

THE KATAHDIN.

**A VESSEL FOR WHICH FOREIGN NATIONS
HAVE NO MATCH.**

**PURELY A RAM. SHE IS EXPECTED TO GIVE A
GOOD ACCOUNT OF HERSELF IN AN EN-
COUNTER WITH AN ENEMY'S SHIP.**

Naval experts have argued for and against the value of the ram vessel Katahdin as a factor in a sea fight, while all admit that the ram itself is an extremely powerful and dangerous weapon. A ship designed exclusively for ramming is something which is not to be tested, and at present the arguers are leading their peace, waiting to hear what the war-like craft will have to say when she confronts an armed enemy. A detailed description of the vessel is given elsewhere in this paper, but the description gives only a faint idea of what the vessel really is. On her first trips she failed to make the speed required by her contract, and improved propellers of manganese bronze were substituted for those originally used. These had the effect of materially increasing her speed and adding to the discomfort of those on board, for the work of building her is not at all agreeable to those who are below when she is in a hurry. When she is going at full speed the only objects visible above the deck are the steel conning tower, which is used as a look-out-house; the smoke pipes, the ventilators and a slender signal mast, and below decks everything is a smother of oil and heat and a deafening racket.

The steam of the Katahdin weighs about fourteen tons, and as her hull, about fifteen feet back from the stem, is of the shovel nose order, she throws a great mass of water up over her deck when under way. As this ram is her only weapon of offence it seems as if this trouble could now be avoided.

A peculiarity of her hull is the knife edge which the deck makes in its projection over the under-water part of her hull. This is expected to exert a great cutting force in case she should succeed in getting her ram through the plating of a ship she intends to sink. She has the advantage of being remarkably quick in answering her helm, and is steady-going even at her highest speed. Her disadvantages are said to be that she cannot strike deep enough to hurt a heavy battleship which she could catch, while the lighter armored vessel, which she could sink, could get away from her by superior speed.

Another point which has been made is the possibility that her ram bow would be twisted off by the motion of a vessel which she might strike while it was at full speed in an effort to escape.

All these points, however, are purely speculative, and those who are interested in the boat are waiting to see what will happen when she runs against a Spanish battleship.

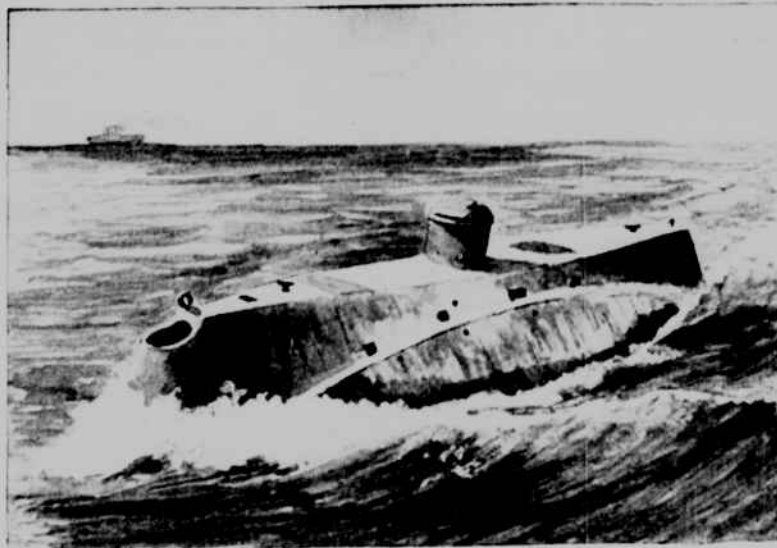
THE HOLLAND SUBMARINE BOAT.

