Nov. 9, 1943. F. C. LA MAR 2,333,942

FUSE

Filed Sept. 9, 1941

Fig. 1.

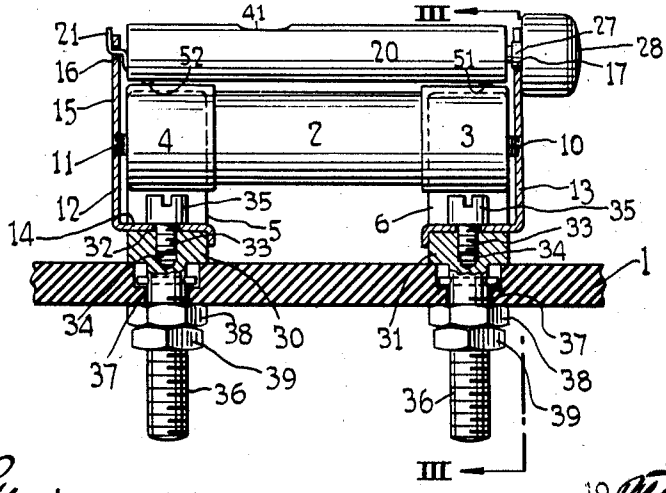


Fig. 2.

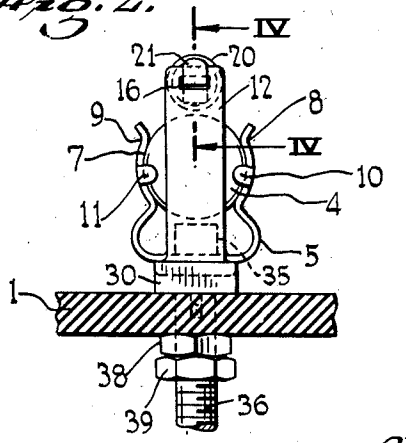


Fig. 3.

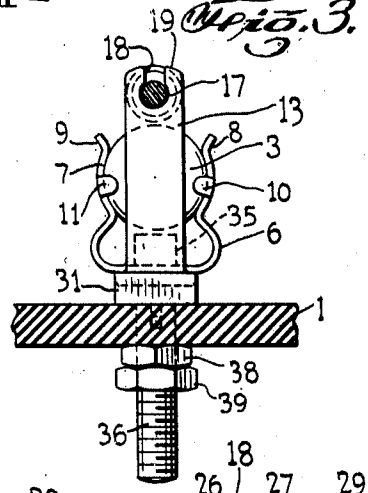


Fig. 4.

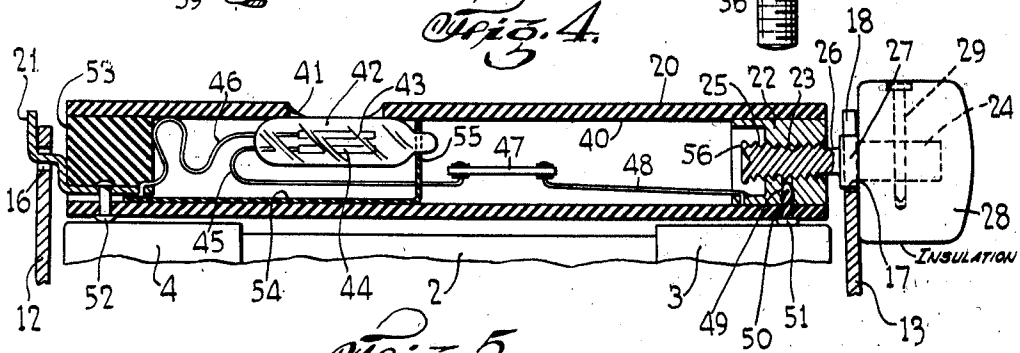
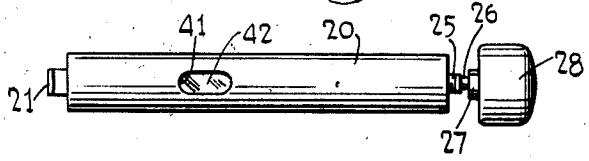


Fig. 5.



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FUSE

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Application September 9, 1941, Serial No. 410,122

2 Claims. (Cl. 200—121)

This invention relates to fuse clips, particularly to fuse clips for cartridge type fuses and more particularly to a combined clip and indicator.

