No. 814,761. PATENTED MAR. 13, 1906.

S. R. WRIGHT.

TELEGRAPHIC SAFETY DEVICE.

APPLICATION FILED OCT. 13, 1903.

2 SHEETS—SHEET 1.

Fig. 1.

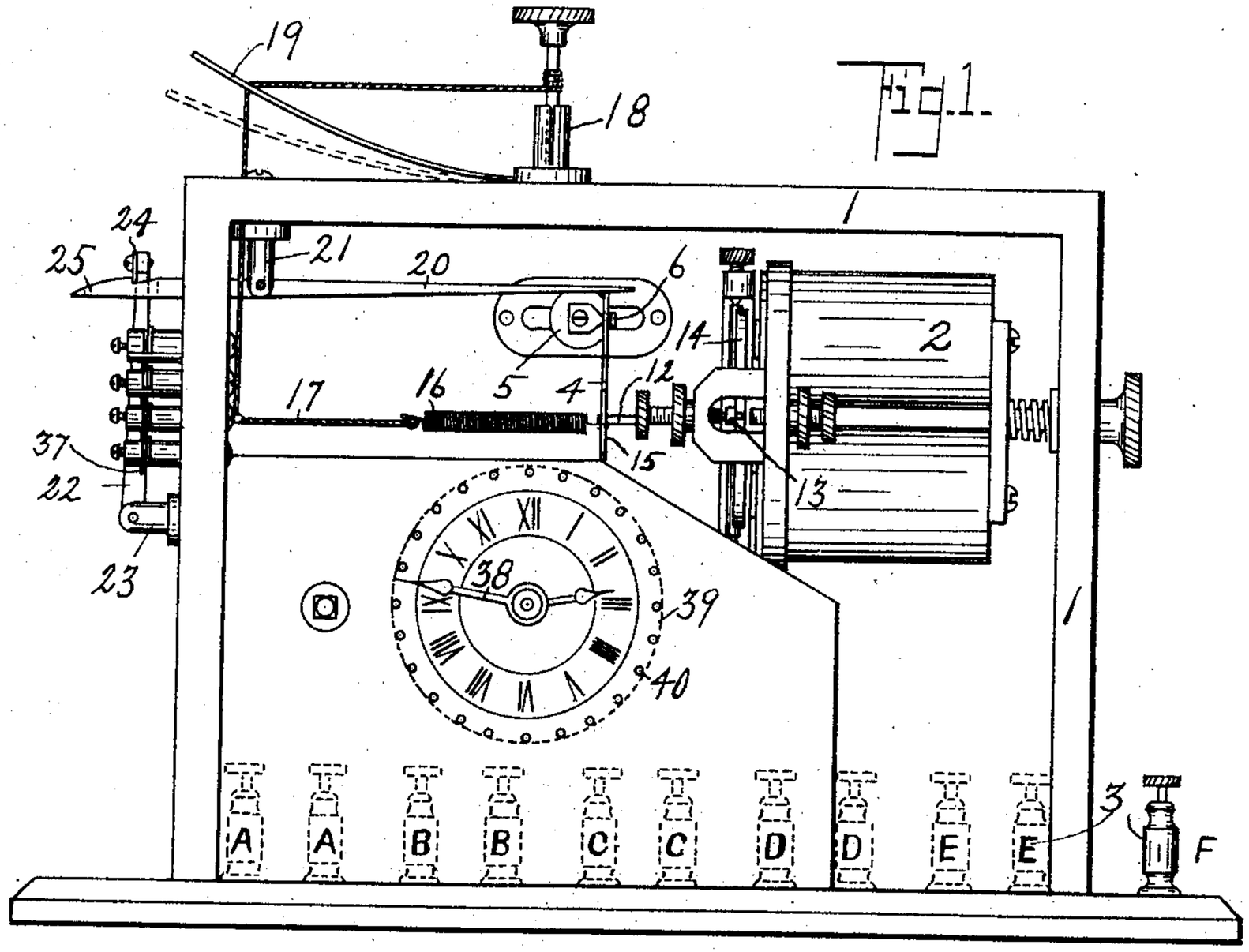


Fig. 2.

