

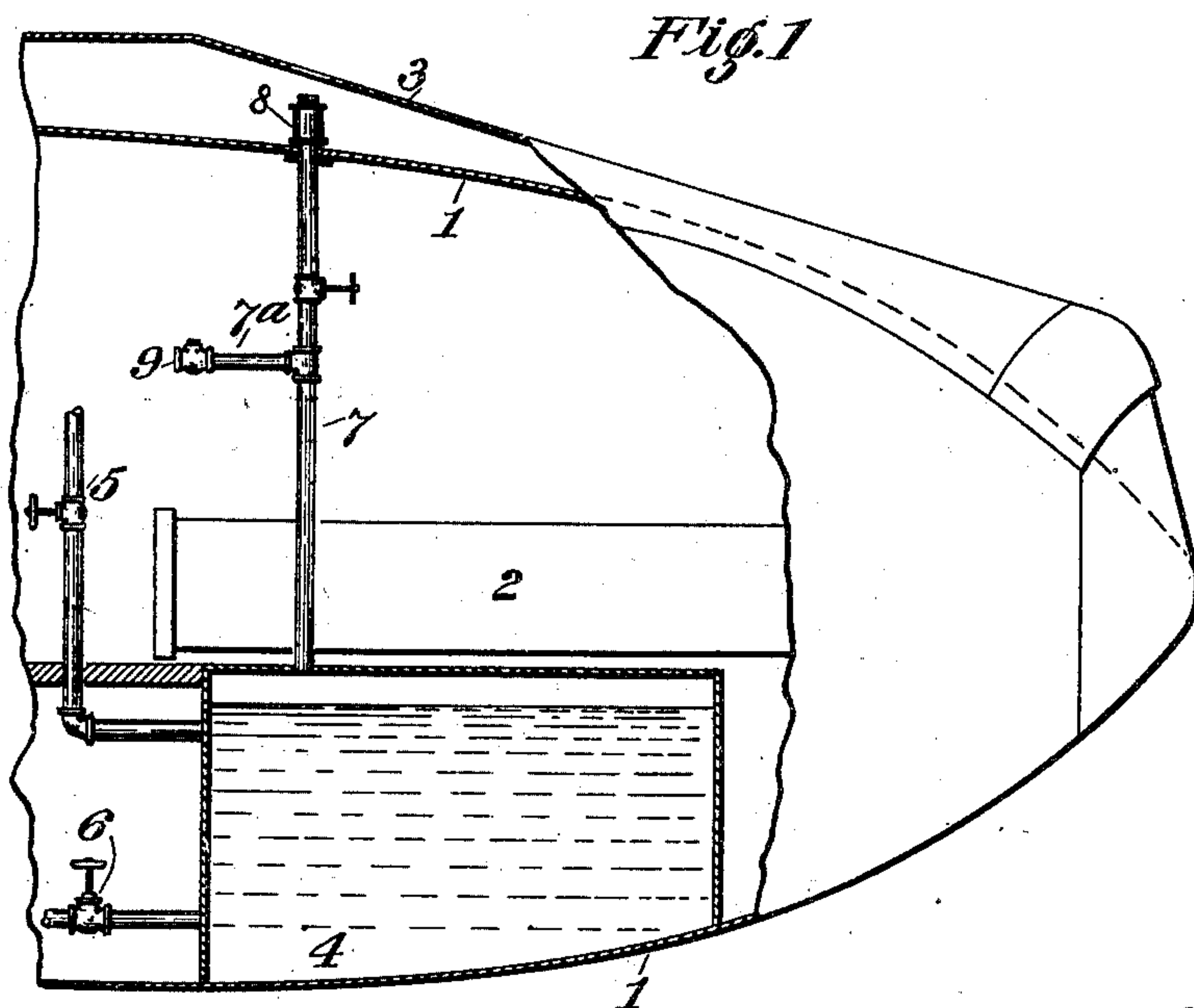
No. 696,972.

Patented Apr. 8, 1902.

