W. H. FAUBER.

HYDROPLANE BOAT.

APPLICATION FILED MAY 19. 1908.

956,487.

Patented Apr. 26, 1910.

4 SHEETS—SHEET 1.

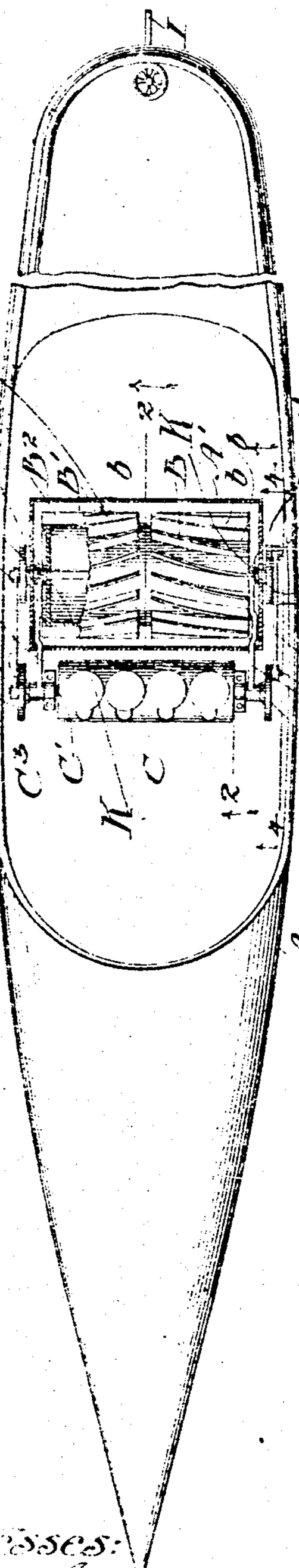

Fig. 1.

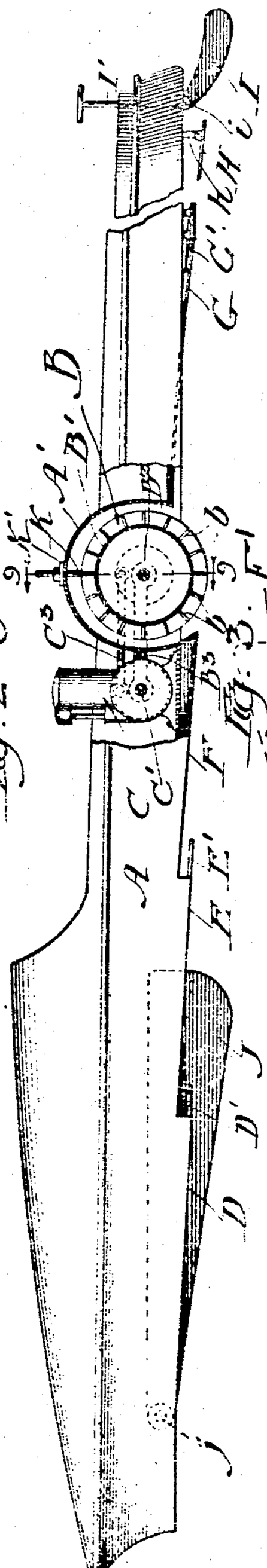

Fig. 2.

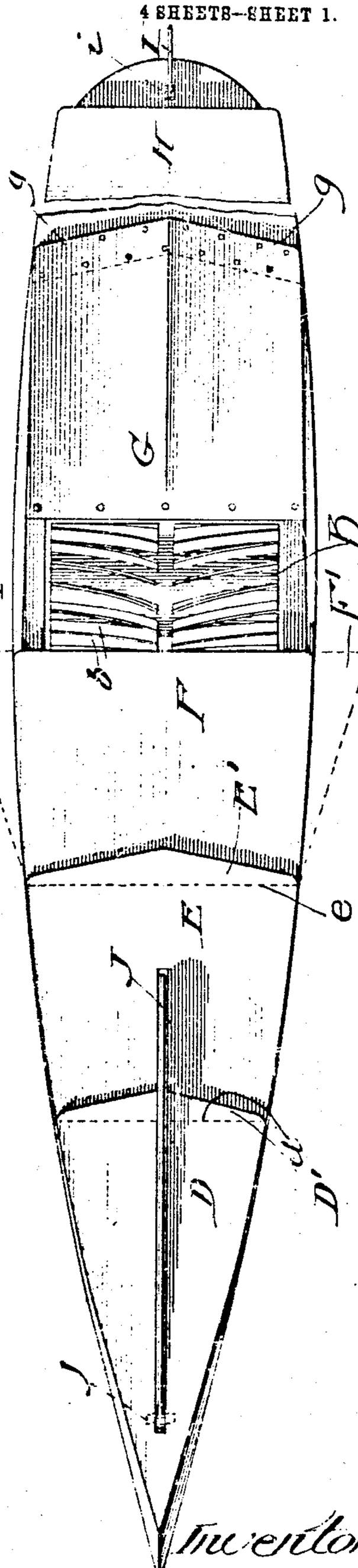

Fig. 3.

Witnesses:
Frank J. Blanchard
P. H. Alfredi

Inventor:
William Henry Fauber.
By Poole & Brown.
Attorneys.

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4 SHEETS—SHEET 2.

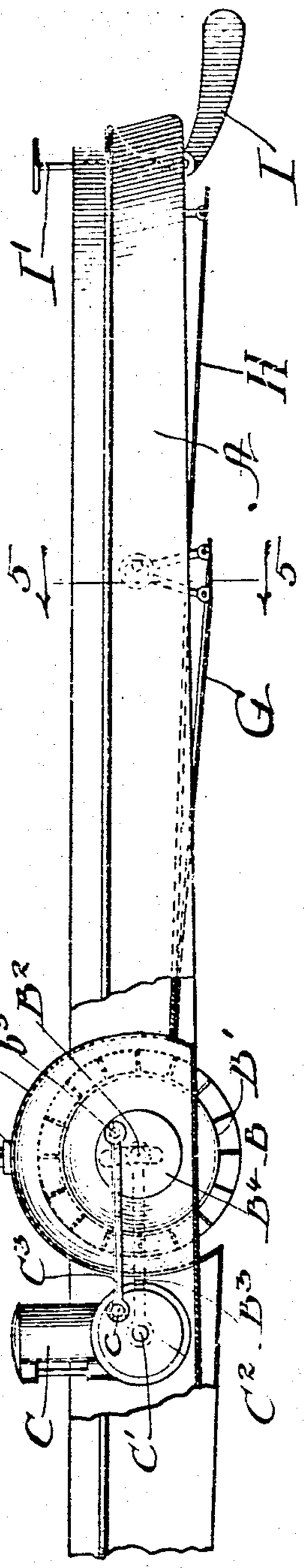

Fig. 4.

