

No. 682,919.

Patented Sept. 17, 1901.

L. W. DOWNES.  
ELECTRIC FUSE.

(Application filed June 11, 1901.)

(No Model.)

Fig. 1.

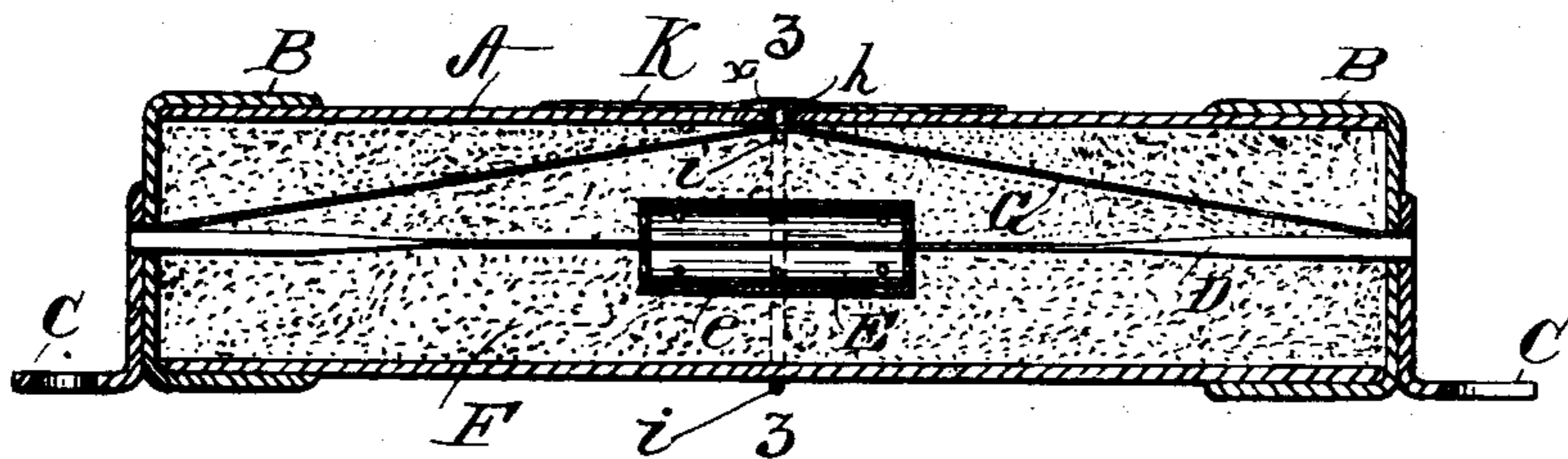


Fig. 2.

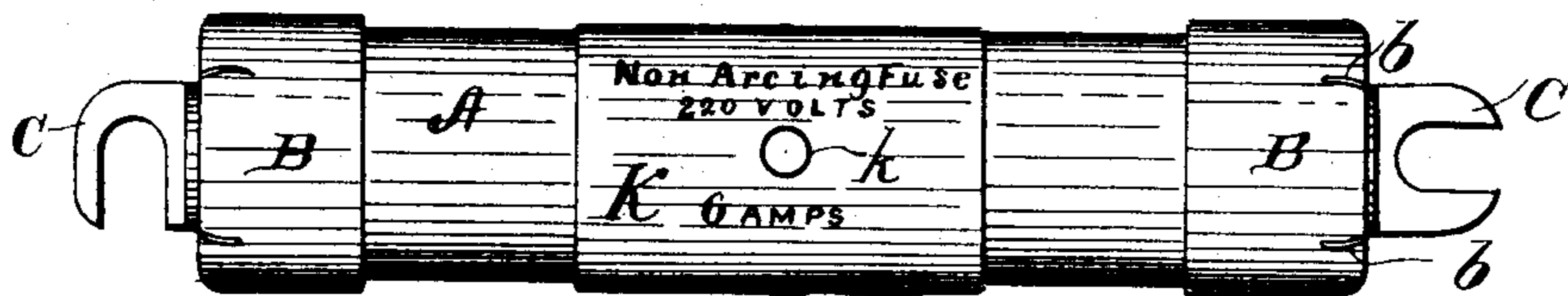


Fig. 3.

