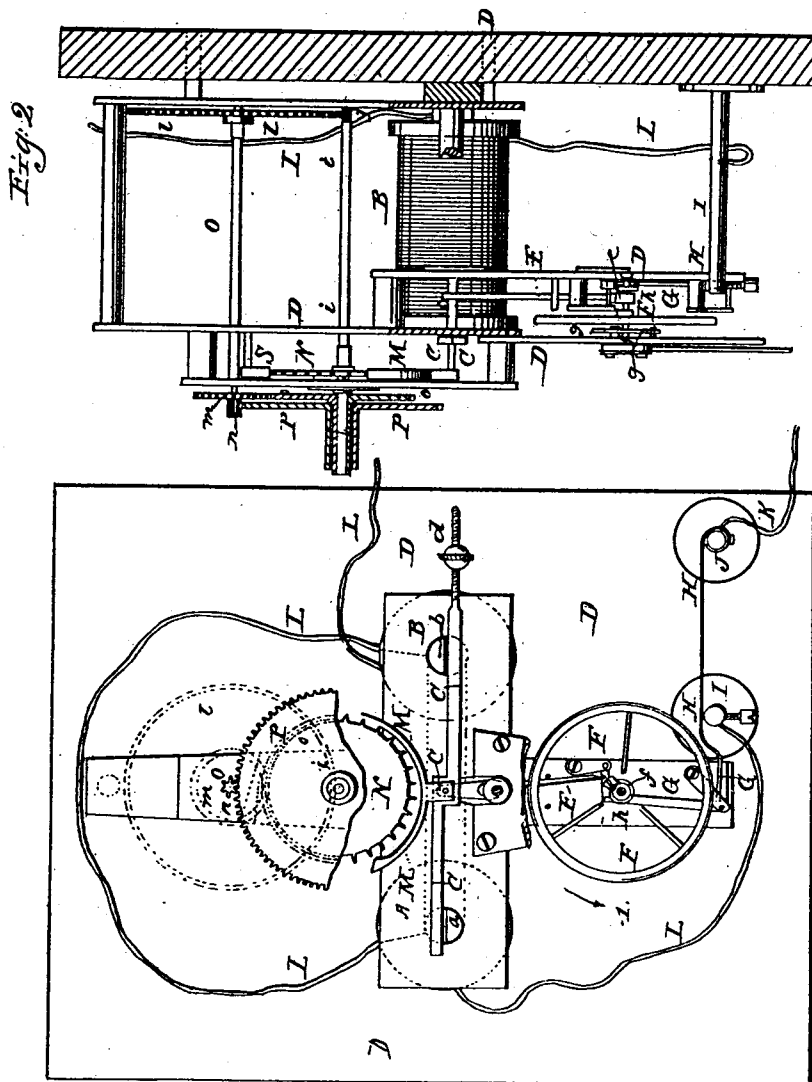


V. HIMMER.
Electric Clock.

No. 98,593.

Patented Jan. 4, 1870.



WITNESSES:

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Letters Patent No. 98,593, dated January 4, 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, VITALIS HIMMER, of the city, county, and State of New York, have invented a new and improved Electric Clock; 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 drawing, forming part of this specification.

Figure 1 represents a face view of my improved electric clock.

Figure 2 is a side view, partly in section, of the same.

Similar letters of reference indicate corresponding parts.

This invention relates to a new clock, which is operated by electricity, without the use of a pendulum, but with the aid of a spring-balance, and which is so constructed that it will operate with absolute exactness, and not be affected by atmospheric influences.

The invention consists, chiefly, in connecting the oscillating armature, which is moved partly by the electro-magnets, partly by its own weight, with an arm that will counteract the balance-spring, and reverse the motion of the balance-wheel.

The invention also consists in providing a stop on the balance-wheel, which, during one motion of the wheel, will move a lever, to break the electric current, whereby the motion of the balance-wheel is reversed.

The invention consists, further, in the employment of an anchor, which is attached to the oscillating armature, and which, engaging in the teeth of a wheel, imparts intermittent rotary motion to such wheel, thereby propelling the hands of the clock.

