PERTUISET, MUNDEL & DE FLERON.

Igniting Explosive Projectiles.

No. 78,322. Patented May 26, 1868.

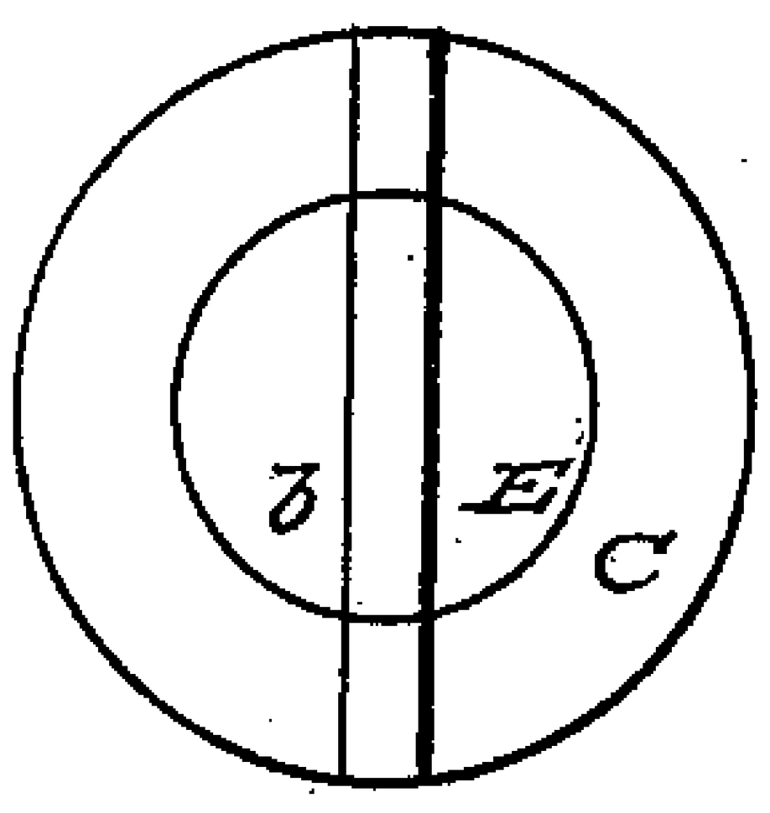


Fig. 2

Fig. 8

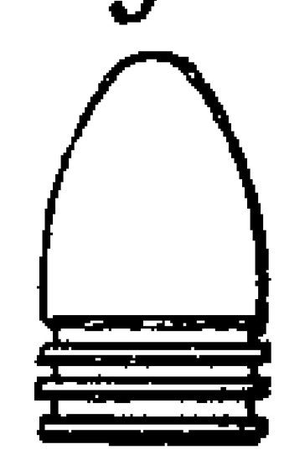


Fig. 9

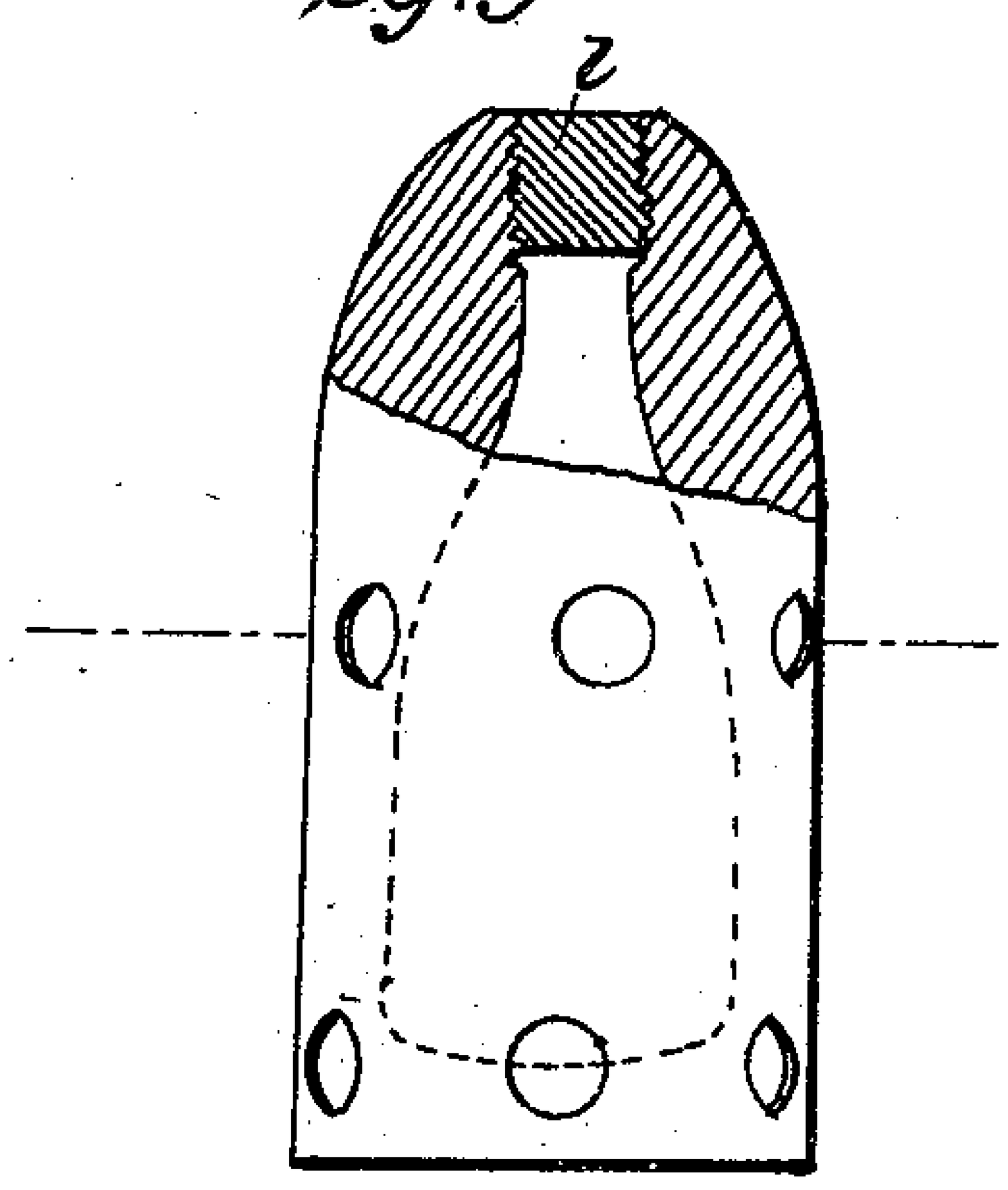


Fig. 1

