United States Patent [19]

Jackowski

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[54] **BOAT AND METHOD OF CONSTRUCTION**

[76] Inventor: **Stanley L. Jackowski,** 315 11th St., West Point, Va. 23181

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[52] **U.S. Cl.** ..... **9/6,** 9/2 C

[51] **Int. Cl.** **B63b 5/00**

[58] **Field of Search** ..... 9/6, 6.5, 2 R, 2 C, 2 S, 9/2 F, 2 A

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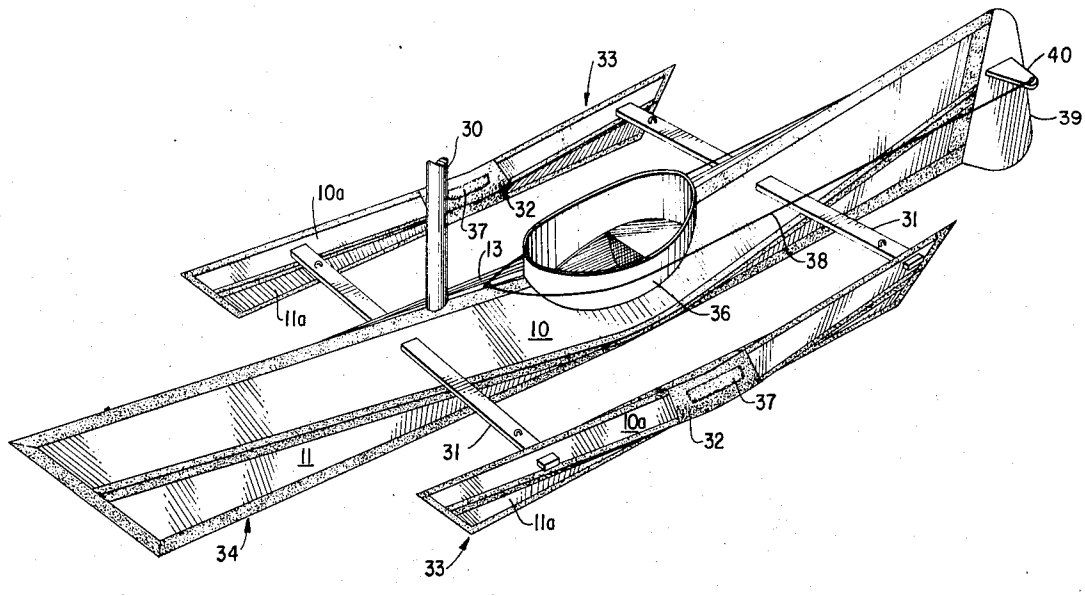
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Primary Examiner—Trygve M. Blix
Assistant Examiner—Donald W. Underwood
Attorney, Agent, or Firm—Auzville Jackson, Jr.

[57] **ABSTRACT**

A novel boat and method of constructing same utilizing four substantially equally sized flat panels hinged together along the length to form an elongated tube which has its ends flattened and fastened together to form a bow and stern with two opposite hinges forming the gunnels, the bottom hinge forming the keel line and the top hinge extending along the deck line.