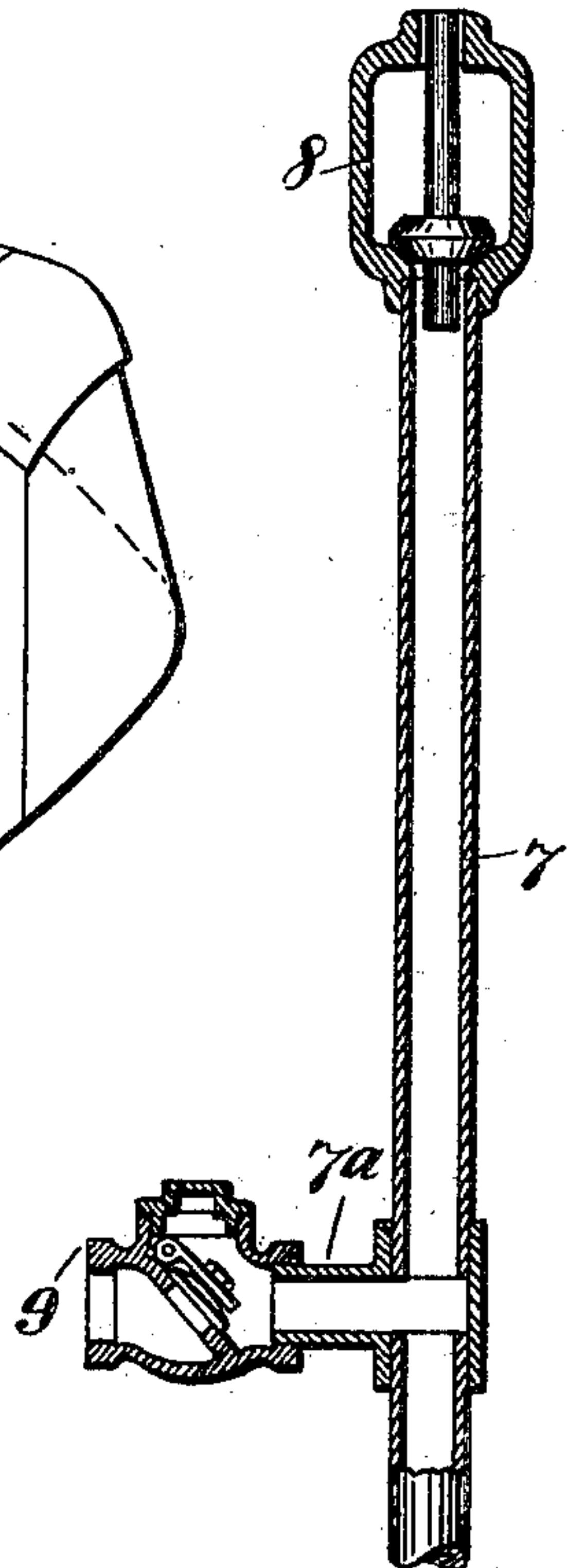
J. P. HOLLAND.  
SUBMARINE BOAT.

(Application filed Aug. 7, 1901.)

