Jan. 19, 1943. C. CAMPODONICO 2,308,911

FIRE ALARM DEVICE

Filed Feb. 19, 1940

Fig. 1

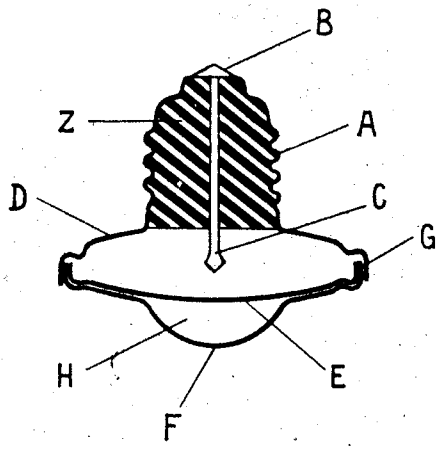


Fig. 2

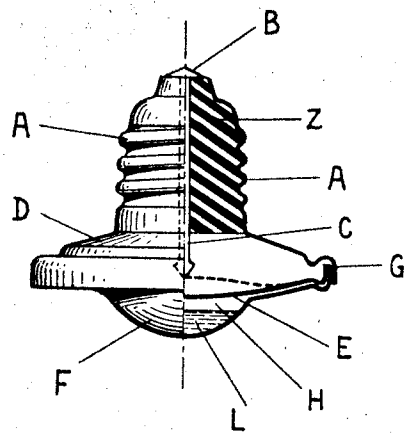
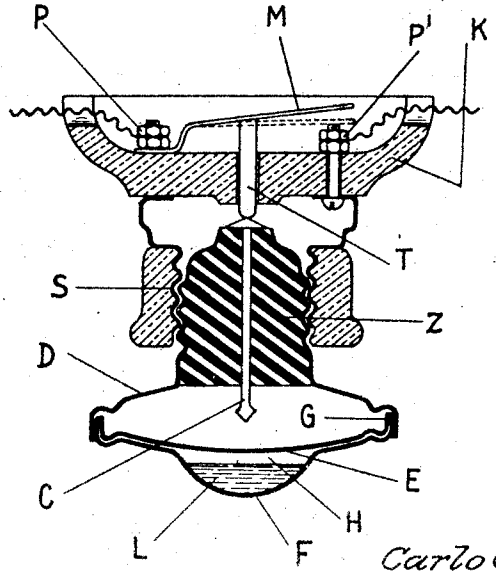


Fig. 3



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UNITED STATES PATENT OFFICE

2,308,911

FIRE ALARM DEVICE

Carlo Campodonico, Genoa, Italy; vested in the Alien Property Custodian

Application February 19, 1940, Serial No. 319,763
In Italy August 23, 1939

1 Claim. (Cl. 200—140)

This invention relates to fire signalling devices of the kind comprising a thermostatic chamber filled with an expansible fluid i. e. which, when the room temperature goes over a predetermined limit, by expanding causes a member to be displaced so as to promote the switching of an electric circuit including signalling apparatus and/or other devices adapted to control fire-extinguishing devices.

The main object of the invention is to provide a device of the class above referred to, which is exceedingly simple and reliable in operation, which can be constructed at very low cost, which will always be ready for operation and which will return automatically to idle position whenever the room temperature falls down below the predetermined value.

Another object of the invention is to provide means adapted to operate alarm signals, whenever one of the thermostatical signalling devices is not correctly inserted in its holder or otherwise connected to the proper fitting.

Other objects and advantages of the invention will be apparent from the following description, reference being made to the attached drawing in which:

Figure 1 is a section of an embodiment of the invention, during its mounting;

Figure 2 is a side view, partly in section, showing a complete device, ready for use, and

Figure 3 is a sectional view of the same device inserted in a holder, so constructed as to close the alarm circuit whenever the device is not correctly inserted in circuit.

