

1,371,207.

T. S. WILKINSON.
PROJECTILE.
APPLICATION FILED SEPT. 4, 1917.

Patented Mar. 8, 1921.

Fig. 1.

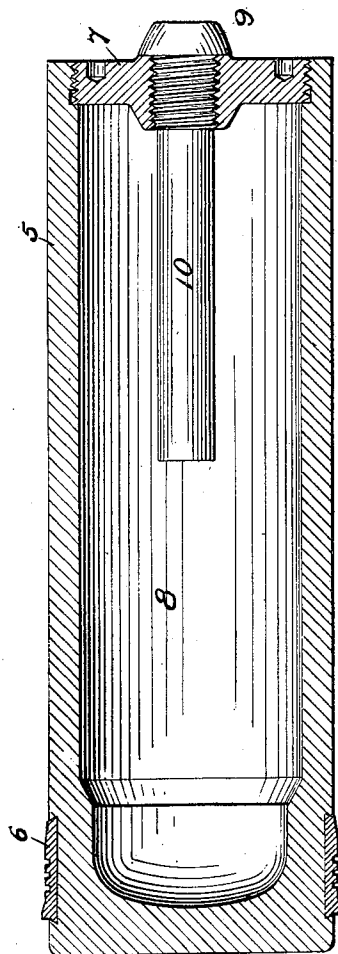


Fig. 2.

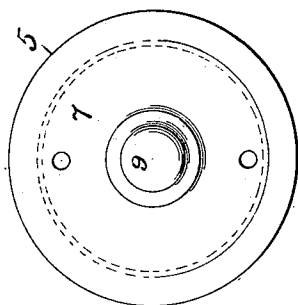
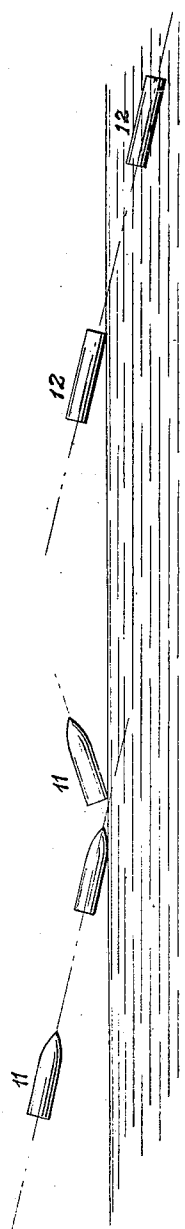


Fig. 3.



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PROJECTILE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, THEODORE S. WILKINSON, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Projectiles, of which the following is a specification.

This invention relates to improvements in projectiles and in its more intense aspect to projectiles particularly adapted for use in combating submarines and the like.

One of the objects of the present invention is to provide a projectile or shell of the above character adapted to enter the water at a low-angle flight without ricocheting.

A further object is to provide a shell of the above character which will maintain its flight when striking the water and continue its true trajectory under water.

A further object is to provide a simple and practical shell having the above characteristics adapted to explode at a predetermined time with respect to the moment at which it strikes the water, that is; either by impact with the water or after having traversed a certain distance under water or after having reached a predetermined depth below the surface.

A further object is to provide a shell or projectile of the above general character having relatively few parts which will be inexpensive to manufacture and which will be reliable and efficient in use and operation.

Other objects will be in part obvious from the annexed drawings and in part indicated in connection therewith by the following analysis of this invention.

This invention accordingly consists in the features of construction, combination of parts and in the unique relations of the members and in the relative proportioning and disposition thereof; all as more completely outlined herein.

To enable others skilled in the art so fully to comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and relation contemplated by this invention, drawings depicting a preferred form have been annexed as a part of this disclosure and in such drawings, like characters of refer-

ence denote corresponding parts throughout all the views, of which:—

Figure 1 is a longitudinal sectional view of the complete shell.

Fig. 2 is a front view thereof.

Fig. 3 is a diagrammatic view.

It may have been attempted to make a non-ricocheting shell by eliminating the ogival point or truncating the same to reduce the tangential contact at the forward end of the shell with the surface of the water.

The truncated ogival point, however, is not satisfactory in that it will not continue its trajectory after the moment of the impact with the water, and the shell will probably ricochet if it strikes the water at an angle less than ten degrees.