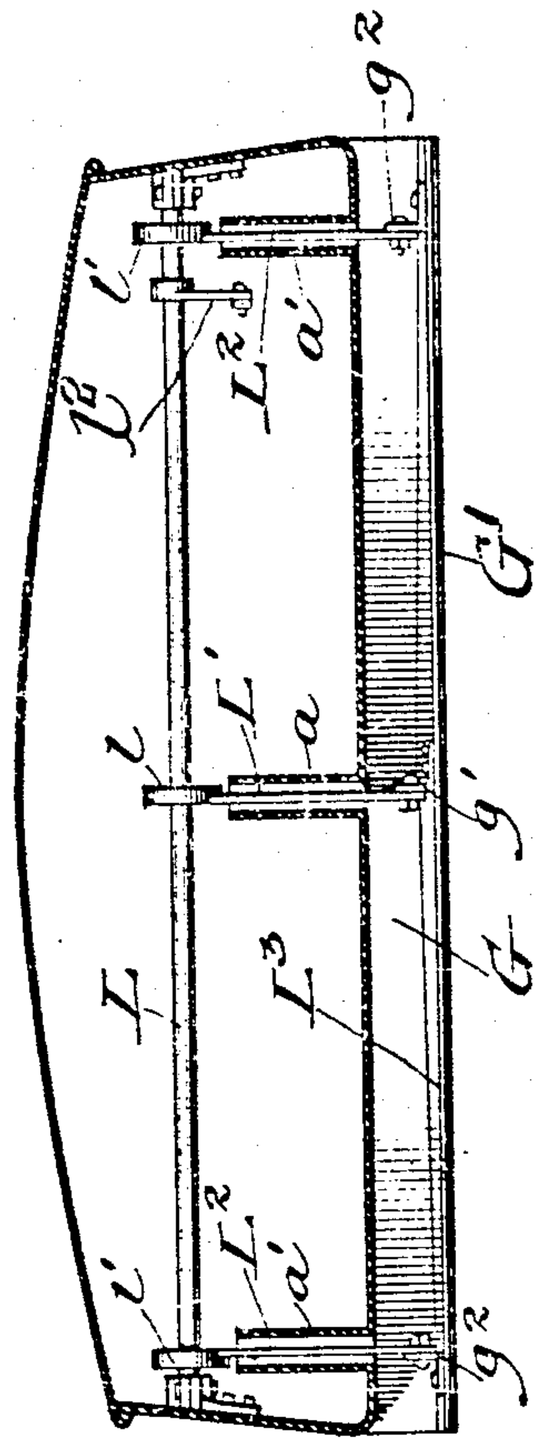

Fig. 5.

Witnesses:
Frank J. Blanchard.
F. N. Alfriede

Inventor:
William Henry Fauber
By Poole & Brown
Attorneys.

W. H. FAUBER.

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4 SHEETS—SHEET 3.

Fig. 6.

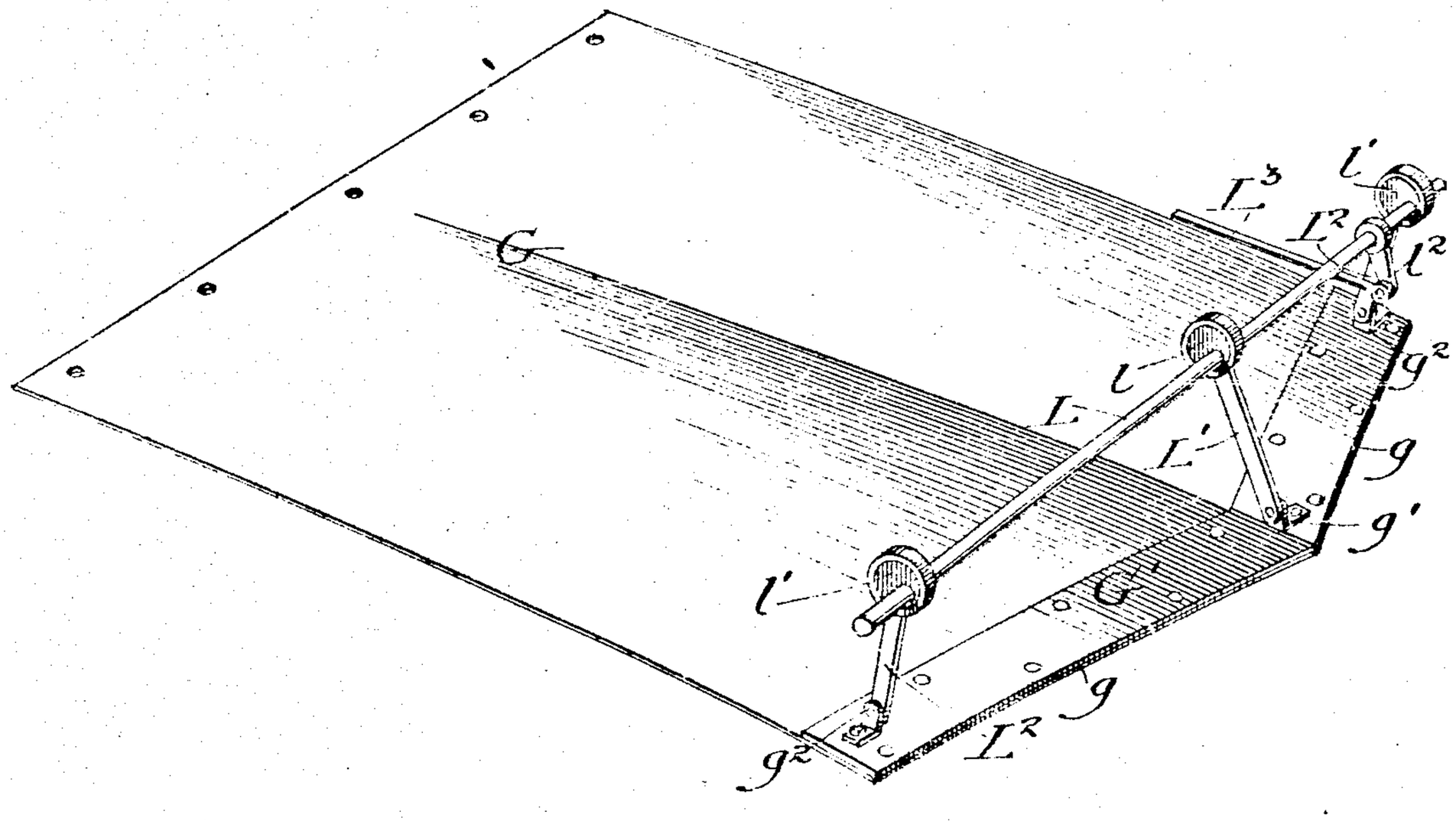


Fig. 7.

