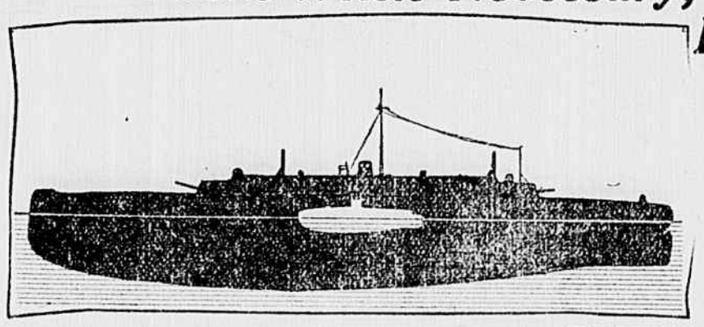
NEXT—The Submarine Battleship

Gigantic Dreadnaughts, That Can Fight Like Floating Forts and Dive Like Ducks When Necessary, to Take the Place of Powerful but Vulnerable Ships of To-day



The Size of the Proposed Submarine Battleship in Comparison to the Present Day Submarine Boat.

THE increasing number of successfully destructive attacks by German submarines upon British warships has brought to a practical head the long-discussed theoretical question whether it was the destiny of the underwater boat to supercede the floating ship.

England, Germany and France are understood to be so certain that the the day of the dreadnaught and superdreadnaught is passed that they are experimenting with plans of the only thing that can remedy the faults of the submarine and maintain the virtues of the battleship—and that is a submarine battleship. The United States is actually building a super-submarine which to all intents and purposes is really a submarine torpedo boat. It will be 265 feet long—100 feet longer than the longest submarine existing.

War, both on land and sea, has become largely a matter of concealment. The submarine boat is almost 100 per cent perfect in this respect. Its **faults** are its slowness under water as compared to the speed of the surface ships; its limited range of activity due to its limited fuel capacity; its instability in anything but moderately calm sea and its inability to effectively operate at night.

On the other hand, given favorable conditions, one torpedo from the submarine can destroy the mightiest of floating ships.

The type of war vessel which the nations are seeking is therefore a submersible battleship; a dreadnaught heavily armored and formidably gunned, of speed equal to the fastest war vessel of the present, with capacity to cover as many miles of sea as a dreadnaught; able to fight on the surface if necessary, just as the dreadnaught does, yet capable also of sinking at will beneath the water—thus gaining concealment while continuing to fight with torpedos, just as a submarine does. In other words a war vessel which shall be able to operate on the surface or under the waves as circumstances may render it advisable.

A battleship constructed on principles of the kind would, of course, demand important modifications, as compared with the surface fighting craft of to-day; but they would not be so many, or so difficult of accomplishment, as might at first glance be supposed. The diagrammatic illustration of such a submersible battleship printed on this page shows its essential parts.

The main problem would be solved by rendering the vessel water-tight, and providing her with an arangement for taking water into compartments and pumping it out again, as is done in the case of the submarine to-day. How the guns aboard of her might be protected against injury by water will presently be explained.

The submersible battleship will not necessarily be obliged to use two different means of propulsion—one for surface voyaging and the other for subsurface travel—as does the submarine of to-day. The internal-combustion type of engine is being so developed that it can be conveniently employed for both purposes—an important convenience, as compared with the present mechanical arrangements for submarine boats. The latter are now equipped with powerful oil engines of the Diesel kind for cruising, and also with electric engines for employment under water. The electric engines are connected directly with the shafts of the oil engines, so that, when high cruising speed at the surface is desired the electric motors and Diesel motors can be used together.

When the problem of the internal-combustion engine has been so far worked out as to render it available for both purposes on submarines, it can be utilized in like fashion for the submersible battleship. Such engines will be in effect automobile engines of huge size and great power.

It remains to determine—or, one should rather say, to surmise—what structural modifications a battleship would require in order to render it conveniently submersible, apart from the arrangements for rising out of the sea or sinking beneath the waves, by taking in water or pumping it out again.

Contrivances for making the deck openings—including hatches and turrets—water-tight are not matters of any difficulty. Riddance will be had of smoke-pipes by the use of internal-combustion engines. The masts suporting wireless apparatus will be hinged at the foot, perhaps, so as to fall along the superstructure. But, it will be said, what can be done with the guns?

