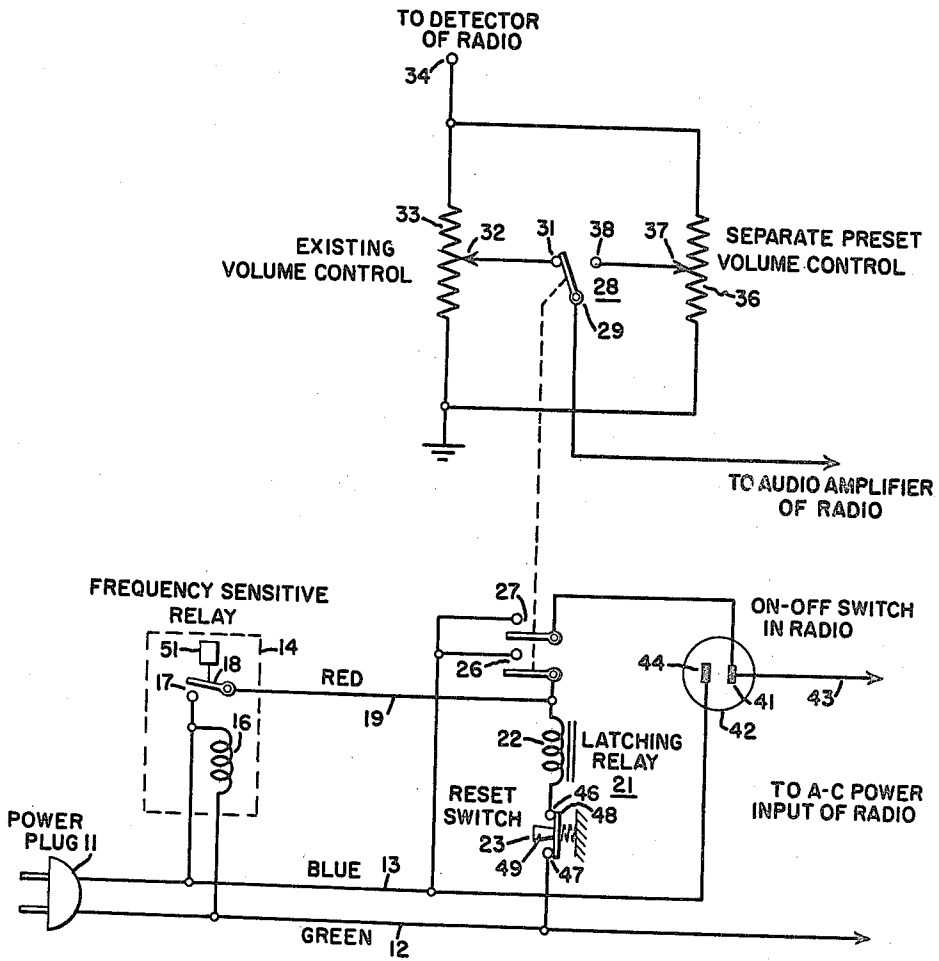


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APPARATUS FOR ENERGIZING RADIO RECEIVER  
IN RESPONSE TO POWER LINE ALARM SIGNAL  
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**APPARATUS FOR ENERGIZING RADIO RECEIVER IN RESPONSE TO POWER LINE ALARM SIGNAL**

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10 Claims. (Cl. 325-394)

This invention relates to alarm devices for alerting people in the event of an emergency situation.

An object of the invention is to provide an alarm system for alerting people in the event of an emergency, and also for notifying people of the nature of the emergency and giving instructions concerning the situation.

Another object is to provide an arrangement for automatically turning on radios in homes and elsewhere, via an emergency signal applied over the power lines.

A further object is to provide an arrangement for automatically turning on radios at a pre-set volume level in response to a power line signal.

Still other objects will be apparent from the following description and claims, and from the drawing in which the single figure thereof is a schematic electrical diagram of a preferred embodiment of the invention.

The invention comprises, basically, an arrangement attached to or incorporated in a radio receiver and comprising a frequency sensitive relay means responsive to an emergency signal having a frequency of 240 cycles, for example, sent out over the power lines either by power companies or by civil defense headquarters or by other authorized means. The frequency sensitive relay is arranged to respond to the emergency signal and turn on the radio receiver and adjust the volume thereof to a predetermined volume level sufficiently high so that the radio is likely to be heard when thus turned on.

Now referring to the drawing, the preferred embodiment of the invention comprises a power plug 11 for connecting two power supply wires 12 and 13 to a household electrical outlet. A frequency sensitive relay 14 comprises an actuating device 16 which is sensitive to a particular frequency, for example a frequency of 240 cycles, and is arranged to close a pair of electrical contacts 17 in response to the aforesaid emergency signal. The device 16 may be a resonant relay coil circuit tuned to the frequency of the emergency signal and arranged to close an armature 18 thereby to close the electrical contacts 17. Alternatively, the armature 18 may be replaced by a vibratile reed having a natural vibration frequency the same as the frequency of the emergency alarm signal, and the device 16 may be a coil arranged to cause this reed to vibrate when the emergency signal is received, the vibrating reed then making the pair of contacts 17 close and open in an alternating manner at the frequency of the emergency signal. The pair of contacts 17 are connected electrically between the power wire 13 and a line 19.

