny runway (see Fig. 16).



★FIG. 16

A number of old-type mechanisms, in which the sloping face of the runway is not cut away, are still in use and in these the arm should be half-way down the sloping face (see Fig. 17).



★FIG. 17

Adjust as follows:—

(i) Attach the Gauge, Locating, No. 5 to the penny runway, ensuring that the guides on the gauge are in contact with the top and sloping edges of the runway [see Fig. 18 and (b)].

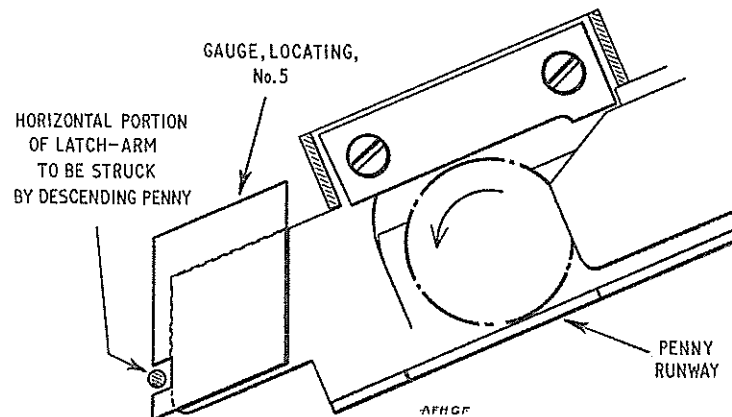


FIG. 18

(ii) Slacken the 6BA nuts which clamp the arm to the latch.

(iii) Move the arm up or down as required, to a position where it will enter the slot in the gauge. The latch-arm stop should be moved if necessary to the right to achieve this adjustment. Ensure that the screws are retightened before proceeding with the latch-arm adjustment.

(iv) Tighten the 6BA nuts.

(c) Loosen the screws securing the latch-arm stop and adjust its position so that the horizontal portion of the latch arm, which is struck by the falling penny, is within $\frac{1}{8}$ in. of the penny runway (see Fig. 19). In

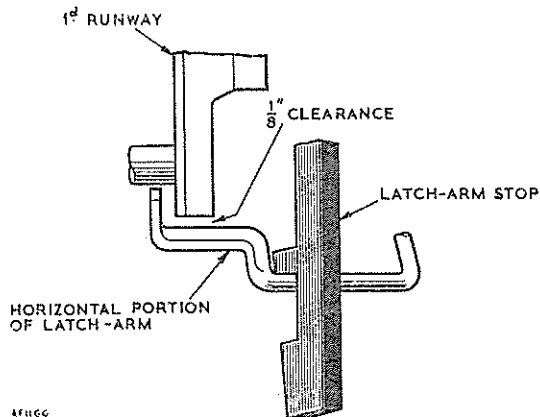


FIG. 19

addition, when the latch arm is moved fully to the left and the balance arm partially operated so that the top surfaces of the latch and catch are in line, there should be a clearance between the tip of the latch and the catch of 40-46 mils (readjust), 36-50 mils (test) (see Fig. 20). If these two requirements cannot be obtained by adjustment of the latch-arm stop alone, it will be necessary to bend the latch arm slightly, taking care that the pivot is not strained.

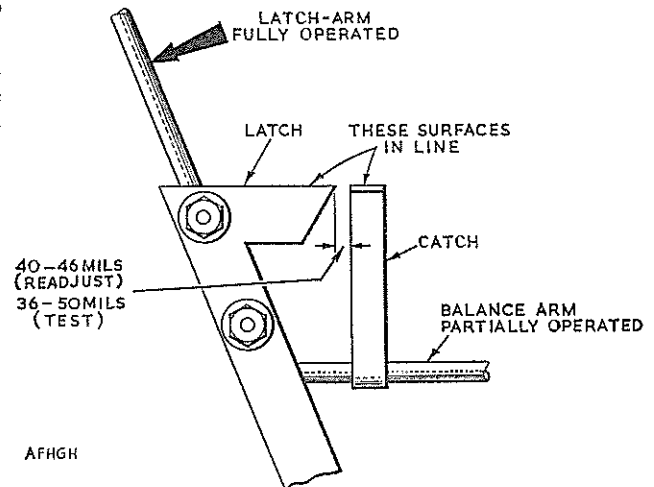


FIG. 20

19. Latch-restoring spring.—The tension of the latch spring should be such that, when the tension gauge pointer is applied to the inside corner of the latch (see Fig. 14), the arm moves with a pressure of 13 gm but resists a pressure of 9 gm.

