J. H. ALSPACH.

FUSE.

APPLICATION FILED MAR. 1, 1912.

1,045,659. Patented Nov. 26, 1912.

FIG. 1

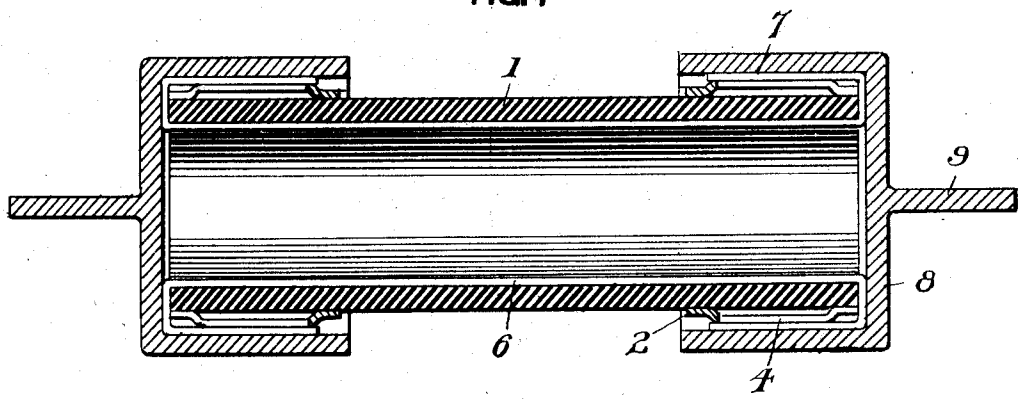


FIG. 4

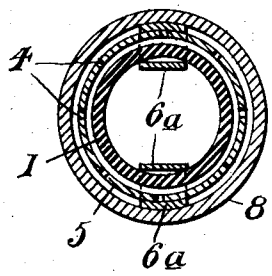


FIG. 2

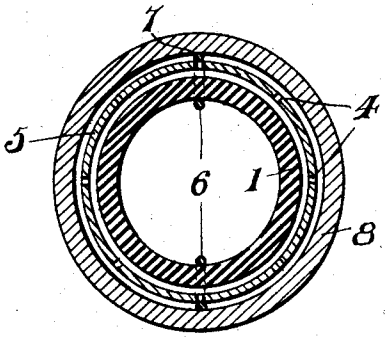


FIG. 5

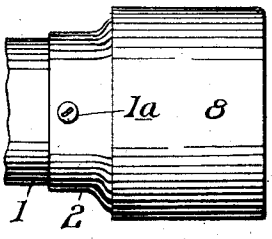


FIG. 6

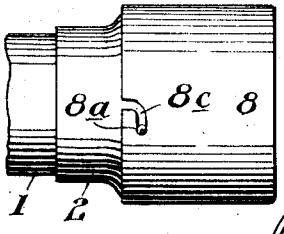
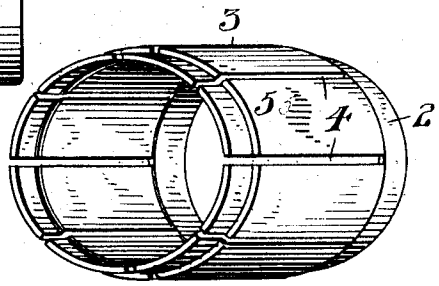


FIG. 3



WITNESSES

J. P. Sullivan

Samuel Payne

INVENTOR

J. H. Alspach.

BY A. C. Evertz & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

JAMES H. ALSPACH, OF PITTSBURGH, PENNSYLVANIA.

FUSE.

1,045,659. Specification of Letters Patent. Patented Nov. 26, 1912.

Application filed March 1, 1912. Serial No. 680,808.

To all whom it may concern:

Be it known that I, JAMES H. ALSPACH, a citizen of the United States of America, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Fuses, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to fuses, and my invention aims to provide a cartridge fuse embodying a novel mechanical construction that has the following advantages: First, that of utilizing a nonfusible cartridge shell, either new shells or the discarded shells of fuses at present upon the market. Second, a cartridge fuse that obviates the necessity of screw threading the ends of the cartridge shell to retain caps thereon. Third, a cartridge fuse having resilient sleeves that serve the double purpose of retaining the ends or terminals of fuses in engagement with the caps or end pieces of the fuse, and clamps said caps or end pieces in a manner that they cannot become accidentally displaced. Fourth, the advantage of providing a cartridge fuse consisting of comparatively few parts that are inexpensive to manufacture, durable and of such construction as to permit of the cartridge fuse being refilled when burned out. Fifth, a cartridge fuse in which a flat or ribbon fuse of a prescribed cross sectional area can be used for a given carrying capacity, the ends of the fuse providing a large contact area, which is a desideratum in connection with refillable cartridge fuses.

My invention further aims to accomplish the above results by a fuse that will be hereinafter specifically described and then claimed, and reference will now be had to the drawing, wherein:

Figure 1 is a longitudinal sectional view of the fuse, Fig. 2 is a cross sectional view of the same, Fig. 3 is a perspective view of a detached resilient clamping sleeve, Fig. 4 is a cross sectional view of a cartridge fuse showing soft metal ribbon fuses located in the cartridge, Fig. 5 is a plan of a portion of a fuse, showing a sleeve fastened to the cartridge shell, and Fig. 6 is a plan of a portion of a modified form of fuse.

