Feb. 14, 1967 L. L. GOSNELL 3,304,393

RETAINER FOR CARTRIDGE FUSE

Filed Sept. 14, 1965

FIG. 1

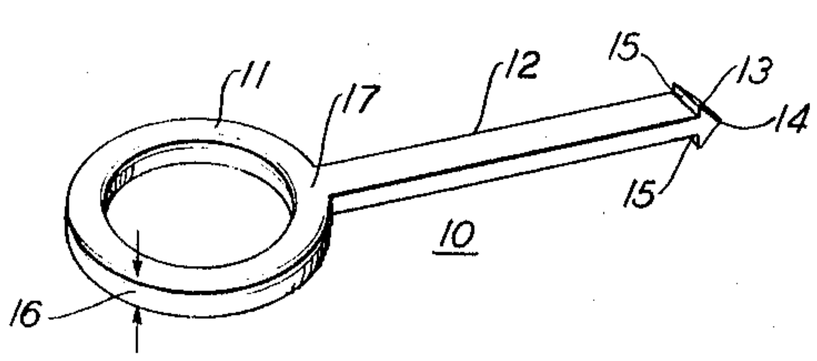


FIG. 1B

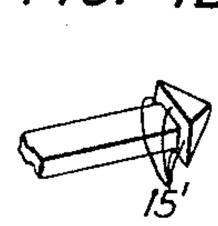


FIG. 1A

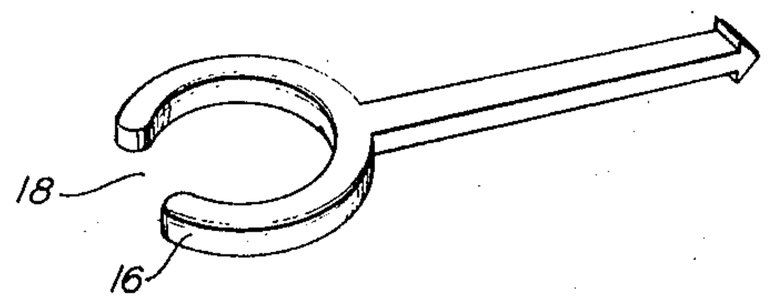


FIG. 2

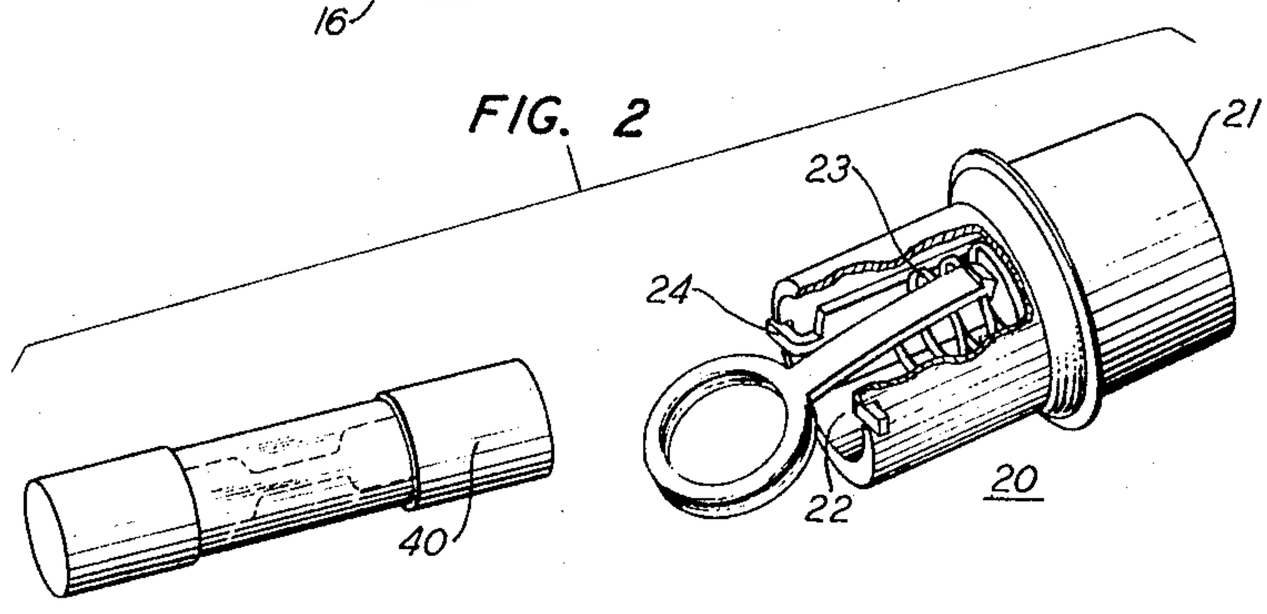
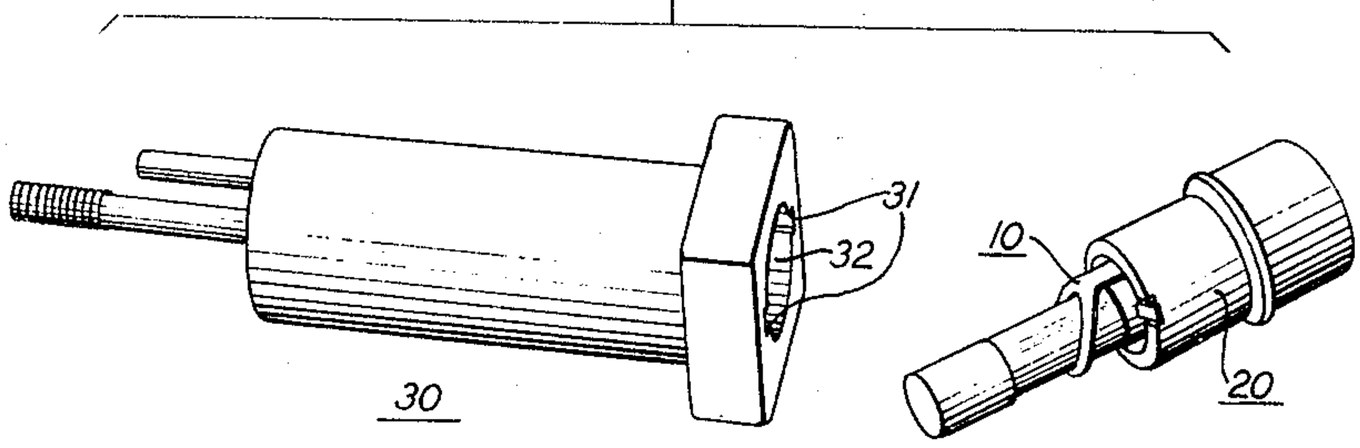


FIG. 3



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RETAINER FOR CARTRIDGE FUSE

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2 Claims. (Cl. 200—129)

This invention relates to cap-and-block type cartridge fuse assemblies and specifically to a fuse retainer for holding a cartridge fuse securely within its cap to facilitate installation and removal.

A highly desirable feature of many cap-and-block type fuse holders is that the cartridge fuse remains within the cap during removal to reduce the incidence of dropping the fuse and to avoid the hazards of removal by hand or prong. The conventional method for securing fuse to cap is to provide a light interference fit between the inserted end of the fuse and the inside walls of the cap, as shown, for example, in Patent 2,581,308, issued to H. J. Smith on January 1, 1952. The expedient of an interference fit is inapplicable, however, to the type of holder in which a contact spring is employed in the cap, since a friction fit would negate the spring's function and might interfere with a good electrical contact. The same reasons still exist, of course, for securing the fuse to the cap.

Accordingly, a prime object of the invention is to retain readily and inexpensively a cartridge-type fuse within its cap without resort to interference fit.

A further object of the invention is to expedite installation and removal of a cartridge-type fuse by lessening substantially the chances of its being dropped inadevertently in the process.

These and other objects are achieved in accordance with the invention by a thin resilient member comprising an annular segment such as a ring that grips one end of the cartridge fuse and at least one leg with an end nub that engages the cap spring.

In one illustrative embodiment of the invention, the resilient member comprises a ring and an attached leg that is inserted well into the space between the inner wall of the cap and the spring. An end nub on the leg lodges beneath a remote turn of the spring and is held there by the combined effects of its own resiliency and that of the spring. One end of the cartridge fuse is then placed through the ring and into the fuse cap where it makes electrical contact with the near end of the spring. The leg is sufficiently slim to avoid interfering with the seating of the fuse. The ring retains the fuse in this position with a surprising tenacity that greatly facilitates its installation and removal.

Pursuant to another aspect of the invention, the resiliency of the ring-leg member contributes to the gripping action upon the fuse. Fabricated as a flat form, the ring portion becomes slightly distended and offset as the fuse is passed through it. An added holding force results since the member tries to assume its normal position and in so doing applies a tensile force to the fuse.

