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[54] **ALARM SYSTEM FOR SIGNALLING FOR EMERGENCY HELP**

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[51] **Int. Cl.²** **G08B 5/00**

[58] **Field of Search** 340/326, 283, 279

[56] **References Cited**

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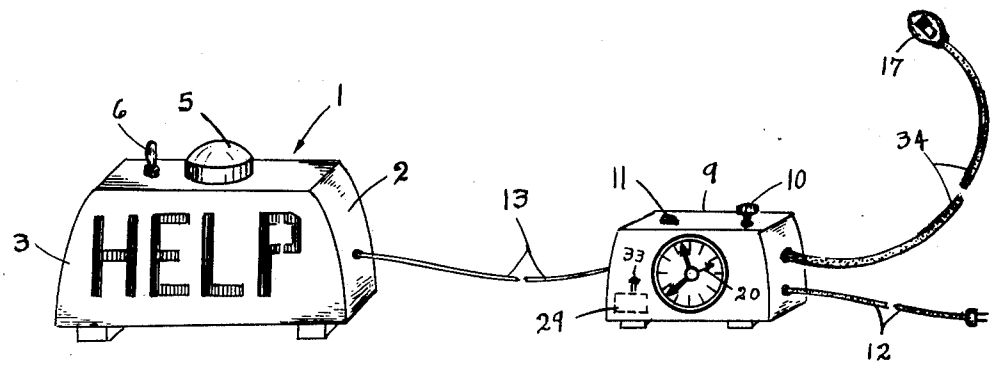
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[57] **ABSTRACT**

An alarm system for signalling for emergency help during sudden illness or intrusion by burglars or other criminals is described. The system comprises an intermittently sounding alarm device with concurrently flashing red light means which signals by means of large letters the word "HELP." The system is operated remotely by manually turning on an emergency switch or by an automatic wireless switching device using a microwave transmitter-receiver arrangement. The invention is also provided with a timing mechanism which turns on the sound alarm with the flashing light at a predetermined time. The signalling unit is positioned facing toward the street whereby it is readily visible to neighbors and passerbys for providing the needed help.

