

(No Model.)

2 Sheets—Sheet 1.

J. D. McANLIS & H. E. FLEMING.

ELECTRIC CLOCK.

No. 485,645.

Patented Nov. 8, 1892.

FIG. 1.

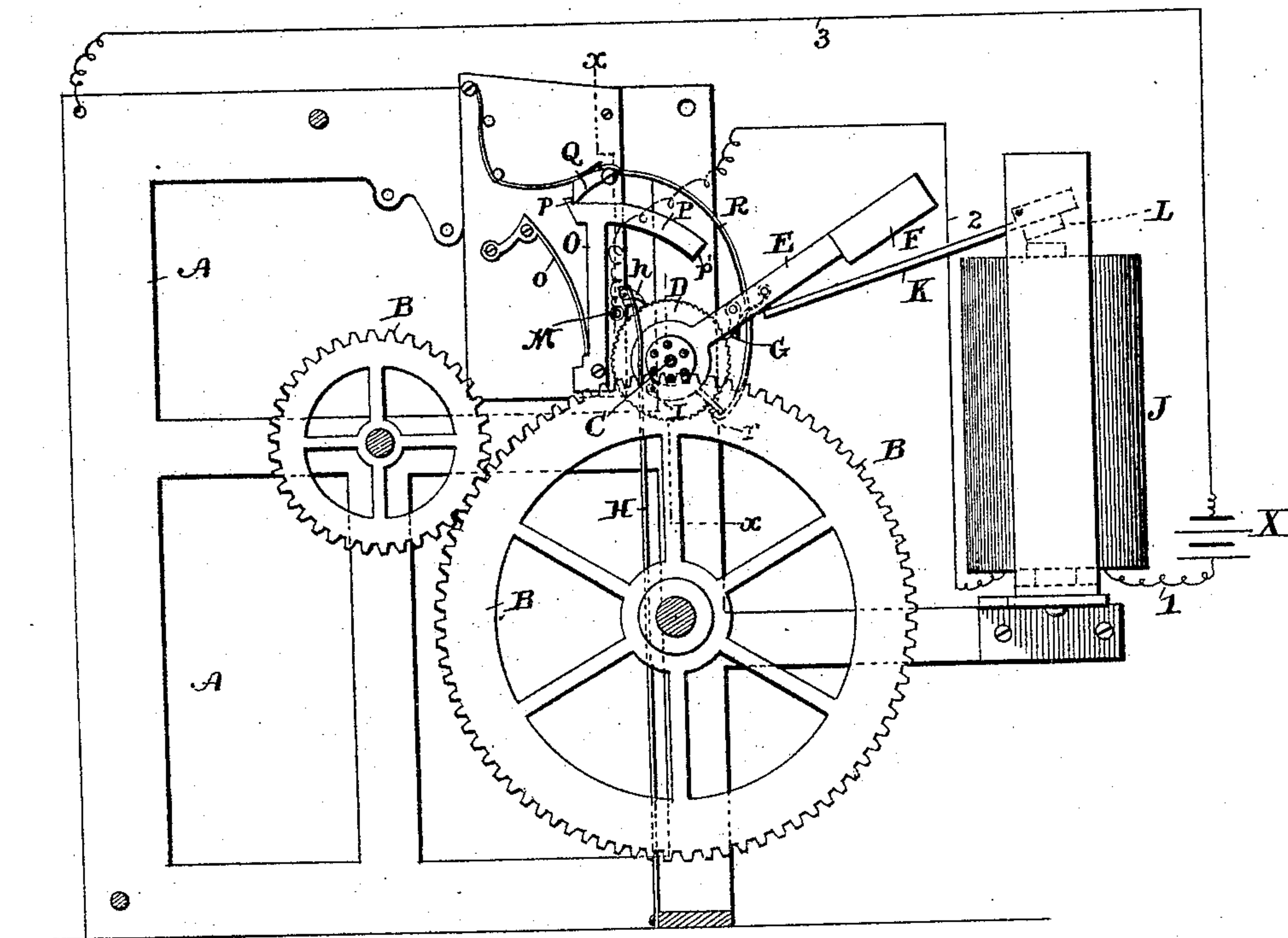


FIG. 3.

