

Aug. 19, 1930.

L. DUMAN

1,773,223

SUBMARINE BOAT

Filed Sept. 20, 1928

3 Sheets-Sheet 1

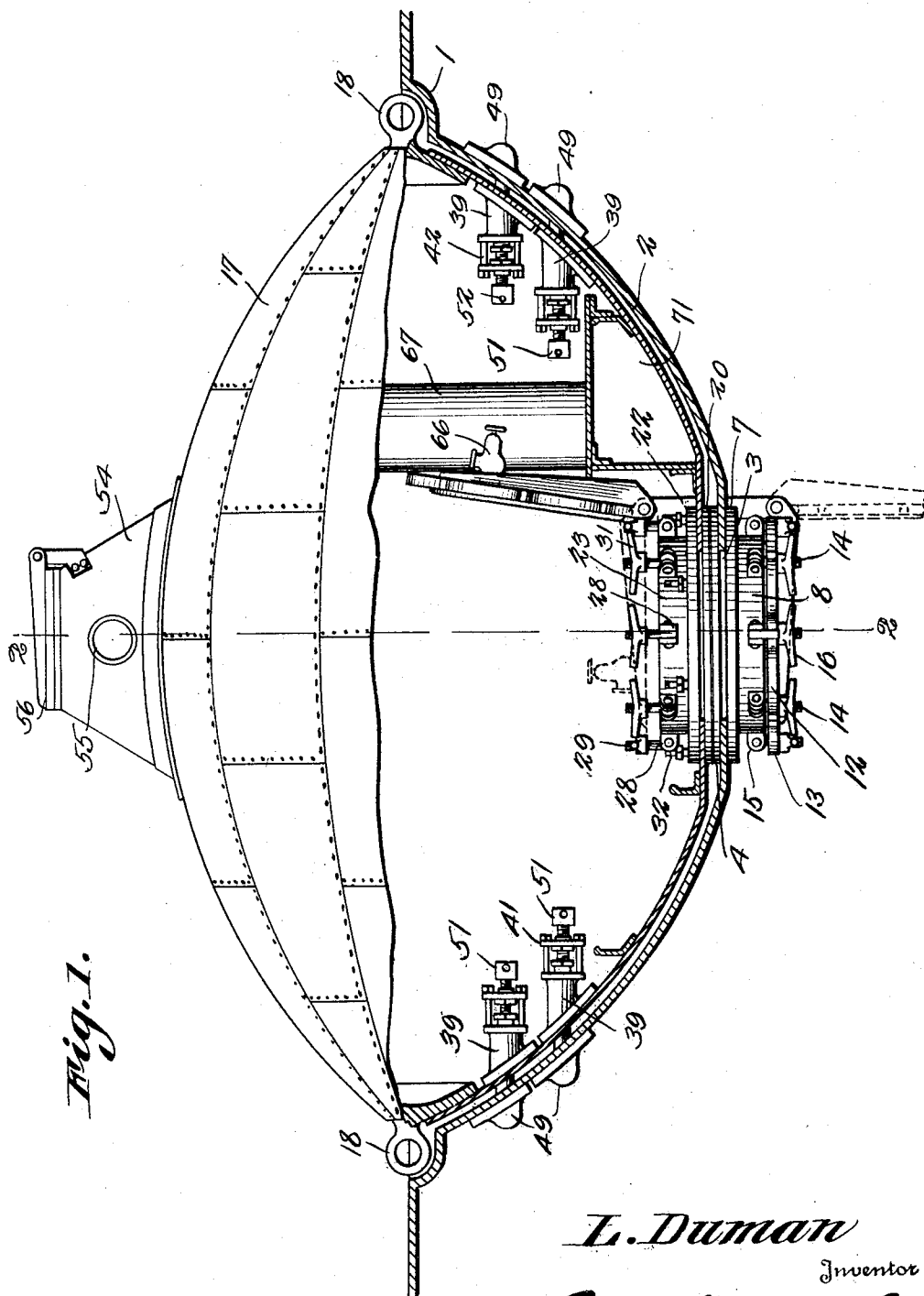


Fig. 1.

