(No Model.)

2 Sheets—Sheet 1.

E. A. REEDER.

ELECTRICAL CALL.

No. 346,314. Patented July 27, 1886.

Fig. 1.

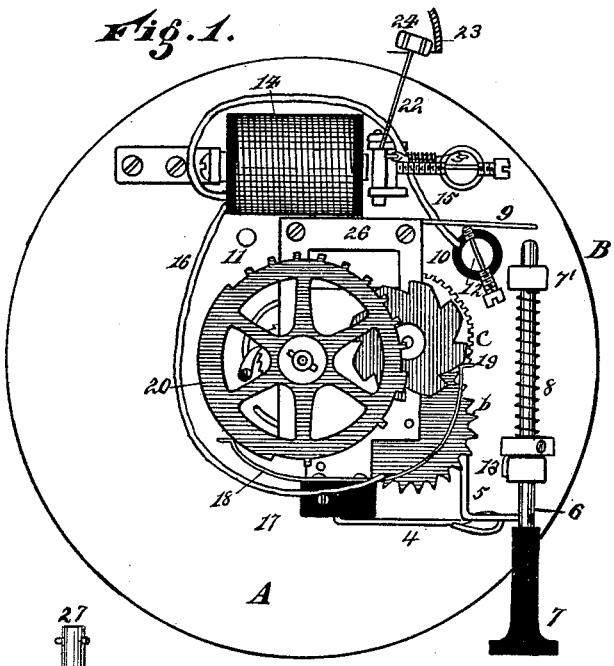


Fig. 2.

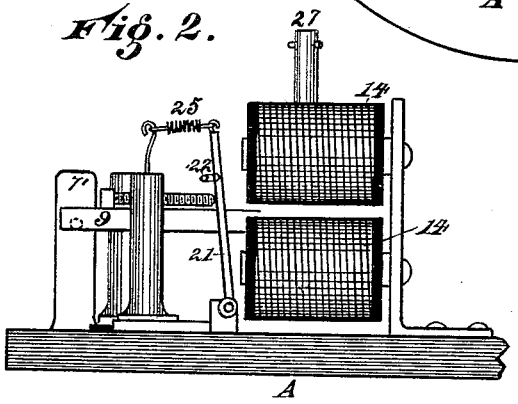


Fig. 3.

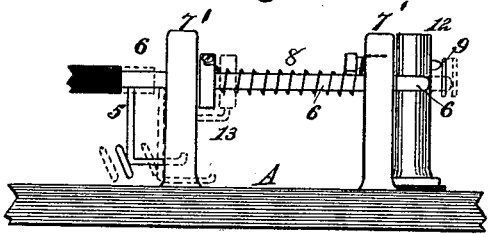
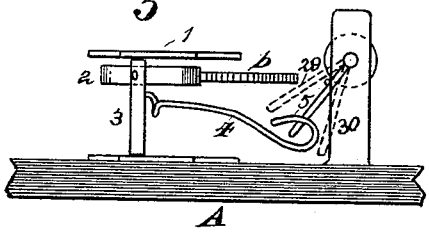


Fig. 4.



Attest

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 5.

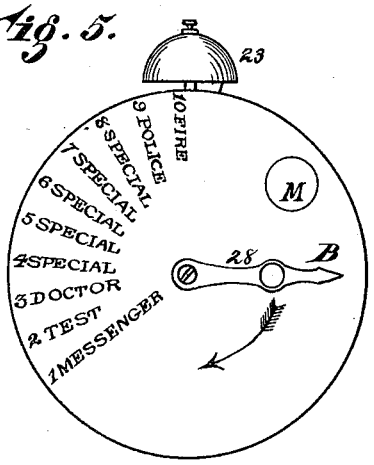

Fig. 6.

