July 14, 1931. H. E. GRIESHABER 1,814,689

SALVAGE AND RESCUE SUBMARINE

Filed Aug. 31, 1928 2 Sheets-Sheet 1

Fig. 1.

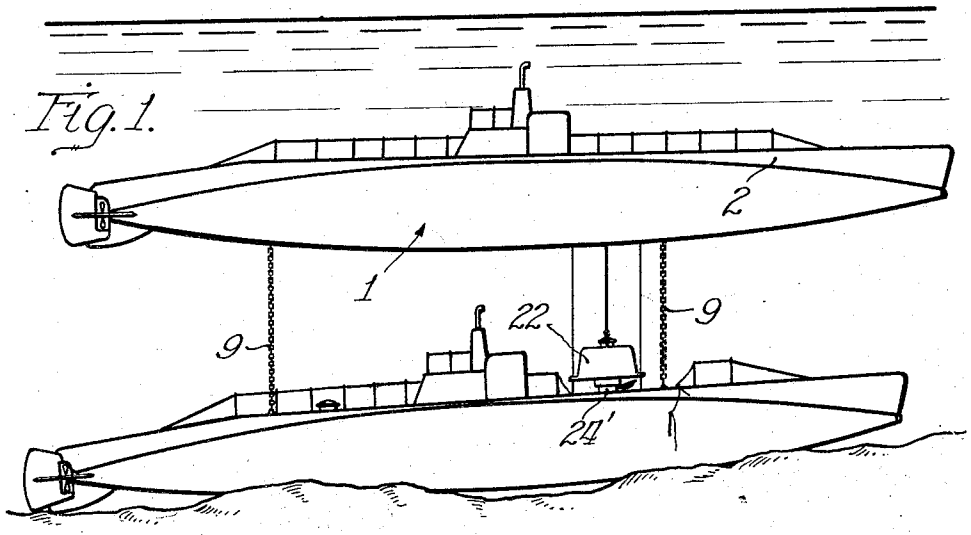


Fig. 3.

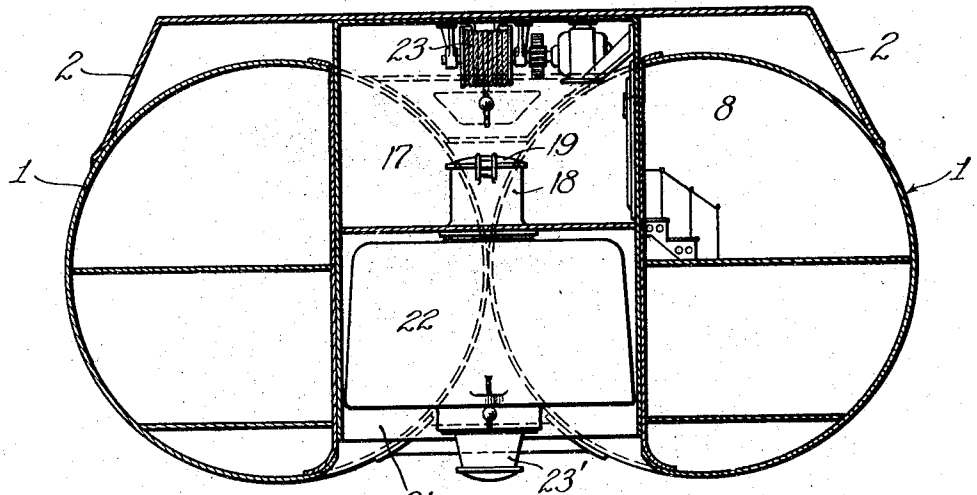
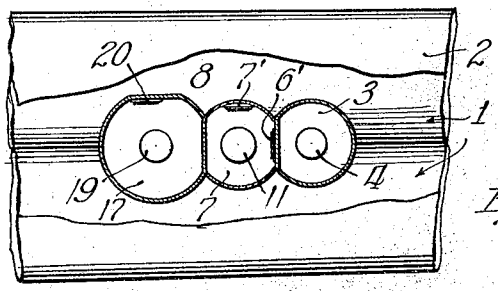


Fig. 4.



