L. B. HARVEY.

PROJECTILE.

APPLICATION FILED JUNE 24, 1918.

1,288,883.

Patented Dec. 24, 1918.

Fig. 1

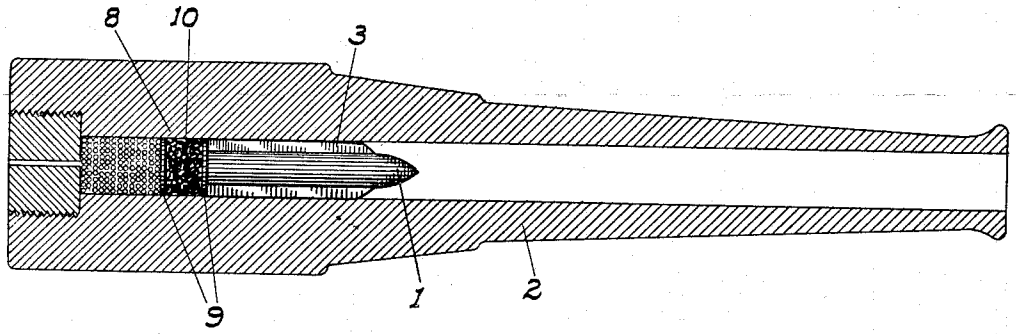


Fig. 3

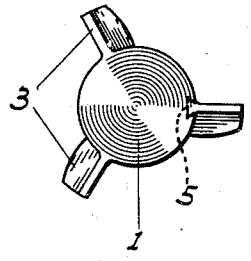


Fig. 2

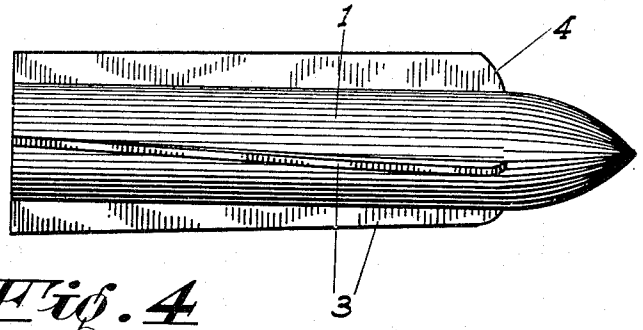
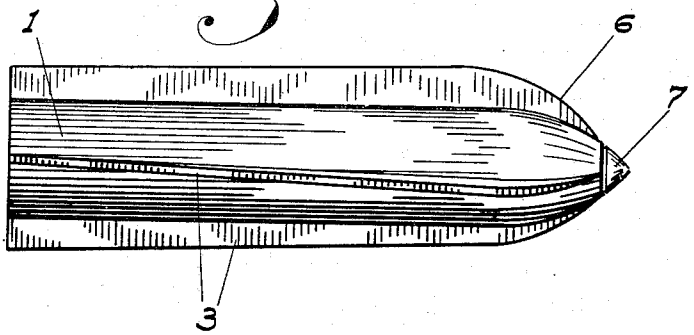


Fig. 4



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PROJECTILE.

1,288,883. Specification of Letters Patent. Patented Dec. 24, 1918.

Application filed June 24, 1918. Serial No. 241,562.

To all whom it may concern:

Be it known that I, LOUIS B. HARVEY, a citizen of the United States of America, residing at the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Projectiles; and I do declare the following to be a clear, full, and exact description of the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in projectiles and particularly to that type used with coast defense or naval ordnance, the principal object of my invention being to produce a projectile or shell which will have a much greater muzzle velocity for a given charge of powder than the present form of shell in the same gun, and hence will be capable of being projected much farther than the ordinary shell under the same conditions.

A further object is to produce a projectile which will do away with the necessity of having the bore of the gun rifled in order to give a rotary or screw motion to the projectile when fired. The present system of rifling the bore of a gun is a slow and costly procedure and unsatisfactory for the reason that the soft collar at the rear of the shell is forced or squeezed into the rifling grooves to assume the screw motion before it leaves the barrel of the gun. This causes great friction and quick wearing of the rifling grooves rendering the gun inaccurate as to aim.

