(No Model.) 3 Sheets—Sheet 1.

J. E. RICHARDS.

WATCHMAN'S ELECTRIC TIME DETECTOR.

No. 270,125. Patented Jan. 2, 1883.

Fig. 1.

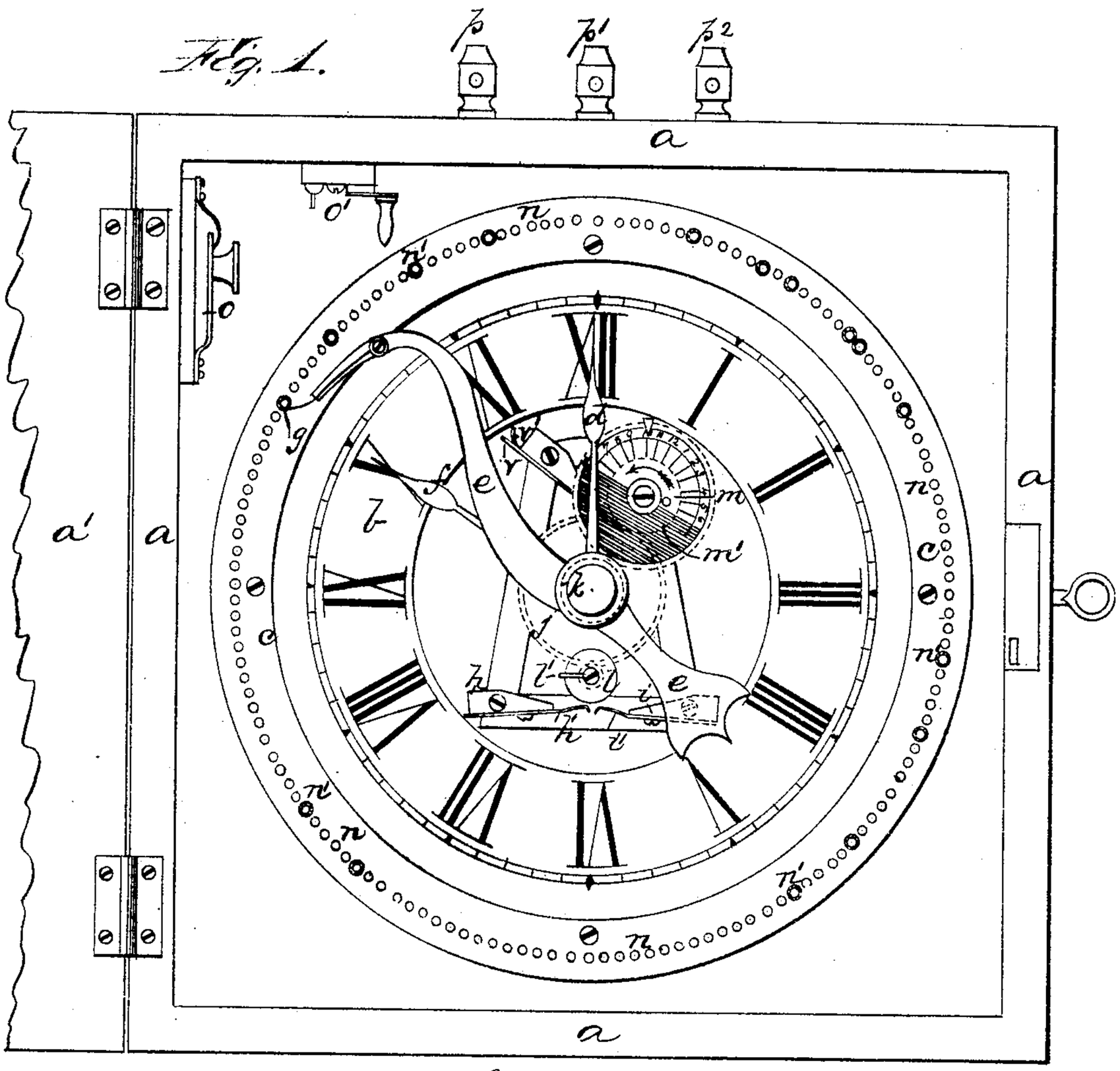
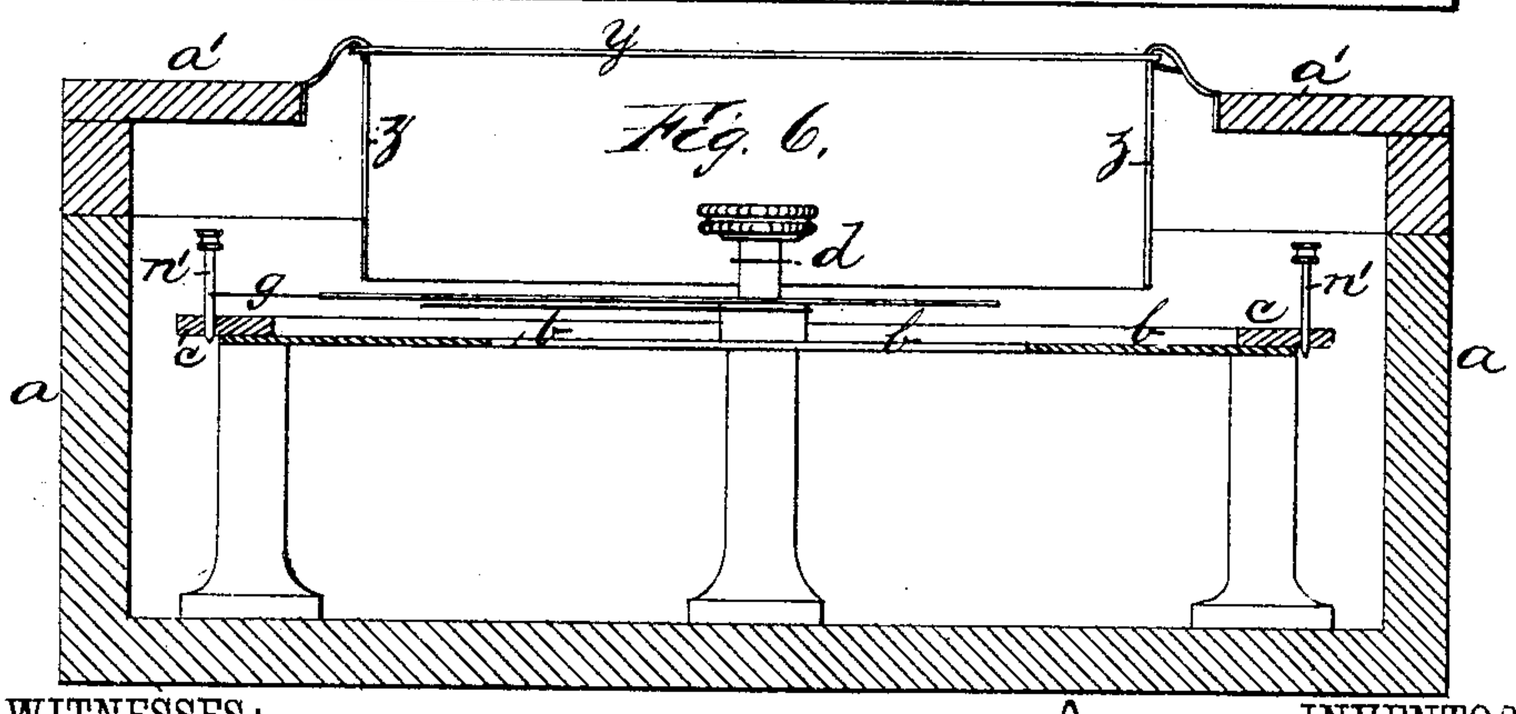


