Feb. 4, 1936. J. W. ALEXANDER 2,029,402

FIRE ALARM

Filed Dec. 28, 1931 2 Sheets-Sheet 1

FIG. 1.

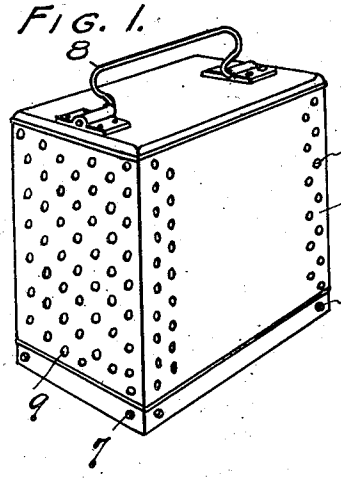


FIG. 4.

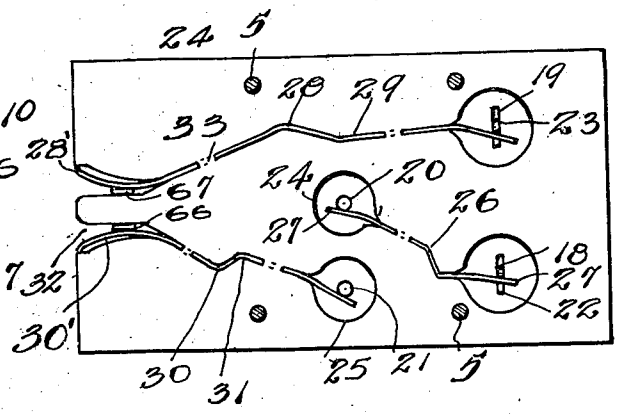


FIG. 2.

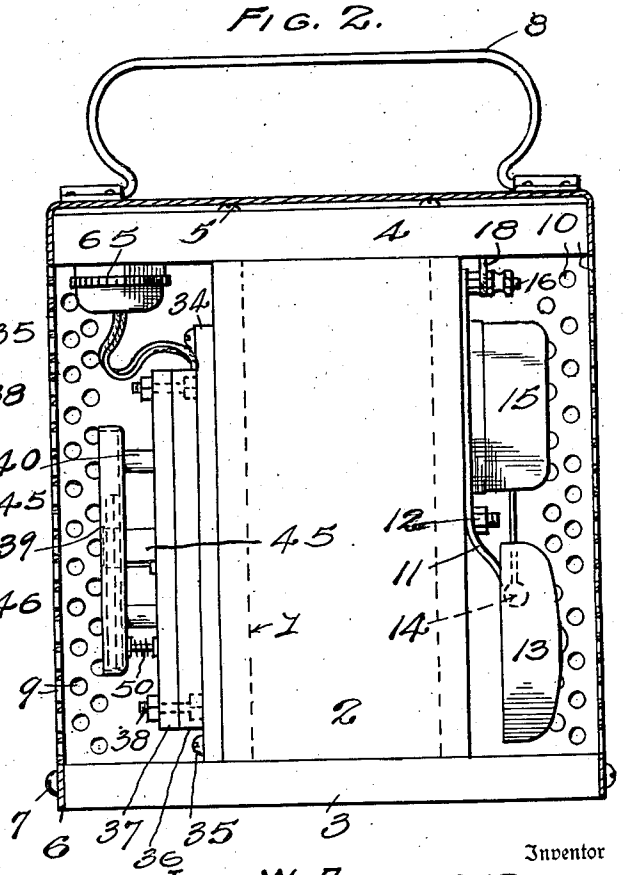
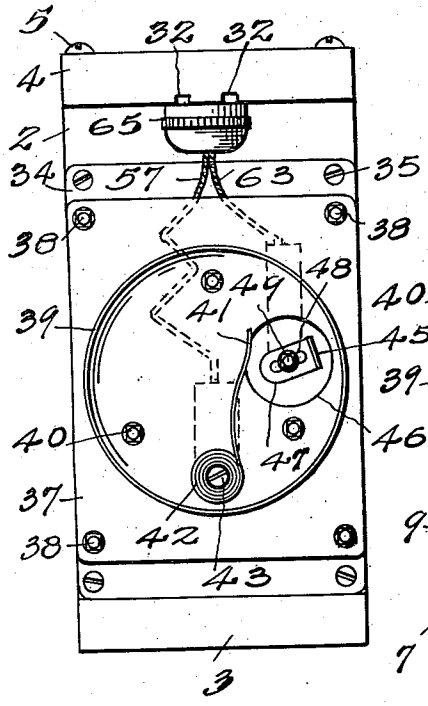


