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PORTABLE THERMAL ALARM AND SIGNAL SYSTEM

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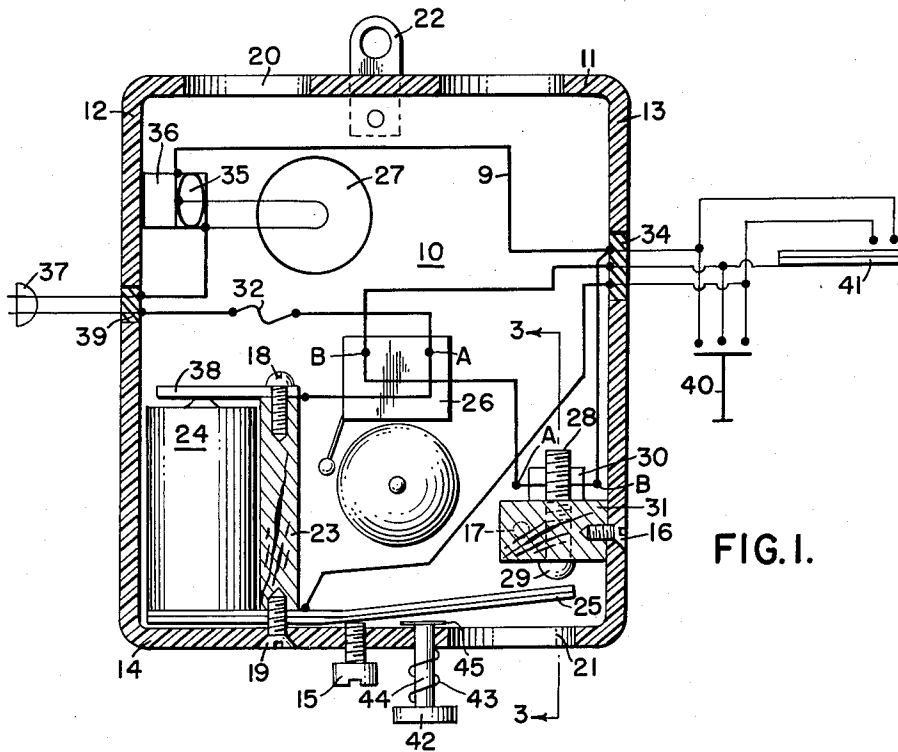


FIG. 1.

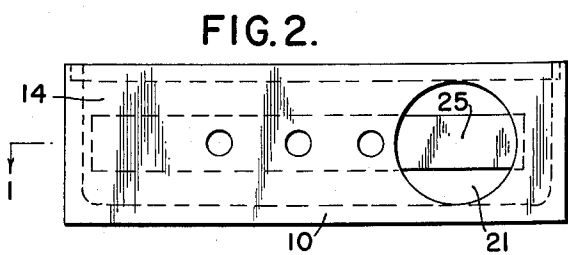


FIG. 2.

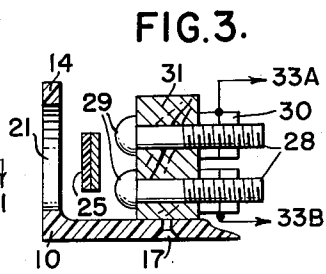


FIG.3.

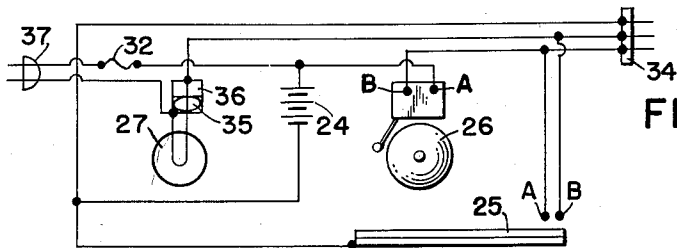


FIG. 4.

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PORTABLE THERMAL ALARM AND SIGNAL SYSTEM

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1 Claim. (Cl. 340—227)

This invention relates to alarm devices; specifically to thermal switch alarm devices as found in fire alarms; and to contact-switch signal devices as found in call systems.

