April 2, 1963 W. SMITH 3,083,540

BOAT LIFT

Filed Aug. 31, 1959 2 Sheets-Sheet 1

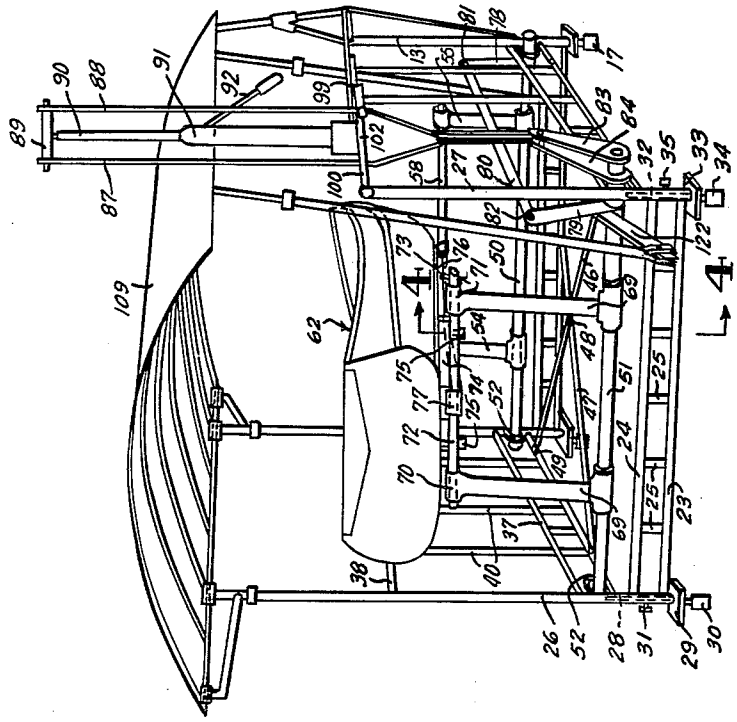


Fig. 2

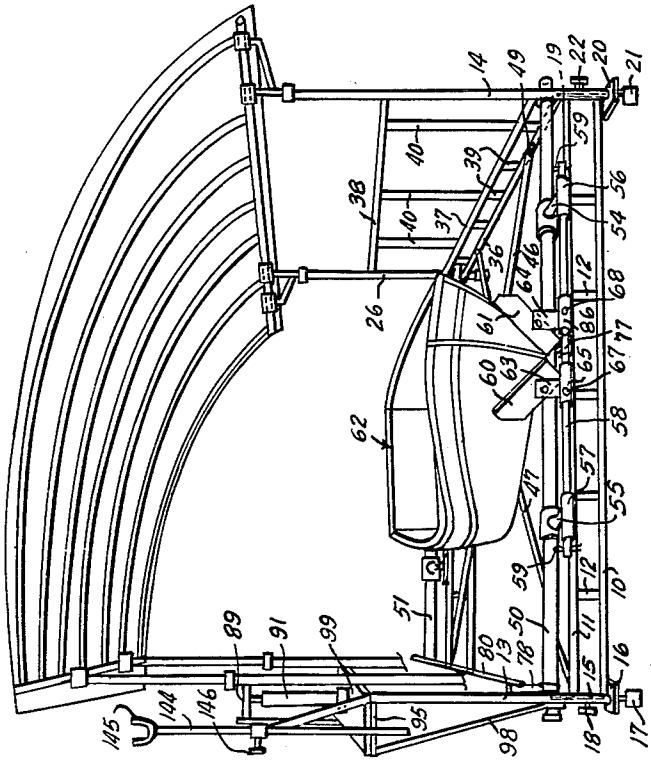


Fig. 1

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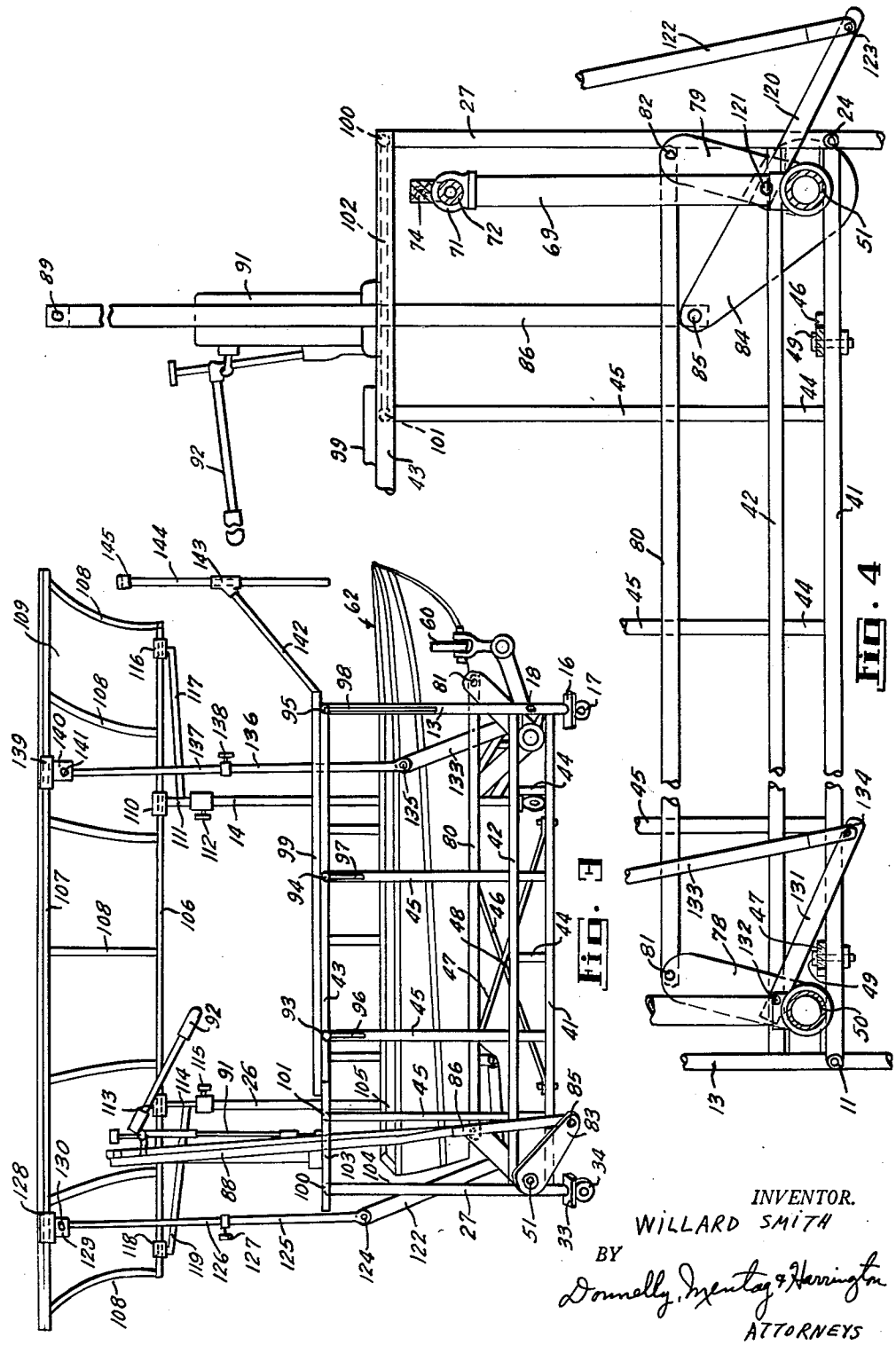


Fig. 4

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BOAT LIFT

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1 Claim. (Cl. 61—65)

This invention relates to the boat lift art, and more particularly to a new and improved boat lift which is portable and provided with a movable roof.

It is an object of the present invention to provide a boat lift of this class which is adapted to be hydraulically operated and which is provided with a roof that automatically raises for easy boarding of the boat when the boat is lowered into the water, and which lowers over the boat when it is raised out of the water.

It is another object of the present invention to provide a boat lift of this class which is simple and compact in construction, economical of manufacture, easily operated and highly efficient in use.

It is a further object of this invention to provide a boat lift of this class which is provided with a cradle having a pair of lifting arms which may be elevated to raise a boat clear of the water.

Other objects, features and advantages of this invention will be apparent from the following detailed description and appended claim, reference being had to the accompanying drawings forming a part of the specification wherein like reference numerals designate corresponding parts of the several views.

In the drawings:

FIG. 1 is a front perspective view of a boat lift made in accordance with the principles of the invention, and showing the roof in a raised position;

FIG. 2 is a rear perspective view of the structure illustrated in FIG. 1, and showing the roof in a lowered position;

FIG. 3 is a left side elevational view of the structure illustrated in FIG. 1; and,

FIG. 4 is an enlarged, fragmentary elevational view of the structure illustrated in FIG. 2, taken along the line 4—4 thereof and looking in the direction of the arrows.

