

(No Model.)

4 Sheets—Sheet 1.

G. STUART.
ELECTRICAL PRIMER.

No. 372,046.

Patented Oct. 25, 1887.

Fig. 1.

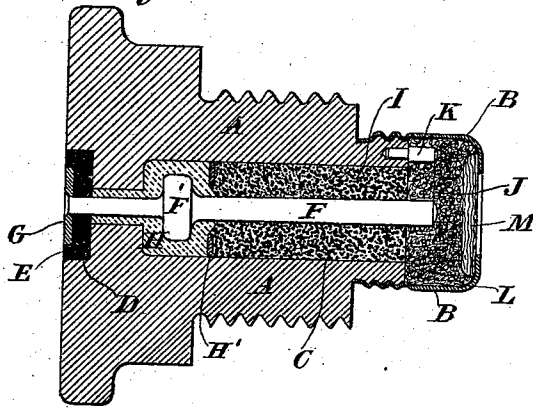


Fig. 2.

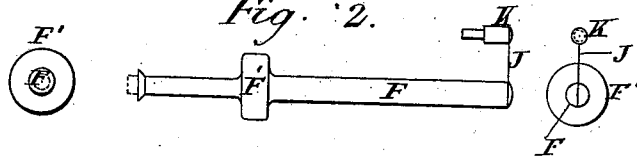


Fig. 3.

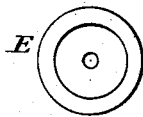


Fig. 4.

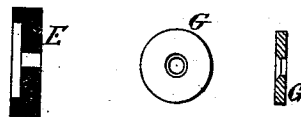


Fig. 5.

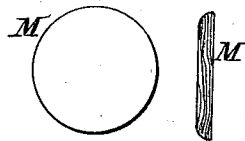
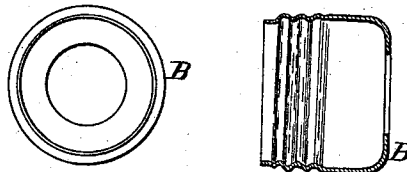


Fig. 6.



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Fig. 7.

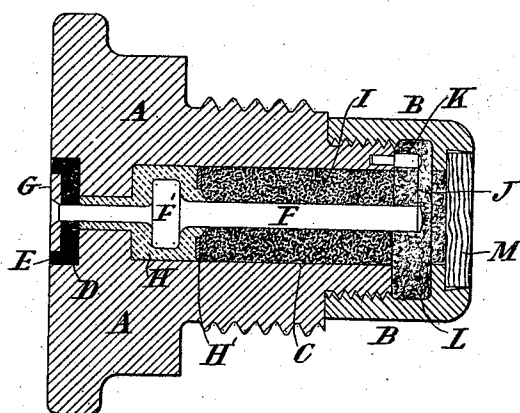
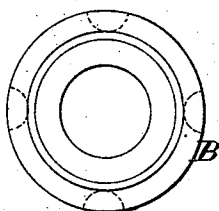
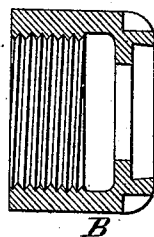
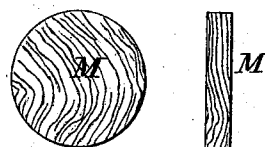


Fig: 8.



Fig^s 9.



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Patented Oct. 25, 1887.

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Fig. 10.

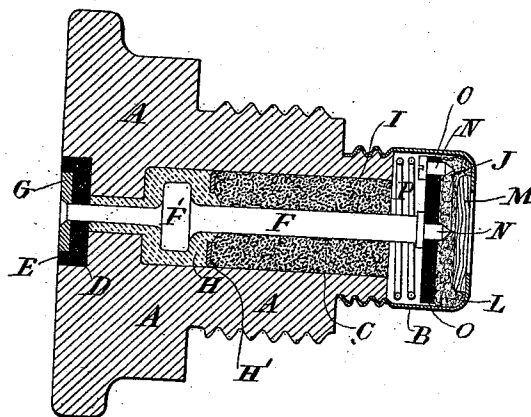


Fig. 11.



Fig. 12.

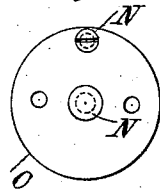
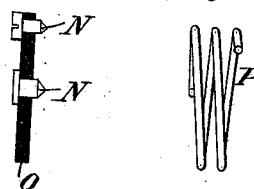


Fig. 13.



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ELECTRICAL PRIMER.

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No. 372,046.

Patented Oct. 25, 1887.

Fig. 14.

