Jan. 11, 1955 A. A. MILLER 2,698,949

BOAT LOWERING DEVICE

Filed June 27, 1951 3 Sheets-Sheet 1

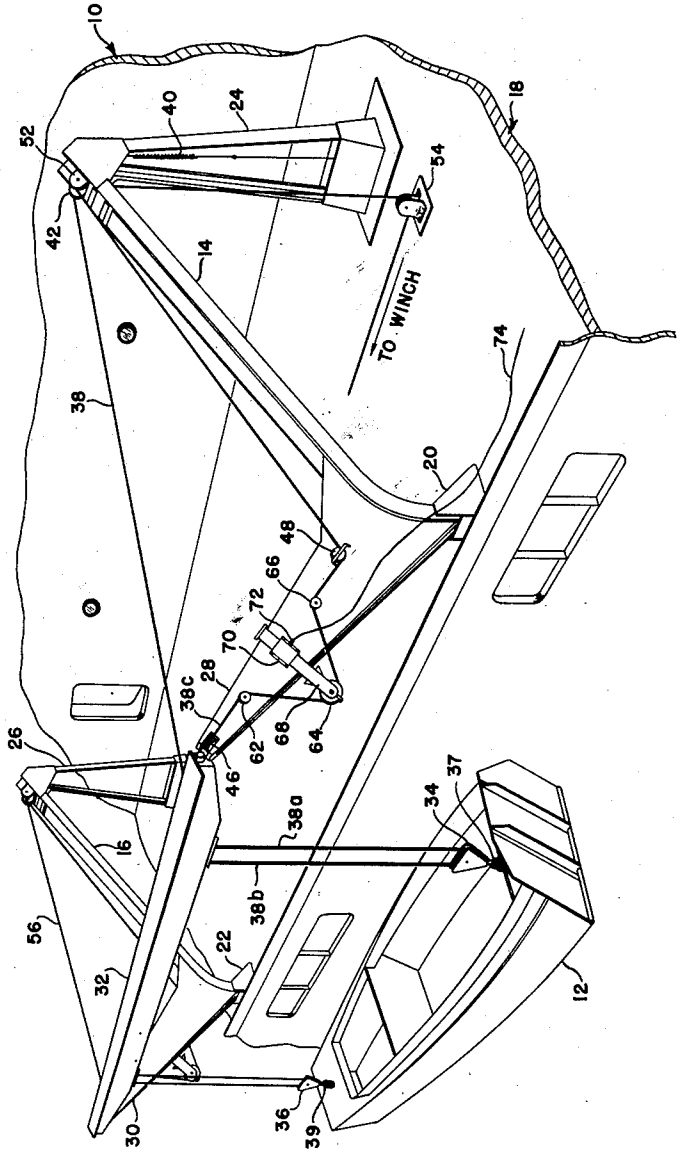


FIG. 1

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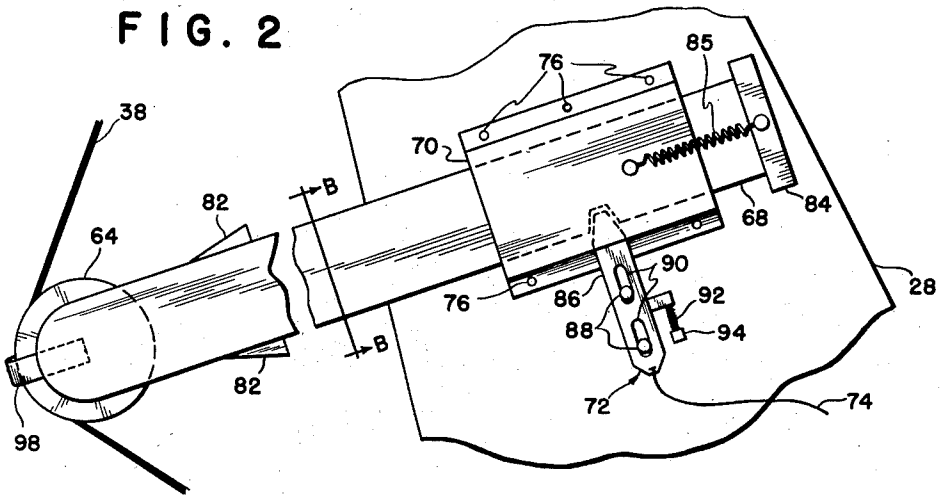
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BOAT LOWERING DEVICE