Referring now to the drawings, and in particular to FIGS. 1 and 2, a preferred embodiment of the invention is shown and includes a front transverse supporting structure including the transverse vertically spaced apart tubes 10 and 11 which are fixedly interconnected by a plurality of laterally spaced apart tubes as 12. The transverse tubes 10 and 11 are fixedly connected at their ends, as by welding, to the vertical front standards 13 and 14 which are preferably formed from a tubular member.

As shown in FIG. 1, the vertical standard 13 is slidably supported on the telescopically mounted rod 15 which is fixedly mounted on the plate 16 which is in turn supported by the roller 17. The standard 13 may be adjusted to any desired vertical position relative to the rod 15 by means of the set screw 18. The vertical standard 14 is slidably mounted on the vertical rod 19 which is telescopically received in the lower end of the standard 14 and which is fixedly carried by the plate 20. The plate 20 is carried by the roller 21, and the standard 14 is adapted to be secured in an adjusted position relative to the rod 19, by means of the set screw 22.

The boat lift of the present invention further includes a rear transverse supporting frame comprising the transverse vertically spaced apart tubular members 23 and 24 which are fixedly interconnected by means of a plurality of laterally spaced apart vertical braces as 25. The ends of the transverse tubes 23 and 24 are fixedly connected to the rear vertical standards 26 and 27 as by means of welding. As shown in FIG. 2, the standard 26 is vertically adjustably mounted on the rod 28 which is fixed

on the plate 29 which is in turn carried by the roller 30. The standard 26 is held in a desired adjusted position relative to the rod 28 by means of the set screw 31. The vertical standard 27 is slidably adjustably mounted on the vertical rod 32 which is fixed on the plate 33 which is in turn mounted on the roller 34. The standard 27 is adapted to be adjustably secured to the rod 32 by means of the set screw 35.

As shown in FIGS. 1 and 2, the boat lift supporting frame further includes the left longitudinal supporting structure, including the longitudinally disposed vertically spaced apart tubes 36, 37 and 38 which are fixedly interconnected by means of the vertical braces 39 and 40. The braces 39 are mounted between the tubes 36 and 37, and the braces 40 are mounted between the tubes 37 and 38. The rear ends of the tubes 36, 37 and 38 are fixedly connected to the vertical standard 26 by any suitable means, as by welding. The front ends of the tubes 36, 37 and 38 are fixedly connected to the left front standard 14 by any suitable means, as by welding.

As shown in FIGS. 3 and 4, the boat lifting frame further includes the right side longitudinal supporting structure, including the longitudinally disposed vertically spaced apart tubes 41, 42 and 43 which are fixedly interconnected by means of the vertical braces 44 and 45. The braces 44 are mounted between the tubes 41 and 42, and the braces 45 are mounted between the tubes 42 and 43. The rear ends of the tubes 41, 42 and 43 are fixedly connected to the vertical standard 27 by any suitable means, as by welding. The front ends of the tubes 41, 42 and 43 are fixedly connected to the right front standard 13 by any suitable means, as by welding. The boat lift structure is further strengthened by the horizontal cross braces 46 and 47 which are fixedly connected at their cross over point by means of a suitable bolt and nut means indicated by the numeral 48. The ends of the cross braces 46 and 47 are suitably fixedly connected to the longitudinal tubes 36 and 41 by any suitable means, as by the bolt and nut means indicated by the numeral 49.

The boat lift of the present invention includes a boat cradle comprising the transverse rockably mounted tubular shafts 50 and 51. The shafts 50 and 51 are rockably mounted at each end thereof between the tubes 37 and 38, and 41 and 42, respectively, by any suitable means, as by the U-shaped bearing members 52 which are made from flat plate material and welded to the standards at each corner of the boat lift. As shown in FIGS. 1 and 2, a pair of laterally spaced apart lifting arms 54 and 55 are fixedly connected at the lower ends thereof to the shaft 50, and these arms are provided on the upper end thereof with the sleeves 56 and 57, respectively. Rotatably mounted through the sleeves 56 and 57 is the shaft 58 which is retained in the sleeves by means of cotter keys as 59. The shaft is adapted to carry a pair of bow blocks as 60 and 61 for supporting the front end of a boat as 62 in the usual manner. The blocks 60 and 61 are pivotally mounted on a pair of U-shaped brackets 63 and 64 which are fixedly connected to the supporting sleeves 65 and 66. The sleeves 65 and 66 are fixedly secured to the shaft 58 by means of the set screws 67 and 68, respectively. The sleeves 65 and 66 may thus be adjusted sidewardly as desired for different size boats.

