June 29, 1965 J. B. POE 3,191,389

BOAT LIFT

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FIG.1

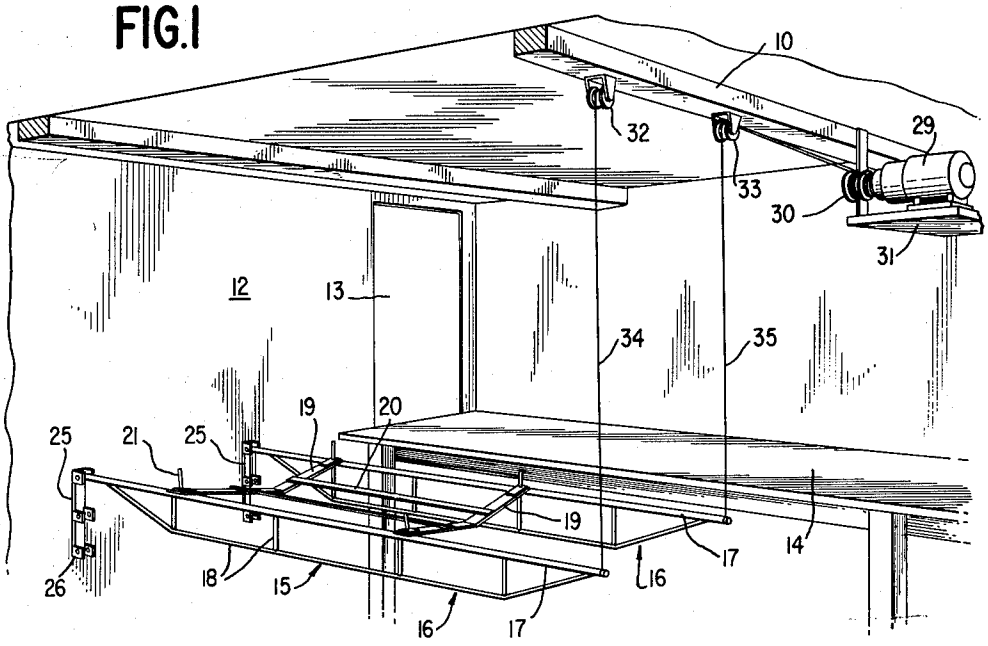


FIG.2

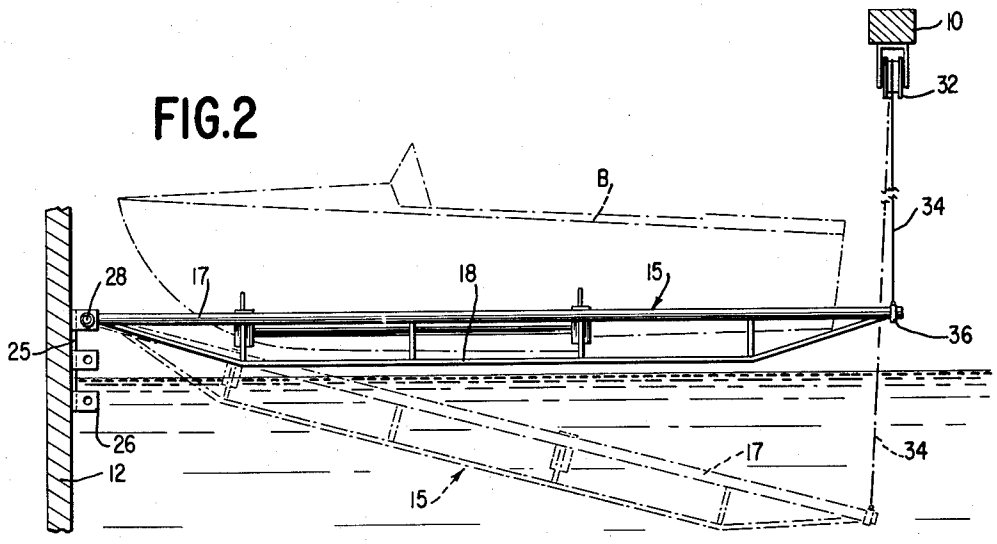


FIG.2a

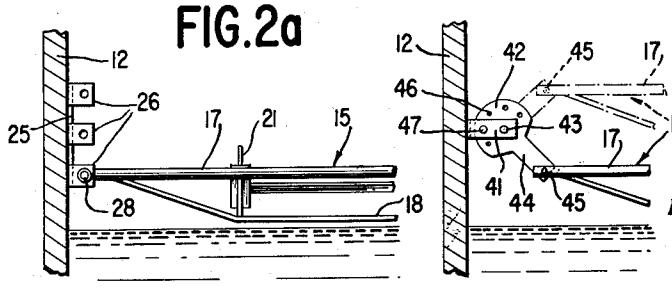


FIG.7

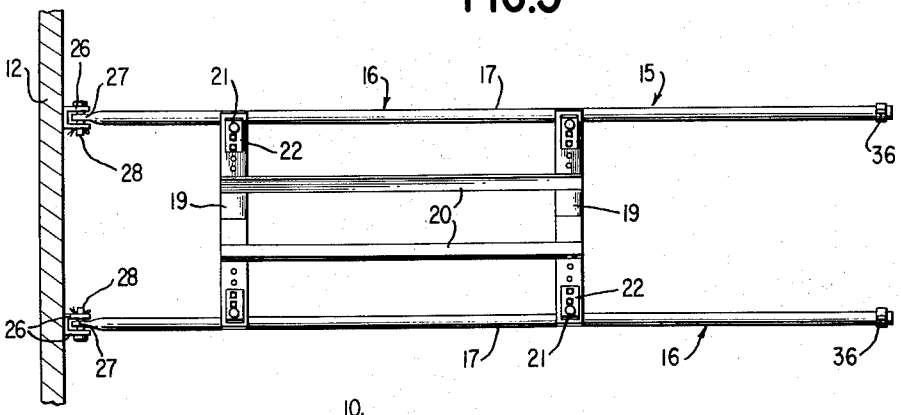