**A NEW AND SUCCESSFUL CRAFT FOR AT-
TACK UNDER WATER—WHAT SHE
CAN ACCOMPLISH.**

After many trials and some changes in the arrangement of her water ballast, the Holland Submarine boat had a test recently, which was declared to be entirely successful. The boat, which was built on the designs of John P. Holland, is intended to destroy an enemy's vessel by torpedoes which can be projected either above or below the surface of the water, submersion being effected by filling tanks in the boat's bottom with water, and changing the angle of fins at the sides. The latest trial of the queer craft was under the supervision of a board of officers from the Brooklyn Navy Yard, and the experts had hard work to keep track of the boat, as she appeared and disappeared with startling and rather uncanny suddenness. In a trip under water at a speed of six knots she was



DYNAMITE GUN VESUVIUS.
300 tons; 1,734 horse-power; 23 knots speed. Lieutenant-Commander John R. Pillsbury commanding.



THE HOLLAND SUBMARINE BOAT.
Showing bow torpedo tube.

seen only once, and that was on her second visit to the surface.

Her aerial torpedo tube, which is operated by air and gunpowder, was worked under only partial air pressure, but threw a dummy projectile 250 yards through the air before it splashed into the water. The submarine tube, using fifty pounds of air pressure, sent a dummy torpedo weighing 800 pounds 100 feet through the water.

The tubes are so arranged that the boat can go under a vessel and discharge from its forward tube on the approach, and then send a parting shot from its stern tube as it passes under the vessel it is endeavoring to sink.

The boat is propelled by electric power from a storage battery, and also has a gasoline engine.

On its latest trial the cover of the turret was not raised for two hours, and when the men inside the boat came out they declared that they had experienced no unpleasant effects, and that the boat was at all times under perfect control.

The inventor has received an offer of a large sum for his boat from a foreign Power, but it is not regarded as probable that the odd but dangerous craft will be allowed to leave this country.

The problem of submarine navigation has been one of great interest, not only to inventors but to naval men, for many years, and the experiments which have been tried have been carefully watched by the naval authorities of the world. Jules Verne's Nautilus has been the model from which many builders have drawn their first ideas, and the recovery of sunken treasure has been one of the goals toward which the inventors have been striving.

Not long ago a submarine boat was tested in the Fox River and Lake Winnebago, and was also declared to be a success. The vessel was the result of eight years of experiment, and remained under water more than an hour, fresh air being furnished, as in the Holland boat, by chemical means, and propulsion being accomplished by an electric motor and a hot-air engine. This boat differed from the Holland boat in that it was shaped like a cigar and had a sharp steel prow, giving it an additional means of offence as a ram.

Final trials of this boat were to be made in Lake Michigan, and it was proposed to fit the vessel with an electric searchlight, for the purpose of making observations while under water.

The Holland boat, however, has advantages over the lake boat mentioned. It is more roomy, and consequently is less tiresome for the men operating it, and its torpedo tubes at each end give it a means of inflicting a double blow on an enemy, while escaping from possible danger.

DYNAMITE GUNBOAT VESUVIUS.

