April 9, 1929. M. HILDAHL 1,708,138

DOORKNOB BURGLAR ALARM

Filed April 19, 1927

Fig. 1

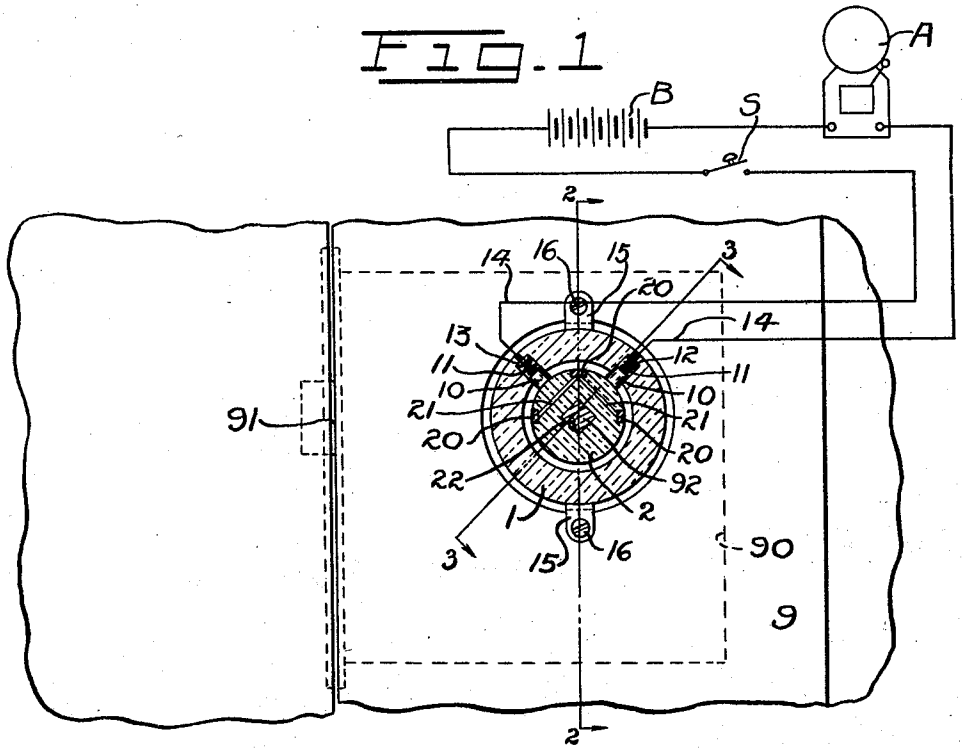


Fig. 2

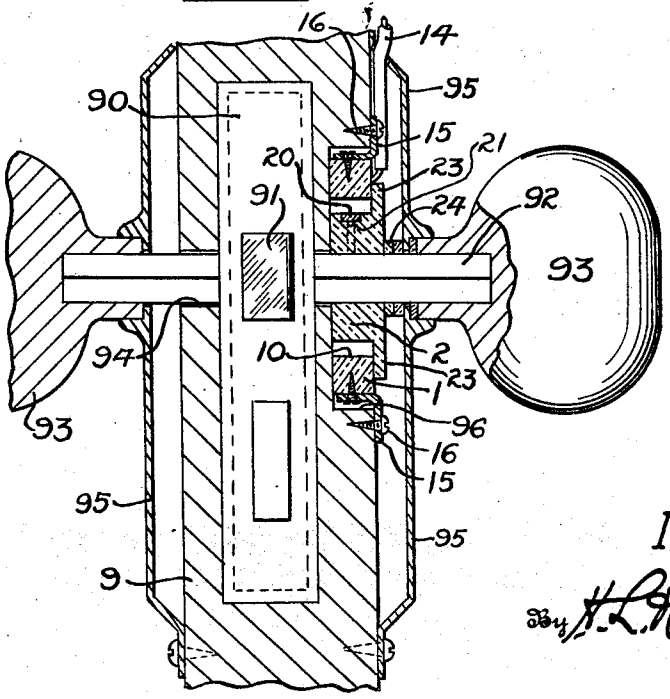
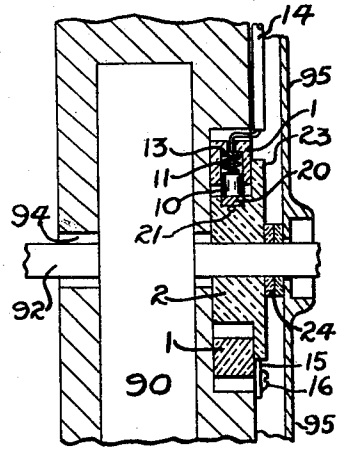


Fig. 3



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UNITED STATES PATENT OFFICE.