As shown in FIG. 2, a rear pair of lifting arms 69 are fixedly mounted at the lower ends thereof on the shaft 51 and are provided on the upper ends thereof with the sleeves 70 and 71. Rotatably mounted in the sleeves 70 and 71 is the horizontal transverse shaft 72 which is retained in said sleeves by means of cotter keys as indicated by the numeral 73. Fixedly mounted on the shaft 72 is a pair of stern blocks as 74 for supporting the stern of the boat 62. The blocks 74 are suitably fixed to the

shaft 72, as by means of the bolts 75. The front and rear transverse shafts 58 and 72 are fixedly interconnected by means of the longitudinally extended shaft 76 through the fittings 77. It will be seen that as the shafts 50 and 51 are rotated, the boat 62 will be lifted from the lowered position shown in FIGS. 1 and 3 to the raised or storage position shown in FIG. 2, as more fully described hereinafter.

The means for rocking the boat cradle includes the pair of levers 78 and 79 which are fixedly connected at the lower ends thereof to the shafts 50 and 51, respectively. The upper ends of the levers 78 and 79 are inter-connected by means of the connecting rod 80 which is hingedly connected to these levers by means of the pivot pins 81 and 82. It will be seen that when one of the shafts 50 and 52 is rocked, the other will be correspondingly rocked. As shown in FIGS. 2 and 4, a pair of spaced apart levers 83 and 84 are connected at the lower ends thereof to the extended shaft 51. Hingedly connected to the levers 83 and 84, by means of the pin 85, is the actuating arm 86. The upper end of the arm 86 is formed into spaced apart portions 87 and 88 which are pivotally mounted on the upper ends thereof to the cross shaft 89. The shaft 89 is fixedly connected to the cylinder rod 90 of a conventional hydraulic cylinder or hydraulic jack. The jack 91 is manually operable in the usual manner by means of the handle 92.

As shown in FIGS. 2 and 3, a plurality of horizontal tubes 93, 94 and 95 are welded to the longitudinal tube 43. The tubes 93, 94 and 95 extend outwardly and are supported by the diagonal braces 96, 97 and 98. The tubes 93, 94 and 95 are adapted to support an operator's platform or plank 99. A pair of horizontal outwardly extended tubes 100 and 101 are also welded to the rear end of the longitudinal tube 43 and have fixed therebetween a longitudinal plate 102 to provide a supporting means for the jack 91. The arm portions 87 and 88 pass on either side of the plate 102. The tubes 100 and 101 are braced by the longitudinal tube 103 and the diagonal braces 104 and 105.

As shown in FIGS. 1 and 3, the boat lift includes a roof which comprises a frame having the outer side tubular rails 106 and 107 which are inter-connected by a plurality of curved or arcuate tubular cross members as 108. The frame is covered with any suitable material 109, as canvas, aluminum or any other suitable lightweight material. The roof is rockably supported by the following described structure. The longitudinal tube 106 is rockably supported in the sleeve 110 which is fixed on the rod 111 which is adjustably mounted in the upper end of the standard 14 by means of the set screw 112. The longitudinal tube 106 is also rockably supported at the rear end thereof by means of the sleeve 113 which is fixed on the shaft 114 which is adjustably mounted in the standard 26 by means of the set screw 115. Additional support for the tubular rail 106 is provided by the sleeves 116 and 118 which are fixedly connected to the rods 111 and 114 by means of the arms 117 and 119, respectively.

