

H. J. SMITH.  
Electric-Fuse.

No. 225,173.

Patented Mar. 2, 1880.

Fig. 1.

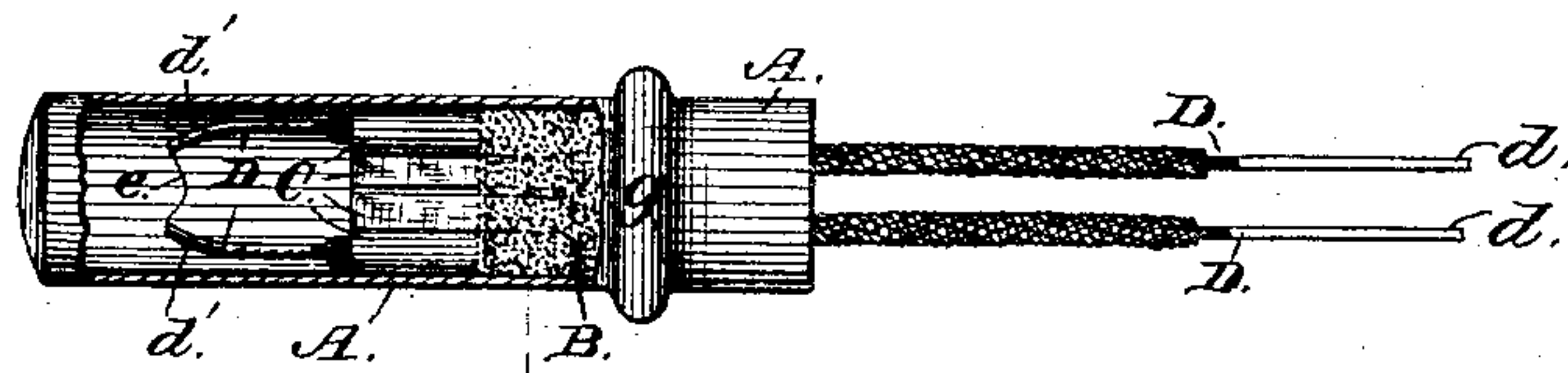


Fig. 2.

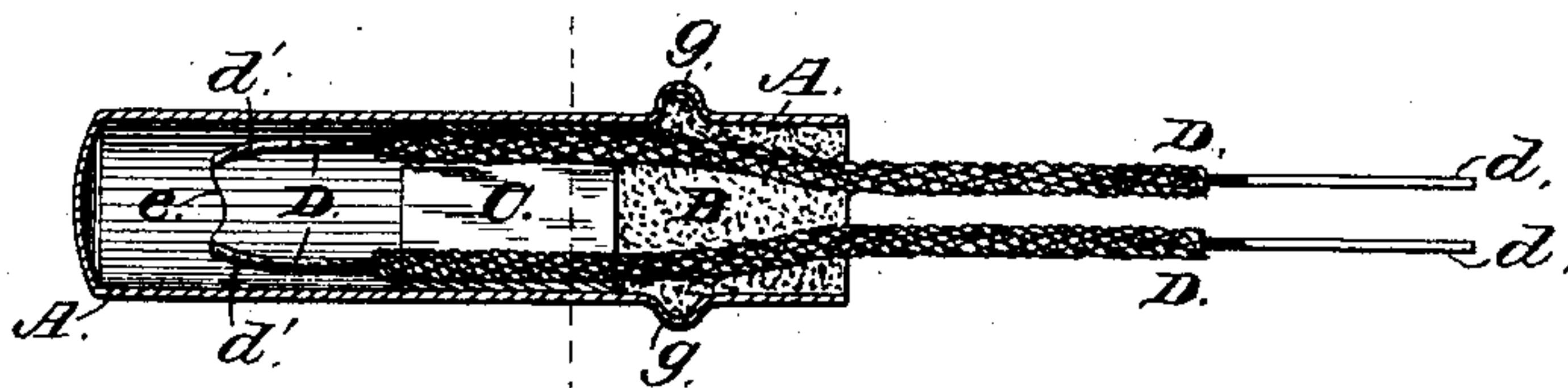


Fig. 3.

