(No Model.)

H. J. SMITH.

ELECTRIC DETONATOR OR PRIMER.

No. 436,023. Patented Sept. 9, 1890.

Fig. 1.

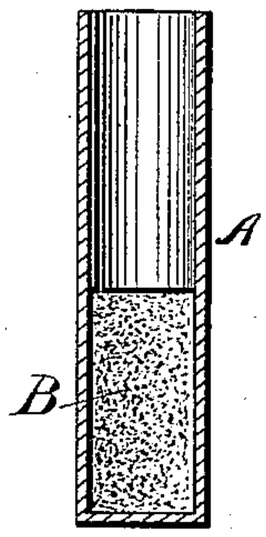


Fig. 2.

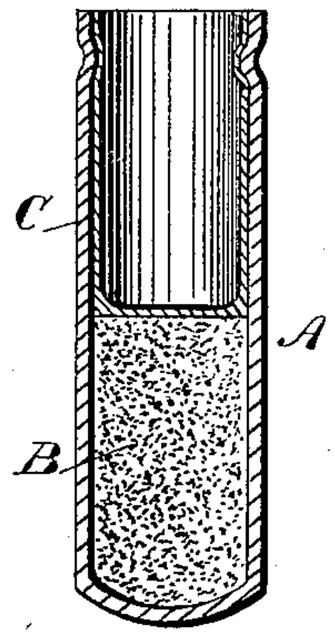


Fig. 3.

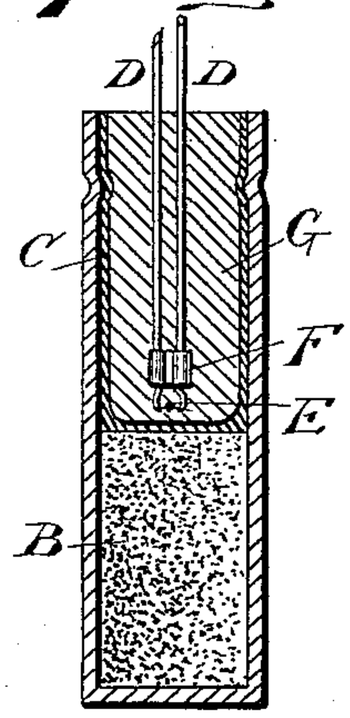
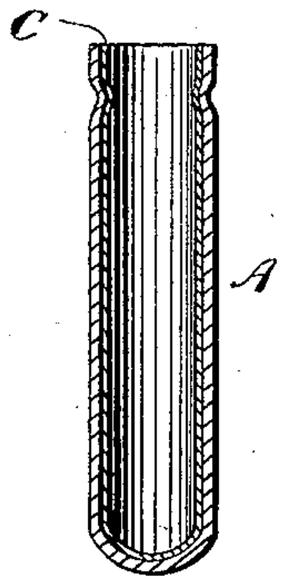


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

HENRY JULIUS SMITH, OF POMPTON, NEW JERSEY.

ELECTRIC DETONATOR OR PRIMER.

SPECIFICATION forming part of Letters Patent No. 436,023, dated September 9, 1890.

Application filed December 14, 1889. Serial No. 333,731. (No model.)

To all whom it may concern:

Be it known that I, HENRY JULIUS SMITH, residing at Pompton, in the State of New Jersey, have invented certain new and useful Improvements in Electric Detonators or Primers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to electric primers or detonators for firing mines, blasts, torpedoes, and the like.

The object of the invention is to seal the charge in the primer or detonator in the metallic or other water-proof casing so that the detonator will be actually water-proof under all circumstances.

Heretofore in applying the wires to a detonator the filling has usually been of melted sulphur poured round the wires to retain them in place. When this cooled, the wires were held firmly, but there was apt to be a difference in the contraction and expansion of materials. When such detonators were placed in submarine mines or other places where they are exposed to water for some time, or under pressure, moisture would creep in between the filling and metallic case, and so injure or destroy the primer.

Figure 1 indicates a central longitudinal section of a case with detonating charge before the application of wires and varnish. Fig. 2 is the same with an interior coating of varnish extending over the detonating-charge. Fig. 3 is a similar view with wires and packing in place. Fig. 4 is a central section of casing with varnish coating.

A denotes the shell, of metal or other water-proof material, such as glass or hard rubber. The shell is usually a short hollow cylinder closed at one end; but may be of other form. These shells are largely manufactured (or imported into this country) with a charge B of fulminate or other detonating material contained therein, as in Fig. 1. When electric wires and their support are applied to the detonator, Fig. 1, there is usually a shrinkage between the shell and filling. I take the shells, Fig. 1, and line them with an elastic varnish or gum, such as a compound of rosin and linseed-oil, or asphalt varnish, or what is known as "rubber paint." This coating may be applied with a brush, and is indicated at C in Figs. 2 and 3.

The electric primers D D are usually insulated, and held together near their ends, as by a clip F. A priming E surrounds the bridge connecting the wires. When the wires so connected are inserted into the end of the shell, a quantity of melted sulphur, rosin, or the like is poured in and hardens about the wires, forming a support and seal to the mouth of the primer. The elastic varnish C will adhere both to the shell and filling, and being somewhat plastic at ordinary temperatures, as well as elastic, will seal the detonator against the entrance of water.

Where the solid material G is first applied to the wires, this material may be coated with the elastic varnish, as by dipping, and then inserted in the shell.

In some instances the elastic varnish C may coat the entire interior surface of the shell or casing, thus surrounding the detonating-charge B, as well as the filling G. (See Fig. 4.) When the priming E is ignited by the electric current passing through the wires and bridge, the varnish coating in proximity thereto is broken and the detonating-charge B is fired.

What I claim is—

1. An electric primer or detonator having a metallic or similar water-proof casing, electric wires and a filling of hard material surrounding said wires, and an elastic adhesive varnish interposed between the case and hard filling.

2. The combination, with a metallic casing, of a lining of elastic adhesive varnish, a detonating-charge, and electric wires embedded in a rigid supporting material, the elastic varnish being interposed between the entire filling and the casing, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY JULIUS SMITH.

Witnesses:

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