

[54] RADIO CONNECTED ALARM SYSTEM

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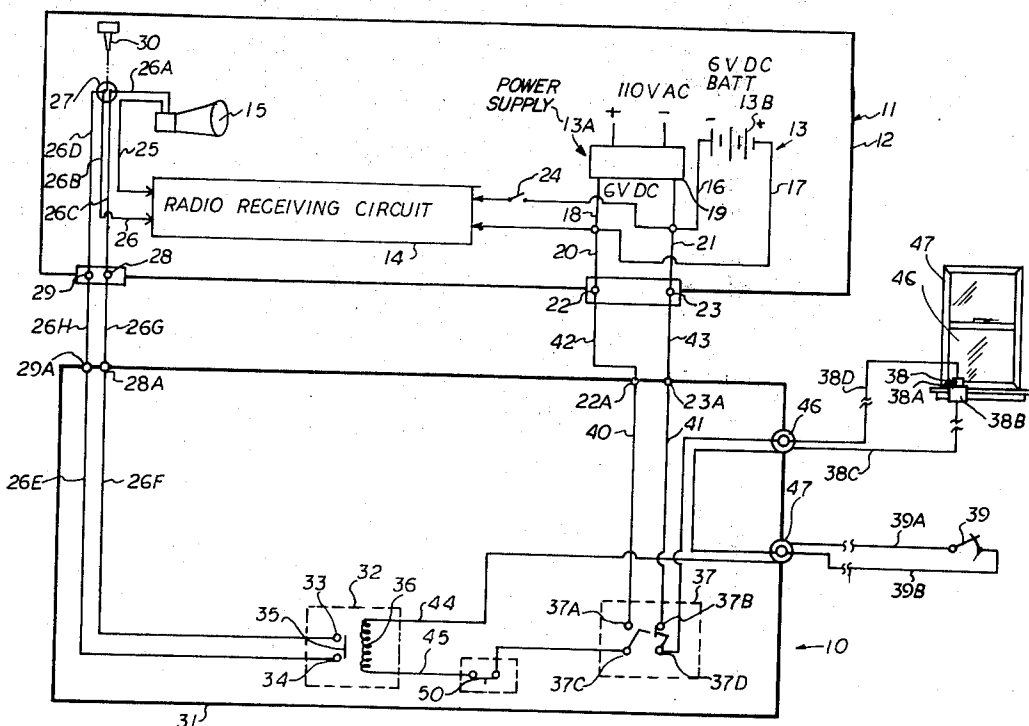
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[57] ABSTRACT

An alarm system is connected to a radio wherein the radio speaker is utilized as an audio alarm to give a warning in the event of fire, burglary, and the like. This is attained by disposing an electrically operated relay switch in one of the speaker leads for interrupting the circuit to the speaker when actuated. An alarm switch connects the relay switch in circuit with the power supply of the radio, which when actuated, actuates the relay switch to open the circuit to the speaker; and a detector is connected in circuit with relay switch and alarm switch to energize the circuit to the speaker when the detector is actuated; thus sounding an alarm by actuation of the speaker.

11 Claims, 1 Drawing Figure



RADIO CONNECTED ALARM SYSTEM

PROBLEM & PRIOR ART

The problem of security in the present day is of particular concern to many persons, particularly the elderly, single women, urban dwellers and the like. Also, the possibility of fire is of major concern to many. These problems are not only present in one's own home, but are also present when one travels and is required to spend the night in strange surroundings, e.g., in hotels, motels, or as guest in one's house or home. Heretofore many efforts have been made to secure one's home from burglary and/or fire. However, such efforts comprised various types of burglar alarms and fire alarms of specific construction which are generally required to be customized to a particular situation or dwelling. Also such alarms comprise generally separate and distinct systems which are not readily portable, and virtually unavailable when one spends the night away from such alarm protected area. Thus when one is traveling or otherwise away from his home, one is generally left without any personal means of security, e.g., an alarm against burglary and/or fire, or the like.

OBJECTS

It is an object of this invention to provide a readily portable and personal security alarm which can be readily adapted to a radio of known construction.

Another object is to provide an alarm system in which the speaker of a radio of known construction is utilized as an audio alarm which can be sounded in case of fire and/or a burglary.

Another object is to provide a personal alarm which is readily adapted to a radio wherein the radio can operate alternately as a conventional radio, or as an alarm against fire and/or burglary and the like.

Another object is to provide a radio connected alarm in which any modification of the radio circuits is minimized.

