Jan. 17, 1961 C. A. BRUVOLD 2,968,271

CATAMARAN

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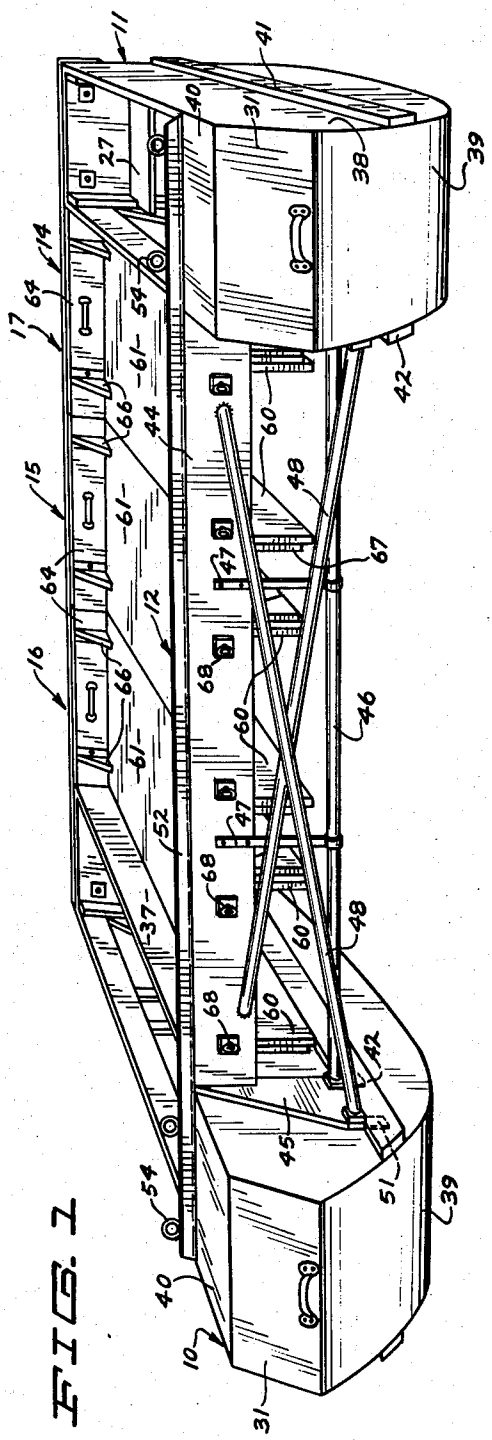