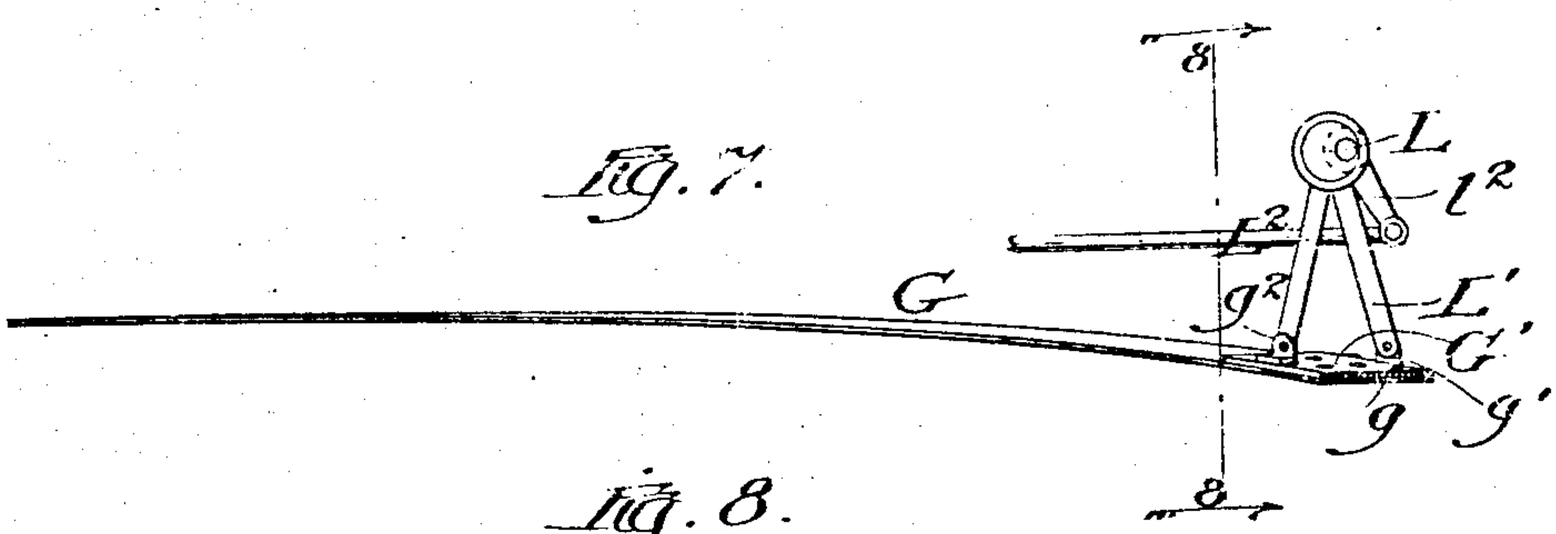
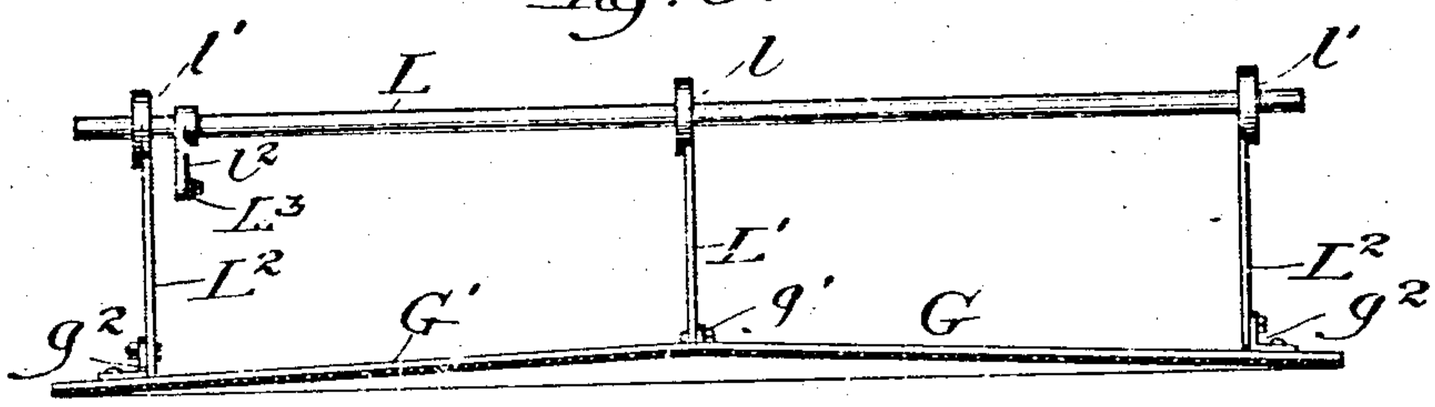


Fig. 8.



Witnesses:
Frank E. Blanchard
F. N. Alfredi

Inventor:
William Henry Fauber
By Poole & Brown
Attorneys.

W. H. FAUBER.

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4 SHEETS—SHEET 4.

Fig. 9.

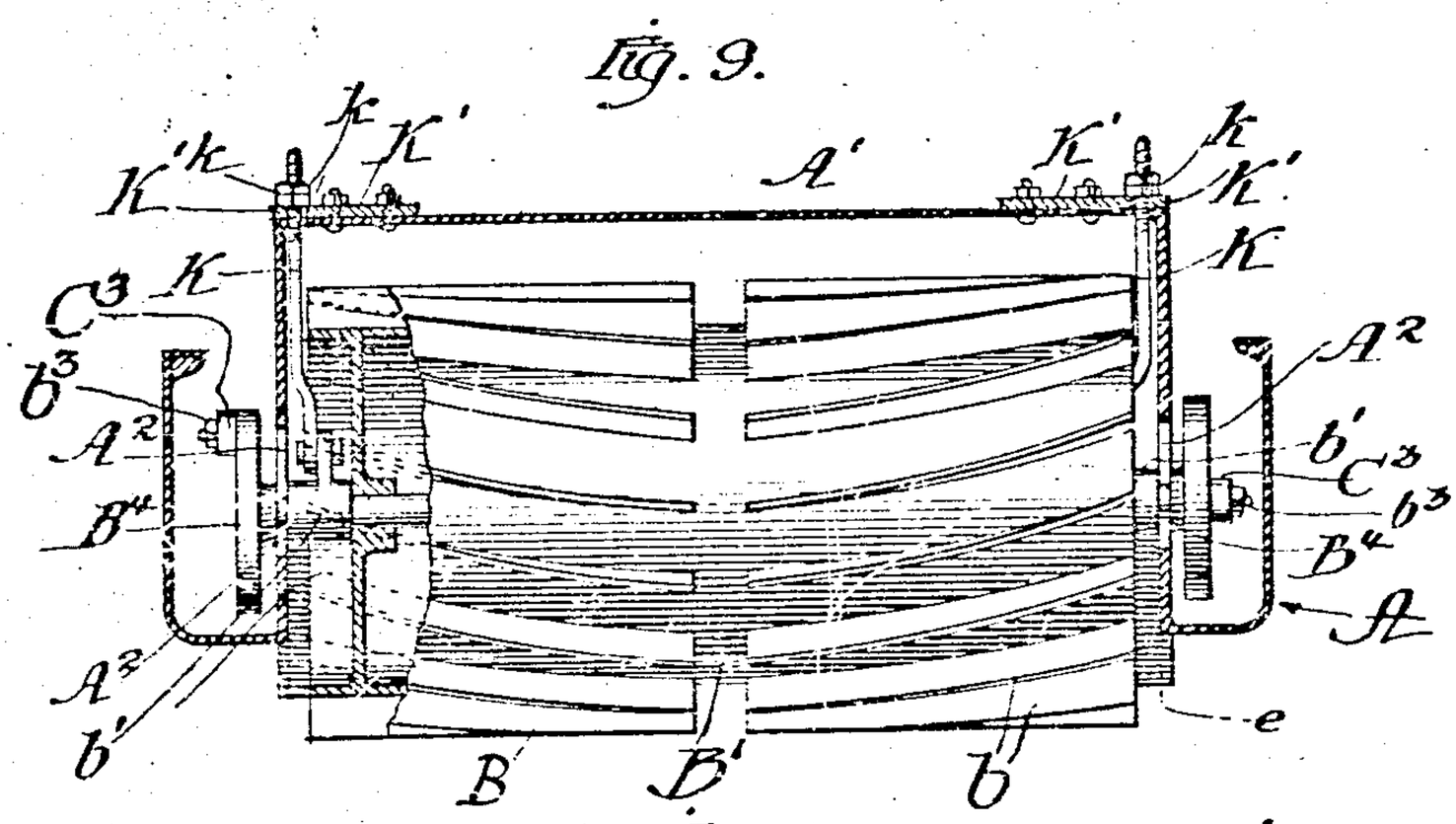


Fig. 10.

