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[54] **UNIVERSAL MARINE MODULE**

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[52] **U.S. Cl.** ..... **114/0.5 F**

[51] **Int. Cl.** **B63b 35/00**

[58] **Field of Search** ..... 114/0.5, 66.5 F, 114/65 R, 77 R, 77 A, 235 A, 235 R, .5 F, .5 R; 9/2 S; 115/1 B

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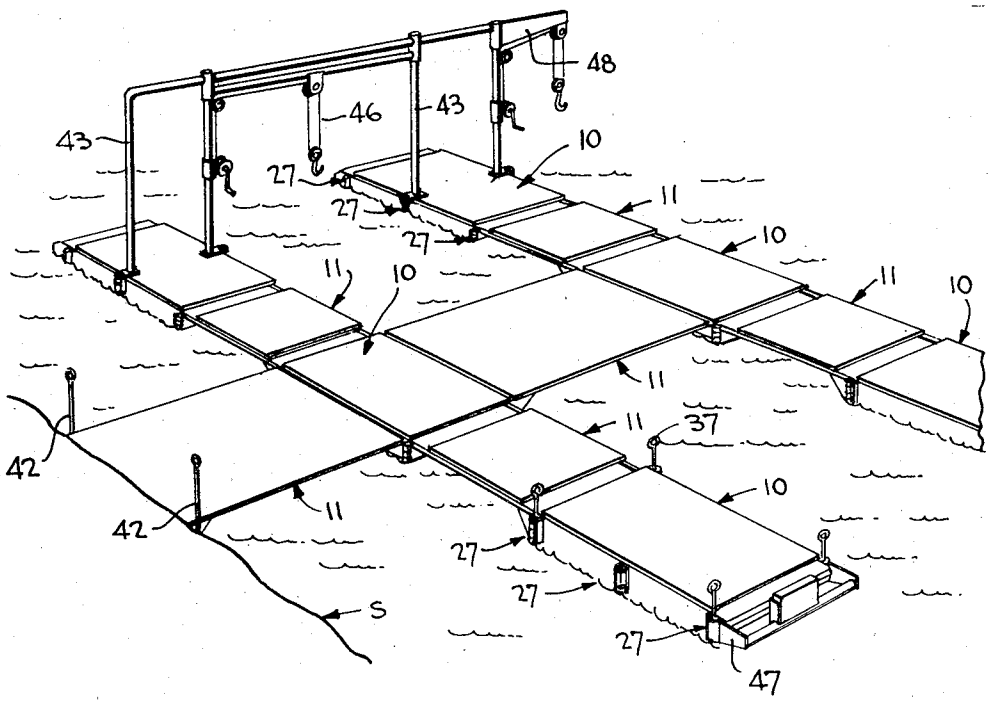
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Assistant Examiner—Paul E. Sauberer
Attorney—Watson, Cole, Grindle & Watson

[57] **ABSTRACT**

A marine module capable of being interconnected with other like modules by means of a coupling platform or platforms into any number of different arrangements for a wide variety of uses, each module comprising a floatable, hollow, metal construction having uniformly spaced coupling brackets thereon, and each platform having connectors thereon, the modules and platforms being rigidly interconnected through the coupling brackets and connectors. Superstructure supports can also be used to couple platforms together.