FIG. 3.



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FIG. 5.

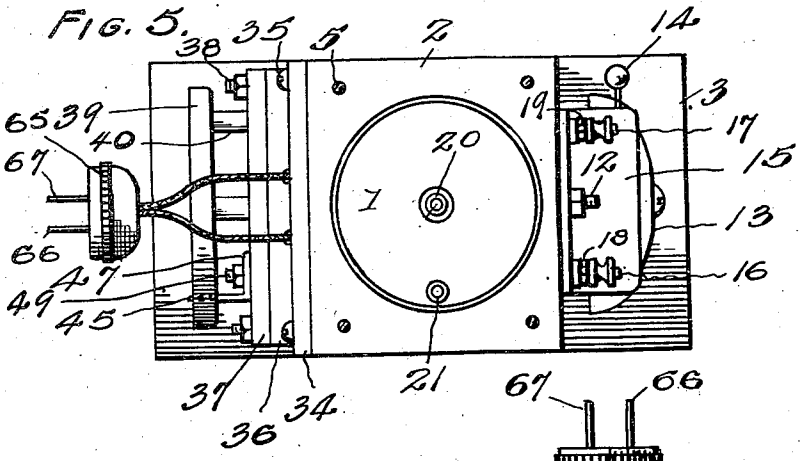


FIG. 6.

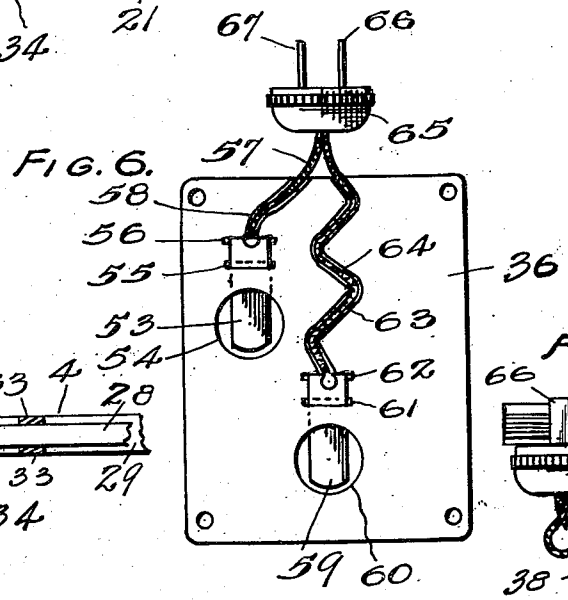


FIG. 7.

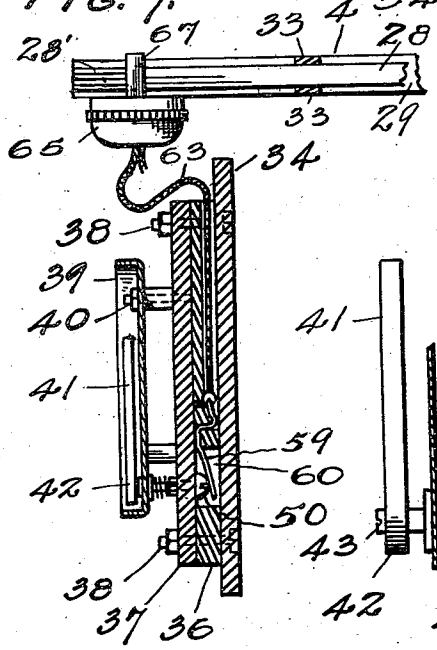


FIG. 8.