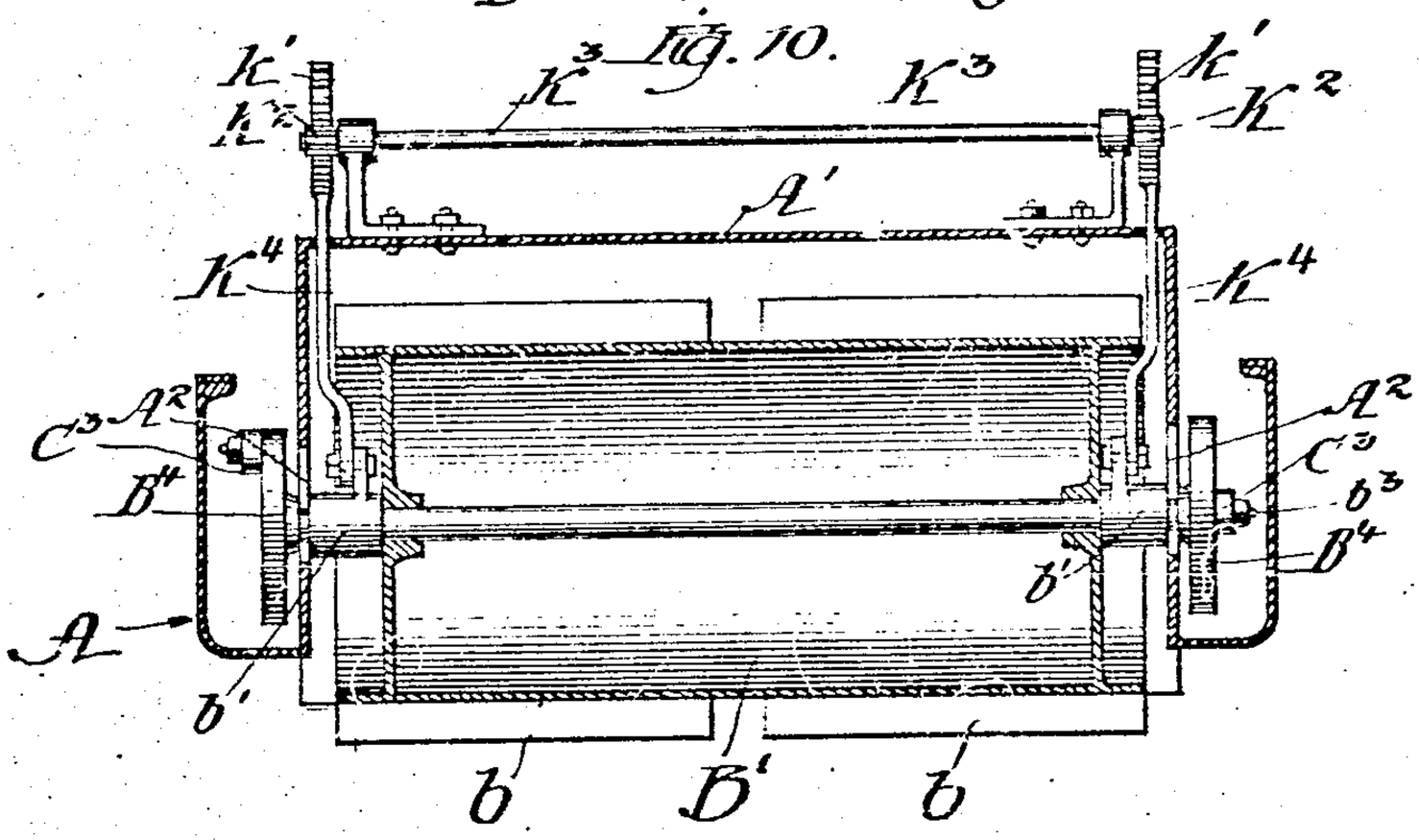
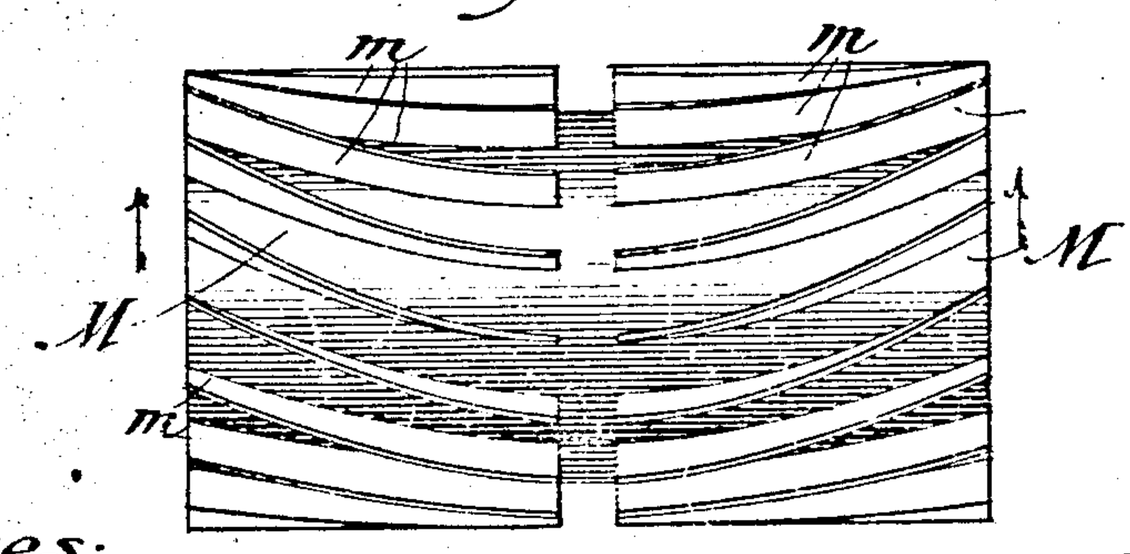


Fig. 11.



Witnesses:

Frank S. Blanchard

F. N. Alfriede

Inventor:

William Henry Fauber

By Poole & Brown

Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM HENRY FAUBER, OF CHICAGO, ILLINOIS.

HYDROPLANE-BOAT.

956,487. Specification of Letters Patent. Patented Apr. 26, 1910.

Application filed May 19, 1908. Serial No. 433,689.

