

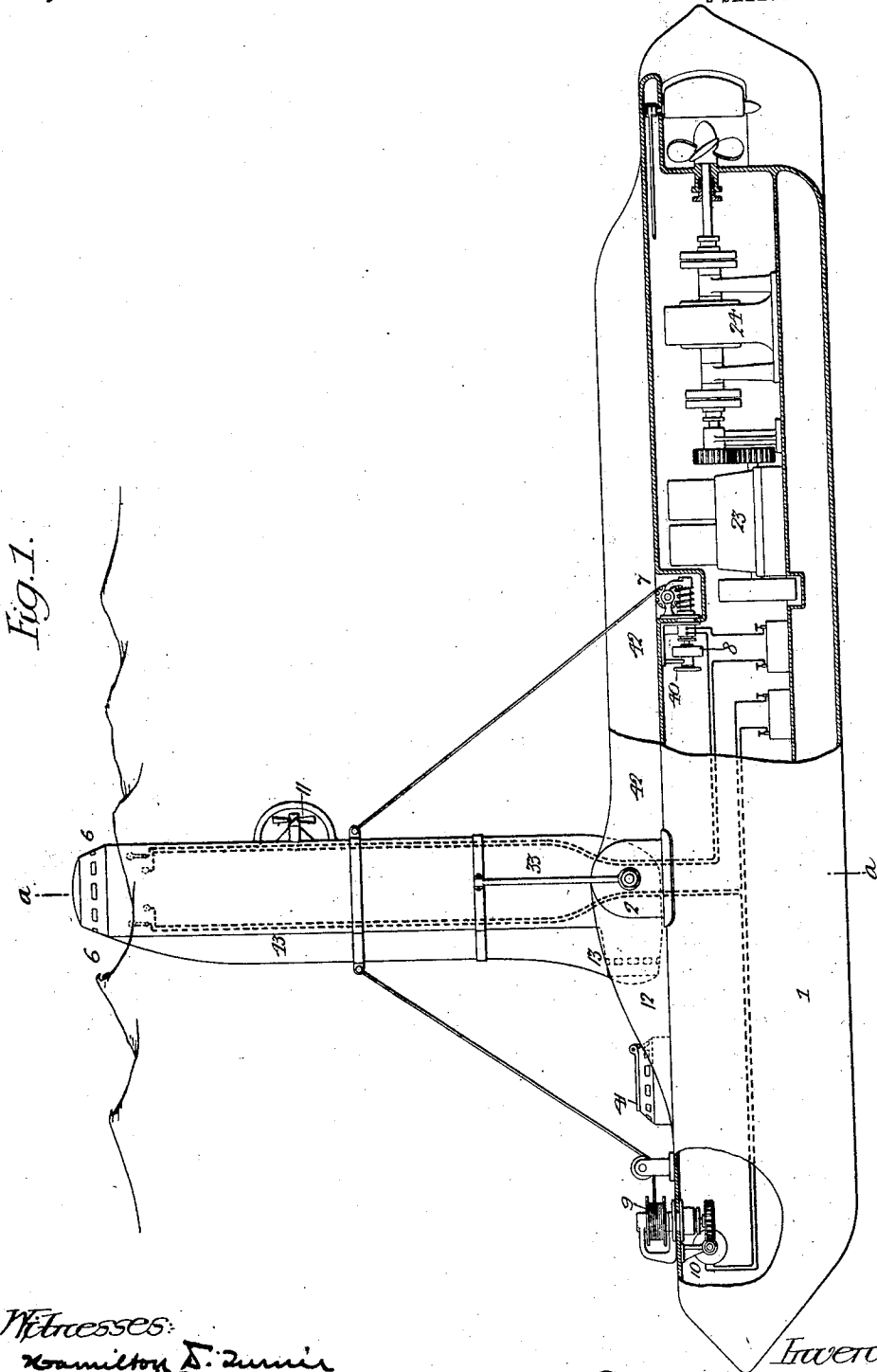
S. C. ROCKMAN.
SUBMARINE BOAT.