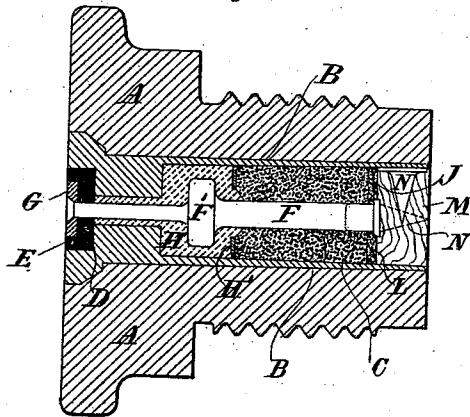
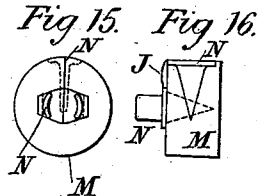
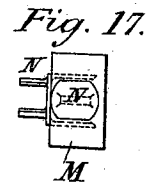
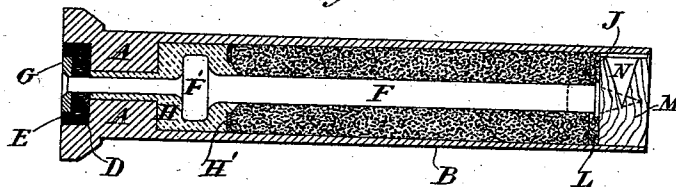


Fig. 18.



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UNITED STATES PATENT OFFICE.

GEORGE STUART, OF ELSWICK WORKS, NEWCASTLE-UPON-TYNE, ENGLAND,
ASSIGNOR TO W. G. ARMSTRONG, MITCHELL & CO., (LIMITED,) OF SAME
PLACE.

ELECTRICAL PRIMER.

SPECIFICATION forming part of Letters Patent No. 372,046, dated October 25, 1887.

Application filed May 31, 1887. Serial No. 239,878. (No model.)

To all whom it may concern:

Be it known that I, GEORGE STUART, a subject of the Queen of Great Britain, residing at the Elswick Works, Newcastle-upon-Tyne, England, engineer, have invented certain new and useful Improvements in Electrical Primers, of which the following is a specification.

This invention has for its object improvements in electrical primers.

The primers are mainly intended for use with axial vented guns, more especially rapid-fire guns. They are of simple construction and possess the great advantage of being easily renewed by being recharged and fitted with a new platinum wire and cap.

The primer is formed of a cylindrical metallic body, by preference screwed on its exterior to screw into the base of a cartridge-case. At its rear end it is formed with an enlarged head, and its front end, which is reduced in diameter, has a screw cut around its exterior for a copper cap to be screwed onto. A main cavity is formed centrally in the body from its front end nearly to its rear end. From the rear end of the cavity is a passage of smaller diameter to the rear end of the body. At the extreme rear end of this passage is also a shallow cavity of larger diameter to receive a disk of ebonite or other non-conducting material. Inside of the main cavity formed in the body are placed disks of asbestos, each having a hole through its center. A metallic spindle is passed centrally into the cavity and through the holes in the asbestos disks, and also made to extend through the small passage at the rear end of the main cavity. The spindle has a collar or flange around it to bear upon the disks of asbestos. More disks of asbestos are then inserted and afterward a metallic ring of gas-check form. The ring and asbestos are then subjected to a greater pressure than that produced in the gun. This forces the asbestos into the small passage at the rear end of the cavity and forms it into a solid insulating-block. The ebonite insulator is then placed onto the rear end of the metallic spindle, the metallic spindle passing through it and also through a metallic disk, which is embedded in its rear end, and, finally, the end of the spindle is riveted over. The front end of the

metallic spindle has soldered to it a platinum wire, which is also soldered to a pin which projects from the front end of the body. The wire is then surrounded with gun-cotton, after which the cavity is filled with gunpowder, and when the copper cap charged with gun-cotton is screwed onto the front of the body the primer is complete and ready for use. On an electrical contact being made by means of an insulated rod passing through the axial vent of a gun, the electricity passes through the central spindle, through the platinum wire, and back again to the battery through the gun, thereby heating the wire and firing the gun-cotton and powder; this blows out a cork disk, which closes an opening formed in the end of the cap, and fires the cartridge. The cap may be of thin metal and a fresh one used each time that the primer is recharged, or it may be of stout metal and not require renewal. In place of the platinum wire being soldered to the front end of the central spindle and to a pin projecting from the front end of the body, it may be soldered to two metallic pins carried by a disk of insulating material within the cap, one pin at the center and the other near the periphery of the disk. When the cap is screwed on, the pin at the center comes into contact with the end of the main central spindle, and the outer pin is connected by a spiral wire spring to the copper cap, so that the electrical connections are completed when the cap is screwed home. In place of using a metallic cap to screw onto the end of the body, the end of the cavity in the body may, as in the service primer, be closed by a cylinder of cork or other non-conducting material, which has driven into it two brass pins, one into the rear end to come against the end of the central spindle and the other into its side to make contact with the body. In this case the bridge of platinum wire is soldered to the heads of the two pins. The exterior of the primer may also be formed to the same pattern as the ordinary service primer.

The drawings hereunto annexed show the modified forms of the fuse above described.

