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AUTOMATIC FIRE ALARM FUSE BULB

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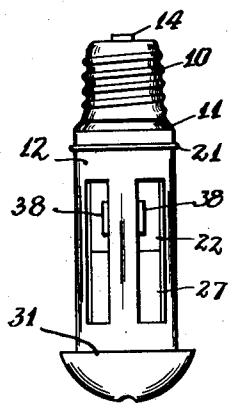


Fig. 1.

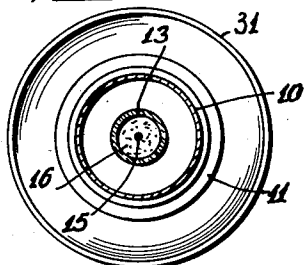


Fig. 3.

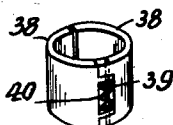


Fig. 4.

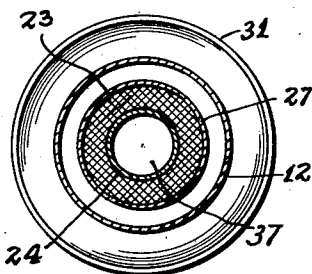


Fig. 5.

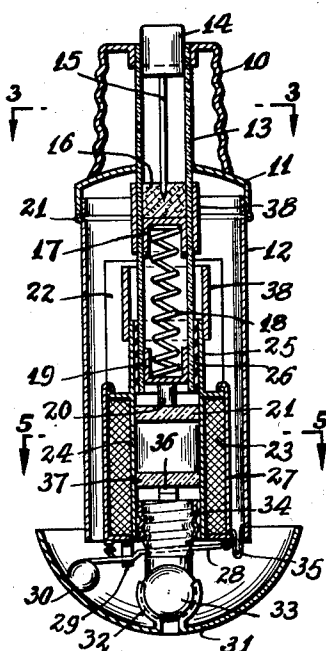


Fig. 2.

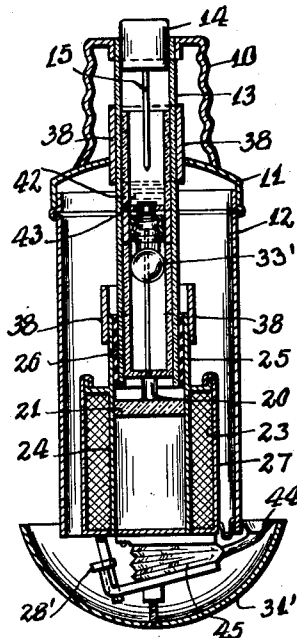


Fig. 8.

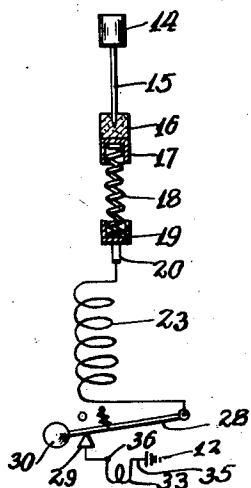


Fig. 6.

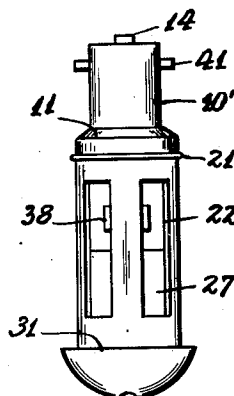


Fig. 7.

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AUTOMATIC FIRE ALARM FUSE-BULB

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Application September 23, 1933, Serial No. 690,668

1 Claim. (Cl. 177—311)

This invention relates to new and useful improvements in an automatic fire alarm bulb.

The invention has for an object the construction of an article as mentioned which is characterized by a shell for engagement in a customary electric socket and mechanism connected with said shell for giving an alarm of a fire.

Still further the invention proposes the inclusion of an insulation tube holding a pin contact separated by fusible material with a spring urged contact to close the circuit for giving the alarm upon the fusing of the fusible material.

Still further the invention proposes the provision of a coil associated in the circuit for operating an armature carrying a clapper to ring a bell as the alarm signal. Furthermore the invention contemplates a modified form wherein the alarm constitutes a whistle or other similar arrangement.

As another object of this invention a provision is proposed for shielding the fusible material to various degrees as desired so as to control the temperature at which the device operates, with liquid expansion.

As another object of this invention an arrangement is proposed whereby a cup of mercury is adapted to be heated for expanding and engaging a contact to close the circuit to operate the device.

Still further the invention proposes the construction of a device as mentioned which is simple and durable and which may be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawing, and to the appended claim in which the various novel features of the invention are more particularly set forth.

In the accompanying drawing forming a material part of this disclosure:

Fig. 1 is a side elevational view of a bulb constructed according to this invention.

Fig. 2 is a vertical sectional view of Fig. 1.

Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a perspective view of one of the insulation pieces.

Fig. 5 is a horizontal sectional view taken on the line 5—5 of Fig. 2.

Fig. 6 is a schematic wiring diagram of the device.

Fig. 7 is a view similar to Fig. 1 but illustrating a slightly modified form of the invention.

Fig. 8 is a view similar to Fig. 2 but illustrating a modification of the invention.

