TILTING LIFT FRAME FOR SMALL BOATS

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TILTING LIFT FRAME FOR SMALL BOATS

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ABSTRACT OF THE DISCLOSURE

Disclosed herein is a tilting lift frame for rescue work, which is adapted for pivotal mounting to a boat hull. The frame has lever arms extending longitudinally of the hull which serve as handles to manipulate the suspension frame which overhangs forwardly of the hull. The suspension frame supports a stretcher for an injured person. The frame can be tilted forwardly for connection to the stretcher and then pivoted rearwardly to elevate the stretcher to a position above the water for travel to an aid station.

This invention relates to a tilting lift frame for small boats.

The tilting lift frame of the present invention has a multitude of uses. Of particular importance is its use in rescue work to recover an injured person from the water and to transport such person to an aid station.

The tilting lift frame of the present invention is characterized by its novel construction and association with a small boat. The tilting frame is elongated along the longitudinal axis of the boat and is pivotally mounted near one end thereof, preferably the bow. The bow has lever arms extending from the pivot axis longitudinally of the boat. The lever arms serve as handles to manipulate an elevated suspension frame which is at the other side of the pivot axis and overhangs the end of the boat. For use in water safety rescue work, a stretcher is adapted to hang from the elevated suspension frame.

In use, the lever arms are manipulated manually to swing the suspension frame toward the water to lower it to a level convenient for attaching a water-immersed patient-bearing stretcher thereto. Thereupon the lever arms are swung downwardly, thus to lift the stretcher-bearing patient out of the water and to an elevated clear-of-the-water position overhanging the end of the boat. Thereupon the boat may proceed to an aid station.

The stretcher is desirably provided with floats by which it will support the patient while the stretcher is floated to a position beneath the suspension frame. The patient is subject to minimum handling and aggravation of his injuries in the course of recovering him from the water.

First aid swimmers will manipulate the patient on the stretcher while he is naturally buoyed up by the water and easy to handle. All subsequent stresses are borne by the stretcher. This is very materially unlike the present crude practice of simply hauling the patient over the side of a small boat, with attendant great danger of aggravating his injuries and also endangering the occupants of the boat by upsetting its trim. In accordance with the present invention, the frame is mounted longitudinally of the boat and tilts in a longitudinal direction. This preserves maximum stability for the boat. The shifting weight of the injured person from the water to the boat is achieved with a minimum disturbance of boat trim.

The apparatus of the present invention has particular utility as a rescue rig for small motor boat races, etc. The rescue rig is typically stationed at a turn in the race course where it will be readily at hand in the event of an accident. The elevated suspension frame can further be provided with a personnel platform useful as a judge's observation platform, etc.

The suspension frame can also be used as a support for a ladder useful in skin diving operations. The ladder will thus be mounted at the end of the boat so that the shift of weight of the skin diver entering and leaving the water will have minimum effect on the boat trim.

Other objects, features and advantages of the invention will appear from the following disclosure in which:

FIG. 1 is a perspective view of apparatus embodying the present invention.
FIG. 2 is a perspective view of a stretcher adapted for use with the tilting frame of the present invention.
FIG. 3 is a perspective view of apparatus embodying the invention in which the suspension frame is swung toward the water and is shown in the course of attachment to a patient-bearing stretcher.
FIG. 4 is a perspective view showing the stretcherborne patient lifted to a clear-of-the-water position.
FIG. 5 is a cross section taken along the line 5—5 of FIG. 4.
FIG. 6 is a fragmentary perspective view showing the tilting frame to which a skin diving ladder is attached.
FIG. 7 is a cross section taken along the line 7—7 of FIG. 6.

Although the disclosure hereof is detailed and exact to enable those skilled in the art to practice the invention, the physical embodiments herein disclosed merely exemplify the invention which may be embodied in other specific structure. The scope of the invention is defined in the claims appended hereto.