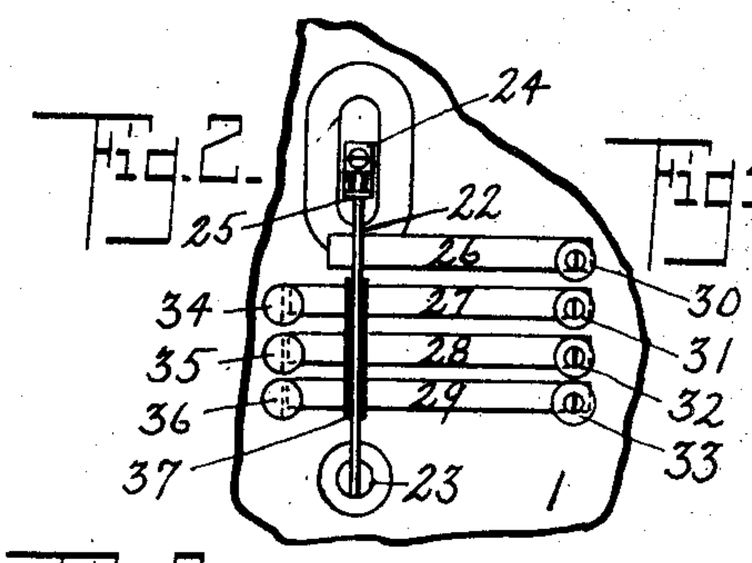


Fig. 3.

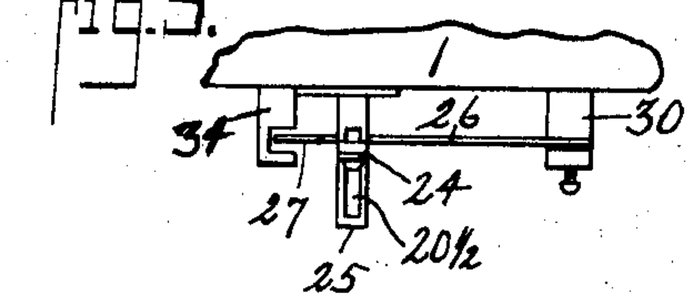


Fig. 4.

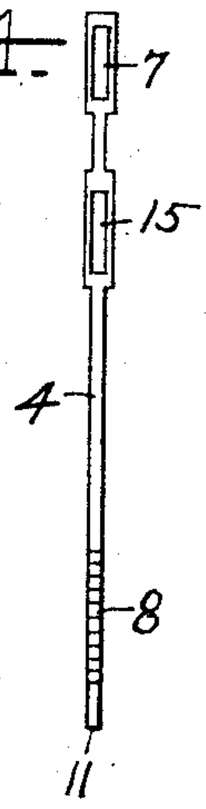
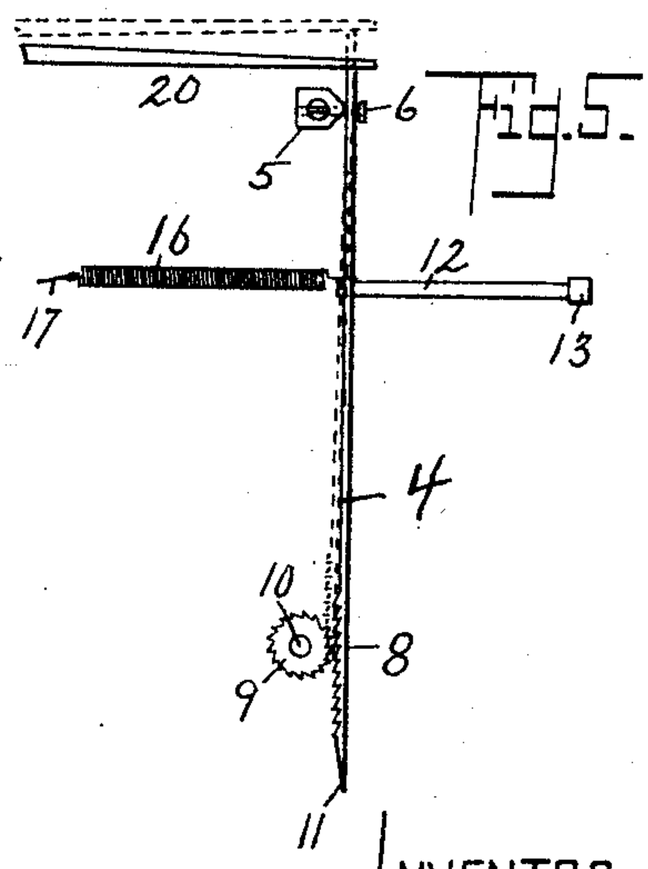


