

F. N. CONANT,
RENEWABLE FUSE.
APPLICATION FILED JULY 26, 1919.

1,422,420.

Patented July 11, 1922.

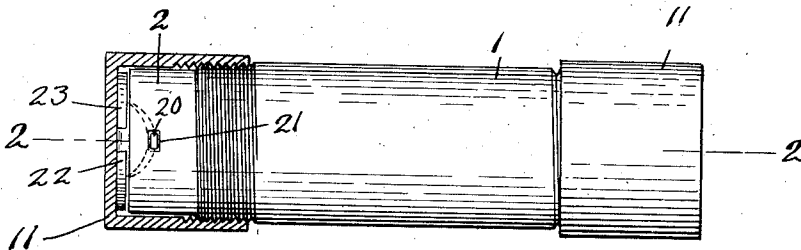


Fig. 1.

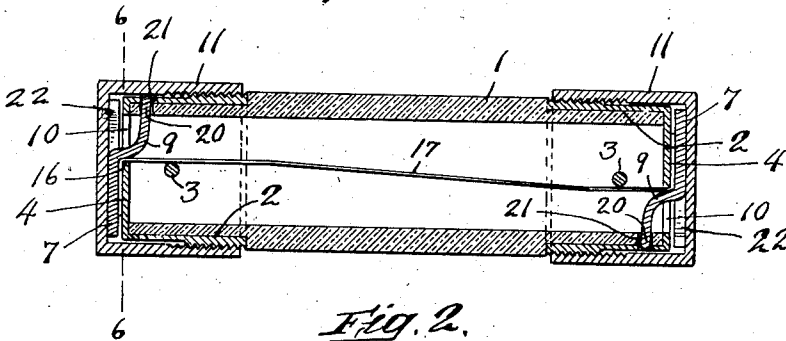


Fig. 2.

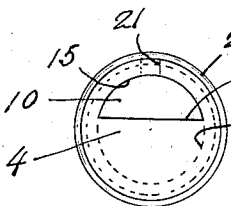


Fig. 3.

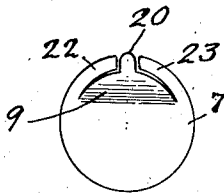


Fig. 4.

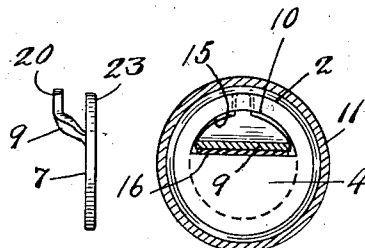


Fig. 5.

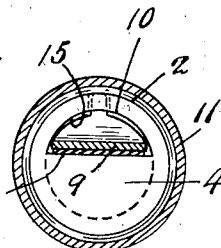


Fig. 6.

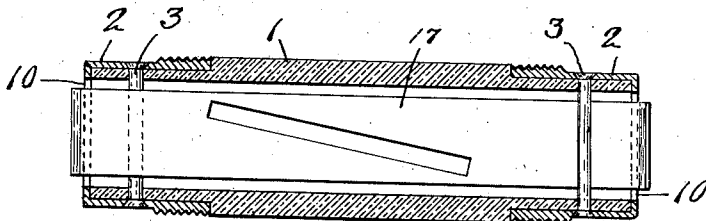


Fig. 7.

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by
Greenwood atty

UNITED STATES PATENT OFFICE.

FRANKLIN N. CONANT, OF NEWBURYPORT, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE CHASE-SHAWMUT COMPANY, A CORPORATION OF MASSACHUSETTS.

RENEWABLE FUSE.

1,422,420.

Specification of Letters Patent.

Patented July 11, 1922.

Application filed July 26, 1919. Serial No. 313,580.

To all whom it may concern:

Be it known that I, FRANKLIN N. CONANT, a citizen of the United States, and a resident of Newburyport, in the county of Essex and State of Massachusetts, have invented an Improvement in Renewable Fuses, of which the following is a specification.

