N° 2879 A.D. 1903

Date of Application, 6th Feb., 1903

Complete Specification Left, 3rd Nov., 1903—Accepted, 10th Dec., 1903

PROVISIONAL SPECIFICATION.

"Improvements in or relating to Electrically Operated Clocks".

We, ALFRED LOEBL, Merchant, of 102, Charing Cross Road, London, W.C. HERBERT SCOTT, Manufacturer, of 6 Selborne Terrace, Bradford, Yorkshire, and THE AMERICAN ELECTRICAL NOVELTY & MANUFACTURING COMPANY, LIMITED, of 102 Charing Cross Road, London, W.C. do hereby declare the nature of this invention to be as follows—

This invention relates to electrically operated clocks, its object being the construction of a clock mechanism which, while reliable and efficient in its operation, is simple and cheap to manufacture and of very few parts.

The invention has particular reference to clocks of the type in which the pendulum receives an impulse from an electro-magnet only when the amplitude of its swing is diminished, a contact being then made which completes an electric circuit in which the electro-magnet and an exciting battery are placed.

In clocks according to this invention the pendulum is provided with a pivotted pawl which engages with the teeth of a ratchet wheel and pulls this wheel round tooth by tooth as the pendulum swings. Preferably the teeth of the ratchet wheel are notched near their points and when the swing of the pendulum is normal the pawl passes right over the notch to the bottom of the tooth, but when the amplitude of the swing diminishes, the pawl lodges in the notch and, moving on the return stroke of the pendulum in a higher plane, is brought against a contact piece yieldingly supported and thus completes the electric circuit containing the electro-magnet. Preferably the contact piece is pivotted and controlled by a light spring to ensure a good wiping contact with the pawl, but in some cases the spring may be dispensed with and the contact piece depend for its action upon gravity alone.

The ratchet wheel is preferably so placed that the tooth operated upon by the pawl lies practically in the line of motion of the pendulum, so that a direct pull is exercised by the pawl as the pendulum swings.

Upon the spindle of the ratchet wheel is a worm which gears with a worm wheel mounted upon the minute hand spindle, and the usual gear is provided between the minute and hour hands. A detent is provided for the ratchet wheel and may conveniently be in the form of a bent piece of wire lightly pivotted and arranged to fall, through the action of gravity into the spaces between the teeth as the wheel revolves.

The pendulum may swing from back to front, *i.e.* practically at right angles to the face dial, and in order to be able to employ a ratchet wheel of fairly large diameter and at the same time to economise space, it is preferred to mount the spindle carrying the ratchet wheel and the worm in an inclined position on the back plate and to slot that plate to allow for the passage of the wheel.

Although it is preferred to employ a ratchet wheel with notched teeth, other arrangements for completing the electric circuit may be used; for instance, a small plate, preferably of insulating material, may be placed adjacent to the tooth of the ratchet wheel operated upon by the pawl in such a posi-

tion that normally the end of the pawl passes over the plate down to the bottom of the notch between the teeth, but when the amplitude of the swing is diminished, the pawl then lodges on the plate and travels along it making contact in its passage with a pin or wire thus completing the electric circuit.

Again, the contact piece itself may be so placed that the pawl normally clears it as it drops down in front of the tooth, but with a diminished swing strikes the contact piece as it descends and thus completes the circuit.

Dated this 6th day of February, 1903.

BOULT, WADE & KELBURN,
Agents for the Applicant.

COMPLETE SPECIFICATION.

"Improvements in or relating to Electrically Operated Clocks."

We, ALFRED LOEBL, Merchant, of 102, Charing Cross Road, London, W.C., HERBERT SCOTT, Manufacturer, of 6, Selborne Terrace, Bradford, in the County of York, and THE AMERICAN ELECTRICAL NOVELTY & MANUFACTURING COMPANY, LIMITED, of 102 Charing Cross Road, London, W.C., do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

This invention relates to electrically operated clocks, its object being the construction of a clock mechanism which, while reliable and efficient in its operation, is simple and cheap to manufacture and of very few parts.

The invention has particular reference to clocks of the type in which the pendulum receives an impulse from an electro-magnet only when the amplitude of its swing is diminished, a contact being then made which completes an electric circuit in which the electro-magnet and an exciting battery are placed.