Fig. 5.



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TELEGRAPHIC SAFETY DEVICE.

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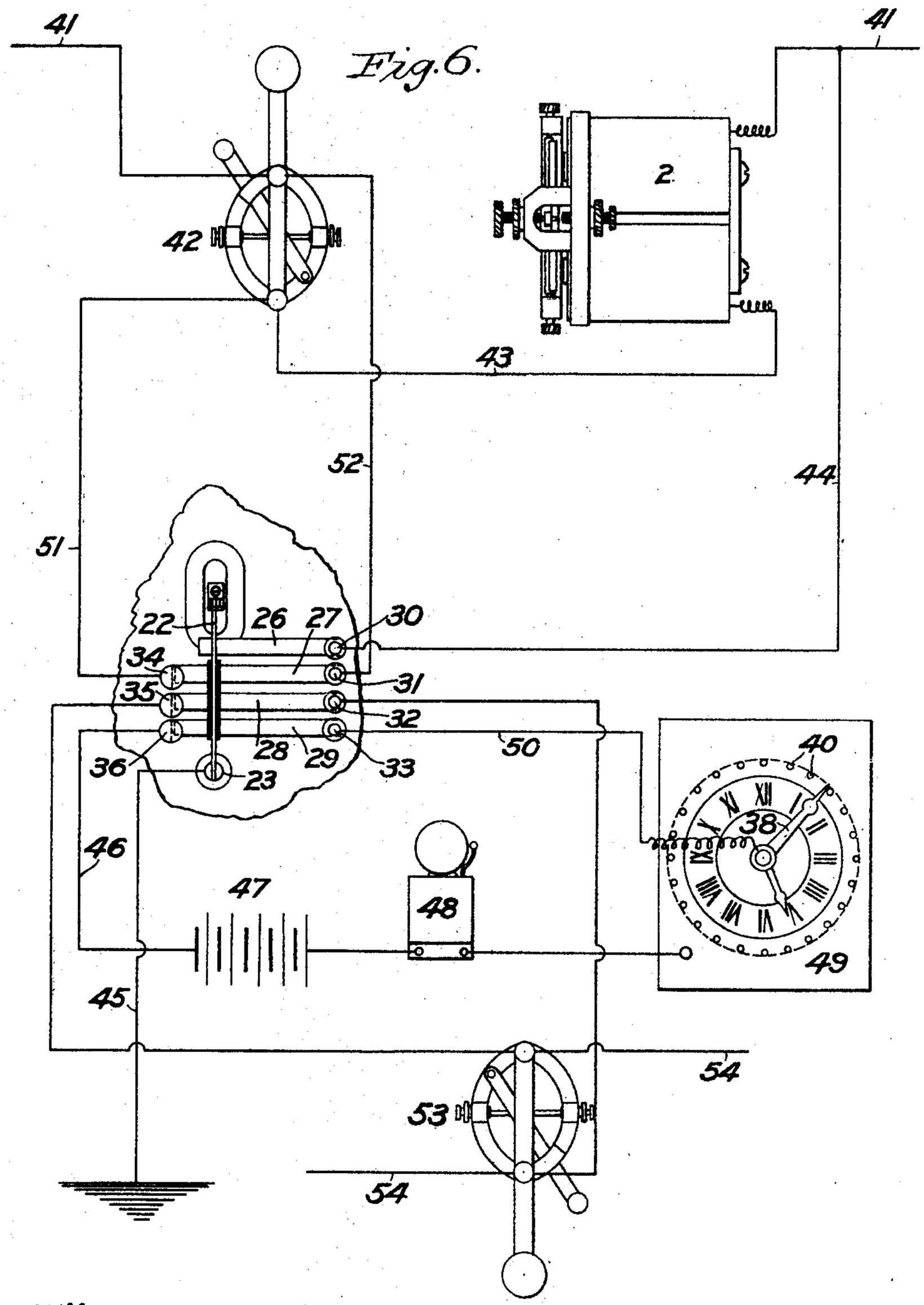
2 SHEETS—SHEET 2.