Accordingly, a prime feature of the invention relates to a resilient member having an annular segment and at least one leg, the leg lodging unobtrusively in the spring cap of the fuse holder while the annular segment retains the fuse therein with a positive, enveloping friction grip.

These and other objects and features of the invention will be pointed out with greater particularity in the detailed description of an illustrative embodiment and in the drawing in which:

FIG. 1 is a perspective view of the retaining member;

FIG. 1A is an alternate shape for the retainer in perspective view;

FIG. 1B shows an alternate shape for the retaining end nub in perspective;

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FIG. 2 is a perspective view in partial cutaway showing the member inserted in a fuse cap; and

FIG. 3 shows a cartridge fuse and retaining member installed in a fuse cap.

In FIG. 1 the retaining member shown as **10** comprises a ring **11** at one end and an elongated leg **12** integrally connected with ring **11**. At the far end of leg **12** is an end nub **13** which has a blunt point **14** and two shoulders **15** on opposite sides of leg **12**. Member **10** is readily fabricated in large numbers from nylon or a similarly resilient material in a molding process. The width **16** of member **10** is relatively thin, on the order of **40** mils, to prevent its interfering with the electrical contact. The neck **17** of member **10** is a resilient juncture of ring **11** and leg **12**. Member **10** is fabricated as a flat form so that when bent at neck **17** a force will be developed that tends to return it to its original shape. An alternative shape for member **10** is illustrated in FIG. 1A wherein the ring **11** has a gap **18** that makes fuse installation easier in some instances. A variation of end nub **13** is shown in FIG. 1B wherein four shoulders are employed, each designated **15'**.

In FIG. 2 a fuse cap **20** is shown with a conventional gripping end **21** and use recess **22** in which is seated a contact spring **23**. A pair of conventional lock arms **24** extend beyond the outer surface of cap **20** for engagement with corresponding lock grooves **31** in a fuse block **30**, shown in FIG. 3.

Member **10** is inserted into cap **20** between inner wall **22** and spring **23**, as shown in FIG. 2. Nub **13** and in particular shoulders **15** may be molded of various widths so as to contact a selected one of the several possible turns of spring **23**. In FIG. 2, for example, nub **13** is shown reaching beyond one of the more remote spring turns. During insertion, as nub **13** encounters each successive spring turn, the combined action of its own resiliency and that of the contacted spring turn causes shoulders **15** to lodge or snap in place under that turn. This action is the essential means which retains member **10** snugly within cap **20** with a force sufficient to grip a fuse during installation, but which allows member **10** to be removed easily by manual manipulation if desired. An advantage of incorporating only two shoulders **15** on nub **13** is that member **10** is thereby permitted to rotate 90 degrees to remove the shoulders from contact with spring **23** to facilitate easy removal.

When member **10** is in the position shown in FIG. 2, a fuse **40** is placed through the ring and into contact with spring **23**, as illustrated in FIG. 3. In this position the fuse is held not only by the frictional action of ring **10** on its surface but also by the light torque imparted to it by the distension of ring **11** with respect to leg **12**. When so retained, cap **20** with fuse **40** can be inserted readily into the conventional connector portion **32** of block **30** without risk of dropping the fuse. More importantly, the assembly may be removed from block **30** without leaving the fuse in the connector **32**. All of the advantages incident to an interference fit as noted earlier are thereby achieved; and in addition, in accordance with the invention, the cap contact spring is left unimpeded in its prime function.

While the preferred embodiment of the inventive concept has been shown and described, it is to be expressly understood that various changes and modifications may be made without departing from the spirit and scope of the invention.

What is claimed is:

1. A fuse holder comprising, in combination, a chambered block with contact means therein, a cap disposed within said chambered block and having an interior chamber having an open and a closed end, a coil spring fas-

tened coaxially at said closed end, a plastic resilient member comprising a loop with a bayonet leg affixed thereto, said leg being frictionally engaged between the coils of said coil spring and the wall of said interior chamber and said loop being disposed adjacent said open end to receive and frictionally grip a cartridge fuse, said fuse contacting said coil spring and said chambered block contacting means when said gap is disposed within said block.

2. A fuse holder in accordance with claim 1, wherein said bayonet leg further comprises a winged nub at its far end for engaging one of the coils of said coil spring.

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