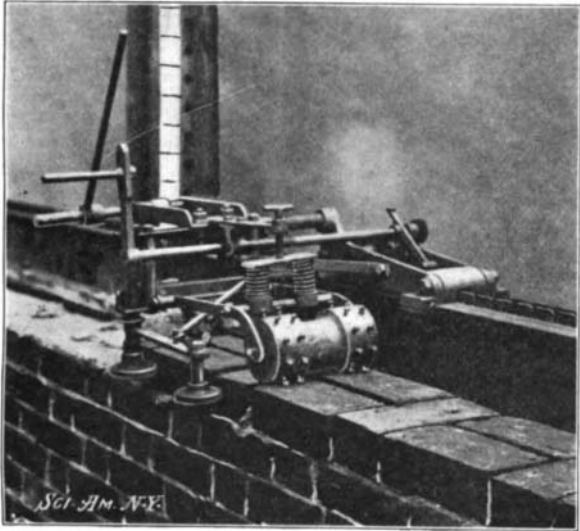


A MACHINE FOR LAYING BRICKS.

A machine which is intended for plain bricklaying, such as walls and the like, is an invention which must be credited to the ingenuity of an Englishman, Mr. John H. Knight, of Barfield, Farnham.

Vertical posts, A, are set in the ground about 15 feet apart, adjacent to the wall to be built. To these



A BRICKLAYING MACHINE.

posts a wooden girder B is secured, upon which a 6-inch by 1/4-inch steel plate C is screwed. Upon the bed thus formed the machine itself runs. The driving mechanism consists of a toothed pinion meshing with a pitched chain along the girder, motion being given to the pinion by the gears E and the handle F. A guide bar G secured to the girder forms a straight-edge for the face of the bricks, which are fed to the machine by hand. A pawl M, operated by the handle N, serves to press one brick back against the previous brick. Each brick, as it moves back, pushes a ridge of mortar in front of it, so that the vertical joint between the two bricks is filled up. Guide wheels HH' press the bricks against the straight-edge. A bricklayer usually pats the top of each brick with his trowel; this mechanical bricklayer does the same. A spiked roller J performs this slight task, the desired amount of pressure being imparted by a stout spiral spring S, and adjusting screws.

The mortar is run out by hand in front of the machine. After each course of bricks has been laid, the girder on which an operator performs is lifted by hand three inches. Holes are bored in the posts to form catches for a lifting lever. Two men and a boy can operate the machine. One man spreads the mortar, the second feeds the machine, and the third operates it. Mr. Knight informs us that anyone can operate the machine. He claims for it an ability to lay 500 to 600 bricks per hour.

OFFICIAL TRIALS OF OUR SUBMARINE BOATS.

The "Adder" and the "Moccasin," two of the six submarine boats which are being constructed for the navy, have recently been undergoing their trials, with results that have been very gratifying both to the builders and to the Naval Board of Inspection, for whose benefit the trials have been carried on. The vessels are the "Adder," "Grampus," "Moccasin," "Pike," "Porpoise" and "Shark." They are all identical in size, construction, and equipment. They were designed to be an improvement upon the "Holland," which was the first torpedo boat owned by the navy, and in them is incorporated the valuable experience which has been gained in a long series of experiments with the pioneer vessel. The "Holland" is 53 feet 11 inches long, 10 feet 3 inches extreme diameter, and displaces 74 tons. As her armament she carries a

torpedo tube and a so-called dynamite gun. The improved "Hollands," of which the "Adder," herewith illustrated, is one, were authorized on June 7, 1900. They are 63 feet 4 inches in length, 11 feet 9 inches in diameter, and they displace, when submerged, 120 tons. When running on the surface they are driven by a single-screw, four-cylinder gasoline engine of 160 horse power. They also carry a 70 horse power generator, which may be driven by the gasoline engine for the purpose of charging the batteries when the boat is at the surface, and when the boat is submerged it can be connected with the batteries and used as a motor for driving the propeller. Like all vessels of her class, the "Adder" is constructed with a double bottom and two transverse bulkheads, dividing her into three watertight compartments. The gasoline tank, the expulsion tube and the air flasks for the torpedoes are carried in the forward compartment; the center compartment holds the main ballast tanks, the cellular structure of the double bottom being used for the latter purpose, while above the ballast tanks are carried the storage batteries, the torpedoes and the air flasks, in which fresh air for living purposes is stored at a pressure of 2,000 pounds to the square inch. The third compartment, in the stern of the boat, contains the gasoline engine, the motor and the steering gear. To submerge the vessel, water is admitted to the trimming tanks, and a pair of horizontal rudders at the stern are inclined so as to depress the nose of the boat and cause her to descend. The vessel is controlled from the conning tower, which will be noticed above the working platform. It is protected from the rapid-fire guns of the enemy by the

four inches of Krupp steel with which the conning tower is clothed.