It is well known to those skilled in the fuse clip art that when an extremely heavy explosion or concussion occurs near a fuse clip, especially in such places as warships, the fuse in the fuse clips is likely to be either thrown from the clips in which it is held or forced down into the clip in a practically inoperative position.

A principal object of this invention is to provide a clip combined with an indicator which shall be so constructed and arranged that both the fuse and the indicator will be so held that neither will be thrown from operative position by a severe explosion or concussion in the immediate vicinity thereof.

A further object of the invention is the construction of a device of the type specified which will be simple in construction, easy to manufacture, convenient to install, low in cost, and easy to maintain and use.

Other objects and advantages will appear as the description of the particular physical embodiment selected to illustrate the invention progresses and the novel features will be particularly pointed out in the appended claims.

In describing the invention in detail and the particular physical embodiment selected to illustrate the invention, reference will be had to the accompanying drawing, and the several views thereon, wherein like characters of reference designate corresponding parts throughout the several views, and in which:

Figure 1 is an elevational view, partly in section, of a device embodying my invention; Fig. 2 is a view of the device as shown by Fig. 1 as seen from the left hand end thereof; Fig. 3 is a cross-sectional view of the device as shown in Fig. 1 on the plane indicated by the line III—III of Fig. 1, viewed in the direction of the arrows at the ends of the line; Fig. 4 is a fragmentary cross-sectional view of the device as shown by Fig. 2, on the plane indicated by the line IV—IV of Fig. 2, viewed in the direction of the arrows at the ends of the line; Fig. 5 is a top plan view of an indicator alone used in connection with my invention.

In Fig. 1, a plate 1 is shown. This plate may be any of the usual or ordinary mounting plates or panels upon which fuse clips are mounted and has no novelty in and of itself or in combination with my invention as it is merely illustrative of a mounting plate. This mounting plate should, of course, be made as is usual, of a suitable insulating material.

The usual and ordinary cartridge fuse of commerce, as shown in Fig. 1, is designated 2. This fuse, as is usual, is provided with usual metallic caps 3 and 4. It is understood that within the interior of the cartridge 2 is the usual fusible link electrically connecting the metallic caps 3 and 4, but the internal construction of the cartridge fuse is no part of my invention.

As most clearly shown in Fig. 2, the metallic caps, as 3 and 4, are positioned between the legs of substantially U-shaped spaced clips 5 and 6. A U-shaped clip, as 5, has each leg formed for a portion of its length into substantially the arc of a circle as 7. The radius of this circle should be substantially the radius of the outside diameter of a cap, as 4. The two legs, as 8 and 9, of the clip are so formed and so positioned that before the positioning of a fuse cap, as 4 therein, they are somewhat nearer together than as shown in Fig. 2 so that when the cap, as 4, is forced therein the two legs as 8 and 9 are forced apart and bear resiliently against the outside surface of a cap, as 4. The material of which the clips, as 5, is made can be any of the usual materials used for such purpose, such as spring brass.

Each of the clips, as 5 and 6, also has on each of the legs, as 8 and 9, teats, as 10 and 11, best shown in Fig. 2. These teats extend inwardly from the legs and the inside face thereof toward a cap, as 4, is in line with the desired extreme endwise position of the end face of a cap as 4, so these teats provide for the proper positioning of the cartridge fuse 2 endwise.

Each clip, as 5 and 6, also has a combined fuse indicator and holding standard, as 12 and 13 positioned on the far side thereof. These standards, as 12 and 13, are preferably integral with the clips with which they are associated and intermediate the legs of the clips. In fact they may be struck out of the same sheet of metal from which the clips, as 5, are struck and then bent up into the form as shown in Fig. 2 just as the legs 8 and 9 are bent up to the form as shown in Fig. 2. These standards as 12, extend out from the base, as 14, of a clip and then upwardly, forwardly of the ends of the legs of the clip, as shown in Fig. 1. The standards, as 12, are, however, positioned such that the outside face, as 15, is substantially in line with the outside face of the teats, as 10 and 11, so that the fuse and fuse clips together occupy substantially no more space longitudinally than ordinary and well known fuse clips.