The adjustment of the tension is made by setting the restoring-spring bracket with its arm to the right or the left, or by bending it slightly. If the spring is too weak, change it.

20. Adjustment of balance-arm spring-set and balance weight.—

★(a) *Manual (C.B.) installations.*—In manual (C.B.) installations, only the 'make' portion of the balance-arm spring-set is required. The 'break' portion should therefore be made inoperative. In the old type of spring-set (which has single contacts), it should be done by carefully bending spring No. 10 at a point just below the buffer spring, clear of the lever spring. In the new type of spring-set (which has twin contacts),

the buffer-spring supporting spring No. 10 should be bent to hold spring No. 10 clear of the lever spring.

Adjustment details are as follows:—

(i) Mal-position the Gauges, Locating, No. 5 so that the latch is held clear of the catch. With spring No. 9 held clear of the operating buffer, position the balance weight so that the balance arm resists a pressure of 19 gm but moves downwards with a pressure of 21 gm. The tension gauge pointer should be applied to the flattened portion of the balance arm (see Fig. 22). After adjustment check that the balance weight is secure.

(ii) Tension spring No. 9 against the operating buffer to a pressure of 6-8 gm (readjust), 5-9 gm (test), measured at the contact [see Fig. 21 (a)].

(iii) Position the buffer of spring No. 8 so that there is a clearance of 15-20 mils between springs No. 8 and 9 [see Fig. 21 (b)].

(iv) Operate the balance arm to its fullest extent and tension spring No. 8 against spring No. 9 to a pressure of 16-20 gm (readjust), 15-21 gm (test), measured at the contact of spring No. 8 [see Fig. 21 (c)].

(v) Allow the balance arm to restore and recheck that the contact clearance between springs Nos. 8 and 9 is 10 mils minimum. Re-position the buffer of spring No. 8 to give this clearance if necessary. This may affect (iv), and a further check and readjustment may be necessary to ensure that all requirements are obtained.

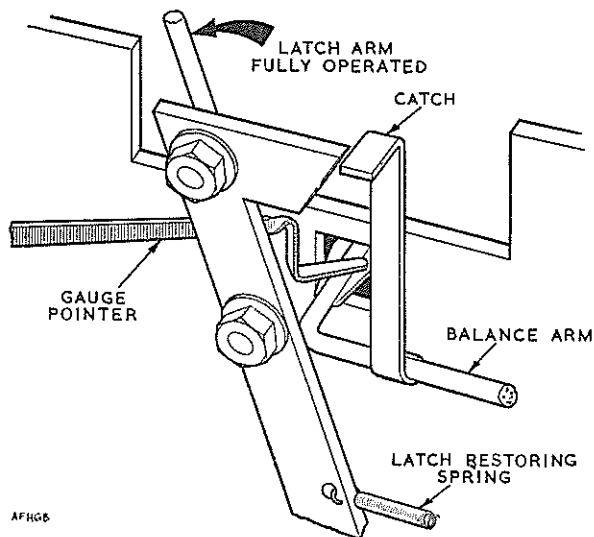


FIG. 22

(b) *Automatic installations.*—In automatic installations, only the 'break' portion of the balance-arm spring-set is required. The 'make' portion should therefore be made inoperative. In the old type of spring-set, which has single contacts, this should be done by carefully bending spring No. 8 at a point just below the buffer spring, clear of the lever spring. In the new type of spring-set, which has twin contacts, the buffer-spring supporting spring No. 8 should be bent to hold spring No. 8 clear of the lever spring.

