

No. 859,547.

PATENTED JULY 9, 1907.

C. S. DAVIS.

SAFETY FUSE FOR ELECTRIC CIRCUITS.

APPLICATION FILED OCT. 27, 1905. RENEWED DEC. 7, 1906.

Fig. 1.

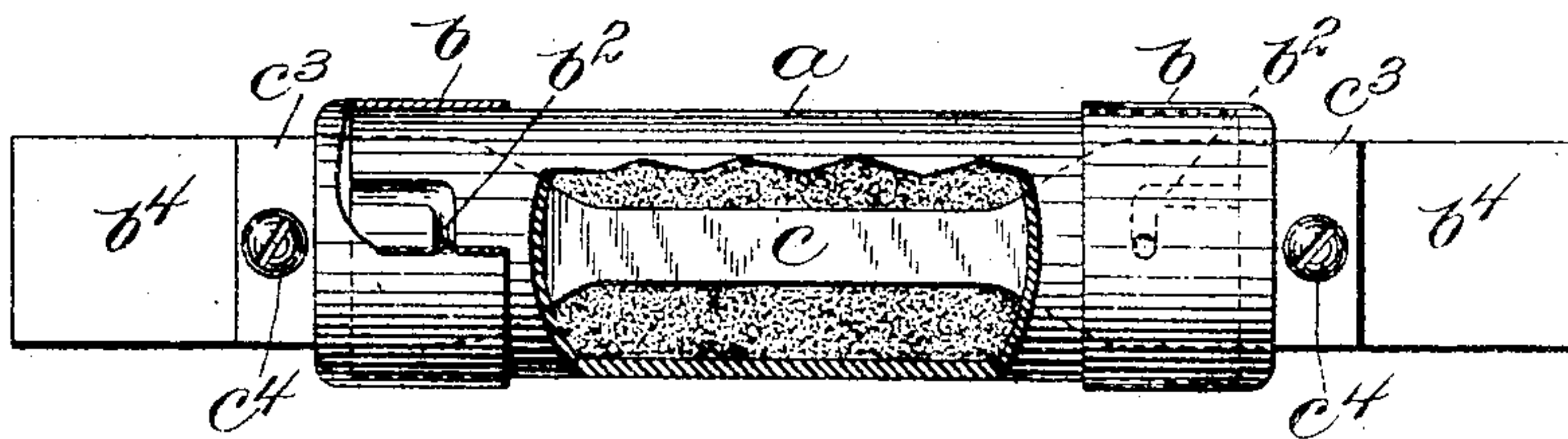


Fig. 2.

