

H. J. SMITH.

Electric Fuse.

No. 112,859.

Patented March 21, 1871.

Fig. 1

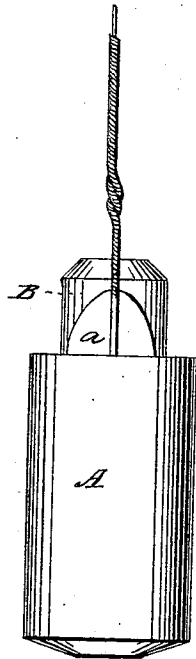


Fig. 2

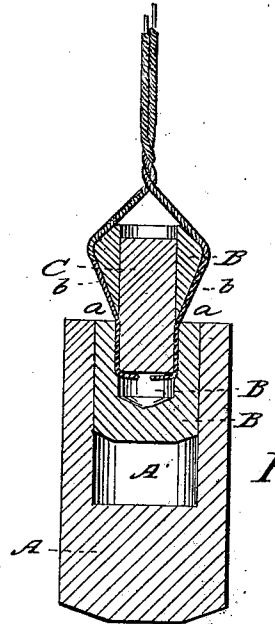
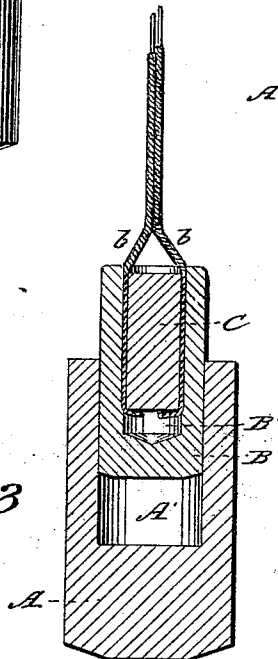


Fig. 3



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HENRY JULIUS SMITH, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN ELECTRIC FUSES.

Specification forming part of Letters Patent No. **112,859**, dated March 21, 1871; antedated March 7, 1871.

I, HENRY JULIUS SMITH, of Boston, in the State of Massachusetts, have invented an Improvement in Electric Fuse, of which the following is a specification:

The invention consists in the peculiar construction of the fuse-head, whereby it is provided with two separate chambers or magazines.

It also consists in the employment of novel devices and means for securing the wires within the fuse-head, whereby the fuse-head itself is made to serve as a shield to prevent communication between those portions of the fuse-wires which are just outside of the head.

On account of its high cost, it is desirable to use as little of the priming employed in fuses as possible—that is, enough of it to make the ignition of the fuse certain, but not enough of it to give as much flame as is desirable for igniting the blast. To increase the amount of flame the fuse is charged with an inferior powder.

When fuses are to be used near the place of manufacture, the priming may be placed in the same chamber with the inferior explosive material of the fuse; but when the fuses are transported any considerable distance, or are handled to any considerable extent, the lump of priming is apt to be ground into dust, and by being diffused through the rest of the charge its extraordinary capability of ignition is lost. By this invention the whole power of the priming is preserved.

In the drawing, Figure 1 is an exterior view of my fuse. Fig. 2 is a sectional view taken at right angles to Fig. 1. Fig. 3 is a sectional view of a modification of my invention.

The figures are enlarged to three times the actual size of the parts represented.

The shell of the fuse is of wood, and consists of two cups; but it differs from other fuses made of two cups in having both cups in an upright position, the bottom of the smaller cup (marked B in the drawing) fitting into the larger cup A, as shown in Fig. 2.

The smaller cup is bored out, so as to leave a thin bottom, as shown. Two nicks are then cut upon opposite sides, about half-way from the bottom to the top of the cup, deep enough to make small holes at the bottom of each nick opening into the cup.

A minute lump of priming having been

placed in the bottom of the cup, the extremities of the two wires *b b* of the fuse-cord are stripped of their insulating-covering, and after having their ends bent into hooks, as shown in Fig. 2, are pushed through the holes at the bottom of the nicks.

A wooden plug, whose diameter is equal to that of the bore of the cup, is then driven into the cup far enough to leave a chamber, B', Fig. 2, only large enough to hold the priming, as shown.

The plug catches the two hooks and holds them in place near the bottom of the cup, at the same time keeping them far enough apart to break the circuit for igniting the priming at the proper time. The plug fits the cup so closely that the wires are well secured within it. The smaller cup, with the wires thus attached, is then driven into the larger cup, bottom downward, leaving a chamber, A', as shown in Fig. 2, containing the powder or explosive compound, which has previously been placed in the larger cup.

The operation of the fuse is as follows: The spark, passing from one wire to the other in the smaller chamber, passes through and ignites the priming. The priming, exploding, blows out the bottom of the small chamber, and ignites the powder in the large chamber. A second explosion follows, which ignites the charge of the blast.

It will be observed that the small cup, with its wires and priming, as above described, is in itself a fuse; and it is obvious that a fuse consisting of one cup, with its wires entering through nicks and secured by a plug pushed in from the mouth, as above described, will be of practical use in blasting, when the chamber at the bottom is left sufficiently large to hold the requisite charge.

The advantage gained by constructing a fuse with two separate chambers may also be gained when the insulated wires of the cord pass in at the mouth of the smaller cup, as shown in Fig. 3. In this case the ends of the wires are stripped of their coverings and bent into hooks, and are kept apart and secured to the fuse-head by a long wooden plug, C, as shown.

I am not aware that the fuse-wires have ever before been secured to the fuse-head by a plug driven into the mouth of the fuse, the plug at

the same time serving to insulate the wires and close up the magazine; but the best way to unite the wires with the fuse-head is to make use of the holes at the bottom of the nicks, cut as above described; and the nicks may be cut with equal advantage, whether the smaller cup is driven into the larger bottom downward, or whether it is inverted before being driving into the larger cup, or whether a cylinder is used in the place of the smaller cup, or whether the fuse-head consists of one cup. When the small cup is inverted, the stripped ends of the wires are pushed through the holes at the bottom of the nicks into the cup. A plug is then driven between the wires to the bottom of the cup, and the wires are bent over the end of the plug, so as to come within a short distance of each other.

The advantage of having the fuse-head serve as a shield between the wires outside of the fuse-head may be obtained by inserting the wires through small holes made by boring directly through the sides of the fuse-head into the chamber without cutting; but there is a liability to split the wood, which is avoided by the use of the nick.

I am aware that I am not the first to make a fuse consisting of two chambers, and I wish to limit my invention in this respect to my

two shells, one being a fuse in itself, as herein described, and fitting closely within the other, as specified.

I claim—

1. A fuse constructed with two chambers, when the shell forming one of the chambers, with its wires and charge, forms an independent fuse, as described, and fits closely within the shell containing the common powder, as specified.

2. Attaching the wires by passing them through the sides of the fuse-head, substantially as described.

3. A nick or nicks cut into the side of the fuse, substantially as described, for the purpose described.

4. Securing the fuse-wires to the fuse-head by a plug driven into the mouth of the fuse, when the plug insulates the wires and closes the magazine, substantially as shown in Fig. 3.

5. A fuse consisting of one cup, with its wires entering through the sides, and secured by a plug pushed in from the mouth, substantially as described.

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