A. F. SHORE.

PROJECTILE.

APPLICATION FILED DEC. 10, 1913.

1,089,161. Patented Mar. 3, 1914.

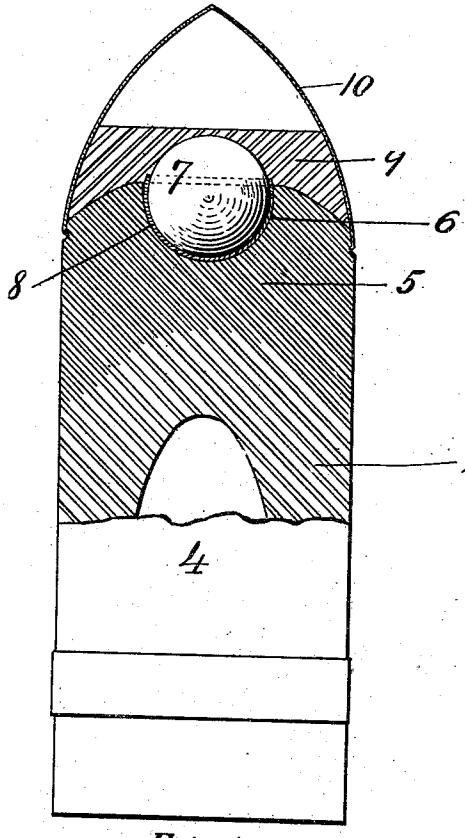


Fig. 1

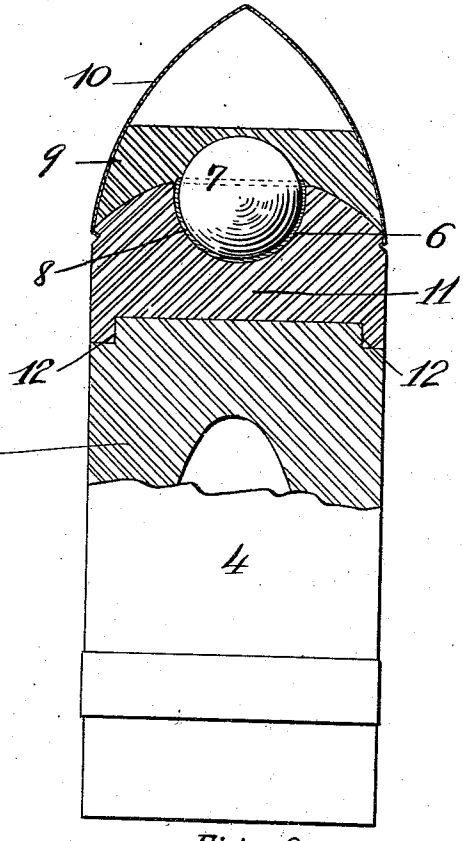


Fig. 2

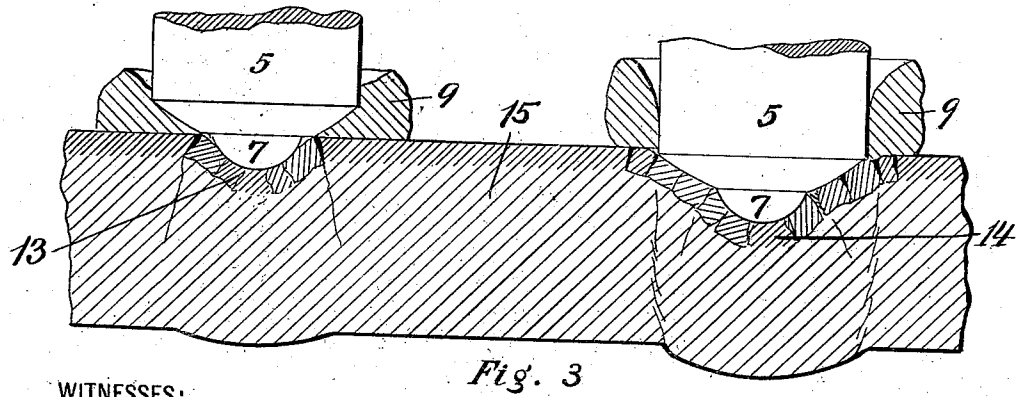


Fig. 3

WITNESSES:

Orinn Dunlap

Stella Washington

INVENTOR

Albert F. Shore

BY

Edward Hoffman

ATTORNEY

UNITED STATES PATENT OFFICE.

ALBERT F. SHORE, OF NEW YORK, N. Y.

PROJECTILE.

1,089,161 Specification of Letters Patent. Patented Mar. 3, 1914.

Application filed December 10, 1913. Serial No. 805,690.

