

(No Model.)

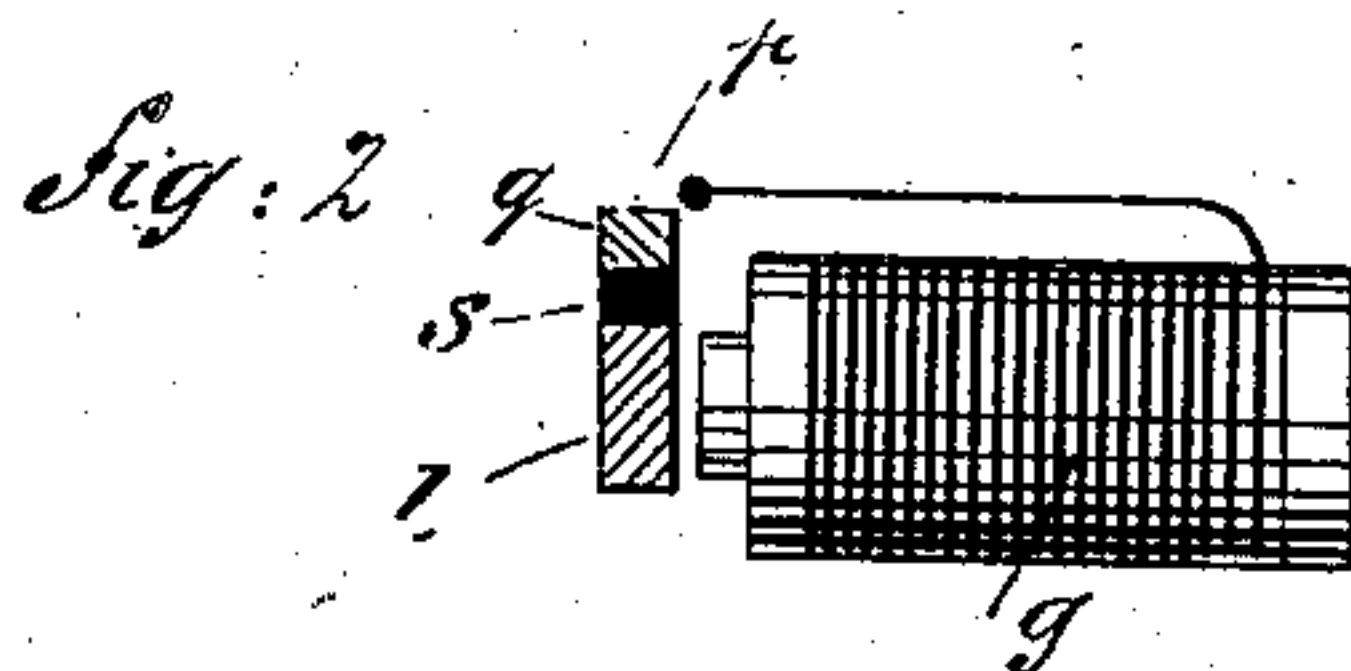