To all whom it may concern:

Be it known that I, WILLIAM HENRY FAUBER, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hydroplane-Boats; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in that class of water craft known as hydroplane boats, which are equipped with inclined surfaces or planes designed to act on the water when the boat is traveling at high speed in a manner to lift the boat and lessen the submerged area of the hull, with consequent reduction of resistance and the attainment of high speed in proportion to the propelling power employed.

The object of my invention is to produce a craft for pleasure or commercial use, in which is combined the desirable features and which has the advantages of both a hydroplane boat and an ordinary boat supported by displacement of the water.

The invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

My invention may be better understood by reference to the accompanying drawings, in which,

Figure 1 is a top plan view of a hydroplane boat embodying my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a bottom plan view thereof. Fig. 4 is a side elevation of the rear part of said hydroplane boat, showing parts adjacent to the paddle wheel in section, taken on the line 4—4 of Fig. 1. Fig. 5 is a vertical section taken on the line 5—5 of Fig. 4. Fig. 6 is a view in perspective of one of the hydroplane members constituting a part of said invention. Fig. 7 is a side elevation thereof. Fig. 8 is a vertical section taken on the line 8—8 of Fig. 7. Fig. 9 is a transverse section of the boat, taken on line 9—9 of Fig. 2, showing the paddle wheel in elevation. Fig. 10 is a sectional view, like Fig. 9, illustrating a modified form of the device for adjustably supporting the paddle wheel. Fig. 11 is a view in elevation of the paddle wheel, showing the blades thereon as made of curved form.

As shown in said drawings, A indicates the hull of a boat which is generally similar in shape to the hull of speed boats as at present constructed and which has a flat or nearly flat bottom surface. Said hull has a long pointed bow, with its greatest beam at a point about midway of its length and from such point tapering forward to the bow and rearwardly to a rounded stern.

B indicates a transversely arranged paddle wheel for propelling the boat, which is located about midway of the length of the boat and at the widest part of the hull. Said paddle wheel is located in a transverse cylindric casing or housing A^1, the lower margins of which are joined to the margins of a rectangular opening in the bottom of the hull, and the paddle wheel extends at its lower part downward through the open bottom of the housing.

C indicates an engine or motor for driving said paddle wheel, which, as shown in the drawings, is located forward of said paddle wheel and consists of a gasolene engine having four upright power cylinders, acting on a crank shaft C^1, which extends transversely of the hull and parallel with the axis of rotation of the paddle wheel.

D, E, F, G and H indicate hydroplane members which are arranged on the bottom of the boat in such manner that by their reaction on the water in the forward movement of the boat they tend to lift the hull out of the water. Said hydroplane members are inclined downwardly from their front toward their rear ends and extend across the bottom of the hull. The members D, E and F are located forward of the paddle wheel B and the members G and H at the rear of said paddle wheel.

I indicates a vertical rudder at the rear end of the boat and J a center-board at the forward part thereof.

The forward hydroplane member D is shown as consisting of two longitudinally separated sections located at opposite sides of the center-board J, and the hydroplane member E is provided in its forward part with a central, longitudinal slot to receive said center-board. Said center-board J is used for keeping the boat in a straight course and preventing it from being later-

ally displaced when it encounters swells or waves at an angle. As illustrated in the drawings, said center-board is mounted on a pivot *j* at its forward end so that its rear end can be lifted when passing over a bar or running the boat upon a beach. The rudder I may be of ordinary construction, but as illustrated is also pivoted to permit it swinging upwardly for the same purpose as in the case of the center-board; said rudder being shown as pivcted at its forward end by a pivot *i* to a rudder post I^1.

Now referring more particularly to the paddle wheel B and other features of the propelling means, the same embrace features of construction as follows: The paddle wheel B comprises a closed hollow cylindrical drum B^1 fixed to a transversely arranged horizontal shaft B^2 and having on its exterior cylindric surface radially extending paddle blades *b b*. Said paddle blades *b b* are arranged upon the exterior surface of the drum B^1 in spiral or oblique direction and are arranged in two sets separated at their inner or adjacent ends by an annular space at the longitudianl center of the drum. The two sets of paddle blades are so inclined with respect to each other that the backward thrust of the blades upon the water will tend to push the water toward the longitudinal center line of the boat. In other words, as seen in Fig. 3, the blades which are at any time at the bottom of the wheel are inclined, from the outer ends of the drum, inwardly and forwardly, or toward the bow of the boat.

The annular space between the two sets of paddle blades permits the escape of any air which may be pocketed or confined by the drum and paddle blades as the latter moves downwardly into the water at the forward part of the wheel.

The spiral arrangement of the two sets of blades secures a better purchase or hold of the blades on the water, because counteracting the tendency of the water to escape laterally outward from the outer ends of the blades, or acting to confine it at the center of the wheel, thereby giving increased efficiency in the paddle wheel and avoiding vibrations that are liable to occur when the blades are parallel with the axis of the wheel. Moreover, the action of the two sets of spirally arranged blades in throwing the water to the center rather than spreading it sidewise avoids the tendency which usually exists, of displacing the water in such manner as to lower the stern of the boat. The employment of the closed drum to support the paddle blades has the advantage of preventing the water from rising or dashing up into the center of the wheel and serves to confine the water being acted upon in a manner to afford a greater resistance to the backward movement of the blades. Moreover, the central annular space between the blades provides an outlet for the air which, in the case of a closed drum, is liable to be pocketed by the blades between the drum and the water, as hereinbefore stated.

Instead of the spirally arranged propeller blades *b b* shown in Figs. 1 and 3 of the drawings, said blades may be longitudinally curved with their concave sides arranged to act upon the water; such concave sides facing toward the stern of the boat when the blades are in the water. A construction of this kind is illustrated in Fig. 11 wherein a paddle wheel drum M is shown, having two sets of oblique, curved blades *m m*.

Most of the advantages gained by the arrangement of the paddle wheel blades obliquely and in two sets will be obtained when the closed drum is absent, although a paddle wheel provided with a closed drum is preferred for reasons hereinbefore stated.

Now referring to the construction illustrated in the engine or motor C and the connection of its crank shaft C^1 with the paddle wheel B, said crank shaft C^1 is parallel with the shaft B^1 of the paddle wheel, and driving connections between said crank shaft and paddle wheel shaft are provided, which are located at the ends of said shafts and adjacent to the sides of the boat. The end walls of the housing A^1 for the paddle wheel are located closely adjacent to the side walls of the hull, a space being left between same sufficient only to afford room for such driving connections. By this construction I am enabled to make the paddle wheel of maximum length or nearly as wide as the boat.

The driving connections illustrated in the drawings consist of cranks C^2 C^2 (shown as having the form of crank-disks) provided with crank pins *c* and like cranks B^4 on the ends of the paddle wheel shaft (also shown as having the form of crank disks) provided with crank pins b^3, and connecting rods C^3 engaged at their ends with said crank pins *c* and b^3; the two pairs of crank pins at opposite ends of the two shafts being arranged at an angle of 90 degrees apart, in order to avoid dead centers.

