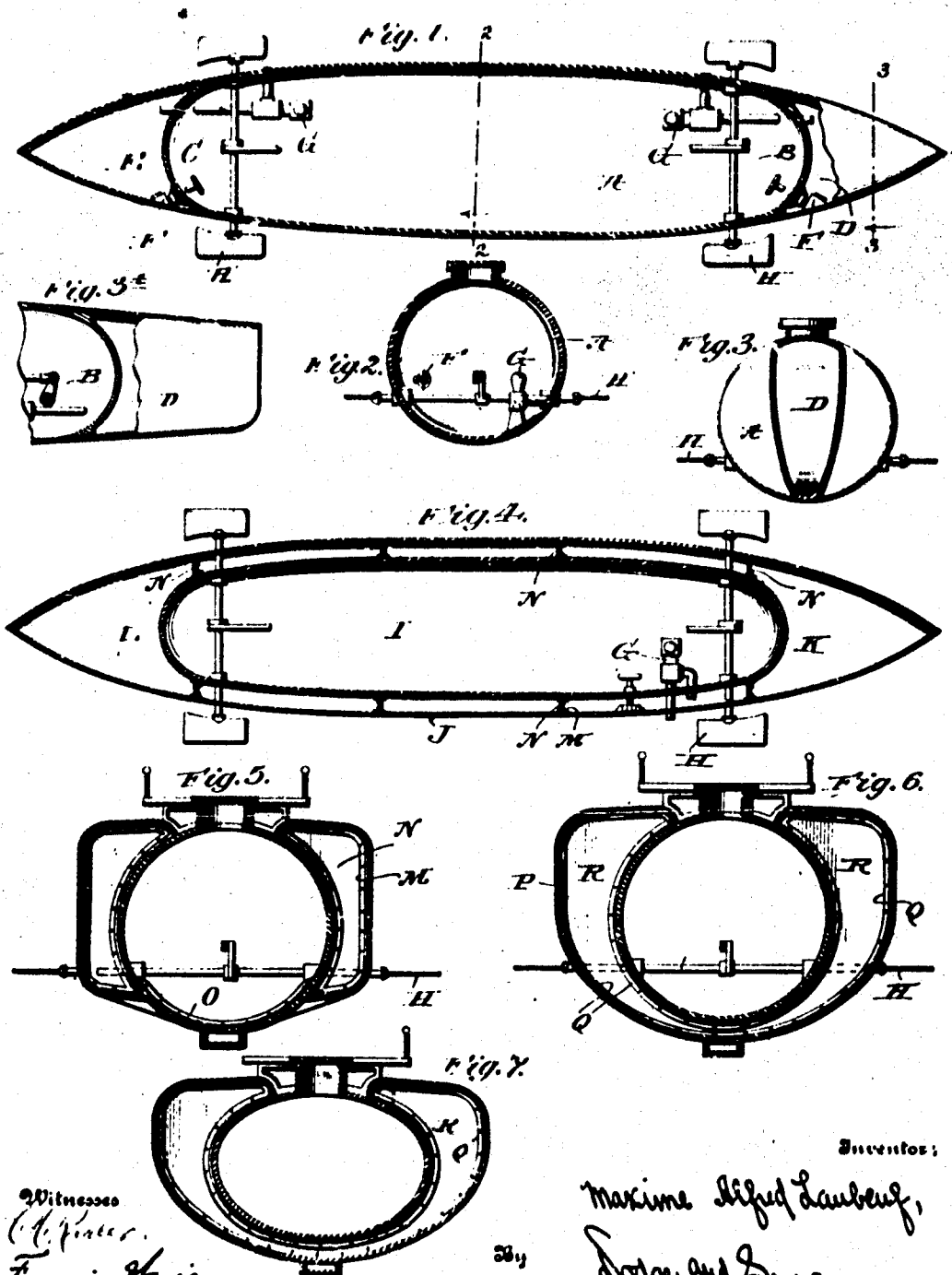


M. A. LAUBEUF.
SUBMARINE VESSEL.
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Patented Apr. 11, 1911.



Witnesses
C. J. Pinner.
Fannie H. H. H.

23,

Inventor:
Maxime Alfred Laubeuf,
Sergeant and Son,
Attorney

UNITED STATES PATENT OFFICE.

MAXIME ALFRED LAUBEUF, OF PARIS, FRANCE.

SUBMARINE VESSEL.

989,371.

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To all whom it may concern:

Be it known that I, MAXIME ALFRED LAUBEUF, a citizen of the Republic of France, residing at Paris, in the Department of the Seine, France, have invented certain new and useful Improvements in Submarine Vessels, of which the following is a specification.

My present invention pertains to improvements in submarine vessels, and has reference more particularly to a construction designed to afford protection to the vessel proper against blows resulting from collisions.

The construction is such that the forward and aft ends of the vessel may be given a different form in cross-section from the body thereof, so that the vessel may be more readily navigated. The compartments which are employed to protect the vessel from injury resulting from collisions are used as water-ballast compartments when the vessel is to be submerged, and as air compartments when it is being navigated on the surface of the water. By isolating the compartments from the body of the boat, it will be seen that should one compartment become injured and fill with water no damage will result therefrom, except that the vessel will be given a slight inclination while navigating upon the surface, whereas if the compartment is broken while the vessel is under water no change in the trim of the vessel will be observed inasmuch as such compartments will at that time be normally filled with water.