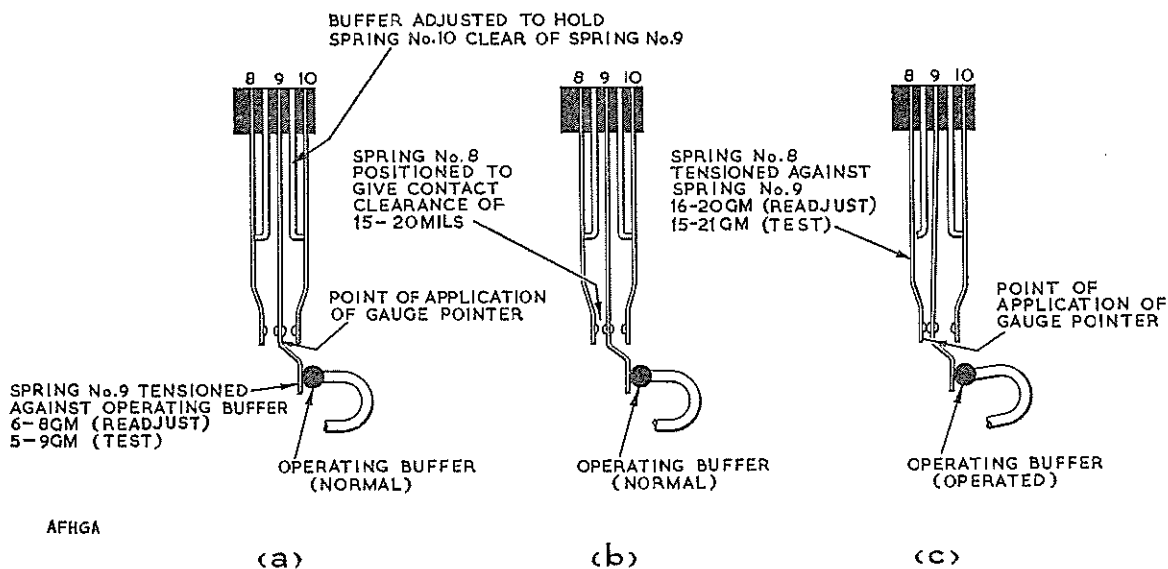


FIG. 21

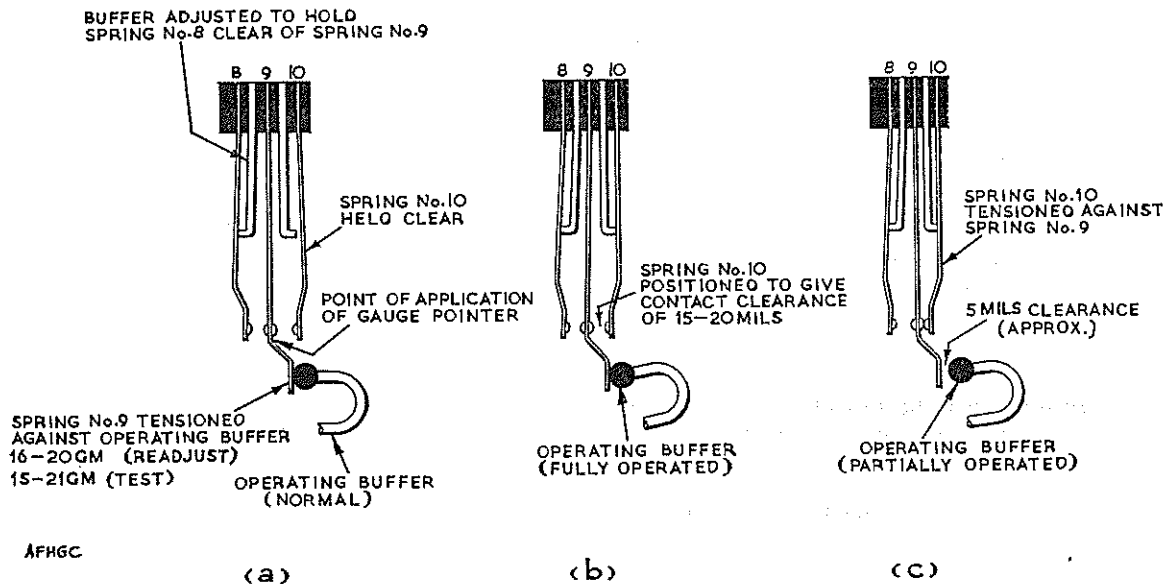


FIG. 23

Adjustment details are as follows:—

(i) Hold spring No. 10 clear and tension spring No. 9 against the balance-arm operating buffer 16–20 gm (readjust), 15–21 gm (test), measured at the contact [see Fig. 23 (a)].