This is a feature of the problem more simple than might be supposed. They can be made so as to be drawn back into the hull, much in the same way as the present type of disappearpearing guns now used by our coast artillery. The same machinery which draws back the guns can be used by means of cogwheels and pinions to automatically close the portholes with a cover resembling the breach block of a large gun, in which case a quarter-turn will make it absolutely water-tight.

Lest this expedient be deemed to fanciful, mention may be here made of the method now used by a foreign nation for stowing a three-inch quick-firing gun on the deck of the submarine. The gun is made to disappear in a pocket in the deck, using the same principle as a typewriter is overturned into and concealed within the familiar kind of desk made for the purpose. Water-tight steel hatches are then bolted over them.

The latter described method will be used for stowing a three-inch quick-firing gun on the deck of the huge sea-going supersubmarine which, recently provided for by Congress, is now in process of construction for the United States Navy. The same is true of the masts for this remarkable craft, which are hinged at the foot and collapsible.

For some time past the submarine has been steadily assuming a greater resemblance to the destroyer and it even threatens to usurp the functions of the latter. Some naval experts go as far as to express the opinion that before long it will render the destroyer obsolete. Originally designed for use in the harbors and in their near neighborhood, it has grown enormously in size—the German submarine of the "U" class is over two hundred feet long—and has become a sea-going craft, being designed to accompany squadrons of battleships.

To keep up with the battleship it must have speed. Accordingly, the newest submarines imitate the destroyers in shape, and are provided with engines of no less than 5,000 horsepower. The supersubmarine now building for the United States navy will be 265 feet long (the biggest craft of this type at present in our service being only 165 feet in length), with a displacement of 1,000 tons, and the cruising speed required of her will be twenty knots an hour. She will cost $1,300,000.

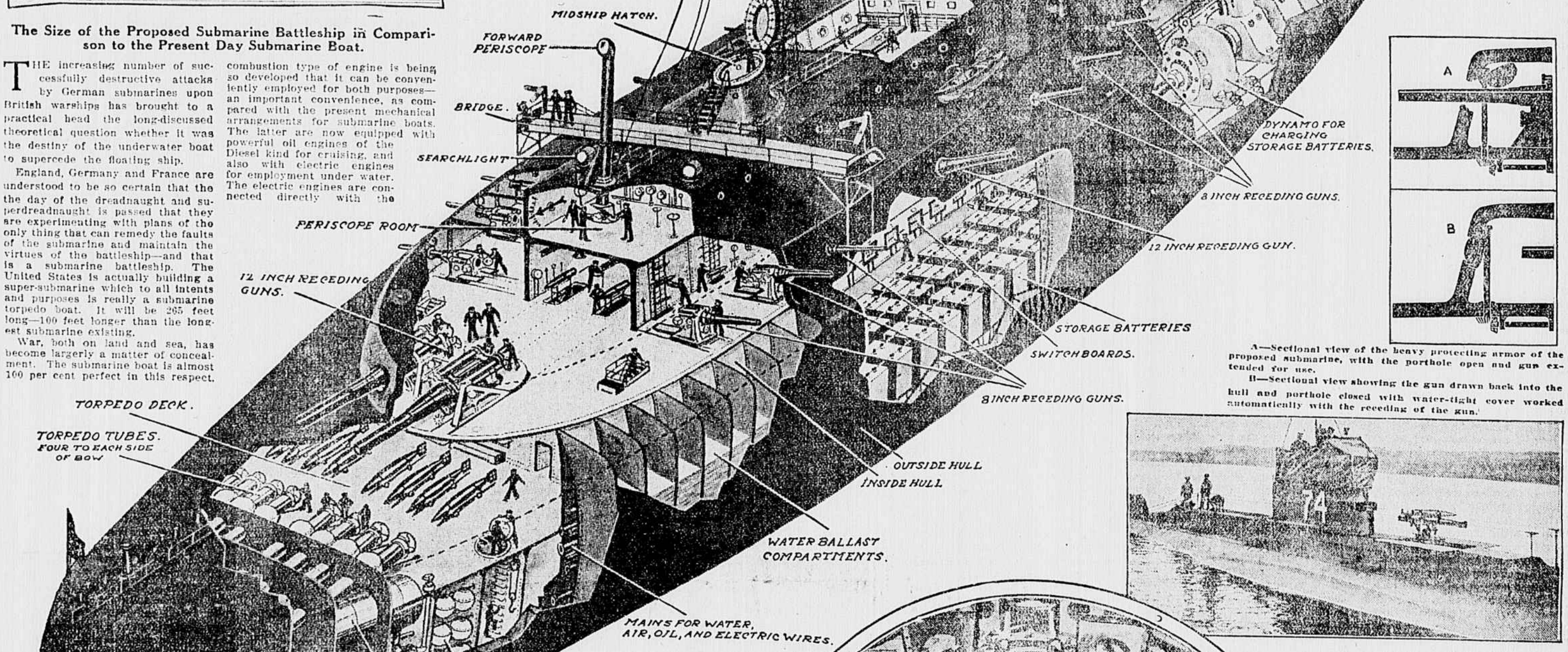
To all intents and purposes this vessel is a submersible destroyer. She will be provided with ten torpedo tubes—four of them mounted on pivots on her deck, so that they can be pointed in any direction, whereas ordinary torpedo tubes are fixed, and the boat has to be turned to aim them. In effect these pivoted tubes are guns, which discharge torpedos instead of shells. Hatchways are provided at each end of the craft, through which, for reloading, the torpedo projectiles can be raised with the help of machinery for hoisting and handling. This supersubmarine will have a cruising radius of 7,000 miles, or can travel 3,500 miles under water without renewing her fuel supply.