L. Duman

Inventor

By *Cashow & Co.*  
Attorneys.

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L. DUMAN

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3 Sheets-Sheet 2

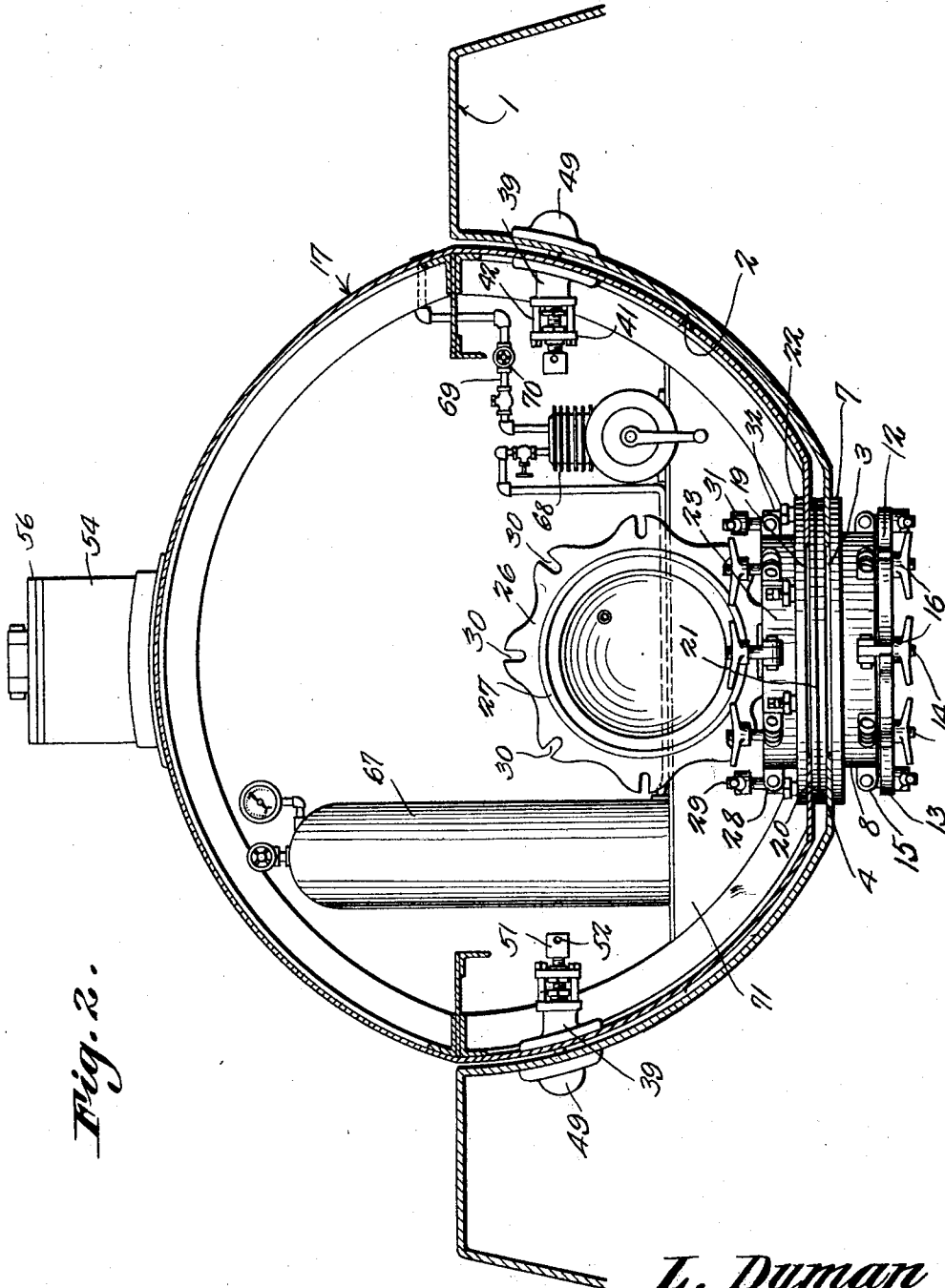


Fig. 2.