12 Claims, 8 Drawing Figures



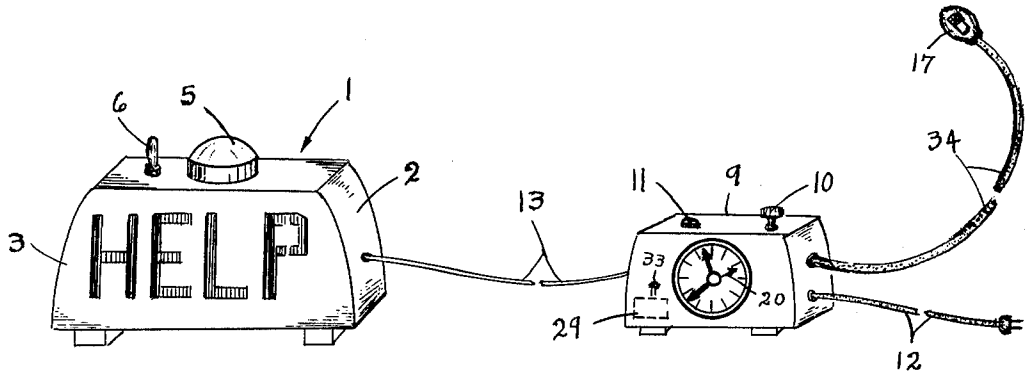


Fig. 1

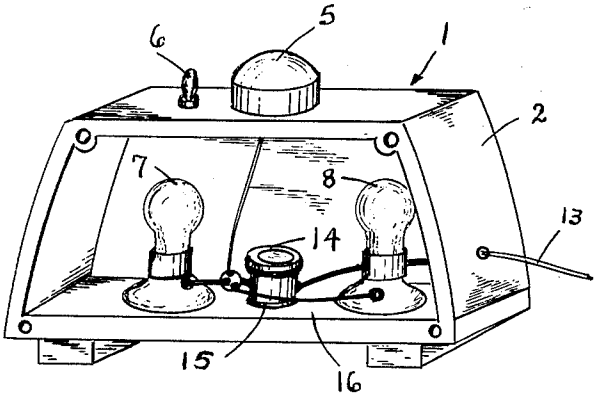


Fig. 2

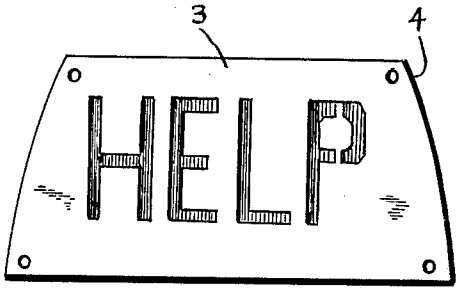


Fig. 3

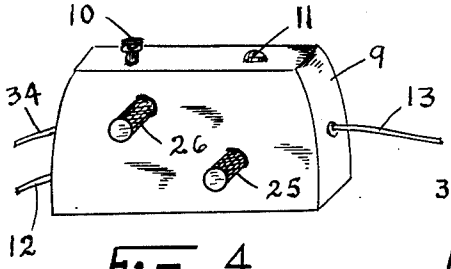


Fig. 4

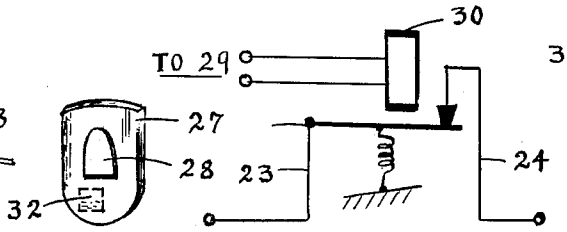


Fig. 6

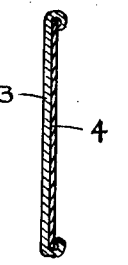


Fig. 8

Fig. 7

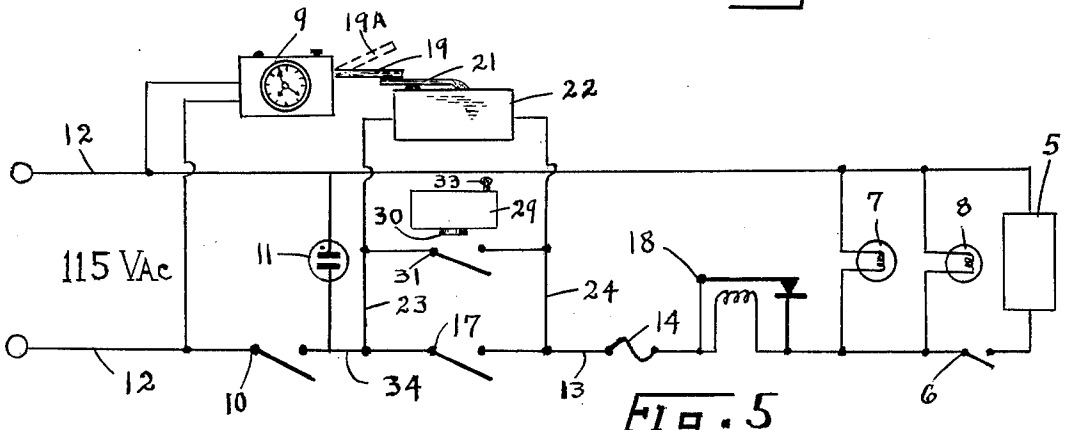


Fig. 5

ALARM SYSTEM FOR SIGNALLING FOR EMERGENCY HELP

The present invention is related to signalling devices and more particularly is concerned with a system for signalling to neighbors, passerbys, and other observers that the person using it is in need of urgent help because of serious illness or danger from intruders.

BACKGROUND OF THE INVENTION

It has been reported that nearly 30 million people in the United States are living alone and comprise senior citizens, young adults, and those inflicted with organic diseases, such as diabetes, heart trouble, periodic convulsions, and similar anomalies whereby when seizure is imminent they need immediate physical help. Some States and cities in California have already established programs through the local police departments to periodically call persons registered with them, such as persons having permanent illnesses and senior citizens who live alone and do not have relatives or close friends to periodically visit or telephone to them to ascertain their physical conditions.