The submersible destroyer being already an accomplished fact, why is it not easy to conceive of submersible cruisers and battleships? Such craft, if they arrive, will owe their creation not to choice, but to necessity. If (as Sir Percey Scott predicts) the battleships of present day pattern are destined to be driven from the seas by submarine boats, their successors will be compelled to seek safety for themselves in hiding, as do the submarines, under water.

The submarine battleship would have all the features of both types mentioned. As a submarine it would have all the advantages of the boats of that class with from 600 to 1,000 per cent more efficiency in torpedo equipment. It could have a compartment for submarine mines, with a hatch for placing them in the path of a pursuing enemy. As a surface battleship it would still have the regular equipment of wireless, stretched between folding masts, searchlights, signals, etc. The small boats could be jettisoned by means of an automatic release when the ship is to be submerged. Extra large periscopes could be installed and used as lookouts, and principally this huge battleship would have the advantage of disappearing beneath the water when it is being overtaken by ships of the enemy.

The large drawing on this page shows what such a submarine battleship would look like. The most notable feature of this new boat is absence of funnels, military masts, cranes and many other deck fittings which indentifies the present day battleship. In the picture sections of the deck have been removed to show the principal internal workings of the future monster submarine with the various parts lettered to give the reader an idea of the many different details contained in the new submarine battleship. Along with having the same armament of the present day battleship, it will, as mentioned, have the full underwater equipment.

A boat of this type may be used with telling effect on coast cities and destroy naval stations, likewise fleets of small warcraft. It may also be used to explode submarine mines by the concussion caused by the explosion of a volley of torpedos discharged in the neighborhood of the mines. It is hard to anticipate just what this huge agent of death would do in actual combat, but we may well consider, judging from performances of our present day submarines, that the next step in naval construction will be the submarine battleship.



Diagrammatic Plan Showing the Shape and Essential Parts of the Possible New Submarine Battleship which May Take the Place of the War Vessels of To-day.

A—Sectional view of the heavy protecting armor of the proposed submarine, with the porthole open and gun extended for use.

B—Sectional view showing the gun drawn back into the hull and porthole closed with water-tight cover worked automatically with the receding of the gun.

How the Quick-Firing Gun Is Mounted on the Deck of Submarines Now Used by a Foreign Nation.

