

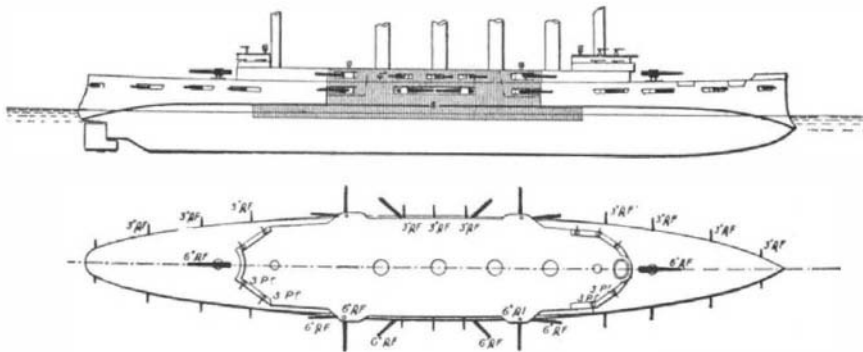
### THE SEMI-ARMORED CRUISERS OF THE "ST. LOUIS" CLASS.

The three vessels of the "St. Louis" class, although they carry side armor, are down on the naval lists as protected cruisers. This is due, doubtless, to the fact that the authorization by Congress, March 2, 1901, calls for protected cruisers. As a matter of fact, the Bureau of Construction, while keeping within the limits of displacement and cost imposed by the act, has been able to add to the protective deck, which marks them as protected cruisers, a partial waterline belt and a broad belt of armor amidships reaching to the main deck. The armored cruiser carries a complete waterline belt, reaching from stem to stern. Hence the "St. Louis" class occupy a position midway between the armored and protected class, and they may be distinguished, very conveniently, as semi-armored vessels.

They compare, in size and efficiency, with the "Monmouth" class of the British navy, in which the belt is carried up to the bow, but terminates at the after casemates, the complete wall of 4-inch armor amidships in the "St. Louis" compensating for the unprotected waterline at the bow.

The main deck of the "St. Louis" is supplemented amidships with a covered superstructure, within which are located four 6-inch rapid-fire guns and six 14-pounder rapid-fire guns; outside the superstructure are two more 6-inch rapid-fire guns, located on the center line, one forward and the other aft. Located on the gun deck is the greater portion of the battery, consisting of eight 6-inch rapid-fire guns, twelve

upon the masts to accommodate the two searchlights. Electric ammunition hoists are designed to supply the guns with the greatest rapidity, making it possible to hurl against an enemy a broadside of about twelve tons of metal per minute. The four lofty smokestacks, extending to a height of 76 feet 6 inches above the normal load waterline, provide draft for sixteen straight water-tube boilers located in four watertight compartments, which, together with the engines, are protected by the side armor, sloping deck armor, and a twelve-foot coal bunker. The inner bottom of these vessels extends to the under side of the protective deck; above the protective deck a cellulose coffer-



Gun and Armor Plan; "St. Louis" Semi-Armored Cruiser Class. "St. Louis," "Charleston" and "Milwaukee."

dam, 30 inches wide and 41 inches above the normal load waterline, extends throughout the length of the vessel. In the construction and equipment of the "St. Louis" class, as small a quantity as possible of wood is to be used, and wherever it is used it will be electric fire-proofed. Each vessel of this class is fitted to accommodate a flag officer and staff in conjunction with the regular complement. In commission the number of officers will be 39 and the crew will number 525 men. The waterline belt, 4 inches in thickness, extends in the wake of the engines and boilers and magazines for over one-third of the vessel's length, and reaches from several feet below to about 3 feet above the normal waterline. Side armor of the same thickness is carried up amidships to the main deck and extends between and includes the forward and after 6-inch guns on the gun-deck. The 6-inch guns at the four corners of the superstructure are also protected by 4-inch armor.

While we greatly admire these vessels, we must express a regret that the waterline armor was not carried up to the bow, even if some compromise had been necessary in the matter of speed or armament. This is an age of armored cruisers, and it is regrettable that these vessels should fall short of the requirements for want of the 120 feet of 2 to 3-inch armor necessary to complete the belt to the stem. It must be admitted that the new ships, although they are not quite in the class of the armored cruisers, are nevertheless more than a match in defensive qualities, at least, for any protected cruiser afloat.

