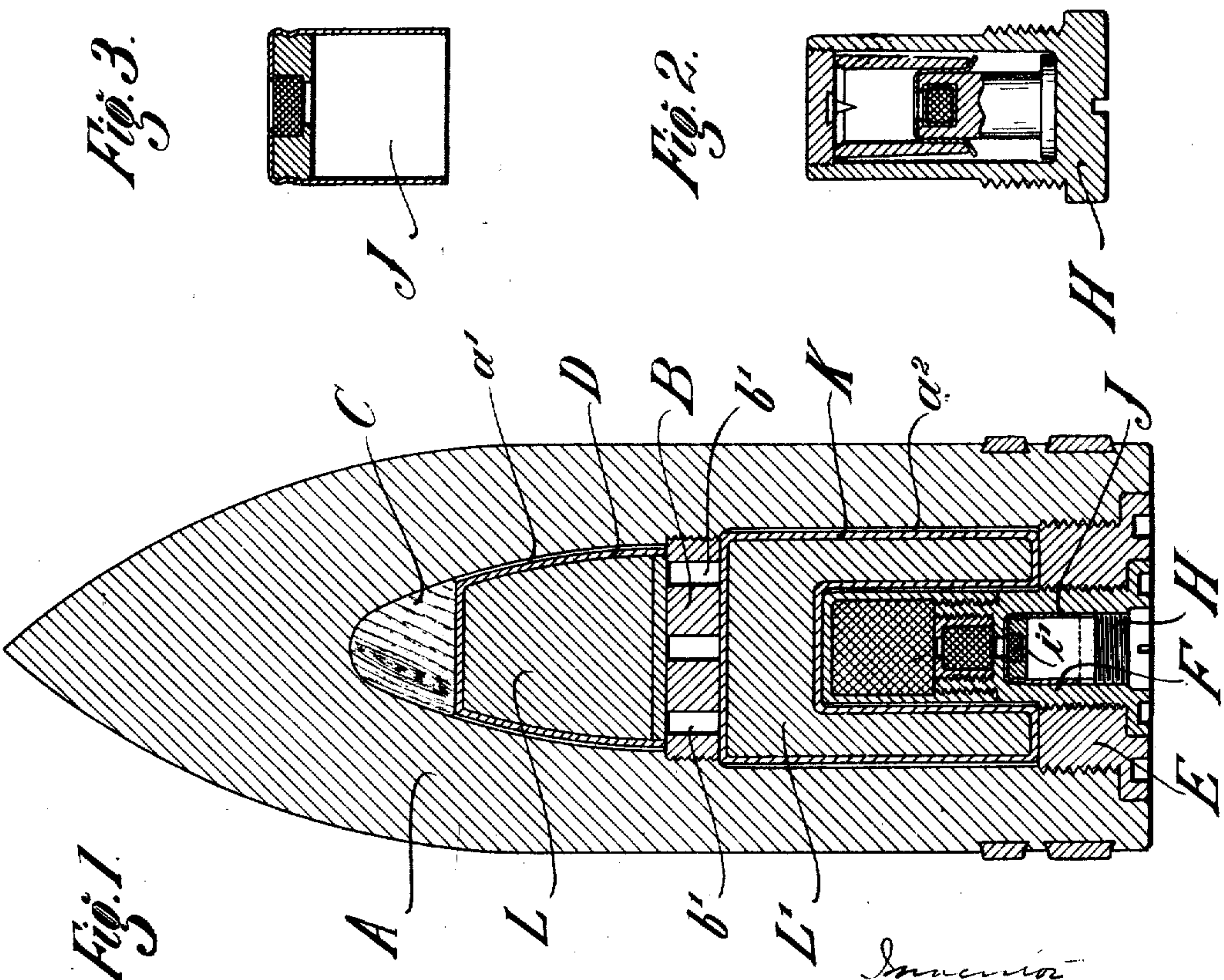