SUMMARY OF THE INVENTION

The foregoing objects and other features and advantages as will be hereinafter set forth are attained by an alarm system connected to a radio of known construction which may comprise either a portable type radio, i.e., one containing its own power source, or a radio of the type powered by household current, in which the speaker of the radio is utilized as an audio alarm for sounding a warning in case of fire and/or burglary or theft. According to this invention an electrically actuated relay switch is disposed in one of the speaker leads for interrupting the circuit to the speaker. The relay switch is normally closed so that the radio may operate in its conventional manner when the radio on-off switch is actuated. An alarm selector switch comprising a double throw, single pole switch connects the coil of the relay switch in circuit with the power supply of the radio so that when the alarm selective switch is turned to an "on" or "operative" position, the relay switch to the speaker lead is open in inactivate the speaker. One or more detector switches are wired in circuit with the alarm selector switch and relay coil to maintain the contacts in the speaker lead open as long as the detector switches remain closed or inoperative. The arrangement is such that with the radio switch in the on position and with the alarm selector switch rendered operative, the actuation of the detector switch in response to

a given stimulus, e.g., the excessive heat of a fire, the unauthorized opening of a door, window or the like, causes the circuit holding the relay switch to open, thus causing the relay switch to close to energize the speaker circuit permitting the radio to play and thereby give warning that one's security is being threatened. The invention contemplates that one or more detector switches, e.g., a temperature responsive switch, an anti-burglary responsive switch and/or other stimulus responsive switches may be connected in series in the circuit so that the actuation of any one given detector switch will result in the sounding of the alarm. A shorting receptacle or jack may be provided in the speaker lead to by-pass the alarm system if so desired. Also a test switch may be provided in the alarm circuit for momentarily testing the alarm circuit.

FEATURES

A feature of this invention resides in the provision of an alarm system which can be readily applied to a radio of known construction, and more particularly to a portable radio to provide for a readily portable personal alarm system.

Another feature resides in the provision of an alarm system which can be simply packaged so that it can be readily plugged into receptacles provided therefor on the radio.

Another feature resides in the provision of a radio connected alarm system which can be readily adapted to a conventional radio, and arranged so that the radio can be selectively utilized as a radio in its conventional manner or in the alternative, as a personal security alarm which can be readily carried from place to place.

Other features and advantages will become more readily apparent when considered in view of the drawings and following detailed description.

In the Drawings:

The drawing is a schematic wiring diagram of the alarm system as adapted to a radio.

DETAILED DESCRIPTION

In the drawing there is disclosed an alarm system 10 which can be readily adapted to a radio 11, e.g., either a portable radio or a console type radio which is energized by house current. In the illustrated embodiment the alarm system 10 is shown as utilized with a portable radio 11.

The radio 11 is generally of well known construction comprising a housing or casing 12 containing a power supply 13, a radio receiving circuit 14 for receiving the radio signals and for amplifying the same as may be required to operate the loud speaker 15 connected in circuit therewith.

In accordance with this invention, the power supply 13A comprises a stepdown transformer and rectifier whereby the household current e.g., 110 v a.c. is rectified e.g. to 6 v d.c. permitting the radio to be selectively operated either on rectified line current or by a supplementary d.c. battery source 13B. As shown the conductors 16 and 17 connected to the electrodes of the battery 13B are connected to the leads 18, 19 of the power supply 13A to place the battery in parallel to the power supply 13A. The leads 16, 17, 18, and 19 in turn are connected to leads 20, 21 which may terminate in suitable jack type receptacles 22, 23 located on the chassis of the radio. A radio on-off switch 24 is located in cir-

cuit with the power supply 13 and the radio receiving circuit 14 which functions to turn the radio on and off.

As shown, the loud speaker 15 is connected in circuit to the radio receiving circuit by leads 25 and 26, wherein lead 26 is divided as indicated by lead portions 26A, 26B which terminate in a jack or receptacle 27 to define a normally open speaker lead 26. In the jack or receptacle lead 26A connects with lead 26C, and lead 26B connects with lead 26D. Leads 26C and 26D in turn terminate in jacks 28 and 29 located on the chassis of the 11. To close the speaker lead 26 so as to connect speaker leads 26A and 26B in circuit with the radio receiving circuit 14 to permit the radio to play when the on-off switch is actuated, there is provided a plug 30 which when inserted into jack 27 will electrically connect leads 26A and 26B to complete the circuit to the loud speaker and by-passes the alarm circuit as will be hereinafter described.