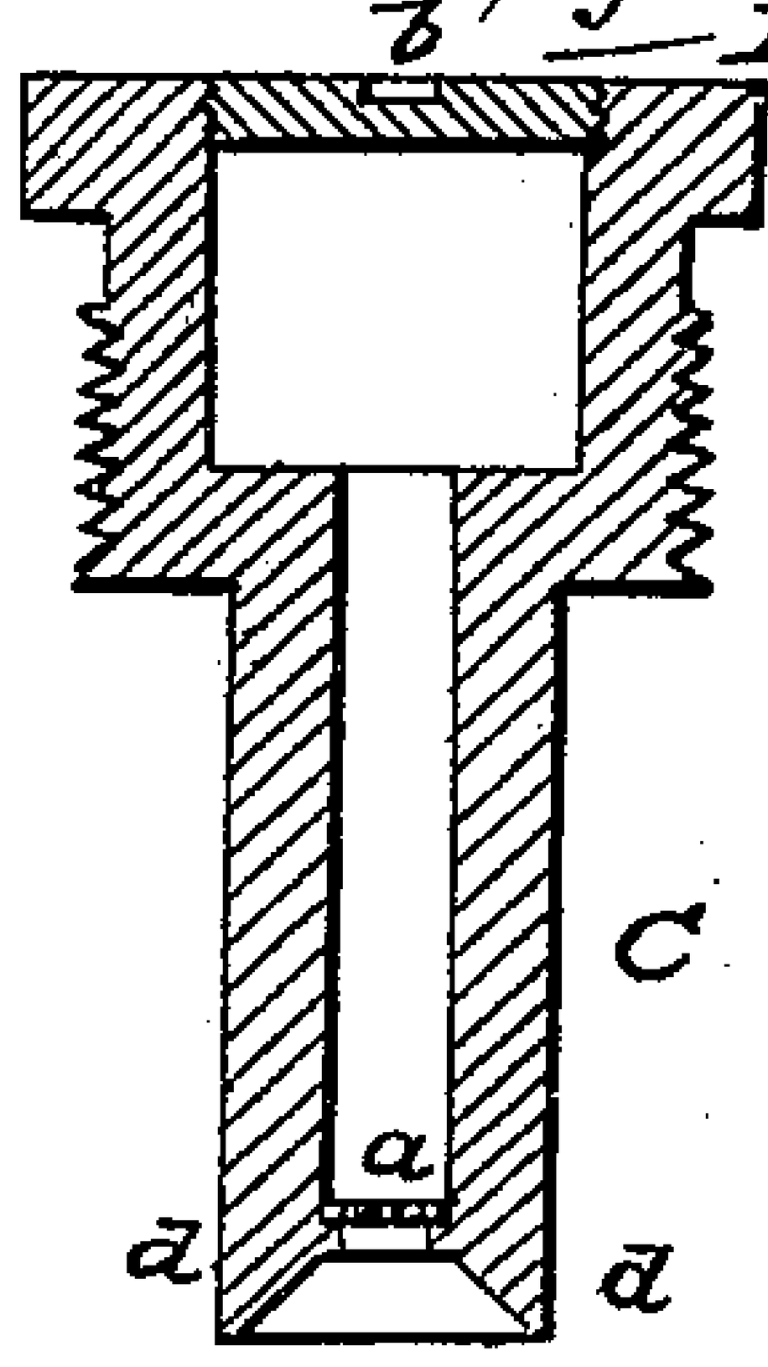


Fig. 6

Fig. 7

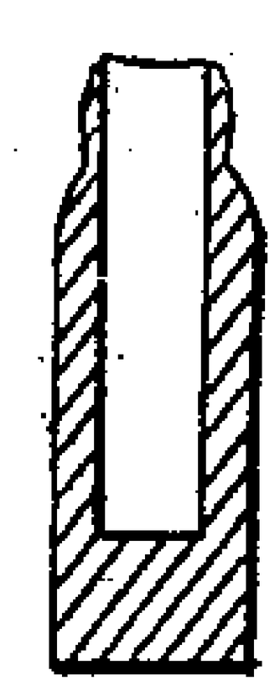


Fig. 10

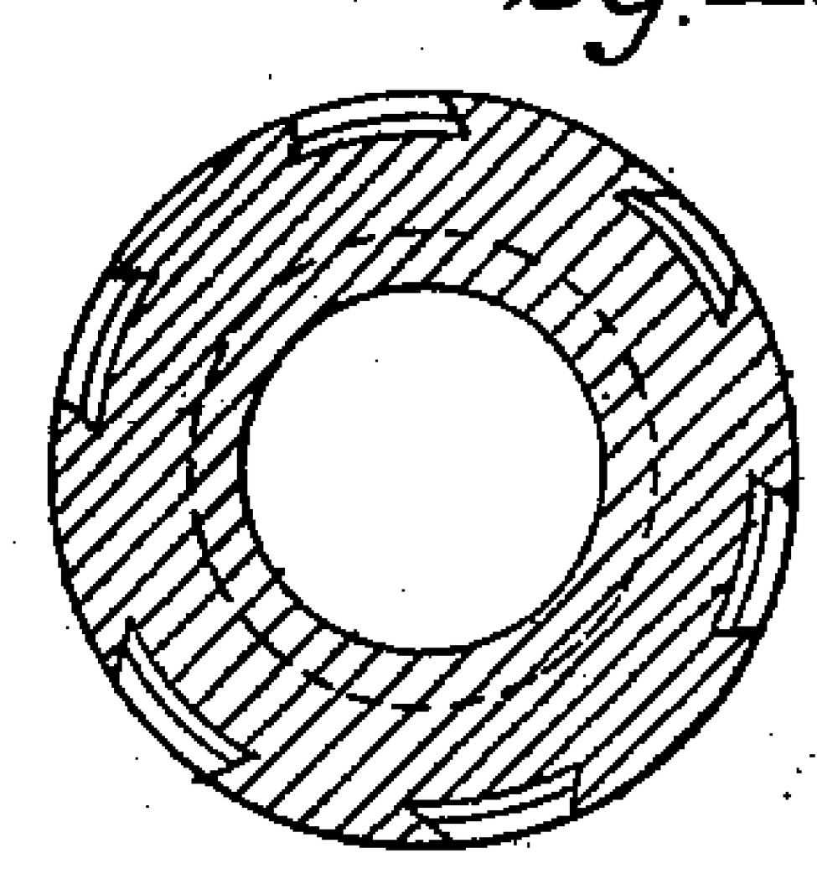


Fig. 3

Fig. 4

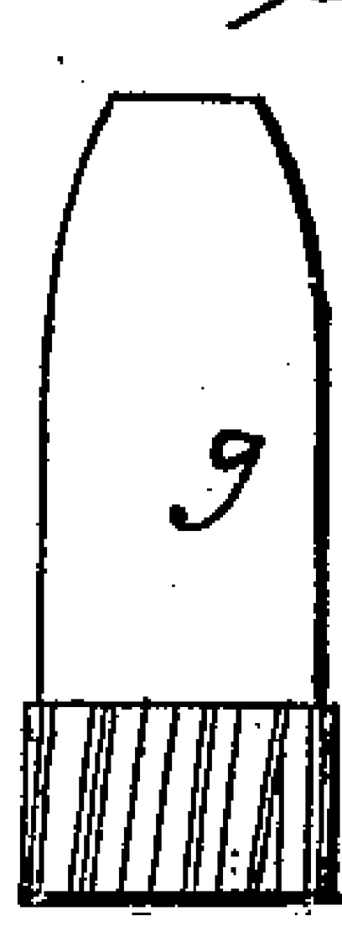
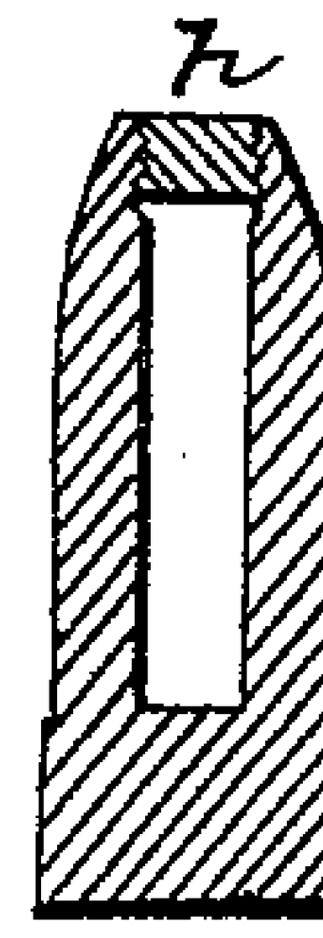


Fig. 5

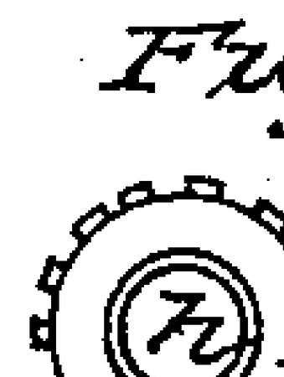


WITNESSES

Marcellus Bailey

C. B. Page jr.

Fig. 4 bis



INVENTORS

O. Pertuiset

Aug. Mundel

J. Ch. de Fleron

By A. Pollok their atty

N. PETERS, Photo-Lithographer, Washington, D. C.

United States Patent Office.

EUGENE PERTUISET, AUGUSTE MUNDEL, AND JEAN ÉTIENNE ARMIDE DE FLÉRON, OF PARIS, FRANCE.

Letters Patent No. 78,322, *dated May* 26, 1868.

IMPROVEMENT IN IGNITING EXPLOSIVE PROJECTILES.

The Schedule referred to in these Letters Patent and making part of the same.

