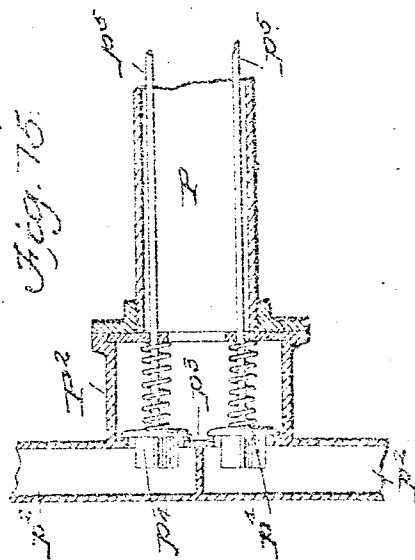
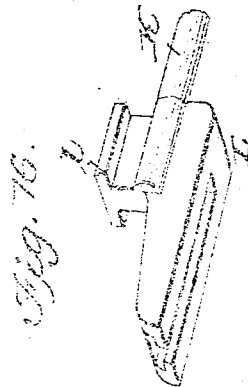
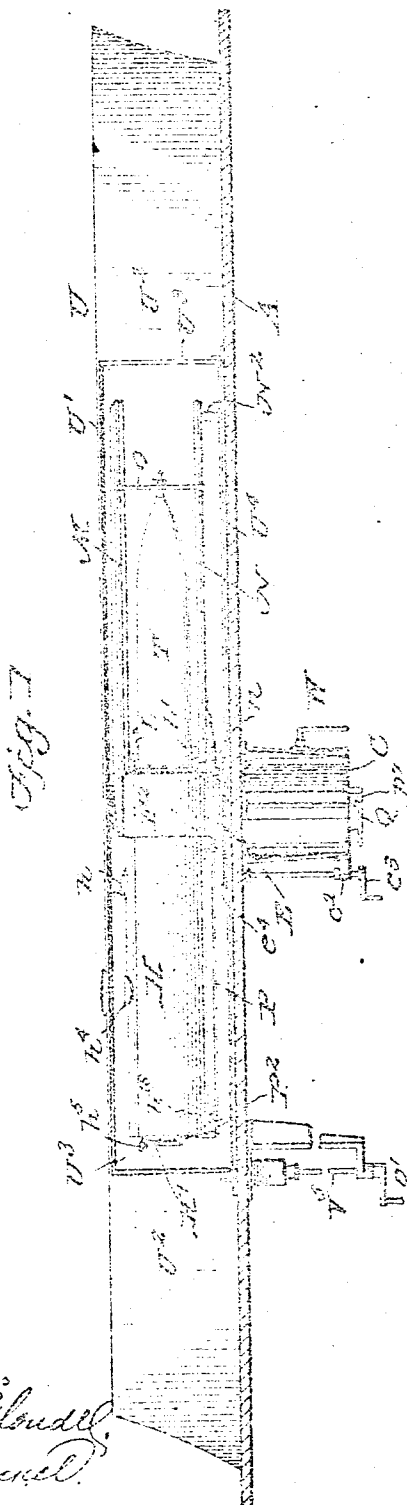


S. LAKE.
TORPEDO LAUNCHING APPARATUS.
APPLICATION FILED DEC. 22, 1908.

949,325.

Patented Feb. 15, 1910.

5 SHEETS—SHEET 1.



Witnesses
W. H. Blundell
E. H. Blundell

Simon Lake
by
W. H. Blundell
Attorney

S. LAKE.
 TORPEDO LAUNCHING APPARATUS.
 APPLICATION FILED FEB. 13, 1908.

949,325.

Patented Feb. 15, 1910.

