

W. G. WATSON & CO. LIMITED.

SOLE AGENTS, 171 CLARENCE ST.

THE NEW
**Balance Wheel
Electric Clock**

(MURDAY'S PATENT).



The
REASON MANUFACTURING CO LTD
BRIGHTON



REASON MANUFACTURING COMPANY, LTD.,
LEWES ROAD, BRIGHTON.

THE NEW
Balance Wheel Electric Clock
(*Murday's Patent*).

THIS consists of a large and heavy balance wheel electrically operated on a somewhat similar principle to the pendulum in our other electric clocks. The balance wheel drives the wheel train, not vice-versa, as in a spring-driven clock or watch.

When the arc of oscillation falls to a certain fixed minimum, the electric circuit is automatically closed and fresh energy is imparted to the balance wheel, by the action of an electro-magnet and armature, sufficient to keep it vibrating for an interval of about two minutes—more or less—according to the condition and strength of the battery.

As with the pendulum operated on this intermittent method, the time-keeping is practically independent of variation in battery power.

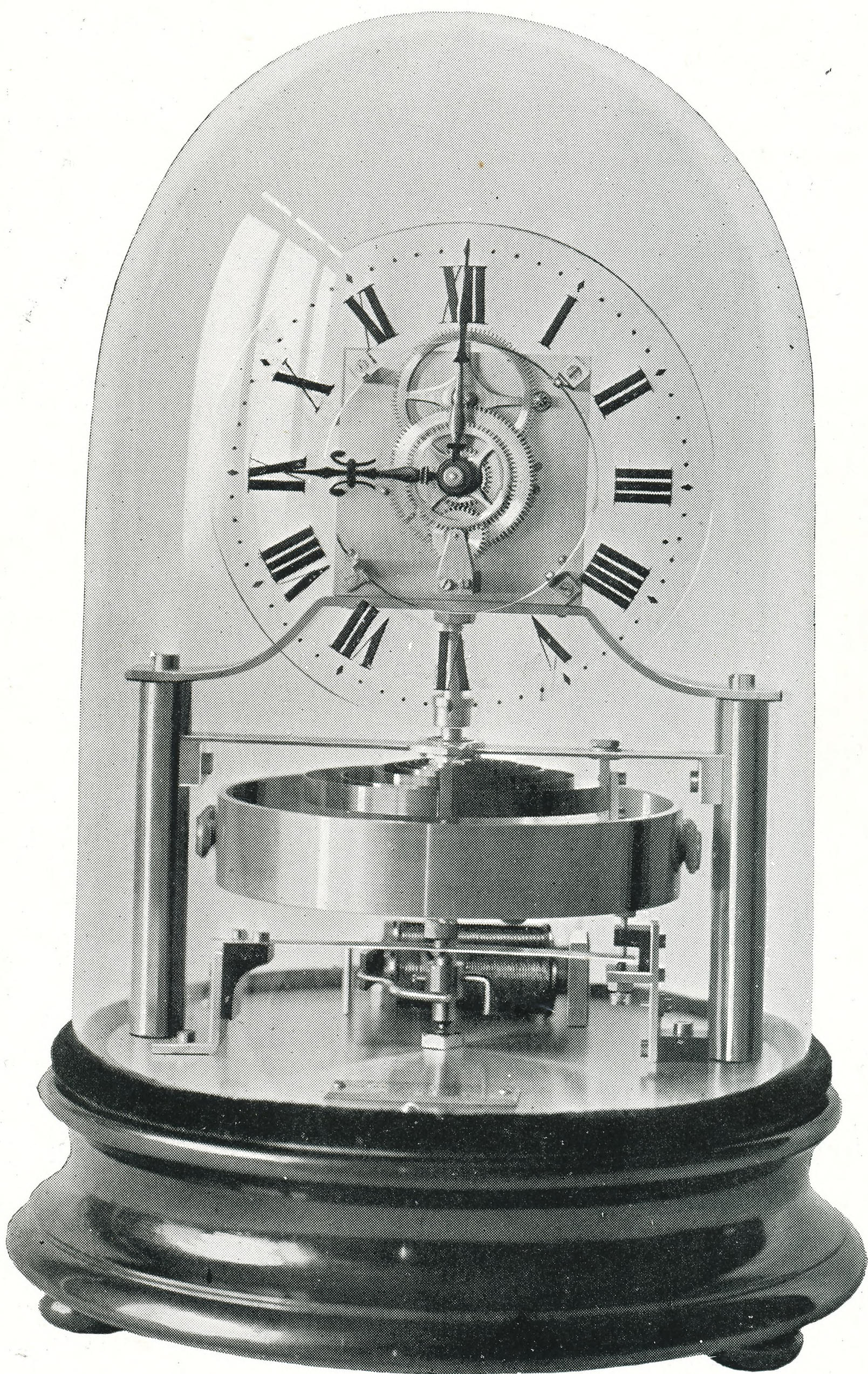
The balance wheel is made of a special nickel steel alloy which is unaffected by changes of temperature and thus does away with the complicated construction of a compensated wheel rim. The hardened steel pivots of the balance wheel staff or arbor are running in large sapphire cups, the friction being almost nil.