In accordance with this invention an alarm system 10 is provided, which can be readily adapted to the radio 11 described, whereby the radio 11 can be readily converted to an alarm without disturbing the radio circuits described. While the alarm system to be herein described can be wired integrally with the radio circuit described and be formed as an integral part of the illustrated embodiment disclosed, the alarm system 10 may also be formed as a self-contained unit which can be readily plugged into jacks 22, 23 and 29, 28 provided on the radio whereby the radio speaker can be utilized as an audio warning signal.

As shown, the alarm system 10 may be contained within its own housing 31, which is provided with outlet jacks 28A, 29A and 22A, 23A whereby the components of the alarm system are electrically wired to the complementary components of the radio as will be hereinafter described. The alarm system includes a magnetic relay switch 32 having contacts 33 and 34 connected to leads 26E and 26F which terminate in jacks 29A and 28A respectively. When attached to the radio, conductor 26G and 26H electrically connect leads 26F and 26E of the alarm system to speaker leads 26C and 26D. The relay switch 32 also includes a contactor 35 arranged to normally close contacts 33 and 34. The coil 36 of the relay switch 32 in turn is connected in circuit with an alarm switch 37 and detector 38 and/or 39 as will be hereinafter described.

The alarm switch 37, as shown, comprises a double pole, single throw switch having contacts 37A and 37B connected to leads 40 and 41 which terminate in jacks 22A and 23A and which in turn are connected to the power supply leads 20 and 21 by connecting conductors 42 and 43 interconnected between jacks 22, 22A and 23, 23A. The arrangement is such that when the alarm switch 37 is actuated to engage contacts 37A and 37B, the circuit to the coil 36 of the relay switch 37 is energized causing the contactor 35 to be shifted to open speaker lead 26.

In accordance with this invention, one or more detectors are electrically connected in series with the leads 44 and 45 of the coil 36. In the illustrated embodiment, two detectors 38 and 39 are shown. Detector 38 comprises a normally closed switch composed of complementary magnetic members 38A and 38B which are mated to normally engage one another to maintain the circuit to the coil 36 energized when the alarm switch 37 has been actuated to its on or operative position. One member 38A of the detector switch 38 is adapted

to be connected to a moveable member of an access opening, e.g., a window 46. The other component member 38B is adapted to be connected to a fixed portion of an access opening, e.g., the window frame 47. Thus in the event the window 46 is opened by any unauthorized person, the movement of the window 46 relative to its frame 47 will cause the switch members 38A, 38B of detector 38 to part, thus opening the circuit to the relay coil 36. When this occurs, as will be described hereinafter, the speaker lead 26 is closed and causes the speaker to sound an audio alarm.

Detector 39 may comprise a thermal responsive switch which will operate to open the circuit to the coil 36 whenever the thermal switch 39 senses a predetermined temperature. In the illustrated embodiment the detector switch 39 comprises a normally closed thermal switch which is electrically energized when the alarm switch 37 is closed, thus functioning to maintain the coil 36 of the relay switch energized until actuated, e.g., by fire. It will be understood that various types of detector switches may be included in the alarm system other than the anti-burglary switch 38 and/or thermal switch 39 described. For example, a smoke responsive switch may be included in the alarm circuit, or an infrared detector may be included, or various audio responsive and/or monitoring switches may be included, e.g., detector capable of monitoring various physiological responses such as heart beat, blood pressure, etc.

As seen in the drawing both the detector switches 38 and 39 may be connected to appropriate leads, e.g., 38C, 38D, and leads 39A, 39B adapted to connect in suitable jacks 46 and 47 disposed in the casing 31 of the alarm unit 10. It will be understood that leads 38C, 38D and 39A and 39B are sufficiently long so as to permit the respective detectors 38, 39 to be remotely disposed from the alarm unit 31 which is plugged into the radio chassis. In this manner the detector may be appropriately positioned for maximum security effect. With the detectors 38, 39 plugged into its respective jacks 46, 47, the detectors are serially connected in circuit with the relay coil so that the actuation of any one detector will de-energize the relay coil to close the speaker lead 26 to sound the speaker 15.

In the system described with respect to the drawing, the arrangement is such that the alarm system 10 may be by-passed even if the alarm switch 37 has been closed by inserting plug 30 into jack 27. Inserting plug 30 into jack 27 electrically connects speaker lead portion 26A to 26B, thereby effecting a by-pass of the alarm circuit.