Fig. 6.



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(No Model.) 3 Sheets—Sheet 2.

J. E. RICHARDS.

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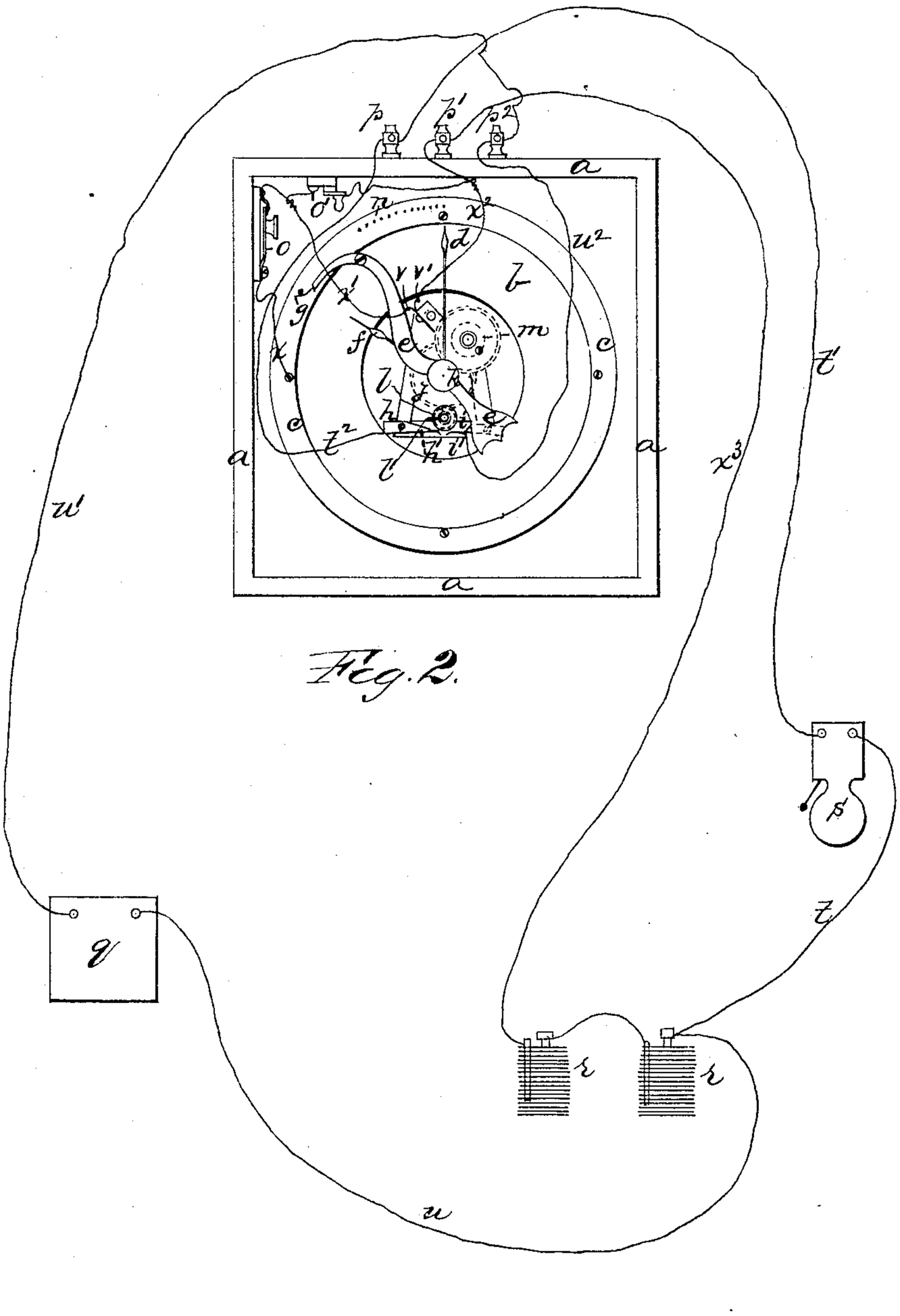

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

J. E. RICHARDS.

WATCHMAN'S ELECTRIC TIME DETECTOR.