FIG. 1

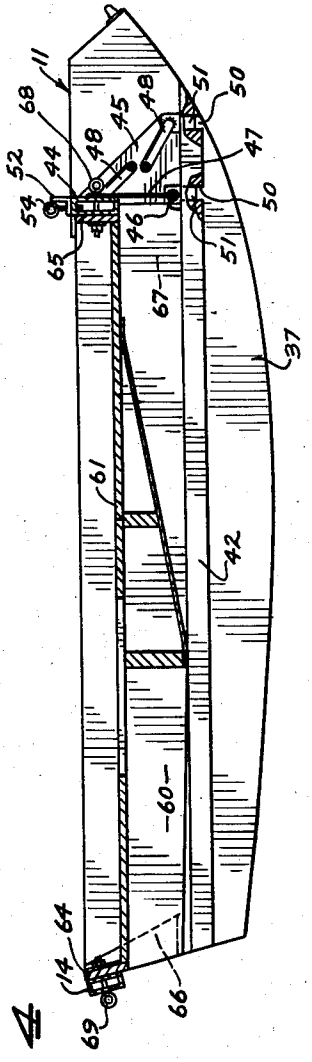


FIG. 4

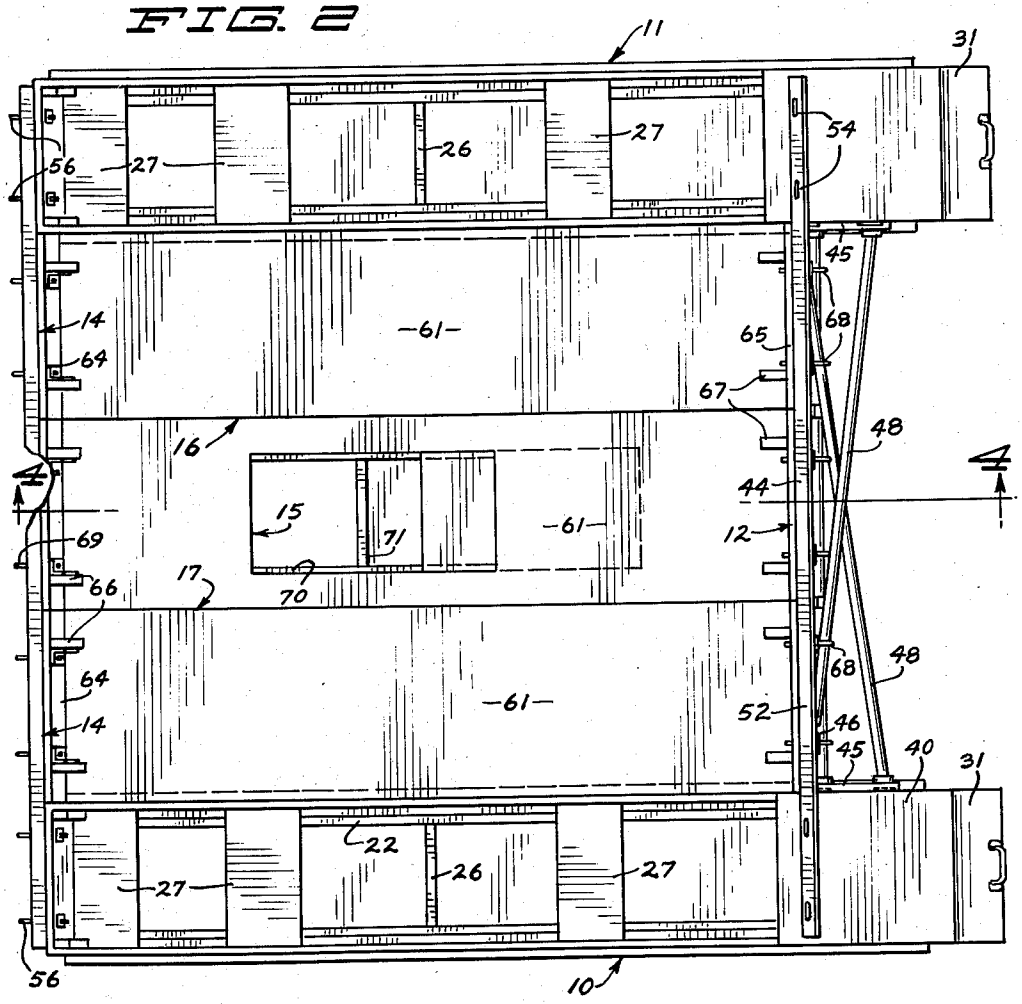
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CATAMARAN

