United States Patent [19]

Nasby, Jr.

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[45] **July 23, 1974**

[54] **MOBILE DOCK STRUCTURE**

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[52] **U.S. Cl.** **61/48,** 52/694

[51] **Int. Cl.** **E02b 3/20**

[58] **Field of Search** 61/48, 49, 46; 14/3, 4, 14/6, 13, 17; 52/694

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Primary Examiner—Robert R. Mackey
Assistant Examiner—Philip C. Kannan
Attorney, Agent, or Firm—Merchant, Gould, Smith & Edell

[57] **ABSTRACT**

A pair of longitudinally extended bar joists connected together in a generally parallel relationship have a wheel-equipped frame mounted spaced from one end thereof for adjustment of the wheels toward and away from the bar joists. A plurality of deck members are secured to the bar joists by nut-equipped bolts which pass through the deck members and selected ones of a plurality of longitudinally extended slots formed in each of the bar joists at spaced intervals longitudinally of the bar joists.

6 Claims, 10 Drawing Figures

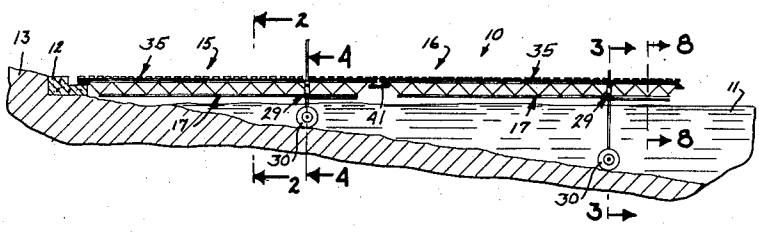


FIG. 1

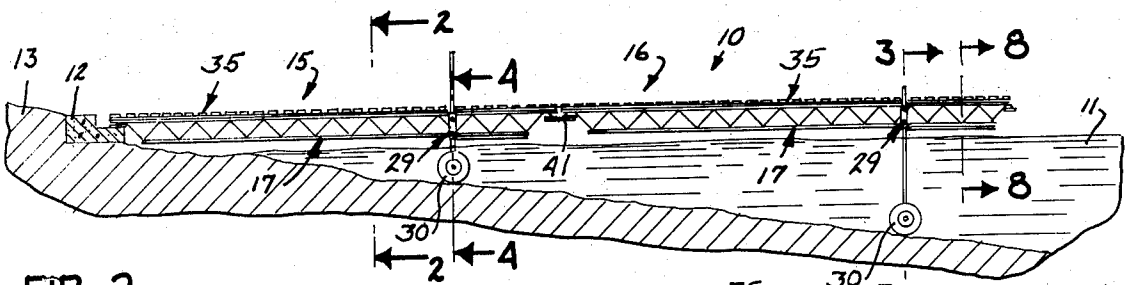
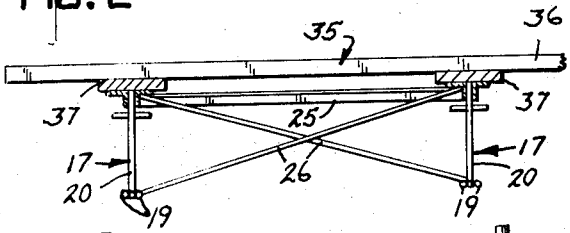