While the tilting frame of the present invention is not limited to attachment to any particular type of boat, it has been found that the illustrated shovelnose type of boat 10 is well adapted for use with my tilting frame because the bow 11 of the boat is broadbeam, has substantial buoyancy, and does not project into the range of swinging movement of the suspension frame. Moreover, boat 10 provides advantageously located corner blocks 12 to which pivot brackets 13 may readily be fastened. This type of boat is also preferred when the boat is provided with an outboard motor 20 which preempts the stern transom area of the boat. If a row boat is used, the frame could be turned end for end to overhang the boat stern.

The tilting lift frame 8 desirably consists of tubular pipes suitably bent and having elbow couplings between some parts and welded connections between other parts, all as indicated in the drawing. The resulting framework consists of a suspension frame 9 which overhangs one end of the boat and means for tilting the suspension frame. In the disclosed embodiment, the said means consists of lever arms comprising a pair of laterally spaced lever arms 14 which are rigid with the frame 9 and which extend longitudinally of the boat 10 and generally along its gunwales 15 so as to leave the center of the boat relatively unobstructed. Lever arms 14 are bent at 16, where they are pivotally connected to brackets 13 on pintles 32, and project upwardly beyond the bend 16 to form upwardly inclined posts 17 of an elevated suspension frame 9.

Suspension frame 9 includes side arms 18 to which the upwardly extending pipes 17 are welded near their forward ends. Arms 18 have downwardly extending arms 19, desirably parallel to posts 17, the ends of which are welded to the lever arms 14. Frame 9 has a front cross piece 20 connected to arms 18 on elbows 28, and a rear cross piece 21 connected to arms 18 on T-couplings 29.

A sheetmetal personnel platform 23 is desirably provided on the suspension frame 9 for the support of a person 24, as shown in FIG. 1. The platform 23 is desirably
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provided with guardrail 25 mounted from the platform 23 on posts 26, to one of which a seat or tray 27 may be attached on bracket 39 as shown in FIG. 3.

Near the rear ends remote from the elevated suspension frame 9 the lever arms 14 are turned downwardly at 30 and are provided with elbows 32 cross connected by transverse pipe 31. The elbows 32 may be provided with eyes 33 to receive the removable fastening pins 34 by which the lift frame may be secured in its position shown in FIGS. 1 and 4. The boat 10 is provided with U-shaped saddle brackets 35 into which the elbows 32 fit. The brackets 35 are apertured to receive the pins 34 and thus lock the frame in its down position.

The front cross member 20 of the suspension frame 9 is provided with couplings such as the eye bolts 36 from which a stretcher 37 may be suspended by means of the free swinging suspension cables 38, as shown in FIGS. 3 and 4.

The stretcher may consist of a closed rectangular loop pipe frame 41 having a canvas web or paitlet 42. Frame 41 is desirably provided with floats 43, 44 by which the stretcher 37 will support an injured person 45 in the water. This is shown in FIG. 3. The stretcher is manipulated by first aid swimmers beneath the injured person 45 who is buoyed up by the water and easily stretched on the stretcher with minimum handling. The stretcher-borne patient is secured to a position forwardly on the boat bow 11. A person in the boat 10 will release the anchor pins 34 and will manually tilt the frame to its position shown in FIG. 3. The suspension frame 9 is thereby swung toward the water so that the cables 38 can be readily attached to the stretcher frame 37, on eye bolts 40, or the like. A limit line 61 is desirably provided to limit the forward swing of the frame.

Thereafter the lever arms 14 of the tilting frame are manually swung to their down position, as shown in FIG. 4, and the anchor pins 34 reengaged. This will lift the stretcher-borne patient gently out of the water and to the bow overhanging position shown in FIG. 4. As is clear from FIGS. 3 and 4, the stretcher and patient will be substantially horizontal throughout the lifting sequence. This is because the suspension cables 38 are free to swing with respect to the frame 9 as it swings on its pintles 22. Gravity will keep the stretcher horizontal. The boat may then be navigated to a first aid station or the like where the stretcher can be detached from the frame 9 and the patient given appropriate medical attention.