9 Claims, 7 Drawing Figures



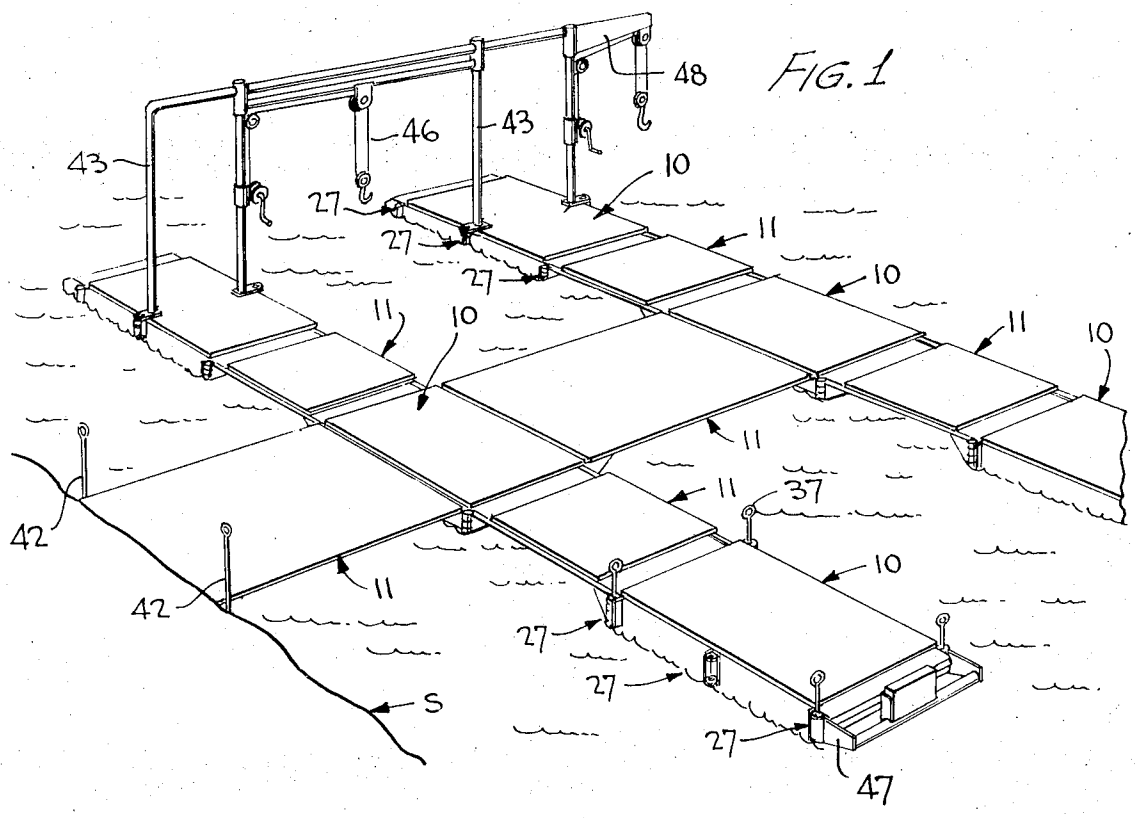
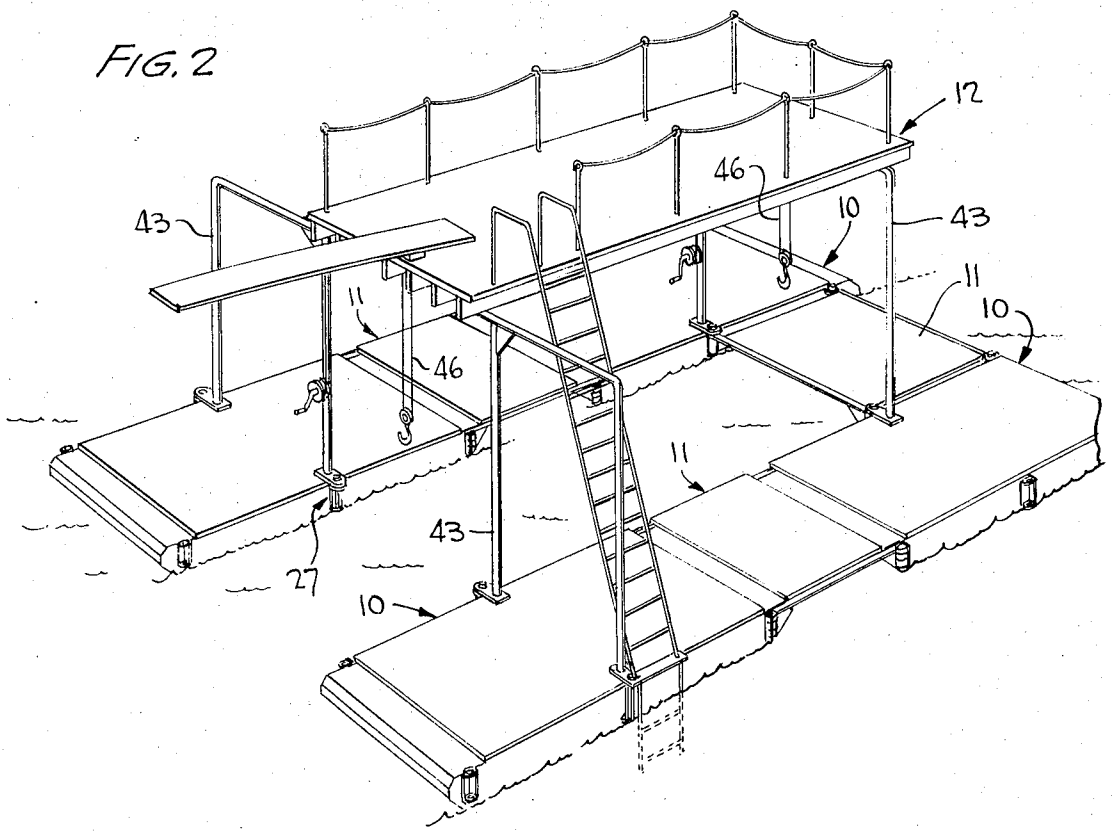