10 Claims, 10 Drawing Figures



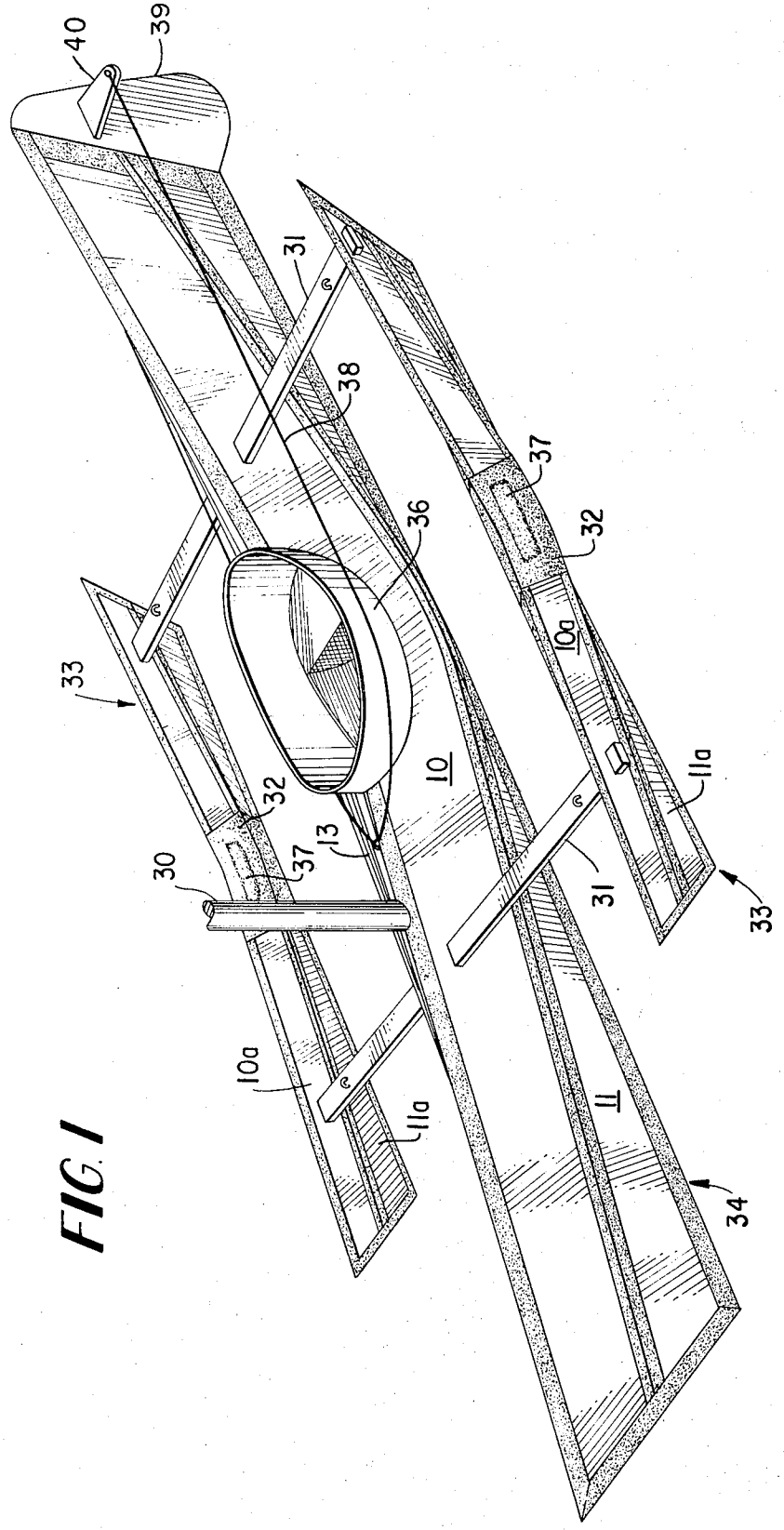


FIG. 1

FIG. 2

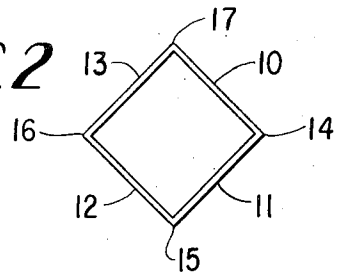


FIG. 3

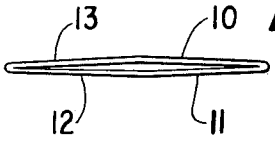


FIG. 4

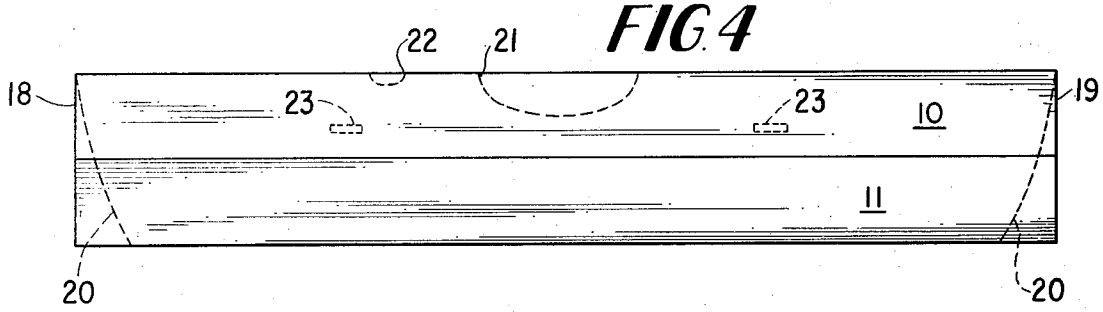


FIG. 5

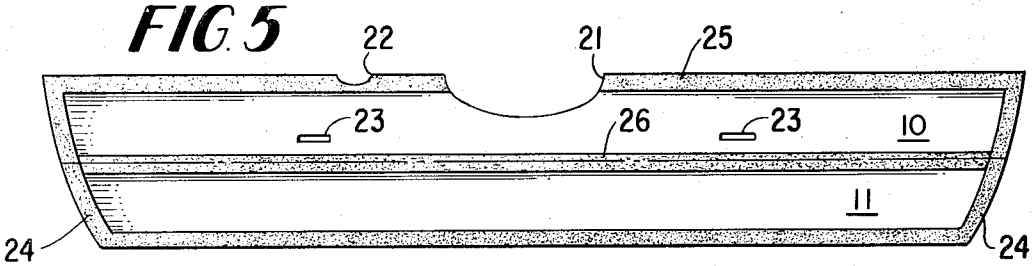


FIG. 6

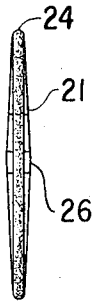


