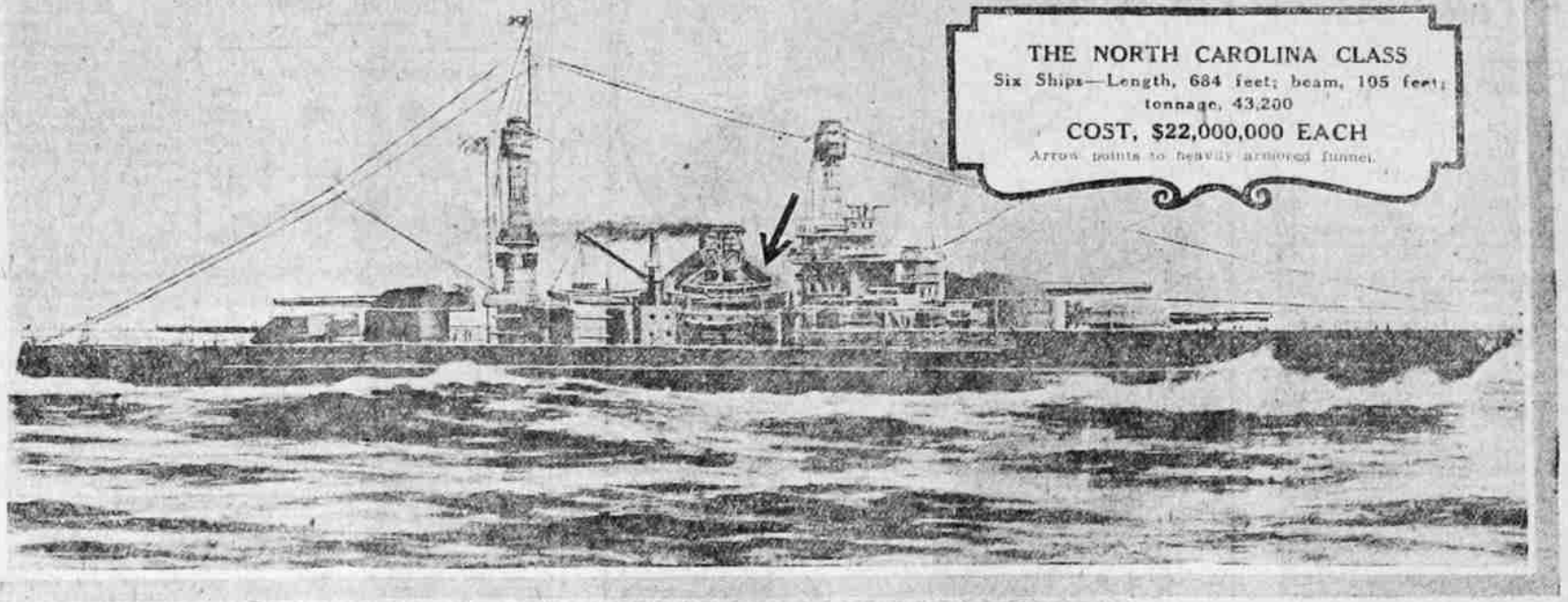


# Our New Battleships and T-Boats Lead World's Navies

### Vessels of the North Carolina Class When Completed Will Put United States in Advance of Any Nation When Major Fighting Craft Are Considered—Fleet Submarines Under Construction Completely Overshadow Famous Deutschland in Size and Speed, Besides Possessing Latest Marvels in Mechanical Equipment

**H**ERewith is another chapter in the series describing the expansion of the United States Navy. Previous chapters have described the lofty knot battle cruiser to cost \$22,000,000; the mammoth dirigible R-38, and the remarkable new flying boat, G B-1. A recently published article, from our Berlin correspondent, describing a new German invention by means of which submarines of 10,000 tons and capable of supporting armor may be possible. The announcement of this invention has a direct bearing upon the submarine programmes of the nations. The following article and the accompanying illustration tell just where the United States stands in this respect. The article also makes public the details of six battle ships of the North Carolina class, which are to cost \$22,000,000 each.



