

No. 737,280.

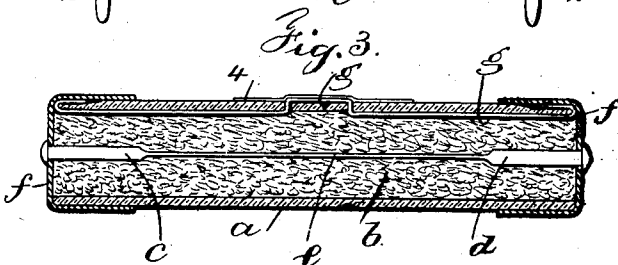
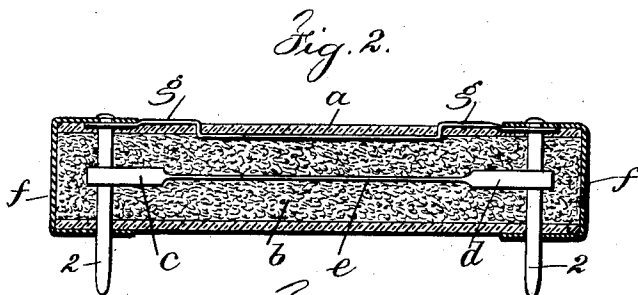
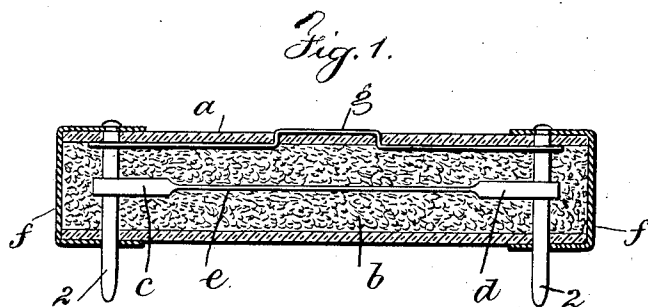
PATENTED AUG. 25, 1903.

J. SACHS.  
SAFETY FUSE.

APPLICATION FILED FEB. 19, 1900.

NO MODEL.

2 SHEETS—SHEET 1.



*Witnesses*

*Charles H. Smith*  
*J. Stait*

*Inventor.*

*Joseph Sachs*  
*per L. W. Serrell & Son.*

*attys*

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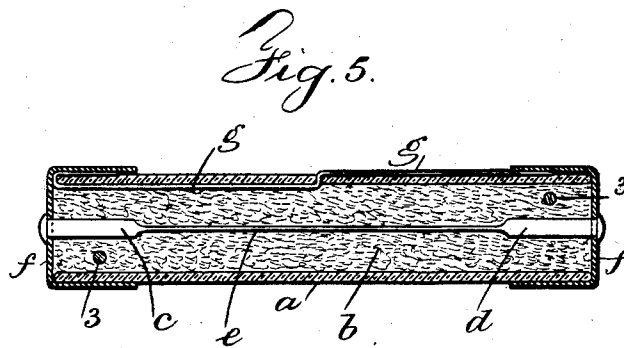
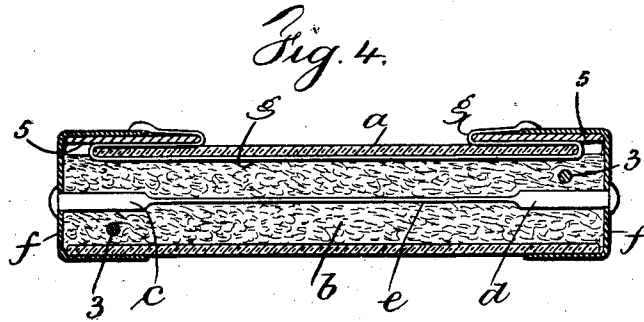
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2 SHEETS—SHEET 2.



Witnesses

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J. Staib

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# UNITED STATES PATENT OFFICE.

JOSEPH SACHS, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE JOHNS-PRATT COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

## SAFETY-FUSE.

SPECIFICATION forming part of Letters Patent No. 737,280, dated August 25, 1903.

Application filed February 19, 1900. Serial No. 5,701. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH SACHS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented an Improvement in Safety-Fuses, of which the following is a specification.

