J. N. LARNED.

ELECTRIC BURGLAR ALARMS.

No. 181,078. Patented Aug. 15, 1876.

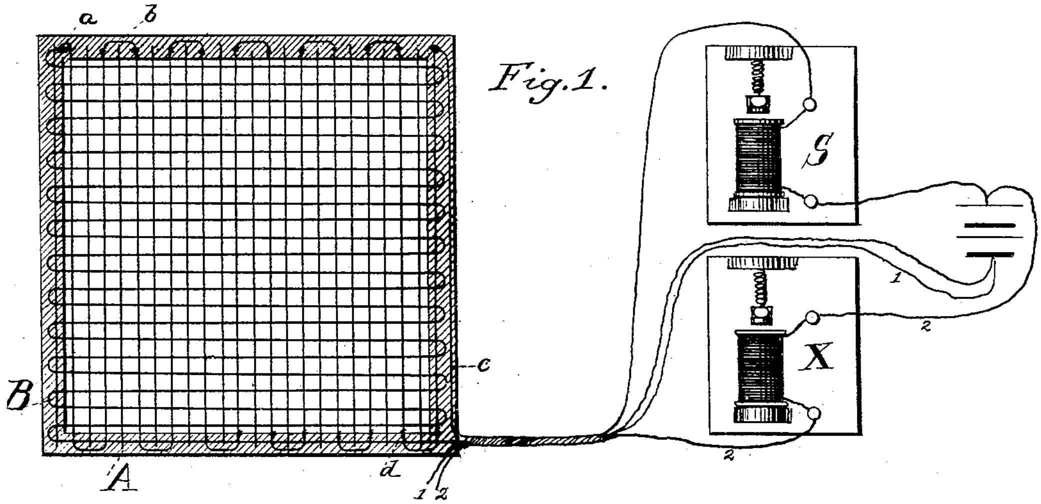

Fig. 1.

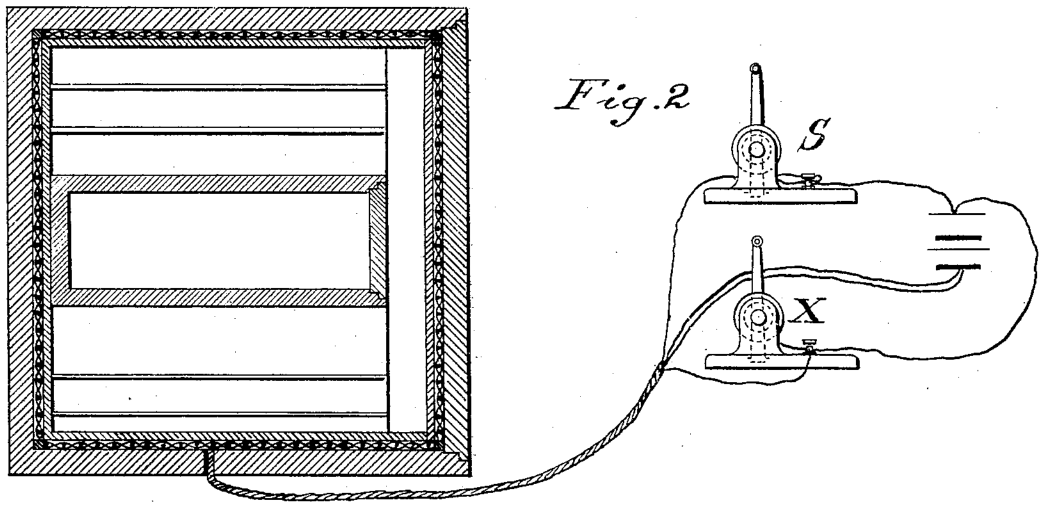

Fig. 2.

