Feb. 23, 1954 A. R. HARPER 2,670,466

BURGLAR ALARM SYSTEM

Filed March 24, 1950

FIG. 1

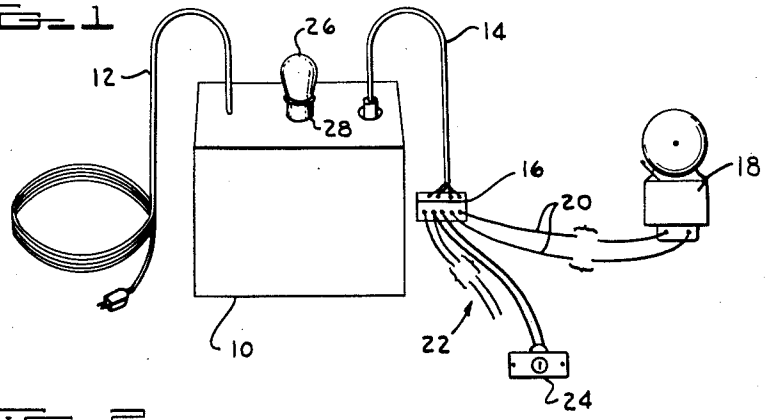
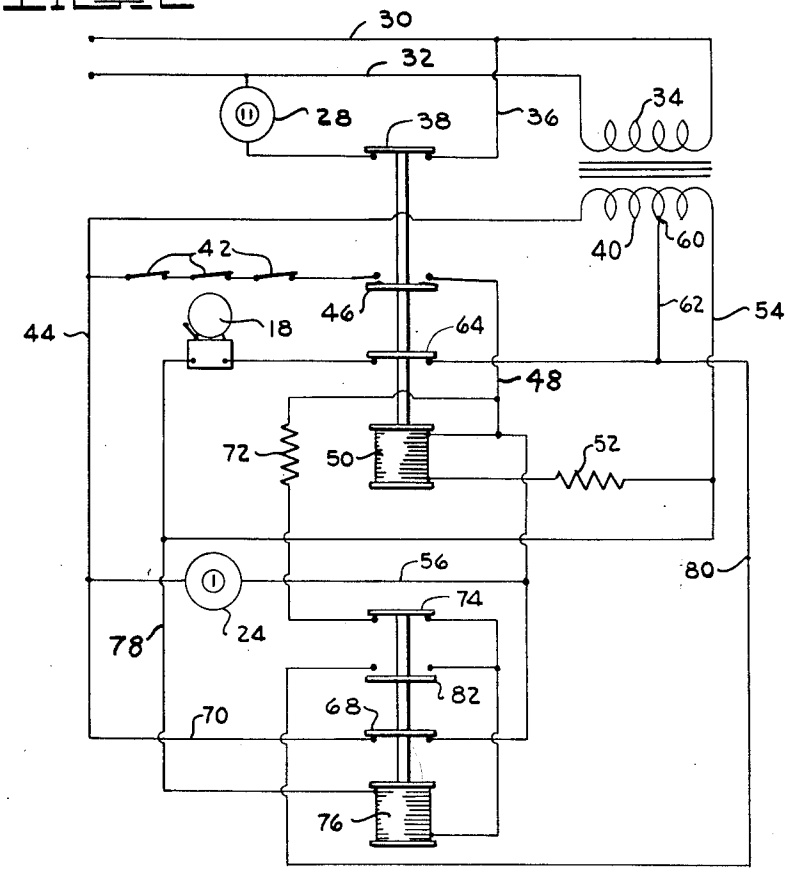


FIG. 2



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BURGLAR ALARM SYSTEM

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2 Claims. (Cl. 340—276)

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The present invention relates to a burglar alarm system of the type which is controlled or actuated by the interruption of flow of electric current through a control circuit operatively associated with doors, windows and the like, of the building in which the system is installed when unlawful or irregular entry therethrough is attempted, such interruption causing the alarm circuit to be energized, actuating the alarm.

It is among the objects of the present invention to provide a burglar alarm system adapted to receive its primary source of power from the electric lighting circuit of the building in which the system is installed, and which is operable to actuate one or more alarms when current in the control circuit for the alarm is disrupted, and further which is operable to automatically reset itself on restoration of power to the lighting circuit if a temporary power failure should occur.

It is a further object of the present invention to provide a burglar alarm system operable on a low voltage circuit adapted to use standard electrical apparatus, while being suitably designed to insure adequate voltage to operate said apparatus irrespective of the length of said circuits, whereby the alarm system can be constructed and operated in the most economical manner and the maximum life of the component part will be insured.

