Oct. 27, 1931. R. J. H. HUDSON 1,828,805

COLLAPSIBLE HULL FOR LIGHT BOATS, FLOATS FOR AIRCRAFT, AND THE LIKE

Filed Aug. 8, 1930

Fig. 1.

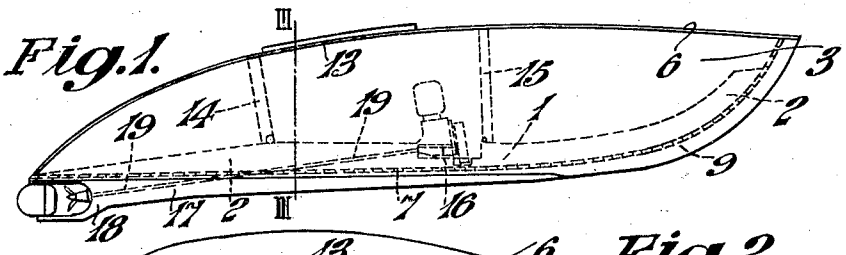


Fig. 2.

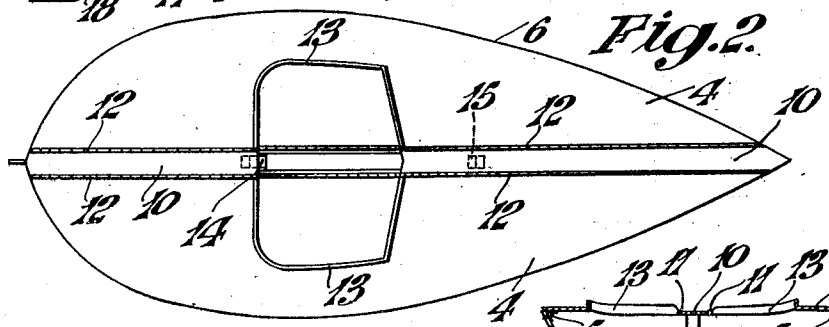


Fig. 3.

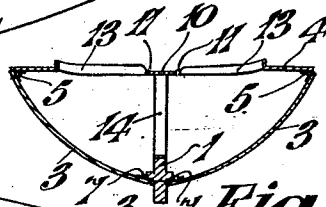


Fig. 4.

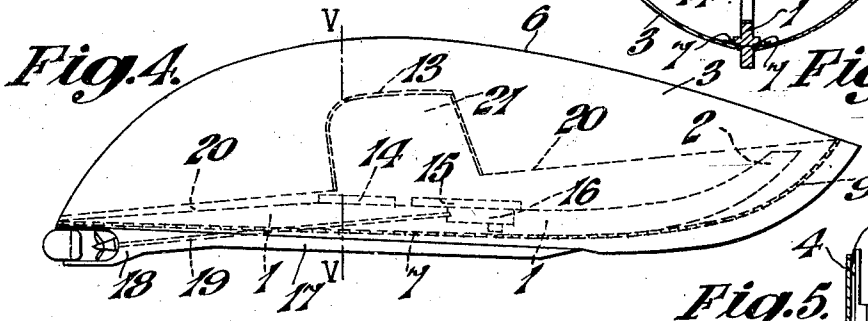


Fig. 5.

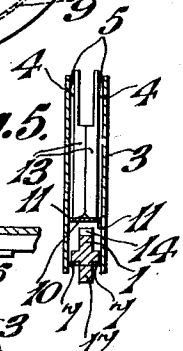


Fig. 6.

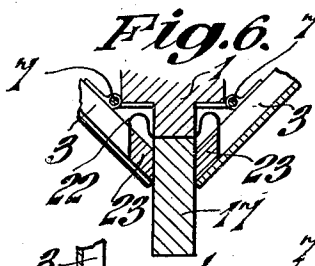


Fig. 8.

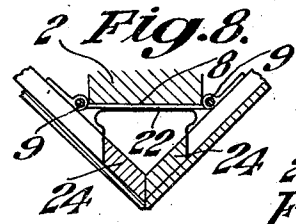


Fig. 10.

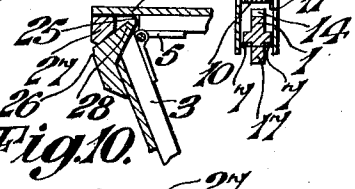


Fig. 7.

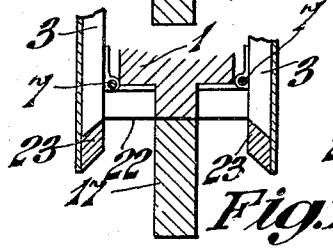


Fig. 9.

