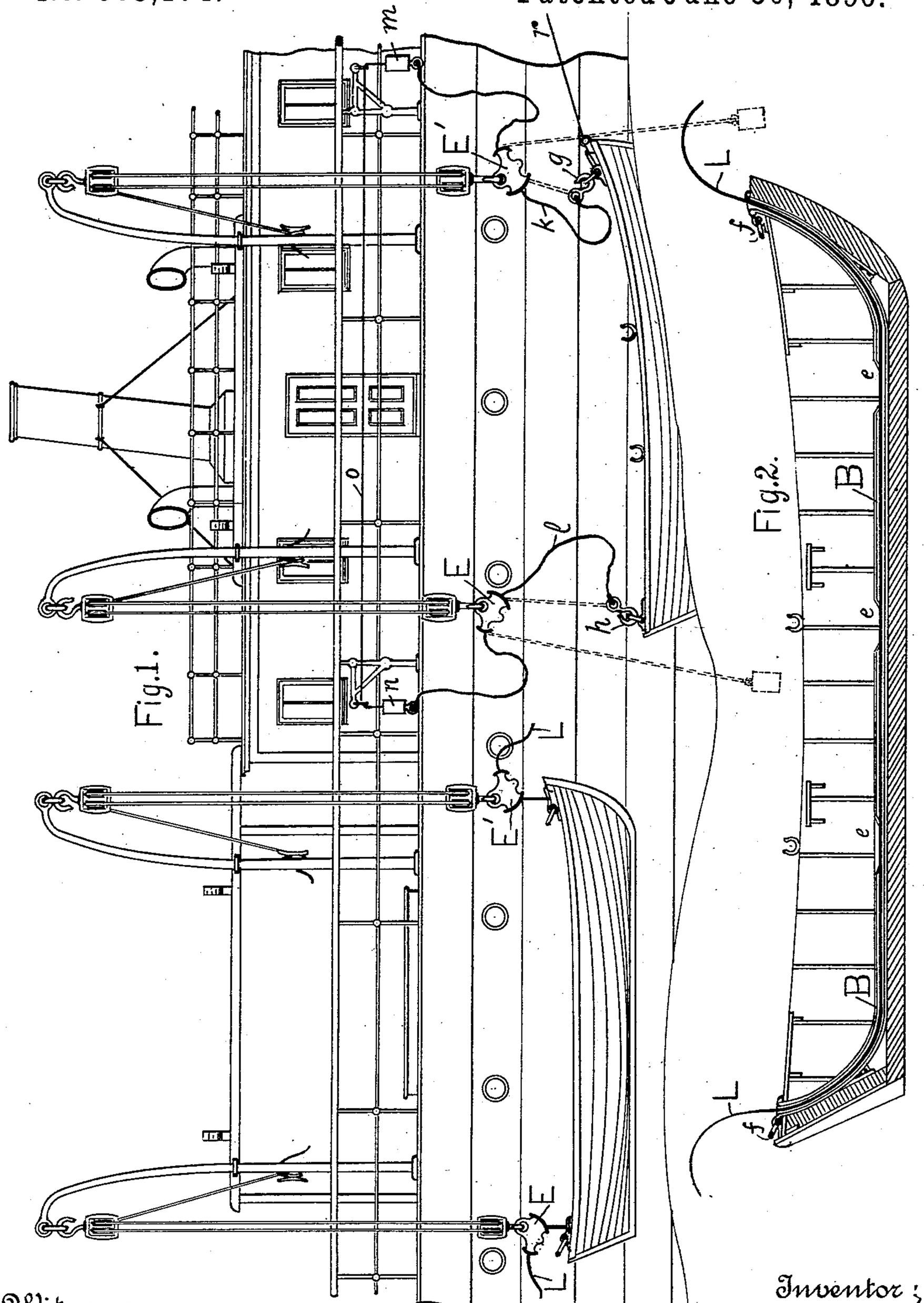
(No Model.) 2 Sheets—Sheet 1.

E. C. HILLYER.

BOAT DETACHING AND RECOVERING APPARATUS.

No. 563,174. Patented June 30, 1896.



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(No Model.) 2 Sheets—Sheet 2.