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FIG. 2



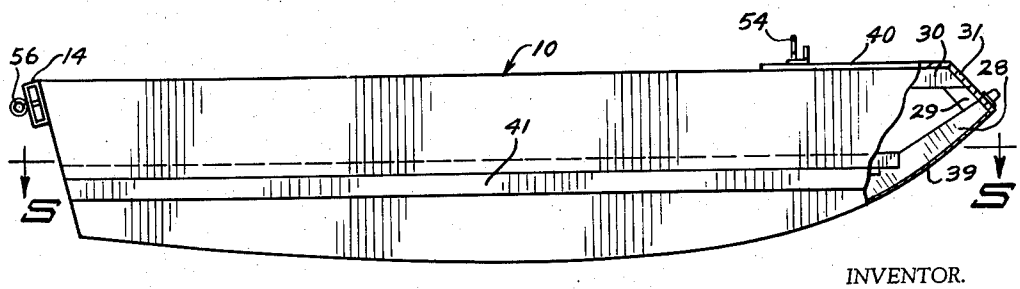


FIG. 3

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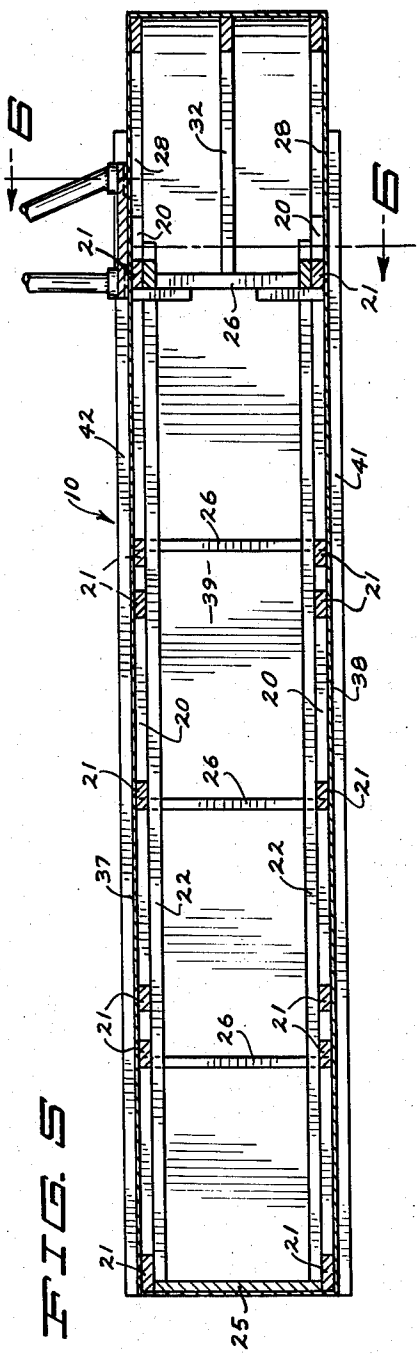


FIG. 5

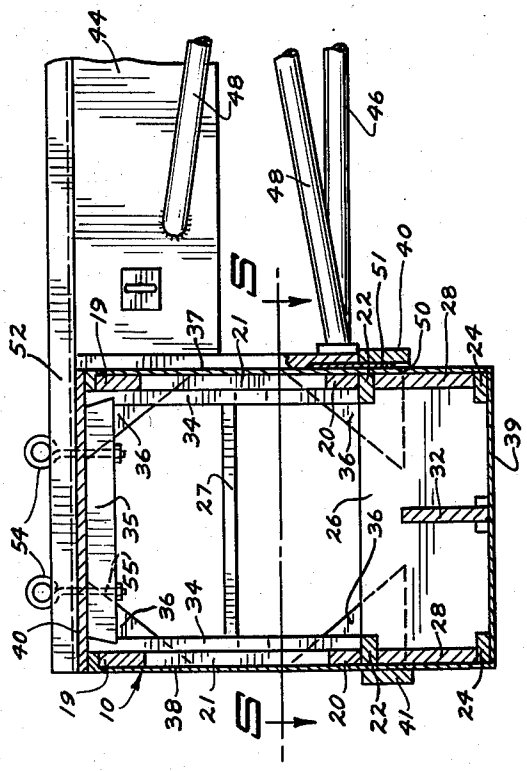


FIG. 6

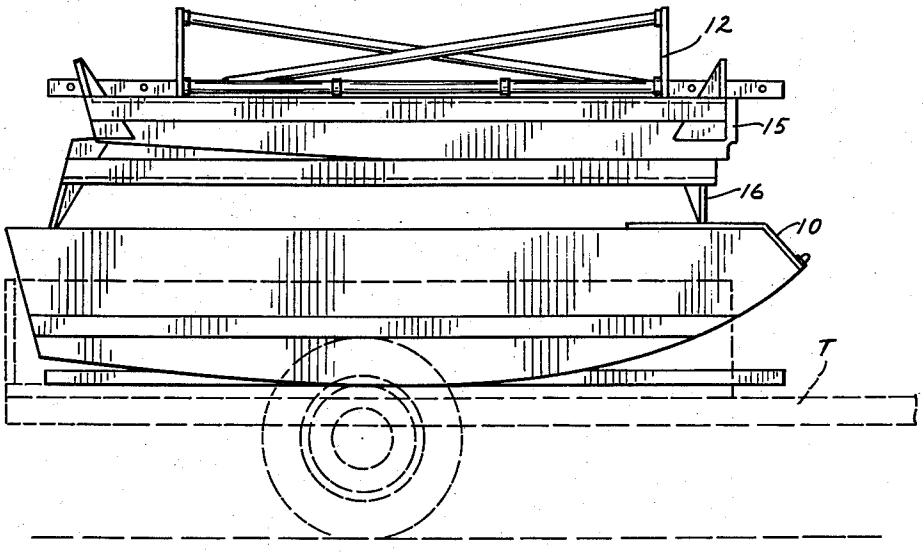
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CATAMARAN

