Aug. 22, 1961 M. B. LUCKER ET AL 2,997,292

BOAT JACK

Filed March 20, 1958 3 Sheets-Sheet 1

Fig. 1.

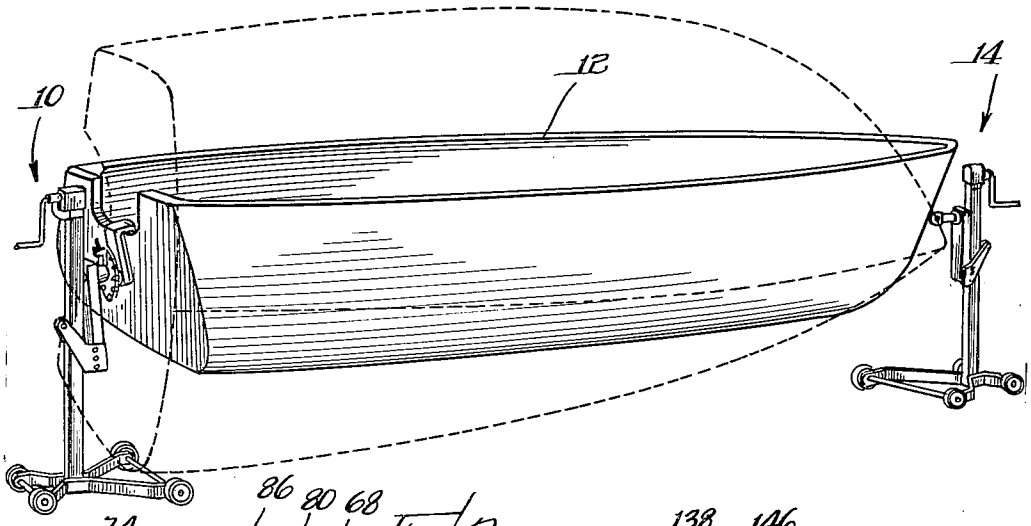
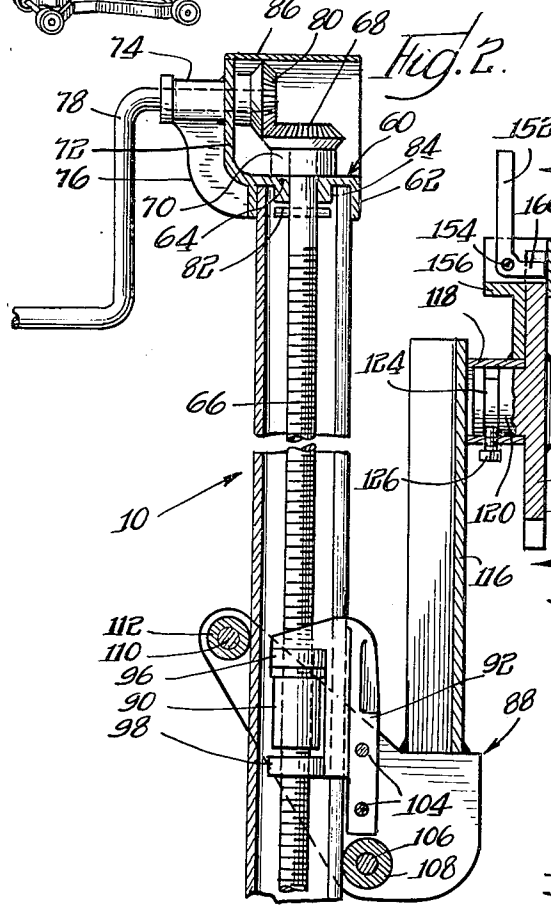


Fig. 2.



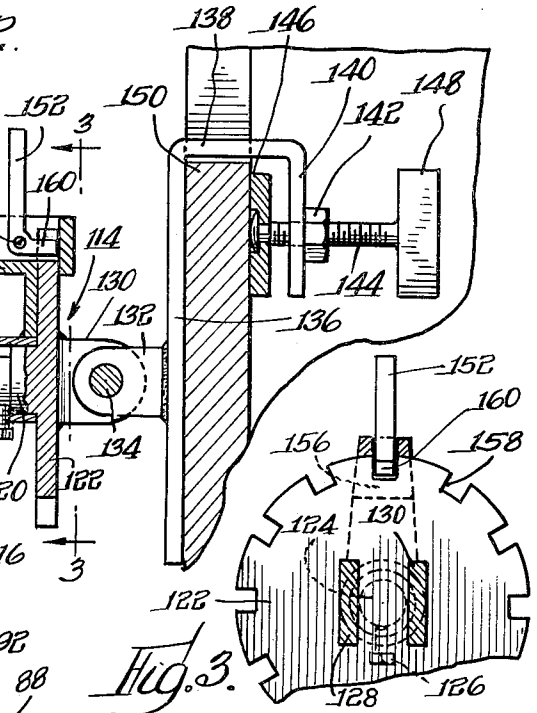


Fig. 3.