2 SHEETS—SHEET 2.

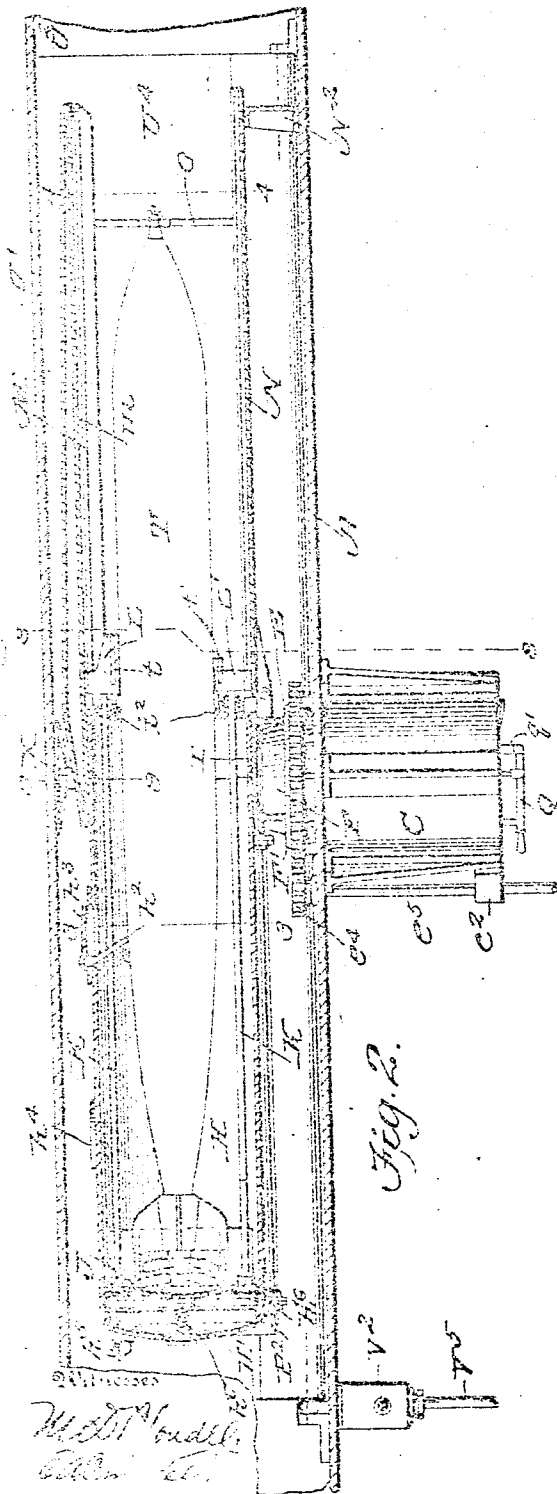


Fig. 2.

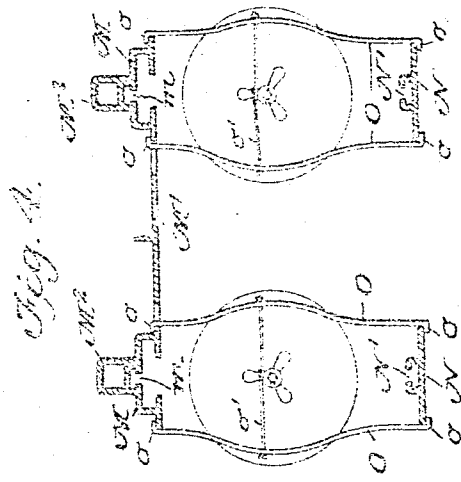


Fig. 4.

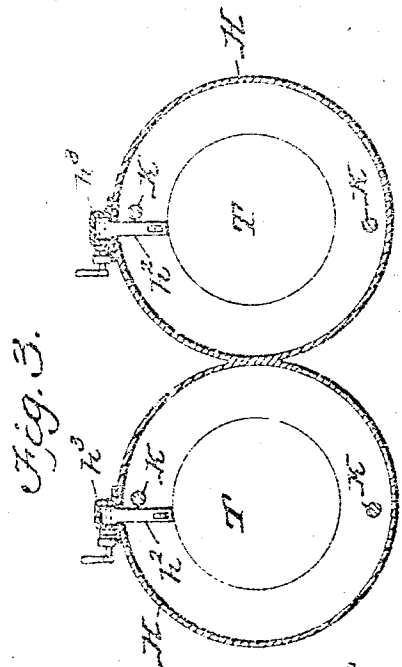


Fig. 3.

Inventor
 Simon Lake,
 by
 W. H. H. H.