**THE NORTH CAROLINA CLASS**  
Six Ships—Length, 684 feet; beam, 195 feet; tonnage, 43,200  
**COST, \$22,000,000 EACH**  
Arrows point to heavily armored funnels

**WASHINGTON, D. C., Saturday.**  
The first of the new fleet submarines now building for the United States Navy, which are the biggest, most improved craft of their kind now actually under construction in the world, are called the T-type, probably because a use had been made previously for other letters of the alphabet. Three other fleet submarines now building at the Portsmouth Navy Yard and six for which bids are now under consideration will be known as the V-boats.

Through the new vessels contain many novel features of design, the new strategic advance with regard to their construction is their speed and great cruising radius. Nearly 100 feet longer than the best types of German U-boats they are swift swimmers, and their hulls are built on a cruising radius equal to that of the most modern battleship. They have a length of 300 feet, a beam of 27 feet and a tonnage of about 2,000 tons (not official). They will carry 40 men.

In speaking of the "most modern battleship" it may be said that the United States now has under construction six craft which when completed will be superior to any ship of their type afloat. They are the six battleships of the North Carolina class, now being built under the building programme of 1916.

longer and of nearly one thousand tons greater displacement than the Deutschland but are also several knots faster.

The present programme contemplates twelve fleet submarines, three to be known as T-boats and nine as V-boats. The first three are being built by the Electric Boat Company of New York and four of the V-boats are being built by the United States Shipbuilding Corporation at the Portsmouth Navy Yard which have been started on them early in 1920. Last April bids were opened for the construction of six more of this type and construction. The ships are expected to cost in the neighborhood of \$2,000,000 each.

The designs for all the fleet submarines were prepared by Admiral D. W. Taylor, chief constructor of the navy, who has made a careful study of all existing types of foreign craft.

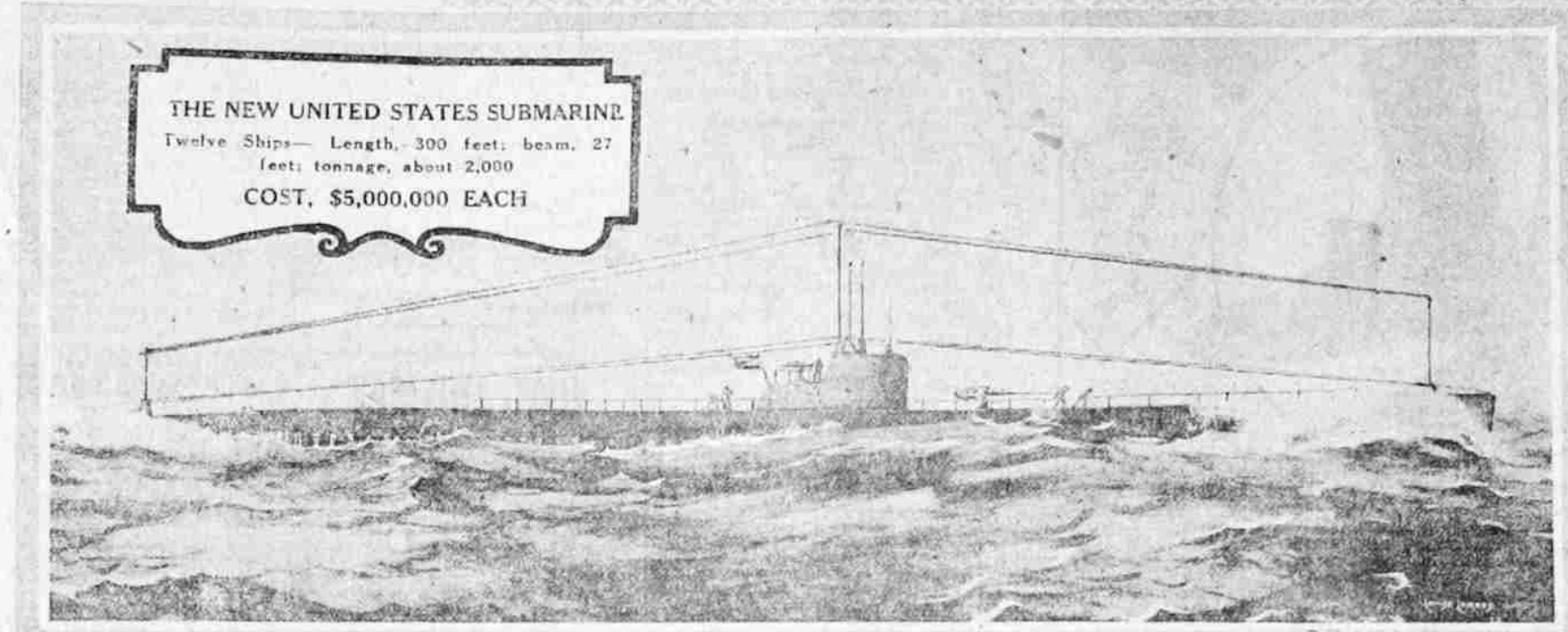
The propelling machinery for surface operations consists of two main Diesel engines, located in the after part of the hull, driving directly on the main shafts, and two auxiliary engines in the forward part of the hull, driving electric generators, which in turn supply electric current to two main motors on each main shaft.