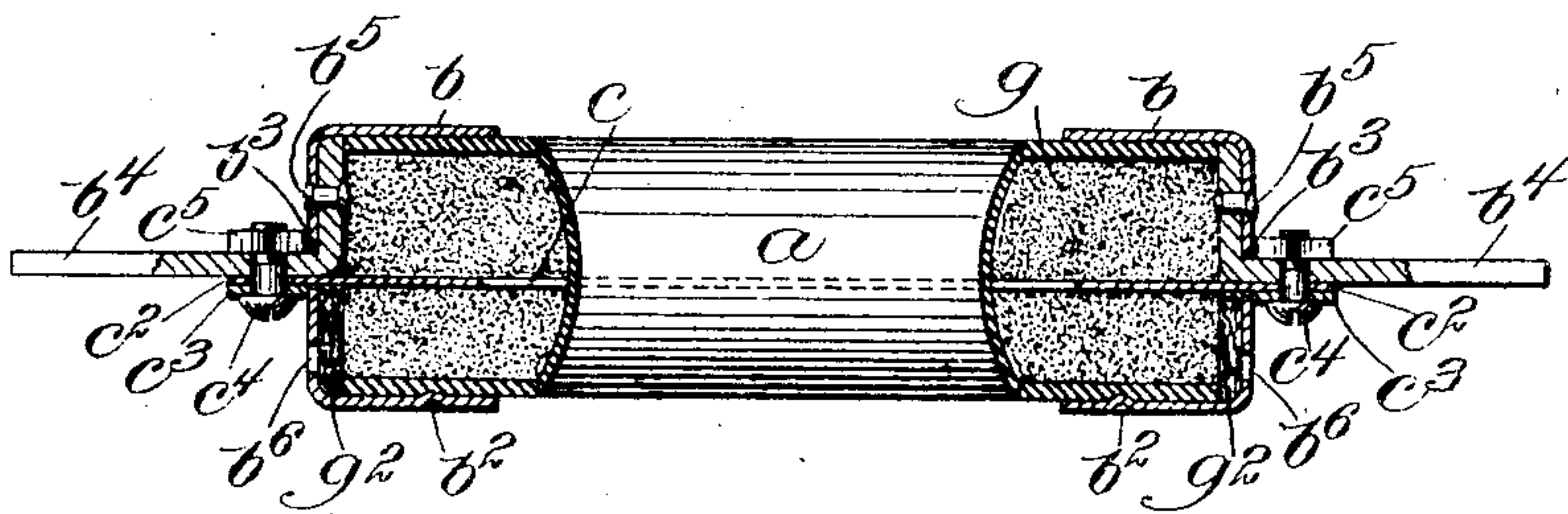
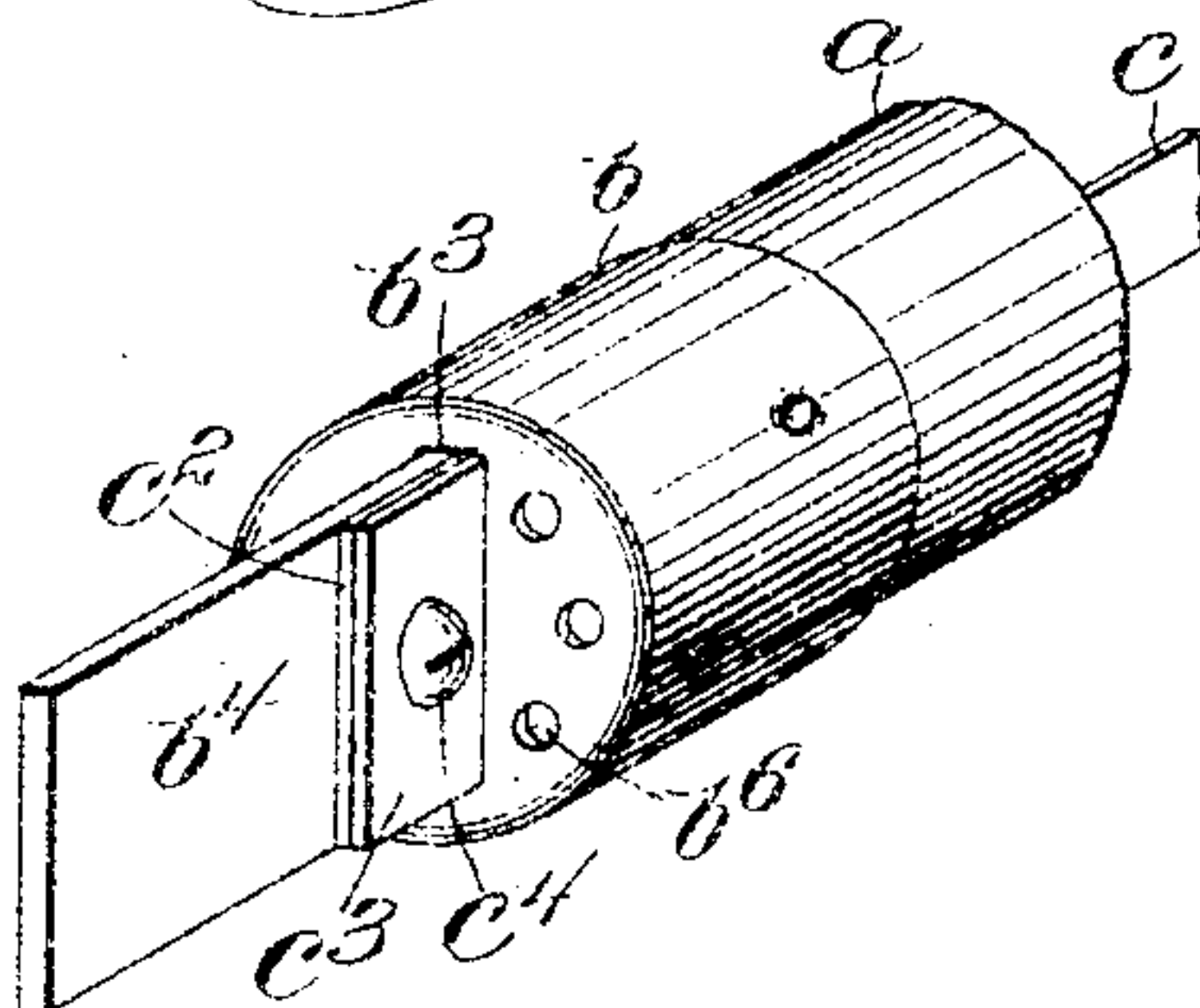