(ii) Operate the balance arm to its fullest extent and position the buffer of spring No. 10 to give a contact clearance of 15–20 mils between springs No. 9 and 10 [see Fig. 23 (b)].

(iii) Tension spring No. 10 against spring No. 9 so that there is a gap of 5 mils approx. between spring No. 9 and the operating buffer as judged by eye when the catch is pressed against the top of the latch [see Fig. 23 (c)].

(iv) Operate the balance arm to its fullest extent and check that there is a clearance between the contacts of springs Nos. 9 and 10 of 10 mils minimum. Re-position the buffer of spring No. 10 to give this clearance, if necessary. This may affect (iii) and a further check and readjustment may be necessary to ensure that all requirements are obtained.

★(v) With the latch held clear of the catch, position the balance weight so that the balance arm resists a pressure of 19 gm but moves downwards when a pressure of 21 gm is applied, until the operating buffer rests against spring No. 9. The tension gauge pointer should be applied to the flattened portion of the balance arm (see Fig. 22). After adjustment check that the balance weight is secure.

21. Relative positions of wire gong and latch arm.—Adjust the mounting bracket of the wire gong

by bending so that the cranked portion of the gong lies $\frac{1}{8}$ in. back from the horizontal portion of the latch arm which is struck by the falling penny (see Fig. 24).

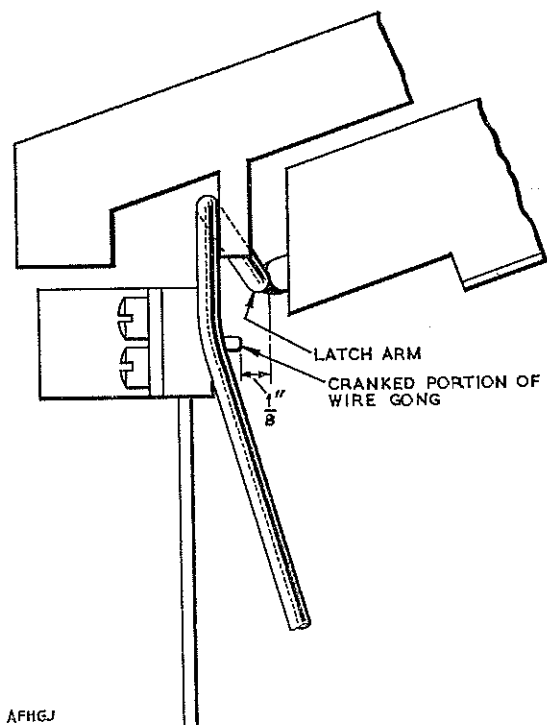


FIG. 24

Adjust the height of the wire gong to give the most sound. Adjustment for height can be obtained by loosening its two fixing screws and moving them about the two fixing holes in the bracket. If a satisfactory sound cannot be obtained by adjustment, change the gong.

It is possible to get some idea of the sound of the gong by resting the blade of a Screwdriver, Instrument, No. 5 or 6 in the corner behind the screws securing the wire gong, and resting the ear against the handle. A final check should be made with the co-operation of the maintenance control officer or an operator, by inserting tokens and carrying out a functional check.

22. Alignment of plug and jack.—All springs of the mechanism plug must make good contact with the corresponding springs of the bell-set jack. Elongated holes are provided in the plug-mounting bracket which allow vertical adjustment of the plug. To position the plug, proceed as follows:—

With the mechanism swung out:—

(a) Check that all jack springs lie in a horizontal plane.

(b) Check that all plug springs lie in a horizontal plane and rest flat against their respective separators. If the springs are splayed outwards from the separators, change the plug assembly.

(c) Slacken the plug-bracket securing screws so that the plug can move freely up and down, and remove the coin chute so that the plug and jack can be clearly seen.

(d) Slowly swing the mechanism into position and adjust the height of the plug so that the plug springs enter the corresponding 'V' apertures between the jack springs. Check that the plug does not foul the floor of the container. If this occurs, slacken the screws securing the bell-set to the container and raise the bell-set to a position where the plug clears the floor of the container. To ensure that the bell-set remains in this position, insert packing between the bell-set frame plate and the floor of the container before re-tightening the securing screws.