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BOAT LIFT

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FIG.3



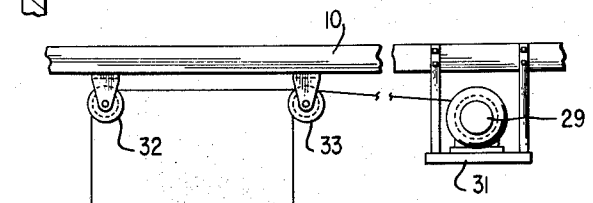


FIG.6

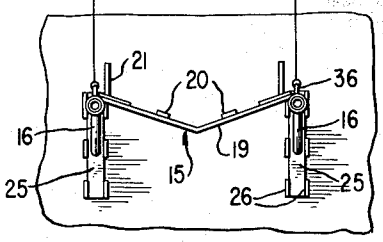
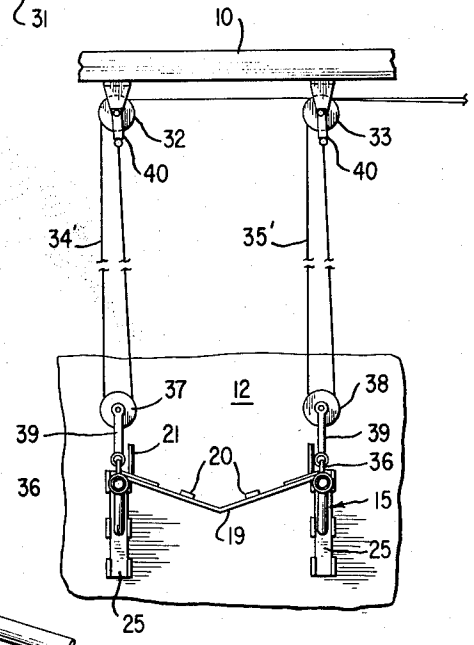