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FIG. 2



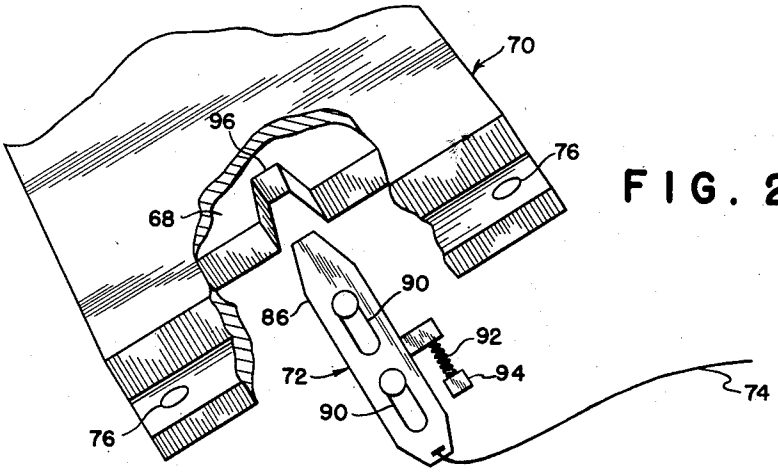


FIG. 2A

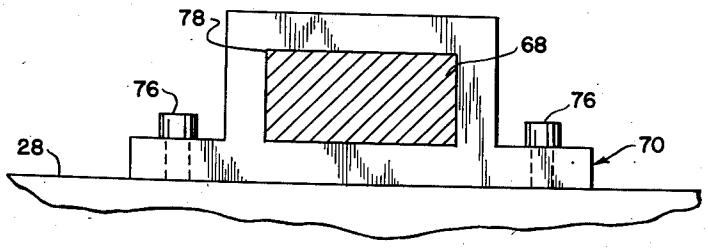


FIG. 2B

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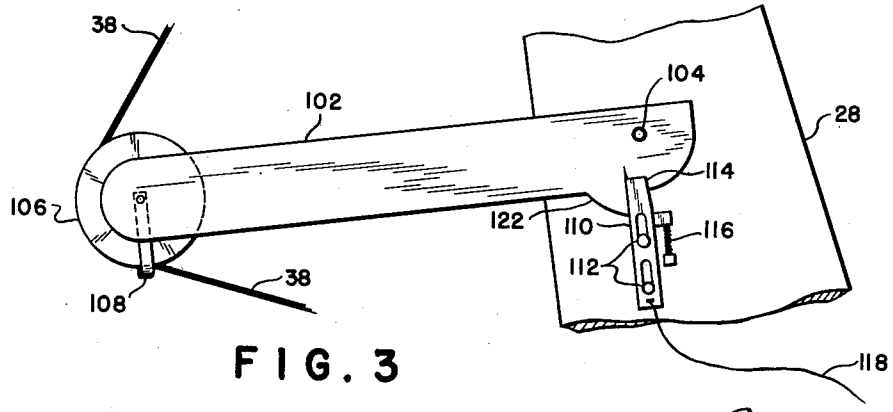


