C. H. SAWYER.

BOAT.

APPLICATION FILED APR. 13, 1910.

984,444.

Patented Feb. 14, 1911.

2 SHEETS—SHEET 1.

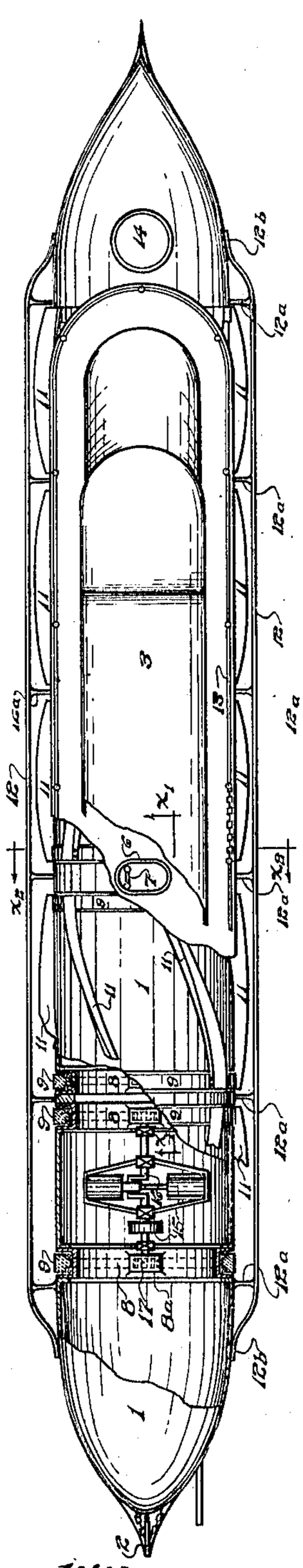

Fig. 1.

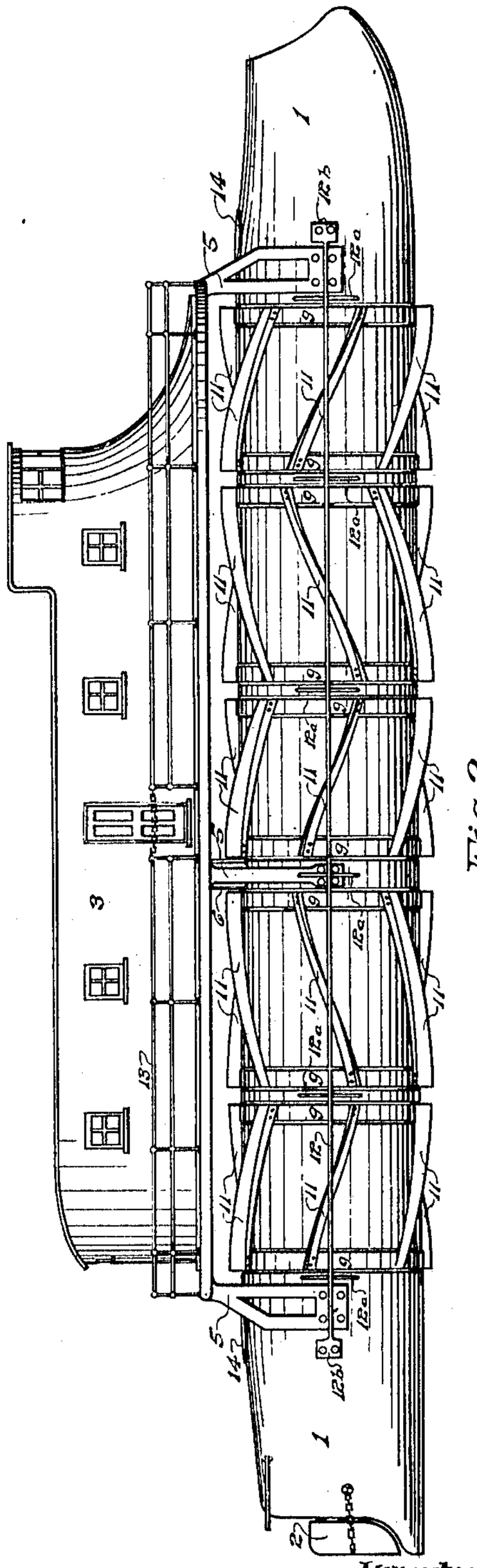

Fig. 2.

Witnesses
E. C. Skinkle
A. H. Obsahl

Inventor:
Charles H. Sawyer
By his Attorneys:
Williamson & Merchant

THE NORRIS PETERS CO., WASHINGTON, D. C.