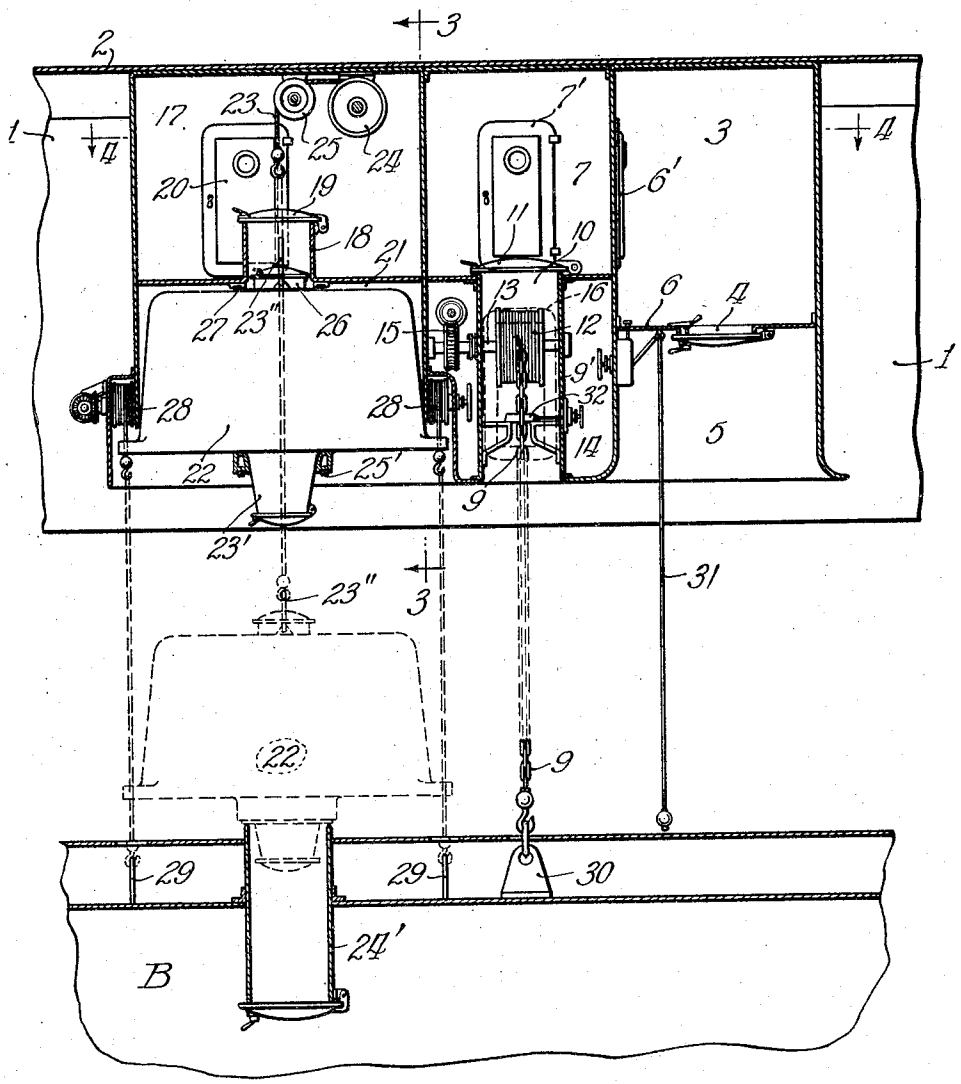
Inventor
Hugo E. Grieshaber
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SALVAGE AND RESCUE SUBMARINE

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Fig. 2.



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Patented July 14, 1931 1,814,689

UNITED STATES PATENT OFFICE

HUGO E. GRIESHABER, OF NEW LONDON, CONNECTICUT, ASSIGNOR TO ELECTRIC BOAT COMPANY, OF GROTON, CONNECTICUT, A CORPORATION OF NEW JERSEY

SALVAGE AND RESCUE SUBMARINE

Application filed August 31, 1928. Serial No. 303,200.

This invention relates to submarine boats, and more particularly to a boat of this type which is particularly adapted for salvage and rescue work.

It is of primary importance that the men on a submarine boat which has been disabled by collision or otherwise, and is unable to rise to the surface, be rescued with as little delay as possible. In the case of a rescue ship operating from the surface, the rescue work is frequently delayed by bad weather conditions with the result that the men on the disabled boat perish This very serious objection to the use of surface craft in rescue and salvage operation can be avoided by providing a suitable submarine salvage and rescue boat which does it work below the surface and is not seriously affected by surface conditions.

My invention has to do with a salvage and rescue submarine boat capable of being moored above and adjacent a disabled boat, the former being particularly adapted for use with a rescue buoy such as that disclosed in my copending application, Serial No. 266,541, filed April 2, 1928. The salvage and rescue boat of my invention is also constructed in such manner as to have a relatively great amount of reserve buoyancy so as to be capable of raising the disabled boat and carrying it into shallow and protected water where the final salvage operations can be carried on. Further objects and advantages will appear from the detailed description.

