

Oct. 25, 1932.

W. L. McGRATH

1,884,792

COLLAPSIBLE BOAT

Filed June 30, 1931

2 Sheets-Sheet 1

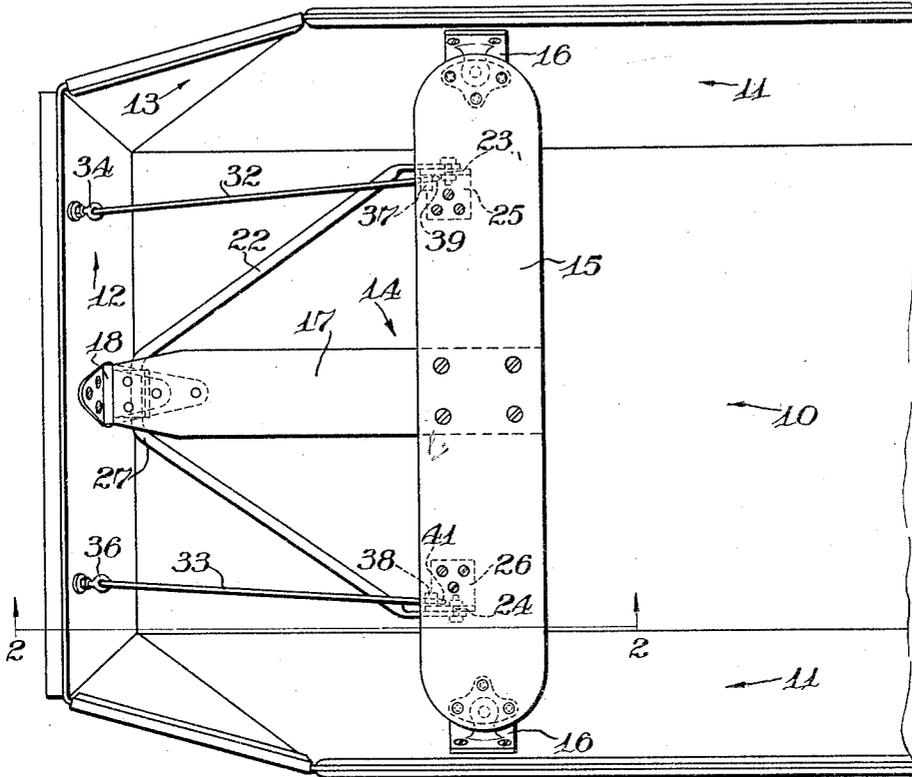


Fig. 1

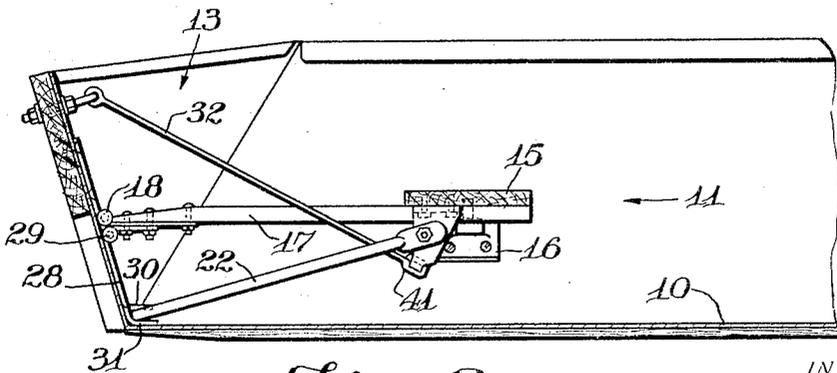


Fig. 2

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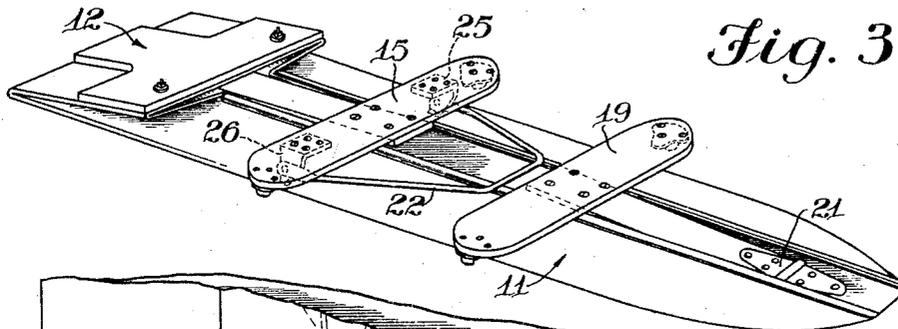