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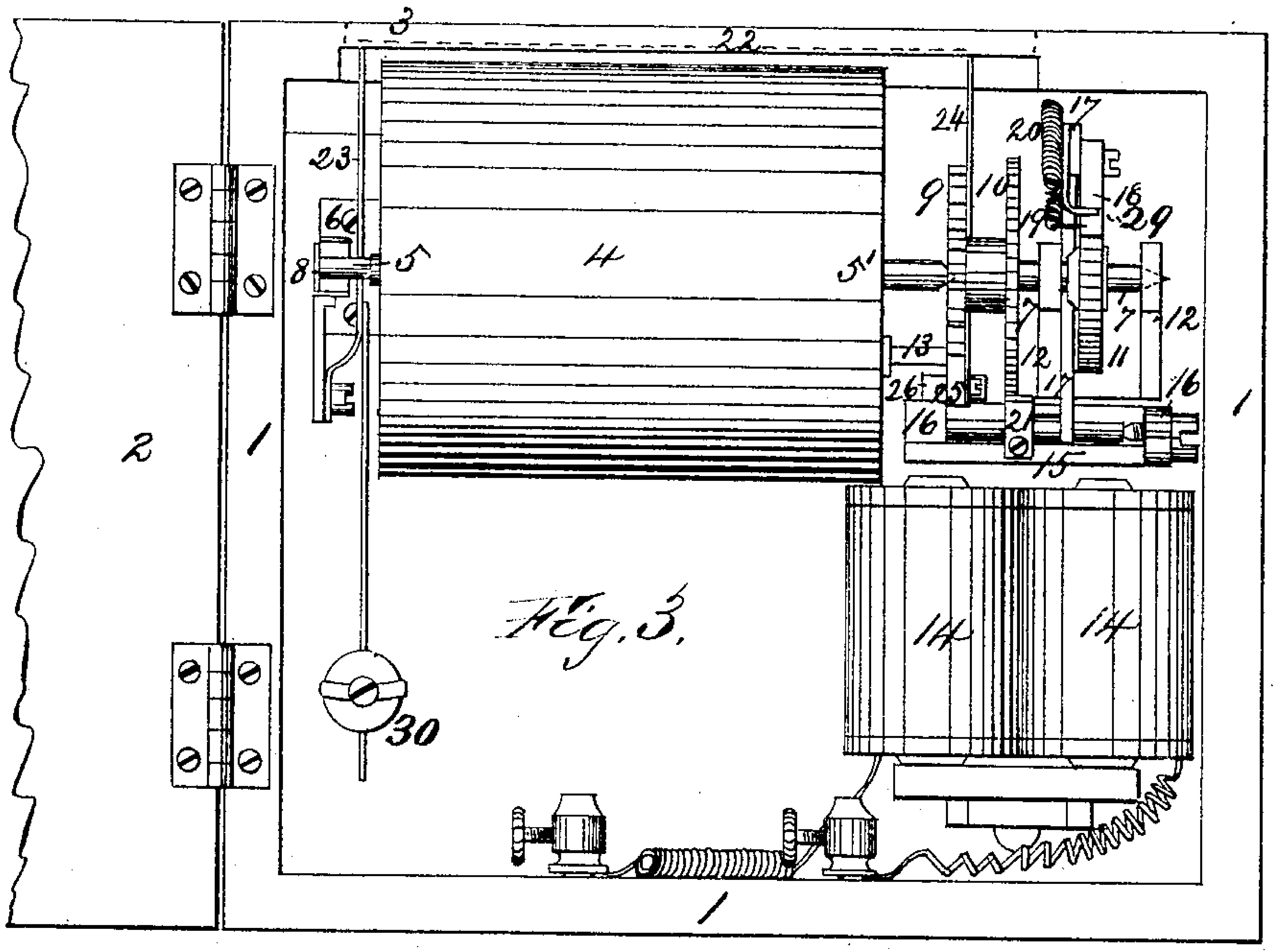


Fig. 4.

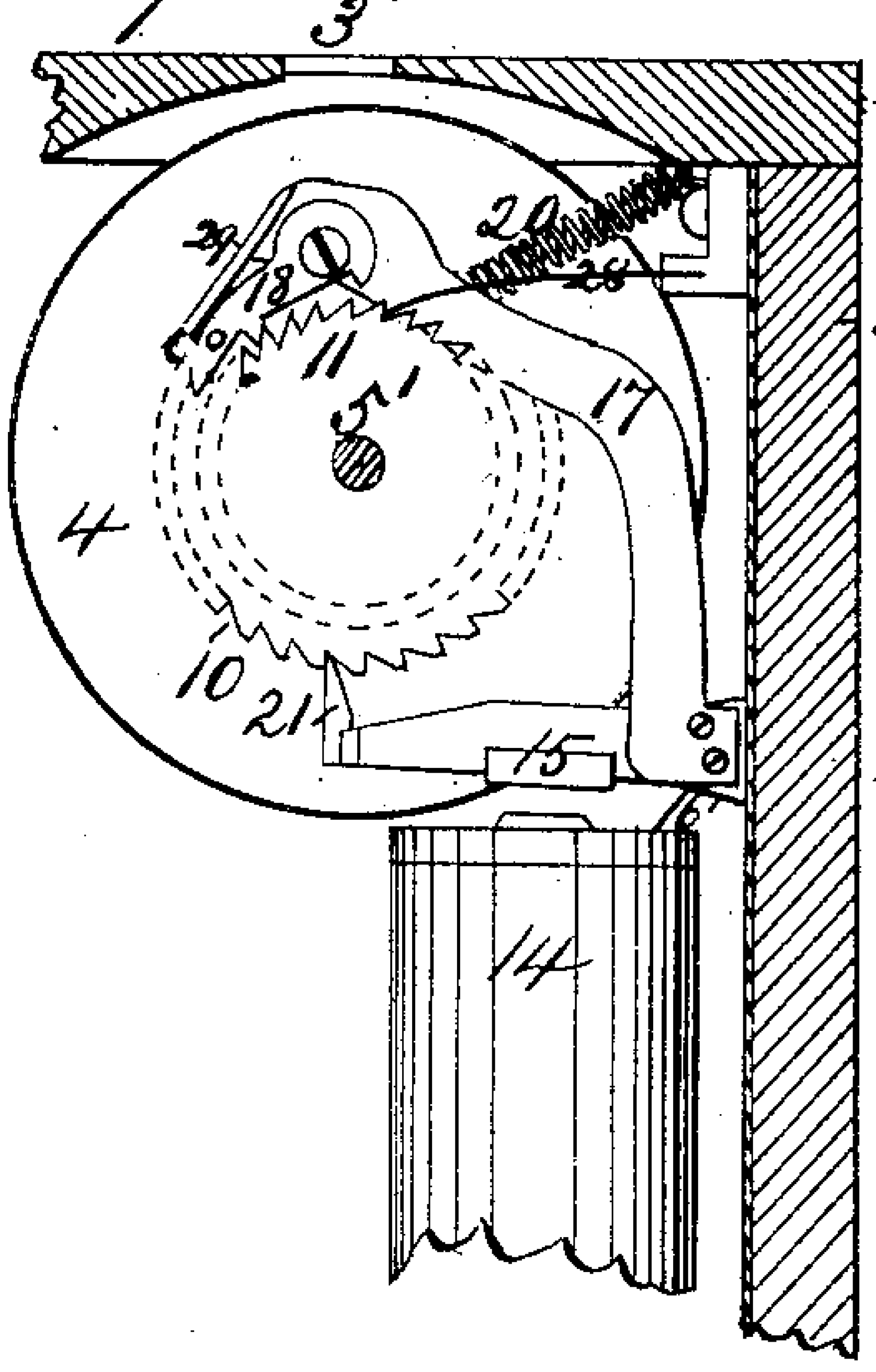


Fig. 5.

