(No Model.)

L. H. SPELLIER.

ELECTRIC MOTOR FOR CLOCKS.

No. 258,818. Patented May 30, 1882.

Fig. 1.

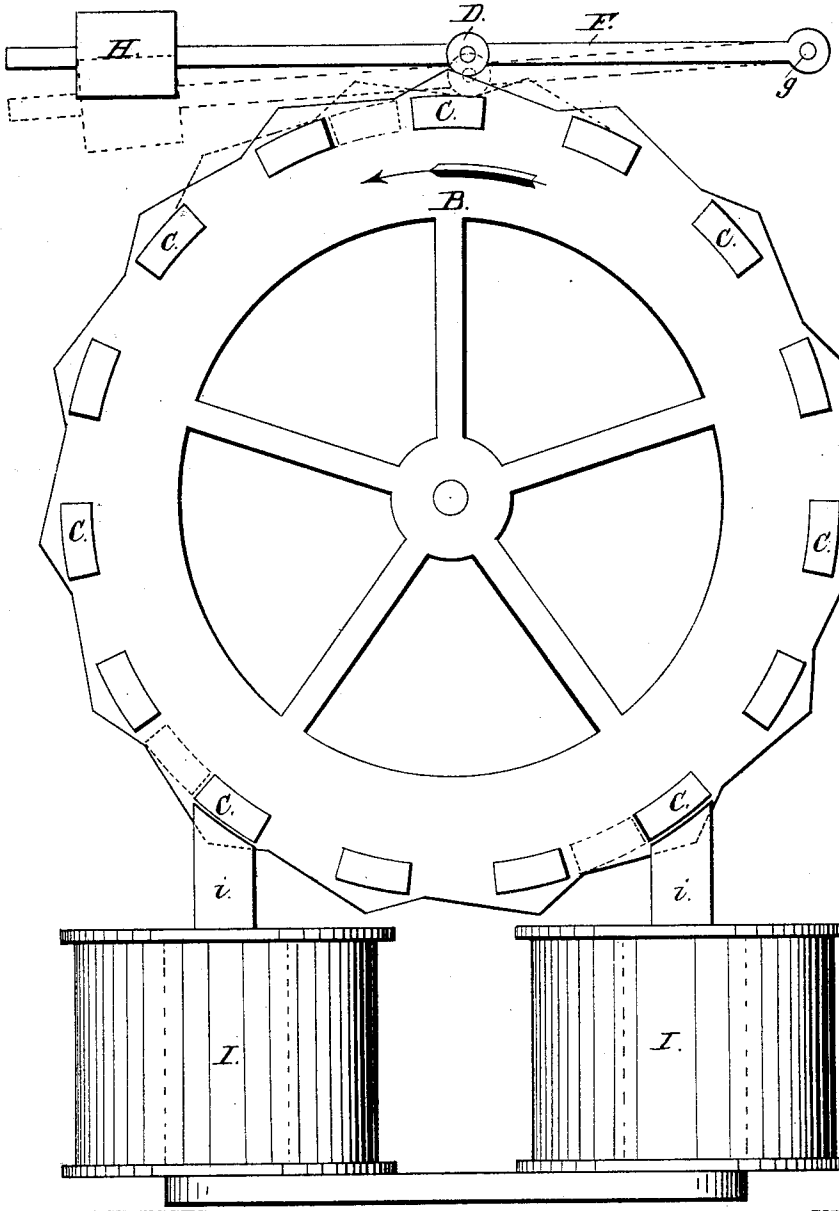
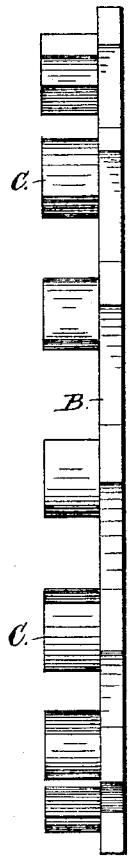


Fig. 2.



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UNITED STATES PATENT OFFICE.

LOUIS H. SPELLIER, OF DOYLESTOWN, PENNSYLVANIA.

ELECTRIC MOTOR FOR CLOCKS.

SPECIFICATION forming part of Letters Patent No. 258,818, dated May 30, 1882.

Application filed December 17, 1881. (No model.)

To all whom it may concern:

Be it known that I, LOUIS H. SPELLIER, of Doylestown, in the county of Bucks and State of Pennsylvania, have invented a new and Improved Electro-Magnetic Escapement; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front view of the escapement, and Fig. 2 is an edge view of the escapement-wheel.