The usual procedure in this case is for a member of the police force to call the registered person on the telephone at a predetermined time every morning. If no reply is forthcoming, a messenger with first aid kit is sent to the dwelling of the registered person to investigate and to administer first aid if necessary; or, even to break into the residence if no answer is forthcoming. The difficulty encountered with this program is that at times the registered person having forgotten that the police will call has left the residence before the appointed time, which situation may cause annoyance and may further become a frustrating nuisance to the police.

Another disadvantage of such a program is that if a "shut-in" or unfrequented person is attacked by an intruder, burgler, or other criminal he or she has no recourse to contacting the police during such an event. Even healthy people living alone, or even with other members of the dwelling, are vulnerable to such crimes, since the attacker or the intruder will not let the person to approach the telephone or any window to call for help.

After having thoroughly scrutinized the above-stated situations and the uncontrollable problems involved with established police programs, the present invention has been devised to eliminate the disadvantages of the present preventive or protective methods and to create an effective means whereby if the lone person has become suddenly ill, unable to go to the telephone to call for help, or has passed out by an unexpected stroke of heart trouble, convulsion, or by any other organic illness, he can receive aid as early as one can reach him. This is made possible by the automatic operation of the invention when the person is unable to actuate it manually.

SUMMARY OF THE INVENTION

The present invention principally comprises a portable, compact, and small-size alarm as well as light signalling system, which can be placed anywhere either outside of the dwelling or on a sill of a window that faces the busiest part of the street in that locality. The invention is provided with an extended electric cord having at the terminal end thereof an easily operable

emergency switch which can be taken into bed at night or during illness and placed at an easily accessible region of the bed, such as under the pillow. When an emergency occurs, the person provided with the device presses a button on the switch to start the intermittent blowing of the alarm device together with the flashing light. The neighbors, apartment managers, or passerbys can effectively hear the high-intensity sound of the buzzer or siren and simultaneously see the red light flash the word "HELP" to immediately initiate measures to reach the person for investigation and help. The system in a modified version is further provided with a microwave transmitter and receiver mechanism in which the transmitter is of the size of a cigaret package and easily can be carried in the shirt pocket of the user, while the receiver is built into the alarm and light signalling unit. Both the transmitter and the receiver operate with dry batteries. The latter mechanism has the capability of operating manually and automatically; a pushbutton switch on the transmitter serves for manual operation and a gravity-operable switch serves to automatically energize the transmitter when a person is fallen on the floor at a supine, prone, or lateral position.

To achive these attributes, an object of the invention is to provide an alarm system which is compact, lightweight, small, and easily portable from one place to another, and is preferably of low cost, since many of the prospective users of such a device usually have limited funds.

A further object of the invention is to provide a system which consists of two units with a long electric cable connecting them remotely; one of the units having a sound alarm and flashing lights with a special switch to set the alarm and the flashing light to operate synchronously at a rate from 30 to 35 times per minute, and the other unit being a timing mechanism to channel current to the alarm and light signalling unit.

A still further object of the invention is to provide in the timing mechanism a microswitch which turns on the alarm and light signalling unit at a predetermined time after it is set.

Another object of the invention is to provide on the face of the alarm and light signalling unit with large letters spelling the word "HELP," the letters being die-cut in the face panel backed by a transparent red plastic or glass sheet, so that when the light flashes, the letters can be seen from a considerable distance.

A still further object of the invention is to provide a switch means on the alarm and light signalling unit housing, whereby if the piercing sound of the alarm device is uncomfortable to the person using the device and having extreme case of ear trouble can turn off the sound alarm device, which is a high dB buzzer or alarm siren.

Another object of the invention is to provide an intermittently current-energizing means connected in the power supply line in series with the lamps and the alarm device, whereby the lamps flash in synchronism with the sounding of the alarm.

Another object of the invention is to provide in the system a microwave transmitter and receiver combination, the receiver serving to close a normally open switch to the remotely located alarm and light flashing unit upon energization of the transmitter either manually or automatically and broadcasting an aerial signal

from any room of the dwelling to the receiver located in the alarm and light signalling unit.