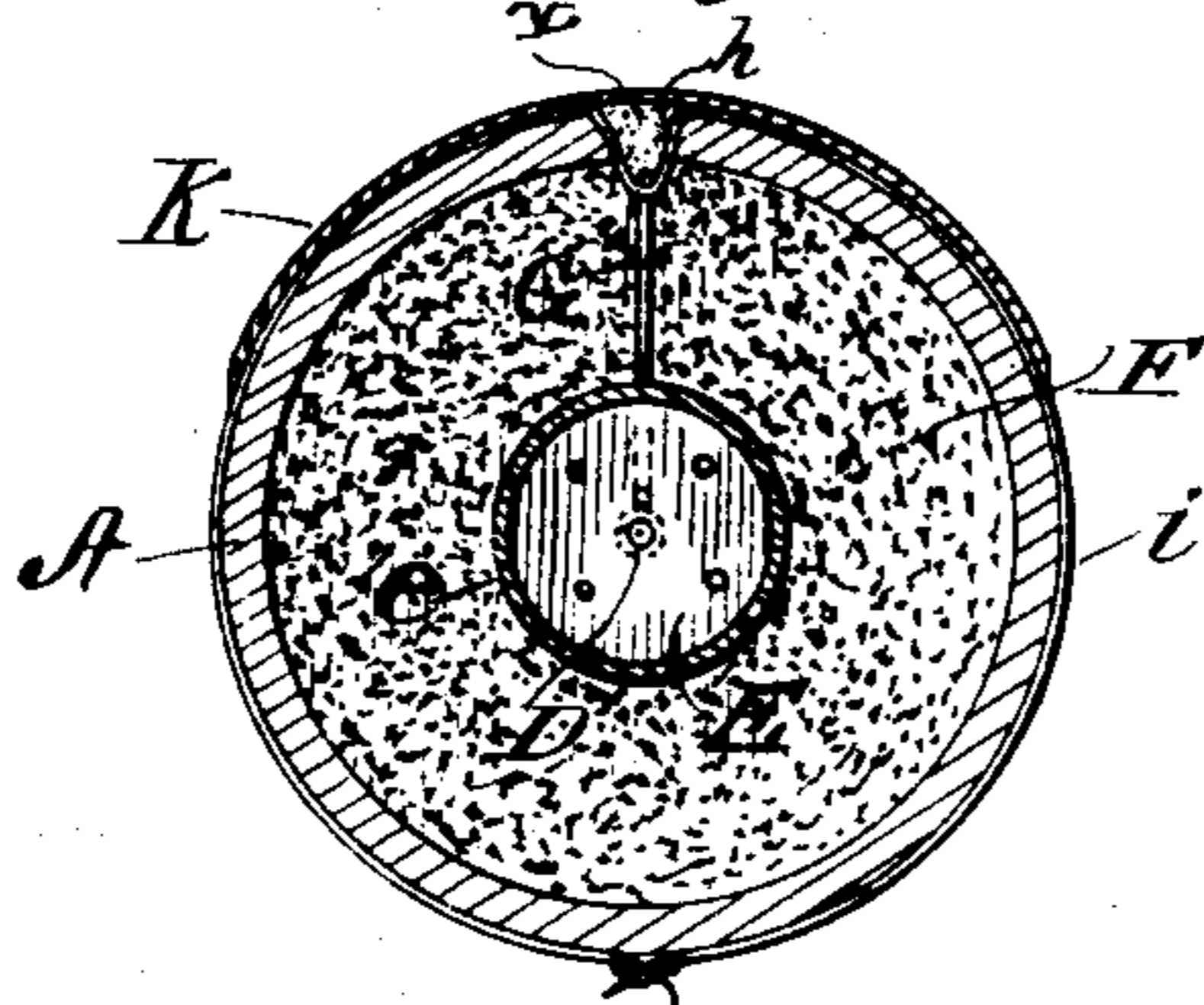
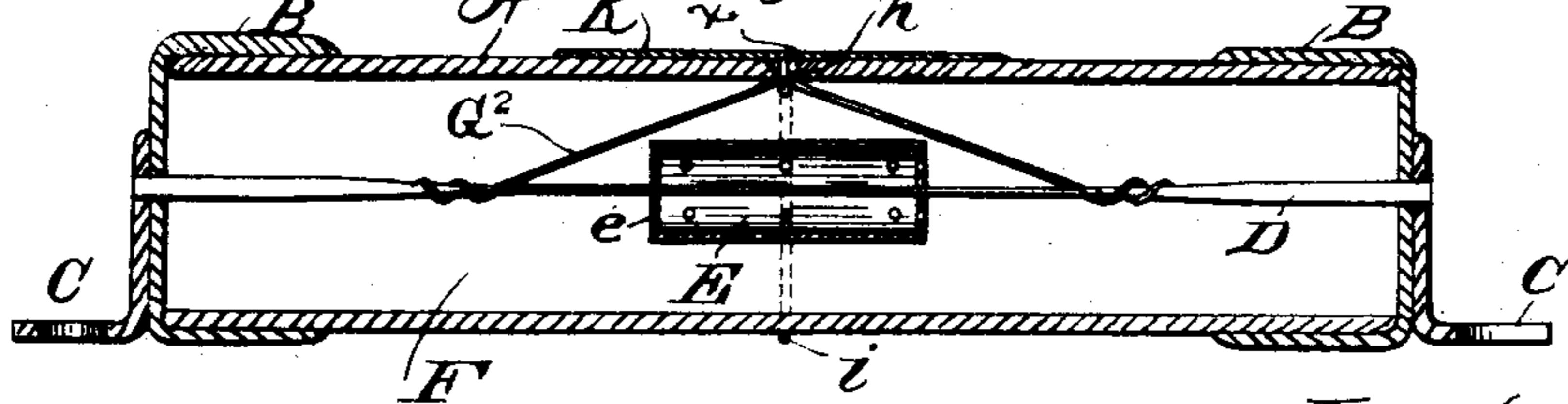