FIG. 7

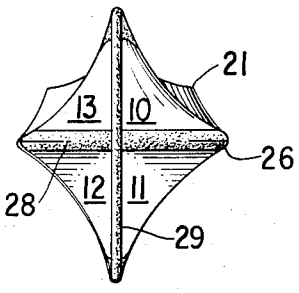


FIG. 8

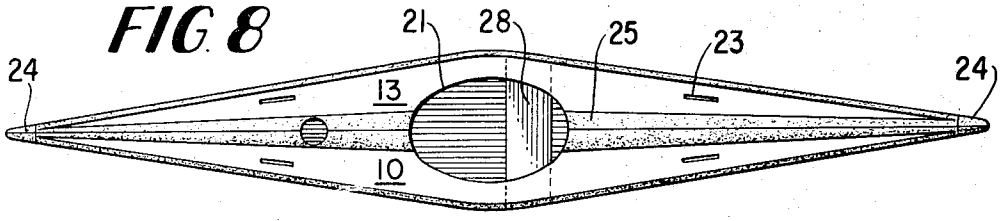


FIG. 9

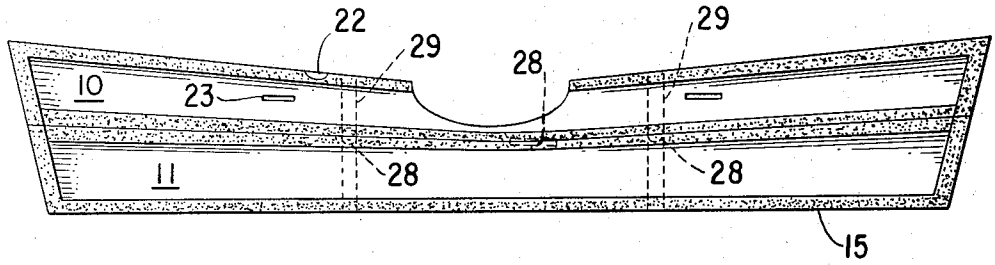
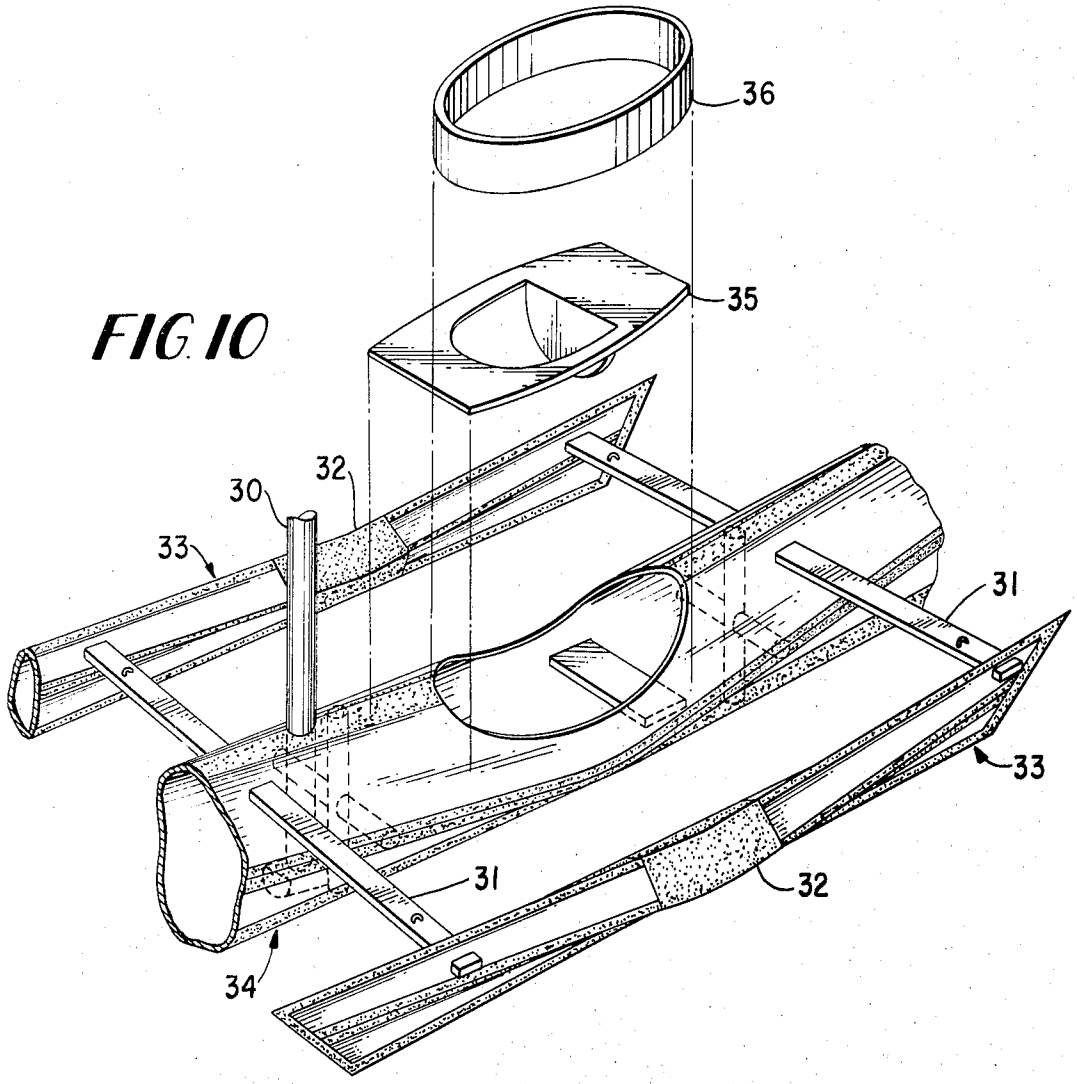


FIG. 10



BOAT AND METHOD OF CONSTRUCTION

BACKGROUND OF THE INVENTION

The invention relates to a boat and method for constructing same from four substantially equally sized panels assembled into a tube by hinges running longitudinally to connect the panels together with at least one end flattened together to form a bow, thus providing a unique and novel approach to boat building to provide an extremely economic method of providing boats to the public.

