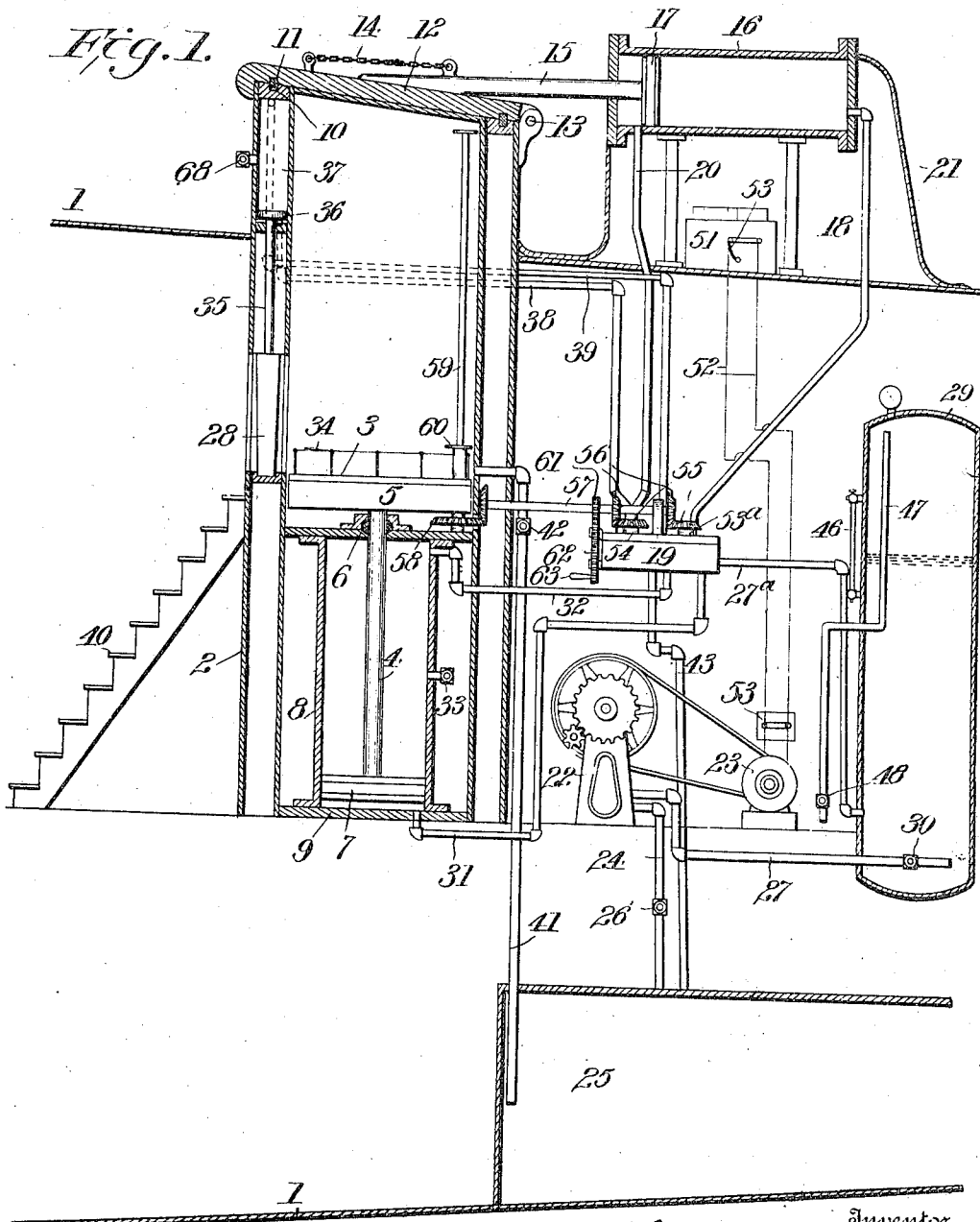


J. SCHNITTER.
 ESCAPE DEVICE FOR SUBMARINE BOATS.
 APPLICATION FILED SEPT. 6, 1910.

1,007,145.

Patented Oct. 31, 1911.

3 SHEETS—SHEET 1.



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Fig. 2.

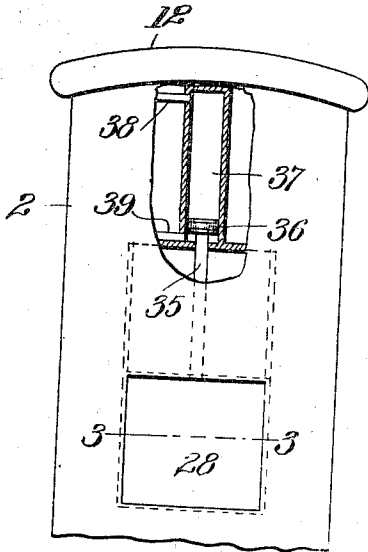


Fig. 3.