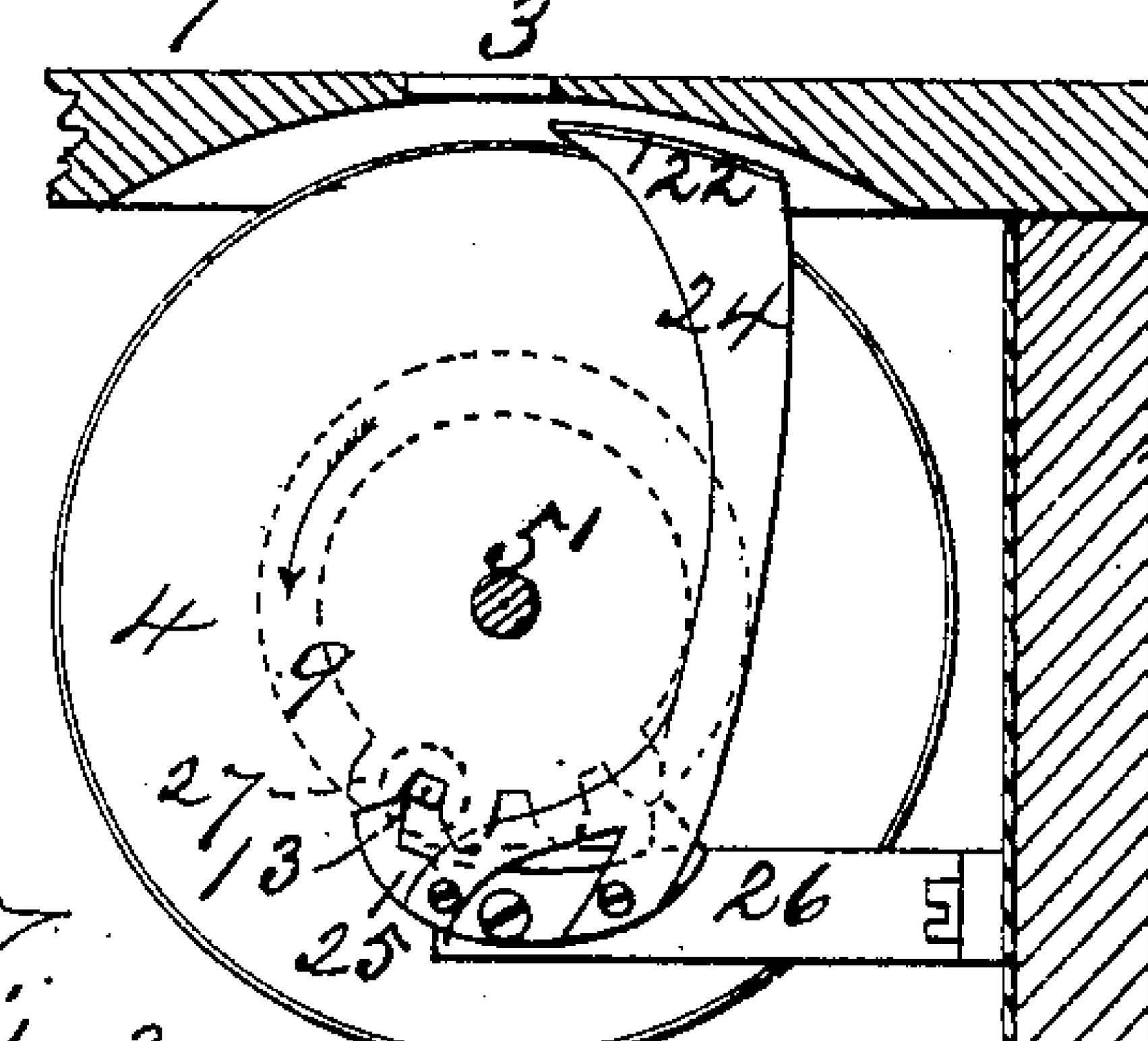
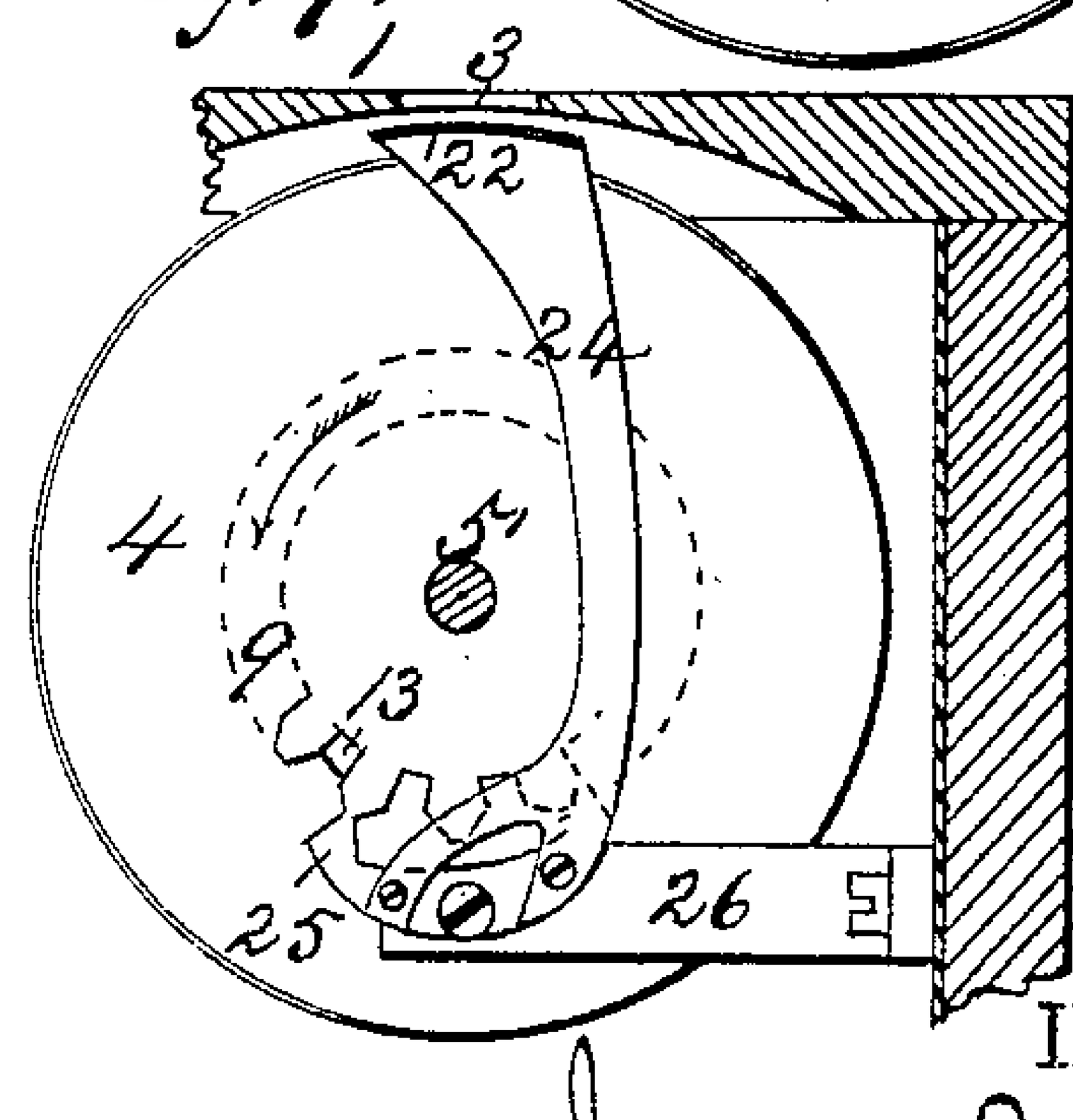


Fig. 7.