Recreational boating has become a very important business and society more and more turns to the marine environment to seek its various pleasures. There has long existed a need for an extremely inexpensive boat capable of being manufactured from inexpensive materials in a simple manner so as to provide a boat which could be purchased at a price far less than the average boat presently sells for. A boat capable of being collapsed for ready transportation to the recreational area is also a huge advantage to those who do not have a place to keep a boat near the water.

Presently the largest segment of recreational boating is manufactured utilizing glass fiber reinforced plastic laid up inside of a female mold to provide a hull having the shape of the mold. There are numerous variations of this process as well as the utilization of other techniques to build boats such as riveted aluminum boats, foamed plastic boats, as well as the traditional planked wooden boats as have been manufactured for many years. Most of these standard boat building techniques are satisfactory for their purpose but do not provide a boat having the unique economic and transportability features of the present boat. Other boats in the past have been provided which are composed of collapsing canvas and other materials but again they do not provide the unique advantages of the present boat and its method of construction.

The present invention permits the use of weatherproof paper formed into a square tube having integral hinges with the two ends of the tube flattened and fastened together. Such an approach permits a boat to be manufactured very inexpensively with a minimum cost of materials and a minimum labor content. This also enables a boat to be sold at such an inexpensive price that it is capable of being purchased by vast numbers of people who would not otherwise purchase a boat.

While the boat is capable of numerous variations and can be made in a more expensive fashion than the use of weatherproof paper panels, such variations and choice of materials will readily be apparent to a man skilled in the art from reading the following disclosure.

BRIEF SUMMARY OF THE INVENTION

The invention relates to a method for constructing a boat and the like utilizing four elongated flat panels of the same width and approximately the same length with the panels being fastened together into a square tube either through the use of integral hinges or hinges added at the joint or a combination of the two. This tube is flattened at least at one end and preferably in a vertical plane so as to form a vertical bow and the two flat panels at the topmost region are notched and the entire boat spread so that the top portion of the boat can shorten at the region of the notch. A spreader is inserted in the boat to maintain its spread position and the notched area can provide a cockpit or if the boat is to be used as a pontoon and the like it can be covered to make it a sealed compartment. The spreaders may be removed if such is desired so the boat can be collapsed for easy transport and in some instances the flattened boat can be folded back on itself to half its length. There are numerous variations and additions that can be made to this basic concept as will be seen from the description which appears below. For example, the boat can be the main hull for a trimaran with two smaller boats being provided as outriggers.

Many objects and advantages of the present invention will become apparent from the following description taken in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an isometric view of a sailing trimaran made in accordance with the invention.

FIG. **2** is a transverse cross-sectional view of a square tube utilized in making a boat.

FIG. **3** is a square tube of FIG. **2** after it has been collapsed flat.

FIG. **4** is a side elevational view of FIG. **3** after it has been reopened and collapsed to a vertical position.

FIG. **5** is a view of FIG. **4** after notching, trimming the ends and applying tape to the joints.

FIG. **6** is an end view of FIG. **5.**

FIG. **7** is the same as FIG. **6** after the boat has been spread.

FIG. **8** is a plan view of a spread boat of FIG. **7.**

FIG. **9** is a side elevational view of the spread boat of FIG. **8.**

FIG. **10** is a detailed exploded view in perspective of a portion of the trimaran of FIG. **1.**

DETAILED DESCRIPTION OF THE INVENTION

We now turn to a detailed description of the boat of the present invention and its method of construction.