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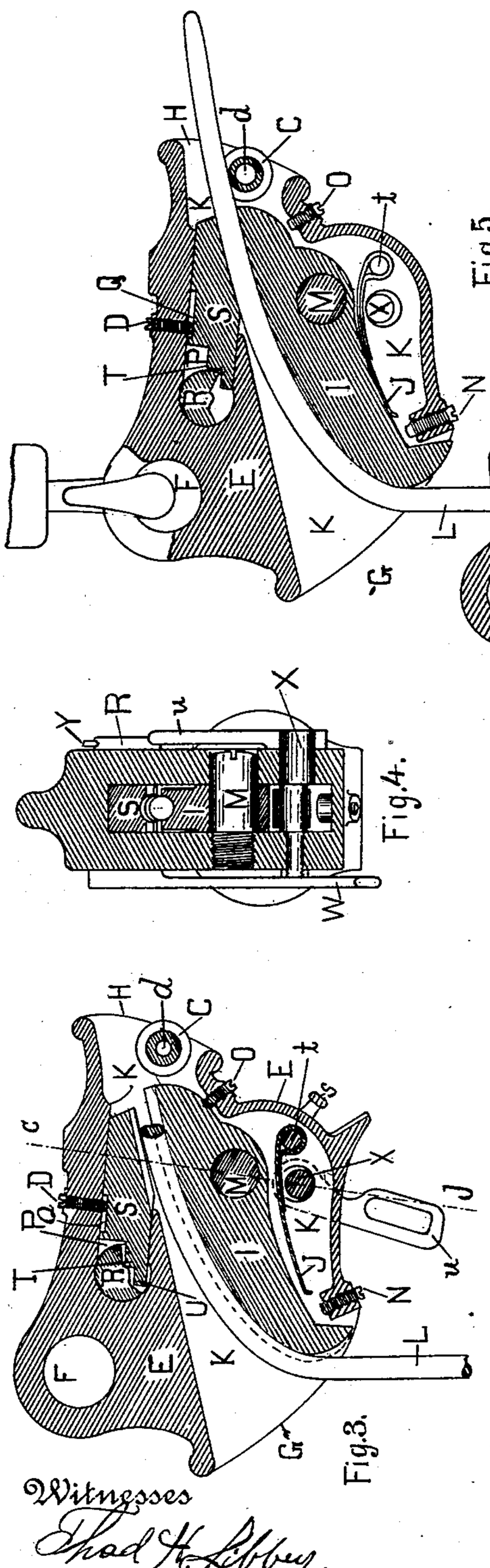

Fig.5.

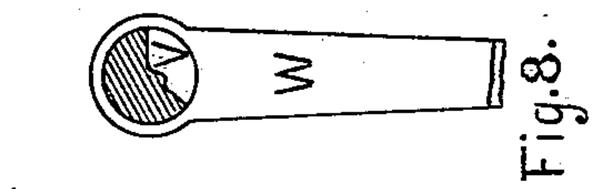

Fig.8.

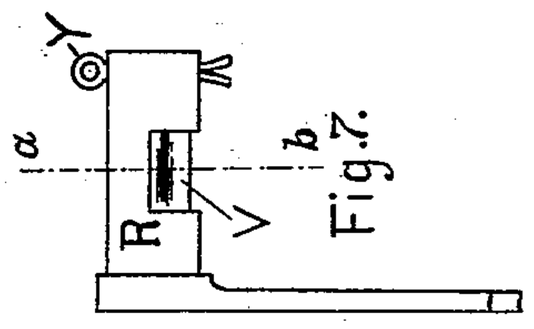

Fig.7.

Fig.4.

Fig.3.