In the recent official trials by the government Board of Inspection and Survey, the "Moccasin" and the "Adder" both achieved speed results considerably above those called for by the contract. The "Adder" made an average speed on the surface of 8.5 knots an hour when running in the light condition, that is with all her submersion tanks empty. In the awash condition she made an average speed of 8 knots an hour, and when totally submerged her speed was 7.5 knots, and thereby she exceeded her contract speeds

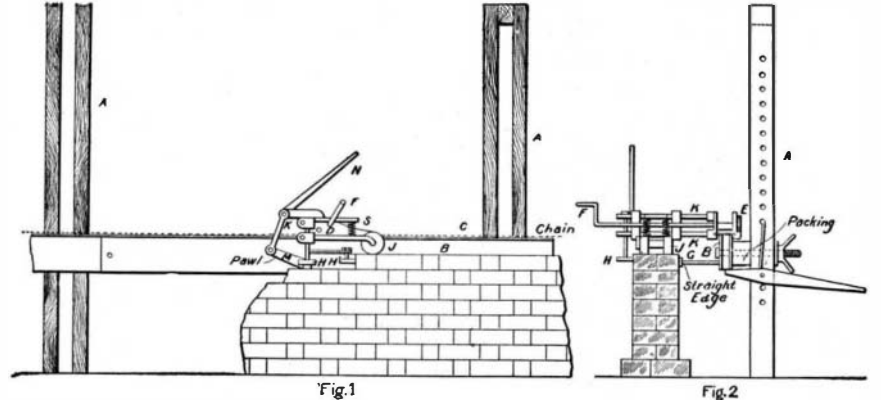
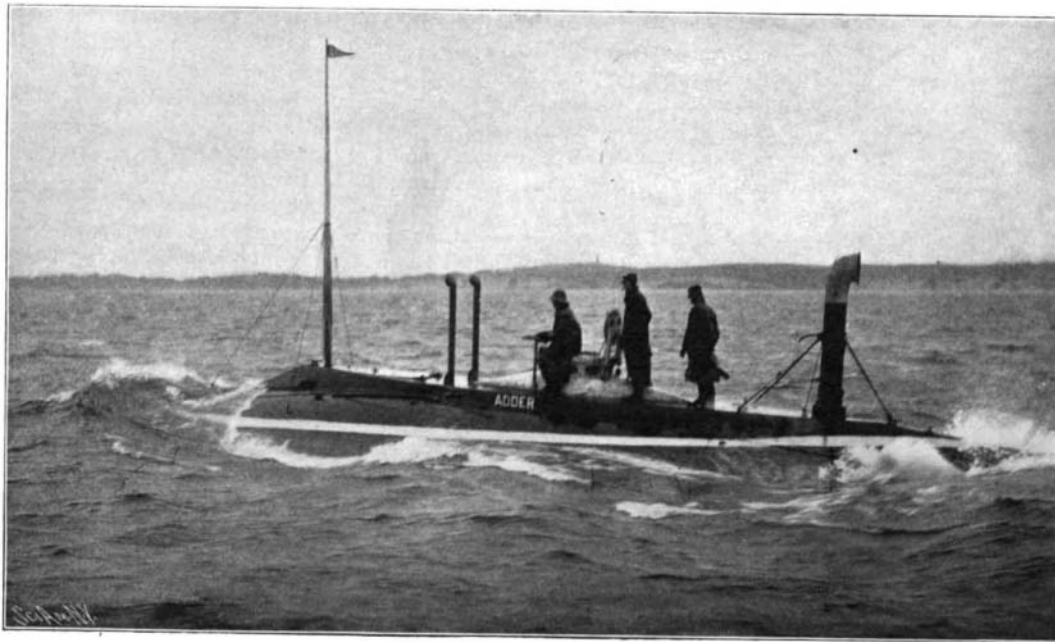


