An alarm system may comprise: a normally open alarm circuit including a signal device and a triggering circuit including one or more trigger switches attached to a door, window or the like of a protected premises and adapted to close on the movement of the door, window or the like. The triggering circuit may include a relay actuable on the closing of any of the trigger switches and having contacts in the alarm circuit closable on actuation of the relay to activate the signal device. The triggering circuit may include a switch connected, through the relay, in parallel with the trigger switches, upon actuation of the relay, to latch-in the relay. The triggering circuit may also include at least one activator switch externally of the premises and one activator switch externally of the premises to allow remote activation and deactivation of the triggering circuit.
BURGLAR ALARM SYSTEM WITH SELECTABLE LATCHING MODE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to alarm systems. More particularly, the present invention relates to a burglar alarm system of the type controlled or actuated by completing a control circuit allowing the flow of current which in turn actuates an alarm device.

2. Description of the Prior Art

The prior art has suggested many types of burglar alarm systems, both mechanical and electrical types, which are designed to indicate unlawful or irregular entry into a building or restricted area. Previous art has disclosed subscription type alarm systems where a plurality of commercial or residential buildings are protected, alarm indications being made at a central station. With such systems, it is necessary to have conductors, e.g., leased telephone lines, to connect the subscriber station with the central station. Examples of subscription type alarm systems may be seen in U.S. Pat. Nos. 2,971,186 and 3,174,143.

Other alarm systems disclosed are systems for protecting a singular residence or business property. These systems use audible or visible indicators for alerting authorized individuals and to discourage intruders. See U.S. Pat. Nos. 2,670,466 and 3,383,674. One such system employs a mechanical latching device comprising a solenoid and a plunger switch having contacts for a triggering circuit and an alarm circuit. In operation, the triggering circuit is normally open. When the switch closes, it completes the circuit which in turn actuates the solenoid, withdrawing the solenoid plunger from a recess in the plunger switch and allowing the plunger switch to drop axially completing an alarm circuit and sounding the alarm. The disadvantage of this arrangement is that once the alarm has been actuated, the system must be manually reset at a control box. In other words, with this system, there is no way of remotely deactivating or activating the alarm.

Disadvantages of other types of alarm systems have been their complexity and high cost. Also, the installation time and expense incurred for maintaining these systems have made the installation of such systems in small businesses or residences unfeasible.

SUMMARY OF THE INVENTION

The burglar alarm system of the present invention is designed to operate on normal A.C. household power and, by using a step-down transformer, the system can be installed by the user without danger of violating the electrical codes for high voltage wiring or using an electrician. The alarm system of the present invention is designed to allow the alarm circuit to be remotely activated or deactivated. Also, a lock-in switch is provided to control the operation of a relay which activates the alarm. When this switch is open, the relay functions as a normal relay. But, when the switch is closed, the relay functions as a latching relay and will be latched-in when the trigger circuit activates the relay.

It is an object of the present invention to provide a burglar alarm system that is of simple design which can be installed at a minimal cost. A further object of the invention is to provide an inexpensive burglar alarm system which is capable of being remotely controlled allowing authorized individuals to enter and leave the building without actuating the alarm system.

The foregoing and other objects, advantages and features of the present invention will be more readily apparent from the following specifications, claims and related drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a schematic wiring diagram of the burglar alarm system of the present invention; and

FIG. 2 is a partial vertical elevation, partially in section, illustrating the installation of a triggering switch employed in the burglar alarm system of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring first to FIG. 1 of the drawings, the present invention, a burglar alarm system is schematically illustrated at 10 having a power supply circuit 11, an alarm control and triggering circuit 12 and an alarm signal circuit 13. The alarm system 10 receives its power from an A.C. line input 14. The A.C. input leads 14 are then applied to a step-down, isolating transformer 15, having a primary winding 16 and a secondary winding 17. Present across the secondary winding 17, between leads 18 and 19 of the transformer 15, is a reduced A.C. voltage which supplies the electric current to actuate the alarm control and triggering circuit 12. Connected in series with the leads 14 and the primary winding 16 is a main power switch 20, and a fuse 21. A pilot lamp 22 may connect across the primary winding 16 for indicating the condition of the system 10.

The alarm control and triggering circuit 12 includes an internal activator switch 23, a plurality of external activator switches 24a, 24b and 24c, a switch 25, a plurality of trigger switches 26a, 26b and 26c, and a relay 27 having leads 28 and 29 and contacts 30a, 30b, 31a and 31b. It is the function of the circuit 12 to provide the necessary control over the alarm system 10. The switch 23, mounted on a housing (not shown) allows the system 12 to be activated or deactivated at the main unit, while switches 24a, 24b and 25c are located internally or externally throughout the premises allowing remote activation of the alarm system 12.