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Filed March 20, 1958 3 Sheets-Sheet 2

Fig. 4.

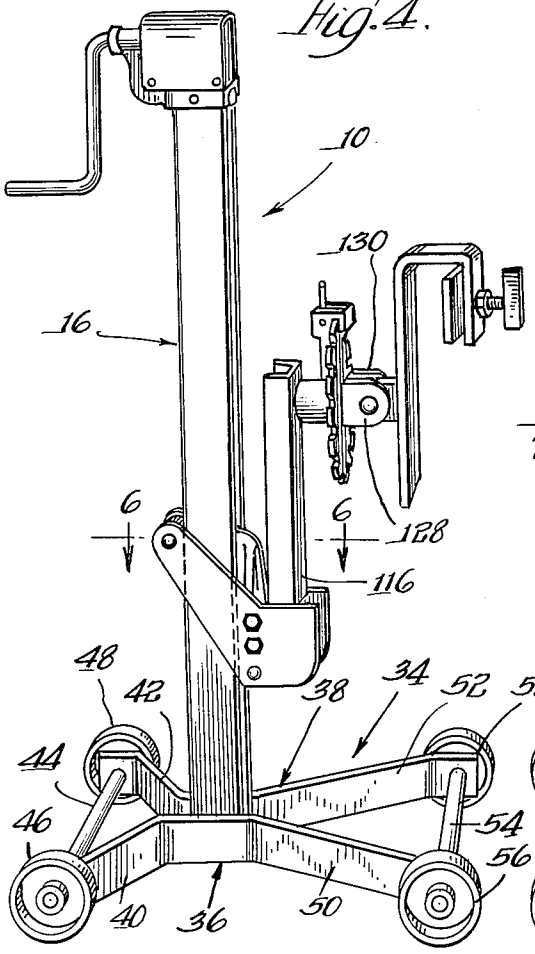


Fig. 5.

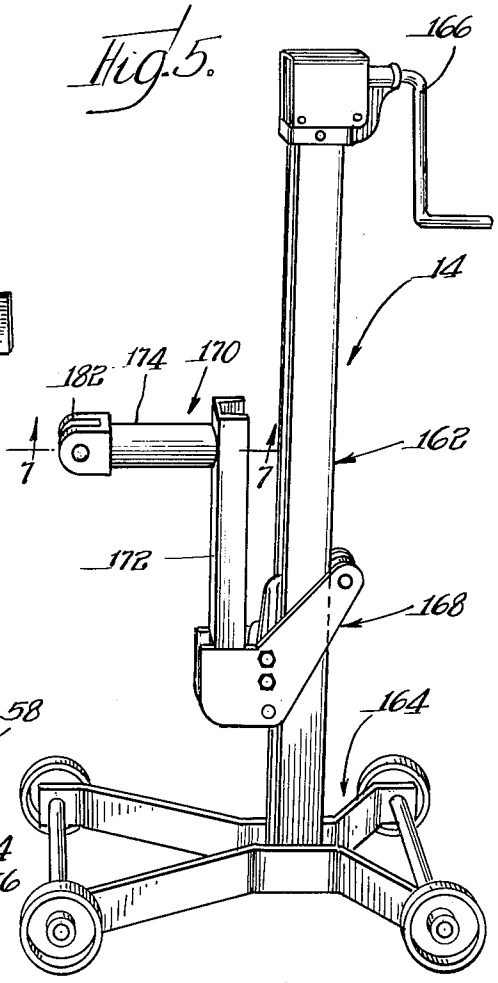


Fig. 6.