Fig. 6.



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UNITED STATES PATENT OFFICE.

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TELEGRAPHIC SAFETY DEVICE.

No. 814,761. Specification of Letters Patent. Patented March 13, 1906.

Application filed October 13, 1903. Serial No. 176,819

To all whom it may concern:

Be it known that I, SELDEN R. WRIGHT, a citizen of the United States, and a resident of Morton, in the county of Orleans and State of New York, have invented certain new and useful Improvements in Telegraphic Safety Devices, of which the following is a specification.

This invention relates to telegraphic safety apparatus; and it consists in the mechanism hereinafter described and claimed.

In the drawings, Figure 1 is a front view of an apparatus embodying this invention, the front cover of the case being removed. Fig. 2 is a front view of certain of the parts shown on the left-hand side of the box in Fig. 1. Figs. 3, 4, and 5 are views of details, and Fig. 6 is a diagrammatic view of the said apparatus.

The box 1 contains the mechanism. A relay 2 of ordinary form and construction is employed, which is connected to the circuit in a suitable way, (not represented,) as through wires, connecting with two of the binding-posts, as 3, represented at the base of the box in Fig. 1. The sounder is operated in the usual way by the armature of the relay when it makes and breaks its circuit. A ratchet-bar 4 is supported in front of the relay 2, so as to be movable both vertically and to and from said magnet. In the drawings the bar is represented as supported by a post 5, that is fixed in the side of the box so as to project out therefrom and that has a screw 6 in its end adapted to pass through a slot 7 in the upper end of said bar 4, whereby said bar is attached to said post, but permits it to move vertically with reference thereto. The lower end of the bar 4 is provided with ratchet-teeth 8, that are adapted to mesh with and to be operated by a ratchet-wheel 9, (see Fig. 5,) that is attached to one of the shafts 10 of a clock mechanism that is located within the box behind the dial. (Shown in Fig. 1.) The extreme end 11 of the ratchet-bar 4 has no teeth, so that it will lie upon the ratchet-wheel without being actuated. The bar 4 is so connected with the armature that when the main circuit is made the bar will be drawn out of engagement with the said ratchet-wheel 9. The connection shown consists of the bar 12, which is attached at one end 13 to the armature 14 and the other end of which extends through a slot 15 in the bar 4 and is enlarged, so that said bar cannot be withdrawn from it.

A spring 16 is attached at one end to the bar 4 and at the other end to a cord 17, which latter is carried through suitable guides out through said casing to a winding device 18, whereby the tension of the spring may be increased or decreased. The spring accordingly tends to draw the bar 4 in toward the driving ratchet-wheel 9, so that the teeth of said wheel engage those on said bar 4. A spring supporting-arm 19 is shown, which is adapted when depressed to relax the tension on said spring 16. Its particular function will be hereinafter described.