Other objects and advantages of the invention will become apparent from the specification taken in conjunction with the accompanying drawing, wherein:

FIG. 1 represents the entire system comprising the sound alarm, flashing signal light, the timing mechanism, the emergency switch and the connecting cables.

FIG. 2 is the perspective view of the alarm-and-light signalling unit with its front panel removed to show the structures within the housing thereof.

FIG. 3 is a view of the front panel isolated from the housing, showing the combination of the metal or plastic panel backed with a transparent red plastic or glass sheet, with letters "HELP" punched out from the metal or plastic panel.

FIG. 4 is the back view of the timing mechanism, showing the knobs for setting the timing mechanism.

FIG. 5 is the schematic circuit diagram of the entire alarm signaling system, showing the timing mechanism, locations of multiple switches, and the battery-operated microwave receiver in block form.

FIG. 6 is an isolated view of the receiver solenoid relay which closes the auditory alarm and light mechanisms.

FIG. 7 is the perspective view of the microwave transmitter.

FIG. 8 is a cross-sectional view of the panel shown in FIG. 3.

Referring to the drawing, the system comprises a portable alarm and light signalling unit **1** having a housing **2**, which is preferably made of plastic or metal, a front panel **3** made of sheet metal or sheet plastic having the letters "HELP" die-cut therein and backed by a transparent sheet of plastic or glass **4** of preferably red color. An electric alarm device **5**, such as a high dB (about 80 to 90) buzzer or siren, is disposed on the housing **2** at a section that offers maximum audibility at a distance of 100 to 125 feet. An on-off switch **6** is connected in series with the alarm device **5** to electrically disconnect the alarm device **5** from the system, when desired, leaving only the light bulbs **7** and **8** to flash repeatedly at a rate of about 30 to 35 flashes per minute and to illuminate the "HELP" during each flash. The switch **6** is maintained closed most of the time for the most effective operation of the system.

A timing mechanism **9**, which may be similar to an electric clock mechanism, except that the timer **9** is provided with a push-on and push-off switch means **10** and an indicator light **11**, which is lit when switch **10** is closed; switch **10** also serves as a main power switch and, when closed, it receives through cable **12** a 115-volt a-c current such as that provided in a household current outlet. When closed, switch **10** provides current to the auditory alarm device **5**, electric lamps **7** and **8**, through cable **13** and fuse plug **14** plugged in a socket **15** located at the base section **16** of the housing **2**. When the main pushbutton switch **10** is opened, the auditory alarm **5**, lamps **7** and **8**, and the emergency switch **17**, which receives current channeled by switch **10** through cable **34**, become deactivated.

As the electric current is led through cable **12** into the timing mechanism **9** the direct-connected timing mechanism **9** begins to operate, independently of any switch provided in the system, and when switch **10** is turned on it channels current through cable **13** to the fuse plug **14** and and its socket **15**. Between the fuse plug **14** and socket **15** is a light flasher **18** (FIG. **5**) of a type usually used for flashing Christmas tree lights or caution lights on the outside door of a photographic darkroom. From the fuse plug **14** and flasher **18** the current is branched off to the sound alarm device **5** and the two lamps **7** and **8**. The flasher **18** causes the alarm device **5** and the lamps **7** and **8** to operate together about 30 to 35 times per minute.

The light-and-alarm combination can also be turned on indirectly by means of the timing mechanism **9**, which normally contains a built-in lever such as the one exemplified by numeral **19** of FIG. **5**. This lever is usually located adjacent the core of the rotor of the timing mechanism and is normally in a position shown by numeral **19A** when the device is operating in its quiescent state. However, when the system user desires to operate the alarm **5** and the lights **7** and **8** at a predetermined time, ordinarily the next morning, he sets the timing pointer **20** on the timing mechanism **9** to the required time before going to bed so that in case he does not wake up due to an organic illness, passing out, or a stroke (even death!) the lever **19** automatically moves to position as at **19**, shown in FIG. **5**, when the set time has arrived. This action moves down the lever **21** of a microswitch **22**, which is positioned adjacent the lever **19** (during manufacture of the timing mechanism) with its lever **21** in abutment with lever **19** and closes the microswitch **22**. Since the microswitch **22** is connected in series with cable **23** and **24** and pushbutton switch **10**, the closing action of the microswitch **22** channels the current from the 115-volt source to the alarm device **5** and the lamps **7** and **8**, energizing them to operation. The setting of the timing mechanism to actuate the light-alarm combination is accomplished with a knurled knob **25** at the back side of the timing mechanism **9**, and to adjust the timing hand on the front surface of the timing mechanism **9** the knurled knob **26** is used.

