

Feb. 11, 1947.

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2,415,495

BOAT

Filed Jan. 28, 1944

4 Sheets-Sheet 1

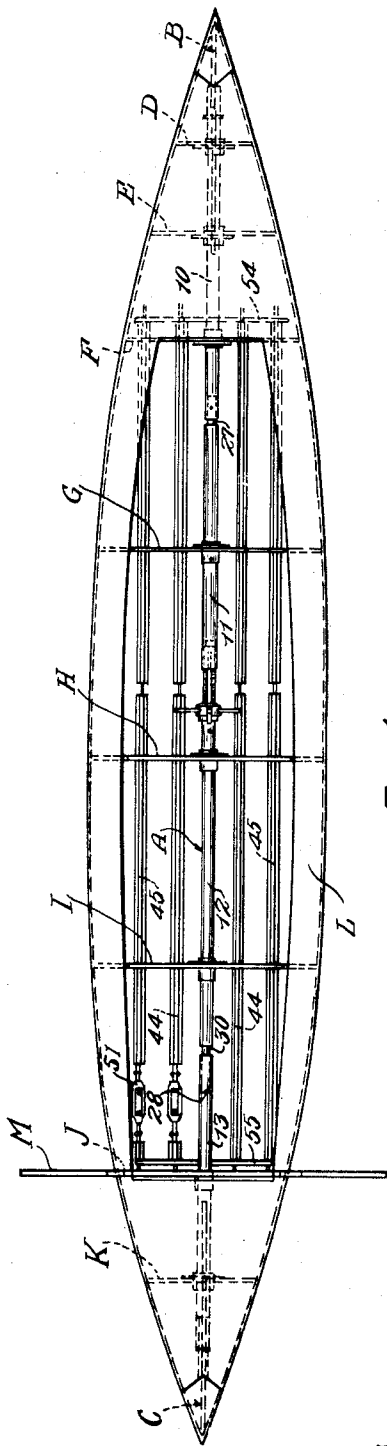


FIG. 1

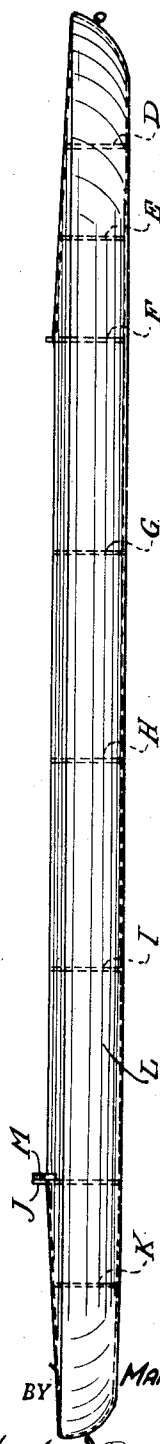


FIG. 2

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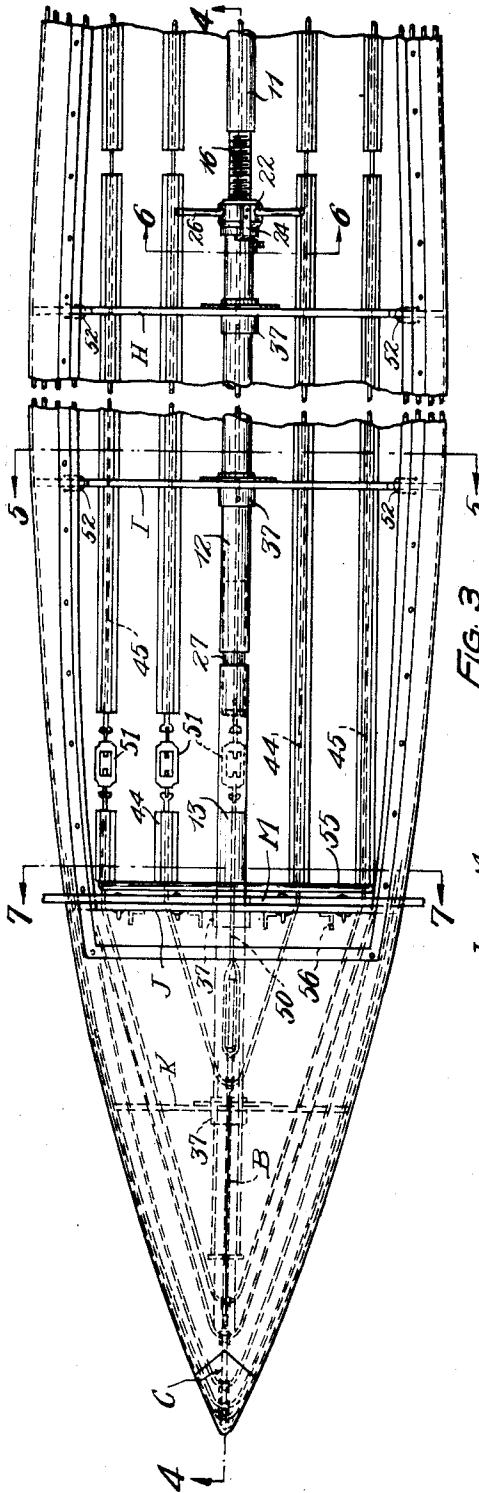


