No. 661,246. Patented Nov. 6, 1900.

G. F. HOLLOWAY.

BOAT.

(Application filed May 17, 1900.)

(No Model.) 4 Sheets—Sheet 1

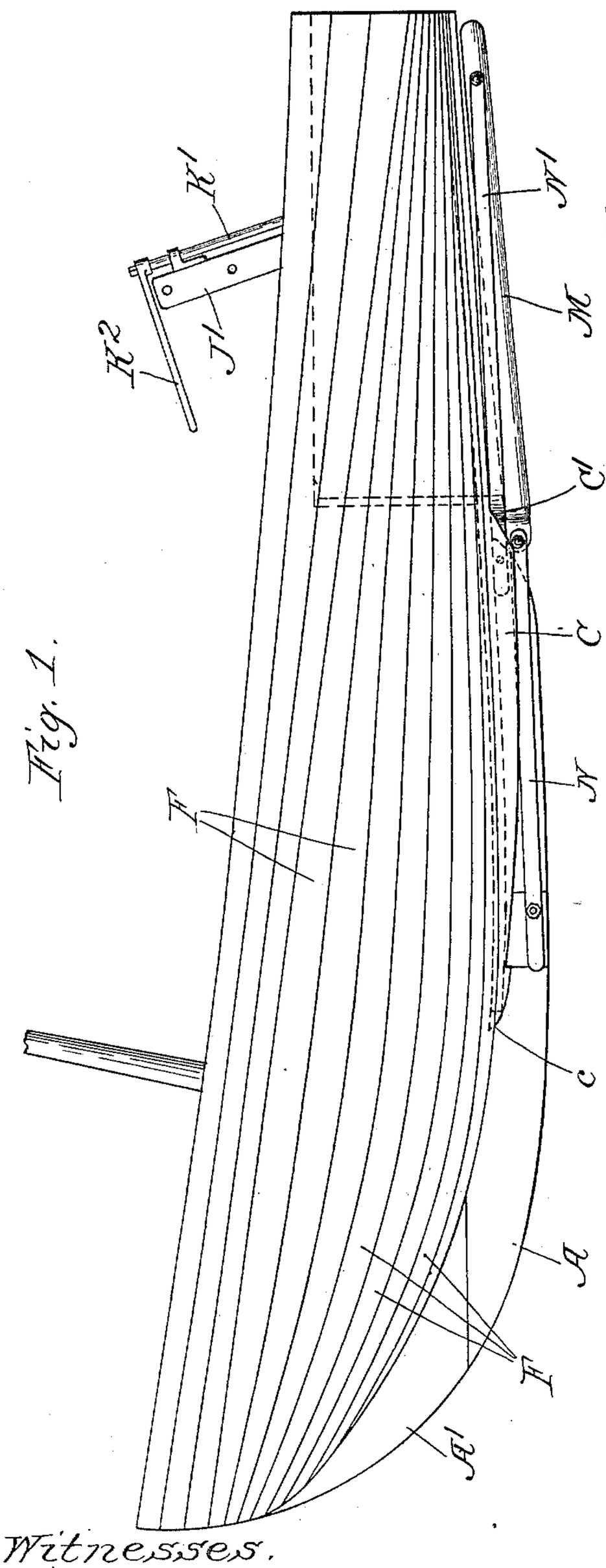


Fig. 1.

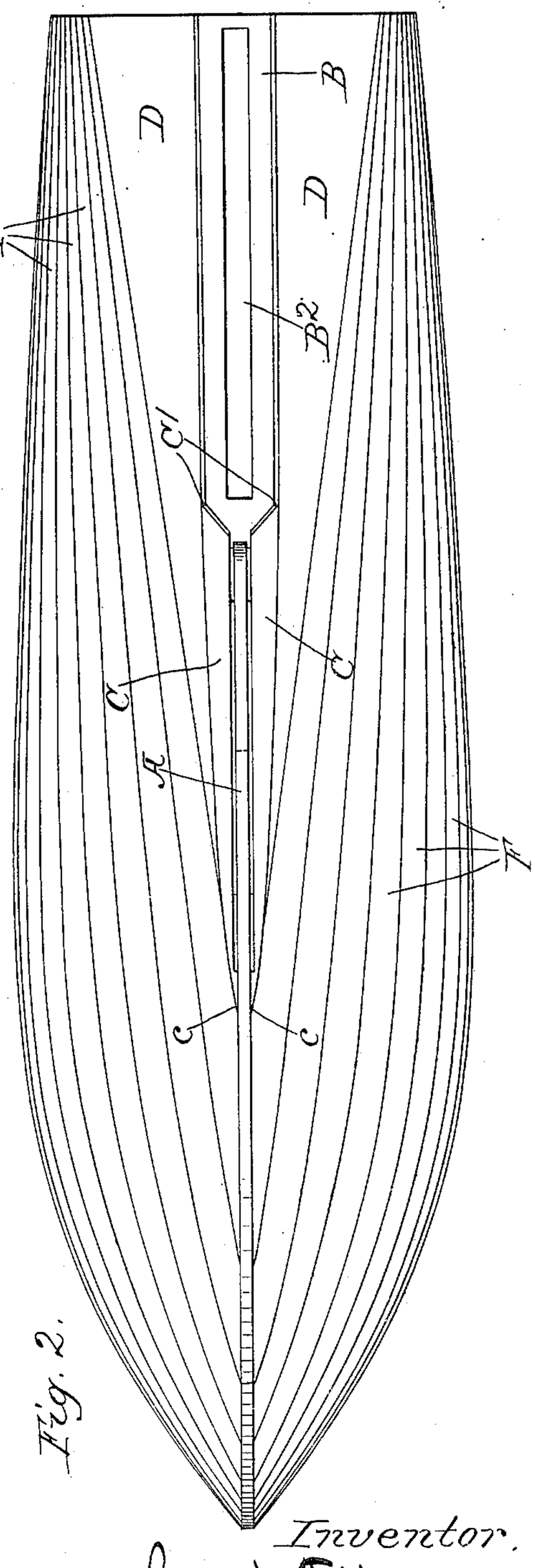


Fig. 2.