First, with reference to FIG. **2,** there is shown a transverse cross-sectional view of a square tube utilized in making a boat. The square tube is made of four elongated flat rectangular panels with first panel **10** being joined along one of its longitudinal edges to a second panel **11** through the intermediary of a first hinge **14.** The remaining longitudinal side of second panel **11** is joined to a mating edge of a third panel **12** through an intermediary second hinge **15.** Again the remaining longitudinal side of third panel **12** is joined to the adjacent elongated side of fourth panel **13** through a third hinge **16** and the remaining elongated side of the fourth panel **13** is joined to the adjacent elongated edge of first panel **10** by fourth hinge **17.** The hinges **14, 15, 16** and **17** may be integral with the panels, may be provided by a score line in a flat panel before being shaped into the tube, may be formed by an attached continuous elongated hinge such as scored polyethylene, may be a reinforced adhesive tape or any combination or equivalent of these various methods of providing hinges. The hinge must be continuous throughout the adjacent portions and either by itself or with the addition of suitable reinforcing and/or protective material be water tight in the final version when it has been made into a boat.

The panels **10, 11, 12** and **13** may be made of a plywood-plastic foam-plywood sandwich material, plastic sheets or other similar materials that are reasonably stiff, inexpensive, capable of some flexing and of sufficient waterproofness either as made or after treatment to withstand the marine environment. However, the preferred material for a 12-foot long hull is an 0.090 inch thick solid laminated kraft board made with waterproof resins. When plywood laminates are used, the panels are held together by attached hinges such as linear scored polyethylene hinges or reinforceing tape or a combination of the two. The kraft board in the 0.090 inch and similar thicknesses can be prescored to provide fold lines as integral hinges which may, optionally, have an adhesive tape applied thereover.

After the square tube has been provided, it is collapsed as shown in FIG. **3** so that the two pairs of adjacent panels such as 10, 11 and 12, 13 are flattened to face one another. AS shown in FIG. **4**, the tube is opened and collapsed in a vertical position so that panel **12** faces panel **11** and panel **13** faces panel **10.** The flattened tube of FIG. **4** is marked by dotted lines so that cuts for the ends made along line **20** will provide a bow end **18** and a stern end **19.** Also, a cut-out **21** for the cockpit, a cut-out **22** for the mast **30,** and two cut-outs **23** for outriggers **33** are provided. While these cut-outs can be made when in other than a flattened tubular form it is preferred that they be cut in this manner.

After the cut-outs have been made the facing panels forming the bow and sterns are fastened together by bow and stern tapes **24** which cover the raw edges and reinforce and protect the bow and stern ends. The tape may be used as the sole fastening means but it is preferred that additional fastening be supplied either through gluing the bow and stern panels together or using staples or both. Likewise deck tape **25** can be applied to the upper fourth hinge **17** between fourth panel **13** and first panel **10.** Still further, gunnel tape **26** may be applied for protection and reinforcing purposes along first hinge **14** and third hinge **16** and bottom or keel tape may be applied along the second hinge **15** which joins second panel **11** and third panel **12.** It is to be noted that it is not necessary to apply a tape in all instances as the type of hinge itself may provide sufficient protection and strength along the hinges or the tape itself may be the hinge.

The next step is to spread apart the assembled flattened panels at a position intermediate the ends and place one or more spreaders **28** therein to hold the gunnels apart. The spread from FIG. **6** to FIG. **7** illustrates the changed shape of the panel as it is moved from its flattened to its spread position. It is to be noted that the bow and stern still provides a vertical or knifelike entry and exit respectively as it goes through the water. The spreader may serve also as a cockpit seat or other function. However, it is essential that it can be provided in a manner that it spreads in a transverse direction the flattened tube intermediate the bow and stern portions. After being spread foam can be utilized as a spreader to maintain the spread or the pressure of the expanding foam itself can be utilized to cause the spreading. It is to be noted that during the spreading the deck length decreases as the cockpit opening or similar cut-out decreases in distance fore and aft. As seen in FIG. **9** a vertical spacer **29** may also be utilized to stabilize the distance apart between the deck and bottom portions of the boat. While one spreader may be sufficient there may be utilized any number of spreaders and spacers as the size and shape of the boat and materials it is made from are varied.

