

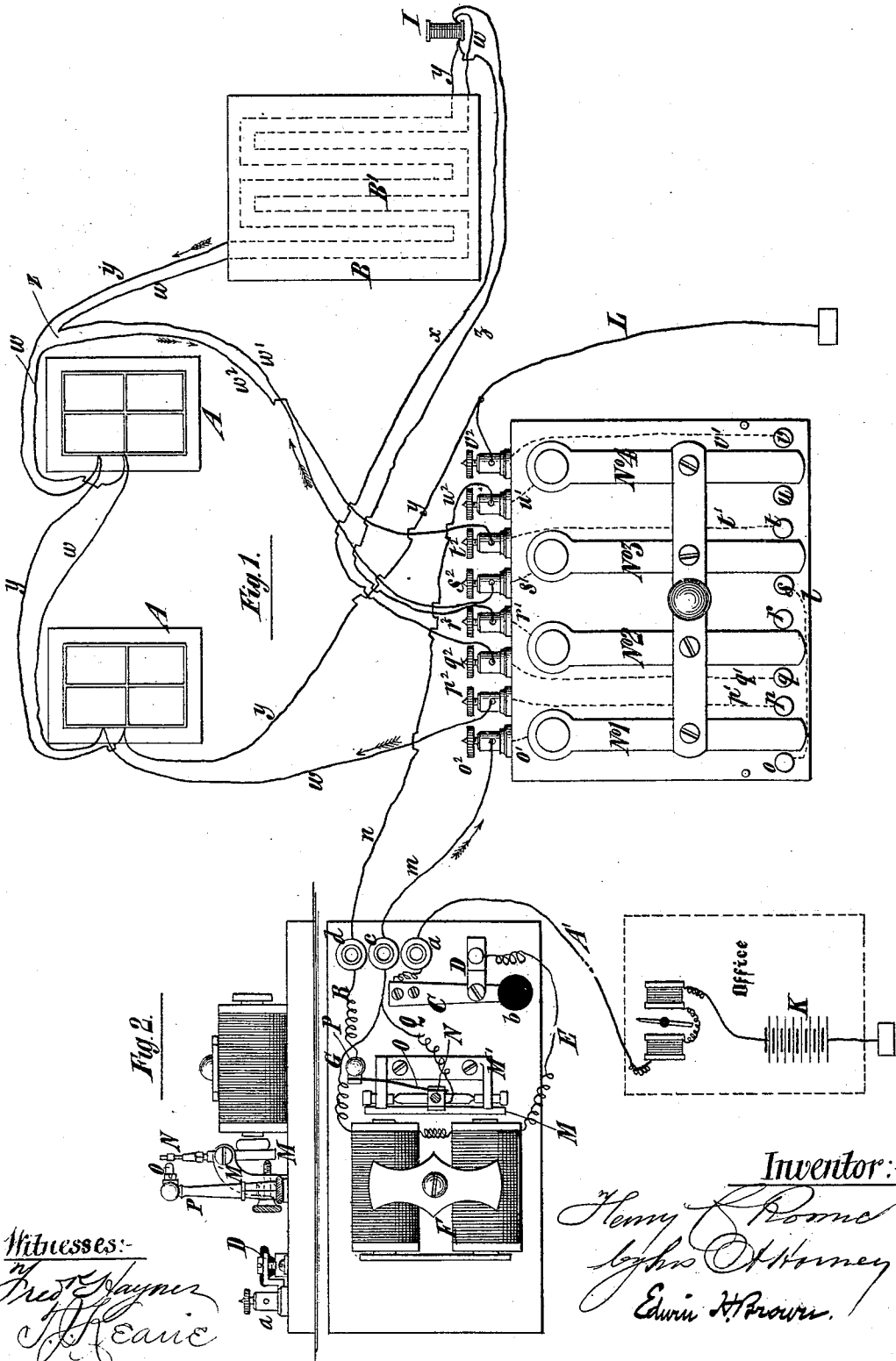
(No Model.)

H. C. ROOME.

ELECTRICAL BURGLAR ALARM.

No. 247,415.

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ELECTRICAL BURGLAR-ALARM.

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To all whom it may concern :

Be it known that I, HENRY C. ROOME, of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Electric Burglar-Alarms, of which the following is a specification.

These improvements relate particularly to those electric burglar-alarms wherein closed electric circuits extend through structures to be guarded and connect them with a station or office where watchmen are kept, resistance-coils being employed in the structures to be guarded, so that on the opening of a door, window, or other article there they will be short-circuited out of the circuits and alarms sounded at the station or office. The improvements are, however, applicable to closed-circuit electric burglar-alarms generally.

