N° 7211 A.D. 1905

Date of Application, 5th Apr., 1905—Accepted, 22nd June, 1905

COMPLETE SPECIFICATION.

"Improvements in or relating to Electric Clocks"

I, HENRI ALFRED CAMPICHE, Watchmaker, of 9 Chantepoulet, Geneva, Switzerland, 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 electric clocks and has particular reference to clocks having receiving dials of large dimensions. Such dials have the disadvantage that their hands owing to their size and inertia are liable to jump more than one minute or other predetermined interval, at each impulse caused by the regulator of the installation; furthermore as these hands are generally placed out of doors, their motions are liable to be influenced by the wind. Now of course this might be avoided by simply covering the hands and the dial with a protecting glass but this would be very inconvenient for very large dials and would be prejudicial to the reading of the time on account of reflections or condensations which would prevent the hands being seen.

The object of the present invention is the construction of mechanism intended to exactly control the motion of the minute hand for a predetermined division of the dial (for instance, minute by minute) whatever may be the dimensions of the said hands.

This is effected on the one hand by constructing the motive device for causing the advance of the hand, in such a manner as to allow the same to operate if necessary during a whole minute whenever a resistance is opposed to the movement of the hand, for instance, by the wind. Further, a multiple stopping device is provided to prevent the hand from jumping more than one division at each impulse received.

The accompanying drawings show one construction of the invention.

Figure 1 is an elevation of the back of the device.

Figure 2 is a vertical section on the line A—B of Figure 1, shown from left to right, and

Figure 3 is a plan.

a is the plate to which is secured the dial b. The axis c of the minute hand carries a small ratchet-wheel d having 60 sharp teeth and intended to cause the rotation of the hands, and a large stop-wheel e provided with 60 straight teeth and intended to prevent the hand jumping more than one tooth at each impulse.

There is provided a driving or propelling lever f pivoted to a suitable bridge g which is fixed to the frame a of the mechanism. Said lever f carries a weight i and a pawl h operated by a spring h^1 and engaging the teeth of the propelling ratchet-wheel d. The stroke of the propelling-lever f is limited in either direction by suitable screws k^1 and k^2 or other adjustable abutments, and the weight of said lever f is intended to cause the propelling of the minute-hand whenever the stop-wheel e is not stopped by the usual stopping-devices which will be described below.

In its normal position the propelling-lever f is resting upon a stop or abutment k^1, but once a minute, it is lifted by the horizontal arm of a crank-lever l, which is pivoted to a fixed point m of the framing and the vertical arm l^1 of which forms the armature of an electro-magnet n. Said armature l^1 carries an adjustable counterweight l^2 and is intended to be attracted by the electro-magnet n.

[*Price 8d.*]

There is further provided on a pivot *o* a rocking stop-lever *p*, bearing one fixed tooth p^2 intended to engage the above mentioned large stop-wheel *e* and to prevent the hand jumping through an angle corresponding to more than one tooth of the wheel at each impulse.

The said rocking-lever *p* carries an arm p^3 with an adjustable stopping-screw *q* which bears against the propelling-lever *f*, so that the said stopping-lever *p* is lifted simultaneously with the propelling-lever *f* at each action of the electro-magnet *n* upon its armature.

The propelling-lever *f* bears an abutment f^1 intended to limit the stroke of stopping-lever *p*. To a fixed point *r* of the frame *a* there is fixed a spring r^1, the free end of which bears against an arm p^3 of the stopping-lever *p* in order to prevent sudden jumps of the latter.

To a secondary lever *s* which is pivoted to the same fixed pivot as the stopping-lever *p*, there is provided a secondary stop-tooth intended to engage the teeth of the stop-wheel *e*. A pin *t* fastened to the propelling-lever *f* is intended to act upon the said secondary-lever *s* and to throw it upward whenever said propelling-lever *f* is lifted by the armature of the electro-magnet *n*.

There is further provided a third safe-click *u* engaging through the action of gravity the teeth of the stop-wheel *e* and there may be provided a fourth or supplementary stop-lever or detent engaging the teeth of the stop-wheel and acted upon by a suitable projection of the propelling lever in such a manner as to engage the said teeth in the very moment when the other stop-teeth or discs are disengaged out of the same.