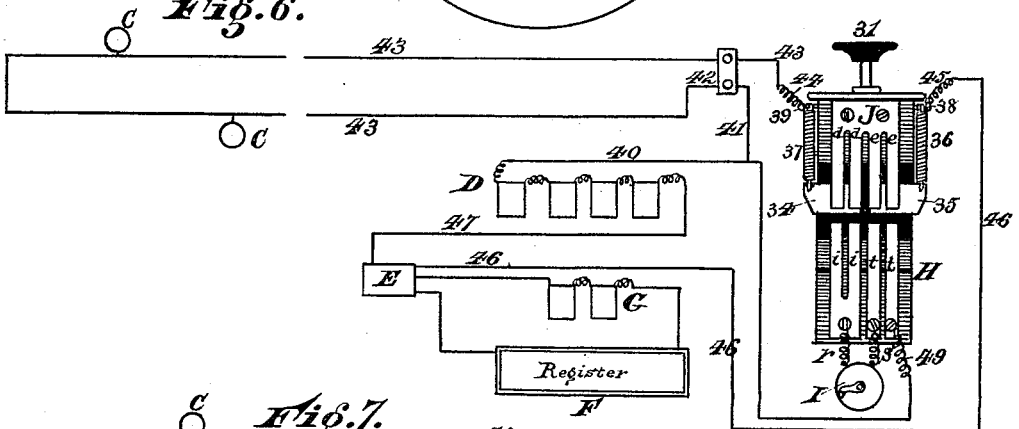

Fig. 7.

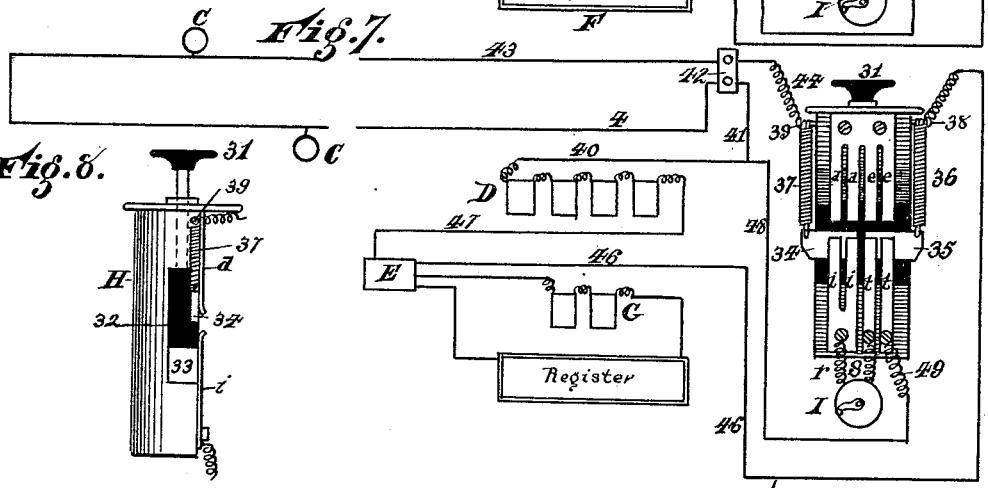

Fig. 8.

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UNITED STATES PATENT OFFICE.

EDRED A. REEDER, OF DAYTON, OHIO, ASSIGNOR TO GEORGE F. GRIFFITH, OF SAME PLACE.

ELECTRICAL CALL.

SPECIFICATION forming part of Letters Patent No. 346,314, dated July 27, 1886.

Application filed February 10, 1886. Serial No. 191,455. (No model.)

To all whom it may concern:

Be it known that I, EDRED A. REEDER, a resident of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Electrical Calls, of which the following is a specification.

My invention relates particularly to an improvement in the construction of a district-telegraph call-box.

One of the objects of my invention is to provide means for setting the index of the call, and allowing it to remain stationary until it is released for the purpose of sending in a message at the option of the sender. This also enables the sender to set the device to any desired call, in which position it remains stationary until released. Thus the caller can send in the right signal with little danger of making a mistake. The mechanism which holds the indicator-hands stationary may be employed to readily check the sending in of a call, should the sender desire to correct it.

Another object of my invention is that by the use of the same devices the automatic mechanism may be set in motion without sending in a call by short-circuiting the current through the box without operating the circuit until it is connected by the setting mechanism.

Another object of my invention is to provide means for receiving a return-call from the main office by employing the same devices which set it in motion to make a circuit through an electro-magnet operating a signal device to respond to a call or message from the main office.

