

Feb. 28, 1939.

A. E. DIETZ

2,148,542

FUSE

Filed July 31, 1937

FIG. 1

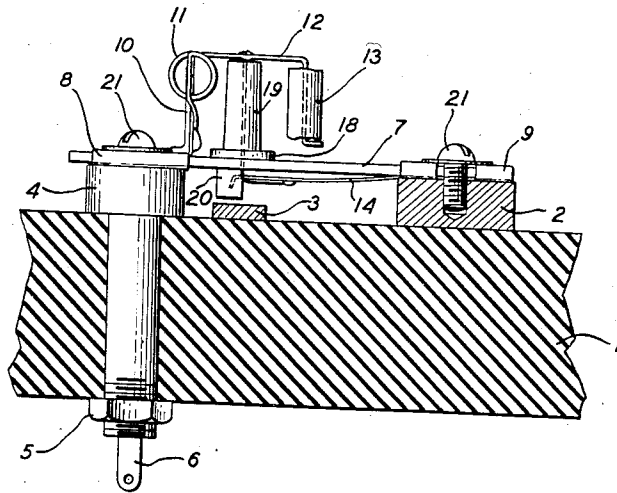


FIG. 2

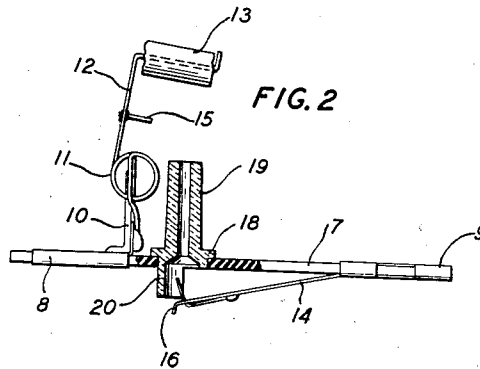


FIG. 3

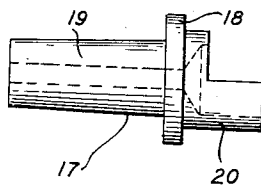
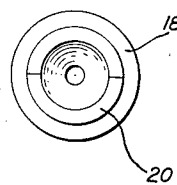


FIG. 4



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2,148,542

FUSE

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Application July 31, 1937, Serial No. 156,672

6 Claims. (Cl. 200—117)

This invention relates to protective devices and more particularly to alarm devices.

The invention applies to alarm fuses of the type disclosed in the patent to Craft, No. 817,959, issued April 17, 1906.

In the use of fuses of this type difficulty has been experienced when they were called upon to break the circuit upon the flow of abnormally high currents. Upon the operation of a fuse due to the application of such high currents there has been a tendency for the arc flash to operate adjacent fuses and also for an arc to form between the alarm spring contact and the adjacent fuse post.

It is an object of this invention to prevent flashing of the arc caused by the operation of a fuse.

It is a further object to prevent the formation of an arc from the alarm spring contact to the fuse post.

A feature of the invention is a shielding member of heat resistant, electrical insulating material surrounding the fuse wire and having a barrier portion between the alarm spring and the fuse post.

Other and further objects and features of the invention will be apparent from the following description of an embodiment illustrated by the accompanying drawing in which:

Fig. 1 is a side view of an alarm fuse device mounted on a panel and shown in non-operated condition;

Fig. 2 is a side view of the alarm fuse device alone, with parts in section to show details of the shielding member and barrier and shows the operated condition;

Figs. 3 and 4 are respectively side and end views of the shielding member and barrier.

The alarm fuse device is shown mounted on a panel 1 of insulating material. The panel 1 carries two bus bars 2 and 3 which are shown in cross-section in Fig. 1. The bus bar 2 is a main or battery bus bar which may be connected to a battery or other suitable source of power. The other bus bar 3 is an auxiliary or alarm bus bar and may be connected to an alarm means, such as a bell or lamp. A fuse post comprising a bolt or stud 4 passes through the panel 1 and is held therein by suitable means such as the nut 5. The bolt or stud 4 is provided with suitable terminal means 6 for connection to the circuit which is protected by the device.

The body or frame portion of the protective device comprises a mounting strip 7 of insulating material having terminal plates 8 and 9 at or

near the ends thereof. The terminal plate 8 carries a supporting member or arm in the form of a right-angled extension 10. A coiled spring 11 is supported by the extension 10 and has one end suitably secured thereto as by soldering. The other end of the spring 11 is extended in the form of an arm 12 which carries on its end a target or indicating means which may be a tubular glass bead 13.

An alarm spring 14 is suitably connected to the terminal 9 and extends from the mounting strip 7 on the side opposite to supporting means 10. In its unflexed condition this spring 14 takes a position as shown in Fig. 2.