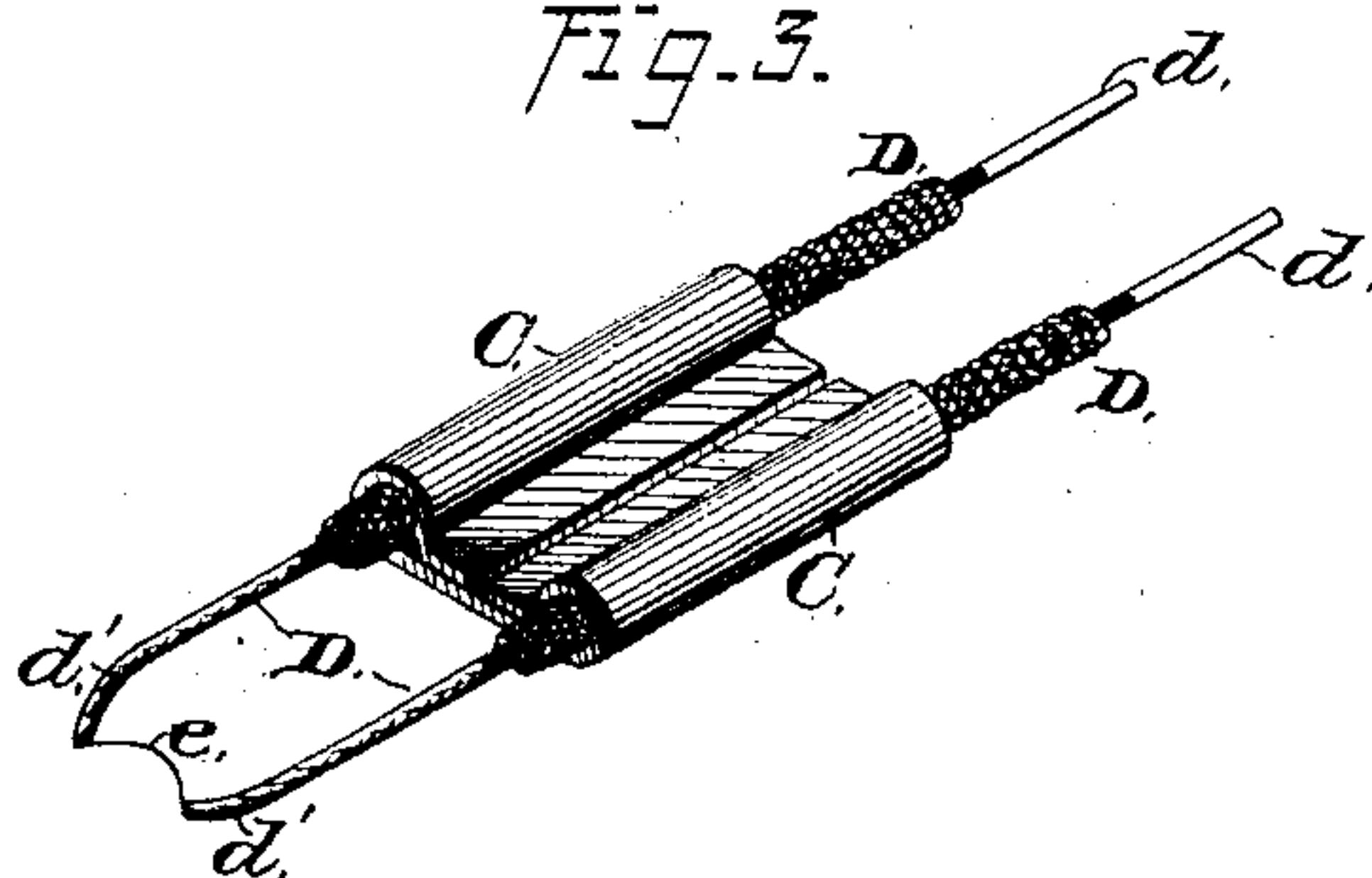
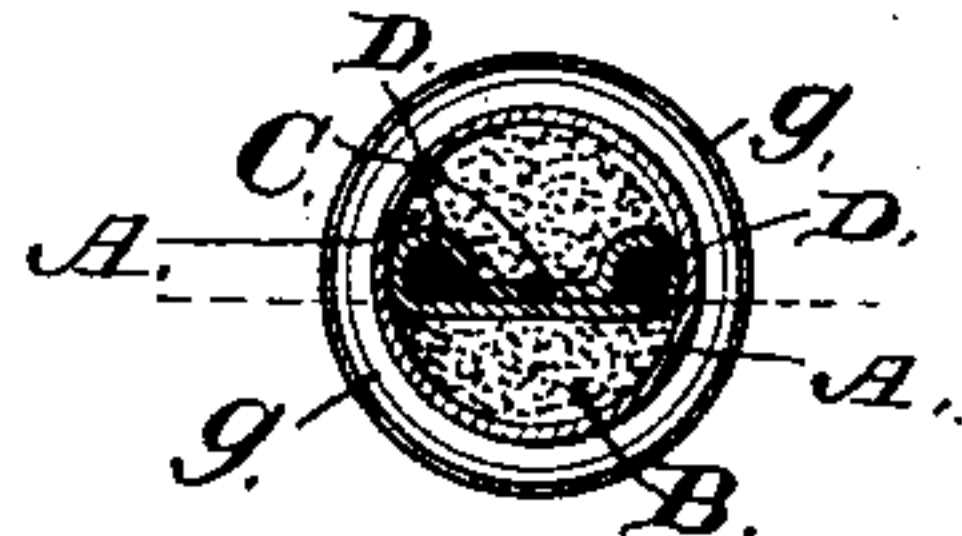


Fig. 4.



WITNESSES-

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INVENTOR-

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# UNITED STATES PATENT OFFICE.

