G. P. GANSTER.

Shell-Fuse.

No. 42,185 Patented Apr. 5, 1864.

Fig. 1.

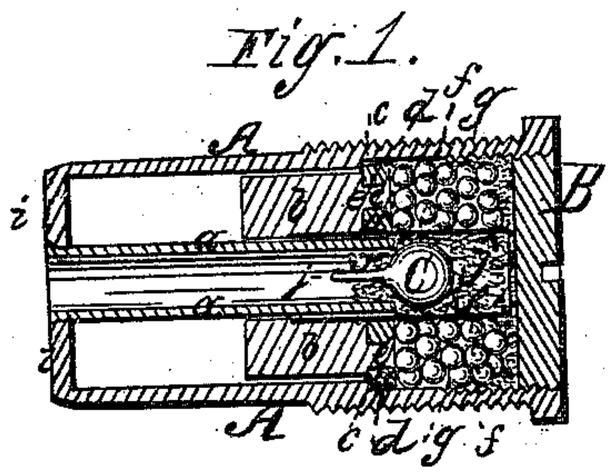
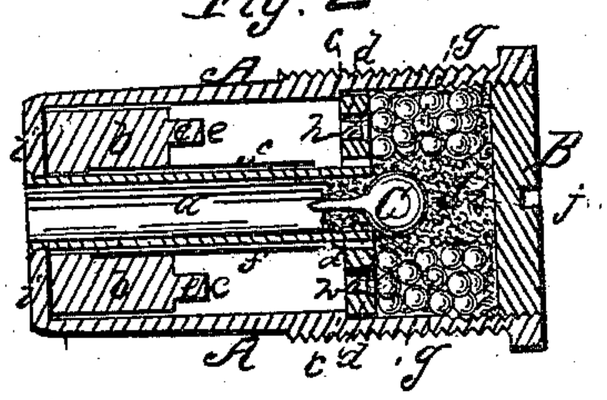


Fig. 2



Witnesses.

Thos. H. Douglas

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UNITED STATES PATENT OFFICE.

GEORGE P. GANSTER, OF NEW YORK, N. Y.

IMPROVEMENT IN PERCUSSION-FUSES FOR SHELLS.

Specification forming part of Letters Patent No. 42,185, dated April 5, 1864.

To all whom it may concern:

Be it known that I, GEORGE P. GANSTER, of the city, county, and State of New York, have invented a new and useful Improvement in Percussion-Fuses for Explosive Projectiles; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figures 1 and 2 are central longitudinal sections of the fuse, Fig. 1 showing the condition of the parts before the projectile is started by the firing of the charge of the gun, and Fig. 2 their condition after the starting of the projectile.

Similar letters of reference indicate corresponding parts in the two figures.

This invention relates to percussion-fuses, the fulminate of which consists of a glass capsule which is filled with a liquid, and the exterior of which is coated with or enveloped in a chemical substance, which is caused to take fire by the contact of the liquid on the breaking of the capsule by the percussion produced by the striking of the projectile against any resisting body when fired from a gun.

It consists in certain means whereby the capsule is prevented from being broken in the handling of or by the accidental dropping of the projectile; but its breakage is insured when the projectile strikes on being fired from the gun.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation. A is the outer tube or shell of the fuse. This is closed at its rear or inner end, except that it has a central opening, in which is inserted and tightly secured a tube, *a*, which extends forward about two-thirds of its length, and its front or outer end is open and provided with an internal screw-thread for the reception of the closing-cap B, and it has the usual screw-thread on its exterior to screw into the fuse-hole of the projectile. The front portion is bored out a little larger than the rear portion, to form a shoulder, *c*, a little in rear of the front end of the tube *a*. *d* is an annular plate, fitted to slip easily to the larger front portion of the interior of the tube, and having in its center a hole a little larger than the exterior of the tube *a*, and which rests against the shoulder *c*. *b* is an annular plunger, of lead or other soft and heavy metal, fitted loosely to the smaller portion of the interior of the tube A, behind the shoulder *c*, and to the exterior of the tube *a*, and having formed upon its front end rivets *e e*, of the same metal, by which it is riveted, as shown in Fig. 1, to the plate *d*, through holes *h h*, Fig. 2, in the said plate. This plunger has strongly attached to its front end a thin metal tube, *f*, the internal caliber of which is the same as that of the interior of the plunger—that is to say, it fits easily to the exterior of the tube *a*. The length of this tube *f* is such that when the plunger is attached closely to the plate *d*, as shown in Fig. 1, its front end will touch or nearly touch the cap B.

C is the capsule, of a size to fit loosely within the tube *f*, but too large to enter the tube *a*, inside of the tube *f*, enveloped with a small quantity of loose cotton or other soft material, *j*, a quantity of which is also placed in front of and behind it, to fill up the tube *f*, and a few grains of fine gunpowder are introduced among the cotton or other soft material. The annular space between the tube *f* and the larger surrounding portion of the tube A, in front of the plate *d*, is nearly filled with shot, *g g*, or with some hard and heavy granular material, and a layer of cotton or other soft material placed as packing between the shot or granular material and the cap B.

The fuse, having its parts in the position and condition shown in Fig. 1, is screwed into the projectile in the usual manner, and the plunger *b* remains in that position, undisturbed by any action to which it can be subject before being inserted in the gun and during the loading; but when the gun is fired, and the projectile is started suddenly by the sudden impact produced by the explosion of the gunpowder, the inertia of the heavy plunger *b* causes its rivets *e e* to draw out from the holes *h h*, and the plunger, with the attached tube *f*, moves forward slower than the other parts of the fuse, until the plunger is left in contact with the closed rear portion, *i i*, of the tube, surrounding the tube, and the tube *f* is withdrawn from in front of the plate *d*, and ceases to separate the capsule C from the surrounding shot or granular material *g*. The said capsule is, however, protected by the cotton

or other soft material, *j*, from being broken by the centrifugal action of the shot which ensues on the discharge of a projectile from a cannon; but on the projectile striking any resisting body, the capsule and the shot or granular material are all caused to move forward together within the tube A, and the shot or hard granules are brought into violent contact with the capsule, which, on being broken, causes the ignition of the fulminate, the fire from which passes through the tube *a* and ignites the bursting-charge of the projectile.

I propose, generally, to fill the capsule C with sulphuric acid, and to coat its exterior with a compound of potash and sulphur, as described in the specification of an application for Letters Patent made by myself and G. Schuyler to the United States Patent Office.

Having thus described my invention, I claim and desire to secure by Letters Patent, as an improved article of manufacture—

A percussion-fuse composed of a screw-tube, A, closing-cap B, tube *a*, thin tube *f*, with attached annular plunger *b*, globule C, soft material *j*, and shot or granular material *g*, the whole united in the manner herein shown and described.

GEORGE P. GANSTER.

Witnesses:
THOS. S. J. DOUGLAS,
M. M. LIVINGSTON.