The various mechanical devices for carrying out my invention will be set forth in the description of the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view of my call-box with the dial-case and index-hand removed. Fig. 2 is a rear elevation of the magnet and armature for operating the call-bell. Fig. 3 is a side elevation of the setting and brake mechanism. Fig. 4 is an end elevation of the same, showing its connection with the escapement. Fig. 5 represents a plan view of the call-box. Fig. 6 is a diagram representing the mechanism in the main office connected in circuit for receiving, registering, and returning a call. Fig. 7 is a similar diagram representing the parts in position for answering a call from the main office. Fig. 8 is a side elevation of the switch and mechanism for bringing in the generator at the principal office to send an answer to the call.

A represents a metallic disk on which the call mechanism is mounted.

B represents the dial-face.

a b c represent the ordinary clock-work for setting in motion the automatic call. These parts are constructed and operated by a spring in the usual manner.

1 represents the escapement-wheel; 2, the escapement, the pawls of which engage with the escapement-wheel 1 in the ordinary manner.

3 represents an oscillating post on which the escapement-pawls 2 are mounted.

4 represents a brake-wire, which is connected to the post 3 and is projected laterally for engagement with the brake 5, which is mounted on rod 6 and operated by a button, 7, to move brake 5 and engage it with or disengage it from connection with brake-wire 4. This wire 4, being attached to the vibrating post 3, moves to and fro with the oscillation of the escapement 2.

The dotted lines in Fig. 3 represent the extreme movement of wire 4, which is shown arrested in its vibrations by its contact with the brake 5. This connection of the parts 4 and 5 checks the oscillation of the escapement 2 and holds one of the pawls in its engagement with the teeth of the escapement-wheel 1, and prevents the operation of the clock-work and circuit-breaker. Rod 6 is constructed and adapted to perform another function. It journals so as to slide laterally in posts 7′.

8 represents a coiled spring, wound around the rod 6 and seating between collar *l* and one of the posts 7′. Its further end projects through the post a sufficient distance to come in contact with a spring, 9.

10 represents a binding-post, to which one of the terminals of the main battery is connected.

11 represents another binding-post, to which the other terminal of the main battery is connected.

12 represents an adjustable screw-rod, against which the spring 9 rests.

When the rod 6 is pushed in a sufficient distance to come in contact with spring 9 and move it away from contact with screw-rod 12, the rod 6 is turned, by means of coil-spring 8, so as to bring the stop 13 in contact with post 7′, the inner end of the stop-piece bearing against the inside face of the post, so as to prevent the spring from pushing the rod back, as shown by dotted lines in Fig. 3. This breaks the connection of spring 9 with the screw-rod 12 and makes the circuit through the magnet 14, which circuit is established by means of wire 15, (insulated by a rubber tube,) and in metallic contact with the binding-post 10. Said wire 15 is the terminal of one of the coils of the magnet 14.

16 represents the other terminal of the magnet-coil, which is properly insulated and its end connected to the circuit-breaker spring 18, one end of which spring is in contact with the spacing-wheel 19 and the other is in contact with the spacing-wheel 20. This latter wheel is shown with contact-points arranged on one portion of its periphery, to indicate the number of the box and to send in the call by the making and breaking connection of spring 18 with wheel 19.

The object of the electro-magnet is twofold: first, to have it in circuit for sending in a call, and, second, to operate the call mechanism on the box, which is accomplished as follows: 21 represents an armature pivoted adjacent to the poles of the magnet. 22 represents a hammer-arm mounted on said armature. 23 represents a gong or sounder, against which the hammer 24 strikes, when the armature 21 is vibrated by making and breaking the circuit through the magnet 14. 25 represents the spring for retracting the armature 21 when the circuit is broken. It has sufficient retractile force to overcome the strength of the main battery.

The battery-circuit for the main station is normally as follows: To binding-post 10, which is in metallic contact with the wire of one of the poles of the main battery, through screw-rod 12, spring 9, frame-work 26, and thence through the frame to metallic plate A and binding-post 11, which has a metallic connection by wire with the other pole of the battery at the main station. Thus in the normal connection of the call the current is shunted or short-circuited through the spring 9, and the current passes unbroken through the circuit.

When it is desired to operate the call, the index-hand 28, which is mounted on post 27, is turned and winds up the spring of the clock-work in the ordinary manner until the pointer is brought to the desired point of the dial indicated in Fig. 5. If the brake 5, mounted on rod 6, is in the position shown at 29 or 30 in Fig. 4, the brake-wire 4 will vibrate with the escapement 2 and allow the wheels 19 and 20 to revolve and send in the alarm indicating the call or station.

