(No Model.)

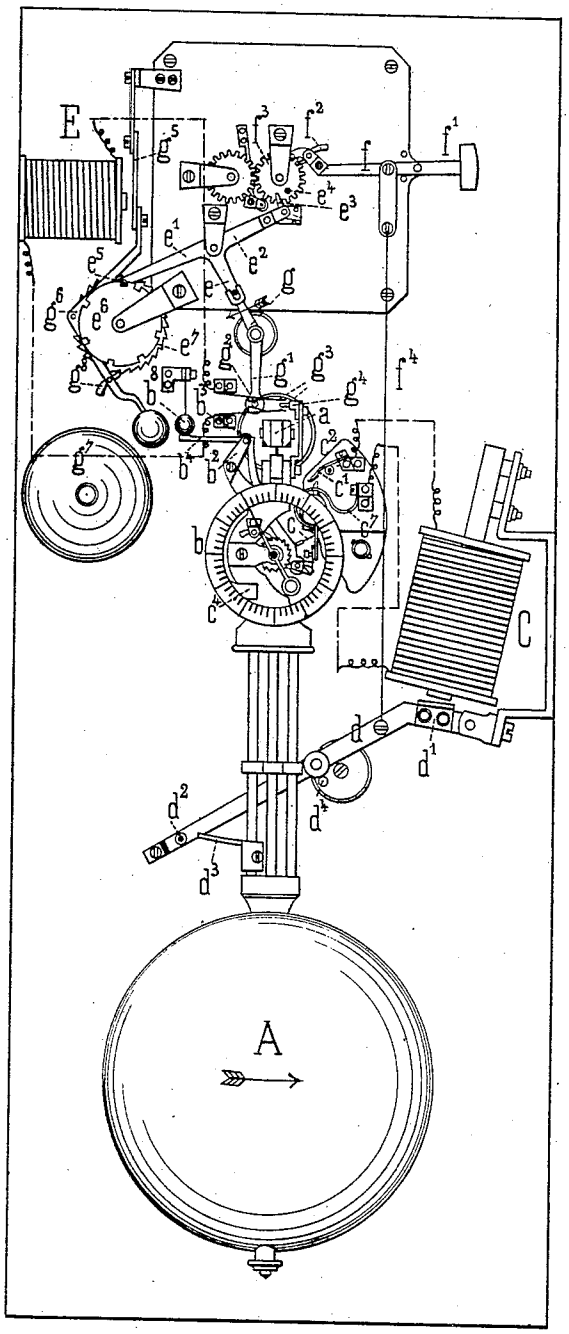
3 Sheets—Sheet 1.

G. M. HEROTIZKÝ.

ELECTRIC CLOCK.

No. 293,613.

FIG.1. Patented Feb. 12, 1884.



Witnesses.

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C. H. Waller

Inventor.

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By Painer & Sons,

Attys.

(No Model.) 3 Sheets—Sheet 2.

G. M. HEROTIZKÝ.

ELECTRIC CLOCK.

No. 293,613. Patented Feb. 12, 1884.

FIG.2.

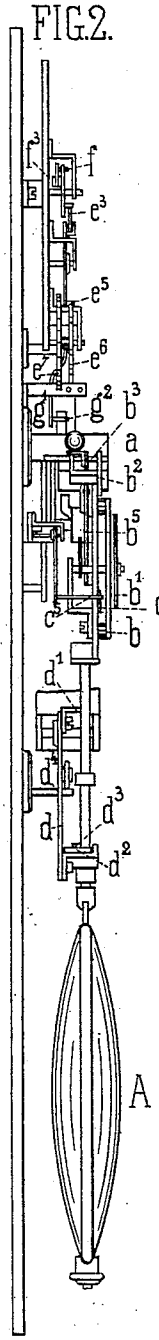


FIG.3.