L. Duman

Inventor

By *Calhoun & Co.*  
Attorneys.

Aug. 19, 1930.

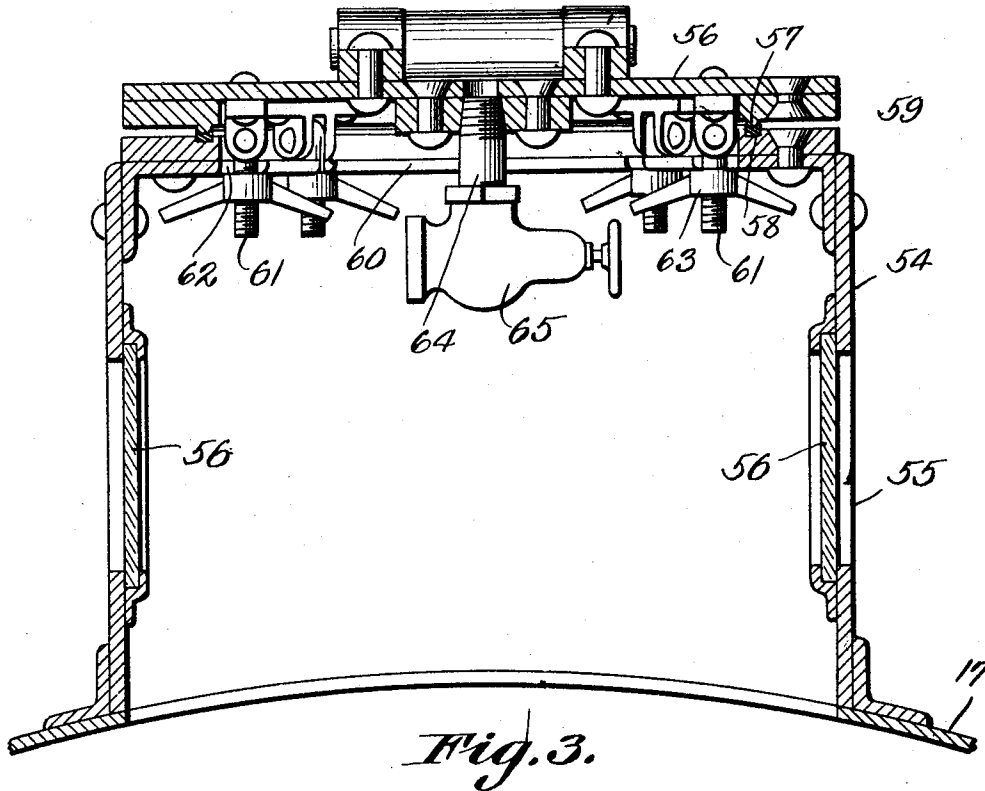
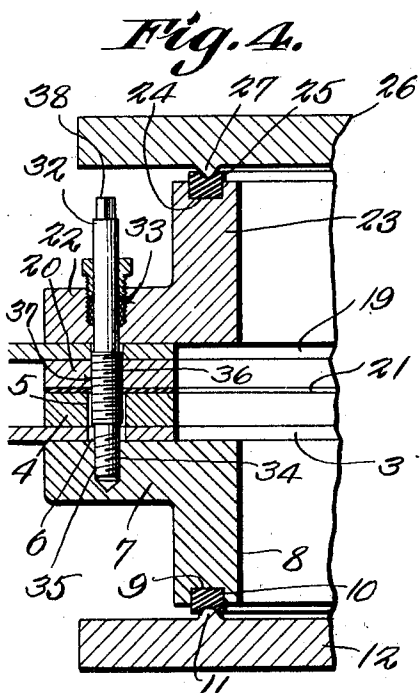
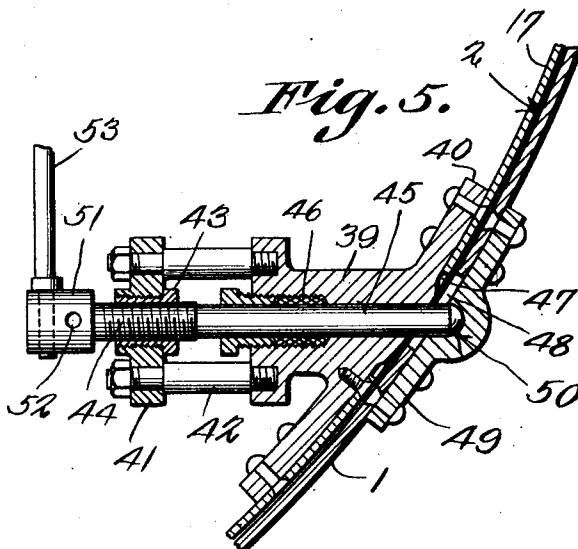
L. DUMAN