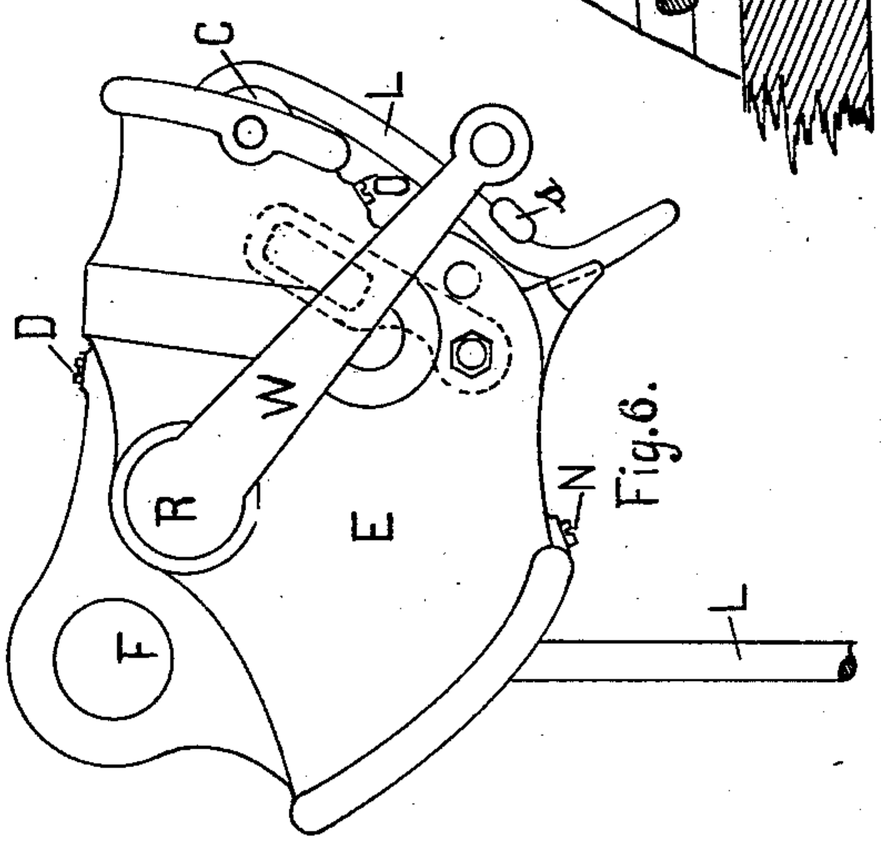

Fig.6.

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UNITED STATES PATENT OFFICE.

EDGAR CURTIS HILLYER, OF NEWPORT NEWS, VIRGINIA.

BOAT DETACHING AND RECOVERING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 563,174, dated June 30, 1896.

Application filed March 30, 1895. Serial No. 543,807. (No model.)

To all whom it may concern:

Be it known that I, EDGAR CURTIS HILLYER, a citizen of the United States, residing at Newport News, in the county of Warwick and State of Virginia, have invented certain new and useful Improvements in Boat Detaching and Recovering Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in boat detaching and recovering apparatus, of which the following is a specification.

The importance of being able to drop a boat and simultaneously release both ends from the davit-tackle with certainty can only be appreciated by having seen the attempt made at sea in rough weather. All devices within my knowledge for this purpose, now in use, attempt to free both ends of the boat by releasing two independent catches or fastenings by which the boat is suspended at bow and stern. The danger is that only one end may be freed and consequently that end will drop, dump out the crew, and swamp the boat. There are many reasons why these devices fail to act: First, they attempt to perform two mechanical movements simultaneously, with two independent mechanical devices; second, boat-detaching devices are only used at rare intervals, and are liable to rust and work stiffly, one device more so than its mate; third, the boat may be loaded heavier at one end, thus requiring more force to loosen that end; fourth, the officer in charge may not operate both catches simultaneously, by reason of not exerting the same force on both tripping devices, or if one device works stiffly by exerting no greater force on one than on the other.

My invention is free from these defects, as, although provision has been made for simultaneously releasing the detaching devices, both independently and automatically, it is only necessary for the device at one end to be released in order to free the boat. Again, the detaching devices now in use are not adapted to recover or pick up the boat with facility except from comparatively still water, as the lower block-hook of the davit-fall is stationary while the boat is rising and falling, and in practice the block and hook are lowered, so as to reach the boat in the trough of the sea, in which case the rising boat is liable to pick up the block and tangle the fall.

My invention provides for a flexible slack connection between the boat and detaching devices, which will gather in the slack and automatically suspend the boat from the davit-falls at the highest point to which a boat has been raised by a wave.

