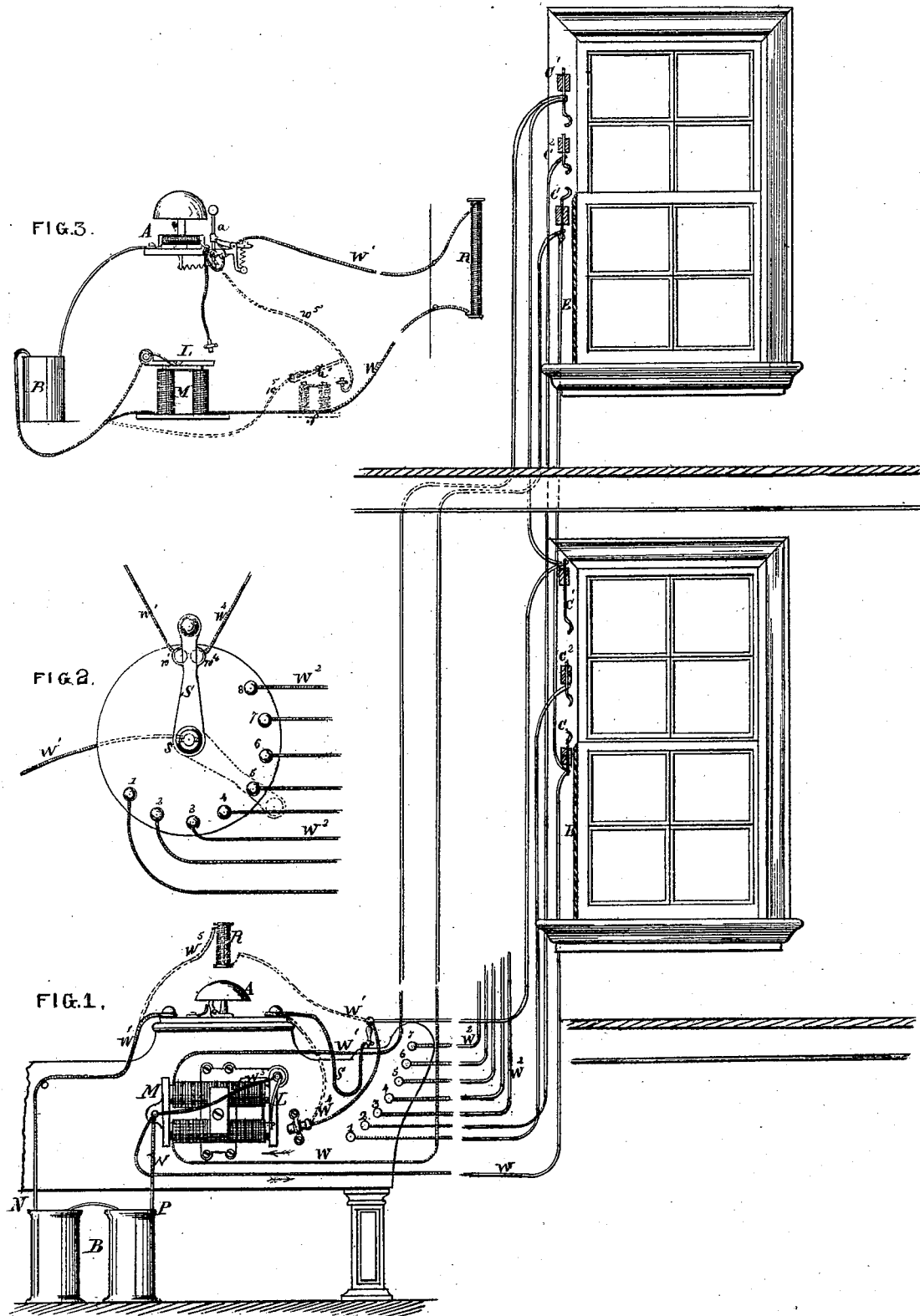


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ELECTROMAGNETIC BURGLAR ALARM.

No. 112,704.

Patented Mar. 14, 1871.



WITNESSES.

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# United States Patent Office.

WILLIAM B. GUERNSEY, OF JERSEY CITY, NEW JERSEY.

Letters Patent No. 112,704, dated March 14, 1871.

## IMPROVEMENT IN ELECTRO-MAGNETIC BURGLAR-ALARMS.

The Schedule referred to in these Letters Patent and making part of the same.

I, WILLIAM B. GUERNSEY, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Electro-magnetic Alarms, of which the following is a specification.