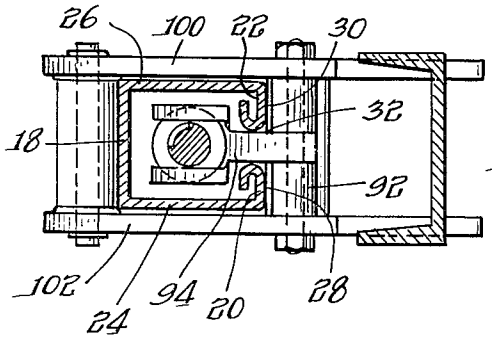
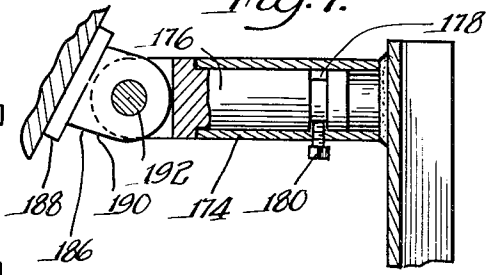


Fig. 7.



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Aug. 22, 1961 M. B. LUCKER ET AL 2,997,292

BOAT JACK

Filed March 20, 1958 3 Sheets-Sheet 3

Fig. 8.

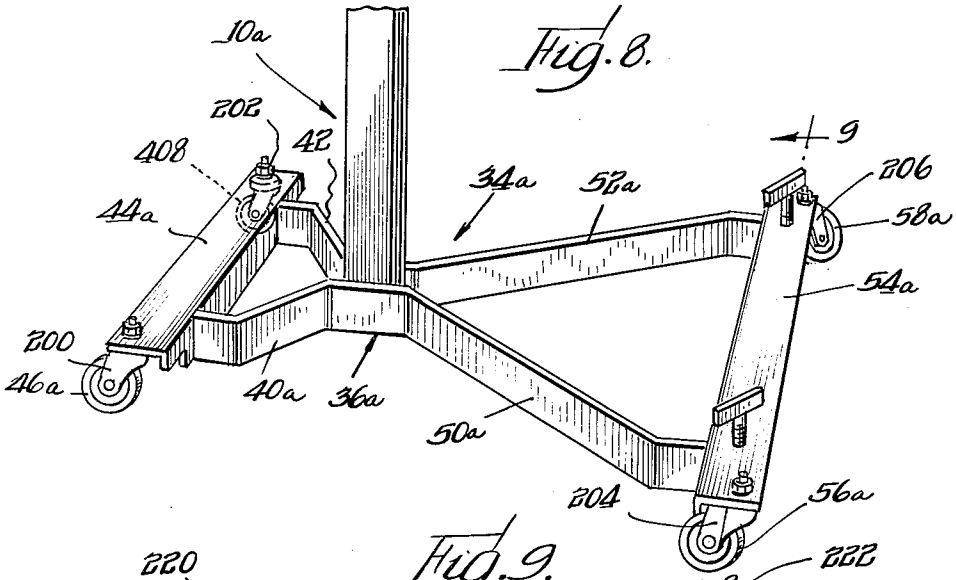


Fig. 9.

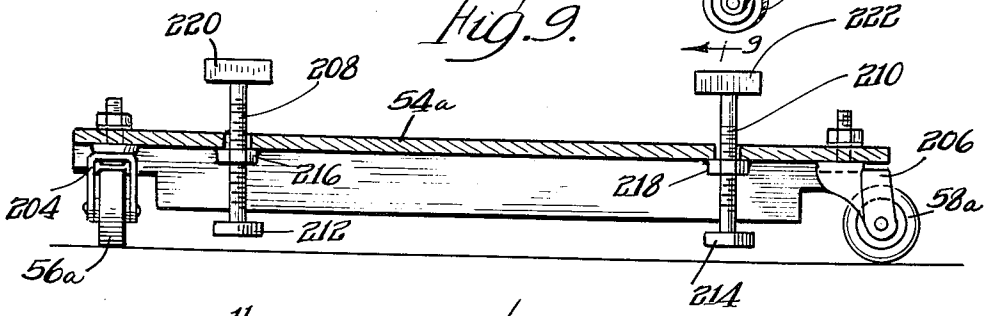


Fig. 10.