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DOORKNOB BURGLAR ALARM.

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My invention relates to an improvement in burglar alarms, and particularly to an alarm intended to be applied to the usual latch mechanism of a door, whereby, upon movement of the door knob to withdraw the latch, the alarm will be given.

One object of my invention is to provide such a device which will operate in whichever direction the door knob is turned, but most especially it is an object to provide such an alarm, electrically operated, and particularly the control switch for such an alarm, which can be incorporated into a door and associated with the lock and latch shaft with the minimum of difficulty.

A further object is to the provision of such a device, which is very simply formed, and which can thus be made cheaply and by quantity production methods, and which yet will operate efficiently, and which can be installed by the ordinary householder without special tools.

My invention comprises the novel parts, the novel combination and arrangement thereof, as shown in the accompanying drawings, described in the specification, and particularly defined by the claims terminating the same.

In the accompanying drawings I have shown my invention in a form which is now preferred by me, it being understood that this form may be departed from in various respects and within the scope of the claims.

Figure 1 is a general cross section through the control switch and lock shaft, showing my device associated with the usual door and latch, and illustrating diagrammatically the alarm circuit;

Figure 2 is a vertical axial section through my device and the door, on the line 2—2 of Figure 1;

Figure 3 is an axial section taken on the line 3—3 of Figure 1, showing the inner ring oscillated into position to make contact between the members carried thereby and the members carried by the outer ring.

My device is intended to be employed in the ordinary house door and in association with the latch usually employed in connection therewith. Consequently, I have illustrated it in association with these parts, and as they may be of any usual or ordinary construction, I have not deemed it necessary to show, nor will I describe these parts, in detail. It is sufficient to note that the door 9 is rabbeted to receive a lock mechanism 90 therein, this lock mechanism including a latch 91 and a shaft 92, which is usually squared, to operate the latch. The shaft 92 carries the door knobs 93 at its opposite ends, and the holes 94 through which the shaft 92 protrudes are covered with escutcheon plates 95 secured upon each face of the door.

The control switch forming the principal part of my invention consists essentially of an outer ring 1 having a large axial aperture 10, within which is received an inner ring 2, these rings carrying contact members and bridge members, as will be described hereafter. Preferably, both rings are of dielectric material, such as vulcanite or bakelite, and thus may be moulded with the contacts, bridges or like elements embedded within them. For example, the inner ring 2 is provided with angularly spaced bridge elements 20 in its outer periphery, these being connected by the conductors 21, embedded in the ring 2, and the bridge members 20 being preferably spaced alike about the ring.

The outer ring 1 is provided with radial bores 11 opening inwardly and receiving contact plungers or brushes 10, which are urged outwardly by means of compression springs 12 behind the plungers 10 and bearing against the inner end of the bores, or against small plates 13 in the bottom of each bore. Lead wires 14 extend through the ring 1 and may be bent over and laid in contact with the plates 13. These plates in turn make contact with the springs 11, and they in turn with the plungers 10. Thus, by connecting the wires 14 in an external alarm circuit, it is possible without soldering or careful connection of the electric members to connect the contact plungers 10 in the alarm circuit. These plungers, it will be understood, are angularly spaced by an amount corresponding to the angular spacing of the bridge members 20 in the ring 2.

The ring 2 is so connected to the shaft 92, as by the expedient of a squared bore 22 received on the squared shaft 92, that it oscillates with this shaft. In the normal position of the shaft, one of the bridge members 20 lies between the two contact plunges, and the other two bridge members 20 lie outside of the respective plungers. Upon oscillation of the knobs, the ring 2 is turned so that two of the three bridge members 20 coincide with and contact with the two plungers 10, thus

closing the circuit at this point, and if the circuit is otherwise closed, energizing the alarm. It will be understood that suitable means are provided for maintaining the ring 1 against rotation, and to this end I have shown angular clips 15, suitably secured in or to the ring 1, and having one flange projecting radially from the outer periphery of the ring 1, and apertured for the reception of wood screws 16, by means of which the ring is secured to the wood of the door.

The alarm circuit may be of any suitable character. As shown, it comprises a source of energy, as the battery B, the alarm A, which may be a bell or other electrically-operated signal, and the switch S, by means of which the device may be rendered inoperative when its use is not required.