(e) Push the mechanism right home; the progressive engagement of the springs should locate the plug correctly in its final position.

(f) Tighten the securing screws, taking care not to disturb the position of the plug.

(g) Swing the mechanism out and in and make a final check of alignment.

(h) Replace the coin chute.

23. Relays No. 128B and No. 309A (manual C.B. installations) and Relay No. 281A (U.A.X. 5 and 6 installations).—*Adjustment information.*—For the method of measuring and adjusting residual gap and armature travel, of adjusting spring tensions,

and for details of the tools required for adjusting these relays, refer to Automatic, B 5104, pars. 12–16 (a), 26–28, 42. For codes of replaceable parts, refer to Manual, A 5911.

(a) *Relays No. 128B and No. 309A (Fig. 25).*

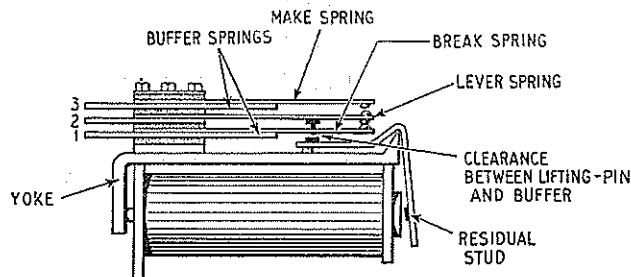


FIG. 25

(i) The residual gap should be not less than 5 mils. If the gap is below this value, change the armature (Armature No. 1A).

(ii) The armature travel should be 29–33 mils.

(iii) Straighten springs if necessary and, with the armature normal, set the lever and huffer springs approximately parallel with the yoke.

(iv) Insert a feeler gauge of just sufficient thickness to hold the armature in its unoperated position, between the armature and the core.

(v) Hold spring No. 1 away from spring No. 2 and tension spring No. 2 so that its lifting pin rests on the armature stud with a pressure of 20–25 gm (Relay No. 128B) or 10–15 gm (Relay No. 309A).

(vi) With the armature operated, adjust spring No. 1 to rest flat on its buffer with a pressure of 5 gm approx.

(vii) With the armature wedged unoperated as in (iv), bend the buffer of spring No. 1 upwards so that it lifts the lifting pin of spring No. 2 clear of the armature by approx. 2 mils.

(viii) With the armature operated, tension spring No. 3 so that it exerts a pressure on spring No. 2 of 20–25 gm (Relay No. 128B) or 10–15 gm (Relay No. 309A).

(ix) With the armature normal, there should be a minimum clearance of 10 mils between the contacts of springs Nos. 2 and 3 and with the armature operated there should be a similar clearance between the contacts of springs Nos. 1 and 2. If necessary, set springs No. 1 and/or No. 3 slightly from a point just in front of the buffer spring to give the correct clearance.

(x) Check the performance of the relay against the following current values and if necessary vary the tension of the spring No. 2 to obtain these requirements.

	Current (mA)	
	Relay No. 128B	Relay No. 309A
Saturate ..	30	150
Release ..	0	2
Non-op. ..	—	150 (reversed)
Operate ..	7	18

(xi) Re-check the clearances specified in (vii) and (ix) and make any necessary final corrections.

(b) Relay No. 281A (Fig. 26).

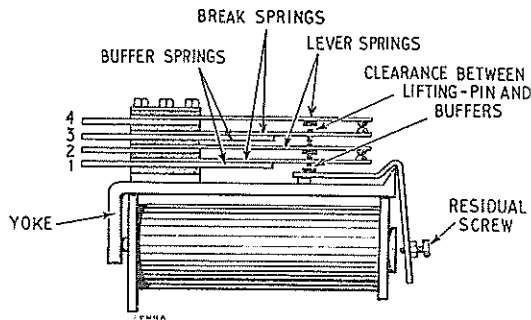


FIG. 26

- (i) The residual gap should be 2 mils minimum.
- (ii) The armature travel should be between 23–27 mils.

(iii) Straighten springs if necessary and, with the armature normal, set the lever springs and buffer springs to be approximately parallel with the yoke.