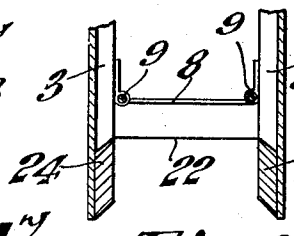
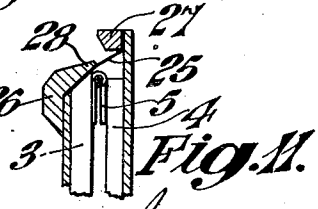


Fig. 11.



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by James Anderson,
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UNITED STATES PATENT OFFICE

RICHARD JOHN HARRINGTON HUDSON, OF LONDON, ENGLAND

COLLAPSIBLE HULL FOR LIGHT BOATS, FLOATS FOR AIRCRAFT AND THE LIKE

Application filed August 8, 1930, Serial No. 473,945, and in Great Britain August 22, 1929.

In my prior British specification No. 300,366 I have described a method of constructing collapsible boats in which a pair of flexible sides are hinged along their bottom edges to a rigid keel provided with a rigid stern and stem post, the sides being hinged together outwardly of the rigid stern and stem posts in a manner forming a flexible false stern and stem adapted to be rigidly coupled to the true posts when the boat is erected for use.

The present invention has for its object to provide by a method of construction analogous to that described in my prior specification an improved construction of float or hull or like floating body differing from the boat previously described principally as follows:

The hull or float of the kind to which the present invention relates is capable of being provided with a top deck preferably formed in two parts hinged about a centre line so that when erected the deck will lie across the top of the sides and prevent the entry of water when the device is moving at speed.

The hull or float is intended to be built generally on the lines followed in the construction of speed boats, the keel being extended forwardly in a continuous curve which only makes a comparatively small angle with the horizontal. Further, the stem post described in my prior specification is preferably dispensed with, the upper edges of the sides of the boat meeting the lower edges in a comparatively sharp angle.

The present invention therefore provides for the construction of such boats as aircraft floats, hulls for motor boats and like constructions differing from that described in my prior specification which more nearly resembled a dinghy or whaler.

The present invention therefore relates to collapsible hulls or floats having a keel or folding sides hinged thereto, and consists primarily in providing a deck formed in two parts and hinged to said folding sides.

The invention further consists in providing a construction in which the after part of the said sides is cut away so that the upper and lower edges meet together at an angle.

The invention further consists in a collapsible hull or float having a rigid keel with a forwardly-inclined forward stem portion extending in a continuous curve from the keel portion, a pair of collapsible sides being hinged partly to said keel portion and partly to each other in advance of the forwardly-inclined stem portion.

The invention further consists in constructions embodying particular forms of joint, and the provision of battens arranged along un-stressed portions in the sides which latter features are, however, not new per se but are analogous to features of construction described in my prior specification above referred to.

The invention is illustrated in one form of execution in the accompanying drawings which show a small motor boat, but it is to be understood that this is by way of example only.

In the accompanying drawing,

Fig. 1 illustrates a side elevation of a motor boat,

Fig. 2 being a plan.

Fig. 3 is a transverse section to Fig. 1 along the line III—III of Fig. 1, the boat being hitherto illustrated in the erected or open position.

Fig. 4 is a side elevation, similar to Fig. 1, when the boat is collapsed, and

Fig. 5 is a transverse section to Fig. 4 along the line V—V of Fig. 4, when the boat is collapsed.

Figs. 6, 7, 8, 9, 10 and 11 show on an enlarged scale some of the joints.

Turning now to the drawings, the form here illustrated comprises a strong keelson 1 and stem 2 of rigid solid construction. The sides of the boat 3 are hinged to the deck 4 by a series of hinges 5 running along the gunwale line 6. The sides 3 and deck 4 are formed of flexible solid material such as thin planking laid diagonally or otherwise, plywood such as is already known in the construction of boats, or metal plate; and the sides 3 are hinged to the keelson 1 by a series of hinges 7 lying along the straight portion of the keelson, Figs. 1 and 4. These hinges are shown transversely in Figs. 6 and

7. Forwardly of the keel, however, the sides are hinged by a series of straps 8, Figs. 8 and 9, comprising a rocking or flexible stem, the said straps 8 carrying hinges 9 at either end and following in continuation of the hinges 7 along the forward curved portion of the keelson which forms the stem of the boat.

It will be observed that the stem extends from the keelson in a continuous curve projecting forwardly at a comparatively small angle with the horizontal in a manner usual in speed boats and hydroplanes.