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FIG. 7



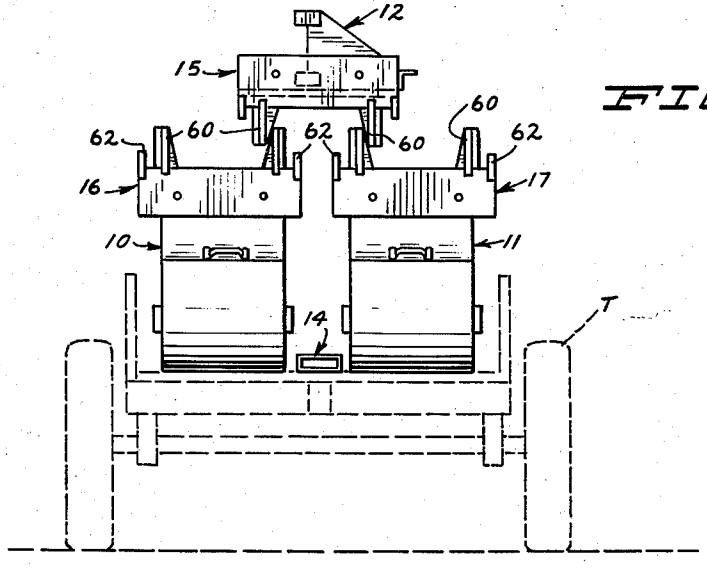


FIG. 8

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CATAMARAN

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9 Claims. (Cl. 114—61)

This invention relates generally to watercraft and more particularly concerns such craft of the catamaran type.

The catamaran type of watercraft is highly desirable due to its speed potential, capacity and stability in the water. One of the undesirable features of such a craft, however, lies in its cumbersome structure which renders transportation and storage very difficult. While others have disclosed knock down or collapsible catamaran constructions, they are not practical, particularly on larger units, as they fail to withstand the stresses and strains to which the craft is subjected at relatively high speeds or in rough water.

The primary object of the present invention is to provide a new and improved catamaran which can be disassembled for storage or transportation and yet which is so constructed as to withstand the various forces to which such a craft is subjected when in use.

Another object of the invention is to provide a catamaran of the knock-down type with a novel means for holding the various components together which can be quickly and simply operated and wherein the components are independently easily manageable by a person of normal strength.

Still another object of the invention is to provide a catamaran construction having hulls, cross beams and deck sections wherein the overall width of the catamaran may be varied merely by employing cross beams of different lengths.

With these and other objects in view the invention broadly comprises a catamaran type watercraft having a pair of elongated hulls arranged in spaced side-by-side relation, a pair of cross beams extending transversely between and interconnecting the hulls to form a rectangular structure, deck means mounted on the beams to cover the area within the rectangle, all of said hulls, beams and deck sections being detachably interconnected for ready disassembly of the craft, and one of said beams forming the front cross beam having a novel construction and being so attached to the hulls as to resist various relative twisting forces to which the hulls are subjected during operation of the craft.

The above mentioned and still additional objects of the invention will be brought to light during the course of the following specification, reference being made to the accompanying drawings, in which—

Fig. 1 is a front perspective view of the catamaran in assembled or operating condition.

Fig. 2 is a plan view of the catamaran in assembled condition.

Fig. 3 is a side elevation of the catamaran with a portion of the hull covering material broken away.

Fig. 4 is a longitudinal vertical section through the craft taken on line 4—4 of Fig. 2.

Fig. 5 is a horizontal section through the right side hull taken along line 5—5 of Fig. 3 and looking downwardly.

Fig. 6 is a transverse vertical section through the front portion of the right side hull taken on line 6—6 of Fig. 5 and looking rearwardly.

Fig. 7 is a side elevation of the catamaran in knocked-down condition with the units thereof loaded upon a transport trailer, shown in broken lines.

Fig. 8 is an end view of the catamaran units loaded on a transport trailer as in Fig. 7.

Referring now more particularly to the drawings, reference numerals will be used to denote like parts or structural features in the different views. In describing the invention various references will be made by use of the words "front" or "rear" or "forward" or "rearward." These positions are used in relation to the normal direction of movement of the craft through the water, the front end thereof extending along the right side of the sheet in Fig. 2.

