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FIRE DETECTION CONDUCTORS

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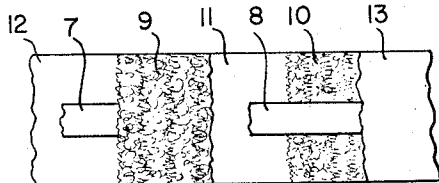
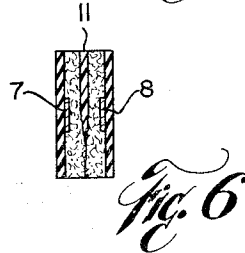
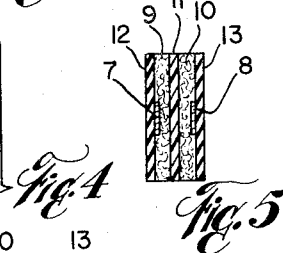
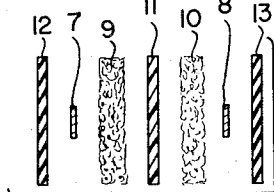
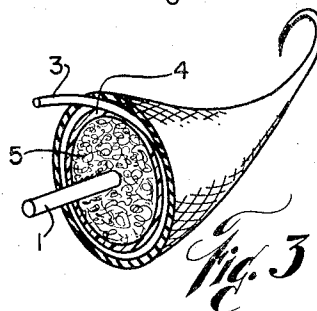
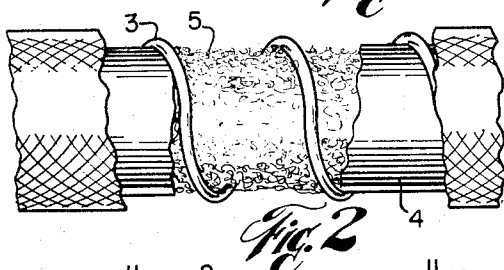
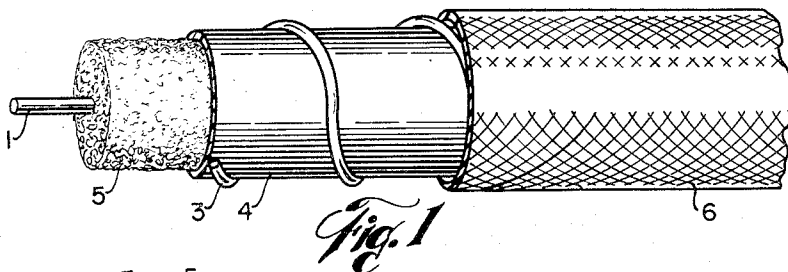


Fig. 7

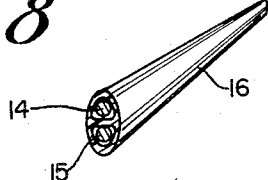
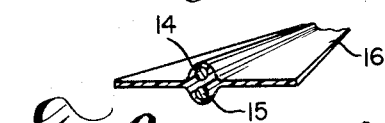
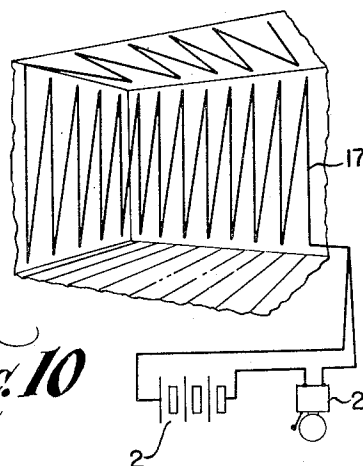


Fig. 9

Fig. 10



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2,774,850

FIRE DETECTION CONDUCTORS

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5 Claims. (Cl. 200—143)

This invention relates to new and useful improvements in fire detection conductors and more particularly to the arrangement of a plurality of electrical conductors separated by a material subject to be melted or dissipated in response to rise in temperatures above the normal ambient temperatures in the area of installation, and it is among the objects thereof to provide a construction of such conductors which will render them highly efficient for detecting fire and of a form to make them applicable for convenient and ready attachment because of their structural design.

The invention will become more apparent from a consideration of the accompanying drawing constituting a part hereof in which like reference characters designate like parts and in which;

Fig. 1 is a view in perspective of a conductor employed as a self-closing circuit element in response to rising temperatures for use in fire detection systems in accordance with my present invention;

Fig. 2 is a similar view showing the arrangement of the conductor and insulating materials in its fire detection function;

Fig. 3 is a view in perspective showing an end of a protective conductor structure as shown in Figs. 1 and 2;

Fig. 4 is an exploded view of an arrangement of conductors and insulation in flat strip form;

Fig. 5, a cross-sectional view of the assembled elements of Fig. 4;

Fig. 6, a cross-sectional view of a plurality of conductor members with the separating insulating material partially melted away;

Fig. 7, a top plan view of a strip type of fire alarm detection conductors partially broken away;

Fig. 8, a view in perspective of still another form of flat type fire alarm detector conductors;

Fig. 9, a view in perspective of still another modified form of circuit closing conductors; and,

Fig. 10, a view diagrammatically illustrating the application of fire detecting conductors mounted in an electric circuit including an audible alarm.

