

(No Model.)

H. W. LELAND.
CIRCUIT PROTECTOR.

No. 497,430.

Patented May 16, 1893.

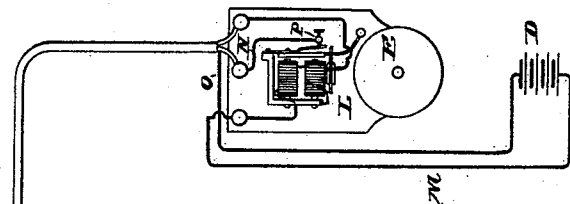


Fig. 1.

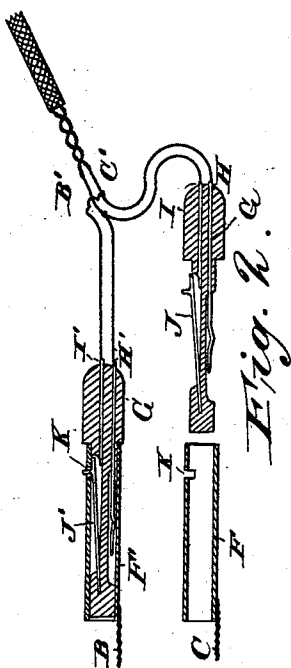


Fig. 2.



Fig. 3.

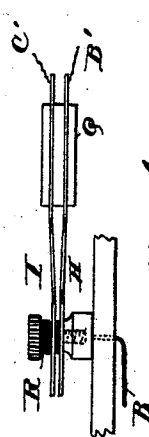


Fig. 4.

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UNITED STATES PATENT OFFICE.

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CIRCUIT-PROTECTOR.

SPECIFICATION forming part of Letters Patent No. 497,430, dated May 16, 1893.

Application filed August 6, 1892. Serial No. 442,299. (No model.)

To all whom it may concern:

Be it known that I, HARRY W. LELAND, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Circuit-Protectors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to protect electric circuits against malicious or other unwarranted interference. Its special object is to prevent the removal or theft of such circuit closing devices as are used before a door to announce the presence or arrival of any person entering a building.

In an application filed by me, Serial No. 417,614, dated January 11, 1892, is described an electric mat for use in connection with an alarm circuit, and my present invention will be found of special value in connection with the device therein described.

The several features of novelty will be hereinafter fully described and definitely indicated in the claims appended to this specification.

In the accompanying drawings which illustrate the invention, Figure 1 illustrates diagrammatically a call or alarm circuit containing my invention as applied to a circuit closing door mat. Fig. 2 is a sectional view of the connector I prefer to use, showing the circuit connections in diagram. Figs. 3 and 4 show a modified form of connector.

A represents a door mat provided with a series of circuit closing devices distributed over its surface, by which, when the mat is trod upon, connection is closed between the two leading wires B and C buried in the mat. These leading wires when the connectors are in operative position, as illustrated in Fig. 1, form the terminals of an electric circuit including a battery and an alarm bell D, E. With an ordinary open circuit arrangement there is no provision for preventing a sneak thief from disconnecting the connecting wires of the mat and surreptitiously removing the latter. It is the design of my invention to prevent such interference. The preferred form of device is illustrated in Fig. 2 and com-

