

**POST OFFICE STANDARD (100-TYPE) METER**  
**[Maintenance Adjustment Instruction (M.A.I.) No. 51]**

**1. Introduction.**—This Instruction details maintenance adjustments for the P.O. standard (100-type) meter, which is illustrated in Figs. 1, 2 and 3.

**4. Tolerances** quoted are only for testing purposes. When readjustments are being made, the mean figure should be used, and the tolerances reduced to a minimum. All screws and nuts must be secure.

**GENERAL**

**ADJUSTMENTS**

**2. Identification of Types.**—“Meters Nos. 100, 101 and 103” are identical as regards the mechanism but the “Meters No. 101 and No. 103” are distinguished by a make contact unit, mounted below the magnet coil, which functions on operation of the armature.

The “Meter No. 103,” in addition, has the armature extension-piece restricted in width, and a small spring welded to the side of the frame. This spring functions as an auxiliary armature-restoring spring (referred to in this Instruction as the auxiliary release spring), which is operative only during the first part of the armature travel on release.

**5. Number wheels.**—The number wheels and stepping pinions must be free on their spindles and the position of the figures in the display window must enable the whole of each figure to be visible when viewed directly from the front. If this condition does not obtain, remove the detent spring, pawl spring, and the lower spacing bar. Obtain alignment of the figures by rotating the “units,” “tens” and “hundreds” wheels until the single notches on the left of the wheels are in engagement with a half-tooth of their respective stepping pinions. Then, rotate the “thousands” wheel so that the figure 0 adjoins the

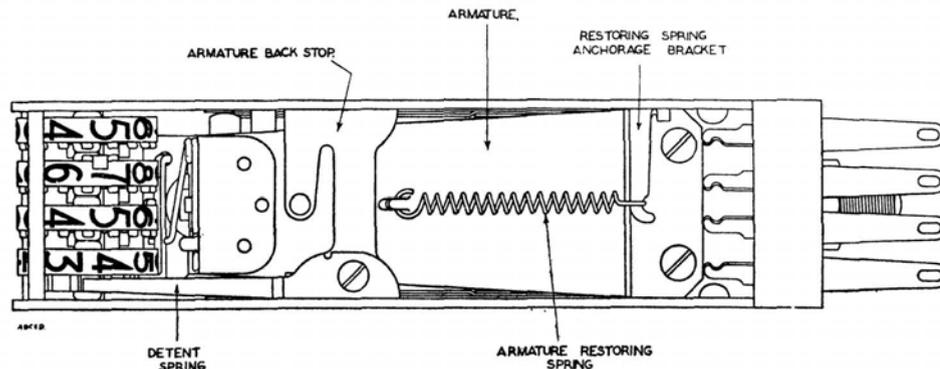


FIG. 1.—‘A’ VIEW

**3. Adjustments of all types of meter** are described in the following paragraphs, and, as a guide to the paragraphs dealing with any particular part or a particular maintenance operation, the principal headings are listed below :—

Adjustment of Number Wheels	...	...	Par. 5
"    Armature	...	...	" 6
"    Armature Back-stop and Pawl Forward Stop	...	...	" 7
"    Contact Springs	...	...	" 8
"    Detent Spring	...	...	" 9
"    Operating Pawl	...	...	" 10
"    Operating-pawl spring	...	...	" 11
"    Armature-restoring spring, and electrical require- ments	...	...	" 12
Details and Sequence of Tests	...	...	" 13
Tools and their uses	...	...	" 14

figure 0 of the “hundreds” wheel. Replace the spacing bar and tighten the securing screws. Replace the detent and pawl springs, taking particular care to ensure that the pawl end of the pawl spring is fitted correctly into its locating hole. (It should not be necessary to twist the spring when replacing the detent, otherwise binding will result).

