Feb. 20, 1962 E. E. HARVEY 3,021,965

BOAT LIFT

Filed Nov. 6, 1959 2 Sheets-Sheet 1

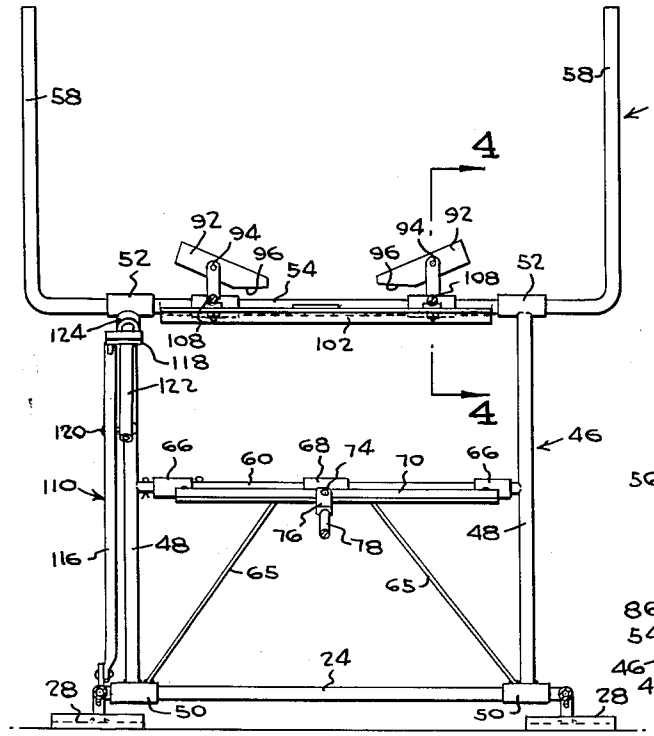


Fig-3

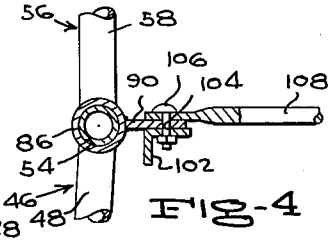


Fig-4

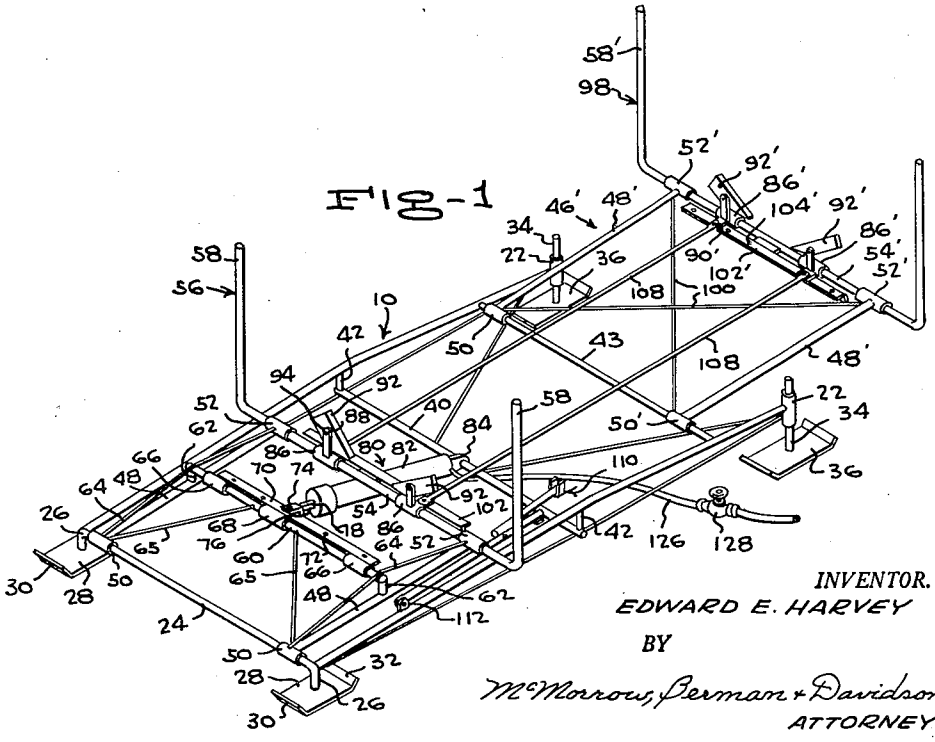


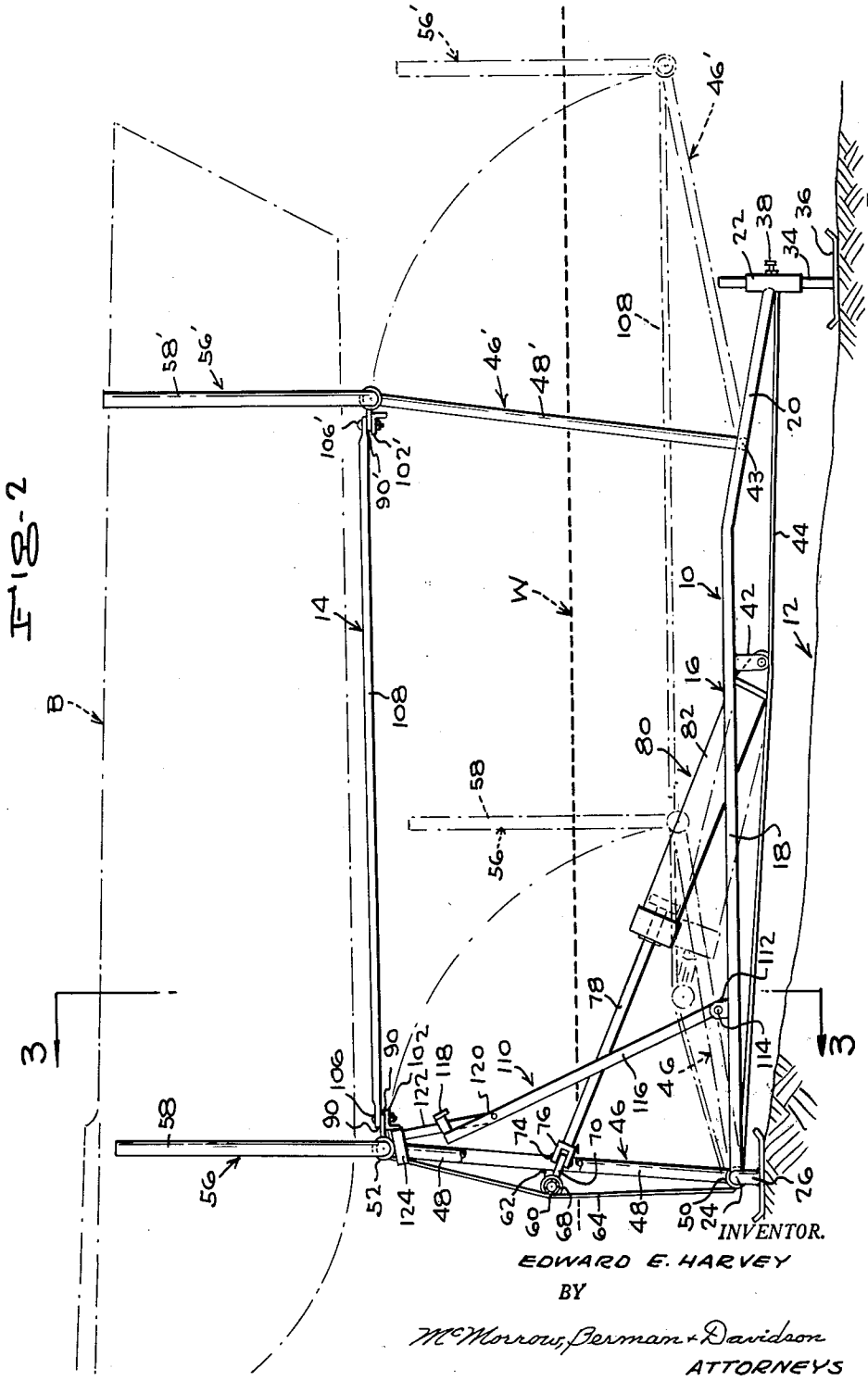
Fig-1

INVENTOR.
EDWARD E. HARVEY
BY
McMorrow, Berman & Davidson
ATTORNEYS

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BOAT LIFT

Edward E. Harvey, Gruver, Iowa

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1 Claim. (Cl. 214—1)

This invention relates to a novel boat lift for installation on the bottom of a body of water, for lifting and holding a boat floated thereover out of and above the water, for cleaning, scraping, or painting of the boat.

The primary object of the invention is to provide a more efficient and more easily used hydraulically operated device of the kind indicated, which can be made in readily portable form for easy transport and installation, and which is devised to be operated by water pressure, such as is available from municipal water supply systems, so that the device requires no expensive hydraulic pump unit, but can be operated merely by connecting thereto a hose leading from any handy source of water under pressure.

Another object of the invention is the provision of an inexpensive and adequately rugged device of the character indicated above, which can be easily assembled from simple and readily available components, such as plumbing pipe and fittings, rods, and sleeves, which can be obtained from local supply houses.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, for purposes of illustration only, a specific form of the invention is set forth in detail.

