

MASTER CLOCKS, GENTS TYPE C7

ADJUSTMENTS AND REQUIREMENTS

1. CANCELLATIONS. Nil.

2. GENERAL.

2.1 This Instruction describes the adjustments and requirements of the Gents type C7 master clocks.

2.2 Clocks, C7, are of the "Synchronome" type, electrically-controlled master clocks having a 1-second pendulum. Provided they have been mounted and installed correctly very little trouble should be experienced as these mechanisms have a very low fault incidence.

2.3 These clocks normally provide 30-second pulses for the purpose of controlling time-of-day clock systems. When modified by the addition of suitable springsets, these clocks are also used for providing 1-second, 6-second, and 30-second pulse distribution in automatic exchanges, the relevant circuit diagram being GBW 13440.

3. GENERAL OPERATION OF A "SYNCHRONOME" CLOCK MOVEMENT.

3.1 In this type of clock, a mechanical pulse is imparted to the pendulum every 30 seconds.

3.2 The action is controlled by a scape wheel with 15 teeth.

3.3 One tooth has a deeply-cut indentation which by changing the position of the driving pawl causes the unlatching of the stirrup catch; this in turn permits the gravity arm to fall.

3.4 A roller on the gravity arm rolls down the inclined face of an extension on one side of the pendulum crutch thus causing a mechanical pulse to be delivered to the pendulum to maintain its motion.

3.5 Near the end of the downward travel of the gravity arm, contacts on this arm and on the armature extension of an electromagnet are made, completing the circuit for the electromagnet.

3.6 The electromagnet is energised and while operating causes the gravity lever to be restored and hold on the latch of the stirrup catch.

3.7 The pendulum continues to swing regularly, advancing the scape wheel one tooth for each two swings until the deep indentation is again reached and the sequence above is repeated.

4. INSTALLATION.

4.1 The following points are to be borne in mind when choosing a position for the master clock:-

(a) the wall is to be firm and free from vibration, and

(b) the position is not to be damp or subject to excessive heat or changes in temperature.

4.2 The clock must be firmly fixed to the wall; all fixing holes are to be used.

4.3 Brass studs are provided on the front and left-hand side of the clock case. Both sets of studs must register vertically with the line of a plumb bob.

4.4 When hanging the pendulum, ensure that the polished side of the rod is at the front.

## 5. REGULATION.

5.1 If the system gains time, regulate the pendulum by turning the graduated rating nut of the bob to the left.

5.2 If the system loses time, regulate the pendulum by turning the rating nut to the right.

5.3 The rating nut is clearly marked in degrees, each of which is approximately equal to one second per day.

5.4 Fine regulation is effected by adding weights to the top or bottom of the pendulum bob.

5.4.1 To increase speed place small weights in the dished top of the pendulum bob.

5.4.2 To decrease speed place small weights on the top of the rating nut.

## 6. CURRENT CAPACITY.

6.1 The current in the electromagnet and slave-clock circuit is to be adjusted by means of the potentiometer to be 220 mA with the transmitter contacts closed.

## 7. ADJUSTMENTS.

NOTE.- The following adjustments are detailed for use only in cases where adjustments are required through prolonged wear, or in cases of interference. The pendulum is to be removed before any adjustments are made.

### 7.1 Contact and Push-Off Screws.

7.1.1 With the armature held flat against the magnet poles by hand, back-off the contact and push-off screws until both are clear.

7.1.2 Screw in the push-off screw until its point lifts the gravity lever catch onto the stirrup catch. Lock the push-off screw.

7.1.3 With the magnet energised electrically, and the upward movement of the gravity lever controlled by hand, screw in the electrical contact screw to such a position that the contacts break when the gravity lever is judged visually to be within  $1/16$  in. of engagement with the stirrup catch. Lock the contact screw.

### 7.2 Armature Backstop Screw.

7.2.1 Adjust the armature backstop screws to give a clearance of 185-190 thousandths of an inch ( $3/16$  in. approx.) between the electrical contacts when the gravity lever is at rest on the stirrup catch and the armature is at rest against its backstop screw.

7.2.2 The dimension 185-190 thousandths of an inch ( $3/16$  in. approx.) applies only to clocks in which the electrical contacts are situated  $2\frac{3}{4}$  in. below the pivot of the gravity lever. In the case of clocks to an older pattern in which the contacts are  $1\frac{3}{4}$  in. below the pivot of the gravity lever, the clearance must be 122-128 thousandths of an inch ( $\frac{1}{8}$  in. approx.).

### 7.3 Armature Restoring Spring.

7.3.1 With a current of 170 mA flowing through the electromagnet the gravity lever should not be lifted.

7.3.2 If adjustment is required, an air gap must be introduced between the magnet and armature in the operated position.

7.3.3 Make minor adjustments to the electrical contact screw, push-off screw, and armature backstop to meet the requirements of par. 7.3.1 above.

### 7.4 Felt Pad.

7.4.1 With the gravity lever in its normal position there should be a slight play between the lever and the felt pad which checks its upward movement.

### 7.5 Resetting the Pendulum.

7.5.1 Hang the pendulum in position and see that the crutch pin is free in the slot of the pendulum and is oiled.

7.5.2 Check that the driving pawl and detent backstop of the scape wheel operate positively when the pendulum is at minimum swing. The driving pawl should advance the scape wheel a little more than one tooth on each forward stroke; and the detent should drop, with slight clearance, into each tooth.