In clocks according to this invention the pendulum is provided with a pivoted pawl which engages with the teeth of a ratchet wheel and pulls this wheel round tooth by tooth as the pendulum swings. Preferably the teeth of the ratchet wheel are notched near their points and when the swing of the pendulum is normal the pawl passes right over the notch to the bottom of the tooth, but when the amplitude of the swing diminishes the pawl lodges in the notch and, moving on the return stroke of the pendulum in a higher plane, is brought against a contact piece yieldingly supported and thus completes the electric circuit containing the electro-magnet. Preferably the contact piece is pivoted and controlled by a light spring to ensure a good wiping contact with the pawl, but in some cases the spring may be dispensed with and the contact piece depend for its action upon gravity alone.

The ratchet wheel is preferably so placed that the tooth operated upon by the pawl lies practically in the line of motion of the pendulum, so that a direct pull is exercised by the pawl as the pendulum swings.

Upon the spindle of the ratchet wheel is a worm which gears with a worm wheel mounted upon the minute hand spindle, and the usual gear is provided between the minute and hour hands. A detent is provided for the ratchet wheel and may conveniently be in the form of a bent piece of wire lightly pivoted and arranged to fall, through the action of gravity, into the spaces between the teeth as the wheel revolves.

The pendulum may swing from back to front, *i.e.*, practically at right angles to the face dial, and in order to be able to employ a ratchet wheel of fairly

large diameter and at the same time to economise space it is preferred to mount the spindle carrying the ratchet wheel and the worm in an inclined position on the back plate and to slot that plate to allow for the passage of the wheel.

Although it is preferred to employ a ratchet wheel with notched teeth, other arrangements for completing the electric circuit may be used; for instance, a small plate, preferably of insulating material, may be placed adjacent to the tooth of the ratchet wheel operated upon by the pawl in such a position that normally the end of the pawl passes over the plate down to the bottom of the notch between the teeth, but when the amplitude of the swing is diminished, the pawl then lodges on the plate and travels along it making contact in its passage with a pin or wire thus completing the electric circuit.

Again, the contact piece itself may be so placed that the pawl normally clears it as it drops down in front of the tooth, but with a diminished swing strikes the contact piece as it descends and thus completes the circuit.

In the accompanying drawings:—

Figure 1 is a rear elevation partly in section of one construction of electric clock according to this invention;

Figures 2 and 3 are respectively a side elevation and a plan of portions of the same;

Figures 4 and 5 are respectively an elevation and plan showing a modified form of ratchet wheel and contact maker, and

Figures 6 and 7 are views similar to Figures 4 and 5 illustrating another modification of the wheel and contact maker.

Like letters indicate like parts throughout the drawings.

With reference first to Figures 1, 2 and 3, upon a base A are standards B forming part of the frame or back-plate of the clock and supporting the dial C. The pendulum D is suspended as at D^1 and provided with an armature D^2 which is carried by the motion of the pendulum over the poles of an electro-magnet E. Pivotted to the pendulum is a pawl F adapted to engage with the teeth of a ratchet wheel G mounted on a spindle H in bearings H^1 on the back plate B. The spindle H carries a worm H^2 engaging with a worm-wheel J mounted directly upon the spindle bearing the minute hand. The gear between the minute hand spindle and the hour hand may be of the usual type and is not shown in the drawings.

In order to economise space and to bring the upper part of the ratchet wheel G practically into the plane of oscillation of the pendulum D the spindle H is placed in an inclined position on the back plate and the plate slotted, as at B^1, to allow the wheel to project through it. Each tooth of the ratchet wheel G is notched, as at G^1, and when the pendulum D is making its normal swing the pivoted pawl F on the forward swing passes over the notch and falls down in front of the top tooth, rotating the wheel G through a space equal to one tooth on its backward swing. When the amplitude of the swing diminishes the pawl F lodges in the notch G^1 and then on the backward stroke of the pendulum a contact F^1 on the pawl makes connection with a contact-piece K^1 on the end of a pivoted arm K. This arm K is supported on a plate K^2 insulated from the frame B and connected as by the wire K^3 to an electric circuit in which a battery, the electro-magnet E and the frame of the clock are joined.