A regulator arm is provided which acts on the giant controlling hairspring exactly as in a watch.

By means of a roller attached to the upper part of the staff a lever is made to operate the wheel train at every oscillation of the balance wheel. This action is particularly safe and almost silent.

The illustration shows the balance wheel clock mounted on a solid, turned and polished base, containing the two driving cells, and protected by a glass shade 12 inches high. The total height over all is about 15 inches by 10 inches dia. base.

The dial is a glass circle $5\frac{1}{2}$ inches dia. with figures enamelled on in black, white, silver or gold as preferred, and in Roman or Arabic design—white figures show up best.



Price - **£4 4s.** each.

REASON MANUFACTURING COMPANY, LTD.,
LEWES ROAD, BRIGHTON.

Self-Contained Electric Pendulum Clocks
(*Murday's Patents*).

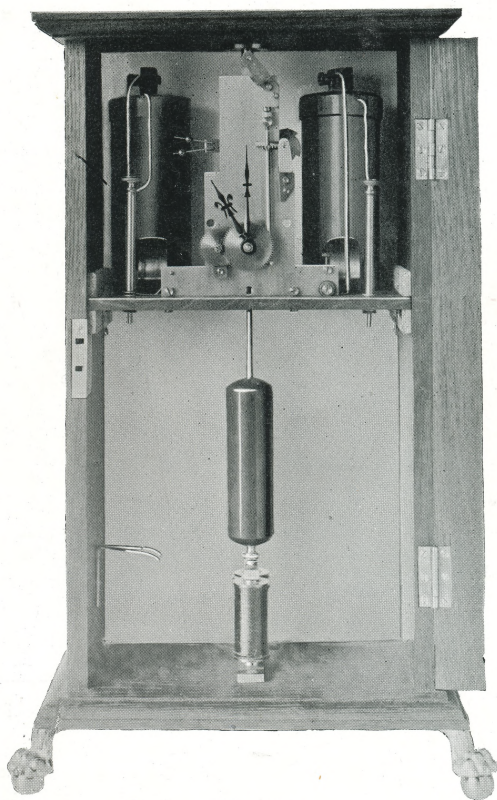


Fig. 1.

GENERAL DESCRIPTION.

Fig. 1 shows a general view of the mechanism of a half-seconds pendulum clock with the dial removed. It will be observed that the wheel train is extremely simple, and

mounted on the front face of a single plate. The complete movement with the dry cells is carried on a platform which can be withdrawn from the case.