A lever 20 is pivotally supported within the box, as by the post 21, in such position that one end lies above and is adapted to be engaged by the bar 4 when the latter is elevated by the clockwork mechanism, as above described, so that it is tilted, as represented by dotted lines in Fig. 5, and whose other end projects out through the end of the box in the manner represented in Fig. 1. A vertical lever 22 is pivotally supported upon the outside of the frame, as by the post 23, and extends up through a slot $20\frac{1}{2}$ in the end of the horizontal lever 20. (See Fig. 3.) The lever 22 carries a lug 24, that engages with a hook 25, forming a notch in the outer end of the lever 20, and engages spring contact-strips 26, 27, 28, and 29, each of which is attached at one end to binding-posts 30, 31, 32, and 33, respectively. The strips 27, 28, and 29 are respectively adapted to make contact with the posts 34, 35, and 36 when released by said lever 22, the contact being broken between said strips and their respective posts whenever the lug 24 upon said lever 22 is in engagement with the notch 25 on the lever 20, as shown in Fig. 3. The inner face of the lever 22 is insulated throughout that part of its length 37 that comes in contact with the strips 27, 28, and 29, as represented in Fig. 2.

The posts 30 and 23 are connected with a ground-wire. The posts 31 and 34 and 32 and 35 are respectively connected with shunts through the binding-posts, represented at the base of the box in dotted lines in Fig. 1, in the usual manner.

The posts 33 and 36 connect through two of said binding-posts at the base of the box

with an electrically-operated bell. The bell-circuit includes a connection between one of said posts 33 or 36 and the clock mechanism, including the minute-hand 38 of the clock and a conducting-ring 39, represented by dotted lines around the face of the clock in Fig. 1. The ring 39 has equally-spaced pins 40 projecting out from it that are adapted to be engaged by said hand 38. When the contact-strip 29 is released by the lever 22, so that said strip springs out and makes contact between the posts 33 and 36, the bell-circuit will be completed whenever the hand 38 comes in contact with one of the pins 40, and the bell will ring until the circuit is broken either by said hand 38 or by replacing the vertical lever 22 in engagement with the horizontal lever 20.

The minute-hand 38 of the clock is represented as extended in a thin flexible end that projects beyond the circumferential line of the pins 40, so that a good contact is assured between the hand and pins, and thereby also prolonging the time that they will be in contact, for the end of the hand will be bent back as the hand passes the pin and will remain in contact with it a short space of time thereafter.

It is sometimes desirable to relax or relieve somewhat the tension of the spring 16, that tends to hold the vertical bar 4, and through it the armature 14, out from the electromagnet. This can be done by depressing the spring-arm 19, which is conveniently placed upon the top of the box for that purpose.

The operation of the safety device is as follows: When the connection is broken through the relay, so that the armature 14 is released, the spring 16 pulls the vertical bar 4 to the left in Fig. 1, so that it engages the teeth on the ratchet-wheel 9, that is driven by the clockwork. If the connection remains broken long enough, the bar 4 will now be raised by said ratchet-wheel until the upper end of the bar comes in contact with the inner end of the horizontal lever 20, which will thereby be tilted up into the position shown in dotted lines in Fig. 5 and by thus releasing the lug 24 on the end of the vertical lever 22 from the notch 25 in the outer end of said horizontal bar 20 permit said bar 22 to tilt out from said box and release the contact-strips 26, 27, 28, and 29. The ground-circuit through the post 30, the contact-strip 26, the lever 22, and the post 23 is accordingly broken, and contact is made between the posts 31 and 34, 32 and 35, and 33 and 36, respectively. The bell-circuit is completed by the said contact thus made by the contact-strip 29, which connects the posts 33 and 36, except where the said circuit is broken between the minute-hand 38 and the pins 41, that project out from the ring 39 around the face of the clock. When, therefore, the minute-hand 38 touches one of these pins, the bell-circuit is completed and the bell, which is located at any convenient place in the office, rings. The bell will continue to ring until the hand 38 has passed beyond the pin and has become disengaged therefrom, thereby breaking its circuit, or until the bell-circuit is broken by replacing the vertical lever 22 in engagement with the horizontal lever 20. If the circuit is not broken, by replacing said lever as aforesaid the bell will ring again as often as the minute-hand comes in contact with one of the pins 40. In the drawings these pins are represented as placed at uniform distances apart and so that the bell will ring at about three-minute intervals. Every instrument on the line will respond to the call. As soon as an operator's attention is attracted by the bell he can stop the ringing of his own particular bell by replacing the outer vertical lever 22 in engagement with the horizontal lever 20, thereby breaking the bell-circuit. If one operator is absent, the others may all break their respective bell-circuits and still leave the bell ringing for the absent operator, and the line will remain in working order.

