

(No Model.)

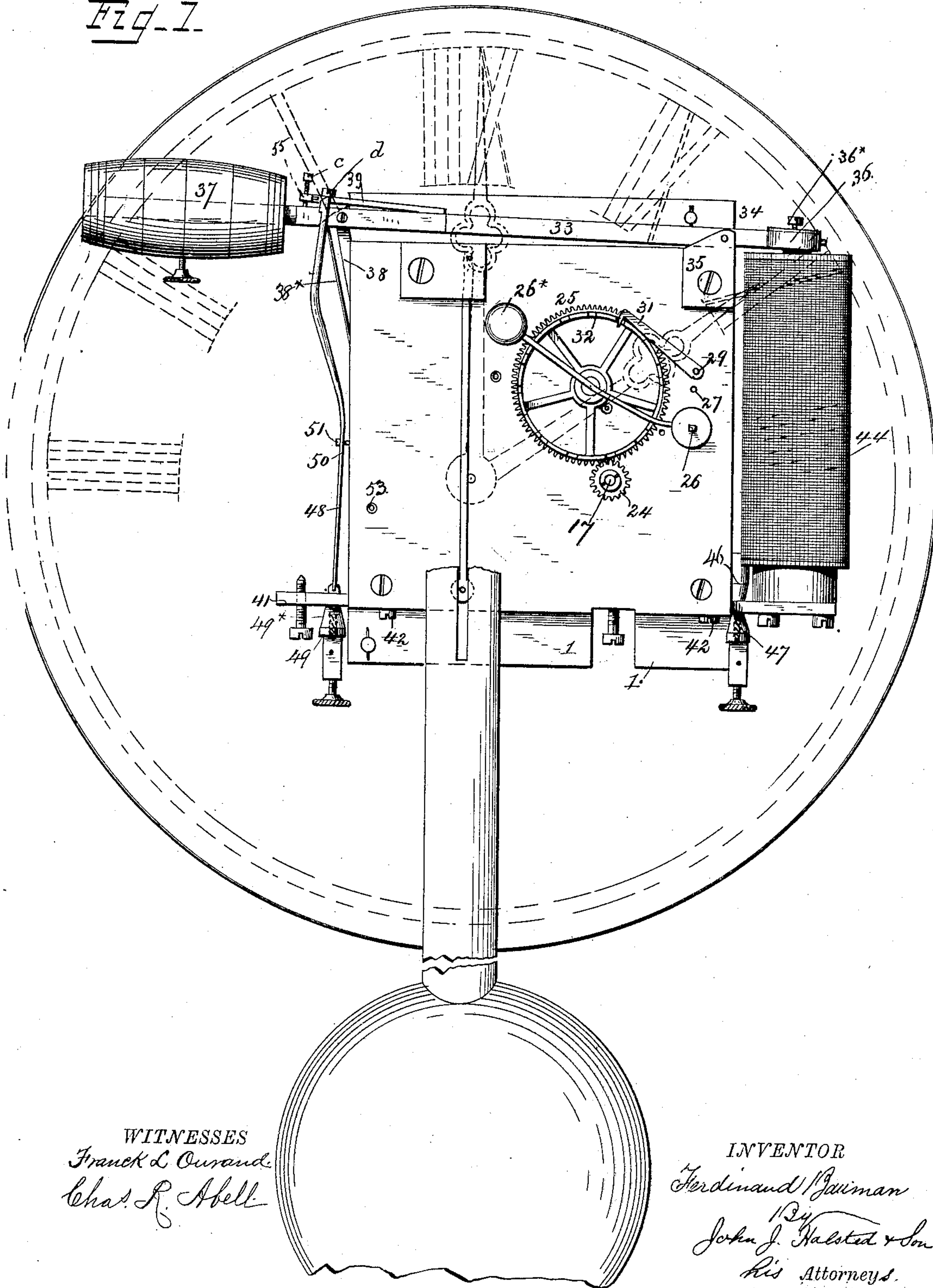
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F. BAUMAN.  
ELECTRIC CLOCK.

No. 320,997.

Patented June 30, 1885.

Fig. 1.