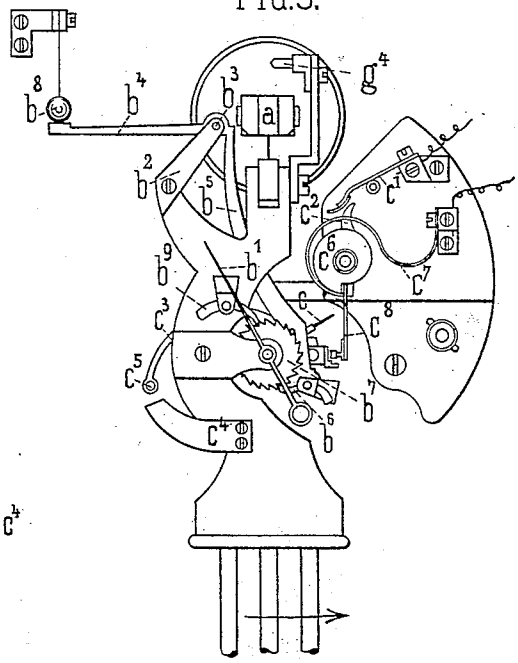


FIG.4.

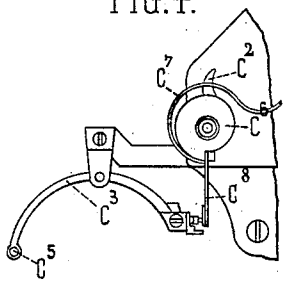


FIG.5.

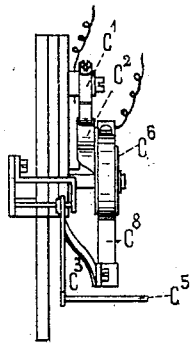
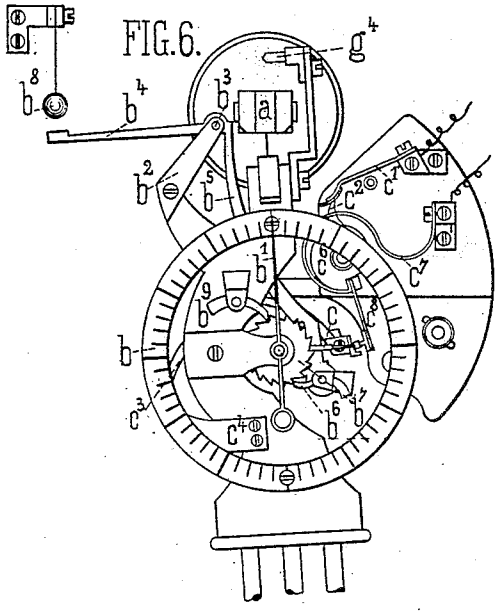


FIG.6.



Witnesses.
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(No Model.) 3 Sheets—Sheet 3.

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ELECTRIC CLOCK.

No. 293,613. Patented Feb. 12, 1884.

FIG. 7.

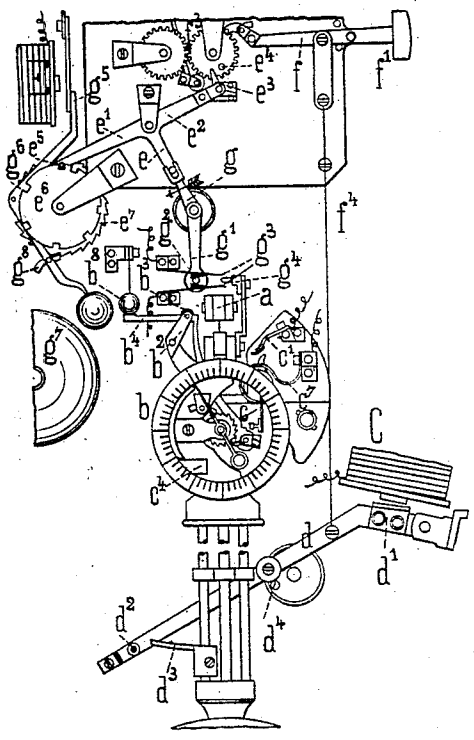


FIG. 8.