In the drawings:

FIGURE 1 is a persepective view of a device of the invention, with the lift mechanism in depressed position;

FIGURE 2 is an enlarged schematic side elevation showing the device installed and levelled on a water bottom, with the lift mechanism in elevated position in full lines and in depressed position in phantom lines;

FIGURE 3 is a vertical transverse section taken on the line 3—3 of FIGURE 2; and,

FIGURE 4 is an enlarged fragmentary vertical section taken on the line 4—4 of FIGURE 3.

Referring in detail to the drawings, wherein like numerals designate like parts throughout the several views, the illustrated device comprises a longitudinally elongated open horizontal main frame **10**, to rest upon and be levelled on a water bottom **12** below water level W, and boat lifting mechanism **14** mounted upon the frame **10**, onto which a boat B is adapted to be floated, to be elevated out of and above the water level W.

The frame **10** comprises a pair of parallel laterally spaced longitudinal side members **16** having straight, normally horizontal forward portions **18** and shorter downwardly angled rear portions **20**. The side members **16** can be single length of pipe or rod, and have vertical sleeves **22** fixed, as by welding, on their rear ends, and are similarly fixed, at their forward ends, to related ends of a forward horizontal cross bar or rod **24**, having downturned ends **26**. Fixed centrally to the lower ends of the downturned rod ends **26** are flat feet or slides **28**, having upwardly angled ends **30** and **32**, which facilitate sliding the feet on the water bottom **12**.

Slidably engaged in the sleeves **22** are vertical shafts **34** which are centrally fixed, at their lower ends, to flat rear feet or slides **36** like the forward slides **28**. Set screws **38**, in the sleeves **22**, are provided for locking the rear slides **36** in vertically adjusted positions, where the downward angulation of the rear portions **20** of the frame side members **16** is not enough to level the frame **10** on a declining water bottom **12**, as illustrated in FIGURE 2.

Additionally spacing and bracing the side members **16**, at the mid-length points thereof, is an intermediate cross

member **40**, suitably of rod or pipe, which is fixed to the lower ends of short vertical elements **42** which are fixed to and depend from the side members **16**. A rear cross member **43** is provided between the side members **16** at points near and spaced from their rear ends. Longitudinal tie rods or braces **44** underlie the side members **16**, are secured to the intermediate cross member **40** and, at the related ends, to the forward cross member **24** and the sleeves **22**.

The lifting mechanism **14** comprises a forward lift frame **46** comprising laterally spaced longitudinal side rods **48** which are fixed at one end to sleeves **50** which are journalled on the forward frame cross member **24**, and fixed at their other ends to sleeves **52** which are journalled on the straight transverse bight portion **54** of a forward U-shaped boat cradle **56**, the bight portion **54** having fixed upstanding arms **58** on its ends, which are spaced from each other at a distance to accept boats of contemplated widths or beams therebetween. The side rods **48** are spaced and connected, at their midpoints, by a cross rod **60** which is set up from the plane of the side rods by short vertical elements **62**. Longitudinal brace rods **64** extend between and are secured to the sleeves **50** and **52** and to the elements **62**. Diagonal brace rods **65** extend between the sleeves **50** and spaced points on the cross rod **60** at the middle thereof. Positioned immediately behind the cross rod **60** and journalled thereon by means of outer sleeves **66** and a middle sleeve **68**, is a hydraulic cylinder angle iron connector bar **70**, which extends for the major part of the length of the cross rod **60** and is provided in one flange thereof, with longitudinally spaced holes **72**, for selective engagement by the connector pin **74** of the clevis **76** on the piston rod **78** of a hydraulic jack **80**, the cylinder **82** of which is journalled, as indicated at **84**, on an intermediate part of the intermediate frame cross member **40**.

Journalled on and slidable along the bight portion **54** of the forward boat cradle **56**, at points inwardly of the sleeves **52**, are spaced sleeves **86** on which are fixed upstanding clevises **88**, and rearwardly extending ears or lugs **90**. Boat chocks **92** are pivoted intermediate their ends, as indicated at **94**, in the upper parts of the clevises **88**, to normally assume laterally inwardly tilted positions, as indicated in FIGURES 1 and 3, and which have bevelled inner end portions **96** which can rest upon the sleeves **86**, upon the weight of a boat B resting upon and between the chocks **92**.

A rear boat cradle **98** is substantially similar to the forward boat rest **56**, except for the absence of a cross rod **60** and its appurtenances, having its components identified by similar primed numerals, is journalled on the rear frame cross member **43**. The rear cradle **98** has thereon crossed and intersecting diagonal brace rods **100** which are secured to the sleeves **50'** and **52'**, which take the place of the cross rod **60** of the forward cradle **56** in lending strength and rigidity thereto.