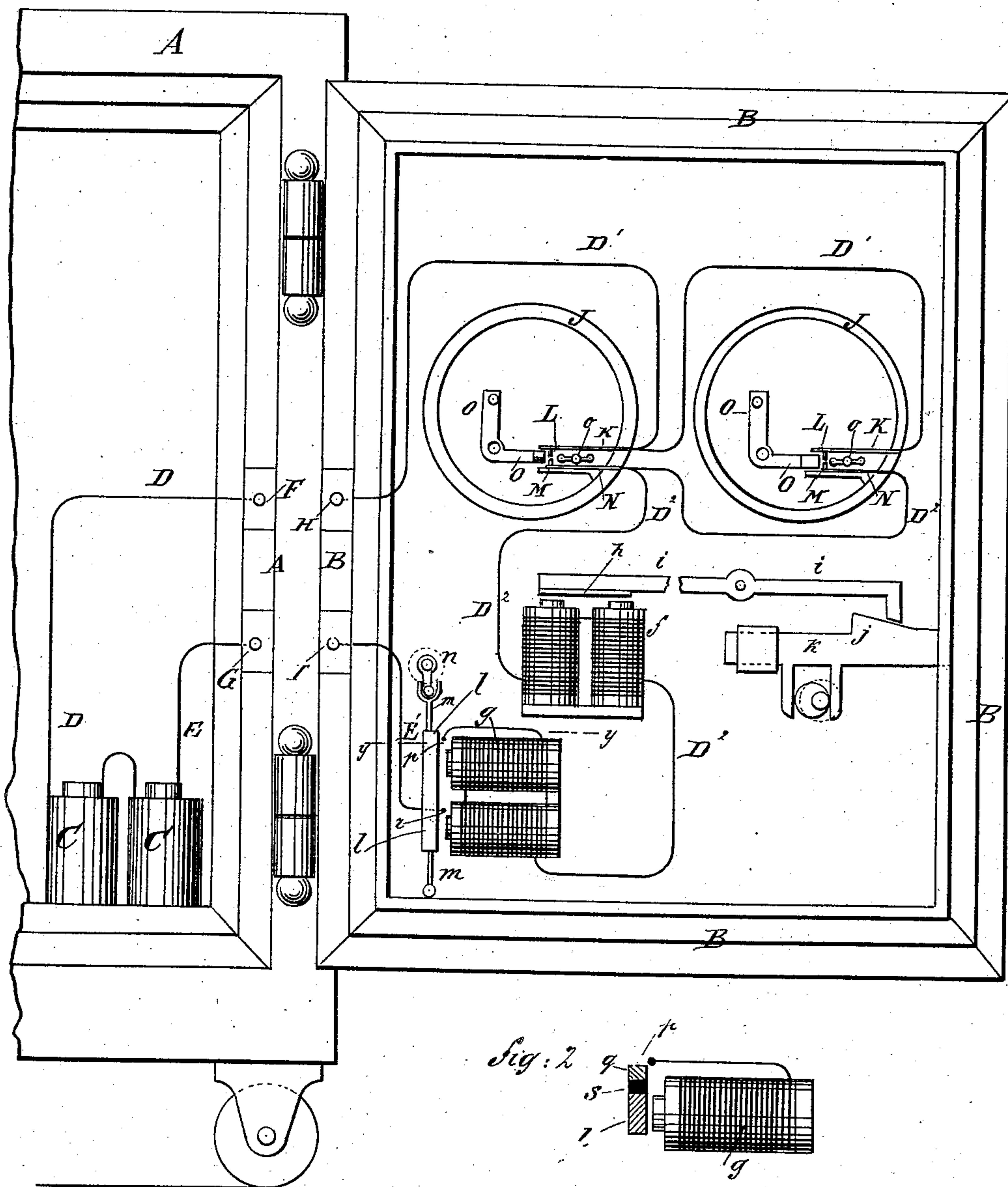
2 Sheets—Sheet 1.