Speaking generally, the objects of my invention are as follows: First, to provide for automatically detaching the boat when its weight is taken by wave or still water; second, to provide for detaching the boat at any time; third, to insure that if one end is released the boat is entirely free; fourth, to provide for hoisting the boat in the usual manner; fifth, in case of rough weather to provide for automatically suspending the boat from the davits at the highest point to which it is raised by wave, such suspension to take place at the discretion of the officer in charge. I attain these objects by the apparatus illustrated in the accompanying drawings, wherein—

Figure 1 is a partial side elevation of a vessel, showing my inproved apparatus in connection with the davits. Fig. 2 is a section through one of the boats, showing the tube or conduit. Fig. 3 is a longitudinal section through the detaching device. Fig. 4 is a section on line *c j*. Fig. 5 is a longitudinal section of the detaching device, boat, and rope-protecting tube. Fig. 6 is a side elevation of the detaching device. Fig. 7 is an elevation of the tripping-pin and handle. Fig. 8 is a section through tripping-pin on line *a b*.

Similar letters refer to similar parts throughout the several views.

Referring to the drawings, E indicates a metal casing, in the upper left-hand portion of which is formed an eye F for attaching the device to the block-hook of a ship's davit. The lower part of the casing forms an irregular pocket K, which traverses the casing from end to end, terminating in the bell-shaped openings G H. This pocket provides for the reception of the swinging jaw I and spring J,

and allows the wire rope L to be reeved through the casing above the swinging jaw I. The swinging jaw I is pivoted on the pin M and is free to revolve a certain distance before coming in contact with the adjusting set-screws N O.

The top edge of swinging jaw I is grooved to receive the wire rope L, the depth of the groove at the short or clamping end of the jaw being a little less than one-half the diameter of the rope. The long end of jaw I is curved to form an easy bend for the rope L, and the top edge of the short end of jaw I is straight in order to clamp the rope L along nearly all of that end of the jaw. The long end of jaw I, from which the weight of the boat is suspended, is so located with reference to the eye F that the direction of the pull on rope L is such as to keep the jaw I nearly horizontal.

The function of the jaw I, when the weight of a boat is hung on the rope L from the long end of the jaw, is to clamp the rope L between the short end of the jaw and the sliding grooved wedge or jaw S.

In the upper part of the casing is a longitudinal rectangular recess P, opening at one end into the pocket K, and at the other end into the cross-hole made to receive the tripping-pin R, the function of recess P being to receive and guide the jaw S in its sliding motion.

The sliding jaw S is rectangular in cross-section and is free to slide in the recess P. The clamping end of the jaw S is beveled, so as to be parallel to the upper side of the short end of the jaw I. The lower face of the beveled end of jaw S is grooved to receive the wire rope L, the depth of groove being one-half the diameter of rope L. At the other end of sliding jaw S are formed two transverse steps T U, the vertical face of the upper step T impinging against the pin R when this pin is in the position shown in Fig. 3, and the jaw S being thus prevented from sliding back farther into the recess P. Across the upper face of the jaw S is formed a slot Q, into which projects the lower end of a screw-pin D, the length of this slot determining the longitudinal movement of jaw S. The tripping-pin R, which is circular in cross-section, traverses the casing at right angles to the jaw S and passes through the end of the recess P, a certain portion of that part of the pin R which is opposite the recess P being cut away, as shown at V, Figs. 5 and 6. In certain positions of the pin R the step end of jaw S can slide back into the recess V, as will hereinafter appear, and as indicated in Fig. 1. One end of the pin R is provided with a tripping-handle W, by which the pin can be rotated either by hand from the small boat or by a cord from the deck of vessel. The other end of pin R is provided with a split pin Y to prevent the pin R from working out. The function of the pin R is to hold the jaw S in position over the swinging jaw I or to release the jaw S at will.

The pin M traverses the casing and is held in place by screw-threads, as shown in Fig. 2, the function of this pin being to form a fulcrum for the swinging jaw I.

In the lower part of the casing under the long end of swinging jaw I is formed a boss through which passes the screw-pin N. When the weight of the boat is suspended from the jaw I, and the wire rope is clamped between the lever I and jaw S, the screw-pin N is so adjusted that its inner end is close to but does not touch the jaw I, the function of the screw-pin N being to arrest the rotary movement of the jaw I when the jaw S is tripped, and to thus prevent the clamping end of jaw I from following up the jaw S and reclamping the wire rope L.

