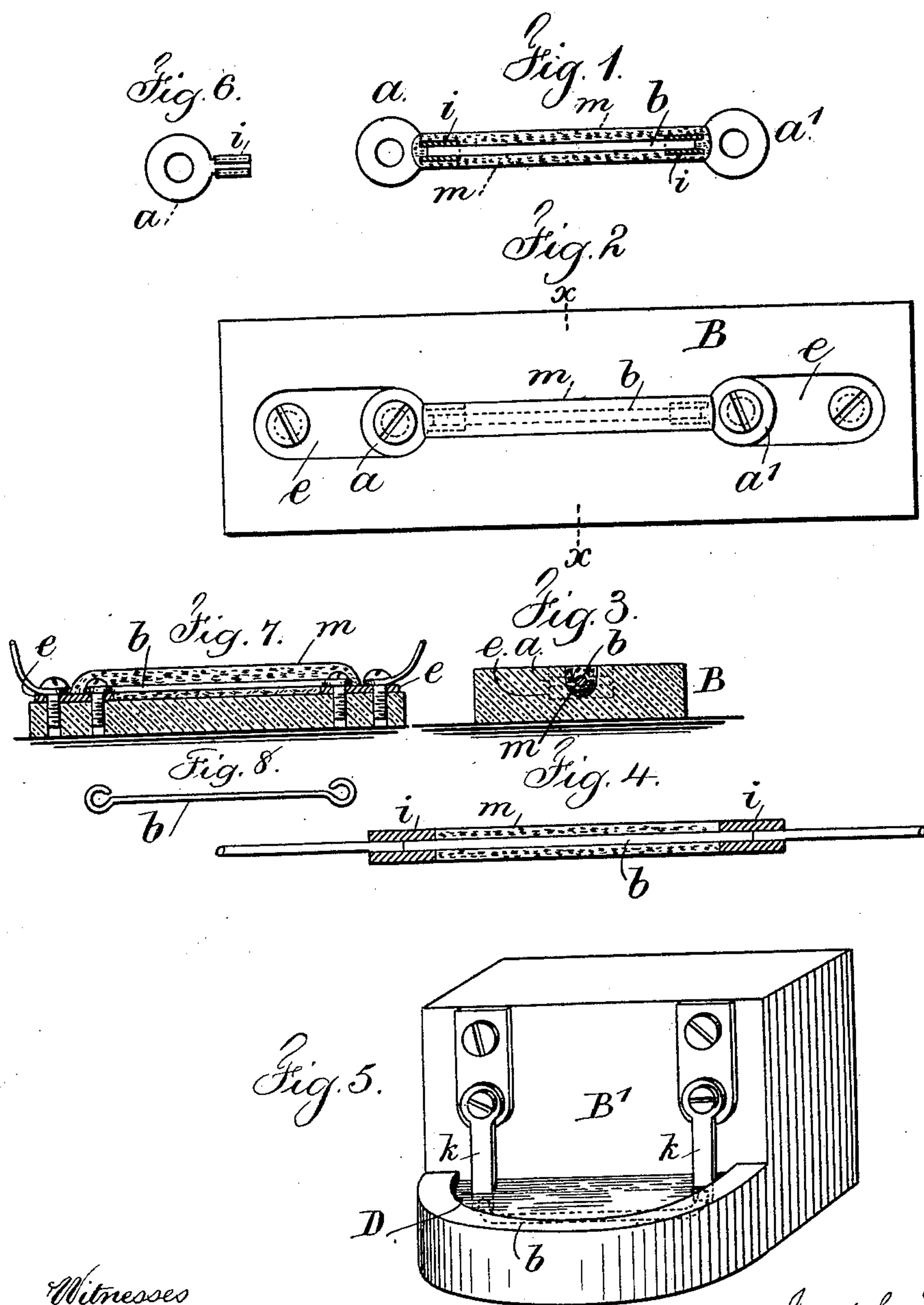


(No Model.)

J. SACHS.  
ELECTRIC SAFETY FUSE.

No. 522,232.

Patented July 3, 1894.



Witnesses  
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# UNITED STATES PATENT OFFICE.

JOSEPH SACHS, OF NEW YORK, N. Y.