### Protected Cruisers.

#### THE SHEATHED SEMI-PROTECTED CRUISERS OF THE "DENVER" CLASS.

An Act of Congress, approved March 3, 1899, had among its provisions one for six protected cruisers "to have the highest speed compatible with good cruising qualities and great radius of action, to carry the most powerful armament suited to vessels of their class." These vessels are now being constructed according to modified designs, which include the following general dimensions and particulars: length, 292 feet; breadth, 44 feet; displacement of 3,200 tons on a mean draft of 15 feet 9 inches. The ships' bottoms will be sheathed with wood and coppered, to suit them for service in the tropics. With 4,700 indicated horse power, they are to have a speed of 16½ knots. On their mean draft, as just stated, they are to carry 467 tons of coal, the maximum bunker capacity being 700 tons. They will be armed with a main battery of ten 50-caliber, 5-inch, rapid-fire guns; eight 6-pounders; two 1-pounders, four Colt automatics, and one 3-inch wheel gun. The protective deck, if such it can be called, is only ½ inch thick, increasing to 1 inch on the slopes toward the ends and 2 inches on the slopes abreast of the machinery spaces. It is probable that no vessels in our navy have

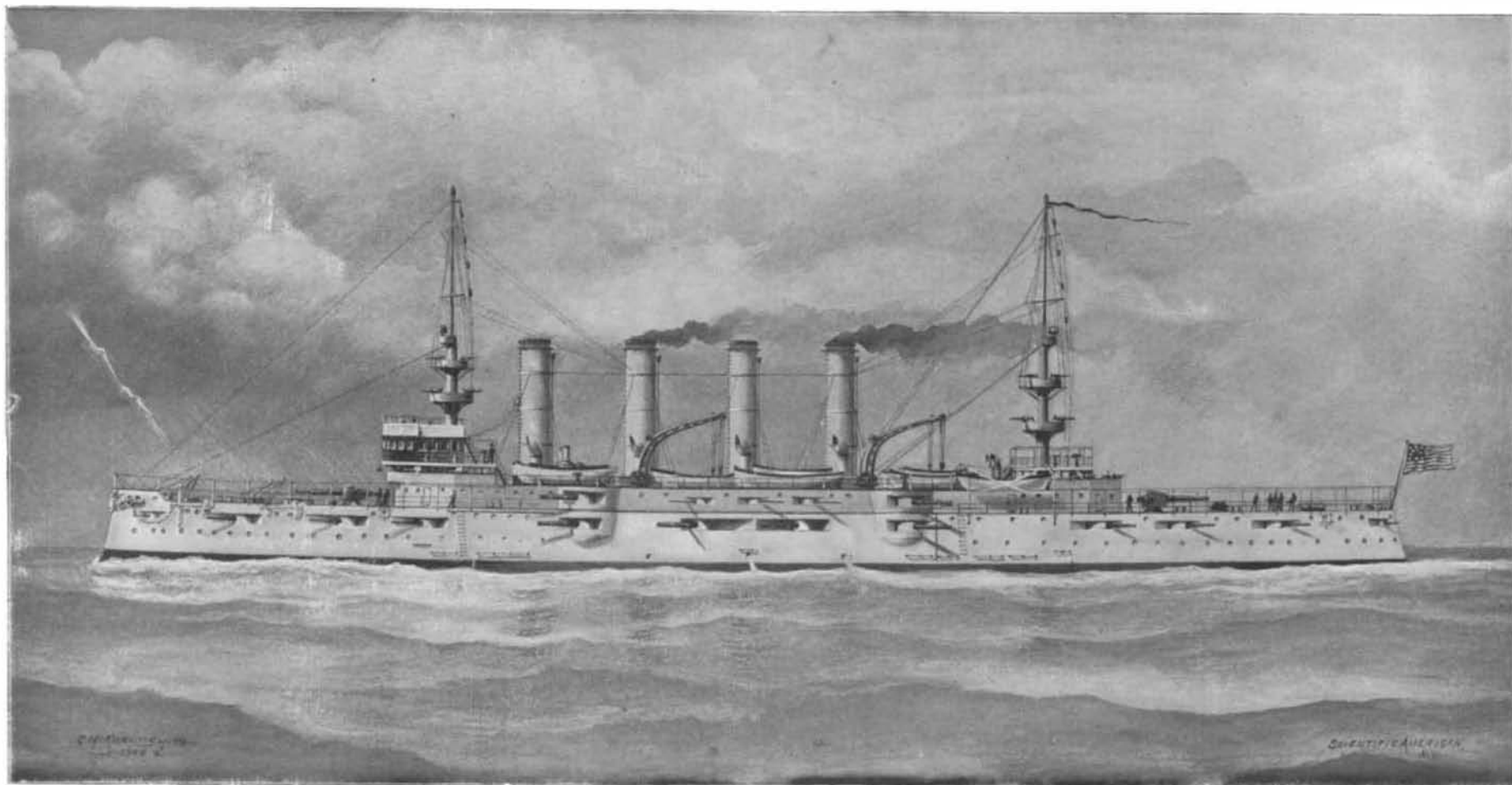
provoked more adverse comment than these, chiefly on the ground that in an age when naval construction is running to armored cruisers, these vessels have been produced with a protection which is even less than that of the average protected cruiser. The speed of 16½ knots also is far too low for an age when armored cruisers are being built by the dozen which have speeds of from 21 to 23 knots an hour; and this journal did not hesitate to pronounce the design unsatisfactory at the time they were made public. The late Chief Constructor of the Navy subsequently explained, in an article before the Society of Naval Architects, that in designing these ships the Bureau had been influenced by the comparative failure of the high-powered "Raleigh" and "Cincinnati" to secure the speed of 19 knots for which they were designed, and that in these ships the coal supply is limited and the coal consumption so great as to make it a serious question in making passages between distant ports. He stated that in the new designs a liberal allowance had been made for all the principal weights; that careful consideration had been given to the strength of the vessels, the scantlings having been made heavier; that the engine-room weights per indicated horse power had been made 10 per cent heavier than in the case of the "Raleigh;" that the large coal supply of 700 tons had been provided, giving them at a speed of 10 knots an hour a cruising radius of 7,000 knots without recoaling, which would cover a continuous trip from San Francisco to Manila. It was also pointed out by the Chief Constructor that as these vessels were intended