It is quite obvious that the manufacture of the boat just described can be varied in the manner in keeping with this invention. For example, the bow and stern may be of a different vertical configuration and may be truly vertical rather than curved as is shown in the figures. Still further, a boat used as a kayak would not need the openings for the outriggers or the openings for the mast but would have the cockpit with a suitable edging material applied to give a smooth rounded surface. Still further, if the boat is not to be sat into but merely to be used as a float, it is only necessary that the cockpit cut-out **21** be a simple cutting or notching across the two panels forming the deck, said notching being between 50 percent and 80 percent across the two panels adjacent the deck hinge. This permits the spreading to take place and then the notched or cut-out portion can be covered to be made water tight to thus form a float. It is also obvious that more than one cut-out on the deck can be provided, all within the keeping of the invention.

Reference is now made to FIG. **1** where an application of the invention to a trimaran is shown. Here a mast **30** has been inserted through the cut-out **22** for the mast **30** and is suitably supported at its lower end on a bottom support and around the openings for the mast. Outrigger struts **31** are inserted through the cut-outs **23** for the outrigger **33,** which have been reinforced around the openings, and are used to support two outriggers **33** which are made similarly to the main hull except on a smaller scale with first panel **10A** and second panel **11A** corresponding to first panel **10** and second panel **11** of the main hull. There is likewise a corresponding third and fourth panel all suitably interconnected by four hinges running along the longitudinal adjoining surfaces of the four panels and likewise the bow and stern portions of the outriggers have a suitable protective tap or other covering applied thereto to protect it from the elements and to give a finished end. In the preferred embodiment tapes are applied at all the hinged surfaces both for reinforcing and decorative purposes and the center cut-out or notch to permit the bending of the deck hinge is covered by a suitable cover **32** after reinforcing strips **37** have been applied to the deck panels.

Attention is now drawn to the exploded view of a partial perspective section of the trimaran in FIG. **10** where the bottom reinforcement for the mast and the use of two cruciform spreaders for both vertical spacing and horizontal spreading are shown. In addition to these cruciform spreaders being shown in dotted lines in FIG. **10** and in side view in FIG. **9** there is also shown a seat support **28** which acts as a spreader. In addition to these members the main hull **34** has a cockpit insert and back rest **35** which integrates with the hull to provide additional stiffening and spreading and a cockpit coaming **36** which further integrates with the hull to enhance its stiffness and strength. It is to be noted in FIG. **10** that the cross-sectional view of the four panels are shown to have taken a rounded form. This depends on the stiffness of the panels as a very stiff panel may approach a flat configuration whereas a kraft paper laminate of 0.090 inches thickness, if it absorbs a slight amount of moisture, will be more rounded.

This flexibility permits, in some cases, the spreaders and spacers to be removed and the structure flattened and folded bow to stern. In this form it is usually easier to store and transport.

The sailing trimaran has a steering arrangement consisting of a tiller line **38** which is connected to rudder **39** through two tiller posts **40.**

Preferably, the boat is finished in any desired color by a waterproof paint but it may be left in an unpainted stage, relying merely on the colors of the materials of construction for the final finish.

While a trimaran has been used as a specific embodiment, it should be understood that the method and structures made thereby may be embodied in other forms and that the invention is applicable to other types of marine vessels with the details of construction, method steps and choice of materials being subject to variations without departing from the spirit or essential characteristics thereof. Therefore, the described embodiment is to be considered in all respects as illustrative and not restricted, the scope of the invention indicated by the appended claims rather than by the foregoing description and all changes which come within the meaning and range of the equivalency of the claims are intended to be embraced therein.