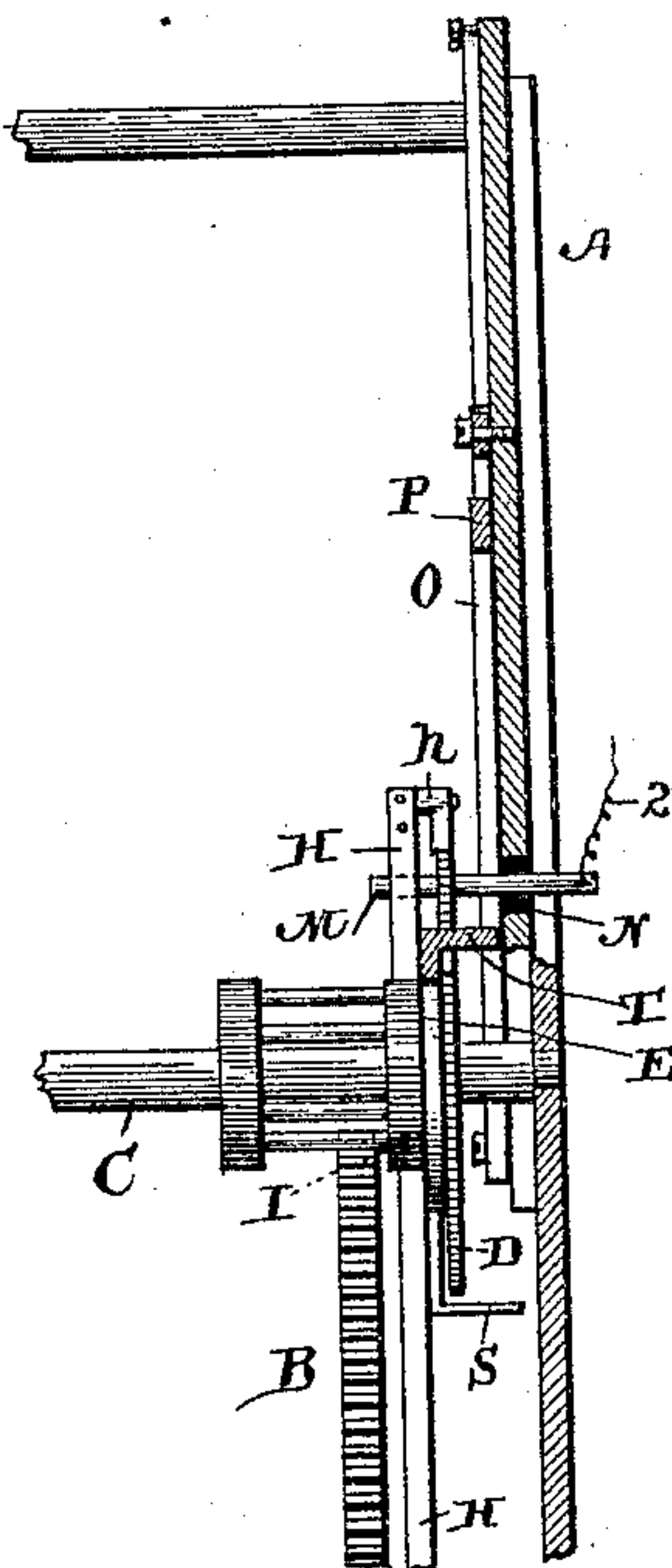
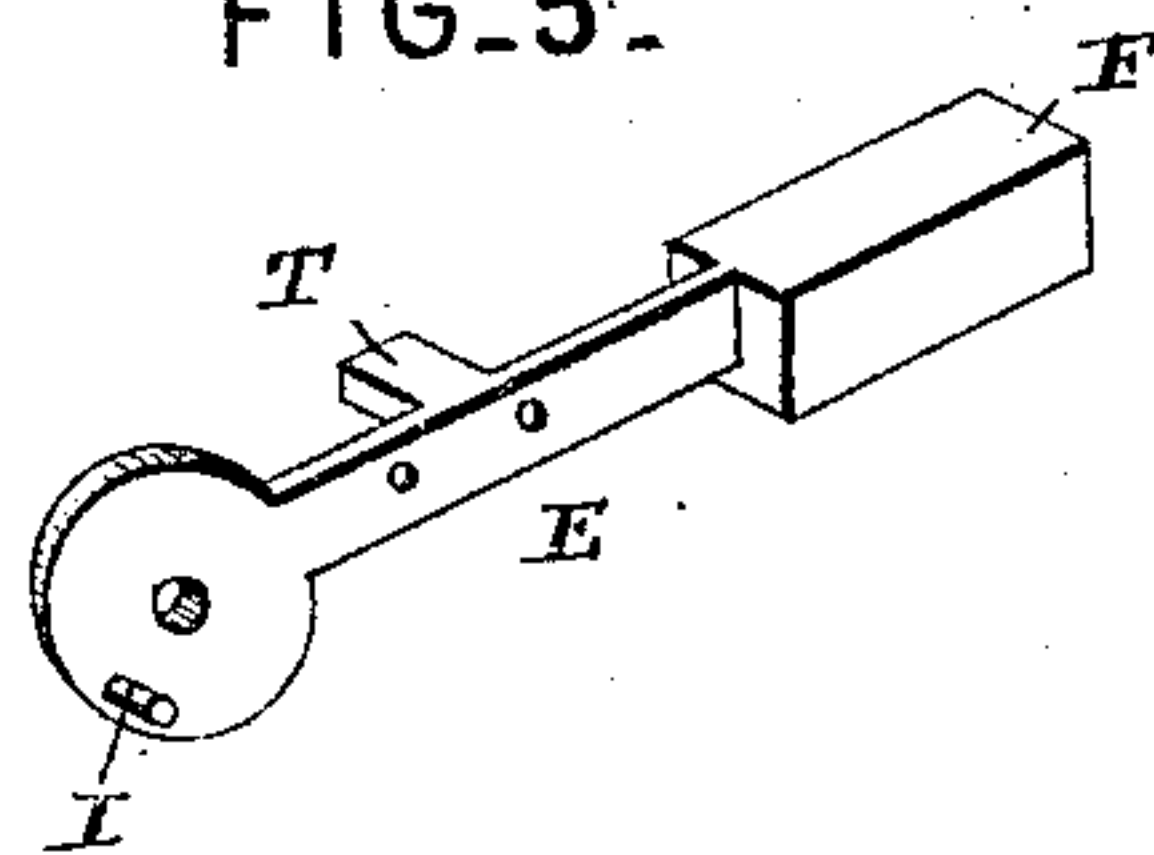