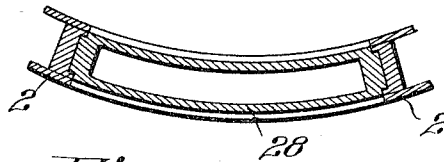


Fig. 4.

Fig. 5.

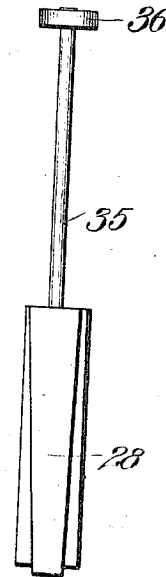
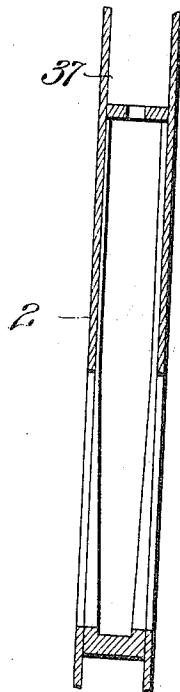
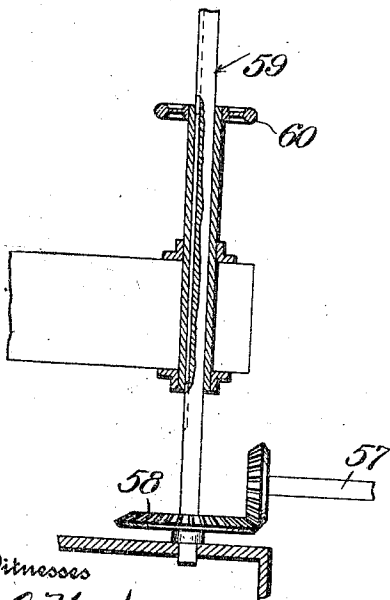


Fig. 6.



Witnesses

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John Schnitter. Inventor

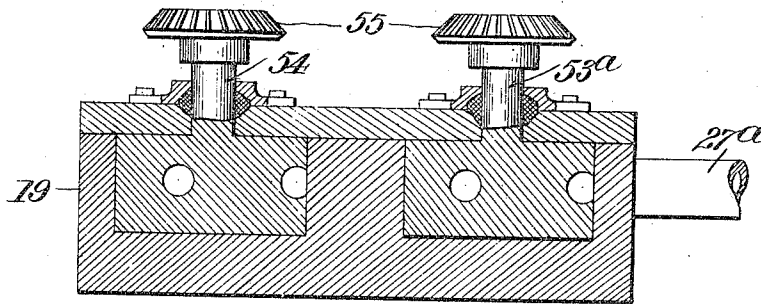
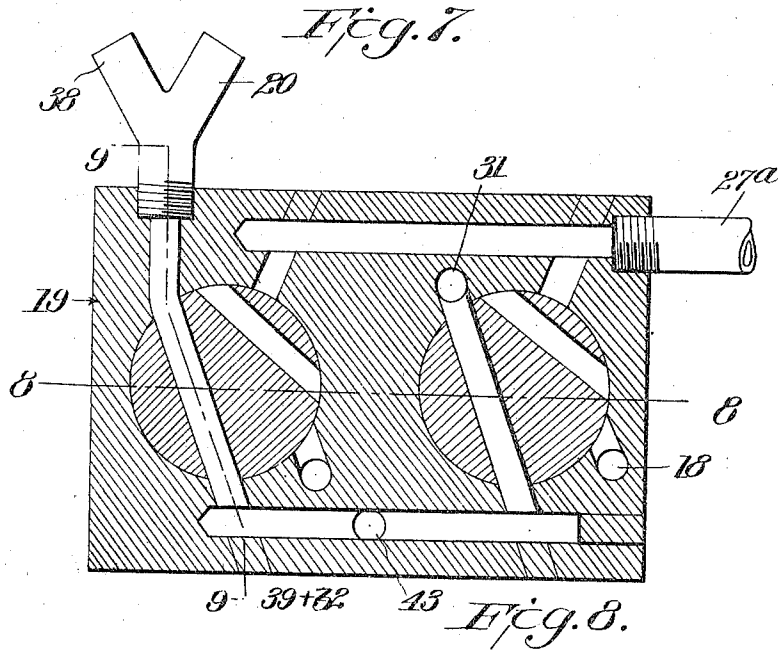
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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ESCAPE DEVICE FOR SUBMARINE BOATS.