A desirable feature of the tilting frame consists in the floats 46 which are mounted by curved pipe bracket arms 47 on the lever arms 14 in a position to overhang the sides of the boat 10 and to enter the water. The floats 46 are mounted as close as practicable to the boat bow and proximate the pivot brackets 13. Accordingly, they add buoyancy to the bow of the boat under the added weight of the frame 8, 9 and any load on the frame 9, such as a stretcher-borne patient, as shown in FIG. 4.

When the suspension frame 9 is swung downward toward the water, as shown in FIG. 3, however, the floats 46 at the opposite side of the pivot brackets 13 are swung upwardly out of the water. Accordingly the bow 11 may be immersed to a greater extent, if desired, without resistance by the floats 46. FIG. 6 shows the tilting frame modified to support a skin diving ladder 50. This ladder consists of a generally rectangular framework 52 having step stools 51 adjustably attached to the frame on T-brackets 49. This ladder may easily be negotiated by a skin diver with flipper foot attachments. The side frame members 52 of the ladder 50 arc turned upwardly at their tops and are provided with slip coupling sleeves 54 adjustable along the suspension frame arms 18. The sleeves 54 may be clamped in any desired position by the set screws 55.

The ladder 50 is adapted to be supported by the rubrail 56 of the bow 11 of the boat 10, thus to support the ladder at various angles of incline, depending upon the adjusted position of the slip couplings 54. In this embodiment the elevated suspension frame desirably further comprises a somewhat elevated cross arm 57 provided with hoist apparatus such as pulley 58 by which heavy skin diving equipment may be handled.

I claim:

1. A tilting lift frame for attachment to a small boat and comprising:
   a suspension frame elevated above the gunwales and overhanging one end of the boat,
   pivot means on which the suspension frame is fastened to the boat near said end and on which the suspension frame may be tilted to swing it toward and away from the water,
   and a lever arm rigid with said suspension frame and extending longitudinally of the boat from said end toward its other end and by which the suspension frame is manually tilted toward and away from the water.

2. A tilting lift frame for attachment to a small boat and comprising an elevated suspension frame overhanging one end of the boat, pivot means on which the suspension frame is fastened to the boat near said end and on which the suspension frame may be tilted to swing it toward and away from the water, lever means extending longitudinally of the boat from said suspension frame beyond said pivot means and toward the other end of the boat for manually tilting the suspension frame about said pivot means, a stretcher and means for hanging the stretcher from the suspension frame and by which the stretcher will be substantially horizontal in all positions as it is lifted to an elevated clear of the water position when the suspension frame is swung away from the water.

3. The lift frame of claim 1 in combination with a personnel platform on the suspension frame.

4. A tilting lift frame for attachment to a small boat and comprising an elevated suspension frame overhanging one end of the boat, pivot means on which the suspension frame is fastened to the boat near said end and on which the suspension frame may be tilted to swing it toward and away from the water, and means for tilting the suspension frame about said pivot means and comprising a lever extending along the side of the boat, in combination with a float attached to the lever adjacent the pivot means and overhanging the side of the boat, said float being adapted to enter the water when the suspension frame is swung upwardly away from the water and to swing clear of the water when the suspension frame is swung downwardly toward the water.

5. The lift frame of claim 1 in which the lever arm is disposed at one side of the boat and extends generally along the gunwale thereof, in combination with another like lever arm at the other side of the boat and extending generally along the other gunwale thereof, said lever arms being laterally spaced one from the other to leave the centre of the boat relatively unobstructed.

6. The tilting lift frame of claim 1 in further combination with a ladder suspended from the suspension frame.

7. The device of claim 6 in which the ladder has a portion intermediate its length to bear against the end of the boat and establish the slope of the ladder.

8. The device of claim 6 in combination with hoist apparatus on the suspension frame over the ladder.

9. The device of claim 6 in which the ladder has an adjustable connection to the suspension frame.

10. Apparatus of the character described comprising:
    a small boat,
    a lift frame as in claim 53 and are provided with slip coupling sleeves 54 adjustable along the suspension frame arms 18. The sleeves 54 may be clamped in any desired position by the set screws 55.

