Wm B. Guernsey.

PATENTED MAR 14 1871

ELECTRO MAGNETIC ALARMS.

112705

FIG. 1.

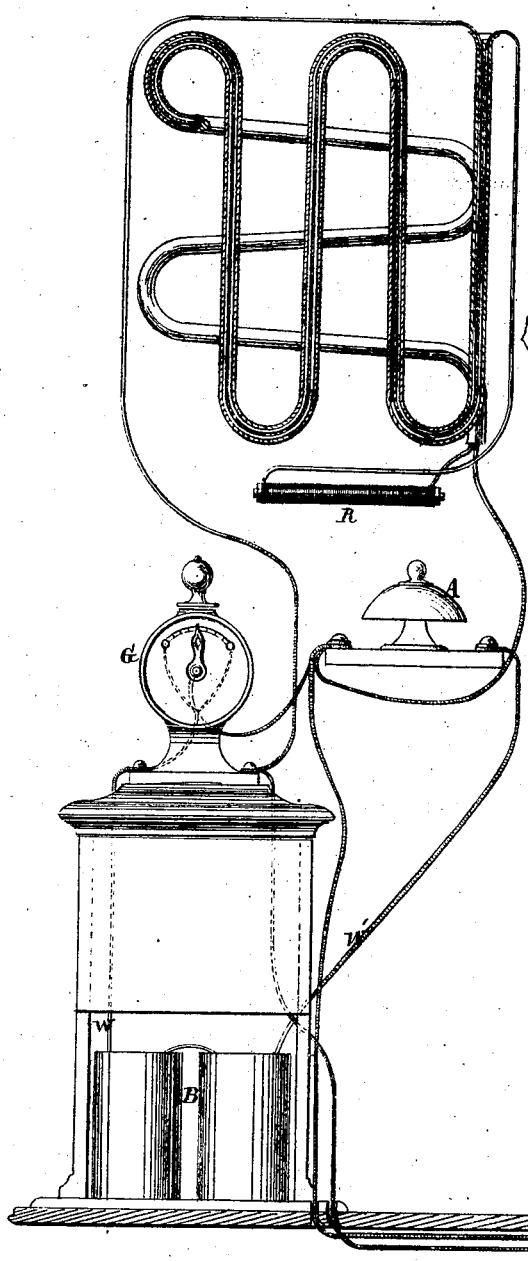


FIG. 2.

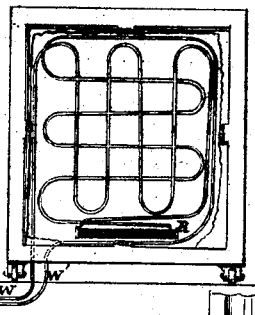


FIG. 4.

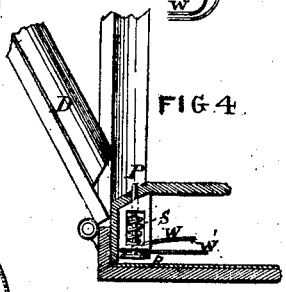


FIG. 5.

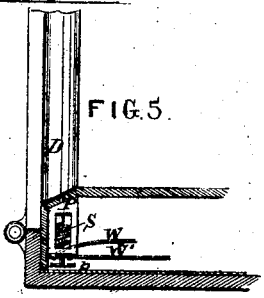
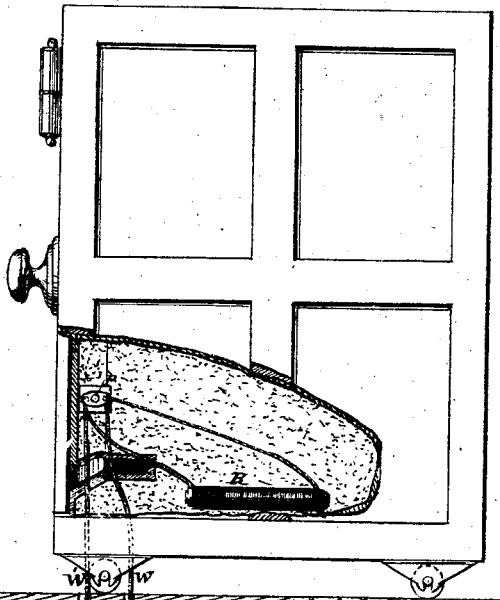


FIG. 3.



WITNESSES.

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Letters Patent No. 112,705, 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.

My invention consists in an improved mode of arranging the conductors of my combined circuit-alarm, patented October 11, 1870, for the purpose of protection, such arrangement being particularly applicable to the protection of safes, vaults, &c.; also for windows, sky-lights, and other openings needing protection, but in which it is desirable not to obstruct the passage of light or air.

I interpose one or more coils or "resistances," through which the current must pass in the normal condition of the apparatus, maintaining a galvanometer connected therewith in a position between two extreme points, at either of which the said galvanometer, by closing either a short circuit or a separate local circuit, may operate the striking or sounding apparatus; or, if an electro-magnet be used instead of the galvanometer, the obstructing power of the resistance-coil or coils will bear such relation to that of the local circuit-closing magnet and of the bell-magnet that, until the main circuit is either broken or short circuited to avoid the resistance, the local circuit will remain open and the alarm inactive. The electrical current in its course also passes through wires so arranged that a portion of said conductor, between the positive pole of the battery and the resistance, shall be nearly in contact with a portion between the negative pole and the resistance, yet separated sufficiently to prevent magnetic communication between them, unless brought into contact by forcible means.