FIG. 5.



Witnesses

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(No Model.)

2 Sheets—Sheet 2.

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FIG. 2.

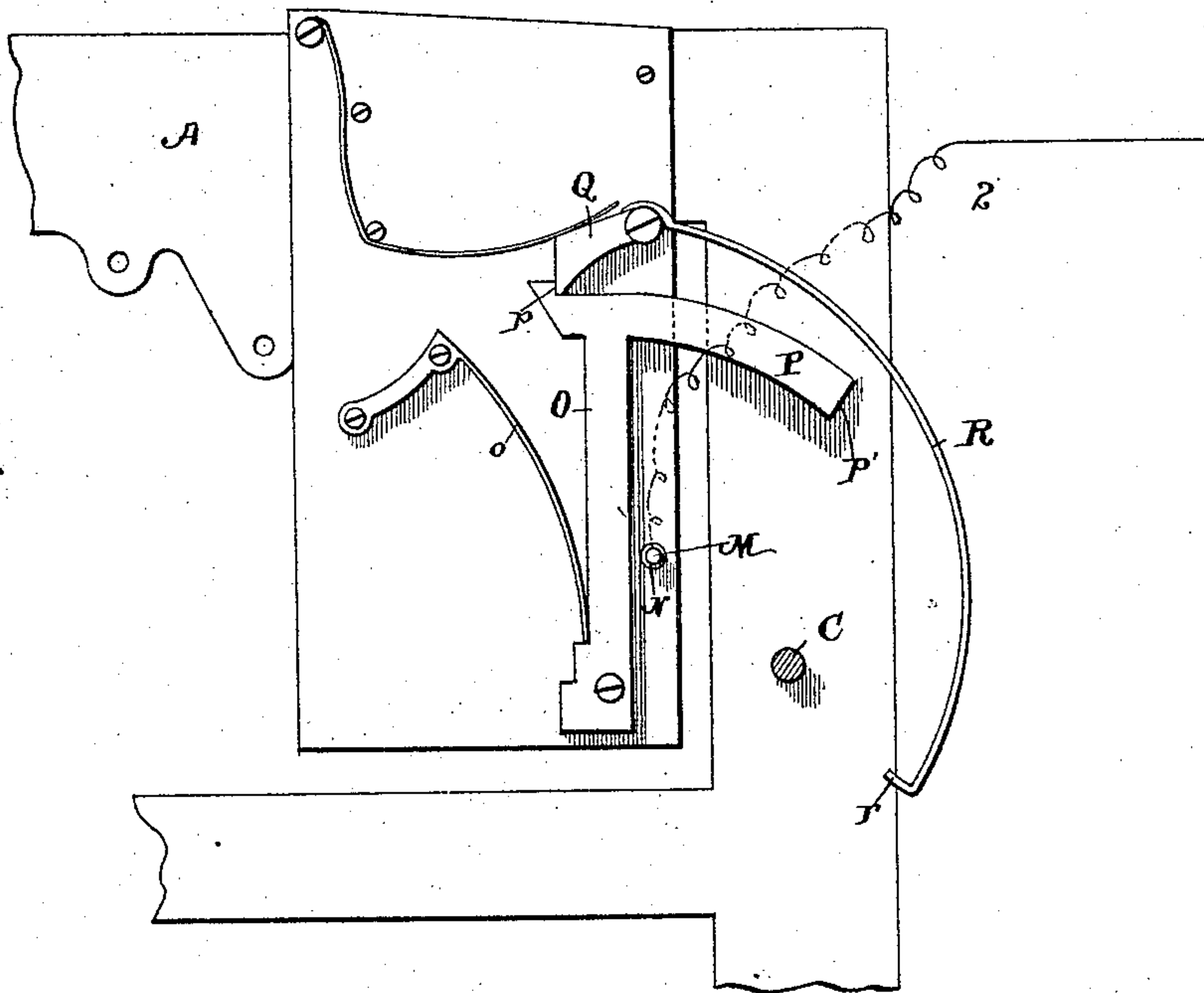
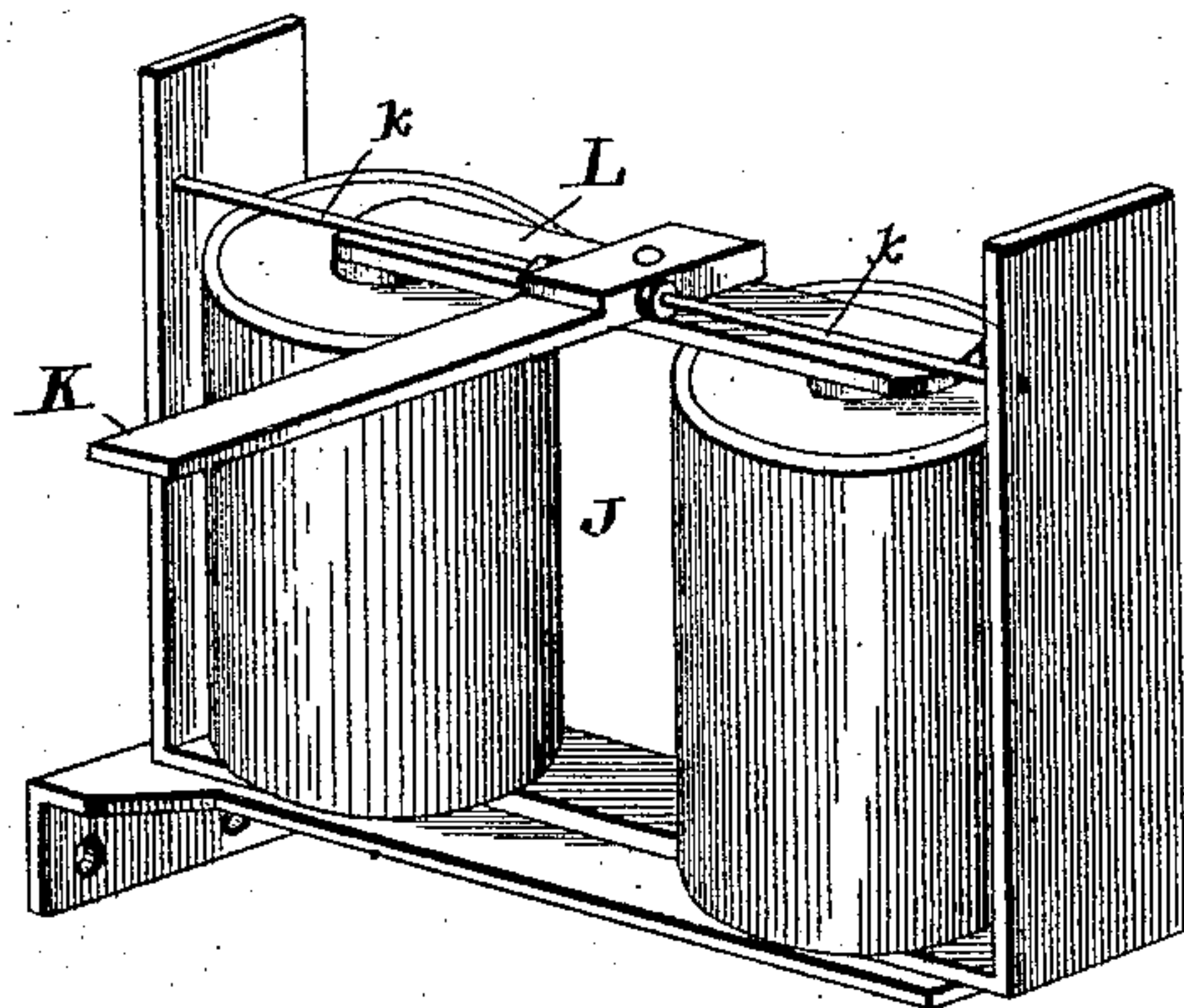