Fig. 3.



Witnesses:  
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Attys.



# UNITED STATES PATENT OFFICE.

CHARLES S. DAVIS, OF SOMERVILLE, MASSACHUSETTS.

## SAFETY-FUSE FOR ELECTRIC CIRCUITS.

No. 859,547

Specification of Letters Patent.

Patented July 9, 1907.

Application filed October 27, 1905. Renewed December 7, 1906. Serial No. 346,805.

To all whom it may concern:

Be it known that I, CHARLES S. DAVIS, a citizen of the United States, residing in Somerville, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Safety-Fuses for Electric Circuits, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to a safety fuse for electric circuits, and is embodied in a fuse of the so-called cartridge type in which the destructible or fusible portion is inclosed in a casing and usually surrounded with some finely divided gas-absorbing material which is packed tightly into the casing. The material commonly used is powdered chalk, some asbestos usually being employed near the ends of the casing to prevent the powdered material from sifting through the vent openings, with which the ends are commonly provided. So far as relates to the present invention, however, it is sufficient to describe the fuse as contained in an inclosed casing.

The purpose of the invention is to construct the fuse in such a manner that the casing may be repeatedly used, and a new strip of fusible material applied thereto without the exercise of special skill or the use of special tools. The body of the casing for a fuse of this description is commonly made of fiber, or similar substance, in cylindrical form, and the ends of the casing are inclosed by metallic caps extended over the ends of the fiber tube, the said caps being provided with terminals or extensions, while the fusible strip extends through the tube from one extension to the other. These extensions are commonly known in the art as knife blade terminals. The fusible strip thus inclosed is usually closely packed in a mass of gas-absorbing material which wholly fills the casing.

In accordance with the present invention, the metallic caps at the ends of the casing are provided with openings for the ends of a fusible strip which is longer than the casing so as to extend through the same and project outward through the openings at both ends. These projecting ends of the fusible strip are connected with the caps at the outside of the casing so as to be readily accessible for removal. Furthermore, the caps themselves are so connected with the body of the casing as to be readily removable therefrom and easily replaceable, so that when a fuse has been blown, a new fuse can be easily inserted, thus utilizing the original casing.

Figure 1 is an elevation, partly in section, of a fuse embodying the invention; Fig. 2 is a longitudinal section, on a plane transverse to that of the section in Fig. 1; and Fig. 3 a partial perspective view.