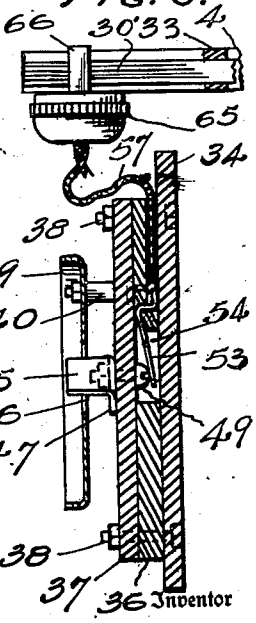
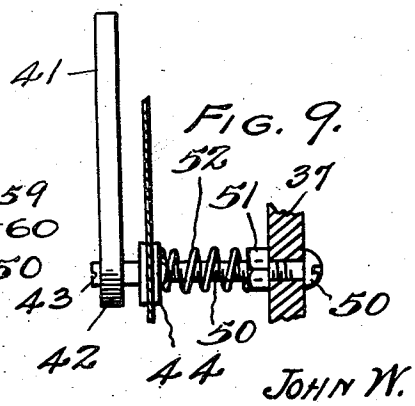


FIG. 9.



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UNITED STATES PATENT OFFICE

2,029,402

FIRE ALARM

John W. Alexander, Clarendon, Va.

Application December 28, 1931, Serial No. 583,561

1 Claim. (Cl. 177—311)

The present invention relates to improvements in fire alarms of the portable, electrically operated type, employing a thermostat as a circuit maker for the alarm or signal circuit in which circuit the alarm device is located. While I have here illustrated the alarm as an audible one, or electric bell, it will be understood that a visible signal or alarm may be actuated when the circuit maker is closed under conditions of excessive heat that actuate the thermostat. By the utilization of my invention I am enabled to produce a self-contained, compact, portable, and convenient device of this character, which while especially designed to perform the functions of an automatic alarm in a hospital, dwelling, &c., is also adapted, for use in various other buildings or structures, to sound an alarm when an excessive degree of temperature is reached.

The invention consists in certain novel combinations and arrangements of parts including a source of electrical energy, as a battery, the electrically operated signal, the thermostat, and connections whereby an efficient, durable, and convenient device of this character is provided. In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention in which the parts are combined and arranged according to one mode I have thus far devised for the practical application of the principles of my invention.

Figure 1 is a perspective view illustrating the exterior appearance of the portable device of my invention. Figure 2 is an enlarged vertical section through the outer casing of the device showing the parts of the device in side elevation. Figure 3 is an end view, with the casing removed, looking from the left in Figure 2. Figure 4 is a plan view of the underside of the top of the instrument, separated therefrom for convenience of illustration. Figure 5 is a top plan view of the device with the top removed. Figure 6 is an inner face view of one of the end plates with terminals for the thermostat. Figure 7 is a sectional view showing one of the terminals for the thermostat and Figure 8 is a similar view showing the other terminal and connections for the thermostat. Figure 9 is an enlarged detail sectional view showing one of the terminal connections for the thermostat.

In the portable, self-contained alarm device I preferably employ a suitable battery 1 that is encased within its holder 2 with the top of the battery approximately flush with the open upper end of the holder, while the holder at its bottom is fashioned with a base 3 of sufficient area to provide a stable support for the device which may rest on the floor of a room, or upon any other suitable support. A removable top 4 is provided for the device or instrument, and as shown the top is secured to the battery holder or body of the instrument 2, by screws as 5.

To protect or shield the instrument or device from breakage of parts, and to present a neat and attractive appearance, I preferably employ a casing 6 that surrounds the operating parts of the device, and screws 7 at the bottom of the casing may be utilized to secure the open bottom casing to the base 3. A pivoted handle or bail 8 is secured at the top of the instrument for convenience in transportation, or this bail may be used to suspend the alarm device from a suitable support on a building wall.