7.5.3 While the pendulum is still at its minimum swing, it should just release the gravity lever when the driving pawl reaches the deep tooth. The gravity lever catch has slotted fixing holes for this adjustment.

### 7.6 One-Second Pendulum Contacts.

7.6.1 With the contacts open adjust the springs as under -

|                        |   |                            |
|------------------------|---|----------------------------|
| Top spring tension     | : | $7 \pm 1$ grams            |
| Bottom spring tension: |   | $1 \pm 1$ grams            |
| Contact gap            | : | 12 thousandths of an inch. |

7.6.2 Adjust the contact fixing bracket laterally so that the contact striker is vertically underneath the agate roller on the pendulum when the pendulum is at rest.

7.6.3 Adjust the pendulum bracket holding the agate roller so that the contacts make when the pendulum is within 10 points of centre as shown on the scale fitted to the floor of the clock.

### 7.7 Contacts on Auxiliary Mechanism.

7.7.1 This mechanism is mounted on the rear of the clock face, adjacent to the time-of-day mechanism.

7.7.2 Contact tension for both the one-second-in-six-seconds springs, and the three-seconds-in-six-seconds springs is to be  $15 \pm 1$  grams.

7.7.3 The contact tension between the one-second springs is to be  $26 \pm 1$  grams.

## 8. LUBRICATION.

8.1 Lubricate the mechanism as specified in B 5051.

9. REFERENCES. B 5051.

(Fig. 1 follows)

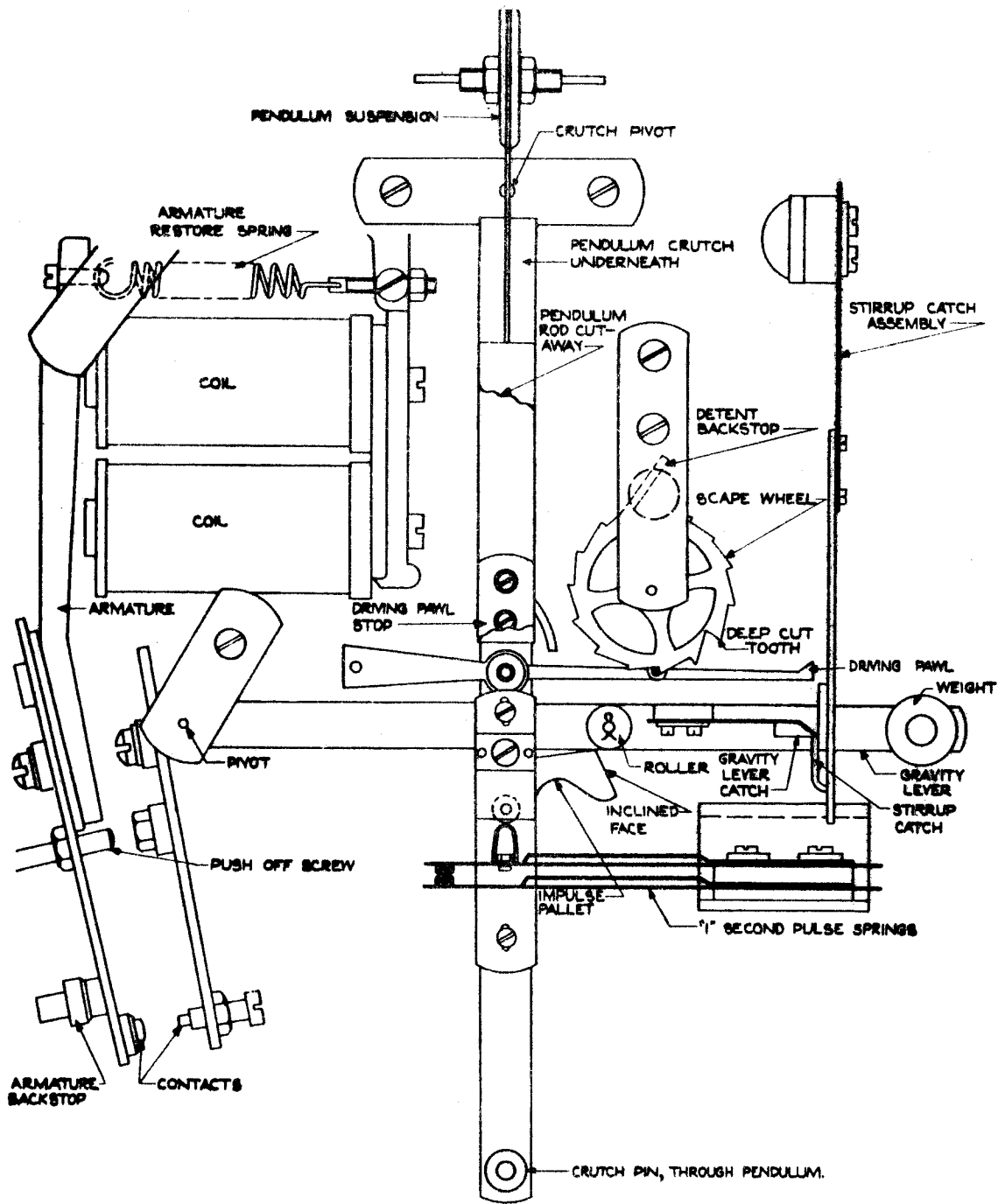


FIG.1 GENTS TYPE C7 MASTER CLOCK

END