The reference numeral 1 denotes a cylindrical cartridge shell made of a non-fusible material, as fiber or a suitable composition. Mounted upon the outer walls of the shell, at the ends thereof, are resilient clamping sleeves 2 that are reamed or provided with circumferentially disposed off-set portions 3 extending from a point in proximity to one end of the sleeve to a point in proximity to the opposite end of the sleeve, the reamed or off-set portion 3 of each sleeve forming the greater part of each sleeve. The sleeves 2 are provided with equally spaced longitudinal slits or slots 4 extending from one end of each sleeve through the off-set portion of said sleeve, the closed or inner ends of the slits or slots 4 terminating at the same point that the off-set portion 3 of said sleeve is removed from the end thereof, thereby providing a portion of the sleeve that is solid and fits upon the shell 1, the solid portions of the sleeves confronting each other, as best shown in Fig. 1. By slitting or slotting each sleeve, a plurality of longitudinal clamping arms 5 are provided, and these arms are adapted to frictionally engage the wall of the shell 1 and hold the sleeves upon said shell. As shown in Fig. 5 the inner end of the sleeve can be secured to the cartridge shell 1 by a screw 1^a or other fastening means.

Arranged longitudinally of the shell 1, either in the body thereof or against the inner walls of said shell, are soft metal wire fuses 6 of greater length than said shell, said fuses having the ends thereof bent against the ends of the shell and then into parallelism with those portions of the fuses within the shell, whereby the extreme ends 7 of the fuses 6 will engage the outer side of the off-set portions 3 of the sleeves. As shown in Figs. 1 and 2, two soft metal fuses are employed and are diametrically opposed, and in arranging the fuses in this manner, it is preferable to position the ends 7 thereof directly over the slits or slots 4 of the sleeves, whereby said slits or slots will form a seat for the ends of the fuses, and the longitudinal edges of the slits or slots engage said fuses. After the ends of the fuses have been bent to engage the sleeves 2, caps or end pieces 8 of a greater diameter than the ends of the shell 1 are slipped on to the sleeves and the ends of the fuses. The caps 8 bind the fuses against the ends of the shell 1 and in placing the caps in position, said caps force the extreme ends 7 of the fuses farther into the slits or slots 4, thereby causing the longitudinal edges of the slits or slots to engage in the soft metal fuses, binding the ends of the fuse against the inner walls of

the caps and thereby frictionally holding the caps in position and insuring a positive electrical connection between the fuses and the caps.

As shown in Fig. 6, the cap 8 can be connected to the sleeve 2 by a pin or rivet 8^a carried by said sleeve engaging in an angle slot 8^c, this connection preventing an explosion or the burning out of a fuse from dislodging the caps 8. The caps 8 have been shown with blades 9, but it is obvious that these blades can be dispensed with and the ends of the fuse constructed for use in connection with standard types of fuse blocks or electrical devices.

Reference will now be had to Fig. 4 showing a flat or ribbon aluminum fuse in lieu of the wire fuse. The flat or ribbon fuse is designated 6^a and the practicability of using the fuse lies in the fact that it is very thin and flexible and will readily conform to the curved shape of the sleeve 2. The ends of the fuse will give a very large contact area which is of the greatest importance in a refillable fuse.

To summarize, by using a single aluminum fuse one of comparative small cross sectional area allows the caps to fit neatly on the sleeves without getting too tight. In fact the cap will always fit neatly with any number of fuses for the resiliency of the sleeves maintains the caps thereon.

It is also obvious that additional soft metal fuses can be arranged within the cartridge shell to increase the capacity of the fuse for the purposes for which it is intended, and I attach considerable importance to the fact that the shell 1 can be refilled should one or more of the fuses thereof be burned out.

What I claim is:—

1. In a cartridge fuse, a shell, resilient sleeves mounted upon said shell at the ends thereof and slitted to provide clamping arms, soft metal fuses arranged longitudinally of said shell and having the ends thereof bent to engage said sleeves, and caps fitted upon said sleeves and held in engagement with the ends of said fuse by the resiliency of said sleeves.

2. A fuse embodying a shell, sleeves arranged upon the ends of said shell and slitted to provide clamping arms, fuses arranged longitudinally of said shell and having the ends thereof bent to be engaged by the slitted edges of the clamping arms of said sleeves, and caps mounted upon said sleeves and retained in engagement with the ends of said fuse by the resiliency of said sleeves.

3. A cartridge fuse comprising a shell, slitted resilient sleeves mounted upon the ends of said shell, fuses arranged longitudinally of said shell against the inner walls thereof and having the ends thereof bent to engage the slitted portions of said sleeves, and caps inclosing the ends of said fuse and frictionally held in contact therewith by the resiliency of said sleeves.

4. A fuse embodying a shell, sleeves mounted upon the ends of said shell and having offset portions providing clamping arms adapted to retain said sleeves in frictional engagement with the outer walls of said shell, fuses arranged longitudinally of said shell and having the ends thereof bent at the ends of said shell into parallelism with said shell and into engagement with the off-set portions of said sleeves, and caps arranged upon the ends of said fuses and retained in frictional engagement therewith by the resiliency of the off-set portions of said sleeves.

5. A cartridge fuse embodying a shell, sleeves frictionally held upon the ends of said shell and provided with offset portions, fuses arranged in said shell and having the ends thereof bent to engage the offset portions of said sleeves, and caps mounted upon said sleeves and retaining the ends of said fuses in engagement therewith

6. In a cartridge fuse, a shell, a slitted sleeve mounted upon an end of said shell, a fuse arranged in said shell and having an end thereof bent to engage the outer side of said slitted sleeve, and a cap fitted upon said sleeve and binding the end of said fuse upon said slitted sleeve.

7. A cartridge fuse comprising a shell, a cap arranged upon an end of said shell, a resilient member interposed between said cap and the side of said shell, and a fuse having an end thereof held between said member and said cap.

In testimony whereof I affix my signature in the presence of two witnesses.

JAMES H. ALSPACH.

Witnesses:

KARL H. BUTLER,

CHRISTINA T. HOOD.