

J. STEIGER & J. BESANÇON.
ELECTRIC WINDING MECHANISM FOR TIMEPIECES.
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Fig. 1.

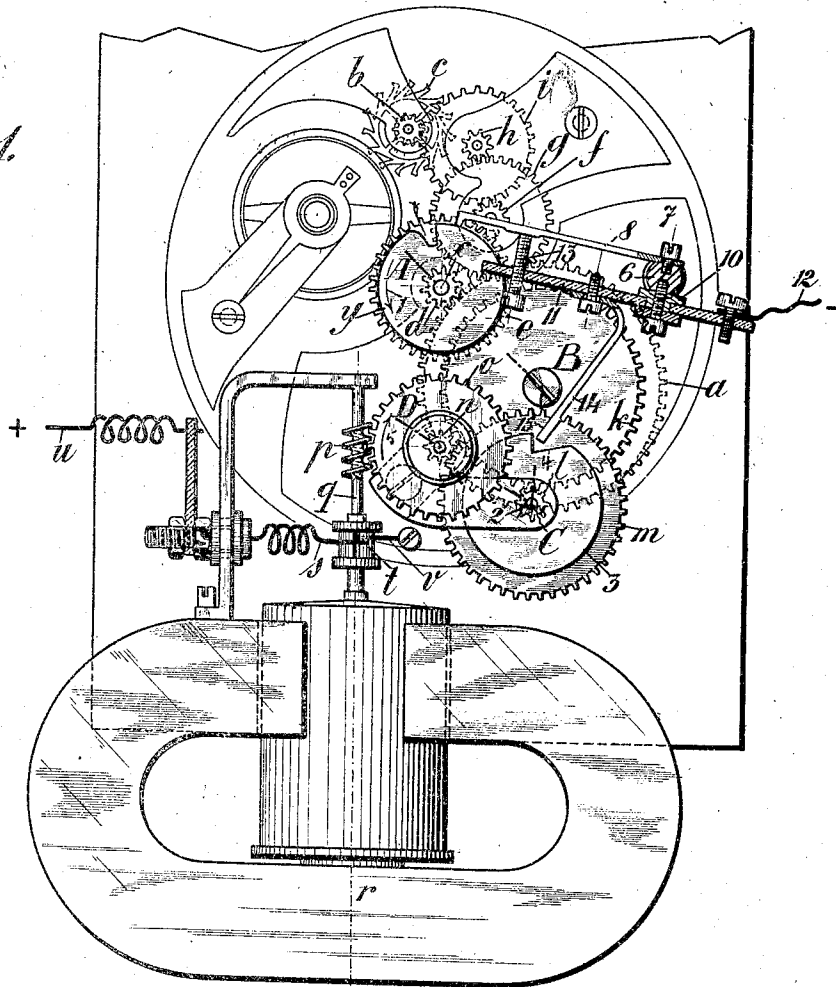
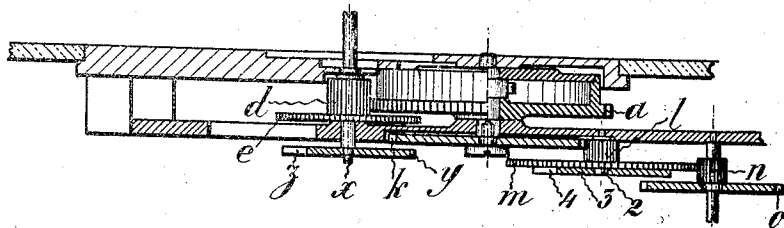


Fig. 2.



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UNITED STATES PATENT OFFICE.

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ELECTRIC WINDING MECHANISM FOR TIMEPIECES.

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Specification of Letters Patent.

Patented Mar. 1, 1910.

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To all whom it may concern:

Be it known that JACOB STEIGER and JAMES BESANCON, citizens of Switzerland, and residents, the first of Besancon, Department of the Doubs, State of France, and the second of La Chaux-de-Fonds, Canton of Neuchâtel, and State of Switzerland, have invented certain new and useful Electric Winding Mechanism for Timepieces, of which the following is a specification.

This invention relates to mechanism for periodically utilizing an electric current to actuate means for winding the movement of a time piece.

One object of the invention is to provide simple means for winding a time piece the winding means being connected in an electric circuit which is broken during the time of operation of the movement, but which circuit is closed as the movement runs down thereby actuating the winding mechanism and causing the latter to wind the time piece movement.

A further object of the invention is to provide means for insuring the winding of the movement in case the current emanating from the source thereof, is not sufficiently strong to accomplish this result.

Other objects of the invention will be disclosed in the following description, reference being had to the accompanying drawing wherein:—

Figure 1 is an elevational view of an apparatus constructed according to the present invention. Fig. 2 is a cross sectional view taken on the broken line A—B—C—D of Fig. 1.

