O. WILHELMI.

EXPLODING PROJECTILE FOR ARTILLERY PURPOSES.

APPLICATION FILED MAY 17, 1922.

1,435,773. Patented Nov. 14, 1922.

Fig. 1

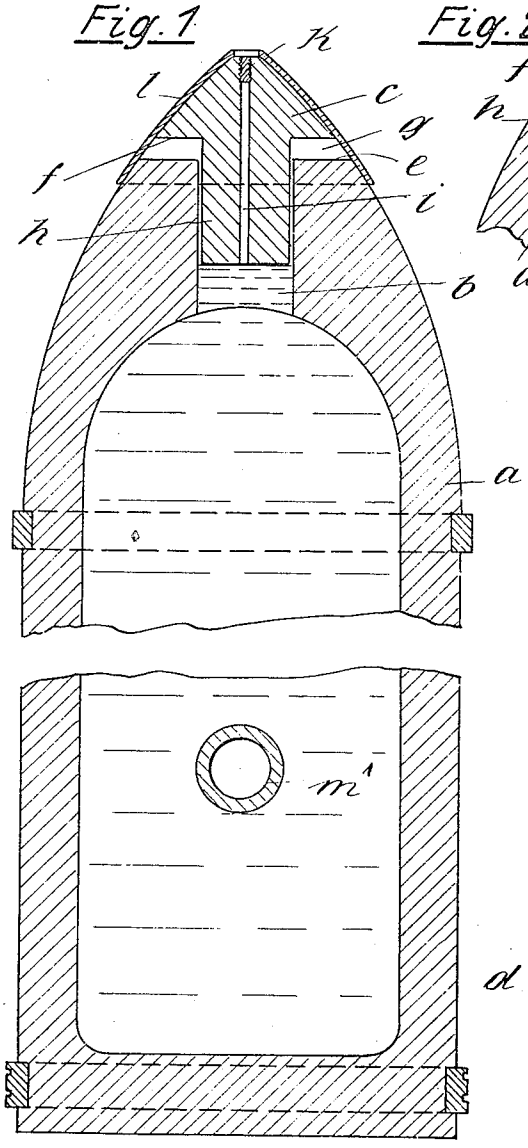


Fig. 2

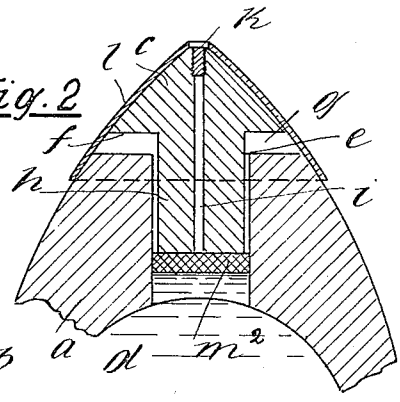
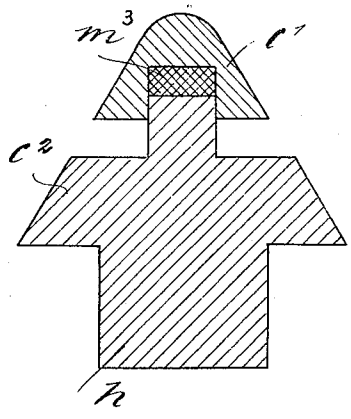


Fig. 3



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UNITED STATES PATENT OFFICE.

OTTO WILHELMI, OF KIEL, GERMANY.

EXPLODING PROJECTILE FOR ARTILLERY PURPOSES.

Application filed May 17, 1922. Serial No. 561,723.

To all whom it may concern:

Be it known that I, OTTO WILHELMI, a citizen of the German Republic, and resident of Kiel, Germany, have invented a certain new and useful Improved Exploding Projectile for Artillery Purposes, of which the following is a specification.

This invention relates to an exploding projectile without an actually exploding charge and without a fuse. These parts are replaced by a liquid completely filling the shell and by a piston-like top which transmits the blow to the liquid when the projectile strikes upon an object whereby the shell is torn to pieces by the liquid and its parts are dashed about like the parts of a projectile burst by an explosive charge proper.

The great advantages which the novel projectile offers consist in its very simple and cheap manufacture, its absolutely dangerless manipulation, and the entire absence of premature explosion and bursting in the gun-barrel, as well as of miss-fire or fail-shot.

