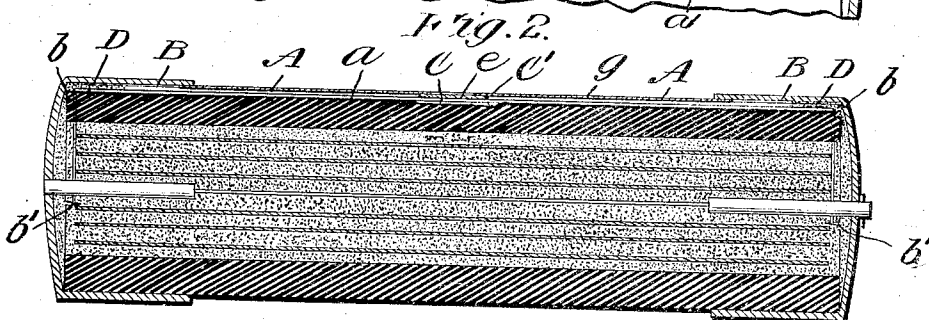
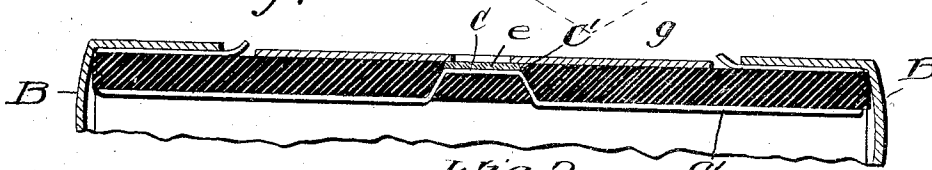
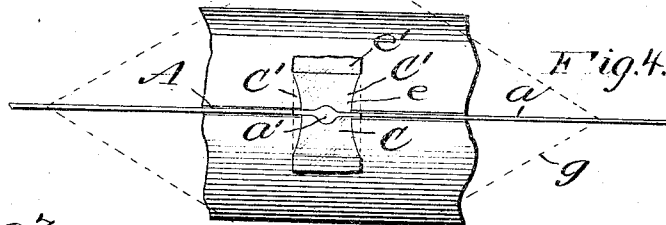
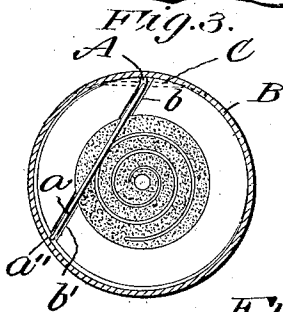
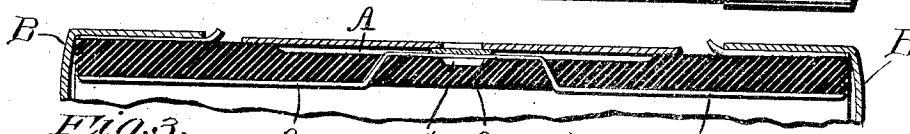
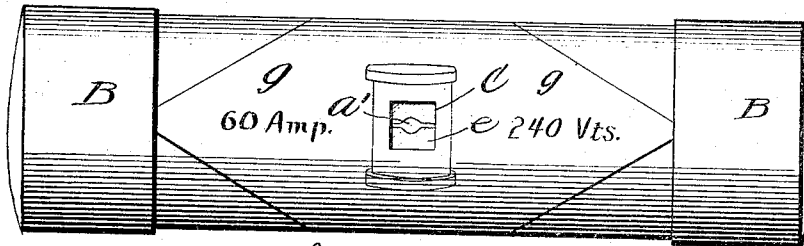


O. C. HOFFMANN.
 INDICATOR FOR INCLOSED FUSES.
 APPLICATION FILED NOV. 5, 1904.

953,204.

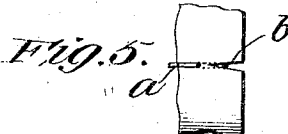
Patented Mar. 29, 1910.

Fig. 1.



WITNESSES:

W. F. Kyle.
Bernard Spelman



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Otto C. Hoffmann
 BY *Buckingham & Evans*
 Attorneys

UNITED STATES PATENT OFFICE.

OTTO C. HOFFMANN, OF BUFFALO, NEW YORK, ASSIGNOR TO CHICAGO FUSE WIRE & MANUFACTURING COMPANY, OF BUFFALO, NEW YORK, A CORPORATION.

INDICATOR FOR INCLOSED FUSES.

953,204.

Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed November 5, 1904. Serial No. 231,492.

To all whom it may concern:

Be it known that I, OTTO C. HOFFMANN, 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 Indicators for Inclosed Fuses, of which the following is a specification.

This specification relates to indicators for inclosed fuses and consists of a novel disposition and arrangement of the indicator fuse or indicating conductor so that it may be fully protected while lying wholly on the surface of the fuse case, and also may be so entirely inclosed as to prevent flash upon fusing, the cover being of such a nature as to indicate the presence of the fuse. As illustrative of this invention in one of its forms, the accompanying drawing may be described as follows:—

Figure 1 is a side elevation of the inclosed fuse; Fig. 2 is a longitudinal section with parts shown beyond the plane; Fig. 3 is an end elevation with the cap in section, showing notches and position of the indicator conductor; Fig. 4 shows one form of the inclosure for the enlarged depression or receptacle for the indicator; Fig. 5 shows a fragment of the casing giving a view of the notch with the indicator conductor broken away for a part of its length. Figs. 6 and 7 illustrate varied forms under this invention.