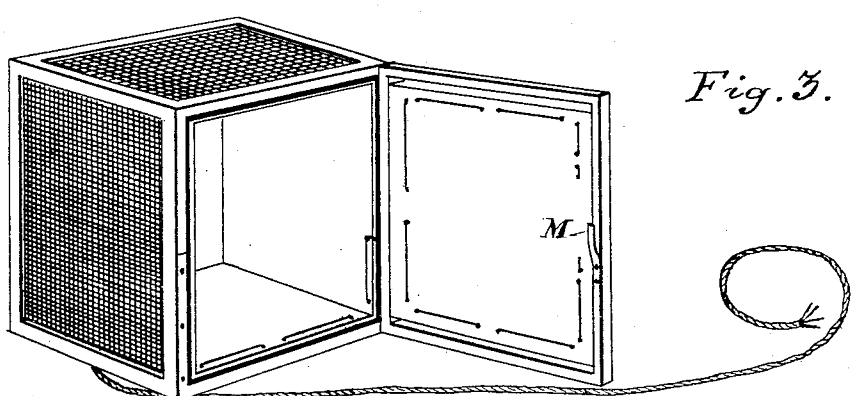

Fig. 3.

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3 Sheets—Sheet 2.

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Fig. 4

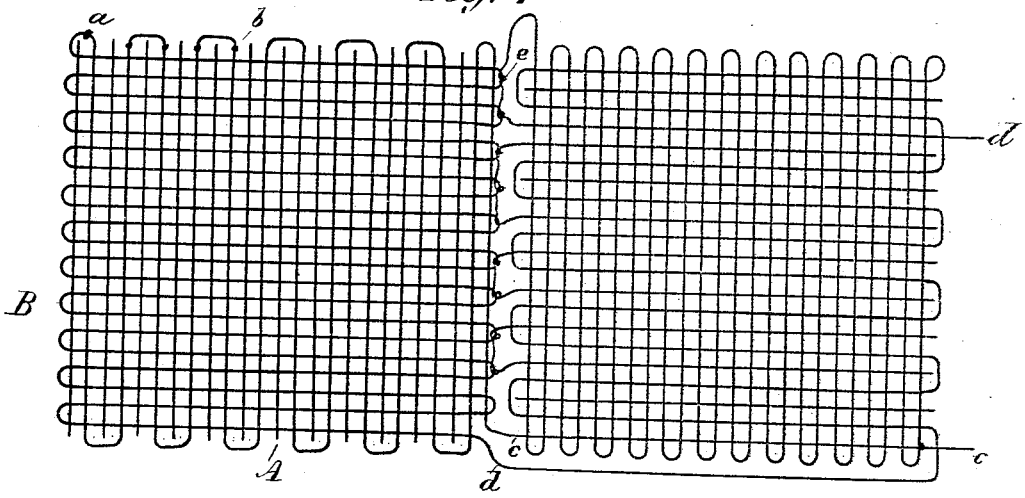


Fig. 5

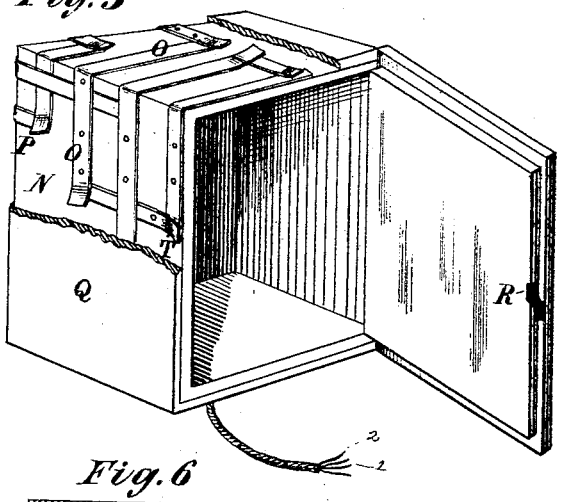
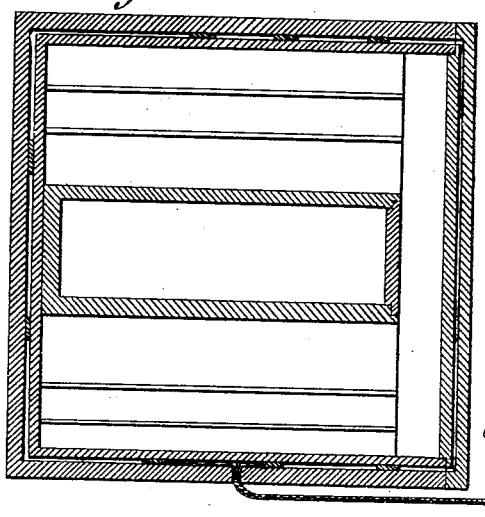