Referring to the drawing, the device comprises a usual two-pole plug, as for instance an Edison screw cap A to the central terminal B of which a metallic stem C is soldered or otherwise attached, so as to extend co-axially into the cap, projecting somewhat beyond its rim. In order to give the stem an enhanced rigidity, the cap A is filled with plaster or the like Z. To cap A a disk or cup flange D is attached, provided with an edge into which a member is fitted constituted of a concave collapsible disk E and of a convex part F. These two parts are soldered or otherwise tightly attached together, as shown at G, the hollow chamber H being partially filled with a volatile liquid L. Disk E is preferably made of metal and is electrically connected to screw cap A. The end of stem C is at such a distance from disk E as to press firmly against said disk when it swells out under the action of a sufficiently strong fluid pressure in chamber H.

The operation is apparent: As may be seen from the drawing (Figure 2), stem C and disk E are so dimensioned and fitted as to remain apart when disk E is in the position shown in full lines. When however the room temperature rises over a predetermined maximum, the fluid pressure causes disk E to snap outwardly (dotted line position in Figure 2). By this snapping the central part of E strikes against the end of stem C, thus conductively connecting A with B. By inserting the device into a lamp holder connected to an alarm circuit, this circuit will be closed whenever the terminals A and B are shorted in the above described way.

If however the device were partially inserted into one of the usual lamp sockets, (which could happen also unintentionally, due to vibration or other causes), no circuit would be closed by the conductive connection of A with B.

In order to avoid this, the improved holder according to Figure 3 has been devised. By this holder, the central terminal is constituted by a metallic stem T slidably mounted into the insulating socket K so as to project inwardly thereof, and integral of a spring blade M fitted to one of the end terminals P. When the cap of the device is not correctly screwed in, the blade M contacts with the second terminal P' thus shorting the electric circuit. When however the screw cap A of the device is completely screwed into the holder, pole B pushes stem T and raises blade M out of contact with terminal P'. In practice, the electric circuit would be preferably so designed, as to indicate the protected room. The electric circuit could include relays or other means for operating automatically fire-extinguishing devices.

It is apparent that the device could be embodied in several ways. Thus instead of an Edison cap, as shown, other kinds of caps or of plugs could be adopted. In the case of the usual pin plug, the plug socket would be fitted preferably with a spring blade or the like shorting the circuit whenever the pins of the plug are not sufficiently plugged in.

It may be mentioned also that also the chamber defined by blade E, disk D and cap A could be partially filled with some liquid or gas so as to generate a certain pressure increase in the said chamber by temperature increase. In this instance, however, the liquid or gas must be either in very lesser amount than in chamber H, or must be lesser volatile, in order that the pressure in chamber H, be always substantially higher than in the other chamber, this difference of pressure increasing remarkably with the tem-

perature increase, until the pressure in the lower chamber is capable of promoting the snapping out of disk E, in spite of the counter pressure in the upper chamber. In this latter case, the device is less sensible to small differences of temperature.

Of course the device according to the invention might be constructed in different other ways. Thus the concave conductive disk E could be conductively attached to the rim of flange D and the member F could be nonconductive, preferably transparent, and gas-tightly attached by a suitable plaster to the rim of D. This construction may be useful, as it provides control at any time whether sufficient liquid exists in the lower chamber of the device. Disk E could be also nonconductive, provided it be sufficiently resilient and adapted to promote the closure of two contacts by snapping into operative position. The two contacts could be also both fixed, and disk E could be provided with metallic bridging member adapted to bridge the separate contacts.

The said embodiments and variations are however, reported only by way of example, it being understood that still other variations will be possible within the scope of the appended claim.

I claim:

A fire-signalling device for use with a lamp plug of the Edison type, having particularly a threaded external contact, an independent axial contact, said device including a sheet metal shell electrically connected to and depending from the external contact, a normally concave flexible wall arranged in the shell and forming with the bottom wall of the shell a sealed chamber to receive an easily vaporizable fluid, the flexible wall moving to a convex position under the pressure of the vapor of the fluid when vaporized under external conditions, and a rigid stem electrically connected to and depending from the independent axial contact and within the external contact, the free end of the stem being positioned to be free of the flexible wall when the latter is concave and to be in electrical contact with such flexible wall when such wall is convex.

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