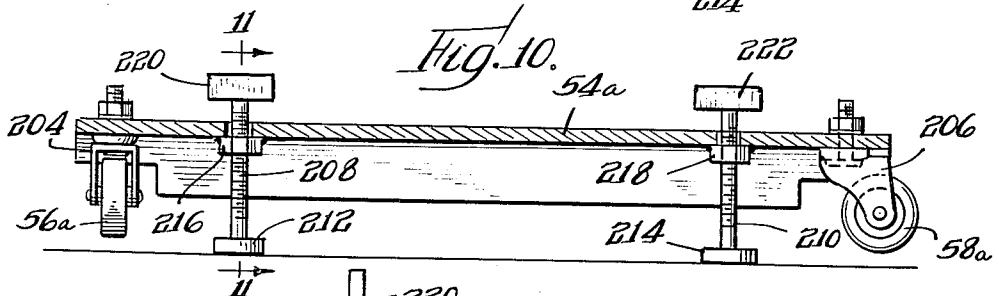
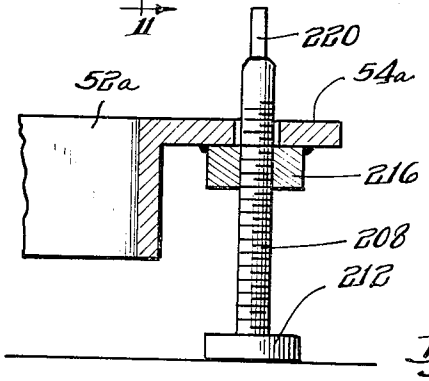


Fig. 11.



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BOAT JACK

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Filed Mar. 20, 1958, Ser. No. 722,765
10 Claims. (Cl. 269—112)

The present invention relates to a novel lifting jack structure, and more particularly to a novel jacking system suitable for handling outboard motor boats, rowboats, and the like.

An important object of the present invention is to provide a novel jacking system for enabling boat dealers, makers, owners, operators and the like, to handle outboard motor boats, rowboats, and the like, efficiently and easily for refinishing, cleaning, storing or any other desired reason.

A further object of the present invention is to provide a novel jacking system which is adaptable to substantially any rowboat, outboard motor boat or the like, regardless of size or weight.

Another object of the present invention is to provide a novel boat jacking system which is constructed so as to enable the boat to be raised and then rotated or rolled about its longitudinal axis for facilitating cleaning or flushing of the interior of the boat as well as maintenance work on the exterior bottom surface of the boat without risking damage to the boat.

Still another object of the present invention is to provide a novel jacking system which is constructed so that it may be moved from one place to another while supporting a boat in a raised position.

A further object of the present invention is to provide a novel boat jacking system which is of rugged, stable and safe construction and which is of compact construction so that it may be easily stored when not in use.

A more specific object of the present invention is to provide a novel boat jacking system of the above described type which is constructed so that a boat supported thereby may be locked in any desired upright, tilted or upside down position so as to facilitate maintenance work and the like thereon.

Other objects and advantages of the present invention will become apparent from the following description and the accompanying drawings wherein:

FIG. 1 is a perspective view showing a jacking system incorporating features of the present invention supporting an outboard motor boat, and further showing in broken lines the manner in which the boat may be tilted;

FIG. 2 is an enlarged fragmentary partial vertical sectional view of a portion of the jacking system connected to the stern of the boat;

FIG. 3 is a fragmentary sectional view taken along line 3—3 in FIG. 2;

FIG. 4 is a perspective view showing one portion of the jacking system which is connectable with the stern of the boat;

FIG. 5 is a perspective view showing another portion of the jacking system which is connectable with the bow of a boat;

FIG. 6 is an enlarged cross sectional view taken along line 6—6 in FIG. 4;

FIG. 7 is an enlarged partial sectional view taken generally along the line 7—7 in FIG. 5;

FIG. 8 is a fragmentary perspective view showing a portion of a modified jack structure which may be incorporated in the jacking system of the present invention;

FIG. 9 is an enlarged partial sectional view taken generally along line 9—9 in FIG. 8 and further showing the caster at the right hand side of the figure turned ninety

degrees with respect to the corresponding caster in FIG. 8 for illustrative purposes;

FIG. 10 is a sectional view similar to FIG. 9 but showing the manner in which the structure may be operated to keep the jacking system from rolling; and

FIG. 11 is an enlarged fragmentary partial sectional view taken along line 11—11 in FIG. 10.

Referring now more specifically to the drawings, wherein like parts are designated by the same numerals throughout the various figures, a boat jacking system covering features of the present invention is shown in FIG. 1 and includes a stern jack structure 10 connectable with the stern of a boat 12 and a bow jack structure 14. As will become more apparent from the description given below, the jack structures are constructed so that the boat 12 may be easily raised or lowered and so that the boat may be maintained within an upright position as shown in solid lines in FIG. 1, or in an inverted postion, or in any of the various tilted postions illustrated by the broken lines in FIG. 1.