FIG. 3

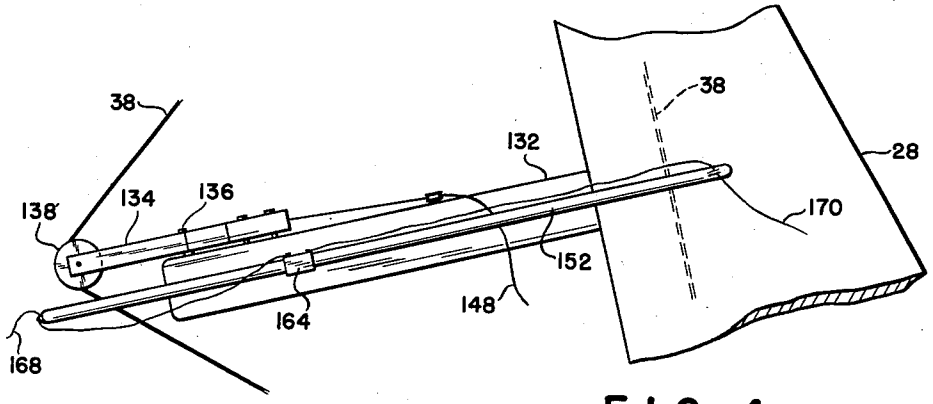


FIG. 4

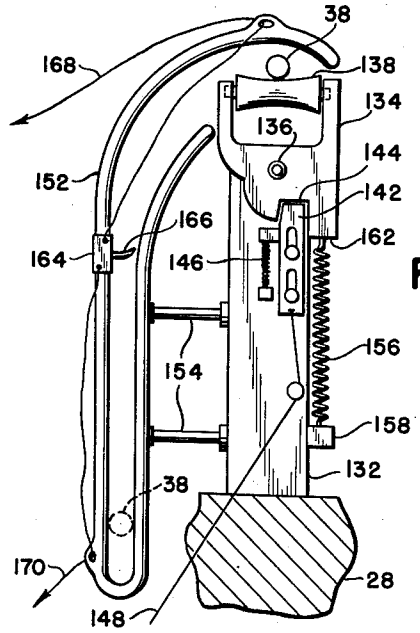


FIG. 5

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United States Patent Office 2,698,949 Patented Jan. 11, 1955

2,698,949

BOAT LOWERING DEVICE

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Application June 27, 1951, Serial No. 233,926

13 Claims. (Cl. 9—34)

(Granted under Title 35, U. S. Code (1952), sec. 266)

This invention relates in general to boat handling and more particularly to devices for lowering lifeboats, surfboats and similar craft. One difficulty encountered when a lifeboat or surfboat is lowered from the deck of a larger vessel or a pier arises at the time that the lifeboat reaches the surface of the water. If waves of a substantial size are present, the crest of a wave will momentarily support the lifeboat and cause the lowering cables to become slack. As the crest of the wave passes and the boat begins to fall into the following trough of the wave, the slack in the lowering cables is suddenly taken up due to the removal of the support of the water. The shock of the sudden tightening of the lowering cables is often sufficient to tear loose the pads to which the lowering cables are attached. In other instances other damage to the boat may result from the alternate rising and falling of the boat when attached to the lowering cables. It would be desirable in such instances to suddenly increase the speed of lowering of the boat at the instant that the boat is first supported by the crest of the wave so that when the following trough of the wave occurs the boat is still supported by the water and the lowering cables remain slack. However, it is impractical to design lowering winches or braking devices capable of providing this rapid acceleration of the lowering speed.

The present invention comprises an auxiliary arm secured to the lowering davit and extending into engagement with the lowering cables so as to form a bight therein, a latch, preferably under the control of the lowering operator, permits the arm to move into a position which effectively removes the bight thus increasing the effective length of the lowering cable.

From the above description it can be seen that it is an object of the present invention to provide an improved device for lowering small boats from the deck of a larger vessel or from a pier.

Another object of the present invention is to provide means for rapidly increasing the lowering speed of a small boat.

Still another object of the present invention is to provide novel means for introducing slack into a lowering cable.

Other objects, features and advantages of this invention will become apparent from the following description of the invention which should be read in conjunction with the accompanying drawings in which:

Fig. 1 is a pictorial drawing of a boat lowering device embodying the present invention;

Fig. 2 is a detailed view of a portion of the lowering device of Fig. 1;

Fig. 2A is an enlarged view, partially broken away, of the latch mechanism of Fig. 2;

Fig. 2B is a cross section of the structure of Fig. 2 taken along the line B—B;

Fig. 3 is a detailed view of a second embodiment of the present invention which may be employed with the lowering device of Fig. 1;

Fig. 4 is a frontal view of still another embodiment of the present invention; and

Fig. 5 is a plan view of the embodiment of the invention illustrated in Fig. 4.

