H. P. NIESEN.

REFILLABLE CARTRIDGE FUSE.

APPLICATION FILED FEB. 4, 1918.

1,316,319. Patented Sept. 16, 1919.

Fig. 1.

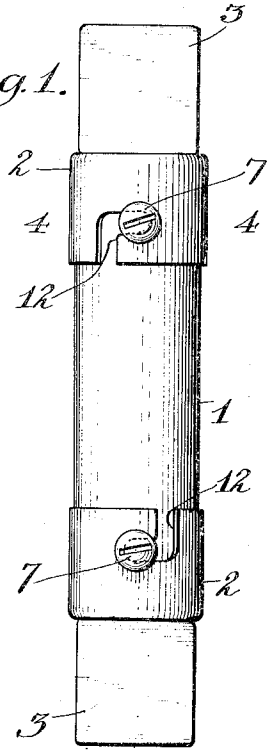


Fig. 2.

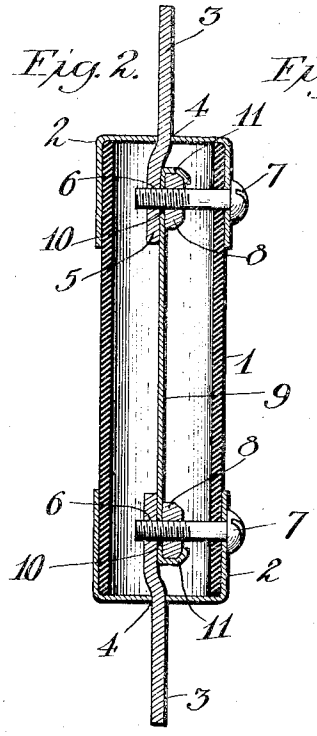


Fig. 3.

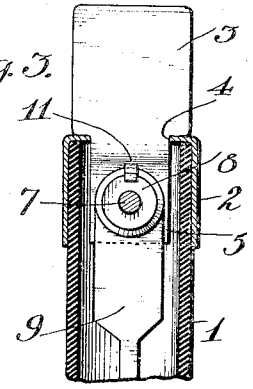


Fig. 4.

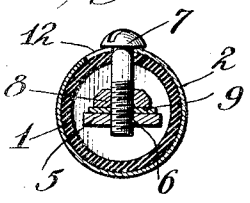


Fig. 7.

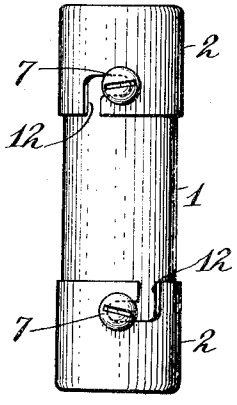


Fig. 6.

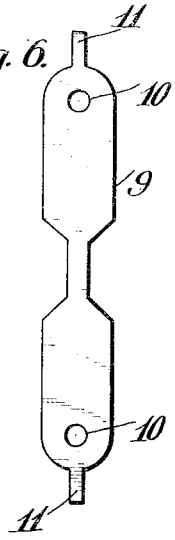
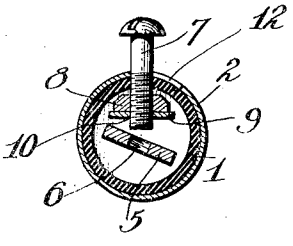


Fig. 5.



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UNITED STATES PATENT OFFICE.

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REFILLABLE CARTRIDGE-FUSE.

1,316,319. Specification of Letters Patent. Patented Sept. 16, 1919.

Application filed February 4, 1918. Serial No. 215,277.

To all whom it may concern:

Be it known that I, HUGO P. NIESEN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Refillable Cartridge-Fuses, of which the following is a specification.

This invention relates more particularly to fuses of the cartridge type which are so constructed that the fuse-member or link can be renewed.

One of the objects of my invention is the production of an inexpensive fuse of this kind comprising few parts which can be readily assembled.

A further object is to improve the construction of such fuses with a view of facilitating the refilling or renewal of the fuse-link.

In the accompanying drawings:

Figure 1 is a side elevation of a cartridge-fuse having knife-blade terminals and embodying the invention. Fig. 2 is a longitudinal section thereof. Fig. 3 is a fragmentary longitudinal section at right angles to Fig. 2. Fig. 4 is a cross section on line 4—4, Fig. 1. Fig. 5 is a similar section showing the position of one of the cap-ears preparatory to turning the cap to its normal locked position. Fig. 6 is a side elevation of the original form of the fuse-link. Fig. 7 is a side elevation of a cartridge-fuse of the ferrule type embodying the invention.

Similar characters of reference indicate corresponding parts throughout the several views.