With a view of rendering the drawing perfectly clear, this fourth stop-lever or detent *v* is shown only in the Figures 1 and 3, and in dotted lines. It is pivoted on an axis v^1 which is parallel to the plane of wheel *e* and it is acted upon by a pin *x* fixed to the lever *f*.

The stop-tooth p^2 and the end of the clicks *s* and *v* are each preferably provided with a roller.

Working.

Whenever the electro-magnet *n* of the receiver connected to the circuit of a regulator-clock of any system whatever, is supplied with current, it attracts its armature, the horizontal arm *l* of which raises the propelling lever *f* and causes the pawl *h* of the same to advance by one tooth the propelling-wheel *d*. The propelling-lever *f* lifts in turn the stopping-lever *p* bearing the stop-tooth p^2 and also the secondary stop-lever *s* and allows the stop-wheel *e* to be turned when the armature is released and the propelling ratchet-wheel is acted upon by means of the weight *i* and the pawl *h*. This causes a rotary motion equivalent to one tooth of the ratchet-wheel *d* and during this time the tooth p^2 of lever *p* and the end of click *s* rests each upon one tooth of wheel *e*. The supplementary stop-lever or detent *v* is constructed and arranged in such a manner that it is engaged into the teeth of wheel *e* by the upward motion of pin *x*, so that as long as the armature l^1 is attracted the wheel *e* cannot rotate even though it is free from the detents p^2 and *s*. As soon, however, as the current ceases and the driving lever *f* descends tending to rotate the wheel *d*, the supplementary detent *v* disengages the stop wheel *e* and allows it to rotate for one tooth.

When the lever *f* has again reached the bottom of its stroke the three clicks p^2, *s* and *u* are blocking the wheel *e* in quite a safe manner until the next impulse caused by the electro-magnet *n* to the lever *f*.

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

1. In the driving and releasing mechanism of an electric clock, the combination with the armature *l* of an electro-magnet *n* of a driving lever *f* having a

pawl h operating a ratchet d and a stop wheel e, this stop wheel being engaged by the tooth p^2 of a stop lever p and by a stop pawl s.

2. In mechanism as claimed in Claim 1 the combination with a driving lever f having adjustable stops k^1 and k^2 and a stop f^1 of a lever p having an arm p^3 carrying a set screw q operated by a spring r^1 and engaging at the end of its travel with the stop f^1.

3. In mechanism as claimed in Claim 1 the combination with the driving lever f and the stop wheel e of a rod t for raising the pawl s and a safety pawl u.

4. In mechanism of the kind described the combination with the driving lever f and stop lever p of a supplementary detent such as v substantially as described.

5. Mechanism for driving and releasing an electric clock comprising an electro-magnet and its armature, a driving lever f having a pawl engaging with a ratchet wheel d, a stop wheel e fixed to the ratchet wheel, a stop lever p disengaged from the stop wheel e at the beginning of the starting or upward stroke of the driving lever, a stop lever or supplementary detent v caused to engage the stop wheel at the end of the starting or upward stroke of the driving lever and one or more pawls such as s and u to block the stop wheel as soon as the driving lever reaches the end of its active or downward stroke substantially as described.

6. The mechanism for an electric clock substantially as described or illustrated in the accompanying drawings.

Dated this 5th day of April, 1905.

BOULT, WADE & KILBURN,
Agents for the Applicant.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1905.

A.D. 1905. April 5. N°. 7211.
CAMPICHE'S Complete Specification.

1 SHEET.

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

Fig.1.

