April 12, 1927. A. M. DE S. GREAVES 1,624,866

PORTABLE FIRE ALARM

Filed Jan. 17, 1922

Fig. 1.

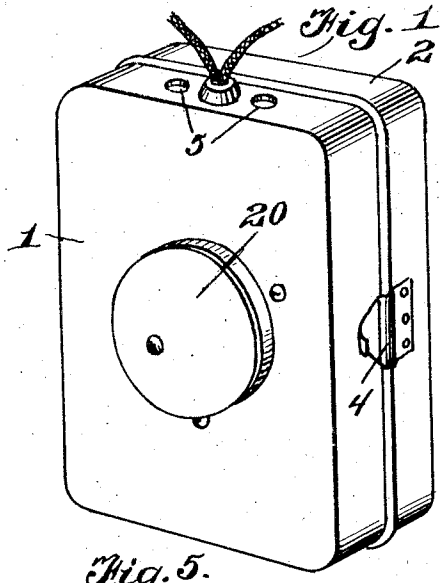


Fig. 2.

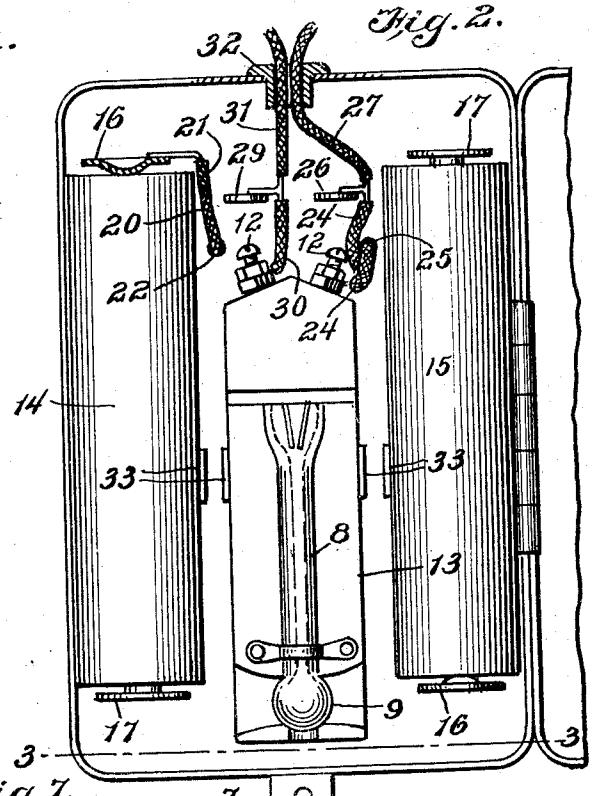


Fig. 5.

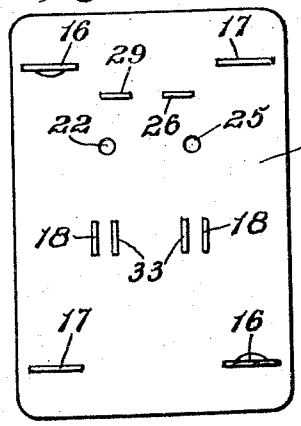


Fig. 7.

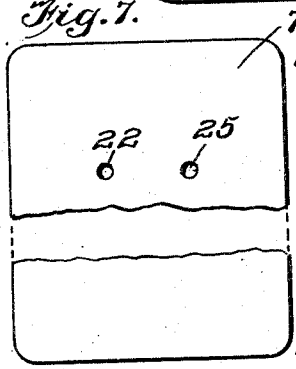


Fig. 4.

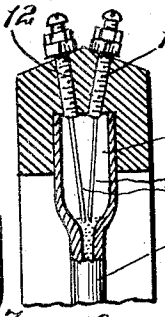


Fig. 6.

