### THE NEW DAVIS PROJECTILE TORPEDO.

Briefly stated, the difference between the standard Whitehead torpedo and the new Davis torpedo which recently underwent a very successful test is that the first carries a charge of gun cotton which is detonated against the side of the ship at the instant of contact, whereas the latter carries, in addition, a smokeless-powder gun which at the instant of impact discharges a high-explosive shell into the interior of the ship where it is exploded by a short-time fuse. The destructive effects of the Whitehead torpedo are not as widespread nor so fatal as the great size of the charge, amounting in the latest torpedoes to over 200 pounds, would lead us to expect. In the Russo-Japanese war, ships that were struck by torpedoes were able to proceed to port, or move into some desired position for repairs, under their own steam. The disparity between the size of the charge and the extent of the damage is due to the fact that the energy of the gun cotton is let loose on the outside of the ship, immediately at the skin plating. The latter is, of course, subjected to widespread damage, a large rent being invariably torn in the side of the ship; but it frequently happens that the damage is practically confined to the outer skin; the walls of the inner compartments proving sufficiently strong to resist the rush of gas and prevent the passage of any considerable amount of water beyond the one compartment affected. The object aimed at in the new torpedo, which is the invention of Lieut.-Com. Cleland Davis, U. S. N., is to attack not merely the outer skin of the ship, but the vitals of the ship itself — to enable the torpedo to carry its high explosive charge, or a portion of it, through the inner bulkheads of the ship, where it can be detonated with correspondingly greater destructive effect.

The means by which the above results are secured are shown very clearly in the accompanying diagram, Fig. 1, which represents approximately the interior construction of the forward portion of the torpedo. At the front is the usual war head. Back of this is a section provided with two diaphragms, *A* and *B*, in which is mounted a light gun of large caliber, with a length of ten calibers, whose walls are less than an inch thick and which weighs less than 350 pounds. It is built of a vanadium steel for which a strength of nearly 250,000 pounds to the square inch is claimed, and it is the great strength of this metal in proportion to its weight which has rendered it possible to mount such a gun in a torpedo, and yet keep within the limits of prescribed weights and proper balance. The gun is loaded with a charge of smokeless powder and with a high-explosive projectile *D*. In the photograph, Fig. 3, showing the complete torpedo ready for firing, there will be noticed projecting from the war head a short horizontal spindle provided with a small screw propeller. The instant the torpedo enters the water, the propeller begins to revolve on the spindle, and in so doing sets the mechanism in the proper position for firing the gun at the moment of contact of the torpedo with the side of the ship. At the instant the torpedo strikes, the powder charge within the gun is ignited, and the projectile driven forward into the interior of the ship. If no fuse is employed, the shell will pass entirely through the vessel; but if a short-time fuse is adjusted, the shell may be detonated at any desired distance within the vessel, say either in the center of the boiler room, or in the engine room or magazine, where its fragments will necessarily cause a large amount of damage. Also, the passage of the shell and its explosion will serve to open several of the compartments of the ship, and involve the flooding of a larger area than would be possible, or at least probable, if the torpedo were one of the ordinary type.

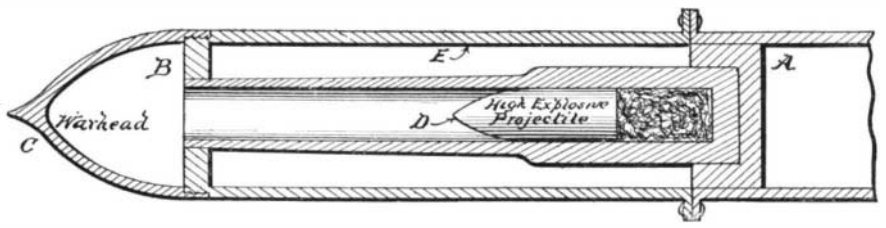


**Fig. 1.—Section of Forward Portion of Torpedo, Showing the Gun with Its Projectile and Powder Charge.**

By the courtesy of the inventor we are enabled to present several photographic views and diagrams, showing the results of a test recently carried out at Fort Strong, Mass. The cylindrical caisson shown in Fig. 5, and in the diagram, Fig. 2, was built to represent roughly the interior structure of a warship below the waterline. The barge from which the torpedo was fired was moored 120 feet from the target. The torpedo was slung on a trolley wire, which was stretched from the barge to the target, in order to insure an accurate hit. The experiment was eminently successful. A huge hole was torn in the front face of the target, and the projectile passed through four separate steel bulkheads, each about half an inch in thickness; passed out through the other side of the target; and landed in the mud 175 feet beyond. The reaction of the explosion drove the after part of the torpedo with the gun attached 40 feet to the rear, and the cylindrical portion of the torpedo which had inclosed the gun was driven 25 feet backward. The projectile did not explode, but even in this case the value of the gun was proved in its cutting a hole entirely through the structure, as is shown in the photograph of the caisson taken after the attack.