The deck 4 is divided into two symmetrical parts each of which is hinged to a central strip 10 by a series of hinges 11, 12. In the form illustrated a cockpit is provided by removing a portion of the deck 4 and central strip 10 and fitting coamings 13. Folding props 14 and 15 are provided to support the deck rigidly when the boat is erect, the said props being hinged at their lower ends to the upper edge of the keelson 1 and their upper ends bearing against the under side of the central deck strip 10 when the boat is erect.

A recess 16 is provided in the keelson to accommodate an engine. A false keel 17, which carries the rudder frame and tail-shaft bearing 18 is screwed to the keelson and the tail-shaft 19 passes from the recessed engine bed 16, through the keelson 1 and false-keel 17 to the tail-shaft bearing in 18.

In collapsing the boat from the position illustrated in Figs. 1, 2 and 3, having removed the engine from its bed 16 but leaving intact the tail-shaft 19, the deck props 14 and 15 are knocked down. The shape of the side sheets and deck are such that the resilience of the sheets is sufficient to maintain the boat in its erect position, so that slight depression along the centre of the deck is necessary to cause the boat to collapse. The centre strip 10 moves downwards and assumes the position illustrated at 20 Fig. 4 lying along a straight line.

The two sides of the deck 4 hinged to the centre strip 10 fold with their upper surfaces inwards, and the coamings 13 round the cockpit may make contact as shown in Fig. 5. At the same time, the sides of the boat 3, hinged by the series of hinges 5 to the deck 4 along the gunwale lines 6, are drawn inwards and rotate about the hinges 7 and 9 finally assuming the folded positions shown in Figs. 4 and 5. This inward folding of the sides 3 causes the sheets to flatten out and the bow or forward edges of the side sheets and the rocking or flexible stem to move outwards. The links 8 which comprise the rocking or flexible stem and which are arranged to bear up against the rigid stem 2 when the boat is erect move away from the rigid stem 2 when the boat is folded as shown in Fig. 4, as will be readily understood.

The sides 3 and deck 4 are strengthened by battens and stiffeners set along portions of the sides and deck which remain straight lines in the collapsed and open position in the manner described in my previous Patent No. 300,366, and the twist given to the sides and the deflection given to the deck during the process of erection run perpendicular to the stiffening battens as therein described.

An examination of the drawings will show that the sides 3 tend to be twisted round their line of attachment to the keelson 7, being held together by the straps 8 along the curved line 9 to form the bow and pressed outwards by the deck towards the stern, thus obtaining the required sharp entrance at the bow and extreme flatness at the stern to support the boat when it is being driven through the water.

It is to be understood of course that the sides 3 and deck 4, although curved considerably in the erect position as shown in Figs. 1 to 3, become plane in the collapsed position, as indicated in Fig. 5, and the curve of the gunwale joint 6 is designed so that the movement of the sides and deck from the erect to the collapsed positions involves a steady flattening of the sides and deck and can be effected without severe stress or overstrain either of the sides, deck or hinges at any point.

Folding seat or seats may be provided in the cockpit, designed in accordance with my previous British Patent No. 317,747 and floor boards may be hinged to the upper part of the keelson 1 to lie down upon the sides 3 when the boat is erect, as provided in my previous British Patent No. 300,366, and it is understood that before the boat is collapsed the said seat or seats are to be folded and the floor boards rocked to a vertical central position to lie within the space 21—shown in Fig. 4, inside the coamings 13.

An important feature of the construction consists in covering all the joints with canvas or other water-proof fabric on their outer sides and in protecting the said canvas or fabric against chafing or other damage when the boat is erect and in use in a manner analogous to the provision in my previous British Patent No. 300,366.

Figs. 6 and 7 illustrate, in transverse section, on an enlarged scale, the lower part of the keelson 1 to which is attached the false keel 17. The method of attaching the sides 3 to the keelson 1 by means of the series of hinges 7, is also clearly shown in these figures. The canvas or fabric 22 which is in one continuous strip through the length of the boat along the keel and stem and is shown in transverse section, passes within the joint between the keelson 1 and the false keel 17 and is there rigidly fixed along the centre of the strip. The edges of the strip are securely fixed to the sides of the boat by means of waterproof adhesive and the fillets 23, screwed to the side

sheets 3, thus rendering the joints watertight. The canvas or fabric is taut when the boat is collapsed, Fig. 7, and space is provided to accommodate the slack canvas without risk of damage when the boat is erect as shown in Fig. 6.