The fuse indicator and holding standards 12 and 13 each has means at its upper or free end by which to attach a fuse indicator. In the form shown in Fig. 1, standard 11 has a rectangular slot 16 in its upper end and standard 13 has a circular perforation 17 therein connecting with a narrowed slot 18 opening in the upper face 19 of the standard 13.

Between the standards 12 and 13 there is positioned a fuse indicator. This fuse indicator, in outward form, is an elongated member, preferably a cylinder 20, formed of insulating material, as best shown in Fig. 1. At one end thereof and suitably attached thereto, is a tongue 21 having a right angle bend intermediate its ends. At the other end, the fuse indicator is provided with a plug 22 provided with an internal thread 23. A stud 24 is provided having external threads 25 formed on the outer surface thereof for a portion of the length of the stud. The stud also has a reduced diameter or a narrow neck at 26 and an enlargement or collar at 27. The narrow neck 26 is of such diameter that it may be moved downwardly through the slot 18 as shown in Fig. 3. The collar 27 is of such diameter that it just neatly or substantially fits into the perforation or orifice 17. The stud 24 has an insulating handle or knob 28 fastened rigidly thereto in any suitable or appropriate manner, as by a pin 29, for turning the stud. After the stud is inserted in the plug 22, the end 56 is spread so that the stud cannot be removed and so lost.

By the construction hereinbefore described, it will be readily apparent that a cartridge fuse, as 2, in the absence of the indicator 20, may be pushed into the fuse clips, as 5 and 6, to take the position as shown in Figs. 1, 2 and 3. Then the fuse indicator may have the end of tongue 21 entered into the slot 16 by holding the indicator about at a right angle to the fuse 2 and then bringing it down towards parallelism with fuse 2 whereupon the narrow neck 26 may be passed through the slot 18 and then the collar 27 moved into the perforation 17 by turning the knob 28 which causes the screw thread 25 cooperating with screw thread 23 to advance the stud into the collar 22 until the knob 28 seats firmly against standard 13 and perhaps collar 27 seats against collar 22.

When the fuse indicator or integrity indicator 20 is in position above, the fuse 2, as shown in Fig. 1, if any concussion occurs in the vicinity of the fuse 2 tending to throw the fuse out of the fuse clips toward the fuse indicator, the fuse indicator will act as a holder and prevent the fuse from being thrown from its clips.

Any suitable or appropriate means may be used for supporting the clips, as 5 and 6, at a suitable distance apart and in proper alignment. I prefer to support the clips, as 5 and 6, upon conducting blocks 30 and 31, respectively. Clips 5 and 6 may be attached electrically and mechanically to blocks 30 and 31 in any suitable and appropriate manner, but I prefer to form orifices, as 32, in each of the clips and to pass a screw threaded headed member, as 33, through the orifice into a screw threaded cavity 34 of the block, as 30. This construction not only gives a firm and secure attachment of the clip to the block but it also, if a proper screw is used, such as a filister head, provides an abutment at each of the clips, on the bases thereof, which is of great importance. This head, as 35, is made of such a height that it comes within a very short distance of a cap, as 4. As there are one of these screws at each end of the fuse, if concussion occurs, tending to drive the fuse downwardly, as viewed in Fig. 1, that is, into the fuse clips into an inoperative position, this motion is prevented by the heads, as 35, of the screws, as 33, so that undue inward motion cannot take place.

By the construction described, it is evident that a concussion, blow or explosion adjacent the fuse cannot operate to jar the fuse out of the clips, outwardly or in an upward direction, as shown in Fig. 1, as hereinbefore explained, nor can it jar the fuse out of the clips into an inoperative position, by reason of the abutment provided by the heads as 35 of the securing screws.

The conducting blocks, as 30 and 31, may be secured to the desired surface in any suitable or appropriate manner, but it is preferred to form a screw threaded portion, as 36, on each which will serve to go through an orifice, as 37, in a mounting plate and afford means for securing to the mounting plate by a nut 38 and a further lock nut, as 39.

The indicator itself, best shown in Fig. 4, includes an elongated hollow body 40, preferably in the form of a hollow cylindrical tube having a sight opening 41. Just beneath the sight opening 41 there is positioned a lamp 42. This lamp may be of any suitable or desired type and form but it is preferred to use a lamp of the discharge type having two electrodes, as 43 and 44, therein which after being evacuated is filled with a rare gas such as neon, perhaps combined with helium or argon or both. There are lead wires, such as 45 and 46, issuing from the lamp. One of these lead wires 45, connects to one end of a resistance 47 of the grid leak type of the order of 50,000 ohms resistance. The other end of the resistance being connected by a conductor 48 to the metallic electrical conducting sleeve 22. The outlet wire 46 connects to the tongue 21 which is made of a metallic electric conducting material, such as copper or brass.