UNITED STATES. "St. Louis."	GREAT BRITAIN. "Monmouth."
Length on load waterline.....	424 feet.
Breadth, extreme.....	66 feet.
Trial displacement.....	9,700 tons.
Mean draught at normal displacement.....	23 feet 6 inches.
Engines, twin-screw, I. H. P.....	21,000
Speed.....	22 knots.
Normal coal supply.....	650 tons.
Coal bunker capacity.....	1,500 tons.

ARMAMENT.	ARMAMENT.
Fourteen 6-inch R. F. guns.	Four 6-inch R. F. guns, in turrets.
Eighteen 14-pdr. R. F. guns.	Ten 6-inch R. F. guns in casemates.
Twelve 3-pdr. R. F. guns.	Ten 12-pdr. R. F. guns.
Four 1-pdr. automatic.	Three 3-pdr. R. F. guns.
Eight 1-pdr. R. F. guns.	Eight machine guns.
Two 3-inch R. F. field guns.	
Two machine guns, 0.30 caliber.	
Eight automatic guns, 0.30 caliber.	

PROTECTION.	PROTECTION.
Main side armor.....	4 inches.
Lower casemate armor.....	4 inches, tapering to 2 inches at bow.
Upper.....	"
6-inch gun protection.....	4 inches.
Conning tower and shield.....	5 "
Signal tower.....	4 "
Splinter bulkheads.....	2 "
Protective deck.....	2½ "

14-pounder rapid-fire guns, and four 1-pounder rapid-fire guns. Sixteen rapid-fire guns are stationed on the superstructure deck and bridges and the remainder of the battery is located in the fighting tops of the two military masts. Additional platforms are built



Displacement, 9,500 tons. Speed, 22 knots. Bunker Capacity, 1,500 tons. Armor: Belt, 4 inches; topsides, 4 inches; deck, flat, 2 inches; slopes, 3 inches. Armament: Fourteen 6-inch R. F.; eighteen 3-inch R. F.; twelve 3-pounder semi-automatic four 1-pounder automatic; two 3-inch field guns; two .30-caliber machine guns; eight .30-caliber automatics. Complement, 564.