The connecting-rod drive described has the advantage of being a simple and positive drive, occupying little lateral space and therefore enabling the ends of the paddle wheel housing to be located close to the sides of the hull of the boat and as a consequence permitting the use of a propeller wheel nearly equal in length to the width of the hull. Moreover, by the employment of such a connecting-rod drive, motors of standard construction may be employed, it being manifest that if the crank shaft of the motor were connected direct to the paddle wheel shaft, the length of the paddle wheel would have to be lessened or specially constructed motors employed. The con-

necting-rod drive described is especially applicable to high power motors adapted to propel the boat at variable speeds. While the said connecting-rod drive described has especial advantages, as hereinbefore pointed out, so far as other features of my invention are concerned any other form of engine or motor and connection between the same and the paddle wheel shaft may be used, and any other form of driving connections may be employed between the ends of a motor crank shaft arranged as illustrated and the paddle wheel shaft.

It is intended that the paddle blades shall always be immersed in the water at a certain predetermined depth. For this purpose the paddle wheel is so mounted on the boat as to be vertically movable or adjustable according to variations in the submerged depth of the hull. To provide for such vertical adjustment of the paddle wheel, the end walls or heads of the housing A^1 are provided with vertically extending curved slots A^2, as indicated in Fig. 9, through which slots pass the ends of the paddle wheel shaft B^2; said slots having the form of circular arcs concentric with the crank shaft of the motor, and said paddle wheel shaft is connected with the motor frame by means of distance or radius rods B^3 mounted concentrically with the engine shaft and provided with bearings b^1 b^1 for said paddle wheel shaft. By the employment of said radius rods the distance between the engine crank-shaft and the paddle wheel shaft B^2 is maintained constant, notwithstanding the vertical adjustment of the paddle wheel.

The paddle wheel shaft-bearings b^1 b^1 may either be adjustably supported and left free to rise, or may be adjustably held at a desired elevation. As illustrated in Figs. 1 to 9, the said shaft bearings are adjustably supported in such manner that the paddle wheel may freely rise. For this purpose, vertical supporting rods K K are attached to the said bearings b^1 b^1 and extend upwardly through horizontal plates K^1 K^1 (Fig. 9) attached to the top wall of the housing A^1; said supporting rods being provided with screw threaded upper ends to which are applied adjusting nuts k k, forming stops for contact with said plates. In order that the paddle wheel may be free to rise above the point at which it is supported by the rods K K, the said rods are adapted to slide upwardly through the said plates K^1 K^1. This construction enables the paddle wheel to lift or rise in case it comes into contact with the bottom, as when the vessel passes over a sand bar or is landed on a beach, and makes it possible to navigate with a light craft in very shallow water.

In case it be desired to provide for more positive control of the vertical position of the paddle wheel, mechanism may be employed instead of the adjusting nuts on the supporting rods K K, for giving more rapid vertical movement to the said rods. Such mechanism may be adapted for both lifting and lowering the paddle wheel, as will be usually necessary in the case of large boats, in order to avoid contact of the paddle wheel with the bottom in shallow places. A mechanism of this kind is shown in Fig. 10, in which like rods K^4 K^4 have at their upper ends rack teeth k^1 engaging pinions K^2 K^2 on an operating shaft K^3 extending across the top of the wheel housing. Such an operating shaft may be actuated either manually or through the medium of driving connections between the same and the motor C, or other engine.

Now referring to the construction and arrangement of the hydroplane members with respect to each other and to the propelling or paddle wheel, these parts, as shown in the drawing, are made as follows: The three hydroplane members D, E and F, at the forward end of the hull, are arranged in fixed angular relation to the bottom surface of the hull, and are inclined backwardly and downwardly toward the stern of the boat. Said members D, E and F will preferably have the same width as the part of the hull on which they are located; or, in other words, will be progressively wider from the bow toward the stern and will conform at their side edges with the contour of the sides of the hull. Said hydroplane members are shown as consisting of metal plates rigidly attached at their forward margins to the flat bottom of the hull and connected with the hull at their rear ends or margins by transverse supports or supporting walls d and e, as indicated by dotted lines. The rear V-shaped marginal parts of said hydroplane members D and E extend rearwardly from the vertical shoulders d e in the form of lips or flanges D^1 E^1, as clearly seen in Figs. 2 and 3. The said forward hydroplane members D, E and F are, moreover, made progressively deeper from front to rear; the rear end of the rearmost member F being lower than the rear ends of the others and being located near the level of the bottom or lower part of the paddle wheel B.

In Fig. 3 the dotted lines F^1 indicate lateral extensions on the hydroplane member F. This is a construction that may be used under certain conditions, as where a narrow hull is desirable and the projection of the hydroplane members outwardly from the side of the hull would not be objectionable. The preferred construction, however, is that shown in full lines in Fig. 3, wherein the sides of the hydroplane members coincide with the sides of the hull. This construction has the advantage that the hydroplane members do not project beyond the sides of

the boat and are not therefore liable to be injured by striking against docks or other boats.

It is intended that the forward hydroplane member D shall have a long slope or curve of such angle as to keep the bow at proper depth. This construction, in connection with the pointed form of the bow, is such that when the forward part of the hull strikes waves or swells, the crest of the wave will be divided and partly thrown to each side of the bow and will then be leveled down and surmounted as the wider part of the bow reaches it. It will, of course, be understood that the second and third forward hydroplane members E and F aid in producing this effect, especially in connection with the construction by which the tapering bow is extended fully half the length of the boat, and also by making the said members D, E and F successively wider and deeper in draft, as hereinbefore stated.

The hydroplane members G and H, at the rear of the propelling or paddle wheel, differ from the forward hydroplane members; the same being made of flexible metal plates, which are secured at their forward margins to the flat bottom of the hull and are vertically adjustable at their rear ends, and the metal plates constituting said hydroplane members being bent or curved downwardly to a greater or less extent when their rear ends are so vertically adjusted.