FIG.4



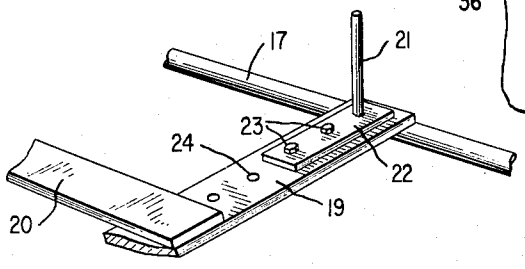


FIG.5

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BOAT LIFT

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11 Claims. (Cl. 61—48)

This invention relates to boat lifting and storing apparatus.

An object of the invention is to provide a sheltered boat lift which may be installed under a waterside cottage or the like or beneath the roof of a boathouse so that boats may be elevated above the water for maintenance purposes or for winter storage while fully protected from the elements.

Another important object is to provide a simplified boat lift which is strong and durable and which is operated by compact winch and cable means installed overhead and thereby permitting the use of the lift in shelters having a minimum amount of head clearance.

Another object is to provide a boat lift which is adjustable vertically upon its mounting to a considerable degree and embodying an absolute minimum amount of structure rendering the lift space-saving and enhancing its usefulness where space is at a minimum.

Another object is to provide a device of the mentioned character which is characterized by simplicity of construction and design, efficiency of operation and economy of manufacture.

The novel features that are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of specific embodiments when read in connection with the accompanying drawings, wherein like reference characters indicate like parts throughout the several figures and in which:

FIGURE 1 is a perspective view of boat lifting and storing apparatus according to the invention and showing the same installed in a boathouse;

FIGURE 2 is a somewhat enlarged side elevation of the apparatus, partly in section, and with parts omitted;

FIGURE 2*a* is a fragmentary side elevation similar to FIGURE 2 and showing the boat cradle in a lowermost adjusted position upon a mounting bracket;

FIGURE 3 is a plan view of the apparatus partly in section and with parts omitted;

FIGURE 4 is an end elevation of the same, partly broken away;

FIGURE 5 is an enlarged fragmentary perspective view of the cradle showing adjustable guide and centering means for the boat hull;

FIGURE 6 is a fragmentary end elevation of a modified form of the apparatus utilized for lifting heavy boats, and

FIGURE 7 is a fragmentary side elevation similar to FIGURE 2*a* illustrating a modified adjustable mounting bracket for supporting the pivoted end of the boat cradle.

With continued reference to the drawings in detail, FIGURE 1 illustrates a fragmentary portion of a boathouse or the like constituting the environment for the present invention. This boathouse may include a ceiling having beams **10**, a side wall **12** with access door **13** leading to a suitable walkway **14** which is elevated from the water. The boathouse contains no floor and is erected over the water so that boats may pass directly into the same. If preferred, the space beneath a waterside cottage could also constitute the point of use or environment of the present invention, and as previously stated, the invention is peculiarly suitable for installation where space is at a premium and a minimum head clearance is available above the water.

Continuing to refer to the drawings, the apparatus of the invention comprises a boat cradle **15** including a pair of spaced parallel side frames or trusses **16** which are elongated and generally horizontal during use. The trusses **16** may be identical in construction and formed from sturdy metal tubing or the like and they preferably include main upper longitudinal bars **17** and suitable depending or underslung bracing **18** rigidly secured thereto by welding or the like to render the cradle **15** very rigid yet relatively lightweight.

The cradle **15** further comprises a bed portion to engage beneath the boat hull and comprising a pair of spaced transverse shallow V-shaped bars **19** arranged intermediate the ends of the trusses **16** and having their opposite ends rigidly secured to the upper bars **17** by welding or by other suitable means. A pair of spaced parallel longitudinal bed members or bars **20** extends between the transverse bars **19** at right angles thereto with the opposite ends of the bars **20** rigidly secured by welding or the like to the bars **19**. The cradle **15** thus constitutes a unitary lightweight and rigid structure for engagement beneath the boat hull to elevate the same from the water, as will be fully described.