Referring now to Fig. 1, **10** represents the supporting vessel on which the smaller boats **12** are normally transported. Only a fragmentary view of vessel **10** is included since the operation of the present invention is not materially affected by the design of vessel **10**. The

lowering device illustrated in Fig. 1 is generally similar to the Welin Triple Bank Gravity Davit manufactured by the Welin Davit and Boat Corporation, Perth Amboy, New Jersey. While this boat lowering device has been selected for the purpose of illustrating the present invention, it should be understood that the present invention is not limited in its application to such davits but may be equally applied to crescent type gravity devits and other well-known types of controlled lowering davits.

The davits illustrated in Fig. 1 comprise trackways **14** and **16** which are secured at their lower ends to the deck **18** of vessel **10** by brackets **20** and **22**, respectively. The upper ends of trackways **14** and **16** are supported in an elevated position by brackets **24** and **26** also secured to deck **18**. Two davit heads **28** and **30** are movable from an inboard to an outboard position along trackways **14** and **16**, respectively. A strongback **32** is provided between davit heads **28** and **30** to support lowering cables which are attached to boat **12** by means of floating blocks **34** and **36**. Floating blocks **34** and **36** may be secured to suitable pads on boat **12** through the use of quick-release hooks **37** and **39**, respectively. Hooks **37** and **39** may be of the type known to the marine art at the Raymond hook. The cabling for the particular davit illustrated is as follows. One end of the hoisting cable **38** is anchored to the deck **18** through shock absorber **40**. Cable **38** then passes over a sheave **42** at the upper end of trackway **14** and enters strongback **32** over a second sheave (not shown). Cable **38** then passes over suitable sheaves in strongback **32** and thence to the floating block **34** as illustrated at **38***a*. Cable **38** then passes back to strongback **32** as shown at **38***b*. After passing over appropriate sheaves in strongback **32**, cable **38** emerges therefrom as shown at **38***c*. A suitable sheave **46** is provided to change the direction of cable **38** to a direction parallel to the arm of the davit head **28**. In the conventional Welin davit of the type herein used for illustrative purposes, the cable **38** passes substantially in a straight line from sheave **46** to a second sheave **48** also located on the davit head **28**. From sheave **48** cable **38** passes over a second sheave **52** located to the upper end of trackway **14** thence through a deck sheave **54** to a hoisting winch. Davit head **30** and floating block **36** are controlled by a second lowering cable **56** which passes over a series of sheaves substantially identical to the sheaves above described. The free end of cable **56** preferably passes to the same winch that controls cable **38**. This winch is generally provided with a separate drum for winding each cable and suitable braking mechanisms to allow gravity lowering of the boat **12**.

In the present invention, the lowering cable at **38***c* passes over an auxiliary sheave **62** thence around sheave **64** and a second auxiliary sheave **66** to sheave **48**. Sheave **64** is mounted on a support arm **68** which is slidably journalled in a guide bracket **70** secured to the side of the davit head **28**. A latch member **72** and a lanyard **74** secured thereto is provided for controlling axial movement of arm **68**.

Reference should now be made to Figs. 2, 2A and 2B which show in greater detail the construction of support arm **68** and guide bracket **70**. Parts in Figs. 2, 2A and 2B have been given reference numerals corresponding to like parts in Fig. 1. Referring particularly to Fig. 2B, it will be noted that guide bracket **70** is fastened to davit head **28** by suitable fastening means, for example, bolts **76**. A rectangular opening **78** is formed in guide bracket **70** to slidably receive arm **68** and to permit axial movement of arm **68**. Support arm **68** is provided with stop member **82** at one end thereof and a stop plate **84** at the other end thereof for limiting the amount of axial travel of arm **68**. A tension spring **85** is connected between stop plate **84** and guide bracket **70** to urge arm **68** toward the left as shown in Fig. 2.