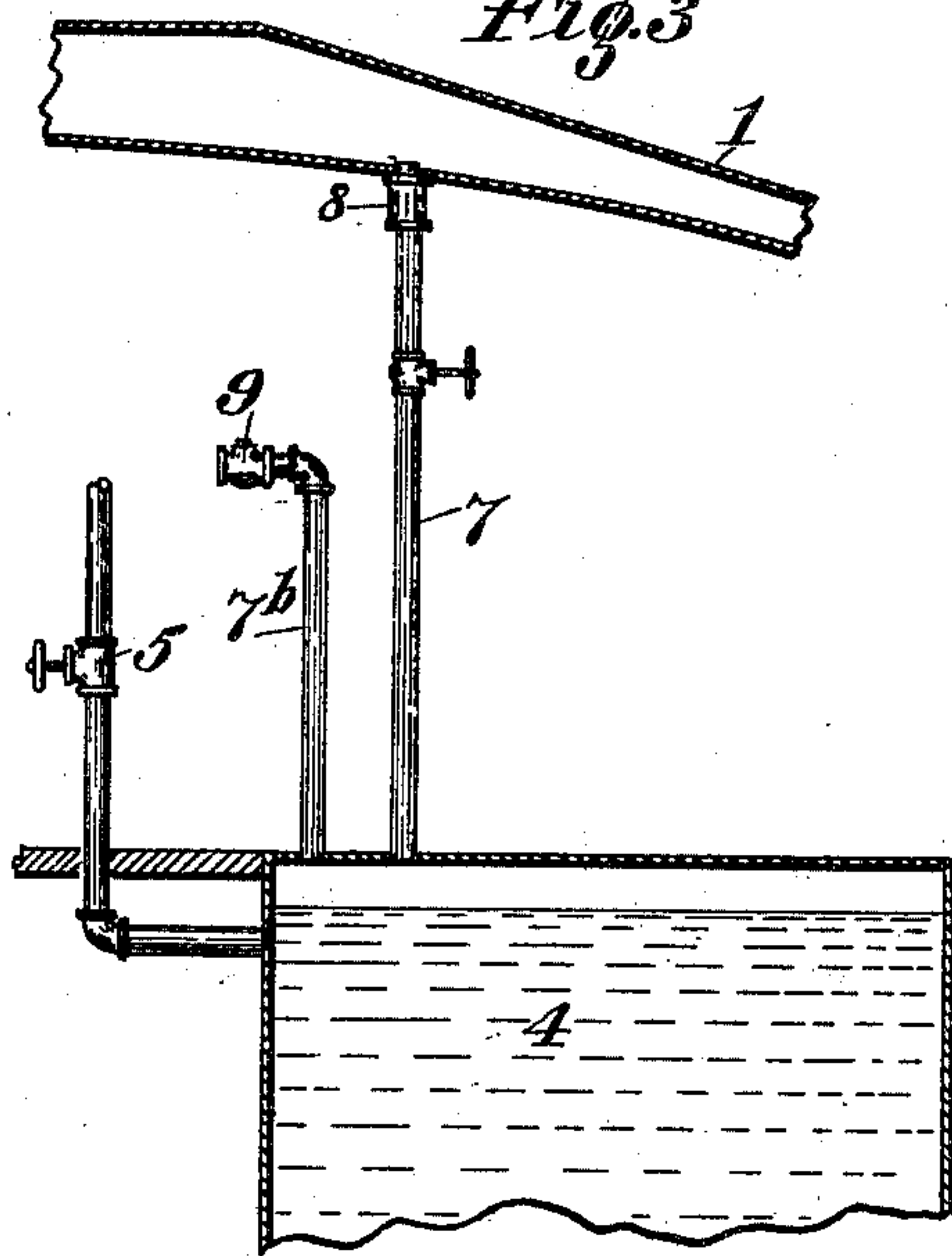
(No Model.)



*Fig. 2*



*Fig. 3*



Witnesses  
Bert C. Jones,  
Charles H. Hildreth.

John P. Holland  
Inventor,  
By his Attorney *Wm. C. Connelley*

# UNITED STATES PATENT OFFICE.

JOHN P. HOLLAND, OF NEWARK, NEW JERSEY.

## SUBMARINE BOAT.

SPECIFICATION forming part of Letters Patent No. 696,972, dated April 8, 1902.

Application filed August 7, 1901. Serial No. 71,131. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN P. HOLLAND, a citizen of the United States, residing in Newark, in the county of Essex and State of New Jersey, have invented certain Improvements in Submarine Boats, of which the following is a specification.

Submarine boats or vessels are commonly provided with internal combustion-engines which consume liquid hydrocarbons or oils of such volatility as to give off vapors at normal temperatures, and it is very desirable in the use of such oils to employ a tight tank or reservoir to contain the supply and to provide a relief exterior to the boat for the gases or gaseous vapors which accumulate in the tank and produce injurious tension or pressure therein; but as the engine takes its supply from the tank it is also desirable to supply air from the interior of the boat to take its place.

It is the object of the present invention to provide means for meeting the above requirements and provide an outlet exterior to the boat for the gases from the tank and an inlet at the interior of the boat for the admission of air to the tank to replace the oil consumed. The outlet and inlet thus provided are controlled by automatic valves, which permit the passage of fluids in but one direction.

