April 7, 1931. A. E. HALL 1,799,847

LIFEBOAT LAUNCHING DEVICE

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Fig. 1.

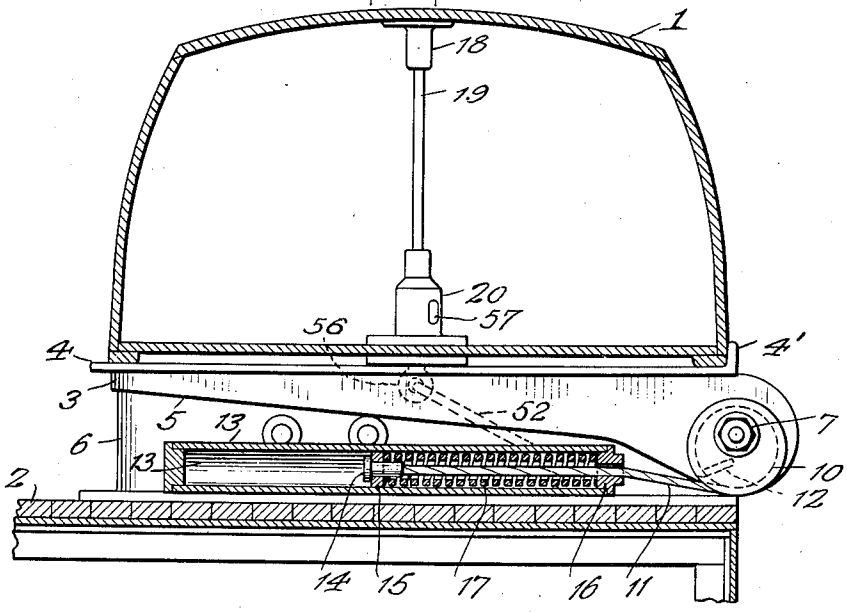

Fig. 2.

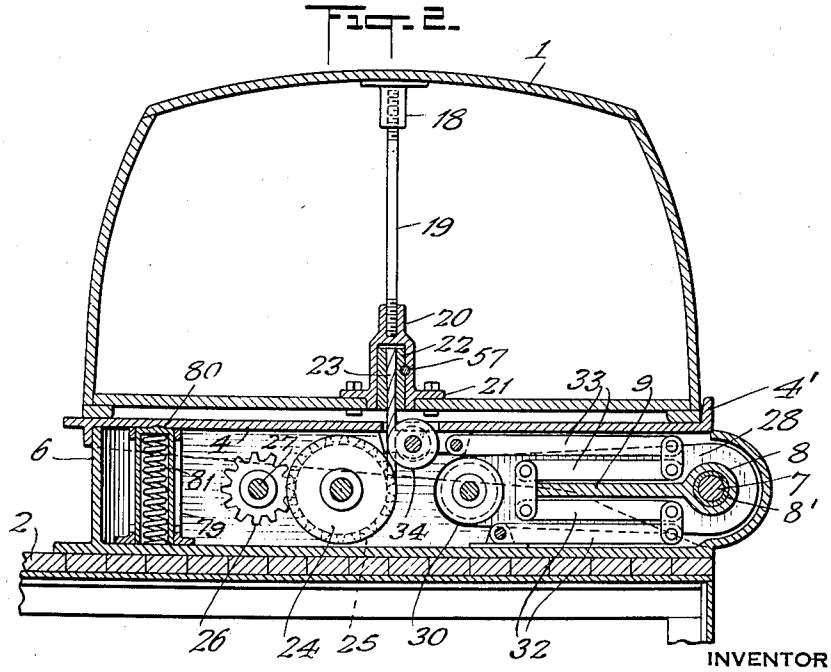

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Fig. 10.

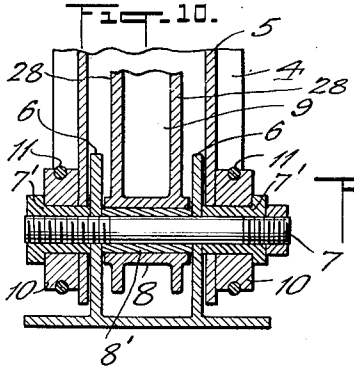

Fig. 3.

Fig. 11.

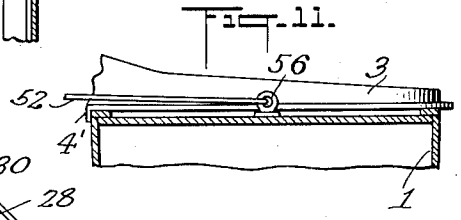

Fig. 4.

