

No. 706,561.

Patented Aug. 12, 1902.

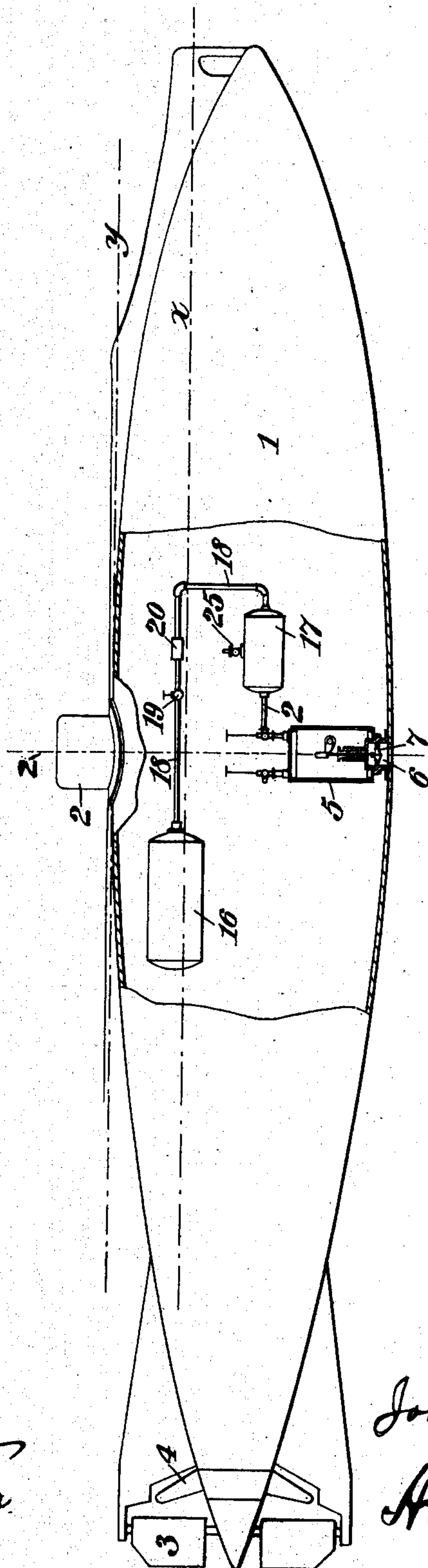
J. P. HOLLAND.
SUBMARINE BOAT.

(Application filed Aug. 7, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1



WITNESSES:

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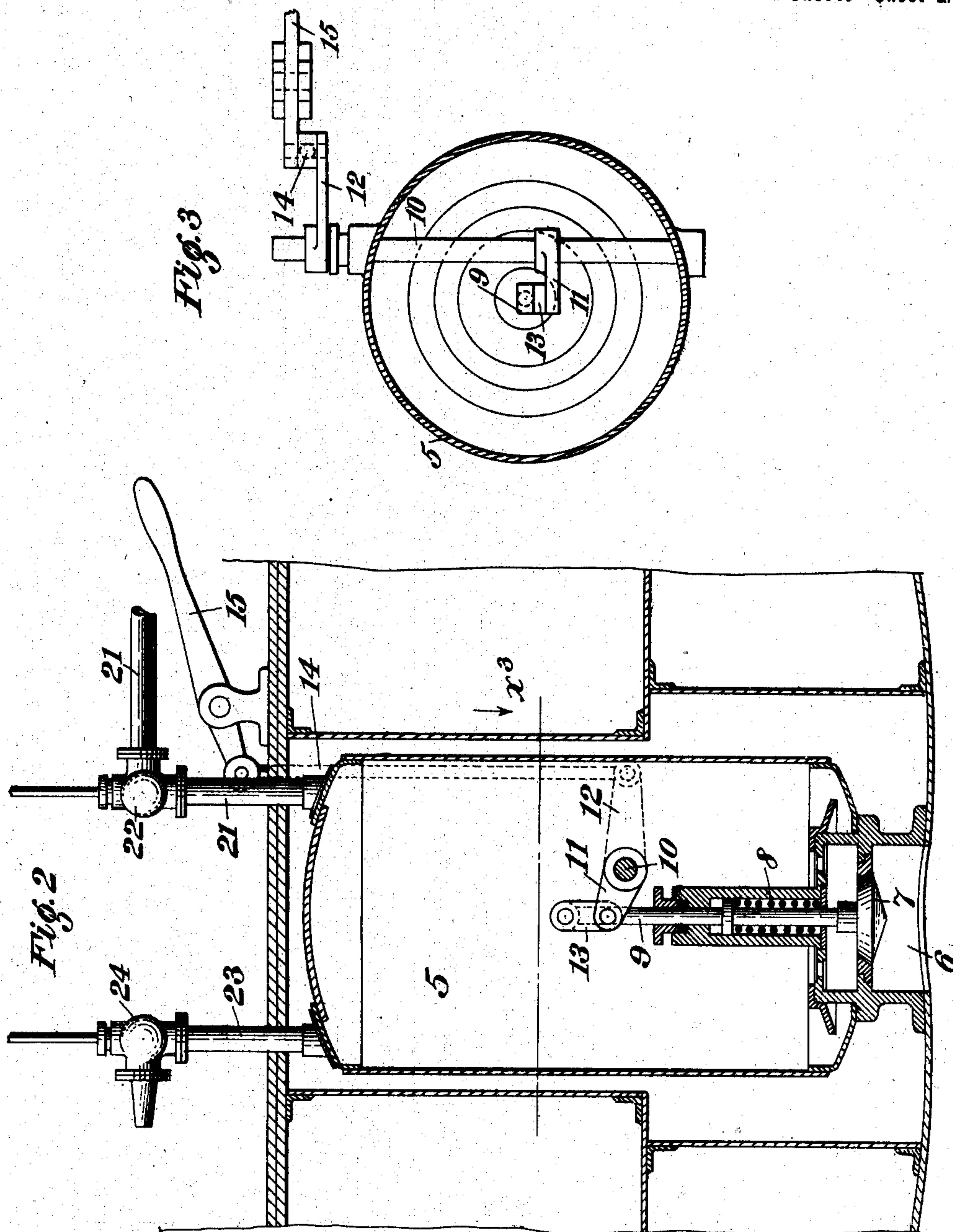
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UNITED STATES PATENT OFFICE.