SEMI-ARMORED CRUISER "ST. LOUIS."

for long voyages and foreign service, liberal berthing accommodation had been made for the crew and more spacious staterooms for the officers. It was further shown that there was no open waist amidships, as in the "Raleigh," the upper deck being carried flush throughout the vessel, and thus giving more deck room and a higher freeboard; and, lastly, that, though the waterline protection is exceedingly light, consisting merely of an inner sloping deck 1 and 2 inches in thickness, considerable protection is afforded by a cofferdam 27 inches in width by 4 feet in depth,

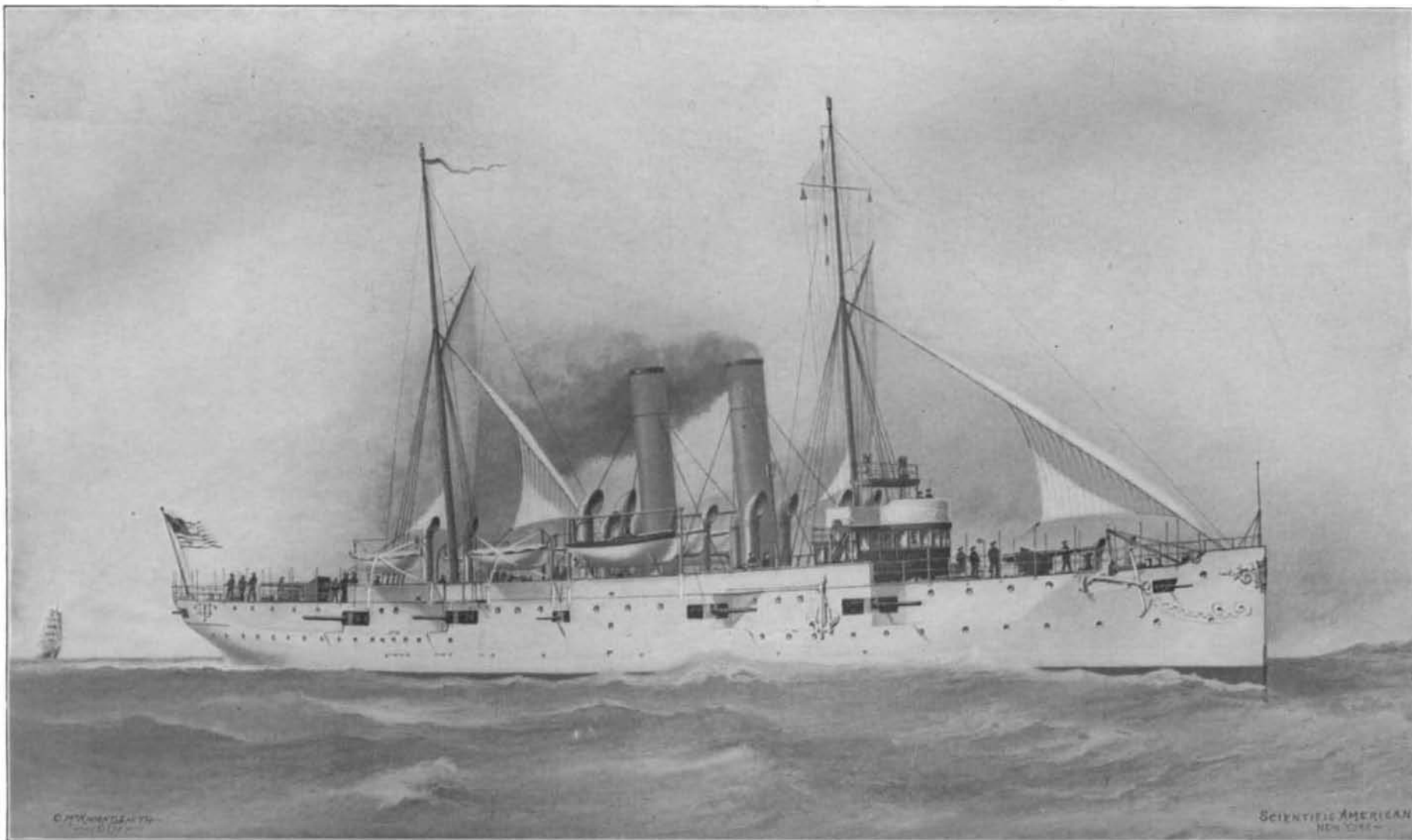
poorly protected to stand up and fight a modern cruiser with any great likelihood of success. What, for instance, would happen to the  $\frac{1}{2}$ -inch protective (*sic*) deck if high-explosive shells, even of small caliber, were bursting above it?