Fig. 6



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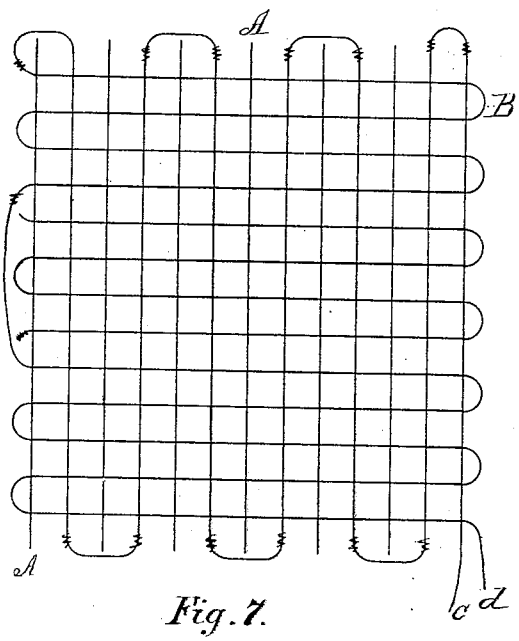

Fig. 7.

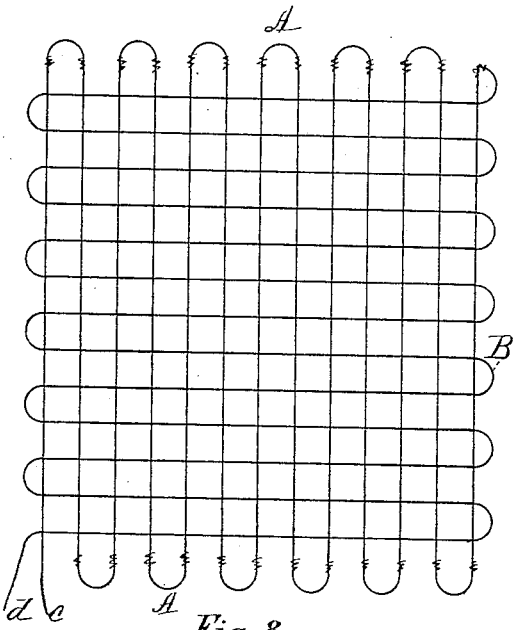

Fig. 8.

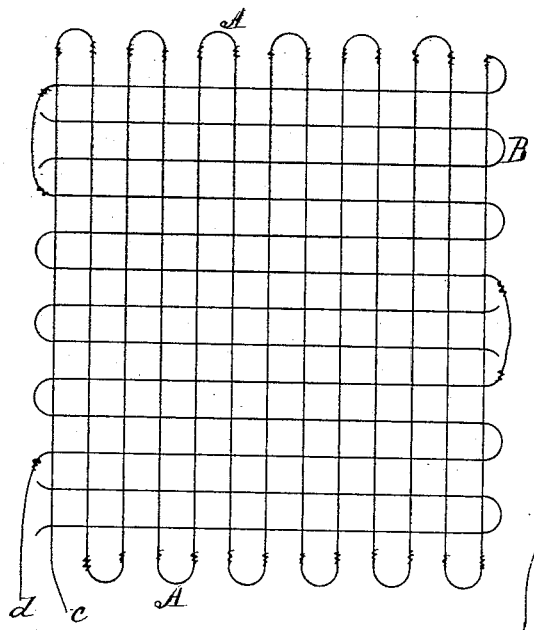

Fig. 9.

