N° 17,779 A.D. 1912

(*Under International Convention.*)

Date claimed for Patent under Patents and Designs Act, 1907, being date of first Foreign Application (in Switzerland), 1st Aug., 1911

Date of Application (in the United Kingdom), 31st July, 1912

At the expiration of twelve months from the date of the first Foreign Application, the provision of Section 91 (3) (a) of the Patents and Designs Act, 1907, as to inspection of Specification, became operative

Accepted, 27th Feb., 1913

COMPLETE SPECIFICATION.

Improvements in or relating to Electric Striking Gear.

I, HENRI CAMPICHE, Clock-Maker, of 9, rue de 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:—

The present invention concerns an improved electric striking gear which indicates by striking, the hour or hours and fractions of the same.

It has been proposed to use in a self-contained electric clock a system of levers for winding up the striking train, operated by an armature, which also serves to drive the going-train, the levers being put out of gear with a ratchet wheel, or the like on the spring barrel as soon as the spring for the striking gear has been wound up to a certain predetermined degree, whilst, as soon as the tension of the spring for the striking gear diminishes, the system of rods or levers engage with the teeth of the ratchet wheel and are thus again enabled to wind up the spring to the utmost permissible tension.

According to the present invention, a barrel is employed, provided with a spring actuating the striking mechanism, and which is wound under the action of an electro-magnet periodically excited, for instance every minute, by a primary or distributing electric clock, so that after each operation of the striking mechanism, the spring is wound a determined number of times before a new operation of the striking mechanism under the action of the spring takes place. Thus it is necessary to wind up the spring only the quantity necessary for one operation of the striking mechanism and a comparatively light spring may be employed and thus the operation of the striking mechanism may be obtained from any desired distance with a power which is practically no higher than the power necessary to operate the usual receiving clock indicating the hour without striking the same.

A spring actuated device carried by the armature of the electro-magnet is employed to wind the spring and this spring device recedes whenever the said spring is wound to a predetermined point.

[*Price 8d.*]

To more fully disclose the invention, the same will now be described with reference to the annexed drawings showing an embodiment of the same.

Figure 1 is an elevation of the said embodiment.

Figures 2 and 3 are separate views of an operating lever of the device, which lever is actuated by the electro-magnet.

Figure 4 is a side view, and

Figure 5 a front view of certain parts of the device.

a is the barrel in which is arranged the light spring operating the striking mechanism which spring tends by means of gear wheels to rotate the shaft *b* carrying the wheel *c* on which are mounted operating pins or studs. Whenever the wheel *c* is rotating, the said pins or studs act on an arm d^1 of a shaft *d*. On this shaft acts a light spiral spring *e* tending to maintain the shaft in a position in which the arm d^1 projects in the path of the studs of the wheel *c*. The shaft *d* furthermore carries a contact piece d^2 which, whenever the arm d^1 is actuated by one of the pins of the wheel *c*, is operated, and comes into contact with the fixed contact springs f^1, f^2 and thus connects said springs. These springs may be connected to the ends of a circuit which causes a bell or other sounding device to be sounded whenever the circuit is closed through the contact springs f^1, f^2. For instance a usual electric alarm may be inserted in the circuit or a relay causing a sounding device to be sounded whenever the circuit is closed.

The rotation of the shaft *b* under the action of the barrel *a* is normally prevented and allowed at definite times by a rack or any other usual known clock striking gear. On the shaft operating said gear is mounted the toothed wheel *g* which may be acted upon by the pawl *h*, carried by the actuating lever h^1 pivotally mounted in h^2. The lever h^1 carries the armature *i* on which acts the electro-magnet *k* periodically excited, for instance once every minute, by a current sent by a generating or primary clock. On the lever h^1 acts the spring h^3 in the free end of which an opening is provided, through which passes the screw h^4, carried by the lever h^1. The spring h^3 tends to maintain the lever h^1 in its retracted or backward position, shown on the drawing and in which the pawl *h* is maintained at a distance from the wheel *g*, and the stop h^5 carried by the lever rests against the fixed support piece h^6 of the spring h^3. The lever h^1 carries a spring *l* the forked free end of which carries a pawl l^1. On this pawl acts a light spring l^2 which maintains the pawl pressed against the teeth of the barrel *a*. Any backward movement of this latter is prevented by retaining pawls *m* and *n* on which act springs which maintain the pawls pressed against the teeth of the barrel *a*. The pawl *n* is a safety pawl mounted on a screw n^1, which passes through an elongated opening of the pawl so that the pawl may move together with the teeth of the barrel *a* during a part of the movement of the same.