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FIG. 1

FIG. 2


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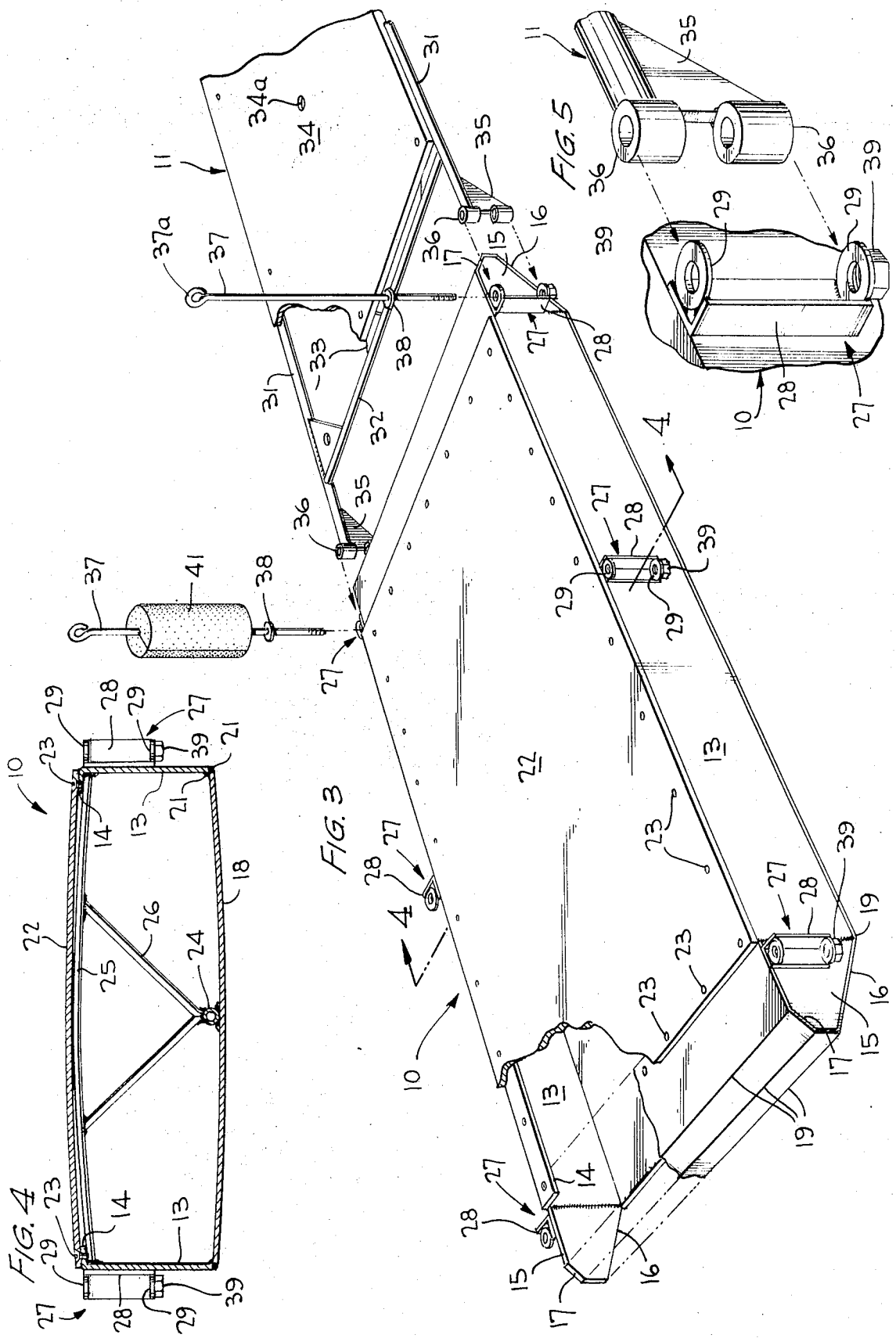