Fig. 3

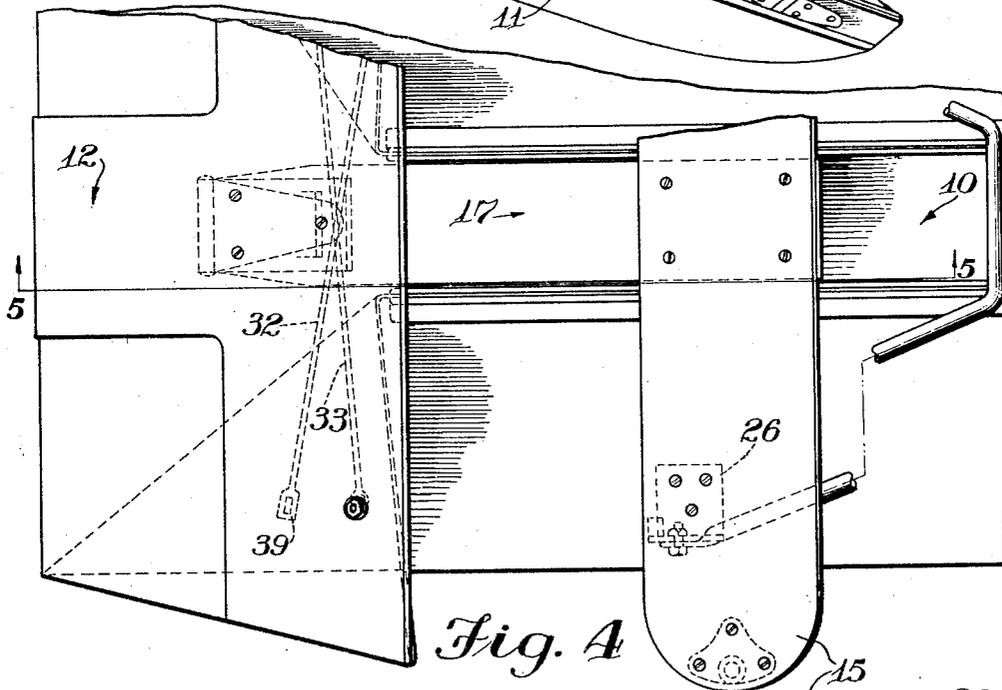


Fig. 4

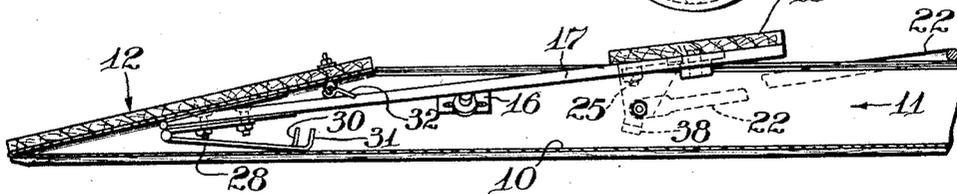


Fig. 5

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COLLAPSIBLE BOAT

Application filed June 30, 1931. Serial No. 547,908.

This invention relates to collapsible boats and more particularly to folding boats to be propelled by outboard motors.

It is difficult to obtain sufficient rigidity for the power operation of folding boats by reason of the lightness of the construction and the flexible joints incorporated therein. The vibration of the power plant and the thrusts of propulsion and of steering all tend to open the seams and joints of the boat and unless special precautions are taken, cause the useful life of the boat to be greatly shortened.

It is an object of the present invention to provide a folding boat embodying novel provisions for increasing the strength and rigidity of the device.

Another object of the invention is to provide such a device in which strengthening members are arranged to prevent flexure of the hull of the boat caused by operation of a power plant attached to the stern.

A further object is to provide such a device in which the strengthening members are arranged to so fold up as not to project from the package formed by the folded boat, and so as not to interfere with the folding of the boat in the usual manner.

Another object is to provide such a device in which the strengthening members are readily placed in operative position when the boat is expanded for use and may be quickly moved to their inoperative positions when the boat is to be folded.

Further objects and advantages will be apparent to those skilled in this art from the following description taken in connection with the accompanying drawings in which:

Fig. 1 is a top plan view of the after portion of a folding boat embodying a preferred form of the present invention;

Fig. 2 is a vertical section taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a perspective view on a reduced scale of the boat in folded position;

Fig. 4 is a plan view of a portion of the after part of the boat in folded position; and

Fig. 5 is a section taken substantially on the line 5—5 of Fig. 4.

