L. L'HEUREUX.

APPARATUS FOR LAUNCHING SHIPS' BOATS.

APPLICATION FILED JULY 7, 1913.

1,162,497.

Patented Nov. 30, 1915.

3 SHEETS—SHEET 1.

Fig. 1.

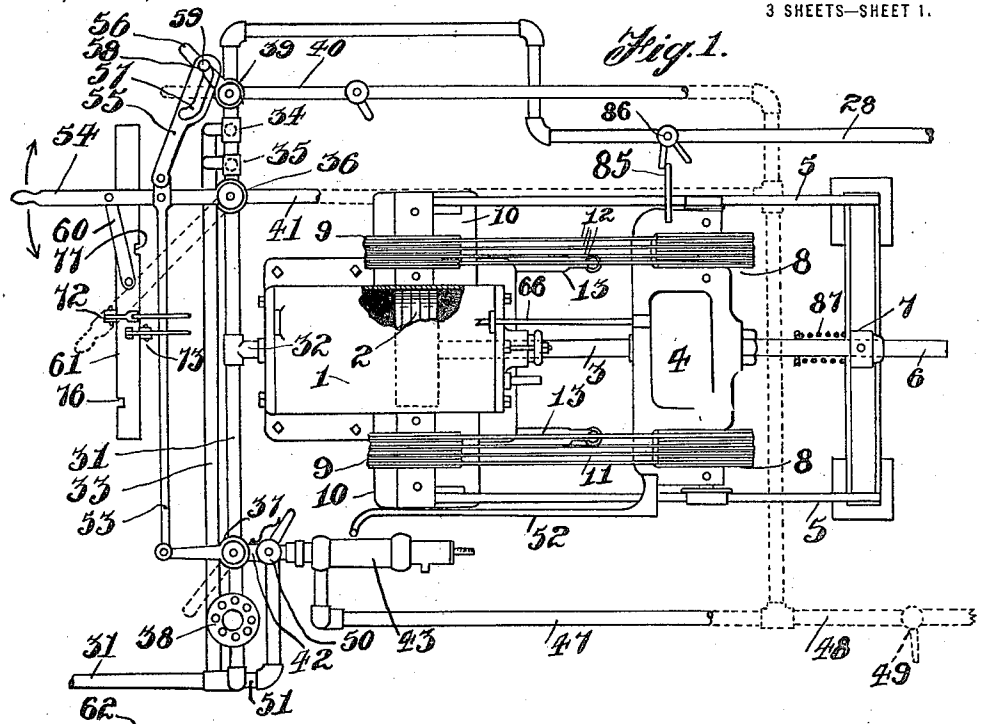


Fig. 2.

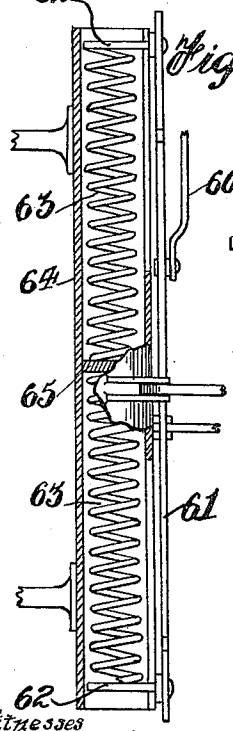


Fig. 3.

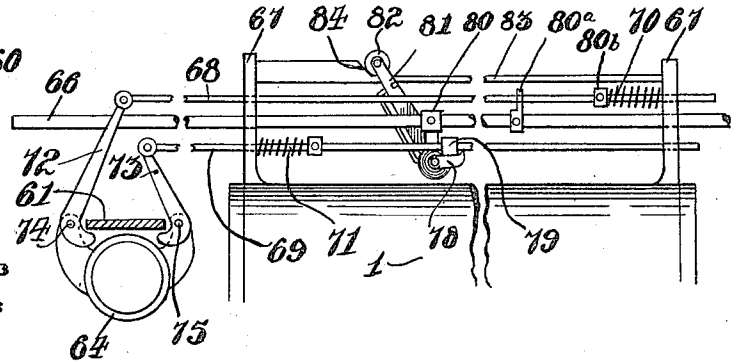
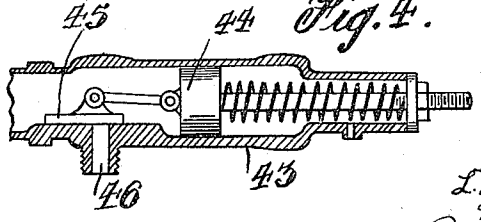


Fig. 4.



