No. 751,158. PATENTED FEB. 2, 1904.

C. J. H. FLINDT.

PROPELLER SHIP.

APPLICATION FILED SEPT. 15, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

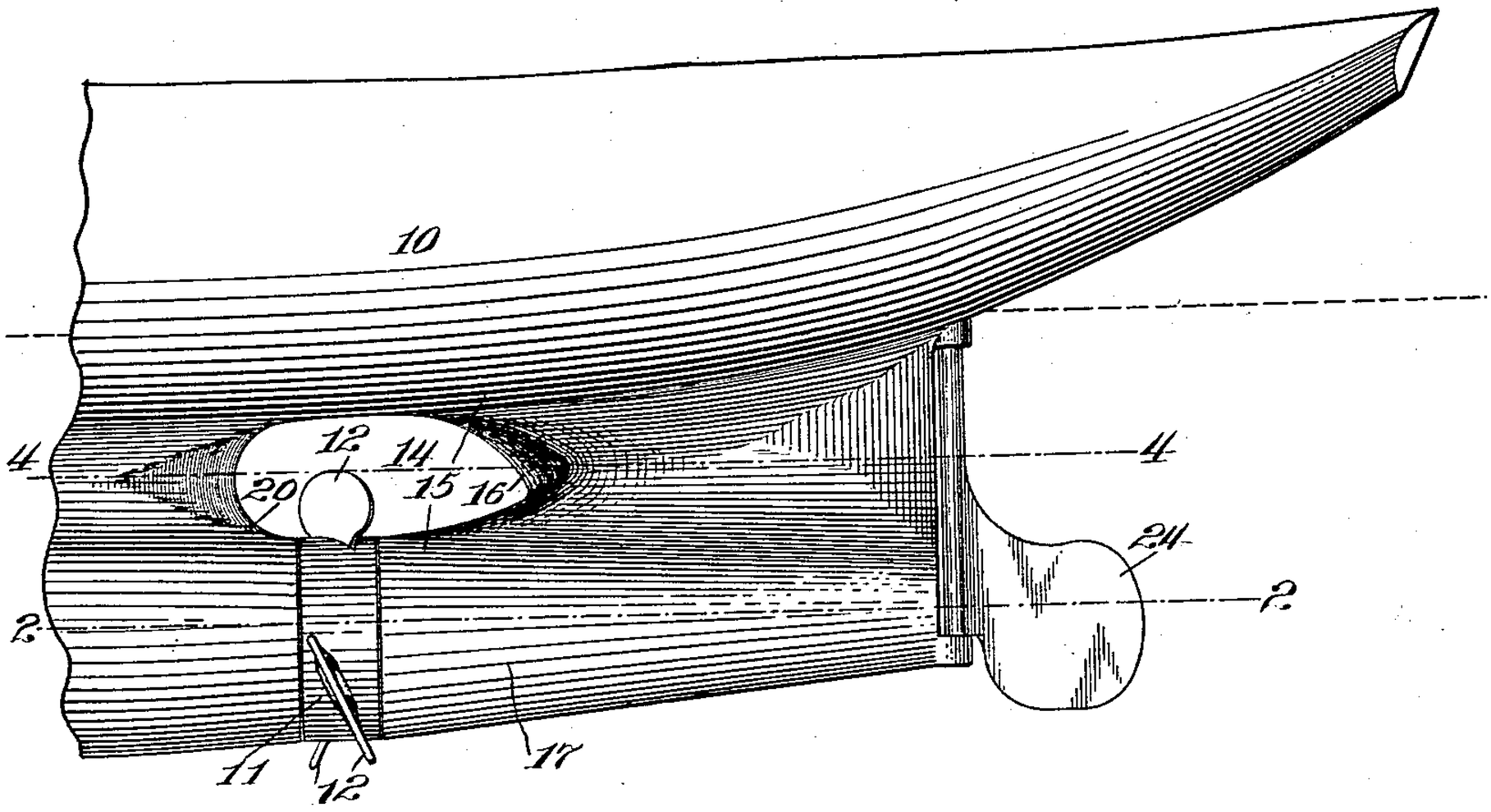
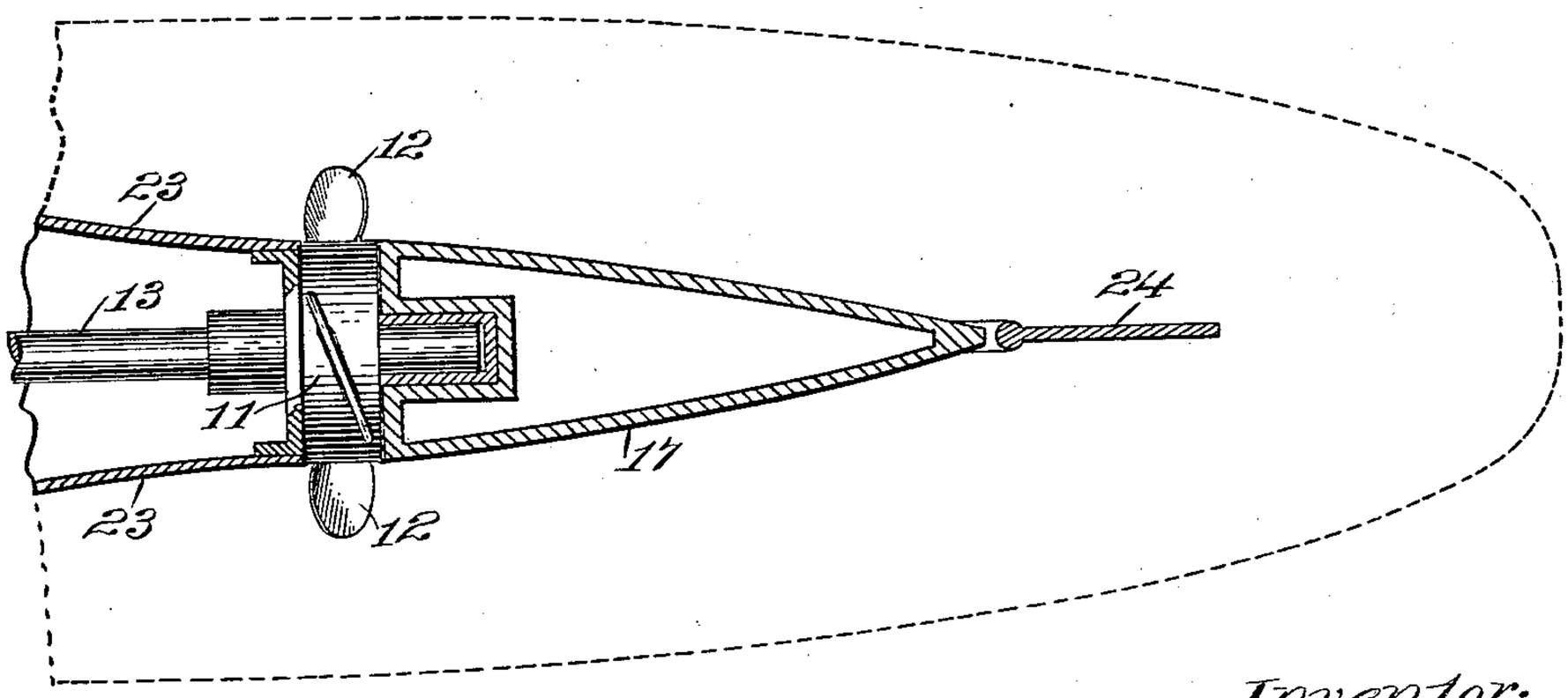