In another application #203,325, filed Nov. 22, 1917, a renewable enclosed fuse of the cartridge type is shown having improved means for holding the terminal portion of a fuse strip.

A desirable feature of a fuse of this type is the fact that it can be assembled and disassembled by the thumb and fingers, without the employment of tools, and the fuse of said application has this capability.

It comprises three essential elements, a ferruled insulating fuse casing, having an integral fuse strip support, a removable fuse-strip engaging element or pressure plate and an end cap.

The present invention has for its object the provision of means for providing the removable fuse-strip pressure plate and element with which it is associated with suitable engaging means whereby said pressure plate is held in place on the casing while the parts are being assembled and thus the chance that the plate may slip to the floor and roll out of reach is avoided. As the success of a refillable fuse depends to a large extent upon the ease of assembling this point is important. The loss of the pressure plate may cause serious delay.

Fig. 1 is a side elevation and partial longitudinal vertical section of an electric fuse embodying my invention.

Fig. 2 is a longitudinal vertical section taken on the dotted line 2-2, Fig. 1.

Fig. 3 is an end view of the casing.

Figs. 4 and 5, respectively, are front and side views of the fuse-strip engaging element or pressure plate.

Fig. 6 is a transverse section taken on the dotted line 6-6, Fig. 2.

Fig. 7 is a longitudinal section of the casing and fuse-strip arranged therein.

As here shown 1 represents the usual insulating cartridge tube or fuse casing and 2 the metal ferrule embracing the end portion thereof and secured thereto by a pin 3 in the usual way or in any other desirable manner whereby said parts are relatively

fixed, and herein termed the ferruled non-conducting casing.

The ferrule is externally screw threaded to receive upon it the internally screw threaded end cap 11, as will hereinafter be described.

Said ferrule has fixedly connected with it a fuse link support, which, as here shown, consists of an end wall 4 extended over the tubular bore of the casing having an aperture 10 through it which is made quite large to admit of the products of combustion and other refuse material being removed from the casing after a fuse-strip has been ruptured.

This "clean out" aperture 10 has a curved side 15 made concentric with the cylindrical wall of the casing and approximately in the same plane to avoid the formation of any obstruction at the outlet, and it has a straight side 16 arranged substantially diametrically of the casing which is made as long as or longer than the width of the fuse-strip, to serve as a support for said strip.

Adjoining said straight side or edge the end wall is made flat to provide a flat contact face of large area.

The end portion of a flat fuse-strip 17 is extended through the aperture 10 and bent over the supporting straight side 16 and laid over upon the flat contact face of the end wall.

This form of fuse link and support therefor is merely illustrative of one embodiment of my invention.

As a means to engage the end portion of the fuse link by a direct thrust as contrasted with a twisting motion I employ a non-rotatable element or pressure plate here shown as a disc 7 of a diameter approximately equalling the diameter of the end of the ferrule, which has a flat contact face adapted to be arranged next the end wall with the end portion of the fuse-strip between them, and preferably a projection 9 adapted to enter the aperture 10, said projection having an inclined portion giving it a wedge-like formation, which is coextensive with the straight side of the aperture thereby to engage the strip on said side support and hold it firmly.

This plate so far described is a loose element and when assembling the parts it is placed on the end of the casing and intended

to repose there while the end cap 11 is being screwed on.

Said cap 11 consists of an internal screw-threaded member adapted to engage with the externally threaded ferrule and is designed to enclose the plate 7 and subsequently to engage said plate 7 and thrust it down against the end of the casing by a direct thrust.

Engaging means are provided for connecting the plate 7 with the casing, as for instance, there may be a tongue 20 on one of said elements, as on the plate, and there may be an aperture 21 provided on the other element as the ferruled casing to receive said tongue, and there may be projections 22, 23, provided on the plate for engaging the casing.

As here shown the tongue 20 is formed on the front edge of the projection 9, and said projection is formed as a lip which is struck up from the disc, and the projections 22, 23, are extended inward respectively towards each other at the outer side of the aperture formed by striking up said projection and tongue and overlying the end of the ferrule.