Thus when the contact F^1 on the pawl F makes connection with the contact arm K^1 the circuit through the electro-magnet is completed, the armature D^2 is momentarily attracted and the amplitude of the swing of the pendulum restored to its normal amount.

The arm K carrying the contact K^1 is provided with a light spring K^4 and a regulating screw K^5.

The battery may conveniently take the form of two cells L contained within

the base A and arranged to automatically make their connections when they are pushed into place.

In order that at each return stroke of the pendulum the wheel G may be rotated through a space equal to one tooth and may then remain stationary when the pendulum swings forward, a detent is provided in the shape of a light wire M pivoted to the back plate B.

Figures 4 and 5 show a modified arrangement of ratchet wheel and contact maker. In this construction the teeth G^2 are not notched and a small plate K^6 of insulating material carrying a contact K^7 is placed beside the ratchet wheel.

With a normal stroke of the pendulum the pawl F falls over the plate and contact without touching them, as shown in chain lines in Figure 4, but when the swing diminishes the pawl lodges on the plate and on the return stroke is dragged over it making contact with K^7.

The arrangement shown in Figures 6 and 7 is somewhat similar, the pawl F normally falling clear of a contact pin K^8, but touching it as it descends when the swing is diminished.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. In an electric clock the combination with a ratchet wheel having notched teeth G^1 of worm gearing directly connecting the wheel with the minute hand spindle substantially as described.

2. In an electric clock the arrangement of ratchet wheel, pawl and contact substantially as described and illustrated in Figures 4 and 5 or Figures 6 and 7 of the accompanying drawings.

3. The electric clock substantially as described and illustrated in Figures 1, 2 and 3 of the accompanying drawings.

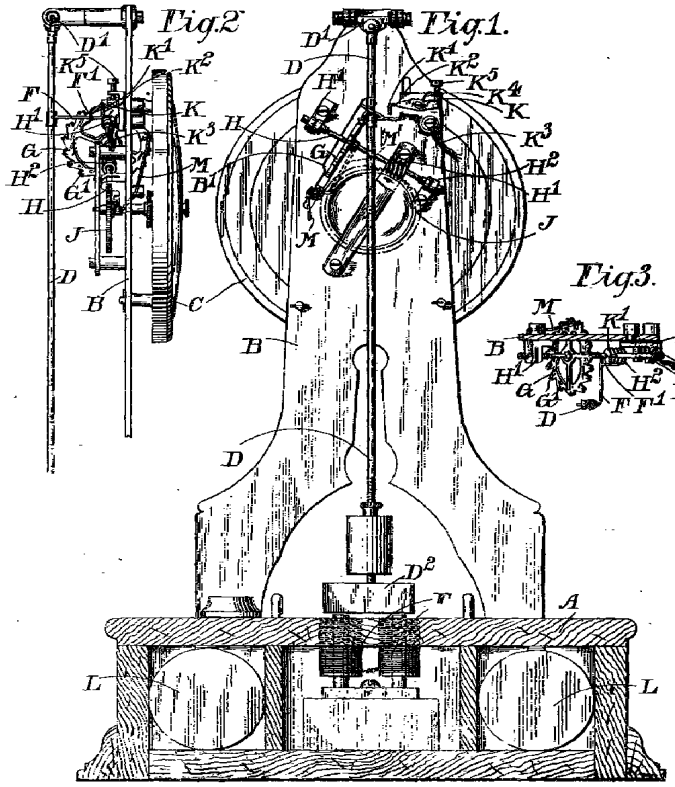
Dated this 3rd day of November 1903.

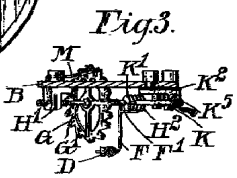
ALF. LOEBL,
HERBERT SCOTT,
Boult, Wade & Kilburn,
Agents for the Applicant.

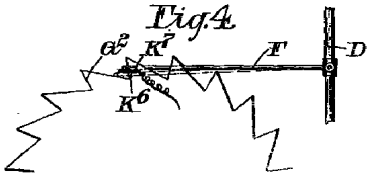
Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1903.