APPLICATION FILED MAR. 3, 1905. RENEWED OCT. 17, 1907.

Patented July 18, 1911.

2 SHEETS—SHEET 1.

998,204.



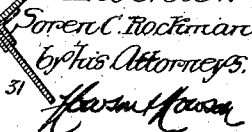
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UNITED STATES PATENT OFFICE.

SOREN C. ROCKMAN, OF PHILADELPHIA, PENNSYLVANIA.

SUBMARINE BOAT.

998,204.

Specification of Letters Patent. Patented July 18, 1911.

Application filed March 3, 1905, Serial No. 248,226. Renewed October 17, 1907. Serial No. 397,918.

To all whom it may concern:

Be it known that I, SOREN C. ROCKMAN, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Submarine Boats, of which the following is a specification.

One object of my invention is to so construct a submarine boat that the same may be run for an indefinite period while submerged at such a distance below the surface as to be measurably free from the effects of wave action, a further object being to provide for the conning of the boat while under way by a commander, who, while subjected to but a minimum of exposure, has a clear view of the surface of the sea, and who can readily drop below the surface when exposure becomes dangerous, such submergence being effected without corresponding fall of the hull of the boat.

These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a view, partly in side elevation and partly in section, of a submarine boat constructed in accordance with my invention, Fig. 2 is a transverse section of the same on the line *a-a*, Fig. 1, and Fig. 3 is a sectional plan view on the line *b-b*, Fig. 2.

1 represents the hull of the boat, which, in the present instance, is of substantially circular cross section, flattened at the top and tapered at the ends, although it should be understood that my invention is not limited to any particular shape or construction of hull, so long as the same is properly calculated to withstand the strains to which it is likely to be subjected.

At any suitable point in the length of the hull, preferably about midway of the same, I form, on the top of said hull, port and starboard hoods 2, each hood presenting an inwardly projecting tubular neck 3, which serves as a bearing for one of the hollow trunnions 4, of a tubular conning tower 5, the latter being thereby pivoted to the hoods, so that it can be raised to the vertical position shown in Fig. 1, or can be swung downwardly and rearwardly to any desired extent. More than one of these conning towers may be used, if desired, in boats of large size.

The conning tower is of such height that when its top is exposed above the surface of

the sea the hull 1 of the boat will be submerged to such an extent as to be measurably beyond the influence of the wave action at the surface, hence the boat may be run upon a level keel at the desired distance below the surface without risk of deflection from its proper course by reason of such wave action, and without the exercise of the constant vigilance and expenditure of power necessary to counteract the effects of such wave action. The commander of the vessel, occupying a position in the conning tower, can have a free view of the surface of the sea, and can maneuver his boat more effectively than by the use of a periscope, or than if it was necessary to bring the boat to the surface in order to make an observation, and then to sink the boat to the running level again. The upper end of the conning tower is provided with properly glazed openings 6, and it may be armored so as to withstand the fire of the machine guns or secondary battery of a vessel which is being attacked.

The commander of the boat can readily withdraw beneath the surface by swinging the conning tower rearwardly on its pivots, a suitable capstan 7, operated by an electric motor 8 or its equivalent, serving to pull the conning tower down and another capstan 9, operated by an electric motor 10, or its equivalent, serving to aid the natural tendency which the conning tower has, by reason of its buoyancy, to assume a vertical position, this latter operation being also, if desired, facilitated by the action of a properly shielded screw propeller 11, projecting from the rear of the conning tower and operated by an electric motor, or its equivalent, on the inside of the same. The conning tower 5 has, at the base and on the forward side, a conning hood 13, which can be used for conning purposes when the tower is lowered and the boat is running awash.

