

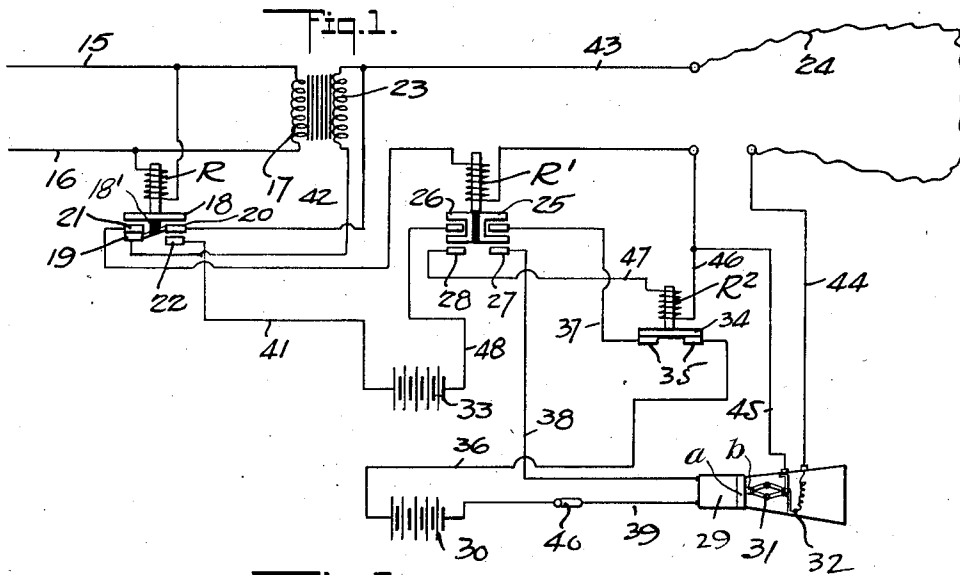
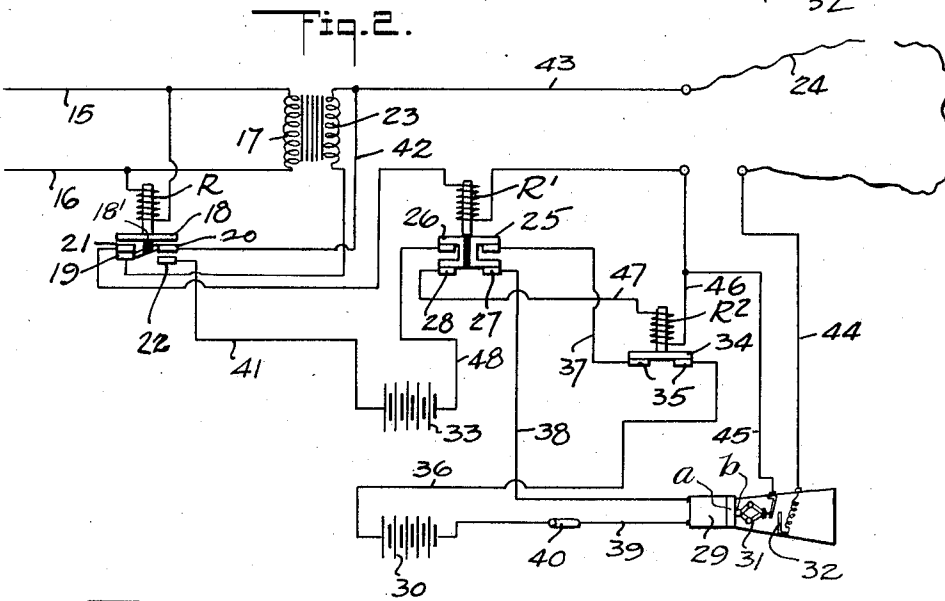
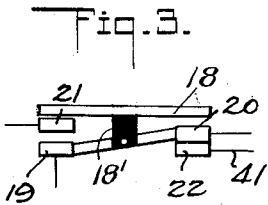
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ALARM APPARATUS

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ALARM APPARATUS

Application filed April 29, 1926. Serial No. 105,544.

My invention relates to burglar and fire alarm apparatus, and a purpose of my invention is the provision of an apparatus which can be applied to a building or the like to actuate an alarm when the surreptitious opening of a door or window is effected or when a fire occurs in the building.