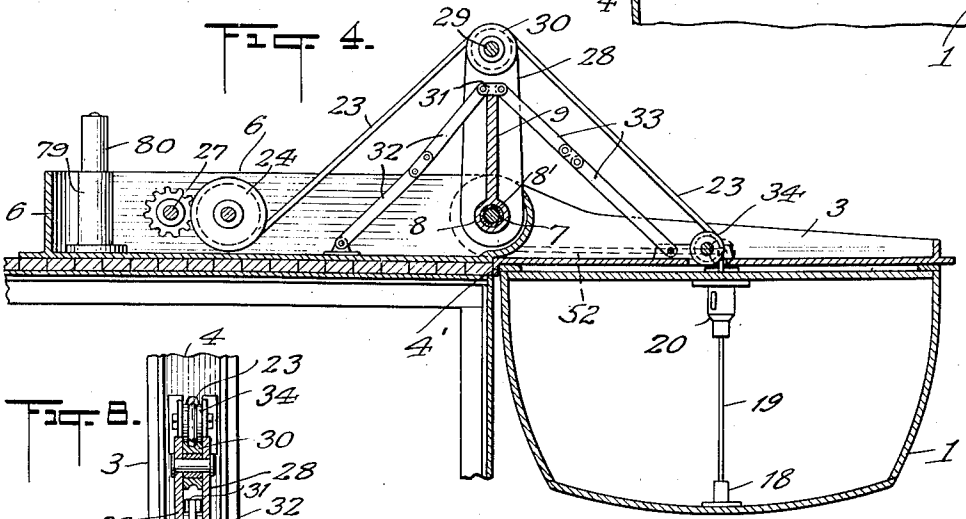

Fig. 8.

Fig. 9.

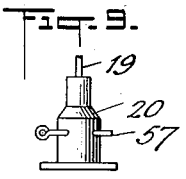

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Fig. 5.

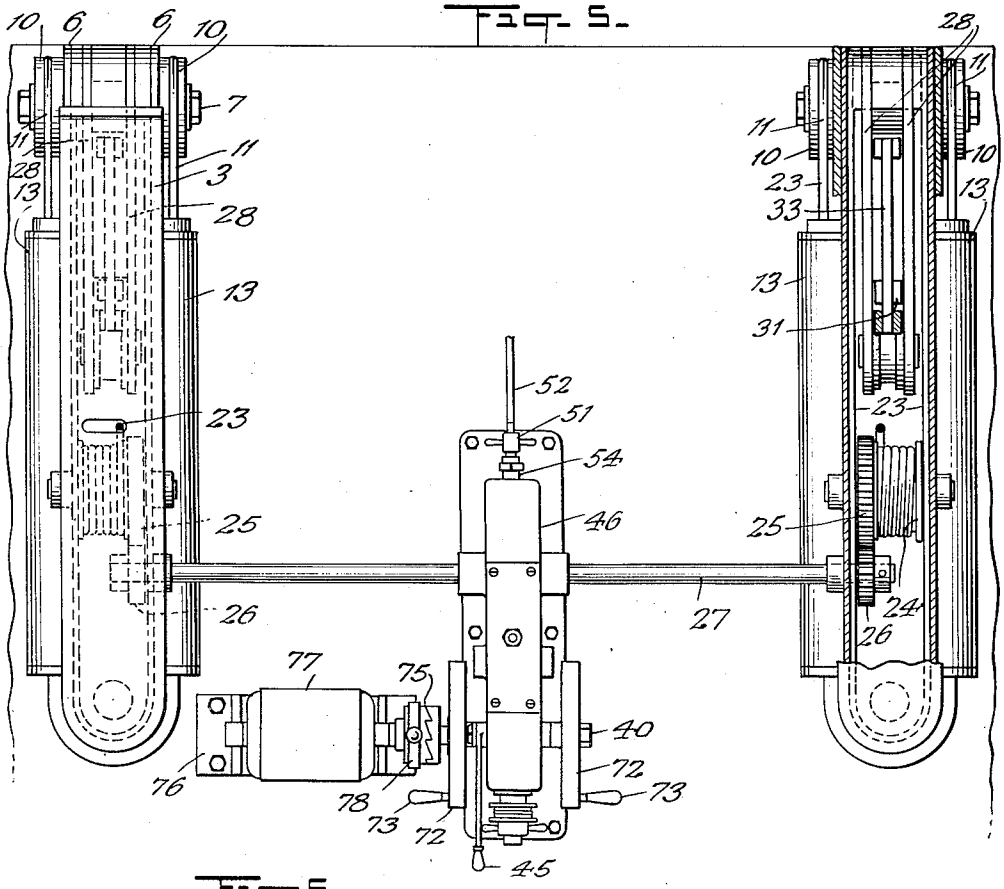


Fig. 6.