In the drawings:

Fig. 1 is an elevational view of a salvage and rescue submarine boat constructed in accordance with my invention, showing the manner of use of the boat in effecting rescue of men from a disabled submarine boat;

Fig. 2 is a longitudinal vertical section of a portion thereof;

Fig. 3 is a transverse section taken on the plane of the line 3—3 of Figure 2; and

Fig. 4 is a longitudinal horizontal section of a portion thereof.

My salvage and rescue submarine includes a hull structure formed of two hulls 1 disposed in parallel relation closely adjacent each other and suitably secured together. These hulls are bridged, at their upper portions, by a common superstructure 2. This hull structure is provided with a diving compartment 3, having a hatch 4 in the bottom of the compartment, i. e. through the diving platform 6. Below the diving platform the vessel is open at 5, as shown. The compartment 3 has communication through a door 6′ with a decompression chamber 7 adjacent thereto, this chamber having also a suitable door 7′ giving access to main hull compartment 8. The compartment 8 may be in the nature of a passage leading to the living compartment of the boat. In this manner, the divers and their assistants may pass from the compartment 3 to compartment 8 and vice versa through the decompression chamber 7. Egress from the diving compartment into the surrounding water, and return, is had through the hatch 4.

Both fore and aft I provide a windless compartment for a mooring chain 9. The forward windlass compartment 9′ lies conveniently below the decompression chamber 7, access thereto being had by way of a hatch 10 normally closed by a hatch cover 11. The windlass is shown at 12, carried upon a shaft 13 which extends into the surrounding compartment 14 wherein it is connected through suitable gearing 15 with a source of power. The compartment 14 may be reached from main compartment 8 through door 16.

At 17 I provide a rescue compartment the platform of which is provided with a rescue trunk 18 having the cover 19. This compartment 17 is connected with the main compartment 8 by way of a door 20. Below the rescue compartment 17, I provide the open bottom compartment 21 which is adapted to receive a rescue buoy 22 of the type disclosed in my copending application hereinbefore referred to. This rescue buoy is adapted for the reception of men from a compartment of a disabled submarine boat B and is then raised into compartment 21 by means of a suitable cable 23 wound upon a windlass 24, in compartment 17, passing over pulley 25 in order that it may be guided down through the rescue trunk 18. The windlass 24 may be operated by hand or suit-

able power means may be provided therefor. The buoy 22 is provided with an entry hatch 23′, at the bottom, which is adapted for co-operation with the escape trunk 24′ of the disabled submarine B, a suitable gasket 25′ being provided for the seating of the buoy on the trunk, and the trunk being provided with suitable means for pumping the water therefrom or flooding it as occasion requires. On the top of the buoy 22 an exit hatch 26 is provided, this exit hatch being for co-operation with the rescue trunk 18, a suitable gasket 27 being provided for the seating of the former on the latter.

Lines for guiding the buoy from the salvage and rescue submarine to the disabled submarine are wound upon reels 28, 28, these lines passing down through guide eyes on the buoy and being adapted for connection with the deck of the disabled submarine as indicated at 29, 29. Guided down by these lines the buoy is made to seat properly upon the escape trunk 24′.

The salvage and rescue submarine of my invention is provided with the usual means for maneuvering it, i. e. propellers, rudders, ballast tanks, etc. Means are provided for maintaining normal buoyancy and also for establishing excess buoyancy so that, when desired, it is in reality a self-propelled pontoon. In the work of rescuing the personnel of the disabled submarine boat and of salvaging the disabled boat, the salvage and rescue submarine of my invention will first be anchored as near the damaged craft as practicable. Its buoyancy will then be adjusted to less than the weight of the anchors overboard and the boat hauled down by its anchor chains to a position near or on the bottom. The mooring chains are then paid out and a diver passed from the diving chamber 3, through the diving hatch 4, is enabled by preliminary work with light mooring lines and appropriate maneuvering of the salvage and rescue vessel, to attach the lifting chains 9 to appropriately disposed lifting pads on the disabled vessel, as indicated at 30. The ultimate position of the salvage and rescue craft relative to the disabled vessel is shown in Figures 1 and 2.

The guide cables are then paid out from the reels 28, 28 and the diver then connects them to the deck of the disabled vessel, as shown. Trips of the diver between the rescue and salvage vessel and the disabled craft may be facilitated by the diver's guide line 31, paid out from a suitable reel in the compartment 5.