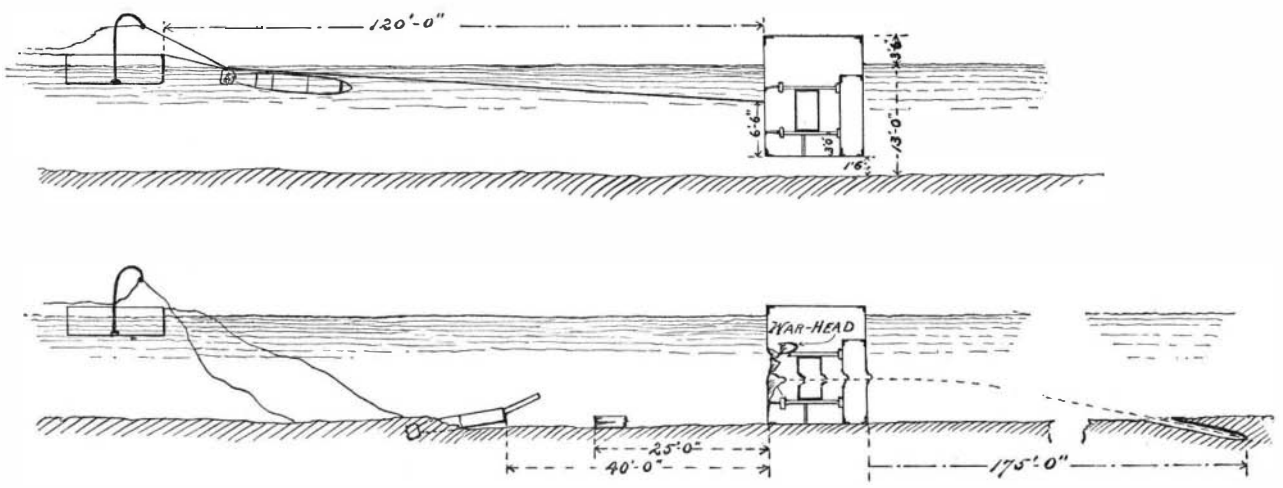


**Fig. 2.—Diagram Showing the Trolley Wire by Which the Torpedo Was Directed to the Target, and the Condition of Target and Torpedo After the Attack.**

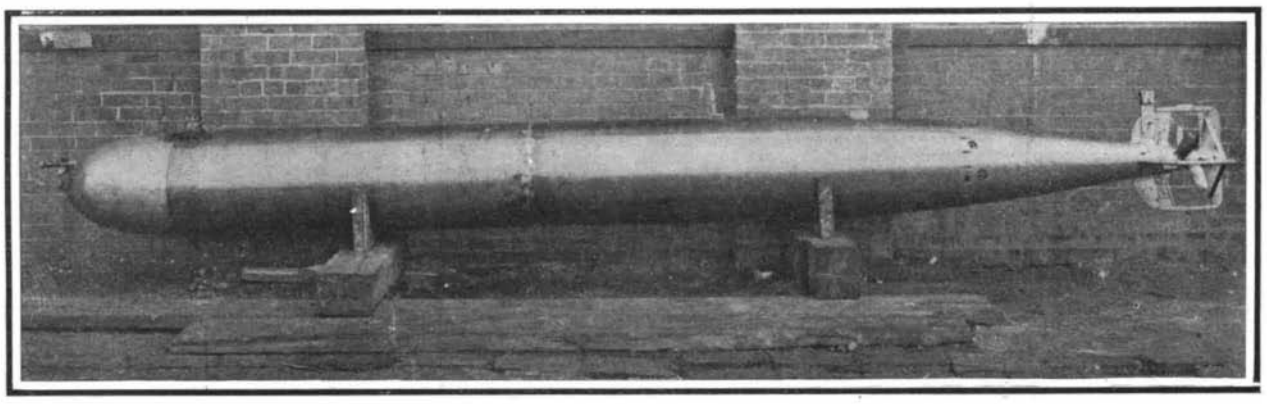

**Fig. 3.—The Projectile Torpedo Ready for Firing.**

Perhaps the most interesting of the photographs is that taken at the instant the torpedo struck, which shows in the photograph the faint white line of the wake of the approaching torpedo, the upward rush of the water and gases, and the very distinct white streak beyond the target, marking the course of the shell after it had passed through.

