R. D'EQUEVILLEY.

SUBMARINE BOAT.

APPLICATION FILED NOV. 13, 1905.

988,632. Patented Apr. 4, 1911.

Fig. 2.

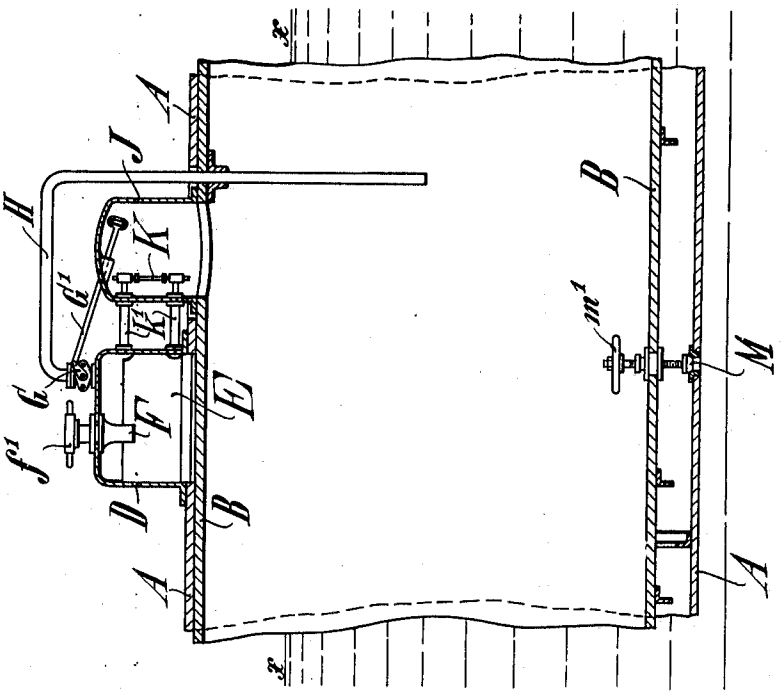
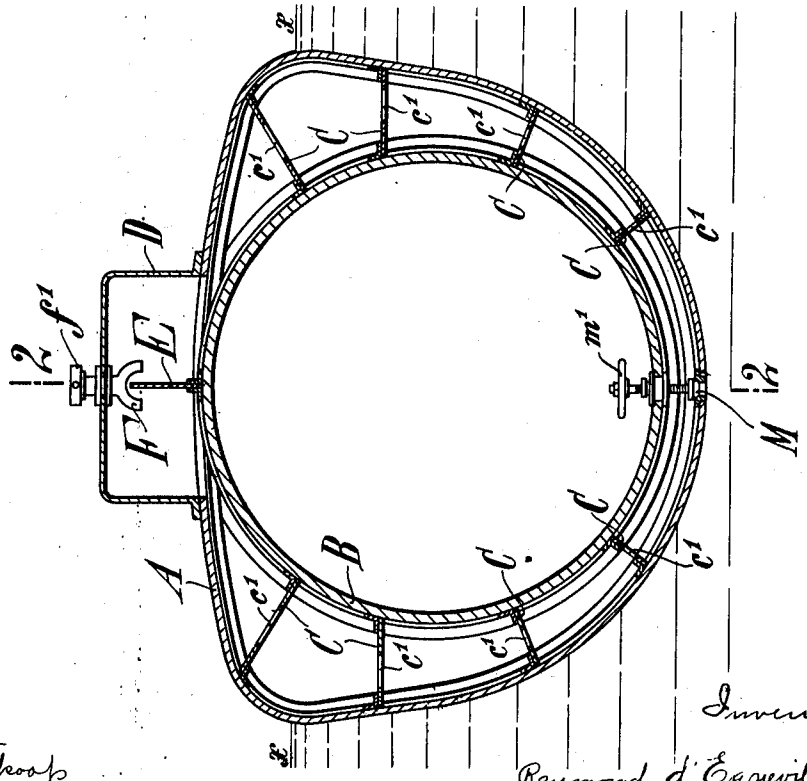


Fig. 1.



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SUBMARINE BOAT.

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To all whom it may concern:

Be it known that I, RAYMOND D'EQUEVILLEY, a subject of the King of Spain, and a resident of Kiel, Germany, have invented certain new and useful Improvements in Submarine Boats, of which the following is a specification.

The present invention relates to submarine boats having double walls and the object of the invention is to utilize the space between the outer and inner wall as a reservoir for liquid fuel and at the same time avoid the danger of the outer wall collapsing when the boat is submerged.

The invention is shown by way of example in the accompanying drawing wherein:—

Figure 1 is a transverse sectional view thereof; and, Fig. 2 is a part of a longitudinal vertical section through the boat.

The hull of the craft is encircled by the outer wall A and is of a shape that insures stability and swiftness of the boat both when it floats on the water level and when it is submerged. The inner wall B surrounds a space of preferably circular cross section. The hollow space between the walls A and B is designed for the reception of liquid fuel and is divided into a plurality of compartments by means of the longitudinal frames C. The compartments communicate with one another through openings c^1 in the frames C.

