Aug. 9, 1960 B. I. CALDWELL 2,948,789

FIRE PROTECTION WIRE OR CABLE

Filed July 7, 1958

Fig-1

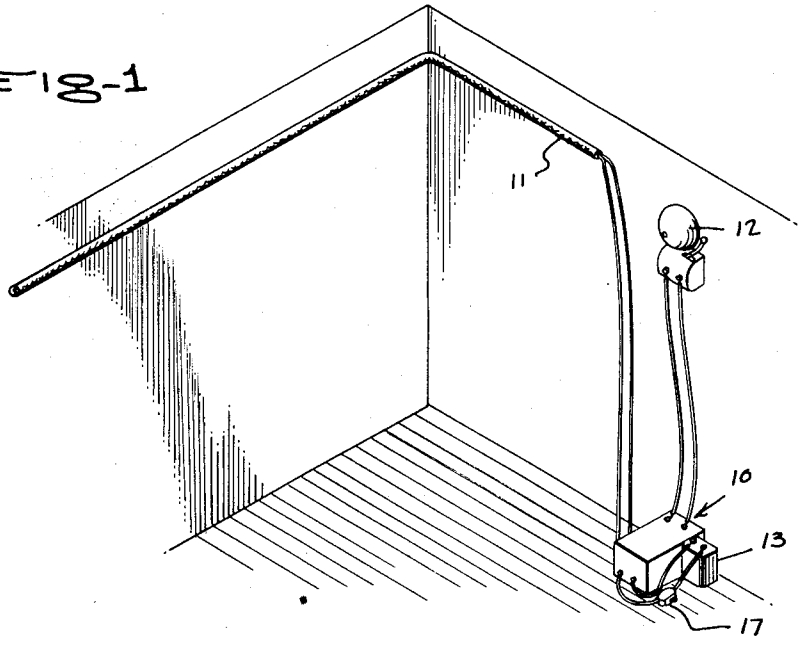
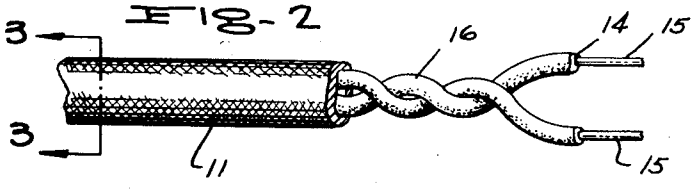


Fig-2



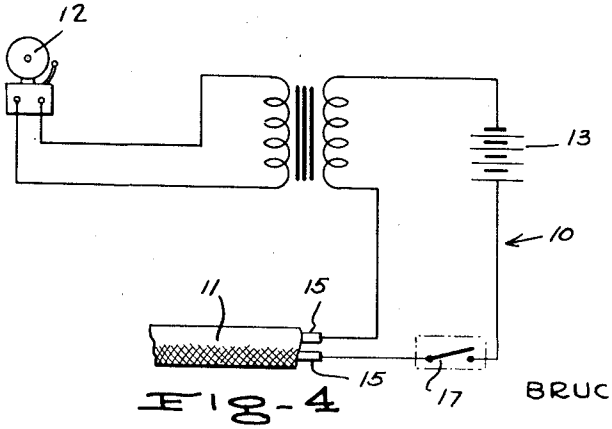


Fig-4

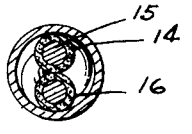


Fig-3

INVENTOR.

BRUCE I. CALDWELL

BY

Christian R. Nielsen

ATTORNEY

United States Patent Office 2,948,789 Patented Aug. 9, 1960

2,948,789

FIRE PROTECTION WIRE OR CABLE

Bruce I. Caldwell, Bradford, Pa., assignor, by direct and mesne assignments, to said Caldwell, Maurice A. Caldwell, Bradford, and Russell W. Fuller, Jersey Shore, Pa.

Filed July 7, 1958, Ser. No. 746,753

3 Claims. (Cl. 200—143)

This invention relates to fire protection wires or cables for use in closing a normally open electrical circuit to an alarm system upon a temperature rise, and it consists in the method, constructions, arrangements and combinations herein described and claimed.

An important object of the invention is to provide a fire protection wire or cable that will be dependable in operation when used in conjunction with an alarm system; inexpensive to manufacture and readily installed by the average layman, thus making it possible for the masses to afford a life saving, property saving, dependable fire alarm system. It is fully realized that there are various types of fire protection systems on the market, but the cost of such installations have been prohibitive to the vast majority of home owners, with the result that during the year of 1957, 11,300 deaths occurred due to fires. An extremely large percentage of these lives could have been spared had a reasonably priced fire protection system been made available to them.