W. E. PEIRCE.  
ELECTRIC TIME LOCK.

No. 287,775.

Patented Oct. 30, 1883.

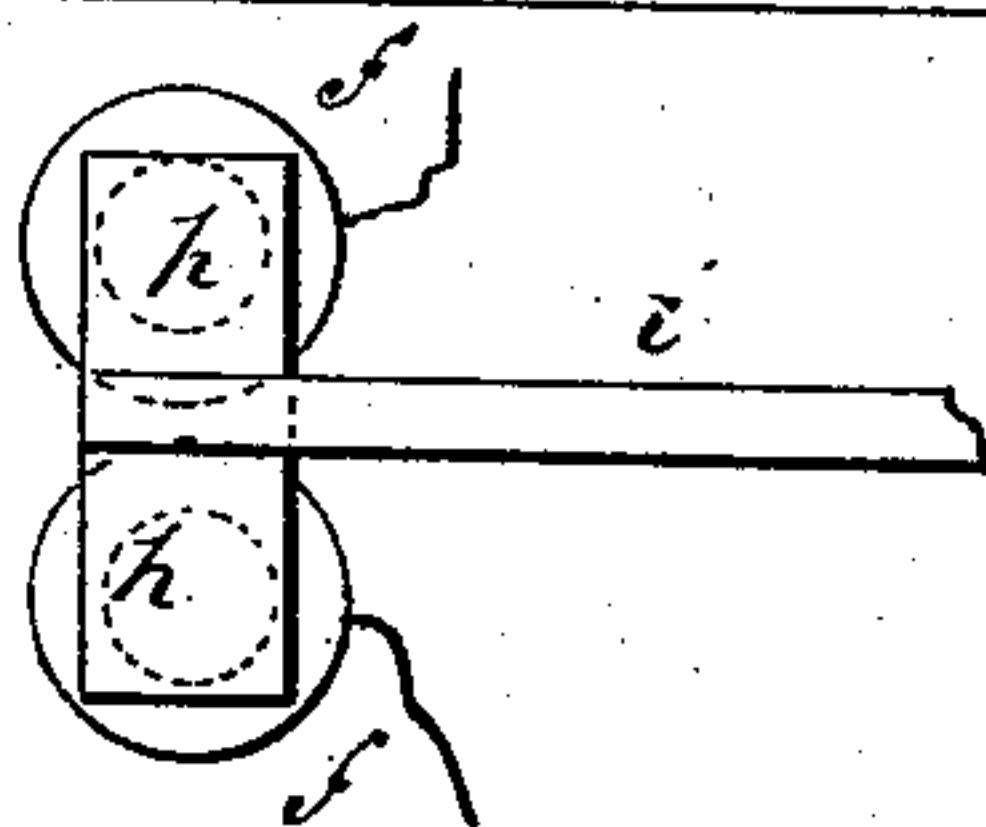
Fig: 1.



WITNESSES:

*Chas. Nida.*  
*E. Sedgwick*

Fig: 3.



INVENTOR:

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ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