(iv) With springs Nos. 2 and 4 lifted clear, adjust springs Nos. 1 and 3 to rest flat against their buffers with a pressure of 5 gm approx.

(v) With springs Nos. 1 and 4 held clear of spring No. 2, tension spring No. 2 so that its lifting pin exerts a pressure of 10–15 gm on the armature stud.

(vi) Bend the buffer of spring No. 1 so that it lifts the lifting pin of spring No. 2 clear of the armature stud by approx. 2 mils.

(vii) Bend the buffer of spring No. 3 upwards so that there is a clearance of 10–20 mils, judged by eye, between the lifting pin and stud of spring No. 4.

(viii) Tension spring No. 4 so that it exerts a pressure of 10–15 gm on spring No. 3.

(ix) Adjust the buffer of spring No. 3 to give a final clearance of approx. 2 mils between the lifting pin and stud of spring No. 4.

(x) With the armature operated there should be a clearance of 10 mils approx. between the contacts. If necessary, set springs No. 1 and/or No. 3 slightly from a point just in front of the buffer to give this clearance.

(xi) Check the performance of the relay against the following current values and if necessary vary the tension of springs Nos. 2 and 4 to meet these requirements:—

	Current (mA)
Saturate ..	200
Release ..	2.5
Non-op.	7
Operate ..	19

(xii) Re-check the clearances specified in (vi), (ix), (x) and make any necessary final corrections.

(xiii) Check that the relay does not release during dialling.

24. 3000-type relays.—3000-type relays, which are fitted in some installations, should be adjusted in accordance with Automatic, B 5144.

25. Dust covers for Relays Nos. 128B and 309A.—A polythene cover, Relay Cover BT, should be fitted over the relay in manual (C.B.) installations.

Supplies Dept. issue these covers in packs of five and, before fitting, it will be necessary to assemble a cover by folding the cardboard stiffener and inserting it into the polythene envelope, rounded corners foremost. Fit the cover over the relays with the flimsy side towards the mechanism.

26. Transmitters Nos. 21 and 25.—Transmitter No. 25, which supersedes Transmitter No. 21, will be found on new and repaired mechanisms, and will be issued as maintenance replacements. The design of the transmitter-fixing bracket has been altered for use with Transmitters No. 25, and new brackets are fitted when the mechanisms are reconditioned. When a Transmitter No. 25 is issued as replacement for a Transmitter No. 21, it will be necessary to fit it to the earlier type of fixing bracket and in such cases two Washers, Locking, No. 1, $\frac{1}{4}$ in., should be fitted to prevent loosening of the transmitter.

(a) *Transmitter No. 21.*—The transmitter-fixing spindle should be located at the inner extremity of the 'L'-shaped slot in the transmitter-fixing bracket. Adjust the transmitter by the nuts on the fixing

spindle, so that there are approximately equal gaps of 80-90 mils between the top and bottom edges of the bell gong and the coin-guide assembly. This type of transmitter can rotate in its fixing slot and it is possible for the microphone-fixing bracket to be in a position where a shilling will pivot on the upper edge of the bracket and lodge inside the bell gong. Rotate the transmitter to a position where this cannot occur, before the fixing nuts are tightened. A Spanner, Flat, No. 4 should be used to tighten the fixing nuts.

(b) *Transmitter No. 25.*—Adjust the transmitter-fixing spindle by means of the fixing nuts, so that there are approximately equal gaps of 80-90 mils between the top and bottom edges of the bell gong and the coin-guide assembly. This transmitter has an advantage over the No. 21 type in that its fixing spindle is made with two flats and, consequently, the transmitter cannot rotate. The transmitter-fixing bracket is provided with two elongated fixing-holes which allow the bracket to be raised, or lowered, to provide for manufacturing tolerances. This adjustment is made when the mechanism is initially assembled and should not require readjustment.

(b) *Microphone-fixing bracket.*—This bracket serves the dual purpose of holding the microphone in position and maintaining a pressure between the microphone and the bell gong. This pressure should be within the limits $\frac{1}{2}$ - $1\frac{1}{2}$ lb. measured with a Gauge, Tension, No. 9 at the shoulder of the bracket (see Fig. 27). Adjustment of this pressure should be made only at an overhaul centre, and should be done by removing the bracket from the mounting spindle and carefully bending it in the required direction. If, after adjustment, the standard of transmission is unsatisfactory, change the complete microphone and bell-gong assembly.

