

(No Model.)

C. Y. WHEELER.
ARMOR PIERCING PROJECTILE.

No. 569,143.

Patented Oct. 6, 1896.

Fig. 1

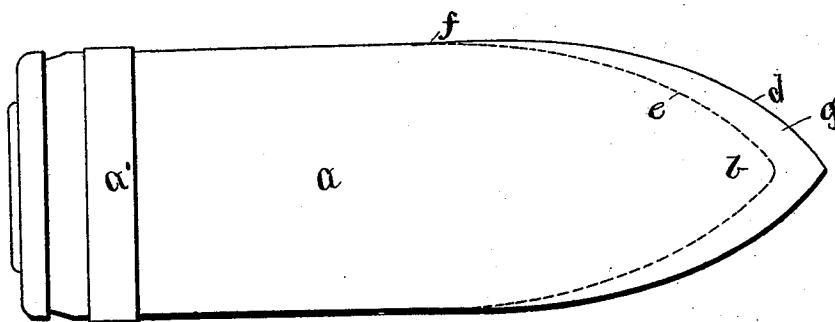
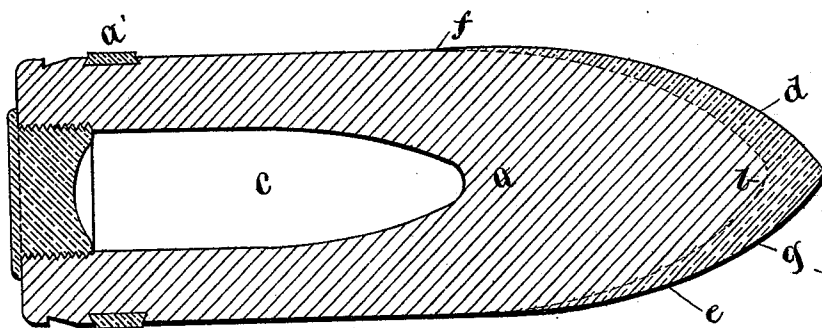


Fig. 2.



Witnesses
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CHARLES Y. WHEELER, OF ALLEGHENY, PENNSYLVANIA.

ARMOR-PIERCING PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 569,143, dated October 6, 1896.

Application filed November 30, 1894. Serial No. 530,346. (No model.)

To all whom it may concern:

Be it known that I, CHARLES Y. WHEELER, a resident of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Projectiles and Their Manufacture; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to projectiles and to what are known as "elongated" projectiles, either solid-shot or shell. These projectiles, in the advance of the art, have been made of a high quality of steel, the conoidal or tapering-point portion or forward end being tempered or hardened to penetrate the armor-plate.

It consists, generally stated, in a projectile having a tapering-point portion or forward end formed of an integral body of steel or other suitable metal, the outer surface metal of the point portion of which is unhardened, while the interior body, back of such surface metal and conforming substantially to the tapering outlines desired for a projectile, is hardened, so that out of the same body of metal a covering of unhardened metal is provided over the hardened interior, which will receive the first impact and which will protect the hardened portion from heating by the impact or blow, and so preserves it in its hardened condition, while the heat generated by the impact of the soft exterior on the plate will soften the plate and aid in the penetration thereof.

It also consists in the method of forming such projectiles, as will be hereinafter more particularly described and claimed.

To enable others skilled in the art to make and use my invention, I will describe the same fully, referring to the accompanying drawings, in which—

Figure 1 is a side view of the completed projectile, indicating by dotted lines the hardened interior thereof, and Fig. 2 is a longitudinal central section of the projectile.

Like letters of reference indicate like parts in each.

The projectile is formed of any approved metal and in any approved way, being generally formed of a high quality of steel, and in the present case the invention will be described in connection with a steel projectile.

The projectile has a cylindrical body portion *a*, with the sabot *a'* at the rear end thereof, and the conoidal or tapering-point portion or forward end *b*.

The projectile is either solid throughout, or is formed hollow, as at *c*, when the invention is employed in connection with shells.

The projectile, as illustrated in the drawings, is preferably made with the point portion somewhat longer in the taper than the present approved lines or contour for projectiles, so providing for an inner hardened portion corresponding substantially to the approved lines of taper of a projectile and a covering of unhardened metal outside thereof. In the drawings the outer contour of the tapering-point portion is indicated by the line *d*, while the general outline of the hardened portion is indicated by the dotted lines *e*, the space between the dotted lines *e* and the lines *d* showing the surface metal, which is unhardened, while the portion within the dotted lines *e* indicates the hardened body of the shell, over which the unhardened covering extends. It is of course to be understood that the exact outline of the hardened body, as well as the point of separation between it and the unhardened covering, will vary, but the line *e* is intended to substantially indicate the line between the hardened and unhardened metal.

The projectile is formed in the ordinary approved way by forging or otherwise, until brought to the desired shape and in condition for tempering or hardening. It is then hardened in any desired way from the forward end along the tapering-point portion to or slightly back of the bourrelet, as at *f*, being hardened by any suitable tempering or hardening process. By any suitable means, such as by a quick heating of the tapering forward end of the projectile, the temper is then drawn for the desired depth, which can, by approved means, be very accurately regulated, so as to leave the outer metal of the point portion untempered for a depth corresponding to the desired thickness of the covering of unhardened metal on the point portion of the shell.

The shell may be formed by hardening it in the manner above described, and then heating it by any accurate heating means which may be timed and controlled, and permitting the

end of the projectile to cool in the atmosphere, so drawing the temper from the outer surface metal while leaving the interior hardened on substantially the approved outline 5 of the projectile. This can be accomplished without affecting the hardness of the temper of metal underneath, so that the projectile is formed from an integral body of steel, but has over its hardened point a covering of the 10 same steel which is unhardened or untempered, as at *g*.

In the use of the projectile it is found that its penetrative power is greatly increased. The reason for this is believed to be that under 15 the tremendous impact of the projectile against the plate an intense heat is generated, which heat is, in the improved projectile, generated between the soft outer portion of the tapering forward end and the armor-plate 20 against which the projectile strikes. This heat of impact acts upon the outer surface of the projectile and upon the armor-plate. The outer unhardened surface metal of the projectile being, of course, first heated by 25 the heat of impact and the armor-plate being softened, the covering of unhardened metal protects the hardened interior portion of the point, which remains cool and hard, and so more easily penetrates the plate, the un- 30 hardened surface metal having served its purpose of sustaining the impact and protecting the hardened interior of the projectile from being so heated by the impact as to withdraw the temper therefrom, and at

the same time of heating and softening the 35 armor-plate at the point where the projectile strikes. The melting or fusion of the unhardened metal of the shell may also aid in the reducing of the friction between the hardened portion of the projectile and the plate. 40

I hereby disclaim the broad idea of a chilled-head projectile having a relatively soft point formed integral therewith.

What I claim as my invention, and desire to secure by Letters Patent, is— 45

1. A projectile having a tapering-point portion or forward end formed of an integral body of metal, the outer surface metal of which is unhardened, while the interior body 50 back of such surface metal and conforming substantially to the desired projectile outlines is hardened, substantially as set forth.

2. The method of forming projectiles consisting in forming a steel projectile, then hardening the forward end for a considerable 55 depth into the body portion, and then drawing the temper from the surface metal of the forward end, so as to leave the projectile with the covering of unhardened surface metal and an interior body back thereof which 60 is hardened, substantially as and for the purposes set forth.

In testimony whereof I, the said CHARLES Y. WHEELER, have hereunto set my hand.

CHARLES Y. WHEELER.

Witnesses:

CAROLINE E. DAVIDSON,
CHAS. W. MACKEY.