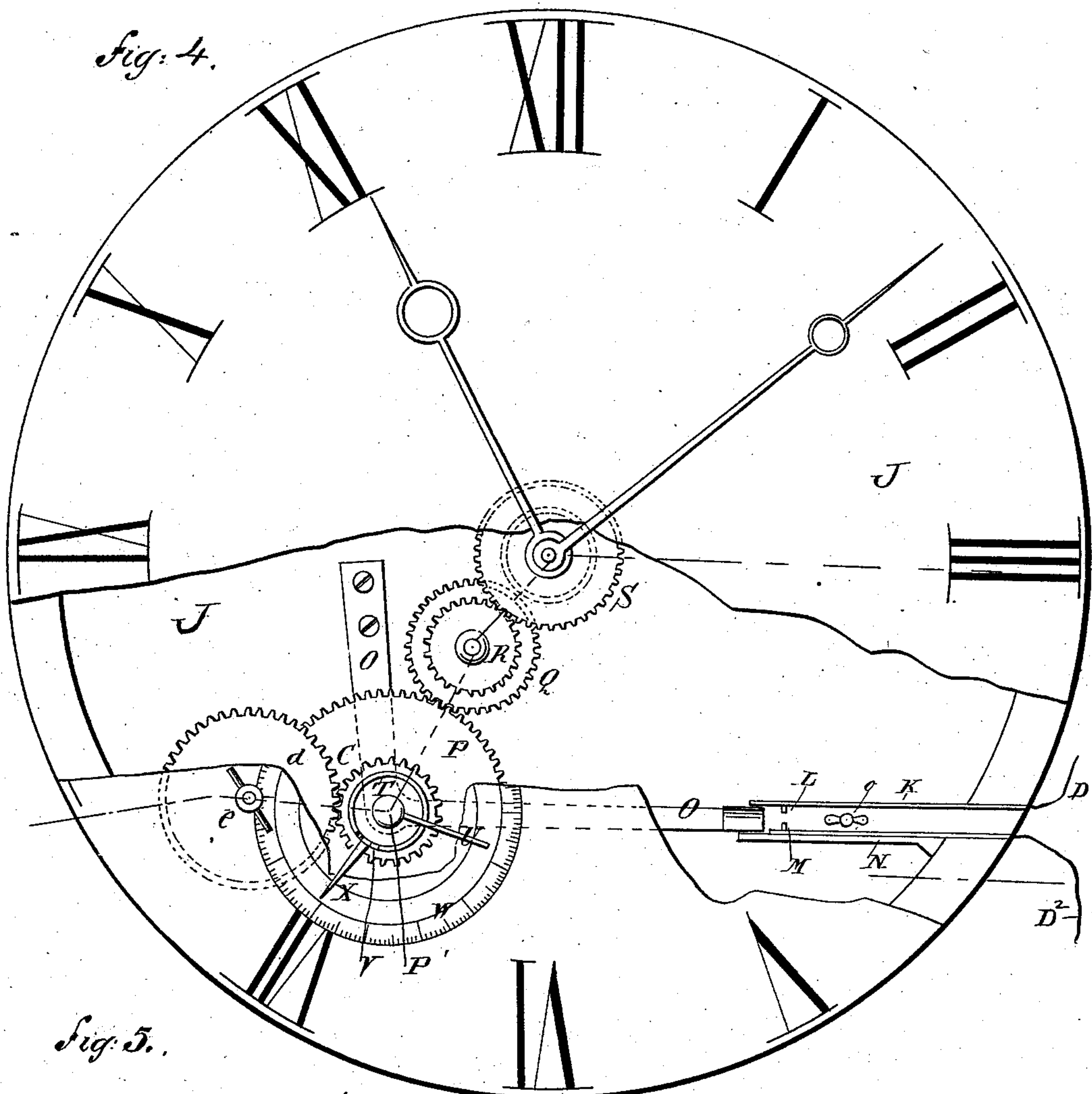
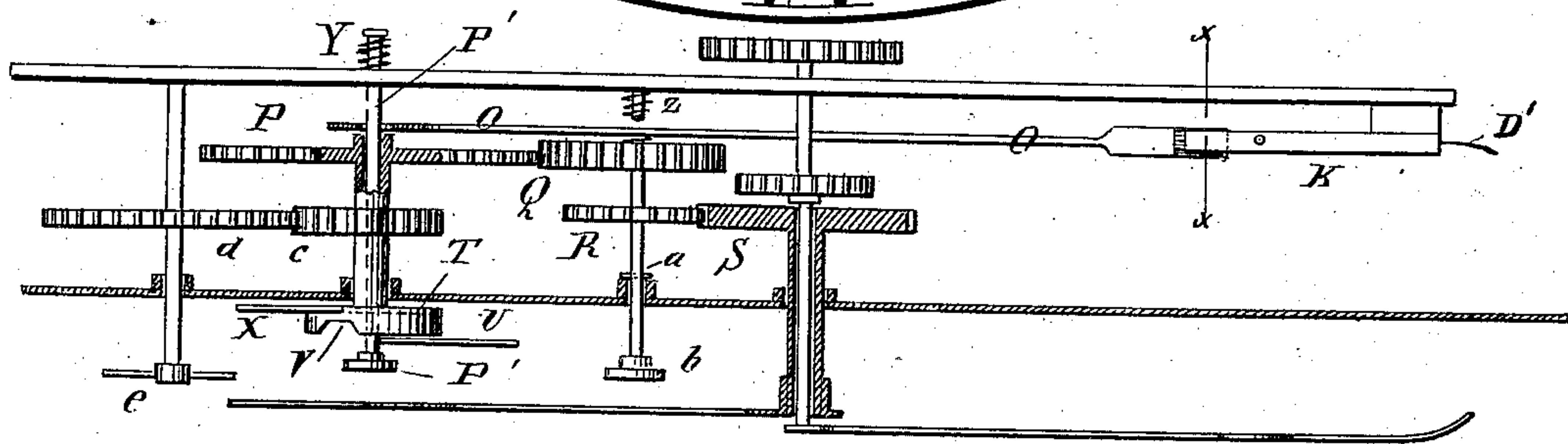


Fig. 5.



WITNESSES:

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*G. Sedgwick*

Fig. 6.

