(No Model.)

L. GEIGER.

PROCESS OF MAKING PROJECTILES.

No. 306,738. Patented Oct. 21, 1884.

Fig. 1.

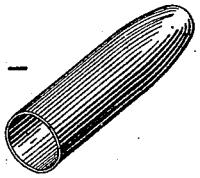


Fig. 2.

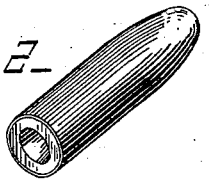


Fig. 3.

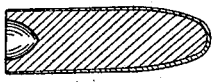


Fig. 4.

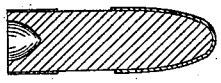
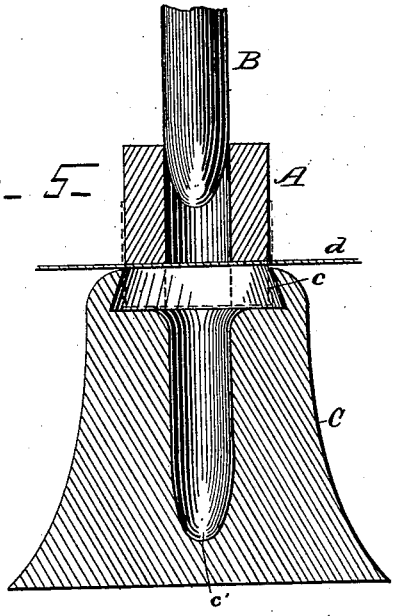


Fig. 5.



WITNESSES:

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LEONARD GEIGER, OF HUDSON, NEW YORK.

PROCESS OF MAKING PROJECTILES.

SPECIFICATION forming part of Letters Patent No. 306,738, dated October 21, 1884.

Application filed May 12, 1884. (No model.)

To all whom it may concern:

Be it known that I, LEONARD GEIGER, a citizen of the United States of America, residing at Hudson, in the county of Columbia and State of New York, have invented certain new and useful Improvements in Processes for Making Coated Projectiles, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates more particularly to the manufacture of conical or Minié bullets, such as are usually made of lead; and the object of it is to produce such a bullet with a very firm, hard point, of greater penetrative power, and having a body which will not damage or foul the barrel in which it is employed.

The invention consists in the process whereby the bullet is made, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a perspective view of the coating of my bullet; Fig. 2, a similar view of a coated bullet; Fig. 3, a longitudinal section thereof. Fig. 4 is a modification, also in section; and Fig. 5, a section of the tools I prefer to employ in making the coating.

To make my improved bullet I employ a sheet of thin metal, preferably copper, according to my experience thus far; but other metals or compositions of metals may be used; and in making the same I employ two punches, A B, and a matrix or mold having a large recess, *c*, at the top, which is circular and about four times the diameter and one-fourth the depth of the lower or finishing recess, *c'*, the bottom of which lower recess is conical. Into the larger or top portion a disk of sheet metal, as *d*, is forced by means of the annular punch A, so as to form a cup thereof, as shown in dotted lines, and immediately after and within it follows the other punch, B, which is conical at its lower end, and of such size as to fit the lower recess, *c'*, less the thickness of the sheet metal employed, which forces this metal down the entire depth of the mold, giving it the conical termination at its apex. This sheet-metal shell is completed by trimming off its ragged upper and open end, forming the shell shown in Fig. 1, and the bullet is then completed by forcing into the shell a lead body a trifle larger than the interior of the shell, whereby the two are made to fit accurately, and the metal of the body is condensed so as to become very hard, which hardness is increased by the power used to force the body into the shell; and it may be further increased by forcing a conical plug into the end of the body, which will condense the metal and make a recess in the base of the body, as shown in Figs. 2, 3, and 4.

By my method of construction the bullet is entirely coated from base to apex with a material that will not appreciably foul the barrel, which will thus seldom require cleaning, for the tendency of the copper covering when forced outward by the expansion of the gases due to the explosion will be to scrape the interior of the barrel and the rifle-grooves clean of the deposits caused by the smoke of the previous discharge. Independently of this advantage and of its more perfect shape when it leaves the barrel, causing it to keep its point forward, and thus travel farther, the bullet will have a greater penetrative power, because, the copper coating being made very hard by the process of forming it, the bullet, on striking a hard substance—such as a bone, for instance, or some of a soldier's accouterments—will still retain its shape, and hence pass through the bone or other obstruction and do execution, where a bullet uncoated would be flattened and become comparatively harmless.

I prefer to make the coating thickest at the apex, as it makes it stronger at this point, and it is thus less liable to be driven out of shape by the impact on striking an obstacle, and will hence have more penetrative power, although it will have a good effect if the coating is of the same thickness from apex to base.

Instead of entirely casing the bullet, I may sometimes leave a portion of the center of the bullet bare, as shown in Fig. 4, as the copper at each end will prevent the lead coming in contact with the barrel.

I am aware that iron and steel projectiles have been coated with copper by electric deposition; and I am also aware that it has been proposed to partly incase an iron projectile in a copper casing by inserting the butt of the projectile loosely in the top of the casing and then closing the same loosely around said projectiles by means of dies. These projectiles, however, are very different from mine, for the

process of making them is essentially different, and neither of them is adapted to be used in small-arms.

No claim is here made to the coated projectile produced by this process, as it will form the subject-matter of a separate application filed as a division of this one.

What I claim as new is—

The process of making projectiles herein set forth, consisting in first making a conical shell of copper or similar ductile hard metal, and then forcing into the base of the same a body of softer metal, substantially as described.

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

LEONARD GEIGER.

Witnesses:

SHERMAN VAN NESS,

WILLARD PEAK.