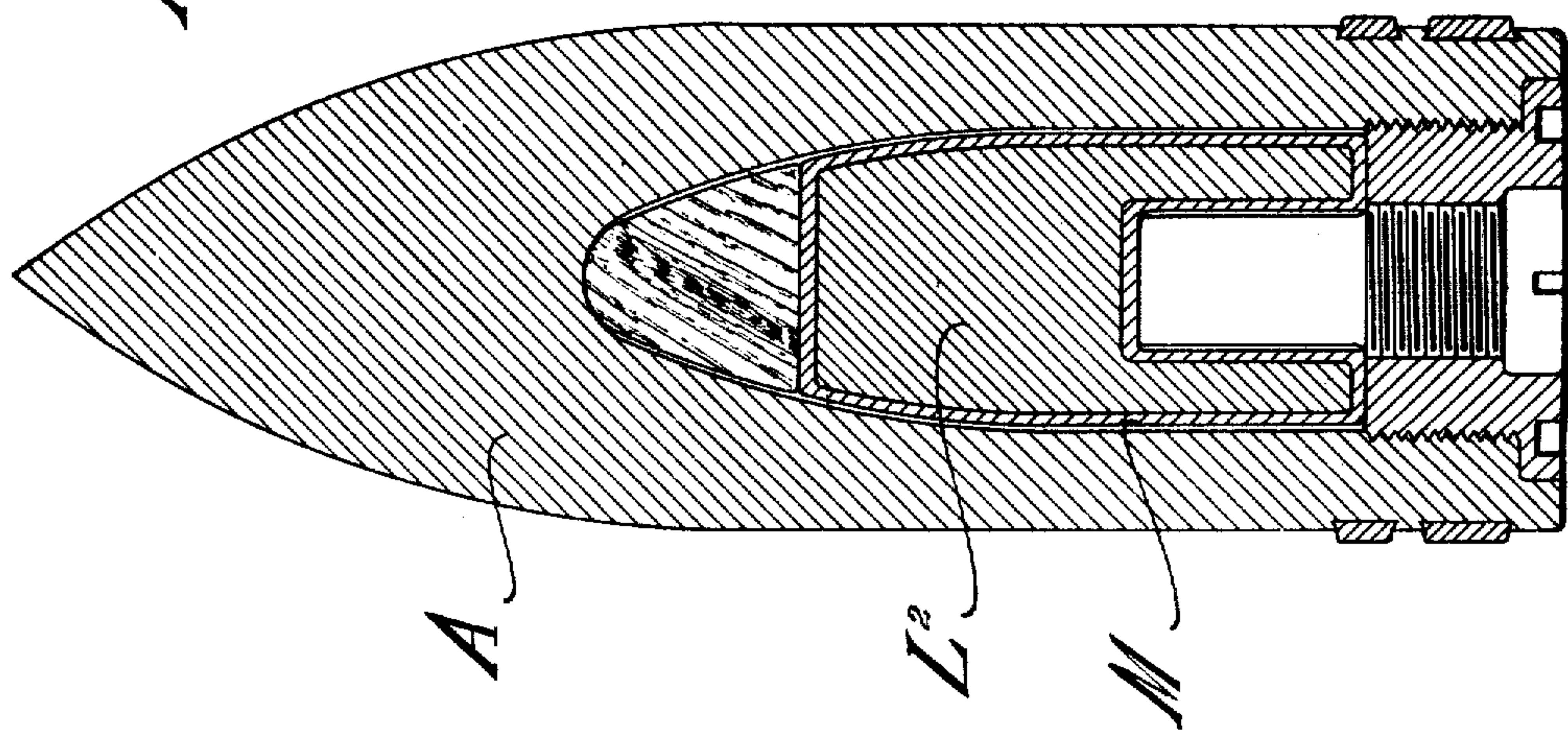