Witnesses.
Edward T. Wray.
Edgar L. Conant

Inventor.
George F. Holloway
by Burton & Burton
his Atty's

No. 661,246. Patented Nov. 6, 1900.

G. F. HOLLOWAY.

BOAT.

(Application filed May 17, 1900.)

(No Model.) 4 Sheets—Sheet 2.

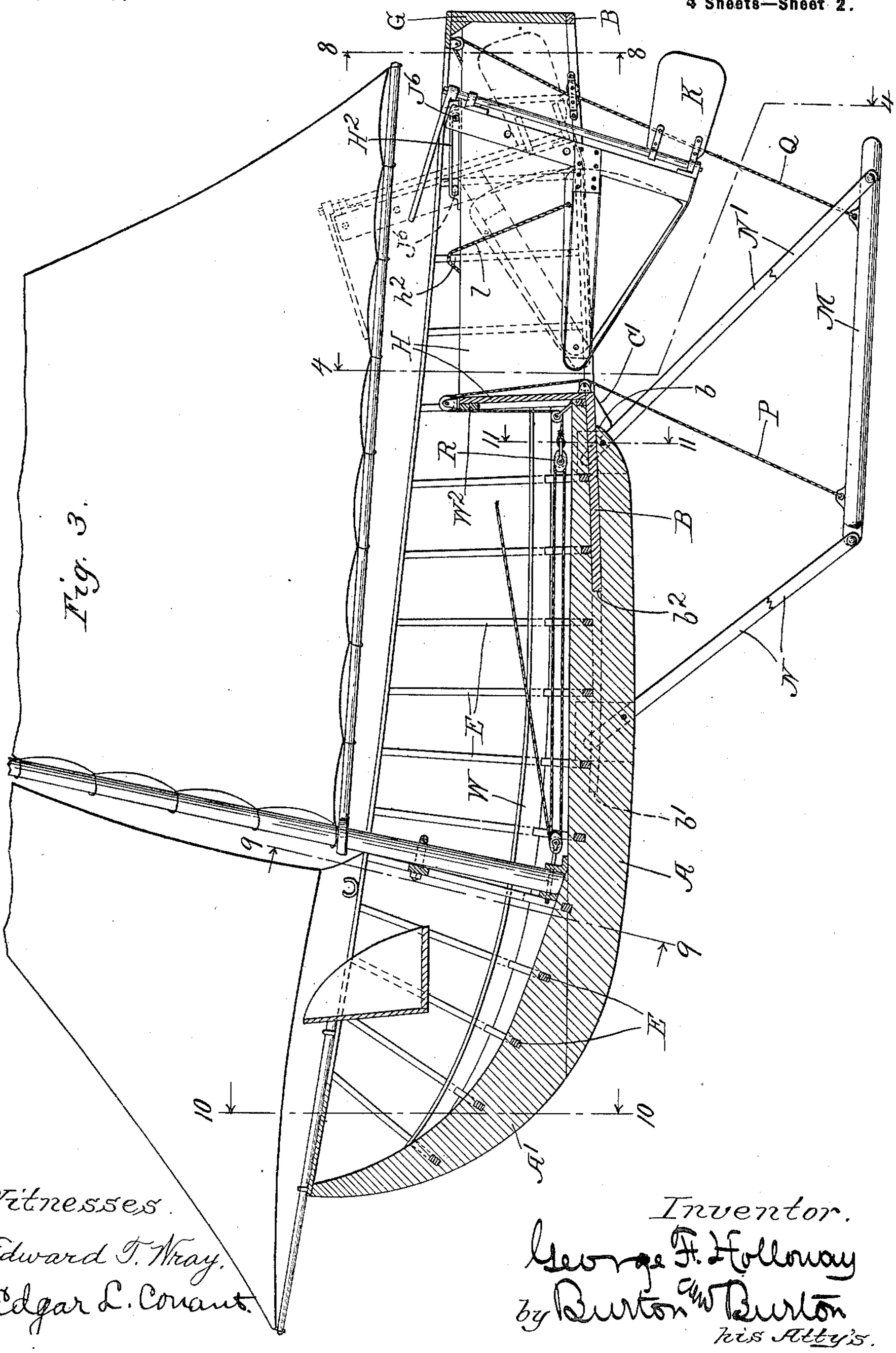


Fig. 3.

Witnesses.
Edward T. Wray.
Edgar L. Conant.

Inventor.
George F. Holloway
by Burton & Burton
his Atty's.

No. 661,246. Patented Nov. 6, 1900.

G. F. HOLLOWAY.

BOAT.

(Application filed May 17, 1900.)

(No Model.) 4 Sheets—Sheet 3.

