

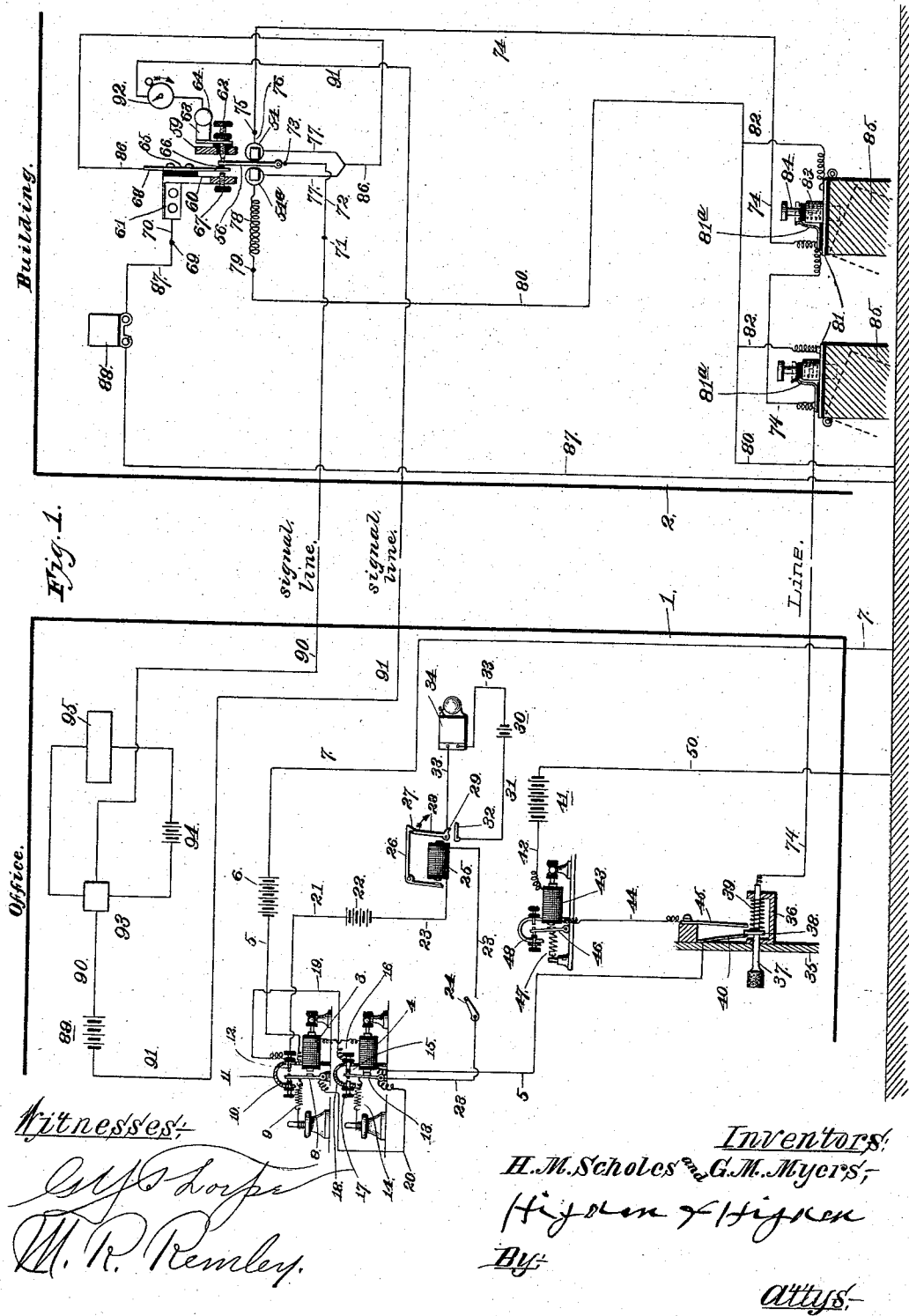
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2 Sheets—Sheet 1.

H. M. SCHOLES & G. M. MYERS.
ELECTRIC BURGLAR ALARM.

No. 532,291.

Patented Jan. 8, 1895.