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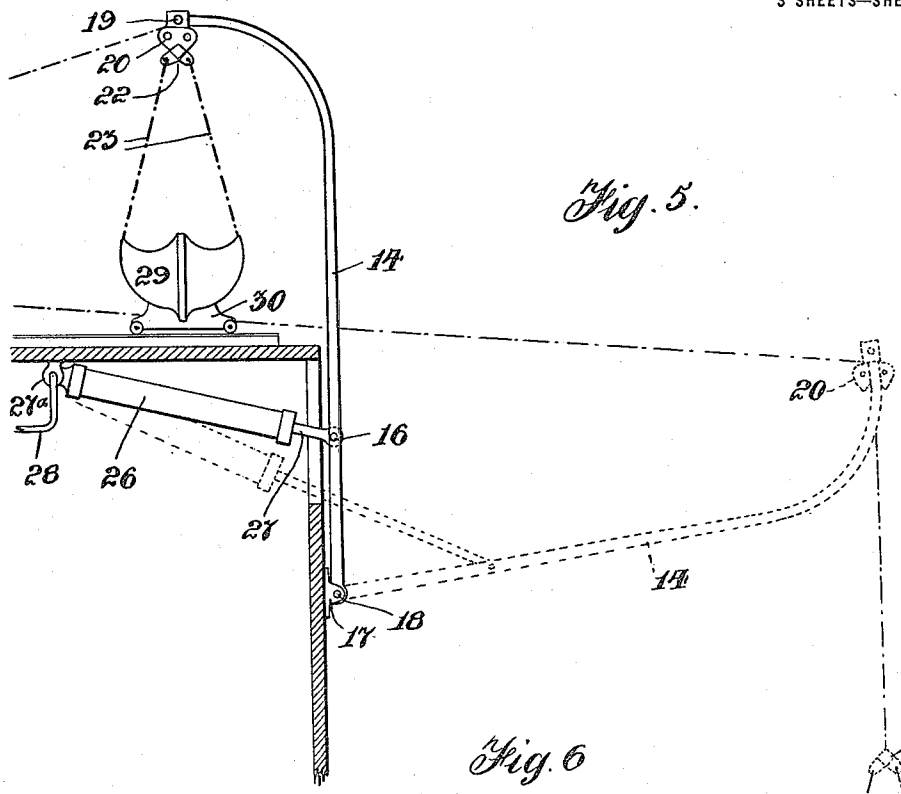


Fig. 5.

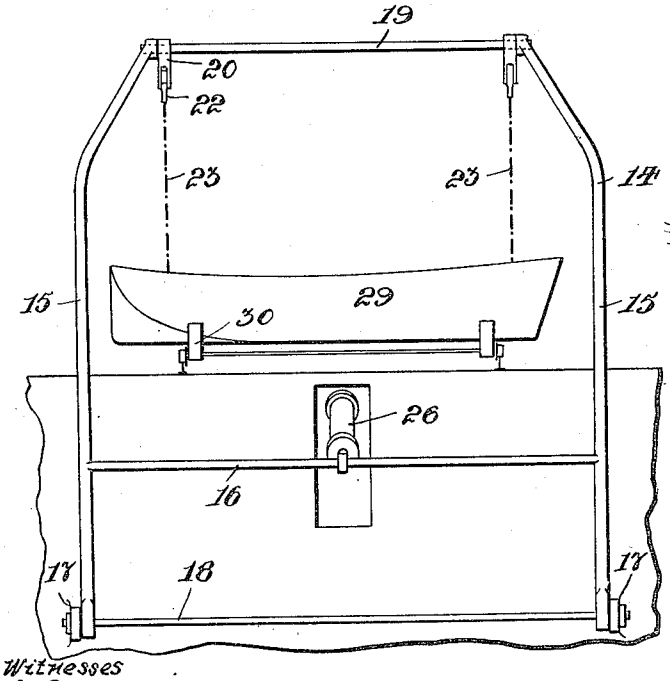
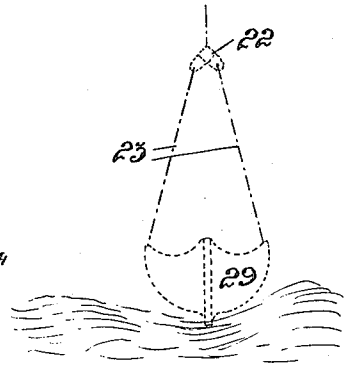


Fig. 6



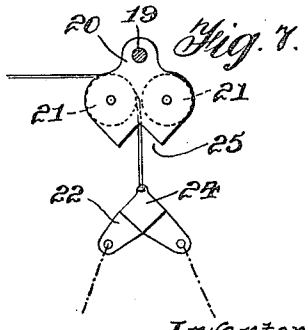


Fig. 7.