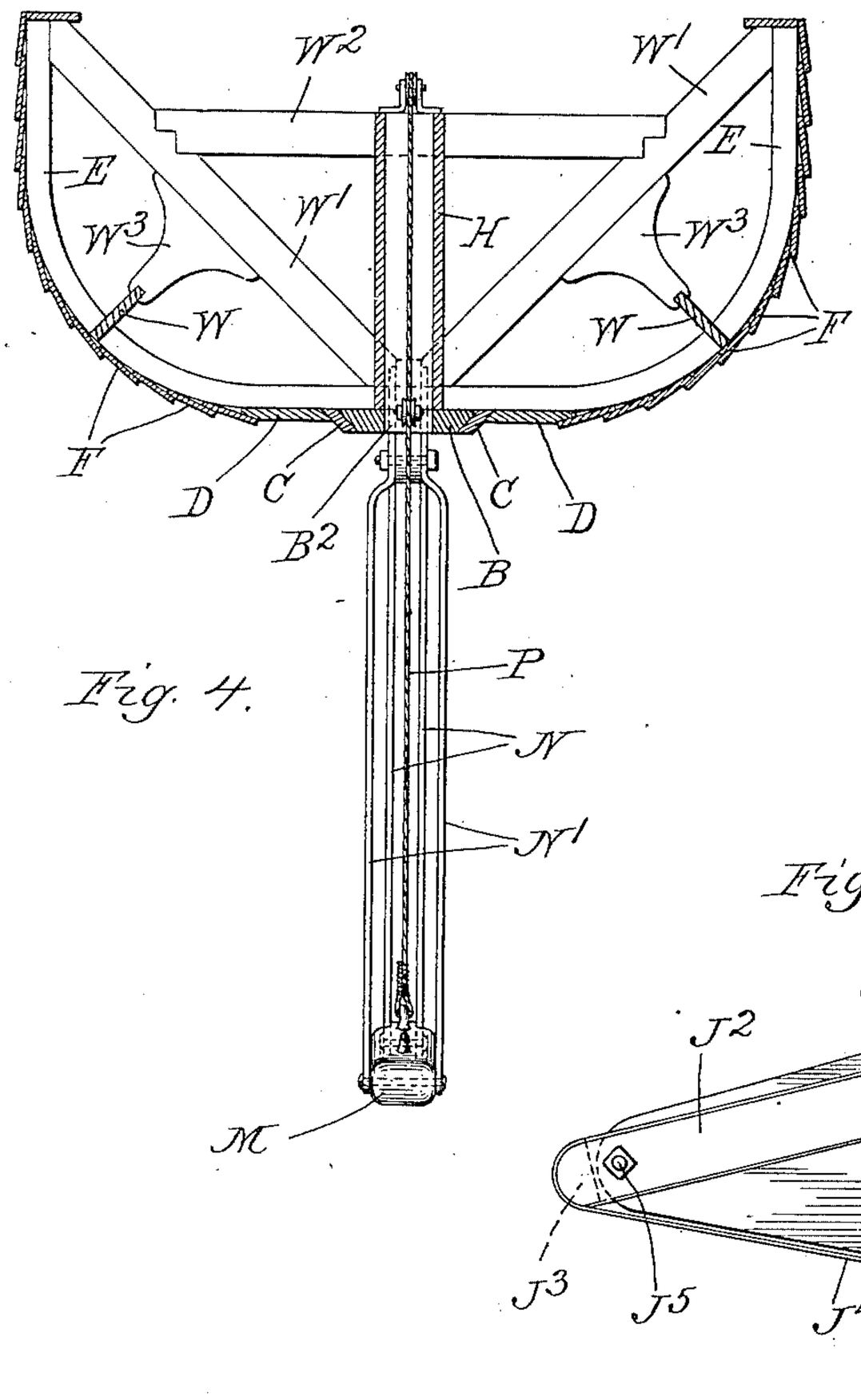
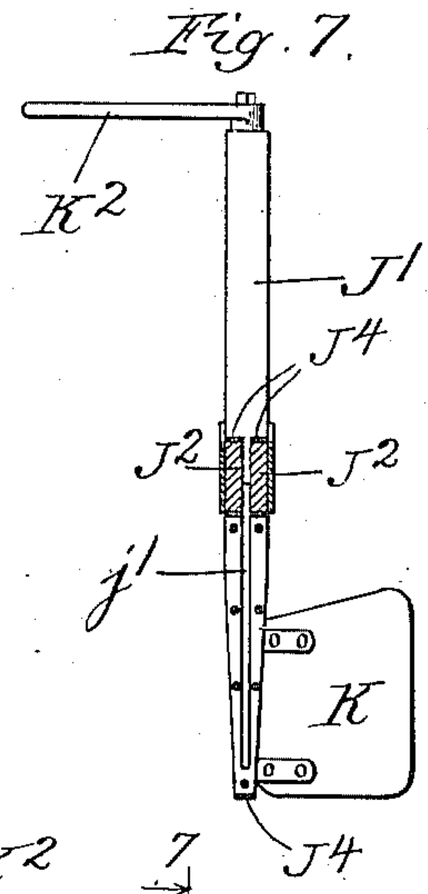


Fig. 4.

Fig. 7.