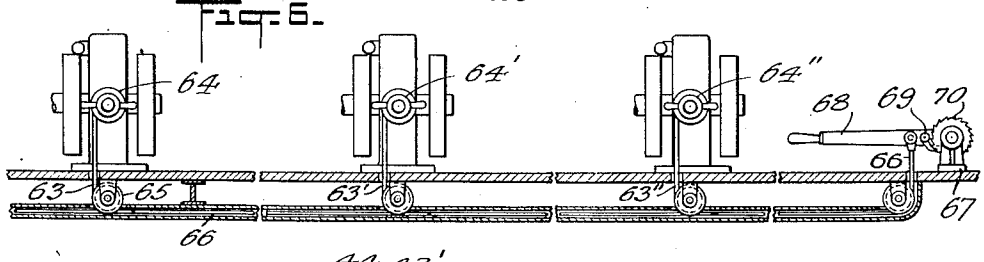
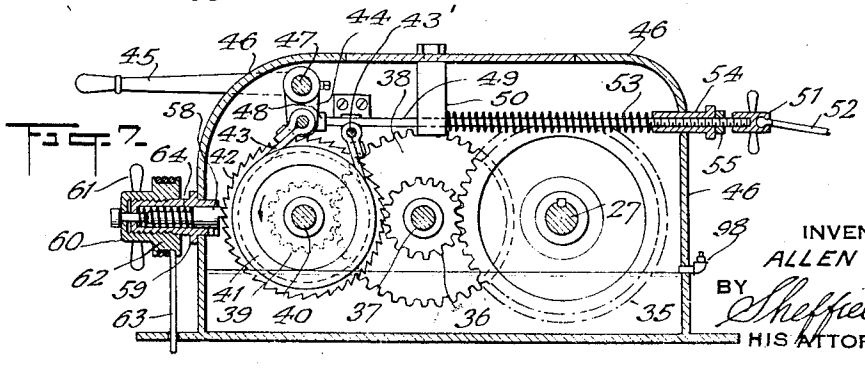


Fig. 7.



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UNITED STATES PATENT OFFICE

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LIFEBOAT LAUNCHING DEVICE

Application filed January 5, 1931. Serial No. 506,670.

This invention relates to devices or apparatus for launching life-boats from the deck of a moving vessel, and obviously from any other point, including those that may be stationary, such as from the floor of a pier or dock.

An important object of the invention is to provide means to enable a life boat to be stowed bottom-up on the deck of a vessel thereby preventing water, snow, etc., from entering the boat and to allow the boat to be turned right side up for loading from the deck of a vessel when an emergency requires launching the same.

Another object of the invention is to provide a life-boat launching device which can be operated by one person, which will position the life-boat to receive its occupants and lower it to the surface of the water in less than sixty seconds and without assistance from any of the other members of the crew or of passengers.

A further object of the invention is to provide a launching device for a life-boat which, when the latter is loaded with the occupants, can be easily lowered to the surface of the water quickly and efficiently through the automatic brake action of the lowering apparatus. This launching of a life-boat may take place even under adverse marine conditions when the elements are at their worst, such as during dark and stormy nights even if the lights on a ship have been extinguished for any reason. This may even be accomplished when the boat is covered with ice or snow and the ship may be badly listed or in a heavy sea.

A further object of the invention is to provide apparatus so that all of the life-boats may be launched at one time by remote control, such as in the pilot house of a ship, or individual life-boats may be launched without interfering with the remote control for the launching of any individual life-boat with which the ship may be provided.

A further object of the invention is to provide apparatus to accomplish the above mentioned objects that will be protected from the weather and so enclosed that the parts will not become corroded or deteriorate during any considerable period of disuse.

Another object of the invention is to provide energizing means for launching the life-boat that will be at all times and instantaneously available regardless of the condition of electric or other power on a ship.

For a detailed description of one form of this invention which is at present deemed preferable, reference may be had to the following specification and to the accompanying drawings forming a part thereof, in which

Fig. 1 is a transverse sectional view of a life-boat arranged according to my invention and stowed upside-down on the deck of a vessel, and also showing spring operated means for positively raising the life-boat from its stowed position.

Fig. 2 is a similar transverse sectional view but showing means for controlling the motion of the life-boat during its launching and apparatus for retracting the life-boat into its stowed position when necessary.

Fig. 3 is a similar transverse sectional view showing a life-boat in the act of being launched and raised to its highest position above the pivots which carry it.

Fig. 4 is a similar transverse sectional view showing the life-boat after it has been swung outward and in position for receiving passengers.

Fig. 5 is a plan view of the deck portion of the launching device with the left-boat itself removed, parts of the apparatus being shown in section.

Fig. 6 is a vertical sectional view showing one form of mechanism for making remote control of a launching apparatus effective from the pilot house or other suitable point.