In the lower part of the casing, under the swinging jaw I, is a flat spring J, one end of which bears against the under side of the long end of jaw I. At the other end of spring J is formed an eye through which passes the pin *t*, the spring J being free to revolve upon the pin *t*, and therefore having no spring action unless pressed up by the eccentric pin X. The function of spring J is to raise the long end of jaw I and thus unclamp the rope L as soon as the weight of the boat suspended by the rope L is removed, either by the boat being lowered in the water, or by its being raised by a wave, or by the release of the rope when the jaw S has been tripped. The spring J is strong enough to raise the jaw I and hold it in the raised position against any ordinary pressure caused by reeving or pulling the rope L through the casing, but the action of the spring is easily overcome by the weight of the boat hanging on the jaw I, if, for any reason, the rope L is held or prevented from freely passing through the casing.

Under the spring J and near its pivoted end is a pin X, which traverses the casing, one end of this pin being provided with a handle *u*, Figs. 1 and 2, whereby it can be rotated. The pin X is circular in cross-section except at its middle portion, which is in contact with the spring J and which is made eccentric, the eccentricity being such that in one position of the handle *u* the eccentric presses up again the spring J, (see Fig. 3,) while, if the handle is revolved one half-revolution, as in Fig. 1, the spring is not brought into play. The function of the eccentric pin X is therefore to control the action of spring J.

On the lower face of the casing E, under the short end of jaw I, is a boss through which passes the adjustable screw-pin O, whose function is to limit the rotary movement of jaw I, caused by the action of the spring J.

C is a grooved pulley placed in the bell-shaped opening H, and held in position by pin *d*, which traverses the casing, and on which the grooved pulley C is free to revolve. The function of the grooved pulley C is to guide the wire rope L between the swinging jaw I and jaw S, and also to allow the rope L to reeve freely through the casing.

In Fig. 7 I have shown in section a small boat showing the tube or conduit B in position. This conduit can be a continuous tube, preferably of metal, or a series of eyes or short tubes through which the rope L is reeved. The conduit can be placed along the keelson of the boat, as shown, or in any other convenient location, providing it extends from bow to stern and forms a free and continuous passage for the rope L. The tube or conduit is provided with one or more openings *e e e*, (in this case three,) where the rope L can be reached in order to facilitate reeving it through the tube or conduit, these openings to be provided with suitable covers to prevent any rubbish getting into the conduit or tube. The tube or conduit is securely fastened to the boat, especially at the bow and stern, as indicated in Fig. 3, and forms a gradual upcurve at the bow and stern to make an easy bend for the rope L. The ends of the tube or conduit project slightly above the gunwale of the boat and terminate in bell-mouthed openings, as shown, and, at a point level with the gunwale, the size of the opening is contracted to nearly the diameter of the rope L, to prevent the boat tipping when suspended. Each end of the tube is provided with a metal eye *f* to receive the hooks or grapples *g h* of wire ropes *k l* (see Fig. 8) when the boat is to be picked up and suspended automatically in rough weather. The function of the tube or conduit is to provide a bearing for the suspension-rope L, and to form a free passage for the rope to reeve through in either direction if either end of the rope is released while the boat is suspended. The wire rope L is made capable of sustaining the boat and its load, and is long enough to reach through the tube or conduit and project a short distance, say four feet, at each end. The ends of the rope are tapered and smoothly finished, so as to be easily threaded through the conduit or tube B and casing E. The function of this rope is to suspend the boat from the davit-clamps attached to the block-hooks of a ship's davits. The rope L can be made of any material, but preferably of copper, so as to be flexible and resist corrosion.

The apparatus as thus far described is used to detach the boat at all times, and to pick the boat up from reasonably smooth water.

The following-described apparatus is used only to pick the boat up and suspend it from the davit-clamps automatically during rough weather.

In Fig. 8 *k l* are wire ropes provided at one end with hooks or grapples *g h*, the other ends of ropes *k l* being tapered and smoothly finished, so as to be easily threaded through the clamp-casings E E′, and they can also be securely fastened to the weights *m n*. These wire ropes are long enough to reach twice from the weights *m n* to the surface of the water in the trough of the sea.

m n are metal weights which are suspended from suitable supports by means of a single cord *o*, passing through eyes in said supports in such a manner that if the cord *o* is cut, both weights will be simultaneously released and will drop, carrying with them the ends of ropes *k l*. Any device suitable for the purpose can be used instead of the cord *o*.