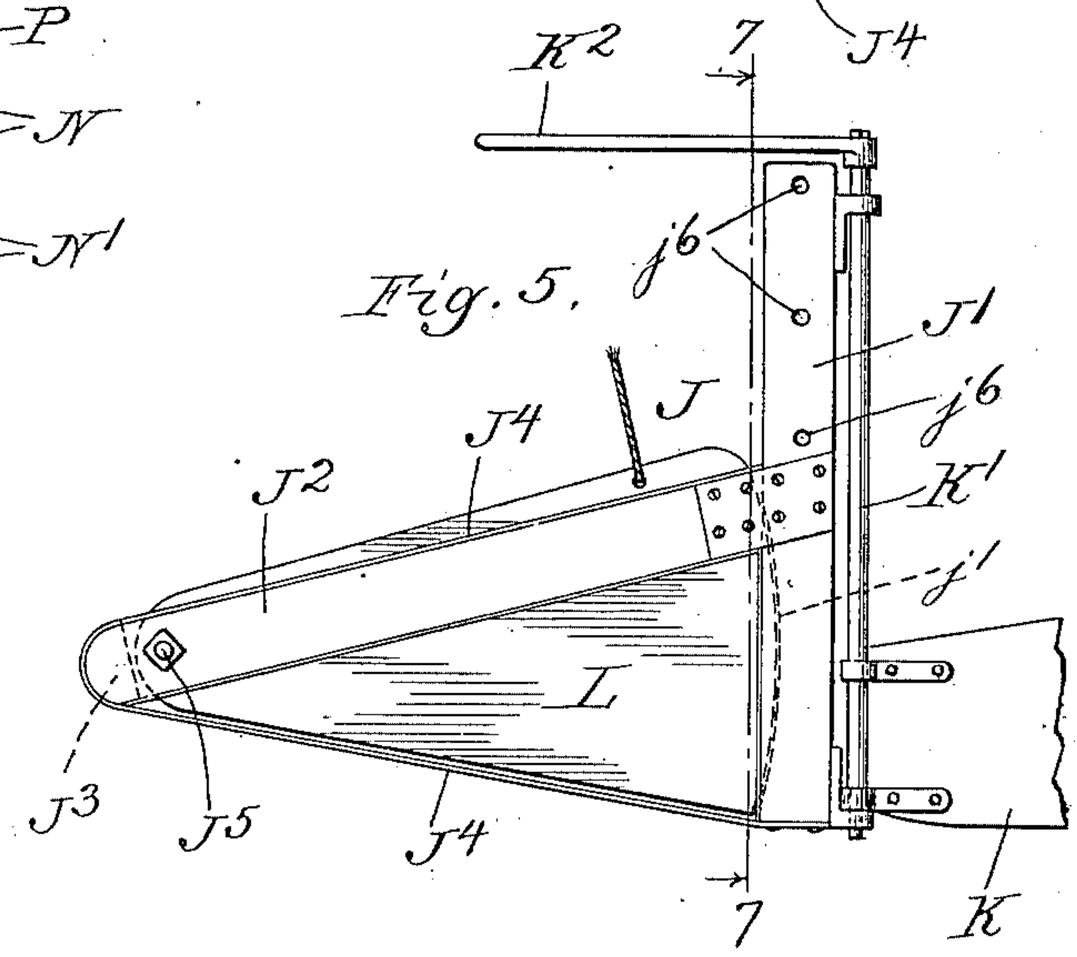


Fig. 5.

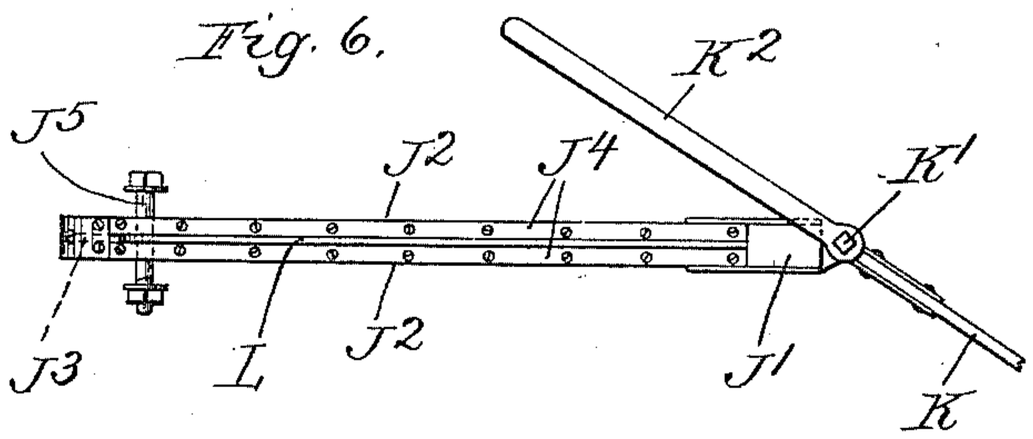


Fig. 6.

Witnesses.
Edward T. Wray
Edgar L. Conant

Inventor.
George F. Holloway
by Burton Burton
his Atty's.

No. 661,246. Patented Nov. 6, 1900.

G. F. HOLLOWAY.

BOAT.

(Application filed May 17, 1900.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 8.

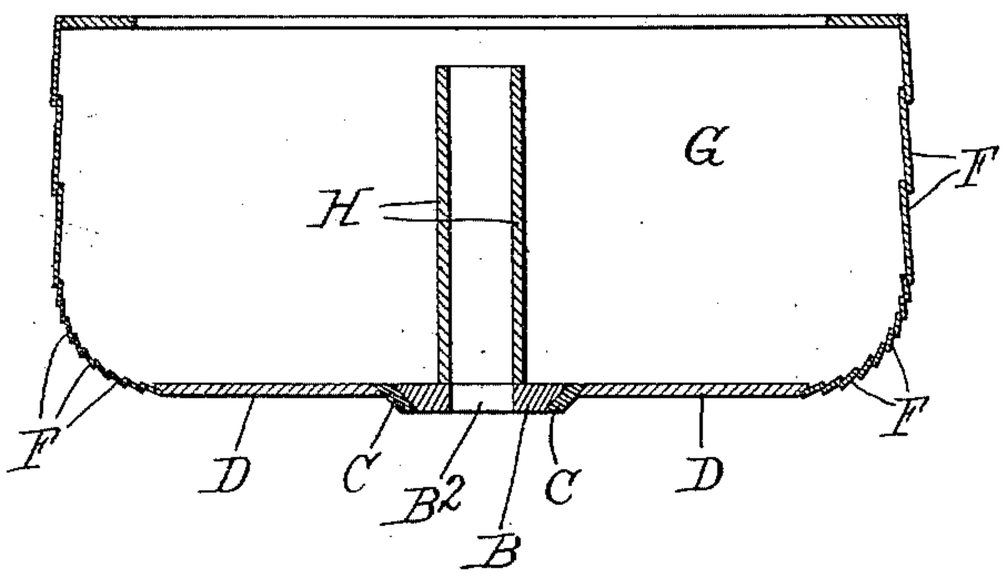


Fig. 10.