Adjustable upstanding guide or centering pins **21** are provided upon the V-shaped crossbars **19** and carried by flat base plate **22** adjustably secured to the bars **19** by bolt means **23**. Each bar **19** has several openings **24** formed therethrough near its opposite end portions to receive the bolt means **23** in the selected adjusted positions of the pins **21**, whereby boat hulls of varying shape and size may be accommodated upon the cradle **15**. The pins **21** may be padded with rubber or the like if preferred.

A pair of mounting brackets **25** are suitably rigidly secured to the wall **12** of the boathouse or shelter for pivotally supporting one end of the cradle **15** as shown in the drawings. Each bracket **25** is vertically elongated and includes several vertically spaced pairs of apertured ears **26** for the selective reception between them of forward apertured portions **27** of the longitudinal bars **17**. The forward ends **27** of the bars **17** are pivoted between the selective pairs of ears **26** by suitable pivot pins **28** which engage through the apertures of the ears and bars as best shown in FIGURE 3. Accordingly, the forward end of the boat cradle **15** is firmly pivotally secured to the brackets **25** at the desired or selected elevation relative to the water level within the shelter. The opposite end of the cradle **15** is freely disposed for vertical swinging movement upwardly or downwardly about the pivoted forward end of the cradle.

Overhead lift and lowering means for the cradle **15** are provided within the shelter, including a preferably electric winch **29** having a built-in speed reducer and a reversing switch. A double flanged winding drum **30** is fixedly secured to the horizontal rotary drive shaft of the winch **29** and the axis of the drum and winch shaft is parallel to the cradle **15** and at an elevation substantially above the cradle and spaced laterally therefrom, as shown in the drawings. The winch **29** is suitably rigidly mounted upon a platform **31** or the like rigidly connected with the overhead or ceiling beam **10** above the cradle.

Sheaves **32** and **33** are likewise secured dependingly to the overhead beam **10** in substantial lateral alignment with the winding drum **30** and directly above the rear free ends of the cradle bars **17**. A pair of cables **34** and **35** connected with the winding drum **30** are trained over the sheaves **32** and **33** and have upper horizontal portions which lie close to the overhead beam **10**. From the sheaves **32** and **33** the cables **34** and **35** extend downwardly for attachment to suitable lifting eyes **36** which are rigidly secured to the rear ends of the longitudinal bars **17**. With the described arrangement, the winch **29** may be energized to wind up the cables on the drum **30**

and elevate the rear end of the cradle 15 and the winch may be reversed by suitable conventional switch means to allow lowering of the cradle 15 as indicated by the broken line showing of the cradle and cables in FIGURE 2. By the operation of the winch, the boat cradle may be elevated to a substantially horizontal position completely above the level of the water, FIGURE 2, or lowered to an inclined position substantially completely below the water level within the overhead shelter.

In use, the motorboat B may be driven directly into the shelter or boathouse and above the cradle 15 while the same is lowered to or near the broken line position shown in FIGURE 2. The winch is then set into operation to elevate the cradle 15 for lifting the boat partially or entirely out of the water for storage or maintenance purposes. The bottom of the boat hull rests directly upon the bed which includes the bars 19 and 20 and the hull is centered and guided by the pins 21, as previously explained. The apparatus may be employed effectively in shelters above the water where head clearance is at a minimum because of the fact that the winch and cable elevating and lowering means are mounted overhead in a very compact manner, and substantially no ground level or water level structure for the cradle 15 is needed except for the two wall-mounted brackets 25 which pivotally support the forward end of the cradle.