It will be appreciated that this eliminates any necessity for tilting the boat on its side and thereby subjecting the boat to possible injury whenever it is desired to flush out the interior of the boat, or perform various other maintenance tasks.

As shown in FIGS. 1–4 and 6, the jack structure 10 is provided with an upstanding channel-shaped strut 16 preferably having a substantially flat back surface 18. Inwardly directed flanges 20 and 22 extend from forward edges about the sides 24 and 26 of the strut and provide forwardly facing substantially flat surfaces 28 and 30 parallel to the back surface 18. Free margins of the flanges 20 and 22 are reversely bent so as to provide smooth edges defining an elongated frontal opening or slot 32 in the strut.

The strut 16 is supported in an upright position by mobile base means 34 which is constructed so as to impart stability to the jack structure and to enable the jack structure to be rolled across the floor or ground while a boat is supported. Thus the jacking system may be utilized for moving the boat from place to place. The base means, which is of simple and rugged construction, comprises heavy strap members 36 and 38 having short intermediate parallel portions welded or otherwise secured to lower ends of opposite sides of the strut. Diverging portions 40 and 42 extend rearwardly from the intermediate portions and are provided with substantially parallel terminal end sections through which an axle 44 extends for supporting wheels 46 and 48. Additional diverging portions 50 and 52 extend forwardly from the intermediate portions and also have substantially parallel free end sections through which an axle 54 extends for supporting wheels 56 and 58. The diverging portions 50—52 are substantially longer than the portions 40—42 so as to resist forward tilting of the jack structure during a boat lifting operation.

A fitting 60 is provided at the upper end of the strut 16, which fitting has a depending socket portion 62 which receives the upper end of the strut and is welded or otherwise suitably secured thereto by rivet or screw means, not show. The fitting 60 has a horizontal section 64 which traverses the top of the strut member. A screw rod 66 extends within the strut member 16 and is provided with an upper end portion which projects through an aperture in the fitting section 64 and has a gear member 68 fixed thereto. Thrust bearing means 70 is provided on the upper end portion of the screw rod between the gear member 68 and the fitting section 64. With this structure the screw rod is pendently supported with the floor end free so as to minimize application of transverse bending stresses to the screw rod during a boat lifting operation. The fitting 60 is provided with an upstand-

ing back portion 72 from which a tubular bearing portion 74 extends laterally rearwardly. An integral rib 76 extends from the socket portion 62 along the back portion of the fitting to the tubular bearing portion for reinforcing the structure. In order to turn the screw rod, a handle member 78 is journalled in the bearing portion 74 and carries a bevel gear 80 fixed to its inner end, which gear meshes with and drives the bevel gear 68. A pin 82 extends through the screw shaft beneath a depending apertured boss 84 integral with the fitting section 64. Preferably a sheet material housing 86 extends over and is secured to the fitting 60 for substantially closing the gears 68 and 80.

The jack structure 10 is provided with load lifting means generally designated by the numeral 88, which means includes an elongated nut member 90 threaded onto the screw drive. A carriage assembly is supported by and moves up the nut member, which carriage assembly has an upstanding member 92 extending along the frontal surfaces of the strut. A narrow upstanding flange 94 is formed integral with and extends rearwardly from a central portion of the member 92 through the frontal slot of the structure, which flange is provided with integral apertured enlargements 96 and 98 at its upper and lower ends. These apertured enlargements freely receive the screw rod therethrough and resist tilting of the member 92 relative to the screw rod. In addition, the enlargement 96 rests on the nut member 90 for establishing a connection between the nut member and the carriage assembly. The carriage assembly is provided with opposite side plates 100 and 102 which extend along opposite sides of the strut and also extend rearwardly of and forwardly of the strut. Forward portions of the side plates 100—102 are secured to opposite edges of the plate member 92 by bolt means 104. An axle 106 also extends between these forward portions of the side plates and below the member 92 for supporting a roller 108 that is adapted to engage the central surfaces 28 and 30 of the strut so as to reduce sliding friction between the carriage assembly and the strut. Rearward portions of the side plates 100 and 102 support an axle 110 therebetween on which is mounted a roller 112 engageable with the rearwardly facing surface 18 of the strut so as further to minimize sliding frictional engagement between the carriage assembly and the strut. It will be noted that the forward roller 108 is located well below the nut member 90 and the enlargement 96 which provides a connection between the carriage assembly and the nut member, and the roller 112 is located at least substantially as high as the enlargement 96. This arrangement minimizes any tendency of the carriage assembly to choke with respect to the strap member or the screw member when a load is supported thereby, so as to minimize any possibility of binding and to promote free and easy operation.