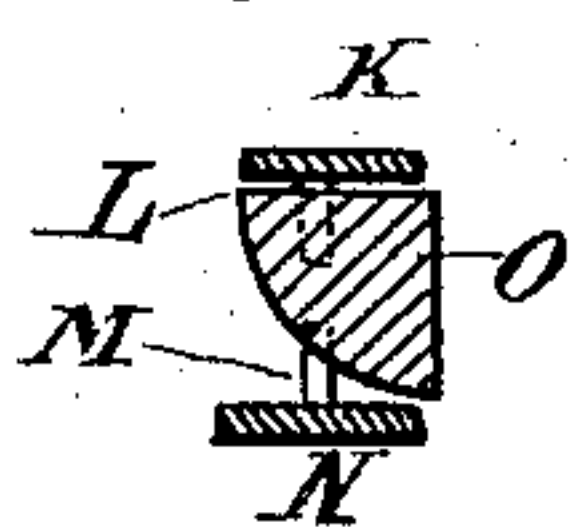
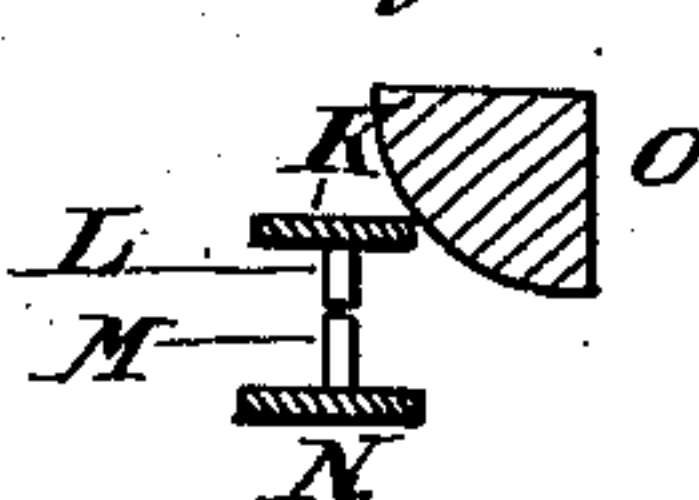


Fig. 7.



INVENTOR:

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# UNITED STATES PATENT OFFICE.

WILLIAM EDGAR PEIRCE, OF NEWARK, NEW JERSEY.

## ELECTRIC TIME-LOCK.

SPECIFICATION forming part of Letters Patent No. 287,775, dated October 30, 1883.

Application filed December 14, 1882. Renewed October 4, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM EDGAR PEIRCE, of Newark, in the county of Essex and State of New Jersey, have invented a new and useful  
5 Improvement in Electric Time-Locks, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1, Sheet 1, is an elevation of my improvement shown as applied to a safe, the safe being represented open and with part broken  
15 away. Fig. 2, Sheet 1, is a sectional elevation taken through the line *y y*, Fig. 1. Fig. 3, Sheet 1, is a plan view of a part of the catch-lever and its magnet. Fig. 4, Sheet 2, is a front elevation of one of the clocks, parts being broken away. Fig. 5, Sheet 2, is a plan  
20 view, partly in section, of the mechanism for closing the circuit in the clock at the proper time. Fig. 6, Sheet 2, is a sectional elevation of a part of the same, taken through the line  
25 *x x*, Fig. 5, showing the circuit open. Fig. 7, Sheet 2, is the same section as Fig. 5, but showing the circuit closed.

The object of this invention is to promote security and reliability in the use of time-locks.

30 The invention consists in an electric time-lock constructed with a battery, the circuit-wires of which have two breaks, one closed automatically by a time mechanism and the other closed by hand, the said circuit-wires  
35 being connected with an electro-magnet having its armature connected with a catch-lever engaging with the locking-bolt, so that the said locking-bolt will be released when both breaks in the circuit are closed, as will be hereinafter  
40 fully described.

A represents a safe, and B represents the safe-door.

Within the safe A is placed a galvanic battery, C, the conduction-wires D E of which are  
45 connected with insulated contact-points F G, secured in the rabbet of the safe-doorway, into which a shoulder of the safe-door fits when the said door is closed.