FIG. 3
FIG. 4
FIG. 5

FIG. 6

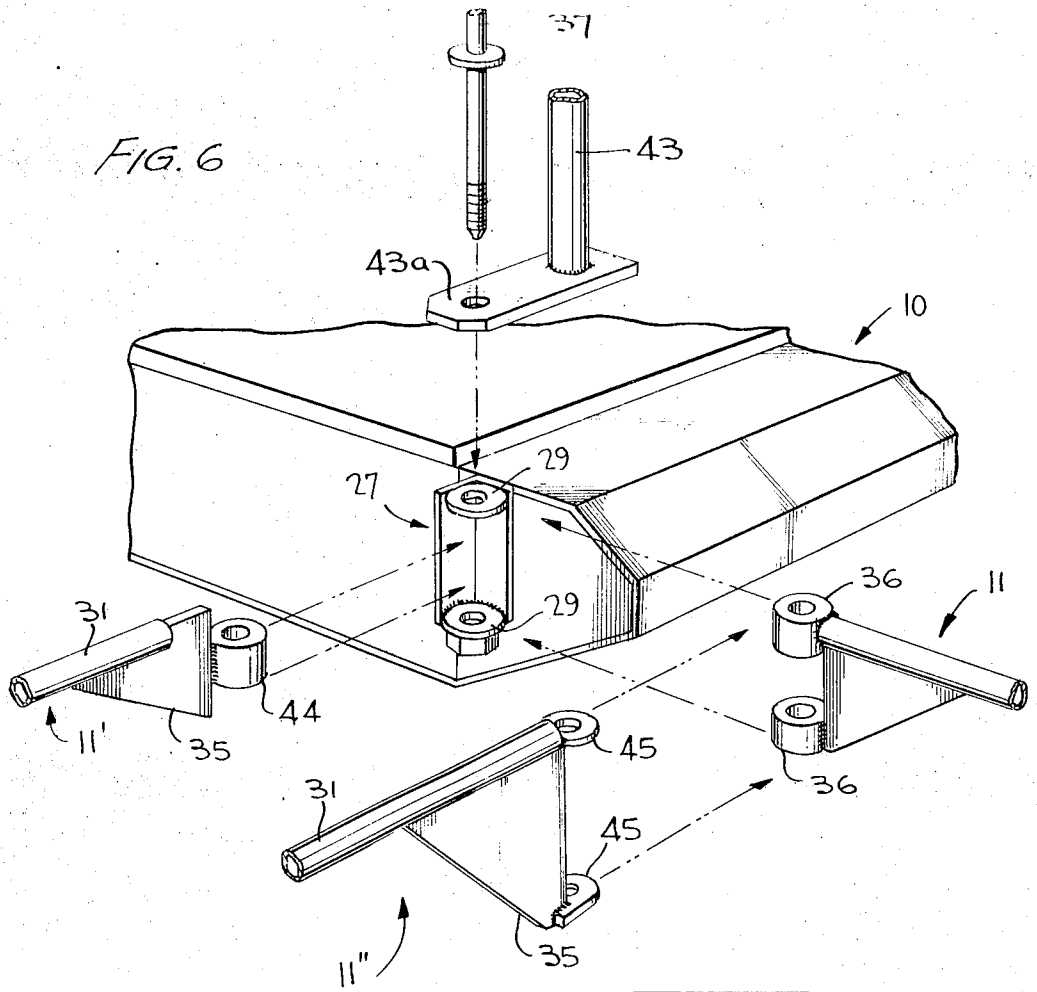
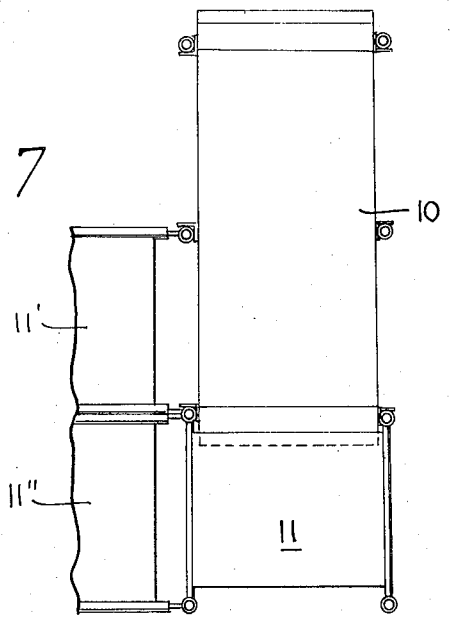


