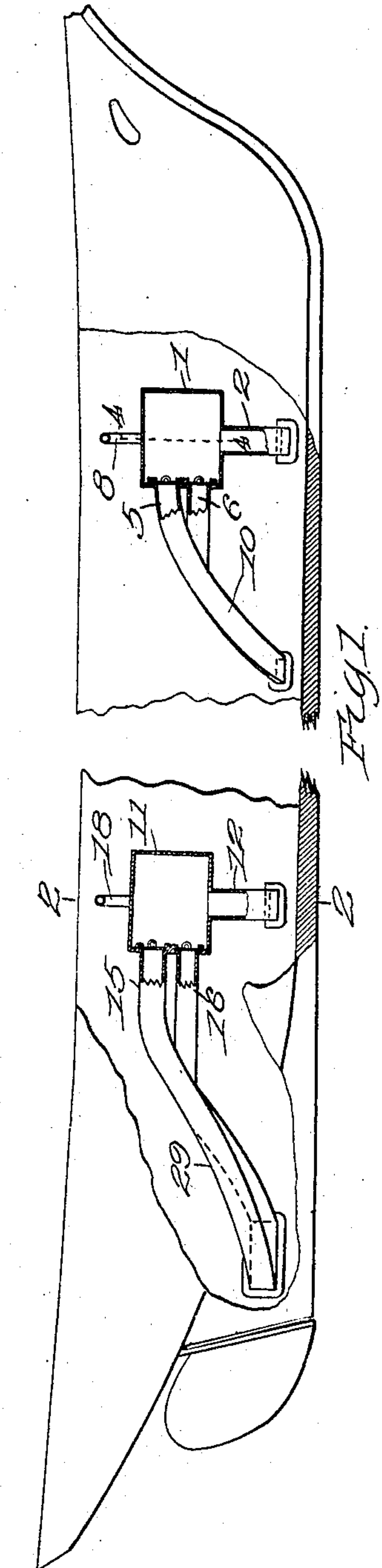


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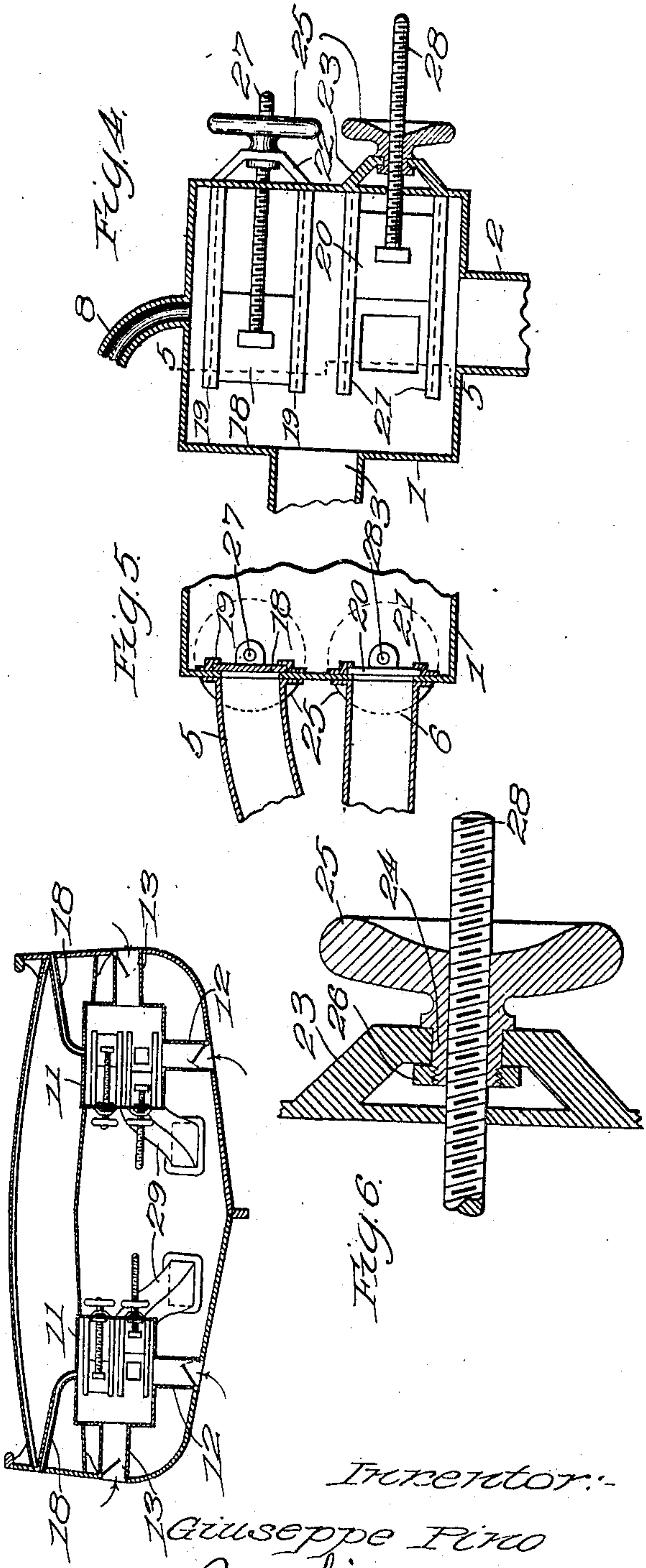
PATENTED NOV. 19, 1907.

