

Instructions for Fixing, Connecting and Setting National Electric Clocks

BRITISH MANUFACTURE



Patentees & Manufacturers:

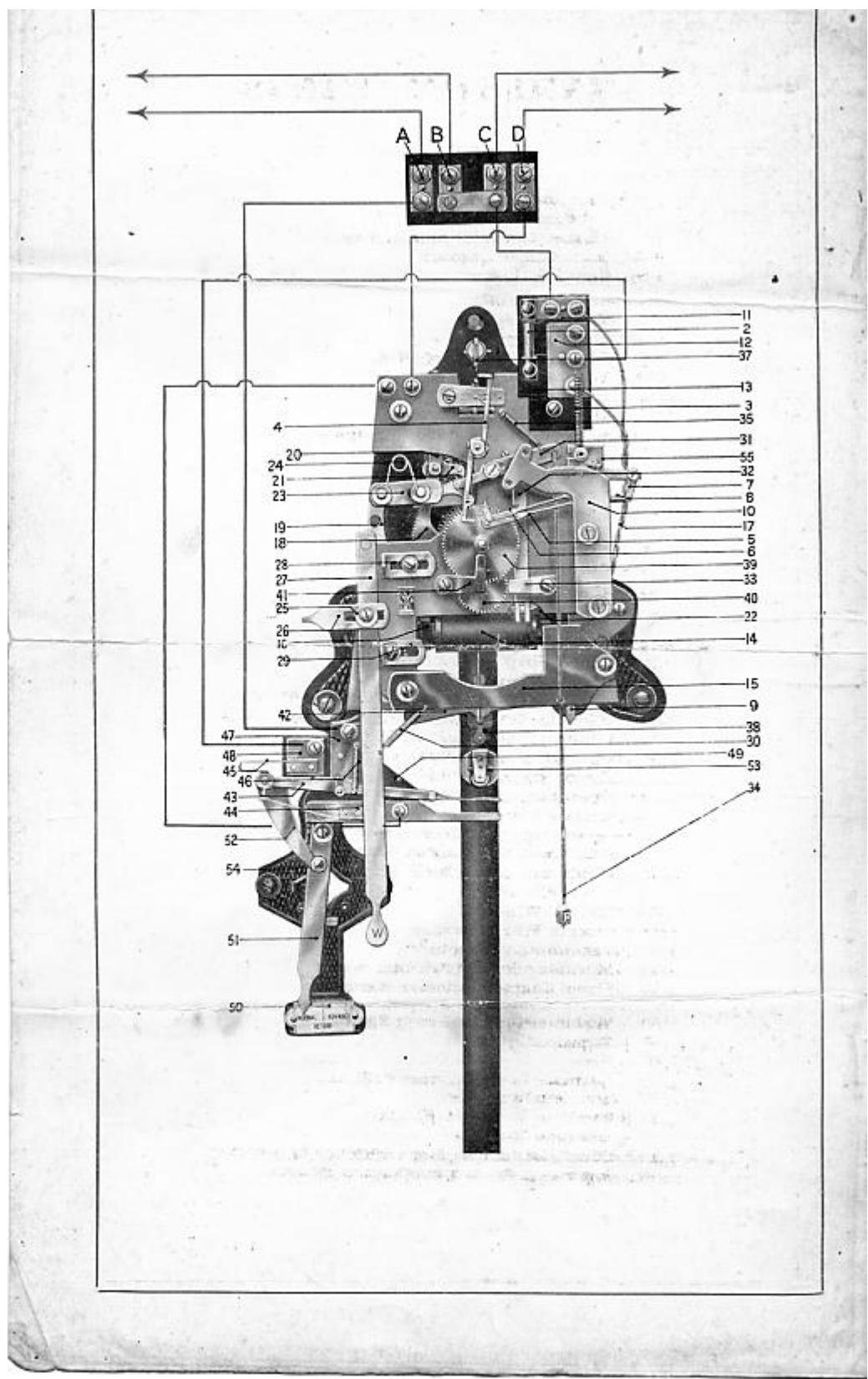
**National Time Recorder Co., Ltd.,
227-228, Blackfriars Road, London, S.E.1.**

Factory: Aquinas Street, Blackfriars, S.E.1.

Telephone Nos.:
HOP 6641 & 6642

Telegraphic Address:
NATRECORD, LONDON.

Branches:
BIRMINGHAM, BRISTOL, MANCHESTER, GLASGOW, DUBLIN.