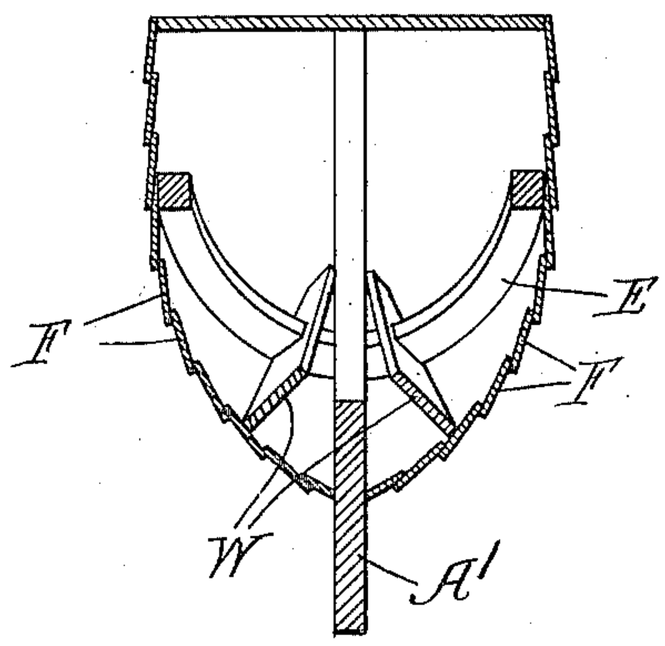


Fig. 9.

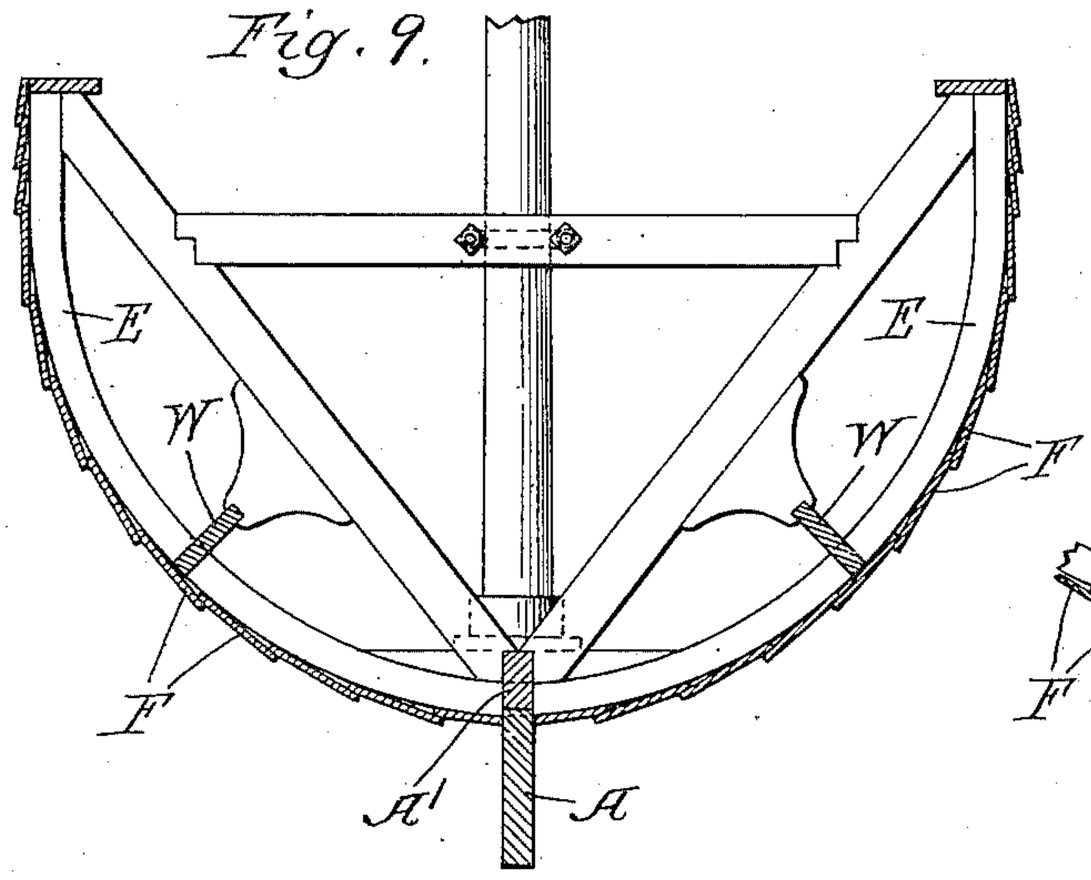


Fig. 11.

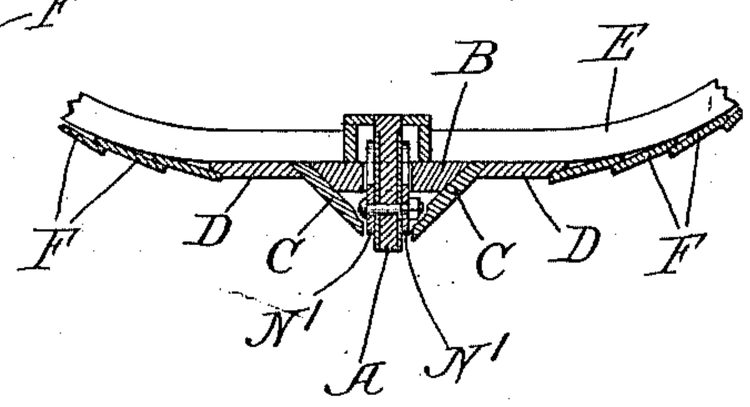
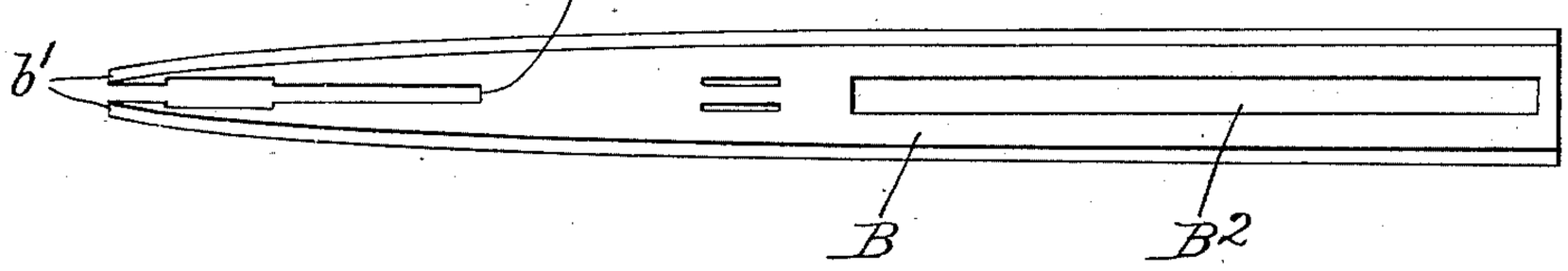