A modified way of operating the light-alarm signalling system is by providing a battery-operated microwave transmitter **27**, which may be carried in a shirt pocket and operated by pressing a button **28** during emergency. The button **28** is a pushbutton switch which closes the transmitter circuit from which a signal is transmitted to the receiver **29** provided with a relay solenoid coil **30**, shown in FIG. **5**. When the aerially transmitted signal reaches the receiver **29** the signal is amplified therein and fed to the solenoid coil **30**, which becomes energized and closes the spring-biased switch **31** connected in series with the cables **23** and **24**. Closure of the switch **31** results in the actuation of the alarm device **5** and the lamps **7** and **8** by a current passing through the flasher **18**.

The signal transmission can be achieved from any part of the dwelling to the receiver **29**, which may be located at a distance of up to 125 feet from the transmitter **27**. The transmitter is also provided internally to its housing with a gravity-operated switch located in a section designated **32** by broken lines in FIG. **7**. In this case, when a person carrying the transmitter **27** is seized by a sudden attack of a cardiac trouble or stroke, causing him to fall on the floor and not be able to get up, the gravity-operated switch **32** becomes closed and thereby energizes the transmitter **27**, which then transmits a signal to the receiver **29** and resulting in the closure of switch **31**. Numeral **35** is a telescopic antenna

which may be left at a predetermined extension at all times.

Another advantage that may be attributed to the invention is to replace the emergency switch **17** by a normally open thermostatic switch which may be taken into bed at night or during illness, the same way as switch **17**, so that when an unexpected disaster inflicts the person, the body temperature falls and thereby the thermostatic switch automatically closes and actuates the alarm system. The thermostatic switch may take the form of a quadrangular aluminum housing (because of its high heat conductivity) of dimensions 2.5 by 2.5 by ½ inches, containing a thermostatic element that warms up by the body heat and thus keeps the switch open as long as the temperature remains above 80°F. When the body cools below 80°F, by ceasing to function, the thermostat closes and actuates the alarm system. This switch would be particularly suitable for situations where the person living alone is not frequented by any relatives or neighbors.

The disclosure of the invention described herein presents preferred methods of operating the invention; however, variations thereof in the form, construction, and application, such as for remotely operating electrical machines or mechanisms, can be made without departing from the spirit and scope of the appended claims.

I claim:

1. An alarm system for signalling for emergency help, comprising: a portable signalling device having therein an auditory and a visual signalling means operable from an electric current source, an operation-interval limiting means having in the electric circuit thereof a system of multiple switches connected in series with the circuit of said auditory and visual signalling means and including a remotely located switching means to control the operation thereof; said auditory and visual signalling means having in the circuit thereof a first means for producing intermittent operation of said auditory and visual signalling means, and a second means adapted to operate said auditory and visual signalling means automatically as well as manually from a remote distance; and, a third means in said operation-interval limiting means for adjustment of time of quiescent operational interval prior to initiation of signalling operation of said portable signalling device.

2. An alarm system for signalling for emergency help as defined in claim **1**, wherein said auditory and visual signalling means comprises a housing having therein an electric light source, a high dB sound alarm means connected in parallel with said electric light source, and a current interrupting means in series connection with both of said electric light source and sound alarm means and adapted to turn them on and off periodically.

3. An alarm system for signalling for emergency help as defined in claim **2**, wherein said housing is provided in the wall thereof with an on-off switch connected in the circuit of said high dB sound alarm means to turn off said sound alarm means when a user feels discomfort produced on him by said sound alarm means.

4. An alarm system for signalling for emergency help as defined in claim **1**, wherein said remotely located switching means is a readily accessible and easily operable emergency switch and comprises a long-length electric cable connected in series with the circuits of said auditory and visual signalling means for control of operation thereof.