### Submarine Torpedo Boats.

#### THE HOLLAND SUBMARINE TORPEDO BOAT CLASS.

The United States government has now no less than eight submarine boats constructed or under con-

mitted the old fault of claiming too much, and there will come, if there has not already begun, a protest on the part of practical naval men against the impossible qualities which have been ascribed to what is, at best, an untried device. The method of attack of the submarine is outlined somewhat as follows: The little craft will steam to within striking distance of a battleship, and before her conning tower can be detected, will sink beneath the surface, approaching, still unsuspected, until within view of the vessel's unprotected hull. She will then discharge her torpedo



**Displacement, 3,200 tons. Speed, 16½ knots. Bunker Capacity, 700 tons. Armor:** Deck,  $\frac{1}{2}$  inch on flat, 1 inch to 2 inches on slopes. **Armament:** Ten 5-inch R. F.; eight 6-pounders; two 1-pounders four Colts; one 3-inch field gun. **Complement, 233.**

**SEMI-PROTECTED CRUISER "DENVER." ALSO "CLEVELAND," "CHATTANOOGA," "DES MOINES," "GALVESTON," AND "TACOMA."**

filled with waterproof corn-pith cellulose; while back of the cofferdam, in the wake of the engines and boilers, will be coal bunkers presenting a horizontal protection of from 8 to 10 feet of coal when the bunkers are full.