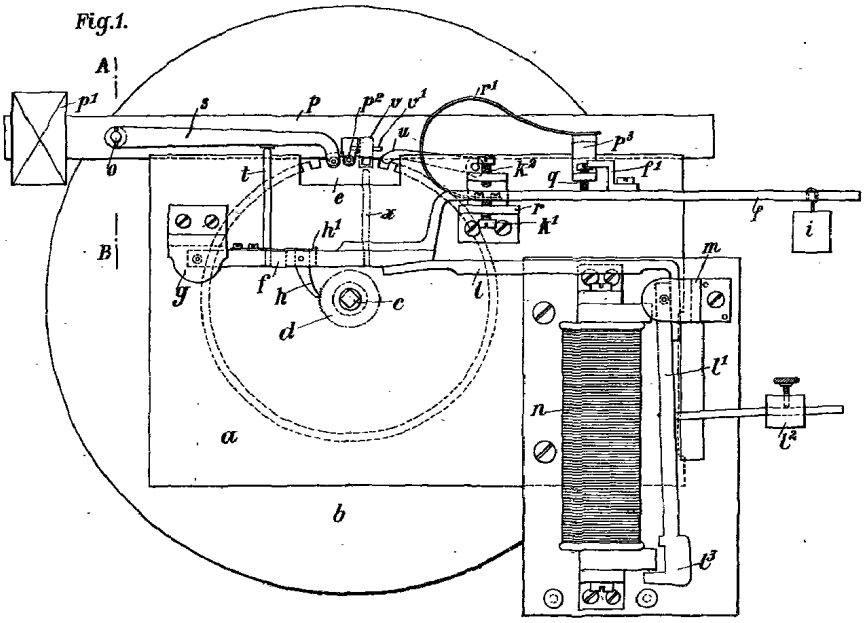

Fig.2.

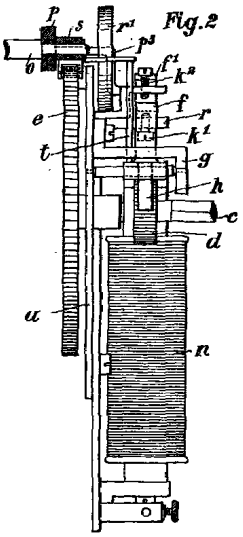

Fig.3.

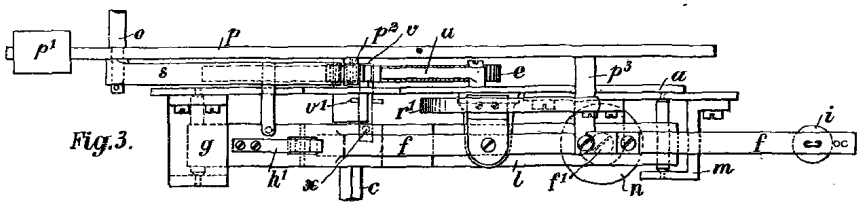

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Fig.1.