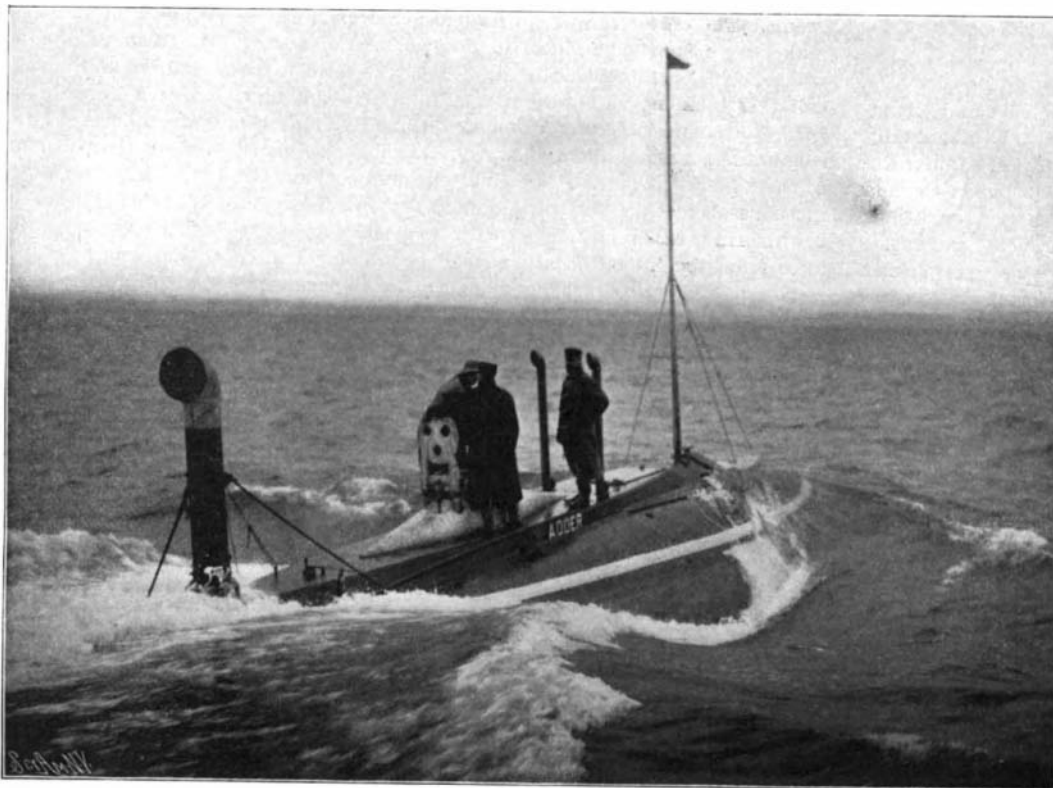
DIAGRAM OF THE BRICKLAYING MACHINE.

by half a knot on the surface, by one knot when awash and by one-half a knot when completely submerged. In her trial on November 18, the "Adder," after taking position on the course and getting underway, ran for a mile submerged, then turned and returned to the starting point and fired her torpedo at a predetermined mark. The turn was made when she was completely submerged, and in the home run only two observations, lasting 30 seconds each, were taken, one of them soon after the turn, and the other

between the half and the quarter mile flags. After the second observation she remained invisible, with no indication of her whereabouts, except when she fired her torpedo, the course of the torpedo being indicated, as it always is, by the trail of bubbles of compressed air from her engine rising to the surface. The torpedo went a few feet wide of the mark, although it was claimed that the divergence was due to the swerving of the torpedo and not to faulty aiming from the "Adder." The whole run submerged occupied a period of three hours, and according to press reports, Naval Constructor Woodward, one of the officers of the Inspection Board, stated that the air, excepting during the last twenty minutes of the run, was perfectly fresh, and even in the latter period it was as fresh as the air on the berth deck of a battleship. Subsequently the engines were tested satisfactorily on a continuous run of 12 hours duration. There is no question that the results achieved in these trials have done much to advance the submarine boat in the opinion of army and navy men. It is considered in army circles that the possession of a few of these boats would greatly strengthen the defenses of any important harbor or shipping port. That increased attention has been directed to the submarine is shown by the presence of a specially constituted Army Board to observe the trials and report upon them to the War Department.



BROADSIDE VIEW OF THE "ADDER," SHOWING WAVE FORMATION.



THE SUBMARINE "ADDER" MAKING HER OFFICIAL SURFACE RUN AT 8.5 KNOTS AN HOUR.

To make a small cork fit a large bottle, and vice versa, it is common practice to trim the sides of a cork when it is too large for a bottle. Generally the knife is dull, and the cut irregular. A simpler way is to cut a wedge-shaped piece out of the cork at its lower end. If the cork is very large, cut out an additional wedge at right angles to the first. This will make a perfect non-spilling stopper.