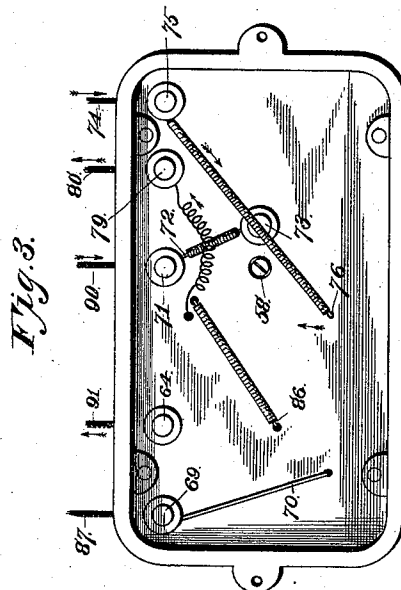
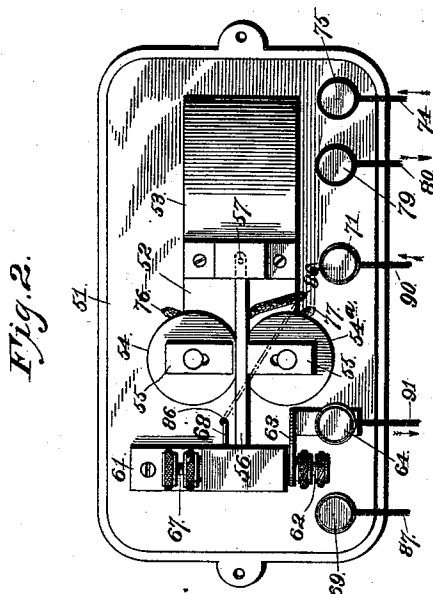
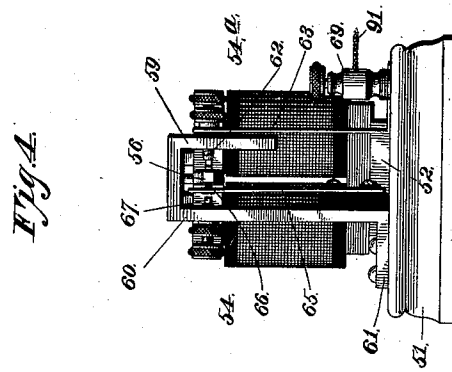
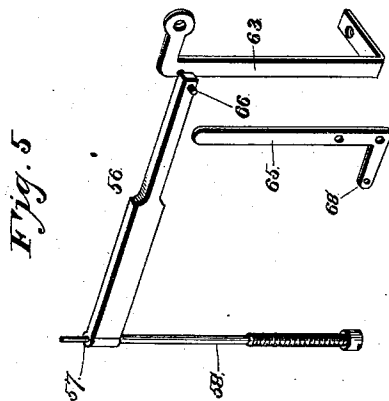
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Witnesses:

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UNITED STATES PATENT OFFICE.

HORACE M. SCHOLES AND GEORGE M. MYERS, OF KANSAS CITY, MISSOURI.

ELECTRIC BURGLAR-ALARM.

SPECIFICATION forming part of Letters Patent No. 532,291, dated January 8, 1895.

Application filed April 17, 1894. Serial No. 507,848. (No model.)

To all whom it may concern:

Be it known that we, HORACE M. SCHOLES and GEORGE M. MYERS, of Kansas City, Jackson county, Missouri, have invented certain new and useful Improvements in Electric Burglar-Alarms, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

Our invention relates to that class of electrical apparatus which is designed to prevent the surreptitious entrance of burglars or other unauthorized persons into residences or other private or public buildings, and more particularly to that class of such appliances which, in the event of the entrance of unauthorized persons into a residence or other building, are arranged to operate an audible or visual signal, or both, which is or are located in a central office.

The primary object of our invention is to produce means whereby the occupants of the protected building and the central office may ascertain at any time whether or not the protection circuit is in proper working order, no matter whether the local drop or bell circuit, or both, is or are in working order or not.

With this and other objects in view, the invention consists in certain peculiar and novel features of construction and combinations of parts, as hereinafter described and claimed.

In order that the invention may be fully understood, reference is to be had to the accompanying drawings, in which—

Figure 1. represents in diagram an electrical burglar alarm circuit embodying our improvements. Fig. 2. represents a top plan view of a polarized relay constructed in accordance with our invention. Fig. 3. is an inverted plan view of the same. Fig. 4. is a front elevation of the same, and Fig. 5. represents parts of the same in detail.

In order to ascertain at any time whether or not the protection circuit is in proper working order, we employ in connection with the protection circuit, a separate or signal circuit, by which the occupant or occupants of the protected building or buildings may signal the office at any time, and means to reverse the polarity of the current so as to operate synchronously the signal test in the protected

building or buildings, and a duplicate test in the office.

In the said drawings, 1 designates the central office, and 2 a building located in the burglar alarm circuit.

