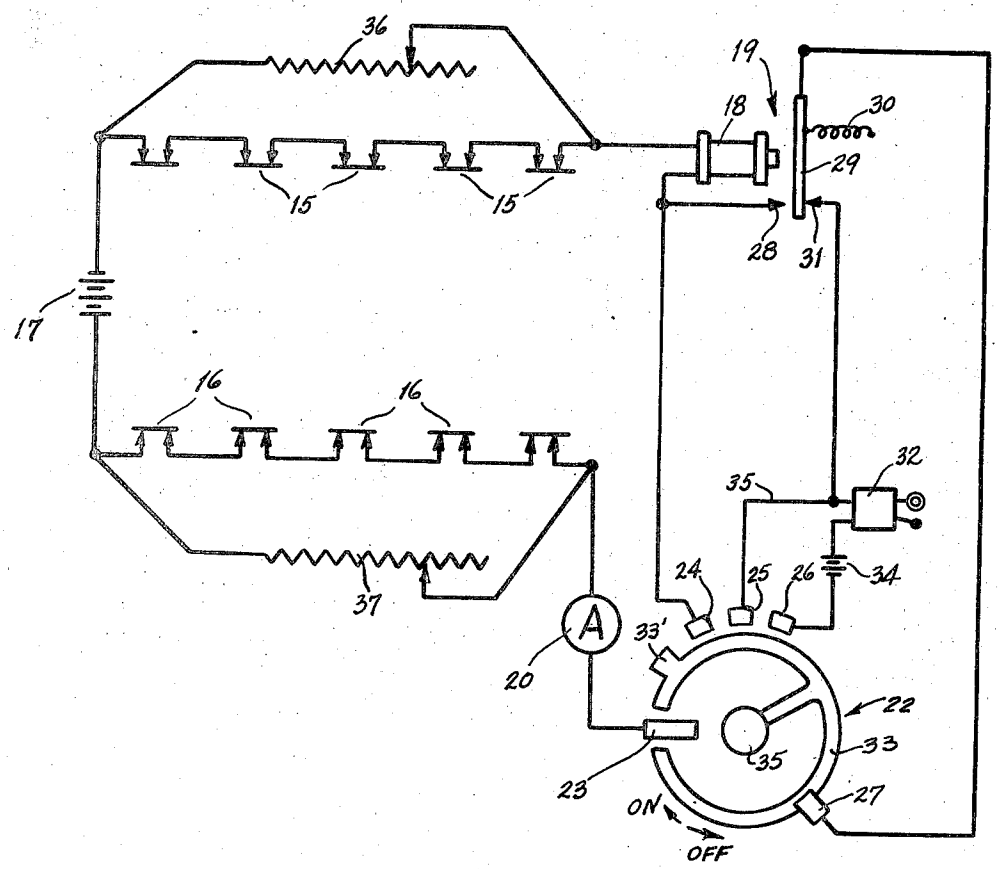
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ELECTRICAL ALARM SYSTEM

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ELECTRICAL ALARM SYSTEM

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1

The present invention relates to electrical burglar alarm systems.

An object of this invention is to provide a novel and improved burglar alarm system employing a very simple circuit.

A further object hereof is to provide a novel and improved burglar alarm circuit adaptable to most existing systems which include a closed protective circuit, so as to render them free from false alarms due to some manner of loose connection in said protective circuit.

Another object of the present invention is to provide a novel and improved electrical burglar alarm system of the character described which is efficient in carrying out the purposes for which it is designed.

Other objects and advantages will become apparent as this disclosure proceeds.

In the accompanying drawing, Fig. 1 shows an electrical wiring diagram of my new system and sets forth means easily added to existing systems to make them false alarm proof.

In the drawing, the numerals 15 and 16 indicate electrical switch devices connected in series, which are automatically set in closed condition upon the shutting of doors and windows protected, as is well known in the art. Connected in series with these switch devices are an electrical energy source 17, the coil 18 of a relay 19, and for practical reasons, an ammeter 20. This comprises what is termed in the parlance of the art, the protective circuit. One of the terminals of the protective circuit is a fixed switch contact point 23 of a switch means indicated generally by the numeral 22, and the other terminal of said protective circuit is connected to both the fixed switch contact point 24 of the switch means 22, and the fixed switch contact point 28, adapted to be contacted by the armature 29 of the relay 19, when the relay coil 18 is actuated to attract said armature against action of a spring 30.