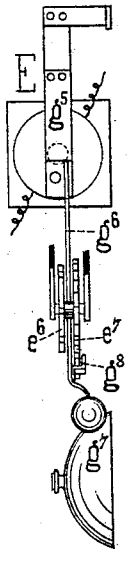
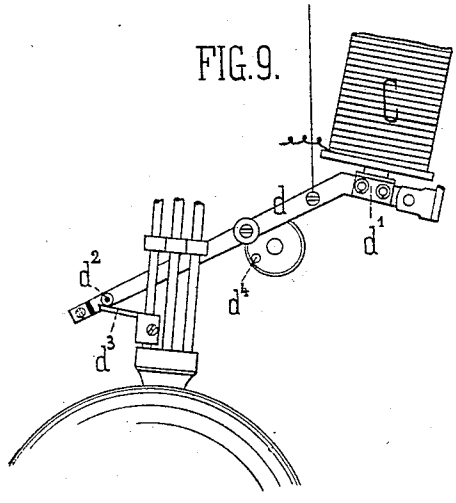


FIG. 9.



Witnesses.
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UNITED STATES PATENT OFFICE.

GUSTAV MAXIMILIAN HEROTIZKŶ, OF HAMBURG, GERMANY.

ELECTRIC CLOCK.

SPECIFICATION forming part of Letters Patent No. 293,613, dated February 12, 1884.

Application filed August 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV MAXIMILIAN HEROTIZKŶ, a subject of the King of Saxony, and resident of Hamburg, in the German Empire, have invented certain new and useful Improvements in Electric Clocks, of which the following is a specification.

My invention relates to improvements in electric clocks which are driven by electric elements; and the objects of my improvements are, first, to give automatically once every minute an impulsion to the pendulum; and, second, to regulate the function of the electric current by means of the swinging pendulum. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front view of the electric clock. Fig. 2 is a side elevation. Figs. 3 to 9 are detailed views.

Similar letters refer to similar parts throughout the several views.

The pendulum A is suspended at the arm *a*. A disk, *b*, indicating the seconds, is attached to the rod of the pendulum. The bracket b^2, fastened to the disk *b*, bears the pivot-pin b^3 of the angle-lever b^4 b^5. The pawl b^6, which catches into the teeth of the ratchet-wheel b^7, is attached to the extremity of the arm b^5. The other arm, b^4, touches, when the pendulum A swings to the left, the weight b^8, suspended on a thread. This stop causes the point of the pawl b^6 to slide over the teeth of the wheel b^7, which is held from backward movement by the click b^9. When the pendulum returns—*i. e.*, when it swings in the direction indicated by the arrow—the lever b^4 b^5 attempts to go back to its normal position. Thereby the ratchet b^6 catches into the teeth of the wheel b^7 and turns it, whereby the hand b', fixed to the shaft of the ratchet-wheel, shows at the disk *b* that a second has elapsed. The lever *c*, also fixed to the arbor of the ratchet-wheel b^7, serves to close the electric current of a galvanic battery, which passes through the bobbin C in the following manner: This lever *c*, rotating with the wheel b^7, is once every minute in such a position as to touch the arm c^5 of the disk c^6, which is pushed by the spring c^7 toward the lever *c*. When the pendulum swings in the direction of the arrow, Fig. 1, the disk c^6 is turned by means of the lever *c*, pushing forward the arm c^5. Thereby the finger c^2 of the disk c^6 comes into contact with the spring *c'*, being the two poles of the electric current passing the bobbin C. This current thus is closed and kept closed by the bow-shaped arresting-lever c^3, one end of which swings automatically in contact with the finger c^5 and remains there until the pendulum A returns to the left-hand side and the arm c^4, attached to the rod of the pendulum, touches the pin c^5 of the lever c^3, when the latter gets out of contact with the finger c^5, and the current is interrupted. The electric current formed by the contact of finger c^2 and spring *c'* causes the core of the bobbin C to become magnetical, which consequently attracts the armature *d'* of the lever *d*, and thereby lifts the lever *d*, resting, ordinarily, on the projection d^4. By the interruption of the current the lever *d* descends again, and its roller or transverse pin d^2 touches the bracket d^3 of the pendulum-rod, thus giving a new impulsion to the pendulum. While the lever *d* was lifted the counter-weight *f'* raised the longer arm of the lever *f*, with the pawl f^2, attached thereon. The descending lever *d* draws also the raised arm of the lever *f* downward, both levers being connected by the thread or wire f^4. Thereby the pawl f^2 catches into the wheel f^3, to the spindle of which the minute-hand of the clock is fixed, and so advances the minute-hand. The rotation of the minute-wheel is communicated in the well-known manner to the hour-wheel. An electric striking-work is easily to be connected with the dial-train. A lever with three arms, *e e' e²*, is attached to the frame behind the dial. The minute-wheel f^3 is provided with one projection, e^4, when the clock strikes every hour. In a striking-train of every half an hour the wheel f^3 bears two, and in a striking-train of every quarter of an hour four projections, e^4. The projection e^4 touches, during the rotation of the wheel f^3, for a moment, the movable incline e^3 of the arm e^2. In consequence thereof the arm e^2 is lowered and the other arm, *e'*, raised, whereby the pin e^5, fastened to the extremity of *e'*, quits the groove of the wheel e^6, the projections of which regulate the number of strokes of the bell. The arm *e* thereby swings in the direction of the arrow, and causes the