It is also a purpose of my invention to provide an electrical burglar and fire alarm apparatus which normally utilizes the house or lighting current and which is operable to prevent actuation of the alarm should the lighting current for any reason be cut off or fail, yet maintaining the apparatus operable to sound the alarm in the event of fire or burglary.

A further purpose of my invention is the provision of an apparatus which normally consumes a relatively small amount of the lighting current to render it operative, and which utilizes local batteries only to actuate the alarm and to thus impose a relatively small drain on the battery current.

I will describe only one form of combined burglary and fire alarm apparatus embodying my invention, and will then point out the novel features thereof in claims.

In the drawings

Figure 1 is a view showing diagrammatically one form of combined fire and burglar alarm apparatus embodying my invention, with the parts thereof in normal position;

Figure 2 is a view similar to Figure 1, showing the parts of the apparatus in the positions when the alarm thereof is being actuated;

Figure 3 is a detail view of one of the relays embodied in the apparatus shown in the preceding views, and disclosing the other position of its armature contacts.

Referring specifically to the drawings, my invention in its present embodiment comprises a source of alternating current supply which may be the house or lighting current of a building and which is represented in Figure 1 as comprising conductors 15 and 16. In this lighting circuit the primary winding 17 of a step-down transformer is interposed, and connected in parallel with the primary winding is a winding of a relay R having an

armature 18 to which is secured an insulation 18'. This insulation in its turn supports two conducting sections so that the sections are insulated from each other as well as from the armature. One of these sections carries thereon a contact 19, and the other section carries thereon a contact 20, and stationary contacts 21 and 22 are placed in such a relation to the contacts 19 and 20 that, when the relay is energized, the contact 19 engages the contact 21, while the contact 20 disengages the contact 22, as shown in Figs. 1 and 2. With the relay de-energized the armature is moved to cause the contact 19 to disengage the contact 21 and the contact 20 to engage the contact 22, as shown in Fig. 3.

The secondary winding 23 of the transformer is included in a control circuit having a conductor 24 capable of being readily cut, broken or fused and which is of such length as to be extended from door to door or window to window of a building and in such manner that when the doors or windows are opened the conductor will be disrupted, thereby disrupting the control circuit. By virtue of the fact that the conductor 24 is fusible it is manifest that in the event of fire in the building the control circuit will likewise be disrupted.

Also included in the control circuit is the winding of a relay R' having two pairs of armature contacts 25 and 26 insulated from each other and disengaging respectively two pairs of stationary contacts 27 and 28 when the relay is energized, but movable to engage such contacts when the relay is de-energized. The contacts 25 and 27 constitute the terminals of an alarm circuit including an alarm, which in the present instance is a motor-operated horn 29, and a battery 30 for supplying current to and actuating the motor of the horn so that the latter will be sounded. The horn motor is designed to actuate a centrifuge 31 for opening a normally closed switch 32 included in the control circuit and functioning to prevent closing of the control circuit following an opening thereof through severing of the conductor 24.

This horn motor may be of any approved type and provided with the usual sound-

producing means. For instance, the horn motor may be used in connection with a siren of the type disclosed in Letters Patent of the United States, No. 1,205,371, granted Nov. 21, 1916. The siren in this patent comprises the combination with a casing of a rotor. It being assumed that such a combination or an equivalent combination of sound-producing means is used in connection with the horn motor 29, the rotor is indicated in Figs. 1 and 2 by the letter *a*, and the motor shaft, on which the rotor *a* is mounted, is indicated in the same figures by the letter *b*, and it is understood that the centrifuge 31 is suitably connected with the end of the motor shaft *b*, so that, when the horn motor causes the centrifuge to be actuated, the sound-producing means are operated in order to give an audible alarm simultaneously with the opening of the switch 32.

To control the alarm circuit independently of the relay *R'*, I provide a second relay *R*², the winding of which is interposed in a circuit including a battery 33 and the contacts 26, 28, 20 and 22, so that, when the several contacts are closed, current will be supplied from the battery 33 to the winding of the relay *R*² to energize the latter, it being particularly noted that the relay *R*² is a direct current relay, while the relays *R* and *R'* are alternating current relays.