A balanced relay located in the office comprises the electro-magnets 3 and 4, which are located on a wire 5, leading at one end to an electrical battery 6. The opposite pole of this battery is grounded by the wire 7. The armature of the magnet 3 is carried by a lever 8, which is normally held away from the magnet by the contraction spring 9, and into contact with the insulated point 10. This insulated point 10, is carried by a conducting standard 11, which also carries the contact pin or screw 12, adjacent to but not in contact normally, with the free end of the conducting lever 8.

The armature of the magnet 4 is carried by a lever 13, and normally rests against the poles of the magnet; the energization of the magnet overcoming the resistance of a contraction spring 14, connected to said lever. The upper or free end of the lever is also normally in contact with the insulated point 15 of the contact pin or screw 16, and not in contact with the contact pin or screw 17 located at the opposite side and adjacent to the free end of the lever 13; the contact pins or screws 16 and 17 being carried by the conducting standard 18. The contact screws 12 and 16, are connected by a wire 19, and the levers 8 and 13 are connected by a wire 20. A wire 21, leads from the local battery 22, to the contact screw 12, and the wire 23, leads from the lever 13, to the opposite pole of the local battery 22; said wire 23 being provided with a switch 24, of the ordinary construction, and an electro-magnet 25. An angle-lever 26 carries upon its vertical arm the armature of the magnet 25, and is formed with a hook 27, at the free end of its horizontal arm. A pivoted drop 28, of conducting material, is normally held in its vertical or approximately vertical position by the hook 27, and is provided with a contact arm 29. A battery 30 is connected by the wire 31, with a conducting-plate 32, located beneath the contact-arm of the drop 28, and said arm is connected to the opposite pole of the battery 30, by the wire 33. An electric

bell 34 is also located in the circuit from the battery 33, in the ordinary manner.

Located also in the central office, is a switch casing 35, of any suitable construction, and carried by this casing is a bracket 36, provided with upturned arms at either end, and extending longitudinally through said casing and said arms is a push-rod 37, which is provided at its end exterior of the casing with an insulated button or head of the ordinary construction. A collar 38, is carried by the push-rod 37, intermediate of the upturned arms of the bracket 36, and the spring 39, spirally encircling said rod and interposed between one of said upturned arms and the said collar, normally holds said collar in contact with a spring-plate 40, carried by the casing, and electrically connected to the wire 5. An electric battery 41, located also in the central office, is electrically connected by the wire 42, with the electro-magnet 43, forming a part of the relay hereinafter called the "test-relay," and this magnet is connected by the wire 44, to the spring contact-plate 45, carried by the casing, and having its free end adjacent to the rear side of the collar 38 of the push-rod, but not in contact with said collar when the spring is expanded and the apparatus is in its normal position. The armature of the magnet 43 is carried by the lever 46, and is normally held away from said magnet by the contraction-spring 47, and also in contact with the screw-point 48. The battery 41, is grounded by means of the wire 50.

A polarized relay, constructed as follows, is located in the protected building: Mounted upon the base 51 of non-conducting material, is a metallic plate 52, which extending longitudinally of said base, is bent upwardly at one end and forwardly to form the upper and overhanging arm 53. Mounted upon the plate 52 at its front end are electro-magnetic coils 54 and 54^a, provided at their upper ends with the poles 55. A longitudinal and horizontal armature 56 is interposed between said poles, and is mounted pivotally at 57 upon the upper end of the metallic screw 58, which extends vertically upward through the non-conducting base, the plate 52 and its arm 53.

A bracket comprises the vertical arms 59 and 60, which are located one at each side and a suitable distance from the free end of the armature lever 56, and the arm 60 extends downward and is provided with a foot-portion 61, which is firmly secured to the base 51. A contact-screw 62 is supported by but insulated from the arm 59 of said bracket, and has its contact end normally in engagement with a pin projecting from the free end of the armature 56, and this contact-screw is also electrically connected by the metallic conducting-plate 63 with the binding-post 64. A spring-conducting-plate 65 is supported by but insulated from the arm 60 of said bracket, and being interposed between said arm and the armature, has its free end bearing against the insulated point 66, projecting from the adja-

cent side of the armature and out of contact, normally, with the contact-screw 67 carried by said arm 60; the inherent resiliency of the plate 65 holding it always in contact with the insulated point 66, unless said plate is moved outwardly by an overcoming force, as herein-after explained, and projecting from said contact-plate 65 is an arm 68. A binding-post 69, mounted upon the base 51, is electrically connected by wire 70 with the foot-portion 61 of the said standard, and the binding-post 71, mounted also upon the base 51, is electrically connected by the wire 72 with a bolt or pin 73, which projects upwardly through the base 51 and contacts with the metallic plate 52.