In order to make my invention more clear, I refer to the accompanying drawing, in which Figure 1 is a longitudinal section through a projectile constructed according to this invention; Figure 2 is a similar section merely through the top of the projectile and shows a slightly modified form of construction; and Figure 3 is an axial section merely through the piston-like end-piece of the movable top member, also somewhat modified and drawn on a slightly enlarged scale.

Referring to Figure 1, the shell *a* is hollow and filled with any suitable liquid *d*. The conical end portion of the shell has a smooth-walled channel *b* which serves as guide for the guide-member *h* of the axially displaceable top-member *c* of the projectile. The guide-member, or piston, is in direct contact with the liquid *d* which fills the channel *b* to a certain height so that a gap *g* remains between the top-face *e* of the shell and the bottom-face *f* of the top-member, *c*, that gap permitting of the necessary inward movement of the top-member on the projectile striking upon an object.

Preferably the top-member *c* is provided with a central bore allowing of the air escaping from the channel *b* when the guide member or piston *h* is inserted. The piston having arrived in its proper position, the bore *i* is closed by a screw *k* or the like.

In order to diminish the resistance to air of the projectile, also to prevent the entrance of impurities in to the gap *g* this latter is preferably covered with a cap *l*, the lower portion of which engages the body of the shell, as shown. The contacting portions of the shells and the cap may be connected with each other by any suitable means, such as screws or any suitable cementing medium, the purpose of the connection being chiefly to hold the parts *c h* in proper position relatively to the body of the shell. It is a matter of course that the cap should not impair the proper action of the piston; it must give way in the moment of the blow.

The piston may be provided with a thin coating of paraffine or the like before it is inserted, the purpose being to pack or tighten it in this manner in the channel *b*.

Existing projectiles of the hitherto employed kind and having a threaded mouth-hole may be made suited for the reception of a liquid and a piston, as above described, by being provided with a smooth-walled sleeve which is screwed into the threaded mouth-hole.

When firing off such a projectile, the top-member *c* is subjected only to its inertia and to the air-resistance; these combined causes are, of course, insufficient to make the shell explode. But if the projectile strikes upon an object, the piston is driven inwards with a force which is practically equal to the kinetic energy of the projectile in the moment of the blow. The pressure thus produced is uniformly transmitted by the liquid to all portions of the shell which then is torn into many pieces that are dashed about as if the shell had contained an actual explosive charge.

It is probable that in the moment of the blow heat is generated in such a measure that, a suitable liquid, such as water, being presupposed, steam or a vapor is produced which assists in making the shell burst. If perhaps, an inflammable liquid is employed, this may become ignited by the heat caused by the impact of the shell.

To attain that the projectile bursts not immediately after the blow, but penetrates first at least a little into the object upon

which it has struck, a compressible body m^1 may be inserted into the liquid or between it and the piston. The bursting of the shell is, by this means, retarded for a fraction of a second during which the projectile penetrates into the object upon which it has struck; only then the bursting takes place.

In the form of execution illustrated in Figure 1, a hollow body m^1 such as a hollow ball of glass or sheet-metal, or a bottle-like glass-body, is made use of and affixed anywhere to the inner surface of the shell or left to itself. In Figure 2 the compressible body m^2 consists of a disk inserted between the piston and the liquid. In Figure 3 the top-member is bipartite and the compressible disk m^3 is inserted between the respective two parts c and c^2.

The top-member may, if desired or preferred, be provided with a blasting-fuse which throws it forward in the moment of the blow, or a time-igniting device may be combined with the top-member, the object being in every case to increase the explosive or bursting action of the liquid enclosed in the shell.

Having now described my invention, what I desire to secure by a patent of the United States is:

1. A projectile for artillery purposes comprising, in combination: a hollow shell; a liquid filling it; a bipartite top member adapted to be axially displaced in a top-channel of said shell; and a compressible disk located between the two parts of said top member; substantially and for the purpose as described.

2. A projectile for artillery purposes comprising, in combination: a hollow shell having an axially extending channel in its top; a bipartite top member located in said bore a compressible plate arranged between the two parts of said top-disk and forming a gap between them; and a cap covering the top member and said gap, substantially and for the purpose as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

OTTO WILHELMI. [L. S.]

Witnesses:

PAUL JARSS,

E. KASPANK.