Referring to the construction of the hydroplane member G, which is located immediately at the rear of the paddle wheel B, the forward end thereof is located at a considerable distance above the level of the rear edge of the forward hydroplane member F; the same, as shown, being located above the level of the bottom line of the hull. The rear margin of said hydroplane member G is made of V-shape, the same having two oblique edges *g g*, which meet at an obtuse point or angle at the center line of the hull, said angle or point being directed rearwardly. The rear portion of said hydroplane member G is, moreover, made V-shape in transverse section, or has its central longitudinal center higher than its side margins, as clearly shown in the sectional view, Fig. 8. Said oblique rear margins *g g* of the hydroplane member G are located substantially in a horizontal plane, so that the surface of the water passing rearwardly therefrom will be in a horizontal plane, notwithstanding the arched or V-shaped cross sectional form of the rear part of the member G. Because of the angular relation of the rear edges *g g*, the angle of which to each other is such that while the said edges are in a horizontal plane, a center line drawn longitudinally through the hydroplane member will intersect the point or apex at the intersection of the edges *g g* while the side margins of said member will meet the outer ends of said margins *g g*, as clearly shown in Fig. 7, which illustrates the said member in side elevation. The purpose of arching the said hydroplane member G at its rear end, in the manner described, is to produce a deflection of the water beneath the member toward the center thereof, rather than to force it laterally outward or sidewise, thereby giving enhanced lifting effect, and avoiding the tendency, which exists in hydroplane boats having successive hydroplane members, to drop or run low at the stern. For adjustably holding the rear end of said hydroplane member G at the desired height or elevation, I provide adjustable supporting means connected with the rear marginal part of said member at different points along the same; this construction serving to hold the center and side portions of the member in proper relative vertical positions, notwithstanding the flexible character of the sheet metal of which it is made. I have shown in the drawings as a means for so adjustably supporting the rear end of said member G, a rock-shaft L, mounted in the hull of the boat, and extending transversely thereof. Said rock-shaft is provided with three eccentrics, one *l* located at its longitudinal center and the two others l^1 l^1 near its ends. Said eccentrics are engaged by the upper ends of connecting rods L^1 L^2 L^2, the middle rod L^1 being connected at its lower end with the hydroplane member G at the center of its rear margin, while the rods L^2 L^2 are pivotally connected therewith near its side edges. The rear margin of said hydroplane member G is shown as having secured to its top surface, a transverse, marginal, stiffening bar or plate G^1, to the upper surface of which is secured lugs g^1 g^2 g^2, to which the lower ends of said rods L^1 L^2 L^2 are respectively pivoted. For turning the rock-shaft L the same is shown as provided with a rigidly attached crank arm l^2, having connected with its outer end a longitudinally extending operating rod L^3. As clearly seen in Fig. 5, the hull of the boat is provided with upright tubes *a* a^1 a^1 located respectively at the center and at the sides thereof, in position for the passage therethrough of the said connecting rods L^1 L^2 L^2.

The eccentrics *l* l^1 l^1 being set at the same angle on the rock shaft L, it follows that if the same be turned, the middle and side portions of the rear end of the hydroplane member G will be raised and lowered to an equal extent, and its margins *g g* thereby retained in substantially the same horizontal plane, in all vertical positions to which the rear end of said member may be adjusted. In effecting the vertical adjustment of the rear end of said hydroplane member G, the same will be bent or flexed at its forward part, where it is substantially flat or not arched.

The rear end of the rearmost hydroplane member H may be adjusted by devices of the same character as above described in connection with the member G. The adjusting devices for said member H are not illustrated except that there is shown in Fig. 2 the lower end of a connecting rod *h*, which is one of a plurality of connecting rods corresponding with those employed to support the member G. The rear end of said member H may be like the rear member G, that is to say, it may be V-shaped or arched in cross section, but, as shown, it is flat at its rear end and provided with a straight, horizontal rear margin.

The hydroplane member G is shown in the drawings as made longer from front to rear than the members D, E and F at the forward part of the hull. The forward end of said hydroplane member G is located above the level of the rear end of the forward member F, and above the level of the bottom of the paddle wheel B, in order to permit the water to pass rearwardly from the paddle blades without interference, or to leave a clear passage for such water.

The construction described in the transversely V-shaped or arched hydroplane member G has advantages by reason of being adapted to deflect the water beneath it toward the center line of the boat, and hydroplane members of like construction may be employed in place of one or more of the members D, E, F and H, illustrated, or may be used upon hydroplane boats which in other respects differ from that illustrated, and when so used may be located in any desired position on the hull of the boat.

A propelling device embracing a paddle wheel arranged as described constitutes a propelling means particularly adapted to hydroplane craft and having several important advantages over a screw propeller when applied to such craft, particularly in the case of boats of small power. The screw propeller, while advantageous for the ordinary speeds of displacement boats, quickly arrives at its maximum effect for higher speeds and to greatly increase the number of revolutions of such screw propeller involves a rapidly increasing percentage of loss of power in forcing the arms and the ineffective parts of the blades through the water. In my propelling device, as compared with a screw propeller, when the peripheral parts or blades of the paddle wheel enter the water they act upon the water at a slight depth only, but embrace a path of considerable width or one nearly as wide as the hull of the boat. The blades are therefore adapted to act by direct rearward pressure with a relatively large surface of contact, thereby avoiding the wasting of power in downward thrust upon the water and by contact of the water with parts of the blades so near the center of rotation thereof as to have relatively little propelling effect. Moreover, by vertical adjustment of the paddle wheel, the blades may be maintained in position to act most effectively upon the water and the same is adapted for use in shallow water where weeds and grass would interfere with the operation of a screw propeller.

The arrangement described of the propeller or paddle wheel with respect to the hydroplane member or members at the rear thereof is of great advantage, because the momentum imparted to the water as it leaves the blades of the paddle wheel is utilized to provide a greater efficiency of said rear hydroplane member or members; the rearwardly moving water impelled by the blades acting on said rear hydroplane members to increase the lifting effect thereof. Moreover, the location of a hydroplane member directly in advance or forward of the propeller wheel is of great advantage because such hydroplane member tends to produce a forward movement of the surface water beneath the paddle wheel, with the result of increased effectiveness of the paddle wheel, because the forwardly moving water better resists the rearward thrust of the paddle wheel blades. In other words, as the hydroplane member or members in front of the paddle wheel pass over the water, they impart to the surface water a forward movement or produce a forwardly moving current and the blades of the paddle wheel acting backwardly on this forwardly moving or opposing current, act with increased power, or with the same power at a less speed of movement, as compared with the effect produced in a hydroplane boat driven by a submerged screw propeller; it being manifest that in the latter case the blades of the screw propeller are too deep in the water to act upon and gather force from the forwardly moving surface current so produced by the action of a hydroplane member forward of it.

The general advantage gained by the construction in which a hydroplane member or members is located at the rear of a transversely extending paddle wheel, will be understood from consideration of the fact that by the action of the paddle wheel blades a certain quantity of the surface water is given backward movement in relation to the surrounding body of water and, since a hydroplane gains its sustaining power by reason of the relative motion or speed of the boat and the water, an advantage in lifting power is gained by the coaction of the said hydroplane members (arranged at the rear of the paddle wheel) and such backwardly moving current of water.

The employment, in a hydroplane boat having substantially a flat bottom, of hy-

droplane members constructed of flexible material attached at their front ends or margins to the bottom of the hull and adjustable at their rear ends, is of great advantage because enabling the angle at which said members act upon the water to be varied, as well as the depth of the rear ends of the hydroplane members with relation to each other.

Another important feature of my invention is the construction of the hydroplane boat with a pointed bow, like that of an ordinary boat, but with a flat bottom and hydroplane members extending across the bottom. This construction is of advantage for the reason that the pointed bow has the effect of neutralizing the effect of the waves and the swells from other boats, making a much greater speed possible, while securing effective action of the hydroplane members in lifting the hull above the water.

So far as the arrangement of the paddle wheel with respect to the hull and the forward hydroplane member immediately in advance of it is concerned, the construction illustrated is of great advantage because by reason of the forward wall of the casing or housing A^1 and the rear end of the hydroplane member F extending downwardly in front of the paddle wheel, the water is prevented from striking the propeller blades at too high a point or in a manner to retard their downward movement, with consequent loss in propelling power. Moreover, the construction last referred to is such that the blades of the paddle wheel act on approximately a uniform amount of water, regardless of the depth to which the boat hull and paddle wheel are submerged, because, as above stated, the hydroplane member forward of the paddle wheel deflects or depresses the water in front of the paddle wheel and prevents the same from resisting the movement of the downwardly moving blades.

