

(No Model.)

P. H. HOLMES.
PROJECTILE.

No. 468,621.

Patented Feb. 9, 1892.

Fig. 1.

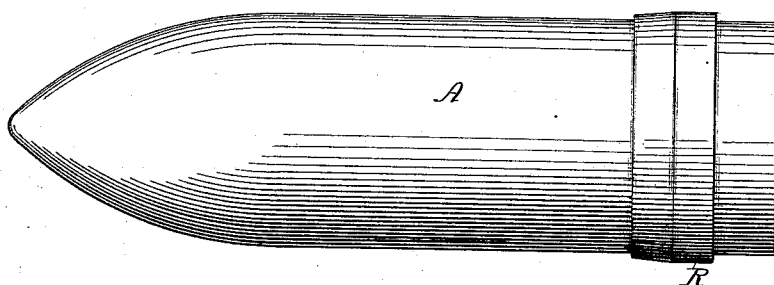


Fig. 2.

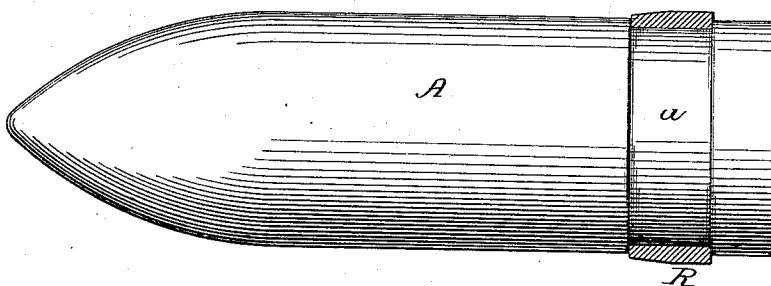


Fig. 3.

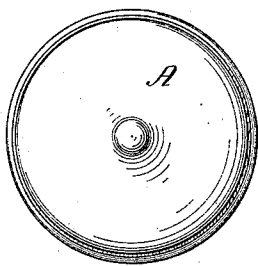
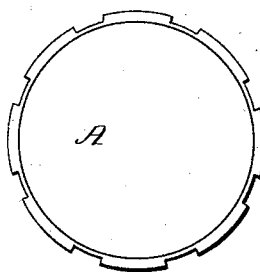


Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

PHILIP HENRY HOLMES, OF GARDINER, MAINE, ASSIGNOR TO THE HOLMES FIBRE-GRAPHITE MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS.

PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 468,621, dated February 9, 1892.

Application filed June 2, 1891. Serial No. 394,889. (No model.)

To all whom it may concern:

Be it known that I, PHILIP HENRY HOLMES, of Gardiner, in the county of Kennebec and State of Maine, have invented certain new and useful Improvements in Projectiles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of my invention is to provide a projectile with a lubricating material which will be formed or shaped by and conform to the rifling of a gun and which will cause the projectile to be turned as it is fired from the gun. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of a projectile, showing my improvement. Fig. 2 is a side view of a projectile, showing the ring in section. Fig. 3 is an end view of a projectile before it leaves the gun, and Fig. 4 is an end view of a projectile after it has left the gun.

In carrying out my invention I make the ring of plumbago and fiber, bound together in any suitable manner, and by preference I make it in the manner or by the process set forth in the application for patent, Serial No. 377,028, of January 7, 1891. In that process I mix fine plumbago with finely-divided fibrous material, preferably wood fiber, then compress and mold it to the desired form, and finally treat with a solution of oil or other varnish. When dried by the action of heat, there is formed in this case a solid ring of lubricating material, which when secured on the projectile will have a substantially uniform or smooth surface to fit the breech of the gun, but which will be readily shaped by the rifling-grooves during the passage of the projectile through the gun. The ring will at the same time have enough strength and tenacity to rotate the projectile on its longitudinal axis in its passage through the gun, so as to give it the required motion and speed. In this instance the proportions of fiber and plumbago may vary according to circumstances, the object being not merely to produce a lubricating-ring, but also to produce

a ring which will have strength enough to prevent the projectile from tearing away the ring in its passage through the gun.

The excellent lubricating and refractory qualities of plumbago, combined with the toughness and elasticity of the bonding material I use in the make up of the rings which I apply to the projectiles, with the readiness of the plumbago to spread itself upon any surface against which it is rubbed, render a ring made in the manner which I will now describe especially applicable for the purpose specified.

The presence of the fiber in the ring gives the requisite strength, while the plumbago is enough of a lubricant to make the passage of the projectile from the gun comparatively easy, and at the same time the plumbago will coat the bore of the gun in the firing, filling up the interstices therein, so that at every discharge the projectile forms a lubricating-coat on the rifled bore of the gun. Better results are thus insured in the firing, and the life of the gun is also increased.

I prefer to make the rings in the following manner: They are first molded, then saturated with a drying-oil or a semi-drying oil, and thoroughly hardened by baking. The rings are then applied to the projectile and turned in a lathe to the proper dimensions; or the rings may be first turned and then applied to the projectiles. The bottom of the groove *a* in each projectile *A* is preferably roughened and the ring in some instances is cut into halves. Cement is then inserted in the groove and is applied to the inside of the ring, and then the two halves of the ring are securely held in place on the projectile until the cement sets. The projectile thus has a complete ring *R* securely fastened to it.

It will be understood that other means of applying the rings to the projectile may be used without departing from my invention, and in some instances a series of segments or guiding projections may be used in place of the complete ring.

In a separate application filed by me on the 23d day of June, 1891, Serial No. 397,188, I have described and claimed a composition of matter, in which semi-drying oil is com-

bined with plumbago or plumbago and fiber to serve as a binder, hence I do not claim the same herein.

I claim as my invention—

- 5 1. A projectile having a guiding portion adapted to fit the breech of a gun, said guiding portion consisting of plumbago combined with a binding material and compressed into a solid homogeneous mass, which will be
10 shaped by the rifling of the gun and will serve to rotate the projectile as it is fired, substantially as described.
2. A projectile having a guiding portion adapted to fit the breech of the gun, said guid-
15 ing portion consisting of plumbago and divided fiber intimately mixed and compressed and combined with a fluid binder, forming a solid homogeneous mass, substantially as described.
- 20 3. A projectile-guiding ring having a sub-

stantially uniform surface to be formed by the rifling of the gun, said guiding-ring consisting of plumbago and divided fiber intimately mixed, compressed, and bound together, substantially as set forth.

4. A guiding-ring for projectiles, formed of a compound consisting of plumbago, fiber, and a drying-oil.

5. A projectile having a guiding-ring composed of plumbago and fiber and a binding 30 material, said ring being made in halves and secured to the projectile by cement.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

PHILIP HENRY HOLMES.

Witnesses:

A. M. SPEAR,
CHARLES L. ANDREWS.