FIG. 4.



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# UNITED STATES PATENT OFFICE.

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SYLVANIA.

## ELECTRIC CLOCK.

SPECIFICATION forming part of Letters Patent No. 485,645, dated November 8, 1892.

Application filed June 7, 1892. Serial No. 435,877. (No model.)

*To all whom it may concern:*

Be it known that we, JAMES D. McANLIS and HARVEY E. FLEMING, citizens of the United States, residing at Beaver Falls, in the  
5 county of Beaver and State of Pennsylvania, have invented a new and useful Electric Clock, of which the following is a specification.

This invention relates to electric clocks; and  
10 it has for its object to provide improvements in electrically-controlled actuating devices for clock mechanism, whereby an ordinary clock is regularly operated without the use of any springs whatever, but which is accurately  
15 and continuously moved by means of electrically-controlled devices.

To this end the main and primary object of the invention is to generally improve upon and simplify the construction of electric  
20 clocks.

With these and many other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination,  
25 and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a vertical sectional view of a clock mechanism having an actuating device constructed in accordance with this invention. Fig. 2 is a similar view directly in front of the circuit-closer. Fig. 3 is a vertical sectional view on the line  
30 *x x* of Fig. 1. Fig. 4 is a detail in perspective of the lifting-magnet; Fig. 5, a similar view of the weight-arm.

Referring to the accompanying drawings, A represents the ordinary metallic frame of a clock mechanism, in which is mounted the ordinary train of gearing B, connected in the  
40 usual manner to turn the hands of the clock, as will be at once apparent. Upon any suitable shaft of the clock mechanism, which may be designated as C, and adjacent to one side of the frame, is fixedly mounted the ratchet-wheel D, which is designed to communicate  
45 motion to said shaft and therefore to the entire clock mechanism. Loosely mounted upon the shaft C, alongside of the ratchet-wheel D, is the swinging weight-arm E, carrying at its  
50 outer swinging end the weight F and at a point above the ratchet-wheel D a spring-

actuated pawl G, which, as the weight carries the arm down, holds fast in the ratchet-wheel and carries the same therewith to move the shaft C, but which, when the arm rises, rides  
55 over said ratchet-wheel to obtain a new grip upon the same. It will be readily seen how the weighted arm pivotally mounted at one end upon the shaft C moves the shaft in its downward movement; but which, when rising,  
60 is disengaged from the ratchet-wheel. While the weight-arm is thus rising, in order to prevent any lost motion whatever I employ a motion-retaining spring H. The said retaining-spring H is fixedly secured at one end to  
65 the frame and carries at its upper end a pivoted pawl *h*, which of its own weight engages the top of the ratchet-wheel D. When the weight-arm E has descended to its lowest limit, an eccentrically-mounted strike-pin I,  
70 secured to the pivoted end of said weight-arm, has at this point already moved the vertical retaining-spring out of its normal vertical plane, so that as the weight-arm is raised in  
75 the manner to be described the said pin is carried away from the spring and allows the tension thereof to keep up the motion of the ratchet-wheel until the weight-arm has secured a new grip thereon. The alternate raising and lowering of the weight-arm actuates  
80 the clock. When the weight-arm has lowered to a certain point which is its limit, the electro-magnets J are brought into play to actuate the lifting-arm K. The lifting-arm K is pivotally mounted upon the rod *k*, mounted in  
85 the frame of the magnets directly above and a little to one side of the cores of the magnet and is connected at such end to the oscillating armature L, which by such connection is always held in very close proximity to the  
90 cores of the magnets, so that immediately upon the magnetization of the magnets the armature is quickly attracted, so as to bring the lifting-arm K up into a horizontal position. The magnets J are located at a suitable point adjacent to one end of the frame  
95 A and are so arranged that the outer end of the lifting-arm normally lies under and at the lower limit of movement of the weight-arm, so that when the lifting-arm is raised the said  
100 weight-arm is also raised to secure a new grip on the ratchet-wheel, as will be at once appar-