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3 Sheets-Sheet 3



*L. Duman* Inventor  
By *Cashow & Co.* Attorneys.

## UNITED STATES PATENT OFFICE

LAWRENCE DUMAN, OF CHEBOYGAN, MICHIGAN

## SUBMARINE BOAT

Application filed September 20, 1928. Serial No. 307,273.

This invention relates to a submarine boat and more particularly to a life boat or yawl for use in connection therewith which, under ordinary conditions, is partly housed within the structure of the submarine boat where it will offer the minimum resistance while travelling through the water and where it is readily accessible to the occupants of the submarine.

10 A further object is to provide simple and efficient means for securing the supplemental boat to the submarine so that it can be released only by the occupants thereof.

15 Another object is to provide means whereby a water tight connection is provided between the submarine and its supplemental boat.

20 A still further object is to provide a supplemental boat with equipment for furnishing fresh air and drinking water to the occupants while submerged, it being possible to replenish the air supply at will after the supplemental boat has reached the surface of the water but while it is still closed to exclude water breaking thereover.

25 With the foregoing and other objects in view which will appear as the description proceeds the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

30 In the accompanying drawings the preferred form of the invention has been shown.

In said drawings,

40 Figure 1 is a view partly in side elevation and partly in section of the supplemental or life boat, a portion of the submarine to which it is connected being shown in section.

45 Figure 2 is a section on line 2—2, Figure 1, the conning tower and the connections between the submarine and the supplemental boat being shown in elevation.

50 Figure 3 is an enlarged section through the conning tower taken on the line 2—2, Figure 1, showing the means for holding the cover

closed and the means for releasing vitiated air.

Figure 4 is an enlarged section showing one of the connections between the bottom of the supplemental boat and the submarine. 55

Figure 5 is an enlarged section through one of the side fasteners.

Referring to the figures by characters of reference, 1 designates a portion of the hull or body of a submarine and in the top thereof is formed a concave recess 2 sufficiently large to receive the bottom portion of the supplemental or life boat. Formed in the bottom of the recess 2 is an opening 3 large enough for a person to pass therethrough and secured around this opening and to the submarine is a reinforcing ring 4 in which openings 5 are provided at desired intervals, these openings registering with similar openings 6 formed in the body 1. Another ring 7 is 70 secured around the opening 3 to the inner surface of the body 1 and has a downwardly extending annular flange 8 the lower or free edge of which is formed with a groove 9 to receive a packing ring 10. This packing ring is adapted to receive thrust from a circular rib 11 formed on one face of a cover 12. This cover has portions 13 extending from the periphery thereof for the reception of bolts 14 which are pivotally connected to 80 ears 15 extending radially from the flange 8. Large clamping nuts 16 engage the bolts 14 and are adapted to press upwardly against the cover 12 to force the rib 11 against the packing ring 10 and thereby seal the man-hole in the ring 7. 85

Removably seated in the recess 2 is the supplemental or life boat 17 made sufficiently strong to resist the same pressures as those to which the body 1 of the submarine can be subjected. The boat is of course to be made water tight and is provided preferably at each end with an eye 18 whereby it can be handled readily by mechanical means when so desired. 90