The body *a* of the casing is shown as consisting of a cylinder or tube, which may be made of fiber board, or other non-conducting substance, the said casing being

closed at the ends by means of metallic cup-shaped caps *b* which may be fastened in any suitable way, the connecting device, to be hereinafter described, serving, in the construction embodying the invention, as a sufficient fastening, although I prefer to use, in addition, a bayonet joint, as indicated at *b*<sup>2</sup>. The ends of the casing, *i. e.*, in the construction shown, the caps *b*, are slotted across the middle, as indicated at *b*<sup>3</sup>, and provided at a point adjacent to the slot with knife blade terminals or extensions *b*<sup>4</sup> for connecting the fuse in the circuit to be protected. These terminals project from the ends of the casing and may form an integral part thereof, and, in the construction herein shown, (Fig. 2), consist of metal strips which project through the slots *b*<sup>3</sup>, and are bent over into contact with the inner surfaces of the caps and secured thereto, as by solder, or rivets, *b*<sup>5</sup>, or both. The fusible strip *c* is made longer than the casing, and extends completely through the same, projecting outward through the slots *b*<sup>3</sup> at opposite ends adjacent to the terminals *b*<sup>4</sup>. The projecting end portions *c*<sup>2</sup> are herein shown fastened outside the casing in electrical contact with the terminals *b*<sup>4</sup> by readily detachable fastening devices, these end portions for example being clamped between washers *c*<sup>3</sup> and the terminals *b*<sup>4</sup> by means of screws *c*<sup>4</sup> and nuts *c*<sup>5</sup>. The fusible strip *c* is shown as embedded in gas-absorbing material *g*, such as powdered chalk, or any suitable chemical, with which the casing is tightly packed. The ends of the caps *b* are shown as provided with vent openings *b*<sup>6</sup>, and to prevent the powdered substance from sifting out, a small quantity of fibrous asbestos may be packed in at the ends, as indicated at *g*<sup>2</sup>.

It will be seen, from the foregoing description, that when a fuse blows out, it is a simple matter to remove the ends of the destroyed fuse from the outside of the caps *b* which may then be removed for the insertion of a new fuse, and the repacking of the casing.

The bayonet joints indicated at *b*<sup>2</sup> serve merely to prevent the caps from being blown off, by the expansion of the gases, when the fuse blows, since it is obvious that when the fuse is complete, the caps are held in place by the fastenings at the end thereof.

In assembling the fuse, the fusible strip *c* packed in the case is so positioned that the ends thereof will be aligned with the slots when the caps are in such position that the projecting part of the bayonet joint will be in line with the longitudinal portion of the channel in the casing. The caps can then be pushed into place, and the casing itself given a turn to the position shown in Fig. 1, thus securing the caps against endwise displacement without twisting or injuring the fuse.

It is not intended to limit the invention to the specific construction and arrangement herein shown and described, especially so far as relates to the casing and



the fastening devices, since modifications may be made without departing from the invention.

Claims.

1. A fuse comprising a case having end portions provided with metallic extensions, said end portions being slotted at points adjacent to said extensions; a strip of fusible material extending through said casing and projecting out through said slots; gas absorbing material within said casing around said fusible member; and removable fastening devices outside of the casing for holding the ends of said fusible member in electrical contact with said projecting portions.
- 15 2. In a safety fuse for electric circuits, the combination with a cylindrical casing; of inclosing caps at the ends of said casing, said inclosing caps being provided with slots extending transversely across the same; metallic terminal projections adjacent to said slots; a fusible strip extending through said casing and projecting outward through said slots; washers extending over said terminal projections; and removable devices for clamping said projecting ends between said washers and said projecting terminal portions, substantially as described.
- 20 3. In an inclosed fuse and casing, a fusible member extending through said casing and projecting out beyond

the ends thereof; projecting portions of conducting material at the ends of the casing; and external removable fastening devices for securing the ends of said fusible member to said projecting portions. 25

4. In an inclosed fuse, a main casing of insulating material; inclosing caps for the ends of said casing provided with projections and slots adjacent thereto; a strip of fusible material extending through the casing and projecting through the slots, and being electrically connected with the projections; and a bayonet joint to prevent endwise displacement of the caps. 30 35

5. In an inclosed filled fuse of the cartridge type, the combination with the casing; of removable and replaceable caps provided with knife blade terminals and with slots adjacent to said terminals; and a fusible strip extending through the casing and the slots of the caps, and attached to the caps at the outsides thereof. 40

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

CHARLES S. DAVIS.

Witnesses:

M. E. COVENEY,  
HENRY J. LIVERMORE.