When operating submerged the vessel will be propelled by the two main electric motors, taking current from a powerful storage battery. It is estimated that the surface speed under full power will exceed twenty knots an hour and that the vessel will be able to operate in submerged condition. The fuel capacity of the ship is such

as to provide for a radius of action of approximately 10,000 miles, the vessel being entirely self-supporting during that time.

Though in American hold the first practical submarine and Americans have been foremost in its development, the Diesel engine, which made possible the modern engineering type of submarine, is the invention of a German. The German Navy refused to adopt the submarine so long as there was only available to propel it on the surface. The U. S. Navy, however, was the first to do so during the early part of the war, and not until 1906 after Dr. Diesel had not his motor into practical working condition.

The advantage of the Diesel engine over the gasoline motor are that it gives more power, uses a cheaper grade of fuel and is much less dangerous. Three out of every four strokes of the piston of a gasoline motor waste power instead of producing it, while the Diesel is a two cycle engine gaining power on every second stroke.



**THE NEW UNITED STATES SUBMARINE**  
Twelve Ships—Length, 300 feet; beam, 27 feet; tonnage, about 2,000  
**COST, \$5,000,000 EACH**

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Three periscopes of the latest improved pattern will form part of the equipment of the fleet submarines, and each vessel will be provided with the latest type of radio telegraph outfit, both for surface and submerged work.

The idea of the periscopes dates from the middle of the nineteenth century when French and Dutch inventors experimented with them. During the civil war when the monitor Geographe had run aground in the Red River, her chief engineer

Thomas Doughty, constructed a periscope from a piece of three inch steam pipe and bits of looking glass, by means of which the warship's commander was able to look over the high banks of the river and repulse an attack by 2,000 Confederates by firing from the monitor's 11 inch guns, directed through the periscope.

So crude was the periscope, however, that as late as 1909 John P. Holland refused to adopt it for his submarines. To the Germans belongs the credit for bringing it to its present efficiency. The three periscopes of the new American undersea boats will enable them to keep a lookout in all directions at once and will also provide "spare" in case one should be damaged.

The first T-boats were equipped with only one periscope, until after the sinking of the U-15, the Germans began putting more on their vessels. During the early stages of the war the U-15 attacked a British squadron, but revealed herself by the winking of her periscope, and a well aimed shot from the cruiser Birmingham smashed the protruding "eye." The U-15 dived blindly to safety. A few moments later she attempted a quick "porpoise dive" up to the surface and down again in an effort to locate her enemy. This time the Birmingham gave her a broadside and a shell tore a great hole through her deck.

**Scope of the Submarine's Work Shows Gain and Is Still Growing**  
Owing to the comparative recency of the development of the ocean-going submarine, particularly of a type of sufficient speed and cruising radius to accompany the fleet, a system of tactics had not yet been completely worked out. The original function of the submarine was to serve as a "daylight torpedo boat," that is, to accomplish in broad daylight that which surface torpedo boats were expected to do under cover of darkness, for a smoke screen, to creep close to an enemy and launch a torpedo unobserved.

