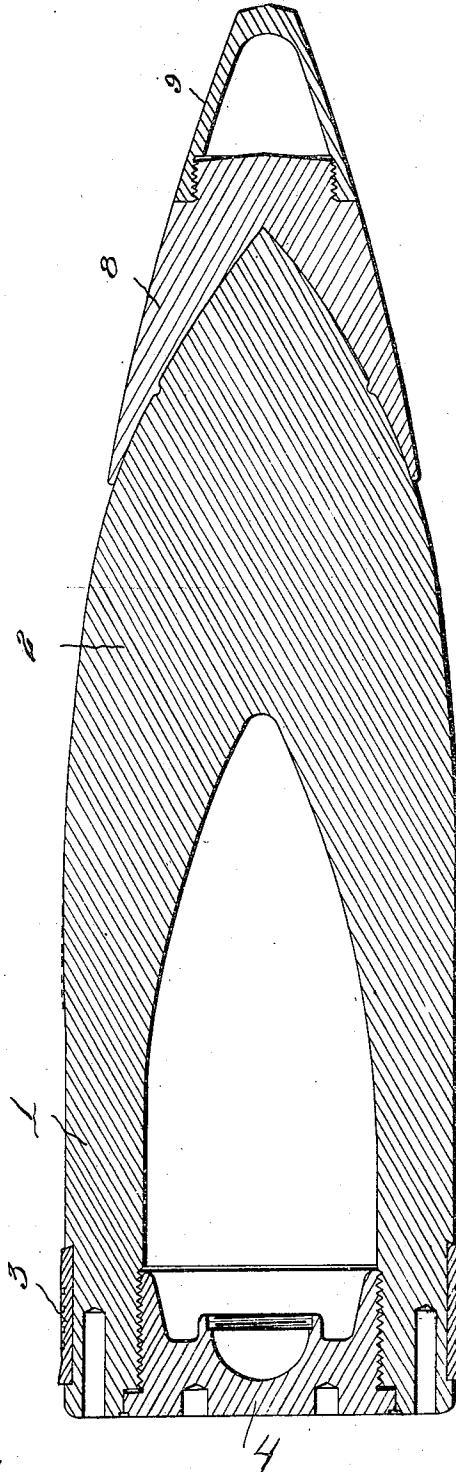


A. J. SODEN.
ARMOR PIERCING PROJECTILE.
APPLICATION FILED JAN. 7, 1913.

1,059,403.

Patented Apr. 22, 1913.

2 SHEETS—SHEET 1.



Witnesses.

Edwin J. Beller.

Oscar W. Helwig

Inventor.
A. J. Soden.

by H. Ayres
Attorney.

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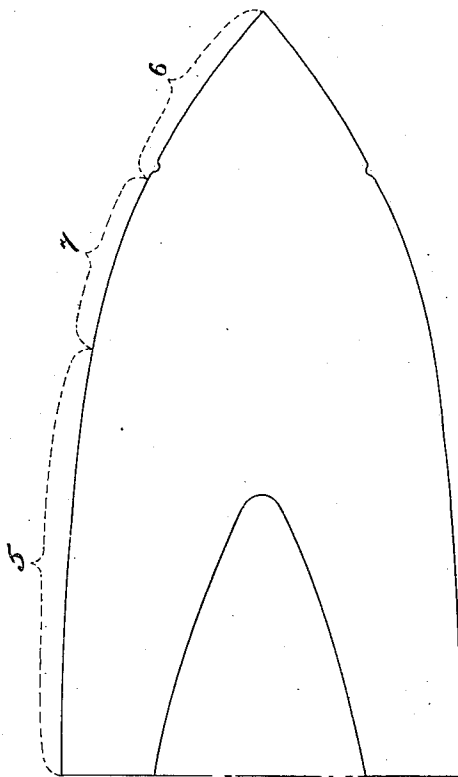


Fig. 2.

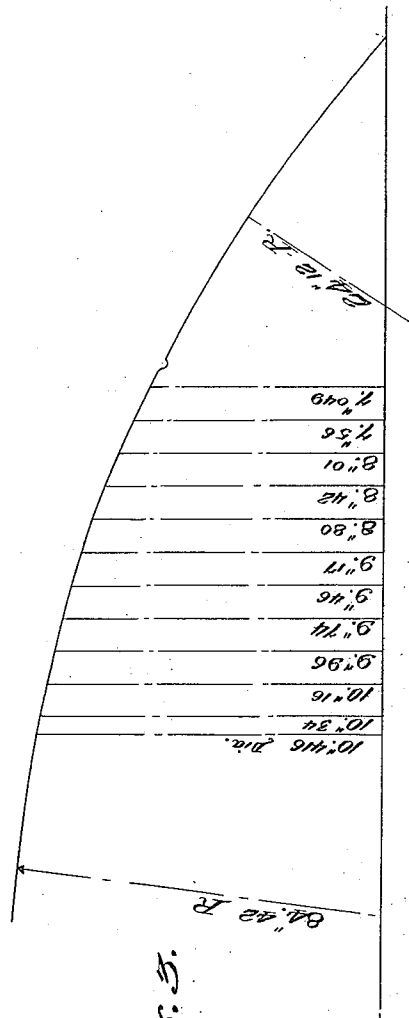


Fig. 3.

Witnesses.

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UNITED STATES PATENT OFFICE.

ALFRED J. SODEN, OF NEWARK, NEW JERSEY, ASSIGNOR TO CRUCIBLE STEEL COMPANY OF AMERICA, OF PITTSBURGH, PENNSYLVANIA.

ARMOR-PIERCING PROJECTILE.