Fig. 2.



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NO MODEL. 2 SHEETS—SHEET 2.

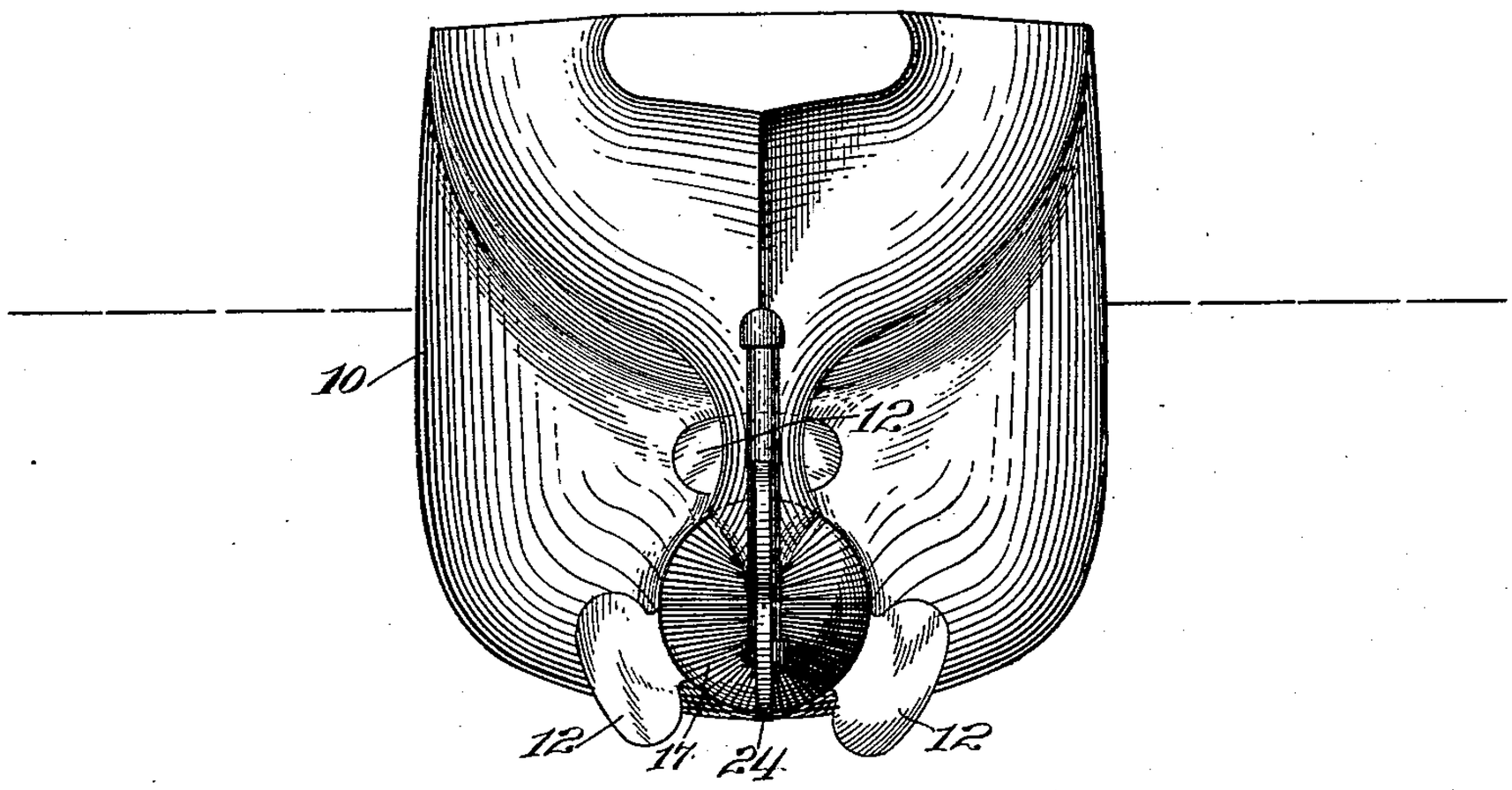

Fig. 3.