The operation of the radio alarm is as follows:

The radio 11 may be played in the conventional manner simply by actuating the radio on-off switch 24 to the on position and inserting plug 30 into jack 27. By so doing, the speaker 15 is connected in circuit with the radio receiving circuit 14 and the radio 11 will play in its normal manner.

To render the radio 11 operative as an alarm, e.g., a burglar and/or fire alarm, the alarm unit 10 is electrically connected to the radio 11 by interconnecting radio jacks 28, 29 with the alarm jacks 28A, 29A by wire connectors 26H, 26G, and the radio jacks 22, 23 to the alarm unit jacks 22A, 23A by wire conductors 42, 43. The respective detector 38 and/or 39 are properly positioned for the desired security, and the respective leads thereof plugged into the appropriate alarm jacks 46 and 47 of the alarm unit. With the respective

component parts thus connected, the system may be used either as a radio or an alarm system. To play as a radio in the conventional manner with the alarm unit hooked into the radio 11, the radio switch 24 is turned to its on position. As the relay switch contacts 33, 34 are normally closed by contactor 35, the speaker leads 26A, 26C, 26G, 26F, 26E, 26H, 26D, and 26B define a closed circuit which permits the speaker to be energized and operate in its normal manner. To turn the radio off, the radio switch is turned to its "off" position.

To operate the radio 11 as an alarm system with the alarm unit 10 hooked into the radio as described, the radio "on-off" switch 24 is first turned to its on position. Also the alarm switch 37 must be thrown to engage contacts 37A, 37B to close the circuit to the relay coil 36. When coil 36 is energized, the relay contactor 35 is attracted thereto to open the speaker lead 26, thereby interrupting the circuit to speaker 24. So long as the detector switches 38 and 39 remain energized and closed, the circuit to the relay coil 36 is maintained and the circuit to the speaker is opened to prevent the speaker from otherwise operating. In the event one or both of the detector switches 38 or 39 is actuated, the circuit to the relay coil 36 is opened. Thus, the coil is de-energized and the contactor 35 held in open position by the energized coil 36 returns to its normal contact closing position wherein the speaker leads are connected in circuit to the radio receiving circuit to actuate the speaker to sound an alarm by playing in its conventional manner. In setting up the alarm, it is also advisable that the volume control of the radio be turned up to maximum power.

To by-pass the alarm unit, when the alarm switch has been actuated to its operative position, plug 30 may be inserted into jack 27. Insertion of plug 30 into jack 27 electrically connects speaker lead portion 26A to 26B for directly connecting the speaker to the receiving circuit 14, thus permitting the alarm unit to be by-passed. In this manner, the radio may be played in a conventional manner even when the alarm system has been activated.

To provide a quick test to determine if the system is operative, there is provided in lead 45 of the relay coil a test switch 50. The test switch comprises a normally closed button switch which when depressed will open the circuit to the coil 36 manually. If the speaker responds to the actuation of the test button 50, when the alarm unit has been set up as herein described, the alarm circuit is known to be in operating condition.

From the foregoing, it will be noted that an alarm system can be readily incorporated in a radio which may be either integrally wired with the circuit of the radio, or be wired into the radio circuits as a unit attachment which is plugged into appropriate jacks provided in the chassis of the radio. The arrangement enables the radio to be used either as a radio, or as an alarm. Depending on the particular type of detector switch employed in the alarm unit, the radio alarm may be used to detect and give warning in response to various types of stimuli, e.g., fire, theft, burglary, etc., either singularly or in combination. The system described may also be used to monitor medical or physiological system by providing appropriate detectors in the alarm circuit and thus be rendered useful in a sick room.

While the invention has been described with reference to a particular embodiment, it will be readily appreciated and noted that variation and modifications

may be made without departing from the spirit or scope of the invention.

What is claimed is:

1. A personal alarm system for guarding a person against the danger of fire and/or unlawful entry comprising a radio,

said radio including a radio receiving circuit, a speaker having a pair of leads connecting said speaker in circuit with said receiving circuit, wherein said speaker functions as an alarm for said alarm system, a power supply for energizing said receiving circuit, and a radio on-off switch means in series with said power supply and radio receiving circuit for energizing and de-energizing said receiving circuit,

electrically actuated means disposed in one of said speaker leads for interrupting the circuit to said speaker,

an alarm switch means for enabling said person to connect said electrically actuated means into and out of circuit with said power supply whereby the circuit to said speaker is interrupted when said alarm switch means is actuated,

and a detector means including a normally closed switch responsive to said danger connected in series with said alarm switch means and said electrically actuated means for completing the circuit to said speaker when said detector means is activated in response to said danger.