H. JULIUS SMITH, OF MOUNTAIN VIEW, NEW JERSEY.

## ELECTRIC FUSE.

SPECIFICATION forming part of Letters Patent No. 225,173, dated March 2, 1880.

Application filed January 13, 1880.

*To all whom it may concern:*

Be it known that I, H. JULIUS SMITH, a citizen of the United States, residing at Mountain View, in the county of Passaic, State of New Jersey, have invented new and useful Improvements in Electric Fuses, of which the following is a specification.

This invention relates to improvements in portable electric fuses adapted for connection with an electric circuit and for use in igniting explosive materials from a station at safe distance.

The object of my invention is to maintain in proper position and at a suitable distance apart the tips of the fuse-wires which are inserted in the fuse-case while the fine platinum igniting-wire is being soldered to said tips and after they have been inclosed in the fuse. This is accomplished by means of a clamp formed of a small plate of sheet metal having its edges folded over to closely embrace the insulated wires near their exposed tips, which project beyond the end of the clamp or plate. After the wires are thus secured their tips are connected by a fine platinum wire, and the clamp is then inserted in the fuse-case a proper distance to embed the wire tips and the connecting igniting-wire properly in the explosive material with which the said case has been previously charged. When the clamp has been thus properly located in the open end of the fuse-case it is secured by filling said end of the case with a quick-setting cement, preferably sulphur melted by steam heat. When the cement has set, the clamp prevents the wires from turning or becoming loose therein, as they would otherwise be liable to do in handling.

In the accompanying drawings, Figure 1 is a side view of a fuse constructed according to my invention, the wall of the case being cut away to show the interior. Fig. 2 is a longitudinal section of the same. Fig. 3 is a perspective view of the clamp detached from the case and embracing the wires, and Fig. 4 is a cross-section of the fuse through the head or packing.

The letter A indicates a small tube or cylindrical casing, of metal or other suitable material, having a portion of its wall cut away for the purpose of exposing its interior to view;

and B is a packing, of sulphur or other insulating material, filling a portion of the casing, and surrounding and maintaining in a central position the metallic clamp C, which embraces the conducting-wires D D, the terminals *d d* of which outside the casing are coated with a non-corrodible metal, preferably tin, and the tips *d' d'* of said wires inside the case are connected by a very fine platinum wire, *e*, soldered to each. The coating of non-corrodible metal on the terminals *d d* is for the purpose of insuring a perfect electrical contact between the said terminals and the main conducting-wire, or with the terminals of other fuses when two or more are joined together.

The cylindrical casing A is closed at its outer end, and has around its inner portion a bead, *g*, which forms a groove around the inner surface of the case, serving to hold the packing in place.

The clamp C consists of a plate of thin sheet metal, preferably tin, bent over at its longitudinal edges to embrace the wires D, which are surrounded with an insulating coating. The plate of tin is of such width that when folded or bent over the wires the clamp will fit snugly in the diameter of the casing, and the terminals or tips of the wires which are to stand within the case are bared of the insulating material and left projecting such a distance that they may stand about one-third of its length from the head of the casing when the clamp C is inserted, as shown in Figs. 1 and 2.

A wooden clamp cannot be practically employed for connecting insulating-wires in the art to which my invention applies, because in soldering the platinum wires to the insulated wires a flux must be employed, which must be removed by washing after the process of soldering is finished. Consequently the wood becomes impregnated with water, which it is almost impossible to remove, and, by swelling, ruptures and often destroys the platinum wires, and renders them utterly useless.

After the clamp is inserted a molten packing material or cement, preferably sulphur, is poured in on each side to hold it in place.

The fuse-wires are copper, and insulated by a covering of cotton or other cheap fibrous or textile material, which may be coated with a



suitable resinous substance, to increase its insulating properties and render the covering water-proof. When the fuse is charged as described, and a current of electricity passed  
5 through the conducting-wires, the fine platinum wire offers a great resistance to said current, and becomes so highly heated as to ignite the charge.

The fuse-wires, after being fixed in the clamp,  
10 may be inserted and secured in a case of any size or shape by means of a proper packing, and said clamp may be inserted any desired distance in the case.

Having thus described my invention, what  
15 I claim is—

1. The combination, in an electric fuse, of the separate insulated wires having tin terminals connected at their tips by the platinum or resistance wire, and the sheet-metal clamp  
20 folded over the fuse-wires and permanently connected therewith, for holding them rigidly

at a fixed distance apart during the interval of soldering, washing, and drying, preparatory to introducing all into its casing.

2. The combination, in an electric fuse, of 25 the cylindrical casing for holding an explosive charge, the insulated fuse-wires having tinned terminals and their tips connected by a platinum or resistance wire, the sheet-metal clamp embracing said wires and permanently con- 30 nected therewith, and the packing for binding the wires with their clamp in position within the case, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set 35 my hand in the presence of two subscribing witnesses.

H. JULIUS SMITH.

Witnesses:

F. LAFLIN KELLOGG,  
S. T. APOLLONIO.