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UNITED STATES PATENT OFFICE.

JAMES E. RICHARDS, OF CEDAR KEYS, FLORIDA.

WATCHMAN'S ELECTRIC TIME-DETECTOR.

SPECIFICATION forming part of Letters Patent No. 270,125, dated January 2, 1883.

Application filed October 11, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. RICHARDS, of Cedar Keys, Florida, have invented a new and useful Improvement in Watchmen's Electric Time-Detectors, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

In the drawings, Figure 1 shows a front view of the clock with the lid of the case open. Fig. 2 shows the connections of the electric circuits. Fig. 3 is a front view of a station-box with the lid of the box open. Fig. 4 is a side view of a station-box, one end of the box being taken away. Fig. 5 is a side view of the wheel and lever by which the slot-closing plate is operated and locked. Fig. 6 shows in horizontal section the method of constructing the case of the time-movement when it is desired to use it as an ordinary clock or time-piece in addition to its function as a part of the detector. Fig. 7 shows the position of the parts when the slot is closed.

Like letters and figures indicate like parts in all the drawings.

My invention relates to that class of electric detectors in which electricity and the spring of the clock-movement are the motors, and it is, among other things, an improvement in the construction of the apparatus by which the invention patented to me by United States Letters Patent dated the 30th day of May, 1882, and numbered 258,603, may be practiced, and by it, among other advantages, the expense of the apparatus is greatly reduced, accuracy of operation secured, and the battery-power required greatly lessened.

In the drawings, *a a a*, &c., are the case for the clock-movement, made of wood or metal, as preferred. It is provided with a hinged lid, *a'*, which is provided with a lock.

b b, &c., is the clock-dial, having the hour and minute designations upon it, all as usual.

c c, &c., is a metallic ring placed around the outer edge of the clock-dial, but insulated from the clock frame and works. In this ring is drilled a series of holes, *n n*, &c. There are one hundred and forty-four of them, equidistant from each other, and they extend entirely around the ring *c*. Thus they are distant from each other, measuring in time, five minutes. A number of little pins, *n'*, are provided, which are to be placed in these holes, for the purpose hereinafter described. They are not fastened in the holes, but may be taken out and changed in position at pleasure.

d is the usual minute-hand of the clock. *e* is the hour-hand, which is preferably made curved, as shown. It is in metal contact with the clock-works through its arbor. For greater ease in ascertaining the time when this part of the apparatus is used as an ordinary time-piece, I attach to this hand *e* a straight pointer, *f*, which points directly in a straight line from the center of the dial to the time designations on the dial.

g is a metallic contact-spring in metal contact with the hand *e*, and in order that it may slip past the pins in the holes *n* when the hands are moved either backward or forward in setting the clock I bend the end of it, as shown, backwardly toward the center of the clock.

h is a block of suitable insulating material, preferably rubber, fastened to the frame of the clock-work, and *i* is another similar block, likewise fastened to the frame of the clock-work. These blocks respectively are provided with metallic contact-springs *h'* and *i'*, which are fastened to the blocks, and their free ends project toward each other, and are so formed and located relative to the metal tongue *l'* of the insulated wheel or disk *l*, hereinafter to be described, that when the apparatus is in operation metal contact will be made between the tongue *l'* and the spring *h'* a few seconds, more or less, as desired, before contact is made by *l'* with the spring *i'*; but both springs should preferably not be in contact with the tongue *l'* at the same time.

j is a wheel fastened to the arbor of the minute-hand. It of course completes a revolution once every hour.

l is a disk or wheel of some suitable insulating material, preferably rubber. It is placed upon a little shaft in metal contact with the clock-work. A tongue-like piece of metal, *l'*, is either let into this rubber disk or placed upon it, which connects with the shaft of the wheel and, projecting radially, extends somewhat beyond the edge of the disk. There is a little pinion placed on the shaft of the rubber disk *l*, below the disk, which gears into the

minute-wheel *j*. The number of teeth on the minute-wheel *j* is twelve times as great as that on the little pinion. Therefore since the minute-wheel *j* revolves once each hour the little pinion and the rubber disk *l*, carried by it, revolve twelve times each hour, or once every five minutes.

k is a wheel attached to the arbor of the hour-hand, its sole function being to drive the disk *m*. It makes a complete revolution once every twelve hours.

m is a disk revolving on a shaft attached to the clock-frame. It is driven by the wheel *k*, which gears into a wheel attached to the disk, and which has twice as many teeth as the wheel *k*. Consequently it—*i. e.*, the disk *m*—makes a complete revolution once every twenty-four hours. The disk *m* is insulated from the clock-work and its frame. One-half of the disk *m* is made of non-conducting material or is covered on its edge with a non-conducting material.

v and *v'* are two contact-springs, side by side, fastened to a block of rubber placed on the frame, thereby insulating them from it. The free ends of the springs rest on the edge of the disk *m*, preferably on the same transverse line across the edge of the disk.

o is a circuit-breaker placed on the inside of the case of the clock, for the purposes hereinafter stated.

o' is an ordinary switch or cut-out. Its function will be hereinafter explained.

p p' p'' are three binding-posts placed on the outside or inside of the clock-case, as desired.

q represents one of the station-boxes. It is arbitrarily placed where it appears on the drawings for the purpose of illustrating the circuits. There may be as many of them on the circuit as desired, depending solely on the battery-power. *r r* in like manner arbitrarily represent the battery. *s* in like manner represents a bell. There may be as many bells on the circuit as desired, being located in different parts of the property over which the watchman has charge.

Having thus described the construction and arrangement of the clock, I now proceed to describe the station-boxes.