Formed in the bottom of the supplemental boat is an opening 19 corresponding with the opening 3 and surrounded by a reinforcing ring 20 secured to the boat 17 and located on the outer or bottom surface thereof. This 100

ring 20 corresponds with the ring 4 and is normally spaced therefrom by a sealing ring 21 adapted to be compressed between the rings 4 and 20. Another ring 22 similar to the ring 7 is secured to the boat 17 about opening 19 but upon the inner surface of the bottom of the boat. This ring has an annular flange 23 extending upwardly therefrom formed with a groove 24 in which is seated a packing ring 25. A cover 26 extends across the manhole defined by the flange 23 and ring 22 and has a circular rib 27 adapted to bear against the packing ring 25. Ears 28 are extended radially from flange 23 and have bolts 29 pivotally connected thereto, these bolts being adapted to swing into slots 30, in cover 26.

Clamping nuts 31 are adapted to be used on the bolts 29 for the purpose of engaging the cover 26 and holding it in sealed position as shown in Figure 4. It is to be understood, however, that under normal conditions cover 26 is open as shown in Figures 1 and 2 and is only adapted to be closed after one or more persons have entered the boat 17 from below.

As a means for clamping the sealing ring 21 between the rings 4 and 20, screws 32 can be extended through packed bearings 33 formed in the ring 22. These screws are located at any desired distances apart, one end portion, 34, being reduced in diameter and adapted to screw into threaded recesses 35 formed in the ring 7. The intermediate portion of each screw is threaded, as at 36, to engage threaded openings 37 in the ring 20. The threads on the reduced portion 34 have a greater pitch than the remaining threads. The screw does not engage ring 4. It will be apparent, therefore, that when the several screws are rotated in one direction by suitable tools engaging the heads 38, the rings 4 and 20 will be drawn toward each other whereas, when the screws are rotated in the opposite direction the rings will be thrust apart and the screws become disengaged from ring 7.

Secured to the supplemental boat 17 at the sides and ends thereof are any desired number of locking devices each of which includes a guide sleeve 39 having a base flange 40 riveted or otherwise fastened to the boat 17. A cross head 41 is connected to each sleeve by tie bolts 42 and in each cross head is secured an interiorly screw threaded bushing 43 engaged by the enlarged screw threaded portion 44 of a bolt 45 which extends longitudinally through the sleeve 39. Suitable packing 46 is provided in the sleeve to prevent leakage of water along the bolt.

The outer end of the bolt 45 extends through an opening 47 in the boat 17 bridged by sleeve 39 and its flange 40 and said bolt also extends into an opening 48 formed in the wall of recess 2 and bridged by a keeper plate 49 having a bolt receiving recess 50. A head 51 is located at the inner end of the

threaded portion 44 and may be formed with openings or recesses 52 for receiving a handle or wrench 53. Thus it will be seen that by turning the bolt in one direction it will be fed outwardly into its recess 50, thereby fastening the boat 17 within recess 2. By reversing the rotation of the bolt it can be withdrawn from recess 50 and into sleeve 39 to release boat 17.

Secured to the top of the boat 17 is a conning tower 54 having closed portholes 55, the closure 56 being of heavy glass capable of withstanding extreme pressure although if necessary the glass can be reinforced at the back by removable covers not shown. Such an arrangement is obvious. This conning tower is accessible from within boat 17 and its top is normally closed by a hinged cover 56 the lower surface of which is provided with a circular rib 57 adapted to bear on a packing ring 58 carried by a reinforcing ring 59 which extends around the opening 60 in the top of the conning tower. Bolts 61 are pivotally connected to the cover 56 and adapted to swing into slots 62 formed in the wall of opening 60, there being clamping nuts 63 engaging the bolts and adapted to bear against the top of the conning tower to draw the cover 56 downwardly into sealing contact with the packing ring 58.

Opening through the cover 56 is a vent 64 adapted to be closed by a valve indicated at 65. This valve can be easily operated by an occupant of the conning tower and is used to permit the escape of vitiated air when the conning tower is closed but is extended above the surface of the body of water in which boat 17 is supported.

Another valve indicated at 66 is provided in the cover 26 and is utilized for admitting air to the boat 17 from the submarine after the cover 26 has been closed and the cover 12 left open. Such use of the valve is not always possible and is to be resorted to only when a supply of fresh air can be obtained from the submarine after the supplemental boat has been sealed by the closing of the cover 26.

