

United States Patent

Pramaggiore

[15] 3,641,469

[45] Feb. 8, 1972

[54] ELECTRIC FUSE

[72] Inventor: **Luigi Pramaggiore**, Corsa Battaglione
Aosta 14, Aosta, Italy

[22] Filed: **Sept. 9, 1970**

[21] Appl. No.: **70,853**

[30] Foreign Application Priority Data

Apr. 11, 1970 Italy68234 A/70

[52] U.S. Cl.337/404, 219/263

[51] Int. Cl.H01h 37/76

[58] Field of Search.....337/401, 404, 405, 407, 416;
219/262-264

[56] References Cited

UNITED STATES PATENTS

3,323,458 6/1967 Hartmann, Jr.337/401

FOREIGN PATENTS OR APPLICATIONS

668,041 8/1963 Canada
1,577,002 6/1969 France

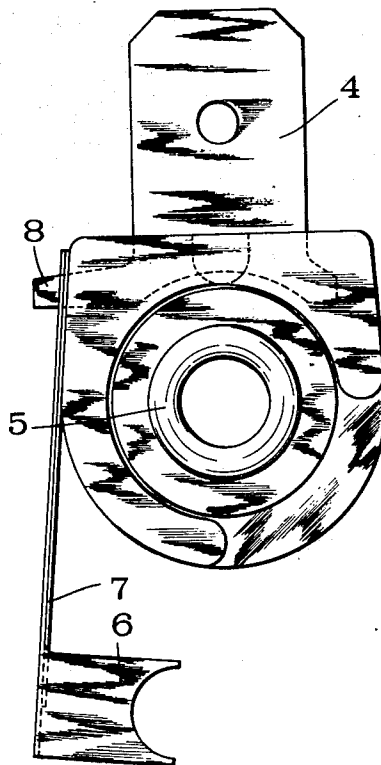
Primary Examiner—J. V. Truhe
Assistant Examiner—J. G. Smith
Attorney—Ernest A. Greenside

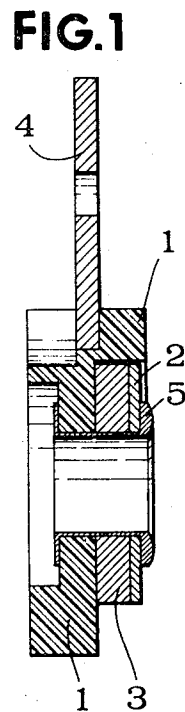
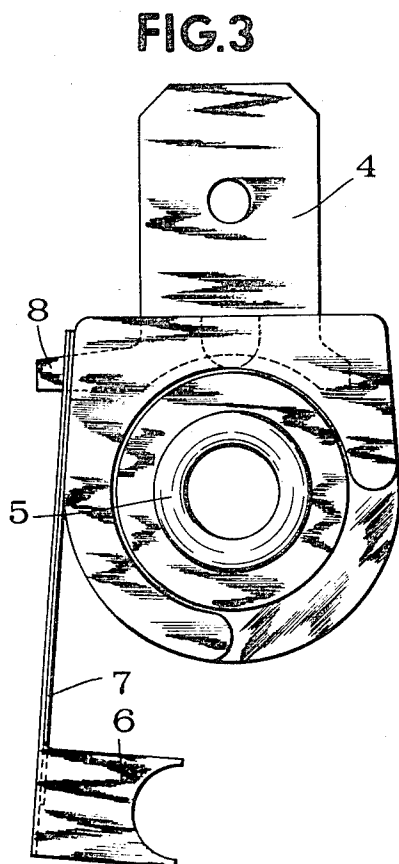
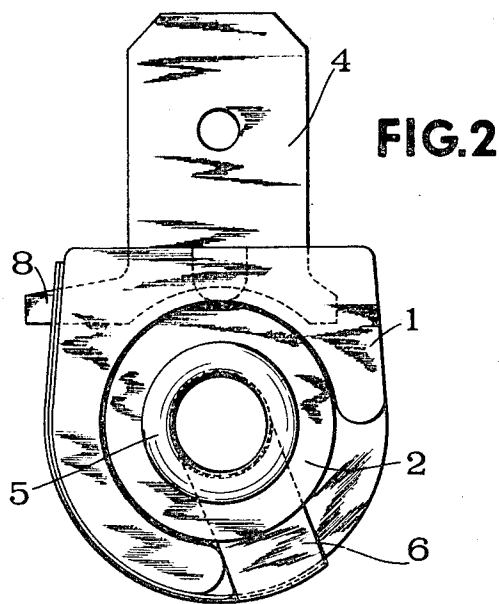
[57]

ABSTRACT

An electric fuse, especially for electric lighters in motor vehicles, comprising electrically conductive fusible means for releasing at a given temperature an electrically conductive metal plate to open the electric circuit and interrupt the supply of current.

5 Claims, 3 Drawing Figures





ELECTRIC FUSE

This invention relates to an electric fuse, especially for electric lighters in motor vehicles.

It is known that there is a considerable risk of motor vehicles catching fire due to defects in the operation of the electric lighter installed therein.

It is an object of the present invention to eliminate this risk by providing an electric fuse which can be attached to the electric lighter and comprises electrically conductive fusible means for releasing at a given temperature an electrically conductive metal plate to open the electric circuit and interrupt the supply of current. In this way the supply of current can be automatically stopped when the resistor of the electric lighter remains continuously energized because of some malfunction of the electric lighter.

The essential or operative part of the fuse is made of metal or an alloy which will melt at a low temperature, for example, a lead alloy, so that when the electric lighter is energized by the rated electric current of the circuit in which it is inserted, the operative part will not be noticeably heated whereas it will be overheated until it melts when the electric resistor is energized longer than a predetermined period whereby the circuit protected by the fuse is interrupted.