A latching relay 21 comprises a winding 22 connected between the line 19 and the power supply wire 12, via a normally closed reset switch 23. The latching relay 21 is arranged to actuate two normally open switches 26 and 27, and a double throw switch 28 having a common terminal 29 normally connected to a terminal 31 which is connected electrically to the adjustable tap 32 of a volume control potentiometer 33 in a radio receiver.

The lower end of the potentiometer 33 normally is electrically grounded as shown, and the upper end thereof normally is connected to the output of the radio detector at a terminal 34, as shown. An auxiliary volume control potentiometer 36 is connected in parallel with the potentiometer 33, and the adjustable tap 37 thereof is connected to a terminal 38 of the switch 28. The com-

mon terminal 29 of the switch 28 is connected, normally, to the input electrode of the audio amplifier of the radio receiver, as indicated in the drawing.

The electrical switch contacts 26 of relay 21 are connected between the power supply wire 13 and the line 19, so as to provide electrical latching for the relay 21. The contacts 27 of the relay 21 are electrically connected between the power supply wire 13 and a terminal 41 of the "on-off" switch 42 of the radio receiver, this terminal 41 being connected to the power supply means of the radio via a wire 43. A second terminal 44 of the switch 42 is connected to the power supply wire 13. Thus, it will be seen that the switch contacts 27 of the relay 21 are connected in electrical parallel with the "on-off" switch 42 of the radio receiver. The reset switch 23 comprises a pair of spaced contacts 46, 47, and a shorting member 48 which normally is in engagement with the terminals 46, 47 thereby completing an electrical connection therebetween. A reset button 49 is arranged for manual depression and is adapted, when depressed, to move the shorting member 48 out of contact with one or both of the terminals 46 and 47 thereby to remove power from the latching relay coil 22 so as to deactivate the relay 21 and return the radio receiver to its normal condition.

The invention functions as follows. In the absence of actuation of the frequency sensitive relay 14, the radio receiver operates normally, and can be turned on and off at will, the volume being adjustable by means of the volume control 33. It is to be particularly noted that many radio receivers are arranged so that when turned off the volume control is set for low or zero volume.

When an emergency alarm signal, having a frequency of 240 cycles for example, is sent over the power line, the frequency sensitive relay 14 becomes actuated thereby closing the electrical contacts 17 so that power from the power supply wires 12 and 13 is applied to the relay coil 22, thereupon actuating the relay 21 and closing its electrical contacts 26 and 27, and also actuating the switch 28 for connecting the terminal 29 to the terminal 38. In this condition, the contacts 26 apply power continuously to the coil 22, thereby maintaining the latching relay 21 in its closed condition. The contacts 27 provide an electrical connection across the terminals of the "on-off" switch 42, thereby turning on the radio receiver by applying power thereto. The double throw switch 28 disconnects the normal volume control 33 from the radio circuit, and connects the pre-set auxiliary volume control 36 into the circuit, this auxiliary volume control 36 being pre-set to cause the radio volume to be at a desired level, such as normal volume level or extra loud volume level. Thus, in the event of a disaster or emergency, all radios which are equipped or modified in accordance with this invention, will turn on automatically to a pre-set volume level in response to an emergency signal sent over the power line system, thereby not only alerting personnel of the danger or emergency situation, but also permitting the personnel to be informed of the nature of the emergency or disaster and to be given warnings or instructions, via a received radio signal.

It may be desirable to provide a time delay of a few seconds in the frequency sensitive relay 14, to prevent this relay from responding to various signals having frequency components the same as that of the emergency signal. Means for providing such a time delay are well known and may comprise, for example, a pneumatic plunger or dash pot 51 connected to the armature 18 of the frequency sensitive relay 16, or alternatively may comprise a gear arrangement for slowing down action of the armature 18. Alternatively, a more elaborate delay device can comprise a motor-driven cam arrangement

having a motor connected to be turned on by a frequency sensitive relay in response to an alarm signal, this motor being arranged to rotate a cam, which after a desired interval of time, actuates a switch for closing the contacts 17 to turn on the radio.

Although the invention has been described primarily for use in or with a radio receiver, it is also intended for use in or with a television receiver, phonograph, telephone, or other utilization device which can be turned on to attract attention. The term "radio alarm" is used herein with a broad meaning to cover all such utilization devices. If desired, the alarm signal can be carried to the utilization device by any suitable utility service, such as power lines, telephone lines, and the like.

While a preferred embodiment of the invention has been shown and described, various other embodiments and modifications thereof will be apparent to those skilled in the art.