At the facing sides of and extending along the bight portions **54** and **54'** of the two boat cradles **56** and **98**, and secured to their sleeve lugs or ears **90** and **90'** are angle iron bars **102** and **102'**, respectively, which are provided with longitudinally spaced bolt holes **104** and **104'** through which bolts **106** and **106'** are selectively engaged. These bolts are on related ends of longitudinal laterally spaced tie rods **108**, whose forward structure is shown in detail in FIGURE 4, extend through related lugs **90** and **90'** on chock sleeves **86** and **86'** and through selected bolt holes **104**, **104'** in flanges of the bars **102**, **102'** of the boat cradles. The chocks **92** and **92'** are given the desired spacing relative to each other on the two boat cradles, by engaging the bolts **106** and **106'** in related holes in the bars **102**, **102'**. The lengths of the tie rods **108** is such that, when erected, the forward

and rear lift frames are perpendicular and parallel, and when depressed, are positioned at slight upward and rearward angles relative to the main frame **10**, as shown in phantom lines in FIGURE 2, so that the device is in a flat and compact form for convenient transport and storage.

For locking the boat cradles in their erect positions, as shown in FIGURE 2, a locking and bracing assembly, generally designated **110** is provided in association with the forward lift frame **46**. The assembly **110** comprises an upstanding lug **112** fixed on a frame side member **16** at a point near to and spaced rearwardly from the forward end of the member **16**, on which is pivoted, as indicated at **114**, the lower end of a straight rod **116**, on which is fixed at its upper or free end, a rearwardly and laterally offset stop arm **118**. Pivoted at **120**, on the same side of the rod **116** as the stop arm **118**, and at a point spaced downwardly from the stop arm, is the lower end of a normally upstanding straight toggle lever **122**, having fixed on its upper end a forwardly extending spring clevis **124** to be forced forwardly onto the adjacent forward lift frame side bar **48**, at the upper end thereof, as shown in FIGURES 2 and 3, with the rod **116** "broken" or off-center forwardly of the toggle lever **122**, and with the toggle lever **122** against the stop arm **118**, as shown in detail in FIGURE 2. This over-center arrangement puts the rod **116** and the toggle lever **122** in locked bracing relation to the forward lift frame **46**, relative to the main frame **12**, so that the forward lift frame **46** is maintained in an erect position. "Breaking" the rod **116** and the toggle lever **122** in a rearward direction permits the forward lift frame **46**, and the rear lift frame **46'**, by virtue of the tie rods **108** which connect these frames, to be depressed to the phantom line positions shown in FIGURE 2.

For operating the hydraulic jack **80**, a suitable connection is provided on the cylinder **82** for connection of a water hose **126**, preferably having a hand valve-equipped connection fitting **128** to which is to be connected a locally available source of water under pressure. When the valve **128** is opened, the piston rod **78** of the jack **80** is extended out of the cylinder **82** and pushes the forward lift frame **46**, and consequently the rear lift frame **46'** to erect position, whereat closing of the valve **128** holds the pressure in the cylinder **82**, so as to maintain the erect positions of the lift frames, and thereby the elevated above-water positions of the boat cradles **56** and **98**. The assembly **110** serves to hold these positions whenever it is desired to disconnect the hose **126** from the water supply.

While there has been shown and described herein a preferred form of the invention, it is to be understood that the invention is not necessarily confined thereto, and that any change or changes in the structure of and in the relative arrangements of components thereof are contemplated as being within the scope of the invention as defined by the claim appended hereto.

What is claimed is:

A boat lift comprising a main horizontal frame having forward and rear ends, a forward lift frame hinged on the main frame at the forward end of the main frame, a rear lift frame hinged on the main frame at a point spaced rearwardly from the forward lift frame, tie rod means spaced above the main frame and extending between and pivotally secured to upper parts of the lift frames and maintaining the lift frames in parallel relationship to each other in erect positions and in depressed reclining positions, cradles mounted on the lift frames, and hydraulic jack means extending between and pivoted to the main frame and to one of the lift frames for erecting the lift frames from depressed positions and for holding the lift frames in erect positions, said cradles comprising U-shaped boat cradles mounted on upper parts of the lift frames having bight portions extending crosswise of the main frame, and pairs of boat chocks mounted on the bight portions, and a locking assembly comprising a normalily vertical rod having a lower end pivoted on the main frame at a point spaced behind the forward lift frame, a rearwardly and laterally extending stop arm on the upper end of the vertical rod, a vertical toggle lever pivoted at its lower end to a side of the vertical rod at a point spaced below the stop arm, said toggle lever having a forwardly extending clevis on its upper end to engage a part of the forward lift frame only in the erect position thereof for holding the lift frames in erect position, with the vertical rod in a forward diagonal position with its upper portion over-center with respect to the toggle lever.

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