FIG. 2



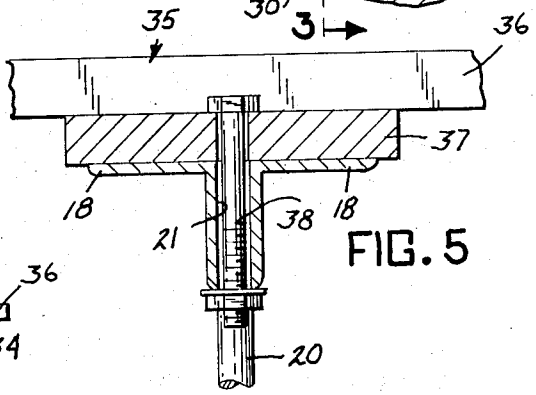
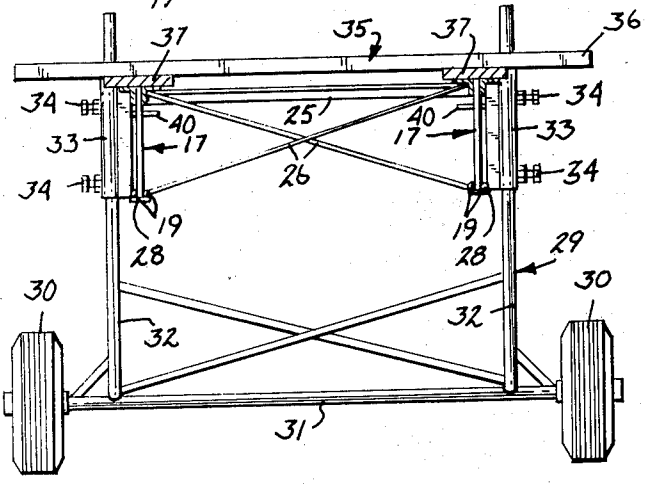


FIG. 5



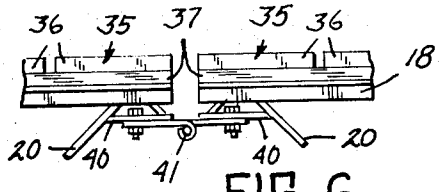


FIG. 6

FIG. 3

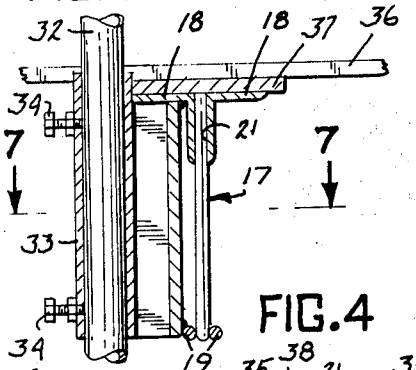


FIG. 4

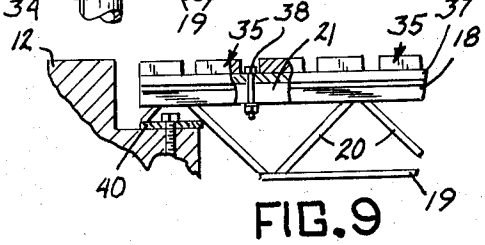


FIG. 9

FIG. 8

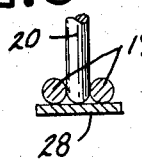
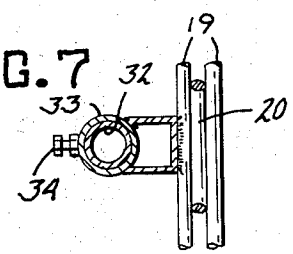


FIG. 7



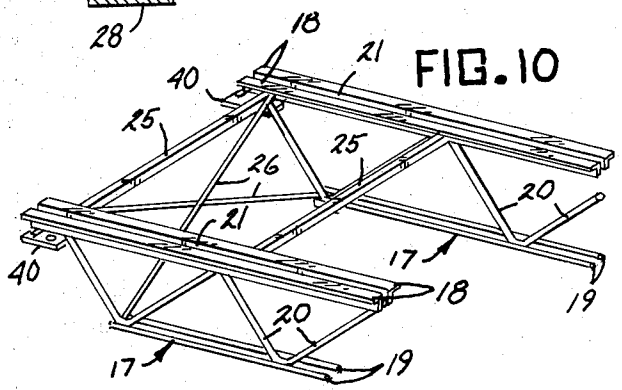


FIG. 10

MOBILE DOCK STRUCTURE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to docking facilities for watercraft and more particularly relates to the construction of mobile type dock structures.