The fuse according to the invention may be applied, for example, to an electric lighter for motor vehicles of the type described in applicant's Italian Pat. No. 570,238 of Apr. 19, 1957. In this case the fuse is mounted on the shaft projecting from the rear of the lighter where conventionally the terminal plate for connection to the electric feed cable is secured.

More particularly the fuse according to the invention comprises a supporting receptacle of insulating material accommodating a fusible element in the form of a washer while another metal washer and finally a nut hold the pack thus formed together on the rear shaft or pin of the lighter in the manner of a riveting.

Between the fusible element and the receptacle of insulating material advantageously a small blade projecting from a tom-bac leaf spring may be secured to establish electric connection between the current supply terminal plate and the resistor of the lighter so that when the thermal element melts due to heating produced by the heat coming from the lighter body, the leaf spring will be released and come out of the pack of the fuse to interrupt the electric circuit. Normally when the electric circuit is closed the leaf spring will be wound around the curved periphery of the receptacle with the free end of the leaf spring inserted between the metal washer and the fusible washer and adhering for a small distance around the periphery of the shaft of the central eyelet in which the rear shaft of the lighter is accommodated. When the fusible washer of lead alloy has melted the leaf spring straightens due to its elasticity and opens or interrupts the electric circuit.

Thus the fuse according to the invention ensures the interruption of the electric current supply when there is a short circuit or when the temperature in the lighter rises beyond a predetermined limit. Apart from electric lighters, the fuse according to the invention may also be supplied to many other electric devices.

Thus this fuse permits the regular passage of current as long as the device on which it is installed operates in the normal regular way, but it interrupts the supply of current in the case of a short circuit or defect of operation of the device to be protected, for example, as mentioned above, when the temperature rises above a certain value.

A preferred embodiment of the invention will now be described by way of example and with reference to the accompanying drawing, in which:

FIG. 1 is a transverse section of a fuse according to the invention, shown on an enlarged scale;

FIG. 2 is a front view of the fuse in the closed or inoperative position (with the circuit closed), and

FIG. 3 is a similar view showing the fuse in the open position when the device is detached (with the circuit open).

The fuse or device according to the invention essentially consists of a supporting receptacle 1 preferably made of fiber glass and having incorporated therein and partly extending therefrom a brass terminal 4 for connection to the electric feed cable (not shown). The portion of the terminal 4 which is embedded in the receptacle 1 has a laterally projecting pointed lug 8 to which a steel spring 7 is secured and bent round. The free end of the steel spring 7 carries a bronze blade 6 which serves for electric connection of the terminal 4 to the central pin of the lighter (not shown), this pin being electrically connected through a rivet 5 in the form of an eyelet with through hole to a fusible washer 3 of an electrically conductive lead alloy and a brass washer 2 for electric connection of the device.

The bronze blade 6 extends in a plane perpendicularly to the plane of the steel spring 7 and has a semicircular recess at its free end which facilitates the insertion of the bronze blade 6 between the fusible washer 3 and the brass washer 2 and ensures its close engagement on the shaft of the rivet 5.

Thus the rivet 5 connects in the manner of a conventional riveting the supporting receptacle 1, the fusible washer 3, and the brass washer 2 so as to form a single block thereof.

The alloy of the fusible washer 3 is so chosen that the washer will melt at a given temperature determined by the temperature of fusion of the metal alloy employed.

To facilitate the winding up of the steel spring 7, which carries the blade 6 projecting therefrom, the lower peripheral portion of the supporting receptacle 1 is provided with a semicircular outer surface.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive.

I claim:

1. An electric fuse for electric lighters in motor vehicles, comprising a receptacle of insulating material for said electric lighter, an electrically conductive terminal projecting from said receptacle, a resilient member connected at one end to said terminal and carrying at its opposite end a contact blade; said resilient member having a first operative and a second inoperative position, and electrically conductive temperature responsive means insulatingly supported by said receptacle with respect to said terminal for maintaining said resilient member in said first position thereof at temperatures below a predetermined temperature and adapted to release said resilient member at temperatures above said predetermined temperature, and electrically conductive means for assembling as a unit said receptacle, said temperature responsive means and said resilient member in said first position thereof, said last-named means being adapted to engage a center projecting pin of a cigarette lighter.

2. A fuse according to claim 1, wherein said receptacle is formed with an opening, said temperature responsive means comprising an electrically conductive fusible washer having a face in substantial engagement with said receptacle and with the opening in said washer in alignment with said opening in said receptacle, and an electrically conductive end washer on the opposite face of the fusible washer with its opening in alignment with the openings in said receptacle and in said fusible washer, said assembly means comprising a rivet extending through all said openings for holding together said receptacle, said fusible washer and said end washer.

3. A fuse according to claim 1, wherein said receptacle defines over at least a portion of its periphery a curved surface adapted to guide said resilient member into said first position thereof.

4. A fuse according to claim 2, wherein said resilient member comprises a steel spring and said contact blade at said opposite end of said member comprises a bronze blade located in said first position of said resilient member between said fusible washer and said end washer.

5. A fuse according to claim 4, wherein the bronze blade carried by the free end of the steel spring extends in a plane

3

4

substantially perpendicularly to said steel spring and has a
semicircular recess at its free end to facilitate the insertion of
the bronze blade between said fusible washer and said end
washer to ensure engagement of the bronze blade with the
shaft of said rivet.

5

* * * * *

10

15

20

25

30

35

40

45

50

55

60

65

70

75