W. O. SMITH.

RENEWABLE FUSE.

APPLICATION FILED MAY 28, 1921.

1,436,919. Patented Nov. 28, 1922.

Fig. 1.

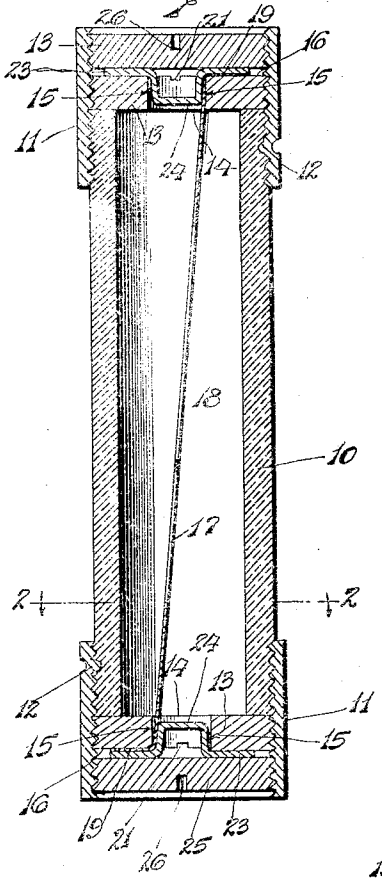


Fig. 4.

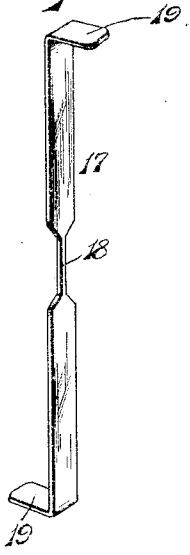


Fig. 3.

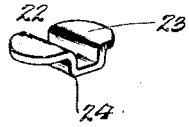


Fig. 5.

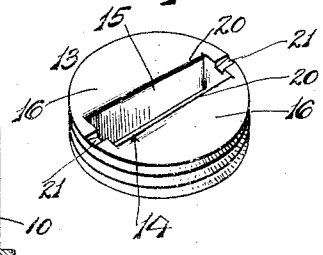
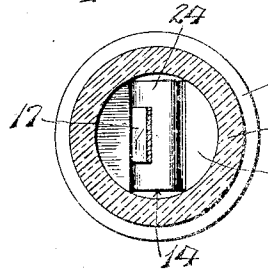


Fig. 2.



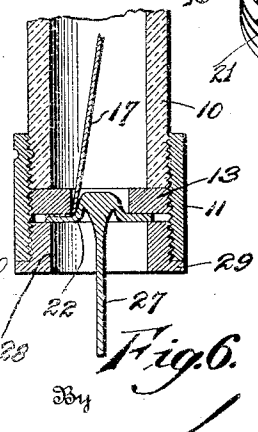


Fig. 6.

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UNITED STATES PATENT OFFICE.

WALTER O. SMITH, OF NEW BEDFORD, MASSACHUSETTS.

RENEWABLE FUSE.

Application filed May 28, 1921. Serial No. 473,248.

To all whom it may concern:

Be it known that I, WALTER O. SMITH, a citizen of the United States, residing at New Bedford, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Renewable Fuses, of which the following is a specification.

This invention is an improved renewable fuse and has for its object the provision of means whereby the fuse may be readily renewed when occasion demands and in which a good electrical contact will be effected between the fuse link terminals and the fuse terminals. A further object of the invention is to provide a simple and inexpensive construction by which access to the interior of the barrel will be permitted when necessary and accumulated soot and other particles may be removed. The invention also seeks to provide improved means for holding the ends of the fuse link against accidental or premature separation from the fuse terminals.

The invention is fully illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section of a fuse illustrating one embodiment of the invention;

Fig. 2 is a transverse section on the line 2—2 of Fig. 1;

Fig. 3 is a detail perspective view of the binder;

Fig. 4 is a detail perspective view of the fuse link;

Fig. 5 is a detail perspective view of the contact plate or disc.

Fig. 6 is a detail section showing another form of the invention.