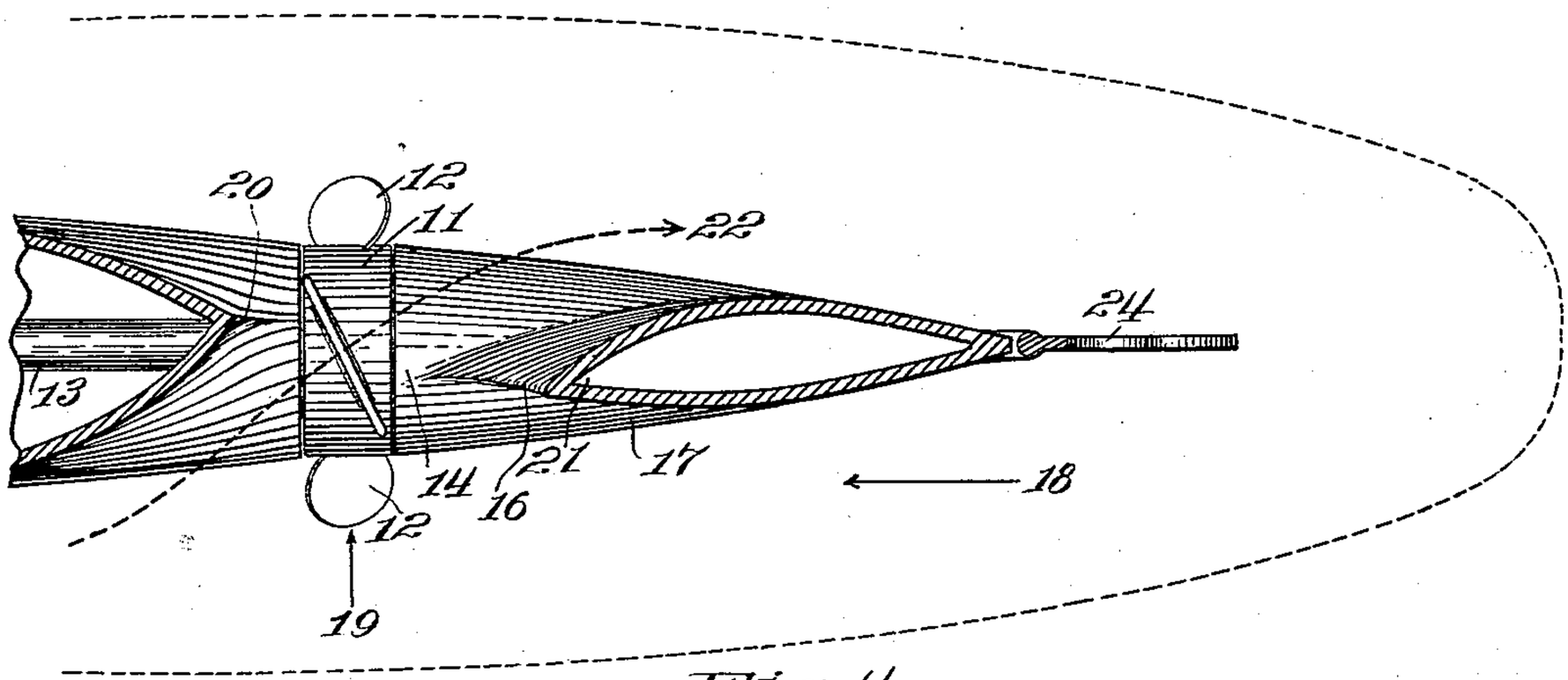

Fig. 4.

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No. 751,158. Patented February 2, 1904.

UNITED STATES PATENT OFFICE.

CARL J. H. FLINDT, OF HOBOKEN, NEW JERSEY.

PROPELLER-SHIP.

SPECIFICATION forming part of Letters Patent No. 751,158, dated February 2, 1904.

Application filed September 15, 1903. Serial No. 173,249. (No model.)

To all whom it may concern:

Be it known that I, CARL J. H. FLINDT, a citizen of the United States, residing in Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Propeller-Ships, of which the following is a specification.

This invention relates to propellers, and has for an object to provide a construction whereby an increased efficiency of the propeller-blade will be obtained, whereby the propeller may be located some distance forward of the stern of the boat, thereby reducing materially the rising-and-falling movement of the propeller in the water due to the pitching of the vessel, and to combine a propeller having a relatively large hub or center wheel with a portion of the vessel so shaped as to permit the water along the sides of the vessel immediately above the keel to flow with a minimum of interruption, to provide for a slower rotary movement of the propeller than would be required in a vessel of a given size, to locate the propeller forward of the rudder a sufficient distance so as to relieve the rudder from the foaming action caused by the propeller in its immediate vicinity, and generally to increase the efficiency of the propeller apparatus in respect to the extent and manner in which the propeller-blades engage and seize upon the water at the sides of and below the vessel.

In the drawings accompanying and forming a part of this specification my invention is illustrated applied to a ship.

Figure 1 is a side view of the stern portion of a ship, showing the propeller in position. Fig. 2 is a section on the line 2 2 of Fig. 1, the propeller-wheel, however, being seen in top view. Fig. 3 is a stern view of the vessel, and Fig. 4 is a section on the line 4 4 of Fig. 1.