TO WHOM IT MAY CONCERN:

Be it known that we, EUGÈNE PERTUISET, AUGUSTE MUNDEL, and JEAN ÉTIENNE ARMIDE DE FLÉRON, of Paris, in the Empire of France, have invented certain new and useful Improvements in Projectiles Capable of Exploding without Priming; and we hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings.

The object we have in view in this invention is to produce a projectile which, without priming, will explode when it reaches its intended destination.

It is useless to indicate the disadvantages attending the use of percussion-caps for projectiles of this nature, for they are well known, and the advantages possessed by our improved projectile will appear from its very description. We will therefore at once proceed to designate the means which are employed by us in order to realize our object, referring, at the same time, to the annexed drawings, in which—

Figures 1 and 2 represent a section and a plan view of a percussion-fuse, which is screwed, or secured by other ordinary or suitable means, in the bullet with which it is used.

This fuse differs from those heretofore employed in that it is provided with no percussion-cap, which fact admits of its being constructed with great facility and simplicity.

In the copper body C, and on a flange, *d*, rests a little copper grate or diaphragm, *a*, shown detached in Figure 3. Under this grate is pasted thin paper or fine cloth, in order to prevent the escape of the fulminant, which is thus held upon the grate *a*.

Upon the powder is spread a coat of wax, or other suitable plastic material, from one to two millimetres in thickness, in order to prevent the immediate contact of the powder with the screw-plug E, which is adjusted or fitted in the body C of the fuse by means of a suitable tool placed in the nick *b*. The bed or coat of wax may be dispensed with, but we strongly recommend it as a useful precautionary measure.

The powder which we employ is composed of two (2) parts of chlorate of potash, one (1) part of sulphur, one-eighth ($\frac{1}{8}$) of hunting-powder, and one-fiftieth ($\frac{1}{50}$) of animal black, which substances are, with the usual precautions, thoroughly mixed together.

In order that the mixing may be as intimate as possible, the operation may be variously conducted, and those skilled in the art will at once understand to what extent the trituration can be modified. The essential point, however, is to first mix together, thoroughly and intimately, the chlorate of potash and the animal black. On the other hand, the hunting-powder and sulphur are mixed together in like manner. By this means the two mixtures will be found covered with a kind of protecting varnish, the result of the operation to which they have been subjected, and it is only then that the whole is mixed together without grinding or trituration, for the powder, at this stage, is extremely inflammable.

The proportions of the substances employed can be varied to a certain extent. If a less explosive powder is required, it will be necessary to increase the proportion of hunting-powder, and by putting in less hunting-powder, the powder will become more inflammable.

It is, however, superfluous to go into these details, which can be variously modified. The important feature is that, by the aid of a fulminant powder, such as just described, or of any other suitable composition, we are enabled to produce projectiles which may be exploded without the assistance of percussion-caps; and it will be sufficient that the detonating-mixture possesses the property of becoming inflamed under the action of the heat developed by the impact of the ball against a resistant body, or its penetration into a soft body. The fulminant may be employed in either a pulverized or a granulated state.

Figures 4, 4 *bis*, and 5, represent, in elevation and section, a ball of hard metal, such as lead and antimony. It is composed of a body, *g*, and a screw-threaded steel or other metallic plug, *h*, which is ovened or filed off after it has been screwed into place.

If the metal of which the ball is composed is lead, the ends are shaped as indicated in Figures 6 and 7, and the upper part has a conical form given it, as is likewise represented in the ball shown in Figure 8.

Figures 9 and 10 represent a bullet without fuse, made in a manner similar to the balls. The screw-plug *l* seals it hermetically.

Having now described our invention, what we claim, and desire to secure by Letters Patent, is—

1. An explosive projectile, composed of a tube or equivalent hollow metallic body, filled with a detonating or fulminating-compound, which will be ignited or inflamed by the action of the heat developed by the impact or penetration of the projectile, substantially as herein shown and set forth.

2. The fulminating-mixture or composition, substantially as herein specified.

3. The percussion-fuse, for containing the fulminating-compound, made substantially as and for the purposes herein shown and set forth.

In testimony whereof, we have signed our names to this specification before two subscribing witnesses.

E. PERTUISET,
AUG. MUNDEL,
J. É. A. DE FLÉRON.

Witnesses:
ÉMILE BARRAULT,
A. POLLOK.