G. PINO.
VESSEL PROPELLING MEANS.
APPLICATION FILED MAY 10, 1906.

2 SHEETS—SHEET 1.



Witnesses:-
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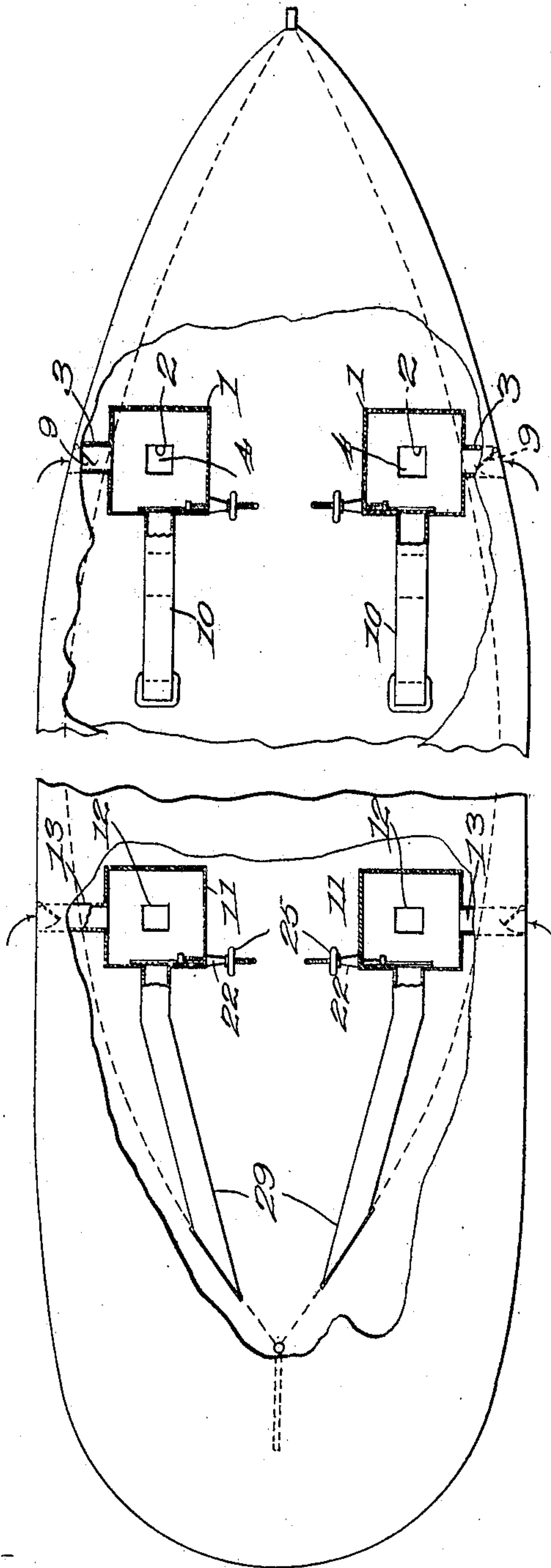
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2 SHEETS—SHEET 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

GIUSEPPE PINO, OF GENOA, ITALY.