Fig. 7 is a longitudinal sectional view of the gearing, brake mechanism and controlling apparatus therefor which allows the launching device to be put into operation and permits control of the outboard motion of the life-boat and the stopping of the launching mechanism when the boat is in position for loading.

Fig. 8 is a transverse sectional view taken substantially on the line 8—8 of Fig. 3.

Fig. 9 is an elevation of the means for

releasing the lowering or hoisting cables from the life-boat.

Fig. 10 is an enlarged sectional view of the bearings forming the pivots of Fig. 8, and

Fig. 11 is an elevational view showing how the controlling cable is attached to a life-boat.

Referring to the drawings, the numeral 1 indicates the hull of the life-boat; numeral 2 a deck of the ship or other structure upon which the launching device is mounted. The life-boat rests upon a pair of pivoted arms 3, one of which arms is located toward the bow of the life-boat, and the other toward the stern thereof.

These arms preferably consist of a flat plate 4 having right angle lips 4′ and flanges 5 which are adapted to fit over the top of the casing 6 to form a weather-tight casing for the parts of the launching mechanism therein. The arms 3 are pivoted at one end as indicated in Figs. 8 and 10 by the use of short bolts or shafts which pass through openings in the casing 6. The bolts are provided with bushings 7′ and 8′ of bronze or other non-corrodible material, and form bearings for the flanges 5 and hubs 10 on the arms 3 and for the arms 28 and the web 9, the function of which parts will be explained hereafter.

The flanges 5 of the arms 3 are welded or otherwise rigidly attached to eccentric grooved disks or hubs 10 so that said flanges and said hubs may rotate or oscillate on said bushings 7′ which form bearings therefor.

When the parts forming the pivots of the arms 3 and 28 and the web 9 are assembled in position, the nuts on the ends of the bolts may be screwed tight, thereby holding said bushings 7′ and 8′ firmly in position against and between the sides of the casing 6.

Referring now to Figs. 1 and 5, it will be seen that ends of the flanges 5 forming the arms 3 are attached to the above mentioned eccentric grooved disks or hubs 10. Cables 11 are attached as indicated at 12, and pass into substantially cylindical tubes or casings 13, each of which are located as indicated in Fig. 5. Each cable 11 terminates in a plug 14 which passes through a slidable disc or plunger 15 within the tube 13. Between the head 15 and the end 16 of the tube is placed a helical spring 17 which tends to force the head and cable toward the left, as shown in Fig. 1. This pressure or force of the spring 17 obviously produces a heavy tension on the cable 11 and tends to rotate the eccentric 10 to raise the arm 3. The force of these springs is sufficient to raise the life-boat to a position approximately as indicated in Fig. 3, after which the continued force thereof combined with the force of gravity acting upon the life-boat will cause it to be lowered or rotated substantially to the position indicated in Fig. 4, the weight of the boat resting on the lips 4′.

As the boat continues to move outwardly it reaches the position shown in Figure 4, at which time the cable 52 becomes taut, thus causing cable 52 to pull on brake rod 49 applying pressure to brake band 43, stopping further movement of cable drums 24 causing the boat to be held stationary and rigidly in the position shown in Figure 4, which is the passenger loading position. The length of cable 52 having been previously adjusted so as to stop the boat just before the links 32 stop the movement of arms 3 which are still under the influence of the downward pressure produced by springs 17.

In that position the life-boat is pulled upward tightly against the plates 4 of the arms 3 which are held so that they are a little above their lowest outward swing, thereby causing the links 32 to be slightly out of alignment. Thus, the life-boat is prevented from swinging when being loaded with passengers regardless of list of the ship or of rolling of the ship in a heavy sea, the flanges 4′ aiding in preventing sidewise motion. When the cable 52 is released and the stopping action of the brake removed the life-boat will descend automatically to the surface of the water.

Referring now to Figs. 2, 3 and 4, in which the controlling mechanism for launching the life-boat is illustrated, it will be seen that the life-boat is provided with a terminal socket 18 which is attached to the hull of the boat or to any other suitable part thereof. The socket 18 carries the end of a rod 19 which is attached to an opposing socket 20, that is bolted or otherwise fastened to the deck or a thwart, as indicated at 21. The opening in the socket 20 is adapted to receive a cylindrical plug 22, to which is attached one end of a cable 23. The cable 23 passes downward through an opening in the plate 4 and is wound upon a drum 24 which is fixed on a shaft passing through the sides of casing 6. The drum 24 carries at one side a gear or toothed wheel 25 which is adapted to mesh with a pinion 26, one of which is carried on each end of the transverse shaft 27.