FIG. 3

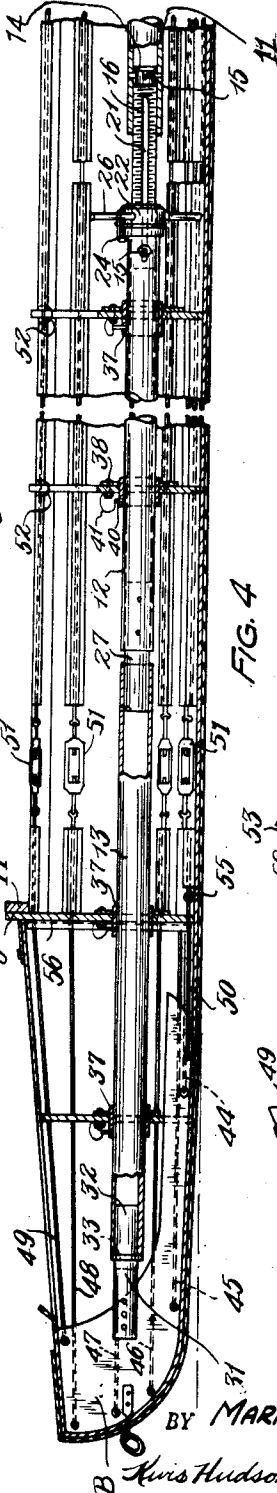


FIG. 4

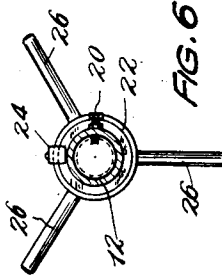


FIG. 6

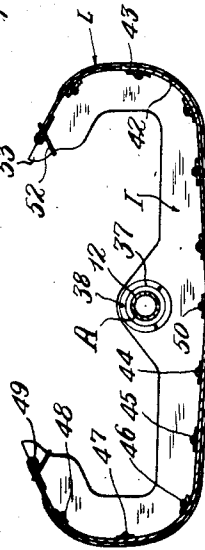


FIG. 5

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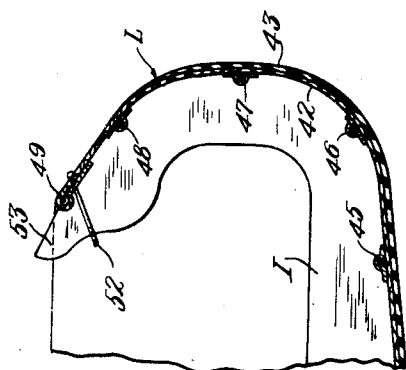


