

J. J. RYAN & C. C. SMITH.
BOAT.
APPLICATION FILED JUNE 17, 1912.

1,157,423.

Patented Oct. 19, 1915.
2 SHEETS—SHEET 1.

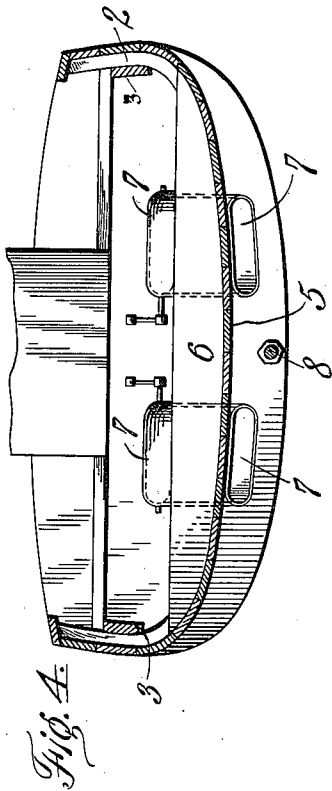
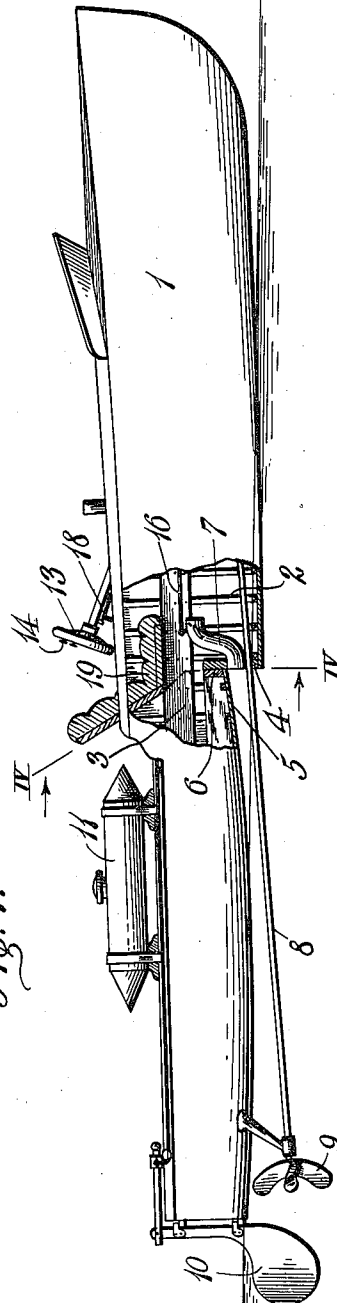


Fig. 1.



Witnesses
Chas. W. Stauffer
Anna M. Dorr

By

Inventors
John J. Ryan,
Christopher C. Smith,
Carthage Smith
Attorneys

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Fig. 3.

Fig. 5.

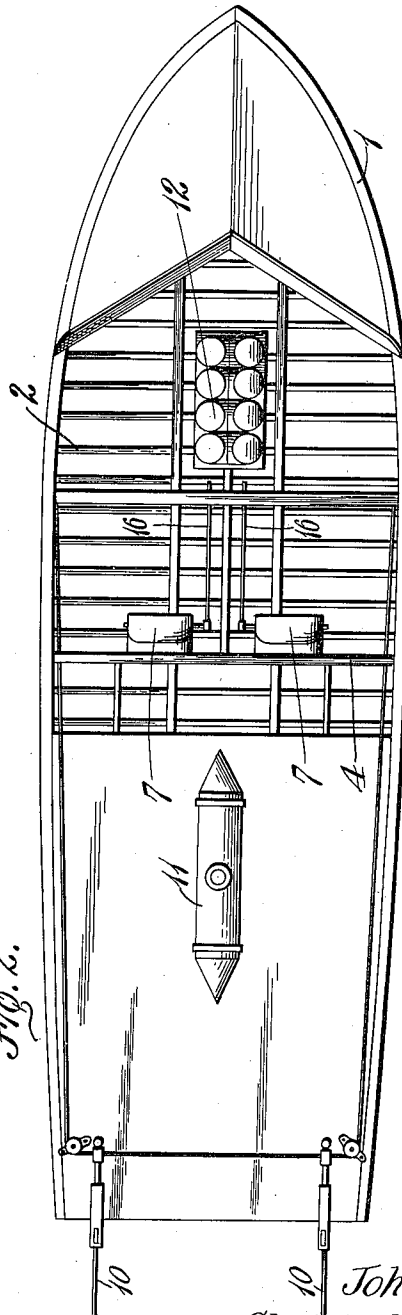


Fig. 2.

Inventors
John J. Ryan,
Christopher C. Smith,

 $\mathfrak{B}_y$

Barth & Barth Attorneys

UNITED STATES PATENT OFFICE.

JOHN J. RYAN, OF CINCINNATI, OHIO, AND CHRISTOPHER C. SMITH, OF ALGONAC, MICHIGAN, ASSIGNORS TO SMITH-RYAN BOAT AND ENGINE CO., OF ALGONAC, MICHIGAN, A CORPORATION OF NEW YORK.