When said armature 29 is not attracted to the relay coil 18, it is in contact with a fixed switch contact point 31, which latter and the fixed contact point 25 of switch means 22, are connected to a terminal of an electric bell or other alarm means 32; said bell being in series connection with a source of electrical energy 34, connected to the fixed switch contact point 26 of the switch means 22. The armature 29 is connected to a fixed switch contact point 27 of said switch means 22. Said contact point 27 is in constant contact with the moveable component indicated generally as 33, of said switch means 22. This moveable component 33 is preferably the segment of

2

a metal ring, axially rotatably mounted and provided with a turn knob 35. This may be termed the alarm circuit.

It is to be noted that the switch means 22 really comprises two separate switches manipulated by turning the single knob 35. One of these switches consists of the moveable member 33 and the contact point 23, whose function is only to open the protective circuit when the system is to be in fully inoperative condition. The other of said switches manipulated by turning the knob 35 consists of the moveable member 33, whose extending integral brush tab 33' makes contact successively with the contact points 24, 25 and 26, in the order mentioned when the system is set into operative condition, and in reverse order when the alarm system is to remain inactive while any of the switch devices 15 and 16 may or may not be in intended open condition.

Disregarding for the moment the resistances 36 and 37, the operation of the system described is as follows:

With the moveable component of the switch means 22, in the position as shown in Fig. 1, the system is in inoperative condition. Note that armature 29 is in contact with point 31. Windows and doors may be opened to open any of the switch devices 15 and 16.

To place the system into operative condition, all windows and doors are shut whereby all switch devices 15 and 16 are set in closed condition. Now by turning knob 35 clockwise, component 33 will make contact with point 23. Nothing is accomplished thereby until contact tab 33' contacts point 24, whereupon the protective circuit is closed and current from source 17 flows through the relay coil 18, which now attracts to it the armature 29. Upon being so moved, the armature breaks its contact with point 31 and makes contact with point 28. Now, so long as component 33 remains in contact with point 23, regardless of position of the tab 33', and there is no break in the protective circuit, the armature 29 will remain so attracted, for said protective circuit remains closed by virtue of contact between armature 29 and point 31. The ammeter, of course, serves as visible means showing that the protective circuit is closed. If with tab 33' on point 24, the ammeter is not actuated, the operator knows that either all the switches 15 and 16 are not in closed condition, or that battery 17 is "dead" or some other cause maintains the protective circuit open. He will therefore remedy this situation, if it occurs, until there is an ammeter reading of predetermined scope.

Tab 33' is now moved to point 25. Nothing is accomplished thereby until tab is in contact with both points 25 and 26, whose distance apart shall permit this, whereupon the bell 32 will ring because the bell circuit which includes the connecting conductor 36, is closed until said contact tab 33' is wholly in contact with point 26. Such ringing of the bell, is a means to test operation thereof. Now, with tab 33' wholly on point 26, the system is in operative condition, meaning, that if a break should occur in the protective circuit, as for instance upon the opening of any of the switch devices 15 or 16, the relay coil 18 will cease to be energized, the armature 29 will be moved by the stressed spring 30, to come in contact with point 31, whereupon the alarm circuit which includes the connection conductor 37, will be closed and bell 32 actuated, thereby sounding an alarm. Turning knob 35 so that tab 33' goes off point 25, will open said alarm circuit.

In normal use, where no break occurs in the protective circuit, with the system in operative condition as described, that is when tab 33' is wholly on contact point 26, to set the system into inoperative condition, knob 35 is turned in counter-clockwise direction. When tab 33' in its travel, contacts both points 25 and 26, the bell circuit which includes the connecting conductor 36, will be closed and the alarm sounded momentarily for knob 35 is kept moving. Such momentary sounding of the alarm is assurance that the bell 32 is in working order. Passage of tab 33' from off point 26, opens the alarm circuit. The protective circuit remains on for which ammeter 20 is a check-up, until the protective circuit is opened when component 33 moves out of contact from point 23, to the condition shown in Fig. 1, whereupon the relay coil 18 is deenergized and its armature will return to contact 31.