1 is a wooden or metallic case or box, which contains a drum supporting a dial on which the watchman records his rounds. It is provided with a strong cover or lid, 2, preferably hinged to the case and provided with a lock. In the upper side of the case a slot, 3, is cut through it to the inside. It is placed directly over the drum 4, hereinafter to be described, upon which the dial is fastened. The slot is sufficiently wide to enable the watchman to make his record upon the dial by introducing a pencil or other suitable utensil through the slot, and it is about but not quite the length of the drum 4. This drum is a cylinder, preferably of metal, provided with heads at both ends, in the center of which are suitable points, 5 5'. The point 5 enters and is supported by the bracket 6, which is fastened to the case, and the point 5' enters the center of the end of the shaft 7. A spring, 8, which is fastened to the bracket 6, presses against the projecting end of the point 5. The spring is preferably indented opposite the end of the point 5, the better to keep the point in place, and it constantly presses the cylinder 4 toward the right, where, by the point 5', it is kept in position in the end of the shaft 7. The drum is so made that it can be readily removed from its supports and taken out of the case for replacing a dial or for inspecting it. To aid in its ready adjustment when returned to the case, I cut out the front end of the bracket 6 by a V-shaped incision, as usual in such cases, so that the sides of the incision shall serve as guides to conduct the point 5 to its proper seat in the bracket.

9, 10, and 11 are three wheels, all rigidly fastened to the shaft 7. The shaft is supported by and revolves in the brackets 12 12, which are fastened to the case. The wheels 10 and 11 have each the same number of teeth, and the wheel 9 has exactly half that number. This relation between these several wheels should be preserved; but it is immaterial how many teeth they have, the only thing to determine that being the number of spaces desired on the dial for the reception of the watchman's record. The teeth on the wheel 9 are flattened on their ends, (best seen in Figs. 4 and 5,) and are additionally recessed at their base. Into this recess at the base of some one of these teeth a carrier-pin, 13, (seen in Fig. 3,) which is rigidly fastened to the head of the drum, is made to enter when the drum is placed in its position. Thus this pin 13 drives the drum in unison with the wheel 9.

14 is the magnet; 15, the armature, which is pivoted to a bracket, 16. 17 is a lever rigidly attached to the armature. It projects upward from it, and upon its upper end is pivoted a pawl, 18. This pawl is what may be called a "stop" or "locking" pawl—that is to say, it has two teeth, one in front of and the other behind its pivotal point, whereby, both teeth engaging in the teeth of the ratchet-wheel 11 at each movement of the lever 17, the back tooth on the pawl, by impingement on the teeth of the ratchet-wheel, prevents the momentum from carrying the wheel around more than one tooth. A spring, 19, keeps the pawl in place on the ratchet-wheel, and a spring, 20, pulls the lever 17 and the pawl back, when the current ceases and the armature is free; but when the lever and pawl are drawn back the front tooth of the pawl, nevertheless, is in constant engagement with some one of the teeth on the ratchet-wheel. A finger or horn, 29, projecting from the lever 17 over the pawl, prevents it from accidentally upsetting. The lever 17, when retracted by the spring 20, brings up against a suitably-located set-screw, which regulates the degree of movement of the armature. To prevent the friction of the pawl

against the ratchet-wheel in its back motion from drawing the ratchet-wheel with it, I provide a suitably-located catch, 28, well known in such apparatus, which rests on the teeth of the ratchet-wheel and holds it in the position to which the pawl has shoved it. A locking-bar, 21, which is a rigid piece of metal fastened to the armature 15, and so adjusted that when the armature is retracted it enters one of the teeth in the wheel 10, locks the shaft 7 and prevents the drum from being moved.

22 is a plate of metal supported on two arms, 23 and 24, one at each end. The arm 23 extends from the plate downward, and is pivoted to the bracket 6. The arm 24 extends also downward, and is rigidly fastened to the piece of metal 25, which is made substantially in the shape shown in Figs. 5 and 7. It is pivoted near its center to the bracket 26. The function of this device is to operate the slot-closing plate 22, acting through the arms 23 and 24, and its operation is somewhat analogous to that of an escapement in an ordinary clock, with the exception that this device is so constructed relative to the teeth on the wheel 9 that the plate 22 is firmly locked in its then position whenever the apparatus is at rest. This device operates as follows: Assuming the plate 22 to be thrown back away from the slot, one end of the piece 25, as will be seen by reference to Fig. 5, (in which figure the plate 22 is thrown back,) rests in the space between two of the teeth, and the other end rests upon the flattened end of another tooth. Thus it will be seen that the plate 22 cannot be moved. Now, as the wheel 9 revolves in the direction of the arrow marked X, the side of the tooth marked 27 in Fig. 5 presses upon the side of that portion of the piece 25 which is contiguous to it, and both these surfaces being at an angle to the line of force, the piece marked 25 is caused to oscillate on its pivot, and when the motion of the wheel 9 has ceased it will be found that the piece 25 occupies the position shown in Fig. 7, the other end of it resting between two teeth, and the end formerly between them resting upon the top of another tooth, and the plate 22 will be moved in front of the slot and the entire apparatus locked. A counter-balance, 30, is attached to the arm 23 to facilitate easy movement of this part of the apparatus.

The operation is as follows, (referring to my said Letters Patent heretofore named for the general plan of the apparatus:) Time is reckoned from the contact-point of the spring *g* on the end of the hour-hand *e*. The little pins *n' n'*, before mentioned, are placed in such of the holes as are opposite the time designations on the clock-dial at which time the watchman is required to make his rounds for that night. These pins thus first placed in the ring *c*, I will name the "call-pins." Now, the time which the watchman will reasonably require to make his rounds and write his record on the dials, as set forth in my said prior patent, having been predetermined, another pin is put into such one of the unoccupied holes in advance, respectively, of the holes occupied by the call-pins as are the requisite distance from them, measuring in time. This second set of pins I will name the "slot-closing pins." From what has been heretofore stated it will be seen that there is continuous metallic contact (speaking now only of the circuit on which the bells are located, and which I will name the "bell-circuit") from one pole of the battery through wire *t* to the bell, through the bell and by wire *t'* to the binding-post *p*, and from *p* by wire *t''* to the contact-spring *h'*, which is fastened to the insulating-block *h*, and since, as before stated, the little disk *l* brings the little metallic tongue *l'* into contact with the contact-spring *h'* every five minutes, as soon as the tongue *l'* does make such contact the metal contact will be continued through the tongue and the shaft on which the disk revolves to the clock-work, thence through the clock-work to the hour-hand *e*, and when the contact-spring *g*, carried around by the hand *e*, comes in contact with any one of the pins placed in the holes *n* in the ring *c* the metal contact will be continued through the pin *n'* to the ring *c*, which has heretofore been insulated from the clock-work, and from the ring *c* the metal contact is continuous through wire *x* to the circuit-breaker *o*, through it and by wire *x'* to the contact-spring *v*, through the metallic portion of the disk *m* to the contact-spring *v'*, through wire *x''* to the binding-post *p'*, through wire *x'''* to the other pole of the battery. Thus the circuit is completed, and of course all the bells on the circuit are operated. The contact-spring *g* on the hour-hand *e* remains in contact with the pin *n'* during all the time that the tongue *l'* is in contact with the spring *h'* and *i'*, and, as stated, the little wheel *l*, carrying the metal tongue *l'*, leaves the contact-spring *h'* after being in contact with it a few seconds, more or less, thus breaking the bell-circuit, and immediately thereafter it comes in contact with the contact-spring *i'*, which is fastened to its insulating-block *i*. When this takes place another and separate circuit is completed—to wit, that on which the station-boxes are placed, and which I will name the "station-box circuit." This circuit is as follows: from one pole of the battery through wire *u*, through the station-boxes, through wire *u'* to binding post *p''*, through wire *u''*, through contact-spring *i'*, through tongue *l'*, through clock-work, through hour-hand *e* and contact-spring *g*, through a pin in the ring *c*, through ring *c*, through wire *x*, through circuit-breaker *o*, through wire *x'*, through contact-spring *v*, through wheel *m*, through contact-spring *v'*, through wire *x''* to binding-post *p'*, and through wire *x'''* to the other pole of the battery.