It is still a further object of the present invention to provide an economical, low cost burglar alarm system having a portable control unit adapted to receive power from a standard lighting circuit receptacle and operable to actuate an alarm in response to disruption of a low voltage control circuit, whereby said alarm system can be installed in homes or other buildings by other than licensed electricians

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

In the drawings:

Fig. 1 is a perspective view of one embodiment of the present invention showing the component parts of the alarm system prior to its installation; and

Fig. 2 is a view showing diagrammatically the wiring circuit for the component parts of the embodiment shown in Fig. 1.

Before explaining the present invention in detail it is to be understood that the invention is not limited in its application to the details of

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construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring now to the drawings and particularly to Fig. 1 thereof, a housing 10 is shown within which is housed the alarm actuating mechanism for the burglar alarm system. This is a portable unit which has an extension cord 12 adapted to be inserted into an electrical receptacle in the 110 volt lighting circuit of the building within which the burglar alarm system is to be used. An electric cord 14 is shown plugged at its one end into the housing 10 and connected at its other end to a terminal block 16. An electrically operated bell 18 is wired to the terminal block 16 by the wires 20. Also connected to the terminal block 16 are control circuit wires 22 which have in their circuit the lock switch 24, and other control apparatus.

As will be more fully explained hereinafter, conductors 22 extend to the various doors, windows and the like, through which unlawful or irregular entry is to be prevented. Switches are contained in the circuit formed by these conductors which are adapted to be opened, should such unlawful or irregular entry take place causing the circuit to be broken to actuate the alarm. The present alarm system has the alarm 18 which will be sounded in the event the control circuit 22 is disrupted, and also has a light 26 which will be lighted simultaneously with the sounding of the alarm 18. If desired, an extension cord (not shown) may be plugged into the light receptacle 26 permitting a flood light to be lighted at any particular place in the building.

Referring now to Fig. 2, a schematic diagram of the present invention can be seen. The electric current for operating the present burglar alarm system is supplied through the conductors 30 and 32 directly from the lighting circuit of the building. In the circuit formed by conductors 30 and 32, the primary winding 34 of a step-down transformer is interposed, and connected in parallel with the primary winding is the circuit 36, which contains a light receptacle 28 for the light bulb 26 and a relay operated switch 38. As can be seen, when the switch 38 is closed the circuit 36 will likewise be closed causing the light bulb 26 to be lighted, and conversely when the switch 38 is opened,

the circuit 36 likewise will be opened preventing the light bulb 26 from being lighted. As will be more fully explained hereinafter, the relay switch 38 is controlled by a relay in the control circuit of the burglar alarm system causing the switch 38 to be closed when the control circuit is interrupted.

The secondary winding 40 of the transformer is included in the control circuit having the switches 42, which are connected respectively, adjacent the various doors, windows and the like, through which unlawful or irregular entry is to be prevented and are adapted to be opened to interrupt the control circuit should such entry be attempted. The control circuit comprises the secondary winding 40, the conductor 44, the switches 42, a relay switch 46, conductor 48, relay 50, resister 52, and conductor 54. Also in the control circuit, arranged in parallel with the switches 42 and the relay switch 46, is the conductor 56 with the lock switch 24 therein. The lock switch 24 is normally closed when the lock to the door or the like, in which the switch is located, is unlocked.

An alarm circuit is provided which includes the conductor 54, the secondary winding of the transformer to the center tap 60, the conductor 62, relay switch 64, the bell alarm 18. The relay switch 64 as well as the relay switch 46 in the control circuit and the relay switch 38 in the lighting circuit are controlled by the relay 50. When the relay 50 is de-energized, the relay switches 38 and 64 are normally closed while the relay switch 46 is open. Thus, it can be seen that the alarm 18 and the light 26 will be actuated whenever the relay 50 is de-energized.

During such periods of time when the burglar alarm system is not to be in operation, the lock containing the lock switch 24 will be unlocked causing the switch 24 to be closed providing a closed circuit for the relay 50 causing the switches 38 and 64 to be maintained in an open position so that the light 26 and bell 18 will not be operated and causing switch 46 to be closed.

When it is desired to place the alarm system in operation, the various switches 42 will be closed as well as the switch 46 which normally is held in a closed position by the relay 50, the latter being energized by virtue of lock switch 24 being closed. The lock switch 24 will then be opened so that the circuit through the switches 42 and 46 will be the only source of supply for energizing the coil 50, and thereafter if any of the switches 42 should be opened by an unlawful or irregular entry, the control circuit will be disrupted causing the relay 50 to be de-energized, with the result that the switches 38 and 64 will be closed, setting off the alarm.