These wires or parts of a conductor are, preferably, disposed, two or more together, in cable form, by the use of some insulating material, and are arranged in a grated or similar shape, crossing each other in front of or within the opening to be protected, so that, in the course of any surreptitious attempt to open the same, the wires will either be severed or brought in contact, in the former case breaking the circuit and causing the galvanometer to be deflected to its zero point, and in the latter "short-circuiting" the current by causing it to pass directly from one set of wires to the other without passing through the resistance-coil, thus deflecting the galvanometer to the other extreme of its arc, and, in either case, causing it to close a local circuit through the alarm; or, in the case of short-circuiting, as stated, the main circuit may suffice to sound the alarm without the use of a local.

Description of the Accompanying Drawing.

Figure 1 represents a coil or grating formed of a plurality of wires, insulated from each other, and connected with a battery, a galvanometer, an alarm, and a resistance-coil.

Figure 2 shows a modification in the combination and arrangement of the wires.

Figure 3 is an elevation, partly in section, of a safe, with a resistance-coil and an automatic key or circuit-closer in connection with the battery and galvanometer before referred to.

Figure 4 is a horizontal section of a portion of the safe, showing the door open and the short circuit closed.

Figure 5 is a view of same parts, showing the door shut and the short circuit broken or open.

General Description.

A may represent an alarm of any suitable form, and B, a battery connected therewith by wires W and W', one of which passes through and controls a galvanometer, G.

The wires W and W' are connected through a resistance-coil, R, causing such an obstruction of the electrical current that the galvanometer-needle will be deflected into a position intermediate between its two extreme points, as represented in the drawing.

In the illustration here given the wires are shown covered with an envelope of gutta-percha or other material which will serve to insulate them from each other while combining the two in one cable. This cable, being arranged in a number of coils or folds, preferable arranged crosswise and secured by any adequate means, will serve as a barrier to prevent access to any place which is to be protected. The spaces in the grating thus formed may vary in diameter from one or two inches to six inches, or more, according to the place and purpose for which it is used.

For protecting the openings of doors, windows, sky-lights, &c., the spaces may be comparatively large; but, where it is used as a protecting envelope or casing for the doors or walls of safes, vaults, &c., the spaces should be small enough to prevent the effective introduction of any instrument without detection.

If preferred, the insulating envelope may be dispensed with, the coils in one direction being formed of the wire W, and those in the other direction of the wire W', crossing the first, but without contact. This modification is illustrated in fig. 2.

For safe or vault-doors or walls the wires will be arranged under the surface in such a manner that any attempt to break through the door or wall will either sever the conductor, thus demagnetizing the galvanometer, causing its needle to be deflected to zero, which, by means of mechanism not necessary to describe, closes a short circuit to sound an alarm, or will bring the two wires or two parts W W' of the wire into electrical contact, so as to avoid the resistance R,

thereby causing a stronger current through the main circuit, which will deflect the needle in the other direction, and either may itself sound an alarm, or may close a new local circuit to do so, as before.

This protecting envelope or casing may be applied to the safe shown in fig. 3 in connection with the resistance-coil, R, there represented, and another device is added to automatically close a circuit, which will avoid the resistance R in the event of the door being opened.

This automatic key or circuit-closer may be constructed in a great variety of ways.

As an illustration, I have shown a pin, P, which, when the door D is shut, will be held in, but when the door is open will be forced out by a spring, S, bringing the head *p* of the pin against buttons connected with the respective wires W and W′, so as to form a direct connection between said wires, avoiding the resistance R, with the effect already explained.

While I have represented and referred to a galvanometer for the purpose of illustration, I do not confine myself to the use of such an instrument, but propose to employ, in carrying out my invention, an electro-magnet, or any form of electro-motor which may be adapted for the purposes in view. I have not thought it necessary to describe specifically any such instrument or the galvanometer itself, because the construction of these instruments and the modes of substituting one for another will be sufficiently well understood by those skilled in the art to which the invention appertains.

The particular arrangement of devices by means of which the galvanometer or other instrument sounds the alarm may be varied to suit the circumstances of the case, it being competent for any intelligent person sufficiently conversant with the art to construct my apparatus to adapt this part of it to the particular use and locality for which it is designed, and the strength or loudness of the alarm to be sounded.

The English patent of T. B. Maxon, numbered 717, of 1866, describes an alarm, in which the conducting-wire is formed as a cage to protect a safe or other object, so that an alarm will be caused in the event of said conducting-wire being severed. The objection to this device is, that it may readily be rendered inoperative by establishing a short circuit, avoiding the point at which it may be desired to cut the wire. This objection is obviated in my invention.

Claims.

I claim as my invention—

1. The arrangement of my continuous conductor or conductors, patented October 11, 1870, to serve as a barrier for the protection of safes, vaults, windows, &c., substantially as herein set forth.

2. The combined coils W and W′, arranged substantially as represented, so that they will be either severed or brought into contact by an attempt to pass through an opening, or to pierce a door, wall, or other object which they are employed to protect.

W. B. GUERNSEY.

Witnesses:

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