Fig. 2 is a back view of the movement with the dry cells removed so that all details may be seen. The crutch, which is the forked rod by means of which the pendulum's motion is communicated to the wheel-work, is shown near the centre line of the movement plate. It is pivotted in a bracket at its upper end, and a little lower down carries a projecting arm on which the wire clicks are centred. These

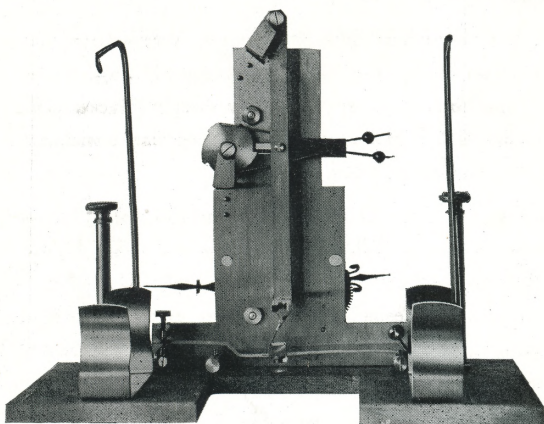


Fig. 2.

clicks, as the crutch swings to and fro with the pendulum, impel the click wheel round with an alternate push and pull motion.

The fork in which the pendulum rod hangs is seen near the lower end of the crutch, while hanging quite freely from the extremity of the crutch is a small piece of steel known as the "toggle." This, as the pendulum swings, slides over and off a brass block attached to a long flat spring, one end of which is fixed in a stud ; the free end is faced with platinum and plays between a platinum tipped contact screw and a

limiting screw above it. Normally the spring presses upwards against the point of the limiting screw, but when the pendulum arc is not sufficient to ensure the "toggle" sweeping right off the block, the point of the "toggle" trips in a groove on the block, thus depressing the contact spring by which the circuit is completed and the electro-magnet energised. This occurs as the armature on the lower end of the pendulum is approaching the magnet, and the attraction exerted on the armature imparts a fresh impulse to the pendulum, which will serve to keep it swinging freely for another 50 or 60 swings.

As the pendulum rod is of nickel steel, there is practically no variation of time-keeping due to change of temperature, and if the clock is placed on a steady shelf or bracket and left undisturbed it may be relied on to keep time to within a very few seconds per week.

Two dry cells will run these clocks satisfactorily for at least two years. It will be seen by referring to Fig. 1 that the two cells are held in position on the shelf which carries the movement by means of spring clips, while the milled head terminals by which they are connected to the clock mechanism are also plainly visible.

The photograph from which Fig. 2 was made was taken after the removal of the two cells, so that the spring clips and terminals are seen empty. This portion of the clock has been designed so that the cells can be removed with a minimum of trouble. The whole of the top shelf slides outwards so that all parts of the movements and the batteries can be got at easily.

The mere fact of sliding the shelf into position again makes the necessary electrical connections by means of spring contact pieces fitted to the shelf itself, and to the side of the case. Care should of course be taken in putting the shelf back to see that the pendulum rod is in its proper place in

the fork of the crutch, after which an impulse given to the pendulum by hand will start the clock going without further trouble.

All the various designs are fitted with movements of a construction similar to the foregoing description and illustrations Figs. 1 and 2 ; the difference in price being due to the style of case.

Instructions for setting up Self-Contained Pendulum Clocks.

The platform to which the movement, dial and battery are fixed must be drawn out of the case and the packing removed. The string holding the crutch should be undone, and the pendulum carefully hooked on the suspension spring which is fixed in the top of case, the opening in the hook being kept towards the front.

Using the pendulum as a plumb bob, level the case by means of the adjustable balls attached to the feet until the iron armature on the lower end of the pendulum rod hangs truly over the magnet poles. It is very important that this adjustment be carefully made, and that the case is steady and does not rock.

When replacing the movement platform, see that the pendulum rod passes between the tangs of the crutch fork. The pendulum should be set swinging through a good arc, and it will afterwards continue to swing of its own accord.

If the clock is to be moved temporarily at any time, it will be found best to secure the pendulum by springing it into the brass hook provided for this purpose at the left-hand side of the case.