It is therefore an object of the invention to provide a fire protection wire or cable that will be desirably flexible, making it easy to install along moldings or baseboards of the rooms, and which in event of a fire, would require no repair at all, or in the event of a direct burn-through of the wire or cable, would necessitate only simple splicing of a portion of the cable or wire to replace the burned out section. Still another object of the invention is the provision of a fire protection wire or cable which can be readily produced by present day methods or practices.

More specifically, it is an object of the invention to saturate two fabric covered conductors of any indefinite length with a hydrate and then tightly twist the two conductors so that they are intertwined for their entire lengths, so that when the temperature adjacent any portion of the cable or wire rises sufficiently, the hydrate will release its water of crystallization, forming an electrolytic solution of the salt, shorting the two conductors, closing the circuit and thus sounding an audible or other alarm.

Additional objects, advantages and features of invention will be apparent from the following description, considered in conjunction with the accompanying drawing, wherein,

Figure 1 is a fragmentary perspective view of an installation embodying the invention.

Figure 2 is a side elevation of a section of the fire protection wire or cable.

Figure 3 is an enlarged cross section of the cable, and

Figure 4 is a diagrammatic plan view of a circuit.

It will be apparent that any hydrate will react as described, but through experimentation, it has been found that alum ($Al_2(SO_4)_3/K_2SO_4/24H_2O$) reacts most desirably, because periods of long service require a hydrate having a primary valence so that it does not loose its water of hydration to the atmosphere.

To construct the wire or cable, a super-saturated solution of alum is heated to the molten state and cotton or other fabric covered conductors are then immersed by any suitable means and immediately withdrawn from the solution. The treated conductors are first intertwined and then wrapped or coated wtih any suitable covering such as plastic cellulose to form the complete wire or cable.

Referring to the drawing, there is shown in Figure 1, a portion of a room having my fire protection circuit installed, generally indicated by the reference character **10**, and embodying the protection wire or cable **11**. Inasmuch as this wire or cable is extremely inexpensive to manufacture, the wire can be placed around the entire perimeter of the room at a nominal cost, thus providing even and accurate control of the system. The protection wire or cable **11** is connected in circuit with any suitable audible or visible alarm **12** and uses any suitable source of electrical supply **13** such as a house current. When the temperature rises sufficiently, the hydrate **14** will throw off the water of crystallization developed by the heat, forming an electrolytic solution of the salt, saturating the cotton or other covering **16** and shorting out the conductors **15**, thus closing the circuit and actuating the alarm. After the circuit has been closed, internal heat is generated by the resistance connection between the two conductors and the circuit will remain closed and the alarm will still be energized until the switch **17** is opened. After the circuit has been manually opened and the temperature of the conductors are cooled, the reverse process takes place, namely, the free water recombines with the salt to form the crystallized hydrate and the alarm system may then be put into operation again with repairs.

In the event that a portion of the wire or cable has been directly burned through by the fire, it is a simple operation to remove the burned out section and splice a new section or wire or cable in its place.

While I have shown and described a preferred form of the invention, this is by way of illustration only, and I consider as my own all such modifications in construction as fairly fall within the scope of the appended claims.

I claim:

1. The method of forming a fire protection wire or cable comprising the formation of a pair of conductors coated with a hydrate of alum

$$(Al_2(SO_4)_3/K_2SO_4/24H_2O)$$

and positioned in contacting relation to each other whereby upon sufficient temperature rise, the circuit of an alarm system embodying the cable will be closed due to the hydrate of alum throwing off its water of crystallization, with the consequent formation of an electrolytic solution of salt and shorting the conductors.

2. A fire protection cable comprising two conductors, each conductor having a coating of hydrate of alum

$$(Al_2(SO_4)_3/K_2SO_4/24H_2O)$$

said conductors being intertwined helically.

3. The method of forming a fire protection wire or cable comprising a pair of conductors covered with a

fabric which is impregnated with a hydrate of alum ($Al_2(SO_4)_3/S_2SO_4/24H_2O$), and positioned in such a relation to each other that upon a sufficient temperature rise the circuit of an alarm system embodying the cable, will be closed due to the hydrate releasing the water of crystallization, the consequent formation of an electrolytic solution of the salt saturating the fabric covering and shorting of the conductors; said solution returning to its original form after a sufficient temperature drop, due to the free water recombining with the salt to form the crystallized hydrate.

References Cited in the file of this patent

UNITED STATES PATENTS

856,162	Kitsee	June 4, 1907
2,413,125	Walbridge	Dec. 24, 1946
2,518,789	Jackson	Aug. 15, 1950
2,804,610	Curtis et al.	Aug. 27, 1957

FOREIGN PATENTS

242,414	Germany	July 24, 1910