What is claimed is:

1. A method for constructing a boat and the like comprising the following steps:

provide a flattened tube having a first and a second end made of first, second, third and fourth elongated flat panels of the same width and approximately the same length with said first panel being hingedly connected by first and fourth hinges along its two elongated sides to the elongated sides of said second and said fourth panels, respectively, and said third elongated panel being hingedly connected by second and third hinges to the remaining elongated sides of said second and fourth panels, respectively,

seal said first end of said tube so that a first end of said first panel is contiguous to a first end of said fourth panel and a first end of said second panel is contiguous to a first end of said third panel so as to provide a bow for said boat,

seal said second end of said tube to provide a stern,

select one of said four hinges to be located in the center of the deck of said boat, two hinges adjacent to said deck hinge to be hinges located at the gunnels of said boat and the remaining hinge to be located along the bottom of said boat,

make a transverse cut intermediate said first end and said second end of said tube across the hinge to be located in the center of the deck of said boat and between 50 percent and 80 percent of the width across the two panels adjacent said deck hinge,

spread the panels apart in the vicinity of said opening so that the deck is shortened and said gunnel hinges are spread to approximately their extreme width, and

provide a spreader means to maintain said gunnels spread apart.

2. The method of claim **1** wherein the second end is sealed so that a second end of said first panel is contiguous to a second end of said fourth panel and a second end of said second panel is contiguous to a second end of said third panel so as to provide said stern for said boat.

3. The method of claim **2** wherein said transverse cut defines a cockpit and the edge of said cut is finished to provide a smooth surface by inserting a cockpit coaming.

4. The method of claim **2** wherein said spread means is removed and the panels flattened for easy transport or storage.

5. The method of claim **4** wherein the flattened panels are folded bow to stern to shorten the structure for easy transport or storage.

6. The method of claim **2** wherein at least two of said panels are scored to provide integral hinges.

7. A marine vessel having first, second, third and fourth elongated panels of equal width and approximately the same length with each panel having a first and a second end and a first and a second elongated side;

a first hinge forming a first gunnel connecting said second elongated side of said first panel to said first elongated side of said second panel,

a second hinge forming a bottom line connecting said second elongated side of said second panel to said first elongated side of said third panel,

a third hinge forming a second gunnel connecting said second elongated side of said third panel to said first elongated side of said fourth panel,

a fourth hinge forming a deck line connecting said second elongated side of said fourth panel to said first elongated side of said first panel,

a bow for said marine vessel having said first ends of said first and fourth panels attached to one another and said first ends of said second and third panels attached to one another,

a stern for said marine vessel formed by sealing said second ends of said panels,

a cut intermediate the ends of said marine vessel extending transversely across the deck and between 50 percent and 80 percent of the width across said first panel from its said first elongated side towards its said second elongated side and between 50 percent and 80 percent of the width across said fourth panel from its said second elongated side towards its said first elongated side,

and a spreader means for transversely spreading said first gunnel from said second gunnel intermediate the ends of said marine vessel.

8. The marine vessel of claim **7** wherein said cut is in the form of a cockpit,

coaming means surrounding said cockpit to provide a finished surface, and

said stern for said marine vessel having said second ends of said first and fourth panels attached to one another and said second ends of said second and third panels attached to one another.

9. The marine vessel of claim **7** wherein said spreader means is removable so that said vessel may be flattened and said panels are sufficiently flexible so the ends of the flattened vessel can be folded to one another for easy transport and storage.

10. The marine vessel of claim **8** in the form of a main hull for a sailing trimaran,

two outriggers similar to said main hull but smaller, each consisting of four elongated hinged together panels located on each side of said main hull,

two outrigger struts fastened to said main hull at the middle of said struts and fastened at the ends to said outriggers,

a spacer means for supporting the deck of said main hull spaced from the bottom of said main hull,

a mast supported by the bottom and deck of said main hull,

a rudder located at the stern of said main hull, and

a tiller means for moving said rudder.

* * * * *