The automatic fire alarm bulb according to this invention comprises a shell 10 for engagement into a conventional electric light socket. A cap 11 is soldered or in any other manner attached upon the outer end of the shell 10 and detachably connects with a casing 12. An insulation tube 13 extends through the shell and through the casing 12. An end contact 14 projects from the inner end of the insulation tube 13 and constitutes the end contact for engaging the central contact of the electric socket.

A metallic pin 15 connects with the end contact 14 and is partially imbedded in fusible material 16 arranged within the tube 13. A movable contact 17 is disposed immediately below the fusible material 16 (this material preferably should be waxed) and is urged towards the end contact 15 by an expansion spring 18 acting between the movable contact 17 and the stationary contact 19. The contacts 17 and 19 are in the form of cups into which the ends of the spring 18 engage. The contact 19 engages a stationary contact 20 mounted upon an insulation piece 21 fixed within the tube 13. The stationary contact 20 connects in an electric circuit hereinafter described.

The shell 10 is formed with external threads so as to threadedly engage the electric socket. The upper end of the casing 12 is formed with a bulged or beaded portion 21 against which the cap 11 may engage. Several window openings 22 are formed in the body of the casing 12 so that the interior of the device may be inspected and also so that light may emanate from a lamp hereinafter further described to signal that the device is in operation. The stationary contact 20 connects with a coil 23 wound upon a core 24 which has a tubular upper end 25 pressed upon the lower end of the insulation tube 13. Heat insulation material 26 is disposed between the tube portion 25 and the tube 13.

A cylindrical cover 27 encases the winding 23. An armature 28 is movably mounted upon the lower end of the cover 27 and operates in conjunction with a make and break 29. A clapper 30 is mounted upon the free end of the armature. This clapper is adapted to operate against a bell 31 which has several fingers 32 at its center adapted to clamp upon an electric bulb 33 mounted in a socket 34 arranged in the lower end of the core 24. This electric bulb is arranged in a circuit with the coil 23 as hereinafter described, when referring to the schematic wiring diagram

in Fig. 6. The lead 35 serves to constitute the ground current from the lamp 33 to the casing 12. The end contact lamp 33 engages in a stationary contact 35 mounted upon a fixed insulation piece 37 mounted within the core 24. This stationary contact 36 connects with the make and break 29.

Several tubular heat insulation members are adjustably arranged upon the tube 13 and are adapted to shield the fusible material 16 to a desired degree so that the device may be regulated to operate at a predetermined temperature. Each of these tubular insulation pieces comprises semicylindrical sections 38 hingedly connected at one of their sides 39 and urged together by a spring 40 arranged upon the pivot point. This arrangement allows the halves 38 of the insulation material to be separated and engaged upon the insulation tube 13 and moved to various adjusted positions. Tension of the spring 40 is depended upon to move the half sections 38 together and frictionally maintain their positions. With this arrangement it is possible to expose more or less of the fusible material to the heat of a fire around the outside of the casing.

The electrical circuit of the device may be traced by examining Fig. 6. Starting at the end contact 14 the circuit passes through the pin 15 and stops at the fusible material 16. In the event that the fusible material fuses then the contact 17 is urged by the spring 18 into contact with the pin 15 and the circuit is completed. The current may then travel from the pin 15 into the contact 17 through the spring 18 to the contact 19, the contact 20, the coil 23, the make and break 29, the lamp 33, the casing 12 and the contact shell 10. The make and break 29 serves to make and break the circuit so that the armature 28 is caused to vibrate and the clapper 39 strikes against the bell and so give the alarm. Simultaneously the light 33 will operate providing illumination to give an additional alarm. The contraption operates on D. C. current and may be modified to operate on A. C. current, either on high or low voltage.

In Fig. 7 another embodiment of the invention has been disclosed which is identical to the previous form except for the fact that it is provided with an end contact 10' having pins 41 instead of the threads. With this arrangement the device is adapted to be engaged in a different type

of electric socket requiring pins instead of threads. In other respects this form of the invention is identical to the previous form and similar parts may be recognized by corresponding reference numerals.

In Fig. 8 a modification of the invention has been disclosed which is very similar to the preferred form except for the fact that a cup 42 containing mercury 43 is substituted for the fusible material. The heat from the fire is depended upon to expand the mercury which will then make contact with the pin 15. The circuit is then closed to the contact 20 and will illuminate the bulb 33'. Instead of a bell, a whistle 44 is actuated by a bellows 45 when the current is closed and winding 23 is energized and attracts armature 28'. The bell shape weight 31' acts as a shield and returns the armature into electrically contacting position when the circuit in winding 23 is open. In other respects the operation is similar. The same parts may be recognized by corresponding reference numerals.

While I have shown and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claim.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:—

In an automatic fire alarm bulb, a shell for engagement in an electric socket, a casing in contact with and supported on said shell, an insulation tube through said shell and casing, an end contact in the end of said insulation tube, a metallic pin connected with said end contact and extending into said tube, fusible material within the tube against the end of said pin, a contact against the under side of said fusible material, resilient means urging said latter contact towards said pin, to close a circuit controlling an alarm upon touching of the contact and pin, said alarm comprising an electro-magnet wound on a core pressed on said insulation tube, a clapper, means including said electro-magnet for operating said clapper, and a bell operated by said clapper, said clapper and bell being supported from the core of said electro-magnet.

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