Oct. 27, 1931. W. K. MASON ET AL 1,829,149

THERMOSTAT

Original Filed Aug. 20, 1927

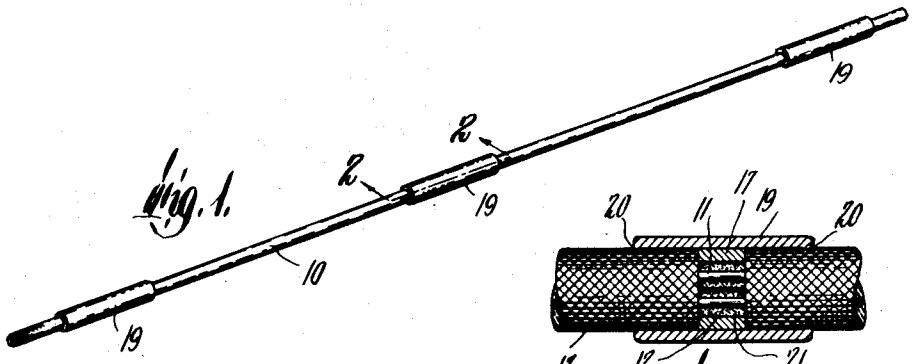
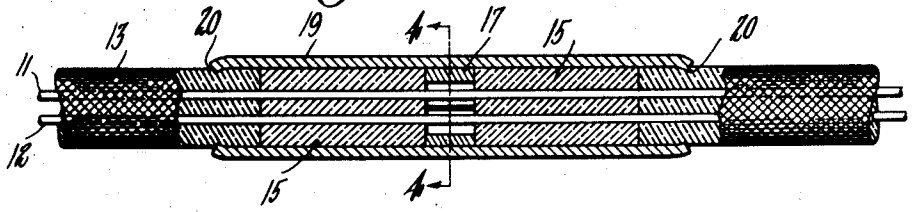


Fig. 1.

Fig. 3.

Fig. 2.



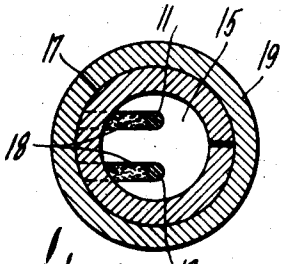


Fig. 4.

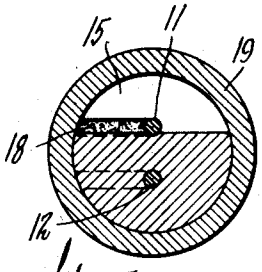


Fig. 5.

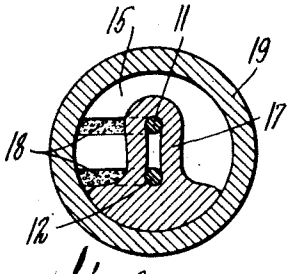


Fig. 6.

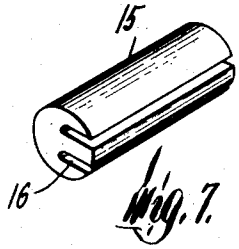


Fig. 7.



Fig. 8.

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UNITED STATES PATENT OFFICE

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THERMOSTAT

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This invention relates to cables provided with a plurality of spaced thermostats which when heated beyond a predetermined temperature short-circuit conductors carried by the cable and thus set in motion an alarm which is connected to the conductors. An object of the invention is to provide a thermostat for such a cable which is reliable and positive in action, which is relatively simple and economical and which is not liable to deterioration.

Various advantageous features of construction will be apparent to one skilled in the art from the disclosure in the following description and from the drawings, of which

Figure 1 shows in perspective a length of cable incorporating a number of the improved thermostatic devices.

Figure 2 is a section on the line 2—2 of Figure 1.

Figure 3 is an elevation, partly in section, showing a slightly different embodiment of the invention.

Figure 4 is a section on the line 4—4 of Figure 2.

Figures 5 and 6 are sections similar to Figure 4 showing conditions of the thermostat after operation.

Figure 7 is a perspective view of a filler member.

Figure 8 is a perspective view of the fusible member.

Referring to the drawings in detail, 10 represents an insulated electric cable preferably comprising a pair of wires 11, 12 surrounded and separated by suitable insulation 13 of any desired kind. The wires 11 and 12 are intended to be attached at one end to a suitable alarm or signal which is actuable whenever a connection between these wires is made. Such a cable may be run through any desired portions of buildings or other locations where there is a possibility of fire and thermostats may be formed on the cable at any desired points along its length. In Figure 1, three such thermostatic units are illustrated, but it will be obvious that any number may be employed and may be spaced as desired along the cable. In constructing the thermostatic units on the cable, a portion of the insulation 13 is stripped from the cable at any desired point, leaving the wires 11 and 12 bare for a short distance at this point. A ring of easily fusible metal is formed to surround the wires in the stripped space but spaced from contact therewith, the outer diameter of the ring being substantially equal to the diameter of the cable. In order to keep the ring separated from both wires and to protect and enclose the ring, a sleeve 19 may be employed to cover the stripped portion of the cable, the ends of this ring being secured to the cable in order to prevent twisting of the cable at the stripped points which might result in a crossing of the bared sections of wire. The sleeve may be secured to the cable by spinning or crimping the ends as at 20 or in any other desired manner. Such construction is illustrated in Figure 3. If desired, the stripped sections may be made long enough to receive a pair of suitable spacers 15 each of which is provided with a pair of slots 16 to receive the wires 11, 12 and to hold them in properly spaced relation. These spacers may be of any suitable insulating material, such for example as fiber. Where spacers are used, the stripped portion of the cable is preferably made long enough to receive two spacers with room between them for a fusible member or ring 17.