## ELECTRIC SAFETY-FUSE.

SPECIFICATION forming part of Letters Patent No. 522,232, dated July 3, 1894.

Application filed April 10, 1893. Serial No. 469,670. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH SACHS, a citizen of the United States, residing in the city and State of New York, have invented an Improvement in Electric Safety-Fuses, of which the following is a specification.

The present invention is for the purpose of preventing the dangerous flash in burning the fuse when the same becomes heated by an excess of current. Previously in protecting an electric circuit, lamps or instruments by a fusible wire, which generally consists of lead or an alloy of lead and tin or similar metal, the fuse was so gaged as to burn out or melt and break the circuit as soon as the maximum of its carrying capacity was exceeded and the metal often was volatilized and to so great an extent as to cause injury to surrounding substances. Although this difficulty has been more or less diminished by previous apparatus and methods, it has never been entirely done away with. By my improvement herein described such flashing or flaring of the safety fuse is entirely stopped.

My invention consists in covering the fusible metal or fuse with a non-inflammable material that is a poor conductor, such as silicic acid, whereby the flash is prevented and the metal converted into a non-conductor.

In the drawings, Figures 1 and 2 represent my improved safety fuse. Fig. 3 shows the supporting block and fuse in section at the line  $x x$  of Fig. 2. Fig. 4 shows the fuse incased. Fig. 5 is a perspective view of a receptacle for a liquid material and the safety fuse therein. Fig. 6 represents one of the fuse ends separately. Fig. 7 is a section of the supporting block with the fuse made with eyes for the attaching screws, and Fig. 8 shows the fuse of Fig. 7 separately.

The fuse wire  $b$  is preferably made with copper ends  $a a'$  by which it is connected in the electric circuit, and this fuse may be provided with terminals  $e e$  and placed within recesses in the block  $B$  of porcelain or other insulating material. The safety fuse wire is sometimes received at its ends into tubular clips or sockets  $i$ , or it may be wound at its ends around the binding screws, as illustrated in Fig. 7. The sockets  $i$  may be part

of the ends  $a a'$ , as shown in Figs. 1, 2, and 3, or they may be separate pieces, as shown in Fig. 4.

I surround the fuse wire with non-conducting material such as silicic acid; this acid is represented at  $m$ . The acid may be spread on the entire surface or introduced around the wire in the recess of the block, or it may be applied around the wire between the tubular sockets  $i$ , as shown in Fig. 4 or around both the wire and sockets, as shown in Figs. 1 and 2 and retained in position in any convenient manner.

The fusible wire preferably of lead combines with the silicic acid under the action of heat developed by an excess of current and forms a silicate of lead which is a non-conductor and therefore the circuit is broken or opened as effectually as if the fuse were melted or burned away, and all risks from a flash or sparks are prevented.

In Fig. 5, I have represented a cavity  $D$  in the insulating block  $B'$  and the fusible wire as passing across this cavity from the conductors  $k$ , and this cavity is adapted to hold the non-conducting and fire-proof material so that when an excess of current passes through the fusible strip the sparks or flash may be extinguished and the metal of the strip combines more or less with the surrounding material.

I do not limit myself to silicic acid alone as any suitable material or compound may be used that will combine with the metal and form an insulating material.

I am aware that a safety fuse has been loosely introduced into a tube, to insure the ejection of one or both electrodes when the safety fuse gives way. In my improvement the non-conductor of fire-proof material that surrounds the safety fuse being in a holder that is in the form of a recessed block, tube or cavity, the parts are retained in position both before and after the safety fuse gives way.

I claim as my invention—

1. The electric safety fuse, composed of a wire or strip to be melted by an excess of current, in combination with a material surrounding such wire, such as silicic acid, that will

combine with the metal and form a non-conductor, substantially as set forth.

2. The combination with a fuse wire and the terminals therefor, of a block of insulating material to which the parts are connected  
5 and a recess in such block, and a chemical substance such as silicic acid in such recess around the wire to combine with such wire

under an excess of current and form a non-conductor substantially as specified. 10

Signed by me this 31st day of March, 1893.

JOSEPH SACHS.

Witnesses:

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