The roof is adapted to be rocked or pivoted about the longitudinal tube 106 as an axle by means of the following structure. A rock lever 120 is fixedly connected at one end thereof, by means of the bolt and nut means 121, to the boat cradle rock lever 79. The other end of the lever 120 is hingedly connected to the link 122 by means of the pin 123 at the lower end of the link 122. The upper end of the link 122 is hingedly connected by means of the pin 124 to the tube 125 in the upper end of which is adjustably slidably mounted the rod 126. The rod 126 is adapted to be fixed in the tube 125 in an adjusted desired position by means of the set screw 127. The upper end of the rod 126 is hingedly connected to the sleeve 128 by means of the integral plate 129 and pin 130. The sleeve 128 is rockably mounted on the roof longitudinal tubular rail 107. The front side of the roof is similarly connected to the front boat cradle rock lever 78. As shown in FIGS. 3 and 4, the roof lifting structure includes the lever 131 which is connected at the one end thereof to the lever 78 by means of the bolt and nut indicated by the numeral 132. The other end of the lever 131 is hingedly connected to the lower end of the link 133 by means of the pin 134. The upper end of the link 133 is hingedly connected to the tubular arm 136 by means of the hinge pin 135. The tubular arm 136 slidably receives the pin 137 and these parts are adjustably secured together by means of the set screw 138. The upper end of the rod 137 is hingedly connected to the sleeve 139 by means of the integral plate 140 and the pin 141. The sleeve 139 is rockably mounted on the roof rail 107. As shown in FIG. 3, a supporting arm is provided for the roof when it is in its lowered position, and this arm includes the rod 142 which is fixedly mounted at its lower end to the standard 13. Fixed on the upper end of the rod 142 is the sleeve 143 in which is adjustably secured a supporting rod 144 which is provided with the U-shaped rest 145 for the reception of the front end of the tubular roof rail 107. The rod 144 is adjustably secured in the sleeve 143 by means of the set screw 146.

In operation, the roof will be in the lowered position when the boat is in the raised position, as shown in FIG. 2. In this position the hydraulic pump 191 has been actuated to raise the arm 86 upwardly whereby the cradle levers 78 and 79 are rocked upwardly, which in turn swings the lifting arms of the cradle upwardly. During such action the arms 120 and 131 of the roof actuating structure will be swung downwardly whereby the links 122 and 123 will also be swung downwardly to rock the roof to its lowered position. When the jack 91 is operated to lower the arm 86, the boat cradle will be rocked to its lowered position and simultaneously the roof lifting levers 120, 131 and the links 122 and 133 will be moved upwardly and the roof will be rocked to the raised position shown in FIGS. 1 and 3, whereby the boat may be boarded with ease. Experience has shown that the boat lift of the present invention is efficient in operation and is easy to use.

While it will be apparent that the preferred embodiment of the invention herein disclosed is well calculated to fulfill the objects above stated, it will be appreciated that the invention is susceptible to modification, variation and change without departing from the proper scope or fair meaning of the subjoined claim. For example, the rollers on the lower ends of the standards may be deleted and suitable skid pads may be substituted therefor.

What I claim is:

In a boat lift device of the class described, the combination comprising: a supporting frame; a pair of longitudinally spaced apart, transversely disposed horizontal shafts rotatably mounted on said supporting frame at opposite ends thereof; a boat cradle connected to said shafts and movable from a lowered boat loading position to a raised boat storage position when said shafts are rotated in one direction and movable back to the lowered boat loading position when said shafts are moved in the other direction; said supporting frame being mounted on a plurality of supporting legs which are adjustable in length to adjust the supporting frame upwardly and downwardly relative to the level of the water into which a boat is to be taken from or launched into; a first pair of vertical standards fixedly connected to said supporting frame along one side thereof and at spaced apart longitudinal positions; a rod adjustably mounted in the upper end of each of said first pair of vertical standards; a roof pivotally connected at one side thereof to the upper ends of said last mentioned rods and extending over said cradle; a second pair of vertical standards disposed along the other side of said cradle in longitudinally spaced apart positions; a second pair of rods adjustably mounted in the upper ends of said last mentioned pair of standards; the other side of said roof being pivotally connected to the upper ends of said last mentioned pair of rods; a first lever fixedly connected

at the lower end thereof to one of said transverse shafts and at the upper end thereof to the lower end of one of said last mentioned pair of vertical standards; a second lever having the lower end thereof fixedly connected to the other shaft and the upper end thereof pivotally connected to the lower end of the other of said last mentioned pair of vertical standards; a third lever having one end thereof fixedly connected to a separate one of said shafts and at an angular position rotated apart from said first and second levers; a hydraulic jack; and a jack lever having the upper end thereof connected to said hydraulic jack and the lower end thereof hingedly connected to the outer end of said third lever, whereby when said hydraulic jack

is operated upwardly, said third lever will rotate said transverse shafts to raise said boat cradle and said first and second levers will be moved to lower the second pair of vertical standards, whereby said roof will be pivoted downwardly at said other side about said one side, and when said hydraulic jack is operated downwardly, the transverse shafts will be rotated in the opposite direction to lower the boat cradle and raise the roof.

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