In carrying out my present invention, I employ a barrel 10 which is preferably of fiber but, of course, may be of any other non-conducting material. Upon each end of the barrel, I secure an internally threaded ferrule 11 which is of some good conductor, preferably copper or brass, the ferrules being threaded onto the ends of the barrel and then indented at one or more points, as indicated at 12, so that the threaded inner end of the ferrule will be partly mutilated and a portion of the material of the ferrule embedded in the barrel. The ferrule will thus be permanently attached to the barrel, as will be readily understood. I also employ a contact member 13 which is preferably a circular plate or disc having threads in its peripheral edge whereby it may be engaged in one of the ferrules 11, it being understood that the construction is duplicated at the two ends of the barrel and the description herein given is applicable equally to either end of the fuse. The disc or contact plate is turned home in the ferrule against the end of the barrel, as shown in Fig. 1, and it is provided with a diametric slot 14 having flat walls 15 through which the end of the fuse link may be inserted. The outer surface of the disc or plate is smooth, as shown at 16, so that the end of the fuse link may be bent against the same and form a perfect contact therewith. The fuse link is preferably a ribbon 17 weakened midway its ends, as shown at 18, and having its extremities bent in opposite directions, as shown at 19, when it is secured in place within the fuse. The edges or corners 20 of the slot 14 in the contact plate are beveled or rounded so as to avoid cutting the fuse link at said points and to facilitate the insertion of the contact plate and also its removal, when removal is desired, I provide notches 21 at the ends of the slot which may be engaged by a screw driver or other turning tool in an obvious manner. To secure the ends of the fuse link in and against the contact plates, I employ a binder 22 which may conveniently be stamped from sheet metal. This binder, as shown in Fig. 3, comprises a base portion 23 and a diametric rib or projection 24 extending across the base portion and having its sides normally converging toward its crown whereby it is adapted to perform the functions of a wedge when inserted in the slot 14 of a contact member 13. It will be readily noted that the projection or rib 24 is struck up from the base portion 23 of the binder and will be more or less resilient so that it will tend by reason of its resiliency to bind within the slot 14 and thereby retain the end of the fuse link in proper position. The base portion of the binder is of less diameter than the contact plate and it is, therefore, not necessary to exercise any great precaution in order to avoid interference between the edge of the binder and the internal threads of the ferrule. As shown in Fig. 1, the sides of the arched projection or rib 24 engage the longitudinal portion of the fuse link and have a wedging or clamping action thereon so that it is held to the side wall of the slot 14 and the base portion of the

binder bears against the outturned extremity of the fuse link and holds it in intimate contact with the outer flat surface 16 of the contact member 13. To retain the binder in operative position, I employ a follower in the form of a closure plug 25 which is threaded into the ferrule and turned home against the base portion 23 of the binder, as clearly shown in Fig. 1, so that the binder will be positively and effectually clamped between the plug and the contact member. As shown in Fig. 1, the closure plug or follower is provided with a central notch 26 which may be utilized as a means of engagement with a turning tool so as to turn the plug home. Instead of the central notch, the plug may be provided with eccentric notches or recesses to be engaged by a spanner.

In assembling the fuse, the ferrules are first threaded onto the ends of the barrel and the indentations formed therein so that the ferrules become a permanent part of the device. The contact members 13 are then turned home in the ferrules so as to abut the ends of the barrel and the parts are so proportioned that, when the two contact members are fully turned home, the slots 14 therein will register. The fuse link is then inserted through the ferrule at one end of the barrel and through the slot in the contact plate within said ferrule, the feeding of the link being continued until the advance end thereof passes through the slot 14 at the opposite end of the barrel. The extremity of the link at one end is then bent against the outer face of the adjacent contact member and a binder is engaged in the slot 14 or said plate and against the outer surface of said plate thereby clamping the end of the link, as shown in Fig. 1. The follower or closure plug is then turned home against the base portion of the binder so that the binder will positively clamp the terminal of the fuse link into tight electrical connection with the contact member and the binder will be clamped between the latter and the follower. The operation is then repeated at the opposite end of the fuse which will then be complete and may be used in the usual manner.

The fuse shown and described is intended to be engaged and held by spring fingers or clamping members which form contacts in the electric conductor. If it be desired to apply the invention to fuses having knife blade contacts, the knife blade 27 is formed on or secured to the binder so as to project therefrom in alinement with the arch of the same and a collar 28 is then threaded into the ferrule so that its inner end will bear upon the edge of the binder, which bears against the end of the fuse link and forces it into tight electrical connection with the contact plate, said collar being provided with a flange 29 at its outer end to facilitate its manipulation and abut the outer end of the ferrule so as to limit the turning movement of the collar.

It will be readily seen that I have provided a very inexpensive fuse which will be found highly efficient in use. The engagement of the end of the fiber barrel against the contact plate will be strong enough to frictionally resist turning of the contact plate so that the fuse cannot be twisted when the outer plug is being tightened. This holding of the fuse link against twisting and consequent accidental rupture does not prevent a perfect contact between the end of the link and the contact member being effected inasmuch as the binder is so constructed that its nose or arched rib projection will fit snugly within the flat-sided slot of the contact plate and its leaves will extend over the outer bent portion of the fuse link and hold it firmly against the contact member and relative movement of the binder will be positively prevented by the engagement of its nose within the contact member. When a fuse blows, it is very common for particles of the metal to cling to the inside of the barrel and frequent blowing causes soot to accumulate within the barrel. With my present construction access may be had to the interior of the barrel to remove all such accumulations and when a new fuse link has been inserted the fuse will be in perfect condition.

Having thus described the invention, what is claimed as new is:

A fuse comprising a barrel, a ferrule fast on the end of the barrel, a contact disc threaded into the ferrule and abutting the end of the barrel, said disc having a flat-sided diametric slot, a fuse link extending through the barrel and having its terminal projecting through the slot in the adjacent contact disc, a binder disposed loosely within the ferrule at the outer side of the contact disc and having a flat-sided nose engaging within the slot of the contact disc and basal leaves bearing against the outer face of the contact disc, the end of the fuse link being held against one wall of said slot by the nose of the binder and against the outer face of the disc by a basal leaf of the binder, and means within the outer end of the ferrule to clamp the binder against the outer face of the contact disc and the end of the fuse link.

In testimony whereof I affix my signature.

WALTER O. SMITH. [L. S.]