Still another object of the invention is to devise a shell which can be aimed at an object under water, as the hull of a submarine, for instance, with the same certainty of hitting it as obtained with land firing, and which does not ricochet from the surface of the water as do the present projectiles.

A still further object is to produce a projectile which will be simple and inexpensive, and yet extremely efficient for the purposes for which it is designed.

These objects, I accomplish by means of such structure and relative arrangement of the parts as will fully appear by a perusal of the following specification and claims.

On the drawings, similar characters of reference indicate corresponding parts in the several views.

Figure 1 is a longitudinal section of a gun showing my improved projectile therein.

Fig. 2 is an enlarged side elevation of the projectile.

Fig. 3 is an end view of the same.

Fig. 4 is a side view of a projectile showing a modified form of fins or vanes thereon.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 designates the body of the shell, this being of a suitable length and approximately half as large in diameter as the bore of the gun 2 in which the shell is used, this gun being of the smooth bore type.

The shell is fitted with a plurality of fins or vanes 3 whose outside diameter is that of the gun bore, the same being deflected from the horizontal axis of the shell so as to have a slight twist and thus form a portion of screw-threads which have a very large pitch, which would probably be about one pitch for every thirty feet of length for an 8-inch diameter shell.

The edges of the fins 3 are parallel for their entire length and terminate with a slight forward incline, as at 4, near the rounded head of the shell. These fins may be either cast in one piece with the shell or may be made separately and fitted in grooves 5 shaped in the body of the shell 1, or by any method found to be most practicable in the art.

In the modified form of fins, as shown in Fig. 4, which is especially intended for naval use, the fins 3 are curved down at their forward end, as at 6, to the point on the shell 1 where the firing head 7 is screwed therein.

In order to prevent the gas and power generated by the explosion of the powder charge in the gun from getting by the shell, a suitable gun wadding member 8, having outside steel plates 9 and inner compressed portion 10 adapted to bear tightly against the bore of the gun, is placed between the shell and the said powder charge.

In the use of this shell, the same takes a rotary or screw motion when fired by reason of the pitched fins, their shape causing the air to impart this form of motion to the shell. This is of especial benefit when in use in naval service, for then the shell, when

striking the water, acts as a propeller and the fins continue to bore down into the water without changing the angle of the trajectory through which the shell passed while in the air.

The bore of the gun being smooth does away with the immense amount of friction generated while forcing the shell both forward and imparting a twisting motion to it at the same time.

A certain amount of frictional wear in a gun barrel is of course unavoidable, but with the use of my improved shell, the same not having any definite location or course in the barrel, the position of the edges of the fins around the periphery of the barrel will probably be altered each time, thereby causing equal wear on all parts of the gun.

By using a shell of half the diameter of the gun barrel, and consequently of comparatively light weight compared with the full sized shell, yet with the same charge of powder as for the larger sized shell, a correspondingly greater muzzle velocity is obtained and consequently a greater distance is covered by the shell in flight, and a greater range of aim is possible.

From the foregoing description it will readily be seen that I have produced such a device as substantially fulfils the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice, such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

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

1. A projectile of smaller diameter than the bore of the gun in which it is to be used having a plurality of dovetail grooves lengthwise thereof and radial thereto, whereby fins having their lower edges flaring outwardly may be slid in the grooves and be held thereby.

2. The combination with a gun, and a finned projectile therein whose body diameter is less than that of the bore of the gun, of a gun wadding member positioned between the projectile and the powder charge; such member comprising a pair of metallic plates spaced apart, whose diameters are slightly less than the bore of the gun, and suitable wadding material secured to and compressed between the plates and impinging against the bore of the gun, the wadding member being independent of the projectile.

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

LOUIS B. HARVEY.

Witnesses:

VERADINE WARNER,

VEIRAN MORRIS.