The paddle wheel arranged in such manner that a part of the hull of the boat extends downwardly in front thereof, thereby affording uniform relation of the paddle wheel blades to the water beneath it, as hereinbefore stated, acts with substantially equal advantage at high speed as a hydroplane propeller and at low speed as a propeller for a displacement boat.

The paddle wheel will be preferably driven at a high rate of speed, and have small diameter, combined with its shallow depth of blades. This results in the water leaving the wheel quickly without the waste of power which would result in a lifting of the water by the rising blades. Ordinarily, it is intended that the paddle wheel be adjusted to bring the blades thereof at a depth below the bottom of the boat found most efficient in practice and no adjustment afterward to provide for changes from high to low speed, or the reverse, will be necessary.

I claim as my invention:

1. A hydroplane boat having a pointed bow and a substantially flat bottom, and provided with a paddle wheel which is located at the widest part of the hull and projects downwardly through an opening in the flat bottom thereof, and with downwardly and rearwardly inclined hydroplane members extending transversely of said bottom forward and at the rear of the paddle wheel; said paddle wheel being substantially equal in length to the width of the hydroplane members at the front and rear of the same.

2. A hydroplane boat having a pointed bow and a substantially flat bottom, and provided with a paddle wheel which is located at the widest part of the hull and projects downwardly through an opening in the flat bottom of the same, and with downwardly and rearwardly inclined hydroplane members extending transversely of said bottom, one of said hydroplane members being located immediately forward, and the other immediately at the rear, of the paddle wheel, the rear end of the hydroplane member which is forward of the paddle wheel being located substantially at the level of the bottom of said wheel and the forward end of the hydroplane member which is located at the rear of said wheel being located substantially above the level of the lower part of said wheel.

3. A hydroplane boat the hull of which has a pointed bow and a substantially flat bottom surface and which is provided at its forward part with a plurality of downward and rearward inclined hydroplanes extending across the bottom of the hull, said hydroplane members being made of gradually increasing width from front to rear, and the rear ends of said hydroplane members being located at progressively increasing distances below the hull from front to rear.

4. A hydroplane boat having a transversely arranged paddle wheel which extends through an opening in the bottom of the hull, and provided with downwardly and rearwardly inclined hydroplane members which extend across the bottom of the hull forward and at the rear of the paddle wheel, the hydroplane member at the rear of the paddle wheel having its forward margin extending transversely of, and secured to, the bottom of the hull and being vertically adjustable at its rear end.

5. A hydroplane boat provided with a downwardly and rearwardly inclined hydroplane member, consisting of a flexible metal plate extending transversely of the bottom of the hull and attached thereto at its forward end, the rear end of said hydro-

plane member being vertically movable, and adjustable connecting means between the rear margin of the hydroplane member and the hull, attached to the said hydroplane member at a plurality of laterally separated points.

6. A hydroplane boat provided with a downwardly and rearwardly inclined hydroplane member, consisting of a flexible metal plate extending transversely of the bottom of the hull and attached thereto at its forward end, the rear end of said hydroplane member being vertically movable, and adjustable connecting means between the rear margin of the hydroplane member and the hull, attached to the said hydroplane member at a plurality of laterally separated points, such adjusting means comprising a horizontal rock-shaft provided with a plurality of eccentric and connecting rods engaging said eccentrics and pivotally connected at their lower ends with said hydroplane member.

7. A hydroplane boat provided with a downwardly and rearwardly inclined hydroplane member, the bottom surface of which at its forward edge, is horizontal and the rear portion of which is downwardly and outwardly inclined from its longitudinal center line to its side margins.

8. A hydroplane boat provided with a downwardly and rearwardly inclined hydroplane member, the bottom surface of which at its forward edge is horizontal and at its rear portion is downwardly and outwardly inclined from its longitudinal center line to its side margins.

9. A hydroplane boat with a downwardly and rearwardly inclined hydroplane member, the lower surface of which at its forward edge, is horizontal, and at its rear portion is downwardly and outwardly inclined from its longitudinal center line to its side margins, the rear margin of said hydroplane member being of V-shape, with its point directed rearwardly.

10. A hydroplane boat provided with a downwardly and rearwardly inclined hydroplane member, the lower surface of which at its forward end, is horizontal and at its rear portion is downwardly and outwardly inclined from its longitudinal center line to its side margins, the rear margin of said hydroplane member being of V-shape with its point directed rearwardly, and said rear margin being arranged on a substantially horizontal plane.

11. A hydroplane boat provided with a downwardly and rearwardly inclined hydroplane member consisting of a metal plate which extends across the bottom of the hull, and at its rear part is downwardly and outwardly inclined from its longitudinal center line to its side margins.

12. A hydroplane boat provided with a downwardly and rearwardly inclined hydroplane member consisting of a metal plate, the forward edge of said plate being flat and the rear portion thereof being downwardly and outwardly inclined from its longitudinal center line to its side margins.

13. A hydroplane boat provided with a downwardly and rearwardly inclined hydroplane member located beneath its hull, said hydroplane member consisting of a metal plate, the forward edge of which is flat and the rear portion of which is downwardly and outwardly inclined from its longitudinal line to its side margins, said rear portion of the plate having vertical adjustable connection with the hull.

14. A hydroplane boat provided with a downwardly and rearwardly inclined hydroplane member consisting of a metal plate, the forward edge of which is horizontal and the rear portion of which is downwardly and outwardly inclined from its longitudinal center line to its side margins, the rear margin of said hydroplane member being of V-shape with its point directed rearwardly.

15. A hydroplane boat provided with a downwardly and rearwardly inclined hydroplane member, consisting of a metal plate the forward edge of which is horizontal and the rear portion of which is downwardly and outwardly inclined from its longitudinal center line to its side margins, the rear margin of said hydroplane member being of V-shape, with its point directed to the rear, and being located in a substantially horizontal plane.

16. A hydroplane boat having propelling means embracing a transversely arranged paddle wheel and provided with a downwardly and rearwardly inclined hydroplane member located forward and at the rear of said paddle wheel, the hydroplane member at the rear of the paddle wheel consisting of a metal plate the rear portion of which is downwardly and outwardly inclined from its center to its side edges.

17. A hydroplane boat having propelling means embracing a transversely arranged paddle wheel and provided with a downwardly and rearwardly inclined hydroplane member located forward and at the rear of said paddle wheel, the hydroplane member at the rear of the paddle wheel consisting of a metal plate the rear portion of which is downwardly and outwardly inclined from its longitudinal center line to its side edges and is connected with the hull of the boat by means affording vertical adjustment thereof.

18. A hydroplane boat provided with a pointed bow and having a substantially flat bottom surface, propelling means located about midway between the forward and rear ends of the boat, downwardly and rearwardly inclined hydroplane members located

forward and at the rear of the propelling means and a center-board located between the bow of the boat and said propelling means.

19. A hydroplane boat provided with a downwardly and rearwardly inclined hydroplane member the rear margin of which is V-shape with its point directed rearwardly.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 4th day of May A. D. 1908.

WILLIAM HENRY FAUBER.

Witnesses:

HANSON C. COXE,

JACK H. BAKER.