In order that the index-hand may be turned to any desired position and there retained, the coiled spring 8 is normally wound around the rod 6, so that it holds the same with the wire 5 in the position shown in Fig. 3. (Indicated by 5 in Fig. 4.)

If the sender desires to start the call and momentarily check it to see that he has indicated the right message, he turns button 7 to the right, which moves the brake 5 up into the position shown by dotted lines 29 in Fig. 4, out of the path of the vibration of brake-wire 4, which starts the train. If the button be released, the brake 5 will drop back into its normal position and arrest the movement of the escapement. It will be observed that this movement of rod 6 is made when it is in the longitudinal position shown in Fig. 1—that is, with its forward point not in contact with the spring 9. While this rod is in this position the circuit is shunted from binding-post 10 to spring 9 and binding-post 11. As soon as it is determined to send the call into the main station the rod 6 is pushed forward, so that the point comes in contact with spring 9 and breaks its connection with screw-rod 12, which sends the current through the wire 15, coil 14, wire 16, to circuit-breaker 18. If it is desired to maintain this circuit through the coil for the purpose of receiving and returning from the main office, the rod 6 is turned by the button 7, so as to bring the stop 13 against the post 7′, as shown in Fig. 3. to maintain the circuit through the coil 14. When it is desired to bring in the short-circuit spring 9, the button 7 is turned to the right, releasing the stop 13, the recoil of spring 8 will retract rod 6 and bring it into the position shown in Figs. 1 and 4, so that the brake 5 will be normally in the path of the vibrating brake-wire 4. The button 7 projects through the case B, so that it may be operated outside of the call-box. The handle 22 of the hammer also projects through the casing of the box, and the gong 23 is suspended or mounted thereon in any desired manner, so that the hammer will come in contact therewith.

In order to illustrate the preferred means of returning the answer to a call, I have illustrated the same by diagram in Fig. 7.

Fig. 6 shows the normal position of the instrument at the central office for receiving calls from boxes C, located in the main-line circuit.

D represents the main battery.

E represents a relay for operating the register F, such as is ordinarily used in the main station for registering a call.

G represents a local battery for operating the relay in the usual manner.

H represents the frame of a switch for cutting in or out a secondary generator.

I represents, say, a magneto or other suitable generator, which generates a circuit of sufficient tension to overcome the resistance of the spring 25 of the call-box, (shown in Fig. 2,) thereby operating the hammer 24. This

magneto or other suitable generator is connected up and brought into circuit in the following way: 31 represents a push button, which is connected by a rod to a block, 32, which seats and moves in a gain, 33, cut in the frame-piece H. 34 and 35 represent two metallic switch-plates separated from each other a sufficient distance to prevent metallic contact. They are mounted on the block 32, and slide therewith. 36 represents a coiled spring, one end of which is connected with the metallic switch-plate 35, the other to binding-post 38. 37 represents a similar coiled spring, one end of which is connected to the metallic switch-plate 34 and the other to the binding-post 39. These springs normally hold the plates 34 and 35 in the position shown in Fig. 8. *d d* represent spring contact-plates, which project from the base-plate J. When the plate 34 is normally in the position shown in Fig. 8, these spring-plates *d* form a part of the circuit, and the plates *e e*, projecting forward, are in contact with the plate 35, and likewise form a part of the circuit, When it is desired to bring in the magneto I, for sending in a return or answer, the block 32 is slid forward by the push-button 31, breaking the contacts of plates 34 and 35 with the spring-contacts *d e*, and establishing the contact with the spring-arms *i t*. *r* represents one terminal of the magneto I, and *s* represents the other terminal, one terminal connecting the spring-arms *i* with one pole of the magneto, and the other terminal connecting the other pole to one of the spring-arms, *t*. 49 represents a coil connecting the other plate, *t*, with the main-line circuit.