To simplify wiring, binding posts 32 and 33 mounted on the housing may be provided, allowing the switches 24a, 24b and 24c to be connected in parallel with the switch 23. The lead 18 from the secondary 17 of the transformer 15 is also connected to the binding post 32. A conductor 34 may connect the switch 25 with the binding post 33. Another conductor 35 connects contact 30a of the relay 27 with the switch 25. The triggering switches 26a, 26b and 26c are connected in parallel with the line switch 25 through contact 30b when the relay 27 is closed. Another pair of binding posts 36 and 37 may be employed to simplify connecting of the switches 26a, 26b and 26c. The lead 28 of the relay 27 is connected to the binding post 37, and a conductor 38 also connects contact 30b of the relay 27 to the binding post 37. Completing the low voltage control circuit, a conductor 39 connects the lead 19 of the transformer 15 to the lead 29 of the relay 27.

The circuit 13 constitutes the high voltage signal circuit, consisting of contacts 31a and 31b of the relay 27, an indicator lamp 40, an alarm 41 which, in the exemplary embodiment is a bell, and a selector switch 42.
3,848,242

Binding posts 43 and 44 are provided to attach the alarm 41 in the circuit. Conductors 45 and 46 connect the primary 16 of the transformer 15 with contacts 47 and 48 of the switch 42, to provide the electrical current needed to actuate the alarm 41.

Referring now to FIG. 2 the installation of a triggering switch 26 is illustrated. The switch 26, a normally closed push button switch, is shown mounted in the jamb 49 of a door frame 50. When the door 51 is closed, the hinged edge 52 will engage the button 53 of the switch 26 causing the circuit to be opened (normally open circuit). Wires 54 and 55 are attached to contacts 56 and 57 to connect the switch 26 with the binding posts 36 and 37 of FIG. 1.

In operation, the system 10 is located in a some accessible area. The triggering switches 26a, 26b and 26c are concealed in a window frame or door jamb while the activator switches 24a, 24b and 24c are installed in inconspicuous places near the entrances or other areas so the alarm system 10 can be activated or deactivated when necessary. The alarm system 10 is energized by closing the main power switch 20. To activate the alarm system 10, one of the switches 23, 24a, 24b or 24c must be closed. Assuming that all doors and windows are closed, the alarm is set, since the switches 26a, 26b and 26c are in their position open. Thus, the triggering circuit 12 may be considered a normally open circuit even though the switches 26a, 26b and 26c are of the normally closed type. The switch 25 is employed to make the relay 27 act as a latching relay. With the switch 25 closed, power is supplied to the contact 30a of the relay 27. If one of the doors or windows, having a triggering switch installed thereon, is opened, the alarm control circuit 13, is completed, by the closing of one of the trigger switches, actuating the relay 27, closing contacts 30a and 30b and 31a and 31b, and, depending on the position of switch 42, the visible indicator lamp 40 or audible alarm 41 will be energized. Usually the switch 42 will be in position for the audible alarm. However, if it is desired to test the circuit without sounding an alarm the switch 42 would be positioned to energize the indicator lamp 40. The relay 27 will be latched-in if the switch 25 is in the closed position and reclosing of the door or window that was opened will not shut off the lamp 40 or alarm 41. To shut off the alarm, the circuit that controls the flow of current through relay 27 must be broken. By opening either switches 23, 24a, 24b, or 24c or the main power switch 20, the flow of current will be interrupted, deenergizing the relay 27, opening contacts 30a, 30b and 31a, 31b and shutting off the alarm.

The foregoing disclosure and description of the invention is illustrative and explanatory thereof. However, various changes in the size, shape and materials as well as in the details of the illustrated construction may be made within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. An alarm system comprising:
   a. an alarm circuit including a signal means; and
   b. a normally open triggering circuit including one or more trigger switches attached to a door, window or the like of a protected premises and adapted to close on the movement of said door, window or the like;
   c. said triggering circuit including a relay actuable on the closing of any of said trigger switches and having contacts in said alarm circuit closeable on actuation of said relay to activate said signal means;
   d. said triggering circuit including a switch selectively positional between a closed position, in which said positionable switch is connected, through contacts in said relay, in parallel with said trigger switches, upon said actuation of said relay, to latch-in said relay and an open position which prevents said relay from being locked in but which allows said actuation of said relay and said activation of said signal means as long as one of said trigger switches is closed;
   e. said triggering circuit including at least one activator switch internally of said premises and at least one activator switch externally of said premises to allow remote activation and deactivation of said triggering circuit.

2. An alarm system as set forth in claim 1 in which said signal means comprises a visible indicator device, an audible alarm device and a selector switch movable between a first position, in which said visible device is connected in said alarm circuit, and a second position, in which said audible device is connected in said alarm circuit.

3. An alarm system as set forth in claim 1 in which said internal and external activator switches are connected in parallel.

* * * * *
UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,848,242 Dated November 12, 1974

Inventor(s) Antonio C. Campagna

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 43: change "25c" to -- 24c --.

Signed and sealed this 11th day of February 1975.

(SEAL)
Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks
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