My present invention is designed as an improvement upon the device shown and described in Letters Patent granted to me November 7, 1899, No. 636,565. In fuses of the character described in this patent and where the connections between the indicator-wire and the fuse-wire are on the surface difficulty sometimes arises in the burning of the contacts; and the object of the present invention is to overcome the said difficulty.

It is essential with the indicator that at least a portion of it should be visible, so as to make known the disruption of the fuse within the case, and in carrying out the present invention the indicator-wire is so placed that a portion of its length between the respective ends of the case and the terminals is visible upon the surface of the case inclosing the fusible strip. The indicator-wire may be visible at about the central part of the case and pass through the case and its ends be beneath the case to electrically contact with the terminals, or the same may be visible adjacent to the metal ends and terminals and pass through the case with the central portion beneath and within the case, or the said indicator-wire may be visible adjacent to one metal end or terminal of the case and be invisible at the other end. The size of the indicator-wire may be varied, and the construction or character of the terminals or metal ends to the case may be varied, and the indicator-wire may, if desired, be covered where visible by a paste or label, either wholly or partially, so that the same may burn when the indicator-wire is disrupted.

In the drawings, Figure 1 is a longitudinal section illustrating my improvement. Figs. 2, 3, 4, and 5 are similar longitudinal sections, showing, however, slightly-modified forms of the invention.

I prefer to employ a tubular case *a*, of insulating material, into which a non-conduct-

ing filling *b* is placed, and *c d* are the terminals of the fuse-strip *e*, which fuse-strip is of metal adapted to be melted by the passage of an electric current in excess, so as to break the circuit before any of the translating devices in the circuit are liable to injury. The metal ends or caps *f* are electrically connected with the terminals. These electrical connections may be in the form of transverse pins 2, as shown in Figs. 1, 2, which pass through the metal ends, through the tubular case and the insulating material, and to which the terminals *c d* are connected within the case. These pins, as in the former patent, serve the purpose of connecting the case to a foundation. The terminals *c d*, as shown in Figs. 3, 4, and 5, may, however, be connected to and pass through the metal ends *f*, and pins 3, as shown in Figs. 4 and 5, may be employed for securing the metal ends to the tubular case.

*g* represents the indicator-wire or second conductor, having a resistance that renders such wire adapted to act in connection with the fusible strip *e*, so that when an excess current disrupts the fusible strip it also destroys the indicator-wire, so that the condition of the fuse is visually apparent. This indicator-wire extends between the metal ends or terminals, so as to be electrically connected with the terminals, the same as the fusible strip.

The different figures of the drawings show modifications in the manner of connecting the indicator-wire so that the object sought may be accomplished—namely, to prevent burning the contacts where the indicator-wire is entirely on the surface.

In Fig. 1 the respective ends of the indicator-wire are within the tubular case connected to the terminals, and the said indicator-wire passes through the case, and a portion of its length is visible upon the surface of the tubular case.

In Fig. 2 the respective ends of the indicator-wire are connected to the metal ends or terminals outside of the case, and portions of the ends of the indicator-wire are visible upon the surface of the tubular case adjacent to the metal ends where the indicator-wire

passes through the tubular case and for the greater portion of its length within the case and adjacent to the under surface thereof.

In Fig. 3, which is similar to Fig. 1, the central portion of the indicator-wire is exposed at about the central portion of the tubular case for a small part of its length, and the same then passes through the tubular case, and the greater portion at the respective ends of the indicator-wire is within the tubular case adjacent to the under surface thereof, and the ends of the indicator-wire are returned around the ends of the tubular case against the under surface of the metal ends *f* of the case where the electrical connection is made, and in Fig. 3 I have shown the paster or label 4 upon the surface of the tubular case covering and protecting the exposed portion of the indicator-wire, and which paster or label is of course burned when the indicator-wire is disrupted and destroyed.

In Fig. 4 the indicator-wire passes along through the tubular case from end to end against the under surface of the case and the ends are returned around the ends of the tubular case and extend beneath the metal ends *f*, and I prefer here to interpose between the ends of the tubular case and the metal ends strips 5, of asbestos or similar non-conducting material, and to return the ends of the fuse-wire around the ends of this material and to solder the same to the edges of the metal ends or caps, so that there are two small portions at the ends of the fusible strip that are exposed where disruption of the fuse will be visible.

