March 7, 1944. F. C. LA MAR 2,343,677

FUSE

Filed Nov. 21, 1942

Fig. 1.

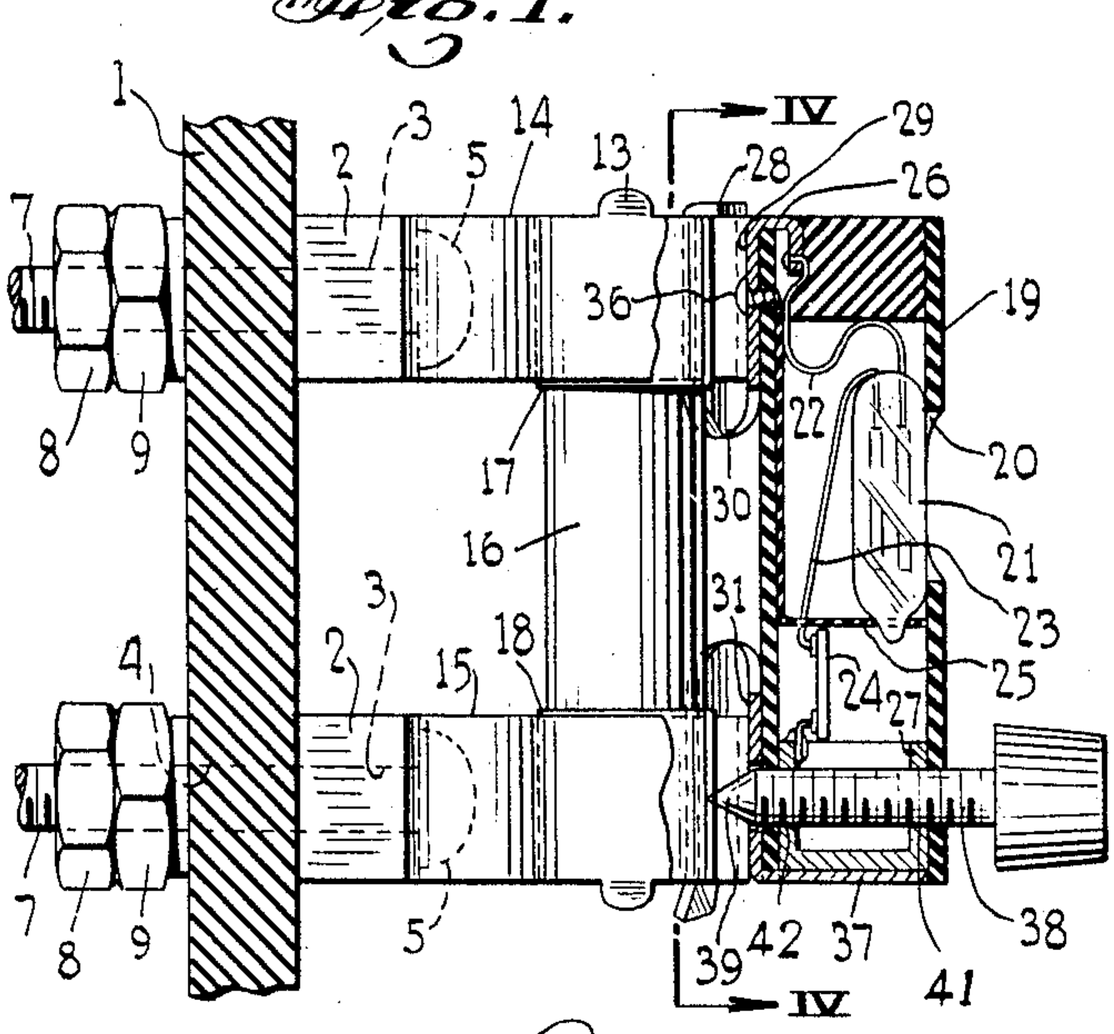


Fig. 2.