In these figures similar letters indicate like parts throughout.

A longitudinal slot A may be provided as shown in Figs. 2—3—4—6 and 7 which may extend more or less of the distance from end to end of the casing on its exterior surface and may lead into notches *b* such as is shown in Fig. 5, also clearly seen in Fig. 3. As shown in this figure the notch is preferably turned at an angle to the radius and continued on the farther side of the casing *b'*; Figs. 2 and 5. No slot, however, necessarily exists on the farther face of the casing at or near *b'*. At any desired point between the caps B B is a depression such as is shown at C in Figs. 1, 2 and 4 and in dotted lines in Fig. 3. This depression communicates with the slot A. In the depression A is laid an indicator conductor or auxiliary fuse *a* which is provided with an enlargement *a'* such, for instance, as is described in my prior application, Serial No.

204,707, dated April 25th, 1904. This wire or conductor may be placed suitably in circuit but I prefer to have it as long as possible for obvious reasons, and to this end I may pass it around the ends of the casing as is shown in Figs. 2 and 3 and bring it in electrical contact at the farther side as is shown in Fig. 3 at point *a*, retaining notches *b* such as is shown in Figs. 2, 3 and 5 may be provided which are found to greatly facilitate the handling and retention of the wire after being placed. This action may be illustrated by the holding notch in the flange of ordinary thread spool.

The circuit connection to the independent wire *a* may be effected by simple impingement between the casing and caps B at any suitable point along this length, but I prefer to have it at the farther side of the casing so that the indicator fuse shall be as long as possible, as stated in this instance, longer than the greatest length of the inclosed fuse itself. It will be plainly seen that the slot A allows this indicator to remain entirely out of circuit connection at all points where the slot passes under the caps in cases where long slots are used.

In case of long slots a packing, or filling D may be employed at either end under the cap to fill the slot A and prevent egress of the contents of the fuse. A covering *e* for the enlarged depression may be held by its side walls and may also protrude beyond the limits of the depression as indicated at *e'* in Fig. 4. Any means for attaching this cover or any suitable cover which will indicate the presence of the indicator, may be employed, but I prefer a transparent cover such as mica. The slot throughout its length may be open, but I prefer to have it inclosed as is shown in Figs. 1 and 2 by suitable cover *g—g*. This is also shown in dotted lines in Fig. 4, and may extend to or under the caps B as shown in Fig. 4. This covering may be in more than one part, but in the figures I have represented it as consisting of the label upon the fuse and provided with an opening through which may be seen the fuse *a*. The label as applied in Fig. 1 is enabled also to secure the edges *e''* of the transparent covering *e* shown in the figures, thus performing the double function of constituting a cover for the slot A, and also means of securing the transparent cover *e*.

The use and operation of the device will be apprehended from the foregoing description.

It will at once be seen that the indicator or auxiliary fuse will disturb the calibration of the main fuse to only a very slight extent owing to the very great length of the indicator included in circuit. The fact that it may be out of contact with the other material at the enlarged depression C and also owing to the fact that it has a lessened cross section and current carrying capacity at this point *a'*, the indicator is designed to fuse at this point. The condition of the fuse being easily ascertained through the opening in the label *g* and the transparent covering *e*. The filling of the fuse may be in any well known form, but I prefer that it be broken up by a non-conducting material as shown in Figs. 2 and 3 for the purpose of breaking up any continuity of cracks or crevices existing in the filling.

While it is designed to employ all the parts in the relation shown, some may be employed without the others and the invention extends to such use.

It will be seen that there is no direct communication from the interior portion of the casing to the exterior through which the filling may sift or blow as through holes used for bringing the wire *a*— to the surface as the transparent cover provides that at all times the indicator is under the surface.

I claim:—

1. In an inclosed fuse a casing and end caps for the fuse, a slot in the exterior surface of the casing, an electrical conductor in the slot and an enlargement in the slot or depression located between the

caps.
2. In an inclosed fuse a casing and end caps for the fuse, a slot in the exterior surface of the casing, an electrical conductor in the slot, an enlargement in the slot or depression located between the caps, a cover for the slot and a separate cover for the enlarged portion.

3. In an inclosed fuse a casing and end caps for the fuse, a slot in the exterior surface of the casing, an electrical conductor in the slot, an enlargement in the slot or depression located between the caps, the wire being provided with an enlarged surface located within the enlarged portion of the slot.

4. An indicator conductor for an inclosed fuse lying along one side of the casing of the fuse passing around the ends out of electrical contact and means for effecting the electrical contact on the farther side of the casing.

5. In an inclosed fuse a casing and end caps for the fuse, a slot in the exterior surface of the casing, an electrical conductor in the slot, an enlargement in the slot or depression located between the caps, a cover for the slot having an opening and a transparent portion covering the opening.

6. In an inclosed fuse a casing and end caps for the fuse, a slot in the exterior surface of the casing an electrical conductor in the slot, an enlargement in the slot or depression located between the caps, a cover for the slot provided with an opening arranged as to location so as to register with the enlarged portion and a transparent cover to the enlarged portion.

7. In an inclosed fuse a casing and end caps for the fuse, a slot in the exterior surface of the casing, an electrical conductor in the slot, an enlargement in the slot or depression located between the caps, a cover for the slot provided with an opening, arranged as to location so as to register with the enlarged portion and a transparent cover for the enlarged portion, the transparent portion being larger than the opening and located beneath the cover.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

OTTO C. HOFFMANN.

Witnesses:

A. D. DANA,
PETER MAUL.