FIG. 8

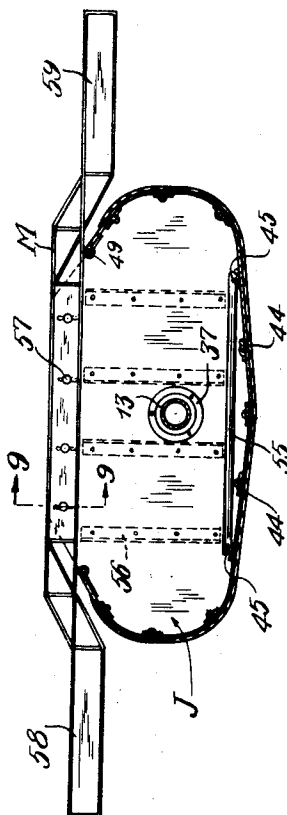


FIG. 7

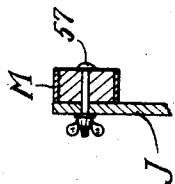


FIG. 9

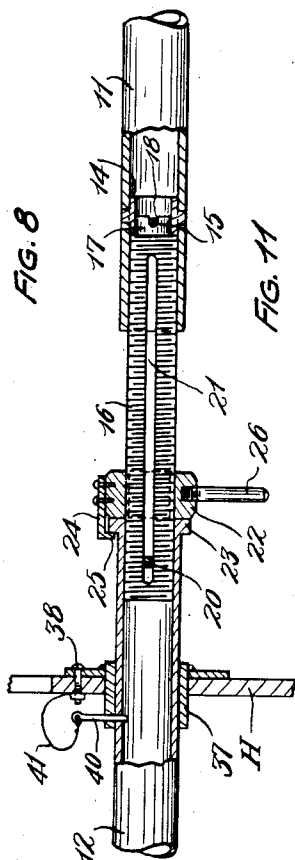


FIG. 11

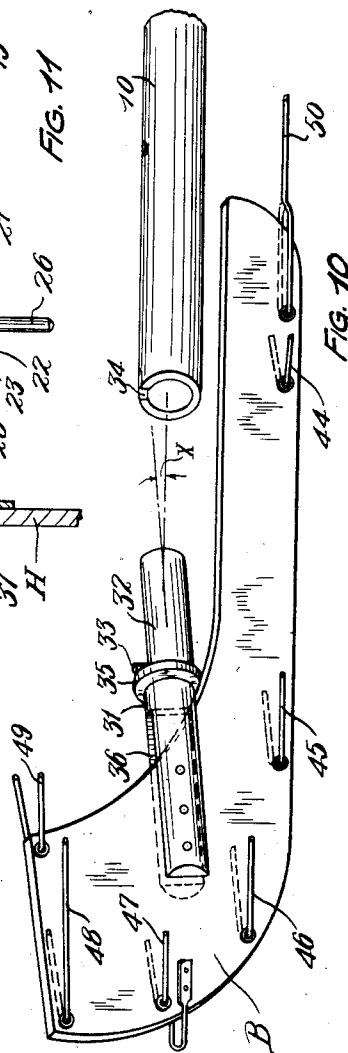


FIG. 10

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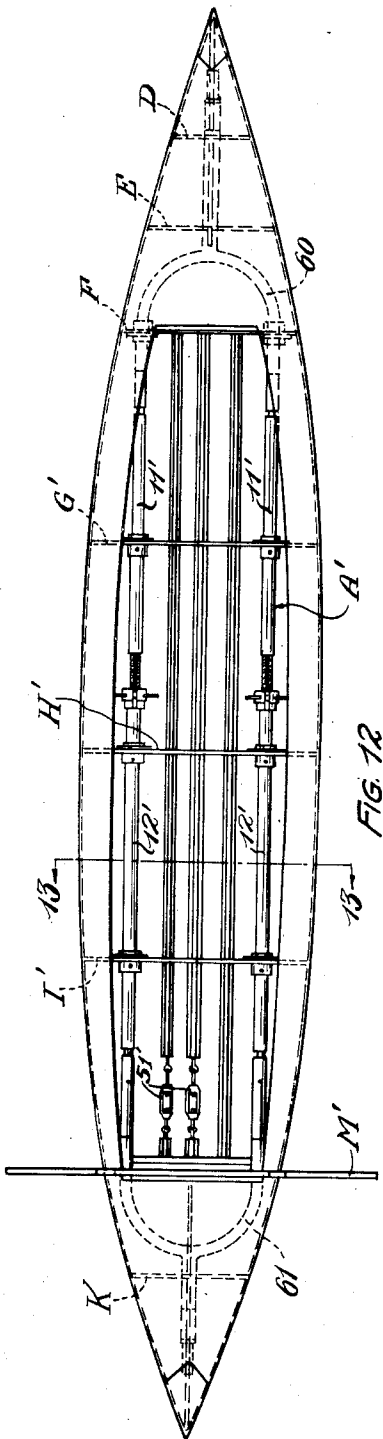