**6. Armature.**—Adjust the armature so that its centre line is parallel with the frame (Fig. 4) and a clearance of 10 (+ 4 or -2) mils exists between the armature and the core with the armature (as shown in Fig. 5) operated manually. It will be found convenient when making this adjustment to insert a gauge of 10 mils between the armature and the core and to press the armature gently against the face of the gauge until it is felt to bed solidly ; then securely tighten the fixing screws. (Verify that the operating

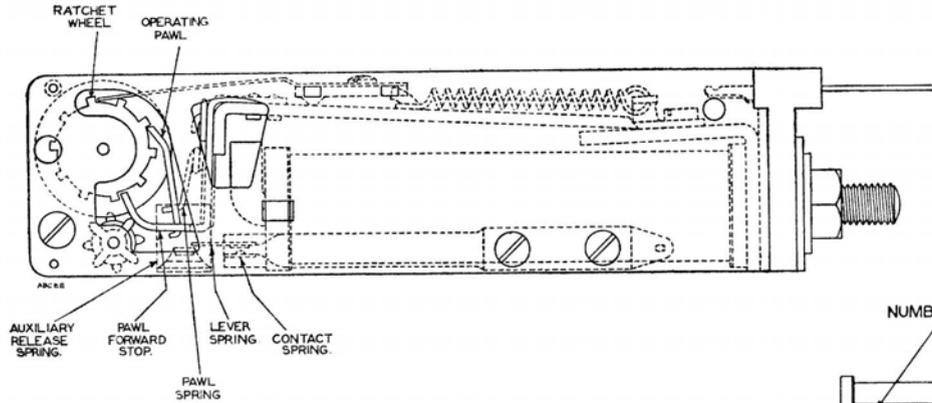


FIG. 2.—' B ' VIEW

pawl and pawl forward stop do not bind on either the "units" wheel or the frame, when the "units" wheel is moved lightly to the right.)

**7. Armature back-stop and pawl forward stop.**—Adjust the armature back-stop by bending it, so that, when the armature is normal and the "units" number wheel is in correct alignment, perceptible clearance is obtained:—

(a) between the tip of the pawl forward stop and the face of the ratchet notch (see Fig. 6) ;

(b) between the lower face of the pawl forward stop, and the inner face of the ratchet tooth (see Fig. 6).

If it is found that this adjustment will not permit both these conditions to be satisfied, adjust the pawl forward stop, by bending, until a mean position is obtained. Verify also that there is a perceptible

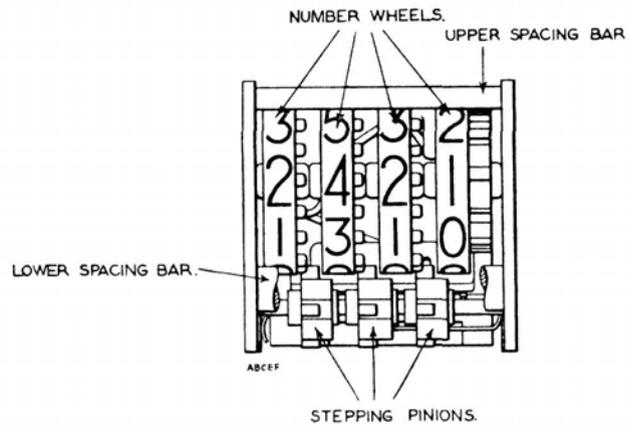


FIG. 3.—' C ' VIEW

clearance between the top of the lower ratchet tooth and the pawl (see Fig. 6).

