May 10, 1932. J. VASQUEZ ET AL 1,857,575

SUBMARINE LIFEBOAT

Filed Feb. 18, 1931 2 Sheets-Sheet 1

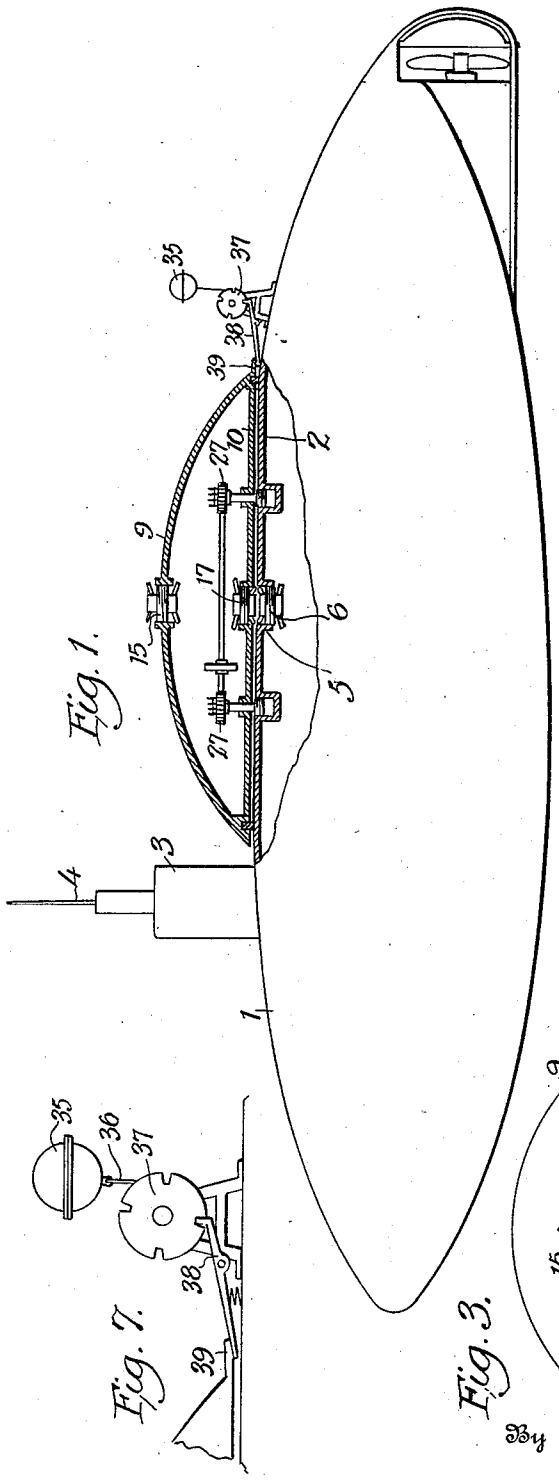

Fig. 1.

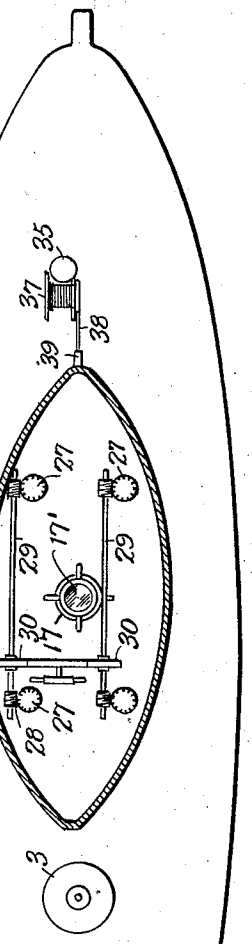

Fig. 2.

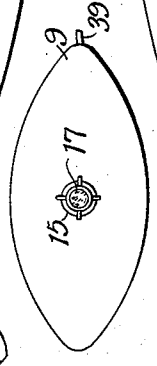

Fig. 3.

Fig. 7.