1,007,145.

Specification of Letters Patent.

Patented Oct. 31, 1917

Application filed September 6, 1910. Serial No. 530,668.

To all whom it may concern:

Be it known that I, JOHN SCHNITTER, a citizen of the United States, residing at Baltimore city, State of Maryland, have invented certain new and useful Improvements in Escape Devices for Submarine Boats, of which the following is a specification.

This invention relates broadly to submarine boats and particularly to means to be installed in such boats to permit occupants to escape therefrom when the boats have been submerged and are in a disabled state. A practicable escape of this character has been the principal need of submarine boats since they were first introduced and many attempts have been made to provide such a device, none of which have been absolutely successful so far as I am able to ascertain.

The object of the present invention, broadly stated, is to provide a practicable escape device for submarine boats under the circumstances enumerated, which will be operative at all times, and so simple in construction and operation as to render it less objectionable and less likely to get out of order than any of the devices heretofore known.

The primary object of the invention may be stated to be to provide an escape device of the character specified wherein is provided a hydraulic pressure in excess of that of the water in which the boat is submerged, means being provided to create this pressure and to utilize it in effecting the prompt release of the occupants from the boat.

A more specific object of the invention is to provide a device of this character for submarine boats with an elevator operating in the entrance and exit way to forcibly eject persons from the disabled submerged boat.

A further object of the invention is to provide an escape device of this character which will be hydraulically operated to overcome the enormous pressure of the water found at great depths which frequently locks the occupants in the boat and thereby effectually prevents their release.

A further object of the invention is to provide in an escape device for submarine boats hydraulic means controlling the entrance and exit gate of the escape and for lifting an occupant through the latter.

With this and other objects in view, the invention consists in the improved constructions, arrangements and combinations of devices hereinafter fully described and afterward specifically claimed.

In order that others skilled in the art to which my invention appertains may be able to construct and use the same, I will now proceed to fully describe the construction and operation of the preferred embodiment of the invention illustrated in the accompanying drawings, in which—

Figure 1 represents a vertical sectional view through a section of a submarine boat in which my invention is installed. Fig. 2 represents a partial front elevation of the elevator tube and escape tower showing the door closed. Fig. 3 represents a horizontal sectional view, the plane indicated by the broken line 3—3 of Fig. 2. Fig. 4 represents a vertical sectional view on a plane passing through the door opening of the escape tower. Fig. 5 represents a side elevation of the same door and its operating piston. Fig. 6 represents a detail sectional view of the mechanism for operating the valves for the passage of the actuating fluid. Fig. 7 represents a horizontal sectional view of these valves. Fig. 8 represents a vertical sectional view on the plane indicated by the broken line 8—8 of Fig. 7. Fig. 9 represents a vertical sectional view on the plane indicated by the broken line 9—9, of Fig. 7.

Like reference characters indicate the same parts in all of the figures of the drawings.

Referring specifically to the drawings, 1 indicates portions of the shell of a submarine boat of any preferred construction which boat is provided with an entrance way formed of steel tubes of different diameters one within the other and forming an escape tower 2. The upper end of this tower or tube is cut off at an inclination, said upper end extending through the shell and above the top of the boat and the lower end depending inwardly from the top to a suitable rest or foundation 9 the hull of the boat about midway between the top and bottom thereof, although this position of the lower end of the tube may be varied to suit circumstances. Within this tube 2 is installed an elevator which comprises a platform 3 mounted on the upper end of a piston rod 4, said rod carrying at its upper end a piston 5 moving in the tube 2, the rod 4 operating through a gland 6 arranged horizontally within the tube at the lower end of the portion thereof which forms the escape tower. The piston rod after passing through the gland 6 extends downward and

carries at its lower end a second piston 7 which is reciprocable in a tube or cylinder 8 arranged within the lower portion of the tower or tube 2, between the gland 6 and the base 9 of said tower or tube, the latter being horizontally secured by any suitable means in the shell of the boat.