The device is applied to a door by merely enlarging the bore 94 on the inner side of the door to provide a recess 96 of large enough diameter to receive the ring 1. The ring 1 is laid in this recess with one end face against the bottom thereof. The inner ring 2 is now slipped over the end of the shaft 92, from which the knob 93 has previously been removed. Preferably, to prevent axial displacement of the two rings, and to prevent access of dust or other foreign material to the space containing the contact members, a flange 23 is provided on the inner ring, which overlaps and lies against the outer face of the ring 1. To close the space between the ring 2 and the adjacent escutcheon plate 95, washers 24 may be employed. Thus the securing of the escutcheon plate in place securely holds all parts in the proper position, and it has only been necessary to insert the two wood screws 16 to secure the device in place.

It will be understood that it may even be unnecessary to provide the recess 96, if the escutcheon plate is sufficiently spaced from the face of the door, or if the rings 1 and 2 are sufficiently thin. The contact is made in a radial direction rather than between two end faces, which permits the device to be made quite thin and thus inconspicuous. The entire device may be readily moulded in bakelite, and, in fact, the securing clips 15 might, instead of being screwed to the ring 1, as shown, be moulded in place therein.

What I claim as my invention is:

1. A control switch for an alarm circuit of the type described, comprising a dielectric ring, and a second dielectric ring fitting within the aperture of said first ring of said rings, one carrying a pair of angularly spaced contact members included in the alarm circuit, and bearing upon the other ring, and the second ring carrying angularly-spaced bridge members normally out of contact with said contact members, but adapted to be contacted thereby upon movement of one ring relative to the other, and means for fixing one of said rings to a support, and the other to a movable latch member.

2. A control switch for an alarm circuit of the type described, comprising two dielectric rings, one within the other, the outer ring carrying a pair of angularly-spaced inwardly-directed contact members in said alarm circuit bearing upon the periphery of the inner ring, three electrically connected bridge members carried by said inner ring, and, in the normal positions of said rings, being disposed one intermediate the two contact members, and one at the outer side of each contact member, and so angularly-spaced from each other that the intermediate and one or the other of the outer bridge members will simultaneously contact with the two contact members upon relative oscillation of the rings, and means for securing the outer of said rings to the door and the inner to the door knob shaft.

3. A control switch for an alarm of the type described, comprising an outer ring having two angularly spaced and radially directed sockets opening inwardly, contact plungers received in said bores, springs in said bores electrically connected to an external circuit and urging said plungers from said sockets, an inner ring lying within the bore of said outer ring, three electrically connected bridge members carried by said inner ring, and angularly spaced to lie normally between and at each side, respectively, of the contact plungers, and to contact therewith when oscillated to either side of its normal position, and means for securing one of said rings to the door and the other to the door knob shaft.

4. A control switch for an alarm of the type described, comprising an outer ring having two angularly spaced and radially directed sockets opening inwardly, contact plungers received in said bores, springs in said bores electrically connected to an external circuit and urging said plungers from said sockets, an inner ring lying within the bore of said outer ring, three electrically connected bridge members carried by said inner ring, and angularly spaced to lie normally between and at each side, respectively, of the contact plungers, and to contact therewith when oscillated to either side of its normal position, securing clips projecting radially from the outer ring forming means for securing it to a support, and said inner ring having a squared axial aperture adapting it for securement upon the usual squared door knob shaft.

5. A control switch for an alarm of the type described, comprising an outer ring having two angularly spaced and radially directed sockets opening inwardly, contact plungers received in said bores, springs in said bores electrically connected to an exter-

nal circuit and urging said plungers from said sockets, an inner ring lying within the bore of said outer ring, three electrically connected bridge members carried by said inner ring, and angularly spaced to lie normally between and at each side, respectively, of the contact plungers, and to contact therewith when oscillated to either side of its normal position, means for securing one of said rings to the door and the other to the door knob shaft, and means interengageable between said rings to prevent relative axial displacement therebetween.

6. A control switch for an alarm of the type described, comprising an outer ring having two angularly spaced and radially directed sockets opening inwardly, contact plungers received in said bores, springs in said bores electrically connected to an external circuit and urging said plungers from said sockets, an inner ring lying within the bore of said outer ring, a flange projecting from said inner ring and engaging the outer end face of said outer ring to prevent relative axial displacement therebetween, three electrically connected bridge members carried by said inner ring, and angularly spaced to lie normally between and at each side, respectively, of the contact plungers, and to contact therewith when oscillated to either side of its normal position, and means for securing one of said rings to the door and the other to the door knob shaft.

Signed at Seattle, King County, Washington, this 14th day of April, 1927.

MARK HILDAHL.