WITNESSES  
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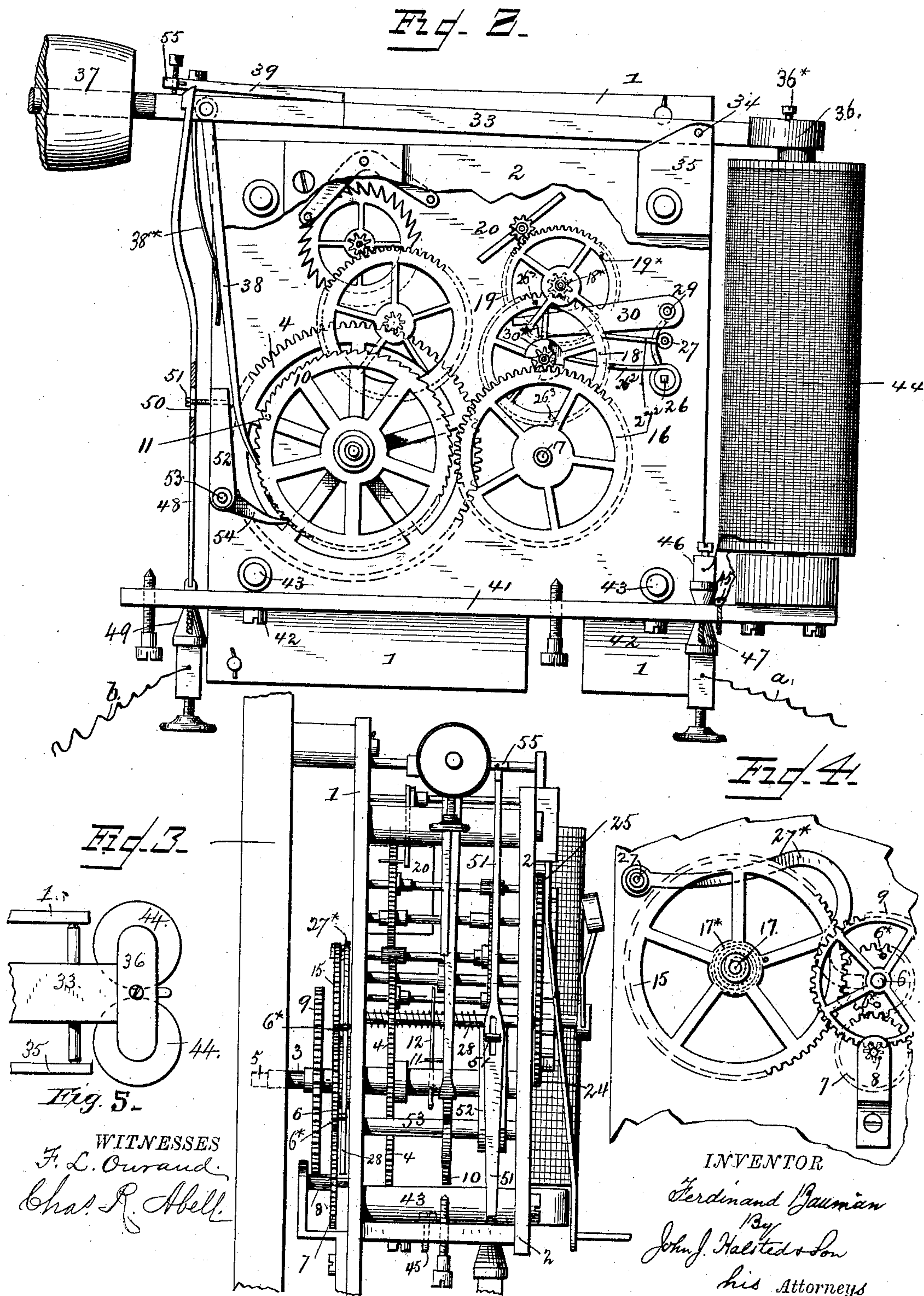
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# UNITED STATES PATENT OFFICE.

FERDINAND BAUMAN, OF WALDENBURG, SWITZERLAND.

## ELECTRIC CLOCK.

SPECIFICATION forming part of Letters Patent No. 320,997, dated June 30, 1885.

Application filed December 12, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, FERDINAND BAUMAN, of Waldenburg, in the Canton of Basel Land, Switzerland, have invented certain new and useful Improvements in Electric Clocks; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in electric clocks, and comprises in its main features operating-works, a lever with weight, the armature, and the electro-magnet, all as hereinafter described.

In the drawings, Figure 1 represents a rear elevation of my improved clock; Fig. 2, an enlarged rear view in elevation, with a portion of the back plate broken away the better to display the works; Fig. 3, an end view of the clock, and Fig. 4 is a face view of part of the mechanism for operating the striking attachment. Fig. 5 is a top view of part of the actuating-magnet.

The wheels are arranged between two plates, 1 and 2.