At the opposite ends of the casing are provided reticulated or perforated portions 9 for the purpose of permitting access of the atmosphere to the thermostat within the casing, and other perforations 10 permit transmission of sound from the alarm.

At one end or side of the holder 2 is attached a bell bracket 11, by means of bolts 12, and the bell 13 with its tapper 14 may be of any well known electro-magnetically operated type with a customary magnet located in the magnet casing 15.

Two terminal bolts 16 and 17 are provided for the bell, and as seen in Figure 5 these bolts have mounted thereon terminal posts 18 and 19 fashioned from copper plate and clamped on the bolts in secure manner.

The battery 1 is provided with the usual terminal posts 20 and 21, the former at the center and the latter at the side of the top of the battery, as indicated in Figure 5.

The top plate 4 may be fashioned from wood, molded or cast from composition material, or other suitable insulating material may be employed in the manufacture of these top plates, and the conductors for the bell and battery and thermostat are encased in these insulated top plates.

Near one end of the plate two holes 22 and 23 are provided through which, or into which, the two terminal posts 18 and 19 project, and a second pair of holes 24 and 25 are provided in the top plate into which the battery terminals 20 and 21 project when the top plate is in place.

A slot 26 connects the two holes 22 and 24 in the top plate and a conductor blade 27, of resilient, conducting material, is encased within this slot, with its free ends projecting into the holes

and in frictional and electrical contact with the respective posts 18 of the bell and 20 of the battery.

A second blade 28 is encased in a slot 29, and a third blade 30 is encased within the slot 31 of the top plate, and these two slots terminate at one end of the plate in socket slots or guide slots 32 that open at the end of the plate. As seen in Figs. 7 and 8 the slots are wider or deeper than the width of the blades, and the slots, as best seen in Figure 4 are arranged in zig-zag form so that the resilient conductor blades will frictionally engage the walls of the slots and hold the blade in place, and bridges 33 are provided at the tops and bottoms of the slots to prevent displacement of the conductor blades.

The resilient ends 28' and 30' of the blades 28 and 30 terminate in the end slots 32, and these guide slots or socket slots receive the blades or prongs 66 and 67 of the connection plug 65, which as indicated in Figure 4 are slid into the slots in frictional and electrical contact with the spring blades to make the connection between the battery and bell and the thermostat.

The thermostat is located or mounted on the side of the battery holder opposite to the bell attachment, and an attaching plate 34 and screws 35 are employed for this purpose. In addition to the attaching plate 34 I employ the intermediate plate 36, and an outer plate 37, and these two plates are secured to the attaching plate by bolts as 38. These three plates and their connections provide a detachable unit for the thermostat that is combined with the battery and bell.

The thermostat includes the circular flanged disk 39 that is spaced from the outer plate 37 and secured thereto by bolts as 40, and the flat-spring or resilient arm 41 and its coil 42 are secured by the screw 43 to the disk, with a contact head 44 for electrical connection. For coaction in making the electric circuit with the resilient arm 41, I employ a stationary, but adjustable blade 45 that projects through an opening 46 in the disk and is located in the path of movement of the arm. It will be understood that when the arm 41 and coil 42 are affected by excessive heat, the arm is swung to the right in Figure 3 into frictional and electrical contact with the blade or contact member 45 to close the signal circuit.

The adjustable contact blade is fashioned with a flange 47 having a slot 48 therein, and the clamp screw 49 is employed to secure the flanged contact plate in proper position with relation to the thermostat arm for closing the circuit under various degrees of temperature. As shown the contact member is mounted on the outer plate 37, and the clamp screw 49 extends through the plate to its inner side to provide one terminal for the thermostat.