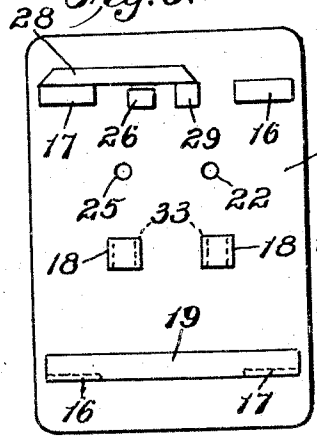


Fig. 8.

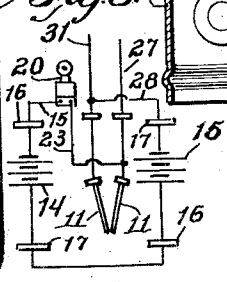
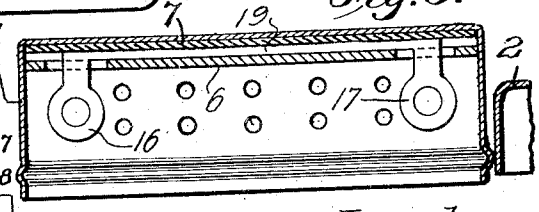


Fig. 3.



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UNITED STATES PATENT OFFICE.

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PORTABLE FIRE ALARM.

Application filed January 17, 1922. Serial No. 529,866.

This invention relates to a portable fire alarm, and one of its objects is to provide an electrical alarm device which is simple and inexpensive in construction, reliable and efficient in operation, and adapted to be placed for use as desired in any room or other portion of a building, so as to be influenced by an abnormal rise of temperature within a given area and to sound an alarm to give warning of the impending danger.

Another object of the invention is to provide an alarm which, when energized, may be used to not only actuate its own alarm device, but also to actuate an alarm device in another portion of a building, or to actuate an annunciator to indicate the particular point of location where a fire has broken out.

A still further object of the invention is to provide an alarm device of such simplicity, small size and ready portability as to be cheaply furnished for household use or to be carried by travelers for their use in hotels and the like.

The invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawing, in which:—

Figure 1 is a perspective view of the alarm device in complete form for use.

Figure 2 is a front view of the same with the front door of the casing thrown open to expose the interior thereof.

Figure 3 is a horizontal section on line 3—3 of Figure 2.

Figure 4 is a detail view of the thermostatic circuit closer.

Figure 5 is a face view of the backing plate.

Figure 6 is a rear view of the same.

Figure 7 is a view of the insulating or shield plate.

Figure 8 is a diagrammatic view of the electric circuit.

In carrying my invention into practice, I provide a casing 1 to enclose the working parts, the body of said casing being open at the front and adapted to be closed by a hinged door or cover 2, secured normally in closed position by a spring clip or other suitable fastener 4. Said casing may be of oblong rectangular form or other suitable form, and the body or the cover member thereof is provided in its bottom wall with air inlet openings 4 and in its top wall with air outlet openings 5. These openings permit air to circulate through the casing, so that the circuit controlling connection inside the casing may be directly influenced by heated air, when the temperature rises to a certain degree, in order to effect the actuation of the alarm.

Arranged within the body of the casing is a backing or support 6 comprising a sheet of fiber or other suitable non-conducting material. This sheet 6 is disposed adjacent to the front wall of the body of the casing, and disposed between said sheet 6 and the front wall of the casing is a similar sheet 7, serving as a protector for certain parts of the electrical connections and to insulate the same from the wall of the casing to obviate liability of short circuiting.

Supported by the sheet 6 is a thermostatic circuit closer comprising a mercury tube 8 communicating at its lower end with a mercury containing bulb 9 and having at its upper end an expansion chamber 10 into which project the circuit closing contacts 11. The lower ends of these contacts 11 are suitably spaced and terminate in line with the bore of the tube 8 and adjacent to its point of communication with the chamber 10, so that said contacts will be connected by the mercury flowing from the bore into the expansion chamber, to complete the circuit, when the temperature rises to the predetermined degree. The contacts 11 are fixed at their upper ends to threaded stems 12 engaging threaded openings in the top of a supporting block or base 13 on which the thermostatic circuit closer is mounted, said stems 12 forming binding posts for the attachment of conducting wires, as hereinafter described.