FIG. 12

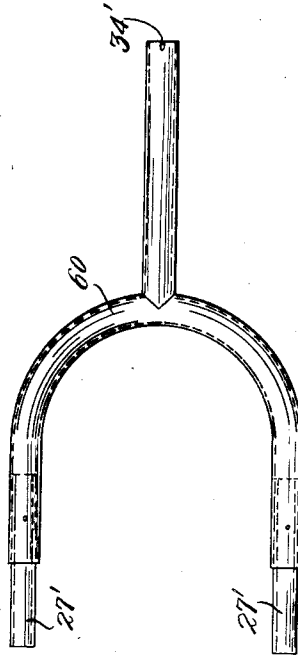


FIG. 14

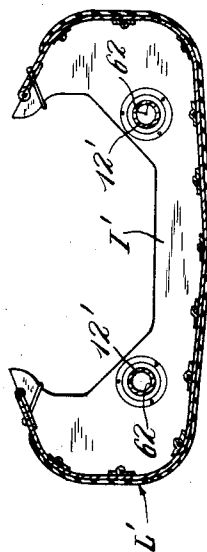


FIG. 13

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2,415,495

BOAT

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Application January 28, 1944, Serial No. 519,987

10 Claims. (Cl. 9—2)

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The present invention relates to boats and, more particularly, to a boat capable of being partly disassembled or collapsed and arranged into a relatively small package.

The principal object of the invention is the provision of a novel and improved boat, which boat can be disassembled, partly disassembled or collapsed and arranged into a small package when not in use and can be readily assembled as desired.

Another object of the invention is the provision of a novel and improved boat comprising a frame structure including a longitudinally extending stress-resisting compression member or assembly and a plurality of longitudinally spaced rigid frame members and an enclosing flexible waterproof covering for the frame structure, which covering together with the intermediate frame sections, constitute guy means for the longitudinally extending stress-resisting compression member.

The invention resides in certain constructions and combinations and arrangements of parts and further objects and advantages thereof will be apparent to those skilled in the art to which the invention relates from the following description of the preferred embodiment thereof described with reference to the accompanying drawings forming a part of this specification in which similar reference characters designate corresponding parts, and in which

Fig. 1 is a plan view of a boat embodying the present invention;

Fig. 2 is a side view of the boat shown in Fig. 1;

Fig. 3 is an enlarged view of a portion of Fig. 1;

Fig. 4 is a section with portions shown in elevation approximately on the line 4—4 of Fig. 3;

Fig. 5 is a section approximately on the line 5—5 of Fig. 3;

Fig. 6 is a section approximately on the line 6—6 of Fig. 3;

Fig. 7 is a section approximately on the line 7—7 of Fig. 3;

Fig. 8 is an enlarged view of a portion of Fig. 5;

Fig. 9 is a section approximately on the line 9—9 of Fig. 7;

Fig. 10 is a perspective view of the bow frame assembly;

Fig. 11 is an enlarged view of a portion of Fig. 4;

Fig. 12 is a view similar to Fig. 1 but showing a boat of modified construction;

Fig. 13 is a sectional view approximately on the line 13—13 of Fig. 12; and

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Fig. 14 is an enlarged detail view of a portion of Fig. 12.