It will thus be appreciated that when the shaft 27 is rotated in one direction or the other, the respective pinions on the ends thereof will be rotated and the gears 25 and drums 24 will be rotated accordingly. This will permit the cables 23 to unwind from the drums or a reverse rotation will cause the cables to be wound upon the drums. In order that the cables 23 may be caused to travel in the proper path to control motion of the life-boat during its rotation of approximately 180 degrees, a pair of arms 28 are provided whose hub 8 is rotatably mounted on the bushing 8′ carried by shaft or pivot bolt 7 and the web 9 extends from said hub and between said arms.

The outer ends of the arms 28 are provided with a bearing or pivot bolt 29, upon which is mounted a grooved wheel 30, and

over which the cable 23 is adapted to run, as indicated in Fig. 4. The web 9 carries at its outer end a short link 31, the ends of which are pivoted to the links 32 and 33. The latter links are adapted to be folded together when the boat is in stowed position, as indicated in Fig. 2, but when the boat is being raised and swung to its outboard position the links 33 first straighten out until the arms 28 are in their vertical position, and then the links 32 are approximately straightened out when the boat is in a horizontal loading position. These links therefore form a limiting stop for the motion of the arms 3 and 28.

As indicated in Figs. 2, 3 and 4, the arms 3 are provided with a grooved wheel or roller 34 over which the cable 23 also passes to avoid friction between the cable and said arms. It will be noticed that the web 9 above referred to serves to strengthen the arms 28 and to maintain the links 31, 32 and 33 in their proper positions at all times.

The mechanism for rotating the shaft 27 and controlling the inboard or outboard motion of the life-boat will now be described.

Referring to Fig. 7, it will be seen that the shaft 27 has keyed to it a gear wheel 35. This gear wheel meshes with a pinion 36 carried on a short shaft 37. The shaft 37 also carries another toothed wheel 38 and the latter meshes with a pinion 39 carried on the shaft 40. The shaft 40 also carries a brake drum 41, one side of which carries a toothed flange 42. The brake drum 41 is enclosed by a brake band 43, one end of which is attached to a suitable support 43′ and the other end to an arm 44, forming a bell crank lever with a handle 45. This is pivoted in the casing 46, as indicated at 47. The arm 44 of the bell crank lever is provided with a pivoted socket 48 into one end of which passes a rod 49 supported in the projecting bracket 50. The rod 49 extends through the gear casing 46 and has a threaded end upon which the cable releasing member 51 is screwed. Cable 52 passes into this member and is provided with a suitable enlarged end which enables the releasing member 51 to be rotated to release the cable. The brake rod 49 passes through a helical spring 53, and also a sleeve 54 which engages screw threads on the rods 49. A lock-nut 55 is also provided on the rod 49 and serves to fix the position of the sleeve 54 thereon. By adjusting the position of the sleeve 54 on the rod 49 the tension of the spring 53 on the brake drum may be varied to suit the required conditions when the brake is operating automatically. The other end of the cable 52 is attached to the life-boat in any suitable manner, such as by an eye 56 which is fixed upon the deck or to a thwart of the boat, or at any other suitable point practically amidship of the boat. This is indicated more clearly in Fig. 11. When said cable is released the action of the spring 53 will still serve to apply the brake band 43 to the brake drum 41 with sufficient pressure to allow the drum to rotate slowly, and therefore the weight of the boat and its occupants will cause the same to descend until the surface of the water is reached. At that point of course cables 23 may be disconnected by withdrawing the pins 57 which cause the plug 22 to be released from within the socket 20.

Since the brake drum 41 is provided with a toothed flange 42 and this is connected as above described with the cable drums 24 a pawl indicated at 58 in Fig. 7 will hold the brake drum in a fixed position against the tension of the springs 17. This pawl passes through the gear casing 46 and is contained within the sleeve 59 which is screw threaded on its exterior surface as indicated in Fig. 7. A screw threaded cap 60 engages the sleeve 59 and is provided with handles 61 for rotating the same. The cap also carries an enlarged portion 62 upon which a small cable 63 is wound. A spring 64 within the sleeve 59 serves to force the pawl 58 toward the right and causes the same to engage the notched flange 42. It will now be seen that by pulling upon the cable 63 the cap 60 will be rotated and will withdraw the pawl 58 from the teeth 42. This will of course allow the life-boat to be raised through the action of the arms 3 and springs 17 and it will thereafter be swung to its outboard position. Obviously, the cap 60 may be rotated independently of the cable 63 by means of the handles 61. In order that all of the pawls on the various life-boat launching units may be operated simultaneously from the pilot house or other suitable point, the cable 62 passes over a grooved wheel 65 below the deck of the ship and is attached to a common cable 66 which runs to the point where the remote control is located, such as indicated at 67. This remote control device may constitute any suitable apparatus to which the end of the cable 66 may be attached, but in Fig. 6 is indicated as comprising a lever 68 carrying a pawl 69 engaging a fixed toothed wheel or rack 70. It will be seen from this device that by an upward pull of the lever 68 the cables 66 and the branch cables 63, 63′ and 63″ will be pulled downward, thereby rotating the drums 64, 64′ and 64″, so that the respective pawls operated thereby are withdrawn from the notched flanges of the cable drums to allow all of said drums to rotate at the same time. As indicated in Fig. 5, the shaft 40 is extended through the sides of the casing 46 and is provided on each end if necessary with wheels 72, the latter having handles 73 so that they may be rotated manually. This provides means for winding up the drums 24 by virtue of their connection with said drums through the gearing and shaft 27. This man-

