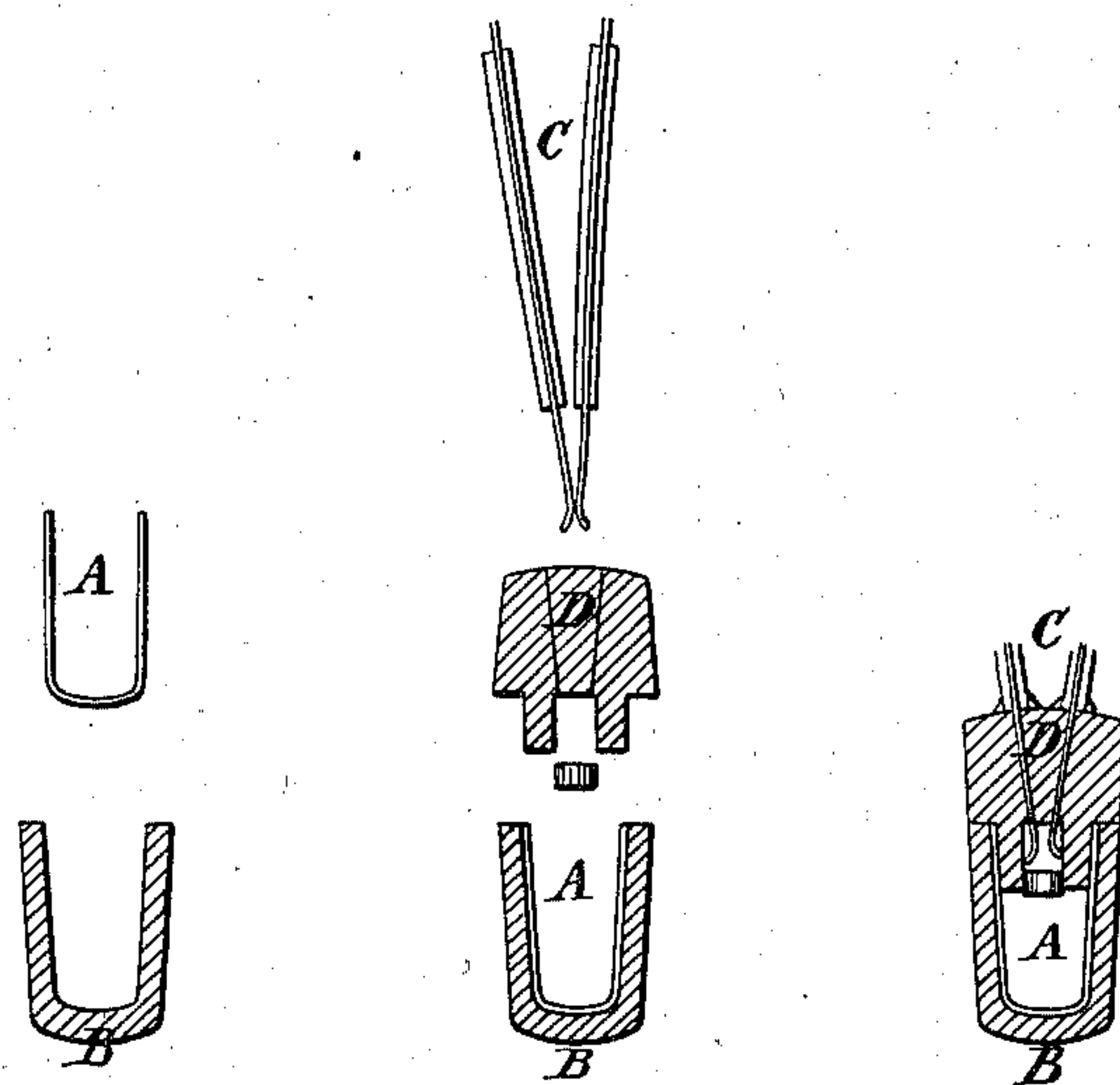


G. M. MOWBRAY.  
Electric-Fuses.

No. 139,686.

