

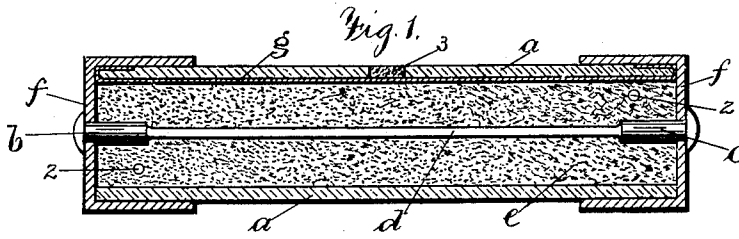
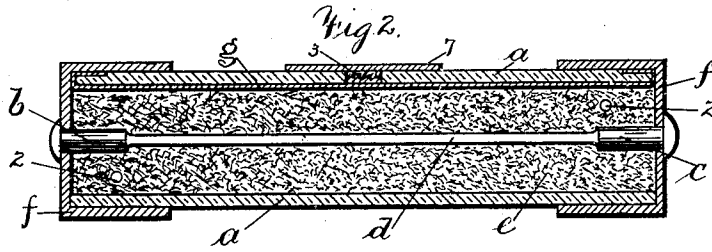
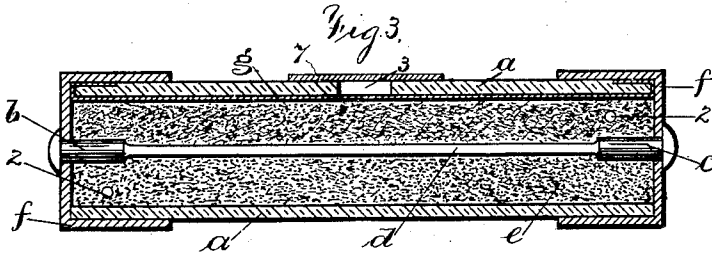
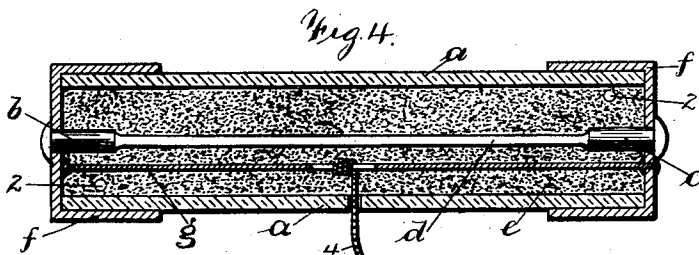
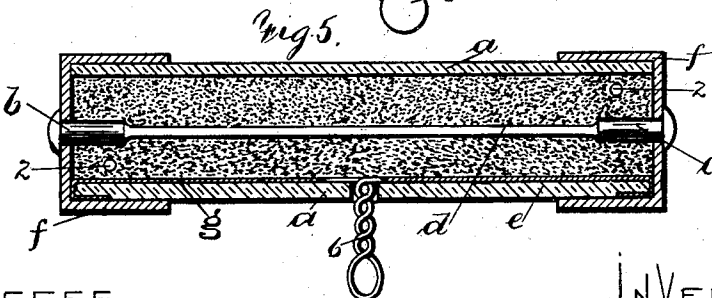
No. 737,281.

PATENTED AUG. 25, 1903.

J. SACHS.
SAFETY FUSE.

APPLICATION FILED MAY 23, 1901.

NO MODEL.



WITNESSES

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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. 737,281, dated August 25, 1903.

Application filed May 23, 1901. Serial No. 61,521. (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 devices shown and described in Letters Patent granted to me November 7, 1899, No. 636,565, and in my application, Serial No. 5,701, filed February 19, 1900, wherein in fuses of the character described an indicator-wire shunting the main fuse is either wholly on the surface of the fuse-case or partly without and partly within the same. In all cases it is not desirable to have any portion of the indicator-wire on the surface of the case; and the object of my present invention is to meet this contingency. In my present invention the indicator-wire is run between the fuse-terminals within the insulating-case and preferably, though not necessarily, against the inner surface thereof, and I provide means whereby the blowing of the fuse within the case is made visible externally of the case. This may be accomplished when the indicator-wire is run along the inner surface of the case by providing an opening or hole in the case and in the path of the indicator-wire, which hole may or may not be filled with a material adapted to change its color or character or be ignited when the fuse is blown, in which latter case the hole is preferably covered with a label. When the indicator-wire is not run against the inner surface of the case, a fuse-string may be attached to the wire and extend through the case, or a portion of the indicator-wire itself may be twisted together and be passed through the case, as a visible indication of the blowing of the fuse. A slight pull on this external cord or wire end will indicate whether the indicator is intact or blown. This cord or wire when the fuse is blown will probably fall away by its own weight and in this manner give a visual indication of the condition of the fuse. The terminals and case may be of any desired form and of suitable materials, the fuse itself of suitable material, and the case may or may not be filled with a finely-divided or other material.

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

In carrying out my invention I prefer to employ a tubular case *a* of insulating material.

b c are the terminals of the fuse-strip *d*, which latter is made of any metal adapted to be fused or blown by an excess current.