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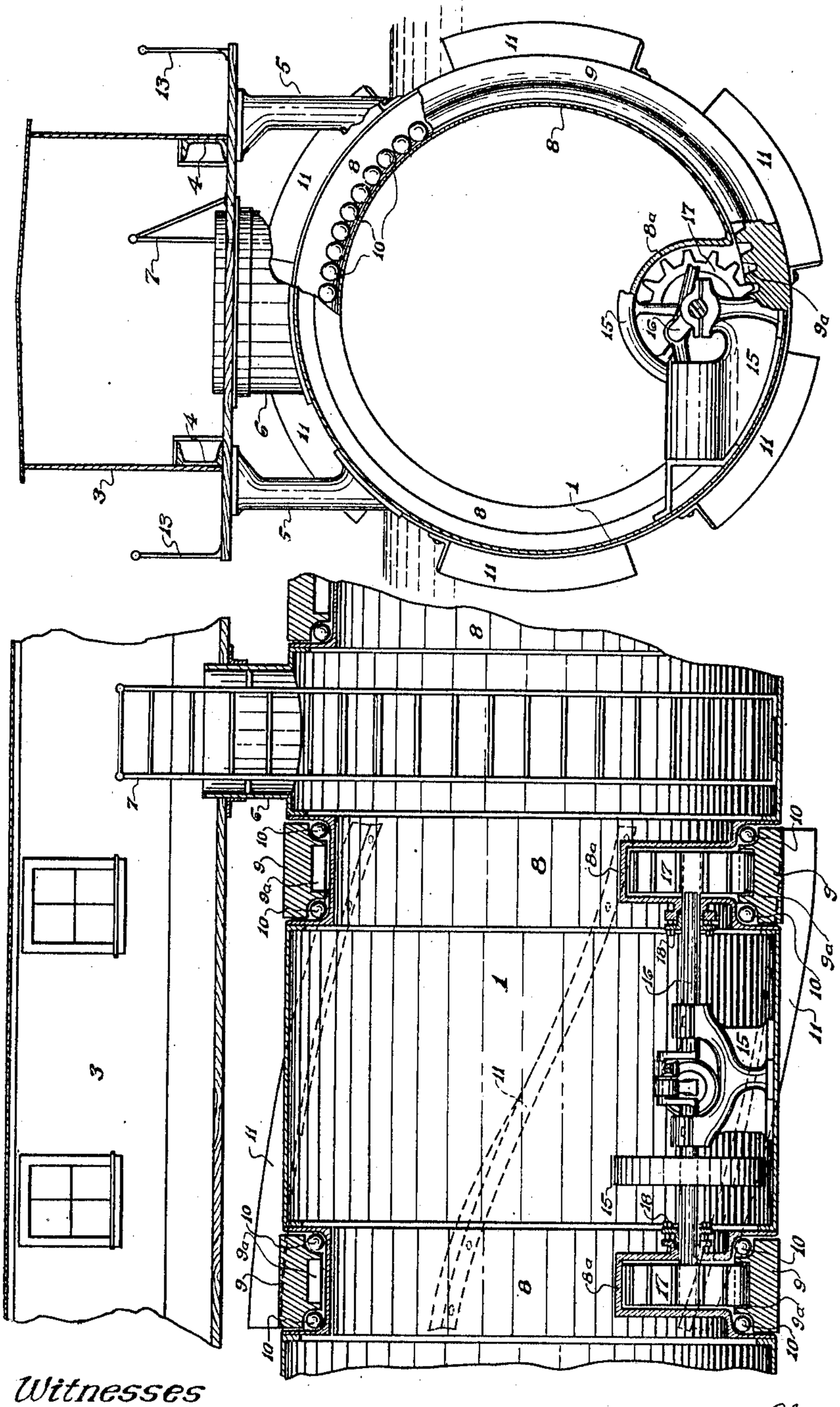

Fig. 4

Fig. 3

Witnesses
E. C. Skinkle
U. H. Obsahl.

Inventor:
Charles H. Sawyer
By his Attorneys:
Williamson & Merchant

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES H. SAWYER, OF MINNEAPOLIS, MINNESOTA.

BOAT.

984,444. Specification of Letters Patent. Patented Feb. 14, 1911.

Application filed April 13, 1910. Serial No. 555,187.

To all whom it may concern:

Be it known that I, CHARLES H. SAWYER, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Boats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to boats, and is designed as an improvement on that type of boats disclosed and claimed in Letters Patent of the United States No. 640,232, issued to me of date January 2nd 1900.

The objects of the present invention are to increase the efficiency and use of manipulation of boats of the character above indicated, and to these ends, the invention consists of novel devices and combinations of devices hereinafter described and defined in the claims.

In the accompanying drawings which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings: Figure 1 is a plan view of the improved boat, some parts being broken away; Fig. 2 is a longitudinal view of a boat embodying my invention; Fig. 3 is a longitudinal sectional view taken on the line x^1—x^1 of Fig. 1, showing typical details of the improved boat; and Fig. 4 is a transverse sectional view taken on the line x^2—x^2 of Fig. 1, showing a section through the cabin and the cylindrical portion of the hull of the improved boat.

