J. B. GRIFFITH.

CARTRIDGE FUSE.

APPLICATION FILED AUG. 2, 1915.

1,278,911. Patented Sept. 17, 1918.

Fig. 1.

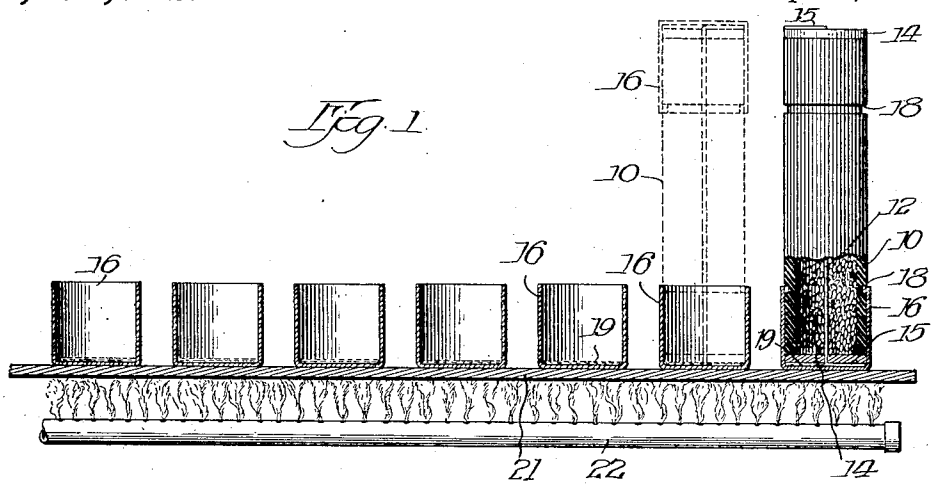


Fig. 2.

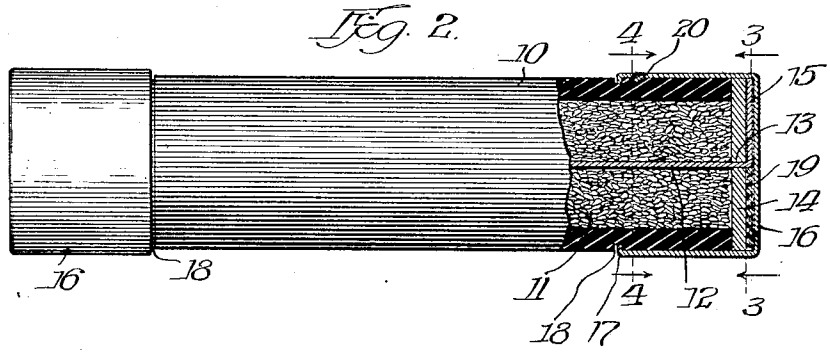


Fig. 3.

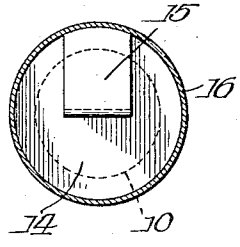
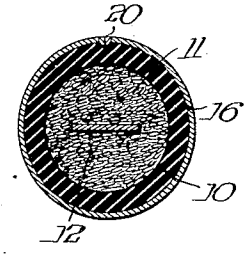


Fig. 4



Witnesses:

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UNITED STATES PATENT OFFICE.

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CARTRIDGE-FUSE.

1,278,911. Specification of Letters Patent. Patented Sept. 17, 1918.

Application filed August 2, 1915. Serial No. 43,076.

To all whom it may concern:

Be it known that I, JOHN B. GRIFFITH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cartridge-Fuses, of which the following is a specification.

My invention relates to cartridge fuses of the non-renewable type for the protection of electric circuits.

In the class of cartridge fuses which are not adapted to be renewed by the user but are intended to be discarded after having been blown a single time it is of importance to provide a construction which is strong and at the same time cheap to manufacture.

It is the object of my invention to provide a cartridge fuse which has end caps to the inner faces of which the ends of the fusible link of the fuse are soldered. It will be apparent that such a construction offers great difficulties of manufacture, but by the use of my improved method the fuse may be quickly and easily assembled and in operation gives excellent results.

These and other advantages of my invention will be more readily understood by reference to the accompanying drawings, which show a preferred embodiment of my invention, and in which—

Figure 1 is a vertical section and partial side elevation, showing one means through which the caps are attached to the fuses;

Fig. 2 is a side elevation and partial longitudinal section showing the novel features of my improved fuse;

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 2; and

Fig. 4 is a transverse section taken on the line 4—4 of Fig. 2.

I will first describe the novel features of my improved fuse, and will then describe a means through which the caps can be assembled with the fuses.

The fuse is provided with the usual casing 10, of insulating material, such as fiber or the like, and may contain the non-conducting filling material 11 through which passes the fusible link 12, preferably flat and constructed of zinc or other suitable metal. The link 12 passes through the aperture 13 in the end washer 14, and the end portion 15 of the link 12 is then bent so that it passes across the outer face of the washer 14, as best shown in Fig. 3.