VESSEL-PROPELLING MEANS.

No. 871,236.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed May 10, 1906. Serial No. 316,125.

To all whom it may concern:

Be it known that I, GIUSEPPE PINO, a subject of the King of Italy, residing at Genoa, Italy, have invented new and useful Improvements in Vessel-Propelling Means, of which the following is a specification.

This invention relates to propelling means for vessels of that class wherein the motive power of the surrounding water is utilized.

10 The primary object of this invention is to provide propelling means of this character and avoiding the use of movable or operating mechanism, the device of my invention being adapted to utilize the motive power
15 of the surrounding water and consisting primarily of parts that are relatively stationary or that are stationary while the boat is being propelled.

20 The improved device of my invention is designed in a manner to act in an efficient and effective manner either when the boat is loaded or empty and to this end adjustable means are provided, in the improved embodiment of the invention, to permit the device
25 thereof to act under the varying conditions stated.

30 The invention will be more fully described in connection with the accompanying drawings and will be more particularly pointed out and ascertained in and by the appended claims.

35 In the drawings Figure 1 is a view in side elevation of a boat equipped with a device embodying the main features of my invention, parts being broken away for clearness of illustration. Fig. 2 is a sectional view on line 2—2 of Fig. 1. Fig. 3 is a diagrammatic plan view of the bow and stern ends of a boat showing one application of the device
40 of my invention. Fig. 4 is a sectional view on line 4—4 of Fig. 1. Fig. 5 is a sectional view on line 5—5 of Fig. 4. Fig. 6 is an enlarged detailed sectional view of a portion of a valve adjusting device.

45 Like numerals of reference designate similar parts throughout the different figures of the drawings.

50 As shown the hull of the boat is provided with thrust chambers which are preferably, though not necessarily, located fore and aft and disposed on opposite sides of the hull. The forward chambers which are designated as a whole by 1 may be anchored in place in any desirable manner and may comprise any

suitable construction for the service required. 55
Each of said thrust chambers communicate with the surrounding water in which the vessel floats in such a manner as to provide a path or course whereby the water may be admitted at one point and discharged at a point 60
remote from the point of admission, the propelling force being obtained by the rocking or tossing of the boat and the usual disturbed or wavy condition of the water. To this end the thrust chambers 1 communicate with the 65
surrounding water, in the preferred construction, in a manner to utilize the power from the water resulting both from the lateral rocking of the vessel and the longitudinal or tossing movements thereof and accordingly 70
the chambers 1 are provided with passages 2 and 3. The passages 2 are desirably vertically disposed and lead from the chambers 1 downwardly to the bottom of the hull at which point they communicate with the surrounding water. Passages 3 are desirably 75
horizontally disposed and lead from the chambers 1 to the sides of the hull at which points they communicate with the surrounding water. Means are provided, preferably 80
in the form of valves to permit ingress of water to said chambers and prevent egress therefrom through said passages 2 and 3 and the said valves are conveniently located at the outer terminals of said passages and are 85
indicated by numerals 4 and 9 respectively. It has been found that an ordinary flap valve will serve to perform the function efficiently. The thrust chambers 1 also communicate with the surrounding water in a manner to 90
afford a flow from the chambers 1 in a reverse direction to that in which the boat is traveling and to this end conduits 10 are provided which preferably lead rearwardly from the chambers 1 and which are downwardly 95
inclined therefrom and communicate with the surrounding water at points adjacent the bottom of the hull.

In order that the device of my invention may efficiently perform its function either 100
when the boat is loaded or empty the conduits 10 are branched at 5 and 6 and the terminals of said branches opening into the chambers 1 are at different vertical planes, the branch 6 being used when the boat is 105
empty and the branch 5 when the boat is loaded. Means are provided preferably in the form of valves for throwing either of said

branches into or out of communication with the chambers 1 and devices are provided for controlling said valves.

As shown in Fig. 4 the terminal of branch 5 is controlled by a valve 18 which is slidably mounted in ways 19. The branch 6 is controlled by a valve 20 which is slidably mounted in ways 21. The devices for controlling said valve comprise as shown brackets 22 and 23 apertured to receive the reduced shanks 24 of hand wheels 25. Nuts 26 are provided to hold said hand wheels in place and permit rotation thereof in the brackets. Threaded rods 27 and 28 are secured in any convenient manner to the valves 18 and 20 and extend through the hand wheels 25 with which they have threaded engagement.