Figs. 8 and 9 illustrate in transverse section on an enlarged scale the forward part of the stem 2 against which the straps 8 come into contact when the boat is erect. The strip of canvas or fabric 22 is securely fixed to the side sheets 3 by means of waterproof adhesive and the fillets 22 Fig. 8 represent the transverse section when the boat is erect and Fig. 9 when the boat is collapsed.

Figs. 10 and 11 illustrate in transverse section on an enlarged scale, the joint between the sides 3 and the deck 4 and show clearly the series of hinges 5. The canvas or fabric 25 is in a continuous strip throughout the length of the gunwale on each side of the boat. One edge of the canvas strip is secured to the side 3 by waterproof adhesive and the fillet 26 and the other edge is secured to the deck 4 by waterproof adhesive and the fillet 27. The fillet 26 is formed with a projection 28 to deflect the canvas into the recess under the deck sheet 4 and to prevent the canvas from being caught in the hinge 5 or between the fillets 26 and 27 and the fillets 26 and 27 together form a complete protection for the canvas Fig. 10, when the boat is erect and in use. When the boat is collapsed Fig. 11, the canvas is taut.

The joints along each side of the central deck strip 10 formed by series of hinges 11, 12, Fig. 2, are similarly rendered watertight by strips of canvas or waterproof fabric and require no separate detailed description.

In the form illustrated, the boat is erected and collapsed by man-handling, without any special mechanical means, by merely drawing the sides of the boat apart and lifting the centre of the deck. The props 14 and 15 being used to secure the boat in its erect position. In the case of larger boats any suitable mechanical means may be employed for lifting the centre of the deck such as a vertical screw with its lower end bearing upon the keelson 1, turned by a handle and carrying a nut which bears upon the under side of the central deck strip 10 and to further stiffen the bow when the boat is erect one or more of the straps 8 may be connected together and clamped to the stem 2.

The engine which is accommodated in the recessed engine bed 16, and which is to be removed before the boat is collapsed would be suitably secured by clamps or thumbscrews for the purpose and would be readily disengaged from the tail-shaft 19.

Obviously the invention is not limited to the precise form of construction illustrated, many details of which will be subject to variation at the discretion of the builder in accordance with the size, shape and strength of the hull or float to which the invention is applied.

What I claim and desire to secure by Letters Patent is:—

1. A collapsible hull or float comprising a keel, folding sides hingedly connected to said keel, a true stem rigidly connected to said keel, a yieldable stem to which said folding sides are hingedly connected and which is adapted to be moved towards and into solid engagement with said true stem, and a deck formed in two parts hinged to said folding sides.

2. A collapsible hull or float comprising a keel, folding sides hingedly connected to said keel, a true stem rigidly connected to said keel, a yieldable stem to which said folding sides are hingedly connected and which is adapted to be moved towards and into solid engagement with said true stem, the after part of said sides being cut away so that the upper and lower edges meet together at an angle substantially as described.

3. A collapsible hull or float formed of resilient material, comprising sides and a deck hinged together along joints running fore and aft, a keel to which said edges are hinged along their lower edges, and links connecting said sides to one another to constitute a yieldable stem along the forward part.

4. A collapsible hull or float comprising a rigid keel having a keel portion and a forwardly-inclined forward stem portion extending in a continuous curve from said keel portion, a pair of collapsible sides hinged to said keel portion, and links by which said sides are hinged to each other forwardly of said keel portion, whereby a yieldable stem is formed adapted to be engaged with said forward stem portion.

5. A collapsible hull or float comprising a keel, folding sides hingedly connected to said keel, a true stem rigidly connected to said keel, a rocking stem to which said folding sides are hingedly connected and which is adapted to be moved towards and into solid engagement with said true stem, and a deck formed in two parts hinged together along the centre and respectively hinged to said folding sides.

6. A collapsible hull or float formed of resilient material and comprising a keel, a deck formed in two parts hinged together along the centre, sides hinged to the respective parts of the deck along their upper edges and hinged to said keel along their lower edges, and links connecting said sides along the forward part to form a rocking and flexible stem.

7. A collapsible float or hull as claimed in claim 3 and comprising stiffening battens lying along lines which remain straight during the flexing movement of the sides.

8. A collapsible float or hull as claimed in

claim 1, wherein the lower edges of the sides extend beyond the region at which they are hinged to the keel and rocking stem, and a strip of waterproof fabric connected between said lower edges.

9. A collapsible float or hull as claimed in claim 1, wherein a strip of waterproof fabric is connected between the respective sides and the deck in such a way as to cover and protect the hinges between said sides and deck.

RICHARD JOHN HARRINGTON HUDSON.