A tank 67 can be arranged in the boat 17 for holding fresh air under pressure and a suitable compressor 68, which can be hand operated, is employed for forcing air into this tank. This compressor may have an air supply pipe 69 extending thereto from outside the boat 17, said pipe having a valve as indicated at 70 for normally closing the pipe. Said pipe is employed for supplying the compressor with fresh air when the boat is not submerged but is otherwise sealed.

Under normal conditions the cover 12 is closed but the cover 26 is open. In case of an emergency required abandonment of the submarine the cover 12 is opened and the crew passes through the manholes into the boat 17. Immediately thereafter the cover

26 is closed and, if any fresh air remains in the submarine, valve 66 is opened to admit it. Thereafter the valve is closed and the screws 32 are turned to release the bottom of the boat 17 from the bottom of recess 2. The bolts 45 at the sides of the boat 17 are retracted, and the end bolts are also withdrawn from their keepers until only one of them is left in holding position. This will result in the boat 17 tilting upwardly before it begins to ascend, it being desirable to have it rise in this manner because the ascent will meet with less resistance. The boat will right itself on reaching the surface and if the water is calm the conning tower can be opened. Otherwise the tower can be kept closed and fresh air supplied from the tank 67 while vitiated air will be vented through the pipe 64.

It will be noted that when the supplemental boat is assembled with the submarine the only parts projecting therefrom into engagement with the submarine are the screws 32 and the bolts 45. When the screws are disengaged from the hull of the submarine the bolts 45 constitute the sole means for holding the supplemental boat in its recess and when these bolts are withdrawn the supplemental boat will rise freely from the recess no matter to what angle the submarine may be tilted. If the supplemental boat cannot rise straight from the recess it will roll therefrom. There is no part of the supplemental boat that projects into the submarine and in any way retards the ascent of the supplemental boat when the submarine is tilted to a considerable angle.

If desired a container 71 for holding fresh water may be located at a suitable point in the supplemental boat 17.

What is claimed is:

1. The combination with a submarine boat having a recess in the top thereof which is broadly concave in all directions, of a supplemental boat having a convex bottom portion adapted to be seated in but spaced from the wall of the recess, said supplemental boat being adapted to emerge freely from the recess while the submarine is tilted at any angle, said supplemental boat, when in the recess, being positioned with its top uppermost, and having registering manholes in the bottom of the supplemental boat and in the bottom of the recess, closures for the respective manholes, and a plurality of means for fastening the supplemental boat in the recess, each of said means including a guide sleeve fixedly connected to and extending inwardly from the wall of the supplemental boat, a bolt slidably and rotatably mounted in the sleeve and projecting beyond the supplemental boat, a cross head connected to each sleeve, a bushing therein, said bolt having a screw threaded portion engaging the bushing, means for rotating the bolt relative to the

bushing to shift it outwardly and inwardly relative to the supplemental boat, a packing gland within the guide sleeve and around the bolt, and a keeper connected to the wall of the recess for engagement by the bolt.

2. The combination with a submarine boat having a concave recess in the top thereof and a manhole in the bottom of the recess, of a supplemental boat within but spaced from the recess, means extending from the ends of the boat for engaging the submarine to hold the supplemental boat against turning in the recess, there being a manhole in the bottom of the supplemental boat adapted to register with the manhole in the bottom of the recess, sealing means interposed between the bottom of the recess and the bottom of the supplemental boat, said sealing means being extended around the manhole, means carried by and operable solely from within the supplemental boat for compressing the packing means to seal the connection between the submarine and the supplemental boat, a closure within the submarine for the manhole in the bottom of the recess, fastening means for said closure, said fastening means being located entirely within the submarine so as to be operated by an occupant thereof, a closure for the manhole in the supplemental boat, fastening means therefor, said fastening means being located entirely within the supplemental boat for actuation by an occupant thereof, and radially disposed bolts carried by and operable from within the supplemental boat for fastening said boat to the wall of the recess.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

LAWRENCE DUMAN.