The jack structure 10 is provided with means 114 mounted on the load lifting carriage assembly and adapted to be connected to the stern of a boat. This means comprises an upstanding channel member or post 116 welded or otherwise secured to forward end portions of the side plate members 100 and 102. A tubular bearing element 118 is secured to and extends forwardly from an upper end portion of the post 116 for rotatably receiving a stud shaft 120 integral with or connected to a disk 122. The stud shaft is provided with an annular groove 124 and is retained within the bearing element 118 by means of a screw 126 threaded through an aperture in the bearing element and extending into the annular groove 124. Apertured ears 128 and 130 are welded to and extend forwardly from the disk 122 and are concentrically arranged with respect to the axis of the stud shaft 120. These ears receive therebetween an apertured projection 132 and are pivotally connected thereto by means of a pin 134. The apertured projection is in turn welded or otherwise secured to an extended leg 136 of a C-clamp member 138 having a relatively short opposing leg 140. An internally threaded element 142 is made integral with or is welded to the leg 140 of the clamp for receiving a screw member 144. The screw member rotatably carries a clamping element 146 at its inner end and is adapted to be turned by a hand knob 148 secured to its outer end for selectively tightening or loosening the clamping element 146. It will be appreciated that the jack structure may be easily applied to the transom 150 of a boat by slipping the clamp member 138 over the transom and then tightening the clamping element 146. The pivotal connection 134 between the clamping means and the disk member 122 enables the clamping means to be applied to a boat transom easily without regard to the angle of inclination of the transom. It is to be noted that the upstanding post 116 projects well above the load lifting carriage assembly. As a result, the clamping means is located so that it may be applied to the transom of a boat resting substantially on the ground when the load lifting assembly is lowered substantially to the ground and to the lower end of the screw rod which extends substantially to the base means 34, whereby the full length of the screw rod may be utilized for lifting the boat, if desired.

As mentioned hereinabove, the jacking system is constructed so that a boat supported thereon may be turned about its longitudinal axis. In order to accomplish this, the disk member 122, and thus the clamping means carried thereby, may be rotated about the axis of the stud shaft 120. Means is provided for selectively locking the disk member 122 and thus the boat at any desired position. This means comprises a latch element 152 which is totally connected by a pin 154 to a bracket 156. The bracket is welded or otherwise secured to, and extends upwardly from, the tubular bearing element 118 and adjacent the disk 122.

The disk 122 is provided with a series of circumferentially spaced notches 158 in its peripheral margin, which notches are adapted selectively to receive a finger portion 160 of the latch element 152, which finger portion is disposed at right angles to the actuating or handle portion of the latch element. It will be appreciated that when the latch element 152 is disposed in the position shown in the drawings, the finger portion 160 will be located in one of the notches 158 so as to lock the disk member 122 against rotation. However, the finger portion 160 may be withdrawn from a notch 158 so as to permit rotation of the disk member by pivoting the latch on it in a counterwise direction as viewed in FIG. 2.

The jack structure 14 is identical to the jack structure 10, except for the means carried by the load lifting assembly and connectable with the bow of a boat. Thus, it suffices to state that the jack structure 14 is provided with an upstanding column or strut 162 identical to the above-described strut 16, and supported by mobile base means 164 identical to the above-described base means 34. A screw rod, not shown, corresponding to the rod 66, is pendently supported at its upper end within the strut 162 and is actuated by a handle 166 corresponding to the handle 78 and gears, not shown, corresponding to the above-described gears 68 and 80. Load lifting means 168, identical to the above-described load lifting means 88, is adapted to be shifted up and down along the strut upon turning of the screw rod, which load lifting means carries means 170 which is connectable with the bow of a boat.

The means 170 comprises an upstanding channel member or post 172 welded or otherwise secured to the load lifting means 168. An elongated horizontally disposed tube or bearing element 174 is welded to and extends from the post 172 and rotatably receives a shaft 176. The shaft is provided with an annular groove 178 therein and is maintained in assembled relationship with the tube 174 by means of a screw 180 threaded through a wall of the tube and projecting into the annular groove. A bifurcated head is provided at the outer end of the shaft 176, which head has spaced apertured ears 182 and

184. A fitting 186 is permanently attached to the boat as shown in FIG. 7, which fitting has a base portion 188 connectable to the boat by suitable screws, not shown, and an apertured projection 190 adapted to extend between the ears 184 and 182. Thus, the jack structure 14 may readily be detachably connected to the boat by inserting a pin 192 through aligned apertures in the ears 182 and 184 and the projection 190.