### *Nature and Objects of the Invention.*

The first part of my invention consists in combining, with a combined or continuous circuit (such, for example, as is described in Letters Patent No. 108,257, granted to me on the 11th day of October, 1870) "section"-wires, arranged to locate the point at which the connection is either made or broken, so as to sound an alarm. This I effect by providing, at each window, door, or other place to be protected, means or appliances to effect two separate connections, one to give an alarm in the event of a window or door being opened, or any other act done which it is desired to detect, the other one to indicate the location of the particular room or other place, so as to enable an authorized party to locate the point where the disturbance has occurred.

The second part of my invention consists in the employment of a switch or its equivalent, arranged to close any one of a number of circuits, or each in succession, in order to locate the point where the alarm is caused, as before stated.

The third part of my invention consists in arranging conducting wires in two or more circuits, so that the closure of one may be caused by the breaking of another or by the short circuiting of another, thus not only securing an alarm but causing such alarm to be continued independently of its originating cause, and controllable only at the instrument.

The fourth part of my invention consists in combining a short-circuiting switch-lever with a combined open and closed circuit-alarm, as hereinafter described.

The fifth part of my invention consists in the employment of a resistance to guard several openings in a combined open and closed circuit, the said resistance being located in near proximity to the alarm, and being preferably made to consist of an electro-magnet for controlling a local circuit.

The sixth part of my invention relates to a device by which the movement which brings the alarm into action is made to break the main circuit, so that it cannot be reclosed except by a party at or near the instrument.

### *Description of the Accompanying Drawing.*

Figure 1 represents, in elevation, a combined closed and open circuit-alarm, made according to my invention, two windows being shown to illustrate the operation, and a number of additional section-wires being

also represented, which are supposed to communicate each with the doors and windows of a separate room.

Figure 2 is an elevation illustrating a mode of arranging the switch and its connections.

Figure 3 illustrates an arrangement of the conducting wires in connection with a magnet and with a resistance, which may be located at the place to be protected.

### *General Description.*

A may represent an alarm, of any suitable construction.

P and N represent, respectively, the positive and negative poles of a battery, B, connected, while the apparatus is in its normal condition, through the wires W, the connection-springs or plates C C, the coils of the electro-magnet M, the wires W', an adjustable switch S, of any suitable form, and the secondary connection-plates C'.

The circuit either passes through the alarm or avoids it, as may be preferred in the construction and arrangement of the apparatus; but if the alarm be located in the main circuit, as illustrated in the drawing, the magnet-helices offer a sufficient resistance to prevent the sounding of an alarm, unless a short-circuit is formed between the two parts W and W' of the main wire, so as to avoid such resistance.

Various devices may be employed to effect this short-circuiting, by the movement of doors or windows, or the doing of any other acts which the alarm is arranged to detect.

In the illustration here given the second connection-springs or plates C' C' are arranged in such relation to the springs or plates C that the two springs or plates of either pair will, through the medium of plates E, be brought into electrical connection by the opening of a door or window, or the doing of any other act which the apparatus is arranged to detect. In this case the current avoids the magnet M, and may pass through the alarm with such force as to cause it to sound.

In addition to the pairs of connection-springs or plates C and C', I further provide a separate spring or plate, C<sup>2</sup>, at each window, door, or other place, those in each particular room communicating with one of the section-wires W<sup>2</sup>, which terminate in buttons numbered 1 2 3 4 5 6 7, respectively. One of these separate wires being employed for each room, they afford means, through the medium of a switch, S, of any suitable construction, to detect instantly the place where the disturbance has occurred, the said switch closing a short-circuit through the alarm and through any one of the section-wires, which communicate with a plate, E.

L is an armature or lever, acted on by the magnet M when the latter is excited by the electric current in the normal condition of the apparatus.

This armature-lever is connected by a wire, W<sup>3</sup>, with the main wire W, and, if released by the magnet, in the event of a break or short-circuit in the main circuit, it will, by the action of a suitable spring, be thrown into connection with a wire, W<sup>4</sup>, causing a short-circuit through the alarm, which will continue the alarm even though the connection between the springs C and C<sup>1</sup> be broken.

If the main circuit W W<sup>1</sup>, instead of passing through the alarm, avoids it, as indicated by the dotted line W<sup>1</sup> in fig. 1, the alarm will be sounded by the current passing through the local circuit W<sup>3</sup>, L, W<sup>4</sup>, &c., as soon as the magnet M is demagnetized by short-circuiting through the main wires W W<sup>1</sup>, as first explained.