With the development of greater speed, armament and range of action, however, the scope of their operations has been broadened. Owing to their low visibility they are now becoming of utility in night attacks on the surface though they are useless for under water attack after nightfall because the periscope is practically blind at night.

The increase in the number of torpedo tubes and the greater power of torpedoes carried, together with the larger gun power, has also tended to increase their utility in engagements with surface ships.

The fleet submarines of the United States Navy carry 16-inch guns, which are larger than those ordinarily placed on submarines, though the British navy is said to have a new submarine mounting a 15-inch gun.

**New Type of Torpedo Tubes Gives a Distinct Advantage**  
One decided advantage which the new American craft will have is that her submerged torpedo tubes are not of the type known as "fixed." This means that when one of these craft wishes to fire a torpedo it will not be required to maneuver. The whole craft is capable of aiming the torpedo tube as in the case with practically all other submarines.

Special attention is understood to have been given to the problem of making the new submarines as nearly immune as possible to depth bomb explosions. On this subject, however, navy officials are reticent, as the method of attaining this immunity is secret. Thickness of armor, far from protecting the craft from an under water explosion, has had the opposite effect, the armor being driven into the vessel after the manner of a projectile if the explosion is within close proximity.

Another feature to which American designers have paid particular attention is that of habitability. Careful and detailed study was given all types of foreign vessels during the war, and it may be safely said that the fleet submarines will be more comfortable for their crews than any other submarines in the world. The emphasis had by navy officials upon this point is due to the belief that efficiency of the average submarine has in the past been very greatly impaired by living conditions which the average layman would consider unbearable. In this connection it may be stated that the world over American sailors have the reputation of being well housed.

**Submarines Under Construction By All the First Class Powers**  
Much has been said in condemnation of the submarine, particularly since its employment by Germany in a ruthless submarine warfare. It is a significant fact, however, that all first class powers are building submarines. Secretary Daniels has made clear his attitude in the following statement: "No nation, if it is to be prepared to engage in warfare upon the sea, can afford to neglect the submarine or to spare any pains to develop it to meet its needs. This type has come to stay as a factor in naval warfare unless outlawed by international agreement. Its abuse by the Germans in their ruthless campaign should not blind us to the fact that there is a large field for its legitimate use. Without accepting the theory of the enthusiasts that submarines should be developed to meet adequately all needs of naval warfare, we must all agree that the submarine cannot be ignored and has a field of its own in the conduct of war upon the sea which cannot be filled by any other character of ship."

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**Than the Famous Deutschland**  
When the Deutschland poked her periscope out of the sea off New London after her epoch making voyage across the Atlantic the world looked on with incredulous amazement. Even well informed men found it hard to credit reports of her power and speed. The new fleet submarines, however, are not only more than one hundred feet

**British Experts Clash Over Types of War Craft**  
Vice-Admiral Sir Percy Scott Holds War Proved Superiority of Submarines—Older Officers Firm for Major Ships

**Think Submarines Instead of Battleships Would Have Won the War for Germany**  
In order to reinforce the arguments against the battleship, Sir Percy brought to light an incident of 1915—a blunder, he calls it—which he believes prevented Germany from winning the war. He recommended in 1912 a British navy programme for the building of submarines and airplanes, instead of two battleships, but the Admiralty overruled. In consequence, he added, Germany built battleships which were not used, rather than submarines and airplanes, which Germany hastened to construct after the war began. It put Germany behind so, such he said, that she was unable to win the war although she came near to doing it.

**Older British Navy Officers Stand Firm for the Battleship**  
The stand against the battleship has attracted innumerable supporters high in the British naval service, but the large surface craft has its defenders, too, in large numbers. In this group are some of the older naval officers, who take the position that the obstacles presented by the submarine have or will be overcome, and that the battleship will remain dominant because of its intense mobility and capability of carrying heavy guns.

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**Bases Opposition to Capital Ships**  
On Air Craft as Well as Submarines  
Sir Percy's attack on the capital ship is based not only on the submarine, but upon aircraft, and he defies anybody to cite a vessel that can resist attack from the skies. His arguments have attracted much applause among British navy officers who approve of his condemnation of the capital ship.

**Other Powers may be Building Battleships**  
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