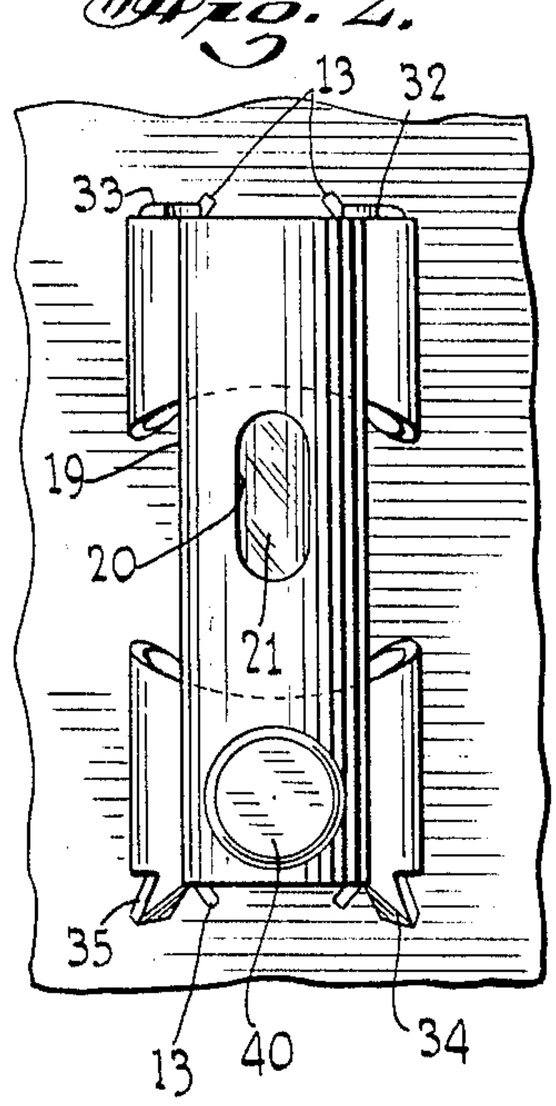


Fig. 3.

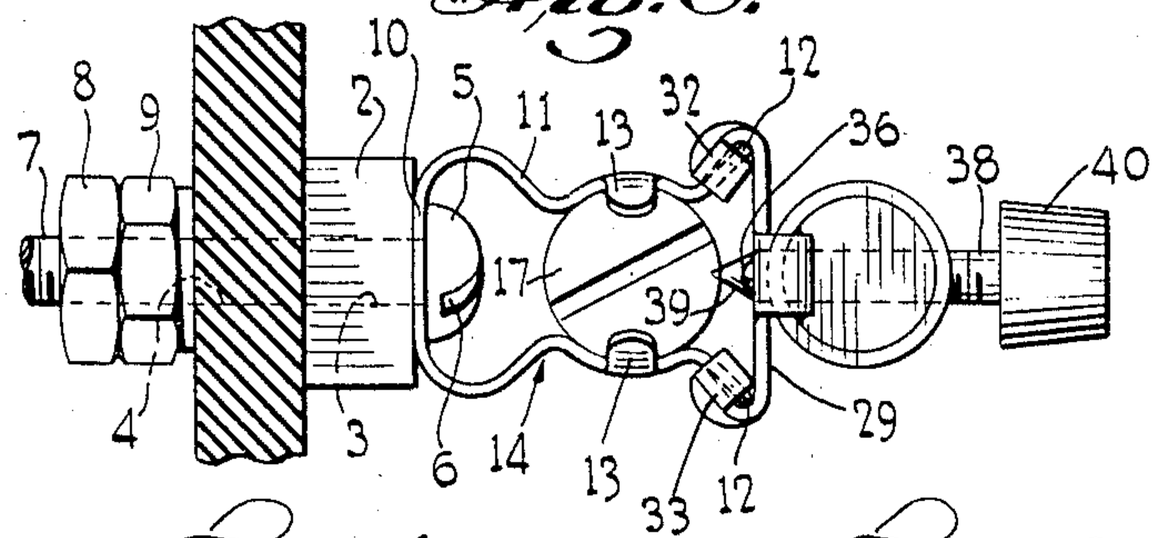


Fig. 4.