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3 SHEETS—SHEET 3.

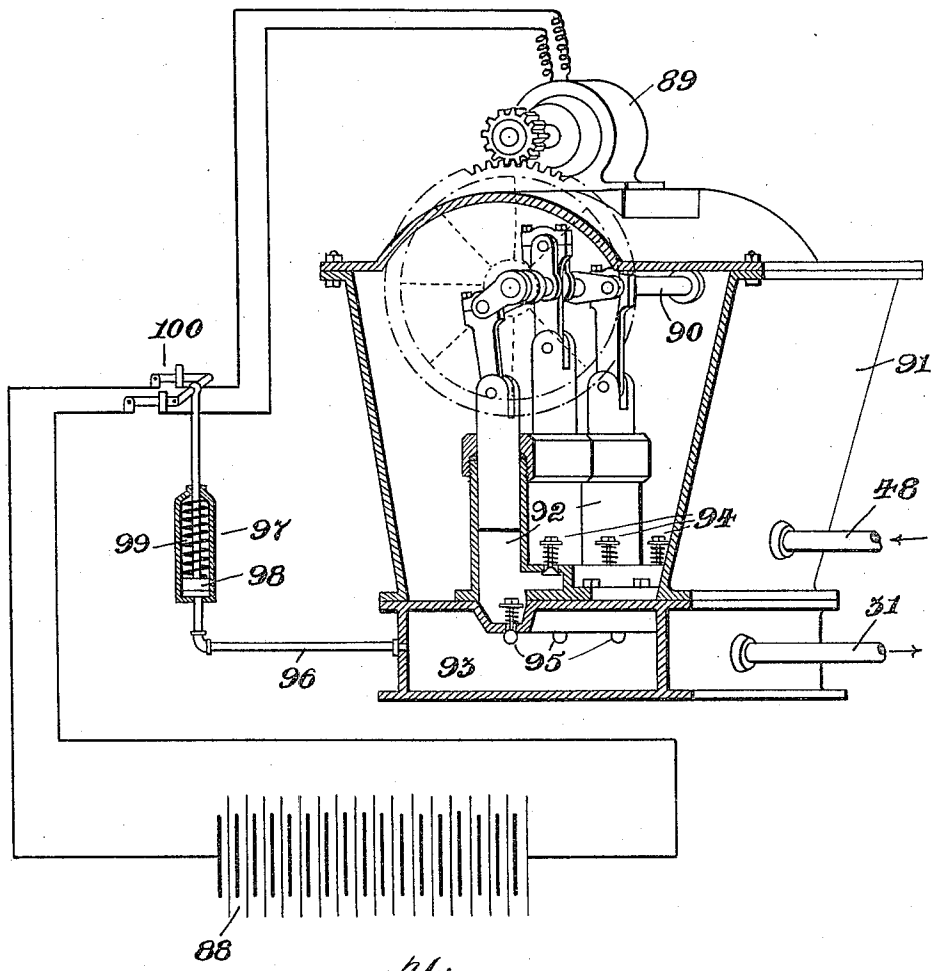


Fig. 8.

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APPARATUS FOR LAUNCHING SHIPS' BOATS.

1,162,497. Specification of Letters Patent. Patented Nov. 30, 1915.

Application filed July 7, 1913. Serial No. 777,712.

To all whom it may concern:

Be it known that I, LUDGER L'HEUREUX, a subject of the King of Great Britain, and resident of 92 St. Hubert street, in the city of Montreal, in the Province of Quebec, Canada, have invented certain new and useful Improvements in Apparatus for Launching Ships' Boats; and I do hereby declare that the following is a full, clear, and exact description of the same.