A section of fuse wire 15 of suitable current carrying capacity is connected between the arm 12 and the alarm spring 14 passing through an opening in the mounting strip 7. The fuse wire 15 is attached to 12 and 14 by soldering or by other suitable means.

The parts are so proportioned that when the fuse wire 15 is attached to the parts 12 and 14 they are held in the positions shown in Fig. 1.

The alarm spring 14 has a bent-over projection 16 at its free end which serves as a contact means for cooperation with the alarm bus 3. When the protector is in its operated condition with the fuse blown as in Fig. 2, contact is made between 16 and 3 closing an alarm circuit.

A member 17 of ceramic or other heat resistant, electrical insulation material is mounted through an opening in the supporting strip 7 with its shoulder portion 18 resting against said strip. A small bore tubular portion 19 of this member surrounds the fuse wire 15. That part of the member which extends through the support member 7 and to the opposite side from the portion 19 is of larger diameter and comprises chiefly the semi-cylindrical barrier portion 20. The part 20 forms a barrier between the fuse post 4 and the end 16 of the alarm spring 14.

The protector device is mounted between the bus bar 2 and the fuse post 4 and is held thereto by suitable fastening means as screws 21.

In practice, a plurality of these devices are mounted side by side on a panel with bus bars as 2 and 3 common to the group and a fuse post as 4 for each protector. Such an arrangement of similar fuse means is shown in the Craft Patent 817,859 previously mentioned.

Due to the enclosure of the fuse wire 15 by the tubular portion 19, flashing of the arc caused by operation of the fuse is prevented from operating other adjacent fuses. Furthermore, the tube is an aid in extinguishing the arc caused

by the fuse operation by confining the gas generated and thereby increasing the pressure in the region adjacent the fuse wire.

The barrier 20 prevents formation of an arc between the end 16 of the alarm spring 14 and the fuse post 4.

A protector provided with the shield means 17 of this invention because of the above-noted features gives better protection and less interference with adjacent protectors than can be attained in this type of device without such shielding.

Although the invention has been described in connection with a particular embodiment it is not to be taken as limited thereby but only by the scope of the appended claims.

What is claimed is:

1. A protective device comprising an insulating mounting strip having a terminal member secured to each of its ends, a fuse element, means for electrically connecting said fuse element to each terminal and for mounting it to extend in a direction substantially perpendicular to said mounting and through an opening therein and a ceramic tube closely surrounding said element over the greater portion of its length and having an extended portion to serve as a barrier between the terminal members.

2. A protective device comprising a flat mounting strip of insulating material having terminal members mounted at each end, a flat spring positioned on one side of said mounting and connected to one of the terminal members, a second spring means connected to the other terminal member and positioned on the opposite side of the mounting strip, a fuse element connected to each spring means and extending through an opening in the mounting strip, and a ceramic tube surrounding the fuse element and extending through said mounting, the major portion of said tube having an internal diameter only slightly greater than that of the fuse element and the remainder comprising a semi-circular chamber of relatively greater diameter.

3. A protective device comprising an insulating mounting having spaced terminals thereon, fuse means connected between the terminals and a ceramic arc shield extending through said

mounting and having one portion closely surrounding the fuse means and another portion extending between said terminals to serve as a barrier therebetween.

4. A protective device comprising a flat mounting strip of insulating material, a first terminal member on one end of said strip having a portion extending at right angles thereto and forming a bracket, a coiled spring mounted on said bracket and having an arm portion biased away from the mounting strip by said spring, a second terminal member on the other end of said strip, a flat spring connected to the second terminal member and extending at an acute angle from the strip on the side opposite to the coiled spring, a fuse wire extending through an opening in the insulating strip and connecting the arm of the coiled spring to the flat spring, and being of such length as to maintain them approximately parallel to the mounting strip and a shield of ceramic material extending through the opening in said strip and having the portion on one side thereof closely surrounding the fuse wire and that on the other side of the strip forming a barrier between the first terminal and the end of the flat spring.

5. In a fuse type protector, a fusible element, arc preventing means enclosing said element and comprising a member of heat resistant, electrical insulating material having a tube portion of inner diameter only slightly greater than the diameter of the fusible element and a portion of relatively greater diameter, the major part of which is in the form of a half cylinder and a spring member to which said fusible element is secured and having its free end positioned under tension within the semicylindrical tube portion.

6. In a fuse device having a section of fuse wire extending through an insulating mounting strip and held in tension between resilient portions of two terminal elements mounted on said strip, an arc inhibiting member comprising a tube portion closely surrounding the major part of said fuse wire and a barrier portion located between one terminal and the resilient portion of the other terminal.

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