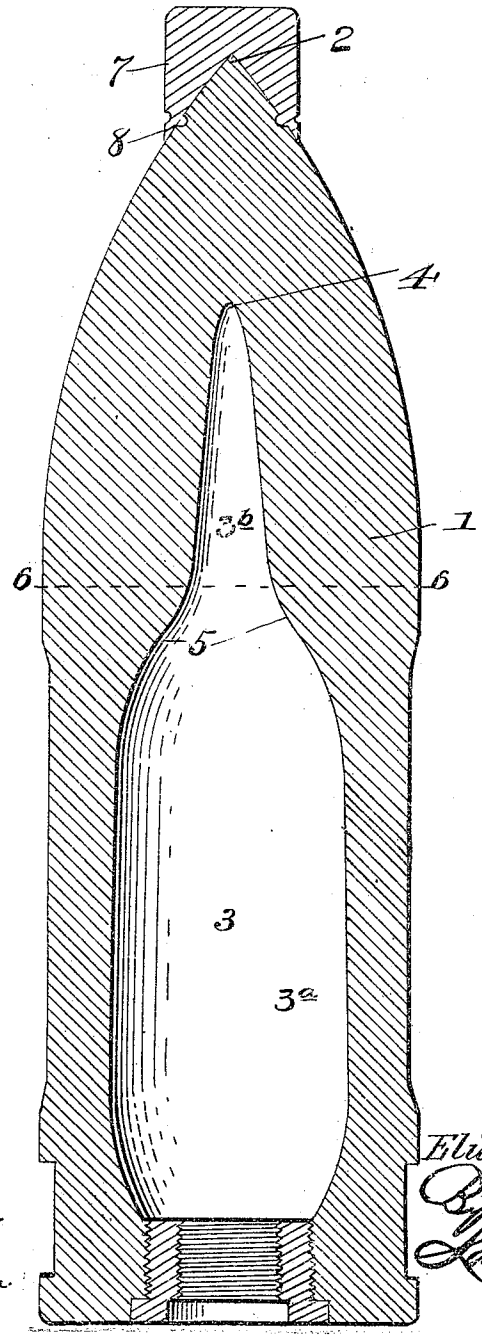
No. 732,638. PATENTED JUNE 30, 1903.

E. M. JOHNSON.

PROJECTILE.

APPLICATION FILED OCT. 20, 1902.

NO MODEL.



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No. 732,638. Patented June 30, 1903.

UNITED STATES PATENT OFFICE.

ELIAS M. JOHNSON, OF NEW YORK, N. Y.

PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 732,638, dated June 30, 1903.

Application filed October 20, 1902. Serial No. 128,008. (No model.)

To all whom it may concern:

Be it known that I, ELIAS M. JOHNSON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Projectiles, of which the following is a specification.

My invention relates to armor-piercing projectiles; and the object of the same is to construct an improved projectile for use in combination with the Johnson cap covered by United States Letters Patent No. 581,211.

The simple and novel construction employed by me in carrying out my invention is fully described in this specification and claimed, and illustrated in the accompanying drawing, forming a part thereof, in which the figure is a longitudinal section of my projectile with the cap thereon.

In constructing modern armor-piercing projectiles, while much study has been expended on the improvement of materials of construction and methods of hardening them, but little study has been made to determine the best form of the charge-cavity. The patented art discloses few patents in which the form of the cavity is directly or even indirectly recited in a claim. Where a cavity is shown, in order to distinguish between a solid shot and a shell it consists of a cylindrical body portion and a conoidal point—that is, it is geometrically similar to the external contour of the projectile itself. Whether this preference is founded on a rational theory or whether each constructor has blindly followed precedent without investigation, supposing the field exhausted, I do not know. However, my experiments seem to show that the ordinary form of charge-cavity can be improved upon and the penetrative form of the shell thereby increased.

One of the exceptions alluded to above is the United States Patent No. 424,442. The projectile described in the specification of that patent is made in two pieces, the pointed head being welded onto the body, thereby forming an internal ridge or bur, which projects into the charge-cavity and breaks the contour thereof, which contour is otherwise of the ordinary form before alluded to. This bur strengthens the weld, but the resulting projectile is probably inferior in strength to an integral one without the bur. In using projectiles containing the ordinary cavity in combination with the Johnson cap I found that the line of failure of the projectile was almost coincident with the line of junction of the point and the body of the projectile, showing that this part was deficient in strength. To remedy this defect is the object of my invention.

The numeral 1 designates the body of a projectile having a point 2 thereon. A charge-cavity 3 is formed in the body 1 and point 2, which cavity is bottle-shaped and comprises a substantially uniform cavity 3^a, which traverses the body 1, and a reduced cavity 3^b, which extends into the point 3 about one-half the length of said point. The reduced cavity 3^b runs out to a point at 4 and the metal is rounded off on a reverse curve at the junction 5 of the cavities 3^a and 3^b. By this construction an additional amount of metal is left in the point of the projectile over the ordinary method of construction, and a series of actual tests on modern armor show that this extra material gives additional strength much in excess of what ordinary theory would lead one to suspect. The junction 5 is located in the same plane with the line 6 of junction of the point 2 and the body 1. A cap 7 is fitted on the end of the projectile and engages a groove 8 thereon to hold it in place. A projectile constructed in this manner is subjected to the usual hardening process both from the outside and inside, thereby securing the maximum strength for the part of the shell subjected to the greatest strain.

I do not wish to be limited as to details of construction, as these may be modified in many particulars without departing from the spirit of my invention.

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

1. An armor-piercing projectile comprising a body bearing a point cast integral therewith, and having a cavity therein which traverses said body and a reduced cavity which traverses said point for a portion of the length thereof, said point having a solid non-apertured tip, substantially as described.

2. An armor-piercing projectile comprising a body bearing a point cast integral there-

with and having a bottle-shaped charge-cavity therein, the reduced neck portion of said cavity extending into the said point of said projectile, said point having a solid non-apertured tip, substantially as described.

3. An armor-piercing projectile comprising a body bearing a point cast integral therewith and having a bottle-shaped charge-cavity therein, the reduced neck portion of said cavity extending into said point, the metal being rounded off on a reverse curve at the junction of said reduced cavity and the main cavity, said point having a solid non-apertured tip, substantially as described.

4. An armor-piercing projectile comprising a body having a point cast integral therewith and containing a bottle-shaped charge-cavity, the line of junction of the reduced neck portion of said cavity and the uniform body portion, lying in the same plane with the line of junction of the said body and said point of the projectile, substantially as described.

5. A projectile cast in one piece having a cavity therein the walls of which are formed by compound curved lines, the forward portion of said cavity being a reduced elongated extension of the rear portion of the cavity forming at their junction a shoulder whereby the part of the projectile most liable to failure and subjected to the greatest strain is reinforced and strengthened, said projectile having a solid non-apertured tip, substantially as described.

6. A projectile cast in one piece having a bell-arched or bottle-shaped cavity therein, the inner and outer walls being hardened whereby the walls adjacent to the elongated reduced portion of the cavity are strengthened and reinforced to resist strain, the point of said projectile having a solid non-apertured tip, substantially as described.

7. The combination of a projectile having a solid point formed integral with the body thereof and containing a bottle-shaped charge-cavity the reduced portion of which extending into said point and a soft-metal cap mounted on the point of said projectile, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ELIAS M. JOHNSON.

Witnesses:
CHAS. C. WOLFROM,
JULIUS BORDOLLO.