This invention aims to provide a readily portable signal device operated by two types of electric current; and providing both a visual and audible signal of either continuous or intermittent nature.

The achievement of the above objectives has been accomplished in this invention, utilizing a single bi-metallic blade thermostatic switch and a single visual and a single audible signal alarm.

A signal device is presented which is of the simplest structure, and consequently the most inexpensive that can accomplish the achieved results.

It is an objective of the present invention to provide a combined A.C. house-current and D.C. battery current operated fire-alarm device which is operated on either the A.C. current alone, the D.C. current alone, or on the combined A.C. and D.C. currents operating the device together at the same time.

In each instance of different current application the resulting signal produced will be of a different nature.

An objective of the invention is to provide a signal alarm which is visual in nature, as well as audible, when operated on the house current. The front cover or the entire casing can be constructed of a transparent or translucent material, through which colored light, issuing from an electric-light bulb, is caused to shine when the circuit is closed, producing a visual signal. The visual signal can be seen at a distance by persons of poor hearing.

Another objective of the invention is to provide a signal alarm which is intermittent in nature in the visual signal, and either intermittent or continuous in the audible signal. The intermittent or flashing light signal is of a more attracting nature than a signal of a steady nature.

The D.C. current operating in the device alone will result in a signal that is continuous in nature in the audible alarm means. The A.C. current operating in the device alone will result in a signal that is intermittent or broken in nature in both the visual and audible alarm means.

The D.C. and A.C. currents operating in the device together and at the same time will result in a signal that is intermittent in the visual alarm means and continuous in the audible alarm means.

The use of a single bi-metallic blade in the device permits the employment of a single adjusting screw for regulating the time at which the device will begin operation of the foregoing signal alarms. The importance of having the device adjustable to operate at different temperatures can be readily seen, in that a portable fire alarm will sometimes be placed at a point lower in the room where the temperature is not raised as quickly by a fire as at a point at the ceiling.

Another objective of the invention is to provide a fire alarm device giving the foregoing signals when operated from a point outside the device, by the inclusion of the same type of thermostatic switch in an outside circuit as is included within the casing. This is accomplished by

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placing an external switch arrangement in parallel to the included switch by means of external connections.

Another objective of the device is to provide a portable call signal system in which the foregoing signal alarms are caused to be given by the inclusion in the device of a pushbutton-type of contact switch in parallel with the included or any external thermostatic switch.

A further objective of the invention is to provide a device whereby the foregoing alarm signals can be caused to indicate a pre-determined cold temperature. This can be accomplished by reversal of the surface of the bi-metallic blade facing the contact points, or by having the contact-points in a double-throw arrangement.

The following is a description of the device with reference to the accompanying drawing:

Fig. 1 is a vertical sectional view of the casing taken along reference line 1—1 of Fig. 2 and showing the included elements in place; also showing external connections.

Fig. 2 is a bottom view of the casing shown in Fig. 1 and showing the bi-metallic blade in proper position relative to the bottom of the casing.

Fig. 3 is a fragmentary vertical section taken along section line 3—3 of Fig. 1. This view shows double-contact points in proper position relative to the bi-metallic blade.

Fig. 4 is a schematic diagram of the wiring arrangement in the device.

The following is a description of the device as presented in the drawing:

A casing of any suitable material and shape, is shown here as a solid shell of plastic material rectangular in shape; consisting of the following: the back wall 10; the top wall 11, drilled as at 20 to provide ventilation; side walls 12 and 13; and the bottom wall 14, drilled as at 21 to provide ventilation.

The hanger 22 is here provided for hanging the device on a wall.

Contained in the casing: the bell 26; the lamp base 36; the flasher element 35; the light bulb 27; the fuse 32; the battery 24; the bi-metallic blade 25; contact block 31 and contact points 29; contact-point studs 28 with fastening nuts 30; battery terminal plate 38 mounted on supporting plate 23; also, wiring 9 and various mounting and attaching means.

In the drilled holes in casing wall: rubber grommet 39 for line-cord 37; plug jacks for external connections 34; adjusting screw 15; push-button assembly 42, 43, 44, 45.