The invention relates to an improved apparatus for launching ships' boats, and has for its object to secure greater safety to the passengers in stormy or calm weather, by the provision of an apparatus simple and sure in its operation which can be operated to launch boats one after another from the same davit with great speed and automatically prevent the upsetting of the boat as soon as it touches the water which is so frequently the case with the apparatus at present in use.

The present invention is an amplification of the "Apparatus for launching ships' boats" described and set forth in my prior application for Letters-Patents of the United States filed on the 20th. day of November, 1912 Serial No. 732482 and contains various improvements in the raising and lowering mechanism whereby it is possible to obtain a much better control of the boat during the lowering or raising to and from the water thus insuring greater safety to the passengers in the boat.

In the present invention as distinct from my former invention the outer ends of the lifting and lowering cables are connected to the boat and the davit is provided with independent means to cause it to swing downwardly. Furthermore in the present invention I provide certain automatic devices for operating the various valves in the lifting and lowering mechanism as hereinafter more fully described.

The invention will now be fully described with the aid of the accompanying drawings in which—

Figure 1 is a plan view of the main launching cylinder and pipes and valves connected thereto, certain parts in this figure being broken away for clearer illustration. Fig. 2 is a sectional elevation through the mechanism for locking the main control lever. Fig. 3 is a side elevation. part section of certain tripping devices for locking and releasing the main control lever. Fig. 4 is a longitudinal section through the special form of pop valve. Fig. 5 is a cross sectional view through one corner of the ship, illustrating the launching of the boat. Fig. 6 is a side view of Fig. 5. Fig. 7 is a fragmentary detail of a pulley block carried by the davit and Fig. 8 is a sectional perspective view of an emergency power storage apparatus.

Like numerals of reference indicate corresponding parts in each figure.

Referring to the drawings, 1 is the main cylinder of the lifting and lowering mechanism suitably secured to the deck of a vessel and having a piston 2 reciprocating therein and from which extends a piston rod 3 through one end of said cylinder and connected at its outer end to a yoke 4 guided in its movement on tracks 5 and by the extension rod 6 sliding through a bearing 7. The yoke 4 carries on opposite sides of the center, two sets of loose pulleys 8 in alinement with corresponding sets of loose pulleys 9 rotating in stationary bearings 10 disposed on opposite sides of the cylinder 1.

11 and 12 are a pair of cables each anchored to a stationary part such as the brackets 13 secured to the deck of the vessel and wound around the pulleys 8 and 9 respectively in well known manner to increase the relative rate of movement of the free end of said cables in relation to the movement of the piston. The free end of each cable is carried from one of the pulleys 9 over any suitable guiding pulleys on or beneath the deck and to a point in front of the lifting and lowering mechanism as hereinafter more fully described.

14 is the up and down swinging davit formed of the pair of bars 15 rigidly connected by the brace 16 and pivotally connected at their lower ends to the ship's side through the medium of the brackets 17 and pivot 18. The upper ends of the bars 15 are bent inwardly to overhang the deck of the vessel, as clearly shown in Fig. 5 and are turned toward one another so that a boat supported from their upper ends can freely swing between the bars 15.

19 is a rod pivoted in the upper ends of the bars 15, and 20 are a pair of pulley blocks rigidly depending from the rod 19 inward of the bars 15 and each carrying a pair of pulleys 21 arranged close together

on parallel axes. The free ends of the cables 11 and 12 before mentioned are brought forwardly each over one of the pulleys 21, through the block 20 and connected to a hanger 22 from which the boat carrying chains 23 extend. The upper part 24 of the hanger 22 is of converging formation as clearly shown in Fig. 7 and the said converging part is adapted to engage a similarly shaped cut out portion 25 of the block 20 when the boat is in an unlowered position on the davit, though it must be understood that the hanger 22 is not connected in any way to the pulley block 20.

26 is a pusher cylinder having a piston operating therein and from which extends the piston rod 27 pivotally connected at its forward end to the brace 16 intermediate of its length. The rear end of the cylinder 26 is pivotally supported in the bracket 27ª secured to the under side of the deck and a fluid supply pipe 28 leads into the pivoted end of said cylinder in well known manner so that the cylinder 26 is free to swing on its pivot, while maintaining the fluid connection thereto.

29 indicates a boat supported on a suitable chock 30 and suspended from the hanger 22 by the aforesaid chains 23.

31 is a main inlet pipe leading from a suitable fluid supply pipe, such for example, as a tank of liquid under pressure, said supply pipe 31 freely opening at one point 32 into the inner end of the cylinder 1 and passing onward beyond said point to the supply pipe 28 to the pusher cylinder 26 before mentioned.