In Fig. 5 an approximate half of the indicator-wire is exposed upon the surface of the tubular case with one free end passed beneath the metal end or cap, and the other approximate half of the indicator-wire passes through the tubular case and against the under surface of the same with the free end returned beneath the metal end *f* or cap.

It will be noticed that in all of these modifications only a portion of the indicator wire or strip is exposed visually; but in all cases there is sufficient of the same exposed to show the destruction or disruption of the fusible strip within the case, so that the condition of the fuse is visually apparent.

I claim as my invention—

1. In a safety-fuse the combination with a tubular case of insulating material, a non-conducting filling, a fusible strip extending through the tubular case, terminals and ends to the case electrically connected together and to the fuse-strip, of an indicator-wire with the free ends thereof connected electrically with the terminals and metal ends of the case, and a part of the indicator-wire extending within the case against the inner surface and a part exposed upon the outer surface of the case, substantially as set forth.

2. The combination in a safety-fuse with a tubular case of insulating material, a non-conducting filling, a fusible strip passing lon-

gitudinally through the tubular case, terminals to the fuse-strip, and metal ends to the case electrically connected with the terminals, of an indicator-wire with parts passing through the material of the tubular case, a part of the length thereof exposed upon the outer surface of the tubular case, and parts extending along the tubular case against the inner surface thereof with the free ends connected electrically to the ends and terminals, substantially as set forth.

3. The combination in a safety-fuse with a tubular case of insulating material, a non-conducting filling, a fusible strip passing longitudinally through the tubular case, terminals to the fuse-strip, and metal ends to the case electrically connected with the terminals, of an indicator-wire with parts passing through the material of the tubular case, a part of the length thereof exposed upon the outer surface of the tubular case and parts extending along the tubular case against the inner surface thereof with the free ends connected electrically to the ends and terminals, and a paster or label upon the tubular case covering the exposed portion of the indicator-wire, substantially as set forth.

4. In a safety-fuse, the combination with a case and means mechanically closing the ends thereof, of a fusible strip extending through the case, terminals for the said fuse, and an indicator-wire partially within the case and partially exposed upon the outer surface of the case with its ends electrically connected with the fusible strip, substantially as set forth.

5. In a safety-fuse, the combination with a case, its ends and terminals, of a fusible strip extending through the case and electrically connected with the ends and terminals and an indicator-wire partially within the case and partially exposed upon the outer surface of the case with its ends electrically connected with the fusible strip, substantially as set forth.

6. In a safety-fuse, the combination with a case and means mechanically closing the ends thereof, of a fusible strip extending through the case, a non-conducting filling material in the case surrounding the fusible strip, terminals for the said fusible strip, and an indicator-wire partially within the case and partially exposed upon the outer surface of the case with its ends electrically connected with the fusible strip, substantially as specified.

7. In an electric fuse or cut-out, the combination with an enveloped main fuse-wire and its casing, of an auxiliary or indicating fuse-wire within the casing but having an indicating part extending to the outside of said casing.

8. In an electric fuse or cut-out, the combination with an enveloped main fuse-wire and its casing, of an auxiliary or indicating fuse-wire within the casing, but having a part projecting through the casing to the outside thereof.

9. In an electric fuse or cut-out, the combination with an enveloped main fuse-wire and its casing, of an auxiliary or indicating fuse-wire within the casing, but having a  
5 part looped through the wall of the casing to the outside thereof.

10. In an electric fuse or cut-out, the combination with an enveloped fuse-wire and its casing, of an auxiliary or indicating fuse-  
10 wire within the casing, but laced through openings in the wall of the casing so that a part thereof lies on the outside of the casing.

11. In an electric fuse or cut-out, a casing,  
15 casing, a main fuse-wire extending from one cap to the other within the casing, and an auxiliary or indicating fuse-wire within the casing connecting said caps but having a

part between its ends projecting to the outside of the casing.

12. In an electric fuse or cut-out, an enclosing casing open at both ends, an auxiliary or indicating fuse-wire, the opposite extremities of which lie against the outside of  
20 the casing, metallic terminal caps fitting over 25 and closing the open ends of the casing and pressing respectively against the extremities of the auxiliary fuse-wire making electrical contact therewith, and a main fuse connected  
30 between the terminal caps within the casing.

Signed by me this 16th day of February, 1900.

JOSEPH SACHS.

Witnesses:

GEO. T. PINCKNEY,  
S. T. HAVILAND.