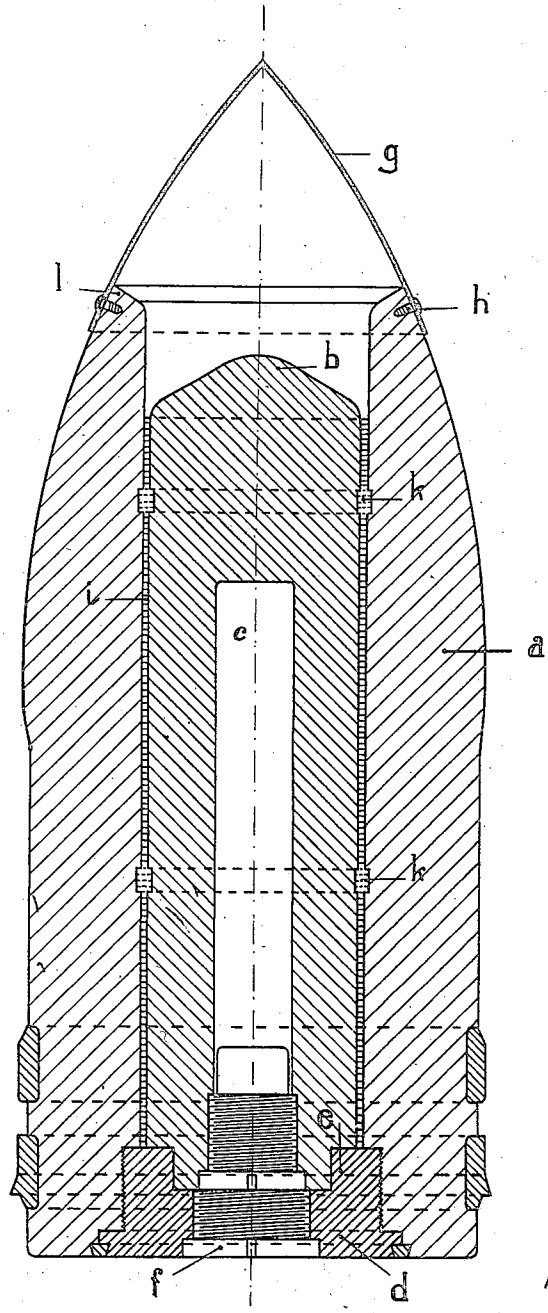
J. W. P. VAN KAMPEN & G. A. COX.

ARMOR PIERCING PROJECTILE.

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1,179,686. Patented Apr. 18, 1916.



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JAN WILLEM PEPPELMAN VAN KAMPEN, OF WATERGRAAFSMEER, NEAR AMSTERDAM, AND GELDOLPH ADRIAAN COX, OF UTRECHT, NETHERLANDS.

ARMOR-PIERCING PROJECTILE.

1,179,686. Specification of Letters Patent. Patented Apr. 18, 1916.

Application filed August 18, 1914. Serial No. 857,405.

To all whom it may concern:

Be it known that we, JAN WILLEM PEPPELMAN VAN KAMPEN, a subject of the Queen of the Netherlands, and residing at Watergraafsmeer, near Amsterdam, Province of Holland, Netherlands, and having a post-office address at Kerklaan 33, Watergraafsmeer, near Amsterdam, and GELDOLPH ADRIAAN COX, a subject of the Queen of the Netherlands, and residing at Utrecht, Province of Utrecht, Netherlands, and having a post-office address at Stadhouderslaan 41, Utrecht, Netherlands, have invented certain new and useful Improvements in Armor-Piercing Projectiles; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

The American Patent No. 1,094,395 relates to a projectile for hand fire arms with a spindle of hardened steel resting with its point against the inner surface of the recessed projectile head.

This construction has for its purpose to exercise a repeated action when touching goals of high resistance; the first impulse being exercised by the circular (annular) head of the projectile, the second one immediately afterward by the hardened steel spindle being projected forward with almost undiminished velocity, this spindle not sharing the reaction exercised by the goal on the projectile head so that the spindle touches the body to be penetrated in an almost unaltered condition. In other words; at the moment the annular projectile head surface touches the goal, the projectile is divided by the reaction into two independent parts which exercise successively their impulses on the goal. Trials have proved that this construction increases the deteriorative action of the projectile.

The here described invention relates to an armor piercing projectile based upon the same constructional principle, namely the division of the projectile at the moment it touches the goal into two or more independent parts some of which are not exposed to reaction and consequently exercise their action in immediate succession and at the same spot of the armor to be pierced in an unaltered condition and with an undiminished or almost undiminished velocity.

