N. P. NELSON.

SUBMARINE VESSEL.

APPLICATION FILED JUNE 3, 1915.

1,165,535. Patented Dec. 28, 1915.

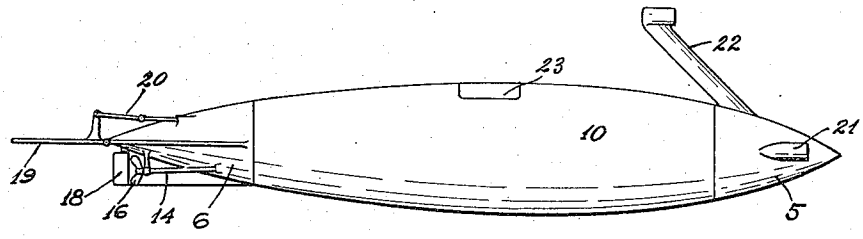

FIG. 1

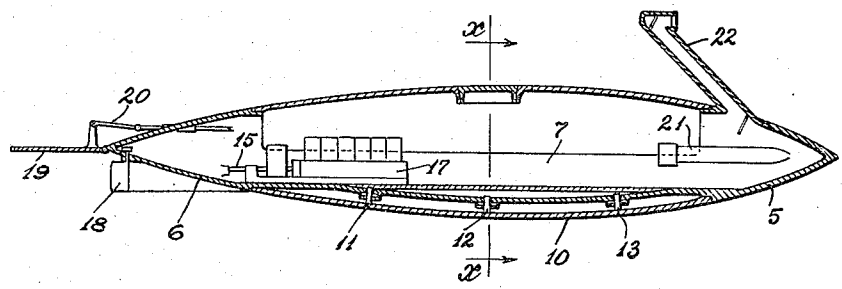

FIG. 2

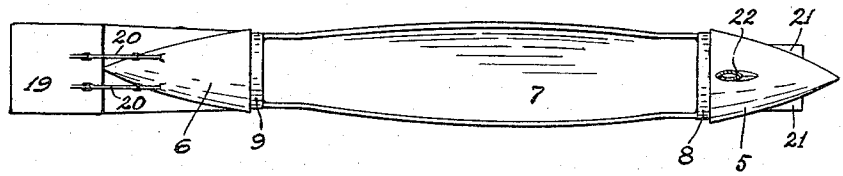

FIG. 3

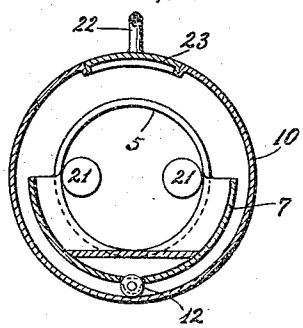

FIG. 4

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SUBMARINE VESSEL.

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To all whom it may concern:

Be it known that I, NELS PETER NELSON, citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented a certain new useful Improvement in Submarine Vessels, of which the following is a specification.

My invention relates to improvements in submarine vessels and the object of my improvement is to provide a submarine vessel whose hull shall be of such form as will offer little resistance to its movement through water when submerged and which shall be provided with rudders and associated steering mechanism which shall be adapted to be operated to direct its course upwardly or downwardly or in any other direction thus to adapt it readily to be operated to submerge itself to a desired depth and to direct its course in an inclined plane to reach the surface of the water without pumping water into, or forcing water out, of tanks for the purpose of changing its flotative factor; and which shall embody a periscope of such form and so disposed that it shall add little resistance to the movement of the vessel through the water, and a further object of my improvement is to provide such a submarine vessel which shall embody a hull whose circular inclosing walls shall comprise a larger portion which is disposed between two smaller portions upon which said smaller portions said larger portion shall be adapted to move rotatively, said two smaller portions being rigidly united by an inner semi-circular hull and by structural iron work, within which inner semi-circular hull shall be disposed all machinery and equipment of the vessel, whereby, when the vessel is in a seaway on the surface of the water, a sea-wave acting on said larger portion of the circular hull may move said larger portion rotatively without causing a like movement of said inner semi-circular hull, thus to prevent a rocking motion of said semi-circular hull and its associated machinery.

I attain these objects by devices illustrated in the accompanying drawings wherein—

Figure 1 is a view in side elevation of a submarine vessel embodying my invention; Fig. 2 is a view of the same in longitudinal mid-section on a vertical line; Fig. 3 is a plan view of the same with the larger portion of the circular wall of the hull removed; and Fig. 4 is a view in vertical cross-section on line x, x of Fig. 2.

Referring to the drawings, throughout which like reference numerals indicate like parts, a cigar shaped hull is formed to have its pointed prow 5 and its stern portion 6 rigidly associated with an inner hull 7 of semi-circular cross-section which extends between said prow 5 and said stern portion 6, as more clearly shown in Figs. 2 and 3.