With the pressure in the compartment 17 properly built up, the hatch 19 may be opened to lower the buoy 22 by means of the cable 23, which is attached to the top of the buoy by means of a yoke 23″, the diver seeing to it that the buoy is seated properly upon the escape trunk 24′. The trunk is then exhausted and the trunk cover and bottom buoy cover are then opened so that the men on the disabled craft may pass into the buoy, whereupon the covers are again closed, the trunk flooded by the diver, and the buoy hauled up into the compartment 21 of the rescue boat. With the buoy 22 properly seated upon the rescue hatch 18 the pressure in the compartment 17 is reduced and the exit hatch of the buoy opened to permit the men to pass into the compartment. From this compartment they may pass into the main compartment 8. In this manner the men are not subjected to high pressures and can enter from the rescue buoy immediately into the living compartment of the rescue boat, thus effecting a material saving in time.

After the rescue of the personnel, the lifting chains 9 are locked by suitable stops 32 and the ballast tanks of the salvage craft are blown to the desired extent to lift the disabled boat from the bottom. The disabled boat is then towed by the salvage boat into shallow water where salvage operations can be completed.

In the event that the disabled boat is filled with water to such an extent that it cannot be lifted as just pointed out, regular salvage operations are conducted from the submarine salvage vessel until the weight of the damaged vessel has been sufficiently reduced in order that it may be lifted, these operations being carried out by means of compressed air or by pump connections provided on the salvage boat.

I claim:

1. In a submarine boat, a rescue compartment, a trunk leading thereto from below, a cover for said trunk, a rescue buoy having an exit hatch for association with said trunk, and means for suspending said buoy from within said compartment through said trunk.

2. In a salvage and rescue submarine boat, a hull structure comprising two hulls connected together, a common superstructure connecting the hulls and bridging the space therebetween, and a rescue compartment between and connecting the hulls, said compartment opening through the bottom of the hull structure.

3. In a salvage and rescue submarine boat, a rescue compartment, a trunk leading thereto from below, a cover for said trunk, a rescue buoy having an exit hatch at its top for association with said trunk, said buoy also having a rescue hatch extending from its bottom adapted for co-operation with an escape hatch of a disabled boat beneath the salvage and rescue boat, and means for lowering the buoy from said compartment and for raising it into the compartment.

4. In a salvage and rescue submarine boat, a hull structure, a rescue compartment, a buoy compartment below the rescue compart-

ment and opening through the bottom of the hull structure, said buoy compartment opening into the rescue compartment from below, a rescue buoy adapted to enter the buoy compartment and having an escape hatch at its top and an entrance hatch at its bottom adapted for cooperation with an escape hatch of a disabled boat beneath the salvage and rescue boat, means for raising and lowering the buoy, a diving compartment opening through the bottom of the hull structure, and a decompression chamber giving ingress to and egress from the rescue compartment and the diving compartment from and to the interior of the hull structure.

5. In a salvage and rescue submarine boat, a hull structure comprising two hulls secured together, a rescue compartment, a diving compartment, and a decompression compartment disposed in alignment between the hulls, the decompression compartment giving ingress to and egress from the rescue compartment and the diving compartment from and to the interior of the hull structure.

6. In a salvage and rescue submarine boat, a hull structure comprising two hulls secured together, a rescue compartment, a diving compartment, and a decompression compartment disposed in alignment between the hulls and lengthwise thereof, the decompression compartment being between the rescue compartment and the diving compartment and giving ingress to and egress from said rescue compartment and said diving compartment from and to the interior of the hull structure.

7. In a salvage and rescue submarine boat, a hull structure comprising two hulls secured together, a rescue compartment, a diving compartment, a decompression compartment disposed in alignment between the hulls and lengthwise thereof, the decompression compartment being between the rescue compartment and the diving compartment and giving ingress to and egress from said rescue compartment and said diving compartment from and to the interior of the hull structure, and a rescue buoy compartment beneath the rescue compartment and opening therefrom below, said buoy compartment and the diving compartment opening through the bottom of the hull structure.

8. In a submarine boat, a hull structure, a rescue compartment, a buoy compartment beneath the rescue compartment and opening through the bottom of the hull, a trunk opening from the buoy compartment into the rescue compartment and a cover for said trunk.

9. In a submarine boat, a hull structure, a rescue compartment, a trunk leading thereto from below, a cover for said trunk, a buoy compartment beneath the rescue compartment and opening through the bottom of the hull structure, a buoy adapted to be raised into the buoy compartment and provided at its top with an exit hatch trunk adapted to fit into the rescue compartment trunk, said buoy having an entrance hatch trunk at its lower end adapted for cooperation with an escape hatch trunk of a second submarine boat, and means for raising and lowering said buoy.

In witness whereof, I hereunto subscribe my name this 8th day of August, 1928.

HUGO E. GRIESHABER.