The circuit for sending in the call from the boxes C in the main line is connected to the various devices, as illustrated by a diagram, Fig. 6, as follows: 40 represents a wire connected, say, with the positive pole of the main battery D; thence by wire 41 through switch 42, wire 43 through the call-boxes; thence by coil 44 to spring 37; thence through plate 34, spring-arms *d*, base-plate J; thence through spring-arms *e* to switch-plate 35; thence through spring 36, coil 45, by wire 46, through relay E, by wire 47 to the negative pole of the battery, the local battery G operating the register F when the current in the main line is broken through the operation of the circuit-breakers in the call-box. If it is desired to operate a signal at the call-box, button 31 is pushed in, moving the switch-plates 34 and 35 from contact with spring-arms *d e*, and carrying them into the position shown in Fig. 7, establishing contact with the spring arms or fingers *i t*. This establishes a circuit from the magneto, and when operated sends a current as follows: Say from the positive pole of the magneto by coil *r*, through spring-arms *i* to switch-plate 34; thence through spring 37, coil 44; thence by wire 43 41 48, coil 49; thence by spring-arms *t* and switch-plate 35 and coil *s* to the opposite pole of the magneto. Thus when the switch-plates 34 and 35 are held by the button 31 in the position shown in Fig. 7 the magneto I can be turned to make and break the circuit above described, thereby operating the hammer 24 and ringing the gong 23. While button 31 is depressed for sending return, as shown in Fig. 7, the main battery D is kept on a closed circuit, and the register F is kept from running off paper in the following manner: starting from battery D, along wires 40 48 to coil 49, to plate *t*, to plate 35, spring 36, coil 38, wire 46, to relay E, and thence through wire 47 to battery D. The tension of the spring 25 is sufficiently great to overcome the power generated by the main battery; hence the latter can be operated to send in calls from the call-box without operating the gong mounted on the box; but the magneto, which is sufficiently high in tension, operates the armature 22 as the circuit is made and broken by the turning of the magneto.

M represents a glass in the face of the casing of the call-box, to allow the position of the brake mechanism to be observed.

I claim—

1. In a district-telegraph box having clock mechanism and escapement, the combination of a rod, 4, connected with the escapement, to vibrate therewith, a rotary rod, 6, and a brake, 5, connected to the rotary rod, to be moved by it to and from the vibrating rod to control the starting and stopping of the escapement and clock-train, substantially as described.

2. In a district-telegraph box having a spring, 9, in electrical circuit, normally-short-circuiting bell-magnet, and a clock mechanism and escapement, a rod connected with the escapement to vibrate therewith, and a rod provided with a brake, 5, said rod having a rotary movement to throw said brake to and from the escapement-rod, and a longitudinal movement to throw said spring into and out of circuit, substantially as described.

3. The combination, with the electrical call-box having the index-dial and the clock-work train operated by a spring, of the rod 4, connected with the escapement, the magnet 14, the switch 9, and the rotary and longitudinally-moving rod 6, provided with the brake 5, to control, substantially as described, the circuit and the movement of the clock-train, substantially as set forth.

4. In a district-telegraph call-box, the combination, with the clock-work train, circuit-breaker 18, and electro-magnet 14, in circuit, of the rod 4, connected with the escapement, switch 9, and rotating and longitudinally-moving rod 6, provided with brake 5, to control the circuit and movement of the clock-train, substantially as described.

5. In combination with the main-line circuit and automatic call-boxes, the magneto or generator I, push-button 31, having block 32 connected therewith, and switch-plates 34 and 35, secured to said block for cutting in or out

the magneto-circuit with or from the main circuit, substantially as described.

6. In combination with the main-battery and magneto circuit, the switches 34 35, the circuit-connecting arms *d e* and *i t*, for bringing in and cutting out the magneto-circuit and connections, substantially as specified.

7. In combination with the magneto and main-battery circuits, the switch device consisting of the block 32, plates 34 35, connecting-plates *d e i t*, and springs for normally holding the switch from metallic contact with the connections of the magneto-circuit, substantially as specified.

8. In an electrical-call system, in combination with circuit-connections to two independent electrical generators, substantially as set forth, a switch device consisting of the spring-arms *d e* and *i t*, block 32, and plates 34 and 35, sliding from one set of said arms to the other, and retractile spring normally holding said plates in contact with the arms *d e*, substantially as described.

9. In combination with the main-battery circuit and the magneto circuit, the adjustable switches 34 35 and springs 36 37, forming a part of the main-battery circuit, whereby the main-battery circuit is maintained when the switch is adjusted to bring in the magneto-circuit, substantially as specified.

In testimony whereof I have hereunto set my hand.

EDRED A. REEDER.

Witnesses:

W. L. FLEMING,

ROBT. W. MOORE.