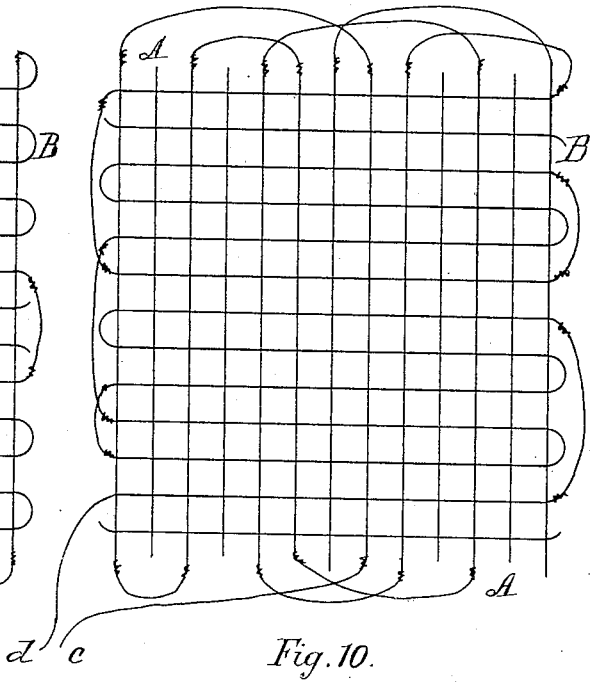

Fig. 10.

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UNITED STATES PATENT OFFICE.

JOSEPHUS N. LARNED, OF BUFFALO, NEW YORK.

IMPROVEMENT IN ELECTRIC BURGLAR-ALARMS.

Specification forming part of Letters Patent No. **181,078**, dated August 15, 1876; application filed October 21, 1875.

To all whom it may concern:

Be it known that I, JOSEPHUS N. LARNED, of the city of Buffalo, county of Erie, and State of New York, have invented an Electric Casing, Lining, or Screen for Protective Purposes; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

The object of my invention is to produce an alarm whenever a given space to be protected is invaded; and it consists in the means hereinafter fully described.

Figure 1 represents a barrier of wires secured to a frame, together with electro-magnets, armatures, and a battery. Fig. 2 is a vertical section of a safe or other receptacle for valuables, representing a barrier of wires entirely surrounding the usual receptacle for articles, electro-magnets, armatures, and wires connecting the barrier to the latter being also shown. Fig. 3 is a perspective view of a case entirely surrounded with a barrier of connected wires, the door being constructed to break the circuit of electricity through the same when opened, and to close said circuit when it is closed. Fig. 4 shows means for uniting a series of the barriers of wires shown in Fig. 1 to form a partially or wholly inclosing cage or casing. Figs. 7, 8, 9, and 10 show various ways of distributing the circuit.

The barrier is made from material capable of conducting electricity, such as wires, strips, rods, &c., which are properly wound or coated to insulate them from one another and from the wires or other objects with which they come in contact. These may be formed into the barrier by weaving, knitting, knotting, or by any of the methods of forming fabrics.

In the drawing I have shown the barrier made by weaving, A representing the warp, and B the woof. The terminal wires of the circuit *c d* are connected to the electro-magnets and the battery.

The circuit of electricity may pass through the whole of the warp and the whole of the woof, as shown in Fig. 8, or it may pass through the whole of the woof and part of the warp, as shown in Figs. 1 and 4; or it may pass through the whole of the warp and part of the woof, as shown in Fig. 9; or it may pass through part of the warp and part of the woof, as shown in Fig. 7; or it may pass backward and forward, crossing itself one or more times, as shown in Fig. 10, either through the whole of the warp and woof, or through part of the warp and the whole of the woof, or part of the woof and the whole of the warp, or through part of both.

The arrangement of the circuits in all the cases above enumerated, except that shown in Fig. 8, and especially in that shown in Fig. 10, prevents an outside conductor from one part to another to be introduced by a burglar who is an electrical expert, so as to permit the intervening wires to be cut out without breaking the circuit, as might readily be done if the circuit ran directly through the whole of the warp and woof.

The barrier may be supported upon a frame of wood or other suitable material.

If by the attempt of any person to effect an entrance into the space desired to be protected one or more of the wires forming the electrical circuit is broken, the circuit is thereby opened, the armature of the electro-magnet S is released, and an alarm is produced by it through suitable and well-known means.