**8. Contact springs.**—The lever spring wings must be straight, and approximately parallel with the top

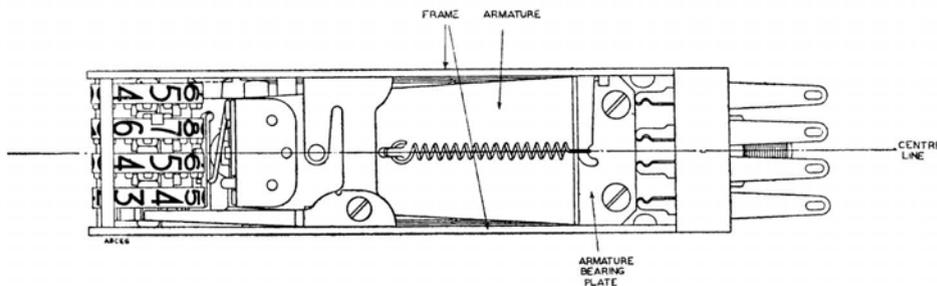


FIG. 4.—ARMATURE PARALLEL TO FRAME

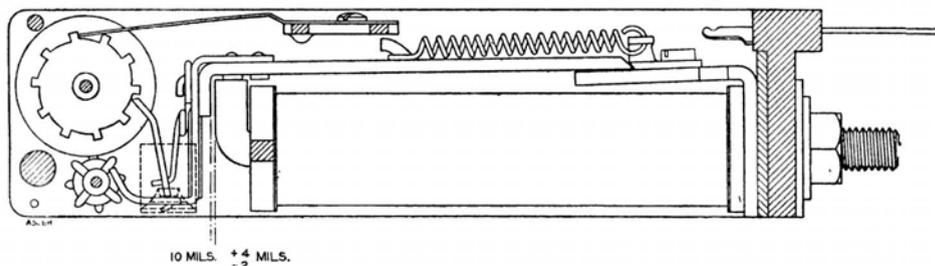


FIG. 5.—ARMATURE CLEARANCE

edge of the meter frame, when the rear wing is resting lightly in the recess in the coil cheek. Adjust the wing of the contact spring so that a minimum contact clearance of 10 mils is obtained. There must be a minimum contact pressure of 15 gm. when the armature is operated, but the total tension must be such that the meter will conform with the requirements specified in par. 9.

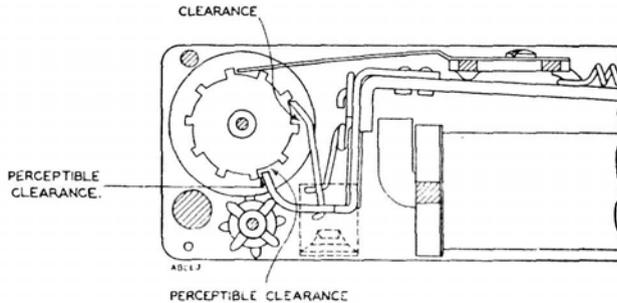


FIG. 6.—ADJUSTMENT OF ARMATURE BACK-STOP AND PAWL FORWARD STOP

**9. Detent spring.**—Adjust the detent spring so that, when the armature is normal, there is just perceptible clearance between the tip of the detent spring and the face of the ratchet tooth, on all teeth of the ratchet wheel (as shown in Fig. 7). The pressure exerted by the detent spring on the forward ratchet tooth must be  $10 \pm 5$  gm., measured as near to the point of contact as possible (see Fig. 7). (Verify by examination that the detent spring does not bind on either the frame or the "units" number wheel, when the "units" wheel is pressed lightly to the right.)

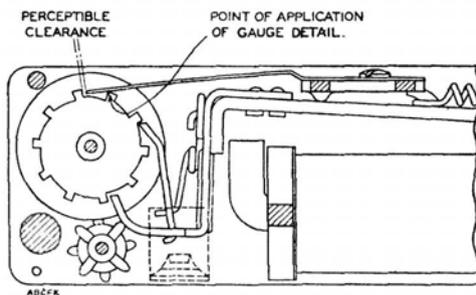


FIG. 7.—ADJUSTMENT OF DETENT SPRING

**10. Operating pawl.**—The operating pawl must be free on its bearings. There must be a perceptible clearance between the tip of the operating pawl, and the ratchet tooth when the armature is operated (see Fig. 8).

**11. Operating pawl spring.**—The operating pawl must exert a pressure of  $6 \pm 4$  gms. against the ratchet notch when the armature is operated; this tension is to be measured as near to the set in the

pawl tip as possible (see Fig. 8). Do not attempt to adjust the spring; if the pressure is not within the tolerances allowed, change the spring. ["Part No. 1/SSP/622."]