angle-lever $g\,g'$ also to swing. The arm g' is provided with a pin, g^2, which hinders, commonly, the two springs $g^3\,g^3$ (the two poles of an electric current passing the bobbin E) from approaching each other. By the oscillation of the lever $g\,g'$ the pin g^2 quits the projections of the springs $g^3\,g^3$, which now approach each other in such a manner as to close the electric current by means of the pin g^4, fastened to the pendulum-rod, at every stroke of the pendulum in the direction of the arrow. The core of the bobbin E thus magnetized attracts the armature g^5 of the lever g^6. Consequently the hammer of lever g^6 strikes the bell g^7 at every oscillation of the pendulum A. The motion of the lever g^6 also causes the rotation of the ratchet-wheel e^7, fixed to the arbor of wheel e^6. Consequently the latter is turned until the pin e^5 falls into the next groove of this wheel, and the lever $e\,e'\,e^2$ returns to its normal position, Fig. 1, whereby the pin g^2 slides again between the springs $g^3\,g^3$, thus interrupting the electric current.

Having thus fully described my invention, what I desire to claim and secure by Letters Patent is—

1. In an electric clock, the combination, with a pendulum and an electric circuit, of the ratchet-wheel b^7, the angle-lever $b^4\,b^5$, the pawl b^6, the suspended weight b^8, and the stop device consisting of the parts c, c^8, c^6, c^2, and c', or their equivalents, all constructed and relatively arranged substantially as herein set forth.

2. In an electric clock, the combination of the bobbin C with the pendulum A, the ratchet-wheel b^7, the lever c, the disk c^6, with arm c^8, and finger c^2, and spring c^7, the contact-spring c', and the arresting-lever c^3, substantially as and for the purpose specified.

3. In an electric clock, the combination of the pendulum A, having bracket d^3, and the inclined lever d, having armature d', and pin or roller d^2, with the magnet or bobbin C, and the stop d^4, substantially as herein set forth.

4. In an electric clock, the combination of the minute-wheel f^3 with the bobbin C, the lever d, the thread f^4, the lever f, the counter-weight f', and the ratchet-pawl f^2, substantially as set forth.

5. In an electric clock, the combination of the bobbin E, the armature g^5, the lever g^6, the pawl g^8, the ratchet-wheel e^7, the disk e^6, the lever $e\,e'\,e^2$, the minute-wheel f^3, the angle-lever $g\,g'$, and the projection g^2, with the contact-springs $g^3\,g^3$, the pendulum A, and the pin g^4, substantially as and for the purpose specified.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 10th day of July, 1883.

GUSTAV MAXIMILIAN HEROTIZKÝ.

Witnesses:
ALEXANDER SPECHS,
EMIL T. HAASE.