BOAT.

1,157,423.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, JOHN J. RYAN, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, and CHRISTOPHER C. SMITH, a citizen of the United States of America, residing at Algonac, in the county of St. Clair and State of Michigan, have invented certain new and useful Improvements in Boats, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to high speed launches or boats and more particularly to what are known as hydro-planes having one or more steps and has for its object to provide a boat of this class which is so constructed and shaped as to prevent the lifting of the bow and depressing or squatting of the stern when under high speed; a further object being to provide a boat of this class with means for supplying air beneath the bottom at or near its junction with a step, which air passes rearwardly along the bottom and operates to reduce the friction and prevent the suction or tendency to form a vacuum which results in the squatting of the stern when under high speed.

We are aware that hydro-planes having one or more steps of general V cross section, the planes being concaved transversely with the surfaces of the planes merging into the sides of the hull with hard bilge lines and having a greater inclination longitudinally than that of the keel, have heretofore been attempted, but we believe we are the first to take a round bilge boat of the displacement type and construct therefrom a hydro-plane having one or more steps which by reason of the introduction of air at this point beneath the after part of the hull prevents the same from squatting and adds materially to the speed. Further, with round bilge boats of the hydro-plane type it is possible to obtain better lines both for speed and seaworthiness as well as for turning at a high rate of speed in a seaway.

With these and other objects in view the invention consists in a boat of the class specified, constructed all as more fully hereinafter described and shown in the accompanying drawings in which—

Figure 1 is a side elevation of a boat of the single step type involving our invention,

parts being broken away to show the step; Fig. 2 is a plan view of the deck showing the location of damper controlled air chutes at the step on opposite sides of the center line; Fig. 3 is an enlarged view in section through one of the damper controlled air chutes at the step; Fig. 4 is an athwartship section on the line IV—IV of Fig. 1, looking toward the bow; and Fig. 5 is a detail of the damper control.

As shown in the drawings 1 indicates a hull of the round bilge type, 2 the ribs, 3 longitudinal bilge stringers and 4 a transverse member for forming a step of the hydroplane, to which the upwardly curved portion 5 of the after section of the hull is secured by means of a second transverse member 6, these together forming a wedge shaped pocket immediately in rear of the step to which air chutes 7 lead preferably on opposite sides of the propeller shaft 8.

9 indicates the propeller, 10 the rudders, 11 the fuel supply tank, 12 the motor, preferably of the V type, and 13 the steering wheel upon which are carbureter and spark control levers 14.

The air chutes 7 are each provided with dampers 15 connected by a suitable rod 16 and bell crank 17 to levers 18 on the pillar of the steering wheel within convenient reach of the operator on the seat 19 from which the entire operation of the boat is controlled. The upper ends of the air chutes are carried some distance above the normal water line and while two have been shown on opposite sides of the longitudinal center of the boat, it is obvious that one or more may be used and while but one step is shown in the drawings more may be provided depending some upon the length of the boat, any one or all of which may be equipped with air chutes.

In operation, in starting, the air chutes are closed, which causes the boat to squat or settle by the stern as the boat gathers increased headway, after which the dampers in the air chutes are opened, permitting air to be drawn underneath the boat by reason of the vacuum or suction created in the pocket immediately in rear of the step which admission of air results in the raising of the stern, giving the boat an increased speed of from ten to twenty miles an hour so that when the boat of say twenty-six foot length,

is traveling at from forty to fifty miles per hour, it would be upon substantially an even keel as shown by the water line in Fig. 1, while at a much lower speed with the air chutes shut off, the bow would be high in the air with the stern dragging heavily, resulting in a considerable deadening of the speed. By proper manipulation of the air controlling valves in the air ducts, a matter that is easy because of the situation of the damper or valve control members on the steering wheel pillar, the boat may be made to settle on one side or the other as occasion requires. Thus in making a turn at high speed, the resultant listing of the hull which is very pronounced in boats of the light construction used in racing, is overcome by closing the duct that is on the inside of the turn, so that that side of the hull clings to the water and the turn is made practically on an even keel. Furthermore the resistance of that side of the boat aids the rudder materially in swinging the boat and in case the rudder is disabled, the boat may be controlled in a measure by admitting air first to one side and then to the other to cause it to veer from a straight course. Similarly, in crossing swells or rollers diagonally, the operator is enabled by manipulation of the valves to balance the boat by causing one side or the other to hug the surface of the water. As the ducts discharge through the vertical wall of the step rearwardly, the motion of the boat over the water tends to draw the air through the ducts and does not choke the duct outlets as would be the case if the ducts opened downwardly.

Obviously, changes in the details of construction may be made without departing from the spirit of the invention, and we do not care to limit ourselves to any particular form or arrangement of parts.

What we claim is:—

1. A boat having a hull of the displacement type with rounded bilges and a transverse step, the cross section of the after stepped portion corresponding in contour substantially to the forward portion and the longitudinal lines of the after portion rounding convexedly, and means for admitting air to the step on each side of the center line of the boat.