A diagram of the circuits, &c., is shown in Fig. 6, in which 41 represents the main line. 2 is the relay heretofore described, and 42 is a key. The main line runs to the relay and said key, which are connected by the wire 43. The ground-wire 44 connects the main line 41 with the binding-post 30 and through the strip 26, arm 22, post 23, and wire 45 with the ground. This connection may run in the usual way through a switchboard. The strip 29 and post 36 are connected by a wire 46 with a battery 47 and electric bell 48 to the clock-face 49, which is insulated from the hand 38, and thence by the wire 50 to the post 33. The strip 27 is connected by the post 34 and a wire 51 with one connection of the key 42, and the other connection of this key is connected by the wire 52 from the binding-post 31. The main line is thus connected at the key with the wire 52, and the wire 43 is connected with the wire 51, thus forming a shunt that is broken by the strip 27 until the strip is released and makes contact with the post 34.

The strip 28 and its binding-posts 35 and 32 are, if desired, in like manner connected with the terminals of a key 53, so as to produce a shunt around said key with reference to a second line 54.

If the key 42 is left open, the clock mechanism will release the lever 22, and thereupon the ground connection through the contact-strip 26 is broken and the shunt connection through the strip 27 is made and the bell connection through the strip 29 is also made. Whenever the hand 38 makes contact with a pin 40, the bell is rung for a period of time determined by the breadth of the top of the pin or of the clock-hand and is repeated at inter-

vals determined by the distances between the pins. So, too, a shunt connection is made around the key, so as to connect the main line, as follows: Beginning with the wire 41 on the left-hand side of Fig. 6, the current will pass through the wire 52, the strip 27, wire 51, wire 43, relay-magnets 2, and main line 41 on the right, thus connecting the main-line circuit. When the key is closed and the levers 22 and 20 are returned to their places, the bell-circuit and the shunt-circuit are both broken.

In Fig. 1 the two binding-posts marked A are used for connections for the wires 51 and 52. The two posts marked B are used for connections for similar wires running to a second key 53. The posts marked C are connections for the bell-circuit wire 46 and the wire from the bell to the clock-face. The posts marked D are for the ground-wires 44 and 45. The posts marked E are for the sounder that is operated by the relay, and a pair of posts, of which one (marked F) is shown, are for the main-line wire 41 and the wire 43 to make connection through the relay-magnets 2.

What I claim is—

1. The combination with a main-line circuit, of an electromagnet in said circuit; a clock mechanism; an electric bell-circuit including therein a spring contact-strip normally adapted to complete said circuit, and a part of said clock mechanism adapted to make and break said circuit periodically; means normally engaging said contact-strip to break the bell-circuit; a part automatically moved into engagement with said clock mechanism, when said main circuit is broken, and adapted to be moved thereby; and means operated by the movement of said part by the clock mechanism for releasing said spring contact-strip.

2. The combination with a main-line circuit, of an electromagnet in said circuit; a clock mechanism; an electric bell-circuit, including therein a spring contact-strip normally adapted to complete said circuit, a plurality of separate contact-points and a part of said clock mechanism, whereby said circuit is periodically made and broken; means normally engaging said contact-strip to break said bell-circuit; a part automatically moved into engagement with said clock mechanism when said main circuit is broken, and adapted to be moved thereby; and means operated by the movement of said part by the clock mechanism for releasing said contact-strip.