NAMES OF PARTS

1. Terminal Panel.
2. Condenser.
3. Master Clock Terminal Board.
4. Escapement Contact.
5. Contact Maker.
6. Contact Breaker.
7. Tension Adjuster.
8. Tension Spring.
9. Pendulum Adjusting Nut.
10. Seconds Dial Bracket.
11. Magnet Terminals.
12. Magnet Terminals.
14. Magnet Coil, 6 volts, 0.7 amps.
15. Magnet Coil Bracket.
16. Armature.
17. Leads to Magnet Terminal.
18. Winding Ratchet Wheel.
19. Armature Operating Arm.
20. Armature Operator.
21. Operating Pawl.
22. Stop Click.
23. Connecting Link.
24. Tension Spring.
25. Armature Spiral Spring.
26. Spiral Spring Bracket.
27. Winding Lever "W."
28. Winding Lever Adjusting Stop, Forward.
29. Winding Lever Adjusting Stop, Zero Position.
30. Winding Lever Spiral Spring.
31. Operating Pawl Release.
32. Operating Pawl Link.
33. Operating Link Guide.
34. Release Cord, "R."
35. Operating Link Coil Spring.
37. Pendulum Suspension Spring.
38. Pendulum Escutcheon Plate.
39. Hour Wheel.
40. Minute Wheel.
41. Minute Wheel Bridge.
42. Pendulum Connector.
43. Movable Contact Advance Lever.
44. Fixed Contact Advance Lever.
45. Contact Advance Spring.
46. Movable Contact Lever Spring.
47. Terminal Plate.
48. Ditto.
49. Advance Lever Insulated Plate.
50. Position Indicator.
51. Position Arm and Pointer.
52. Advance Bracket.
53. Fixed Contact Advance Roller and Bracket.
54. Normal Advance and Retard Bracket.

INSTRUCTIONS.

1. FIXING MASTER CLOCK.

Before freeing the pendulum, hang the Master Clock in position by the hanging plate provided at the top. Remove the five screws and *carefully* withdraw the packing block from the pendulum.

Gently move the case until the end of the pendulum screw hangs *exactly* over the "O" on the scale, then secure the clock, using the two screw holes by which the packing block was fixed.

2. MASTER CLOCK CONNECTIONS.

Expose terminal panel by removing cover on top of case.

1. Connect wire from Relay to Terminal A.
2. " " B.
3. " Master Battery to " C.
4. " " " D.

Replace cover of terminal panel, and *before* starting the Master Clock complete secondary circuit as follows:—

3. FIXING AND CONNECTING SECONDARY CLOCKS.

Fix hanging screw in the selected position and before hanging the clock, open the back and insert the connecting wires through the hole provided, securing either of the wires to either of the terminal screws. Before replacing the back proceed to set the clock.

4. INITIAL SETTING OF SECONDARY CLOCKS TO ONE TIME.

(a) Press the armature arm on to the magnet once for every impulse it is required to advance the clock. Do this with each clock until all are showing the same time.

(b) When it is necessary to set a dial forward several hours this can be done quickly by—

(c) Lifting over the top left hand (when facing the back) locking pawl out of gear with the wheel, and

(d) Whilst holding the armature arm on to the magnet, spin the wheel in the driving direction until the hands approximate to the desired setting time, replace locking pawl referred to in (c) and impulse on as described in (a).

(e) Replace back of clock and hang in upright position.

5. STARTING THE SYSTEM.

If the foregoing instructions have been carried out the circuit is now ready for starting. All the secondary dials being at one time, proceed as follows:—

6. WINDING THE MASTER CLOCK.

Master Clocks are sent out unwound. Operate lever marked "W" to the left ten times, then swing pendulum to start and set hands to correct time. (Note, when the seconds hand is at "60" the minute hand should be exactly upon one of the minute divisions.)

7. ADVANCING SECONDARY DIALS TO CORRESPONDING TIME OF MASTER CLOCK.

Switch over lever 51 to "advance" position and leave there until secondary clocks reach correct time, then return lever 51 to the "normal" position.

8. STOPPING SECONDARY DIALS UNTIL MASTER CLOCK CORRESPONDS WITH THEM.

Switch over lever 51 to "retard" position and leave there until the correct time corresponds with the time at which the secondary dials are standing, then return lever 51 to the "normal" position.

9. MOVING MASTER CLOCK TO ANOTHER POSITION.

Pull cord 34 to release tension, replace packing block and proceed again as instructions 1 and 6.

10. STANDARD VOLTAGE AND CURRENT, D.C.

The minimum voltage at which National Dials and Relays will operate is 3 volts, Time Recorders and Master Clocks at $4\frac{1}{2}$ volts. The maximum voltage may be as high as 20 volts.