Fig. 12.



Witnesses.
Edward T. Wray.
Edgar L. Conant

Inventor.
Geo. F. Holloway
by Burton Burton
his Attys

UNITED STATES PATENT OFFICE.

GEORGE F. HOLLOWAY, OF OAK PARK, ILLINOIS.

BOAT.

SPECIFICATION forming part of Letters Patent No. 661,246, dated November 6, 1900.

Application filed May 17, 1900. Serial No. 16,953. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. HOLLOWAY, a citizen of the United States, residing at Oak Park, county of Cook, State of Illinois, have invented certain new and useful Improvements in Boats, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide a boat adapted to be sailed, rowed, or otherwise propelled in very shallow water as a flat-boat and also to be trimmed so as to sit deep in the water and carry a good area of sail when the depth of water permits. The invention comprises as a means to this end, first, the novel shape of the hull, which is flat-bottomed at the stern portion and sharply lanceolate in cross-section at the bow and merges from the one shape to the other over the middle portion of the length; second, the novel construction of the stern portion, which has a vertical longitudinal pocket, into which the rudder-carrier may be withdrawn when the boat is trimmed, so as to ride on the flat bottom in shallows; third, the novel construction of the centerboard, which is arranged to be withdrawn into such pocket and protruded downward therefrom into the water, according to the opportunities for the use of such centerboard; fourth, the particular method of attaching and adjusting the counterweight, so that as it is raised or lowered it is shifted longitudinally, contributing to the proper trimming of the load for shallow or deep water, and, fifth, the novel construction and arrangement of a counterweight disposed below the hull and arranged to be raised and lowered by tackle operated in the boat, adapting the boat to carry a large area of sail when the depth of water permits the lowering of the counterweight.

In the drawings, Figure 1 is a side elevation of my improved boat with the counterweight, centerboard, and rudder withdrawn to their highest limit. Fig. 2 is a bottom plan with counterweight, centerboard, and rudder removed. Fig. 3 is a longitudinal section showing the counterweight, centerboard, and rudder depressed, as for deep water. Fig. 4 is a section at the line 4 4 on Fig. 3. Fig. 5 is a detail side elevation of the centerboard, rudder-carrier, and rudder construction. Fig. 6 is a plan of the parts shown in Fig. 5. Fig. 7 is a detail section at the line 7 7 on Fig. 5. Fig. 8 is a section at the line 8 8 on Fig. 3. Fig. 9 is a section at the line 9 9 on Fig. 3. Fig. 10 is a section at the line 10 10 on Fig. 3. Fig. 11 is a detail section at the line 11 11 on Fig. 3. Fig. 12 is a detail plan of the horizontal keel-plank.

I make my boat-hull upon the foundation of a keel comprising an edgewise vertical plank A and a horizontal plank B, said planks being each deeply notched at one end and let into each other, their interlap extending over a large part of the middle portion of the length of the boat, and the planks together constituting a keel which extends from bow to stern of the boat, the plank A having an upwardly-curved extension A′, suitably spliced and braced onto it and which forms the bow-stem. The horizontal plank B is curved in lateral outline, narrowing toward the forward end until each arm of the fork by which it interlocks with the vertical plank A runs out to a point against the side of the latter plank, as seen at *b* in Fig. 3. As a guard for certain parts of the structure yet to be described and also to prevent sharp angles in the cross-section outline of the boat I apply the triangular pieces C C at an angle of forty-five degrees to both the planks A and B across the right angles formed between them on the under side of the plank B from the point *c* rearward, said triangular pieces C being lapped onto the edges of the plank B to the rear end of the latter, but being cut away at the line of the under surface of said plank from the point C′ a little beyond the end of the keel-plank A. The plank B is slightly sprung or bent longitudinally substantially throughout its entire length, as shown in Fig. 3. The curve, however, is so slight that as to the portion from the point b' to b^2 which is interlocked with the plank A it is scarcely material whether the notch in the latter plank is made straight or has the corresponding curvature.

D D are triangular boards having their lateral edges slightly curved, so that when they are longitudinally bent to correspond with the longitudinal curvature of the plank B and placed with their edges abutting on the surface of the boards C, which cover and are conformed to the curved edges of the latter

plank, all transverse lines in their surface lie horizontal. Thus the two triangular boards D D and the horizontal plank B together form a triangular flat bottom extending from the stern forward, as most clearly seen in Fig. 2. From this flat bottom and the vertical keel-plank A the frame of the hull is built up by application of the bent ribs E E E, &c., which are properly secured on the upper side of the plank B and let into or through the upper projecting portion of the vertical plank A and are respectively shaped and proportioned and arranged in longitudinal order, so as to define the shape of the boat in respect to its longitudinal curves fore and aft and the progressive change of cross-section from the flat-bottom shape at the stern to the more sharply lanceolate shape at the bow.