Next to gold, petroleum is the most valuable mineral product of California.

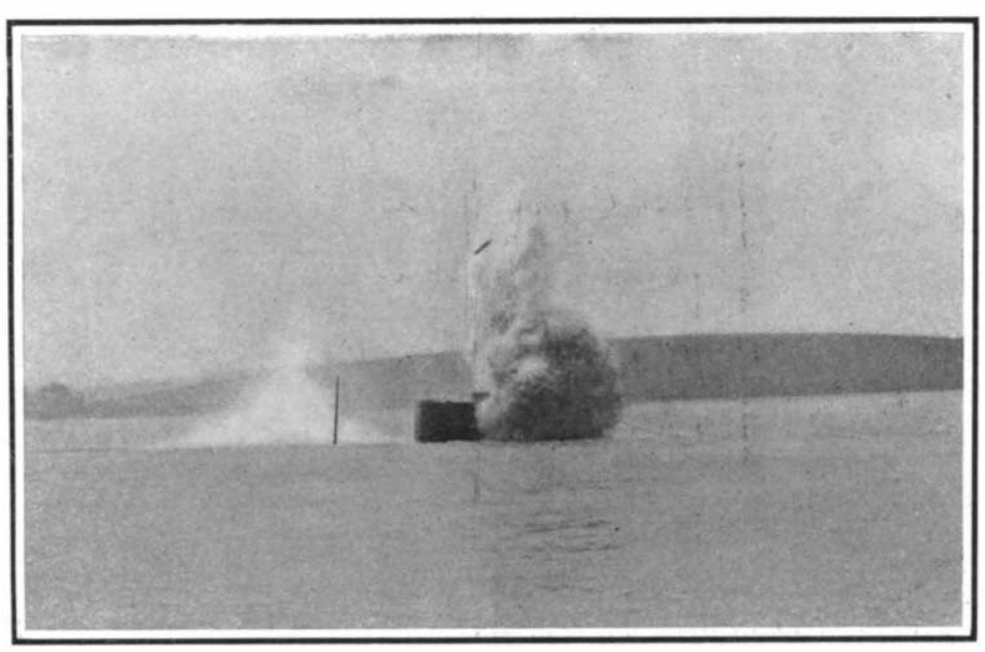

**Fig. 4.—Instantaneous Photograph of the Attack. Note the Wake of Shell to Left, After It Has Passed Through Target.**

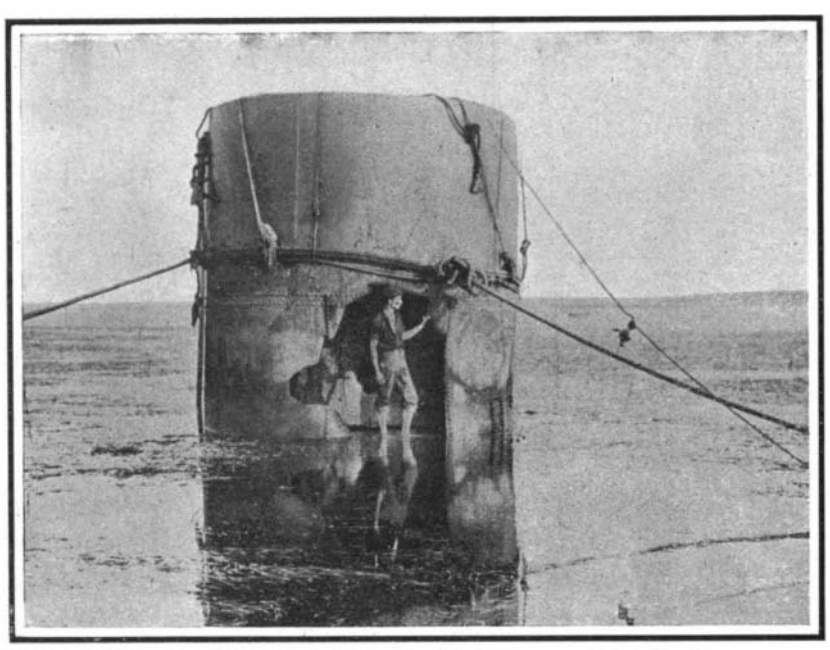

**Fig. 5.—Target After Attack; Front Blown Away, and Hole Made by Shell Near Right Hand of Boy.**

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