(No Model.)

O. E. MICHAELIS.

OBTURATING PRIMER.

No. 333,655. Patented Jan. 5, 1886.

Fig. 1.

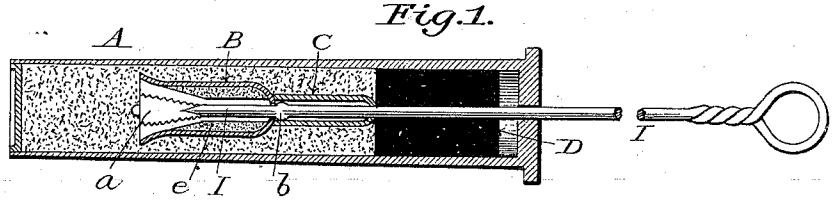


Fig. 2.

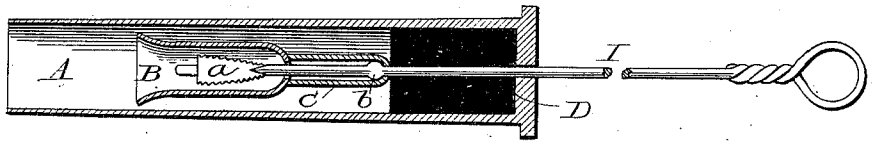


Fig. 3.

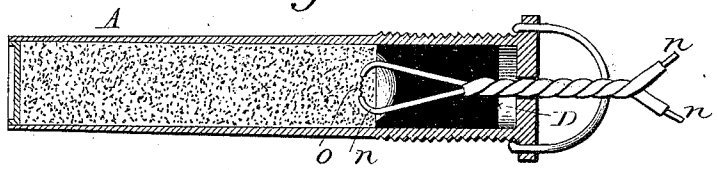


Fig. 4.

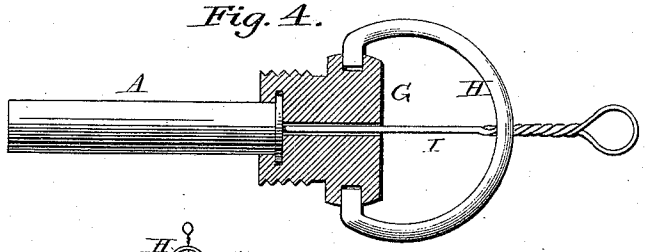
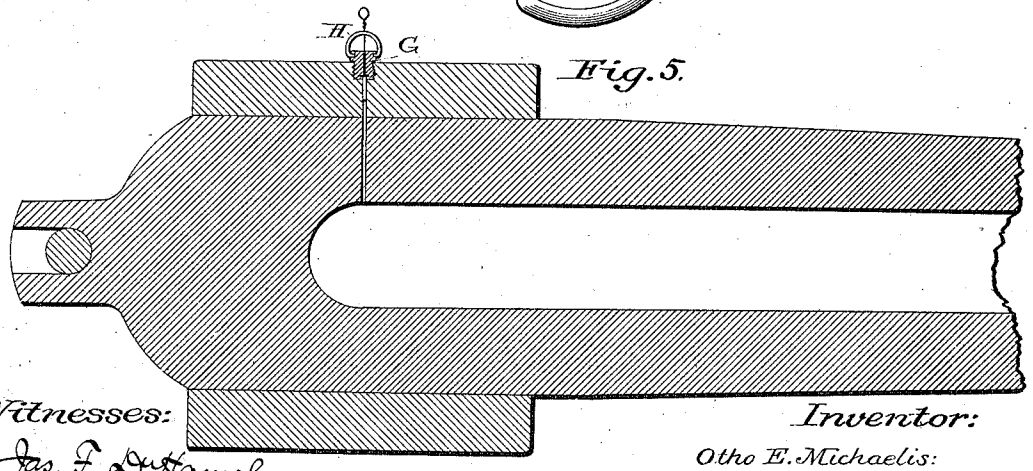


Fig. 5.



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OBTURATING-PRIMER.

SPECIFICATION forming part of Letters Patent No. 333,655, dated January 5, 1886.

Application filed November 28, 1885. Serial No. 184,205. (No model.)

To all whom it may concern:

Be it known that I, OTHO E. MICHAELIS, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, at present stationed at the Watervliet arsenal, have invented certain Improvements in Obturating-Primers, of which the following is a specification.

My invention relates to primers for firing ordnance; and the invention consists in so constructing the primer that when fired it prevents the escape of the gas at the vent-hole of the gun, thus forming what is termed an "obturating-primer."

Figure 1 is a central longitudinal section. Fig. 2 is a similar view of the primer after it has been fired. Fig. 3 is a central longitudinal section of the primer arranged to be fired by electricity. Fig. 4 is a sectional view of a screw-plug adapted to hold the primer in the gun, and Fig. 5 shows the manner of applying the same to a gun.

Friction primers, as generally used with ordnance, were simply placed loosely in the vent-hole, and were not so constructed as to serve as a gas-check. The escape of gas at the vent-hole, more especially since the adoption of the greatly-increased charges now used in guns, sooner or later scores, enlarges, or otherwise injures the vent-hole, and consequently the gun.