With reference to Figs. 1, 2 and 3 of the drawings, the numeral 1 designates a suitable conductor for electric currents supplied from any source, such as a battery 2, Fig. 10, and 3 a similar conductor separated from the conductor 1 by low temperature melting insulating material 4 and by a highly conducting electrical current medium such as copper wool or steel wool 5. A protective outer layer of insulating material 6 protects the inner structure from moisture and gives it sufficient rigidity and strength for handling and mounting around a building wall in a manner shown in Fig. 10, as by stapling or the like.

The conductor separating material 4 is preferably a heat sensitive plastic insulating material such as vinylite film, wax, nylon, polyethylene, etc., there being a wide selection of such materials having a melting point within a range of 120° to 900° F. and a choice of this material determines the temperature at which the conductors are

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effective in energizing an alarm. As shown in Fig. 2 of the drawing, the heat sensitive separating material 4 has melted away to expose the steel wool material 5, thus effecting electrical contact between the outer conductor 3 and the inner conductor 1 with which the steel wool 5 is in contact.

I have found that by employing a lightweight pliable conducting material such as steel wool or other suitable material between the central and outer wrapped conductors, the arrangement is much more efficient and sensitive, since a large area of contact between the two conductors is affected, thereby.

In the flat strip form of the materials, as shown in Figs. 4 to 7, inclusive, of the drawing, the numerals 7 and 8 designate the conductors; the numerals 9 and 10 the steel wool, and numeral 11 the heat sensitive separating material; numerals 12 and 13, the outer protective material in the assembled form. As shown in cross-section in Fig. 5, the conductors are related to the separating conducting material 9 and 10 and to the heat sensitive separating material 11 in the same manner as the conductors and insulation material in Figs. 1 to 3 of the drawing, so that when the heat sensitive separating material 11 melts away, as shown in Fig. 6, the conducting materials contact to establish the circuit between the conductors 7 and 8.

In the form of the device shown in Figs. 8 and 9, conductors 14 and 15 are molded into a substantially flat strip by a composition such as vinylite or polyethylene designated by numeral 16. The heat sensitive material 16, when melted in response to rising ambient temperature of a room, for example, will cause the conductors 14 and 15 to contact to establish an alarm circuit. The same is true in the oval or rounded shape of the molded form of conductors shown in Fig. 9 of the drawing.

From the various composite forms of the conductors shown in the several figures, it is evident that the arrangement of parts adapts the invention to a variety of shapes as well as a variety of construction materials. The ultimate shape and composition will in each case depend on the particular manner of attachment, temperature conditions or placement for use.

One example of the use of the fire detecting conductors is shown in Fig. 10 in which the conductors generally designated by the numeral 17 are attached to a wall or ceiling by stapling, or otherwise, or in the joints of panel members as desired. The ends of the conductors like the conductors 1 and 3, are connected respectively to a battery 2 and an alarm 2' and when, because of rising temperature in the area in which the conductors 17 are located the heat sensitive material disintegrates or melts away, the conductors will make contact in the manner heretofore described and thereby establish the circuit to energize the alarm 2' in Fig. 10.

In place of the battery as a source of power, other sources of current may be employed and in place of the bell alarm in Fig. 10, a great variety of possible ways to design the alarm to energize audible or visible devices are possible. It is further evident that the self-closing circuit conductors may be employed to operate relays of power circuits for operating sprinklers or fire door closing or other mechanism. By means of the above invention, it is evident that the presence of fire can be almost instantly detected by the generation of heat in the area of its installation.

Although several embodiments of the invention have been herein illustrated and described, it will be evident to those skilled in the art that various modifications may be made in the details of construction without departing from the principles herein set forth.

I claim:

1. A current controlling cable comprising a pair of

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conductors separated by a bulky infusible electrically conducting material, one of said conductors being separated from said bulky conducting material by insulating material of a relatively low melting temperature to establish an electrical circuit between said conductors through said bulky material in response to rising temperatures above normal ambient temperatures in the area of installation and an outer wall covering for said cable.

2. A current controlling cable comprising a pair of conductors separated by a bulky fibrous metallic electrical conducting material, one of said conductors being separated from said bulky conducting material by insulating material of a relatively low melting temperature to establish an electrical circuit between said conductors through said bulky material in response to rising temperature above normal ambient temperatures in the area of installation and an outer wall covering for said cable.

3. A current controlling cable comprising a pair of conductors separated by a bulky steel wool electrical conducting material, one of said conductors being separated from said bulky conducting material by insulating material of a relatively low melting temperature to establish an electrical circuit between said conductors through

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said bulky material in response to rising temperature above normal ambient temperatures in the area of installation and an outer wall covering for said cable.

4. A current controlling cable of cylindrical form comprising an electrical conductor disposed centrally of said cable, a layer of a fibrous infusible electrical conducting material disposed around said conductor, a relatively thin layer of insulating material covering said infusible conducting material, a second conductor disposed around said insulating material and a cover material surrounding said last-named conductor.

5. A current controlling cable comprising a pair of electrical conductors of flat strip form embedded in a bulky infusible electrical conducting material, a layer of insulating material disposed between said conductors and covering material forming the outer walls of a flat current conducting cable for housing said bulky material.

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