The upper end of the wall of the tube 2 is provided with an annular groove 10 adapted to receive an annular shoulder 11 on the under face of a closure gate 12, hinged at 13 to the tube 2 and resting, when closed, in an inclined position on the inclined upper end of the tube. This gate 12 is connected by means of a suitable cable 14, to a piston rod 15, the outer end of which is cut away at an inclination to fit snugly upon the upper face of the gate, the piston rod projecting through the end wall of a horizontal cylinder 16 mounted upon the shell 1 and being provided at its inner end with a piston head 17 which is adapted to reciprocate in said cylinder 16. Any suitable pressure fluid is supplied to the cylinder 16 by means of a feed pipe 18 which leads from a valve casing 19 to one end of said cylinder 16, and by a second pipe 20 connecting said valve casing 19 with said cylinder 16. A suitable hood or shield 21 secured to the shell of the boat is arranged to cover the cylinder 16 and protect it against the action of the sea water. The pressure fluid is supplied to the cylinder 16 by means of a suitable pump 22 which is actuated by belting or otherwise, from an electric or other motor 23, the pump receiving its supply of oil, water, glycerin or air from an intake pipe 24 which communicates with a suitable reservoir 25 mounted in the bottom of the shell of the boat, or at any other suitable position therein, said pipe 24 connecting the pump with the interior of the reservoir and being provided with a suitable valve 26. Discharge pipe 27 leads from the pump 22 and may be directly connected with the valve casing 19 or connected with the pressure tank 29, the upper end of said tank being intended to contain air, when a liquid is used in it, the pipe 27 is provided with a suitable valve 30.

The valve casing 19 is connected by a feed pipe 31 with the lower end of the cylinder 8 in the elevator tube 2 and is also connected with said cylinder 8 by means of another pipe 32. The cylinder 8 is provided with a suitable safety valve and gage 33 and the platform 3 with a suitable railing 34.

The tube or tower 2 has in one side an opening or gate, controlled by a door 28, said door being secured to the lower end of a piston 35, the upper end of which carries a piston head 36 operated in a cylinder 37 which is formed in the wall of the tube or tower 2, said cylinder being connected by pipes 38 and 39 with the valve casing 19

and being provided with a suitable gage and safety valve 68. Steps 40 lead from the door 28 to the floor of the boat.

At 41 is a pipe which connects the tube or tower 2 with the reservoir tank 25, said pipe being provided with a suitable valve 42. A drain pipe 43, connects the reservoir 25 with the chambers of the valve casing 19.

The tank or reservoir 29 is provided with a suitable water glass or gage 46 whereby its contents and pressure may be indicated. As before stated, the upper end of the tank 29 which contains the air supply under pressure has an air pipe 47 extending therefrom into the interior of the shell of the boat, provided outside of the tank 29 with a suitable valve 48 whereby air can be supplied to the interior of the boat, suitable branch pipes leading from the air pipe 47 to the hood and other portions of the boat.

Within the hood 21 is provided a box of storage batteries 51 which are connected by feed wires 52 with the motor 23. The pump 22 is normally driven by the engines of the boat and the motor 23 is brought into use only when these engines break down, the strong batteries furnishing current to run the motor. A suitable automatic switch board 53 is mounted on the box 51 and a second switch board, with independent wire connections from the storage batteries to the motor, may be arranged at any suitable position in the boat for providing a lower control of batteries at the motor 23.

The valves in the valve casing 19 are operated through the medium of valve stems 53^a and 54 on the upper ends of which bevel gears 55 are mounted, which gears engage with gears 56 mounted on a rod 57, said rod carrying a gear meshing with the gear 58 on a vertical rod 59 which extends through the tube 2 and the elevator platform, and piston head 5 and carrying at its upper end an operating wheel 60 which may be provided with a suitable gage to guide the operator in manipulating the valves in the casing. The rod 57 carries a gear 61 which meshes with a gear 62 mounted on a shaft secured to the end of the valve casing 19 and is provided with a suitable crank handle 63 whereby it may be manually rotated.

In the event of the boat becoming disabled or submerged in deep water, in order to enable the crew to escape, the pump 22 is started, and a supply of fluid under high pressure is created. The elevator platform is kept down near the gland 6 and the door 28 is opened by opening the valves which control the pipes 38 and 39 when the piston 36 will be elevated. Prior to the elevation of the piston, the person to be ejected from the shell of the boat enters the escape tower and takes a position on the elevator platform 3. The door 28 is then closed and the valve controlling the pipes 31 and 32 are

operated so that the piston 4 and its head 7 are forced upwardly in the cylinder 8 thereby carrying upward the upper piston head 5 and elevator platform 3. In the meantime the valves controlling pipes 18 and 20 are operated so that the pressure fluid is admitted to the cylinder 16 and the piston head 17 is withdrawn into the cylinder 16, thereby opening the escape door 12. The elevator is intended to be operated under very high speed and the pressure for operating it must be in excess of the pressure of the water in which the boat is submerged. After the escape door is opened the elevator rises with sufficient speed and energy to forcibly eject the person on the platform through the water so that the person will rise to the surface.

