Oct. 20, 1959 J. S. STAMM ET AL 2,909,631

FIRE ALARM

Filed Aug. 13, 1957

Fig. 1

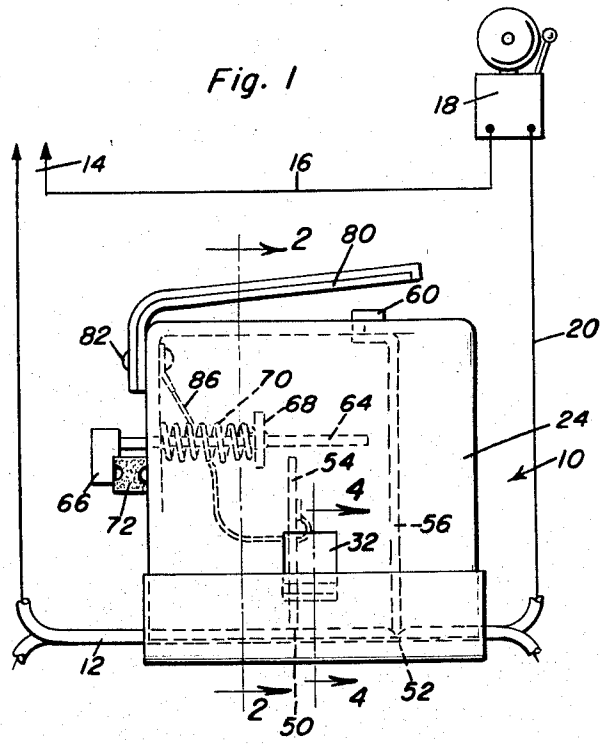


Fig. 2

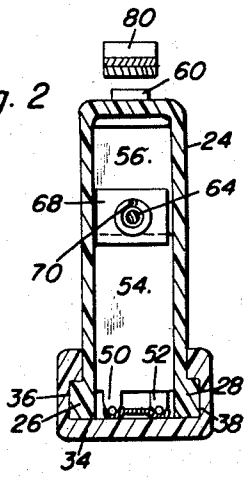
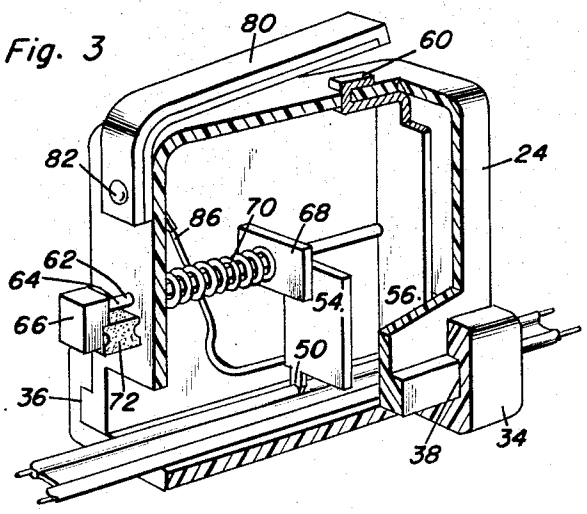


Fig. 3



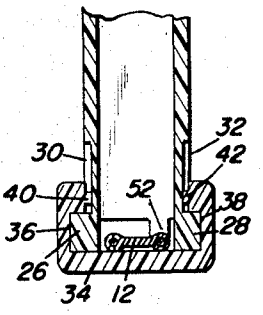


Fig. 4

Joseph S. Stamm
Wilford G. Bennett
INVENTORS,

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

United States Patent Office

2,909,631

Patented Oct. 20, 1959

2,909,631

FIRE ALARM

Joseph S. Stamm and Wilford G. Bennett, Baltimore, Md., assignors to F & G Supply Co., Baltimore, Md., a corporation of Maryland

Application August 13, 1957, Serial No. 677,883

9 Claims. (Cl. 200—136)

This invention relates to an electrical alarm system and actuator therefor and more particularly to a fire alarm circuit closing device.

The primary object of the present invention is to provide a contact closing device for completing an operative electrical circuit between a source of power and an alarm device which contact closing device may be easily and conveniently secured on a conventional conductor such as a twin-lead conductor or the like.

A further object of the invention is to provide a fire alarm actuation device which includes means for securing the device on a twin lead electrical conductor for completing an operative electrical circuit between a source of power and an alarm device without the necessity of cutting the insulation away from the conductor and without the necessity of separately attaching the conductors to terminals on the actuation device.

A further object of the invention is to provide a small and efficient circuit closing device which is no larger than the ordinary plug type electrical connector, which includes not only a bi-metallic switch but also a mechanical switch held out of circuit closing position by means of a meltable substance such as sealing wax.

Further objects and features of this invention reside in the provision of a fire alarm including actuation devices which may be produced at a very low cost thereby permitting wide use and distribution, which may be attached at any place on a conductor without requiring that the conductor be detached from an installed position, and which is simple to install and easy to use.