33 is a branch inlet pipe having two points of connection 34 and 35 with the main inlet pipe (at a point beyond the cylinder 1) in order that fluid may flow in opposite directions along said main pipe when necessary.

36 and 37 are a pair of coupled three way valves in the main inlet pipe 31 disposed on each side of the cylinder inlet 32 and so arranged and coupled that when one is opened to the cylinder 32, the other is shut off and vice-versa.

38 is an ordinary reducing valve arranged in the main inlet pipe 31, a short distance before it reaches the valve 37, the purpose of this reducing valve being to allow the inlet fluid to reach the cylinder 1 through the valve 37 at certain times under a pressure so much reduced, that it is just sufficient to lift the davit and tackle or at most an empty life boat.

39 is a pusher regulating valve also arranged in the main inlet pipe 31, but on the far side of the connection 34.

40 is the exhaust pipe from the pusher valve 39, it being understood that there is only one pipe to the pusher cylinder, namely the pipe 28, this pipe at times being an inlet pipe and at other times acting to convey the fluid back from the cylinder 26 where it passes through the valve 39 into the exhaust pipe 40.

41 is the main exhaust of the cylinder 1 through which fluid passes from said cylinder by way of the valve 36 when the piston 2 is traveling inwardly.

42 is an exhaust pipe from the three way valve 37 which also acts as an inlet pipe at certain times as hereinafter more fully explained.

43 is a pop relief valve arranged in the pipe 42 which said pipe conveys fluid from the cylinder 1 into the pop valve 43.

According to the present invention, this pop valve comprises a cylinder in which a spring pressed plunger 44 reciprocates and in its reciprocation slides the slide valve 45 over or off an exhaust port 46. I found in experiments, that an ordinary pop relief valve operates too suddenly with consequent jerk on the apparatus, hence, the present arrangement of pop valve which provides for a much less sudden escape of the fluid. The exhaust pipes 40 and 41 and the exhaust pipe 47 from the port 46 are all connected up to the common exhaust pipe 48 in which is arranged a total cut off valve 49.

50 is a three way valve arranged in the pipe 42 between the pop valve and the valve 37 and into which leads the branch inlet pipe 51. The three way valve 50 is spring pressed in one direction to normally shut off the inlet branch pipe 51 and open up connection between the valve 37 and pop valve 43, but the said valve is, under certain conditions, operated by a finger 52 rigidly carried by the yoke 4 and which contacts the said valve 50, turning it to a position shutting off the pop valve and opening connection between the inlet branch 51 and valve 37.

As already explained, the three way valves 36 and 37 are coupled to operate together, this being accomplished through a coupling rod 53 pivotally connected at one end to the handle of the valve 37 and at the other end to the main operating lever 54 connected with the valve 36. A short connecting rod 55 also extends from the lever 54 to the handle 56 of the pusher valve 39, the distance of the pivot from the center of the valve at the pusher valve end being only about half the distance of the pivot from the valve at the other end of said rod 55 as it is desired to turn the pusher valve lever 56 about twice the speed of the main lever 54. Furthermore the connecting rod 55 contains a slot 57 having a shoulder 58 at one end and in which the pivot pin 59 slides at a time when it is necessary to move the lever 54 over to the far side while the pusher valve lever 56 is at the limit of its movement as shown in full lines in the drawings.

According to the invention, I provide means for always returning the main operating lever 54 to a central position, (as shown in full lines in the drawing) after the said lever has been moved over to either side of said central position. In the said normal position of the operating lever (as shown in the drawings) the pusher valve 39 is cut off so that there is no inlet to the pusher cylinder, also the valve 36 is cut off so that there is no inlet therethrough to the main cylinder 1, but the valve 37 is open on three sides, namely, to the reducing valve 38, to the cylinder 1 and to the pop valve 43 and this is the normal position of the said valves no matter whether the boat is on deck or on the surface of the water.

60 is a link pivotally connected at one end to the handle 54 and at the other end to a reciprocating bar 61, said reciprocating bar having a finger 62 adjacent to each end contacting the outer end of a spring 63 preferably contained in a casing 64 having a central partition 65 against which the inner ends of said springs abut. Consequently one of the springs 63 will be compressed whenever the bar 61 is reciprocated in either direction and the tendency will therefore be to always bring the bar and consequently the lever 54 to a central position.