The battery 24 is held in place by block 23 serving as the side support to hold the battery in position, the block being held in position by screw 19 which also serves to hold the bi-metallic blade in place. The battery terminal plate 38, held in place by screw 18, serves both as the battery positive terminal and the top support to hold the battery in place.

The bi-metallic blade 25 is held in place by screw 19 and serves as the negative terminal of battery 24.

The bi-metallic blade 25 makes contact with contact-points 29 attached to contact studs 28 which are of suitable magnetic or non-magnetic conducting metal, and which are in turn held in position by block 31 of a suitable electrical insulating material. Block 31 is fastened to the back wall 10 or the side wall 13 by the fastening screws 16 or 17. The four fastening nuts 30 hold the studs 28 in place and serve as fasteners to hold the wire connections 33A and 33B in contact with the studs as shown in Fig. 3.

Fig. 2 shows the thermostat 25 in place; provision for operation is provided by ventilation through openings or hole 21 in the bottom wall of the casing.

Fig. 1 shows the adjusting screw 15, which can be made of insulating material, whereby the included bi-

metallic blade may be changed in position relative to the contact-points 29.

To permit flush mounting of the screw fasteners all holes are countersunk. If preferred, the mountings may be riveted.

The house-current line-cord enters the casing through the provided hole, the hole having rubber grommet 39 inserted into it for protection of the line-cord.

One side of the house current power from the line-cord is connected to the fuse 32, the fuse being of a proper safety value. Other suitable current limiting means may be used in place of the fuse.

The other side of the house current power from the line cord is connected to the lamp base 36 containing a light socket; the light socket holds flasher button 35; the light bulb 27, which is of wattage sufficient to provide limited current adequate to operate signal alarm 26, is inserted in the lamp socket; from the other lamp base terminal the circuit is connect to the terminal 33B of contact stud 28 to which it is fastened by stud nut 30; thence to one of the contact-points 29. When the circuit is closed by the application of heat to the included bi-metallic blade 25, the current flows from one contact-point 29 on stud 28 with terminal 33B, through the bi-metallic blade laterally to the other contact-point 29 on stud 28 with terminal 33A. The bi-metallic blade may be solid or split in the center for part of its length. From connection terminal 33A the circuit runs to terminal designated 26B of the included audible signal means, through the signal means to designated terminal 26A, thence the circuit is completed through fuse 32 to the line-cord 37 and the outside power source. All the foregoing elements are in series in the circuit. When this circuit is closed, the signals given will be intermittent in nature in both the visual and audible alarms.

The second, or battery circuit contained in the device, runs from the included battery 24 terminal in contact with positive battery terminal plate 38, held by mounting screw 18, to the designated audible signal means terminal 26A, through the signal means to designated terminal 26B. From 26B the circuit runs to terminal 33A and connected contact-point 29, thence, when the circuit is closed by the application of heat to the included bi-metallic blade 25, lengthwise through the bi-metallic blade to the negative battery terminal in contact with said bi-metallic blade. The foregoing elements are in series in this circuit. When the circuit is closed, the audible signal given is of a continuous nature.

The two foregoing circuits, the A.C. house current circuit and the D.C. battery current circuit, are in parallel through the bi-metallic blade, through contact-point and stud connected to terminal 33A, and through the audible signal means.

Upon the application of house current and battery current at the same time to both circuits, the visual signal alarm will be operated by the house current and will be of an intermittent or flashing nature. The audible signal alarm will be operated by both types of current at the same time, the D.C. battery portion of the current causing the alarm signal to be of a steady or continuous nature. Should the D.C. current be terminated for any reason, such as depletion of the power in the battery, the A.C. house current will continue to operate the audible alarm. The signal will automatically change from a continuous signal to one that is intermittent in nature.

The foregoing signal alarms can be caused to operate by closing the thermostatic switch manually by the pushbutton 42, consisting of insulated button 42, shaft 44, top plate 45, and return spring 43. The pushbutton provides a quick test of the operating condition of the device.