Guide bracket **70** is formed with a second opening in the side thereof to receive the latch bolt **86** of latch **72**. Latch bolt **86** is secured to davit head **28** by bolts **88** which pass through elongated openings **90** formed in latch bolt **86**, the elongated openings **90** permitting limited amount of movement of latch bolt **86** in a direction

perpendicular to the direction of movement of arm 68. A compression spring 92 which is fastened at one end to a post 94 mounted on davit head 28 normally urges latch bolt 86 into a notch 96 in arm 68. This notch is most clearly shown in Fig. 2A. Lanyard 74 is provided for withdrawing latch bolt 86 from notch 96 against the action of spring 92.

Fig. 2 also illustrates lowering cable 38 passing over sheave 64. A guard 98 is provided to prevent cable 38 from accidentally becoming disengaged with sheave 64 when the present invention is in operation. It is to be understood that a second device identical to that shown in Fig. 2 is provided on davit head 30.

The present invention operates as follows. Assuming that the winch is paying out cable 38 so that boat 12 is being lowered into the water, support arm 68 would normally be in the position shown in Fig. 2 with latch bolt 86 engaging notch 96 thus preventing axial movement of arm 68 within guide bracket 70. As will be seen from Fig. 1, the length of cable from sheave 62 around sheave 64 and back to sheave 66 is greater than the length of cable required to pass directly from sheave 62 to sheave 66. At the instant that boat 12 is first supported by the water or even when it is slightly above the water, lanyard 74 may be pulled disengaging latch bolt 86 from notch 96 and member 68. The tension in lowering cable 38 will then cause arm 68 to slide within guide bracket 70 until stops 82 engage guide bracket 70. This movement of arm 68 will introduce a considerable amount of slack in the lowering cable 38 which will be taken up by a rapid descent of floating block 34 under the weight of boat 12. The length of travel of arm 68 may be made great enough to introduce enough slack to compensate for the difference between the height of the wave from the crest to the trough. Thus, boat 12 may be dropped into the trough of a wave without danger of the lowering cables becoming taut and thus damaging boat 12 or the pads which engage hooks 37 and 39. With the boat 12 safely in the water, hooks 37 and 39 may then be released and the winch operated to raise floating blocks 34 and 36 into the position to lower another boat which may be located on deck 18. At any time before the next boat is lowered sufficient slack may be introduced in lowering cable 38 to allow arm 68 to return to its normal position with latch bolt 86 in engagement with notch 96. With arm 68 disposed in a position illustrated in Fig. 1 the weight of arm 68 is usually sufficient to cause it to slide into its normal position as soon as tension in the bight of cable 38 passing over sheave 64 is removed. However, spring 85 is provided to positively urge arm 68 toward its normal position. It will be understood that in order to drop the boat into the water in a level position, the lanyard associated with the device mounted on davit head 30 should be pulled simultaneously with the pulling of the lanyard 74 thus introducing slack into lowering cables 38 and 56 at the same instant. Alternatively, electrical, mechanical or hydraulic release mechanisms may be provided for simultaneously tripping the two devices at the same instant.