Referring to Figs. 1 to 11, inclusive, of the drawings, the boat shown therein comprises a frame structure, including a longitudinally extending stress-resisting compression member or assembly A, opposite ends of which are connected to bow and stern frame members B and C, respectively, and a plurality of transversely extending intermediate rigid frame members, designated generally by the reference characters D, E, F, G, H, I, J and K and which transverse frame members are preferably though not necessarily of the web type. The frame structure is enclosed by a flexible waterproof covering L, which covering together with the intermediate transverse frame members, constitute guy means for the stress-resisting assembly A. In the particular embodiment shown, eight transverse frame members are employed, however, it is to be understood that any desired number may be used depending upon the size of the boat, etc. The outside contour of the transverse frame members corresponds with the shape of the boat at the place where the particular cross frame in question is located and the upper part of the covering L is provided with an opening which forms the cockpit of the boat.

The longitudinally extending stress-resisting compression assembly A, as shown, comprises a plurality of tube sections 10, 11, 12 and 13 adapted to be connected together and to the bow and stern frame members B and C and includes means located between two of the tube sections, in the present instance sections 11 and 12, for expanding and contracting the assembly A longitudinally so that the assembly A can be expanded to stretch the covering L about the frame structure, including the bow and stern frame members, or collapsed to permit its removal and the removal of the various transverse frame members from the covering L when it is desired to disassemble or collapse the boat. As shown, the tube section 11 is provided with a sleeve 14 welded to the interior thereof adjacent to its left-hand or aft end, see Fig. 11, and a pin 15 extending through the center of the sleeve. The sleeve 14 forms a stop for the right-hand or forward end of a threaded rod 16 projecting into the open end of the tube section 11 and provided with a reduced inner end 17 having a slot 18 which engages over the pin 15 to prevent relative rotation between the tube section and the rod while permitting the same to be readily disassembled. The aft end of the rod 16 projects into the forward

end of the tube section 12 and is maintained in assembled relation therewith by a bolt 20, see Figs. 6 and 11, fixed in the tube 12, the inner end of which projects into an elongated slot 21 extending substantially the length of the rod 16.

The rod 16 is adapted to be moved longitudinally of the tube section 12 for the purpose of expanding or contracting the assembly A by a nut member 22 threaded thereon and adapted to abut against a member 23 welded to the right-hand end of the tube section 11. The movement of the nut member 22 away from the member 23 is limited by a member 24 fixed thereto and provided with an inwardly projecting flange 25 which engages the left-hand side of the member 23. The nut member 22 is provided with a plurality of rods 26 which facilitate rotation thereof without the use of tools. As shown, three rods 26 are employed, each of which is threaded in a tapped hole in the nut member 22, however, any desired number of rods may be used and they may be fixed to the nut member in any desired manner.

The tube sections 10 and 11, as shown, are connected together by a short rod 27 projecting into their adjoining ends. The rod 27 is fixed within the aft end of the tube section 10 while the opposite end thereof is slidable within the tube section 11. Relative rotation between the tube section 10 and the rod 27 is prevented by a pin fixed in the tube 11 projecting through the center thereof and received within a slot formed in the end of the rod 27. The tube sections 12 and 13 are connected together in a similar manner by a rod 30. While one particular form of dismantlable or collapsible stress-resisting assembly has been described and shown other suitable constructions may be employed and means other than the threaded rod and cooperating nut construction shown may be employed for expanding and contracting the length of the assembly, for example, a toggle mechanism, a ratchet mechanism, or a friction jack mechanism, etc. It is also to be understood that any number of sections may be employed and any suitable means used to connect the sections together so long as the stress-resisting assembly is capable of being dismantled or collapsed and of being expanded for the purpose of tightening or stretching the covering L over the frame structure.

The forward end of the stress-resisting assembly A is connected to the bow frame member B by a member 31, see Fig. 10, fixed to the bow frame proper and provided with a reduced end 32 slidable within the forward end of the tube section 10. A pin 33 fixed to the member 31 and engageable within a slot 34 in the end of the tube 10 prevents relative rotation between the tube section 10 and the member 31. A collar 35 fixed to the member 31 as by being welded thereto forms an abutment for the end of the tube section 10. The bow frame proper is preferably made of relatively light material, such as plywood, and in the embodiment shown, the forward end of the member 31 is provided with a slot 36 for the reception of the bow frame proper. Preferably the center line of the portion 32 of the member 31 forms a slight angle, designated in the drawings as α , with the longitudinal center line of the stress-resisting assembly A prior to the assembly of the tube section 10 with the member 31. This construction slightly raises, or has a tendency to slightly raise, the bow of the boat when the parts are assembled. The tube section 13 at the aft end of the stress-resisting assembly A is connected to

the stern frame C in a manner similar to that in which the tube section 10 is connected to the bow frame B and will not be described in detail.