FIGURE 6 illustrates a slight modification of the invention adapted to handle heavier boats than could be accommodated readily by the apparatus according to the first form of the invention. In FIGURE 6, the identical cradle 15 and mounting brackets 25 are employed along with the identical winch 29 and associated elements. However, in FIGURE 6, a lower pair of differential pulleys 37 and 38 are employed below and in conjunction with the guide sheaves 32 and 33 and the pulleys 37 and 38 are connected with the lifting eyes 36 of the cradle 15 by means of suitable rigid links 39, as indicated. Lifting cables 34' and 35' engage the sheaves 32 and 33 and the pulleys 37 and 38 in the manner shown and have their ends secured at 40 to the overhead mounting brackets of the sheaves 32 and 33. The cables 34' and 35' are connected with the winch winding drum 30 in the identical manner shown and described in the first form of the invention. All other parts of the embodiment shown in FIGURE 6 are identical in their construction and operation with the corresponding parts shown and described in connection with FIGURES 1 through 5.

The operation of the invention as shown in FIGURE 6 is substantially identical to the operation of the prior form of the invention, and the only difference is the fact that the pulleys 37 and 38 in the cable system provide a well-known differential lift arrangement wherein the lifting force of the winch 29 is multiplied to effect the raising and lowering of relatively heavy boats.

FIGURE 7 illustrates a further slight modification of the invention wherein readily adjustable mounting bracket means for the forward pivoted end of the boat cradle 15 are provided so that such end may be raised and lowered relative to the water and locked in the selected adjusted position without the necessity of detaching the cradle from its mounting brackets. This means comprises in FIGURE 7 fixed brackets 41 rigidly secured to the wall 12 adjacent the forward ends of the bars 17. Sector plates 42 are pivoted at 43 to the bracket 41 for turning movement in vertical planes and the sector plates have radial arms 44 pivoted at 45 to the forward ends of the bars 17. A plurality of circumferentially spaced adjustment openings 46 are formed through each sector plate 42 in concentric relation to the pivot 43 and a suitable locking pin or bolt 47 is selectively engageable through an opening 46 of the sector plate and a registering opening formed through the bracket 41, to lock the sector plate and its arm 44 in the selected adjusted position. By this means, the forward end of the cradle 15 may be raised or lowered with respect to the water level and securely locked in the selected vertically adjusted position as indicated clearly in FIGURE 7. In all adjusted positions, the cradle 15 has its forward end freely pivoted upon the arms 44 and the overall operation of the device during use is the same as previously described in the foregoing embodiments. A further advantage of the FIGURE 7 construction is that the lowering of the forward end of the boat cradle is rendered semi-automatic. That is to say, the mere pulling of the locking pins 47 to disengage them from the sector plates 42 allows the forward end of the cradle to drop by gravity to the lowermost position where the arms 44 depend vertically. The construction in FIGURE 7 may be employed equally well with the embodiment of FIGURES 1 and 2 or with the embodiment shown in FIGURE 6.

In connection with all described embodiments of the invention, it will be understood that multiple boat lifting and storage units according to the invention may readily be installed side-by-side within the boathouse and operated independently by separate winch and cable units of the type shown or by a single suitably powerful winch and multiple cable system, if preferred. Such a winch system common to several boat cradles may be provided with suitable clutch or control means and multiple winding drums necessary to effect the independent control and operation of the individual boat cradles. Also, the several branch cables operated by a single winch unit may be detachably connected to the rear ends of adjacent boat cradles to facilitate selective raising and lowering of individual cradles upon attachment of the proper branch cables thereto.

Although certain specific embodiments of the invention have been shown and described, it is obvious that many modifications thereof are possible. The invention, therefore, is not to be restricted except insofar as is necessitated by the prior art and by the spirit of the appended claims.