Fig. 3 illustrates a second embodiment of the present invention in which an arm 102 is pivotally secured to davit head 28 by a bolt 104 passing through these two members. Bolt 104 may be located on davit head 28 at a position between sheaves 62 and 66 and somewhat closer to sheave 66 than to sheave 62. Thus arm 102 will have a normal position very similar to that of arm 68 of Fig. 1. Arm 102 is provided with a sheave 106 and a cable guard 108 which serve the same functions as sheave 64 and cable guard 98 of Fig. 2. A latch bolt 110 secured to davit head 28 by fastening means 112 passing through elongated openings in latch bolt 110 engages the notch 114 near the pivoted end of arm 102. A spring 116 corresponding to spring 92 of Fig. 2 is provided for normally forcing bolt 110 into engagement with notch 114. A lanyard 118 is provided for withdrawing bolt 110 from notch 114. The embodiment of Fig. 3 operates in a manner quite similar to the embodiment illustrated in Figs. 1 and 2. When boat 12 has reached a position where it is supported or about to be supported by the crest of a wave lanyard 118 is pulled withdrawing bolt 110 from notch 114. The tension in lowering cable 38 will then cause arm 102 to rotate in a clockwise direction as shown in Fig. 3 until it lies in a position nearly parallel to a line drawn between sheave 62 and sheave 66. This movement of arm 102 will eliminate the bight in cable 38 and thus introduce sufficient slack to allow boat 12 to drop into the trough of the wave. Arm 102 is prevented from rotating more than about a quarter turn by cable guard 108 which passes around lowering cable 38. Alternatively, a stop (not shown) may be added to davit head 28 to restrict the movement of arm 102. When the boat 12 has been released and it is desired to restore arm 102 to its normal position, this may be accomplished by introducing slack into lowering cable 38 and arm 102 will be returned to its normal position by gravity. A stop 122 is provided on arm 102 which will engage latch bolt 110 even though it is fully withdrawn from notch 114. Stop 122 will thus prevent arm 102 from rotating in a counterclockwise direction beyond its normal position. Again, mechanical or electrical devices may be provided for withdrawing bolt 110 from notch 114, and means other than bolt 110 and notch 114 may be employed to control the rotation of arm 102 without departing from the present invention.

Figs. 4 and 5 illustrate still another embodiment of the present invention. As shown in these figures, an arm 132 is rigidly secured to davit head 28 at a point substantially midway between sheaves 62 and 66 of Fig. 1. Arm 132 extends generally in the plane defined by davit head 28 and trackway 14 and may be substantially perpendicular to the line between sheaves 46 and 48. A roller bracket 134 is pivoted at the outer end of arm 132 by means of a suitable pivot pin 136. Bracket 134 carries a roller 138 which in its normal position is substantially perpendicular to the plane of the bight in lowering cable 38. A latch bolt 142 engages a notch 144 on bracket 134 under the force of compression spring 146. Bolt 142 is mounted to arm 132 in a manner similar to that described above in connection with bolt 110. A lanyard 148 is attached to bolt 142 for withdrawing bolt 142 from notch 144. A cable guard 152 is secured to one side of arm 132 by suitable brackets 154. To operate the device shown in Figs. 4 and 5, lanyard 148 is pulled which allows bracket 134 to rotate in a counterclockwise direction as shown in Fig. 5 due to the tension in lowering cable 38. As bracket 134 rotates in this counterclockwise direction, lowering cable 38 slips off roller 138 and falls into cable guard 152 to the position illustrated in Figs. 4 and 5 by the dotted lines. Again this will introduce sufficient slack into lowering cable 38 to allow boat 12 to rest in the trough of the wave without taking up all of the slack in the lowering cables. To aid in restoring bracket 134 to its normal position a tension spring 156 may be secured at one end to bracket 134 and at the other to arm 132 as at 158. Lowering cable 38 may be repositioned on roller 138 by introducing sufficient slack in this cable. Cable guard 152 will assist in the positioning of cable 38 on roller 138. As a further aid to positioning cable 38 on roller 138 a block 164 carrying a hook 166 may be slidably mounted on guard 152. Block 164 may be positioned by means of lines 168 and 170 passing through guide openings formed in guard 152. Hook 166 has sufficient curvature to lift cable 38 onto roller 138 but is short enough to allow cable 38 to drop onto roller 138 as block 164 moves along the curved section of guard 152. In certain applications of the present invention block 164 may be dispensed with since cable 38 may be positioned on roller 138 by hand or by the use of other types of positioning devices adapted for this purpose. As in the previous embodiment of the invention a stop 162 has been provided to prevent bracket 134 from rotating in a clockwise direction past its normal position.

In general it will be preferable to employ the same embodiment of the present invention on each lowering cable of a pair but where other design factors conflict with such practice any combination of two of the three embodiments illustrated may be employed. It should be understood that the exact position of the present invention along the lowering cable is not critical and will depend to some extent on the design of davit with which it is employed. However, it is usually undesirable to introduce the slack at a position adjacent the winch for the reason that the winding drums of the winch are usually provided with spiral grooves for receiving the cable and the sudden introduction of a slack condition

in the cable might interfere with the spooling of the cable in the proper groove.