FIG. 7



UNIVERSAL MARINE MODULE

This invention relates generally to a floatable universal marine module and more particularly to an assembly of at least one such module rigidly interconnected with a flexible coupling platform or platforms in any number of different module-platform arrangements for a wide variety of uses.

Floatable pontoons, or modular constructions, have been devised in the past with a means for coupling them together to form a float construction for some purpose. Such pontoons are normally interconnected directly with one another to form a deck surface to support a specific load. Hinged or even rigid connectors are used for locking the pontoons together. Most of these constructions are, however, somewhat difficult and uneconomical to manufacture, and their connectors are either relatively complex or clumsy to manipulate. Moreover, the cost of such an interconnected assembly is high since the pontoons must be normally joined directly with one another.

The present invention seeks to avoid these various drawbacks by designing a floatable module as a basic unit which may be interconnected with like modules through a flexible coupling platform or platforms and/or superstructure supports in such a manner as to produce a horizontally rigid yet vertically and torsionally flexible assembly capable of any number of module-platform arrangements for a wide variety of recreational and other uses. This is the principal object of the present invention.

Another object is to provide such a basic module as having brackets equally spaced along opposite sides thereof whereby the coupling platform or platforms, having collar means thereon spaced apart a distance equal to the bracket spacing, may be rigidly interconnected therewith side-by-side.

A further object of the present invention is to provide such a module having a unique and sturdy construction of side plates, a base plate wrapped about opposite ends of the side plates and extending partially thereover, and a deck plate, all in an economical and simple manner without the need for extensive truss supports.

A still further object of this invention is to provide an assembly of modules and coupling platforms interconnected by means of spaced bracket plates on the module and cooperating collars on the coupling platforms in a manner whereby a simple nut and bolt connection may be utilized for assembly and disassembly in a quick and efficient manner.

A still further object of this invention is to provide such an assembly wherein two or even three coupling platforms, superstructure, attachments and other auxiliary elements may be interconnected with a module through a common bracket thereon by means of a single bolt, thereby avoiding the need for extensive connectors.

A still further object of this invention is to provide such an assembly wherein any number of elevated structures may be supported with the use of a versatile module-platform assembly in a safe and sturdy manner.

Other objects, advantages and novel features of the present invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings wherein:

FIG. 1 is a perspective view of an exemplary assembly of interconnected modules and coupling platforms usable as a boat dock, one of the modules being shown with a motor-mount attachment thereon and superstructure module attachments shown between spaced modules;

FIG. 2 is a perspective view of another exemplary arrangement of interconnected modules and coupling platforms used to support an elevated structure such as a combination diving platform, sundeck and boathouse;

FIG. 3 is a slightly enlarged perspective view showing the details of both the basic modular unit and a typical interconnected coupling platform;

FIG. 4 is a transverse sectional view of the modular unit taken substantially along a line 4—4 of FIG. 3;

FIG. 5 is a still slightly enlarged perspective view showing in detail the manner in which the module and platform are interconnected;

FIG. 6 is an exploded perspective view showing in detail the manner in which three coupling platforms and a superstructure support may be interconnected with the modular unit at a common bracket thereon; and

FIG. 7 is a schematic plan view of the interconnected platforms and module of FIG. 6.