I claim:

1. The combination of a boat handling apparatus with a boat shelter having a substantially upright wall protruding above the surface of a body of water and a stationary roof fixed to said wall and extending over the water, said apparatus comprising an elongated boat supporting cradle within said shelter and capable of extending longitudinally under a boat to seat the latter longitudinally thereon, bracket means fixed to said upright wall and including vertically shiftable pivot means supporting one end of the cradle at one of a number of different elevations relative to the surface of the water so that said one end of the cradle may be pivotally supported slightly above the water, and an overhead lift and lowering means within the shelter secured to said roof and connected to the cradle remote from said pivot means to raise and lower the other end of the cradle above and below the water, said lift and lowering means controlling the movement of said cradle from a boat receiving position in which the cradle depends at an angle from said pivotally supported one end with the other end below the water to a boat elevating position in which said other end is lifted above the water.

2. The combination set forth in claim 1, wherein said lift and lowering means comprises a winch and cable connected to said cradle.

3. The combination according to claim 2, wherein said winch is electrically operated and reversible.

4. The combination according to claim 1, wherein said bracket means comprises a vertically elongated bracket having vertically spaced journal elements, and said pivot means includes a displaceable pivot element selectively insertable in said journal elements.

5. The combination according to claim 1, wherein said bracket means includes a fixed element secured to said upright wall, a sector plate pivoted to the fixed element

and having an extension arm pivoted to said one end of the cradle at a point displaced from the pivot axis of the sector plate, a plurality of circumferentially spaced openings concentric to the pivot of the sector plate, said fixed element having an aperture spaced from the pivot of the sector plate, and a locking pin selectively engageable through the aperture of the fixed element and one of said openings of the sector plate.

6. The combination set forth in claim **1** wherein said cradle comprises spaced longitudinal side trusses and a connecting bed portion to engage beneath a boat in the water, said bracket means comprises a pair of laterally spaced fixed mounting brackets adjacent corresponding ends of said trusses and pivotally supporting the same, and said lift and lowering means comprises suspension cables carrying the opposite ends of said trusses and extending above the same, overhead guide sheaves engaging said cables and supporting them, and winch means common to said cables and mounted overhead and spaced laterally of said guide sheaves and including a winding drum secured to said cables to wind up and pay out the same.

7. The invention according to claim **6**, and wherein said mounting brackets are vertically elongated and include vertically spaced pairs of apertured ears for selective pivotal mounting of the first-named ends of said trusses at the desired elevation relative to the surface of the water.

8. The invention according to claim **6**, and differential pulleys connected with said cables intermediate said guide sheaves and said opposite ends of the trusses for multiplying the lifting force of said winch means upon said cradle.

9. The invention according to claim **6**, and laterally adjustable upstanding boat centering and guide elements carried by the bed portion of said cradle to stabilize boats resting thereon.

10. The invention according to claim **9** wherein said cradle bed portion comprises a pair of longitudinally spaced, V-shaped transverse bars secured to said side trusses, each of said transverse bars having laterally spaced openings, said centering and guiding elements each comprising an upstanding rod fixed to a plate having a bolt which may be selectively engaged in one of said openings.

11. A boat supporting cradle to be used in water near the surface for elevating and lowering a boat respectively above and into the water, comprising a pair of laterally spaced longitudinal side trusses, a pair of longitudinally spaced V-shaped members secured to said trusses and forming part of a bed to engage the bottom of a boat, laterally adjustable boat centering and guide elements carried by said V-shaped members, the forward end of said pair of trusses being provided with a vertically adjustable pivot support means, and the rear end of said pair of trusses being provided with eyes for attachment of a lift and lowering cable, said pivot support means comprising a circular sector plate having a radial extension arm pivoted to said forward end of the pair of trusses, a support arm pivotally secured at one end to the sector plate near its center and being adapted to be secured at its other end to a fixed support, a plurality of circumferentially spaced openings in said sector plate near its periphery, said support arm having an opening spaced from the pivot of the sector plate, and a removable locking pin selectively engageable through the opening of the support arm and any one of the circumferential openings in the sector plate.

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