Preferably the propeller-blades are relatively short diametrically of the propeller and the propeller is so located that these blades extend for a relatively large part of their length below the line of the keel in that part of the ship where the propeller is located, it being understood that the keel at this point may, if desired, be at a somewhat different elevation than in other portions of the length of the ship. Also in practice it is deemed preferable with my present improvements to make the total diameter of the propeller somewhat larger than now generally used in vessels of a given size, and by reason of this additional size, taken in connection with the improvements of the construction of the propeller and that portion of the vessel adjacent thereto, the rotary movement of the propeller may be substantially less than would otherwise be required for driving the vessel at a given speed or in driving the propeller with a given maximum power. Said increased diameter of the propeller causes the blades to pass through a curved path of relatively large diameter, so that during a given number of feet of movement in said curved path the propeller-blades will "rotate" in speed to a less extent—that is to say, the propeller-blades will tend to set the water into a rotary movement to a lesser extent than will ordinarily occur with smaller propellers located at the stern of the vessel, especially as with my present improvemenrs "suction" which ordinarily forms at the rear of the vessel is reduced to a minimum. Also the propeller-blades by extending around the curved and molded portion of the vessel forward and backward of the propeller and by extending into the water below the line of the vessel seizes upon masses of water, so to speak, which are normally in favorable condition for exerting the reaction necessary for enabling the propeller to drive the ship forward in the water.

In the operation of the propeller mechanism when combined with the vessel of the molded form and organized substantially as herein set forth there is a maximum tendency of the blades to drive the water backward with a relative reduced tendency to throw the water outwardly radially of the propeller. The extension of the vessel rearward of the relatively large propeller center wheel prevents access of water to the space within the blades from rearwardly of the propeller through the operation of any suction such as would ordinarily occur with a propeller located at the stern of the ship.

The hull of the ship is designated in a general way by 10 and is shown as broken away forward of the propeller. The propeller in the present instance comprises a hub 11, having upon its perimeter a number of screw-propeller blades 12, and is mounted upon a shaft 13 having bearings in the ship's frame and will be driven in some convenient manner. The hull of the ship adjacent to such propeller is made of a peculiar formation to adapt it to the propeller and to the conditions which will exist by use of such propeller whereby efficient results may be obtained.

Rearward of the upper side of the propeller is a transverse opening or chamber 14 in the vessel through which the blades of the propeller travel in passing from one side of the ship to the other, and the vessel is rearwardly elongated, as indicated, for instance, at 15, Fig. 1, and rearwardly of this point the opening of the vessel is narrowed down, the thin edge 16 pointing forwardly, so as to divide the stream of water incidentally formed by the action of the propeller-blades in the upper part of their circuit of movement, thereby to minimize the resistance which might be otherwise created at this point; but it should be noted that this part of the propeller being in relatively shallow water, where the resistance is therefore less, while the highest efficiency of the propeller occurs where the blades pass deeper in water, and the hull of the ship immediately adjacent to the hub has a cylindrical formation 17, which for the purpose of reducing friction may best be made flush with the hub. Assuming the ship to be traveling in the direction of the arrow 18 in Fig. 4 and the propeller-blades to be moving in the direction of the arrow 19, there will be a tendency of the water to pass from one side to the other of the ship through the chamber 14 in the direction in which the blades are moving through such chamber, and to facilitate such passage of water with a minimum of resistance the lower edges of such chamber will be built up so that the rearward portion 20 will be a little toward the middle line veering toward one side and the portion 21 will be in the other direction, whereby the water passing through such channel will not impede the progress of the ship nor interfere unduly with the propeller-blades, the dotted line 22 illustrating the passage of the water.

In the plan view Fig. 2 the "lines" of the vessel at the height of the dotted line 2 2 in Fig. 1 is approximately indicated by the lines 23 23, showing the hull of the vessel narrowed down toward the stern of the ship until its proportions correspond with the center wheel or enlarged hub 11 of the propeller, and rearward of the said propeller the lower portion of the ship is extended in a tapering and preferably in a somewhat curved or molded form to the extreme rear or stern of the vessel, where it approaches to a point of a size only sufficient to carry the rudder 24. The walls of such extreme rear of the stern adjacent to the hub of the propeller are substantially flush with the perimeter thereof, and the blades, projecting as they do beyond such hub, do not have opportunity to agitate the water at the region of the axis of the propeller, and consequently the "curl" of the water created by the blades now in use is not present in action, and the solid center prevents the carrying of "dead" water. It will be observed that with this organization of the hull of the ship and of the propeller and rudder that the water passing along the tapered sides of the ship after being driven backward by the blades of the propeller will flow in streams tending to converge at the place where the rudder is located, this convergence being of course controlled in part by the normal suction due to the forward movement of the vessel, especially when this movement is rapid, and thereby the large rapidly-moving streams of water will operate with a high efficiency on the rudder, while leaving this important device relatively free of the direct effect of the suction and of the foaming and whirling of the water due to the propeller action thereon.