The standard voltage is 6 volts for all installations and the current required is as follows:—

Master Clock ...	at 6 volts	= 0.3 amps.
All Time Recorders at 6 volts		= 0.3 amps.
Dials at 6 volts	= 0.1 amps.
Relay at 6 volts	= 0.1 amps.

11. WIRE AND WIRING. (See wiring diagrams.)

(a) All wiring in parallel, 3/20 lead covered wire is a suitable size but this may be varied to suit local conditions.

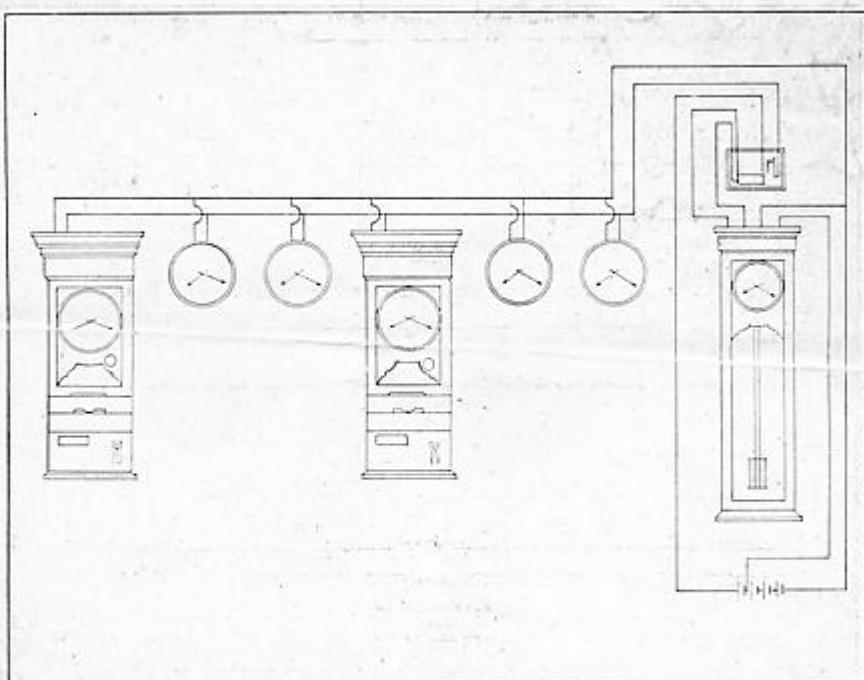
(b) To find maximum allowable resistance of conducting wires take the sum total of the current (in amps.) required by the complete installation and divide it into the voltage available after deducting the 6 volts required by the installation, *vide* usual electrical formula, and the answer will represent the allowable resistance in ohms of the wires connecting the Master Clock or Relay (see general remarks) with the most distant secondary unit.

GENERAL REMARKS.

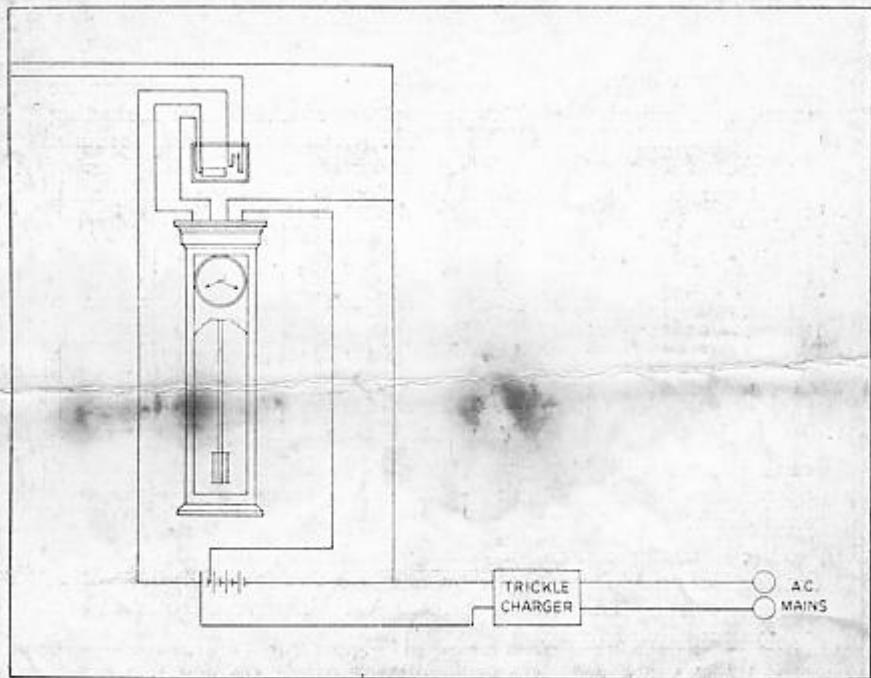
(a) Where secondary units include Time Recorders on a scattered or long wiring system, a National Relay should be employed and fixed in the middle of the circuit to halve the effect of voltage drop and permit the use of cheaper wire, at the same time giving freedom to fix the Master Clock in any desired position.