The object of my present invention, therefore, is to produce a primer with means for securing it firmly in position in the vent-hole of a gun, and which, when fired, shall prevent the escape of gas at the vent. To accomplish this result, I provide a metallic case, A, which, as shown in Figs. 1, 2, and 3, is made in the form of what is known as a "solid-headed" cartridge-shell. These cases may be drawn from sheet metal, the same as cartridge shells or cases, and that is the style that I prefer to use generally; or they may be bored from a solid piece of metal, especially in those cases where it is desired to cut a screw-thread on the case for holding it in place in the gun, as shown in Fig. 3, in which case greater thickness of metal will be required.

If the primer is to be fired by friction, it will be prepared as shown in Fig. 1, in which D represents a compressible plug, having a hole through its center longitudinally for the passage of the friction-wire I, the head of the case A being also perforated, as shown, for the same purpose, and the inner end of the wire I being flattened, and having its edges serrated or roughened, as shown at *a*, as is usual, to create the necessary friction to ignite the fulminate *e*.

B represents a small metallic tube for holding the fulminate, with a hole in its upper end for the passage of the wire, and C represents another and still smaller tube interposed between the tube B and the plug D, to hold the tube B in position. The wire I is of course inserted while straight, its outer end being subsequently formed into a loop, as shown, for attaching the lanyard or cord by which it is pulled, and it is provided with an enlargement, *b*, to serve as a stop to limit its movement when pulled. This stop *b* may be formed by solder applied to the wire, or by bending the wire upon itself so as to form a loop in it, or by upsetting the wire, the particular method of forming it being immaterial.

If desired, the tube C may be omitted, in which case the tube B will bear directly against the plug D, the stop *b* in that case being made at or near the serrated part *a*, the operation being the same in either case.

To hold the primer securely in the vent-hole of the gun and prevent it from being blown or forced out by the pressure of the gas, I provide a plug, G, (shown in section in Fig. 4,) said plug having a recess or slot cut in its lower end, of such a shape as to permit the case A to be shoved laterally therein, as shown, there being also a longitudinal slot cut in the plug for the wire I to rest in, as represented. This plug G is provided on its exterior with the well-known interrupted screw-thread, by which it is secured in place in the gun with the primer attached, as represented in Fig. 5, the vent-hole, of course, being suitably enlarged or counterbored to receive the primer and plug, and provided with a corresponding screw-thread to hold the plug. This plug G is also provided with a handle, H, by which it can be turned to lock or unlock it, and to enable it, with the primer-case, to be withdrawn after firing.

In lieu of the plug G, the case A may have a screw-thread formed on it, as represented in Fig. 3, and be provided with a handle, thumb-

piece, or suitably-formed projection, by which it can be screwed in and out, there being of course a corresponding screw-thread formed in the gun.

In case it be desired to use an electric current for firing the charge, the friction devices will be omitted, and instead thereof two insulated conducting-wires, *n*, will be inserted, as represented in Fig. 3. These wires will be extended through the plug or wad D, and have their ends connected by a small piece of platinum wire, *o*, as usual, for igniting the charge.

The plug D, which constitutes a very important feature of my invention, may be made of any suitable material that will be compressed by the force of the gas at the time of discharge, so as to close the hole through which the wire passes, and thus seal the case and prevent the escape of any gas at that point, the thin walls of the case at its lower end being at the same time pressed outward and held tightly against the surrounding walls of the recess in which it rests, thereby preventing the gas from escaping at the sides of the case, the same as the metallic cartridge-shell does in the ordinary rifle or shotgun.

By experiment I have found that the plug D, when made of the material known in the market as "vulcanized fiber," works well, and that is the material which I prefer to use, more especially for electric primers, but do not limit myself to the use of that material, as these plugs may be made of rubber or other material.

When arranged to be fired by electricity, the plug D must be made of a non-conducting material, or the wires *n* must be coated with an insulating material all the way through the plug D. If the plug itself be made of a non-conducting material, it may be molded on the wires *n*, in which case the wires need only be coated from a short distance within the plug outward, as shown in Fig. 3. Whichever method of igniting the charge be used, the result will be that the force of the gas will force the plug D firmly up against the closed end or head of the case A, and by compressing it longitudinally close the central opening and make it fill the upper portion of the case A so completely as to effectually prevent the escape of any gas through the vent-hole of the gun, thus preventing all injury to the gun from that source.

By using the drawn-metal cases they can be made very cheaply, and at any place where the tools or appliances for making metallic cartridges exist, thus avoiding the necessity for a special plant or outfit for their production.

It is obvious that these primers may be used with both muzzle and breech loading guns, and that, if desired, they may be fitted in the movable breech-closer of the latter class.

Having thus described my invention, what I claim is—

1. An obturating-primer consisting of the metallic case A, having its outer end closed by a solid metal head, with a central perforation for the firing-wire, with a compressible plug, D, arranged therein, said parts being constructed and arranged to operate substantially as and for the purpose set forth.

2. The combination, in a primer, of the metallic case A, provided at its outer end with a flanged metallic head, the compressible plug D, and the firing wire or wires, all arranged to operate substantially as shown and described.

OTHO ERNEST MICHAELIS.

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