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SUBMARINE LIFEBOAT

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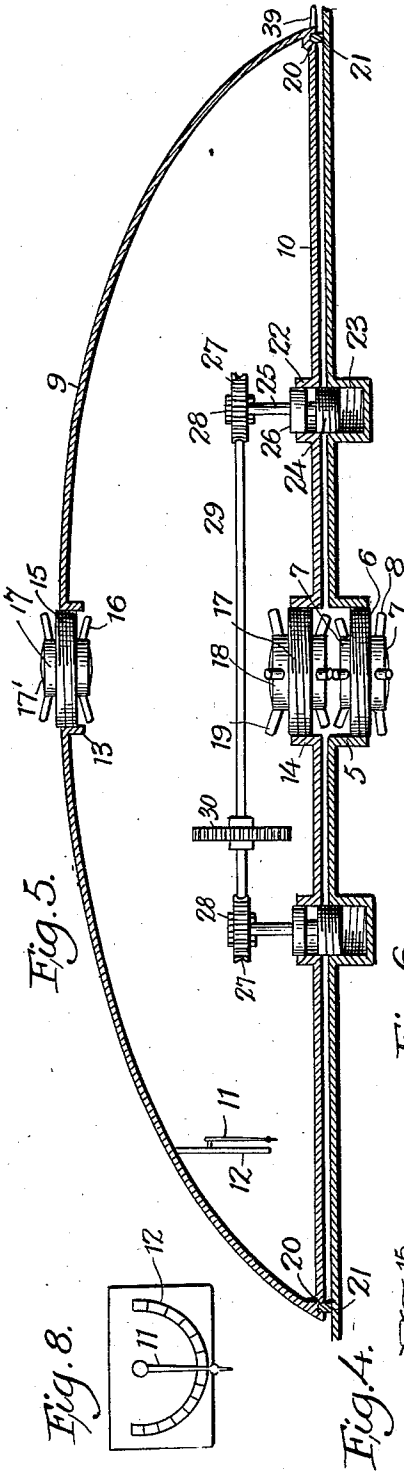

Fig. 5.

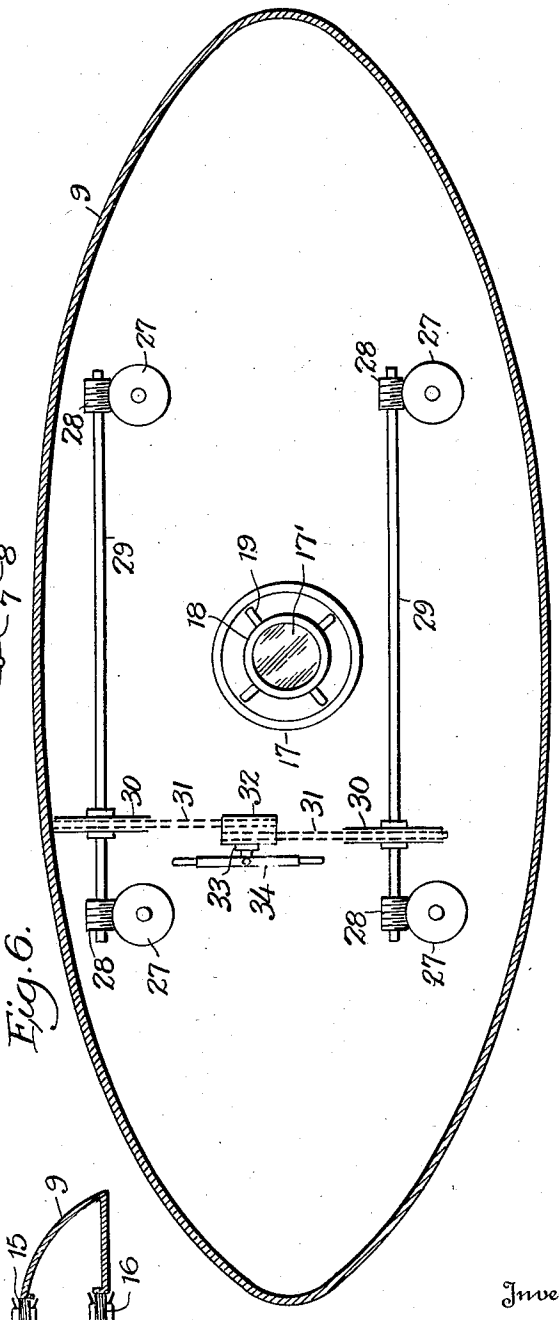

Fig. 6.

Fig. 8.

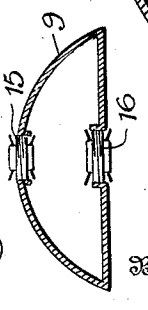

Fig. 4.

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UNITED STATES PATENT OFFICE

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SUBMARINE LIFEBOAT

Application filed February 18, 1931. Serial No. 516,769.

This invention relates to submarine vessels, and particularly to a life boat for vessels of this character.