There are two classes of electric clocks—the electric clock proper, or the electro-magnetic pendulum, and the electro-magnetic time-telegraph. The former has been to this day more of a scientific curiosity than a useful invention. It is only the latter—the electric time-telegraph—which has proved a partial success. As the name indicates, it is an instrument which receives the time telegraphed. For this purpose a standard clock, which in certain intervals of time completes or breaks the circuit of a galvanic battery, is needed. Although many and various in construction, electric clocks all resemble each other very closely in their most essential parts. They mainly depend upon the action of one electro-magnet and one armature. The latter is a piece of iron, which is attracted by the poles of the electro-magnet, when the telegraphing-clock completes the circuit of a galvanic battery connected with it. As soon as the clock breaks the circuit again the armature is repelled to its former position by a spring or weight. This movement of the armature turns a wheel which drives time-indicating machinery, and is repeated as often as this machinery is required to indicate the time of the clock, which makes or breaks the electric circuit. Such instruments work very well if the action of the armature is only needed about once every minute, but if repeated every second or two, then its imperfections become apparent. The movement of the armature is sudden and rapid. With a lightning-like velocity the armature moves toward the magnet, and is checked instantaneously in its rapid progress just at a time when nearest the magnet and most powerfully attracted. Naturally the wheel, which receives its moving impulse directly from the armature, moves with the same rapidity and is checked as suddenly. Those sudden checks offered to the armature and wheel show their damaging results in a comparatively short time, and soon impair the correctness of such instruments.

For correcting these evils my invention, which is in the nature of an escapement, consists in constructing a wheel or disk with a series of armatures and a corresponding series of inclined teeth and combining the same with an electro-magnet which acts upon the armature, and with a weighted lever with bearing-roller resting upon the inclined teeth, the parts being arranged to produce a progressive intermittent feed movement of the wheel in one direction, one movement being effected by the magnets in attracting the armature, and then when the current is broken the weight bearing roller, acting upon an inclined tooth of the wheel, causes the wheel to move farther in the same direction, bringing another armature within the range of attraction of the magnet.

Referring to the drawings, I have a number of armatures, C, fastened at equal distances around the face of wheel B. On its circumference the wheel B (which is made of soft cast-iron) has as many cogs of the peculiar inclined form shown in the figures as it has armatures. F is a lever with its oscillating center at *g*, and has a friction-roller, D, which presses against the circumference of the wheel B by the weight H. I *i* is the electro-magnet. The electro-magnet is connected with a galvanic battery, of which the circuit is closed and opened by the oscillations of a pendulum.

The instrument acts in the following manner: When the current of the galvanic battery is closed the armature nearest to the magnet will be attracted by the electro-magnet and move B in the direction indicated by the arrow and stop it as soon as the armature is directly over the magnet. When in this position the roller D rests upon the upper part of the cog and presses against it. As soon as the electric current is disconnected and the electro-magnet discharged of its magnetism, the pressure of the roller D against the cog moves B in the direction indicated by the arrow,

as shown in dotted lines. It stops moving when the roller has reached the deepest point of the cog. This movement of B has brought the next armature near the magnet *i*. This armature will now be attracted at the next closing of the electric current. Then B will be moved again, and the next cog of B lifts the lever, putting it in position to again move the wheel as soon as the electro-magnet is again discharged of its magnetism, and so on, intermittently, the electro-magnet and the roller will alternate in action and keep B revolving in this manner as the pendulum of the clock connects and disconnects the electric current. The object in view—to avoid the sudden check to the armature—is hereby accomplished. No sudden check is offered to the armature, but when attracted it swings for a moment in short vibrations over the magnet before it comes to rest. It is comparatively noiseless in its movements, its sound being hardly perceptible. In this respect it is very much unlike other time-telegraphs, whose clapping noise is an inseparable concomitant.

Instead of using a weighted lever for giving an alternate movement with the magnet, a spring may be used. The armatures and cogs may also be placed on separate wheels rigidly keyed to the same shaft. More than one magnet may also be employed.

Having thus described my invention, what I claim is—

The combination, with one or more wheels having a circular series of armatures and a corresponding series of inclined teeth, of an electro-magnet for attracting the armature, and a pressing device arranged upon the inclined teeth to operate alternately with the magnet to produce a progressive intermittent movement of the wheel in the same direction, as described.

LOUIS H. SPELLIER.

Witnesses:
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