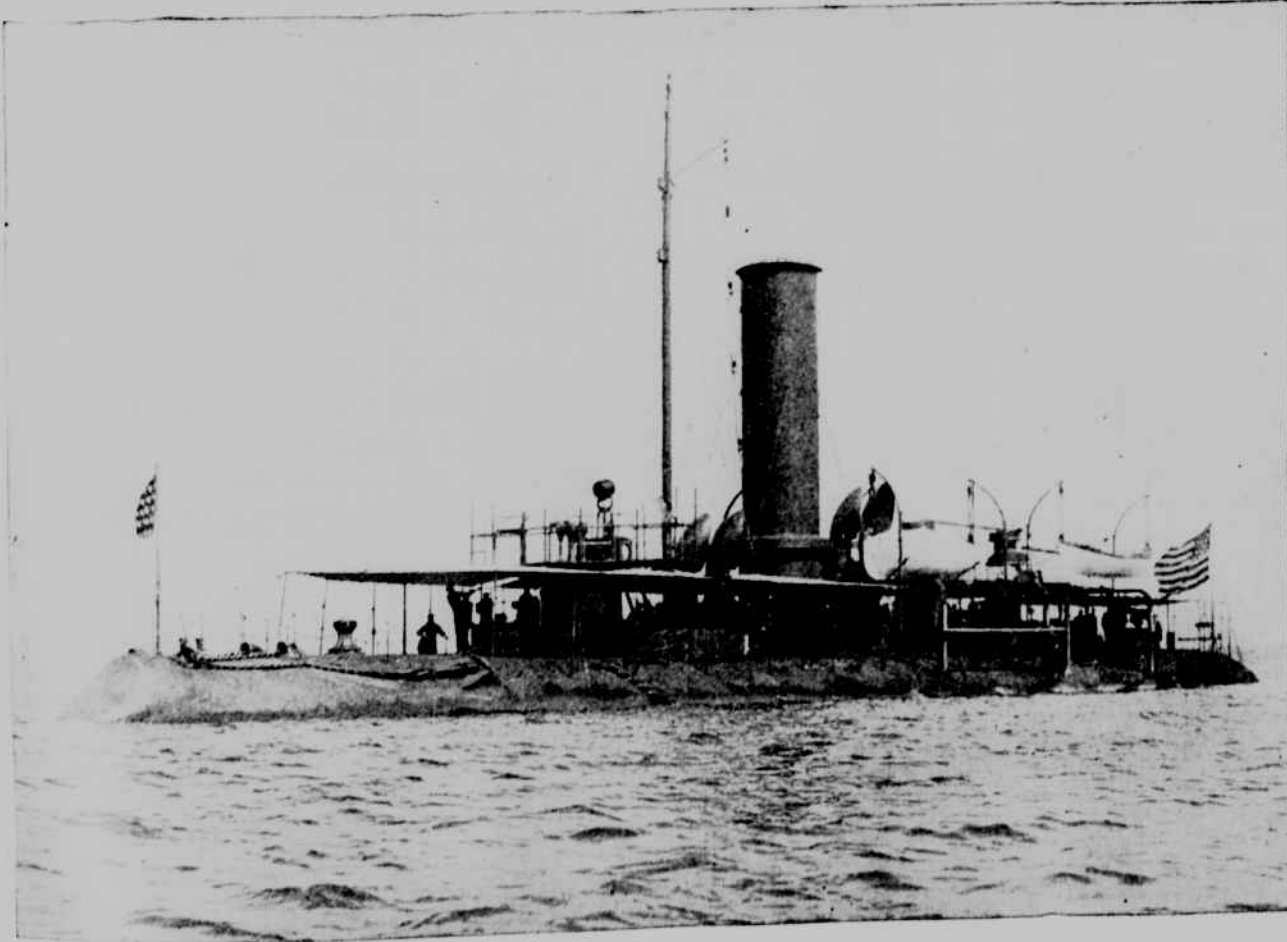
**CARTRIDGES OF THE EXPLOSIVE HURLED
AT AN ENEMY BY AIR PRESSURE.**

The dynamite gunboat Vesuvius, which is regarded as one of the most formidable vessels of the Navy at short range, is a long, low, narrow vessel, with a bow like a knife blade, capable of good speed, and equipped with three tubes for throwing dynamite at an enemy. She has never been used with intent to destroy, and the first trials of the tubes, with dummy projectiles, were not satisfactory. Changes were made, and after a long series of trials she was at last declared satisfactory. She is a familiar figure in New-York waters, having been laid up at the Brooklyn Navy Yard for repairs and alterations at different times.

Her tubes are supplied with power by powerful air compressors, and are capable of sending 20 pounds of dynamite a distance of a mile and a half.

This charge would be sufficient to wreck the stoutest battleship afloat, and as three cartridges can be fired almost simultaneously, her destructive power is extremely great.

The idea of discharging dynamite by the use of compressed air was first carried out by Lieutenant Zallinski, whose experiments at Fort Hamilton attracted a great deal of attention. The Vesuvius is an adaptation of that idea.



HARBOR-DEFENCE RAM KATAHDIN.
3,300 tons; 4,000 horse-power; 15 knots speed. Commander G. F. F. Wilds commanding.

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