Turning now to the drawings wherein like reference characters refer to like and corresponding parts throughout several views, there is shown in FIG. 1 an assembly of interconnected marine modules **10** and coupling platforms **11** arranged and anchored to the shoreline S in such a manner as to provide a boat dock. In FIG. 2 the modules **10** and platforms **11** are interconnected in such a manner as to support an elevated structure such as a diving platform **12**. The details of the basic marine module **10** are shown in FIG. 3 as including side plate sections **13** constructed, for example, of a standard 4 feet ×8 feet ×⅛ inch-thick metal sheet, divided lengthwise to produce three side plate sections, with each section being bended along one lengthwise edge thereof throughout 90° to form an inwardly directed flange **14**. A side plate section **15** is welded along the fore and aft edges of each section **13**, each section **15** being cut along a 45° line **16** from a single plate so as to conserve sheet material. Also, each end plate is shaped along another 45° line **17** so that a standard 4 feet ×12 feet bottom plate **18** may be secured along the lower edges of each section **13** and along all four edges of each section **15** simply by bending the plate four times at each end throughout substantially 45° along bend lines **19**. The bottom plate **18** may then be simply secured in place as by fillet welds **21**, shown most clearly in FIG. 4. A standard 4 feet ×8 feet plywood sheet or other type deck plate **22** is thereafter secured along top edges of the side plates as by means of self-tapping screws **23** to both suitably provided screw openings in both flanges **14** and the opposite ends of bottom plate **18** which are wrapped about and lie over the top edge of the side plate sections.

An internal support may be installed before securing the top deck **22** in place, the support comprising a less than full 8 feet length longitudinal rod member **24** tack welded substantially along the center line of the module to the inner surface of base plate **18**, a transverse rod member **25** spaced mid-length of the module and welded at opposite ends to flanges **14**, and a V-shaped strut member **26** welded along opposite ends to transverse rod **25** and at its bend portion to longitudinal rod

member 24. The V-shaped strut 26 is sufficiently long to permit a bulging outwardly of both bottom plate 18 and deck plate 22, as seen in FIG. 4, so as to respectively increase displacement of the module acting as a minor interior keel on the hull bottom and to assure water runoff from the deck. The hollow module may be optionally filled with a plastic foam if it is desired to render it more durable in accordance with its intended use, as well as making it virtually unsinkable should it happen to become punctured.

Brackets 27 are secured as by welding along the side plates, as shown in FIG. 3, and substantially comprise a vertically disposed angle bar 28 and a pair of spaced, apertured bracket plates 29, which may simple be standard structural washers. As clearly see in FIG. 5, each bracket plate is welded to both legs of the angle bar near opposite ends thereof. Also, it should be noted that the brackets are secured to sections 15 just outward of the edges of sections 13, and are also secured intermediate the edges of sections 13 substantially along the transverse centerline of the module. Since the side plate sections 13 are 8-feet long, for example, and since the deck plate is 4 feet ×8 feet in dimension, for example, adjacent ones of the brackets in each pair will be substantially 4 feet apart and equal to their spacing across the module width.

A typical coupling platform 11 is also shown in FIG. 3 in an exploded view with relation to the marine module 10. Only one end of the platform 11 is shown, it being understood that the opposite end is similar in all respects to that shown in FIG. 3. The platfrom comprises interconnected longitudinal rod or pipe members 31 and transverse rod or pipe members 32, the rods 31 being either solid or hollow and having bracket plates 33 welded thereon with screw openings for the attachment of a platform deck 34, which may have a centered drain hole 34*a*. Opposite ends of each longitudinal rod member 31 are provided with an angle plate 35 for supporting a pair of spaced collars 36 welded thereto, the outer ends of which are spaced apart a distance equal to the spacing of bracket plates 29 so as to be in contacting engagement and coaxial relationship therewith. A standard coupling rod member 37, having a standard structural washer defining a shoulder 38 thereon, is inserted through the coaxial openings of the bracket plates 29 and collars 36, after which a nut 39 may be threaded along the free end thereof. For convenience, nut 39 is shown as being tack-welded to the bottom bracket plate 29, thereby avoiding any need for tools in assembling rods 37. Module 10 and coupling platform 11 may be therefore rigidly interconnected without movement or bending therebetween, so that such an assembly will be buoyed upwardly and downwardly on the water as a unit. However, design of platform 11 permits some vertical and torsional flexure, thereby compensating for wave action and uneven bending.

Depending on the use to which such an assembly is put, the rod members 37 may be either elongated, as shown in FIG. 3, or they may simply be a bolt of a length sufficient to extend just outwardly of the bracket plates 29. Also, if the assembly is to be used as a boat dock, a sleeve of plastic foam 41 may be disposed about the upper portion of the elongated rod 37 for serving as a boat pad. The top end loop 37*a* serves the multiple purpose of a post eye when a rope is strung therethrough, a locking clamp for a chain padlocked to a pair of shore mounts, and a turning eye during assembly of rod 37 during insertion of spare rod into it and turning.