The cap 16 fits over the end of the casing 10, and is held in position by a flange 17 formed by crimping the edge of the skirt of the cap into the groove 18 cut in the body of the fuse casing. The end 15 of the link 12, the washer 14, and the cap 16 are securely held together by means of the solder 19. The cap 16 is prevented from rotating by sinking an indentation 20 into the body of the casing 10, as best shown in Figs. 2 and 4.

It will be evident that the construction of fuse which I have described is very simple, and that an excellent electrical contact is provided between the end of the fuse link 12, the washer 14, and the end cap 16, while at the same time the end cap 16 is securely held in position by the action of the flange 17 and the indentation 20. It will be understood that although I have described only one end of the cartridge fuse shown in Figs. 2 to 4, the construction of the opposite end is preferably exactly the same.

Since introduction of conditions above described would involve some difficulty, I will now describe a means which will facilitate assembling the fuse which I have described. The filling material 11, if such is used, and the link 12 are first inserted in the casing 10, the ends of which are closed by bringing the end washers 14 into contact with the ends of the casing. The end portions 15 of the link 12 are bent over the washers 14 into the position shown in Figs. 2 and 3. The end caps 16 which are to be placed in position on the two ends of the casing 10 are heated in any suitable manner, as, for example, on a plate 21, which itself is heated by the gas burner 22. A small amount of solder 19 and suitable flux, such as zinc chlorid or the like, is placed in each of the caps 16, and the heat causes the solder to melt. The fuse casing 10 with its contents is brought to the position shown at the right-hand portion of Fig. 1, the lower end of casing 10 being inserted in the cap 16 while the latter remains on the hot plate 21. Before insertion the end 15 of the fuse link 12 and the washer 14 are preferably smeared with suitable flux in order that the solder may adhere to the portion 15 of the fuse link 12 and to the outer face of the washer 14.

After the fuse casing has been brought into the position shown in Fig. 1 the casing and cap are removed from the hot plate 21,

and the solder is allowed to solidify. The fuse casing is then reversed in position and the opposite end of the casing with its end washer 14 is inserted in a second cap 16 resting on the hot plate 21, and the soldered connection is made in the same manner as previously described. After the solder in in the second cap 16 has cooled and solidified the edges of the caps 16 are crimped to form flanges 17 occupying positions within the grooves 18, so that the caps are thereby prevented from being removed from the casing 10. The indentations 20 are then made in order to prevent the caps 16 from rotating, and the fuse is then complete.

It will be seen that the construction leaves the attached end of the link wholly housed and inaccessible, and leaves the cap wholly intact and free from end perforations, either open or solder-filled, that might be availed of for introduction of a new and improper link. Thus, the construction is such as to discourage unauthorized renewal, and this condition is realized in a fuse in which conductivity between the cap and the link is rendered perfect by having them directly united through means of solder.

It will be apparent to those skilled in the art that many changes could be made from the exact construction and method of manufacture which I have described without departing from the spirit or scope of my invention as defined in the appended claims.

What I claim is:

1. In a cartridge fuse, the combination of a casing, a fuse link passing through said casing and having a bent-over end, a cap fitting over the end of said casing, the end of the link being wholly within and rendered inaccessible by the cap, and means integrally connecting the bent-over end of said link with the inner surface of said cap.

2. In a cartridge fuse, the combination of a casing, apertured means for closing the end of the casing, a fuse link passing through said casing and the aperture of said closing means, a cap fitting over the end of said casing and said closing means and wholly inclosing and rendering inaccessible the end of the link, and means integrally connecting the end of said link with the inner surface of the end of said cap.

3. In a cartridge fuse, the combination of a casing, an apertured metallic washer at the end of said casing, a fuse link passing through said casing and the aperture of said washer, a cap fitting over the end of said casing and said washer, and solder connecting the end of said link with the outer surface of said washer and the inner surface of the end of said cap.

4. In a non-renewable electric fuse, the combination of a tubular casing, end washers abutting the ends of said casing, a link in the casing with its ends penetrating the end washers and overlying the outer faces thereof, end caps embracing the ends of the casing with imperforate integral end walls confining the overlying ends of the link upon the washers, and a body of solder molded in the space between the end cap and the washer and uniting them together and to the fuse link.

5. A cartridge fuse, comprising a tubular casing, end caps surrounding the ends of the casing and having imperforate end walls, and a fusible link having its ends soldered directly to and wholly within the end walls of the caps; said casing also having end washers abutting its ends within the end caps, with portions of the links penetrating the washers and lying and terminating between the washers and the end walls of the caps; the inner end faces of the end caps being also soldered to the washers.

6. A cartridge fuse, comprising a tubular casing, end caps surrounding the ends of the casing and having imperforate end walls, and a fusible link having its ends soldered directly to and wholly within the end walls of the caps; said casing also having end washers abutting its ends within the end caps, with portions of the links penetrating the washers and lying and terminating between the washers and the end walls of the caps.

In witness whereof, I hereunto subscribe my name this 30th day of July, A. D., 1915.

JOHN B. GRIFFITH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."