The apparatus is used as follows: Suppose a boat fitted with a tube or conduit to be suspended from the ship's davits, as shown at the left of Fig. 8, by means of a wire rope L and davit-clamps E E′, the ends of the wire rope being clamped between the respective swinging jaws and sliding jaws, as described. Referring to Fig. 3, the position of the different parts of the davit-clamp would be as follows: The long end of jaw I would be pulled down by the weight of the boat hanging on rope L, the spring J would be compressed, the short end of jaw I would press up and clamp the rope against the jaw S, which would be in the position shown in Fig. 3, the tripping-handle W, as in Fig. 4, the tripping-pin R bearing against the jaw S, as in Fig. 3, and the ends of rope L projecting from the bell-shaped openings H, as shown in Fig. 3, say one foot. Suppose, first, the boat to be lowered into still water by means of the davit blocks and falls. As soon as the boat floated and the weight was removed from rope L and swinging jaw I, the spring J would raise the long end of jaw I, whereupon the short end of the jaw would be depressed and would free the rope L, this action occurring at both ends of the boat. The ends of the rope could then be drawn through the casings by hand, or would themselves reeve through if the boat moved away. Suppose, secondly, that while the boat was suspended, as shown at the left of Fig. 8, a high wave should raise it enough to slacken rope L. The same action would take place, the springs J J would operate the swinging jaws I and release the ends of rope L, and the boat would free itself at both ends as the wave receded. Suppose, thirdly, that it was desirable to drop the boat on a wave. At the proper time the tripping-handle W, attached to tripping-pin R of either davit-clamp, is operated either by hand from the small boat or from the vessel's deck by a cord attached to said handle. As the tripping-handle is pulled or pushed up, the tripping-pin R is rotated from the position shown in Fig. 3 to that shown in Fig. 1, which allows the step end of jaw S to slide back into the recess V of pin R and thus free the rope L. When the jaw S begins to slide back, the short end of jaw I will follow it up until the long end of jaw I comes in contact with the screw-pin N, which arrests the rotary motion of the jaw I and prevents any further clamping of the rope L. The drag or pull on the rope L still continues, however, and tends to slide the jaw S into the recess V until the rope L is entirely released from the clamping action and reeves freely through the casing and drops one end of the boat. As soon, how-

ever, as the strain on the rope L has been relieved by the operating of the tripping-handle of one of the davit-clamps, as just described, the spring J of the davit-clamp at the other end of the boat would raise its respective jaw I and release the other end of rope L.

In either of the three cases cited the releasing of one end of the rope L will automatically release the other end. If, however, one of the clamps should fail to act and only one end of the rope be released, the boat would drop perfectly free, as the released end of the rope would reeve through the tube B. Therefore, under all conditions, a boat can be positively and safely detached by the above-described apparatus.

To recover a boat and hoist it to the davits from moderately still water, it is only necessary to reeve the two ends of rope L through the respective davit-clamp casings, turn the eccentric pin X to the position shown in Fig. 1, and hoist on the davit-falls. The long ends of jaws I, being relieved from the pressure of springs J J, will fall of their own weight and bring the short end of jaws I in contact with rope L in a position to clamp said rope as soon as any strain is put on the long ends of jaws I by hoisting on the davit-falls. To prevent any slipping the ends of rope L can be reeved back through the eye *s* and bent down to the position shown in Fig. 4. This will produce sufficient tension to bring the jaws into play immediately.