In stores and other places forming structures to be guarded by such electric burglar-alarms, partitions, walls, skylights, and like articles are commonly protected by fine wires traversing the same and arranged in the circuits, so that burglars cannot effect an entrance through them without severing the wire and causing an alarm to be sounded at the station or office. Frequently these fine wires are accidentally broken during the day when the stores or other places are open and the alarm is inoperative, and in this way they occasion much annoyance, as their breakage is not discovered until the store is closed and it is too late to repair them without great inconvenience to the tenants.

One object of my present improvements is to provide a means for indicating when such breakage occurs, so that it can be repaired before the ordinary time of closing the stores or other places. This is accomplished by placing all the partitions, walls, skylights, and other like articles which are protected by fine wires in the manner described in one portion of the electric circuit at the structures to be guarded, and all openings needing to be guarded—such as doors and windows—which are used while the structures are in use, in another portion, and by combining with these portions of the electric circuit a suitable switch or switches, whereby the tenants of the said structures may cut out of the electric circuit the doors, windows, and other like openings, and allow the partitions, walls, skylights, and other like ar-

ticles to remain in the electric circuit and in communication with the station or office.

To prevent burglars from concealing themselves in the structures to be guarded, and by means of the switch or switches cutting out the portion of the electric circuit which includes the doors and windows without giving an alarm at the station or office, this invention also comprises a resistance-coil and another switch or switches, by means of which, when the branch of the circuit which includes the doors and windows is cut out, the resistance-coil will be short-circuited out and an alarm sounded at the station or office.

In the accompanying drawings, Figure 1 is a diagrammatic view of an electric circuit at a structure to be guarded, comprising two branches, an instrument having a short-circuiting device, and switches for cutting out one branch of the circuit, and also a view of the circuit at the station or office; and Fig. 2 is a side view of the instrument having a short-circuiting device.

Similar letters of reference designate corresponding parts in both figures.

A designates windows in the structure to be guarded; and B designates a partition in the same, shown on a smaller scale, and protected by fine wires B' traversing it. Before describing these windows and this partition in detail I will premise that doors and other similar openings may be protected in a manner analogous to that in which the windows are protected, and that skylights and other like articles may be protected in a manner analogous to that in which the partition is protected. The opening of the windows makes a short circuit, and the severing of the fine wire at the partition breaks the circuit.

w and y designate wires forming that portion of the electric circuit when the electric burglar-alarm is set for the night, and at other times when the structure to be guarded is to remain closed, which extends to and from the windows and partition, including the latter in the circuit, and terminating at the resistance-coil I.

The switches employed are designated No. 1, No. 2, No. 3, and No. 4, and consist of metal bars pivoted at one end to a common base-board, and adapted to be vibrated one way or the other to make electrical contact with metal

contact-points, two of which are provided for each switch, and which are respectively designated o, p, q, r, s, t, u, v . These switches are connected by a bar of insulating material, so that they may be moved in unison. The contact-points p, q, t , and v are respectively connected by wires p', q', t' , and v' with binding-posts p^2, q^2, t^2 , and v^2 on the said base-board, and the switches No. 1, No. 2, No. 3, and No. 4 are respectively connected by wires o', r', s' , and w' with binding-posts o^2, r^2, s^2 , and w^2 .

Attached to the ends of the wires w and y at the resistance-coil I are wires x and z , which lead to and are connected with the binding-posts q^2, r^2 of switch No. 2, and when this switch is turned or vibrated to the left it will short-circuit the resistance-coil I. At a point, Z , beyond the last window in the circuit the wire w has formed in it a loop, $w'w^2$, the ends of which extend to and are fastened in the binding-posts s^2, t^2 of switch No. 3. A ground-wire, L , leads from the wire y at the first window in the circuit, and a connection is made with it from the binding-post v^2 of switch No. 4. A wire, n , connects the binding-post w^2 of this switch No. 4 with the binding-post d of an instrument having a short-circuiting device, and presently to be fully described.

The electric current enters the building from the station or office on the line-wire A' , which is connected to the binding-post a of the aforesaid instrument. Leaving this instrument, the electric current passes along the wire m , connected with the binding-post c of the instrument to the binding-post o^2 of the switch No. 1.