ual operation or raising of the life-boat need only be used when power devices are not available or are out of commission. The raising and stowing of the life-boat in its upside-down position on deck or other place is obviously an operation reverse to that of launching. Assuming that the life-boat is on the water ready to be raised, the plugs 22 of the cables 23 are inserted in the fore and aft sockets 20 and the pins 57 inserted to hold said parts together.

The hoisting motor 77 is then started, after the clutch 75 is engaged and the boat will be raised until it contacts with the arms 3. The continued motion of the cables will then cause the arms 3 to be raised also until the boat is stowed in the position shown in Figs. 1 and 2. The upward and inward motion of the arms 3 will cause the plungers 15 to be moved toward the right (Fig. 1) so that the spring 17 will be compressed to store up the energy which will become active when the arms 3 are again released to launch the life-boat.

Thus the action of the spring causes the launching mechanism to be entirely automatic and the necessary power is always ready for instant use when needed, regardless of the condition of the electric or other power with which this ship may be provided.

Power devices can be supplied in any suitable way for rotating the shaft 40, but I have indicated in Fig. 5, a clutch 75 which may be connected with one end of the shaft of an electric motor 77. The clutch may be operated in any preferred manner, such as by the use of a handle 78. The motor 77 is preferably portable or detachable or may be fixed in permanent position if desired. It is connected to the driving clutch 75 when it is desired to raise the boat by this means.

The motor 77 may be mounted upon a suitable base or support 76 either permanently or detachably. If the motor 77 is detachably mounted, a single motor may be used for all of the life-boat launching mechanisms when the boats are being individually stowed and may therefore be moved from one boat to another as occasion may require. In such cases the electric power may be supplied by suitable cables plugged into adjacent or convenient electric outlets. The life-boat may be raised manually by turning the crank handles 73 in case the electric power is not available or is out of commission.

In order to form a buffer for the arms 3 when rotated into their horizontal position when the boat is stowed on the deck, the tubular casing 79 is mounted within the casing 6 (Figs. 2 and 3) and said tubular casing 79 is adapted to receive a telescoping casing 80 which contains an helical spring 81 which when compressed allows the parts to assume the position shown in Fig. 2, but when the arms are raised will allow the telescoping tube 80 to be forced upward, as indicated in Fig. 3. This device not only forms a buffer when the arms are rotated to their stowed position, but also, owing to the compression of the spring, produces an initial upward force which when the pawl which holds the arm in position is released, causes an additional lifting thrust to accelerate the upward rotating movement of the arms 3 and the life-boat 1.

Obviously other energizing devices may be adopted for launching the life-boat instead of the force of the springs 17, which cause a tension on the cables 11, but it is preferred to use such springs because of the energy stored in them when compressed and because of their automatic action which is available at all times when released to swing the life-boat into outboard position for loading.

After a consideration of the above description of construction and operation of my improved life-boat launching device, it will be appreciated that the apparatus holds the boat rigidly at the deck level where it is retained securely bottom up in stowed position without the necessity of using any auxiliary holding or securing devices, such as are used with other types of launching gear, and which ordinarily must first be untied or unfastened before the life-boat can be lowered. Since the life-boat is stowed upside down on special stowage devices, the boats are protected from the elements and remain dry without the use of canvas covers, such as are customarily used on life-boats when hung from davits in the usual way.

A further advantage of the apparatus will be evident because of the fact that the casing 6 is closed by the plate 4 and the flanges 5 which form a cover for said casing, and this casing may be adapted to contain grease or other lubricant to prevent rust or corrosion and for lubricating the gears, cables and other parts within said casing. This also applies to the casing 46 which contains the releasing and brake mechanism for lowering and raising the life-boats. This casing may be partially filled with oil, grease or other lubricant, whose level may be determined by the tap and plug 98.

Since the steel cables are enclosed in casings which contain grease they will last much longer than has heretofore been possible in life-boat launching devices, where cables have been exposed to the weather.