3. The combination with a main-line circuit, of an electromagnet in said circuit; a clock mechanism; an electric bell-circuit including therein a spring contact-strip normally adapted to complete said circuit, and a part of said clock mechanism adapted to make and break said circuit periodically; means normally engaging said contact-strip to break said bell-circuit; a lever whereby said means are held in engagement with said contact-strip; and a part automatically moved into engagement with said clock mechanism when said main circuit is broken, and adapted to be moved thereby to tilt said lever to release thereby said contact-strip from said engaging means.

4. The combination with a main-line circuit of an electromagnet in said circuit; a clock mechanism; an electric bell-circuit including therein a spring contact-strip normally adapted to complete said circuit, and a part of said clock mechanism adapted to make and break said circuit periodically; a lever adapted to engage said contact-strip, whereby said bell-circuit is broken; a second lever adapted to engage the first to hold it in engagement with said contact-strip; and a part automatically moved into engagement with said clock mechanism when said main circuit is broken, and adapted to be moved thereby to tilt said last-mentioned lever to release thereby said first-mentioned lever.

5. The combination with a main-line circuit, of an electromagnet in said circuit; a clock mechanism; an electric bell-circuit including therein a spring contact-strip normally adapted to complete said circuit, and a part of said clock mechanism adapted to make and break said circuit periodically; means normally engaging said contact-strip to break the bell-circuit; a bar adapted to be moved by said clock mechanism to release said engaging means from said contact-strip; a connection between said bar and the armature of the electromagnet in said main circuit, whereby said bar is held out of engagement with said clock mechanism when said main circuit is completed; and a spring adapted to bring said bar into engagement with said clock mechanism when said main circuit is broken.

6. The combination with a main-line circuit, of an electromagnet in said circuit; a clock mechanism; an electric bell-circuit including therein a spring contact-strip normally adapted to complete said circuit, and a part of said clock mechanism adapted to make and break said circuit periodically; means normally engaging said contact-strip to break the bell-circuit; a bar adapted to be moved by said clock mechanism to release said engaging means from said contact-strip; a connection between said bar and the armature of the electromagnet in said main circuit, whereby said bar is held out of engagement with said clock mechanism when said main circuit is completed; a spring adapted to bring said bar into engagement with said clock mechanism when said main circuit is broken; and means for relaxing the tension of said spring.

7. The combination with a main-line circuit, of an electromagnet in said circuit; a

clock mechanism; an electric bell-circuit, including therein the circuit-breaker consisting of the hand 38 of the clock mechanism and the equidistant contact-points 40, said circuit being normally broken at another point; a part automatically moved into engagement with said clock mechanism when said main circuit is broken and adapted to be moved thereby; and means operated by the movement of said part to close said bell-circuit.

8. The combination with a main-line circuit, of an electromagnet in said circuit; a clock mechanism; an electric bell-circuit including therein the elastic contact-strip 29 and its post 36, and parts of said clock mechanism by which said last-mentioned means said circuit is periodically made and broken; the vertical lever 22 adapted to engage said strip 29 to force it out of contact with the post 36; the horizontal lever 20 adapted to retain the lever 22 in the position last described; the longitudinally-movable bar 4 adapted to tilt said lever 20 so as to release said lever 22; and the spring 16 attached to said bar 4 at one end and to a stationary support at the other end, whereby said bar 4 is drawn into engagement with said clock mechanism; substantially as shown and described.

9. The combination with a main-line circuit, of an electromagnet in said circuit; a clock mechanism; an electric bell-circuit; the bar 4 adapted to be moved by said clock mechanism to close said bell-circuit; a connection between said bar 4 and the armature of said magnet whereby said bar is held out of engagement with said clock mechanism when said main circuit is completed; the spring 16 connected at one end with said bar 4 and at the other end to the post 18; and the spring supporting-arm 19; substantially as shown and described.

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