S. A. KENNEDY.

ELECTRIC CLOCK.

No. 99,321. Patented Feb. 1, 1870.

Fig. 1

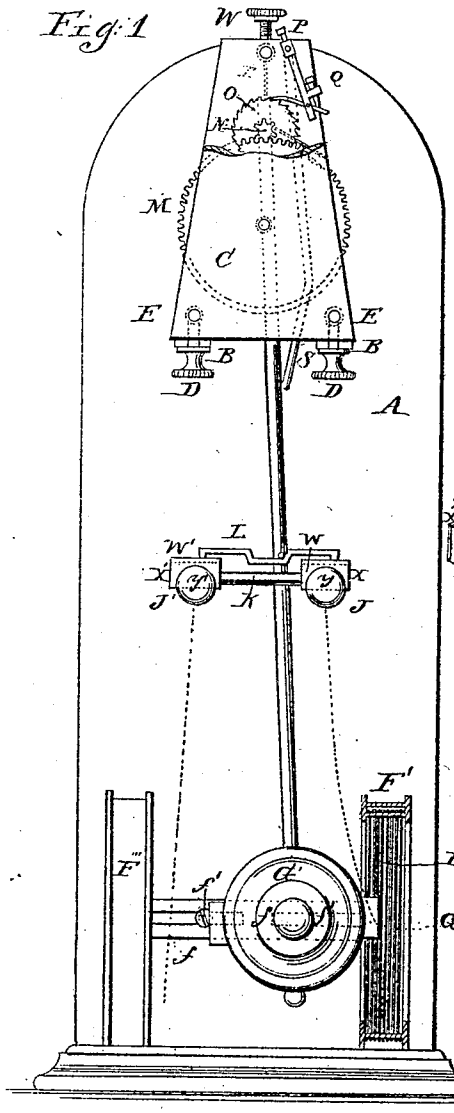

Fig. 2.

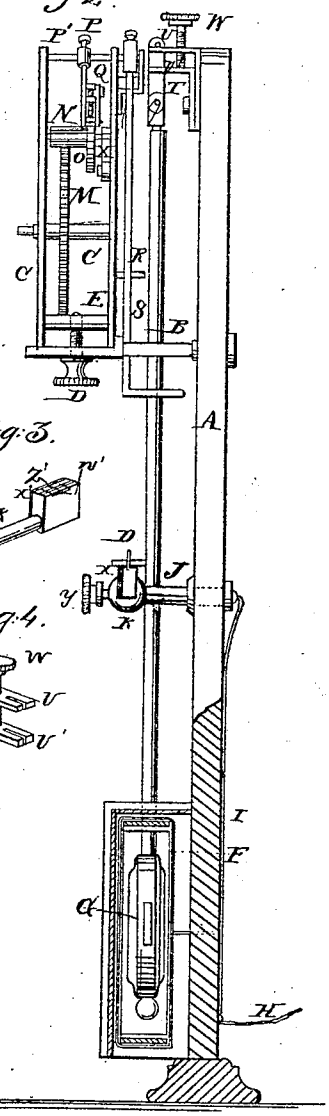

Fig. 3.

Fig. 4.

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Letters Patent No. 99,321, *dated February* 1, 1870.

IMPROVEMENT IN ELECTRIC CLOCKS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, SAMUEL A. KENNEDY, of Attleborough, in the county of Bucks, and State of Pennsylvania, have invented a new and useful Improvement in Electric Clocks; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The nature of the present invention consists principally in the employment of a single wheel in the clock-train to carry the dial-movement, which wheel is driven directly by the pinion of the ratchet-wheel, thus diminishing the resistance in the clock-train, so that the motive-power which is applied through the pendulum, may also be decreased, and the clock rendered more simple in construction, and more accurate in operation, as will be fully understood from the following description, in which—

Figure 1 represents a front elevation of my improved electric clock, parts being broken away in order to show its construction more fully.

Figure 2 is a side view of the same.

Figure 3 is a perspective view of the bridge.

Figure 4 is a perspective view of the adjustable holder for the pendulum.

Similar letters of reference indicate corresponding parts.

A represents a board or tablet, corresponding to the back of the clock-case, to which the several parts of the clock are attached, and from which project arms B B, on which the upright plates C C are supported.

The arms B B are flattened and slotted on that portion on which the plates C C rest, which plates are held secure to the arms B B, by means of screws D D, which run into the pillars E E, which extend between plates C C, as shown.