The protection wire 74, is connected at one end to the inner end of the push-rod 37 of the switch mechanism, and the opposite end of said wire is electrically connected to the binding-post 75, carried by the base 51, of the polarized relay, and this binding-post is connected electrically with the magnetic coil 54 by means of the wire 76, from which the wire 77 leads to the magnetic coil 54^a, and the wire then leads to the resistance coil 78, and from said coil to the binding-post 79, also carried by the base of said relay; and from said binding-post 79, the wire 80 leads to the ground.

Mounted in the recess occupied by the inner edge of each door inlet or exit of the building is a plate 81, and mounted upon but insulated from each of said plates is a spring contact-plate 81^a; these spring contact-plates being located in the circuit with the protection-wire 74, and wires 82 electrically connect the wire 80 with the plates 81. Casings 83 are carried by each plate 81, and mounted reciprocally in said casings are the headed contact-rods 84. These door-connections are so constructed that when the doors are closed the heads of the rods 84 are not in contact with the spring contact-plates 81^a, but when a door is opened, as indicated by dotted lines, Fig. 1, its rod 84 moves inward until the head contacts with its respective spring-plate 81^a, and the protection circuit is completed from the battery 6, through the balanced relay, the switch, said door connection, the wire 82 connected thereto and the wire 80, to the ground, and by thus shortening or grounding the circuit and thereby shunting the polarized relay coils and the resistance coil out of the circuit, the strength of the battery 6 is increased, and this increased strength increases the attractive power of the magnet 3, sufficiently to overcome the resistance of the spring 9, and attract its armature. The attraction of this armature causes the lever 8 to contact with the pin or screw 12, and this contact completes the local drop circuit from the battery 21; the current passing through the wire 21 to the contact-pin 12, thence through armature-lever 8 and wire 20 to armature-lever 13, thence through wire 23 and switch 24 (said switch, of course, being closed) through magnet 25, and back to the

battery, and this current, energizing the magnet 25, attracts its armature and thereby pivotally operates the bell-crank lever 26, and allows the drop-plate 28 to pivotally operate in the direction of the arrow until the arm 29 comes in contact with the plate 32. Immediately this takes place the circuit from the battery 30 is completed and the alarm is sounded.

From the foregoing, it will be apparent that by grounding the circuit a visual, the drop, and an audible, the bell, signal are operated in the central office to notify the occupants of the grounding of the protection circuit.

Should the protection circuit be broken by severing the line, the magnet 4, of the balanced relay would be demagnetized. Consequently the spring 14 would withdraw the armature from said magnet, and would cause the lever 13, carrying said armature, to contact with the contact pin or screw 17, and by so doing the drop circuit from the battery 22 would be completed; the current passing through wire 21 to contact pin 12, thence through the wire 19 to the contact pin or screw 16, thence through the standard 18 and contact pin or screw 17 to the armature-lever 13, thence through the wire 23 and switch 24 (when closed) and electro-magnet 25, back to the battery, and the energization of the magnet 25 would cause, as above explained, the drop to fall and the alarm to sound.

The circuits just traced are old in the art, and form a part of our invention only in combination with other elements. While door connections only are shown, it will be understood, of course, that window-connections of any suitable or preferred construction are also connected up in the same circuit, so that by raising any window of the protected building, the visual and audible signals will be operated, and it is also to be understood that we do not confine ourselves to a balanced relay of the specified construction shown, as a galvanometer may be used in lieu thereof.

Referring again to the polarized relay, 86 designates a wire which is electrically connected at one end to the wire 77, and is electrically connected at its opposite end to the arm 68 of the contact-plate 65, and leading from the binding-post 69 of said relay to the ground is the wire 87, and electrically connected in circuit with said wire is the buzzer or alarm, 88 of the ordinary construction.

Located in the central office is a battery 89, and leading from one pole of this battery to the binding-post 71 of the polarized relay is a wire 90, and leading from the opposite pole of this battery to the binding-post 64 of said polarized relay is the wire 91, and electrically connected in circuit with said wire and located in the protected building is the signal box 92, of the ordinary construction.

Located in the central office and in circuit with the wire 90, is the relay 93 of the ordi-

nary construction, and this relay is also located in the circuit of a local battery 94, and located also in said circuit is a register 95, of the ordinary or any preferred construction.