In FIG. 1 it can be seen that a pair of three modular units 10 are each interconnected by means of spaced coupling platforms 11 to form a pair of spaced rows parallel to the shoreline S, and are maintained in such a space relationship by means of a pair of spaced coupling platforms 11, one of which is simply anchored through its collars 36 to the shoreline S by means of standard anchor stakes 42. One of the modules 10 is shown as being provided with a motor-mount attachment 47 at one end and four rods 37. An outboard motor may therefore be mounted on attachment 47, the module disconnected from its platform 11 and driven away. Also, superstructure supports 43 are shown mounted between spaced modules with a boat lift arrangement 46 and a davit 48 arrangement at one end.

Another example of a possible arrangement for the interconnected modules and coupling platforms is shown in FIG. 2 wherein two pairs of modules 10 are each interconnected by means of a coupling platform 11 to form spaced rows interconnected by another platform 11. An elevated structure 12 in the form of a diving platform is simply and easily mounted onto the decks of modules 10. The uprights or superstructure supports 43 of the diving platform are held in place by means of brackets 27. Of course, the uprights may be spaced differently from that shown, but, in any case, it has been shown that the modular assemblies of this type are sufficiently stable to support a large number of bathers and divers thereon. Such an arrangement also provides the additional structural framework for boat lift equipment 46.

In FIG. 6 it can be seen that two additional coupling platforms, 11′ and 11″, may be interconnected with the marine module 10 along a common bracket 27. As usual, the collars 36 of coupling platform 11 are disposed between and in contact with upper and lower bracket plates 29 of the brackets 27 in a manner similarly described with reference to FIGS. 3 and 5 of the drawings. However, if it becomes desirable to interconnect a coupling platform such as 11′ at the side of the module (see FIG. 7), a collar such as 44 is welded to an angle plate 35 thereof in such a manner that the axis of collar 44 lies slightly outwardly of the plane of its plate 35.

Platforms 11 and 11′ may be secured in place to common bracket 27 by simply inserting collars 36 in between brackets 29 and thereafter inserting collar 44 in between collars 36. A rod member 37 may then be inserted through the axially aligned collars and plates 29.

To facilitate interconnection of a third coupling platform such as 11″ with one or another marine module, collars such as 45 are welded to an angle plate 35 thereof in such a manner that the axis of collars 45 lies slightly outwardly of the plane of its plate 35. This third platform 11″ may be secured in place to common bracket 27 by placing its collars 45 outwardly and in engagement with brackets 29 before rod 37 is lowered through the axially aligned collars and plates 29. As described above, collars 44 and 45 are offset toward one another to facilitate coaxial alignment with plates 29 without interference by their rods 31. Also, it should be noted that either collars 36, 44 or 45 are provided on the remaining angle plates 35 of platforms 11, 11′ and

11'' to facilitate a one, two or three-point interconnection, as desired.

Any number of module(s)-platform(s) arrangements, in addition to those shown by way of example in FIGS. 1 and 2, are made possible in accordance with the present invention depending on the specific intended use. For example, modules and coupling platforms such as 11 and 11' may be sequentially interconnected to define a swimming enclosure having three interconnected sides and a fourth side defined by the shoreline, the free ends of the swimming enclosure sides being conveniently anchored to the shoreline. A floating gym may then be possibly secured along one side of such an enclosure as a pair of modules 10 are interconnected by means of a platform 11, such as shown in FIG. 2, and thereafter connected to one side of the swimming enclosure by means of rods having swings thereon, for example. Any of the brackets 27 may be utilized for such a connection.

A sailboat float may also be conveniently arranged by simply providing an enclosure of interconnected modules and coupling platforms having four sides and anchored offshore.

In lieu of a flat deck 34 for coupling platform 11, an elevated step structure may be used to interconnect a pair of modules for serving as a super-elevated cruiser bridge, or a swamp or small creek crossing.

Also, one or several of the interconnected modules 10 may have a floating camper interconnected therewith and anchored to the shoreline. Or, a single one of the modules 10 may be provided with a motor-mount for a motor along one end thereof to be used as an individual boat. A guard rail may then be simply provided along the perimeter of such individual module.