In ships having the rudder directly at the rear of the propeller the rudder-blade will act when turned to one side to dam up the water and constict the free flowage thereof from the propeller, thus not only interfering with the action of the wheel and minimizing its action, but also interfering with the steering of the ship. By having the propeller located in a forward position it is placed nearer to the engine than in ships having it at the extreme stern. Such decrease of distance gives a shorter shaft, and consequently less bearings, thus reducing friction, and such arrangement also reduces vibration. It will be apparent that other forms of my invention may be used as practice demands.

Having described my invention, I claim—

1. The combination in a ship having a rudder at its stern, of a hull; a propeller having blades and carried by the hull at its rear but at a distance considerably forward of the rudder; an opening through the hull to admit the passage of the propeller-blades from one side thereof to the other, the walls surrounding such opening having guide-faces projecting generally in the direction of flow of the water incident to the movement of the propeller-blades.

2. The combination in a ship, of a hull; a propeller having blades carried thereby; a transverse opening through the hull to admit the passage of the propeller-blades from one side thereof to the other, the walls thereof at the rear having a thin edge pointing forwardly to divide the stream of water incidentally formed by the action of the propeller.

3. The combination in a ship, of a hull; a propeller having blades carried thereby; a

transverse opening through the hull to admit the passage of the propeller-blades from one side thereof to the other, the walls thereof at the rear and toward one side having a thin edge pointing forwardly to divide the stream of water incidentally formed by the action of the propeller.

4. The combination in a ship, of a hull; a propeller having blades carried thereby; a transverse opening through the hull to admit the passage of the propeller-blades from one side thereof to the other, the walls thereof at the rear and toward one side of the propeller having a thin edge pointed forwardly and opposite the direction of rotation to divide the stream of water incidentally formed by the action of the propeller.

5. The combination in a ship, of a hull; a propeller having blades carried thereby; a transverse opening through the hull to admit the passage of the propeller-blades from one side thereof to the other, the walls thereof at the rear and toward one side of the propeller having a thin edge pointing forwardly and opposite the direction of rotation to divide the stream of water incidentally formed by the action of the propeller and having at the front a thin edge pointing rearwardly to prevent the suction in front of the blades.

6. The combination in a ship, of a hull; a propeller having blades carried thereby; a transverse opening through the hull to admit the passage of the propeller-blades from one side thereof to the other, the walls thereof at the rear and toward one side of the propeller having a thin edge pointing forwardly and opposite the direction of rotation to divide the stream of water incidentally formed by the action of the propeller and having at the front a thin edge pointing rearwardly and toward the direction of rotation of the propeller to prevent suction in front of the blades and to direct the water through such opening with decreased resistance.

7. The combination with a ship's hull, of a propeller having blades carried thereby, a transverse propeller-blade passage-way through the hull, the walls thereof at the front having a thin edge pointing rearwardly and at the rear having a thin edge pointing forwardly.

8. The combination with a ship's hull, of a propeller having blades carried thereby; a transverse propeller-blade passage-way through the hull, the walls thereof at the front having a thin edge pointing rearwardly to prevent suction in front of the blades.

9. In a ship, the combination with a hull, of a propeller carried thereby and having a comparatively large cylindrical hub, blades carried by the hub, a passage-way through the hull to permit the rotation of the hub with its blades, the hull adjacent to such hub having a cylindrical formation and substantially circumferentially equal with the hub and the walls of such passage-way in front of and behind the blade ending in thin edges directed toward the blades.

Signed at Nos. 9 to 15 Murray street, New York, N. Y., this 8th day of September, 1903.

CARL J. H. FLINDT.

Witnesses:
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CHAS. S. RUSSELL.