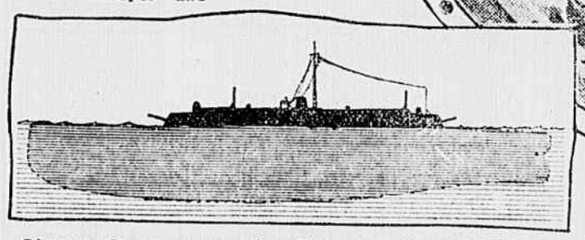
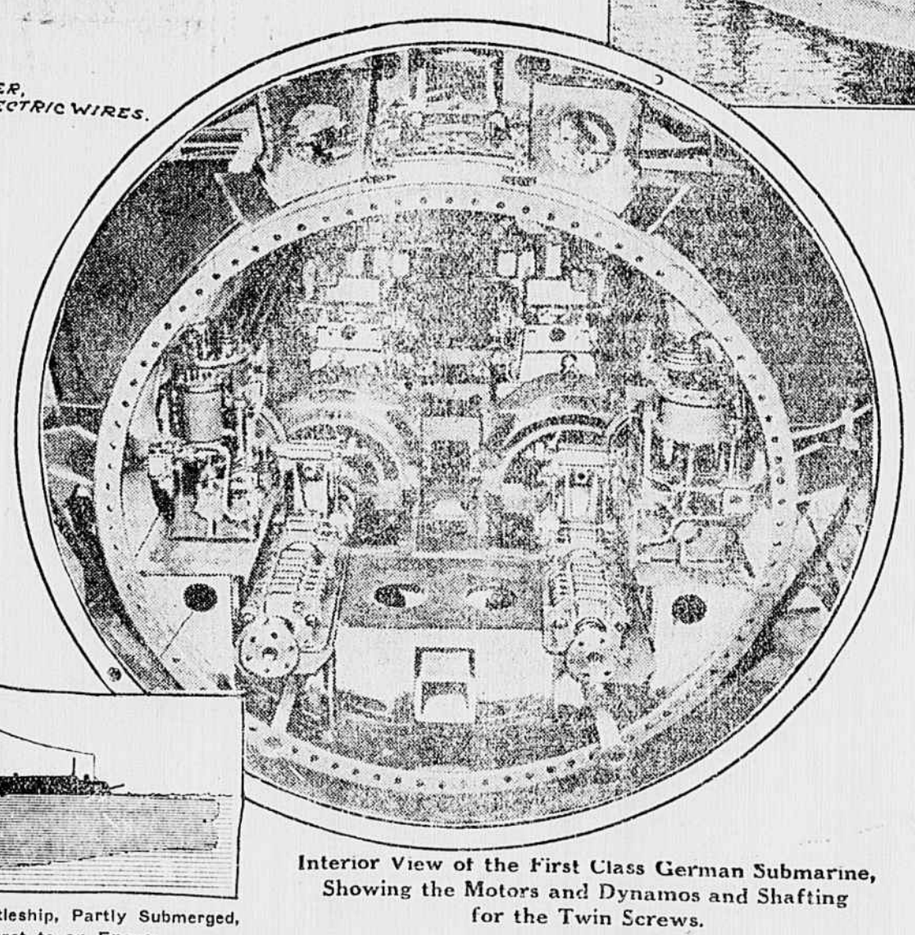


Diagram Showing How New Battleship, Partly Submerged, Will Offer Only a Small Target to an Enemy.



Interior View of the First Class German Submarine, Showing the Motors and Dynamos and Shafting for the Twin Screws.

A Song's "Catchiness" Depends On How It Can Be Breathed

SINGING is really a breathing exercise. The song that is closest in harmony with normal breathing is the easiest to sing. The rate of average composer's breathing is unconsciously and irresistably reflected in his music. His rate of breathing being that of the average person's, his songs are bound to be more popular than those of a composer who is so skilled in the making of music that he creates it independently of his lung action.

This in brief, is the interesting theory advanced by "The Hospital," an authentative English Medical publication, to explain why some songs became popular and others do not, and why particularly what is called "good music" never has the "catchiness" desired by the mass of people.

The average person, says "The Hospital," breathes about twenty times a minute. The most popular song, therefore, will be the one on which the accent or beat occurs twenty times a minute, or in harmonious ratio with that rate—that is ten times a minute, thirty, etc.

"The English army's song, 'Tipperary,' is a case in point. It has been asked why it should be more popular than the fine patriotic song 'Land of Hope and Glory,' by Elger. The reason is that 'Tipperary' is in agreement with the theory of natural respiration and Elger's song is not.

"Sentimental verses," concludes "The Hospital," "have also a natural breathing quality, and this is why sentimental songs when joined to respiratory music are the most 'catchy.'"