Suitable life buoys or life preservers are provided for each member of the crew to be worn when said member is to be ejected by the elevator.

The cylinders 16 and 37 may be provided with auxiliary ports whereby pressure fluid may be supplied from the outside of the boat and the door operated when the machinery is completely disabled. Suitable auxiliary drain pipes may be also provided on each cylinder.

By means of the mechanism herein described any number of persons may be released and hydraulically ejected from the boat even though the boat is submerged to a great depth. Should the motor 23 break down and become useless, the pump 22 may be operated by means of a windlass and weight so the resulting pressure may be made to exceed the pressure of the surrounding water. Suitable alarm buoys may be released when the escape is operated either at the beginning of the operation or one with each person, or such buoys may be released from time to time to indicate the position of the boat and the number of persons ejected by the escape.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is—

1. An escape device for submarine boats, comprising a tube, fluid operated admission and exit gates or doors for said tube, fluid operated ejecting means within said tube, and means within said tube for controlling said gates or doors and ejecting means.

2. An escape device for submarine boats, comprising a tube, fluid operated admission and exit gates or doors for said tube, fluid operated ejecting means within said tube, means within said tube for controlling said gates or doors and ejecting means, and manual control means for said gates and ejecting means outside of said tube.

3. An escape device for submarine boats, comprising a tube, a gate for the upper end of said tube having its top inclined when

closed, fluid operated means for opening and closing said gate, said means embodying a cylinder, a piston, and a piston rod, the end of which has a sliding contact with the inclined top of said gate, an entrance gate for said tube, ejecting means within said tube, and means for controlling said gates and ejecting means.

4. An escape device for submarine boats, comprising a tube, a gate for the upper end of said tube having its top inclined when closed, fluid operated means for opening and closing said gate, said means embodying a cylinder, a piston, a piston rod, the end of which has a sliding contact with the inclined top of said gate, and a chain connected to said gate and piston rod, an entrance gate for said tube, ejecting means within said tube, and means for controlling said gates and ejecting means.

5. An escape device for submarine boats, comprising a tube, an entrance gate, an exit gate, and a fluid operated ejecting means in said tube, said means embodying a piston carrying a platform, a cylinder, a piston in said cylinder, and a piston rod connecting the two pistons, and means within said tube for controlling the operation of said gates and ejecting means.

6. An escape device for submarine boats, comprising a tube having an entrance gate, an exit gate, and an ejecting means therein, means for operating said gates and ejecting means, embodying cylinders and fluid actuated pistons, a fluid pressure tank, pipes connecting said tank and cylinders, and means for controlling the fluid to said cylinders.

7. An escape device for submarine boats, comprising a tube having an entrance gate, an exit gate, and an ejecting means therein, means for operating said gates and ejecting means, embodying cylinders and fluid actuated pistons, a fluid pressure tank, pipes connecting said tank and cylinders, and means for controlling the fluid to said cylinders, said means consisting of valves connected to said pipes intermediate said tank and cylinders.

8. An escape device for submarine boats, comprising a tube having an entrance gate, an exit gate, and an ejecting means therein, means for operating said gates and ejecting means, embodying cylinders and fluid actuated pistons, a fluid pressure tank, pipes connecting said tank and cylinders, and means for controlling the fluid to said cylinders, said means consisting of valves connected to said pipes intermediate said tank and cylinders, and means extending from said valves to the inside of said tube for operating said valves.

9. An escape device for submarine boats, comprising a tube having an entrance gate, an exit gate, and an ejecting means therein,

means for operating said gates and ejecting means, embodying cylinders and fluid actuated pistons, a fluid pressure tank, pipes connecting said tank and cylinders, and means for controlling the fluid to said cylinders, said means consisting of valves connected to said pipes intermediate said tank and cylinders, means extending from said valves to the inside of said tube for operating said valves, and means mounted adjacent said valves and connected to said operating means for manually operating said valves.

10. An escape device for submarine boats,

comprising a tube having an entrance gate, an exit gate, and an ejecting means therein, fluid operated means for said gates and ejecting means, a pressure tank, means connecting said tank and said fluid operating means, a fluid supply tank, and a pump for compressing the fluid in said pressure tank.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN SCHNITTER.

Witnesses:

E. WALTON BREWINGTON,
BROWN M. ALLEN.