It is found by experience that a flat-nose shell or a shell of substantially plain cylindrical contour will overcome these and other objections and will not ricochet at an angle above three degrees. It has been demonstrated that shells of this character have given a non-ricochet action at two degrees and less in nearly half of the experiments tried.

Other types of shells may have been devised adapted to avoid ricocheting and continue their trajectory after striking the water but these have been found to be complicated, expensive and generally unsatisfactory in use.

A high explosive shell of general cylindrical contour may also have been devised but not with the purpose of maintaining its true trajectory after striking the water. Neither were they equipped with an explosive device adapted to explode the shell at a predetermined and desired instant with respect to the moment of the impact with the water.

The present invention is therefore designed to overcome these and other objections and produce a simple, non-ricocheting and practical shell of general cylindrical contour adapted to explode at a predetermined instant with respect to the moment of impact.

Referring now to the drawings in detail, 5 denotes the cylindrical body of a shell provided at its rear end with a copper banding ring 6 while its forward end is provided

with a screw plug 7, closing the explosive chamber 8. The central part of the screw plug is provided with a removable exploding device or detonator 9 of any desired type adapted to set off a priming charge within a tube 10 axially disposed within the shell.

The detonator is preferably of the delayed action type, that is; it is so constructed as to explode the charge at a certain definite time after the moment of impact and while the projectile is still maintaining its trajectory, as distinguished from that type adapted to explode the shell after the same has sunk a predetermined depth below the surface. Although it is understood that either of these types may be used, an impact type of detonator may be substituted adapted to explode the charge on impact with the water.

It has been found by experience that shells of this character will maintain their trajectory for a distance of 100 to 200 feet under water and as above stated will not ricochet at an angle above three degrees. Thus, projectiles of this type are found advantageous in use against submarines in which the shell striking the water at a low angle will continue its flight and explode in close proximity to the boat while the ordinary pointed or semi-ogival shell would ricochet out of the water, or, if continuing under the water would trend to one side or the other without injury to the boat attacked.

In Fig. 3 there is illustrated diagrammatically the effect of an ogival shell striking the water, as well as a shell of the type embodying the subject of this invention. The ogival shell 11 having a curvature at its forward end may be assumed to strike the water at a tangent to the curvature, pressing the water slightly ahead thereof forward of the point of tangency thereby to raise the nose or point of the shell upwardly and usually to one side, resulting in ricochet from the water. In the flat-nose shell 12, the water is engaged by the forward flat end so that its lower edge would theoretically form a turning point. The location of the center of gravity of the shell and its momentum in the normal direction of its trajectory will, however, counterbalance this turning effect and cause the shell to enter the water without ricocheting and to continue in its true

trajectory under water, as indicated by the dotted line.

It is thus seen that the present invention is simple, practical, reliable and particularly adapted for use in combating submarines in that it primarily maintains its trajectory after striking the water and explodes at a predetermined time with relation to the moment of impact without ricocheting.

Without further analysis, the foregoing will so fully reveal the gist of this invention that others can by applying current knowledge readily adapt it for the various applications without omitting certain features that, from the standpoint of the prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention, and therefore such adaptations should and are intended to be comprehended within the meaning and range of equivalency of the following claims.

I claim as my invention:—

1. A projectile having a body portion of general cylindrical shape, the forward end of said body portion forming a flat unbroken surface so as to prevent ricocheting on striking the water at a low angle, and to maintain the projectile in its true trajectory under water.

2. A projectile having a body portion of general cylindrical shape, and a rigid non-compressible plug at the forward end of said body portion, the end of said cylindrical body portion and the face of said plug forming a flat unbroken surface so as to prevent ricocheting on striking the water at a low angle, and to maintain the projectile in its true trajectory under water.

3. A flat-nose projectile having a body portion of general cylindrical shape throughout its length and provided with an explosive chamber, a rigid plug at the forward end of the body portion having a flat substantially unbroken surface forming a right angle with the walls of said body portion, and an explosive device located within said plug adapted to explode the charge after the shell has traveled a predetermined distance in its true trajectory under water.

Signed at Washington, D. C., this 9th day of August, 1917.

T. S. WILKINSON.