The hull, considered as a geometrical volume, comprises two quarter-cigar-shaped elements symmetrically situated with respect to a fore-and-aft vertical plane containing the keel, said quarter-cigar-shaped elements of the total volume, however, being disposed with their axes converging from stern to bow and intersecting in the vertical plane of the keel directly above the apex of the triangular flat portion of the bottom, so that in the bottom plan view, Fig. 2, the lines denoting the sides of this triangular portion of the bottom also indicate the location of the axes of the quarter-cigar-shaped elements of the volume. By reason of the convergence of these axes, so that the two volumes would, respectively, extend across the vertical fore-and-aft plane of the keel if made geometrically complete, said volumes are both obliquely truncated by being terminated at that plane.

G is the stern-board, which is suitably joined to the stern end of the plank B and the triangular boards D D and affords the rear end fastening for the remaining sheathing-boards F F, &c. In the plank B at the stern end, commencing immediately forward of the stern-plank G, I form an oblong rectangular aperture B^2, and from the margins of this aperture I erect a boxing H, preferably nearly as high as the sides of the boat This boxing constitutes, with the aperture in the plank, a pocket which opens downward in the water. It must be open for a short distance at the top to permit the oscillation of the rudder-bearing post and rudder, as hereinafter explained, and it need not be closed at all at the top. Within this pocket I locate a rudder-carrier J, which is in the form of a frame or skeleton, comprising the rudder-bearing post J′ and two oblique side bars J^2 J^2, secured at one end to the rudder-bearing post J′ at opposite sides of the latter and to a spacing-block J^3 at the opposite ends, and further braced and secured by straps J^4 J^4, extending along the upper edges of the side bars J^2 around their rear ends and thence down to the lower end of the bearing-post J′.

K is the rudder, having its staff K′ suitably mounted upon the rear side of the rudder-bearing post J′ and having the tiller or lever-arm K^2 extended above the staff forwardly. As illustrated, and according to the construction which I consider preferable, the pocket is made long enough to accommodate the frame or rudder-carrier described and the rudder when the latter is extended direct to the rearward therefrom, so that the entire rudder and carrier can be withdrawn into the pocket. The rudder-carrier is pivoted at the forward end of the bars J^2 J^2 on a suitable bolt J^5, set through them and into the boxing H, which forms the side walls of the pocket, suitable provision being made for avoiding leakage where the bolt is thus inserted. Within the same pocket, and between the side bars of the skeleton frame which constitutes the rudder-carrier, I locate a centerboard L. This centerboard is preferably pivoted on the same bolt which forms the pivot for the rudder-carrier, and the forward side of the rudder-bearing post J′ is preferably grooved at j' to afford a seat and guidance for the rear edge of the centerboard L, which is sectoral in form, the rear edge being the arc of a circle about the pivotal center. The rudder-carrier and rudder may be set at any height and may be retained by means of a bolt or pin J^6, which may be set through any one of the several holes j^6 j^6 on the rudder-bearing post j', said pin or bolt being passed under the loops or guards H^2 H^2, secured upon the upper edges of the side walls of the boxing H, the length of the loop being sufficient to accommodate the fore-and-aft swing of the rudder-bearing post as it is oscillated vertically about its pivot. The dotted-line position of the rudder in Fig. 3 shows the pin or bolt near the rear limit of the loop, while the full-line position of the rudder, being its lowest position, shows the pin at the opposite limit of the loop. In order to control the position of the centerboard, a cable l is attached to its upper edge and runs over any suitable guide, as the cross-bar h^2, across the top of the pocket, suitable provision being made for hitching the end of the rope, thus holding the centerboard at any position to which it may be lifted. With this construction it will be seen that the rudder may be lowered to the full-line position, the centerboard being either lowered with it or retained at the high position.

It will be understood that the different contour of the boat at the stern and the bow, being flat-bottomed at the stern and adapted to sit deep in the water at the bow, is to be taken advantage of by shifting the load or "trimming" the boat, so that in shallows, for example, the load being mainly at the rear, the bow will be lifted from the water and the flat bottom of the rear portion of the boat will be adapted to ride in very shallow water, whereas when the water is deep the load may be shifted to the forward end, and the bow will thus be settled into the water, giving the boat the necessary steadiness in heavy waves.

To further adapt the boat for carrying a

large area of sail when the depth of water permits it, I have provided a counterweight M, of heavy metal, which is suspended by links N N at the forward end and N′ N′ at the rear below the bottom of the boat. The links are pivoted to the plank A, both of the links N being on the same pivot, one on each side of the plank, both of the links N′ being on another pivot, also one on each side of the plank, so that the counterweight is held rigidly as respects transverse movement, while it is free to move longitudinally with the swing of the links fore and aft. To further increase the stiffness or rigidity with which the weight is held as against transverse movement, I extend the links N and N′ upward past their pivots some distance and arrange them to bear for that distance on the opposite sides of the plank A, thus bracing them against lateral movement. At and sternward from the points where they are thus located the lower edges of the boards C are cut away to allow the links N to swing up alongside the plank A, and the horizontal plank B is cut away adjacent to the plank A to allow the ends of the links to protrude past it, and a suitable hood is formed over the aperture thus made, which would otherwise admit the water to the boat. For the purpose of raising and lowering the weight I provide cables P and Q, the former attached to the forward end and the latter to the rear end of the weight and each running over suitable guide-pulleys, through the pocket H, to the clevis of the pulley R, tackled to the foot of the mast. The links N′ N′, which connect with the rear end of the counterweight, are spread, so that when the weight is drawn up against the flat bottom of the boat it enters between the links, thus leaving all the parts in compact arrangement directly under the pocket, which receives the rudder-carrier and centerboard.