To recover the boat and hoist it to the davits in rough weather, when high waves are running, the rope L (in the tube) is not used, but the two ropes *k l* and weights *m n*, Fig. 8, are brought into play. While the small boat has been away the ropes *k l* have been reeved through the davit-clamp casings and their upper ends attached, respectively, to the suspended weights *m n*, as shown, the lower ends provided with hooks or grapples *g h*, (preferably snap-hooks which cannot work loose,) reaching to the trough of the deepest wave. The returning boat is first brought into position under the davits by the painter *r*, the hooks or grapples *g h* are snapped into the rings *f f* at each end of the boat, the cord *o*, which holds the weights *m n*, is cut, and the weights drop, carrying with them the ends of the two ropes *k l*. The weights immediately sink and gather in all the slack of ropes *k l*, as shown by dotted lines at the right of Fig. 2. As the boat rises on the next wave and the ropes *k l* are slackened, the weights sink still more and gather in all the slack rope. As the wave recedes the boat starts to fall, but as the ropes *k l* are tightened, and as the tension caused by weights *m n* is sufficient to compress the springs J J, the clamp-levers I are brought into play, the ropes are clamped, and the boat swings suspended at the highest point to which it was raised by the wave, and can then be hoisted by the davit-falls in the usual manner. Thus the davit-clamps serve to detach and recover the boat under all conditions. The advantage of recovering a boat in this manner is that the men in the small boat have only to snap the hooks or grapples of the two slack ropes into the rings at each end of the boat. The weights *m n* and the crew on deck perform the balance of the operation.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. Boat-detaching apparatus, consisting of a suspending rope or cable, a protecting-tube disposed endwise of the boat and through which the rope passes, a releasable davit-clamp securing one end of the rope, and a releasable davit-clamp securing the other end of the rope; substantially as described.

2. Boat-detaching apparatus, consisting of a suspending rope or cable passing freely through the boat but not affixed thereto, a releasable davit-clamp securing one end of the rope, and a releasable davit-clamp securing the other end of the rope, whereby, on the release of either clamp, the boat is freed, and means for positively releasing either clamp while the rope is under strain; substantially as described.

3. The combination with boat-suspending ropes or cables, of automatic slack take-ups therefor and davit-clamps through which said ropes or cables pass; substantially as described.

4. The combination with boat-suspending ropes or cables provided at one end with a grapple for attachment to the boat and at the other end with a weight, of davit-clamps through which said ropes or cables pass; substantially as described.

5. The combination with boat-suspending ropes or cables, provided at one end with a grapple for attachment to the boat, and at the other end with a weight, of davit-clamps through which said ropes or cables pass, and means for simultaneously dropping both weighted ends overboard; substantially as described.

6. A rope-clamp for boat-detaching apparatus and the like, comprising a casing or main body portion having a swinging jaw mounted therein, a coöperating sliding jaw, and means for releasing the sliding jaw; substantially as described.

7. A rope-clamp for boat-detaching apparatus and the like, comprising a casing or main body portion having a swinging jaw mounted therein, a coöperating sliding jaw stepped at its inner end, and a notched turn-pin mounted in the casing adjacent to the stepped end of the sliding jaw, and having an operating-handle; substantially as described.

8. A rope-clamp for boat-detaching apparatus and the like, comprising a casing or main body portion, having a swinging jaw, a spring located beneath the long end of said jaw, and an eccentric below the spring for putting the spring under strain, said eccentric having an operating-handle; substantially as described.

9. A rope-clamp for boat-detaching apparatus and the like, comprising a casing or main body portion having a swinging jaw mounted therein, a coöperating sliding jaw, and means for releasing the sliding jaw, and adjustable stops for limiting the play of the swinging jaw; substantially as described.

10. A rope-clamp for boat-detaching apparatus and the like, comprising a casing or main body portion having a swinging jaw mounted therein, a coöperating sliding jaw, and means for releasing the sliding jaw, and a pin entering a recess in the sliding jaw and serving as a limiting-stop to said jaw; substantially as described.

11. A rope-clamp for boat-detaching apparatus and the like, comprising a casing or main body portion, having a swinging jaw, a spring located beneath the long end of said lever, and an eccentric below the spring for putting the spring under strain, said eccentric having an operating-handle, a sliding jaw coöperating with the swinging jaw, said sliding jaw being stepped at its inner end, and a notched turn-pin mounted in the casing adjacent to the stepped end of the sliding jaw and having an operating-handle; substantially as described.

12. A rope-clamp for boat-detaching apparatus and the like, comprising a casing or main body portion, having a swinging jaw, a spring located beneath the long end of said lever, and an eccentric below the spring for putting the spring under strain, said eccentric having an operating-handle, a sliding jaw cooperating with the swinging jaw, said sliding jaw being stepped at its inner end, and a notched turn-pin mounted in the casing adjacent to the stepped end of the sliding jaw and having an operating-handle, and stops for limiting the play of the swinging and sliding jaws; substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EDGAR CURTIS HILLYER.

Witnesses:

H. BARTON KANE,

F. J. KING.