ent. One of the magnet-wires 1 is connected in circuit with an ordinary battery X, while the other magnet-wire 2 is connected to the circuit-closing pin M. The said circuit-closing pin M, thus connected in the battery-circuit, is passed through and insulated from the frame-plate N, secured to and therefore in circuit with the frame of the mechanism. Pivotally mounted at its lower end to said frame-plate and below the circuit-closing pin M is the spring-actuated circuit-closing arm O, which is normally pressed toward and against the circuit-closing pin by means of the spring o, bearing thereagainst, so that when the arm is against the pin the circuit is completed through the frame of the clock and the current returns to the battery through the wire 3, connected to the frame and the battery. The circuit-closing arm O is provided with an upper curved head P, having a notched shoulder *p* at one end and extended into a strike-arm *p'* at the other end. The said shoulder *p* is normally engaged by the spring-pressed pawl Q, pivotally mounted on the frame-plate and normally held into the shoulder, so as to hold the circuit-closing arm out of contact with the circuit-closing pin while the weight-arm is lowered. A pawl wire or arm R is connected to the securing-pawl Q, and has an outer curved operating arm or end *r*, which is engaged by the strike-arm S, connected to the weight-arm. The strike-arm S engages said pawl-wire when the weight-arm has reached its lower limit, so that the securing-pawl Q is lifted from the head of the circuit-closing arm and allows the said arm to be forced in contact with the circuit-closing pin to close the circuit and bring the magnets into play, as already described. As the weight-arm rises the strike-lug T, carried upon one side of the same, engages the end of the curved head P, or at least the strike-arm *p'*, and presses the circuit-closing arm out of contact with the pin and allows the securing-pawl to again engage the notched shoulder *p*, as will be at once apparent.

It will be observed from the foregoing that an electric clock is provided in which a continuous and uninterrupted motion is insured and wherein the various parts of the same are certain in their movement.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

55 1. In an electric clock, the combination, with a springless clock mechanism, of a ratchet-wheel fixedly secured to a shaft of the mech-

anism, a swinging weight-arm loosely mounted upon the same shaft and carrying a spring-actuated pawl engaging said ratchet-wheel and also having an eccentrically-disposed pin, a motion-retaining spring carrying a pawl at its upper free end normally engaging said ratchet-wheel, said spring being engaged by said pin while the weight-arm is falling, a circuit-closing device arranged adjacent to said arm and opened and closed at the upper and lower limits of movement of the same, respectively, an electro-magnet in circuit with said circuit-closer, and a lifting-arm controlled by said magnet and arranged under said weight-arm, substantially as set forth.

2. In an electric clock, the clock mechanism, a swinging weight-arm connected with and moving the mechanism and provided with a strike-arm and a strike-lug, a circuit-closing pin mounted in and insulated from the metallic frame of the mechanism, a spring-actuated circuit-closing arm mounted adjacent to said pin and provided with a notched shoulder and strike-arm engaged by said lug, a spring-actuated securing-pawl engaging said shoulder, a pawl-wire connected with said securing-pawl and engaged by the strike-arm of said weight-arm to disengage the pawl from said shoulder, an electro-magnet in circuit with said circuit-closing pin, and a lifting-arm controlled by said magnet and arranged under said weight-arm, substantially as set forth.

3. The combination, with the metallic frame, of the swinging weight-arm mounted within said frame and provided with a strike-arm and a strike-lug, a circuit-closing pin insulated from said frame, a spring-pressed circuit-closing arm mounted adjacent to said pin and provided with an upper-curved head having a notched shoulder at one end and extended into a strike-arm engaged by said strike-lug, a spring-pressed securing-pawl engaging said shoulder, a pawl-wire connected with said securing-pawl and engaged by the strike-arm of said weight-arm, and an electrically-controlled lifting device in circuit with said pin and arranged under said weight-arm, substantially as set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

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HARVEY E. FLEMING.

Witnesses:

JOHN M. FALLICK,  
G. L. FBERHART.