Referring particularly to Figs. 1 and 2 of

the drawings which show the boat in expanded position, it will be seen that the hull of the boat comprises a bottom panel 10, side panels 11, hinged thereto and a stern panel also hinged to the bottom panel 10 and connected to the side panels 11 by triangular panels 13 hinged to the side and the stern panels and adapted to fold under the stern panel as illustrated in Fig. 3 when the boat is collapsed.

A stretcher 14 comprising a transverse member preferably in the form of a thwart or seat 15 is provided for holding the sides in extended position and is provided with suitable detachable anchorages on the side panels as indicated at 16. A longitudinal stretcher member 17 is rigidly attached to the middle portion of the thwart 15 and is hinged to the center portion of the stern panel as indicated at 18, thus serving to hold the stern panel in its extended position when the thwart 15 is anchored to the side panels 11. A transverse stretcher or thwart 19 (Fig. 3) similar to the stretcher member 15 is provided in the forward part of the boat, being hinged to the bottom panel 10 adjacent the bow of the boat as shown at 21 and serves to brace the forward parts of the side panels 11 when the boat is expanded.

It has been found in practice that when an outboard motor is attached in the conventional manner to the stern panel of a boat of this character, the vibration of the engine and the thrust of the propeller cause the seams and hinges of the hull to be strained to such an extent that after a moderate amount of use they may open up and leak.

It has been found in particular that the thrust of the propeller causes a pivotal motion of the stern panel about the hinge 18 as an axis which places heavy stresses upon the joints between the stern panel and the bottom panel and at the edges of the triangular panels 13.

This disadvantage is overcome according to the present invention by a system of folding braces which prevent any pivotal motion of the stern panel about the hinge 18, or any weaving of the stern panel with respect to the hull of the boat. As best shown in Figs. 1

and 2, these braces comprise a U-shaped thrust member 22 the arms of which are pivoted as indicated at 23 and 24 to brackets 25 and 26 fastened underneath and near the ends of the thwart 15. The base 27 of the member 22 is arranged to engage in the lower end of a bracket 28 which is hinged at 29 to the rear end of the longitudinal stretcher member 17. The bracket 28 is preferably provided with fingers 30 and 31 arranged to receive the base 27 of the member 22 and position it adjacent the bottom edge of the stern panel 12.

In order to further stiffen the stern panel and to prevent its pivoting around the hinge 18, a pair of link members 32 and 33 are pivotally attached near the upper edge of the stern panel 12 and approximately opposite the brackets 25 and 26 as shown at 34 and 36. The brackets 25 and 26 have downwardly extending arms terminating in lugs 37 and 38, and the links 32 and 33 are formed with eyes 39 and 41 which are adapted to fit over said lugs whereby the links may be rigidly connected to the thwart 15.

It will be seen that by this arrangement of braces, a rigid truss construction is formed whereby the thrusts of the propeller will place the brace 22 under compression and the links 32 and 33 under tension, these forces being transmitted directly to the stretcher 14 whereby the hinges of the hull are relieved from excessive strain and are prevented from working during the operation of the propelling means. It will further be noted that, by reason of the spacing of the points of attachment of the three braces, with respect to the hinge 18 that weaving of the stern panel 12 under lateral forces caused by swinging the motor in steering the boat is prevented.

When boats of this type are to be collapsed or folded, the stretchers 14 and 19 are first raised from their anchorages in the side panels 11, the side panels are then folded inward, the stern panel folded on top and the stretchers then lowered into the positions illustrated in Fig. 3. The bracing mechanism of the present invention does not interfere with this operation and calls for only a slight amount of extra manipulation. When the stretcher 14 is raised, the links 32 and 33 become loosened and their eyes 39 and 41 are readily detached from lugs 37 and 38. The brace 22 is then swung forward approximately in the plane of the stretcher 14, the links 32 and 33 are placed crosswise as indicated in Fig. 4 and the folding of the boat then proceeds as usual. When the stern panel 12 is folded forward, the lower end of the bracket 28 slides along the bottom panel 10 into the position shown in Fig. 5. When the boat is to be expanded again, the operations are reversed and the final placing of the stretcher 14 on its anchorages 16 causes the braces 32, 33 and 22 to be placed under

initial stress so that the assembly is taut and rigid.