The main object of our invention is to provide a life boat affording a means of escaping from the submarine vessel in the event that the vessel is unable to rise to the surface of the water or in the event that some of the crew are required to leave the vessel for the surface at any time.

A further object of the invention is to provide a life boat for the purpose described which is adapted to be attached to the deck of the submarine vessel for free communication between the vessel and boat at all times or whenever needed, and which boat is capable of being easily and rapidly sealed hermetically and released from the submarine vessel to rise to the surface of the water.

A still further object of the invention is to provide novel fastening and releasing means for connecting the boat to the vessel whereby a positive locking or releasing action may be effected without liability of the binding of the fastening and releasing means during a fastening or releasing action.

A still further object of the invention is to provide a life boat or safety boat for submarine vessels which is of novel construction and shape so as to avoid resistance to the movement of the vessel through the water when applied to the submarine vessel.

A still further object of the invention is to provide a life boat of the character described which by reason of its shape can not pitch or move up and down on its horizontal transverse axis, which can only roll to a limited extent, and which if accidentally displaced from an upright or normal position will automatically return to such position whenever free to do so in the water.

A still further object of the invention is to provide novel means whereby the crew of a submarine may, on leaving the submarine, enter the life boat and seal the hatches or doorways in both the submarine and the life boat, so as to prevent any entrance of water into the submarine through the escape hatch after the release of the life boat.

A still further object of the invention is to provide novel means for holding and releasing a buoy upon the release of the life boat, for indicating at the surface the position of the submarine.

With these and other objects in view, the invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Fig. 1 is a side elevation of a submarine vessel, partially in section, showing the application of our invention thereto.

Fig. 2 is a top plan view of the submarine showing the life boat in horizontal section.

Fig. 3 is a top plan view of the life boat on a reduced scale.

Fig. 4 is a transverse section through the life boat.

Fig. 5 is a vertical longitudinal section on an enlarged scale through the life boat and deck of the submarine.

Fig. 6 is a horizontal longitudinal section through the life boat looking in an upward direction.

Fig. 7 is a view showing the buoy holding and releasing means.

Fig. 8 is a view of the roll indicator.

Referring now more particularly to the drawings, 1 designates a submarine vessel of any ordinary form, 2 the flat top deck of the submarine, 3 the conning tower, and 4 the periscope, which parts may be of ordinary or any approved construction.

In the deck 2 is an internally threaded entrance and exit doorway or hatch, through which the crew may enter and leave the submarine. This doorway or hatch 5 is adapted to be closed by a screw plug 6, with which may be associated any suitable sealing means for closing the hatch in a water-tight manner when the plug is secured in position. The plug is provided at each side with a head 7 having handles 8 for manipulating the same, whereby the plug may be operated from either the outside or the inside of the submarine.

A life boat or safety boat 9 is releasably attached to the submarine 1. This boat 9 is made of metal or other suitable material and

comprises a body of maximum depth and width at the center and having a flat bottom 10, the said body being both longitudinally and transversely of concavo-convex form and tapering from its center toward each end. The boat, in other words, may be described as consisting of a body portion of the shape from its center toward each end of a cigar divided horizontally along its longitudinal axis and having a flat bottom. It has been found in practice that a boat of this shape will easily float to the surface from a considerable depth, and will readily ride the surface of the water with a minimum degree of roll and without pitching. This shape of boat, also, if turned over or submerged in the water in any other than an upright position will automatically return to an upright position. Thus the life boat when released from the submarine vessel will under all conditions rise to the surface in an upright position unless prevented from assuming such position by an encountered obstacle. Since a boat of this shape will not pitch or move upwardly or downwardly vertically on its horizontal transverse axis, it is not necessary to employ any indicating means to enable the crew confined therein, during an escape action, to determine the degree of longitudinal instability, since normally instability of this character will not occur. We, therefore, provide a roll angle indicator for indicating any degree to which the boat may be laterally displaced from a normal position. This may consist, as shown particularly in Fig. 8, of a pivoted and weighted indicator arm 11 of pendulum type, movable over a suitable indicating scale 12. While the use of a pitch angle indicator, as stated, is not necessary, one of a type similar to the roll angle indicator may be employed, if desired.