The joints between the hollow trunnions of the conning tower and the necks 3 of the opposite hoods, are preferably provided with stuffing boxes to prevent leakage, one of the trunnions being closed at the end by a watertight door 14, and the other by a plate 15, having a stuffing box through which passes a tube 16 communicating with an air duct or pipe 17, which extends up through the conning tower to a point near the top of the same, so that when the boat is running with the conning tower raised

this pipe or duct will serve as an intake for fresh air, the tube 16 being bent downwardly through the hood so that it may be connected, at its inner end, with the pump whereby a supply of fresh air is drawn into the boat. Contained within the pipe 16 is another pipe 18, which communicates with a pipe or duct 19, the latter also extending up through the conning tower to a point near the top of the same, so as to provide for the discharge of foul air and gases from the hull, the inner end of said pipe 19 being intended to be connected to the apparatus whereby such foul air and gases are discharged. Both pipes will be provided with suitable inboard and outboard valves, so that they can be closed both at their outer and inner ends, if desired. The pipes 16 and 17 may be used alternately for the inflow of fresh air and for the discharge of foul air, the pipes 18 and 19 serving simply for the discharge of the waste gases from the engine.

Access to the conning tower is obtained through one of the hoods and hollow trunnions of said tower, a ladder 20 permitting access to the hood from the hull of the boat, and a ladder 21, on the inside of the conning tower, providing a means of reaching the top of the same, said ladder 21 leading to a platform 22, upon which the commander of the boat stands when the boat is in action, said platform being, preferably, provided with a watertight door, so that it can be closed in case of injury to the upper or exposed part of the conning tower. A double protection against the flow of water into the hull through the conning tower is thus provided, first by the watertight platform 22, and again by the watertight door 14 which closes the end of the hollow trunnion 4.

The boat is preferably equipped with two sets of power devices, namely, a gas or gasoline engine 23 for providing power when an outlet for the waste gases is available, and an electric motor 24 for use when all parts of the boat are submerged.

The boat has a hollow keelson 26, which serves as a bilge, and can be filled with water for ballasting purposes, or emptied in order to increase the buoyancy of the vessel when it is desired to rise to the surface, and on each side of this hollow keelson are bilge tanks 27.

Tanks 30, for the storage of air, are suitably disposed along the sides of the hull, and extending around the hull are bilge keels 31. The lower edges of the bilge keels 31 are in the same horizontal plane as the bottom of the main keel, so that they prevent the tipping of the boat to port or starboard when it is resting on the bottom.

The conning tower will be equipped with all necessary electric wires, switches, speaking tubes, and the like, so that the com-

mander can communicate with the crew of the vessel at all times, or can control the various motors directly where quick action is desired, as for instance, in the motor which pulls down the conning tower, the submergence of this conning tower to a safe depth being effected much more readily than the submergence of the entire boat from a position afloat or awash.

The natural buoyancy of the conning tower, when submerged, may be sufficient to raise it to a vertical position independently of the hoisting devices provided for the purpose, or such buoyancy may be aided by the lifting power of the screw propeller 11, the latter also serving to resist, in a measure, the backward pressure of the water upon the conning tower when the latter is raised and the boat is under way, thus relieving the hoisting devices of a corresponding amount of strain. The buoyancy of the conning tower also tends to retain it in its proper midship position, and thus tends to prevent rolling of the boat, when the same is submerged. In order to properly stay the conning tower transversely bars 33 are connected at their upper ends to the tower at a suitable point in its height, the lower ends of these stay bars being pivoted at 34 to the hoods 2, at points in line with the axis upon which the conning tower swings.

Of course, it will be understood that the boat is intended to be equipped with the appliances at present in use for the purpose of indicating the course, the depth of submergence, etc., and for discharging projectiles, laying mines, and the like, or the boat may, if desired, be used for peaceful commercial purposes, such as submarine surveying, or as a life boat.

The shafts of the motors which effect the raising and lowering of the conning tower are, preferably, provided with hand wheels 40, so as to provide for the operation of these devices by hand in case of any accident to the power operating mechanism.

The boat is preferably provided with a fixed conning hood, 41, forward of the pivoted conning tower, for use when the boat is running afloat, and running fore and aft on the top of the hull are fins or flanges 42, which serve as guards for the conning tower when the latter has been lowered to the full extent.