On the top of the outer wall A a dome D is arranged, the interior of which communicates with the space between the walls A and B. On the top of the inner wall is secured a partition wall E which extends in the longitudinal direction of the boat and into the dome D. On the dome is arranged a feed pipe F which is bifurcated at its lower end in order to provide for equal distribution of the fuel to both sides of the boat. A screw cap f^1 serves as a closure for the upper end of the feed pipe. On the dome D is further secured the housing of a cock G and a suction pipe H leads from said housing to the interior of the boat and communicates with a suitable suction and compression device (not shown in the drawing) through the medium of which the fuel can be drawn out from the dome D and forced to the place of consumption. The cock G may be opened and closed by means of a rod G^1 which leads to the interior of a dome J, communicating with the interior of the boat inclosed by the wall B. In the interior of the dome J is arranged a gage tube K whose inlet pipes k^1 open into the dome D and the space between the walls A and B. The partition wall E is cut out where the pipes k^1 open into the dome and the space between the walls, so as to provide communication of the liquid to both sides of the partition wall.

At the lowermost place of the boat, a valve M is arranged in such a manner that by opening the valve the space between the walls A and B is placed in communication with the water on the outside. The stem of the valve M projects through the wall B and is provided with a hand wheel m^1.

The above described arrangement is adapted only for use of liquid fuels which have a specific gravity less than the specific gravity of the water and the other properties of which prevent a mixing or a chemical combination of the fuel with the water to an extent that makes the fuel unfit for use.

Let it be assumed that the valve M and the feed pipe F are open, and that the craft floats on the water having the level x—x. In this event the water in the space between the walls A, B is in alinement with the level x—x of the outside water. If liquid fuel of the aforesaid kind is introduced into the space between the walls through the feed pipe F the fuel will be equally distributed on both sides of the partition wall E through the bifurcated lower end of the feed pipe F. The fuel being of less specific gravity remains on the top of the water and when the pressure of fuel increases, the fuel forces the water out through the valve M. As soon as the outflow of fuel is perceived, the attendant closes the valve M by turning the hand wheel m^1, completes the filling, and finally closes the feed pipe F by means of the screw cap f^1. If the valve M is subsequently opened, pressure of the outside water prevents the fuel from passing out. If the cock G is opened and fuel is drawn off through the pipe H, the pressure of the outside water will cause an equal amount of water to pass in until the space between the walls A, B is almost filled with water when nearly all of the fuel has been drawn off. Through the gage tube K it may be perceived from the interior of the boat when the fuel supply is pretty nearly exhausted, and the cock G may then be closed in order to prevent water from passing into the fuel pipe H. Access of water to the space be-

tween the walls may be regulated by means of the valve M according to the degree of pressure of water on the outside.

The two walls A and B come together at the uppermost place of the boat.

A submarine boat constructed in accordance with the present invention is capable of carrying an immense amount of liquid fuel and the distance, which the boat can travel without renewal of the fuel supply, is consequently considerably increased. Furthermore, the entire exterior surface of the fuel space is continuously exposed to the cooling action of the water and the fuel is consequently highly cooled and insured against danger of fire or explosion. Finally the space between the walls of the boat being continuously in communication with the outside water during the travel of the boat, the outer wall of the boat is entirely free of pressure and there is no danger of the outer wall collapsing even at great depths.

The space between the walls A and B may be divided into separate compartments by means of transverse bulkheads, which compartments may be emptied in succession and each of which communicates with the water on the outside.

Having thus described the invention the following is what I claim as new therein:

1. A submarine boat provided with a storage chamber comprising the hull of the boat as the inner wall of said chamber, and an outer shell spaced from the hull, as the outer wall of said chamber; said chamber lying substantially below the plane through the uppermost wall portion of the hull of the boat whereby to give the least interference with the center of stability and buoyancy of the vessel.

2. A submarine boat provided with a storage chamber comprising the hull of the boat as the inner wall of said chamber, and an outer shell as the outer wall of said chamber, said outer shell being spaced from the sides and beneath the hull and having the top wall thereof lying substantially beneath the horizontal plane through the uppermost wall portion of the hull whereby to so position the storage chamber as will give the least interference with the center of stability and buoyancy of the vessel.

3. A submarine boat provided with a liquid fuel chamber comprising the hull of the boat as the inner wall of said chamber, an outer shell as the outer wall of said chamber, reinforcing means intermediate said walls, said outer shell being spaced from the sides of and beneath the lowermost wall portion of the hull, and having the top wall thereof lying substantially beneath the horizontal plane through the uppermost wall portion of the hull whereby to so position the fuel chamber as will give the least interference with the center of stability and buoyancy of the vessel, and controllable means for admitting and discharging fuel and water within and from said chamber.

The foregoing specification signed at Kiel, Germany, this 28th day of October, 1905.

RAYMOND D'EQUEVILLEY.

In presence of—

JULIUS RÖPKE,

CARL TODT.