The fact that the life-boat does not require the regular canvas cover is of considerable importance since it saves much valuable time which would be lost in removing life-boat covers from the boats, particularly when the boats are covered with ice or snow. Such canvas life-boat covers are relatively fragile and are of short life owing to the action of the elements. The cost of renew-

ing them from time to time is also saved when the boats are stowed as above described.

The launching device herein described holds the life-boat rigidly at the deck level when it has been swung outward and is in the passenger loading position, as indicated in Fig. 4. It is held securely in that position as though it were practically a part of the ship itself. This makes it possible for passengers to get into the life-boat with much greater safety and ease than in cases where other launching devices are used where the life-boat is allowed to swing from davits or similar supports which permits great variation and uncertainty in the position of the life-boat with reference to the deck when the ship lurches in a heavy sea.

The fact that the apparatus is capable of launching a life-boat in less than a minute, and since all of the boats may be swung out to loading position simultaneously by use of the remote control occasioned by the operation of a single lever placed in the pilot house or other suitable position, saves a great deal of time in a sudden emergency. A single life-boat may be launched independently of the others, and such a boat can be swung to its outboard position by one person, which action will require only about ten seconds, and it is then in a position for the loading of passengers.

The use of this automatic launching device eliminates the necessity of training boat crews to handle the boats and when the life-boats are propelled when in use by a suitable gasoline or other oil-burning motors, one trained seaman or officer may be in complete charge of the launching and navigation of each boat, thereby making the other members of the crew available for assisting the passengers or subject to the orders of the captain to maneuver or handle the ship.

Having thus described this form of my invention, I do not wish to be understood that the same is limited to the details illustrated, for various changes may be made by those skilled in the art without departing from the spirit and scope of my invention.

What I claim and desire to protect by Letters Patent is:

1. A life-boat launching device adapted to have a life-boat stowed thereon in up-side-down position, said device comprising latently active power means for vertically rotating the boat outboard to place the same in normal position for loading.

2. A life-boat launching device adapted to have a life-boat stowed thereon in up-side-down position, said device comprising a pair of pivoted supporting arms and latently active power means connected directly therewith for vertically rotating said arms to place the life-boat in normal position for loading.

3. A life-boat launching device adapted to have a life-boat stowed thereon in up-side-down position, said device comprising a casing, a pivoted supporting arm having a cover adapted to form a closure therefor, latently active power actuating mechanism within said casing, and means for releasing said power mechanism to cause the motion of said arm to place the life-boat in normal position for loading.

4. A life-boat launching device adapted to have a life-boat stowed thereon in up-side-down position, said device comprising pivoted supporting members, latently active power means adapted to contain stored energy for vertically rotating said members to place the life-boat in normal position for loading, and automatic means for stopping the motion of the life-boat to fix the same at said loading position.

5. A life-boat launching device adapted to have a life-boat stowed thereon in up-side-down position, said device comprising a pair of pivoted supporting arms, latently active power means for vertically rotating said arms to place the life-boat in normal position for loading, cables for holding said life-boat in position on said arms until the loading position is reached, and automatic means for controlling the motion of said boat and stopping the same at the loading position.

6. A life-boat launching device adapted to have a life-boat stowed thereon in up-side-down position, said device comprising pivoted supporting members, means for vertically rotating said members, said means comprising parts retained under spring pressure when the boat is stowed, and means for releasing said parts to rotate said members and place the same in normal position for loading.

7. A life-boat launching device adapted to have a life-boat stowed thereon in up-side-down position, said device comprising a pair of pivoted supporting arms, springs retained under pressure for rotating said arms to place life-boat in normal position for loading, and means for releasing the action of said springs to produce the rotations of said arms.

8. A life-boat launching device adapted to have a life-boat stowed thereon in up-side-down position, said device comprising a pair of pivoted supporting arms adapted to swing the boat over the pivots thereof outward beyond the side of a ship, springs acting upon the pivots of said arms to rotate the same, flexible cables connecting said springs and arms, and means for releasing the action of said springs to swing the life-boat outward.

9. A life-boat launching device adapted to have a life-boat stowed thereon in up-side-down position, said device comprising pivoted supporting members, latently active power means for vertically rotating said members to place said life-boat in loading position,

cables for retaining said life-boat on said supporting members, drums upon which said cables are wound, and mechanism adapted to regulate automatically the movement of said members during their outboard motions.

10. A life-boat launching device adapted to have a life-boat stowed thereon in up-side-down position, said device comprising a pair of pivoted supporting arms, compression springs for rotating said arms to place the life-boat in loading position, cables detachably connected with said life-boat, drums on which said cables are wound, devices for controlling the motion of said cables during the launching of the life-boat, and power devices connected with said drums adapted to rotate the latter to retract said cables and compress said springs to place the life-boat in stowed position.