The pipes, wires, etc., leading from the conning tower to the hull may be passed through the fixed frame of the watertight door 14, or through the pipe 16.

Although I have shown the conning tower as pivoted so as to swing in a fore and aft plane, and although I prefer this construction, the tower may, if desired, be pivoted so as to swing athwartship, and although I prefer in all cases to use two hoods, and a conning tower with two trunnions, but a

single hood and a single trunnion may, if desired, be used.

The conning tower is of oval cross section, with its longer axis fore and aft, so as to provide the desired amount of space within the tower with the minimum of resistance to the passage of the elevated tower through the water, and in order to protect the tower from injury due to impact with floating objects it has, on its forward side, a projecting central guard fin 43. The top hood of the conning tower is pivoted thereto and provided with fastening devices on the inside of the tower, so that it provides a means of ingress and egress when the top of the tower is raised above the surface of the water.

Having thus described my invention, I claim and desire to secure by Letters Patent:—

1. A submarine boat having a conning tower projecting above the same to such an extent as to permit direct observation above the surface of the sea while the hull is so submerged as to be measurably free from wave action, said conning tower providing, at all times, a passage through which the commander can enter or leave the same, and ventilating devices extending into said conning tower from the hull through the supports for said conning tower, substantially as specified.

2. A submarine boat having a conning tower pivotally mounted thereon, and providing, in different positions of adjustment, a passage through which the commander can enter or leave the same, in combination with ventilating devices passing through the pivot of the tower, substantially as specified.

3. A submarine boat having a conning tower pivoted thereto and providing, in different positions of adjustment, a passage whereby the commander can enter or leave the same, said conning tower having ventilating devices passing through the pivot, and also having a movable top hood, substantially as specified.

4. A submarine boat having a conning tower pivoted thereto by means of a hollow side trunnion communicating with the hull and through which the commander can enter or leave the tower, substantially as specified.

5. A submarine boat having a conning tower pivoted thereto and having a movable top hood, an intermediate door, and a bottom door through which the commander can enter or leave the tower, substantially as specified.

6. A submarine boat having a conning tower projecting above the hull so as to permit direct observation above the surface of the sea while the hull is so submerged as to be measurably free from wave action, said conning tower communicating with the hull through a movable door and having within it and above the door communicating

with the hull a working platform with a movable door, substantially as specified.

7. A submarine boat having a conning tower projecting above the hull so as to permit direct observation above the surface of the sea while the hull is so submerged as to be free from wave action, a water-tight door for closing the communicating passage between the hull and said conning tower, the latter containing a working platform wholly within itself with a water-tight door, substantially as specified.

8. A submarine boat having a conning tower pivoted to the hull so as to swing in a fore and aft plane, devices fore and aft of said tower for raising and lowering the same and pivoted lateral stays connecting said tower and hull, substantially as specified.

9. A submarine boat having a hollow projecting hood thereon, and a conning tower having a transversely projecting hollow trunnion pivoted to said hood and providing means whereby the commander can enter or leave the conning tower, substantially as specified.

10. A submarine boat having a hollow projecting hood with neck thereon, and a conning tower having a transversely projecting hollow trunnion pivoted in said neck and providing a means whereby the commander can enter or leave the tower, substantially as specified.

11. A submarine boat having on the top of the hull a pair of hoods, and a conning tower having transversely projecting trunnions pivoted to said hoods, one of said trunnions providing a means whereby the commander can enter or leave the tower, substantially as specified.

12. A submarine boat having on the top of the hull a pair of hoods with projecting necks, and a conning tower having transversely projecting trunnions pivoted in said necks, one of said trunnions providing a means whereby the commander can enter or leave the tower, substantially as specified.

13. A submarine boat having a hull with projecting hood, a conning tower having a hollow trunnion pivoted to said hood, and ventilating pipes passing through said trunnion, substantially as specified.

14. A submarine boat having a hull with projecting hood, a conning tower with hollow trunnion pivoted to said hood, and closed at its inner end, and ventilating pipes passing through said closed end of the trunnion, substantially as specified.