2. An alarm system comprising a radio,

said radio including a radio receiving circuit,

a speaker having a pair of leads connecting said speaker in circuit with said receiving circuit, wherein said speaker functions as an alarm for said alarm system,

a power supply for energizing said receiving circuit, and a radio on-off switch means in series with said power supply and radio receiving circuit for energizing and de-energizing said receiving circuit,

electrically actuated means disposed in one of said speaker leads for interrupting the circuit to said speaker,

a switch means for connecting said electrically actuated means into and out of circuit with said power supply whereby the circuit to said speaker is interrupted when said switch means is actuated,

and a detector means connected in series with said switch means and said electrically actuated means for completing the circuit to said speaker when said detector means is activated,

said electrically actuated means includes a relay having a pair of spaced apart contacts disposed in one of said speaker leads, a coil connected in circuit with said power supply, and magnetically energized contactor operatively associated with said coil, said contactor normally closing said contacts when said coil is de-energized,

and including means connecting said speaker in circuit with said receiving circuit when said contacts in said one speaker leads are open.

3. An alarm system comprising a radio, said radio including

a radio receiving circuit, a speaker having a pair of leads connecting said speaker in circuit with said receiving circuit wherein said speaker functions as an audio alarm for said alarm system,

a power supply for energizing said receiving circuit,

and a radio on-off switch disposed in series with said power supply and radio receiving circuit for energizing and de-energizing said radio receiving circuit,

a magnetic relay having a switch means disposed in one of said speaker leads and a coil for magnetically activating said switch means, an alarm switch means for connecting the coil of said relay in circuit with said power supply to energize said coil to activate said alarm system,

and an alarm detector means connected in series with said alarm switch means and said coil, whereby said relay is energized to energize said speaker for sounding an alarm when said alarm detector means is activated,

and including a by-pass receptacle disposed in said one speaker lead,

and a by-pass plug adapted to be received in said by-pass receptacle to activate said speaker when said relay coil is energized.

4. The invention as defined in claim 3 wherein said relay switch means includes a normally closed switch.

5. The invention as claimed in claim 3 wherein said radio includes a self contained power supply whereby said radio is rendered readily portable.

6. The invention as defined in claim 3 wherein said alarm detector means includes a temperature responsive switching means.

7. The invention as defined in claim 3 wherein said alarm detector means comprises a magnetic switch means.

8. The invention as defined in claim 7 wherein said magnetic switch means comprises a pair of complementary magnetically attractive members,

each of said members being adapted to be fixed to complementary portion of an access opening, and said members being electrically connected in series with said relay coil and said alarm switch means,

said members being normally attracted to define a normally closed switch for maintaining said relay coil energized when said alarm switch means is activated to energize said coil.

9. The invention as defined in claim 3 wherein said alarm detector means includes switch means responsive to temperature changes, and a switch means responsive to motion,

said temperature responsive switch means and mo-

tion responsive switch means being connected in series with said alarm switch means and relay coil whereby said alarm detector means may function either as a fire alarm and/or burglar alarm depending upon which of said latter mentioned switch means is activated.

10. The invention as defined in claim 9 wherein said temperature responsive switch means and said motion responsive switch means comprise normally closed switch means.

11. A alarm system comprising:

a readily portable radio having a receiving circuit, a speaker having a pair of leads connecting said speaker in circuit with said receiving circuit wherein said speaker is adapted to function as an audio alarm, a self-contained power supply for energizing said receiving circuit, and a radio on-off switch disposed in series with said power supply and radio receiving circuit for energizing and de-energizing said radio receiving circuit,

a magnetic relay having switch contacts disposed in one of said speaker leads, a magnetically energized switch for closing said switch contacts, and a relay coil, said switch normally closing said contacts when said relay coil is de-energized,

a by-pass receptacle disposed in series with said switch contacts in said one speaker leads,

a by-pass plug adapted to be received in said receptacle to close said one speaker lead when said switch contacts are open,

an alarm switch means for connecting the coil of said relay in circuit with said power supply, said alarm switch means including a double pole, single throw switch,

said alarm switch having a pair of contacts connected to the power supply leads and a second pair of contacts connected in series to a relay coil lead,

a pair of detector means connected in series to said coil,

said detector means including a normally closed switch means responsive to changes in temperature,

and a second normally closed switch means responsive to movement whereby when said alarm switch and said radio on-off switch are closed, said speaker is energized to sound an alarm when one of said detector switch means is opened.

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