The catamaran shown comprises seven basic components all of which are clearly observable in Figs. 1, 2 and 8. These components are each designated generally as follows: The right side hull **10**, the left side hull **11**, the front cross beam unit **12**, the rear cross beam **14**, the center deck section **15**, and identical right and left deck sections designated at **16** and **17** respectively. The hulls **10** and **11** are arranged in transversely spaced side-by-side relation and are rigidly interconnected at their front ends by the front cross beam unit **12** and at their rear ends by the rear cross beam **14**. The deck sections **15**, **16** and **17** lie in side-by-side relation between the hulls and are connected to the front and rear cross beams to present a continuous platform between the hulls.

The various components and their interconnecting means will now be described in greater detail and the hull sections shown in detail in Figs. 5 and 6 will be first discussed. Each hull has a rigid interior frame structure formed of upper and lower longitudinally extending members denoted respectively at **19** and **20** which are interconnected at each side of the hull by spaced vertical frame members **21**. Horizontal strips **22** are bolted to extend along the undersides of the members **20** and longitudinally extending limber boards **24** are disposed in spaced relation therebelow at each side of the hull. A back board **25** extends the depth of the hull connecting the rearmost members **21** and longitudinally spaced cross boards **26** integrally associate the members **22** and **24**. Added cross bracing is provided by seats **27** which extend crosswise between the opposing members **21**. The longitudinal frame members **20** and **22** extend forwardly beyond the forwardmost vertical supports **21** where they are integrally united with the fore chines **28** which curve upwardly (Fig. 3) for connection at each side as by block **29** with the forward extension **30** of member **19**. The front frame members at each side are interconnected by the transversely extending bow plate **31**. A stem board **32** extends longitudinally from the front cross board **26** to the bow plate **31**.

The various frame members in each hull are thus positioned and rigidly interconnected to give the hull a very sturdy structure. The structure has additional reinforcement near the bow where the greatest strains are applied. This may be understood by reference to Fig. 6. The front vertical members **21** are reinforced by the bars **34** which are attached thereto and extend therealong and upwardly therebeyond across frame members **19** to which they are secured and downwardly across members **20** to which they are secured to abut against the strips **22**. A cross bar **35** connects the upper ends of the members **34**. In addition upper and lower triangular brackets **36** are provided at each corner of this forward frame portion. Each of these is secured to the member **35** and the adjacent vertical member **34**.

The frames of the two hulls **10** and **11** as thus far described are identical in construction. Each hull is

provided with a waterproof outer covering shell comprising inner and outer side panels, designated at 37 and 38 respectively, attached to members 19, 20, and 24, and a bottom panel 39 extending from the stern board 25 along the underside of members 24 and 28 to the bow plate 31. A short panel 40 closes the top of the hull front portion. These panels are of waterproof sheet material such as sheet metal or plywood and are sealed along their mating edges by a suitable watertight sealing compound to render the hulls buoyant.

A spray rail 41 is attached to the hull to extend along the outer wall 38 at substantially the elevation of the outer frame strip 22. On the opposite or inner side of the hull a rail 42 is mounted. This rail is secured to the inner frame members 20, 22 and 28 so as to be integrally tied to the hull frame structure. The purpose of this rail will be subsequently understood.

The front cross beam unit 12 will now be described in detail with particular attention directed to Figs. 1, 2 and 4. It comprises a relatively heavy beam 44 having triangular truss plates 45 rigidly secured to each end to depend therefrom on parallel longitudinal vertical planes. Each plate 45 has its bottom edge disposed on the horizontal to rest upon the rail 42. The depending portions of the plates are interconnected by a rigid cross bar 46, the central portions of which are supported by hanger straps 47 which hang from the beam 44. A pair of diagonally intercrossing bars 48 are also provided on the front beam unit to resist torsional strain and twisting of the unit. These bars have their upper or inner ends integrally connected to beam 44 near the opposite ends thereof and then extend downwardly and forwardly in transversely diagonal intercrossing relation for connection of their lower or outer ends with the forward portions of opposite plates 45.