The boat 9 is provided in its top wall with an entrance or exit door or hatch 13 and in its bottom wall with a similar hatch 14, said hatches being in alinement with each other. For closing the hatch 13, a screw plug 15 is provided, which is adapted to be used in connection with suitable sealing means to close the hatch water-tight. This plug is provided with suitable operating handles 16 and with a bull's-eye 17′ of glass or other suitable material for admitting light to the interior of the craft. The hatch 14 is designed to be closed by a plug 17 similar in construction to the plug 6, said plug 17 having oppositely projecting heads 18, provided with manipulating handles 19, whereby the plug may be operated from either the inside or the outside of the boat 9. Normally the crew will enter the submarine vessel through the hatches 13, 14 and 5, and leave the submarine in reverse order through the same hatches. When the life boat 9 is released from the submarine its passengers when reaching the surface, may unseal and leave through the hatch 13 at all times when the boat is in its normal upright position. If, through any cause, the boat 9 should become turned up-side-down or inverted, the passengers may unseal the hatch 14 and pass out therethrough. If desired, additional hatches may be provided in the sides of the boat to enable the crew to enter and leave the boat with greater ease and facility, or to enable the crew to escape through a side hatch in the event that either the top hatch or the bottom hatch should be submerged.

The boat 9 is provided in its bottom near each end with gage recesses 20 adapted for engagement with pins 21 on the deck 2 to adapt the boat to be accurately applied in operative position. The boat 9 is adapted to be secured in operative position and to be instantaneously released when required by fastening means of novel construction. The fastening means comprises front and rear pairs of internally threaded guide tubes or openings 22 in the bottom 10 equidistantly in front and rear of the waist and on opposite sides of the keel line of the boat, which openings or tubes register with internally threaded keeper sockets 23 in the deck 2. A threaded plug or screw 24 is movable in each guide tube or opening 22 and the registering keeper socket 23 and is carried by a stem 25 on which is a guide head 26 and a worm wheel 27. The guide head 26 is movable in the tube or opening 22 to center the screw 24 and stem 25 and guide the same to secure accuracy of movement of the screw into and out of the socket 23. The worm wheel of the rotary fastening and releasing screws on each side of the keel line are engaged by worms 28 on operating shafts 29, and on said shafts 29 are sprocket wheels 30 connected by chains 31 with a double sprocket wheel 32 on a drive shaft 33 on which is a hand wheel 34 whereby the shafts and worms may be simultaneously rotated either in a clockwise or a counter-clockwise direction for fastening or releasing movements. When applying the life boat in position upon the submarine, the boat is centered in position and the operating means of the fastening screws actuated to move said screws down into the sockets 23 and thus firmly secure the life boat to the submarine. In releasing the life boat from the submarine for an escape action it is merely necessary to operate the wheel 34 in the proper direction to withdraw the screws 24 from the sockets 23, whereupon the boat will be released and rise to the surface. This operation of simultaneously releasing the screws in the manner described ensures equal unscrewing movements of all the screws to the same degree from the sockets so that the screws will become disengaged from the sockets at the same instant, thereby obviating liability of one or more screws binding, which would be the case in the event that the screws did not simul-

taneously release, as the tendency of the boat to rise would cause binding of the unreleased screws in the keeper sockets.

It will be observed that the shape and arrangement of the boat is such that it is of proper streamline conformation such as to allow of its easy passage through the water, so that it will not oppose any material resistance to the speed of the submarine. By this means a great objection to escape boats of circular or box type or other types causing high resistance and reduction of speed of the submarine is obviated. Thus the life boat constitutes normally an entrance and exit chamber at the top of the submarine which does not interfere with its normal operation. In the event that the vessel from any cause is unable to rise to the surface of the water, or it is desired to send some of the crew to the surface of the water from the submerged submarine, this may be effected in a certain and positive manner. In such an escape operation, the closure plug 6 will first be released to open the hatch 5, and may be supported by a member of the screw or other suitable means while the plug 7 is being removed from below to open the hatch 14 and during the passage of the crew through the opened hatches from the vessel into the life boat. After the members of the crew have passed from the submarine to the boat 9, the plug 6 is reapplied to close the hatch 5, thus sealing said hatch against the inlet of water, and the plug 17 is reapplied to seal the hatch 14 against the entrance of water to the boat 9. The boat 9 thus being placed in condition for rise to the surface, the wheel 14 is operated to release the screws 24 from engagement with the screw sockets 23, whereupon the boat 9 will rise to the surface of the water and the members of the crew at their convenience may remove the closure 14 to unseal the hatch 13 so as to allow the members of the crew to pass out, or, in the event that they are far from shore or from other vessels, the hatches 13 and 14 may be kept sealed so that the crew may remain afloat in the boat 9 until their rescue is effected. Of course, it will be understood that the boat 9 may be provided with a flag or other suitable device which may be raised to indicate its location in the water, and thus call attention to the plight of the members of the submarine crew therein, or that a radio apparatus of suitable type may be carried in the boat so that proper messages may be transmitted to shore or to other vessels so that help may be quickly summoned.