The apparatus in the station-boxes is operated by the current as follows: The lever 17, fastened to the armature 15, brings the pawl 18 forward, which, being in engagement with

the teeth of the ratchet-wheel 11, causes it to revolve one teeth, the back tooth on the pawl meantime, as before stated, preventing the momentum from carrying the ratchet-wheel over more than one tooth. The wheel 9, being fast on the shaft 7, is carried around by the movement of the lever 17 half a tooth, which, as before stated, causes the piece of metal 25 to rock on its pivot, whereby the plate 22 is tipped backward and away from the slot in the top of the box, and is locked in this position, as before stated. The carrier-pin 13, during this revolution of the wheel 9, causes the drum 4 to revolve with it an equal distance. Thus that part of the dial (which, as stated, is wrapped around the drum) upon which the watchman has last made his record is carried away from in front of the slot, and a clear space is presented for his next record. As soon as the tongue l' leaves the spring i' the current is broken, and the spring 20 draws the lever 17 backward, and the pawl 18 engages with the tooth of the ratchet-wheel 11, one to the rear of that which it has just left, and the locking-bar 21, moving upward, engages with a tooth of the wheel 10 and locks it, as stated. Thus the drum and all the apparatus are firmly locked until another movement of the armature. The dials in the several station-boxes thus remain exposed during the time required by the watchman to visit them all and note his record. At the expiration of this time the contact-spring g on the hour-hand e has reached the slot-closing pin immediately succeeding the "call-pin" which opened the slots. When this second contact between the spring g and the pin takes place the above-described operation of all the devices is repeated by a repetition of the same movements—*i. e.*, the bells all ring, then the station-boxes all operate in the same manner as before—with this difference, however, that the wheel 9 on this second impulse acts positively upon the other end of the piece of metal 25 and causes it to rock in the opposite direction. Thus at this second movement the plate 22 is moved in the opposite direction and the slot is closed at all the station-boxes.

It should be noticed that the drum 4 receives two forward impulses for each record made by the watchman—one by the action of the call-pin when he is summoned to make the record and the slots are uncovered, and another by the action of the slot-closing pin when the slots are closed. Consequently I make the diameter of the drum relative to the other devices in the station-box such that these two movements combined shall rotate the drum the necessary distance to remove the part of the dial on which the record has been made away from in front of the slot.

The foregoing describes my apparatus when the clock-work is used solely for the purposes of the detector; but it can be readily made to serve the purposes of an ordinary clock or time-piece as well by the addition of the following devices, illustrated in Fig. 6, which figure represents the clock in horizontal section through the center of the arbors.

Like letters indicate the same devices as in the other figures.

a is the case. b is the dial; c, the ring; d, the minute-hand; e, the hour-hand; and y is a glass face set in the lid of the case.

If the device were left as just above described, it might be possible for an unscrupulous watchman to ascertain the combination on which the clock was set by looking through the glass face y. To avoid this I provide a deep metallic shield, z, which is fastened to the edge of the opening in the lid, and it extends, when the lid is closed, inwardly toward the dial, and hides all the pins which are inserted in the ring c. This shield z is of such depth as just to clear the hour-hand e, and the minute-hand d is not long enough to touch it. When thus constructed the time designations on the dial of the clock and the hands are exposed to view, as in an ordinary time-piece; but the pins in the ring c are hid by the shield z. When the combination on which the detector is set is to be changed the lid will be unlocked and opened and the pins changed.

The function of the disk m is to automatically cut out and prevent the closing of both of the circuits during twelve of the twenty-four hours, during which time no current can pass over either the bell or station-box circuits. This is done in order that during the day-time the detector part of the apparatus will not be in operation, the clock meantime continuing to act as a time-piece.

Care should be taken, in the event of the clock running down, that when resetting it the disk m is in the proper position to make metal contact with the springs v and v' during the twelve hours that the watchman is desired to make his records; and to facilitate this I provide a pointer and figures to represent hours on the day half of the disk m, and also an arrow showing the direction in which the disk m turns. But it may be desirable that the detector apparatus should run continuously day and night; and in order that this may be done when desired I attach to the side of the clock-case an ordinary switch, o', which being closed, the disk m and the contact-springs v and v' are cut out, a shorter circuit being established through the switch by connecting through it the wires x' and x''.

It is also to be noticed that several distinct bell and station-box circuits can be alternately operated by the same battery and clock-work by combining with the make-and-break circuit disk l other insulated contact-springs the same as those marked h and i'. Of course such additional contact-springs must be provided with their own separate lines of wire, and the contact-spring g on the hand e must of course remain in contact with the pins n' while the wheel l is alternately making connection with the springs k and i', as well as such additional ones as may be added.

The function of the circuit-breaker o is to

prevent ringing the bells and operating the station-boxes when setting the clock. This is done by depressing the button and breaking metal contact on both circuits.