The operation of the device is as follows: Each time the electro-magnet *k* is excited, the armature *i* is attracted and the lever h^1 swings. Thus the pawl *h* is brought against the teeth of *g* and said wheel is rotated until the pawl *h* comes to bear against the free end of the stop-screw *o*. The current through the electro-magnet having ceased, h^1 is again moved into its position of rest by h^3. A pawl *p* prevents the backward movement of *g*. The spring *l* is swung together with the lever h^1 and causes the barrel *a* to be rotated and the spring placed in the barrel to be wound up if said spring is not sufficiently wound for the operation of the striking mechanism. If the spring of the barrel *a* is sufficiently wound up, the spring *l* is bent without causing further movement of the barrel. The arbor carrying the wheel *g* may carry a minute indicating hand connected by means of a usual motion gear to an hour indicating hand movable together with the minute hand before a dial in the usual way, or no hands may be provided. Whenever the impulse sent by the generating or primary clock to the electro-magnet corresponds to an hour or a fraction on which striking must take place, the usual gear operated by *g* leaves free the arbor *b* and said arbor is

rotated by the spring of the barrel *a* until the arm d^1 has been operated by the pins of the wheel *c* a number of times corresponding to the hour to be indicated by striking. Each time the shaft *d* is operated, closing of the striking circuit through the springs f^1, f^2, is caused, and the alarm or other sounding device operated by said circuit is sounded.

Instead of causing a sounding device to be operated by the closing of an electric circuit, the shaft *d* may as in the usual clocks carry a hammer or any other usual means which may strike on a bell or other equivalent means or otherwise mechanically cause such means to be sounded.

The gear leaving free at predetermined intervals the spring actuating the striking mechanism may be of the rack type or of any other usual type in which the heavy spring necessary to operate the striking mechanism during a period comprised between two consecutive winding up of the spring that is to say as a rule during eight days or at least one day is replaced by a light spring having only the power necessary to operate the striking mechanism to strike only once without being wound up.

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. An electric striking gear intended to be combined with an electric receiving or secondary clock, characterised by a winding mechanism of the spring operating the striking mechanism, said winding mechanism comprising an electro-magnet and an operating lever which at the same time actuates the mechanism of the secondary clock so that a single attraction of the electro-magnet causes at the same time the registration of the minute or fraction of the same and the winding up of the striking work without affecting the accuracy of the registration of the minutes owing to a receding or resilient arrangement with which the operating lever is provided to wind up the striking mechanism.

2. An electric striking gear according to Claim 1, characterised by a barrel operating a striking mechanism and provided with a light spring which, after each operation of the striking mechanism, is wound up a determined number of times by an electro-magnet periodically excited by a primary clock, the action of the electro-magnet being transmitted to the barrel by a mechanism which ceases to cause the barrel to be operated whenever the spring of this last has been wound up sufficiently for one operation of the striking mechanism.

3. An electric striking gear according to Claim 1, in which the barrel containing the spring operating the striking mechanism is operated by a pawl carried by a spring mounted on a lever actuated by the electro-magnet, which lever carries further a pawl operating a usual clock striking gear to let free the striking mechanism at predetermined intervals.

4. An electric striking gear according to Claim 1, in which the backward movement of the barrel in which is placed the spring operating the striking mechanism is prevented by two pawls one of which is mounted on a screw passing through an elongated opening of the pawl.

5. An electric striking gear substantially as described or illustrated in the accompanying drawings.

Dated this 31st day of July, 1912.

BOULT, WADE & TENNANT,
111 & 112, Hatton Garden, London, E.C.,
Chartered Patent Agents.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1913.

A.D. 1912. JULY 31. No. 17,779.
CAMPICHE'S COMPLETE SPECIFICATION.

(1 SHEET)

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

Fig. 1.