While I have described what are presently believed to be the preferred embodiments of the present invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention as defined by the hereinafter appended claims.

The invention described herein may be manufactured and used by or for the Government of the United States of America for Governmental purposes without the payment of royalty thereon or therefor.

What is claimed is:

1. In a boat lowering device including a davit head, a lowering cable passing adjacent said davit head, and means for paying out said cable, an arm movably mounted on said davit head, a sheave rotatably mounted on an end of said arm remote from said davit head and engaging said lowering cable, said arm when in a first position forming a substantial bight in said lowering cable, said arm when in a second position forming a bight of shorter length in said lowering cable, said arm being so positioned that tension in said cable urges said arm toward said second position and so that gravity urges said arm toward said first position upon the release of tension in said cable, a latch for releasably retaining said arm in said first position, and means for releasing said latch to shorten said bight for substantially instantaneously permitting extension of said lowering cable without change in the relative horizontal position thereof.

2. In a boat lowering device including a davit head and a lowering cable passing adjacent said davit head, a guide bracket secured to said davit head, an arm slidably journaled in said guide bracket, a sheave rotatably mounted on an end of said arm, said sheave engaging said lowering cable, said arm when in a first position forming a substantial bight in said lowering cable, said arm when in a second position forming a bight of shorter length in said lowering cable, said arm being positioned substantially along the bisector of the angle formed by said bight when said arm is in said first position, said guide bracket limiting movement of said arm to a direction parallel to said bisector, a releasable latch for releasably retaining said arm in said first position, and means for releasing said latch whereby said bight is substantially instantaneously shortened during movement of said arm from said first to said second position, thereby abruptly paying out said cable solely in said lowering direction a distance equal to the extent said bight is shortened.

3. In a boat lowering device including a davit head and a lowering cable normally under tension when lowering said boat passing adjacent said davit head, a guide bracket secured to said davit head, an arm slidably journaled in said guide bracket, a first sheave rotatably mounted on an end of said arm, second and third sheaves mounted on said davit head, said lowering cable passing from said second sheave and around said first sheave to said third sheave thereby to form a bight in said cable, said arm when in a first position forming a relatively long bight in said cable, said arm when in a second position forming a bight of shorter length in said cable, stop members mounted on said arm for limiting the travel of said arm upon engagement with said guide bracket, releasable latch means for releasably retaining said arm in said first position and means secured to said latch for effecting the release thereof, the normal tension in said cable being operative upon release of said latch means to substantially instantaneously displace said arm from said first to said second position, said boat being thereby abruptly freed for an unimpeded drop solely in the lowering direction for a distance substantially equal to the shortening of said bight.

4. In a raising and lowering device having a cable adapted to be secured at one end to an object to be raised or lowered, and a plurality of pulleys for guiding said cable, the improvement which comprises cable control means mounted between two pulleys, said two pulleys being fixedly secured with respect to each other, said cable control means having at least two positions of operation, releasable latch means for retaining said cable control means in a first position of operation, said cable control means in said first position forming a bight in said cable, said cable control means in a second position forming a bight of shorter length in said lowering cable.

5. In a raising and lowering device having a cable adapted to be secured at one end to an object to be raised or lowered, and a plurality of pulleys for guiding said cable, the improvement which comprises cable control means mounted between two pulleys, said two pulleys being fixedly secured with respect to each other, said cable control means having at least two positions of operation, releasable means for retaining said cable control means at a first position of operation, said cable control means in said first position forming a bight in said cable, said cable control means being so positioned that tension in said cable urges said cable control means toward a second position of operation, said cable control means in said second position forming a bight of shorter length in said lowering cable, independent means for releasing said retaining means whereby said cable when under tension from an object being lowered abruptly displaces said cable-control means from said first to said second position, said object being thereby instantaneously freed for a substantially unimpeded drop solely in the lowering direction for a distance substantially equal to the length of cable released by the shortening of said bight.