The accompanying drawing represents a form of execution of the armor piercing projectile in longitudinal section. The projectile consists of an outer projectile *a*, preferably of hardened crucible steel and provided with a bore intended for containing the inner projectile *b*, which is also preferably made of hardened crucible steel.

In order to stabilize the projectile during its trajectory it is necessary that the outer and the inner parts obtain the same rotation about their longitudinal axis when the shot is fired. Moreover, as after the outer projectile has touched the armor to be pierced the inner one should be brought forward with undiminished or at least with almost undiminished velocity, the inner projectile should remain in its correct position relative to the outer one during the trajectory.

In order to answer these conditions the threaded bottom *d* of the outer projectile is provided with projections *e* fitting with corresponding recesses in the bottom of the inner projectile, while a certain clearance *i* is provided between the outer and the inner projectiles, this clearance being increased by one or more circular grooves *k* in the outer and inner projectiles. This clearance is filled with a material of low resistance, lead for example. The inner projectile is preferably provided with a central bore *c* intended for containing an explosive charge and with a fuse at the bottom. The bottom of the outer projectile is provided with a threaded stop *f* in order to render the fuse easily accessible. The outer projectile bears at its head a wind cap *g*, which may be made for example of steel plate or copper and fastened by means of screws *h* to the outside of the outer projectile.

The effect of the armor piercing projectile when touching the armor is the following: The low resistance of the wind cap can be neglected. The first impulse is exercised by the annular head of the outer projectile, a certain pressure being consequently exercised on the armor after the manner of a heavy hammer blow. The second impulse is immediately after the first one exercised by the inner projectile which is not influenced by the reaction and forced forward with undiminished or with almost undimin-

ished velocity on and at the inside of the annular part of the armor plate, the latter being already exposed to a certain pressure and consequently in a favorable condition for being pierced. The head of the inner projectile is of course made with such a shape that it is most fit for piercing, that is to say deteriorating, armors or other kinds of goals with high resistance.

The head of the projectile shown in the drawing has the shape of a cone; this head may be developed for example to the ordinary ogival shape, or for example to a stamp or punch, to a crater, etc. Moreover, it is possible to connect the outer and the inner projectiles in another manner, *e. g.* by substituting the circular grooves by grooves having another, *e. g.* a longitudinal direction, in which case the bottom of the outer projectile may be in one piece with the cylindrical wall. The bottom may then be provided with recesses corresponding with projections of the bottom of the inner projectile. It is also possible to partially fill the empty space of the outer projectile in front of the inner projectile and also partially the empty space of the wind cap with any material of low resistance, lead, for example; this might be desirable for increasing the weight of the projectile head to a maximum or in case it is thought necessary to lock up the inner projectile, or in other words, to secure it better in its position. Furthermore, the outer projectile may also be provided with an explosive charge, in which case it should contain an empty space.

Having now particularly described and ascertained the nature of our said invention and the manner in which it is to be performed we declare that what we claim is:

1. In a projectile the combination of a tubular impact body having an axial bore opening to the front end of the projectile and having also a hard blunt impact nose to impart a hammer blow to the target, together with a piercing projectile fitting within said bore in the body and detaching therefrom on impact to pierce the target at a point within the area affected by said impact nose.

2. In a projectile the combination of a tubular impact body having an axial bore opening to the front end of the projectile and having also a hard blunt impact nose to impart a hammer blow to the target, together with a piercing projectile fitting within said more in the body and detaching therefrom on impact to pierce the target at a point within the area affected by said impact nose, said impact body and piercing projectile being arranged to come successively into action against the target in the order named.

3. In a projectile the combination of a tubular impact body having an axial bore opening to the front end of the projectile and having also a hard blunt impact nose to impart a hammer blow to the target, together with a piercing projectile fitting within said bore in the body and detaching therefrom on impact to pierce the target at a point within the area affected by said impact nose, said piercing projectile being normally held with its piercing end at a point to the rear of the impact nose of said projectile body.

4. In a projectile the combination of a tubular impact body having a hard annular impact nose and a piercing projectile fitting within said bore in the body and detaching therefrom on impact to pierce the target at a point within the area affected by said impact nose, together with an explosive charge carried by said piercing projectile.

5. In a projectile the combination of a tubular impact body having a hard annular impact nose and a piercing projectile fitting within said bore in the body and detaching therefrom on impact to pierce the target at a point within the area affected by said impact nose, said piercing projectile having a chamber opening to the rear end thereof to receive an explosive charge.

In testimony that we claim the foregoing as our invention, we have signed our names in presence of two subscribing witnesses.

JAN WILLEM PEPPELMAN VAN KAMPEN.
GELDOLPH ADRIAAN COX.

Witnesses:
W. R. ATKINSON,
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