The sleeve 22 may be held within the end of the tube 40 by any suitable or appropriate means but I prefer to form a cavity, as 49, in the sleeve 22 and a cavity 50 in the tube 40 and to then drive a drive screw 51 through the opening in the tube 40 into the cavity in the sleeve 22.

The tongue 21 may be held in place in the end of the tube 40 in any suitable or appropriate manner but applicant prefers to hold it therein by means of a rivet, as 52, passing through the wall of the tube 40 and through the material of the tongue 21 but it is entirely feasible to omit the rivet and to hold the tongue 21 in the end of the tube 40 merely by means of the closure 53. This closure 53 is put into the end of the tube along with the tongue 21 and when pushed home can well be relied upon to hold the tongue in place because the closure 53 I prefer to make of a comparatively soft rubber having considerable resiliency although I do not mean to exclude the use of a much firmer material such as hard rubber for closing one end of the tube 40. The lamp 42 is held in place by the lamp holder 54 which is provided with an orifice 55 into which the point of the lamp extends and the holder extends along the inside of the tube 40 and is held from movement by being frictionally held between the tongue 21 and the inside wall of the tube 40.

I want it completely understood that although I have shown a particular form of construction, that is, a filister head screw 35 for preventing inward movement of the fuse 2, I do not thereby intend to exclude any other form of abutment

positioned between the clip 5 and the caps, as 3 and 4.

I desire to have it further understood that although I have desired a particular form of fuse indicator having highly specific means for attachment to standards, as 12 and 13, nevertheless, I desire to have it understood that I do not thereby mean to exclude other specific forms of fuse indicator which may be provided and which may be so constructed as to have the ends attached fixedly but manually movable from the standards, as 12 and 13.

It is further to be understood that although I have shown the member 20 as being a fuse indicator it might well be free from any indicating properties, that is, a member such as 20 could well be used merely as a fuse holder, and the body simulating applicant's fuse indicator might well be a plain cylinder or other suitable form fixedly attached at each end to the standards as 12 and 13 merely to prevent the fuse from being shaken from the clips. Applicant's fuse indicator could act merely as a fuse holder by omitting the lamp 41 and its connections.

Although I have particularly described a particular embodiment of my invention and explained the principle, construction and mode of operation thereof, nevertheless, I desire to have it understood that the form selected is merely illustrative but does not exhaust the possible physical embodiments of the idea of means underlying my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. A cartridge fuse holder, including, in combination: two spaced substantially U-shaped clips, each adapted to receive and hold an end of a cartridge fuse; standards, one on each clip and positioned on the far side of each and each standard extending forwardly of the ends of the legs of the U clip, one standard formed with a slot adjacent its free end, the other formed with an orifice connected by a slot of less width than the orifice opening in the face of the free end; an elongated member; a tongue protruding from one end of the elongated member insertable in the said first mentioned slot; a plug formed with a through screw threaded bore in the other end of the elongated member; an externally screw threaded stud engaging the screw threads of the plug, said stud formed with a reduced diameter portion and with an enlargement, the said enlargement substantially fitting the orifice in the standard and the reduced diameter portion passable through the slot connecting with the orifice whereby the elongated member may be positioned fixedly between the standard and serve as a holder to prevent the fuse from moving out of the clips, means carried by the elongated member to indicate the integrity of the fuse.

2. A fuse indicator, including, in combination: a hollow elongated body provided with a sight opening; a metallic electrical conducting tongue projecting from one end of the body; a metallic electrical conducting plug in the other end of the body, said plug formed with an internally threaded through bore; an externally screw threaded metallic stud threaded into the plug, said stud formed with a reduced diameter portion and an enlarged collar; an electric lamp within the body at the sight opening; means for electrically connecting said lamp to the tongue and to the plug and means for electrically connecting said tongue and said stud to a fuse clip containing a fuse whereby the integrity of the fuse may be indicated.

FRANK C. LA MAR.