The beam unit 12 is attached to the hulls 10 and 11 in the following manner. It will be noted in Figs. 4 and 6 that the rails 42 mounted on the inner sides of the hulls are provided with a pair of longitudinally spaced upwardly opening sockets 50 which extend vertically along the hull side panel 37. These sockets are located in the forward portion of the rail with the rearmost of the two directly opposing the reinforced forward portion of the hull frame structure. The forward socket of the pair is spaced from the rear socket a distance substantially equal to the spacing between the connections of bars 46 and 48 to the plate 45. In transverse alignment with said last mentioned connections the plate 45 carries downwardly projecting lugs 51 adapted to fit snugly in the sockets 50 with the plate 45 flush against the inner hull panel 37 (Figs. 1 and 6). An angle bar 52 is mounted on beam 44 to extend along the top of the beam and beyond the ends thereof a distance substantially the width of the hulls. This bar is secured to the hull frames by means of eye bolts 54 which extend through the members 35 and are threaded into nuts 55 which are suitably affixed to the underside of such member.

It will thus be observed that the front cross beam unit is securely associated with the two hulls by being connected to the members 42 and 35 which are integral portions of the hull frames.

The rear cross beam 14 is a straight relatively heavy member which is equal in length to the bar 52. This beam is secured across the rear ends of the hulls by means of eye bolts 56 (Fig. 2) extending through the hull stern boards 25 and anchored in internally threaded nuts mounted on the forward side thereof.

The deck sections 15, 16 and 17 are structurally identical with one optional exception in the center section which will be subsequently explained. Each section comprises a pair of elongated stringers 60 arranged in spaced parallelism with a rectangular section of flat sheeting 61 mounted thereon to form a platform. Strips 62 are provided to extend along the side edges of the section. The section carries upright end walls 64 and 65 at its rear and front ends respectively. Rear wall 64 is secured to the rear edges of triangular truss plates 66 which are set into the rear edge portion of platform 61 and having their lower portions secured to the adjacent stringers 60. Similarly the front walls 65 are secured to the front edges of the triangular truss plates 67 which are set into the leading edge portion of platform 61 with the lower portions of the plates bolted to the stringers.

Each deck section is supported between the front cross beam 44 and the rear cross beam 14 by means of eye bolts 68 at the front which extend through beam 44 and end wall 65 to be held by nuts mounted on the rear side of the latter, and by eye bolts 69 at the rear which extend through beam 14 and end wall 64 to be held by nuts mounted on the front side of the latter.

The three deck sections are preferably mounted with a slight spacing therebetween to allow the drainage of any water from the platforms 61. The center section 15 is provided with an opening 70 near its longitudinal center. A motor mounting bar 71 is secured between the stringers 60 on the center section to extend transversely across the opening 70. The small section of the platform lying immediately ahead of opening 70 is hinged at its front edge for forward folding to enlarge the opening for reception of the powerhead of an outboard motor when such motor is tilted to an inoperative position. A filler section (not shown) may be used to close the opening 70 when the craft is used without a motor.

The assembling of the catamaran from its knocked down condition shown in Figs. 7 and 8 will now be readily understood. The two hulls 10 and 11 are placed in proper relative side-by-side spaced position to receive the cross beams. Front beam tongues 51 are slipped into the sockets 50 in the two hulls and bolts 54 are secured through the members 35 tying the unit 12 and the front ends of the two hulls rigidly together. Beam 14 is connected across the rear ends of the hulls by bolts 56. The deck sections are then placed in position and anchored at the ends by bolts 68 and 69. Conversely by loosening the various bolts the components may be separated for storage or loading on a trailer as in Figs. 7 and 8.

The knock-down feature of the craft is made possible by the construction of the components themselves and the manner in which they are interconnected. The cross beam unit is braced by the various cross bars to resist twisting and is so tied in with the hull frames when mounted as to assure a parallel relationship between the two hulls in even the roughest operating conditions.

The invention accordingly economically and effectively carries out the aforementioned objectives. It is understood that suitable modifications may be made in the structure as disclosed, provided such modifications come within the spirit and scope of the appended claims. Having now therefore fully illustrated and described my invention, what I claim to be new and desire to protect by Letters Patent is:

1. In a catamaran, a pair of elongated hulls arranged in spaced side by side relation, a beam frame transversely interconnecting the corresponding end portions of the two hulls, said frame comprising an elongated beam having its end portions connected to the respective hulls, a pair of side plates spaced longitudinally of the beam and connected one to each hull, and a pair of rigid stress bars connected to opposite side plates and extending inwardly in diagonal intercrossing relation for connection to the beam.