The relay *R*² provides additional means for controlling the alarm circuit, its armature 34 being adapted to bridge a pair of contacts 35 when the relay is de-energized, but when the relay is energized the armature is moved to disengage the contacts.

The operation of the apparatus is as follows:

With current constantly flowing in the lighting circuit the relay *R* is energized to cause its contacts to occupy the position shown in Figure 1, while current from the primary winding 17 is induced into the secondary winding to energize the relay *R'* and thus maintain the contacts 27 and 28 open. Should the conductor 24 be disrupted for any reason, the control circuit is opened so as to de-energize the relay *R'*, thereby closing the contacts 25 and 27 and hence the alarm circuit to sound the horn 29. Current is then supplied to the alarm as follows: From positive side of battery 30 through wire 36, contacts 35 and armature 34, wire 37, contacts 25 and 27, wire 38, horn motor 29 and wire 39 back to battery. Upon energization of the horn motor the centrifuge 31, after attaining a certain speed, effects the operation of the sounding means and causes the switch 32 to open, so that, should one attempt to bridge the gap in the conductor 24, it will be ineffective to restore continuity of the control circuit. It will thus be seen that unless the alarm circuit is disrupted the alarm will continue to sound. However, to permit those with proper au-

thority to discontinue sounding of the horn the wire 39 has interposed therein a switch 40 which, when opened, will disrupt the alarm circuit.

Should the lighting circuit for any reason fail or be intentionally cut off, the relay *R* and the transformer will be de-energized, and with de-energization of the latter the relay *R'* will likewise be de-energized, so that the armatures 18 and 25, respectively, of the two relays will move to positions in which the contact 19 is open, the contact 20 closed and the contacts 27 and 28 closed. With both relays *R* and *R'* de-energized and the control circuit intact the direct current relay *R*² is now energized through the following circuit to prevent sounding of the alarm: From positive side of battery 33 through wire 41, contacts 22 and 20, wires 42 and 43, conductors 24, wire 44, switch 32, wires 45 and 46, winding of relay *R*², wire 47, contacts 28 and 26, and wire 48 back to battery. With energization of the relay *R*² the contacts 35 are opened, thus disrupting the alarm circuit, although the contacts 27 are closed by de-energization of the relay *R'*.

From this operation it will be manifest that failure of the lighting current will be ineffective to actuate the alarm. However, the apparatus is still operative to actuate the alarm should the conductor 24 be disrupted because of the fact that through its disruption the circuit from the relay *R*² is broken, thereby causing de-energization of the relay to close the contacts 35 and thereby permit the battery 30 to supply current to the motor of the horn.

Through opening of the contacts 19 and 21 with de-energization of the relay *R* the de-energization of the relay *R*² on account of the failure of the lighting current is prevented, so that thereby the operation of the horn motor is assured.

I claim:

1. An alarm apparatus comprising an alarm, a circuit therefor, a control circuit having a conductor capable of being fused or severed, a relay in the control circuit controlling the alarm circuit in such manner that when the control circuit is disrupted the relay will be de-energized to close the alarm circuit, a second relay having its contacts included in the alarm circuit and being adapted to control the alarm circuit in conjunction with the first relay, the first relay being normally energized and the second relay normally de-energized, and means by which the second relay is energized to open the alarm circuit when the supply of current to the control circuit fails.

2. An alarm apparatus comprising a source of alternating current supply having a circuit including a relay and the primary winding of a step-down transformer, a control circuit including the secondary of the trans-

former, and a conductor capable of being
fused or severed, a relay in the control cir-
cuit, an alarm, an alarm circuit controlled
by the second relay, a direct current relay
5 having its contacts included in the alarm
circuit and being adapted to control the
alarm circuit in conjunction with the second
relay, the relay in the control circuit being
normally energized, and the direct-current
10 relay being normally de-energized, a normal-
ly closed switch in the control circuit, means
operable by the alarm to open said switch,
and means operable by the relay in the con-
trol circuit so as to energize the direct cur-
15 rent relay to open the alarm circuit when
the source of alternating current fails and
to effect de-energization of the direct current
relay when said conductor is disrupted.

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