Having thus described my invention, I claim—

1. The combination of a battery, a clock-movement continuously operating a make-and-break-circuit hand, *e*, the contact-spring *g*, the insulated metallic ring *c*, the holes *n*, the pins *n'*, the wheel *j*, the continuously-moving make-and-break-circuit disk *l*, the insulated contact-springs *h'* and *i'*, the wheel *k*, the cut-out disk *m*, the contact-springs *v* and *v'*, the break circuit *o*, the switch *o'*, the binding-posts *p*, *p'*, and *p''*, an electric bell or bells, a station box or boxes having locked lids and a slot through the side, and in which are the following devices, to-wit: an electro-magnet operating an armature, the lever 17, the springs 19 and 20, the shaft 7, upon which are rigidly fastened the toothed wheels 9, 10, and 11, the pawl 18, engaging with the teeth on the ratchet-wheel 11, the locking-bar 21, engaging with the teeth on the wheel 10 when the armature is retracted, the catch 28, engaging with the teeth of the ratchet-wheel, the pivoted piece of metal 25, the plate 22, supported by the arms 23 and 24, the revolving removable and dial-supporting drum 4, driven by the action of the armature 15, and suitable metallic connections, all combined and arranged substantially as and for the purposes set forth.

2. The combination of a battery, a clock-movement continuously operating a make-and-break-circuit hand, *e*, the contact-spring *g*, the insulated metallic ring *c*, provided with the holes *n*, the pins *n'*, the wheel *j*, the continuously-moving make-and-break-circuit disk *l*, the insulated contact-springs *h'* and *i'*, the wheel *k*, the cut-out disk *m*, the contact-springs *v* and *v'*, the break-circuit *o*, the binding-posts *p*, *p'*, and *p''*, an electric bell or bells, and a station box or boxes having locked lids and a slot through their sides, and in which are the following devices, to wit: an electro-magnet operating an armature, the lever 17, the spring 20, the shaft 7, upon which are rigidly fastened the toothed wheels 9, 10, and 11, the pawl 18, engaging with the teeth on the ratchet-wheel 11, the locking-bar 21, engaging with the teeth on the wheel 10 when the armature is retracted, the catch 28, engaging with the teeth of the ratchet-wheel 11, the pivoted piece of metal 25, the plate 22, supported by the arms 23 and 24, the revolving removable and dial-supporting drum 4, driven by the action of the armature 15, and suitable metallic connections, combined and arranged substantially as and for the purposes set forth.

3. The combination of a battery, a clock-movement continuously operating a make-and-break-circuit hand, *e*, the contact-spring *g*, the insulated metallic ring *c*, provided with the holes *n*, the pins *n'*, the wheel *j*, the continuously-moving make-and-break-circuit disk *l*, the insulated contact-springs *h'* and *i'*, the wheel *k*, the cut-out disk *m*, the contact-springs *v* and *v'*, the binding-posts *p*, *p'*, and *p''*, an electric bell or bells, and a station box or boxes having locked lids and a slot through their sides, and in which are the following devices, to wit: an electro-magnet operating an armature, the lever 17, the spring 20, the shaft 7, upon which are rigidly fastened the toothed wheels 9, 10, and 11, the pawl 18, engaging with the teeth on the ratchet-wheel 11, the locking-bar 21, engaging with the teeth on the wheel 10 when the armature is retracted, the catch 28, engaging with the teeth on the wheel 11, the pivoted piece of metal 25, the plate 22, supported by the arms 23 and 24, the revolving removable and dial-supporting drum 4, driven by the action of the armature 15, and suitable metallic connections, substantially as and for the purposes set forth.

4. The combination of a battery, a clock-movement continuously operating a make-and-break-circuit hand, *e*, the contact-spring *g*, the insulated metallic ring *c*, provided with the holes *n*, the pins *n'*, the wheel *j*, the continuously-moving make-and-break-circuit disk *l*, the insulated contact-springs *h'* and *i'*, the binding-post *p*, *p'*, and *p''*, an electric bell or bells, and a station box or boxes having a slot through one of their sides, and in which are the following devices, to wit: an electro-magnet operating an armature, the lever 17, the spring 20, the shaft 7, upon which are rigidly fastened the toothed wheels 9 10 11, the pawl 18, engaging with the teeth on the ratchet-wheel 11, the locking-bar 21, engaging with the teeth on the wheel 10 when the armature is retracted, the catch 28, engaging with the teeth on the wheel 11, the pivoted piece of metal 25, the plate 22, supported by the arms 23 and 24, the revolving removable and dial-supporting drum 4, driven by the action of the armature 15, and suitable metallic connections, substantially as and for the purposes set forth.

5. The combination of a battery, a clock-movement continuously operating a make-and-break-circuit hand, *e*, the contact-spring *g*, the insulated metallic ring *c*, provided with the holes *n*, the removable pins *n'*, the wheel *j*, the continuous-moving make-and-break-circuit disk *l*, the insulated contact-springs *h'* and *i'*, the binding-posts *p* and *p' p''*, an electric bell or bells, and a station box or boxes having a slot through one of their sides, and in which are the following devices, to wit: an electro-magnet operating an armature, which armature, acting through a lever, rotates a shaft upon which is a dial-supporting cylinder placed opposite the slot on the side of the box, and which armature-lever also operates a door which automatically covers and uncovers the slot, substantially as and for the purposes set forth.

6. The combination of a battery, a clock-movement continuously operating a make-and-

break-circuit hand, *e*, the insulated ring *c*, provided with the holes *n*, the pins *n'*, against which pins the hand *e* makes metal contact, the continuously-moving make-and-break-circuit disk *l*, and the insulated contact-springs *h'* and *i'*, whereby the current from the battery is alternately diverted from one circuit into another circuit, substantially as and for the purposes set forth.

7. The combination of the electro-magnet 14, the armature 15, the lever 17, the pawl 18, the spring 20, the shaft 7, the wheels 9, 10, and 11, the locking-bar 21, the catch 28, the piece of metal 25, the plate 22, the arms 23 and 24, and the drum 4, whereby at each movement of the armature the drum is rotated and the plate 22 moved and upon the cessation of each movement of the armature both the drum and the plate 22 are locked in their then position, substantially as and for the purposes set forth.

8. The combination of a battery, a clock-movement, a make-and-break-circuit device geared to the clock-movement, and so constructed that the times when the circuit will be closed may be varied at will, and a second make-and-break-circuit device, also geared to the clock-movement, and so constructed that the current from the battery will be alternately diverted from one circuit to another circuit, substantially as and for the purposes set forth.

9. The combination of the clock-movement, inclosed in a locked case and provided with the usual dial, the hand *e*, carrying the contact-spring *g*, the ring *c*, in which are the holes *n*, the removable pins *n'*, placed in the holes *n*, and the shield *z*, substantially as and for the purposes set forth.

JAMES E. RICHARDS.

Witnesses:
JOHN J. CAULDWELL,
PHILLIPS ABBOTT.