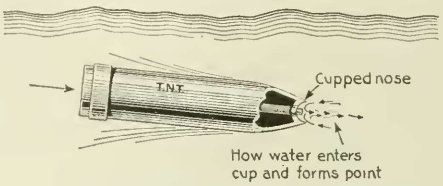
Sinking U-Boats with a Sub-Sea Barrage

The Isham shell, which does not ricochet, is the latest destroyer of the submarine

By Robert G. Skerrett

THE diving shell is the latest thing for attacking hostile submarines. It is the depth-bomb improved and therefore more potent. Indeed, in the opinion of many experts the diving shell is the most formidable instrument yet devised for battling with the foe's U-boats. It is an out-and-out American invention and the climax of years of study and development on the part of its originator, Willard S. Isham.



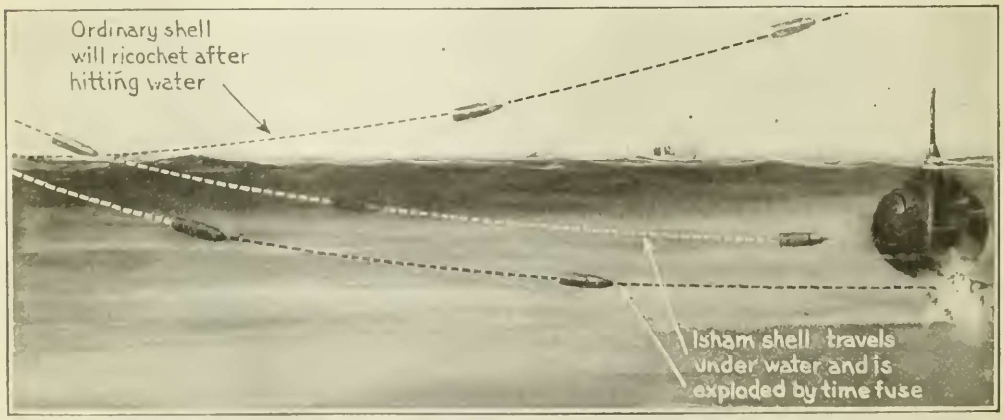
High-angle firing makes the shell strike the water at such an angle that it will dive into the sea instead of ricocheting

Of depth-bombs there are several sorts, but of diving shells there are only two kinds—a foreign adaptation of the Isham missile and the Isham projectile, pure and simple. The reason for this is that the French and British governments have been more alive to the merits of the American invention than our own ordnance officials, and, as a result, have actually been the first to apply the diving shell to wartime service. We are catching up, however, if reports from Washington can be accepted at their face value, and the so-called "non-ricochet shell" is likely soon to have its place in the magazines of all of our destroyers operating in European waters.

High-Angle Fire and Its Drawbacks

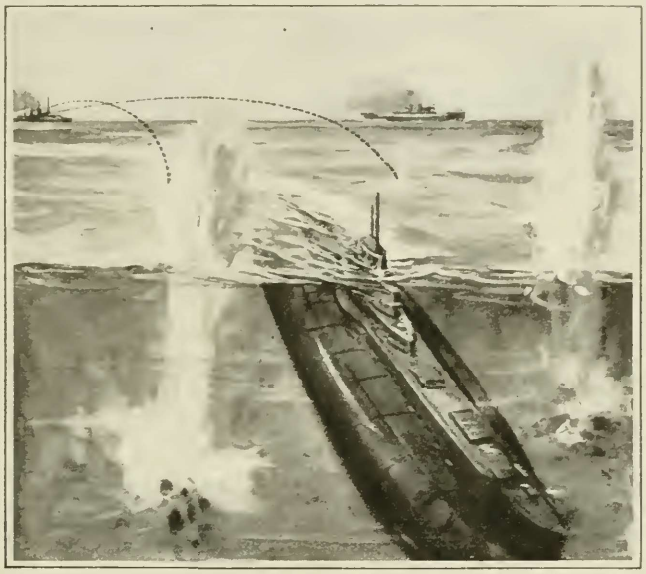
The British and French vessels that are armed to throw their form of diving shell resort to high-angle fire, the projectile traveling a course much like that of a missile discharged from a mortar. In this way, the shell strikes the water at an angle sufficiently blunt to obviate ricocheting and to insure penetration into the sea. Once the missile has plunged beneath the surface its explosion is automatically regulated. The detonating fuse is set to operate at a predetermined submergence as in the case of a depth-bomb.

High-angle fire from a moving craft at an object in motion has a number of drawbacks. First, there is the comparatively protracted flight of the pro-



The explosion of the Isham shell beneath the surface is regulated automatically by a time fuse set to operate at a certain degree of submergence regardless of hydrostatic pressure

jectile; second, its prolonged exposure while in the air to the deviating sweep of the wind; third, the fact that a slight roll of the gun platform will greatly change the arc of travel and, therefore, the range of the shell; and, finally, that the target offered by either the periscope or the conning tower of a submarine under way is a mark that is very hard to "range" accurately. These points are mentioned in order to emphasize the advantages of the Isham type of diving or torpedo shell which can be fired over a flat trajectory like any ordinary projectile from a naval gun.



The missiles fall all about the U-boat and form a veritable subaqueous barrage—an under-water curtain of fire

The Isham torpedo shell was originally intended to attack the under-water body of an armored ship and thus to reach her vitals. In the invention's present form we see a shell especially and peculiarly suited for battling with U-boats at long range even though the enemy craft offer but the smallest possible mark—the exposed tip of a periscope. Three years ago the Isham shell was tested by a board of naval officers, and while the fuse did not function satisfactorily in its entirety it showed even then that the designer was working in the right direction. The projectile, however, demonstrated that its author, by employing an unusual type of nose, could make the shell dive, on striking the water, and thereafter pursue a submerged course at a gradually increasing depth below the surface.

It Dives and then Explodes

The trial board reported that "a high explosive shell is an urgent necessity for naval use in addition to the armor-piercing shell now adopted." And the same commission stated:

> "It would be highly desirable to have a high-explosive shell having a fuse such as has been suggested by Mr. Isham, viz, to detonate a shell on striking thin metal, such as the side of a destroyer, but which in striking water would not detonate until after a period of approximately a second—this in order that a shell which struck short of a ship might continue its run under water and explode on contact with the under-water body or near it."

Since that time, Mr. Isham has developed a fuse that he declares will do all of the foregoing things and more, i.e., it will explode after a certain time, following a dive, even should it fail to meet an obstacle in its path, and if it hit a solid body, whether thick or thin, it will burst within one hundredth of a second thereafter.

When the projectile impacts with water the momentary checking of its speed fires a time element or "train" of powder which must be consumed before the flame reaches the primer which actually detonates the high-explosive bursting charge. If it hits either thin or thick plating, a percussion cap instantly sets off the principal mass of high explosive. Hydrostatic pressure does not interfere with the functioning of the fuse. The moment a submarine is seen from afar, the gun will be loaded with the Isham projectiles and hurled at the foe, the missiles forming a veritable subaqueous barrage and creating an under-water curtain fire one or two hundred feet short of the target, so that the shells may strike the body of the submarine and explode or, failing in this, be detonated like so many mines near by and wreck the undersea craft.