In our burglar alarm system, a protection wire 74 will run from the central office to each protected building, the ground being utilized for the completion of the circuit, but all of the protected buildings will be located on a single signal circuit, as will be readily understood.

When the protected building is closed for the night, the occupant operates the signal box 92 in the ordinary manner, and this operation alternately makes and breaks the signal circuit a certain number of times so as to send a corresponding number of pulsations over the signal circuit, and these pulsations, through the relay 93, cause a corresponding number of pulsations from the local battery 94, through the register 95, which notes the message or number of the signal box upon a band of paper; the circuit from the signal battery 89 passing through the wires 90 and 72, to the metallic plate 52 of the polarized relay, thence through pivoted screw 58, and armature 56, to contact-screw 62, thence through contact-plate 63 to binding-post 64, thence through wire 91 and signal box 92, back to the battery. The central office being thus notified, the operator throws the switch 24 in circuit, and pushes inward the rod 37 of the switch mechanism until the collar 38 contacts with the spring-plate 45, and reverses polarity in the battery and causes the synchronous operation of the buzzer 88 in the protected building, and the test-relay and the signal circuit mechanism in the central office, which test conclusively proves whether the protection circuit is in proper working order.

When the polarity in the battery is reversed the circuit is traced from the battery 41 through the wire 42, the test-relay magnet 43 and the wire 44 to the contact-plate 45, thence through the switch-rod 37 and the wire 74, to the binding-post 75, thence through the wire 76 to the magnetic coil 54, and from said coil through the wire 77, to the magnetic coil 54^a, so to ground which coils co-act until connection is made between the contact-plate 65 and the contact-screw 67, by the operation of the armature lever 56. Immediately this connection is made, the coil 54^a is shunted out of circuit, and the current passes from the wire 77, through the wire 86, to the arm 68 of the contact-plate 65, thence through the contact-screw 67, arm 60, and the foot-portion 61 of the standard carried by the polarized relay and the wire 70, to the binding-post 69, thence through the wire 87 and the buzzer 88 to ground, and thence through the wire 50, to the opposite pole of the battery 41, and the operation of the lever 56, hereinbefore referred to, in moving from engagement with contact-screw 62, will break the signal circuit from battery 89, and complete the circuit from

the local battery 94, to operate the register mechanism. It will thus be seen that a test is made at each end of the protection line synchronously, and at the same time the office obtains a test in the local drop and bell circuits, because as soon as the circuit from the battery 6 is broken by the inward movement of the switch 37, the magnet 4 is demagnetized, and the visual and audible signals are operated.

From the foregoing it will be evident, if the drop or bell battery be out of order, that by reversing the polarity, as above explained, a double test is obtained in the office, one by the operation of the test-relay and the other by the operation of the signal mechanism, and at the same time the buzzer in the protected building is in operation.

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

1. In an electric burglar alarm system, the combination in a protection circuit, of a balanced relay, a polarized relay and resistance coil, a signal circuit separate from the protection circuit and completed through the armature of the polarized relay, and an alarm mechanism located on a branch of the protection circuit, with a switch mechanism located in the protection circuit, a test relay, and means, by the operation of said switch mechanism, to reverse polarity in the protection circuit and thereby shunt one of the coils of the polarized relay and the resistance coil, and complete the protection circuit through the alarm mechanism, to cause the synchronous operation of the same and the test-relay, and at the same time, by the operation of the armature of the polarized relay, break the signal circuit and cause

the register mechanism to be operated, substantially as set forth.

2. In an electric burglar alarm system, the combination in a protection circuit of a balanced relay, a switch mechanism, connections whereby the circuit may be shortened, and a polarized relay and a resistance coil, with a conducting standard, an alarm mechanism, electric conductors connecting said standard and said alarm mechanism, and said alarm mechanism with the ground, a spring contact-plate normally out of engagement with the said standard, and in engagement with an insulated point of the armature of the polarized relay, an electric conductor connecting said spring contact-plate with the electric connection leading from one coil to the other of the polarized relay, a test relay located in the office and electrically connected to a contact-plate, and a battery connected to said relay and to the ground, so that the proper operation of the switch mechanism will reverse the operation of the current in the protection-wire, will shunt one coil of the polarized relay and the resistance coil out of the protection circuit, and will complete said protection circuit through the alarm mechanism of the building, by the operation of the armature lever, and will cause the synchronous operation of said alarm mechanism and the test relay located in the office, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

HORACE M. SCHOLLES.
GEORGE M. MYERS.

Witnesses:

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