66 is a rod rigidly connected at one end to the yoke 4 and extending inwardly over the cylinder 1 where it slides in the guiding brackets 67 whenever said yoke is moved inwardly or outwardly. 68 and 69 are rods also sliding in the brackets 67, the former being spring pressed inwardly by the spring 70 and the latter pressed outwardly by the spring 71.

72 and 73 are locking levers having hooked shaped lower ends and pivoted at 74 and 75 to brackets extending upwardly from the casing 64, said locking levers being pivoted at their upper ends to the rods 68 and 69 respectively and, as shown in the drawings disposed on opposite sides of the sliding bar 61, consequently as will readily be seen, the hooked ends of said levers are normally spring pressed against the under side of the said bar 61. The bar 61 is provided with a pair of notches 76 and 77 arranged one in each side edge and adapted to be engaged by the locking levers 72 and 73. For instance, when the main operating lever 54 is thrown over to the dotted position shown in the drawings, the notch 77 will be brought into alinement with the locking lever 73 whose hooked end at once snaps into the said notch 77 and thereby locks the lever 54 in its thrown over position. Similarly if the lever 54 is thrown over to the opposite side of the central position, the notch 76 comes into alinement with the locking lever 72 and locks the lever 54 in its thrown over position.

When the lever 54 is moved into either of its diagonal positions it is, as just explained locked there, but only for a short period, that is, while the boat is going down or being brought up to deck again and it would be well to now explain the operation of the whole device. Assuming the boat is on the chock 30 ready for launching as shown in Fig. 5, the yoke 4 would be at its outward limit of movement. The main operating lever 54 being in its normal central position, it is now thrown over to the dotted position shown in Fig. 1 which has the effect of opening the pusher valve 39 from the inlet to the pipe 28 and simultaneously shutting off the exhaust pipe 40, thus providing for a free inlet of the operating fluid to the pusher cylinder 26. Simultaneously, the valve 36 is open so that there is a free exhaust from the cylinder 1 into the exhaust pipe 41, while the inlet through the valve 36 from the connection 35 remains shut off as it was in the normal position of the lever 54. In the same movement, the valve 37 is turned so as to shut off any inlet to the cylinder 1 in that direction. The lever 54 is now automatically locked in its thrown over position, while the piston in the pusher cylinder 26 is forced outwardly, consequently pushing down the davit to the dotted position shown in Fig. 5 and pulling with it the hangers 22 and consequently the boat and pulling on the cables 11 and 12 thereby forcing the yoke 4 and piston 2 inwardly, the fluid in the cylinder 1 passing out through the valve 36 into the exhaust pipe 41. The davit 14 being now in its extreme down position, the weight of the passengers in the boat causes the said boat to drop to the surface of the water, the hangers 22 at this time parting from the pulley blocks 20 and still further pulling on the cables 11 and 12, until the yoke 4 is nearly at the limit of its inward stroke when the pivoted dog 78 carried by the rod 66 which slides with the yoke contacts a rigid collar 79 on the rod 69 thereby pushing over the locking lever 73 and releasing its hooked end from the notch 77 of the sliding bar 61 thereby causing the lever 54 to fly back to its central position with consequent reversing of the valves. It is necessary however to again release the dog 78 from engagement with the collar 79 and for this purpose, said dog is pivoted in a bracket 80 rigidly depending from the sliding rod 66 and has, movable with it on the other side of the bracket a tripping lever 81 with a roller 82 at its upper end normally rolling on a track 83 having an upward incline 84 near its inner end. The tripping lever 81 is normally spring pressed downwardly with its roller bearing on the track and with the dog 78 in a position to contact the stop 79, but as soon as the yoke has moved forward far enough to cause the

release of the lever 54 as just described, the roller 82 mounts the incline 84 and consequently causes the release of the dog 78 from the collar 79 as will readily be seen in Fig. 3. It is necessary for the dog 78 to release from the collar 79 immediately after operating the lever 73, because the rod 66 will move quite a distance farther inward if the launched boat washes very far away from the end of the davit.