It will be seen from the foregoing that by the use of the closures 6 and 17 of the type disclosed hatches 5 and 14 may be sealed from either within or without the submarine and the boat, respectively. By this means it is possible for the members of the crew of the submarine on leaving the submarine through the hatch 5 to close said hatch against any entrance of water to the submarine before closing the hatch 14 in the life boat, thus leaving the submarine in better condition to be brought to the surface by a salvaging crew. We also provide a means whereby, on the release of the life boat 9 from the submarine, a buoy or other signal device secured to the submarine may be released for movement of the buoy to the surface, so that the point of location of the submarine may be indicated at the surface. As shown particularly in Figs. 1, 2 and 7 the buoy 35 is fastened to one end of a rope or cable 36 wound about a suitable reel 37 permanently mounted on the submarine and to which the other end of the rope or cable is fastened. A locking dog or device 38 is provided to hold the reel 37 from rotation and the cable 36 from unwinding, and this dog normally underlies a detent projection 39 at one end of the bottom 10 of the boat 9, so that as long as the boat 9 is attached to the submarine, the cable is held from unwinding and the buoy 37 from upward movement in the water. When, however, the boat 9 is released from the submarine, for passage to the surface, the latch 38 is released and is retracted by gravity or by the action of a spring, or by the pressure on the buoy, and the reel is thereby released, allowing the cable to unwind and the buoy to move upward to the surface of the water. By this means the escape of the crew from a submarine unable to rise to the surface may not only be effected, but at the same time means released to indicate the point at which the submarine is submerged, thus avoiding the difficulties generally encountered in locating a submarine under these conditions.

From the foregoing description, taken in connection with the drawings, the construction, mode of operation and advantages of our improved means for permitting of the escape of the crew of a submerged submarine unable to rise from the surface, and means for indicating the point of location of such submarine, will be readily understood and appreciated by those versed in the art, without a further and extended description. While the constructions disclosed are preferred it will, of course, be understood that changes in the form, construction and proportions of parts, as well as in the arrangement of the parts, may be made within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus fully described our invention, we claim:—

1. In combination, a submarine vessel having a top deck provided with an inlet and exit opening, a life boat adapted to rest upon said deck and having an inlet and exit opening in its bottom to register with the opening in the deck, reversible and interchangeable

screw plugs for respectively closing the opening in the deck and the opening in the life boat, said plugs being operable from either the inside or the outside of the life boat, and means for attaching the life boat to and releasing it from the submarine.

2. In combination, a submarine vessel, a life boat releasably connected therewith, and a buoy connected to the submarine and automatically released for movement to the surface to indicate the position of the submarine by upward movement of the life boat when the life boat is released.

3. In combination, a submarine, a life boat detachably connected therewith, a buoy, a reel, a cable connecting the reel and buoy, and means for holding the reel from unwinding motion when the life boat is in operative position on the submarine and for automatically releasing the reel for unwinding motion through the upward movement of the life boat when the life boat is released from the submarine.

4. In combination, a submarine, a life boat detachably connected therewith, a buoy, a reel, a cable connecting the reel and buoy, a locking and releasing wheel carried by the reel, an automatically retractible dog for engagement with the wheel to hold the reel from unwinding motion, and a detent on the life boat for engagement with said dog to hold the same in locking position and adapted on the upward movement of the released life boat to free the dog for automatic retraction.

5. In combination, a submarine vessel having a top deck provided with an inlet and exit opening therein and threaded sockets, a life boat adapted to rest upon said deck and having in its bottom a coacting inlet and exit opening, means for sealing said openings in the vessel and life boat, a plurality of vertically disposed threaded fastening screws on the life boat for engagement with the threaded sockets for securing the life boat to the submarine, gears on said fastening screws within the sealed life boat, parallel horizontal shafts connecting the gears in pairs, an operating shaft between the first-named shafts, and gearing between the operating shaft and each of the first-named shafts for simultaneously operating said first-named shafts for simultaneously disengaging said fastening screws.

In testimony whereof we affix our signatures.

JOAQUIN VASQUEZ.
MANUEL BERNARDEZ.