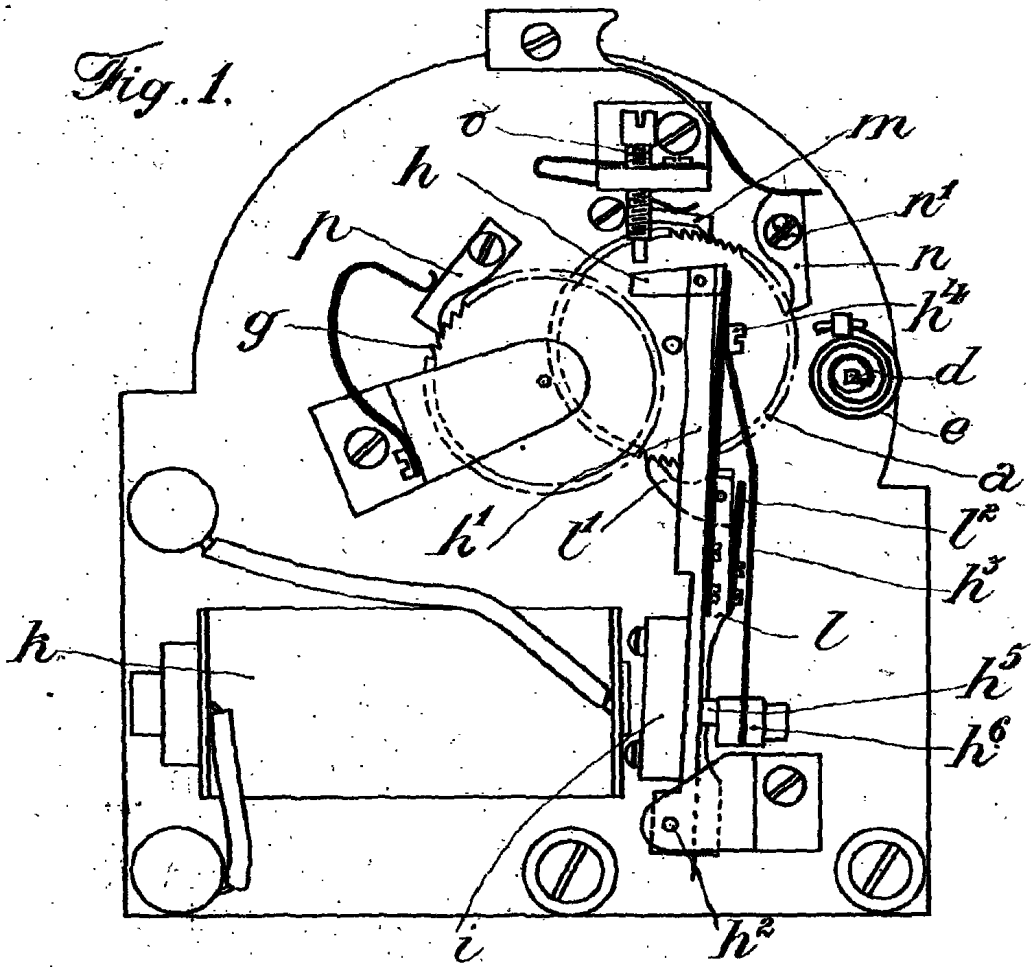


Fig. 2. Fig. 3.

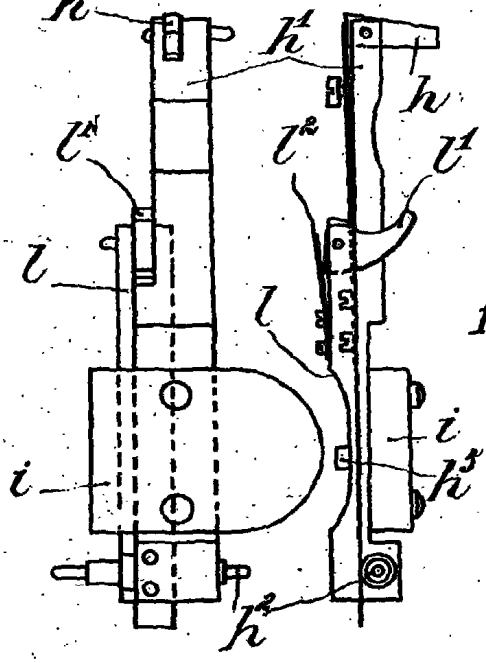


Fig. 4.

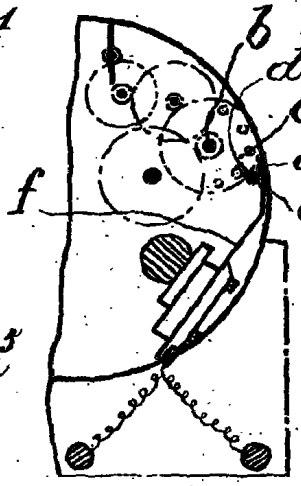
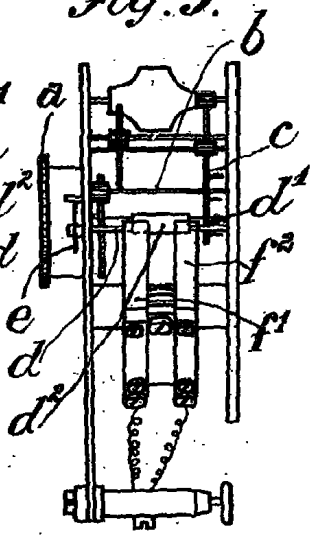


Fig. 5.



Mathy & Sons, Photo-Litho.