The electric coil F, enclosed within an ornamental case, F′, is a hollow oblong, adapted in form and position to receive the end of a permanent magnet, G, which is carried by or forms part of the pendulum G′; but I also propose, in some cases, to reverse the position of the coil and magnet, using the electric coil on the pendulum, and making the magnet stationary. In either case, the joint repulsion between the coil and magnet, keeps up the oscillations of the pendulum.

Upon the side of the pendulum, opposite the case F′, is placed a similar case, F″, merely for ornamental purposes, and containing no coil.

The position of the cases F′ and F″, is adjusted by the slotted arm *f*, and the screw *f′*, whereby they are also attached to the back of the case A

The terminals of the electric coil F, extend through the board or tablet A, one connecting directly with the battery, the other extending up to the pillar or support J of the bridge K, which latter is composed of some suitable non-conducting material, and over the top of which, at *z z′*, and front at *x x′*, extend metallic strips to connect with the screws *y y′* of the arms *j j′*.

The two supports J J′ always remain electrically insulated from each other, except when connected by the metallic slide L, the points of which move in a guiding-groove, *w w′*, which extends across the upper face of the plates *z z′*, and the bridge K, substantially as shown.

The slide L is formed of a single bar of metal, having a depression in its centre, and a shoulder at each side of the depression, as shown, against which shoulders, the pin *l*, projecting from the front of the pendulum, strikes, and thus, by the oscillations of the pendulum, the slide L is moved alternately right and left, and thus the points of the slide L alternately travel upon and beyond the metallic strips *z z′*.

When these points rest upon the strips *z z′*, the battery-circuit is complete through the coil, via the supports I I. The direction of the current must be such that both the coil F′ and the magnet *m* must present like polarities toward each other.

The circuit is closed at *z z′*, after the magnet *m* has passed into the coil F′, and just before the pendulum arrives at the point of rest, when, by the natural repulsion of coil and magnet, the pendulum is driven back to the other end of its arc of oscillation, but just before arriving there, the pin *l* takes the slide L back, and, the circuit is again interrupted, and remains broken, until the pendulum has returned, and the magnet re-entered the coil, as before described.

The lever S, suspended from the rock-shaft P′, is moved aside by the pendulum, but returning by its own gravity, drives the clock-train.

The arm in which the pawl *p* is pivoted, is also attached to the rock-shaft P′ by the screw P, which serves to clamp and hold the said arm at any desired angle, and by adjusting screw P, the extent of the catch for the pawl may be regulated.

The adjustment of the pawl is also assisted by means of the set-screw Q, which operates on the heel of the pawl.

N is a pinion on the shaft of the ratchet-wheel O, which pinion meshes in the teeth of the train-wheel M, and imparts motion thereto.

By this arrangement of a single train-wheel with the ratchet-wheel, the resistance is diminished, and less driving-power is required.

In order to render the resistance to the pendulum constant, the spaces through which the weight or lever S is carried, must be always equal. To secure this equality of distance, I employ the stop-pin R, or other suitable device, to arrest the descent of the lever S at a fixed point, where the pendulum, by passing on, leaves it, and returning, receives it again.

The pendulum-rod is constructed of wood, kiln-dried,

and filled in with paraffine, glycerine, or other like substance, so as to prevent absorption of moisture.

T is a spring, on which the pendulum hangs. This spring is inserted in slits in the adjustable brackets U U'. The portion marked U', is provided with a slot, V, so that it may be moved up or down on the spring T, by turning the thumb-screw W for the purpose of regulating the oscillations of the pendulum.

X is a spring, which bears on the shaft of pinion N, to prevent any retrograde motion thereof.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The method of vibrating a pendulum, having a magnet attached thereto, by the repulsion of a single electric coil, always having the same polarity as the end of the magnet opposite thereto, and whose connection with the battery is intermittently broken.

2. For the use and purposes of an electric clock, the employment of a clock-train, consisting of a single wheel, M, driven directly by the pinion of the ratchet, which is in turn driven by the pendulum-lever.

3. Regulating the angle and extent of catch of the driving-pawl of a clock, by means of the rock-shaft P' and screw P, arranged and operated in the manner described.

4. The combination of the set-screw W, slide U', and its parts, and the spring T at the top of the pendulum, to adjust the length of the latter, substantially as herein shown and described.

5. Rendering the resistance of the lever S to the pendulum uniform, by always arresting the gravitating movement of said lever at a fixed point, in the manner described.

6. Also, the manner of adjusting the position of the electric coil F, by having a slotted bar, Y, with set-screw extending through it into the board or tablet A, substantially as shown.

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Witnesses:

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