It will be appreciated that, with the structure described above, the jack units 10 and 14 may be easily and quickly connected with the boat regardless of the size or shape of the boat. After the units have been connected with the boat, the boat may be easily raised to any desired elevation by turning the handles of the jack units. If two operators are available, the handles may be turned simultaneously, but if necessary, a single operator may first raise one end of the boat and then the other. After the boat has been elevated to the desired position, it may be readily turned or tilted merely by releasing the latch element and then manually pushing down or pulling up on one side of the boat. It will be further appreciated that the jack units are not only adapted for handling a boat easily and efficiently in the manner just described, but they are also of compact, rugged, and economical construction, and they may be easily moved to and from various positions. Furthermore, jack units require little storage space when not in use.

Referring now specifically to FIGS. 8 through 11, there is shown the lower portion of a modified jack structure which may be incorporated in the jacking system of the present invention. This modified jack structure base portion could be incorporated into either one or both of the above described jack structures 10 and 14, if desired. In order to facilitate this disclosure, elements of this modified jack structure which correspond to certain elements of the above described structure 10 will be designated by the same reference numerals with the suffix *a* added. In this embodiment the structure is such that the jack 10*a* may be readily rolled to any desired location while at the same time means is provided for preventing the jack from moving or rolling along the floor when desired. More specifically, in this embodiment the transverse members 44*a* and 54*a* are in the form of bars or angleirons welded or otherwise secured to the opposite side strap elements of the base means 34*a*. The rollers in this embodiment are in the form of caster wheels which are respectively connected to the transverse members 44*a* and 54*a* by suitable caster brackets 200, 202, 204 and 206. This arrangement not only permits the jack structure to be moved back and forth, but this structure also enables the jack to be moved sideways in any desired manner.

In order to lock or retain the jack structure at any desired location, means is provided for lifting at least a portion of the base means 34 so as to raise certain of the casters above the floor. In the event the weight of a boat being supported by the jack structure is sufficient, it may be merely necessary to engage the locking or retaining means aggressively against the floor without actually raising the base means in order to prevent the base from moving across the floor. This locking or retaining means includes a pair of threaded studs or rods 208 and 210 which respectively have friction pads 212 and 214 secured to their lower ends. The stems 208 and 210 extend downwardly through suitable apertures in the upper horizontal section of the angle iron 54*a*, and internally threaded nut elements 216 and 218 are welded or otherwise secured to the angle iron 54*a* for threadedly receiving the stems. Any suitable means such as the handles 220 and 222 are provided at the upper ends of the stems for permitting the stems to be adjusted.

It will be appreciated that when the stems 208 and 210 are in the adjusted positions shown in FIG. 9, their respective friction pads are disengaged from the floor so that the jack structure is free to be moved. In order to lock the jack structure in the desired adjusted position, the stems are rotated toward the adjusted positions shown in FIG. 10 so that their respective friction pads are at least aggressively engaged against the floor and, if desired, the stems may be adjusted sufficiently to raise the casters from the floor in the manner shown. While the locking means or, in other words, the stems and their associated elements are shown mounted in connection with the transverse member 54*a*, it is to be understood that the locking means could be located on the transverse member 44*a* if desired. In addition, similar locking means could be mounted on both of the transverse members 44*a* and 54*a*. However, the locking means on the member 54*a* is usually sufficient and it is preferable to mount the locking means in association with this transverse member since this member is offset forwardly of the boat engaging means of the jack structure whereby at least a portion of the weight of the boat will be directly above the friction pads.

While the preferred embodiments of the present invention have been shown and described herein, it is obvious that many structural details may be changed without departing from the spirit or scope of the appended claims.

The invention is claimed as follows:

1. A boat jacking system of the type described comprising first and second jack units respectively detachably connectable to stern and bow portions of a boat, each of said jack units including a base, an upstanding strut supported by said base, load lifting means movable along said strut, actuating means connected with said load lifting means for shifting the load lifting means along said strut, single means supported by the load lifting means for rotation about a horizontal axis extending forwardly of said load lifting means, and single means carried by said rotatable means and detachably connectable with a boat so as to permit pivotal movement of a raised boat about a horizontal axis extending between said jack units.