Fig. 4.



Witnesses.

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# UNITED STATES PATENT OFFICE.

LOUIS W. DOWNES, OF PROVIDENCE, RHODE ISLAND.

## ELECTRIC FUSE.

SPECIFICATION forming part of Letters Patent No. 682,919, dated September 17, 1901.

Application filed June 11, 1901. Serial No. 64,159. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS W. DOWNES, of Providence, Rhode Island, have invented a new and useful Improvement in Electric Fuses, which invention is fully set forth in the following specification.

My invention has reference to the type of electric fuses or cut-outs wherein a small auxiliary-fuse wire or link is employed to indicate the condition (whether fused or unfused) of an inclosed main-fuse wire or link.

The improvements constituting the invention reside principally in the disposition and arrangement of the auxiliary-fuse wire with reference to the main-fuse wire and the inclosing casing, whereby the parts may be readily assembled in proper relative position.

The invention can best be explained and understood in connection with the accompanying drawings, illustrating the same, wherein—

Figure 1 is a longitudinal sectional view. Fig. 2 is a plan of the same. Fig. 3 is an enlarged transverse sectional view on line 3 3 of Fig. 1; and Fig. 4 is a longitudinal sectional view illustrating a modified arrangement of the auxiliary-fuse wire.

Except for the auxiliary-fuse wire and its accessories the construction of the fuses illustrated in the drawings are substantially the same as that of my Patent No. 569,373, A being a tubular casing, preferably of a fibrous material; B B, metallic caps secured over opposite ends of the casing and having slits or perforations *b*, through which vapors or gases evolved in the casing may escape to prevent explosion or blowing open of the fuse-casing; C C, terminal brackets secured to the caps; D, a main-fuse wire connected between terminal brackets C C and passing through the interior of the casing, and E an air-space about the fuse-wire at about the center thereof, said air-space being formed by a perforated paper drum *e*.

F is a filling of a suitable material, preferably in a finely-divided state, such as slaked lime, the principal function of which is to dissipate the heat from those portions of the wire which come directly in contact therewith, thus causing the rupture to take place at that part of the fuse which penetrates the air-space, and, furthermore, said material

provides a multitude of minute paths or interstices for the escape of the vapor or gas evolved upon the fusing or blowing of the main fuse D.

While I have herein illustrated the improvements constituting my present invention in conjunction with the particular construction of fuse set forth in my patent referred to, it is to be understood that the invention is equally capable of use in other constructions of fuses.