When the lever 54 flies back to its central position as explained, the shoulder 58 in the short connecting rod 55 pushes over the pivot pin 59 consequently moving the pusher valve to its exhausting position, but there is a finger 85 rigidly carried by the yoke which operates a cutoff valve 86 in the pipe 28 to trap the fluid in the cylinder 26 just as soon as the said yoke has moved inward to an extent corresponding to the extreme downward position of the davit, this mechanism being for the purpose of locking the davit in its down position to prevent the weight on the cables 11 and 12 pushing the davit up again by a pressure on the upper ends of the davit, which point is some distance above horizontal. The lever on the valve 86 which the finger 85 contacts, is of forked formation so that the said valve will open again at the same point in the outward travel of the yoke 4. The position now is with the boat and its complement of passengers on the surface of the water and with the valves turned as hereinbefore explained to their normal position giving a reduced pressure through the valve 37 to the cylinder 1. Now supposing the boat is dashed up by a wave, the weight will of course be thereby relieved from the cables 11 and 12 and the reduced pressure will be then sufficient to force the piston 2 outwardly and pull on the said cables, consequently there is no danger of the boat being capsized for it remains suspended from the said cables and when the wave again permits the boat to fall the yoke 4 and consequently the piston 2 will be forced inwardly by the strain on the cables and the fluid in the cylinder 1 will be forced back again along the inlet pipe through the valve 37 into the pop valve 43 where it forces back the plunger 44, uncovers the port 46 and escapes through the exhaust pipe 47, this operation continuing with the piston 2 slightly reciprocating in its cylinder when the boat 29 is washed up and down by the waves. Should the boat wash outwardly or inwardly from or toward the vessel's side more than is deemed safe, the finger 52 will contact the valve 50 when the yoke 4 reaches the limit of its inward stroke and consequently as hereinbefore explained, fluid will pass through the inlet pipe 51 through the valve 50 and valve 37 (which is at this time open) into the cylinder 1 thereby pushing the piston and yoke outwardly again, pulling on the cables and bringing the boat back beneath the end of the davit after which the finger 52 disengages the valve 50, which, as before stated, is spring operated. When it is deemed safe to cast loose the boat the suspension chains 23 are released from the boat by any suitable means, such for instance as that shown in my prior patent application, and the weight being thus taken off the cables, the reduced pressure forces the piston and yoke outwardly bringing up the hangers 22 which engage the pulley blocks 20 on their way up and therefore carry up the davit to the inboard position shown in full lines in Fig. 5, the pusher cylinder 26 during this movement exhausting its contents into the pipe 40 by way of the pipe 28 and valve 39. Another boat on a chock 30 may, in the meantime, have been run into position for launching so that suspension chains 23 have to be again connected to a boat. A spring 87, normally extended, is adapted to be compressed by contact with the yoke 4 when said yoke reaches the limit of its outer stroke which of course is when the davit is back in the inboard position and the said spring is of only very slightly less strength than the pressure from the reducing valve which is at this time forcing out on the piston 2, therefore it will readily be understood that only a very slight pull on the chains 23 is necessary to bring them down to the boat for hitching purposes, for in pulling the said chains, the yoke is forced inwardly a short distance but is assisted in such movement by the spring 87 tending to expand therefore the occupants of the boat do not have to pull against the full reduced pressure in order to hitch the suspension chains to the boat. When it is desired to pick a loaded boat from the water to the deck of the vessel the operating lever 54 is thrown over to the far side and temporarily locked in such position by the locking lever 72 engaging the notch 76. In this movement of the operating lever, the valve 36 is open to provide an inlet of fluid from the connection 35 into the cylinder 1 (the valve 37 being simultaneously shut off and the slot 57 sliding over the pin 59) therefore the full inlet pressure will be applied to the piston 2 forcing out the yoke, pulling on the cables 11 and 12 and lifting up the boat and davit, the pusher cylinder at this time exhausting into the pipe 40 through the valve 39. The lever 54 is released at the end of this movement by finger 80^a on rod 66 contacting the collar 80^b on the rod 68 thereby releasing the locking lever 72.

In Fig. 8 is illustrated a power storage plant which may be used in case the engines and the ordinary pumping system are out of order. In this plant, 88 is a storage bat-

tery wired to a motor 89 geared to a crank shaft 90 journaled in a receiving tank 91, said crank shaft driving the pistons of a set of pumps 92 adapted to pump oil or like fluid from the receiving tank 91 into the pressure tank 93, suitable non-return valves 94 and 95 being used. 96 is a pipe leading from the pressure tank 93 to a relief valve 97 having a plunger 98 therein normally pressed downward by a spring 99, said plunger being connected at its upper end to a switch 100. When the pressure in the tank 93 exceeds a predetermined limit, the oil will flow through the pipe 96 and force the plunger 98 upwardly, overcoming the pressure of the spring 99 and, in raising, the plunger will open the switch 100 and stop the operation of the pumps. The fluid inlet pipe 31 leads from the pressure tank 93, while the exhaust pipe 48 leads into the receiving tank 91.