The operating-works, which measure the time, count the number of vibrations, and regulate the action of the striking-works, consist of a large main wheel, 4, ratchet-wheel 10, and the pawl 38. The wheels 4 and 10 are carried by the same arbor; but the ratchet-wheel 10 is loose on said arbor, while the wheel 4 is fast on the arbor. The arbor of the main wheel 4 may carry the squared tube 5, which is to support the minute-hand. The minute-wheel 6 is mounted upon this tube 5, and is placed on the outer face of the front plate, 1, and drives a pinion, 7, having as many teeth as wheel 6, which carries a pinion, 8, that drives the hour-wheel *g*. The tubular arbor of the hour-wheel 9 is to carry the hour-hand. On the rim of the ratchet-wheel 10 is a pin, 11, which at times bears against one of a series of flexible arms, 12, that project from the arbor of the main wheel 4. The minute-wheel of the clock is turned by an electric attachment, which attachment may also operate the striking part of the clock. I need, however, not

explain the details of the striking mechanism, as that may be of any suitable character. The striking-works, if connected to the clock, are moved by a winding-wheel, 15, which meshes with the minute-wheel 6, and is driven by the latter and winds up the striking-spring—that is to say, the minute-wheel, when turned, serves to keep the striking-spring wound up.

33 is a weighted lever, pivoted to the frame of the clock at 34, and carrying an armature, 36, at one end. 37 is the adjustable weight for balancing said lever. The lever 33 carries also the pawl 38, which engages with the ratchet-wheel 10. A spring, 38\*, keeps the pawl 38 in proper engagement with the ratchet-wheel.

39 is a metal bar attached to the lever 33, said bar having a projecting arm, 55, for contact with a spring, 50, as hereinafter described.

44 is an electro-magnet, which is carried by the frame of the clock, in alignment with the armature 36, and which connects by a wire, *a*, with the battery and by a wire, 45, with the metal frame of the clock. The wire *a* is insulated from the metal frame of the clock. The other battery-wire, *b*, connects with the spring 50, but is otherwise insulated from the frame of the clock.

52 54 is a detent, which engages with the ratchet-wheel 10 to prevent it turning back. This detent may be pressed against the ratchet-wheel 10 by the spring 50, bearing against the head of a screw, 51, in which case the detent must be insulated from the metal frame of the clock.

To use the clock, a suitable battery (not necessary to be shown) is employed to set the works in motion. The battery may be arranged in the same casing in which the clock-works are contained, so that the clock forms an entirety.

As soon as the connections with the battery are established a current is caused to flow through the electro-magnet whenever the weight 37 draws its end of the armature lever down, and the electro-magnet then attracts the armature and lifts the weight; but as soon as the weight is lifted the parts 50 and 55 break contact, thus interrupting the current, whereupon the weight will fall, and thereby re-establish contact between the parts



50 and 55, when a current is re-established and the weight again raised. Whenever the weight descends, the larger pawl 38 will turn the ratchet-wheel 10 one tooth. The pin 11 5 on the wheel 10, being on the flexible arm 11 and bearing against it, turns the wheel 4. Thus the battery serves to supply the clock mechanism with the necessary power, which will enable the pendulum to remain in motion. The pendulum is shown in Fig. 1, and 10 is connected with the train of wheels and with the escapement in the ordinary manner. As the ratchet-wheel is provided with sixty teeth and revolved once in an hour, its action upon 15 the arm 12 and wheel 4 occurs sixty times per hour—that is, every minute—but the number of teeth of the ratchet-wheels may be varied without departing from my invention. By the turning of the axis of the main wheel 4 20 the minute-wheel 6, secured on the extended axis, will be revolved. This minute-wheel meshes into the winding-up wheel 15, and thus this is set in motion. The wheel 15 winds up the spring 17\*, attached to a stud. If the

spring is so tensioned that it possesses the 25 power for the clock to strike twelve and twelve-thirty, it is sufficiently wound up, and will, as long as the elements are strong enough to raise the lever, continue to operate. The minute-wheel 6 has projecting pins 6\*, which 30 serve to raise the lever-arm 27\*. This in turn raises the lifting-arm 27<sup>2</sup>, which is under the lever 30, lifting that and also the angle-arm 31. When 31 is raised, the spring 17\* is free to turn the wheel 32, and the striking-wheel 18, 35 which causes the striking-works to operate until 31 drops into another notch.

I claim—

In an electric clock, the combination, substantially as described, of electro-magnet 44, 40 armature-lever 33, contact-piece 39, spring 50, pawl 38, detent 54, and ratchet-wheel 10, all arranged to operate substantially as herein shown and described.

FERDINAND BAUMAN.

Witnesses:

FRITZ BERGER,  
BOSSARDT.