A B, in the drawing, are two magnetic coils, placed horizontally at a suitable distance apart, with their poles *a b* flattened at the upper and lower sides, respectively, as shown in fig. 1.

C is the armature, made in form of a bar, and pivoted, by a pin, *c*, to the frame D of the clock.

When attracted by the poles *a b*, one end will be pulled down upon *a*, and the other drawn up toward *b*, as indicated in fig. 1. That end of the armature nearest to *b* is weighted, as at *d*.

When the electric current is broken, the weight will draw its end down, and thereby bring the armature away from both poles.

The alternate closing and breaking of the circuit will, therefore, have the effect of oscillating the armature on its pivots.

From the armature projects downward a spring-arm, E, which, during the motion of the armature, is brought

in contact with a cam or stud, *e*, projecting from the axle *f* of a balance-wheel, F.

The balance-spring *g* tends to move the wheel F in the direction of the arrow 1; the arm *e* throws it in the opposite direction.

A stud, *h*, on the balance-wheel shaft is, during every other motion of the wheel, brought against one arm of an elbow-lever, G.

The said lever acts with its other arm against a spring-bar, H, which, by its own power, is held in contact with a standard, I, while it is fastened to another standard, J.

One wire, K, from the battery, is fastened to the standard J, the other, L, to one of the electro-magnets, and thence carried to the standard I. Thus, when the spring H is in metallic contact with the standard I, the two wires are connected, and an electric circuit is established. When, however, the stud *h* throws the lever G, so as to raise the spring H, the metallic connection will cease, and the circuit is broken.

On the armature-lever C is secured an anchor, M, which engages with its points between the teeth of a wheel, N, so that the oscillations of the armature and anchor will, by striking the teeth of N, revolve the same.

The second-hand of the clock may be set upon the axle *i* of N. The same axle has a pinion, *j*, meshing into the teeth of a wheel, *l*, on a shaft, O. Said shaft O carries other toothed wheels *m* and *n*, which mesh respectively into the teeth of wheels *o p*, that are hung on the shaft *i*, and that carry, on their tubular shafts, the minute and hour-hands, respectively.

The arrangement of wheels may be modified to any desired extent, although it cannot be simplified. The anchor may have but one arm, which, during every other stroke, will serve to move the wheel N; thereby a more noticeable movement of the second-hand would be produced, and a very correct indication of the seconds.

The operation is as follows:

When the circuit is closed by the contact of H and I, the armature is drawn up by the pole *b*, and, by being drawn up, it moves the balance-wheel back against the balance-spring, and causes the stud *h* to move the lever G, and to break the current.

When the current is broken, the armature drops off the poles by the weight, and releases the balance-wheel, so that the same may be acted on by the balance-spring; thereby the lever G is also released, and will be thrown back by the spring H, which drops upon I, and re-establishes the current. Thus, when the current is closed, the mechanism moves to break it, and when broken, the mechanism serves to close it.

In this manner, perpetual motion is obtained, as long as the battery remains in force. The oscillations of the armature-lever swing the anchor, or its equivalent, and impart thereby the requisite motion to the hands.

By adjusting the weight *d* more or less far away from the pivot *c*, the motion can be regulated.

A click, *s*, is employed on the wheel *N*, to prevent the same from turning in the wrong direction.

This instrument will be a very correct time-keeper, and can be used to great advantage on board of vessels, and wherever a pendulum is not desired or practicable. In place of the weight *d*, a permanent magnet, weaker than the electro-magnets, and acting on the insulated end of the armature-lever, or a spring

may be employed. In this case, the change of position of the clock would not affect its action.

Having thus described my invention,

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

The oscillating armature-lever *C*, acted upon by the electro-magnets *A B*, in one direction, and by a weight, or its equivalent, in the other direction, and connected with the arm *E*, and with the anchor *M*, to move the hands and reverse the motion of the balance-wheel, substantially as herein shown and described.

VITALIS HIMMER.

Witnesses:

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FRANK BLOCKLEY.