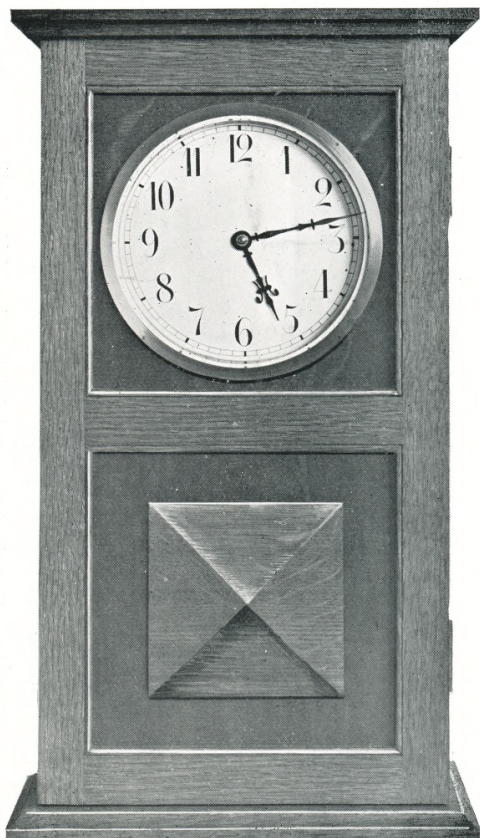
When packing for transit the pendulum must be removed from the case and packed separately, while the crutch should be tied up to the left and paper packing placed between the cells as when sent out.

Regulation is accomplished as in other pendulum clocks by means of the thumb screw beneath the bob. Raising the bob will make the clock go faster, while lowering it will have a slowing effect. One turn of the screw will make a difference of about half-a-minute per day.

REASON MANUFACTURING COMPANY, LTD.
LEWES ROAD, BRIGHTON.

Electric Pendulum Clock.

No. 1.

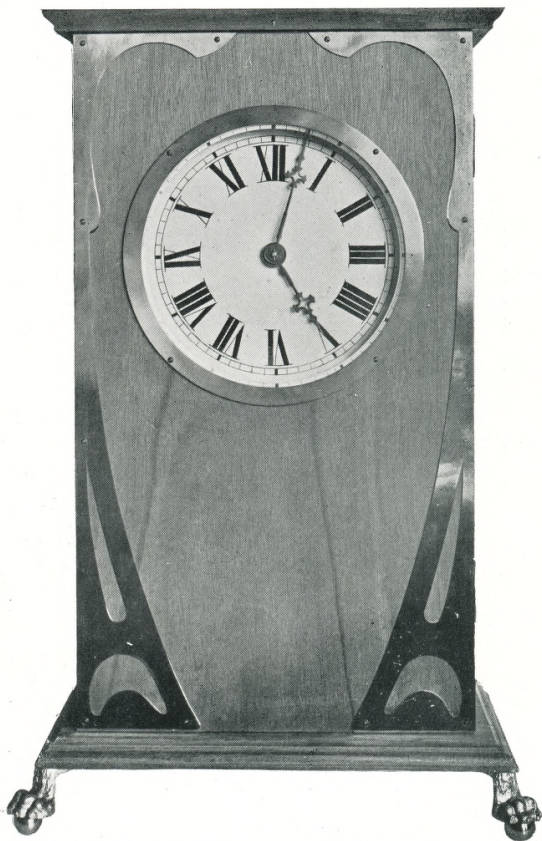


Fumed oak case with panelled door, best quality enamelled dial 6 inches dia., bevelled plate glass, mounted in solid brass bezel. Size of case, 18 in. high, by 10 in. by 6 in.

PRICE—**£2 2s.** each.

REASON MANUFACTURING COMPANY, LTD.,
LEWES ROAD, BRIGHTON.

Electric Pendulum Clock.
No. 2.



Solid oak case, fumed or stained, with brass or copper mountings.