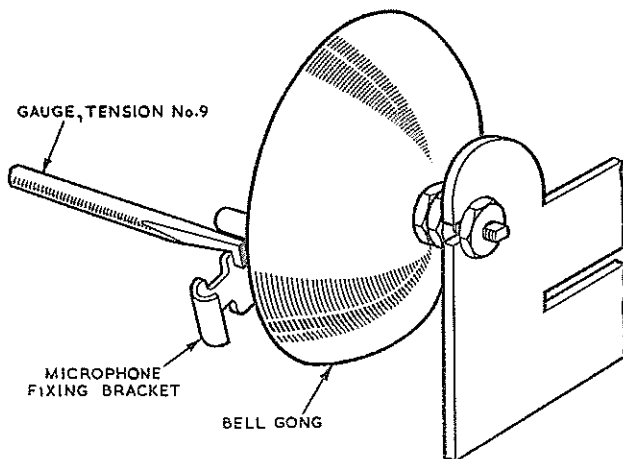


FIG. 27

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27. Escapement mechanism (postpayment).—Operate the coin-slot crank-arm. The escapement mechanism should return to normal in not less than 1 second and not more than 3 seconds. If the escapement fails on this test, check the adjustment of the switching springs and, if they are out of adjustment, adjust as detailed in par. 28. If, when the switching springs are correctly adjusted, the escapement does not meet the timing test, the following action should be taken:—

(a) If the escapement restores in less than 1 second change the escapement mechanism.

★(b) If the escapement takes longer than 3 seconds to restore, remove it and lubricate with Oil, Bearing, No. 16, applied sparingly with a Brush, Lubricating, No. 3. Apply the oil to the bearings in the back, and front, of the casework, and to the pawl and its pivot. Then replace the escapement mechanism. If the trouble persists after lubrication, change the escapement mechanism.

28. Adjustment of switching springs (post-payment).—With the cam normal:—

(a) Straighten the springs if necessary.

(b) With the spring No. 2 held clear, tension springs Nos. 1 and 3 against the cam with a combined pressure of 15 ± 2 gm (readjust), 15 ± 5 gm (test), measured immediately behind the bend of spring No. 1 [see Fig. 28 (a)].

(c) Tension spring No. 2 against spring No. 3 so that there is a clearance between spring No. 1 and the cam of 5 mils approx. [see Fig. 28 (b)].

(d) Tension spring No. 3 downwards so that spring No. 1 again rests against the cam, with a pressure of 10 ± 2 gm (readjust), 10 ± 5 gm (test), measured immediately behind the bend of spring No. 1 [see Fig. 28 (c)].

(e) Adjust spring No. 4 so that there is a contact clearance of 10 mils minimum between springs Nos. 3 and 4 [see Fig. 28 (c)].

With the cam operated:—

(f) Check that there is reasonable 'follow' on spring No. 4 and a contact clearance between springs Nos. 2 and 3 of 10 mils minimum [see Fig. 28 (d)].