Other coupling brackets and connecting rods, different from that shown, may be used to provide for the simultaneous attachment of an almost limitless variety of superstructure items such as lifts, awning and roof supports, gym and playground equipment such as slides and swings, boarding ladders, anchor and mooring devices, boat bumpers, railings, divingboard mounts, bridge supports, etc.

Moreover, one of the platform units 11 may be rectangular, hexagonal or some other multi-sided shape, with coupling platforms attached along its sides and other modules of various configurations connected to the opposite ends of such coupling platforms.

From the foregoing, it can be seen that a unique barge or modular unit 10 has been devised in such a manner for interconnection with a coupling platform 11 and may be arranged with other modules and platforms for any number of intended uses by reason of the rigid connection between module and coupling platform and the spacing of the coupling brackets on the module. Each module is simple in its design, has a pleasing appearance, and may be mass-produced with ease without expensive equipment in an economical manner since only a minimum amount of material is wasted during manufacture. Each modular unit is of a balanced structural design having only an internal support where needed, thereby avoiding unnecessary reinforcement. The brackets 27 are welded or otherwise secured along the opposite sides of the modular unit which present unobstructed areas available for mounting thereof. Also, each modular unit is quite durable against damage although it is easy to repair. Moreover, the modular units are each designed to have good buoyant characteristics, yet are heavy enough to minimize minor wave action and tipping while being of a sufficiently small size to render them portable although each is designed for a more than one-ton displacement. Also, in the event the module becomes frozen in ice, the angularity of the hull at the forward and rearward ends thereof provides an adequate lift surface, and the metallic construction of the unit will substantially prevent damage during removal of the unit from the frozen water or ground. In addition, the strength of the module minimizes damage during handling and while in use.

Obviously, many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. An assembly comprising at least one marine module and at least one coupling platform interconnected therewith, said module having coupling brackets secured along opposite sides thereof and being spaced at an equal distance from one another along and between said sides, each said bracket including upper and lower bracket plates, said platform having first collar means along opposite sides at one end thereof, said collar means being spaced a distance equal to the spacing of said brackets, and said collar means each being coaxial with said bracket plates of a first adjacent pair of said brackets, and a bolt extending through said axially aligned collar means and bracket plates of each said first adjacent pair.

2. The assembly according to claim 1 wherein each of said bolts comprises an elongated rod member extending upwardly from each of said upper bracket plates.

3. The assembly according to claim 1 wherein two of said modules are provided and are interconnected by means of said coupling platform, said platform having second collar means along opposite sides at an end opposite said one end thereof, said second collar means being spaced a distance equal to the spacing of said first collar means, and said second collar means each being coaxial with said bracket plates of an adjacent pair of brackets on the other one of said two modules, and a second bolt extending through said axially aligned collar means and bracket plates of said other module.

4. The assembly according to claim 1 wherein two of said coupling platforms are each interconnected with said at least one module, said first collar means on the other one of said platforms being coaxial with said bracket plates of a second adjacent pair of said brackets, and a third bolt extending therethrough.

5. The assembly according to claim 4 wherein one of said brackets of said first adjacent pair coincides with one of said brackets of said second adjacent pair whereby one of said first collar means on each said platform is coaxial with one another, said first bolt extending therethrough.

6. The assembly according to claim 5 wherein one of said coaxial collar means includes a pair of vertically spaced collars and the other of said coaxial collar means includes a single collar disposed between said spaced collars.

7. The assembly according to claim 1 wherein three of said coupling platforms are each interconnected with said at least one module, said first collar means on two of said three platforms being coaxial with said

bracket plates of two pair of adjacent ones of said brackets, one of said brackets being common to said two pair whereby one of said first collar means of each of said two platforms are coaxial with one another, one of said first collar means of the third one of said three platforms being coaxial with said coaxial collar means of said two platforms and a bolt extending therethrough.

8. The assembly according to claim **7** wherein one of said coaxial collar means includes a pair of vertically spaced collars, another of said coaxial collar means includes a single collar disposed between said spaced collars and the remaining one of said coaxial collar means includes a single collar disposed above and below said upper and lower bracket plates of said common bracket.

9. The assembly according to claim **1** wherein said module comprises side plates, a base plate secured to said side plates along the lower edges thereof, said base plate being longer in lengthwise direction than each of said side plates, said base plate being secured along the forward and rearward edges of said side plates and further being secured partially along the upper edges of said side plates, and a deck plate secured to said side plates along the remaining portions of said upper edges.

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