The alarm circuit controlled by the said thermostatic circuit closer includes a pair of dry battery cells 14 and 15, disposed vertically on opposite sides of the thermostatic circuit closer, which circuit closer is preferably arranged at a central position within the casing and between said battery cells. Each battery cell is clamped between a pair of spring clips 16 and 17 carried by the backing 6, and these spring clips 16 and 17 also form contacts for engagement with the opposite poles of the battery. In applying each battery for use, it is inserted through the open front of the casing between the clips 16 and 17 which yield to permit it to enter between them, and then the clips

spring back by their resiliency and engage the exposed poles of the battery at the ends thereof and clamp said battery in place. In addition a spring clip or finger 18 may be provided upon the backing sheet to engage the inner side of each battery cell and hold it pressed against the adjacent side wall of the casing body, the several clips 16, 17 and 18 forming supports which hold the battery securely in position against casual displacement while admitting of its ready removal and replacement whenever occasion requires.

The contacts 16 and 17 associated with the respective cells 14 and 15 are reversed in their order of arrangement. As shown particularly in Figure 6, the lower contacts 16 and 17 engaging unlike poles at the lower ends of the cells, are connected by a conducting strip 19 uniting said contacts at the back of the sheet 6, while the upper set of contacts 16 and 17 engaging unlike poles at the upper ends of the batteries are normally electrically disconnected. Suitably mounted upon the front wall of the casing is a bell or other desired type of signal, and extending from the upper battery contact 16 to one pole of this bell is a conducting wire 21 which passes through registering openings 22 formed in the sheets 6 and 7. The other pole of the bell 20 is connected by a conductor 23 with the binding post 12 of one of the circuit closing contacts 11, with which binding post is also connected another conductor 24, the second conductor 23 extending between said bell and binding post through registering openings 25 in the sheets 6 and 7. Conductor 24 is secured to and electrically connected with a junction plate 26 mounted on the backing 6, and also secured to said junction plate 26 and electrically connected with the conductor 24 is a conductor 27.

It will be observed from the foregoing that the upper pole of battery 14 is connected by conductor 21 with one pole of the bell 20, the other pole of which bell is connected with one of the circuit closing contacts 11. Also it will be observed that the lower pole of battery 14 is permanently connected by means of the conductor 19 with the lower pole of battery 15. The upper pole of battery 15 is connected with a conductor 28 which comprises a metallic strip arranged upon the back of the sheet 6, much the same as is member 19, and extending between the battery contact 17 and a junction plate 29 supported by the sheet 6, to which junction plate is secured and electrically connected a conductor 30 leading to the binding post 12 of the other circuit closing contact 11. Also secured to and electrically connected with the junction plate 29 is a conductor 31. The circuit connections above described, exclusive of the conductors 27 and 31, form, with the batteries 14 and 15 and the thermostatic circuit closing device, a complete electric alarm circuit within the casing which, when energized, will sound the bell or signal 20. The conductors 27 and 31 lead outwardly from the casing through an opening 32 and may form component parts of an outside circuit which may be energized by the said enclosed circuit for the purpose of actuating an alarm or annunciator at a distance, as hereinafter described.

In practice, the alarm device embodying the parts and connections above set forth, and which is completely enclosed within the casing or container 1—2, may be made of very small size and of such compact shape that it may be carried in the pocket or within a traveling case so that it is readily portable and may be mounted for use wherever desired. While the bell is described as being mounted upon casing body 1, it may, of course, be mounted upon the casing cover 2. As shown in the present instance, the cover 2 is arranged to form the back part of the casing, and is designed to be fastened in any desired manner upon a wall, door frame or other support, leaving the body portion 1 free to be opened or closed on the hinged connection between the same and the cover. This arrangement, however, may be reversed, as will be apparent from the foregoing description. The device as thus constructed may be mounted vertically, as stated, or may be arranged upon any suitable support for use in any room or portion of a house or other building, so that in the event of a fire breaking out in the immediate vicinity in which it is located the mercury expanding and rising in the tube 8 will connect the contacts 11 and energize the alarm circuit to sound the alarm bell 20, thus warning the occupants of the room or building of the impending danger. It therefore provides a convenient alarm device for the use of householders who may desire to place a signal alarm device at any point within the house, and it may also be employed in a convenient manner by travelers who desire to carry an alarm device with them to give warning in the event of fire breaking out in their room or in an adjacent portion of a hotel at which they are stopping. The device is also well adapted for the use of campers and others who desire to employ a protecting device of this kind. By the use of the conductors 27 and 31, which may be extended to any part of a house or building, the alarm device may also be employed to operate one or more distant alarm devices located at one or more points in a building, for giving a general alarm when the circuit of the alarm device in question is closed by the thermostatic circuit closer. The contacts 27 and 31 may also be connected with an annunciator, such as shown diametrically in Figure 8 located at a main point in a building so as to indicate