In the accompanying drawings, which illustrate an embodiment of the invention, Figure 1 is a sectional view of the bow portion of a submarine boat provided with this invention, the plane of the section being vertical and substantially in the axis of the boat. Fig. 2 is an enlarged sectional view of the ventilating-pipe and check-valves. Fig. 3 is a view illustrating a slightly-modified arrangement of the parts.

In the drawings only such portions of the internal features of the boat are shown as will aid in understanding the invention.

1 is the hull or body of the boat, 2 the expulsion-tube therein, and 3 the hollow superstructure on the back or rounded top of the boat. This latter feature forms the subject of another application of mine and is merely shown fragmentarily herein for the better illustration of the other features.

In the boat is a tank 4 to contain a liquid

hydrocarbon or oil to supply the engine or to be used for other purposes. This is a tight closed tank having any suitable means for filling it and for supplying the oil to the engine or other point.

In Fig. 1, 5 designates the inlet for filling, and 6 the supply-pipe.

A ventilating-pipe 7 leads out from the top of the tank 4 above the oil, extending up to and through the shell of the boat under the superstructure 3. Exterior to the shell of the boat in Fig. 1 is a check-valve 8, (seen in section in Fig. 2,) which will permit the gases or vapors from the tank to pass outward, but which will not permit water to enter should the boat be submerged. A branch pipe 7<sup>a</sup> from the ventilating-pipe opens to the interior of the boat, and in it or controlling it is a check-valve 9, (seen also in Fig. 2,) which permits air to enter the tank from the interior of the boat, but prevents the passage of gases or vapors from the tank to the interior of the boat.

The operation is simple. If gases or gaseous vapors accumulate in the tank 4 above the oil, they will pass off to the exterior of the boat by the valve 8; but this valve will permit nothing to enter. If the engine is using oil from the tank, thus tending to create a vacuum therein, as soon as the pressure in the tank becomes less than that in the interior of the boat air will enter the tank through the branch pipe 7<sup>a</sup>, passing the valve 9, thus restoring the equilibrium; but this valve will permit nothing to pass it coming from the tank.

I have shown in Fig. 1 the preferred arrangement and construction; but obviously the parts may be arranged in any way so long as the object sought is attained. For example, the pipe 7<sup>a</sup>, which supplies air, may connect directly with the tank 4; but it is as well to connect it with the pipe 7, as shown. The valve 8 might also be situated just inside of the boat. These modified constructions are shown in Fig. 3, wherein the pipe which supplies air to the tank is designated by 7<sup>b</sup>.

Any good form of check-valve may be employed.

Having thus described my invention, I claim—

1. A submarine boat or vessel having in it



- a closed tank containing a liquid hydrocarbon, means for charging and supplying the liquid from same, a ventilating-pipe extending from the upper part of said tank out through the  
5 shell or hull of the boat, a check-valve controlling said pipe and opening outwardly, and means for automatically controlling the admission of air to said tank from the interior of the boat to replace the liquid used.
- 10 2. A submarine boat or vessel having in it a closed tank containing a liquid hydrocarbon, means for charging and supplying the liquid from same, a ventilating-pipe extending from the upper part of said tank out through the  
15 shell or hull of the boat, a check-valve controlling said pipe and opening outwardly, said valve being situated exterior to the boat, and means for automatically controlling the

admission of air to said tank from the interior of the boat to replace the liquid used. 20

3. A submarine boat or vessel having in it a closed tank containing a liquid hydrocarbon, means for discharging the accumulated gases and vapors from said tank exterior to the boat, a pipe from the interior of the boat for admit- 25  
ting air to said tank, and a check-valve controlling said pipe and opening inwardly, whereby the liquid consumed is replaced by air.

In witness whereof I have hereunto signed 30  
my name, this 30th day of July, 1901, in the presence of two subscribing witnesses.

JOHN P. HOLLAND.

Witnesses:

PETER A. ROSS,  
K. M. CAPLINGER.