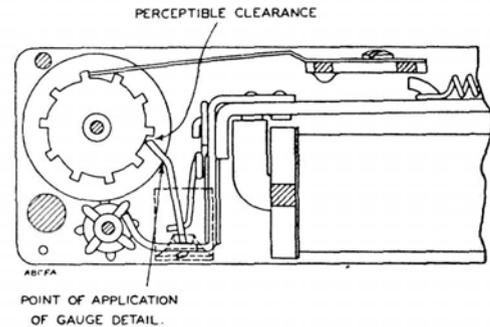


FIG. 8.—ADJUSTMENT OF OPERATING PAWL

**12. Armature-restoring spring, and electrical requirements.**—When making bench tests, the meter testing circuit must be wired so that, when the meter is mounted on the rack, the direction of the current through the meter will be the same in each case.

(a) For all meters, except "Meters, No. 103a" Tension the armature-restoring spring when necessary, by bending its anchorage bracket (see Fig. 9) so that the meter will conform with the requirements given in Table 1.

(b) "Meter No. 103a". Adjust the armature restoring spring and auxiliary release spring by the following method:—

Make a preliminary setting of the auxiliary-release

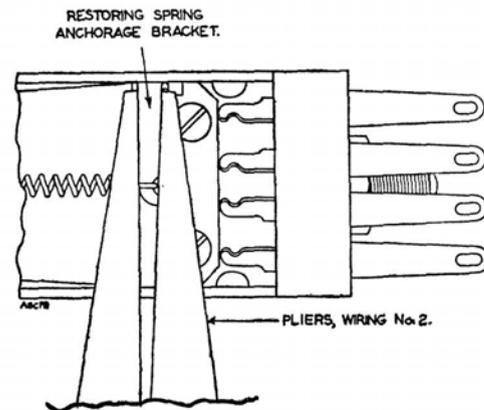


FIG. 9.—ADJUSTMENT OF ARMATURE-RESTORING SPRING

spring to make sure that the pawl reaches the top of the ratchet tooth, before the armature touches the release spring. Then adjust the armature-restoring spring, as in (a), to just meet the "operate current" figure. Check the "release" current and, if neces-

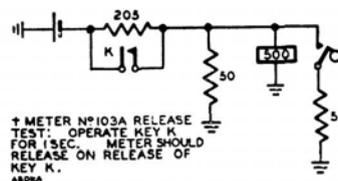
sary, increase the tension of the auxiliary-release spring. Re-check the "operate" current. If this is not now met, the auxiliary-release spring has been tensioned excessively and its tension must be reduced accordingly.

- Adjuster, Interrupter No. 2 For adjusting the armature back-stop
- „ Spring No. 11 For adjusting the detent spring
- „ „ No. 20 For fine adjustment of the armature-restoring-spring bracket, when meter is *in situ*

13. Details and sequence of tests to be applied are as follows :—

TABLE 1

Test	Meter No.						Remarks
	100 A	100 B	100 C	100 D	101 A	103 A	
Resistance (ohms)	500	2300	2300	4.1	2300	500	
Saturation (mA.) ... ..	104.6	45.2*	22.6	350	22.6	80	* Applied for 3 seconds
Hold (mA.) ... ..	—	14	—	—	—	—	
Release ... ..	Dis.	Dis.	Dis.	Dis.	Dis.	†	
Non-operate (mA.) ... ..	25	22.5	11.5	180	11.5	30	
Operate (mA.) ... ..	35	29.7	16.5	260	16.5	60	



NOTE.—The electrical tests must be finally checked when the meter is fitted in the rack. If necessary, fine adjustments may be made by means of "Adjuster, Spring No. 20."

14. Tools and their uses.

- Screwdriver—
  - Instrument ... No. 1
  - Instrument ... No. 2
- Pliers, Adjusting ... No. 5
- „ Wiring ... No. 1
- Mirror Inspection
- Pliers, Wiring ... No. 2 For adjusting the pawl forward stop and armature - restoring-spring bracket

- Gauges, Tension ... No. 2 For measuring tensions
- Spanner, Box ... No. 3 For meter mounting screw
- Gauges, Feeler ... No. 1 For adjusting the armature

15. The tools specified above should be used only for the purpose for which they are intended. Any tool that is in such a condition that screws, nuts or springs would be marred by its use must not be used but should be changed.

Reference :—None  
(Tp2/8)

END