The aperture 21 is formed in the side wall of the ferruled casing at or about the middle of the circular side of the aperture 10, a short distance inward from the end and when so disposed it will be noted that the tongue 20 enters the aperture 21 when the projection 9 enters the aperture 10.

A loose fit only is required to keep the plate 7 from slipping off the end of the casing while the end cap is being applied and this structure enables this result to be accomplished.

This construction admits of the plate 7 being removed easily and quickly and also to connect it with the other parts, whereby it may be easily and quickly disassembled and may be subsequently assembled without the employment of a screw driver or other tool; and the device may be easily and quickly cleaned out and a new fuse-link supplied and perfect contacts assured.

If desired a finely divided non-conducting material may be supplied to the tube or casing to improve the action of the fuse on short circuit.

The device without the fusible link is a complete article of manufacture in itself and may be sold to be supplied with any suitable link.

The device is somewhat easier to assemble if the pins 3 are placed slightly eccentric, so that the fusible element 17 may be threaded in a straight line through the tube, without striking the pins, but the central arrangement of the pins is slightly preferable as a matter of construction.

I claim:—

1. In an enclosed electric fuse of the cartridge type, the combination of a fer-

ruled casing provided with a fixed end wall having an aperture, a fuse strip having its end portion extended through said aperture, a removable non-rotatable plate arranged over said end wall, having a lip struck up from it which enters the aperture and presses the fuse strip against the edge thereof and a threaded end cap which encloses said plate and applies pressure thereto to hold the fuse strip.

2. In an enclosed electric fuse of the cartridge type, the combination of a ferruled casing provided with a fixed end wall having an aperture with a straight side, a fuse strip having its end portion extended through said aperture, and adapted to engage the straight side thereof, a removable plate having an inclined lip with a straight side struck up from it which enters said aperture and presses the fuse strip against the straight side thereof, and a threaded end cap which encloses said plate and applies pressure thereto to hold the fuse strip.

3. In an enclosed electric fuse of the cartridge type, the combination of a ferruled casing provided with a fixed end wall having an aperture with a straight side and having a flat face adjoining said straight side, a fuse strip having its end portion extended through said aperture and bent over the straight side thereof onto said flat face, a removable plate having a lip struck up from it which enters said aperture and presses the fuse strip against the straight side thereof, and also against said flat face, and a threaded end cap which encloses said plate and applies pressure thereto to hold the fuse strip.

4. In an enclosed electric fuse of the cartridge type, the combination of a ferruled casing, a fuse link support at the end thereof, a fuse link contained within said casing, a removable element associated with said support to apply direct pressure thereto to hold the fuse link, means detachably connecting said element with said casing to hold it while the parts are being assembled, and an end cap which encloses said element and applies pressure thereto.

5. In an enclosed electric fuse of the cartridge type, the combination of an insulating casing, a metal ferrule and a fuse link support on its end, a fuse link contained within said casing, a removable element cooperating with said support and arranged to apply direct pressure thereto to hold the fuse link, means detachably connecting said element with said casing, and an end cap which encloses said element and applies pressure thereto when screwed onto the ferrule.

6. In an enclosed electric fuse of the cartridge type, the combination of an insulating casing, a metal ferrule and a fuse link support on its end, a fuse link contained within said casing, a removable element co-

operating with said support and arranged to apply direct pressure thereto to hold the fuse link, means detachably connecting said element with said casing and ferrule and an end cap enclosing said element which applies pressure thereto when screwed onto the ferrule.

7. In an enclosed electric fuse of a cartridge type, the combination of a casing, a link support with an aperture, permanently attached thereto, a fuse link having its end portion extended through said aperture and over upon the link support, a plate for engaging said fuse link on the link support and also for engaging said fuse link at the side of the aperture, holding means for said plate which holds said plate in place on the casing while assembling the parts and which is readily removable from the casing when disassembling the parts, and an end cap for applying pressure to said plate.