Referring to Figs. 1–6, 1 indicates the tubular body or shell of the fuse and 2 the metallic end-caps applied thereto and carrying the terminal contact-lugs or blades 3. In the construction shown, these lugs pass through central slots 4 formed in the heads of the caps and are provided with internal ears or extensions 5. Each of these extensions has a screw-threaded transverse opening 6 which receives a fastening-screw 7 passing through a circular or other suitable opening in the shell. Each of these screws is provided within the shell and at a suitable distance from its inner end with a nut or collar 8 adapted to clamp the adjacent end of the fuse-link 9 against the companion ear 5. The heads of these screws are preferably nicked to receive a screw driver, but they may be flat sided, if desired, to receive a wrench. These collars also serve as stops to prevent complete withdrawal or loss of the screws when unscrewed from said ears.

The fuse-link has holes 10 for the passage of the screws 7, and it is also preferably provided at its ends with retaining lips or extensions 11 adapted to be bent around the collars of the screws, as shown in Fig. 2, to retain the link upon the screws in assembling the parts of the fuse.

In the preferred construction shown in the drawings, the end-caps 2 are provided with L-shaped slots or notches 12 which receive the screws 7. As shown in Fig. 1, these slots extend inwardly from the inner edges of the caps, and the closed or outer ends of the transverse portions of the slots are arranged to register with the threaded holes of the respective ears 5 when the parts are properly assembled and secured together. By this construction, the screws perform the double function of securing the caps to the ends of the cartridge-body and the fuse-link to said ears. At the same time, the L-shaped slots by the above-described relation between their horizontal portions and the perforated ears, serve to predetermine the proper position of the ears to receive the screws and thus facilitate the assemblage of the parts.

In order to pass the caps over the ends of the shell, the longitudinal portions of their slots must be brought in line with the clamping screws. In this position of the caps their ears stand obliquely to the screws and clear them, as shown in Fig. 5, thereby permitting the caps to be fully slipped upon the shell. To lock the caps in place, they are turned until the closed ends of their slots come in contact with the screws. By this partial rotary movement, the ears 5 are turned at right angles to the screws in which position their holes register with and easily receive the ends thereof, as shown in Fig. 4, the transverse portions of the slots being of such length that their closed ends form stops which predetermine the proper assembling position of these parts. Upon now tightening the screws, the fuse-link is clamped against said ears and the caps are locked in place. To facilitate this operation, the ears are slightly offset with reference to the terminal lugs 3 shown in Fig. 2.

In assembling the parts, the screws 7 are passed through the holes of the shell and the nuts or collars 8 are applied to them. The fuse-link, while still in the form shown in

Fig. 6, is then engaged with the inner ends of the screws and its lips 11 are bent around said collars to hold it reliably thereon. The caps are then passed over the ends of the shell and turned to their limit, as hereinbefore described, to bring the ear-holes 6 in register with the screws, after which the screws are tightened to secure the link and the caps in position. The travel of the nuts or collars on the screws 7 may be limited by any suitable stop-means; for example, by flattening or mutilating the threads or screws at the proper point after applying the nuts.

To renew the fuse-link, the operations just described are performed in the reverse order and a new fuse is substituted for the blown one, after which the caps are replaced and the screws tightened.

The invention is obviously applicable to cartridge-fuses of the ferrule type, as well as the end-lug type. Fig. 7 shows its embodiment in a fuse of the ferrule type, the only difference between the construction shown in Fig. 7 and that illustrated in the remaining figures being that the terminal-lugs 3 of the first-described construction are omitted.

This improved construction, while facilitating the refilling of the cartridge, involves a minimum number of parts and can therefore be manufactured at low cost.

I claim as my invention:

1. A cartridge-fuse comprising a shell, a terminal-member applied to the end of the shell and carrying an internal ear, a fuse-link, a fastening member passing through the shell and the fuse-link and engaging said ear, said fastening member being provided within the shell with a projecting part and the end portion of the fuse-link interlocking with said projecting part, to retain the link on said fastening-member while applying said terminal member and ear to the shell.

2. A cartridge-fuse comprising a shell, a terminal-member applied to the end of the shell and carrying an internal ear, a screw passing through the shell and engaging said ear, said screw having a collar within the shell, and a fuse-link clamped to said ear by said screw and interlocking with said collar.

3. A cartridge-fuse comprising a shell, a terminal-member applied to the end of the shell and carrying an internal ear, a screw passing through the shell and engaging said ear, said screw having a collar within the shell, and a fuse-link clamped between said ear and said collar and provided at its end with a lip which is bent around the collar to retain the link in place on the screw in assembling the parts.

HUGO P. NIESEN.