These, together with the various ancillary objects and features of the invention which will become apparent as the following description proceeds, are attained by this fire alarm actuation device, a preferred embodiment of which has been illustrated in the accompanying drawings, by way of example only, wherein:

Figure 1 is an elevational view somewhat diagrammatic and with certain concealed parts shown in dotted lines of the fire alarm system comprising the present invention;

Figure 2 is a vertical transverse sectional view taken substantially along the plane of the line 2—2 in Figure 1 illustrating in particular the relative arrangement of the various parts employed in the circuit closing device of the invention;

Figure 3 is in enlarged perspective view of the circuit closing device with parts thereof being broken away to show other parts in section and further illustrating the contact making and breaking elements in detail; and

Figure 4 is a sectional detail view taken in vertical transverse section along the plane of the line 4—4 in

Figure 1 illustrating those parts of the invention in which the closure member is locked to the housing.

With continuing reference to the accompanying drawings wherein like reference numerals designate similar parts throughout the various views, reference numeral **10** generally designates one of the circuit closing devices utilized to actuate the fire alarm in accordance with the concepts of the present invention. This circuit closing device **10** may be positioned at any point along a twin-lead conductor **12** or any other suitable electrical conductor. It is within the concept of the present invention to connect one of the leads of the twin-lead electrical conductor **12** to one prong of an electrical connector plug, the other of the prongs of the plug, not shown, being connected to a conductor **16** which is electrically connected to a bell **18** or other suitable audible alarm. It is to be understood that in addition to or in place of an audible alarm, visual alarms, not shown, may be employed. The plug is to be connected to a source of electrical power as suggested at **14** and the alarm or bell **18** is connected to a conductor **20** to the other conductor of the twin-lead conductor **12** so that when a circuit is closed between the conductors of the twin-lead conductor, an operative electrical circuit will be completed from the source of electric power to the alarm.

The circuit closing device **10** is adapted to close the circuit between the source of electrical power to the alarm device **18** by completing an operative electrical circuit between the conductors of the twin-lead conductor upon subjection to a predetermined amount of heat.

The actuating device **10** includes a housing **24** of any suitable shape which is shown as open at its lower end. The housing is provided with a pair of tongues or ribs **26** and **28** on the lower sides thereof as shown in Figures 2–4, and has depressions disposed in the sides thereof as indicated at **30** and **32** in Figure 4 above the tongues **26** and **28**.

A generally channel-shaped closure member **34** is provided for closing the open lower end of the two side walls of the housing **24** and includes grooves as at **36** and **38** in the inner side walls corresponding to the tongues **26** and **28** and adapted to receive the tongues therein. In order to provide means for locking the channel closure member **34** in place, lugs **40** and **42** are integrally formed on the inner faces of the side walls of the channel shaped closure member **34** and are adapted to be engaged within the recesses **30** and **32**. It is to be recognized that the material from which the housing is constructed is of such a nature as to resiliently yield while the channel-shaped closure member **34** is being positioned on the housing and yet arranged so as to lockingly hold the channel member when in a locked position.

The channel member is adapted to have the twin-lead conductor **12** positioned thereon and when the closure member **34** is pushed to its above mentioned locked position on the open end of the housing, it will cause the piercing edges **50** and **52** of contact plates **54** and **56** respectively to penetrate separate conductors of the twin-lead conductor **12**. The plates **54** and **56** are mounted with their side edges extending into grooves, not shown, in the side walls of the housing **24** or otherwise positioned therein and it is noted that the contact plate **56** has a contact plug **60** extending through the top wall of the housing **24**.

The housing 24 is further provided in an end wall with an aperture 62 in which a rod 64 is slidably mounted. The rod is provided with a head as at 66 outside of the housing and has a contact 68 mounted thereon inside the housing. A spring 70 coaxial with the rod 64 abuts the inner wall of the housing and the contact 68 normally urging the contact 68 to a position engaging the contact plate 54 and the rod to a position where its extremity engages the contact plate 56 to complete an operative electrical circuit between the contact plate 54 and the contact plate 56, it being noted that the rod 64 and the contact 68 are of electrically conductive materials.

In order to prevent the spring 70 from functioning to close the operative electric circuit between the contact plate 54 and the contact plate 56, a piece of sealing wax 72 or other suitable meltable substance is positioned between the head 66 and the housing 24. When heat is applied sufficient to melt the sealing wax 72, the circuit will close.

However, it is possible that a fire will be located at a point remote from the housing so that the sealing wax will not be quickly enough melted for actuation yet the heat is sufficient to desire that the device function. In order to assure proper functioning of the device and in any event that the spring 70 may be inoperative to cause a closure of the circuit, there is provided a bi-metallic switch consisting of a bi-metallic element 80 riveted as at 82 to an end wall of the housing 24 and which overlies the housing top wall and is adapted to coact with the lug 60 upon the latter to complete an operative electrical circuit from the contact plate 54 to the contact plate 56, it being noted that a conductor 86 interconnects the bi-metallic strip 80 with the contact plate 54.