As previously stated, the shape of the various transverse frame members corresponds with the cross-sectional shape of the boat at the place where the particular frame member is located and obviously any desired suitable shape and number of members may be employed. The transverse frame members are preferably made of light strong material, such as plywood, and those located at the cockpit of the boat are preferably cut out as shown in Fig. 5 so as to obstruct the cockpit of the boat as little as possible. The transverse frame members are provided with apertures through which the various tube sections of the stress-resisting assembly A extend and are preferably connected to the assembly A in such a manner that they will be retained in their desired locations longitudinally of the boat. As shown, the transverse frame member H is provided with a flanged sleeve member 37 fixed thereto as by bolts 38 and through which the tube section 11 of the assembly A projects. Relative movement between the sleeve member 37 and the tube 11 is prevented by a pin 40 projecting through aligned apertures in the sleeve 37 and the tube 11. The various transverse frame members are connected to the assembly A in a similar manner. When it is desired to remove the stress-resisting assembly A from the transverse frame members, the pins 40 can be withdrawn and the tube sections removed. Preferably the pins are attached to wires 41 fixed to the frame members so that they will not be lost while the boat is dismantled.

The waterproofed flexible covering L shown forms an enclosure for the frame structure and engages the peripheries of the numerous transverse frame members. The covering L comprises a waterproof canvas member or part 42, the lower portions of which are further waterproofed by an outer rubber-like coating 43, see Figs. 5 and 8. As shown, the covering L is reinforced by a plurality of continuous flexible cables 44, 45, 46, 47, 48 and 49 encircling the frame structure and preferably fixed to the canvas 42 by tapes sewed to the interior of the covering, and a cable 50 extending between the bow and stern frame members B and C. The respective cables lie in substantially horizontal planes and each cable is provided with a turnbuckle 51 for adjusting its length. As shown, the cables pass through holes in the bow and stern frame members, which construction retains the bow and stern frame members within the covering when the boat is dismantled and collapsed. Alternatively a single cable looped around the frame structure a plurality of times can be employed in place of the plurality of individual cables shown. It is also to be understood that the cables need not necessarily pass through holes in the bow and stern frame members but may merely engage the peripheries thereof, in which event the frame members are preferably provided with suitable notches for the reception of the cables.

As an alternative construction, the cables need not be sewn or attached to the interior of the covering L but can be entirely separate therefrom and assembled with the frame structure as a separate unit or permanently secured to the frame structure, for example, as by passing through holes in the transverse frame members similar to the holes now employed in the bow

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and stern frame members. In small size boats, the cables may be omitted altogether provided the covering is made strong enough to withstand the stresses to which it is subject in use.

The covering L adjacent to the opening which forms the cockpit of the boat is preferably provided with loop-like members 52 adapted to engage over the projecting ends 53 of the transverse frame members so as to better retain the covering in position on the frame structure. A plurality of spreader members 54 and 55, see Figs. 1 and 3, located adjacent to the fore and aft ends, respectively, of the cockpit help to strengthen the bottom of the boat. As shown, the spreader members engage opposite parts of the cable 45. Each of the members is provided with a hole adjacent to one end through which the cable passes while the other ends are provided with slots adapted to detachably receive the cable. Additional spreader members may be employed if desired.

As shown, the frame member J located at the aft end of the cockpit is reinforced by a plurality of vertically positioned angle irons 56, see Fig. 7, extends above the gunwales, and is adapted to receive a transverse bracket member M detachably secured thereto by a plurality of thumb screws 57. The bracket member M extends to opposite sides of the boat where it is provided with rectangular sections 58 and 59 adapted to receive outboard motors. A similar bracket member may be attached to any of the other transverse frame members if desired. The particular construction of the frame M forms no part of the present invention. Preferably it is made as light as possible and, as shown, consists of a metal reinforced wood member.