The shoulder of the safe-door is provided  
50 with two insulated contact-points, H I, corresponding in position with the insulated points

F G, and with which the continuations D' E' of the wires D E are connected, so that when the safe-door is closed the parts D E of the circuit-wires within the safe A will be in electric connection with the parts D' E' of the said  
55 wires attached to the safe-door B.

From the contact-point H the circuit-wire D' passes to the clock J, secured to the inner side of the safe-door B, and is connected with  
60 an insulated conducting-bar, K, attached to the case of the clock, and provided with a point, L, to come in contact with a corresponding point, M, upon an insulated conducting-bar, N, secured to the clock-case, and with  
65 which is connected the continuation D<sup>2</sup> of the circuit-wire D D'.

The bar K is made elastic, and when left free will hold the point L in contact with the point M, closing the circuit at this point.  
70

The points L M are held out of contact by the end of the elbow-spring O, the other end of which is secured to the clock-case in such a position that the post P' of the gear-wheel P will be in or pass through the angle of the  
75 said spring, so that the said spring will rest against the inner side of the said gear-wheel or the inner end of its hub, and when left free will force the said wheel outward.

The teeth of the gear-wheel P mesh into the  
80 teeth of the large gear-wheel Q, with which is rigidly connected a small gear-wheel, R. The teeth of the gear-wheel R mesh into the teeth of the hour-wheel S of the clock-work.

The hub of the gear-wheel P is made long,  
85 and upon its outer end is formed, or to it is attached, a disk, T, having an annular flange around its rim which rests and slides against an index, U, attached to the post P' of the gear-wheel P. In the flange of the disk T is  
90 formed a recess, V, to receive the index U and allow the gear-wheel P to move outward.

The index U points to the division-marks of a dial, W, formed upon or attached to the main dial of the clock J, and which represents  
95 hours and fractions of an hour. To the disk T, in a radial line with the recess V, is attached an index, X, which points to the dial W, so as to show at what point the recess V stands, so that the index U can be so set that  
100 the recess V will come opposite to the said index U in any desired number of hours. The



index U is held in place and against the flange of the disk T by a spring, Y, connected with the post P' and with the frame of the clock-work S.

5 The gear-wheel P may be constructed to make a revolution in one, two, three, or any other desired number of days, and the dial W has as many hour division-marks as the gear-wheel P requires hours to make a revolution.

10 The gear-wheel Q is made so long that the movements of the gear-wheel P upon its post P' will not throw its teeth out of gear with the teeth of the said gear-wheel Q.

15 The post of the gear-wheel Q slides longitudinally in its bearings, so that it can be pushed inward, to throw the said gear-wheel out of gear with the gear-wheel S, to allow the gear-wheel P to be turned without turning the clock-work, to bring the recess V into such a position that it will reach the index U in any desired number of hours at whatever hour of the dial W the said index may be set.

20 The wheels Q R are held outward by a spring, Z, connected with their post and with the frame of the clock-work, and their outward movement is limited by a collar or shoulder, a, attached to or formed upon the post of the said wheels. The post of the wheels Q R is provided with a key or knob, b, for convenience in pushing the said wheels inward, to throw them out of gear with the clock-work S.

30 To the post of the gear-wheel P is attached a small gear-wheel, c, the teeth of which mesh into the teeth of the large gear-wheel d. The post of the gear-wheel d revolves and slides longitudinally in bearings in the frame of the clock-work, and is provided with a key or knob, e, for convenience in turning it to adjust the recess V of the flanged disk T when the gear-wheel P is out of connection with the clock-work. With this construction, when the hour at which the index U has been set arrives the recess V comes opposite the index U and allows the spring O to force the gear-wheel P outward. This outward movement of the spring O carries the free end of the said spring out from between the ends of the bars K N, and allows the points L M to come in contact and close the circuit at that point.