The tubular case *a* may be and preferably is filled with a non-conducting material—such, for instance, as asbestos, powdered soapstone, &c.—in order that the fuse *d* may be blown and the molten metal of the blown fuse be dissipated in the filling within the case without injurious effects therefrom. Various arrangements for accomplishing this purpose are described in the prior patents issued to me.

The metal end caps *f* are electrically connected to the fuse-terminals *b c*. As shown in the drawings, the terminals *b c* may pass through and be connected to these end caps *f*, the caps being held to the case *a* by pins 2, or the connections may be made in other ways, the essential feature being that of having the terminals *b c* and the end caps *f* electrically connected to one another.

g represents the indicator-wire, which is of very small section and of a suitable material and necessarily of much higher resistance than the fuse-strip *d* to be adapted to blow simultaneously with or after said fuse. The indicator-wire *g* is electrically connected with the terminals *b c* and preferably is run along the inner surface of the fuse-case *a*, as shown in Figs. 1, 2, 3, and 5. In this construction therein represented I provide a hole or opening 3 in the insulating-case *a*, the indicator-wire being placed in a position to cross the opening 3, or, in other words, the said opening is in the path of the indicator-wire. This opening 3 I prefer to fill with a material to come in contact with the indicator-wire and also be visible on the surface of the case *a*, which material is adapted to change its color or its character or to be ignited upon the blowing of the fuse, thus providing a visual indication as to the condition of the fuse. In this

latter instance or when the material filling the hole 3 is adapted to ignite when the fuse is blown I preferably employ a paster, label, or transparent closure 7 over said hole and material, as shown in Figs. 2 and 3.

Referring to Fig. 3, I may make the hole 3 in the case somewhat larger and dispense with any of the aforesaid materials, the indicator-wire passing directly beneath the hole, which is made large enough for the wire to be plainly visible, and hence easily seen when the fuse is blown. When the indicator-wire blows, the margin of this hole will probably be burned, and this will also indicate the disruption of the fuse.

Referring to Fig. 4, instead of running the indicator-wire *g* along the inner surface of the casing *a* it may be electrically connected to the terminals of the fuse-strip and run in any position between the said fuse-strip and the casing *a*. In this instance a wire or string 4 is secured to the indicator-wire and passed through the casing, there being a tag 5 or equivalent indicating device secured to the end of the wire 4. It is evident that so long as the fuse remains intact the wire 4 cannot be readily pulled from the casing; but as soon as the fuse is blown the wire 4 will probably fall away easily. In this instance the indicator-wire may be fastened to the fuse-terminals in any desired manner; but I prefer, as shown in the drawings, to fasten one end of the indicator-wire to the inner surface of one terminal by a drop of solder and to pass the other end of the indicator-wire through an aperture in the other terminal and to fasten the same in position by a drop of solder.

In Fig. 5 I have shown a modification of the construction shown in Fig. 4, wherein the indicator-wire is run along the inner surface of the casing and a portion 6 thereof is twisted into a cord and passed through the casing. This portion 6 will probably be burned away when the fuse is blown.

I claim as my invention—

1. The combination in a safety-fuse with a one-compartment case, a non-conducting filling, a fusible strip, terminals therefor and end caps electrically connected to said terminals, of an indicator-wire of greater resistance than the fusible strip within the said case and electrically connected to said terminals; and means in direct relation with the said indicator-wire for visually indicating the blowing of the fuse, substantially as set forth.

2. In a safety-fuse the combination with a casing of insulating material having a perforation therein, of terminals for said casing, a main fuse centrally located within the said casing, an indicator-wire within the said casing and adjacent to the said perforation, and a finely-ground filling material within the said casing and between the said main fuse and the said indicator-wire, substantially as set forth.

3. The combination in a safety-fuse with a one-compartment case, a non-conducting filling, a fusible strip, terminals therefor, and end caps electrically connected to said terminals, of an indicator-wire running along the inner surface of the said case and electrically connected to said terminals, and means in direct relation with said indicator-wire for externally indicating the blowing of the fuse, substantially as set forth.

4. In a safety-fuse the combination with a casing of insulating material having a perforation therein, of terminals for said casing, a main fuse, an indicator-wire, and a filling of insulating material within the said casing and completely surrounding the said main fuse and partially surrounding the said indicator-wire, substantially as specified.

5. The combination in a safety-fuse with a one-compartment case of insulating material having a hole therein, a non-conducting filling, a fusible strip and terminals therefor, of an indicator-wire within the said case and electrically connected to said terminals, and a material coacting with said indicator-wire and located in the hole of said case for externally indicating the blowing of the fuse, substantially as specified.

6. In a safety-fuse for electric circuits, the combination with a fusible strip of metals, terminals therefor and end caps to which said terminals are electrically connected, of a tubular case of insulating material and of one compartment having a hole therein, a non-conducting filling within said case, an indicator-wire electrically connected to said terminals and running along the inner surface of said case adjacent to said hole, and a material in said hole and in contact with said indicator-wire, the said material being susceptible of undergoing a change upon the blowing of the fuse to externally indicate the condition of said fuse, substantially as set forth.

Signed by me this 14th day of May, 1901.
JOSEPH SACHS.

Witnesses:

DANIEL W. BENJAMIN,
JAS. C. HOWELL.