2. A boat having a hull of displacement type with rounded bilges, and with a transverse step, the cross section of the stepped portion corresponding in contour substantially to that of another portion, and the longitudinal lines thereof rounding unbrokenly and convexly from the angle of the step into the lines of the other portion, and means for admitting air to the step and for regulating the air supply from an operator's station.

3. A boat having a hull of displacement

type with rounded bilges, and with a transverse step, the cross section of the stepped portion corresponding in contour substantially to that of another portion, and means regulatable from the operator's station for admitting air through the step on either side of the center line of the boat as desired.

4. A boat having a hull of displacement type with rounded bilges, and with a transverse step, the cross section of the stepped portion corresponding in contour substantially to that of another portion and the lines thereof rounding unbrokenly and convexly from the angle of the step into the lines of the other portion, and regulatable means for admitting air to the step in line with the direction of travel.

5. A boat having a hull of displacement type with rounded bilges and with a transverse step, the cross section of the after stepped portion corresponding in contour substantially to that of the forward hull portion, and regulatable means for admitting air to the step in line with the direction of travel on each side of the center line of the boat adjustable to restrict and cut off the air supply on one side or the other as desired.

6. A boat having a hull of displacement type with rounded bilges and with a transverse step, the contour of the stepped portion corresponding in contour substantially to that of the forward hull portion, conduits for admitting air from above the water line to the step in line with the direction of travel, and means in each conduit for controlling the passage of air therethrough.

7. A boat having a hull of displacement type with rounded bilges and with a transverse step having an upright wall, the cross section of the stepped portion corresponding in contour substantially to that of another portion, and the lines thereof rounding unbrokenly from the angle of the step into the lines of the other portion, and conduits discharging rearwardly through the upright wall in line with the direction of travel for admitting air to the step on each side of the center line of the boat.

8. A boat having a hull of displacement type with rounded bilges and with a transverse step, the cross section of the stepped portion corresponding in contour substantially to that of another portion, and the lines thereof rounding unbrokenly and convexly from the angle of the step into the lines of the other portion, conduits for conducting air from above the waterline through the vertical wall of the step and that discharge in line with the direction of travel in rear of the step.

9. A boat having a hull with transverse step, means for admitting air to the step on either side of the center line of the boat at the will of the operator in line with the di-

rection of travel, means for steering and driving the boat, means for controlling the steering and driving means and means operable for regulating and controlling the admission of air to the step adjustable for reducing and shutting off the air on either side of the center line of the boat at the will of the operator.

10. A boat having a hull with transverse step, means for steering the boat, means for driving the boat, means for controlling the driving and steering means from an operator's station, means for admitting air to the angle of the step on each side of the center line of the boat, and means for regulating and controlling the air supply on each side, adapted to be operated from the operator's station.

11. A boat having a hull of displacement type with rounded bilges and with transverse step, a motor for driving the hull, means for steering the boat, a steering wheel for controlling the steering means, means on the steering wheel for controlling the motor, regulatable means for admitting air to the angle of the step, and means adjacent the steering wheel for manipulating the air admitting means to reduce and cut off the air supply on either side of the center line of the boat.

12. A boat having a hull with transverse step, means for steering the boat, means for driving the boat, a steering wheel adjacent an operator's station for controlling the steering means, means on the steering wheel for controlling the driving means, conduits for admitting air to the angle of the step on each side of the center line of the boat, means for controlling the flow through each conduit, and means adjacent the operator's station for operating the flow controlling means.

13. A boat having a hull of displacement type with rounded bilges and with a single transverse step having an upright wall, the cross-section of the stepped portion corresponding substantially in contour to the thwartship section of the hull with the lines

thereof rounding unbrokenly from the angle of the step into the lines of the thwartship section of the hull, means for steering the boat, means for driving the boat, and means for directing air from above the water line rearwardly through the upright wall into the pocket formed by the step in line with the direction of travel.

14. A boat having a hull of displacement type with rounded bilges and with a transverse step, the cross section of the stepped portion corresponding substantially in contour to the thwartship section of the hull with the lines thereof rounding unbrokenly from the angle of the step into the lines of the thwartship section of the hull, means for steering the boat, means for driving the boat, conduits for admitting air to the angle of the step, dampers controlling the flow through each conduit, and means operable from an operator's station for regulating and controlling the driving means, steering means and dampers.

15. In a boat, a hull, the bottom portion of the hull abaft the waist line being stepped, a vertical wall at the juncture of the stepped surfaces, and air ports in said wall.

16. In a boat, a hull, the bottom portion of the hull abaft the waist line being stepped, a vertical wall at the juncture of the stepped surfaces, air ports in said vertical wall, and means for controlling the supply of air to said ports.

17. A boat having a hull with rounded bilges, a transverse step, the bottom of the stepped portion merging into the sides of the hull and regulatable means for admitting air through the vertical wall of the step on either side of the center line of the boat.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN J. RYAN.
CHRISTOPHER C. SMITH.

Witnesses:

OTTO F. BARTHEL,
C. R. STICKNEY.