Figure 1 is a longitudinal section of the fuse. Figs. 2, 3, 4, 5, and 6 show separate views of some of the parts of which it is com-

posed. Fig. 7 is a longitudinal section of a modified form of the fuse, in which the front end of the fuse is closed with a cap of solid metal. Fig. 8 shows an end view and longitudinal section of this cap, and Fig. 9 shows a face and edge view of the disk of cork carried by it. Fig. 10 is a longitudinal section of a modified form of the fuse, in which the means adopted for making electrical connections with the ends of the platinum wire are modified. Fig. 11 shows separately the central stem of this fuse. Fig. 12 shows the ebonite disk and platinum wire and metal pins carried by it, and Fig. 13 shows a separate view of the coiled spring. Fig. 14 is a longitudinal section of a modified form of the fuse, in which the front end of the fuse is closed in the way adopted in the ordinary service fuse. Figs. 15, 16, and 17 show end and side views of the cylinder of cork, which in this fuse closes the end of the cavity C. Fig. 18 is a longitudinal section of the same fuse made of the same form or pattern as the ordinary service fuse.

In Figs. 1 to 6, A is the outer metallic body, formed externally to screw into the base of a cartridge-case, and with its front end of reduced diameter and having a screw-thread cut around it for a metal cap, B, to screw onto. C is the central cavity in the body A. D is a passage from the rear end of this cavity to another shallow cavity at the rear end of the body. E is an ebonite disk placed in this latter cavity. F is a metallic spindle passing centrally through the cavity C and the passage D, of smaller diameter, and through the ebonite disk E. G is a metallic disk placed in a recess in the rear face of the ebonite disk E. The spindle F passes through this disk G and is riveted over, as shown. H is the packing of compressed asbestos filling the rear end of the cavity C and the passage D and surrounding the spindle F, some of the packing being in rear of a collar, F', on the spindle and some in front of it. H' is a dished metallic washer placed in front of the asbestos packing. I is fine-grained gunpowder contained in the front end of the cavity C. J is a fine wire of platinum soldered at one end to the front of the spindle F and at the other end to a metallic pin, K, which is inserted into a hole in the front end of the body A. L is gun-cotton surrounding the wire J and inclosed in the cap B. M is a disk of cork which closes the hole in the front end of the cap.

In the fuse shown at Figs. 7, 8, and 9 the construction is practically the same and the parts are marked with the same letters of reference. The only difference is that the cap B is made of thick in place of thin metal.

In the fuse shown at Figs. 10, 11, 12, and 13 the construction is the same, except that the platinum wire, instead of being soldered to the end of the spindle F and to the pin K, is soldered to two metallic pins, N, carried by an ebonite disk, O, the head of one of these pins being in contact with the end of the spindle F

and the other being in contact with a coiled spring, P, which at one end is attached to the cap B. The disk O has two small holes through it, by which the flash from the gun-cotton surrounding the wire J may pass to the gunpowder I.

In the fuse shown at Figs. 14, 15, 16, and 17 the end of the cavity C is closed by a cylinder, B, of cork, which has inserted into it two metallic pins, N, to which the wire J is soldered. The head of one of the pins comes in contact with the body A, and the head of the other with the end of the spindle F.

Fig. 18 shows a longitudinal section of the same fuse, but outwardly made of the same form as the ordinary service fuse.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. The combination, in an electrical primer, of the body having a main cavity extending from its front nearly to its rear end and a passage of smaller diameter extending rearwardly from the main cavity, an insulated rod passing centrally through the passage and cavity, and having upon it, near the rear end of the main cavity, a collar of larger diameter than the said passage, and a packing of compressed asbestos around the collar, substantially as and for the purpose set forth.

2. In an electrical primer, the combination of the body having a longitudinal main cavity extending from the front nearly to the rear end and a passage of smaller diameter than the cavity extending rearwardly therefrom, an insulated rod passing through the passage and cavity, and having upon it, near the rear end of the cavity, a collar of larger diameter than the passage, a packing of compressed asbestos around the collar, a fine platinum wire passing from the front end of the insulated rod to the front end of the body, and explosive material around the wire, substantially as and for the purpose set forth.

3. In an electrical primer, the combination of the body having a longitudinal main cavity extending from the front nearly to the rear and a passage of smaller diameter than the cavity extending rearwardly therefrom, an insulated rod passing through the passage and cavity, and having upon it, near the rear end of the cavity, a collar of larger diameter than the passage, the compressed packing around the collar, a fine platinum wire passing from the front end of the insulated rod to the front end of the body, explosive material around the wire, and a screw-cap screwing onto and closing the front end of the body, and having in its end a central hole closed with a disk of cork or like material, substantially as and for the purpose set forth.

4. In an electrical primer, the combination of the body having a longitudinal main cavity extending from the front nearly to the rear end and a passage of smaller diameter extending to the rear end from the main cavity, an in-

5 insulated metallic rod passing through the pas-
sage and cavity, and having upon it, near the
rear end of the cavity, a collar of larger di-
ameter than the passage, the compressed pack-
ing around the collar, a non-conducting disk,
O, carrying two metallic pins, N, to which a
fine platinum wire is coupled, one of which
pins is held against the front end of the insu-
lated metallic rod and the other against a
10 coiled spring which bears against the front end

of the body, and a screw-cap screwing onto
and closing the front end of the body, and hav-
ing in its end a central hole closed with a disk
of cork or like material, substantially as and
for the purpose set forth.

G. STUART.

Witnesses:

WM. JOHN GREY,
Notary Public.

T. PURVIS.