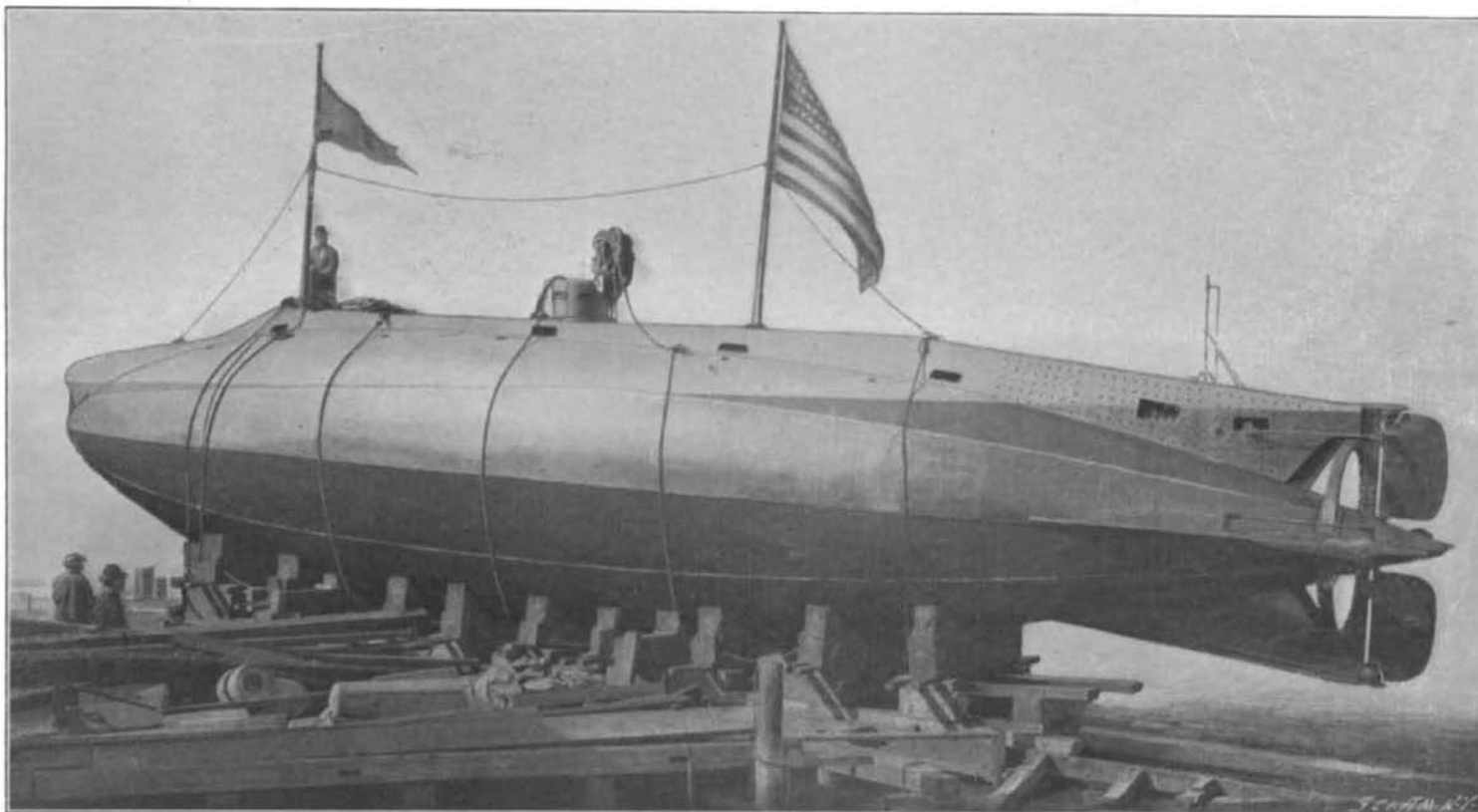
We have no doubt whatever that the prediction of the late Chief Constructor that the vessels will be exceedingly comfortable and will become, on that account, popular with officers and crew, will be fulfilled, at least in peace times; and no doubt the vessels will find a useful sphere of work in representing this government at foreign stations. We cannot help asking the question, however, as to what would be the fate of one of these slow, poorly-protected vessels should she fall in with an armored, or even a protected, cruiser of 20 knots speed or over, that was capable of overhauling her and overmatching her with the power of her armament. The type is one that is too slow to run away and too

struction. These are of the Holland type, which has been adopted by our own and by the British navy. In the absence of any experience with the submarine under the hard conditions of actual warfare, it is difficult to assign to this novel craft its proper value as a fighting unit of the navy. Just now, its value varies from nothing to everything, according to the conservative judgment or over-sanguine temperament of the critic. The friends and promoters of the submarine have undoubtedly com-

and stealing away under water, will come to the surface beyond range of the enemy's guns. All this is picturesque and, if practicable, would certainly be awe-inspiring. There is one difficulty, however, which would render an exploit of this kind exceedingly hazardous, and that is the impossibility of seeing under water with sufficient clearness for maneuvering. When the boat is submerged the navigator can see but dimly, if at all, and his course, as laid, is subject to errors in both a vertical and a horizontal plane. The chief

value of the submarine will lie in its moral effect in keeping the enemy continuously on the move, particularly should he be engaged in blockading a harbor in which a few submarines were known to exist.

The first of our torpedo boats, the "Holland," is 53 feet 11 inches long, 10 feet 3 inches diameter and 11 tons displacement, and is driven by a 50-horse power engine. She carries one torpedo tube and one dynamite gun as her armament. The six vessels author-



**Length, 63 feet 4 inches. Diameter, 11 feet 9 inches. Displacement Submerged, 120 tons. Speed at Surface, 8 knots. Speed Submerged, 7 knots. Gasoline Tank Capacity, 850 gallons. Armament:** One torpedo-expulsion tube; five 45 cm. by 11 feet 8 inches Whitehead torpedoes.

**THE HOLLAND SUBMARINE TORPEDO-BOAT CLASS—"HOLLAND," "ADDER," "GRAMPUS," "MOCCASIN," "PIKE," "PORPOISE," AND "SHARK."**