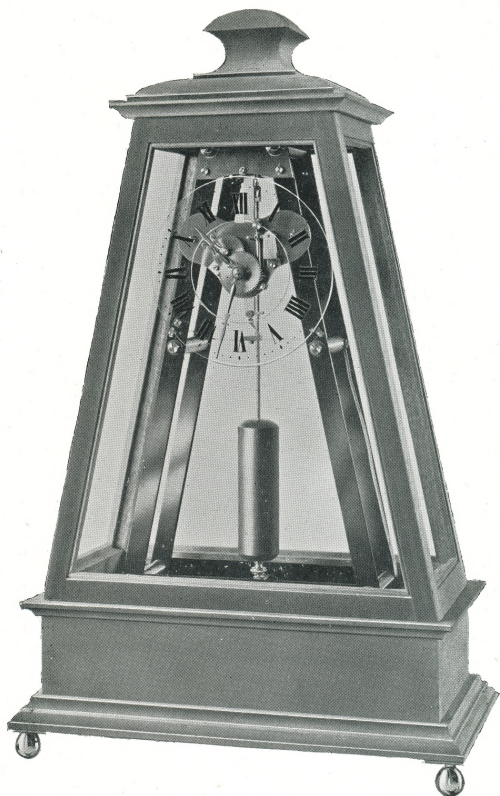
PRICE—**£3** each.

Highly polished mahogany case, with brass or copper mountings.

PRICE—**£3 3s.** each.

REASON MANUFACTURING COMPANY, LTD.,
LEWES ROAD, BRIGHTON.

Electric Pendulum Clock. No. 3.

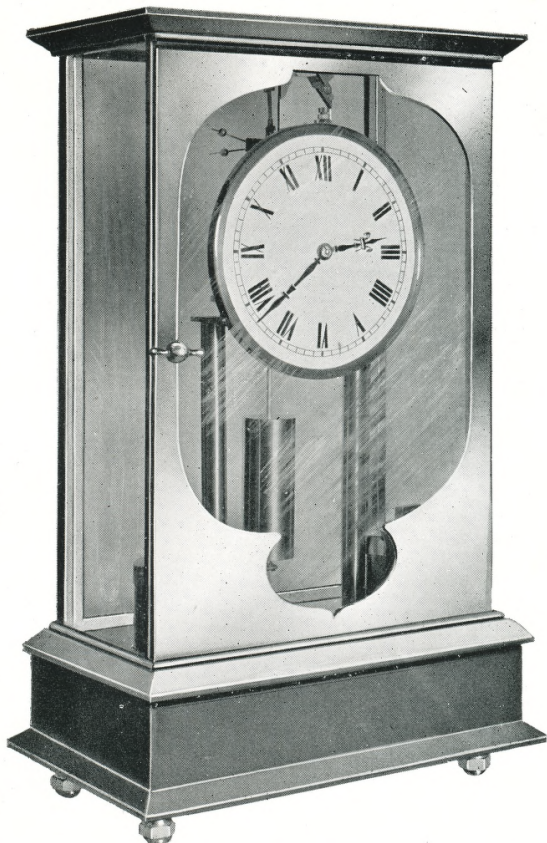


"A" design. A novel form of case, in highly-polished mahogany and glass, showing all working parts. The dial is a glass circle, $5\frac{1}{2}$ in. diameter, with figures (Roman or Arabic) painted in white, silver or gold as desired. The battery of two cells is contained in the base.

PRICE—**£3 3s.** each.

REASON MANUFACTURING COMPANY, LTD.,
LEWES ROAD, BRIGHTON.

Electric Pendulum Clock. No. 4.



A handsome case consisting of solid brass pillars with heavy bevelled brass base and top, glazed with best quality plate glass, hinged brass and glass door, the whole mounted on polished mahogany base containing the cells.

PRICE—**£4 4s.** each.

REASON MANUFACTURING COMPANY, LTD.,
LEWES ROAD, BRIGHTON.

Electric Pendulum Clock.

No. 5.



Diagonal frame, in fumed oak, with 12in. dial, fitted with half-seconds pendulum movement, as shown in figs. 1 and 2, suitable for Workrooms, Offices, Schools, &c.

PRICE—**£2 12s. 6d.** each.