In practice, false alarms are sounded because of breaks in the protective circuit, of slight momentary duration, caused by defects in the switch devices 15 and 16 or in loose connections thereto. So although when the system is set in operative condition, and apparently all appears in good order, mere drafts of wind, for instance may set loose parts in motion, to cause the momentary breaks in the protective circuit. I have provided means to avoid the giving of the alarm under such circumstances. However, if the break persists for more than a slight instant, the relay 19 will operate to actuate the bell 32.

To accomplish this, only the switch devices 15 and 16 are shunted by high resistance means 36 and 37, which may be of the variable type. The character of these high resistance shunts, is that upon a momentary break as mentioned, occurring in any of said switch devices 15 and 16, while the system is in operative condition, the feeble current afforded in the protective circuit through these resistances, shall together with the effect of the existing but "dying" residual magnetism in the relay core, be sufficient to hold the armature attracted an instant during which the said break repairs itself. Of course, if such break persists more than a moment, as occasioned by the opening of a door or window protected by said switch devices 15 and 16, the relay will become deenergized to an extent to release the armature 29, though such feeble current be flowing through the relay coil 18; such feeble current being insufficient to actuate the relay 19, by its own action.

It is to be noted that upon contact of moveable switch component 22, with point 23, at setting the system into operative condition, the ammeter will show a small reading if any of the switch devices 15 and 16 are open, but will indicate a comparatively large reading when all such switch devices are closed. Such shunting resistances may be across each switch device 15 and 16 individually, or preferably as shown, in parallel with a series of such devices. The resistances are of course such as to have the system function as mentioned.

This shunting resistance means may of course be applied to any alarm system having a normally closed protective circuit including a relay for control of the alarm circuit.

This invention is capable of numerous forms and various applications without departing from the essential features herein disclosed and may be applied and used for instance to fire alarm or other alarm system. It is therefore intended and desired that the embodiment shown herein be deemed illustrative and not restrictive and that the patent shall cover all patentable novelty herein set forth; reference being had to the following claims rather than to the specific description herein to indicate the scope of this invention.

I claim:

1. In an electrical alarm system of the character described, a switch mechanism comprising a first, second, third and fourth fixed switch contact points and a moveable electrically conductive component adapted in one position to be out of contact with said contact points, when moved in one direction to be positioned successively in contact with said first, second and third contact points, when moved in the opposite direction to be successively in contact with said third, second and first contact points, also adapted to contact the second and third contact points simultaneously and while in contact with any of the first, second or third contact points or between any two of them to be in electrical contact with the fourth contact point, an alarm circuit having the second and third contact points as its respective terminals, a protective circuit including a relay; the first and fourth contact points being the respective terminals of said protective circuit; the relay including an armature and a fifth and sixth fixed switch contact points; said armature being in contact with the fifth contact point while the relay is inactive and in contact with the sixth contact point when the relay is actuated to move said armature away from said fifth contact point; said fifth contact point being in electrical connection with the second contact point; the sixth contact point being in electrical connection with one of the terminals of the protective circuit and said armature being in electrical connection with the moveable component of the switch mechanism.

2. In an electrical alarm system of the character described, a protective circuit including protective switch means adapted to be in closed condition when the system is set into operative condition, a relay and a source of electrical energy in series electrical connection with said switch means in said protective circuit, an alarm circuit controlled by said relay and high electrical resistance means shunting only said switch mechanism; said resistance means being characterized in that upon a momentary break occurring in the shunted portion of the protective circuit after the system is set into operative condition, sufficient current will flow in the protective circuit to augment the action of the re-

sidual magnetism in the relay core to maintain the armature of the relay in its attracted position during such momentary continuance of such break to avoid operation of the alarm circuit during such momentary continuance of said break, and further characterized in that while said armature is in released position the current flowing in the protective circuit is insufficient to actuate the relay to attract the armature during any break in said switch means in the protective circuit.

3. A system as defined in claim 1, wherein the protective circuit includes protective switch means adapted to be in closed condition when the system is set in operative condition and including a high electrical resistance means shunting only said protective switch means; said

resistance means being characterized in that upon a momentary break occurring in the shunted portion of the protective circuit after the system is set into operative condition, sufficient current will flow in the protective circuit to augment the action of the residual magnetism in the relay core to maintain the armature of the relay in its attracted position during such momentary continuance of such break to avoid operation of the alarm circuit during such momentary continuance of such break, and further characterized in that while said armature is in released position the current flowing in the protective circuit is insufficient to actuate the relay to attract the armature during any break in said switch means in the protective circuit.

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