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FUSE

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This invention relates to fuses, particularly to the fuse clips for cartridge type fuses, and more especially to a combined fuse clip clamp and cartridge fuse indicator holder and fuse lock.

A principal object of this invention is to provide a device which may be readily applied to existing fuse clips which will not only strengthen the fuse clips but will also provide a holder for retaining a fuse indicator so positioned and constructed that it will act as a stop or lock for preventing a fuse from being thrown out of the fuse clips.

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 and easily applied to existing fuse clips, 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, in which:

Figure 1 is a side elevational view of a pair of clips mounted on an insulating panel including my invention for strengthening the clips and holding an indicator in place locking the fuse in place; Fig. 2 is an end elevational view of the device as shown in Fig. 1, as viewed from the left hand end of Fig. 1; 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 arrow at the ends of the line; Fig. 4 is a cross-sectional view of the device as shown in Fig. 1 on the plane indicated by the line IV—IV, viewed in the direction of the arrows at the ends of the line; Fig. 5 is a fragmentary longitudinal cross-sectional view of the device as shown in Fig. 1 taken on the plane indicated by the line V—V of Fig. 2 viewed in the direction of the arrows at the ends of the line; and Figs. 6 and 7 are views of the left hand and the right hand fuse clip clamps respective.

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 usually 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 usual, is provided with the usual metallic caps 3 and 4. It is understood that within the interior of the cartridge 2 is the usual fusible link electrically connected metallic caps 3 and 4, but the interior structure of the cartridge fuse is no part of my invention.

As most clearly shown in Figs. 2 and 3, the metallic caps, as 3 and 4, are positioned between the legs of substantially U-shaped spaced clips 5 and 6. Each of these clips is substantially U-shaped and each has legs as 7 and 8. Each of the legs, about mid-way of its length is formed into substantially the arc of a circle as 9 and 10. The radius of the arcs, as 9 and 10, is substantially that of the radius of a cap, as 4, although when the fuse is not in place in the clip, the normal position of the legs of the clip is much closer together than is shown, for example, in Fig. 2 so that it is necessary to exert some force to push the caps, as 3 and 4, down into the clips and on the other hand, in order to remove the caps, as 3 and 4, from the clips, some considerable force must be used.

It has been found in practice, especially in those situations where fuses are installed in fuse clips and at times are in the vicinity of extremely heavy explosions or concussions, for example, on warships, the fuse in the fuse clips is extremely likely to be either thrown from the clips in which it is held or forced down into the clip into a substantially inoperative position.

It is also well-known, that, in certain situations, it is extremely important to know immediately that a fuse has blown, even before, or without notification from the operator of the function or device supplied with electric current through the fuse. This is extremely important in such places as the fuse room of warships where many hundreds of fuses and fuse clips are assembled in one small space attended by one or more men who are charged with the duty of keeping all fused lines supplied with good fuses.

In order for a fuse replacer to know instantly that a fuse has been blown, it is necessary to equip the fuses with fuse indicators.

This invention provides a device for taking care of both of the requirements by strengthening the clips so that the fuse will not be thrown therefrom by explosion or concussion and by providing a fuse indicator which by an indicator, such as a

light, will indicate the blown condition of the fuse and which indicator by its position and arrangement acts as a stop or lock to prevent a fuse from being thrown from its clips by the occurrence nearby of a violent explosion or a concussion.

In order to strengthen the clips and reinforce them, the clamps, as 11 and 12, are positioned surrounding each clip. Each of these clamps consists of substantially a hollow rectangle, as best shown in Fig. 4. The dimensions of the hollow or cut-away portion of the square are such that with no fuse in a clip the free ends of the legs 7 and 8 of the clip may be squeezed together sufficiently to allow the clamp to pass down over the clip to a position as shown in Figs. 2 and 3. Each clamp is provided on an outer edge, at substantially a right angle to the interior edges, with downwardly depending portions, as 13 and 14, which lie along the inner faces of the clips and so prevent the clamps from moving outwardly and slipping from the clip and which also strengthen and firmly tie together the two separate marginal portions, as 15 and 16. Rising from the interior edge of each marginal portion, as 15 and 16, are clip leg supporting members, as 17 and 18. These clip leg supporting members are upturned and flared outwardly and each bears on the outside of the portion of the leg of the U just about opposite the starting of the arc and in the reverse curve at this point and the proportions of the parts are such that after the clamp has been applied to the clip, as shown in Figs. 2 and 3, it requires a very considerable more pressure or force to force the fuse into the clip and a much more considerable force to withdraw the fuse from the clip, so that the clamp very considerably strengthens the legs and the holding power thereof.

Not only are the two marginal portions 15 and 16 strongly held together by the depending member, such as 14 but at the opposite end of the clamp there is another cross member as 19.

The cross members, as 19, are bent at a right angle, upwardly as viewed in Fig. 1, and one, 20 serves to hold one end of a fuse indicator and the other, 21 serves to hold the other end of the fuse indicator.

By reference to Fig. 2, it will be seen that the fuse indicator holding leg 20 is provided with a rectangular through orifice 22 and the fuse indicator holding leg 21 is provided with a slot 23 opening in the top edge therein, as viewed in Fig. 1, merging with a circular through orifice 24 of larger diameter than the cross dimension of the slot 23 as viewed in Fig. 3.