2. The subject matter of claim 1 wherein the beam and side plates are detachably connected to the hulls.

3. In a catamaran, a pair of elongated hulls arranged in side by side transversely spaced relative position, each of said hulls being provided with a pair of longitudinally spaced upwardly opening sockets near the front end thereof, an elongated cross beam unit mounted across the

front ends of the hulls, said unit having a pair of downwardly projecting lugs at each end extending downwardly into said sockets, and bolt means securing the cross beam unit to said hulls.

4. In a catamaran having a pair of buoyant hulls rigidly connected in side by side spaced apart relation, by means of a cross beam, each hull having a frame construction including longitudinal, vertical and transverse frame members rigidly interconnected and including a rectangular frame portion lying on an upright transverse plane, a mounting board extending longitudinally along each hull and rigidly connected to the hull frame structure, and means on the hulls adjacent said rectangular frame portions for connecting the beam to the said frame portions and mounting boards.

5. A catamaran type watercraft comprising a pair of elongated buoyant hulls arranged in side by side spaced parallelism, each hull having a rigid internal frame structure including a rectangular frame portion disposed crosswise within the hull near one end thereof and longitudinally extending frame members integrally associated with said frame portion, spray rails extending along the facing sides of the two hulls and each being integrally secured through the hull with one of said longitudinal frame members, each of said spray rails having a pair of upwardly opening sockets therein spaced longitudinally of the hull and adjacent said rectangular frame portion, a rear cross beam mounted across and interconnecting the ends of the hull remote from said frame portion, a front cross beam unit mounted across and interconnecting the hulls in the area of said frame portions, said unit including a beam having end plates disposed beside the facing sides of the hulls and each of said plates having a pair of fingers projecting downwardly into said rail sockets for upward removal therefrom.

6. A catamaran type watercraft comprising a pair of elongated buoyant hulls arranged in side by side spaced parallelism, each hull having a rigid internal frame structure including a rectangular frame portion disposed crosswise within the hull near one end thereof and longitudinally extending frame members integrally associated with said frame portion, spray rails extending along the facing sides of the two hulls and each being integrally secured through the hull with one of said longitudinal frame members, each of said spray rails having a pair of upwardly opening sockets therein spaced longitudinally of the hull and adjacent said rectangular frame portion, a rear cross beam mounted across and interconnecting the ends of the hull remote from said frame portion, a front cross beam unit mounted across and interconnecting the hulls in the area of said frame portions, said unit including a beam having end plates disposed beside the facing sides of the hulls and each of said plates having a pair of fingers projecting downwardly into said rail sockets for upward removal therefrom, said unit having a bar extending across the hulls with the end portions thereof bolted to said frame portions, and intercrossing stress bars having their outer ends connected to the plates and their inner ends connected to the unit beam.

7. In a catamaran having a pair of fore and aft extending spaced hulls connected by front and rear cross beam units, a front cross beam unit comprising an elongated beam connected transversely across the hulls and integrally carrying in transversely spaced positions a pair of truss plates lying on longitudinal vertical planes along the facing inner sides of the two hulls, each of said plates extending downwardly and forwardly from the beam, a transverse bar extending between the plates, and a pair of intercrossing stress bars having their outer ends connected to the plates at points forward of and below the beam and extending diagonally upwardly and rearwardly in intercrossing relation and having their inner ends integrally connected to the beam.

8. A catamaran type watercraft comprising a pair of elongated hulls arranged side by side in transversely spaced, fore and aft extending direction, a front cross beam unit mounted transversely across and interconnecting the front portions of the hulls, a rear cross beam mounted transversely across and interconnecting the rear portions of the hulls, and a plurality of elongated deck sections arranged in fore and aft extending side by side position between the hulls, each of said sections comprising a rectangular platform having elongated stringers secured longitudinally along the underside thereof, upright end walls secured to each end of the platform, means connecting the stringers to the end walls at each end, and means for securing said end walls respectively in fore and aft contiguous relation to said front and rear cross beams.

9. In a catamaran, a pair of elongated hulls arranged in spaced side by side relation, a beam unit transversely interconnecting the corresponding end portions of the two hulls, said unit including a pair of vertical members secured one to each hull in transversely opposing relation, a cross beam extending horizontally between transversely opposing portions of the vertical members, and a pair of transversely disposed rigid stress bars having their outer ends connected to opposing points on the vertical members spaced vertically from the beam and extending inwardly in vertically intercrossing relation with their inner ends connected to the beam.

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