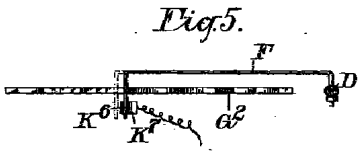
A.D. 1903. Feb 6, N° 2879.
LOEBL & *others'* Complete Specification.

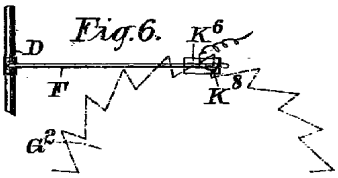
(1 Sheet)

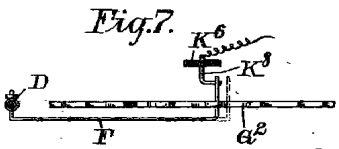












[This Drawing is a reproduction of the Original on a reduced scale.]

Malby & Sons, Photo-Litho.

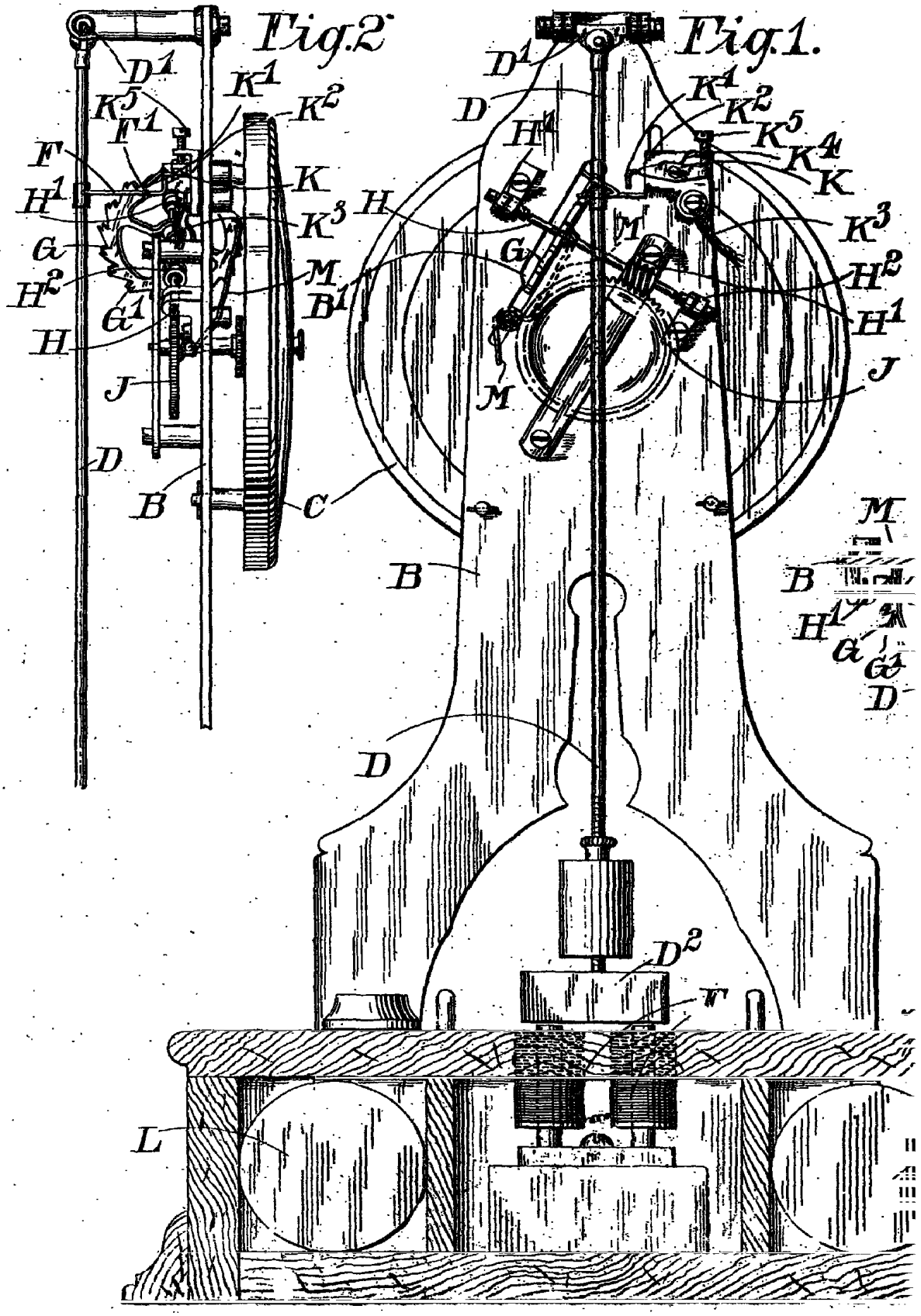


Fig.2
Fig.1.
D1
K1
K2
K5
K4
K
K3
H
H1