6. Apparatus for lowering a boat comprising, a supporting davit, cable reeling apparatus, a cable extending from said reeling apparatus over said davit and carrying said boat, means disposed at a point between said davit and said reeling apparatus for forming a bight in said cable, said last-mentioned means being arranged to facilitate unobstructed passage of said cable therethrough during lowering under control of said reeling apparatus, and independent means for substantially instantaneously releasing said bight for abruptly freeing said boat from control of said reeling apparatus for a rapid and unimpeded drop solely in the lowering direction.

7. Apparatus for lowering a boat from a platform comprising, a plurality of boat supporting davits and cable reeling apparatus secured to said platform, a corresponding plurality of cables extending from said reeling apparatus over said davits and carrying said boat, means associated with each of said davits each at a point between said davit and said reeling apparatus for forming a bight in each of said cables, said last-mentioned means being arranged to facilitate unobstructed passage of said cable therethrough during lowering under control of said reeling apparatus, and independent means for substantially instantaneously and synchronously releasing each of said bights for abruptly freeing said boat from direct control of said reeling apparatus for a rapid and unimpeded drop solely in the lowering direction.

8. Apparatus as in claim 7 wherein each of said bight-forming means includes first and second pulleys substantially rigid with respect to the respective davit, an arm slidably journalled in a relatively rigid guide bracket, a third pulley mounted on said arm, said cable passing through said bight-forming means over said first, second and third pulleys, said arm when in a first position forming said bight in said cable, a releasable latch for retaining said arm in said first position, said latch when released permitting said arm to slide substantially instantaneously to a second position for releasing said bight.

9. Apparatus for lowering an object comprising, a first rigidly disposed pulley, cable reeling apparatus, a lowering cable extending from said reeling apparatus over said pulley and supporting said object, the length of cable between said first pulley and said object defining a vertical axis, cable-control means arranged in the region between said first pulley and said reeling apparatus for accommodating a preselected length of said cable while unobstructing passage of said cable therethrough under control of said reeling apparatus, independent means for releasing said pre-selected length of cable for substantially instantaneously freeing motion of said object from control of said reeling apparatus, thereby permitting rapid and unimpeded drop of said object solely along said vertical axis as said pre-selected length of cable is payed out over said first pulley.

10. Apparatus as in claim 9 wherein said cable-control means includes, second and third rigidly disposed pulleys and a slidable arm forming a bight therebetween, and wherein said independent releasing means when actuated permits shortening of said bight by said pre-selected length of said cable under influence of cable tension established by gravitational force on said object.

11. Apparatus for lowering a boat from an elevated platform comprising, a supporting davit and cable reeling apparatus rigidly affixed to said platform, a cable extending from said reeling apparatus over said davit and carrying said boat, the length of cable between said davit and

said boat normally being under tension and defining a vertical axis, cable-control means disposed at a point between said davit and said reeling apparatus for accommodating a bight in said cable, said cable-control means being arranged to facilitate unobstructed passage of said cable therethrough while said boat is lowered under control of said reeling apparatus, and independent means for substantially instantaneously releasing said bight for abruptly freeing said boat from control of said reeling apparatus for a rapid and unimpeded drop solely along said vertical axis.

12. Apparatus for lowering a boat into water from an elevated platform comprising, an outwardly extending supporting davit and cable apparatus rigidly affixed to said platform, a cable extending from said reeling apparatus over said davit and carrying said boat over said water, the length of cable between said davit and said boat normally being under tension established by gravitational force on said boat and defining a vertical axis, cable-control means disposed at a point between said davit and said reeling apparatus for accommodating a bight in said cable, said cable-control means being arranged to facilitate unobstructed passage of said cable therethrough while said boat is lowered under control

of said reeling apparatus, and independent means for substantially instantaneously releasing said bight for abruptly and momentarily freeing said boat from control of said reeling apparatus for a rapid and unimpeded drop solely along said vertical axis, whereby a slack-wire condition is attainable by release of said bight when said boat is above water by a distance less than the length of cable abruptly payed out when said bight is released.

13. Apparatus as in claim 12 and substantially automatic means for re-forming said bight when said boat is released in said water and the aforesaid normal tension removed from said cable.

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