It will be noticed that the manner of suspending the counterweight is such as to cause it to move rearward as it is elevated or to cause it to move upward when it is forced rearward. Two advantages are gained by this construction—first, the fact that the weight moves rearward as it is elevated, contributing to trimming the boat for shallow or deep water, for when the boat is to be trimmed for shallow water it is necessary to shift the load to the rear, and the lifting of the counterweight, as necessary to permit the boat to move in shallow water, carries so much of the weight toward the rear; second, if the counterweight, hung low, as for deep water, encounters an obstruction while the boat is moving forward it immediately yields rearward and, being at the same time elevated, tends readily to pass over the obstruction, thus automatically trimming the boat and returning to its depressed position as soon as the obstruction is passed.

W W are longitudinal ribs located in planes radial to the axes of the respective quarter-cigar-shaped elements of the hull, extending from the keel-plank at the bow to the stern-plank G and notched at their outer edges to receive the ribs E E E, &c.

I claim—

1. A boat-hull, having at the stern portion a downwardly-open pocket; a rigid frame pivoted at its forward end to the hull, and arranged to oscillate vertically in the pocket; such frame comprising a rudder-bearing post at the rear end, and rigid braces extending from such post forwardly to such pivot, and the rudder mounted on the bearing-post.

2. A boat-hull, having at the stern portion a narrow, longitudinally-extended pocket, downwardly open throughout its whole extent and upwardly open at a rear portion; a rigid frame pivoted at its forward end to the boat-hull and arranged to oscillate in such pocket, such frame comprising at the rear end a rudder-bearing post which extends through the pocket, the upwardly-open part thereof fitting between the side walls of the pocket; and rigid braces extending from such bearing-post forward toward the pivot, and the rudder mounted on the rear side of such bearing-post.

3. A boat-hull, having a central longitudinal, downwardly-open pocket at the stern end; a skeleton rudder-carrier and a centerboard in such pocket, both pivoted at the forward end and arranged to be oscillated vertically at the rear to cause them to protrude more or less downward; and the rudder, mounted on the rear end of the carrier.

4. A boat-hull, having a central longitudinal, downwardly-open pocket at the stern end; a skeleton rudder-carrier in such pocket pivoted at its forward end and having a rudder-bearing post forming its rear end; a centerboard within the skeleton carrier, pivoted on the same line as the latter and at its rear edge engaging and obtaining guidance in the rudder-bearing post.

5. A boat-hull, having a central longitudinal, downwardly-open pocket at the stern end; a skeleton rudder-carrier and a centerboard in such pocket, both pivoted at the forward end and arranged to oscillate vertically at the rear end to cause them to be protruded more or less from the pocket downward; the rudder mounted on the rear end of the carrier; and means for raising and lowering the carrier and the centerboard independently of each other.

6. In combination with a boat-hull, a counterweight; links attached to the counterweight and pivoted to the hull so as to swing fore and aft in vertical plane; means by which such links are stayed against the hull so as to hold the counterweight rigid with the latter as respects lateral movement, at a position remotely below the bottom of the hull when the links are approximately vertical, such links being constructed and arranged to swing up rearward, away from such vertical position,

whereby the boat is automatically trimmed to cause the bow to sit higher in the water when the counterweight is elevated.

7. In combination with the boat-hull, a counterweight of relatively small vertical dimensions; links attached to the counterweight and pivoted to the hull so as to swing fore and aft in vertical plane, and stayed laterally at their connection with the hull at the upper end, so as to hold the counterweight rigid as respects lateral movement at a position remotely below the hull's bottom when the links are approximately vertical.

8. A boat-hull, having a centerboard, and means for raising and lowering it, and a counterweight; arms by which the counterweight is connected to the hull rigidly as respects lateral movement, adapted to hold such counterweight remotely below the bottom of the hull, and means for raising and lowering it independent of the means for operating the centerboard; whereby either centerboard or counterweight may be operated without operating the other.

9. A boat-hull having at the stern a downwardly-open pocket, the centerboard attached to the hull and adapted to be withdrawn upward into the pocket and lowered to protrude therefrom; in combination with a counterweight, and arms by which it is held rigid with the hull as respects lateral movement, said arms being adapted to hold the counterweight remotely below the bottom of the hull forward of the position occupied by the centerboard; and means for raising and lowering the counterweight independent of the means for raising the centerboard.

10. In combination with a boat-hull having a central longitudinal, downwardly-open pocket at the stern end, and a centerboard in such pocket arranged to be raised and lowered therein to cause it to protrude more or less below the bottom of the pocket; a counterweight, and the pivoted arms which attach it to the hull, arranged to cause such weight at its highest position to lie under the centerboard at the highest position of the latter.

11. A boat which is flat-bottomed at the rear part, and whose cross-section increases and becomes lanceolate from the middle forward, with increasing acuteness toward the bow, and which has at the stern a downwardly-open pocket; in combination with a rudder-carrier in such pocket and arranged to be raised and lowered therein; and a rudder arranged to be mounted at the rear end thereof; whereby the boat may be trimmed to ride on the flat bottom at the rear, with elevated rudder, in shallows, and may be trimmed in deep water to sit deep in the water at the bow with the rudder depressed.

12. A boat which is flat-bottomed at the rear part and whose cross-section increases and becomes lanceolate from the middle forward, in combination with a counterweight secured and longitudinally movable underneath the hull, and connections therefrom extending into the boat to move such counterweight fore and aft at will to trim the boat, and cause it at will either to ride upon the flat-bottomed portion toward the stern, or to sit deep in the water at the bow.

13. A boat which is flat-bottomed at the rear part, and whose cross-section increases and becomes lanceolate from the middle forward, in combination with a counterweight, and links attached to the counterweight and pivoted to the hull so as to swing fore and aft in vertical plane as it is lowered and raised by the links, whereby the boat is automatically trimmed by the adjustment of the counterweight, to ride upon the flat-bottom portion of the stern when the counterweight is raised, as for shallow water, or to sit deep in the water at the bow when the counterweight is lowered in deep water.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 15th day of May, A. D. 1900.

GEORGE F. HOLLOWAY.

In presence of—
CHAS. S. BURTON,
EDGAR L. CONANT.