A. WRATZKE.
 ARMOR EXPLODING PROJECTILE.
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905,042.

Patented Nov. 24, 1908.



Witnesses
 James M. Wynkoop
 L. R. Hewitt

Inventor
 Alfred Wratzke
 By *Knight*
 Atty

UNITED STATES PATENT OFFICE.

ALFRED WRATZKE, OF ESSEN-ON-THE-RUHR, GERMANY, ASSIGNOR TO FRIED. KRUPP
AKTIENGESELLSCHAFT, OF ESSEN-ON-THE-RUHR, GERMANY.

ARMOR EXPLODING PROJECTILE.

No. 905,042.

Specification of Letters Patent.

Patented Nov. 24, 1908.

Application filed December 14, 1907. Serial No. 406,540.

To all whom it may concern:

Be it known that I, ALFRED WRATZKE, a subject of the Emperor of Germany, and a resident of Essen-on-the-Ruhr, Germany, have invented certain new and useful Improvements in Armor Exploding Projectiles, of which the following is a specification.

The present invention relates to armor exploding projectiles having a hollow space containing one or more chambers, the hollow space being gradually tapered towards the projectile-point for convenience of manufacture.

The object of the invention is to provide a projectile of this type, the bursting charge of which does not become prematurely ignited by the concussion when the projectile hits the armor, and which furthermore is of very simple construction.

The object of the invention is attained in the following manner: The bursting medium contained in each chamber of the projectile is arranged in such a manner that its cross-sectional area nearest the projectile-point receives the pressure of the entire charge of the chamber when the projectile hits the armor. Furthermore, the bursting charge of the chamber nearest the projectile-point lies with an abutting surface against a member arranged in the reduced portion of the chamber, the abutting surface being of such area that the bursting charge cannot become ignited by the concussion which takes place when the projectile hits the armor. Finally provision is made for retarding the transmission of the fire from the fuse to the bursting charge.

In the accompanying drawings, Figure 1 shows an axial longitudinal section of one embodiment of the invention in the form of a two-chambered projectile; Fig. 2 is a longitudinal section of the fuse, on an enlarged scale; Fig. 3 is a longitudinal section of the sleeve containing the retarding composition, the view being on an enlarged scale; and Fig. 4 is an axial longitudinal section of another embodiment of the invention in the form of a single-chambered projectile.

In the embodiment shown in Figs. 1 to 3 the hollow space of the projectile-point A which tapers towards the projectile-point is

divided into two chambers, viz. the point-chamber a' and the base-chamber a'' , through the medium of a plate B having perforations b' .

In the front part of the point-chamber a' is arranged a wooden body C which snugly fits the chamber a' and which has its bottom surface at right angles to the axis of the projectile. The remaining hollow space of the chamber a' is filled with a body L consisting of a high-explosive material which is inclosed in a card-board shell D and forms a part of the bursting charge of the projectile.

The abutting surface which the wooden body C presents to the bursting charge of the chamber a' is so great that the specific surface pressure, which is exerted by the bursting charge on the body C when the projectile hits the armor, cannot cause ignition of the bursting medium.

The base-chamber a'' of the projectile-body A is closed by a base-screw E which receives the detonator-screw F that projects into the chamber a'' . Into the rear part of the detonator-screw F is screwed the impact-fuse H which has removably applied thereon the sleeve J containing a retarding composition i' . The impact-fuse H and the sleeve J are shown in section and on an enlarged scale in Figs. 2 and 3.

The part of the hollow space of the base-chamber a'' which is not occupied by the detonator-screw F is filled with a body L' consisting of high-explosive material and forming the second part of the bursting charge of the projectile. The body L' is inclosed in a card-board shell K.

If the armor-projectile is fired against an armor, the body L of bursting material lies with great pressure against the abutting surface of the body C when the projectile hits the armor. However, by reason of the great area of the abutting surface of the body C this pressure cannot cause ignition, as would be feared if the bursting material also filled the space of the chamber a' that is occupied by the body C.