1,059,403.

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed January 7, 1913. Serial No. 740,741.

To all whom it may concern:

Be it known that I, ALFRED J. SODEN, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Armor-Piercing Projectiles, of which the following is a specification.

My invention relates to improvements in armor-piercing projectiles and caps therefor, and it consists in the constructions, combinations and arrangements herein described and claimed.

An object of my invention is to provide an improved armor-piercing projectile of greatly increased strength adapted to bite into and penetrate an armor plate throughout a maximum range in the angle of incidence.

A further object of my invention is to provide an improved armor-piercing projectile and cap, constructed to minimize the resistance to its flight and the velocity and energy required for penetration.

In the accompanying drawings, forming a part of this application and in which similar reference symbols indicate corresponding parts in the several views: Figure 1 is an axial section, illustrating one embodiment of my invention applied to a 12-inch projectile; Fig. 2 is a diagrammatical view showing the form of the axial elements of the contour of the projectile point, and Fig. 3 is a diagrammatical view, drawn to one-quarter scale, showing a portion of one of the axial elements.

Referring to the drawings, 1 indicates the cylindrical body portion of a projectile provided with my preferred point 2, which is shown of greater length than the standard ogival point having a uniform curvature radius of two calibers.

The projectile is provided with a band 3, and a base plug 4 constructed to screw tightly to place against a graphite gasket.

In my improved projectile, the preferred form of point is provided with a base portion 5 which is sharper than that employed in the previous armor-piercing projectiles; said base portion being shown with a radius of longitudinal curvature equal to substantially seven calibers, and extending through approximately one-half the total length of point. The point is formed with a blunter

tip portion 6, extending through substantially one-fourth the total length of the point, and formed with the longitudinal curvature of a standard ogival point having a uniform curvature radius of two calibers. The base and tip portions of the point are connected by an intermediate portion 7, formed with a variable curvature radius, all axial contour elements of which comprise variable curves, and which is blunter than said respective portions at points adjacent thereto; said intermediate portion extending through substantially one-fourth the total length of the point.

From the above description, it will be understood that my invention provides an improved projectile, in which all axial elements of the point contour comprise a tip arc of approximately two-caliber radius, a base arc of greater radius, and a variable curve connecting said arcs. This improved construction provides a projectile having an integral point substantially one and three-fourths calibers long, comprising a base portion extending through substantially one-half the total length of the point, and formed sharper, or with a greater radius of longitudinal curvature, than previous constructions; a blunter tip portion extending through substantially one-fourth the total length of the point, and corresponding in taper to the standard naval ogival point of two-caliber radius curvature; and an intermediate portion all axial contour elements of which comprise variable curves extending from said base portion with a progressively increased curvature tangentially to said tip portion for producing a blunting of the point at approximately .875 caliber length from the tip.

In this construction, the chamber for the explosive charge is extended within the long and sharp base portion of the point: said base portion providing walls of maximum resistance to shearing on cones of forty five degrees at the forward end of said chamber. This insures an enlarged chamber capacity, and efficiently advances the position of the center of gravity of the projectile. The improved contour of the point provides a construction which will bite into and penetrate armor plate at a reduced velocity energy of the projectile, and in which a maximum resistance will be provided throughout the

point against failure of the projectile through crushing or chipping of the tip and shearing strains.

The cap for my improved projectile comprises a solid body portion 8 and a hollow tip portion 9, which present through the length of the cap a smooth contour constituting a continuation of the contour of the sharp base portion 5 of the projectile point: the cap having the same longitudinal curvature as said base portion 5. By this construction, the resistance of the projectile during flight will be minimized, the center of mass of the cap will be advantageously positioned relative to the projectile tip, and the sharp contour of the solid body portion 8 of the cap insures an efficient bite into the armor plate throughout a maximum range in the angle of incidence.

Having thus described my invention, what I claim as new and desire to secure by Letters-Patent is:

1. The herein described improved armor-piercing projectile provided with an integral point having all axial elements of its contour comprising a tip arc of at least two-caliber radius, a base arc of greater radius, and a variable curve having a greater degree of curvature throughout than said base arc and extending from the latter with a progressively increased curvature to said tip arc.

2. The herein described improved armor-piercing projectile provided with an integral point having all axial elements of its contour comprising a tip arc of at least two-caliber radius extending approximately .44 caliber length from the tip, a base arc of greater radius, and a variable curve having a greater curvature throughout than said base arc and extending from the latter with a progressively increased curvature to said tip arc.

3. The herein described improved armor-piercing projectile provided with an integral point having all axial elements of its contour comprising a base arc having approximately seven caliber radius, a tip arc of less radius, and a variable curve having a greater degree of curvature throughout than said base arc and extending from the latter with a progressively increased curvature to said tip arc.

4. The herein described improved armor-piercing projectile provided with an integral point of substantially one and three-fourths calibers length, comprising a base portion having a length approximately one-half that of the entire point, a sharper tip portion having a length approximately one-fourth that of the entire point, and an intermediate portion having a progressively increased curvature from said base portion to said tip portion.

5. The herein described improved capped armor-piercing projectile provided with an integral point having all axial elements of its contour comprising a base arc having approximately seven caliber radius and extending through substantially .875 calibers, a tip arc of less radius, and a variable curve having a greater degree of curvature throughout than said base arc and extending from the latter with a progressively increased curvature to said tip arc, and a cap comprising a solid body portion and a hollow tip portion formed throughout with a smooth contour constituting a continuation of the contour of the base portion of said projectile point.

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

ALFRED J. SODEN.

Witnesses:

WM. H. CAMFIELD,
W. A. JOHNSON.