The rearward end portion of the prow 5 is provided with a circular flange 8 and the forward end of the stern portion 6 is provided with a similar flange 9 and mounted on said flanges 8 and 9 to be rotatable thereon is an outer hull 10 of circular cross-section which varies in its diameter at different points between its ends to complete the cigar shaped form of the vessel shown in Fig. 1, said flanges 8 and 9 and the respective end portions of the outer hull 10 being joined in such manner as to make a water-tight joint irrespective of any relative rotary movements of the inner and outer hulls 7 and 10.

The outer hull 10, constituting the chief flotative factor of the vessel, serves to support all that portion of the weight of the semi-circular inner hull 7 which is not supported by the prow 5 and the stern portion 6, and in order to distribute the weight of the inner hull 7 and its contents so that such weight shall bear on different points between the ends of the outer hull 10 I have provided roller bearings 11, 12 and 13 disposed on the bottom of the inner hull 7, as shown in Fig. 2; thus whatever be the relative circumferential positions of the outer hull 10 and the inner hull 7, said inner hull 7 will be supported at the same distance from the inner surface of the hull 10.

Projecting rearwardly through the walls of the stern portion 6 are two propeller shafts as the shaft 14 of Fig. 1 and the shaft 15 of Fig. 2, upon each of the outer ends of which shafts 14 and 15 is a propeller, like the propeller 16 of Fig. 1, both of said shafts 14 and 15 being connected with an engine of suitable form as indicated by the numeral 17 in Fig. 2.

A rudder 18, of well known form, is associated with the stern portion 6 and adapted by any well known means, not shown, to steer the boat in a horizontal plane to starboard or port in a well known manner; and also associated with said stern portion 6 is a

rudder 19 whose plane is normally disposed to be horizontal but which may be inclined or declined with respect to the horizontal axis of the vessel to direct the course of such vessel upwardly or downwardly as may be desired as it moves through the water while submerged, said rudder 19 being operated by connecting rods 20 which extend into the vessel to connect with suitable steering mechanism not shown.

The prow 5 is provided with torpedo tubes 21 of a common form and disposition well known and is further provided with a periscope 22 whose tube extends obliquely upward to lean rearwardly and whose cross-section is parabolic in form whereby it may offer little resistance to the action of water as the vessel travels therethrough, the optical features of said periscope 22 being of a well known form of construction.

The outer hull 10 is provided with a tightly closable hatchway 23 disposed about midway between its ends and normally such hatchway 23 is in a circumferential position that registers with the periscope 22.

In the operation of a submarine vessel embodying my invention, when such vessel is traveling on the surface of a rough sea its larger exposed portion comprising the outer hull portion 10 may yield to the action of waves freely to roll without communicating the effect of such action to the inner hull 7 with which is associated the machinery and operative parts of the vessel whereby such hull 7 may be on even keel and when it is desired that the vessel shall dive beneath the surface of the water to travel while submerged then the rudder 19 is actuated to swing downwardly whereupon the stern of the vessel will be raised with the consequent result that the prow will turn downwardly and the propelling force of the propellers will cause the vessel to take an obliquely downward course to a required depth whereupon said rudder 19 may be actuated to move to a horizontal plane to cause the vessel to travel in such horizontal plane and if it be desired to direct the vessel toward the surface of the sea then the rudder 19 will be actuated to swing upwardly to cause the stern portion of the vessel to be depressed thus to point its prow upwardly with the result that the vessel will approach the surface of the sea in an obliquely upward course in an obvious manner.

To change the course of the vessel to port or starboard the rudder 18 will be actuated in a manner well known.

Obviously, a vessel embodying my invention, as illustrated and described, may be submerged to a required depth and again brought to the surface without pumping water into or ejecting water from water tanks in the manner usually employed by submarine vessels.

Changes may be made in the forms, dimensions and arrangement of parts of my invention without departing from the spirit thereof.

What I claim is:

1. A cigar shaped vessel of the class described, which embodies a prow portion and a stern portion which are rigidly connected by an inner hull of semi-circular cross-section, and an outer hull of circular cross-section disposed to extend between said prow portion and said stern portion to surround said inner hull portion, and adapted to move rotatively therearound.

2. A cigar shaped submarine vessel of the class described, which embodies a prow portion and a stern portion which are rigidly connected by an inner hull of semi-circular cross-section, an outer hull of circular cross-section disposed to extend between said prow portion and said stern portion to surround said inner hull portion and adapted to move rotatively therearound, a periscope tube disposed to extend obliquely upward and rearwardly from said prow portion, a controllable rudder attached to said stern portion and adapted to swing in a vertical plane and another controllable rudder attached to said stern portion and adapted to swing in a horizontal plane.

In witness whereof, I, hereunto subscribe my name this fifteenth day of May A. D., 1915.

NELS PETER NELSON.

Witnesses:
FRANK WARREN,
MAY ARCHER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."