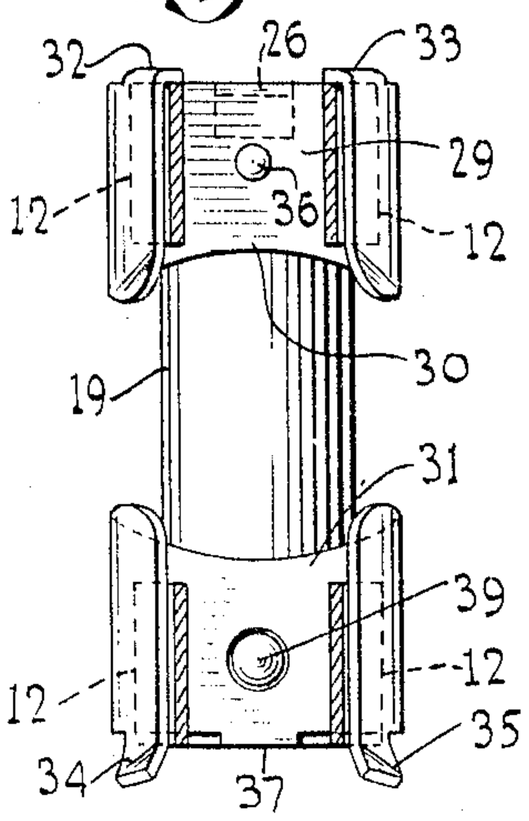


Fig. 6.

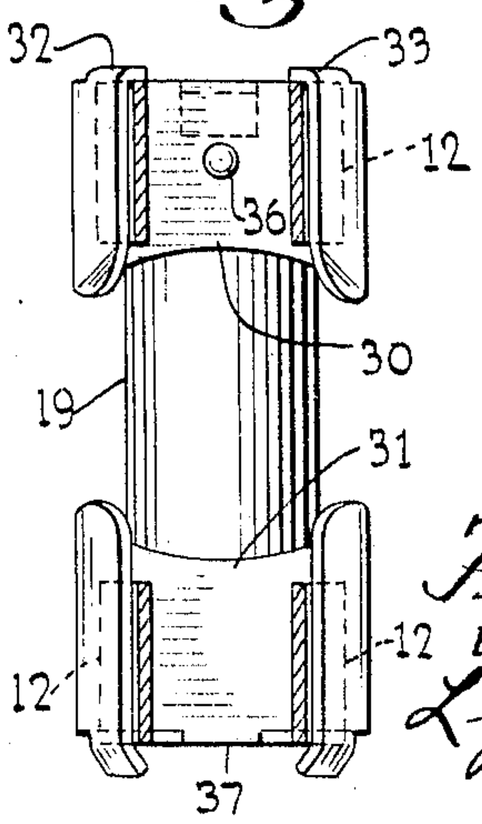
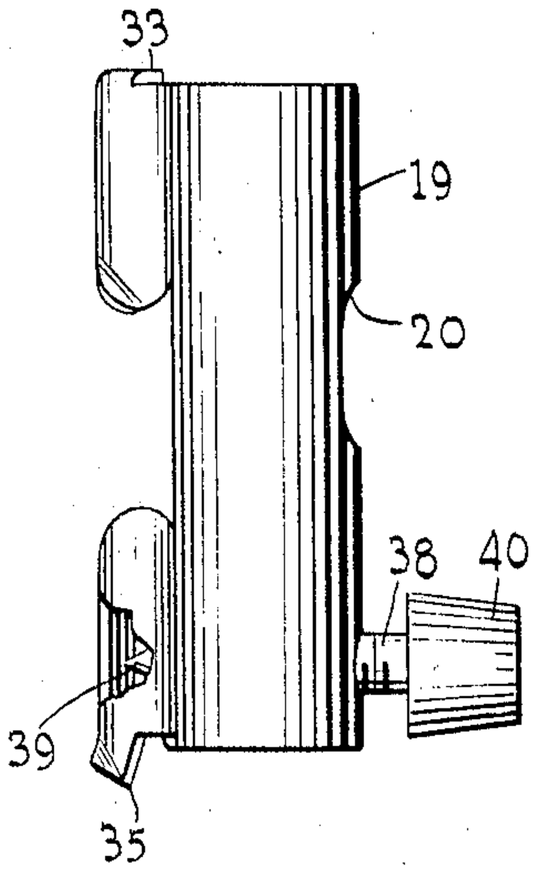


Fig. 5.