(b) For still larger and longer installations additional Relays can be employed as sub-control Transmitters to introduce additional power thus forming "banks" and keeping voltage drop and wire sizes down.

(c) Existing circuits of other manufacture, may be controlled by the National Master Clock by simply inserting National Relay in place of existing Transmitter, connecting old Transmitter connections to contact side of Relay.

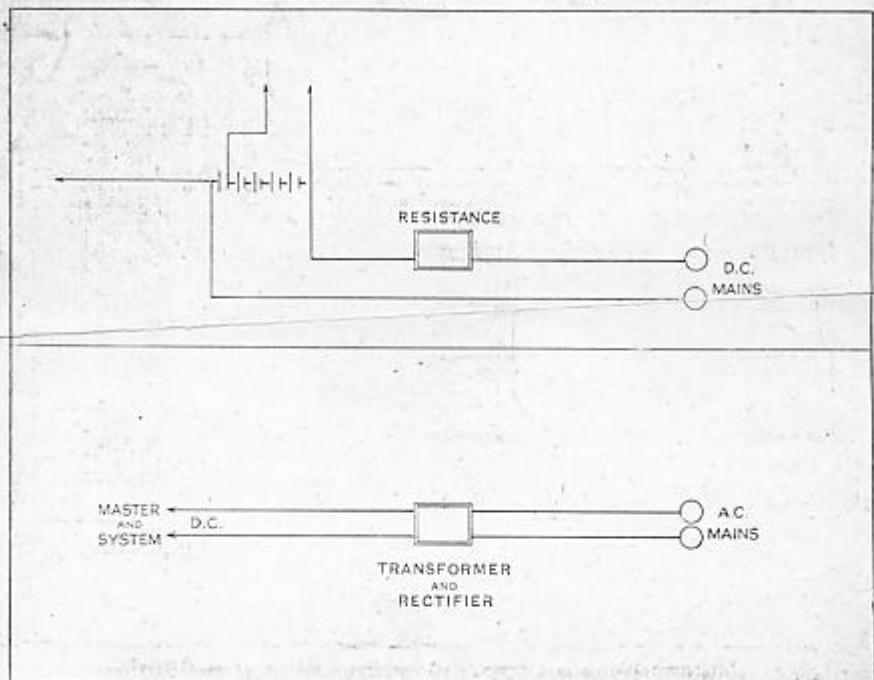


1. Diagram showing a complete National installation from Batteries
For Accumulators, see diagrams 2 & 3.

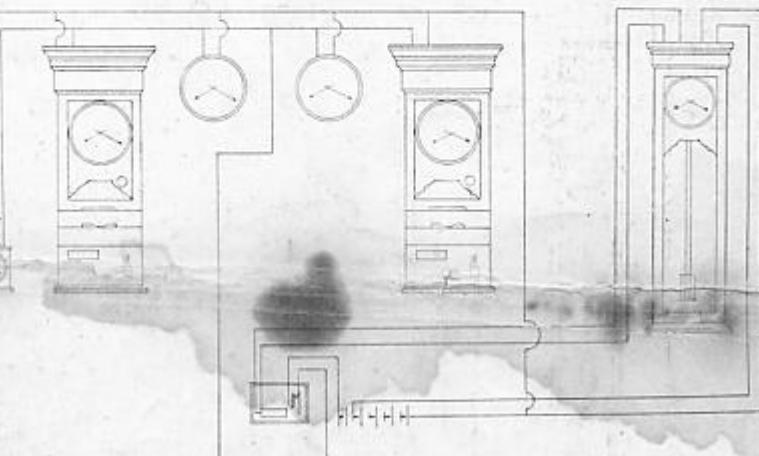


2. Diagram showing charging of Accumulator from A.C. mains.

3. Diagram showing charging of Accumulator from D.C. mains.



4. Diagram showing system and Master Clock working direct from A.C. mains.



5. Diagram showing advantage of placing Relay into the centre of system to halve voltage drop.

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