After the spacers 15 have been arranged in place with the wires 11 and 12 and the slots 16, the remaining space in these slots is preferably filled up with plaster or other convenient filler 18. After the fusible member 17 has been bent around the wires into a circular form having an external diameter approximately equal to that of the cable, a sleeve 19 is slipped over the entire stripped portion of the cable, this sleeve providing a tight cover protecting the thermostatic elements within and holding the fusible unit 17 concentric with the cable and thus spaced from the wires 11 and 12. The sleeve 19 may be a tubular section slipped over the end of the cable or may be a thin sheet of metal wrapped about the cable into tubular form, or may be made of a plurality of parts joined together. The sleeve is preferably of relatively thin metal such as brass or copper

through which heat can easily and quickly penetrate to act upon the fusible element 17.

The melting point of the fusible element may be determined by the nature of the alloy used and selected for the purpose desired. For example, we may use an alloy having a melting point of 150° F., this temperature being well above the ordinary range of atmospheric temperatures but sufficiently low to give prompt warning of unusual heat conditions, but we do not limit ourselves to this or any other specific melting point. In case the temperature in the vicinity of one of these thermostats rises above the melting point of the fusible element, the heat quickly penetrates through the sleeve 19 and melts the member 17 causing it to slump down over the wires 11, 12 somewhat, as shown in Figure 6. The wires are thus electrically connected and the alarm to which they are connected is actuated. This action on the part of the element 17 can be relied on, but in order to avoid the remote possibility of its failing to slump across the wires in the course of melting, the material in the ring 17 may be sufficient to fill up the space when melted to a level sufficient to touch the upper of the two wires, as shown in Figure 5. Thus the sounding of the alarm is absolutely assured.

The sleeve 19 not only normally spaces the fusible ring 17 from the wires but also stiffens the cable at the stripped portion and protects the bared wires and fusible element from dirt and corrosion, which in the case of many thermostats reduce the efficiency and dependability of the devices. In order to protect the wires of the cable from surface oxidation due to the presence of sulphur usually found in the insulating material of the cable, we prefer to use cable containing wires which have been plated with tin, German silver or other protective metal. As a further protection against surface oxidation of the exposed portion of the wire, the cavity or hollow space within the sleeve may be filled with a suitable substance having a lower melting point than that of the ring 17. Such a filling material is illustrated at 21 in Figure 3 and may be petrolatum, paraffine, beeswax, or any other equivalent. This construction increases the dependability of the thermostat by additionally insuring it against the possibility of a surface oxidation of the wires which might render the contact with the ring 17 uncertain, and in no way interferes with the operation of the thermostat when heated up to the melting point of the ring 17. Although the filler has been illustrated only in the form of the invention shown in Figure 3, it is obvious that it may also be used with any other arrangement of wires, ring, and other elements, such for example as I have illustrated in Figure 2. This improved thermostat being protected from deteriorating influences will remain effective for an indefinite period of time.

Having thus described certain embodiments of this invention, it should be evident to those skilled in the art that various changes and modifications might be made therein without departing from its spirit or scope as defined by the appended claims.

We claim:

1. A thermostat comprising a pair of spaced conductors, a member of low melting point metal surrounding said conductors and arranged to fall against the conductors when melted, and means for holding said member normally spaced from said conductors, no portion of said holding means being between said conductors and said member.

2. A thermostat comprising a pair of spaced conductors having adjacent bare portions, and a member of low melting point metal surrounding said bare portions and normally spaced therefrom, the space between said conductors and member being entirely free of solid material.

3. A thermostat comprising a pair of spaced wires, insulating material surrounding and separating said wires, said material being interrupted to expose short parallel stretches of the wires, a ring of low melting point metal surrounding the exposed stretches of the wires and spaced therefrom, and a sleeve enclosing the exposed stretches of wire and metal ring, and holding the ring out of contact with the wires.

4. A thermostat comprising a pair of wires separated and surrounded by insulating material, a sleeve on the outer surface of said material, said material being interrupted to form a cavity within said sleeve containing bare stretches of said wires, and a member of low melting point metal contained in said cavity and normally spaced from said wires, said member containing sufficient metal to form a pool when melted rising to the level of the upper wire.

5. A thermostat comprising a pair of spaced wires, insulating material surrounding and separating said wires, said material being interrupted to expose short parallel stretches of the wires, a ring of low melting point metal surrounding said exposed stretches and spaced therefrom, and a sleeve enclosing said ring and exposed stretches, said sleeve being secured at its ends to said insulating material.

6. An electric cable comprising a pair of wires embedded and spaced in insulating material, a series of thermostats arranged at intervals along said cable, each said thermostat comprising adjacent bared portions of said wires, a ring of low melting point metal surrounding said wires but spaced therefrom, and a heat-conducting sleeve enclosing said bared portions and said ring, said sleeve hav-

ing its end portions firmly engaging the insulating material of the cable.

7. A thermostat comprising a pair of spaced conductors, a member of low melting point metal surrounding said conductors and normally spaced therefrom, means enclosing said member and the conductors adjacent thereto, and nonconducting material having a melting point lower than that of said metal covering the conductors adjacent to said member.

8. A thermostat comprising a pair of spaced wires, insulating material surrounding and spacing said wires, said material being interrupted along short parallel stretches of said wires by other insulating material having a low melting point, a metal ring embedded in said other insulating material and arranged to surround said wires, said ring having a melting point which is relatively low but is higher than that of said other insulating material, and a sleeve of heat-conducting material enclosing said ring and said other insulating material.

In testimony whereof we have affixed our signatures.

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EDWARD STEVENS.