INVENTOR.
Frank C. La Mar
BY
Lyman E. Dodge
ATTORNEY

Patented Mar. 7, 1944

2,343,677

UNITED STATES PATENT OFFICE

2,343,677

FUSE

Frank C. La Mar, Tucson, Ariz.

Application November 21, 1942, Serial No. 466,389

1 Claim. (Cl. 200—134)

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

A principal object of this invention is to provide a device which may be readily applied to and removed from 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, or clamp 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 easy to apply 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 proresses and the novel features will be particularly pointed out in the appended claims.

In discussing 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, partly in section, showing a conventional and well-known type of fuse clip together with my improved fuse clip clamp and indicator in place thereon; Fig. 2 is a front elevational view of the device as shown by Fig. 1; Fig. 3 is a top plane view of the device as shown by Fig. 1; Fig. 4 is a cross sectional view on the plane indicated by the line IV—IV of Fig. 1, viewed in the direction of the arrows at the ends of the line; Fig. 5 is a side elevational view of my improved fuse clip lock and indicator alone; Fig. 6 is a fuse clip lock corresponding to Fig. 4 but of a modified form.

Numeral 1 designates any usual, conventional or ordinary plane or panel or insulating material as commonly used for mounting fuse clips. In the form shown, there is also included mounting blocks of metal 2. Both the mounting blocks of metal 2 and the plate are formed with alined orifices 3 and 4 through which pass mounting bolts 5 having screw driver slots 6 in their heads and provided with screw threads 7 upon which nuts as 9 and 8 may be positioned to secure all parts firmly together.

Under the heads of the bolts 5 are positioned the connecting member 10 of a somewhat U shaped metallic clip 11. These metallic clips are generally made of copper or a copper alloy such as brass and are electrically conducting. Although they are in general form the shape of U, each of the legs of the U, intermediate their ends are given an arcuate form so as to be substantially the same radius of curvature as the end of a cartridge fuse so that the end of a cartridge fuse may fit neatly therein and make good mechanical and electrical contact therewith. The legs of the U above the position formed into the arcuate shape are flared outwardly as at 12. In addition, each leg of each U has stop nibs, as 13, which are positioned somewhat in the plane of each of the U's and so act as longitudinal stops to prevent longitudinal displacement of a cartridge fuse after being positioned in place in the clips.

The clips are arranged in pairs, as shown in Fig. 1, and commonly so that one clip is vertically above the other that is clip 14 is one member of the pair and is positioned vertically above clip 15, the other member of the pair.

The usual and ordinary cartridge fuse 16 is placed so as to be held within the arcuate portions of each clip, as shown in Fig. 1, with its usual metallic ends, 17 and 18, in contact with the metallic clips.

All of the hereinbefore discussed construction is old and well known and is merely illustrative of the commonly used type of clip to which my invention is applicable.

It has been found in practice, that where fuse clips of the type hereinbefore discussed are used in situations where the clips and fuse are, at times, subjected to extremely severe vibrations or jarring shocks, such as on battleships, when a big gun is fired or a torpedo or bomb explodes on or close to the battleship, the fuses are thrown from the clips, rendering inoperative all of the electrical apparatus which is in circuit with the fuse.

My improvement is designed to obviate the above mentioned difficulty and at the same time to provide an indicator of the integrity of the fuse.

My indicator is made largely in accordance with well known practice. It includes a tube 19 of insulating material which may be made of the well known horn fibre. This tube is provided with a sight opening at 20. Within the tube a lamp 21 is placed so as to be observable through the sight opening 20. The lamp is preferably of the gased filled discharge type and preferably

of the neon filled type in which some argon is present. One terminal of the lamp is indicated at 22 and the other at 23. Connected in series with terminal 23 is the usual and well known high ohmic resistance 24 preferably made in the form of the well known grid leak type. The lamp is suitably supported by a right angle member 25.

In order to keep an electrical circuit through the lamp 21, one terminal 22 is connected to the metallic member 26 and the free terminal of the grid leak resistance 24 is connected to the metallic thimble 27.