To set the burglar-alarm for the night the switches are moved to the right, and the electric current, entering on the line-wire A' and passing to and from the said instrument, arrives at the switch No. 1. Thence it passes to the contact-point p of this switch, along the wire p' to the binding-post p^2 , and from the latter to the wire w . It then passes along the wire w to and through the wire w^2 to binding-post t^2 of the switch No. 3, and thence out at binding-post s^2 and the wire w' to the wire w , and through the partition B, to and through the resistance-coil I, returning on the wire y to the ground-wire L .

After the structure to be guarded is opened in the morning the switches are turned to the left, whereupon the electric current, after reaching switch No. 1, as before explained, passes to the contact-point o of said switch, and thence by a wire, l , to the contact-point s of the switch No. 3. It then passes from this switch by the loop-wire w' to the wire w , thence through the wire of the partition B to the resistance-coil I. Thence it passes by the wire z to the binding-post r^2 and wire r' to the switch No. 2. From this switch it passes to the contact-point q , thence by the wire q' to the binding-post q^2 . Leaving the binding-post q^2 , it traverses the wire x to the wire y at the resistance-coil I, and then it passes to the ground-wire L . The circuit is thus completed, so as to short-circuit

or cut out the resistance-coil I. It will be seen that the circuit is thus completed through the fine wire of the partition B during the time the structure to be guarded is open, as well as when it is closed for the night, and that during the time the structure is open it is not affected by the opening of the windows. Any break of the fine wire of the partition occurring during the day is therefore instantly indicated at the station or office, and can at once be repaired without closing the structure to be guarded, and before the tenants desire to close and leave the same.

The wires w and y are, in this example of my invention, designed to be so combined with the windows A that on the opening of the latter switches or springs will operate to connect them, and short-circuit or cut out the resistance-coil I, the electric current flowing then only to the first window which is open, and thence to the ground-wire L .

The loop $w'w^2$ is inserted in the electric circuit at the point Z , beyond the last window, in order that the opening of the windows or doors in the structure shall not affect the branch of the electric circuit which includes the partition B.

Where the electric circuit is so organized that it is broken by the opening of a window, it is important that the circuit should be broken in but one of the wires w and y , and always in the wire w , so that when the windows are opened during the day the wire y will always be intact to conduct the electric current from the fine wire of the partition B to the ground-wire L .

As I have before shown, the wire n connects the binding-post d of the instrument having a short-circuiting device to the binding-post w^2 of switch No. 4, and from this binding-post the electric current passes by the wire w' to the switch, and, when the switch is turned to the right, along it to the contact-point v . From the contact-point v the electric current passes along the wire v' to the binding-post v^2 , and thence to the ground-wire L . Therefore when this switch is turned to the right it establishes communication between the instrument having a short-circuiting device and the ground, and when it is turned to the left it severs the communication between the said instrument and the ground.

I will now more particularly describe the instrument having a short-circuiting device.

From the binding-post a the wire extends to a circuit-breaker consisting of a metallic flap spring or elastic strip, C , secured at or near one end to the base-piece of the instrument, and provided with a thumb-piece or button, b , whereby it may be manipulated. This circuit-breaker is combined with a keeper, D , consisting of an arm of metal or other conducting material projecting over the circuit-breaker, so that the latter will, when in its normal position, maintain a contact with it. This keeper may be pivoted to the base-piece B, so that it

can be swung aside out of contact with the circuit-breaker when desirable to retain the circuit broken for any length of time without holding the circuit-breaker depressed with the hand. From the keeper D a wire, E, extends to an electro-magnet, F, whence a wire, G, extends to a binding-post, *c*, on the base-board of the instrument. From this binding-post *c* the wire *m* extends to the binding-post *o*² of the switch No. 1, and when the switch is turned to the right it is in communication with the resistance-coil I, as I have above explained. It will also be remembered that the wire *n* leads from the binding-post *d*, through the switch No. 4, to the ground-wire L.

M designates a vibratory armature arranged in proximity to one end of the electro-magnet F, and pivoted to a supporting-bracket, M', so that it can be attracted by the magnets into contact with them, or, when released, may swing away from them under the influence of a spring or otherwise.

Extending from the armature M, in this instance above the same, is an arm, N, of conducting material—such as metal—which, when the armature is attracted to the electro-magnet F, moves outward, and thereby comes in contact with an arm, O, of conducting material, extending from a post, P, of conducting material, erected on the base-piece of the instrument.

A wire, Q, extends from the armature M to the wire G, and is fastened, as here shown, in the binding-post *c*; and another wire, R, extends from the post P to the binding-post *d*, connecting there, if the switch No. 4 is turned to the right, with the ground-wire L.