It will be seen from the foregoing that by rotating the hand wheels 25 in opposite directions the valves will be operated to cover or uncover the terminals of the branches 5 and 6 and the guides 19 and 21 will effectively support the valves in their opened and closed positions.

In order to prevent water hammer in the chambers 1 and afford ready escape of air therein to admit water thereto air outlets 8 are provided which conveniently lead from the chambers 1 and discharge at the sides of the vessel and above the water line thereof.

In the form shown thrust chambers 11 are provided adjacent the stern and said chambers communicate through passages 12 and 13 with the surrounding water at the bottom and the sides of the hull and at points rearwardly of the chambers 11 conduits 29 are provided similar to conduits 10 and communicate with chambers 11 by branches 15 and 16. The chambers 11 are provided with valves similar in construction and operation to the valves of chambers 1 and therefore they need not be described in detail. Said chambers 11 are likewise provided with air outlets 18 to prevent water hammer.

When the vessel is riding a high sea and is tossing longitudinally and rocking laterally downward movement of the bow will cause the water to open the flap valve 9 and rush upwardly through passages 2 into the chambers 1. Upon completion of downward movement and subsequent raising of the bow the weight of the water will close the valves 9 and the impetus given the water by the upward movement of the bow will cause the water in the passage 2 to rush into the chambers 1 and with the contents thereof outwardly through the conduits 10 into the surrounding water. The displacement resulting from discharge at the terminals of conduits 10 will serve to propel the boat forwardly. Likewise when the boat is rocking laterally the chambers 1 are filled through conduits 3 and during restoring movement the contents of the chambers 1 are forced outwardly through the conduits 10. It will

thus be seen that where the chambers 1 are provided with passages 2 and 3 an increased propelling power may be obtained over a construction wherein only passages 2 or 3 are provided although it will be understood that the device of my invention is not limited to the provision of both lateral and vertical passages in order that its advantages may be fully realized. Likewise the invention is not limited to the provision of the hereinbefore described devices located fore and aft of the hull.

I claim:—

1. A boat hull provided with thrust chambers, vertical passages leading from said chambers to the bottom of said hull and communicating with the surrounding water, horizontal passages leading from said chambers to the sides of said hull and communicating with the surrounding water, valves for the outer terminals of said passages permitting ingress and preventing egress of water to said chambers, downwardly inclined conduits leading rearwardly from said chambers and communicating with the surrounding water, and air inlets communicating with said thrust chambers and the outer air.

2. A boat hull provided with thrust chambers, vertical passages leading from said chambers to the bottom of said hull and communicating with the surrounding water, horizontal passages leading from said chambers to the sides of said hull and communicating with the surrounding water, valves for the outer terminals of said passages permitting ingress and preventing egress of water to said chambers, downwardly inclined conduits provided with branches connecting with said chambers at different vertical planes and leading rearwardly therefrom and communicating with the surrounding water at points adjacent the bottom of said hull, valves for said branches whereby upper or lower branches may be thrown into or out of communication with said chambers, and air inlets communicating with said thrust chambers and the outer air.

3. A boat hull provided with thrust chambers, passages leading from said chambers to the bottom of said hull and communicating with the surrounding water, passages leading from said chambers to the sides of said hull and communicating with the surrounding water, means for permitting ingress and preventing egress of water to said chambers, and rearwardly extending conduits communicating with said chambers at different vertical planes and communicating with the surrounding water at points adjacent the bottom of said hull.

4. A boat hull provided with thrust chambers, passages leading from said chambers to the bottom of said hull and communicating with the surrounding water, means for permitting ingress and preventing egress of wa-

ter to and from said chambers through said passages, and rearwardly extending conduits communicating with said chambers at different planes and communicating with the
5 surrounding water.

5. A boat hull provided with thrust chambers, passages leading from said chambers to the sides of said hull and communicating with the surrounding water, means for per-
10 mitting ingress and preventing egress of water to and from said chambers through said

passages, and discharge conduits communicating with said chambers at different planes and communicating with the surrounding water.

15

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

GIUSEPPE PINO.

Witnesses:

A. FERRAI,

A. BORAQUIO.