The stress-resisting assembly A is spaced from the sides and the bottom of the boat, see Figs. 5 and 7, and the center line thereof corresponds substantially with the intersection of the vertical and horizontal center planes of the boat. The cables and/or covering L extends along not only both sides of the stress-resisting assembly but also above and below the same. The construction is such that the stress-resisting assembly can be made relatively light because the transverse frame members, in combination with the cables and/or covering, form a guy means therefor and prevent its bending under the various stresses to which it is subject in use. If the stress-resisting assembly is not straight when the boat is first assembled, it can be straightened by adjusting the turnbuckles 51 on the various cables in a manner similar to the way the mast of a sailboat is straightened by adjusting the various guy wires or stays therefor. The cross frames, in the present instance, serve the same or a similar function as that of the cross arm of the mast.

The boat shown in Figs. 1 to 11 of the drawings and described above is intended to be paddled or otherwise manipulated by persons sitting side by side, one on either side of the stress-resisting assembly A. As shown, two persons can sit between each of the transverse frame members F to J, inclusive. Preferably, the transverse frame members which extend across the cockpit of the boat, are cut out as indicated in Fig. 5 while the other frames are preferably solid to afford greater strength. Obviously any desired seating arrangement may be employed.

Where the boat is intended to be manipulated by one person or a number of persons sitting in tandem, the stress-resisting assembly is prefer-

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ably constructed as shown in Figs. 12, 13 and 14, which disclose a boat similar in construction to the boat shown in Figs. 1 to 11, except that the stress-resisting assembly A' intermediate its ends is divided and opposite sides thereof extend along the sides of the boat in such a manner that a person or persons can sit between the same. Corresponding parts are designated by the same reference characters with prime marks affixed thereto.

The tube sections 10 and 13 of the boat shown in Figs. 1 to 11 are replaced by yoke members 60 and 61 located at the bow and stern of the boat, the single prongs of which yoke members engage the bow member 31' and the corresponding stern member in a manner similar to that in which the corresponding members engage the tube sections 10 and 13. The yoke members are connected together and adapted to be moved towards and from each other to expand and contract the stress-resisting assembly A' by a pair of side members, including tube sections 11' and 12' similar in construction to the tubular sections 11 and 12 previously described and connected together in a similar manner. The intermediate transverse frame members F', G', H' and J' of the boat shown in Figs. 12, 13 and 14 are similar in construction to the frame members shown in Figs. 1 to 11 except for the fact that the central openings through the members shown in Figs. 1 to 11 are replaced by pairs of openings 62 adjacent to but spaced from the sides of the frame members. The function of the stress-resisting assembly A' shown in Figs. 12, 13 and 14 is the same as that of the stress-resisting assembly A shown in the preceding figures. When either of the boats shown are not in use, the stress-resisting assemblies and the transverse frame members can be removed and assembled with the cover L and the other parts into a relatively small package.

From the foregoing, it will be apparent that the objects of the invention heretofore enumerated and others have been accomplished and that a new and improved collapsible boat has been provided, which boat is light in weight and can be arranged into a relatively small package when dismantled and which can also be readily assembled for use. While the preferred embodiment of the invention has been described in considerable detail, it is to be understood that the invention is not limited to the particular constructions shown, which constructions may be varied within the scope of this invention and it is my intention to hereby cover all adaptations, modifications and variations thereof which come within the practice of those skilled in the art to which the invention relates and within the spirit and scope of the appended claims.

Having thus described my invention, what I claim is:

1. In a boat the combination of a bow frame member, a stern frame member, a plurality of longitudinally spaced transverse frame members intermediate said bow and stern frame members, a flexible waterproof covering having an opening in the top enclosing said frame members, and a longitudinally extending stress-resisting member connected to said bow and stern frame members and extending through said transverse frame members spaced from said covering.

2. In a boat the combination of a bow frame member, a stern frame member, a plurality of longitudinally spaced transverse frame members intermediate said bow and stern frame members,

a longitudinally extending member connected to said bow and stern frame members and extending through said transverse frame members, a flexible cable-like member extending around said frame members and connected thereto adjacent to their outer edges, a flexible waterproof covering having an opening in the top enclosing said frame members and said cable-like member, and means for detachably connecting said covering to a plurality of said frame members.