When the switches are set for the night, and the windows and doors of the structure to be guarded are closed properly, the electric current will enter on the line-wire A', pass through the circuit-breaker C, keeper D, and wire E to the electro-magnet F. Thence it passes along wire G to wire *m*, thence through the switch No. 1, the wire *w*, resistance-coil I, to the wire *y*, and from the latter thence to the ground-wire L. Then any momentary change in the resistance of the circuit outside the structure will cause only a momentary alarm to be given at the office with which the line-wire A' communicates. If, however, one of the doors or windows be opened, the electric circuit will be short-circuited from the wire *w* to the wire *y*, and the resistance-coil I will be short-circuited and an alarm will be given at the station or office. Whenever the electric circuit is short-circuited at a window or door, and the armature M attracted to the electro-magnet, the electric current will be short-circuited again by the instrument having a short-circuiting device, this time through the wire G to the wire Q, from the latter to the arm N, thence to the arm O, thence through the post P and wire R to the wire *k*, switch No. 4, and ground-wire L. In consequence of the latter short-circuit-

ing the electro-magnet will hold the armature M to them, even if the opened door or window be instantly closed again, because the greater portion of the electric current will take the easiest course to the ground, and an alarm will continue to be given until the existing short circuit is broken by a watchman at the station or office opening the line or otherwise, so as to effect the release of the armature M, whereupon the normal electric circuit may be reinstated through the resistance-coil L. The instrument having a short-circuiting device in the structure to be guarded will then be in condition to be again attracted when a door or window is opened.

The short alarm given through a momentary change in the resistance of the electric circuit from any accidental or other cause outside the structure to be guarded, and the long-continued alarm given through a change in the resistance occasioned at or in the said structure from short-circuiting out the resistance-coil, may be easily distinguished from each other. Hence the difficulty heretofore experienced from the failure to distinguish at the station or office between alarms from such causes and sources is obviated.

K designates the battery with which the line-wire A' is connected.

When the electric circuit has been short-circuited before locking up the structure to be guarded for the night, the circuit-breaker C may be employed to release the armature M to reinstate the normal electric circuit through the structure and resistance-coil I, and where the building is to be left after being locked the circuit-breaker may be utilized to signal to the watchman at the station or office to reinstate the circuit through the structure by opening the line-wire after the opening and closing of the door of said structure to permit the exit of the tenants.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an electric burglar-alarm, the combination of an electric circuit at a structure to be guarded, including windows, doors, and like openings, and the fine wiring protecting partitions, walls, skylights, and other like articles, a switch located at the said structure to be guarded for cutting out a portion of said electric circuit, including the windows, doors, and like openings, a resistance-coil located in the said electric circuit at the said structure, and a switch also located at said structure for short-circuiting the resistance-coil when the said portion of the electric circuit which includes the windows, doors, and other like articles is cut out, substantially as and for the purpose specified.

2. In an electric burglar-alarm, the combination of the line-wire, the switches No. 1 and No. 2, the contact-points *o p q r*, the wires *w* and *y*, the wires *w'* and *w''*, the wire *l*, a connection between the wires *l* and *w'*, the resist-

ance-coil I, and the wires *x* and *z*, substantially as and for the purpose specified.

3. In an electric burglar alarm, the combination of a line-wire, the switches No. 1, No. 2, and No. 3, the contact-points *o p q r s t*, the wires *w* and *y*, the wires *w'* and *w²*, the wire *l*, a connection between *l* and *w'*, the resistance-coil I, and the wires *x* and *z*, substantially as and for the purpose specified.

4. In an electric burglar-alarm, the combination of an electric circuit at a structure to be guarded, including windows, doors, and like openings, and the fine wiring protecting partitions, walls, skylights, and other like articles, a switch located at the said structure to be guarded for cutting out a portion of the said electric circuit, including the windows, doors, and other like openings, a resistance-coil located in the said electric circuit at the said

structure, and a switch also located at the said structure and connected with the aforesaid switch for short-circuiting the resistance-coil when the said portion of the electric circuit which includes the windows, doors, and other like articles is cut out, substantially as specified.

5. In an electric burglar-alarm, the combination of a line-wire, an instrument having a short-circuiting device, the wires *m* and *n*, the switches No. 1, No. 2, No. 3, and No. 4, the wires *w* and *y*, the wires *w'* and *w²*, the resistance-coil I, the wires *x* and *z*, and the wire *l*, substantially as specified.

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