The metallic member 26 is formed integrally with or electrically connected to a fuse clip clamp. The fuse clip clamp 28 is provided in duplicate, one at each end of the tube 19 but each clamp is positioned reversely to the other. Each clamp includes a substantially plane or stretcher portion 29 which extends substantially from one flared end of a U clip to the other flared end. At about the point of contact with a flared end, as 12, the plane portion 29 is bent so as to run about parallel with the side of the flared portion 12 of the clip so that there is in effect formed two channels, one at each side of the clamp into which the flared portions 12 may be placed so that outward movement of the flared portion is prevented and so outward movement of the arcuate portion of the legs of the U is also prevented so that when a shock occurs the fuse 16 can not be thrown out of the clips.

Each of the lock clips or clamps 30 and 31 are provided with ears, as 32, 33, 34, and 35. The ears 32 and 33 are bent into a position such that they bear against the end of the fuse clip 14. The ears 34 and 35, in one form of the device, as shown by Figs. 1 to 5, inclusive, are not bent so as to contact the end of the fuse clip to which it is positioned adjacently but are so positioned that the fuse clip clamp, as 31 may be passed over fuse clip 14 and 15 to rest in the position as shown in Fig. 1.

Lock clip 30 may be attached to tube 19 in any suitable or appropriate manner, preferably by a drive screw as 36.

Locking clip 31 is attached to the indicator by being provided with a right angle portion 37 which is positioned over the end of the tube 19 and lying against the metallic thimble 27 to which it may be attached mechanically and electrically in any suitable or appropriate manner as by solder. The combined indicator and fuse clip lock as hereinbefore discussed may be placed in position on fuse clips, as shown in Fig. 1, and would be retained therein if clip 14 is vertically positioned above clip 15 but, in order to prevent displacement, means are provided for holding it securely in place. The simplest means would be to push down the ears 34 and 35 into a position abutting the end face of clip 15 and the embodiment of my invention, as shown in Fig. 6. illustrates this construction.

It is preferred, however, to attach the combined indicator and fuse clip lock by leaving the ears 34 and 35 outstanding, as shown in Fig. 2 and to form a screw thread in the metallic thimble 27 in the through bores 41 and 42 and to pass therethrough a screw threaded member 38 having at one end an end 39 to be firmly screwed down against the metallic end ferrule of the cartridge fuse 16 and preferably a pointed or conical end so that the screw 38 may be forced somewhat into the material of the end ferrule. In order to more conveniently perform the turning operation a knurled finger piece 40 is provided rigidly attached to the screw member 38.

From the hereinbefore given description, it will be apparent that applicant's device provides a strong rigid structure which may be placed upon the flared ends, as 12, of U fuse clips to prevent the legs of the U shape clip from opening or separating and that these members may be placed upon each of the pair of fuse clips ordinarily used to retain a fuse. That the members so used may be mounted upon a common member, as a tube 19, so as to be positioned to properly engage each of the fuse clips and that this common member may serve merely to connect the two members together or may also serve as a support or containing device for a fuse indicator. It will be also seen that when the fuse clip lock is in place there is no chance for the fuse to be thrown from the clips. It will be further seen that various methods may be used for so attaching the fuse clip locks that they will not be displaced after once being positioned.

Although I have particularly described one particular physical embodiment of my invention and a modification thereof, nevertheless, I desire to have it understood that the forms selected are merely illustrative and do 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:

A lock for a fuse clip of the form including flared upper ends used in pairs for supporting a fuse at each end thereof, including, in combination: two stretcher members, each stretcher member positioned over and adapted to extend across the upper end of a fuse clip from one flared upper end to the other, each stretcher member formed with bent over portions at either side and each bent over portion lying substantially parallel and on the outer side of its adjacent flared upper end; a tube extending substantially from the extreme end of one stretcher member to substantially the extreme end of the other stretcher member; a metallic thimble in one end of the tube, said thimble having screw threaded bores in each of the opposite walls in alinement; a screw threaded rod extending through the screw threaded said bores in the screw threaded thimble and extending through the adjacent stretcher member, said stretcher member being formed with an orifice therefor, said screw threaded rod adapted to bear upon the metallic ferrule at the end of a cartridge fuse in the clips, said screw threaded rod provided with means for screwing said rod firmly against said ferrule.

FRANK C. LA MAR.