The fuse indicator, designated generally as 25, is provided at one end with a tongue 26 which passes through the orifice 22 of the supporting member 20. At the other end of the fuse indicator 25 there is a knob 27, as best shown in Fig. 5, having a screw threaded projection 28 cooperating with a screw threaded bore 29 of the metallic member 30. The screw threaded member 29 being of such diameter as to readily pass through the slot 23 but having on it adjacent the inner surface 31 of the button 27 a circular enlargement 32 which is of such diameter that it cannot pass longitudinally through the slot 23 but can rest and fit nicely into the orifice 24 so that if the tongue 26 is put into the holder 20 and then the fuse 35 dropped to a position not quite parallel to the fuse 2, the stud or projection can slip through slot 23 and then upon turning the knob 27 the enlargement or collar 32 will fit nicely into the orifice 24 and hold the indicator

securely in position so that it cannot be removed by being moved upwardly at the right hand end, as viewed in Fig. 1, until the knob 27 is grasped and the stud 29 unscrewed so that the enlargement 32 is moved out of engagement with the orifice 24.

Not only is the indicator held firmly in position by the construction just described but an indicator may bear directly upon the fuse 2 or, in any event, it is very closely adjacent thereto and consequently the fuse 2 cannot move from its clips because it is stopped from so doing or locked in position by the secure fastening of the indicator 25.

The indicator cannot be taken from its position as shown in Fig. 1 without turning the knob 27 because the tongue 26 is given a right angle bend, as at 33, so that the portion 34 prevents the member 20 from being moved out of engagement with the tongue 26.

The fuse of the indicator itself includes a tube 35 of insulating material having a side opening 36. Within the tube 35 is positioned a lamp, as 37, which may well be of the neon discharge type. This lamp is preferably supported in position by a right angle member 38 having an orifice 39 therein to receive the point of the lamp and having one end as 40 held by a plug 41 positioned in an end of the tube 35.

The other end of the tube 35 is plugged by the metallic member 30.

The lamp terminals are connected by the conductors, as 42 and 43 to the metallic electrical conducting tongue 26 and the metal plug 30 respectively. There is a well-known high resistance member 44 inserted in the conductor 43.

It should also be noted that fuse indicator holder 21 is made of spring metal and has a set such that if knob 27 and screw threaded projection 29 do turn slightly, the holder will follow the collar 30 and keep it in the orifice 24 so that the fuse indicator will still keep the fuse locked in place.

The hollow rectangles 11 and 12, as described, not only clamp the legs of the U clip together but also furnish a support for the fuse indicator holding members 20 and 21, so that they may well be called combined clip, clamp and fuse indicator support.

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 and means underlying my invention.

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

1. A combined fuse indicator support and fuse clip clamp including, in combination: two spaced substantially U-shaped clips, the legs of each formed for a portion of their length into an arc of a circle; hollow rectangular bodies each adapted to be passed over the free ends of the legs; said rectangular bodies each provided with upturned opposite edges, each adapted to rest upon a leg on the outside opposite about the beginning of the said arc whereby the leg is stiffened; each leg being reversely curved just beyond the rectangular body toward the base preventing downward movement of the rectangular body and means attached to each rectangular body extending upwardly toward the free ends of the clips whereby a fuse indicator may be supported.

2. A combined fuse indicator support and fuse clip clamp including, in combination; two spaced substantially U-shaped clips, the legs of each formed for a portion of their length into an arc of a circle; hollow rectangular bodies each adapted to be passed over the free ends of the legs; said rectangular bodies each provided with upturned opposite edges, each adapted to rest upon a leg on the outside opposite about the beginning of the said arc whereby the leg is stiffened; each leg being reversely curved just beyond the rectangular body toward the base preventing downward movement of the rectangular body one of the edges of each rectangular body being formed into depending flanges adapted to bear against the opposing edges of the clips.

3. A combined fuse indicator support and fuse clip clamp including, in combination; two spaced substantially U-shaped clips, the legs of each formed for a portion of their length into an arc of a circle; hollow rectangular bodies each adapted to be passed over the free ends of the legs; said rectangular bodies each provided with upturned opposite edges, each adapted to rest upon a leg on the outside opposite about the beginning of the said arc whereby the leg is stiffened; each leg being reversely curved just beyond the rectangular body; toward the base preventing downward movement of the rectangular body one of the edges of each rectangular body having formed into depending flanges adapted to bear against the opposing edges of the clips and means attached to each rectangular body extending upwardly toward the free ends of the clips whereby a fuse indicator may be supported.

4. A combined fuse indicator support and fuse clip clamp, including, in combination; two spaced substantially U-shaped clips, the legs of each formed for a portion of their length into an arc

of a circle; means stiffening the legs at the start of the arc and means supported by said first named means adapted to support a fuse indicator.

5. A fuse clip clamp formed as a substantially hollow rectangular body, opposite interior edges being upturned and flared outwardly, adapted to bear against and stiffen the opposite legs of a U fuse clip at a point substantially opposite the start of the arc of the circle of the clip embracing a fuse.

6. A fuse clip clamp formed as a substantially hollow rectangular body, opposite interior edges being upturned and flared outwardly, adapted to bear against and stiffen the opposite legs of a U fuse clip at a point substantially opposite the start of the arc of the circle of the clip embracing a fuse, said body having an outer edge at substantially a right angle to the said interior edges downturned to a position bearing against the end edges of the clip whereby the body is strengthened and prevented from slipping in one direction off the clip.

7. A fuse clip clamp formed as a substantially hollow rectangular body, opposite interior edges being upturned and flared outwardly, adapted to bear against and stiffen the opposite legs of a U fuse clip at a point substantially opposite the start of the arc of the circle of the clip embracing a fuse, said body having an outer edge at substantially a right angle to the said interior edges downturned to a position bearing against the end edges of the clip whereby the body is strengthened and prevented from slipping in one direction off the clip, and said body also having the exterior edge opposite the first mentioned exterior edge upwardly turned whereby the body is strengthened and prevented from slipping in an opposite direction off the clip.

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