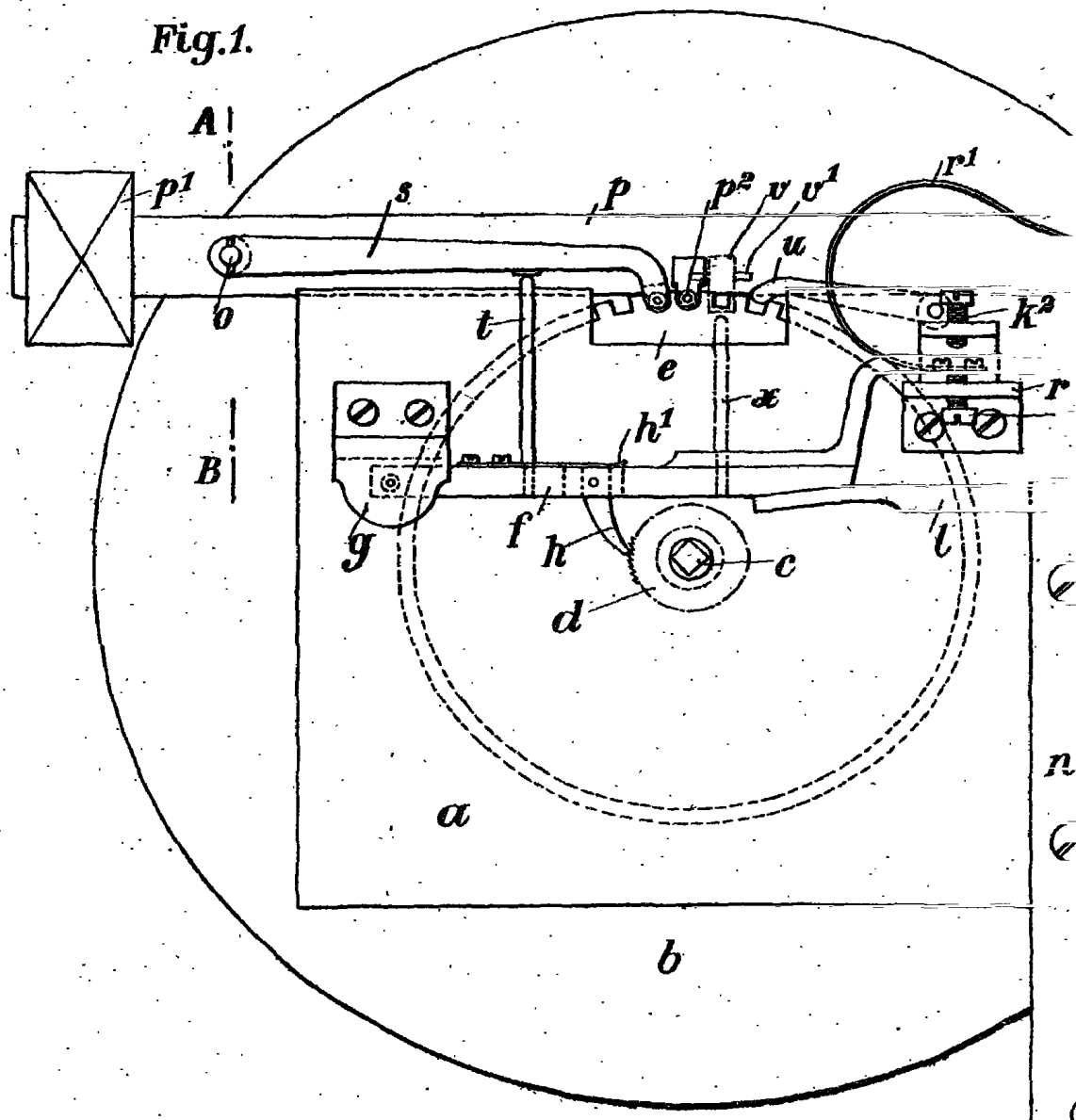
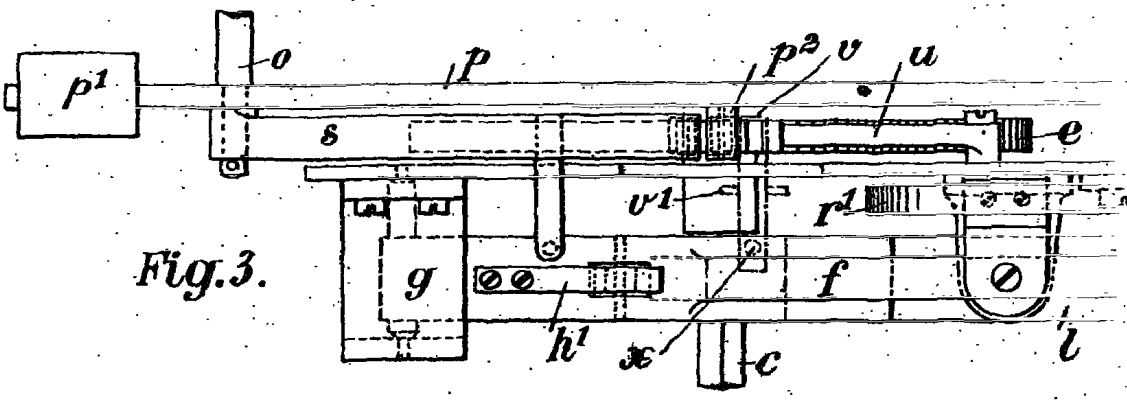


Fig.3.