prises a socket F and plug G. The latter carries two electrodes H, I, which are soldered to or otherwise connected with the wires of the call or alarm circuit. One of these wires, as H, is arranged so that when the plug is inserted in the socket electric connection will be formed with the socket and thence with the leading wire B or C with which the socket is connected. The other wire, I, is so arranged that when the plug is being inserted in the socket electric connection will be made, but when thrust home this connection will be broken. This is preferably accomplished by providing a spring tongue J provided with a knee or spur as illustrated in Fig. 2 which will bear upon the wall of the socket when the plug is being inserted, but will enter a recess K when the plug is thrust home. A separate connector is used for each of the leading wires B and C, the sockets being electrically connected with such wires, and the wire H of each plug is connected with the wire I of the other. Under these circumstances, supposing both plugs to be inserted in their sockets, an uninterrupted connection will exist from one wire C' of the call circuit through the wire H and socket F to the leading wire C of the mat and from the wire B' of the call circuit through the wire H' of the upper plug, see Fig. 2, socket F' to the leading wire B. The closure of the circuit at any point in the mat will therefore act upon the call circuit and ring an alarm. In case either plug being surreptitiously removed from its socket the spring J or J' will be forced into contact by the wall of the socket with wire I or I', thus closing a circuit between the wires B' and C' by way of H or H', F or F', J or J' and I or I', thus operating the bell. I prefer to use a bell of a type which when thrown into action will continue to operate until the call is responded to. For this purpose any of the known types of electrically released mechanical bells may be used, or an electrical bell of the type illustrated in the drawings may be used. In the latter there is an automatic interrupter which is normally held out of action by a pivoted lever L, the circuit being normally completed through this lever. Upon the circuit being closed the arm is released from contact with the vibrator and the latter is thrown against

its back stop permitting the rheotomic or automatic action to take place. For example, when the circuit is closed at an outlying point, as the door mat, Fig. 1, current will flow from the positive pole of battery D, by wire M and the magnet coils, thence to the lever L, through the call circuit to the outlying circuit closer, back to the bell and by way of O to the other pole of the battery. This will energize the magnet, pull forward the armature, and permit the lever L to drop, when the armature will be forced against the back stop P, thus closing a local circuit from the battery by way of the magnet, armature, back stop D, wires N and O. An ordinary vibrating bell might be used but in such cases the removal of the mat making only a temporary closure of the circuit will only give a few taps upon the bell. It being desirable that a continuous alarm should be given a bell of the type herein described will give more satisfactory results. The sockets F, F', are preferably rigidly connected with the mat, and when the latter is formed of plastic material, such as rubber, may be readily molded therein. The interconnection between the wires H, I, and H', I', is made close to the mat and overwound with tape so as to form apparently a single connecting wire with each socket, as indicated in Fig. 1. A braided multiple strand wire is preferably used, so that in case of an attempt to cut the wires without removing the plugs a cross-connection between some of the strands will close the circuit and give the alarm.

In Fig. 3 a modified form of connector is illustrated designed for use with an ordinary screw connector or binding post. The device comprises two strips of spring metal H, I, in an insulated head Q, and adapted when free to spring together. Over the stem of the screw is placed a grooved washer R of insulating material. The extremity of each spring is forked so as to straddle the stem of the screw or washer. On making connection the upper spring is lifted so as to slide in the groove of the washer and when the screw is tightened the springs will be held out of con-

nection, one of them, as H, forming the connection of one of the circuit wires B' with the wire B of the mat and thus establishing the same relationship as existed in the case of the connector shown in Fig. 2. Upon the removal of the connector the springs H and I connected together close the circuit and give an alarm. With this type of connector an ordinary rheotomic bell may be used, as the closure of the circuit upon removal of one member of the connector is permanent.

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

1. The combination of an electric mat or other movable device of an alarm or call circuit, and connectors normally maintaining the continuity of the circuit to the mat, one member of each connector being in communication with both terminals of the circuit, and containing a spring actuated circuit closer for connecting the terminals and ringing an alarm upon disconnection of the members.

2. A circuit connector having as one member a conducting socket, and as the other an insulating plug having the electrodes H, I, and the circuit closing spring J provided with a locking tongue entering a recess in the socket to prevent accidental separation of the members adapted to be actuated upon separation of the members.

3. A circuit connector having as one member a metallic socket slotted as at K, and as the other an insulating plug having the electrodes H, I, and the circuit closing spring J provided with a locking tongue entering a recess in the socket to prevent accidental separation of the members provided with a spur to enter the slot, as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY W. LELAND.

Witnesses:

ROBT. H. READ,
VICTOR E. BURKE.