2. Description of the Prior Art

Docking facilities suitable for mooring small watercraft and for use during swimming and other water-related sports have long been produced. Examples of such structures may be seen in U.S. Pat. No. 1,975,049 issued Sept. 25, 1934, to H. Middlebrook; U.S. Pat. No. 3,081,601 issued Mar. 19, 1963, to A. E. Fentiman; and U.S. Pat. No. 3,380,257 issued Apr. 30, 1968, to R. Gillman et al. In spite of the heavy development in this field, dock structures of the type contemplated have heretofore been highly unsatisfactory for a number of reasons. By way of example, when it has been attempted to construct such docking facilities in a manner to simplify construction and reduce the expense thereof, such facilities have failed to withstand the rigors of use and unfriendly elements. Attempts to overcome the above difficulties have resulted in somewhat complicated structures which are not only expensive to manufacture but require constant maintenance and repair. In addition, the prior art structures, despite their complexity, often fail to provide the necessary durability.

SUMMARY OF THE INVENTION

It is a primary object of the present invention to provide a dock structure which is simple in construction, relatively inexpensive to manufacture and which requires but a minimum of maintenance and repair.

A further object of the present invention is to provide a device of the class above described which is mobile for easy removal from or insertion into a body of water.

A still further object of the present invention is to provide a device of the class above described which is extremely durable and is easily adaptable, with a minimum of added expense, to varying conditions of use.

With the above objects in mind, the present invention includes a pair of longitudinally extended bar joists having upper and lower chord elements and angularly disposed connecting elements. The bar joists are connected together in a generally parallel relationship, with the upper chord elements in a common horizontal plane, by a series of braces therebetween. A wheel-equipped frame has laterally spaced vertical support members which are telescopically received in tubular elements secured to the bar joists in spaced relation to the end thereof. A plurality of deck members extend laterally outwardly of the bar joists and are secured to the upper chord elements by nut-equipped bolts extending through the deck members and selected ones of a plurality of longitudinally extended slots formed in the upper chord elements of the bar joists, and each of the bar joists is formed at opposite ends to provide for hinged attachment of a like dock structure utilized to extend the length of the dock.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring particularly to the drawings wherein like characters indicate like parts throughout the several views:

FIG. **1** is a view partially in side elevation and partially in vertical section of the operative placement of a mobile dock structure constructed in accordance with the present invention;

FIG. **2** is an enlarged vertical section as seen generally from the line **2—2** of FIG. **1**;

FIG. **3** is an enlarged vertical section as seen generally from the line **3—3** of FIG. **1**;

FIG. **4** is a greatly enlarged vertical section as seen generally from the line **4—4** of FIG. **1**;

FIG. **5** is a greatly enlarged fragmentary detailed section showing the attachment of the deck members to the supporting structure thereof;

FIG. **6** is a fragmentary elevational view of a portion of FIG. **1** illustrating the hinged connection of the separate dock sections thereof;

FIG. **7** is a horizontal sectional view as seen generally from the line **7—7** of FIG. **4**;

FIG. **8** is an enlarged sectional view as seen generally from the line **8—8** of FIG. **1**, portions thereof being broken away;

FIG. **9** is an enlarged fragmentary elevational view of one end of the dock structure of FIG. **1** showing that end adjacent the shoreline, portions thereof being broken away; and

FIG. **10** is a fragmentary view in perspective of the structure shown in FIG. **9**, portions thereof being removed.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring with greater particularity to the drawings, FIG. **1** illustrates a dock structure, indicated generally by the numeral **10**, which extends into a body of water **11** from an anchoring pad **12** situated adjacent the shoreline **13** of the body of water **11**. The particular application shown in FIG. **1** illustrates the use of a pair of dock sections hereinafter indicated as an inner and outer dock section **15, 16**, respectively. It will be here noted that the inner and outer dock sections **15, 16** are substantially identical structures and in certain applications only the dock section **15** may be utilized. Therefore, in the interest of brevity, similar parts of inner and outer dock sections **15, 16** will carry like numerals throughout the following description.