The adjusting screw 15 provides a means for determining the temperature of operation of the device. Upon turning the adjusting screw inwardly or outwardly from a point outside the device, a means is provided to deter-

mine at what temperature the device will operate. Where the fire-alarm is not placed near the ceiling, it is important to have the device regulated to operate at a lower temperature.

The device can be caused to operate by activation from a distance to give the foregoing signal alarms, by the inclusion of external thermostats or pushbutton means, as shown in Fig. 1. External thermostats 41, the same type as the included thermostat, operate in parallel with the included thermostat. Also in parallel, the three-contact pushbutton switch 40, as shown in Fig. 1, will operate the device in the same manner.

Referring to Fig. 1, the center terminal of the external connection 34 is connected to terminal 26B of the audible signal means and is the common conductor connection for both external circuits. One of the remaining terminals of 34 serves as the extension terminal of the A.C. circuit. The third terminal of 34 serves as the extension terminal of the D.C. circuit, and is connected to the negative battery terminal.

Whereas changes may be made in the details of construction by the inventor or assignee, it shall be understood that such changes shall be within the spirit and scope of the invention as defined by the appended claim.

Having set forth and disclosed the nature of my invention, what is claimed is:

A portable signal system comprising: a casing; a line-cord means to introduce A.C. electric current from outside to inside the said casing; an electric light bulb visual signal means in series with the said line-cord; a low voltage audible signal means in series with the visual signal means; said visual signal means being a current-limiting means for the low voltage audible signal means; said visual light-bulb signal means mounted in a suitable base into which is inserted a current-interrupting means to cause the visual signal to be of an intermittent nature; a thermostatic switch in series with the foregoing circuit and comprising the following: a bi-metallic blade fastened at one end to the bottom of said casing and disposed immediately above an opening in the bottom of said casing; an insulating block mounted upwardly from a wall side face of said casing and directly above the free end of said bi-metallic blade and to serve as the mount for two separate insulated contact-points to which separate electrical contact-terminals are connected; both said contact-points mounted on the same face of said insulating block to face downwardly to the same side of said bi-metallic blade and both at the same distance from the free end of said bi-metallic blade; and having an adjusting means for determining the relative distance between said bi-metallic blade and contact-points when the circuit is open; said adjusting means comprising a screw threaded through the bottom of said casing and in contact with the said bi-metallic blade on side other than that facing said contact-points; said threaded screw providing, upon being turned inwardly or outwardly from a point outside the device, a means to control the degree of temperature at which the device will be caused to operate on closing of the circuit by the application of heat to the bi-metallic blade to cause it to bend toward the said contact-points till it comes into circuit-closing contact; the current to pass from such engagement point to the said bi-metallic blade, through the blade laterally to the second said contact-point and terminal, from the second said contact-point terminal to the said audible signal means in series to the foregoing circuit; from the other terminal of said audible signal means to said outside line-cord; the operation of said circuit causing an alarm signal that is intermittent in nature in the visual signal and audible signal; and also included in the casing a second circuit comprising the following: a battery source of electric current to the terminal designated negative of said audible signal means, through the audible signal means in series, to the second said terminal and contact-point; from the second said contact-point, upon closing of the circuit when

sufficient heat is applied to the said bi-metallic blade to cause circuit-closing engagement, through said bi-metallic blade longitudinally to the negative terminal of the included battery electric source located at the fixed end of said bi-metallic blade; the operation of said circuit causing an audible alarm signal that is of a continuous nature.

References Cited in the file of this patent

UNITED STATES PATENTS

1,011,175 Egan ----- Dec. 12, 1911 10

2,107,525
2,115,027
2,439,331
2,450,450
2,456,038
2,550,673
2,611,016
2,663,860
2,741,099

Derby ----- Feb. 8, 1938
Leonard ----- Apr. 26, 1938
Bean ----- Apr. 6, 1948
Schmidinger ----- Oct. 5, 1948
Young ----- Dec. 14, 1948
Cufalo ----- May 1, 1951
Nuccio ----- Sept. 16, 1953
MacInnes et al. ----- Dec. 22, 1953
Beane ----- Apr. 10, 1956