JOHN P. HOLLAND, OF NEWARK, NEW JERSEY.

SUBMARINE BOAT.

SPECIFICATION forming part of Letters Patent No. 706,561, dated August 12, 1902.

Application filed August 7, 1901. Serial No. 71,132. (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, Essex county, New Jersey, have invented certain new and useful Improvements in and Relating to Submarine Boats, of which the following is a specification.

This invention relates to the class of boats chiefly employed for war purposes which are adapted to dive and operate submerged, and in this class of boats or vessels it is desirable that the boat shall be capable of rising quickly and momentarily to the surface for purposes of observation and as quickly sinking again out of sight, these movements being independent of the normal diving operation of the boat.

The object of the present invention is to provide a submarine or submergible boat or vessel with means to enable it to attain the above object, and these means will now be described, with reference to the accompanying drawings, which illustrate an embodiment of the invention.

In the drawings, Figure 1 is a side elevation of a submarine boat partly broken away to show the devices for the purpose stated. The other internal mechanisms of the boat are omitted, as forming no part of the present invention. Fig. 2 is an enlarged sectional view of the ballast-tank and its appurtenances, the plane of the section being vertical and axial; and Fig. 3 is a horizontal section of same in the plane indicated by the line x^3 in Fig. 2.

In the drawings, 1 designates the hull or body of a submarine boat provided with my invention. 2 is the conning-tower of the boat, 3 the rudders for horizontal steering, and 4 the propeller. These features form no essential part of the invention, although they are necessary parts of such a boat.

The water-line when the boat is in condition for surface running is indicated by the line x . When it is awash or prepared for diving, the water-line will be at y .

z designates a vertical line through the center of buoyancy of the boat when it is submerged.

A tank 5, having a capacity of about one-half of one per cent. of the boat's total displacement, is set in the boat under its center

of buoyancy—that is, in the line z —as shown. This tank has communication with the water of flotation through an opening 6, controlled by a valve 7, which opens outwardly and which is held up to its seat by a suitable spring 8 about the stem 9 of the valve. This spring is merely to overcome the weight of the parts, as the pressure of the water will ordinarily hold the valve to its seat. The valve 7 may be operated for opening it to admit water to the tank by means of a rock-shaft 10, which rocks in bearings in the wall of the tank and has two arms 11 and 12, one of which is coupled by a link 13 to the stem of the valve. The other arm outside of the tank is coupled to an operating-rod 14, which extends up to a point above where ready access can be had to it from the interior of the boat for operating the valve. Any means may be employed for operating the rod 14. As shown in Fig. 2, a lever 15 is utilized.

In the boat is an air-tank 16, containing air at high pressure—say up to two thousand pounds per square inch—and this tank supplies with air at a lower pressure a service-tank 17 through a pipe 18, in which is a stop-valve or cut-off 19 and a reducing-valve 20. The service-tank 17 supplies air to the tank 5 through a pipe 21, provided with a readily-accessible stop-valve 22, and an air-discharge pipe 23 opens into the interior of the boat, being controlled by a stop-valve 24. The air-service tank 17 has a relief-valve 25.

In order to cause the conning-tower of the boat to rise above the surface of the water and to disappear again quickly, so as not to attract notice, the water is forced rapidly from the special tank 5 while the boat is submerged, thus reducing its weight by one-half of one per cent. The boat will then rise, and as soon as the conning-tower reaches the surface the air is discharged from the said tank at the valve 24 and the water admitted to the tank at the valve 7. The upward movement of the boat will carry the greater part of the tower above the surface of the water; but the increased total weight due to restoring the water to the tank and the increase in weight due to the emergence of the whole of the tower instead of only about one-third of it, which normally represents reserve buoyancy, will cause the boat to sink and the tower to

disappear quickly. The boat being in motion slowly, this maneuver can be assisted by the diving-rudders; but the apparatus described may be operated independently of the diving mechanism.

5 Having thus described my invention, I claim—

1. A submarine boat having the usual water-ballast tanks, an independent special tank
10 to contain a predetermined quantity of water, a valve controlling the admission of water thereto from the outside, manually-operable means for opening said valve from the interior of the boat, a manually-operable stop-
15 valve controlling communication between the top of said tank and the interior of the boat, a tank containing compressed air, a pipe connecting said tank with the said special tank, and a manually-operable stop-valve control-
20 ling said pipe.

2. A submarine boat having the usual water-ballast tanks, an independent water-ballast tank of fixed and predetermined capacity situated below the center of buoyancy of the boat when submerged, manually-controlled
25 means of rapidly discharging the water from said tank to permit the boat to rise to the surface, and manually controlled and operable means for rapidly refilling said tank as soon as the conning-tower reaches the sur-
30 face, substantially as and for the purpose set forth.

In witness whereof I have hereunto signed 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.