The numeral 1 indicates the hull of the boat which hull 1 is cylindrical and circular in section except where it is tapered at the bow and stern. The rudder 2 is mounted at the stern in the usual or any suitable way. The cabin 3 is mounted above the hull 1 by means of stringers 4 and brackets 5, brackets 5 being rigidly secured to hull 1. The hatchway 6 or portion of hull 1 extending vertically upward into cabin 3 provides access to cabin 3 from hull 1 by means of ladder 7 as best shown in Fig. 3. The hull 1 is constructed of circular sheet metal tubes rigidly secured end to end by means of channel-iron rings 8, bent to a circular form with flanges out, as best shown in Figs. 1 and 3. Said rings 8 serve to give rigidity to sheet metal hull 1.

The numeral 9 indicates rings with boxed racks 9^a on the inner side, forming internal gears. The rings 9 are mounted within the channels of rings 8 by means of ball bearings 10. Said balls 10 bear on the fillets of channels 8 and in the circular portion of rings 9 as best shown in Fig. 3. and Fig. 4. The rings 9 are rigidly joined together in pairs by means of helical shaped paddles 11 as best shown in Fig. 2.

The numeral 12 indicates the guard rails which are rigidly secured to hull 1 by means of brackets 12^a and by flanged ends 12^b.

The numeral 13 indicates the hand rail extending around the deck of the boat.

The numeral 14 indicates the hatches at the bow and stern of the hull.

The numeral 15 indicates the double cylinder, reversible, center cranked, engines rigidly secured to the bottom of hull 1.

The numeral 16 indicates the crank shafts mounted on engines 15. On each end of crank shafts 16 are mounted pinions or external gears 17 which project through openings in the webs of channel-iron rings 8 and set in mesh with internal gears or racks 9^a as best shown in Fig. 3. The openings in the webs of channel-iron rings 8 as well as pinions or external gears 17 are inclosed by water tight housings 8^a rigidly secured to channel-iron rings 8; the crank shafts 16 being admitted into housings 8^a by means of water tight stuffing boxes 18.

Referring to Fig. 2, there are shown five sets of helical shaped paddles 11, axially alined longitudinally of the boat. The first set of paddles 11 causes a forward movement of the boat relative to the water by revolving toward the right or by revolving in a direction such that the paddles 11 belonging to the first set appear to move downward on the side shown in Fig. 2. The second set of paddles 11 gives the boat a forward movement by revolving toward the left. The third set gives the boat forward movement by a right hand revolution whereas the fourth set must turn to the left and the fifth to the right to produce the same movement.

The forward movement of the boat as above described may be arrested by a reversal of the directions of revolution of the several sets of paddles 11 namely the first set to revolve to the left; the second to the right; the third to the left; the fourth to the right; and the fifth to the left. The backward movement of the boat is effected by revolving the various sets of paddles 11

in directions opposite to those required for a forward movement of the boat. When the boat is moving either forward or backward the first, third and fifth sets of paddles 11 are revolving in one direction and the second and fourth sets of paddles 11 are revolving in the opposite direction. The areas of the first, third and fifth sets of paddles 11 equal the areas of the second and fourth sets of paddles 11 as best shown in Fig. 2. Hence when the boat is made to move either forward or backward, the side draft which the first, third and fifth sets of paddles 11 tend to produce is counterbalanced by the side draft which the second and fourth sets of paddles 11 tend to produce, thus reducing the resultant side draft to zero and allowing the boat to move directly forward or backward on its course without any lateral movement.

The operation of my improved boat is as follows: The engines 15 having been started; the crank shafts 16 cause the pinions or external gears 17 to revolve and these in turn mesh into and revolve the internal gears 9^a or the rings 9. When each pair of rings 9 is revolved the set of helical paddles rigidly secured thereon is forced through the water thus imparting motion to the boat.

Obviously in many respects the details of my invention may be modified, and I do not therefore desire to confine myself to the construction herein shown and described.

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

1. The combination with a tubular boat hull, of propellers having rings rotatively mounted on said hull and provided with right and left spiral propeller blades, and means for rotating the right spiral propellers in one direction and the left spiral propellers in the opposite direction, substantially as described.

2. A boat, comprising a hull substantially circular in cross-section having near the central part an upright extension through which access may be had to the interior of said hull, brackets extending upward from said hull, a deck supported upon said extensions and extending over said hull, a series of rings encircling said hull, helical paddles mounted on pairs of said rings, and means for revolving said rings and said helical paddles, substantially as described.

3. In a boat having a cylindrical hull, channels encircling said hull, openings in the webs of said channels, pinions mounted on a shaft, said pinions projecting through said openings and engaging internal gears mounted within said channels, said pinions and said openings covered by water tight housings, said shaft entering said housings through watertight stuffing boxes, substantially as described.

In witness whereof I have hereunto set my hand this 9th day of April, 1910.

CHARLES H. SAWYER.

In presence of—
R. B. Hostetler,
Wesley Barker.