40 The recess V is made with inclined sides, so that as the wheel P continues to revolve the flange of the disk T, pressing against the index U, will force the wheel P and the spring O back to their places and force the free end of the said spring inward above the bar K, leaving the points L M in contact until the bar K is raised by operating the button o, hereinafter described.

5 The free end of the spring O is made of hard rubber, or other suitable non-conducting material, so that it cannot act as a conductor to the electric current, and is beveled upon its side next the rigid bar N, so that when the gear-wheel P and spring O are forced back by the action on the index U of the flange of the disk T the said free end of the spring O can

pass above the said bar K, and the bar K can be raised to the top of the spring O by the button o, hereinafter described.

One, two, or three clocks are attached to the safe-door B, and are connected with the same circuit-wire, so that should either of the said clocks stop or get out of order the other or others will close the circuit at the proper time.

70 The wire D<sup>2</sup> passes from the bar N to the helix of the magnet f, and passes thence to the helix of the magnet g, the other end of the helix-wire being connected with a contact-point, p. The armature h of the magnet f is insulated from and connected with the end of the lever i, which is pivoted at its middle part to the safe-door B, and has a catch or shoulder formed upon its forward end, to engage with a shoulder, j, of the bolt k, so as to hold the said bolt from being thrown back until the electric circuit is closed, and the engaging end of the catch-lever i is withdrawn from the bolt k by the attraction of the armature h by the magnet f. With this construction there is no strain upon the clock in drawing the bolt.

80 The armature l of the magnet g is connected with a spring-bar, m, the lower end of which is attached to the safe-door B by a screw or other suitable means, and which is so formed as, when left free, to hold the armature l away from the magnet g and the conductor q away from the contact-points p r. The contact-point r is connected with the part E' of the circuit-wire, so that the break in the circuit can be closed by bringing the conductor q in contact with the points p r. The conductor q is connected with the armature l, and is insulated from the said armature by rubber s or other suitable means.

90 The upper end of the spring-bar m is forked, to receive the bit of a key or knob, n, which passes through the safe-door B. With this construction, when the circuit is closed automatically at the clock the key or knob n can be turned at any time to bring the conductor q into contact with the points p r and close the circuit at that point, when the catch-lever i will be withdrawn from the bolt k and the said bolt can be drawn back by the ordinary means.

100 The bolt k can be shot and drawn back by a knob, a key, or other suitable means, and can have a combination-lock, or other lock, connected with it, if desired.

105 When the conductor q is brought into contact with the points p r, the armature l is in contact with the poles of the electro-magnet g, so that the said conductor and armature will be held in place by electrical attraction until the circuit is broken by opening the safe-door. This retention of the conductor q and armature l in place by electrical attraction allows the operator to release the key n and use his hands to withdraw the bolt k or unlock the lock connected with the said bolt when such a lock is used. With this construction there is great economy in the battery-power,



as the current is in use only while withdrawing the bolt and opening the safe-door.

5 *o* is a button placed beneath the bar K, and attached to a knob-spindle passing through the clock-face. The button *o* should be a non-conductor, so that when brought into contact with the bars K N it will not close the circuit. The button *o* is designed to raise the bar K when it is desired to admit the spring O be-  
10 tween the bars K N in setting the apparatus.

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

1. An electric time-lock constructed substantially as herein shown and described, and consisting of a battery the circuit-wires of which have two breaks, one closed automatically by a time mechanism and the other closed by hand, the said circuit-wires being  
15 20 connected with an electro-magnet having its

armature connected with a catch-lever engaging with the locking-bolt, so that the said locking-bolt will be released when both breaks in the circuit are closed, as set forth.

2. In an electric time-lock, the combination, with the circuit-wires, D D' D<sup>2</sup>, of the battery C, and the clock-work, of the insulated conducting-bars K N, having contact-points L M, the spring O, the gear-wheels R Q P, the flanged disk T, connected with the gear-wheel P, and having recess V, and the adjustable index U, substantially as herein shown and described, whereby the break in the circuit-wire will be closed automatically at a fixed time, as set forth.

WILLIAM EDGAR PEIRCE.

Witnesses:

JNO. C. AVERILL,  
HOMER E. FOOTE.