2. A boat jacking system of the type described comprising first and second jack units respectively detachably connectable to stern and bow portions of a boat, each of said jack units including an upstanding strut, base means for supporting said strut, load lifting means movable along said strut, actuating means connected with said load lifting means for shifting the load lifting means along the strut, and single means rotatable about a horizontal axis extending forwardly of said load lifting means and supported by said load lifting means and detachably connectable with a boat so as to permit pivotal movement of a raised boat about a horizontal axis extending between said jack units, and one of said jack units including means for releasably locking its rotatable means for preventing pivotal movement of a raised boat about a horizontal axis.

3. A boat jacking system, as defined in claim 2, wherein said rotatable means associated with the locking means is provided with a series of circumferentially spaced notches, said locking means comprising an element selectively insertable into said notches, and means shiftably supporting said element so as to prevent rotation thereof about the axis of the rotatable means.

4. A boating jacking system, as defined in claim 2, wherein said rotatable means of said first jack unit includes clamping means releasably connectable with the stern of a boat, and said rotatable means of said second jack unit includes apertured means and pin means releasably connectable with an apertured fitting secured to the boat.

5. A boat jacking system of the type described comprising first and second jack units respectively detachably connectable to stern and bow portions of a boat, including a base, an upstanding strut supported by said base, load lifting means movable along said strut, actuating means connected with said load lifting means for shift-

ing the load lifting means along said strut and single means detachably connectable with a boat and pivotally connected with said load lifting means for pivotal movement about a substantially horizontal axis extending transversely to a longitudinal axis of the boat so as to permit raising of opposite ends of the boat one at a time, said last mentioned means of each jack unit also being mounted on said load lifting means of each unit for pivotal movement about a horizontal axis substantially parallel to the longitudinal axis of the boat so as to permit pivotal movement of a raised boat about its longitudinal axis.

6. A boat jacking system of the type described comprising first and second jack units respectively detachably connectable to stern and bow portions of a boat, each of said jack units including an upstanding channel shaped strut having a longitudinal opening along one side thereof, a pendently supported screw rod within the strut, means for rotating said screw rod, nut means threaded on said screw rod, a load lifting assembly supported by said nut means and including first and second roller means respectively engaging rearwardly and forwardly facing surfaces of the strut above and below said nut means, base means supporting said strut and including strap members secured to a lower end of the strut and having relatively short rearwardly extending and diverging portions and relatively long forwardly extending and diverging portions, axles respectively extending between the ends of said rearwardly extending portions and the ends of said forwardly extending portions, rollers mounted adjacent opposite ends of said axles and movably supporting the jack unit, and means supported by the load lifting assembly and rotatable about a horizontal axis and detachably connectable with a boat so as to permit pivotal movement of a raised boat about a horizontal axis, and one of said jack units including means for releasably locking its rotatable means for preventing pivotal movement of a raised boat about a horizontal axis.

7. A jack unit as defined in claim 6, in which each jack unit includes means supporting said rotatable means for pivotal movement about a second horizontal axis disposed transversely of the longitudinal axis of a boat to be raised.

8. A jack unit, as defined in claim 6, wherein said base means of one of said jack units includes floor engageable wheel means for permitting the jack unit to be rolled across the floor, friction means associated with said base means and engageable with the floor, and means adjustably mounting said friction means on said base means for movement into and out of engagement with the floor.

9. A jack unit, as defined in claim 8, wherein said means adjustably mounting said friction means includes an internally threaded member fixed to said base means, and an upstanding threaded stem extending through said threaded member and secured to said friction means.

10. A jack unit, as defined in claim 8, wherein said base means includes a portion extending forwardly beneath said means which is connectable with a boat, said means adjustably mounting said friction means being mounted on said base means portion.

References Cited in the file of this patent

UNITED STATES PATENTS

160,485	Thomas	Mar. 2, 1875
1,029,823	Richardson	June 18, 1912
1,101,598	Weinke	June 30, 1914
1,453,901	Anderson	May 1, 1923
1,559,453	Pritner	Oct. 27, 1925
1,782,306	Kirsten	Nov. 18, 1930
1,969,310	Lowrie	Aug. 7, 1934
2,610,747	Hall	Sept. 16, 1952
2,785,814	Corley	Mar. 19, 1957