3. In a boat the combination of a bow frame member, a stern frame member, a plurality of longitudinally spaced transverse frame members intermediate said bow and stern frame members, a longitudinally extending member detachably connected to said bow and stern frame members and extending through said transverse frame members, a plurality of vertically spaced flexible cable-like members extending around said frame members and connected thereto adjacent to their outer edges, and a flexible waterproof covering having an opening in the top enclosing said frame members and said cable-like members.

4. In a boat the combination of a bow frame member, a stern frame member, a plurality of longitudinally spaced transverse frame members intermediate said bow and stern frame members, a longitudinally extending composite member connected to said bow and stern frame members and extending through said transverse frame members, means for movably connecting together a plurality of the parts of said composite member, a cable-like member extending around said frame members and engaging the same adjacent to their outer edges, and a flexible waterproof covering having an opening in the top enclosing said frame members and said cable-like member.

5. In a boat the combination of a bow frame, a stern frame, a plurality of longitudinally spaced transverse frames intermediate said bow and stern frames, a longitudinally extending composite member connected to said bow and stern frames and extending through said transverse frames, means for movably connecting together a plurality of the parts of said member, a flexible cable-like member extending around said frames and engaging the same adjacent to their outer edges, means for varying the length of one of said members, and a flexible waterproof covering having an opening in the top enclosing said frames and said cable-like member.

6. In a boat the combination of a bow frame, a stern frame, a plurality of longitudinally spaced transverse frames intermediate said bow and stern frames, a longitudinally extending composite member extending through said transverse frames, means for movably connecting together a plurality of the parts of said member, means for movably connecting said member to said bow and stern frames, means for varying the length of said member, a flexible cable-like member extending around said frames and connected thereto adjacent to their outer edges, and a flexible waterproof covering having an opening in the top enclosing said frames and said cable-like member.

7. In a boat the combination of a bow frame, a stern frame, a plurality of longitudinally spaced transverse frames intermediate said bow and stern frames, a longitudinally extending composite member extending through said transverse frames, means for movably connecting together a plurality of the parts of said member, means for movably connecting said member to said bow and stern frames, a flexible cable-like member

extending around said frames and connected thereto adjacent to their outer edges, means for varying the length of said endless cable-like member, and a flexible waterproof covering having an opening in the top enclosing said frames and said cable-like member.

8. In a boat the combination of a rigid bow frame, a rigid stern frame, a plurality of longitudinally spaced rigid transverse frames intermediate said bow and stern frames, a longitudinally extending rigid composite member extending through said transverse frames and spaced from the edges thereof, means for detachably connecting together a plurality of the parts of said member, means for detachably connecting said member to said bow and stern frames, means for varying the length of said member, means for detachably connecting said cross frames to said member, a plurality of vertically spaced flexible endless cable-like members extending around said frames and connected thereto adjacent to their outer edges, means for varying the length of said endless cable-like members, a flexible waterproof covering having an opening in the top enclosing said frames and said cable-like members, and means for detachably fastening said covering to a plurality of said frames.

9. In a boat, the combination of a frame structure comprising a longitudinally extending stress-resisting assembly, means for expanding said stress-resisting assembly lengthwise, bow and stern frame members connected to opposite ends of said stress-resisting assembly, a plurality of intermediate transverse frame members of the web type connected to said stress-resisting assembly at spaced points, a plurality of transversely spaced flexible cable-like members connected to said bow and stern frame members and extending over the outer edges of said web frame members, and a flexible waterproof covering enclosing said frame structure and cable-like members and having an opening in the top thereof, said stress-resisting assembly extending through said web frame members in spaced relation to said covering.

10. In a boat, the combination of a frame structure comprising a longitudinally extending stress-resisting assembly, bow and stern frame members connected to opposite ends of said stress-resisting assembly, a plurality of intermediate transverse frame members of the web type connected to said stress-resisting assembly at spaced points, and a flexible waterproof covering enclosing said frame structure and having an opening in the top thereof, said stress-resisting assembly extending through said web frame members in spaced relation to said covering.

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