An added feature of the above control circuit is that the burglar alarm system cannot be left in an inoperative condition after the lock switch 24 has been locked. If any of the switches 42 have been inadvertently left open, the alarm will sound immediately when the lock containing the lock switch 24 has been closed. This necessarily follows, since immediately after said lock is closed, the lock switch 24 will be opened causing the relay 50 to be de-energized. If such a condition should occur, a check of the various switches 42 can be made to ascertain which one is open, and when this switch has been closed, the building may be properly locked with the alarm system in operation.

The present burglar alarm system also has provisions made to re-energize the relay 50 should a temporary power failure occur causing the entire alarm system to be de-energized. As is believed readily apparent, if the entire system becomes de-energized, the relay 46 will be opened and since the circuit containing the relay switch 46 is the only circuit available to supply current to the relay 50 when the alarm is set, once this switch has been opened the relay coil 50 will not thereafter automatically be re-energized on restoration of power. For this reason, an auxiliary circuit is provided for controlling the relay switch 68 which is in circuit with the conductor 70 arranged in a parallel relationship with the circuit containing the switches 42 and 46. As can be seen, if this relay switch 68 is normally closed when the relay controlling it is de-energized, in the event of a power failure, the switch 68 will close and on restoration of the power, the relay 50 will be re-energized through the conductor 70. Thus, current will flow from secondary winding 40 through conductors 44 and 70, relay switch 68, through relay 50 and resistor 52, and back to secondary winding 40 via conductor 54.

The auxiliary circuit also includes the resistor 72, relay switch 74, relay 76 and conductor 78. On restoration of power after the failure, and after relay 50 has been re-energized thereby closing relay switch 46, current will then flow from secondary winding 40 through switches 42 and 46, via conductor 48 to resistor 72, switch 74, relay 76, conductor 78 and back to secondary winding 40 by way of conductor 54. In this manner relay 76 will be re-energized causing relay switches 68 and 74 to reopen. The auxiliary circuit also includes relay switch 82 and conductor 80. When relay 76 is initially re-energized the switch 82 will be closed simultaneously with the opening of relay switches 68 and 74. Closing of relay switch 82 completes a circuit through relay 76 so as to maintain the latter energized. Thus, a circuit is completed whereby current flows from secondary winding 40 through conductors 62 and 80 to relay switch 82, through relay 76 and back to secondary winding 40 via conductors 76 and 54. It can be seen that this causes the relay 68 to remain open so as not to effect the operation of the control circuit for controlling the flow of current through the relay 50.

The step-down transformer with the center tap is utilized to provide 24 volts through the control circuit while maintaining 12 volts in the alarm circuit and the auxiliary circuit. It is desirable to use 12 volt circuits so that standard electrical equipment, such as 12 volt relays may be used. However, it is found necessary to use a higher voltage through the control circuit because of the voltage drop therein which, if a 12 volt circuit were used, might not provide proper actuation of the relays. The resisters 52 and 72 are placed in series with the relays 50 and 76 to prevent overheating of the relays when energized by the 24 volt circuits.

Thus, it can be seen that a portable alarm system is provided which can be installed by one who is not a licensed electrician and can be easily installed at a relatively low cost. The burglar alarm system is adapted to actuate both a visual and an audible alarm, and cannot be accidently left in an inoperative condition. Further, in the event of a temporary interruption of electric power, such as may result from an electrical storm or the like, the alarm system will be automatically reset when the power is restored to the system.

Having thus described my invention, I claim:

1. A burglar alarm system comprising an alarm and a circuit therefor, a control circuit including in series therein the winding of a control relay, a plurality of switches adapted to open when entry through a door, window or the like is attempted and a first contact of said relay closed by the relay winding when it is energized, the alarm circuit including therein a second contact of said relay closed when the relay winding is de-energized, a lock switch in parallel with the said switches and the first relay contact for independently energizing the relay winding so that lawful entry may be made through said door or window without causing the alarm circuit to be closed, all of the said circuits being fed from a single source of power, so that in case of failure of the source of power the relay winding will be de-energized and will not be able to be re-energized, upon restoration of the source of power, due to the opening of the first relay contact and the alarm will not operate in the absence of power from said source, and means for restoring said relay by momentarily re-energizing said winding when the power is restored comprising a relay having a winding connected to the power source and having a contact closed in a re-energizing circuit for the first relay independent of the first relay contact when the second relay is de-energized.

2. A burglar alarm system as claimed in claim 1 which includes a portable unit in which said relays and their respective contacts are housed, said unit having a conductor adapted to be connected to the single source of power for feeding all of said circuits.

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