#### What I claim is:

1. An alarm arrangement for turning on a sound-producing utilization device in response to the occurrence of an alarm signal of predetermined frequency impressed across two wires of a utility service, said alarm arrangement comprising frequency sensitive actuating means responsive to the predetermined frequency of said alarm signal, means for connecting said actuating means across said two wires of the utility service for receiving said alarm signal, means connecting said actuating means to said utilization device for causing said utilization device to turn on when said actuating means responds to said alarm signal, adjustable volume control means adapted, when actuated, to establish the sound of said device at a desired volume as determined by pre-set adjustment of the volume control means, and means connecting said actuating means to actuate said adjustable volume control means when said actuating means responds to said alarm signal.

2. An alarm arrangement for turning on a utilization device in response to the occurrence of an alarm signal of predetermined frequency impressed across two wires of a utility service, said alarm arrangement comprising frequency sensitive actuating means responsive to the predetermined frequency of said alarm signal, means for connecting said actuating means across said two wires of the utility service for receiving said alarm signal, means connecting said actuating means to said utilization device for causing said utilization device to turn on when said actuating means responds to said alarm signal, said utilization device being adapted to produce audible sound, adjustable volume control means for said utilization device, means inactivating said adjustable volume control means during normal operation of said utilization device, and means for activating said adjustable volume control means when said actuating means responds to an alarm signal thereby causing said utilization device to produce audible sound of volume as determined by pre-set adjustment of said adjustable volume control.

3. An alarm arrangement for turning on a utilization device in response to the occurrence of an alarm signal of predetermined frequency impressed across two wires of a utility service, said alarm arrangement comprising a utilization device provided with an on-off switch, a first volume control potentiometer, an auxiliary on-off switch, an auxiliary volume control potentiometer, and a frequency sensitive relay device adapted to be connected across said two wires and responsive on receipt of said alarm signal to electrically substitute said auxiliary volume control potentiometer for said first volume control potentiometer and to actuate said auxiliary on-off switch to its "on" condition.

4. An alarm device comprising a first switch adapted to turn on a sound-producing utilization device, an adjustable volume control means normally disconnected from the circuit of said device so as to be inactive for affecting the volume of said utilization device, a second switch adapted to electrically connect said adjustable volume

control means into the circuit of said utilization device so as to control the volume thereof by pre-set adjustment to a desired value, and a frequency sensitive relay device adapted to be connected across two wires of a utility service and further adapted to actuate said first and second switches upon receipt of an alarm signal of pre-determined frequency carried by said utility service.

5. An alarm as claimed in claim 4, in which said frequency sensitive relay device comprises time delay means for providing a time delay between the occurrence of said alarm signal and the actuation of said switches.

6. An alarm device for a radio or the like having an on-off switch and a first volume control potentiometer, comprising an auxiliary potentiometer having a resistance element adapted to be connected in parallel with that of said first potentiometer, a latching relay having an actuating coil and having a first switch adapted when actuated by said coil to selectively connect the adjustable tap of said auxiliary potentiometer into the radio circuit in lieu of the adjustable tap of said first potentiometer, said latching relay further having a second switch connected in parallel with said on-off switch and adapted to close electrically when actuated by said coil, and a third switch adapted to close electrically when actuated by said coil, said radio being provided with a two-wire power line adapted to be connected to a source of electrical power, a frequency sensitive relay connected across said power wires and adapted to electrically close a fourth switch upon the occurrence of an alarm signal of given frequency over said power wires, a normally closed reset switch, means connecting said fourth switch, said reset switch, and said actuating coil electrically in series across said power wires, and means connecting said third switch electrically in parallel with said fourth switch.

7. In an alarm circuit for a radio or the like reception device adapted to respond to an alarm signal, said reception device having a normally connected adjustable volume control potentiometer, the combination of an auxiliary adjustable volume control potentiometer and control means responsive to said alarm signal for connecting said auxiliary adjustable volume control potentiometer to control the volume of said reception device by pre-set adjustment of said auxiliary adjustable volume control potentiometer to a desired value in lieu of said normally connected volume control potentiometer.

8. The combination as claimed in claim 7, in which the resistance element of said auxiliary adjustable volume control potentiometer is connected in parallel with said normally connected volume control, and in which said control means comprises a switch adapted to normally connect the input of an audio device to the adjustable tap of said normally connected adjustable volume control potentiometer and further adapted, in response to said alarm signal, to connect said input of the audio device to the adjustable tap of said auxiliary adjustable volume control potentiometer in lieu of said normal connection to the tap of the normally connected volume control potentiometer.

9. In an alarm circuit for a radio or the like reception device adapted to respond to an alarm signal, said reception device having a normally connected adjustable volume control device, the combination of an auxiliary adjustable volume control device and control means responsive to said alarm signal for rendering said auxiliary adjustable volume control device effective to control the volume of said reception device by pre-set adjustment of the adjustable volume control device to a desired value in lieu of said normally connected volume control device.

10. In an alarm circuit for a radio or the like reception device adapted to respond to an alarm signal, the combination of adjustable volume control means normally inactive for controlling the volume of said reception device and means responsive to said alarm signal for rendering said adjustable volume control means effective to control the volume of said reception device by pre-set ad-

justment of the adjustable volume control means to a desired value.

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