This alarm may be a sounding or an indicating one of any well-known construction.

The barrier, as thus described, may be used as a window or door screen, thus obviating the objection, especially in summer, to the use of the common burglar-alarm for doors and windows, which only permits the window or door to be raised or opened a few inches.

When it is desired to protect safes or other receptacles, a series of these barriers may be used to form the sides, top, bottom, back, and door of a case or cage. These may be connected together by threading prolonged ends of the warp over and through loops and meshes of the barrier, and then uniting them to the terminal wires of the contiguous barrier, as shown at *e*, Fig. 4; or they may be secured to a frame-work, and the terminal ends of the adjacent barriers connected together, the circuit being completed through the barrier on the door by connections through the hinges and a metal plate, M, which comes in

contact with a metal plate on the frame, or a metal plate to which one end of the circuit of the adjacent side barrier is connected when the door is closed, the opening of the same breaking the circuit.

One or more of these barriers may be placed opposite the entrance to the safe or receptacle, or a series of them may be placed around the same. When the barriers are placed within the safe or receptacle, as shown in Fig. 2 of the drawing, the ends of the circuit pass through an aperture in the same to the battery and electro-magnet, a suitable cement being employed to close up the space left surrounding them.

These barriers can be made to form the walls of cells or other inclosures for prisoners, the breaking of the circuit by an attempt to escape indicating the same.

The wires which form the circuit cannot be pushed aside to effect an entrance without breaking the same, and, therefore, the circuit.

In Fig. 5 I have shown another means of carrying out my invention when applied to safes or other receptacles. Secured to a suitable shell, N, of wood or other non-conducting material are a series of metal strips, O, which are free to spring away from each other, as shown at P, and are held in contact with each other by the shell Q of wood or other non-conducting material, which is rigidly secured to the inner shell. These metal strips are disposed between the shells to form a circuit, traversing in an irregular path the space between the same. This circuit is completed through similar metal strips between the continuation of the shells forming the door by connection through the hinges of the latter and a metal plate, R, which comes in contact with the end T of the circuit when the door is closed. If the outer shell Q is broken to effect an entrance, or it and the inner one are split, the metal strips O spring away from each other, and thus break the circuit and produce the alarm; or, if the door is opened, the same result is produced.

I shall now proceed to describe my method and means of preventing the completion of the circuit between the space to be protected and the mechanism for producing the alarm. If but two main circuit-wires were used this completion of the circuit could be effected by a person skilled in electrical science by bringing the two wires stripped together. I prevent this in the following manner: Secured to or near the frame to which the barrier is attached, but insulated from said barrier and from each other, are two wires, 1 and 2, one of which passes to the battery and the other to a separate electro-magnet, X. These two wires and the two connecting the barrier with the battery and electro-magnet S are twisted or braided into a rope, and pass together from the barrier and separate at the electro-magnets and battery.

An attempt to cut off the current by stripping the wires will be frustrated by the inability of the person to determine which of the four wires are the proper ones to bring together. If all of them are brought into contact the circuit will be closed, and the armature of electro-magnet X will produce, through suitable mechanism, an alarm. The necessity of concealing the wires connecting the barrier with the electro-magnet and battery is in this way obviated.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of an electrical circuit lineally and superficially distributed, formed by insulated wires connected together in such a manner that they cannot be separated or moved from one another without breakage, and so that if part of such wires be connected together to form said circuit, such part cannot be distinguished from the rest, with means for producing an alarm, substantially as shown and described.

2. The combination of an electrical circuit lineally and superficially distributed, formed by insulated wires connected together in such a manner that the current of electricity shall frequently return backward in its progress through said circuit, with means for producing an alarm, substantially as shown and described.

3. The combination of an electrical circuit lineally and superficially distributed, formed by metal strips held between two shells, which spring apart and break said circuit when the shells are split or broken, with means for producing an alarm, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPHUS N. LARNED.

Witnesses:
E. B. ROLLINS,
A. L. MUNSON.