H2
F
F1
G
G1
M
B1
B
C
J
D
D2
W
L

(1 SHEET)

Fig.4.

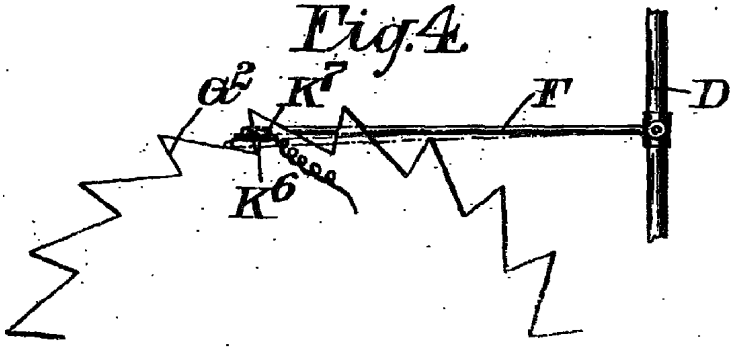


Fig.5.

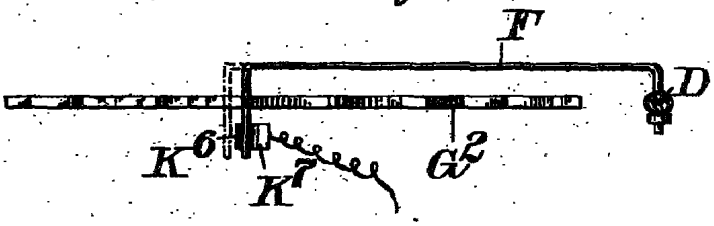


Fig.3.

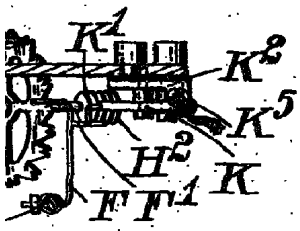
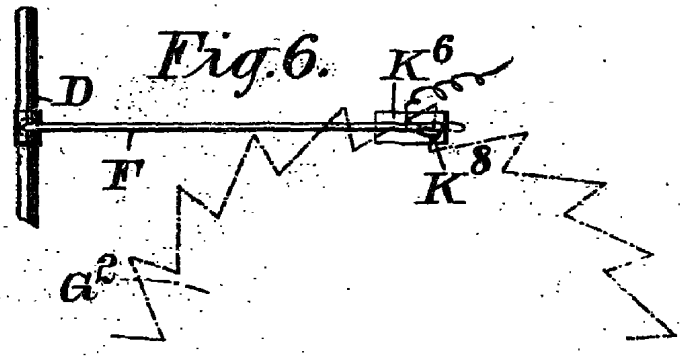


Fig.6.



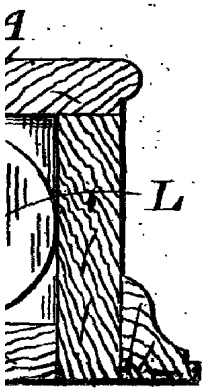
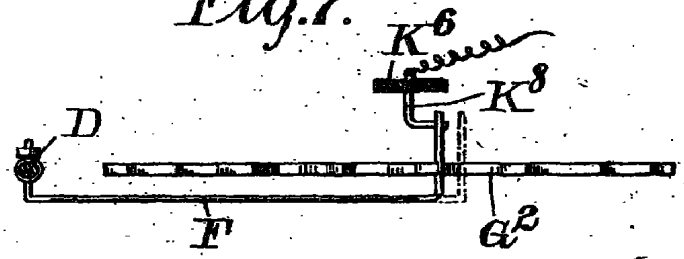


Fig.7.



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