The invention is illustrated in the annexed drawings, wherein:

Figure 1 is a horizontal sectional view of a submarine vessel having my invention applied thereto; Fig. 2 a transverse sectional view on the line 2-2 of Fig. 1; Fig. 3 a similar view on the line 3-3 of Fig. 1; Fig. 3^a is a vertical sectional view of the bow. Fig. 4 a horizontal sectional view of a vessel showing a modification of the invention; Fig. 5 a transverse sectional view of a vessel similar to that shown in Fig. 4; Fig. 6 a like view, showing a slightly different form of the outer chambers or compartments; and Fig. 7 is the same as Fig. 6 except that the hull is elliptical instead of round.

The invention is designed primarily to protect the forward and after portions of the vessel, which are more liable to injury than the sides thereof, and to this end the

vessel shown in Fig. 1 is provided at the forward and aft ends with compartments which have no communication with the interior of the vessel proper.

Referring to Figs. 1 to 3^a inclusive, A denotes the body of the vessel, made of relatively heavy plates, which are carried around, forming bulkheads B and C. Secured to the forward portion of the vessel, or to the bulkhead B, is a chamber or compartment D, made of relatively thin plates like a torpedo boat but of sufficient strength to resist the ordinary water-pressure when the vessel is being navigated upon the surface. As will be noted upon reference to Fig. 3, the compartment D is tapering and the full height of the vertical axis is maintained substantially throughout the length of said compartment. The transverse axis is, however, narrowed as the compartment reaches the prow of the vessel so as to form a sharp bow, similar to the constructions used in the torpedo boats of today. A compartment E, likewise formed of relatively thin plate, is secured to the after bulkhead C, said compartment being given the same form as the compartment D, or any other shape which may be found desirable. Suitable sea valves F, operated from the interior of the hull, will be employed to flood the compartments D and E, and pumps G will be installed to withdraw the water from said compartments. It will be understood that the drawings are merely diagrammatic, and that all the detail of construction is not shown. Suitable horizontal rudders H will be used to cause the vessel to plunge and ascend, and also to maintain it upon an even keel.

In Figs. 4 and 5 is shown a submergible vessel, in which the hull I is made of heavy plate, as is usual. Extending around upon each side of the vessel is an outer shell J, made of thin plates, which is carried well forward and aft so as to form sharp-pointed compartments K and L. Where the shell extends along the side walls of the main hull it is connected thereto by a large number of suitable angle-irons M not water tight and transverse bulkheads N, whereby separate compartments or chambers are formed, and the forward and aft chambers K and L are separated from those upon the sides. The upper portion of the vessel is thus left clear for the placement of a deck or superstructure. In order to stiffen the lower portion

of the main hull I, angle-bars O may be secured to the inner face of the bottom of the hull.

In Fig. 6 a somewhat similar vessel is shown. Instead of having separate compartments upon opposite sides of the hull the outer shell P is made continuous and extends beneath the bottom of the main hull. Angle-irons Q are also employed, as in the former construction, and by securing bulkheads R to said angle-irons a series of separate and independent pockets is formed upon each side of the vessel. Suitable sea-valves and pumps will be employed for filling and emptying the various compartments, but it is not thought necessary to show these in each instance.

It is to be noted that in Figs. 1 to 3 inclusive the shafts upon which the rudders H are mounted do not extend through the compartments D and E; so that should said compartments be broken and, therefore, flooded no water could pass into the main hull. In Fig. 4 the shafts on which the rudders are mounted do not pass through the main or forward and aft compartments K and L, but merely through the relatively small side pockets or compartments; so that there is but little danger of flooding the vessel from injury to these compartments. Moreover, said compartments are not so liable to be injured by reason of their being upon the sides of the vessel. The large number of angle irons M and the several bulkheads N, shown in Fig. 4 permit of an elliptical form of hull instead of the customary circular form.

Having thus described my invention, what I claim is:

1. In a submarine vessel, the combination of a hull; and chambers secured to the forward and after ends of the hull, said chambers being of relatively light and thin material and entirely cut off from all communication with the interior of the hull.
2. In a submarine vessel, the combination

of a hull having forward and aft bulkheads formed as a continuation of the hull proper; and chambers secured to the hull at each end, said chambers being formed of relatively thin and light material.

3. In a submarine vessel, the combination of a hull having a forward bulkhead formed as a continuation of the hull proper; and a chamber secured to the hull and extending forward of the bulkhead, said chamber being of substantially the same height throughout, with the side walls inclining toward each other as they approach the bow.

4. In a submarine vessel, the combination of a hull having a bulkhead formed at one end of the hull as a substantial continuation thereof; and a chamber secured to the hull and extending forward of the bulkhead, said chamber being wedge-shaped in cross-section.

5. In a submarine vessel, the combination of a hull having a bulkhead formed at one end of the hull as a substantial continuation thereof; and a chamber formed of relatively thin material extending outwardly from the bulkhead, said chamber being wedge-shaped in form.

6. In a submarine vessel, the combination of a hull having a bulkhead at each end formed as a continuation of the hull proper; a protecting chamber formed of relatively thin material extending outwardly from each end of the vessel beyond said bulkheads, the side walls of the chambers being prolonged and extending along each side of the vessel; and numerous frames and bulkheads interposed between said side walls and the hull proper.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MAXIME ALFRED LAUBEUF.

Witnesses:

CHAS. H. WHITING,
JOHN BAKER.