8. In an enclosed electric fuse of the cartridge type, the combination of a ferruled casing provided with a fixed end wall having an aperture, a fuse strip having its end portion extended through said aperture, a removable plate arranged over said end wall having a projection which enters said aperture and presses the fuse strip against the side thereof, means detachably connecting said plate with said casing, and a threaded end cap which encloses said plate and applies pressure thereto to hold the fuse strip.

9. In an enclosed electric fuse of the cartridge type, the combination of a ferruled casing provided with a fixed end wall having an aperture, a fuse strip having its end portion extended through the aperture and over the end wall adjacent thereto, a removable plate arranged over said end wall having a projection which enters the aperture and presses the fuse strip against the side thereof and also against the end wall, means detachably connecting said plate with said casing, and a threaded end cap which encloses said plate and applies pressure thereto to press it into engagement with the fuse strip.

10. In an enclosed electric fuse of the cartridge type, the combination of a ferruled casing provided with an end wall having an aperture, and also having an aperture in its side wall, a fuse strip having its end portion extended through said aperture, a removable plate for holding the fuse strip having a tongue struck up from it for engagement with the aperture in the side wall of the casing by which to detachably connect said plate with said casing and hold it while the parts being assembled, and an end cap which encloses said plate for applying pressure thereto.

11. In an enclosed electric fuse of the cartridge type, the combination of a ferruled casing having an apertured side wall, a fuse

link, fuse link supporting means at the end of said casing including a removable element arranged to apply pressure to hold the fuse link and means detachably connecting said element including a tongue which enters the aperture in the side wall of the casing.

12. In an enclosed electric fuse of the cartridge type, the combination of a ferruled casing having an apertured side wall, and an end wall with an aperture having a straight side, a fuse strip having its end portion extended through said aperture and bent over the straight side thereof, a removable plate having a projection which enters the aperture and presses the fuse strip against the straight side thereof, and having a tongue which enters the aperture in the side wall and a threaded end cap which encloses said plate and applies pressure thereto.

13. In an enclosed electric fuse of the cartridge type, the combination of a ferruled casing having an apertured side wall and an end wall with an aperture having a straight side, a fuse strip having its end portion extended through said aperture and over the straight side thereof, a removable plate having a lip struck up from it which enters the aperture, and having a tongue which enters the aperture in the side wall, and a threaded end cap which encloses said plate and applies pressure thereto.

14. In an enclosed electric fuse of the cartridge type, the combination of a ferruled casing having an apertured side wall and an end wall with an aperture having a straight side, a fuse strip having its end portion extended through said aperture and bent over the straight side thereof, a removable plate having an inclined lip struck up from it and having at the termination of said lip a tongue adapted to enter the aperture in the side wall and a threaded end cap which encloses said plate and applies pressure thereto.

15. In an enclosed electric fuse of the cartridge type, the combination of a ferruled casing having an apertured side wall and an end wall with an aperture having a straight side, a fuse strip having its end portion extended through said aperture and over the straight side thereof, a removable plate having a projection which enters the aperture and having a plurality of projections engaging the casing to detachably connect said plate therewith and a threaded end cap which encloses said plate and applies pressure thereto.

16. In an enclosed electric fuse of the cartridge type, the combination of a ferruled casing having an apertured side wall and an end wall with an aperture having a straight side, a fuse strip having its end portion extended through said aperture and bent over the straight side thereof, a removable plate having a projection which en-

ters the aperture and having a tongue on said projection which enters the aperture in the side wall of the casing and having projections for engaging the end of the casing.

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17. In an enclosed electric fuse of the cartridge type, the combination of a threaded enclosing casing having an apertured end wall and a fuse-strip engaging face and an
10 aperture in its side-wall, a pressure-plate having a projection extended through the

aperture in its end-wall and a tip removably received in the aperture in its side-wall and a threaded end-cap which encloses said plate and applies pressure thereto.

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In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

FRANKLIN N. CONANT.

Witnesses:

ERNEST Q. PRULOZMAN,
HARRY C. MOORE.