By reason of the insertion of the retarding composition i' the impact-fuse H, which has its igniting pellet struck at the moment the projectile hits the target, cannot effect

immediate ignition of the detonator and of the bursting charge. The projectile will, therefore, first penetrate into or through the armor before the bursting charge is detonated.

If the projectile is to be discharged against a target which has less resistance it may be advisable to screw the fuse H out of the projectile prior to firing, whereupon the sleeve J with the retarding composition is removed and the fuse is again inserted. The bursting charge of the projectile will then be detonated at the moment the projectile hits the target.

The embodiment shown in Fig. 4 differs from the embodiment just described in having the hollow space of the projectile-body A formed with only one chamber, while the bursting charge consists of a single body L² of high-explosive bursting material and arranged in a card-board shell M.

The filling body C need not be made from wood, nor need it completely fill the front part of the hollow space of the projectile. It is merely necessary that it consists of a material that is only compressible to a slight extent (metal, colophonium, powder, etc.) and that it presents the required abutting surface for the bursting charge. As filling body may even be used liquid inclosed in a shell.

Instead of the impact-fuse with a removable sleeve containing a retarding composition an impact-fuse may be used which has a delay action means permanently connected thereto. Furthermore one can also use an impact-fuse with delay action means that can be switched in and out.

Particular attention is called to the fact that it is old to provide projectiles with tapering hollow spaces having one or more chambers, in which the bursting material contained in each chamber is arranged in such a manner that its cross-sectional area nearest the projectile-point receives the pressure of the total charge of the chamber on impact. Furthermore it is not new to fill the reduced portion of the hollow space of the projectile with an elastic or inelastic body. However, this known arrangement is for a purpose that is totally different from that of the body C of the projectile according to the present invention.

Finally it is of course also old to provide armor-projectiles with devices for retarding the transmission of the fire from the fuse to the bursting charge.

The single parts of the armor-projectile according to the present invention are, therefore, known *per se*, and the invention consists merely in the successful combination of these known details. Through this combination an armor-projectile is obtained which is of extremely simple construction and in which accidental ignition of the bursting

charge by the concussion due to the projectile hitting the armor is safely avoided.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. In an armor-projectile having a hollow space tapering towards the projectile-point, the combination of a bursting charge arranged in the hollow space and having its cross-sectional area nearest the projectile-point receiving the total pressure of the charge on impact; a solid body arranged in the reduced portion of the hollow space and having an abutting surface against which the bursting charge lies, of sufficient area to prevent ignition of the bursting charge by concussion when the projectile hits the armor; a fuse adapted to be ignited at the instant of impact; and means adapted to retard the transmission of fire from the fuse to the bursting charge.

2. In an armor-projectile having a hollow space tapering towards the projectile point and a plurality of chambers, the combination of a bursting charge arranged in each of said chambers and having its cross-sectional area nearest the projectile point receiving the total pressure of the charge of the chamber on impact; a solid body arranged in the reduced end of the hollow space and having an abutting surface against which lies the bursting charge of the chamber nearest the projectile-point, said abutting surface being of an area sufficient to prevent ignition of the bursting charge by the concussion caused by the projectile hitting the armor; a fuse actuated by the impact of the projectile upon the target; and means interposed between the end of the fuse and the bursting charge, said means being adapted to retard the transmission of fire from the fuse to the bursting charge.

3. In an armor-projectile having a hollowed tapering point, the combination of a bursting charge arranged in the hollow space; a solid body arranged in the reduced end of the hollow space and having an abutting surface against which lies the bursting charge, said abutting surface being of an area sufficient to prevent ignition of the bursting charge by the concussion caused by the projectile hitting the armor; a fuse adapted to be ignited by longitudinal displacement at the instant of impact; and means separating the fuse from the charge, whereby the transmission of fire from the fuse to the bursting charge is delayed.

The foregoing specification signed at Dusseldorf, Germany, this 29th day of November, 1907.

ALFRED WRATZKE.

In presence of—

WILHELM FLASCHE,
C. M. RURAMY.