Inner and outer dock sections **15, 16** each include a pair of longitudinally extended bar joists **17**. Bar joists **17** are truss-type supporting structures and each includes an upper chord element formed of longitudinally extended laterally spaced rail members **18**, a lower chord element formed of laterally spaced rail members **19** and angularly disposed connecting elements **20**. As seen particularly in FIGS. **2–5** and **9**, the angularly disposed connecting elements **20** are formed from a single length of round bar stock as are the laterally spaced rail members **19** of the lower chord element. The laterally spaced rail members **18** of the upper chord element are formed from longitudinally extended right angles to add lateral stability to their respective bar joists **17** when such bar joists **17** are disposed with the connecting elements **20** lying in a vertical plane. Opposite end portions of the connecting elements **20** are disposed between and secured to the laterally spaced rail members **18, 19** such that the portions of the connecting members **20** disposed between the rail members **18** cooperate therewith to define longitudinally extended slots **21** that are spaced and ex-

tend longitudinally of the bar joists **17.** The function of the slots **21** will be explained in greater detail hereinafter. Brace means rigidly connecting the bar joists **17** of each dock section **15, 16** in a generally parallel relationship include a plurality of right angle bars **25** extending between and secured to adjacent rail members **18** of the upper chord elements and transversely extending braces **26** each secured to and extending from the upper chord elements of one bar joist **17** to the lower chord elements of the other bar joist **17** so as to form an X-brace therebetween. As will be appreciated, the above-described construction maintains the laterally spaced rail members **18** of the bar joists **17** in a common plane and provides a supporting structure which is extremely rigid to withstand both lateral and vertical forces as well as twisting forces on a longitudinal axis that may be exerted thereon during use thereof.

A wheel-equipped frame means, indicated generally by the numeral **29,** supports one end of each of the dock sections **15, 16** with the wheels **30** thereof providing a mobile base for the dock sections **15, 16** either singly or as the unit indicated at **10** in FIG. **1.** As shown particularly in FIG. **3,** the frame means **29** includes a transverse axle **31** for mounting the wheels **30** and having laterally spaced upwardly extending vertical support members **32.** Each of the vertical support members **32** is telescopically received within one of a pair of tubular members **33** to permit vertical adjustments of the wheels **30** toward and away from the bar joist **17.** Tubular members **33** are secured one to each of the bar joists **17** and extend between an upper and lower chord element of its respective bar joist **17** to provide a maximum degree of support to the wheel-equipped frames **29** in directions longitudinally of the dock members **15, 16,** with a minimum of angular bracing. A pair of set screws **34,** associated with each of the tubular members **33,** limit movements of the vertical support members **32** relative to the tubular members **33.** As shown, particularly in FIG. **1** of the drawing, the wheel-equipped frame **29** is spaced from the outer end of the dock members **15, 16** to provide a cantilevered outer end portion to permit use of the outer end of the docking structure **10** with a minimum of underwater obstacles. An elongated plate-like member **28** is secured to the underside of lower rail members **19** of each bar joist **17** by welding or the like and extends from adjacent the tubular member **33** to the extreme end of bar joist **17** to provide additional reinforcement for the cantilevered end of the dock sections **15, 16.** While the structure of FIG. **1** is shown as simple rectangular dock sections **15, 16,** it will be appreciated that section **16** could be constructed in a plan shape of an L or T with the short leg of the L or cross head of the T forming the cantilevered outer end thereof. Such structure, of course, would provide facilities at the outer end of the dock for use by a number of persons, such as swimmers or the like, with a minimum of danger of injury thereto due to engagement with such underwater obstacles. The particular construction of the bar joists **17** together with their brace member **25, 26** particularly adapts the above-described construction to such shapes with a minimum use of braces due to the rigid nature of such construction.

Dock sections **15, 16** further include deck means in the nature of a plurality of deck members **35.** Each deck member **35** is formed from a plurality of transversely extending slats **36** secured to a pair of generally parallel stringers **37** at spaced points longitudinally thereof. Stringers **37** extend longitudinally of their respective bar joists **17** and engage the adjacent upper chord thereof in the common upper plane of the bar joists **17.** Securing means in the nature of nut-equipped bolts **38** extend through each of the stringers **37,** generally at opposite ends thereof, and an adjacent underlying slot **21.** This permits longitudinal adjustments of the deck members **35** relative to one another and the longitudinal dimensions of the dock sections **15, 16.** While a preferred type of deck has been described hereinabove, somewhat less expensive deck covering may be utilized through the provision of sheet-like deck members formed from rectangular pieces of exterior plywood or the like. Such sheets of plywood would be secured directly to the bar joists **17,** without the use of stringers **37,** much in the manner of deck members **35** (i.e., with carriage bolts or the like). The slotted openings **21** would likewise permit adjustments of the plywood deck members longitudinally of the dock sections **15, 16** to provide an unbroken deck surface for each of the sections **15, 16.**

