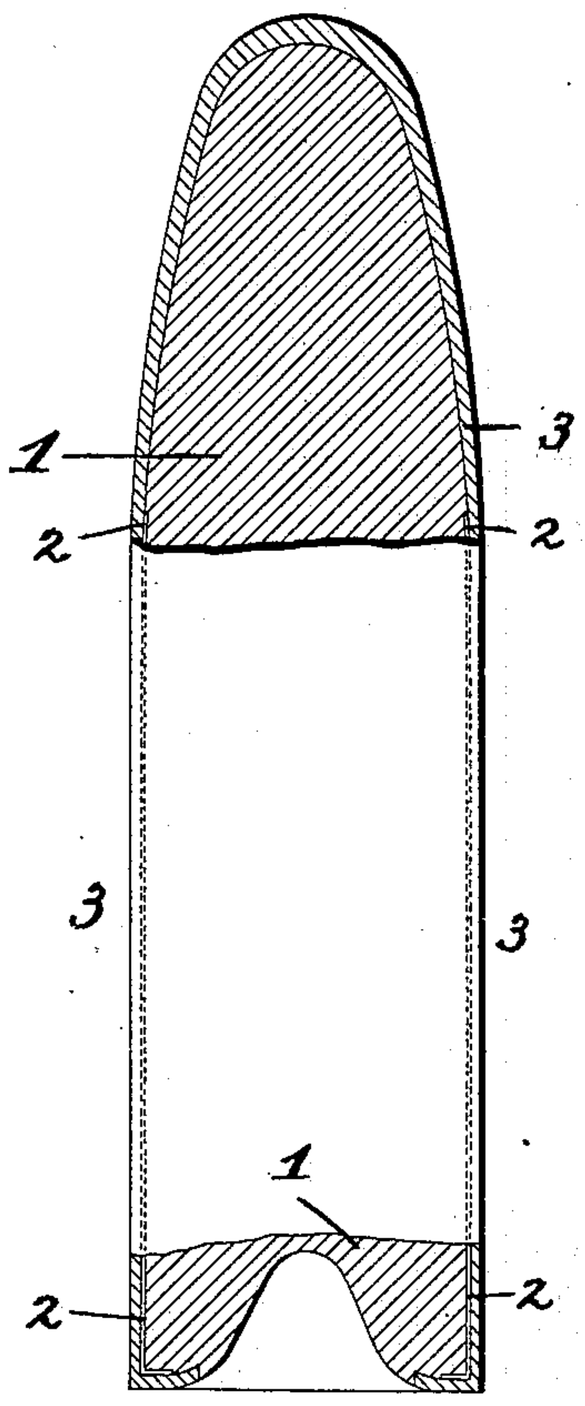
(No Model.)

H. ST. JOHN HALFORD & W. E. METFORD.

PROJECTILE.

No. 406,728. Patented July 9, 1889.



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UNITED STATES PATENT OFFICE.

HENRY ST. JOHN HALFORD, OF WISTOW, AND WILLIAM ELLIS METFORD, OF REDLAND, BRISTOL, ASSIGNORS OF ONE-THIRD TO ARTHUR GREENWOOD, OF LEEDS, ENGLAND.

PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 406,728, dated July 9, 1889.

Application filed May 5, 1888. Serial No. 272,992. (No model.)

To all whom it may concern:

Be it known that we, HENRY ST. JOHN HALFORD, baronet, C. B., colonel, a subject of the Queen of Great Britain, and a resident of Wistow, England, and WILLIAM ELLIS METFORD, civil engineer, a subject of the Queen of Great Britain, and a resident of Redland, Bristol, England, have invented new and useful Improvements in the Manufacture of Projectiles for Fire-Arms, of which the following is a specification.

Our invention is designed to provide improved projectiles or bullets for breech-loading rifles and machine or other guns, and relates to that class of projectiles in which a core or central portion of lead or other suitable metal or alloy is inclosed in a case or envelope of copper or other metal or alloy harder than lead. In the use of such projectiles great difficulty has arisen from the inaccuracy and uncertainty of the practice in relation to the first shot with a rifle which has been cleansed from the fouling of previous firing. This inaccuracy and uncertainly caused by the fusion or partial fusion of the core by the heat due to the friction, though specially attending the first shot out of the cleansed bore, is also found to be more or less existent in and therefore prejudicial to the efficiency and accuracy of the succeeding shots from such bore. In relation to efficiency, it weakens the tenacity of the core, and by so doing causes the projectile to yield on its impact and even break up readily, while the shedding of the melted material, which at times takes place during its flight, and the limpness due to the plastic condition of the core, cause the inaccuracy and uncertainty above referred to. Heretofore, although the existence of this difficulty has been well known and has now been attributed to the right cause—viz., the injury to the projectile in consequence of the fusion or partial fusion of the core by the heat due to the friction of the projectile in the barrel—no satisfactory means have been discovered or provided for its prevention. We have, however, discovered that the difficulty may be avoided by protecting the core or interior of the bullet against the access of sufficient heat to raise the temperature of the core to the melting or fusing point of the lead or other metal or alloy of which it is formed. We effect this object as follows—that is to say, we insert between the core and the outer case or envelope a tube, coil, or sleeve of some non-conductor or slow conductor of heat, and thus obstruct the passage of the heat through the casing to the core to such an extent as will prevent the melting or partial melting or fusion of the latter. For this purpose we use paper, textile fabrics, leather, wood, asbestus, pigments, or other slow conductors of heat capable of application to the projectile in the manner specified. If we use paper, textile fabric, or the like, we form it into a tube and place it on the core or wrap or coil it around the core before placing the envelope or case thereon. If we use a pigment or the like, we apply it in any suitable manner to the core before placing the latter in the case; or we apply the protective substance to the interior of the envelope or case at any convenient stage of its manufacture.

In the annexed drawing the figure represents a central sectional view of a projectile made in accordance with our invention.

In said drawing, the numeral 1 designates the core; 2, the tube, coil, or sleeve of non-conducting material, and 3 the outer case or envelope.

What we claim is—

A projectile or bullet having a solid metal core formed of lead or alloy inclosed in a case of copper or other metal harder than lead, said projectile or bullet having its solid core protected against fusing by friction in a gun-barrel through the medium of an additional thickness of substance interposed between the core and case and which is of slower conductivity than the solid core, substantially as described.

In testimony whereof we have hereunto signed our names in the presence of two subscribing witnesses.

HENRY ST. JOHN HALFORD.
WILLIAM ELLIS METFORD.

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