What I claim is:—

1. In a means for launching ships' boats, an up and down moving davit, boat carrying cables running over said davit, winding mechanism for said cables mounted on the ship, a separate device for pushing said davit to its down position, controlling means for said cable winding mechanism and means connected with the aforesaid means for controlling said pusher devices.

2. In a means for launching ships' boats, in combination, a rising and falling davit and means to push said davit to its down position, boat carrying cables running over said davit, cable winding mechanism and automatic means to cause the winding in of said cables by said mechanism when the boat rises on a wave.

3. In a means for launching ships' boats, a rising and falling davit and means to push said davit to its down position, boat carrying cables running over said davit, means for winding and unwinding said cables and automatic means connected with said winding means for causing the winding in of the cables by said winding mechanism with consequent lifting of the davit when the boat load weight is relieved from said cables.

4. In a means for launching ships' boats, in combination, a davit, boat carrying cables running over said davit, fluid pressure means for winding and unwinding said cables, fluid supply pipes leading to said winding means and a reducing valve in one of said pipes for obtaining a reverse movement of said winding means when the boat load weight is relieved from said cables.

5. In a means for launching ships' boats, a rising and falling davit, boat carrying cables running over said davit, winding mechanism for said cables mounted on the ship, separate means for pushing said davit to its down position and automatic means for locking said davit in its down position and releasing for the purpose herein described and set forth.

6. In a means for launching ships' boats, an up and down swinging davit, fluid pressure means for pushing said davit to its down position, boat suspension means, a main fluid pressure cylinder suitably mounted and having a piston reciprocating therein, cables operatively connecting said piston and said boat suspension means and slidably connected to the upper end of the davit, fluid supply pipes leading to said main cylinder and to said pusher cylinder, a fluid pressure supply and coupled valves in said pipes simultaneously controlling both said cylinders.

7. In a means for launching ships' boats, an up and down swinging davit, fluid pressure means for pushing said davit to its down position, boat suspension means, a main fluid pressure cylinder suitably mounted and having a piston reciprocating therein, cables operatively connecting said piston and said boat suspension means and slidably connected to the upper end of the davit, fluid supply pipes leading to said main cylinder and to said pusher cylinder, a fluid pressure supply, one of said valves having a main operating lever connected thereto, spring devices for normally retaining said lever in a central position, means for locking said lever in a thrown over position on either side of said central position and means for automatically releasing said lever from either of said thrown over positions when said main cylinder piston is adjacent to the end of its outstroke or instroke, for the purpose herein described and set forth.

8. In a means for launching ships' boats, an up and down swinging davit, fluid pressure means for pushing said davit to its down position, boat suspension means, a main fluid pressure cylinder suitably mounted and having a piston reciprocating therein, cables operatively connecting said piston and said boat suspension means and slidably connected to the upper end of the davit, fluid supply pipes leading to said main cylinder and to said pusher cylinder, a fluid pressure supply, a pair of three way valves arranged one on each side of the main cylinder in said inlet pipe, a valve in said inlet pipe controlling the pusher cylinder, means for operatively coupling these three valves together, a reducing valve in said inlet pipe and a pop relief valve leading from one of said three way valves, a spring restrained valve between the last mentioned three way valve and said pop valve and a branch inlet leading thereto and a finger movable with said piston and adapted to operate said spring pressed valve when said piston is at the limit of its inward stroke for the purpose herein described and set forth.

9. In a means for launching ships' boats, an up and down swinging davit, means for pushing said davit to its down position, boat suspension means, a main fluid pressure cylinder suitably mounted and having a piston reciprocating therein, cables operatively connecting said piston and said boat suspension means and slidably connected to the upper end of the davit, fluid supply pipes leading to said main cylinder, a reducing valve in one of said fluid supply pipes adapted to supply a reduced pressure to said cylinder at certain times and a spring buffer for said piston adapted to approximately counter balance said reduced pressure for the purpose herein described and set forth.

Signed at Montreal, Quebec, Canada, this nineteenth day of June, 1913.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."