Referring to Figs. 1 to 3, G is the auxiliary indicating-fuse, consisting of a fine wire, of German silver or other suitable metal, located, as shown, within the casing A. *h* is a small preferably countersunk opening through the casing A. A thread or cord *i*, of suitable material, preferably non-conducting, is looped inwardly through said opening and under the auxiliary-fuse wire or link G, the ends of said thread being carried in opposite directions around the casing and tied together, as clearly shown in Fig. 3. The thread thus serves to draw and hold the auxiliary-fuse wire against the inner side of the casing across the opening *h*. In assembling the parts the thread *i* is first pushed or threaded through the opening *h* in the casing to form a long loop within the same. The indicator-fuse wire G is then threaded through this loop. The thread *i* is then drawn out of the opening, at the same time drawing the auxiliary-fuse wire up against the inner side of the casing across said opening, as already explained. The ends of the thread are then tied together. A suitable material *x*—such, for example, as a paste composition of about the consistency of thick paint, made of ordinary gunpowder dissolved in a water solution of gum arabic—is then applied to the opening *h*, filling the same and covering that part of the indicator-fuse which crosses said opening. After this paste thoroughly dries out, becoming very hard, the fuse is finished in the ordinary way. A label or covering K, of paper or other suitable material, (upon which may be printed words and figures indicating the capacity of the fuse,) is then pasted on the casing A, so that a circle *k* printed thereon rests over the hardened paste, filling in the opening *h*. Upon the blowing of the fuse the auxiliary indica-

tor-fuse wire is instantly heated and causes the paste to burn, but not with the ordinary rapidity of gunpowder, nor is the heat developed sufficient to actually burn a hole through the paper, but simply chars the paper, turning it black within the circle *k*, thus indicating that the fuse is blown. Any suitable mark or means other than the circle *k* may be employed to designate or distinguish the certain known portion of the label which will be visually affected to indicate the disruption of the main fuse. This marking or designation of the point on or part of the label at which the disruption of the main fuse is or is to be visually indicated is broadly new and of great importance. It facilitates a hasty examination and determination of the condition of the fuse. Any visually-affected means other than the paste and label referred to may be associated with the indicator-fuse link to indicate the disruption of the main fuse, or such means may be entirely omitted and the condition of the indicator-fuse observed through the opening *h*.

In the construction shown in Fig. 4 the ends of indicator-fuse wire *G*<sup>2</sup> are shown as coiled around the main-fuse link *D*. Filling *F* is omitted from Fig. 4 in order to show the other parts clearly.

I claim—

1. In an electric fuse or cut-out, a main-fuse wire, an inclosing casing for the same having an opening through the wall thereof, an auxiliary-fuse wire within the casing, and a thread for holding the auxiliary-fuse wire in a position across the inner end of the opening in the casing.
2. In an electric fuse or cut-out, a main-fuse wire, an inclosing casing for the same having an opening through the wall thereof, an auxiliary-fuse wire within the casing, and a thread extending through the opening in the casing for holding the auxiliary-fuse wire in a position across the inner end of said opening.
3. In an electric fuse or cut-out, a main-fuse wire, an inclosing casing for the same having an opening through the wall thereof, an auxiliary-fuse wire within the casing, and a thread looped through the opening in the

casing and about the auxiliary-fuse wire for drawing the latter to and holding it in a position across the inner end of said opening.

4. In an electric fuse or cut-out, a main-fuse wire, an inclosing casing for the same having an opening through the wall thereof, an auxiliary-fuse wire within the casing, a thread for holding the auxiliary-fuse wire in a position across the inner end of the opening in the casing, and a filling of material in said opening adapted by the disruption or heating of the auxiliary-fuse wire to effect a visual indication at the exterior of the casing of the disruption of the main fuse.

5. In an electric fuse or cut-out, a main-fuse wire, an inclosing casing for the same having an opening through the wall thereof, an auxiliary-fuse wire within the casing, a thread for holding the auxiliary-fuse wire in a position across the inner end of the opening in the casing, a cover on the exterior of the casing over the outer end of said opening and a filling of material in said opening adapted by the disruption or heating of the auxiliary-fuse wire to effect a visual change in the condition of the covering thereby indicating the disruption of the main fuse.

6. In an electric fuse or cut-out, an inclosing casing, caps for closing opposite ends of the casing, each cap having an opening there-through, a main and an auxiliary fuse wire within the casing passing at opposite ends through the same opening in the caps respectively.

7. In an electric fuse or cut-out, the combination with an inclosing casing and a main-fuse wire or link, of a label or covering of a suitable material adapted to be visually affected upon the disruption of the main-fuse wire, and means for distinguishing or designating a certain known portion of the label which is to be so affected.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

LOUIS W. DOWNES.

Witnesses:

JOHN HENSHAW,  
JOSEPH A. PHILLIPS.