the exact point in the building where the fire has broken out. Conductors 27 and 31 further provide a means by which the alarm device in question may be connected with a fire alarm circuit of a hotel or other building where an annunciator or indicator is employed for the stated purpose, whereby the occupant of the room will not only be advised of the breaking out of the fire but such information will also be communicated to the main office or some other point of a hotel, apartment house or other building to give additional warning of the breaking out of a fire.

As stated, the batteries 14 and 15 are secured in position in a manner to admit of their ready and convenient insertion and removal. The thermostatic circuit closer may also be removably secured in position by clips 33 anchored in the backing 6, and the wires 24, 25 and 30 in conjunction with the junction plates 26 and 29 will additionally serve to hold the thermostatic circuit closing device in position against liability of casual displacement, while admitting of its ready and convenient removal.

Having thus fully described my invention, I claim:—

1. A portable fire alarm comprising a casing, a non-conducting backing sheet within the casing, two pairs of spring contacts carried by the backing sheet, a dry cell arranged between each pair of spring contacts adjacent to the sides of the casing and having the poles thereof engaged by said contacts, clips carried by the backing sheet and holding the cells pressed against the sides of the casing, a conducting connection between a spring contact of one pair of contacts and a spring contact of the other pair of contacts, an alarm device on the casing, conductors associated with said contacts and forming therewith and with said dry cells an electric circuit in which said alarm device is arranged, circuit closing contacts in said circuit, and a thermostatic circuit closer enclosed within said casing for electrically connecting said circuit closing contacts at a predetermined temperature.

2. A portable fire alarm comprising a casing, a non-conducting backing sheet within the casing, dry cells disposed at opposite sides of the casing, pairs of spring clips secured to the backing sheet and engaging the poles of each cell and holding said cells in position, a thermostatic circuit closer supported upon the backing sheet between said cells and having circuit closing contacts, an electrical connection between two spring clips engaging opposite poles of the cells, a pair of junction plates, an electrical connection between one of said junction plates and one of the other cell clips, electrical connections between the junction plates and the circuit closing contacts, a bell, a conducting connection between one terminal of the bell and the remaining cell clip, and a conducting connection between the other terminal of the bell and the junction plate connected with the other cell clip of the same pair.

3. A portable fire alarm comprising a casing, a backing sheet within said casing, dry cells disposed on opposite sides of the center of the casing at the front of said backing sheet, an upper and a lower spring clip for each dry cell engaging the poles thereof, side clips for holding said cells pressed against the sides of the casing, a thermostatic circuit closer supported upon the backing sheet between the dry cells, said thermostatic circuit closing device having contact points, an electrical connection between two of the pole engaging clips of the cells, a pair of junction plates supported by the backing sheet, electrical connections between the same and the circuit closing contacts, a conducting connection between one of said junction plates and one of the other pair of spring clips, a bell supported by the casing, a conducting connection between one pole of the bell and the remaining spring clip, a conducting connection between the other pole of the bell and the other junction plate, certain of said conductors being disposed upon the rear of the backing sheet, and an insulating covering between said connections and a wall of the casing.

In testimony whereof I affix my signature.

ABILIO M. DE SILVA GREAVES.