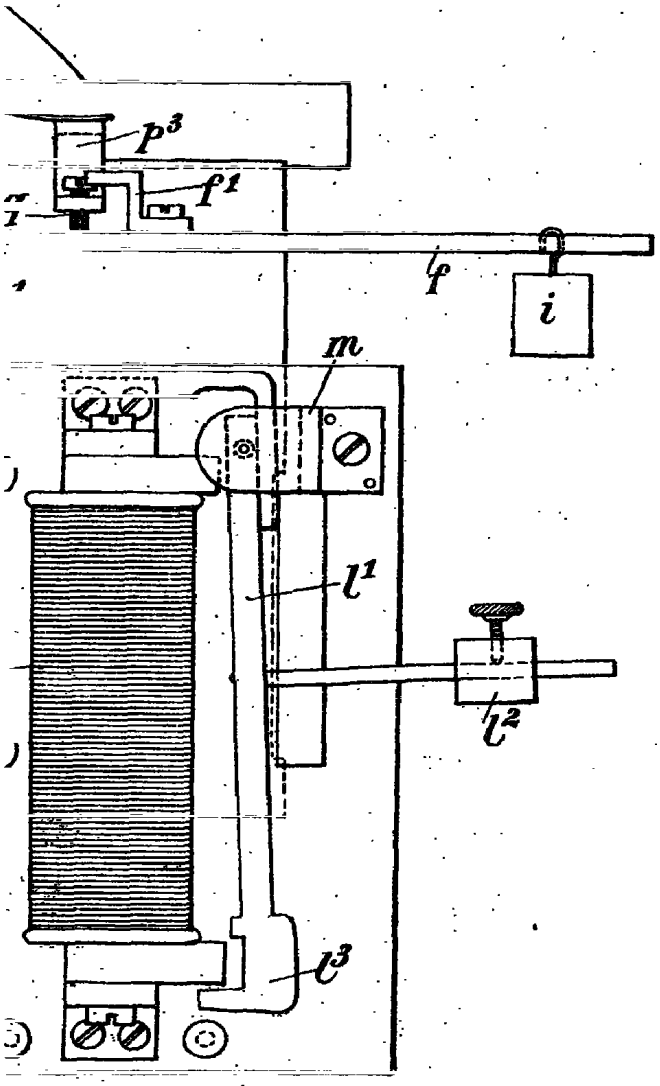
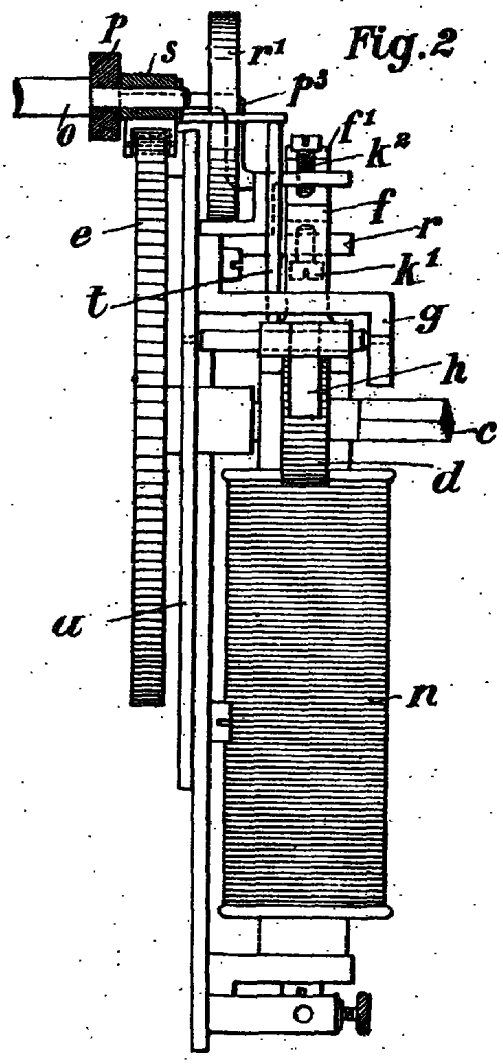
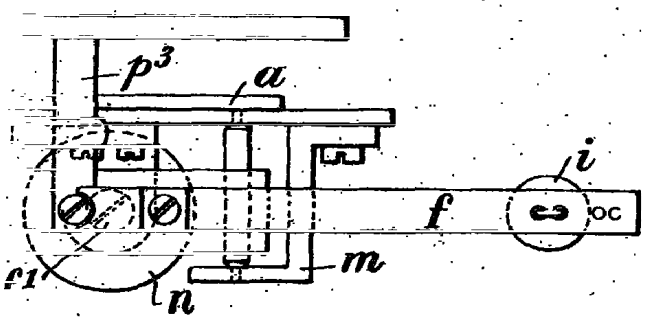


Fig. 2





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