29. Tools and their uses.—The tools required for mechanism adjustments are listed in the following Table 1.

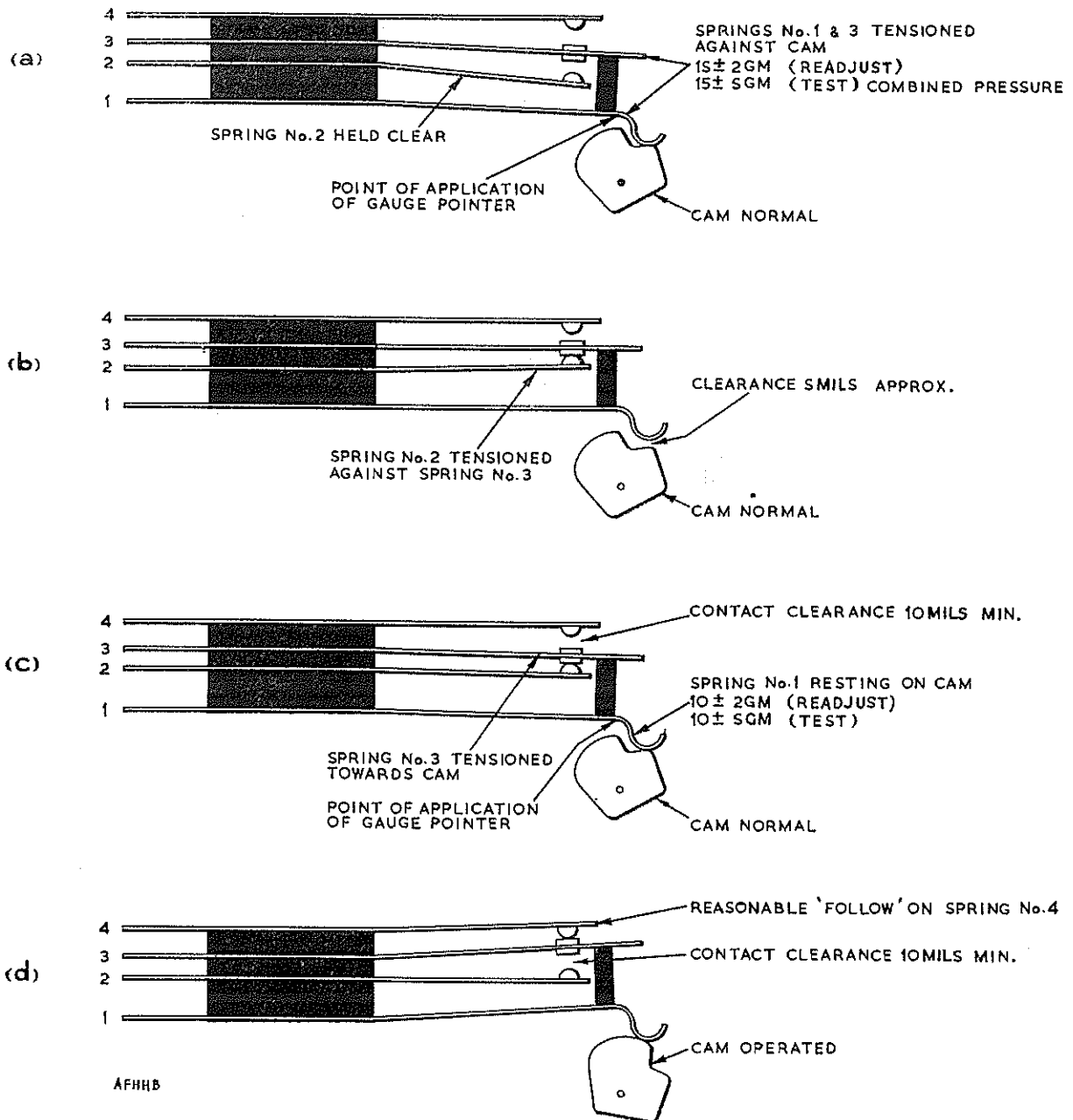


FIG. 28

★TABLE I

Rate Book title	Use
Adjuster, Spring, No. 2	Adjustment of twin-contact tongues
Brushes, Lubricating, No. 3	Lubrication of coin-box mechanism
Brushes, Uniselector, Cleaning	Cleaning of coin-box mechanism
Gauges, Feeler, No. 1	} General use
Gauges, Feeler, No. 9	
★Gauge, Locating, No. 5	Latch arm adjustment
Gauge, Tension, No. 1	} General use
Gauge, Tension, No. 2	
Gauge, Tension, No. 9	
Pliers, Adjusting, No. 1 or 1A	Bent duckbill pliers for adjustment of mechanically-operated springs
Pliers, Adjusting, No. 4	Adjustment of coin guides and sides of swinging container
Screwdriver, Inst., No. 1	} General use
Screwdriver, Inst., No. 2	
Spanner, Flat, No. 3	} Locknuts on balance-arm and latch-arm pivots and for latch-arm clamping nuts
Spanner, Flat, No. 4	
Spanner, Flat, No. 5	
Spanner, Flat, BA4-6	

References:—D 5003, D 5501, D 5502
(TPM2/3) Automatic, B 5104, B 5144
Manual, A 5911

END