If the circuit thus avoids the bell it is advisable to introduce a resistance, as shown at R, fig. 1.

In the illustration given in fig. 1 the switch S is shown as constructed of a flexible conducting-wire or cord, which, when at rest, hangs upon a pin or button in contact with the main wire W<sup>1</sup>, so that said switch will form a part of the circuit.

A convenient way of arranging the switch and its connections is illustrated in fig. 2.

The switch-lever S is pivoted at s, and, in the normal condition shown, forms, as before, a part of the circuit W<sup>1</sup> by resting on the button w<sup>1</sup>, and, at the same time, rests on the button w<sup>2</sup>, so as to form a part of the circuit W<sup>3</sup> W<sup>2</sup> in the event of this short-circuit being closed by the movement of the lever L.

If, now, an alarm is sounded by short-circuiting through the connections C E C<sup>1</sup>, the place at which such short-circuiting occurs may at once be determined by removing the switch-lever from the buttons w<sup>1</sup> w<sup>2</sup>, thus breaking the circuit already made, and turning it over the buttons 1 2 3 4 5 6 7, in succession, until the alarm again sounds, indicating where a connection exists, through a spring, C<sup>2</sup>.

While describing the connections as formed with springs C C<sup>1</sup> C<sup>2</sup> in the window-frame, and a conducting-plate, E, in the sash, I do not restrict my claim to any specific form or arrangement of the connections. I may and do employ in practice for the members C<sup>1</sup> C<sup>2</sup> pins or plates, arranged side by side, and for the member C a spring attached to the window-frame, projecting over C<sup>1</sup> C<sup>2</sup>, and resting within a cavity in the edge of the sash, so that the parts will be brought in contact by the opening of the window.

For doors I employ connections operating on the same general principle, but necessarily different in construction and arrangement.

Various forms of connection devices or automatic keys for different places and purposes are so well known to those skilled in the art that I do not deem it necessary to specifically describe any.

In fig. 3, R may represent a resistance located at a single point to be protected, as set forth in my patent No. 108,257, dated October 11, 1870.

Under the arrangement here illustrated an alarm will be produced either by contact between the wires W and W<sup>1</sup>, avoiding the resistance R, and thus causing a stronger current to pass through the alarm A,

or by cutting either of said wires, by which the magnet M or a galvanometer, or other device used instead thereof, will be demagnetized, and a short circuit formed through the lever L or other device.

The bell-armature *a* is so arranged that at the instant of starting it will break the circuit through W<sup>1</sup>.

In practice, the force of the battery B, and the relative resistances at M, R, and A, must be so proportioned or adjusted that in its normal condition the resistance R will not prevent the action of the magnet M, but will prevent the action of the alarm A, whereas if a short circuit be formed, so as to avoid the resistance R, the alarm A will be actuated.

A convenient arrangement will be, for example: six cells of battery at B, twenty miles of resistance in magnet M, one hundred miles of resistance in coil R, and three miles of resistance in magnet of alarm A.

If preferred, a three-mile magnet may be introduced at *f*, with an armature, *a'*, arranged to close a short-circuit through the wires w<sup>3</sup> w<sup>2</sup>. The bell-magnet, not being depended on for resistance, may then be made to act with greater force, and so ring a louder alarm. In either case, the ringing once commenced will be continuous, and can only be arrested at the instrument.

A galvanometer or any other suitable form of electro-magnet may manifestly be substituted for the magnet shown at M without departing from the essential principles of the invention.

The results stated in the third, fourth, and fifth parts of the invention, herein described, are involved in the invention described in my patent of October 11, 1870, but I did not there describe minutely the mechanism by which these parts of the invention are carried into effect.

#### Claims.

I claim as my invention—

1. An electro-magnetic alarm, provided, at each window, door, or place to be protected, with means or appliances for forming two distinct connections, one for giving an alarm and the other for locating the point at which the alarm is given, substantially as explained.

2. The switch S, or substantially-equivalent device, in combination with a second or indicating circuit, and a circuit which is previously closed, to give an alarm.

3. Conducting-wires arranged in two or more circuits in such a manner that the closure of one circuit may be caused either by the breaking or closure of another circuit, substantially as herein explained.

4. The short-circuiting switch-lever L, or its equivalent, in combination with the resistance-magnet and closed and open circuits, substantially as herein described.

5. A resistance, located in near proximity to an alarm, and employed to control a number of openings which the said alarm is to protect.

6. A device by which the alarm is made to break the main circuit, so as to render the alarm continuous, substantially as set forth.

Witnesses: W. B. GUERNSEY.

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