Although but one form of the invention has been shown and described in detail, it will be understood that various changes may be made in the details and arrangements of the parts without departing from the spirit of the invention as defined in the claims appended hereto.

What is claimed is:

1. A collapsible boat including a bottom panel, side panels and a stern panel hinged thereto, stretching means for holding the side panels and stern panel in extended position and means connecting the edges of said stern panel to said stretching means to transmit thrusts from the stern panel to the stretching means and prevent angular movement of the stern panel.

2. A collapsible boat, including a bottom panel, side panels and a stern panel hinged thereto, a stretcher adapted to be detachably anchored to said side panels and hinged to the stern panel at a substantially medial point thereof, and means connecting the free edge of the stern panel to said stretcher to prevent angular motion of the stern panel.

3. A collapsible boat including a bottom panel, side panels and a stern panel hinged thereto, a stretcher adapted to be detachably anchored to said side panels and hinged to the stern panel at a substantially medial point thereof, and means connecting the top and bottom of said stern panel to said stretcher to transmit thrusts from the stern panel to the sides of the boat.

4. A collapsible boat including a bottom panel, side panels and a stern panel hinged thereto, a stretcher adapted to be detachably anchored to said side panels and hinged to the stern panel at a substantially medial point thereof, and braces connecting the top and bottom of the stern panel to said stretcher, said braces being detachably anchored to one of said members and hinged to the other so as to fold up without interfering with each other or with the collapsing of the boat.

5. A folding boat adapted for power propulsion including a bottom panel, side panels and a stern panel hinged thereto, said stern panel being arranged to receive and support the propelling device, a transverse stretcher member adapted to be detachably anchored to the side panels to hold them extended, a longitudinal stretcher member connected to medial parts of said stern panel and said first stretcher member to hold the stern panel extended, and a compression member detachably connecting the lower side of the stern panel to the transverse stretcher member.

6. A folding boat adapted for power propulsion including a bottom panel, side panels and a stern panel hinged thereto, said stern panel being arranged to receive and support the propelling device, a transverse stretcher

- member adapted to be detachably anchored to the side panels to hold them extended, a longitudinal stretcher member connected to medial parts of said stern panel and said first
 5 stretcher member to hold the stern panel extended, and a hinged compression member arranged to transmit the thrust of the propelling device from the stern panel to the transverse stretcher member.
- 10 7. A folding boat adapted for power propulsion including a bottom panel, side panels and a stern panel hinged thereto, said stern panel being arranged to receive and support the propelling device, a transverse stretcher
 15 member adapted to be detachably anchored to the side panels to hold them extended, a longitudinal stretcher member connected to medial parts of said stern panel and said first stretcher to hold the stern panel extended,
 20 and a pivoted brace adapted to connect the upper part of the stern panel to the transverse stretcher member.
8. A folding boat adapted for power propulsion including a bottom panel, side panels
 25 and a stern panel hinged thereto, said stern panel being arranged to receive and support the propelling device, a transverse stretcher member adapted to be detachably anchored to the side panels to hold them extended, a
 30 longitudinal stretcher member connected to medial parts of said stern panel and said first stretcher member, to hold the stern panel extended, a bracket hinged to said stern panel and extending adjacent the lower edge there-
 35 of and a brace hinged to the transverse stretcher member and adapted to engage the end of the bracket to transmit the propeller thrust from the stern panel to the transverse stretcher member.
- 40 9. A folding boat adapted for power propulsion including a bottom panel, side panels and a stern panel hinged thereto, said stern panel being arranged to receive and support the propelling device, a transverse stretcher
 45 member adapted to be detachably anchored to the side panels to hold them extended, a longitudinal stretcher member connected to medial parts of said stern panel and said first stretcher member, to hold the stern panel extended,
 50 a bracket hinged to said stern panel and extending adjacent the lower edge thereof, a brace hinged to the transverse stretcher member and adapted to engage the end of the bracket, and a pair of pivoted braces adapted
 55 to connect the upper end portions of the stern panel to the transverse stretcher member.
10. A collapsible boat including a bottom panel, side panels and stern panel hinged
 60 thereto, stretching means for holding the side panels and stern panel in extended position, compression means cooperating with the lower part of said stern panel and said stretching means for preventing angular
 65 movement of the stern panel, said means being detachably anchored to one of said stern panel and stretching means and hinged to the other, so as not to interfere with the folding up of the boat.
- In testimony whereof I have signed this specification.
- WILLIAM L. McGRATH.

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