The use of this invention is self-evident. The bell and the plug being connected to a manner heretofore described, the devices can be installed at any points along the twin-lead conductor and serve to protect the areas in which they are located.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A fire alarm circuit closing device comprising an electrically insulative housing having an open end, a closure member detachably secured to said housing, said housing and said closure member being adapted to clampingly engage a pair of electrical conductors, a first contact plate disposed in said housing and having piercing means for engaging one of said pair of electrical conductors, a second contact plate disposed in said housing spaced from said first contact and having piercing means for engaging the other of said pair of electrical conductors, said housing having an aperture therethrough, an electrically conductive rod extending through said aperture and having a head outside of said housing, a contact on said rod in said housing, a meltable substance disposed between said head and said housing, a spring engaging said contact and said housing urging said rod to a position engaging said first contact plate and with said contact engaging said second contact plate to complete an operative electrical circuit between said first contact plate and said second contact plate.

2. A fire alarm circuit closing device comprising a housing of electrically insulative material, a first contact plate disposed in said housing, a second contact plate disposed in said housing and spaced from said first contact plate, said housing having an aperture therethrough, an electrically conductive rod extending through said aperture and having a head outside of said housing, a contact on said rod in said housing, a meltable substance disposed between said head and said housing, a spring engaging said contact and said housing urging said rod to a position engaging said first contact plate and with said contact engaging said second contact plate to complete an operative electrical circuit between said first contact plate and said second contact plate.

3. A fire alarm circuit closing device comprising a housing of electrically insulative material, a first contact plate disposed in said housing, a second contact plate disposed in said housing and spaced from said first contact plate, said housing having an aperture therethrough, an electrically conductive rod extending through said aperture and having a head outside of said housing, a contact on said rod in said housing, a meltable substance disposed between said head and said housing, a spring engaging said contact and said housing urging said rod to a position engaging said first contact plate and with said contact engaging said second contact plate to complete an operative electrical circuit between said first contact plate and said second contact plate, a bi-metallic strip secured to said housing and electrically connected to said second contact plate, said first contact plate having a contact lug forming a part thereof extending through said housing, said bimetallic strip being engageable with said contact lug to complete an operative electrical circuit between said first contact plate and said second contact plate.

4. A fire alarm circuit closing device comprising an electrically insulative housing having an open end, a closure member detachably secured to said housing, said housing and said closure member being adapted to clampingly engage a pair of electrical conductors, a first contact plate disposed in said housing and having piercing means for engaging one of said pair of electrical conductors, a second contact plate disposed in said housing spaced from said first contact and having piercing means for engaging the other of said pair of electrical conductors, said housing having an aperture therethrough, an electrically conductive rod extending through said aperture and having a head outside of said housing, a contact on said rod in said housing, a meltable substance disposed between said head and said housing, a spring engaging said contact and said housing urging said rod to a position engaging said first contact plate and with said contact engaging said second contact plate to complete an operative electrical circuit between said first contact plate and said second contact plate, a bimetallic strip secured to said housing and electrically connected to said second contact plate, said first contact plate having a contact lug forming a part thereof extending through said housing, said bimetallic strip being engageable with said contact lug to complete an operative electrical circuit between said first contact plate and said second contact plate.

5. The combination of claim 2 wherein said housing has parallel side walls with said first and second contact plates being fixedly secured thereto in parallel relation to each other, said rod being disposed substantially perpendicular to said contact plates.

6. The combination of claim 2 wherein said housing has parallel side walls with said first and second contact plates being fixedly secured thereto in parallel relation to each other, said rod being disposed substantially perpendicular to said contact plates, said second contact plate being shorter than said first contact plate with said rod being positioned in spaced relation at all times to said second contact plate.

7. The combination of claim 2 wherein said housing has parallel side walls with said first and second contact plates being fixedly secured thereto in parallel relation to each other, said rod being disposed substantially perpendicular to said contact plates, said first contact plate having its upper end extending through a wall of said housing and having a contact lug thereon, a bimetallic strip secured to the exterior of said housing and thermally operable into engagement with said lug, means elec-

trically connecting said bimetallic strip to said second contact plate.

8. The combination of claim 2 wherein said housing has parallel side walls and a closed top wall with an open bottom, laterally projecting ribs along said side walls, a channel closure for said open bottom having parallel resilient flanges embracing said side walls, said flanges having channels receiving said ribs.

9. The combination of claim 2 wherein said housing has parallel side walls and a closed top wall with an open bottom, laterally projecting ribs along said side walls, a channel closure for said open bottom having parallel resilient flanges embracing said side walls, said flanges having channels receiving said ribs, said side walls having grooves extending vertically upwards from said ribs, projections on said flanges engageable in said grooves.

References Cited in the file of this patent

UNITED STATES PATENTS

454,746	Leonard	June 23, 1891
1,977,191	Levenstein	Oct. 16, 1934
2,204,237	Slack et al.	June 11, 1940
2,552,331	Lamb	May 8, 1951

FOREIGN PATENTS

S29948x/39a	Germany	Mar. 15, 1956