15. A submarine boat having a hull with projecting hood, and a conning tower having a hollow trunnion pivoted to said hood, and having its inner end closed by a watertight door, substantially as specified.

16. A submarine boat having a conning tower pivoted thereto, and provided with

lateral stays likewise pivoted concentric with the pivotal axis of the tower, substantially as specified.

17. A submarine boat having a hull with projecting hoods, a conning tower having trunnions pivoted to said hoods, and stays connected to said conning tower and pivoted to the hoods in line axially with the pivotal axis of the tower, substantially as specified.

18. A submarine boat having a conning tower pivoted thereto, and having capstan and cable connections with opposite sides of the same for positively raising and lowering the tower, and swinging brace connections with the other sides of the tower, substantially as specified.

19. A submarine boat having a conning tower pivoted thereto, a power device on the inside of the hull for raising or lowering said tower, and means whereby the operation of said tower device can be controlled from the interior of the conning tower, substantially as specified.

20. A submarine boat having a pivoted conning tower, capstan and cable connections with said conning tower on the outside of the hull, and a motor for said capstan located on the inside of the hull, substantially as specified.

21. A submarine boat having a pivoted conning tower, capstan and cable connections with said conning tower on the outside of the hull, a motor for said capstan located on the inside of the hull, and means whereby the operation of said motor can be controlled from the interior of the tower, substantially as specified.

22. A submarine boat having a conning tower pivoted thereto, and having a projecting guard fin on its forward side, and means for raising and lowering said conning tower, substantially as specified.

23. A submarine boat having a conning tower pivoted thereto, so that its free end can be raised above or lowered beneath the surface of the water, said conning tower having a conning hood which is raised into position as the conning tower is lowered, substantially as specified.

24. A submarine boat having a conning tower pivoted thereto, so that its free end can be raised above or lowered beneath the surface of the water, and a screw propeller carried by said conning tower, and aiding to raise the same or maintain it in the raised position, substantially as specified.

25. A submarine boat having a fixed conning hood, and a pivoted conning tower, through whose pivot the commander can enter or leave the tower, and means for retaining said tower in different positions of adjustment, substantially as specified.

26. A submarine boat having a conning

tower consisting of a single hollow tube or mast, pivoted to the hull of the boat, through which pivot the commander can pass to or from the hull, said tube or mast having a conning chamber at its free end, and means for positively raising and lowering said hollow tube or mast, substantially as specified.

27. A submarine boat having a conning tower pivoted thereto, so that its free end can be raised above or lowered beneath the surface of the water, said conning tower having means of entrance and exit for the commander, both at the free end and through the pivot, substantially as specified.

28. A submarine boat having a conning tower pivoted thereto, and accessible from the interior of the hull in its different positions of adjustment, means for raising and lowering said conning tower, and means whereby said raising and lowering devices can be controlled from the interior of the conning tower in any position of the latter, substantially as specified.

29. A submarine boat having a conning tower pivoted thereto, so that its free end can be raised above or lowered beneath the surface of the water, said conning tower being of oval cross section with its longer axis fore and aft and having ventilating pipes at front and rear, substantially as specified.

30. A submarine boat having a conning tower pivoted thereto, so that its free end can be raised above or lowered beneath the surface of the water, said conning tower being of oval cross section with its longer axis fore and aft, and being provided on the forward side with a projecting guard fin, substantially as specified.

31. A submarine boat having a conning tower projecting above the hull and in permanent communication therewith, a working platform within said conning tower, a movable door carried by said platform, and ventilating pipes extending into said conning tower from the hull, said pipes passing through said working platform out of contact with the movable door.

32. A submarine boat having a conning tower in permanent communication with the hull, said conning tower being substantially elliptical in contour with its longest dimension lying fore and aft, ventilating pipes extending from the hull into said conning tower, said ventilating pipes being disposed fore and aft in said tower.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

SOREN C. ROCKMAN.

Witnesses:

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