The time-keeper illustrated comprises a driving barrel *a*, actuating the pinion *b* of the escapement wheel *c* by the aid of the pinions and wheels *d*, *e*, *f*, *g*, *h* and *i* respectively. The ratchet wheel *k* of the barrel gears with a pinion *l*, revolving with a wheel *m* which gears with a pinion *n*, revolving with a wheel *o* which is in mesh with a worm *p*, fixed upon the driving shaft *q* of a small electro-motor *r* of which one brush *s* in frictional contact with the collector *t*, is connected by means of an insulated conducting wire *u* to the positive pole of a source of electrical energy, such as a battery, an accumulator or the like, not shown in the drawing, while the other brush *v* is connected to the metallic mass of the movement. On the arbor *x* of the

wheel *e* there is fixed a collet *y*, having a notch *z* and revolving as a result of the action of the barrel *a* in the direction indicated by the arrow 1. On the arbor 2 of the wheel *m* is fixed a collet 3, having a notch 4, and being adapted to rotate under the action of the electromotor *r* in the direction indicated by the arrow 5. To a metallic pillar 6, screwed to a bridge 7 of the movement, is fitted by one of its extremities a flat spring 8, the other extremity of which terminates in a dog 9, bearing constantly against the face of the collet *y*. To the pillar 6 is also secured a yoke 10 of insulating material, supporting a flat spring 11, connected by means of an insulated conducting wire 12 to the negative pole of the above mentioned source of electrical energy. Carried by this flat spring 11 is an adjusting screw 13, with the point of which the flat spring 8 is adapted to contact, as soon as the notch *z* of the collet *y* is in line with the dog 9 of this flat spring. At the other end, the flat spring 11 carries an arm 14, the end 15 of which bears upon the periphery of the collet 3. The position of the flat spring 11 and of its arm 14 is so arranged that even though the dog 9 of the flat spring 8 rests on the collet *y*, while not engaged in the notch *z* of this collet, the point of the screw 13 is in contact with the said flat spring 8, as long as the extremity 15 of the arm 14 bears against the collet 3, so that the contact between the screw 13 and the flat spring 8 will only be broken, the moment the extremity 15 of the arm 14 catches into the notch 4 of the collet 3.

While the movement is in operation as a result of the action of its barrel *a*, and while the parts occupy the position as indicated by Fig. 1, the electric circuit, within which is included the motor *r*, is broken in as much as there is an absence of contact between the screw 13 and the flat spring 8. Since however the collet *y* rotates in the direction indicated by the arrow 1, the notch *z* will in time come into line with the dog 9 of the flat spring 8; the dog will then catch therein, causing the screw 13 to contact with this flat spring, which will complete the circuit and operate the motor *r*, whose worm *p*, actuating the wheel *o*, winds up the barrel *a* by means of its ratchet wheel *k*. The collet 3 participating in the motion produced by the electromotor, rotates in the direction

indicated by the arrow 5; and its notch, corresponding no longer with the extremity 15 of the arm 14, is lifted by the aid of the face of this collet 3 which will make contact between the screw 13 and the flat spring 8 for the whole time of one entire revolution of this collet and consequently the wheel *m*, quite independent of the length of the notch *z* and the strength of the source of electrical energy.

It is evident that the winding up of the barrel of the movement might also be accomplished without the intervention of the collet 3 and of the arm 14, but in such a case it would become necessary to adjust with great nicety the length of the notch *z* of the collet *y*, to secure a sufficiently long period of contact to insure the operation of the electromotor long enough to effect the winding of the time piece. Besides should in the long run the strength of the source of electrical energy fall off through wear, the speed of the electromotor would necessarily diminish and become inadequate to accomplish its work of winding up the barrel within the time that the dog 9 is engaged in the notch *z* and stoppage of the movement would ensue after a certain lapse of time. To overcome this difficulty it would be possible to enlarge the notch *z* to suit the diminution of the electrical energy, but this course will scarcely be feasible, for in such a case, when replacing or strengthening the source of electrical energy it would become necessary to replace also the collet *y*. By adopting however the auxiliary collet 3 and the arm 14, this difficulty is entirely obviated and permanent and regular winding up of the movement is thereby insured, whatever the decrease in electrical energy may be, and this will continue so until the source of electrical energy is exhausted to such an extent, that it is no longer able to work the electromotor at all. The auxiliary collet 3 might just as well be placed on any other arbor than the one indicated, always provided that the same is made coactive with one of the intermediate gears between the electromotor and the barrel, so for example it might cooperate with the ratchet wheel *k* of the barrel and in

this case, it would be provided with a plurality of notches, to successively engage the flat spring 11, with a view to insure a sufficiently long period of contact for completing and breaking the circuit of the electromotor.

The motor, pertaining to the movement, which in the example shown, is constituted by a spring barrel, might also be a weight, acting upon a roll or toothed cylinder.

The form, the sizes and the relative arrangement of the various parts of the mechanism, may be considerably varied without departing from the spirit of the invention as defined by the accompanying claims.

Having now described our invention, we claim as new and wish to secure by Letters Patent:—

1. In clock winding mechanism of the character described, the combination with an electric motor, of a pair of contact members for closing the motor circuit, a collet engaging one of said members and permitting the same to descend by gravity at a predetermined time, and a second collet acting upon the second contact member to raise the same into contact with its companion member, substantially as described.

2. In clock winding mechanism of the character described, the combination with an electric motor, of a pair of parallel contact members for closing the motor circuit, a dog at the extremity of one contact member and an arm depending from the other contact member, a rotary collet having its face engaging the dog and having a slot into which the dog falls to permit the contact member to descend by gravity, and a second collet acting upon said arm to elevate the contact member which carries it into contact with its companion member, substantially as described.

Signed at Berne in the canton of Berne, and State of Switzerland this 3d day of May A. D. 1909.

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