The contact head 44, together with a screw 50 forms the other terminal for the thermostat, and this screw 50 is secured also in the outer plate 37, by means of a lock nut 51 and the screw-head. The screw 50 is alined with the coil screw 43, and between the screw 50 and the head 44 is interposed a spring 52 coiled around screw 50 to insure at all times the proper contact for electrical current between the screws 43 and 50.

As best shown in Figures 6, 7, and 8, the intermediate plate 36 is provided with a pair of contact blades for connection with the terminals of the thermostat, the resilient or spring blade 53 being held in contact with the terminal screw 49.

The plate 36 is fashioned with an opening 54 to permit frictional contact between the resilient blade and the screw, and the blade is bent or shaped in such manner that it may be secured in two parallel slots 55 and 56 in the intermediate plate. Thus the resilient free end of the blade is located at the outer side of the intermediate plate for contact with the screw head 49 and the plates 36 and 37 are clamped together to insure close frictional contact and similar electrical contact between the screw and blade. A conductor or wire 57 is soldered or welded to the upper end of the resilient blade, and this wire is depressed in a groove 58 in the inner face of the intermediate blade as indicated in Figures 6 and 8.

A second resilient blade 59 is mounted in the intermediate plate adjacent the complementary hole or orifice 60, and this blade is held in close frictional and electrical contact with the screw 50 as indicated in Figure 7. A pair of parallel slots 61 and 62 are provided in the intermediate plate for anchoring the resilient blade 59, and a conductor 64 is welded or soldered to the blade. This conductor is depressed in the zig-zag groove 64 in the inner face of the intermediate blade, and it will be apparent that as the two plates 36 and 34 are clamped together, the conductors 57 and 63 depressed in the grooves provided therefor, are securely anchored and protected against wear or breakage. As clearly shown in Figure 6 these conductors 57 and 63 are passed through the plug 65 and are then secured to the two prongs or blades 66 and 67 of the plug.

The thermostat unit as thus described is a compact combination and arrangement of the required parts to insure a simple and inexpensive thermal device, which is attached to or mounted on the holder 2 by means of the screws 35, and the parts are firmly secured against displacement or breaking, thus substantially avoiding or eliminating the necessity for repairs.

The plug is detachably connected with the top plate of the device, and it will be apparent that the prongs or blades 66 and 67 of the plug 65 may be slipped upwardly into position at the openings of the grooves 33 and 30, and then these prongs are slid along the socket grooves until the prongs slide into frictional and electrical contact with the resilient coils or springs 29 and 30. The prongs are forced between the spring coils and the walls of the socket grooves into close frictional contact, and the plug with its prongs is supported by the frictional contact from the top plate. In this manner the electrical connection between the thermal device and the bell and battery is completed and the alarm is set. If desired or necessary to disconnect these parts, the plug is slid to the left in Figure 2 (after the casing 6 has been removed) thus breaking the circuit, and the plug may hang freely on its cords 57 and 63.

From the above description taken in connection with my drawings it will be apparent that I have provided a durable, compact, and conveniently arranged instrument for the purpose desired, which is inexpensive in the cost of manufacture, reliable, and efficient in the performance of its functions.

While I have shown one complete example of the physical embodiment of my invention, it will be evident that changes and alterations may be made, within the scope of my claim, without departing from the principles of my invention.

Having thus fully described my invention, what

I claim as new and desire to secure by Letters Patent is:

The combination in a fire alarm with a holder, a battery therein, and an alarm mounted on the holder, of a removable top plate for the holder having holes and open-end slots, terminal posts on the battery projecting into two of said holes and terminal posts of the alarm projecting into two other holes, a resilient conductor blade in one slot having a free end in contact with an alarm terminal and another free end projecting into the open end of its slot, a second conductor blade having a free end in contact with a battery post and its other end projecting into the open end of its slot, a thermostat mounted on the holder and a connecting plug electrically connected therewith, blades on said plug for frictional engagement with the ends of the blades in the open end slots, and a third conductor blade in a slot of the top plate having its resilient ends in contact with a battery post and an alarm post respectively.

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