5. An alarm system for signalling for emergency help as defined in claim **1**, wherein said first means for producing intermittent operation of said auditory and visual signalling means is a thermosensitive element actuated by the energization current led thereby into said auditory and visual signalling means.

6. An alarm system for signalling for emergency help as defined in claim **1**, wherein said second means comprises a microwave transmitter and a receiver, wherein said transmitter contains a manually controlled switch means and an automatically controlled switch means, each of which is capable of functioning independently of each other.

7. An alarm system for signalling for emergency help as defined in claim **6**, wherein said receiver is positioned in adjacent relation to said operation-interval limiting means and is provided with a solenoid relay capable to close a normally open spring-biased switch located in the circuit of said auditory and visual signalling means and connected in series therewith.

8. An alarm system for signalling for emergency help as defined in claim **6**, wherein said automatically controlled switch is a mercury switch operable by gravity when said transmitter is tilted 45° or more from the position normally maintained by said transmitter, for energizing said transmitter to transmit a signal to said reveiver for initiation of the operation of the alarm system.

9. An alarm system for signalling for emergency help as defined in claim **1**, wherein said third means comprises a timing mechanism connected in the main circuit line leading to the auditory and visual signalling means and is provided with a lever means movable by the rotor of said timing mechanism at manually set intervals; a normally open switch disposed adjacent said lever means and operable thereby being in series connection with said auditory and visual signalling means to actuate said auditory and visual signalling means upon expiration of the timing interval for which the timing mechanism is set.

10. An alarm system for signalling for emergency help as defined in claim **1**, said auditory and visual signalling means is provided with a housing therefor, and wherein the visual signalling section of said auditory and visual signalling means comprises electric lamps positioned within said housing, said housing having a front panel with alphabetical letters forming the word "HELP" die-cut therein and a transparent colored sheet element disposed in abutment with said front panel on the interior aspect thereof, whereby when said electric lamps are energized they illuminate said word "HELP" so that the word can be visible at a considerable distance from said housing.

11. An alarm system for signalling for emergency help as defined in claim **1**, wherein said alarm system comprises two electrically operated units connected together through an electric cable; one of said units having a housing with a base and a front panel with letters HELP affixed therein, and included in said housing being a plurality of electric lamps disposed side by side on said base, an auditory alarm device having 80 to 90 dB sound intensity positioned adjacent to said plurality of electric lamps and electrically connected in parallel therewith, and a fuse plug with a socket containing a light flasher therebetween and electrically connected in

series with said auditory alarm device and said electric lamps; the second of said electrically operated units comprising a timing mechanism receiving a current from an external source for operation thereof, a main switch means disposed in said second unit and receiving a current from said external source for channeling a current to an emergency hand switch remotely located from said second unit, to said auditory alarm device, and to said plurality of electric lamps through the fuse plug and flasher combination; said timing mechanism having a rotor and a movable lever means positioned adjacent thereto and operated thereby, a microswitch means having a switching lever being positioned adjacent to said movable lever in abutment therewith whereby when said movable lever means changes position due to the timing mechanism it causes the switching lever to move therewith and to close the microswitch, thereby permitting a current to flow from said external source to said auditory alarm device and said plurality of electric lamps to energize them to signalling operation; a microwave receiver having an electrically isolated discrete transmitter and being provided with a solenoid means disposed within the housing of said timing mechanism, and a normally open switch means connected in series with the electric line leading to said auditory alarm device and said plurality of electric lamps being positioned in adjacent relation to the solenoid means of said microwave receiver whereby when said microwave receiver means receives a wireless signal from said transmiter the solenoid means becomes energized, closing the normally open switch means and thereby energizing the alarm device and the electric lamps which then signal repeated sound alarm and light flashes in synchronism.

12. An alarm system for signalling for emergency help as described in claim **1,** wherein said remotely located switching means is a thermosensitive element included in an aluminum housing for accommodation adjacent to a person's body for operation by the heat thereof, and when the body heat cools down to a predetermined temperature the thermostatic element closes the circuit, thereby allowing a current to flow to the alarm and light signalling means to incite said means to signalling for emergency help.

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