Each of the bar joists **17** of the dock sections **15, 16** is formed at opposite ends to provide a support plate **40** having a planar surface which lies in a plane generally parallel to and spaced from the common upper plane of the bar joists **17.** As shown in FIG. **1,** the planar surface of the support plate **40** at the outer or one end of dock section **15** cooperates with the planar surface of the support plate **40** at the opposite or inner end of the dock section **16** to provide a mounting surface for the separate leaves of a hinged connection **41.** The hinged connection **41** permits pivotal movements of the dock section **15** relative to the dock section **16** on an axis extending transversely of the dock structure **10** parallel to the common plane of the bar joists **17.** In this manner, separate adjustments of the wheel-equipped frame means **29** associated with section **15** may be made independently of the wheel-equipped frame means **29** of section **16** to effect a desired deck attitude of the section **15** relative to section **16** depending on the underlying land contour. The particular hinge connection **41** permits preliminary assembly of the dock structure **10** on the shoreline **13** before insertion into the body of water **11** as well as removal of the entire structure **10** to the shoreline **13** for disassembly of the sections **15, 16** and subsequent separate movement thereof to a storage area.

When the dock structure **10** is initially moved into the body of water **11** to the position as shown in FIG. **1,** the support plate **40** associated with the opposite or inner end of the section **15** rests upon and is secured to the notched edge of the anchoring pad **12** (See FIG. **9**). The anchor pad **12** provides a more stable installation of the dock structure **10** and prevents accidental displacement thereof during the act of mooring watercraft, during adverse conditions, or during other extrenes of use.

While a specific embodiment of a double dock structure is illustrated and described, it should be understood that further modifications and improvements will occur to those skilled in the art. I desire it to be understood, therefore, that this invention is not limited to the particular structure shown, and I intend in the appended claims to cover all modifications which do not depart from the spirit and scope of this invention.

What is claimed is:

1. A mobile dock structure comprising:

a. a pair of longitudinally extended bar joists having upper and lower chord elements and angularly disposed connecting elements;

b. brace means rigidly connecting said bar joists in a generally parallel relationship with the upper chord elements in a common horizontal plane;

c. base-equipped frame means having laterally spaced vertical support members;

d. means carried by one end of each of said bar joists mounting said vertical support members for adjustments of the bases thereof toward and away from said bar joists; and

e. deck means, and securing means mounting said deck means to said upper chord elements in said common plane;

f. said upper chord element of each bar joist being formed by a pair of longitudinally extended laterally spaced rail members with portions of said angularly disposed connecting elements positioned between each pair, said portions of said angularly disposed connecting elements cooperating with said pair of rail members to define longitudinally extended slots receiving said securing means.

2. The structure of claim 1 in which said deck means is formed from a plurality of deck members extending laterally outwardly of said bar joists and in which said securing means are nut-equipped bolts extending through said deck members and selected ones of said slots of each bar joist whereby each deck member is adjustable longitudinally of said bar joist.

3. The structure of claim 2 in which each of said plurality of deck members include a plurality of slats extending transversely and spaced longitudinal of said bar joists and a pair of generally parallel stringers secured to and joining said slats, said stringers each engaging one of said upper chords in said common plane, said nut-equipped bolts extending through said stringers.

4. The structure of claim 2 and a plurality of support plates, one attached to each end of each bar joist, each plate lying in a plane generally parallel to and spaced from said common plane.

5. The structure of claim 4 in which said mobile dock includes a pair of dock sections hingedly connected together in an end-to-end relationship, and in which said support plates of adjacent ends of said dock sections provide planar surfaces for mounting the hinge connection of said dock sections for pivotal movements on an axis extending transversely of said dock structure parallel to said common plane thereof.

6. The structure of claim 1 in which said lower chord element of each bar joist is formed by a pair of longitudinally extended laterally spaced lengths of round bar stock, with portions of said angularly disposed connecting elements positioned between and affixed to said lengths, and said pair of rail members comprises a pair of longitudinally extended pieces of right angle stock.

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