The ladder 50 is adapted to be supported by the rubrail 56 of the bow 11 of the boat 10, thus to support the ladder at various angles of incline, depending upon the adjusted position of the slip couplings 54. In this embodiment the elevated suspension frame desirably further comprises a somewhat elevated cross arm 57 provided with hoist apparatus such as pulley 58 by which heavy skin diving equipment may be handled.

I claim:

1. A tilting lift frame for attachment to a small boat and comprising:
   a suspension frame elevated above the gunwales and overhanging one end of the boat,
   pivot means on which the suspension frame is fastened to the boat near said end and on which the suspension frame may be tilted to swing it toward and away from the water,
   and a lever arm rigid with said suspension frame and extending longitudinally of the boat from said end toward its other end and by which the suspension frame is manually tilted toward and away from the water.

2. A tilting lift frame for attachment to a small boat and comprising an elevated suspension frame overhanging one end of the boat, pivot means on which the suspension frame is fastened to the boat near said end and on which the suspension frame may be tilted to swing it toward and away from the water, lever means extending longitudinally of the boat from said suspension frame beyond said pivot means and toward the other end of the boat for manually tilting the suspension frame about said pivot means, a stretcher and means for hanging the stretcher from the suspension frame and by which the stretcher will be substantially horizontal in all positions as it is lifted to an elevated clear of the water position when the suspension frame is swung away from the water.

3. The lift frame of claim 1 in combination with a personnel platform on the suspension frame.

4. A tilting lift frame for attachment to a small boat and comprising an elevated suspension frame overhanging one end of the boat, pivot means on which the suspension frame is fastened to the boat near said end and on which the suspension frame may be tilted to swing it toward and away from the water, and means for tilting the suspension frame about said pivot means and comprising a lever extending along the side of the boat, in combination with a float attached to the lever adjacent the pivot means and overhanging the side of the boat, said float being adapted to enter the water when the suspension frame is swung upwardly away from the water and to swing clear of the water when the suspension frame is swung downwardly toward the water.

5. The lift frame of claim 1 in which the lever arm is disposed at one side of the boat and extends generally along the gunwale thereof, in combination with another like lever arm at the other side of the boat and extending generally along the other gunwale thereof, said lever arms being laterally spaced one from the other to leave the centre of the boat relatively unobstructed.

6. The tilting lift frame of claim 1 in further combination with a ladder suspended from the suspension frame.

7. The device of claim 6 in which the ladder has a portion intermediate its length to bear against the end of the boat and establish the slope of the ladder.

8. The device of claim 6 in combination with hoist apparatus on the suspension frame over the ladder.

9. The device of claim 6 in which the ladder has an adjustable connection to the suspension frame.

10. Apparatus of the character described comprising:
    a small boat,
    a lift frame as in claim 53 and are provided with slip coupling sleeves 54 adjustable along the suspension frame arms 18. The sleeves 54 may be clamped in any desired position by the set screws 55.
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5 ly tilted to swing the suspension frame toward and away from the water,

and by which the stretcher is selectively disposed in a water immersed position when the suspension frame is swung toward the water and in a water clear position when the suspension frame is swung away from the water.

11. Apparatus of the character described comprising a small boat, a lift frame comprising a lever extending longitudinally of the boat, an elevated suspension frame overhanging one end of the boat, pivot means on which the lift frame is fastened to the boat near said one end and on which the frame may be tilted to swing the suspension frame toward and away from the water, a stretcher, means for hanging the stretcher from the suspension frame and by which the stretcher is selectively disposed in a water immersed position when the suspension frame is swung toward the water and in a water clear position when the suspension frame is swung away from the water, said lift frame being provided with a float which overhangs the side of the boat and is adapted to enter the water when the suspension frame is swung away from the water and to swing away from the water when the suspension frame is swung toward the water.

12. The apparatus of claim 10 in combination with a personnel platform on the suspension frame and above the level at which the stretcher is hung therefrom.

13. The apparatus of claim 10 in which the stretcher has floats to support an injured person in the water.

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