Patented June 10, 1873.



Witnesses  
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# UNITED STATES PATENT OFFICE.

GEORGE M. MOWBRAY, OF NORTH ADAMS, MASSACHUSETTS.

## IMPROVEMENT IN ELECTRIC FUSES.

Specification forming part of Letters Patent No. 139,686, dated June 10, 1873; application filed March 19, 1873.

### *To all whom it may concern:*

Be it known that I, GEORGE M. MOWBRAY, of North Adams, in the county of Berkshire and State of Massachusetts, have invented an Improved Electric Fuse-Exploder, of which the following is a specification;

The nature of my invention consists in an improved method of securing the conducting-wires, the priming, and the fulminating-cap used for exploding nitro-glycerine, gun-cotton, dynamite mica blasting-powder, and other explosives whose blasting power is enhanced by the initial explosion of the priming charge, so as to avoid the deteriorating influence arising from either disturbance of their relative parts, or from heat, cold, moisture, or rough handling, and at the same time to so confine the priming that is fired by the electric current, in the presence of the fulminate, as to secure a very heavy explosion by means of a comparatively moderate charge of said fulminate. Although I do not confine my invention to gutta-percha and copper—but it is equally applicable to any plastic material of good insulating properties which hardens by cooling, as this gum does, while a steel, brass, or sheet-iron shell for the shell portion of the device answers in like manner—yet in this specification, for the sake of brevity, I shall confine my description to gutta-percha in describing the insulating material, and to copper for the wires and for the shell. The ductility of this latter and its excellent conducting properties, while the easy manipulation of gutta-percha, its facility for molding into shape, and its property of welding, renders it, with its insulating power, well adapted for this device. Moreover, the power to resist strain is very great both in copper and gutta-percha, which property is valuable in my invention.

Figure 1 shows the copper shell A and the insulating envelope B.

Fig. 2—C, the insulated wires; D, the plug containing the electric fuse-priming composition; A, the copper shell; B, the insulating envelope.

Fig. 3 shows the electrical fuse-cap complete. A, the copper shell, which is charged with about twenty grains of the mercuric fulminate; B, insulating envelope; C, insulated conducting and return wire; D, insulated priming-plug.

The conducting and return wires are drawn to a gage of about No. 22 or No. 24, and

covered with insulation to a gage of No. 14, both English standard gages. The terminals of the wire are stripped of insulation for about half an inch. A plug of gutta-percha is molded so as to have a section, as shown at D, Fig. 2. A mold is prepared consisting of a tapering tube, a pin to carry the copper shell, and a piston to push out the envelope and shell when cold. With this mold an insulation of gutta-percha is formed, enveloping the copper shell, which is then charged with about twenty grains of mercuric fulminate. The plug D, after inserting a few grains of suitable priming between the terminals of the copper wire, is closed with a disk of card-board, and the flanged edge, being moistened with a solution of gutta-percha, is immediately fitted and pressed into the insulated shell A B, Fig. 2, forming when complete Fig. 3.

It will be observed that the insulation of the wires C is welded to the capping-plug D, and this capping-plug is cemented, as previously described by its flange, to the rim of the insulating envelope B surrounding the copper shell A. A tough, impermeable, and insulated coating extends from the insulation of the wires entirely round the priming-chamber and the fulminating-shell, whereby the electric current of the discharging-battery is retained within the priming-chamber. The priming composition is protected from deterioration and held in presence of the mercuric fulminate until the great force necessary to burst the shell and its insulated envelope is discharged into the nitro-glycerine with a sudden violent explosion, so necessary to the full development of the blasting force of this explosive and others of a kindred nature.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The plug D with its priming-chamber and flange, substantially as described.
2. The insulated copper shell A B, substantially as described.
3. The combination of insulated wires C with the molded plug D, substantially as described.
4. The combination of the insulated wires C, the plug D, and the insulated copper shell, substantially as described.

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Witnesses:

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