11. A life-boat launching device comprising, horizontally pivoted supporting members, spring actuated parts for rotating said members, a cable adapted to be attached to a life-boat, a drum upon which said cable is wound, gearing connecting said drum with a rotatable shaft, means for retarding the motion of said shaft, and a releasable stop for holding said means in a fixed position.

12. A life-boat launching device comprising, horizontally pivoted supporting members, spring actuated parts normally under tension for rotating said members in vertical planes, a cable adapted to be attached to a life-boat, a drum upon which said cable is wound, gearing connecting said drum with a rotatable brake device and means for regulating and stopping the action of said brake device.

13. A life-boat launching device comprising, pivoted supporting members upon which a life-boat may be stowed, latently active power means for rotating said members in vertical planes, a releasable stop for holding said supporting members in stowed position against the action of said power means and an automatic brake device to regulate and to prevent the rotation of said supporting members when said stop has been released.

14. A life-boat launching device comprising, pivoted supporting members upon which a life-boat may be stowed, springs for rotating said members upward, a cable adapted to be attached to a life-boat, a drum upon which said cable is wound, gearing connecting said drum with a rotatable shaft, means for rotating said shaft to wind said cable on said drum, a releasable stop for holding said drum in fixed position, and a brake device connected with said shaft to control the rotation of said supporting members when said stop has been released.

15. A life-boat launching device comprising, pivoted supporting members upon which a life-boat may be stowed, cables connected with the pivots of said members, springs for producing a tension on said cables, additional cables adapted to be attached to a life-boat, drums upon which said cables are adapted to be wound, gearing connecting said drums with a rotatable shaft, means for rotating said shaft to wind said cables on said drum, a releasable stop for holding said rotating means in a fixed position, and a brake device connected with said shaft to control the rotation of said supporting members when said stop has been released.

16. A life-boat launching device comprising, horizontally pivoted supporting members, means for rotating said members, pivoted arms adjacent said supporting members, controlling cables adapted to be attached to a life-boat and arranged to pass over the ends of said arms, and devices for causing and limiting the upward movement of said arms.

17. A life-boat launching device comprising, horizontally pivoted supporting members, means for rotating said members, pivoted arms adjacent said supporting members, controlling cables adapted to be attached to a life-boat and arranged to pass over the ends of said arms, and links for causing and limiting the upward movement of said arms.

18. A life-boat launching device comprising, horizontally pivoted supporting members, means for rotating said members, pivoted arms carried by the pivots of said supporting members, supporting cables adapted to be attached to a life-boat and arranged to pass over the ends of said arms, devices for causing and limiting the upward movement of said arms, and for limiting the outward movement of said supporting members.

19. A life-boat launching device comprising, horizintally pivoted supporting members upon which a life-boat is carried, means for rotating said members upward, cables adapted to be detachably connected with said life-boat, drums, upon which said cables are wound, brake mechanism connected with said drums to control the rotation thereof, and connecting means extending from said brake mechanism and attached to said boat and adapted to apply said brake mechanism at a predetermined position of said boat, to prevent the downward motion of the latter at the loading position.

20. A life-boat launching device comprising, horizontally pivoted supporting members upon which a life-boat is carried, springs for rotating said members upward, cables adapted to be detachably connected with said life-boat, drums upon which said cables are wound, brake mechanism connected with said drums to control the rotation thereof when said boat is being lowered, connecting means between said brake mechanism and said boat and adapted to apply the brake mechanism

at the desired position to stop the downward motion of said boat, and a power device for rotating said drums to compress said springs and to raise said boat and place the same in stowed position on said supporting members.

21. Life-boat launching devices comprising for each life-boat, horizontally pivoted supporting members, releasable means for automatically rotating said members, releasable devices for holding said members in retracted or stowed position, connections between said releasable devices for the supporting members of the respective life-boats by the movement of which the boats may be launched simultaneously, and a manually operable part located at a desired point for actuating said connections and said holding devices.

22. Life-boat launching devices comprising for each life-boat horizontally pivoted supporting members, spring actuated parts for rotating said members, cables adapted to be attached to a life-boat, drums upon which said cables are wound, releasable stops for holding said drums in fixed position, connections between successive releasable stops by which the respective life-boats may be launched simultaneously, and a manually operable part located at a desired point for actuating said connections and said releasable stops.

23. A life-boat launching device comprising pivoted supporting arms, a pivoted guide arm, a pivot shaft for said arms, bushings on said shaft and carried in bearings in the ends of said arms, a support for said shaft, and means for drawing said bushings and said support together to fix said bushings in position on said shaft.

Signed this 18th day of December, 1930.

ALLEN E. HALL.