To all whom it may concern:

Be it known that I, ALBERT F. SHORE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Projectiles, of which the following is a full, clear, and exact specification.

This invention relates to improvements in projectiles of the type used for piercing armor plates, and the object of the invention is to provide a projectile of improved construction embodying certain novel features whereby the projectile becomes more efficient and effective in crushing and penetrating the armor plate, and whereby the cost of manufacturing such projectiles is lessened.

To this end, my invention consists of such parts and elements arranged in combination as hereinafter set forth and as illustrated in the accompanying drawing, in which—

Figure 1 is a view partly in section of a projectile embodying my invention. Fig. 2 is a similar view, showing a modification, and Fig. 3 is a view illustrating two phases or positions of the projectile in the act of penetrating and crushing an armor plate.

The manufacture of large size modern projectiles for use against armor plate is accompanied by great difficulties because of the failure of the large mass of steel to harden properly. Another objection, is the enormous expense of making the whole mass of the projectile of alloy steel, when only the point or impact portion needs to be hardened. As projectiles are now made, the forward end is pointed to facilitate penetration and to cut the air, but since this point is at once crushed against a hard plate, final penetration and crushing of the plate is effected by the flattened or blunt nose by the process of punching out a plug the full diameter of the shell. The point is, therefore, not the product of the most advantageous design. A cylinder of less hard material having a relative blunt nose or impact portion of intensely hard steel will embody a mechanical principle far more effective to crush the face of the armor plate, and since the body of the shell can be of comparatively inferior material, the same efficiency can be obtained at considerable less cost than when the entire projectile is made of high grade of alloy steel.

My invention is, therefore, embodied in a projectile comprising a body portion provided with a chilled fore end and further provided with an impact member of intensely hard steel and which preferably is in the form of a ball. The fore end of the projectile is thereafter furnished with the usual soft cap and a sheet metal point to facilitate cutting of the air.

The detailed construction and arrangement is illustrated in Fig. 1, in which the reference numeral 4 denotes the body of the projectile, which is a relatively soft casting, in the usual form. The fore end 5 of this cylinder is chilled and hardened and provided with a socket 6 for the reception of a ball 7 of intensely hard steel. A thin layer or lining 8 of soft steel is interposed between the ball and the cylinder to afford better and uniform contact and to eliminate uneven strains at the moment of impact. 9 represents the usual soft metal cap and 10 is the sheet metal point which is shrunk on to the fore end 5.

The modification illustrated in Fig. 2 differs from Fig. 1, in that the chilled fore end 11 is separate from the body 4 and is shrunk on, the body and fore end being provided with coöperating shoulders at 12. At the moment of impact, the metal cap is, of course, shattered and the soft cap 9 is forced back exposing the ball 7, which crushes in the hard face of the armor plate at 13, Fig. 3, without itself being damaged by those improper strains to which a sharp solid point would be exposed, as, for instance, when the projectile strikes the plate at an angle or obliquely.

At 14, Fig. 3, the plate 15 is shown weakened by the penetration of the ball and the body of the projectile will punch through the usual plug and thus penetration is effected with a ballistic mass of comparatively inferior and cheaper metal.

It is obvious, that by using a ball, that is a small body with a large chilling surface, I not only obtain the maximum depth of hardness, but also the maximum fineness of grain, intensity of hardness, and very great strength, because but little superheat is required in the hardening process. The ball acts as a blunt punch or impact body and penetrates the plate gradually to crush it without unduly shocking or upsetting the body of the projectile.

The invention being susceptible of changes

in the detailed construction, I do not wish to be limited beyond the scope of the appended claims.

I claim:

1. An armor-piercing projectile comprising in combination a relatively soft body having a hardened blunt fore end to the full diameter of said body, and provided with a socket, a hardened steel ball seated in said socket, a soft cap forward of the said hardened fore end, and a sheet metal point secured to the latter.

2. An armor-piercing projectile comprising in combination a relatively soft body having a hardened blunt fore end provided with a socket, a hardened steel ball seated in said socket, a soft lining in said socket interposed between said hardened fore end and the said steel ball, a soft cap over the latter and a metal point secured to the said hardened fore end.

3. An armor-piercing projectile comprising in combination a relatively soft body, a hardened fore end portion shrunk on to said body and provided with a socket, a hardened steel ball seated in the latter, a soft cap forward of said hardened fore end and the said steel ball, and a hollow metal point secured to the said hardened fore end.

In testimony whereof, I affix my signature, in presence of two witnesses.

ALBERT F. SHORE.

Witnesses:
HERMAN C. BELMAR,
MARTHA W. SHAW.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."