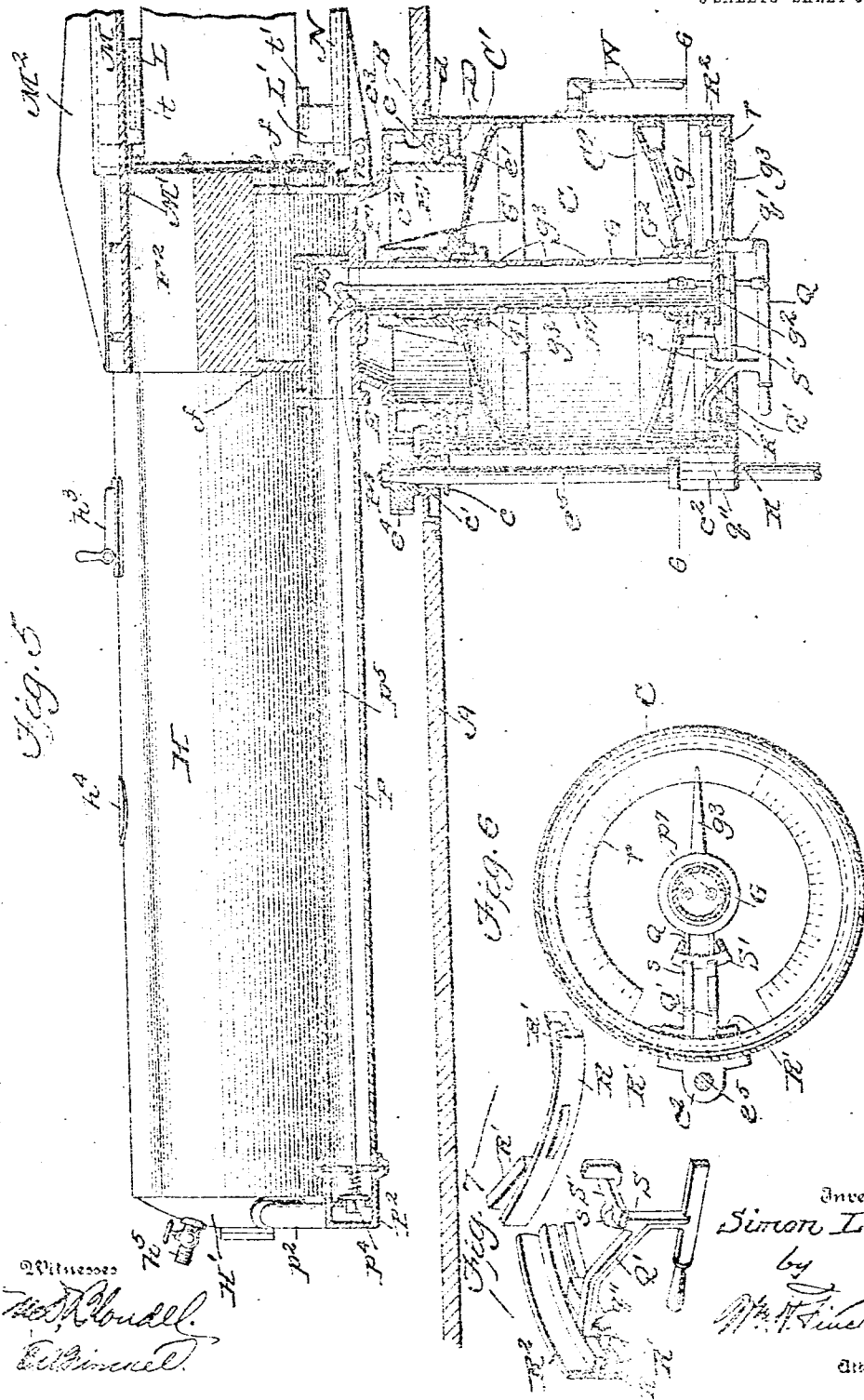
Attorney

S. LAKE.
TORNADO LAUNCHING APPARATUS.
APPLICATION FILED DEC. 19, 1906.

949,325.

Patented Feb. 15, 1910.

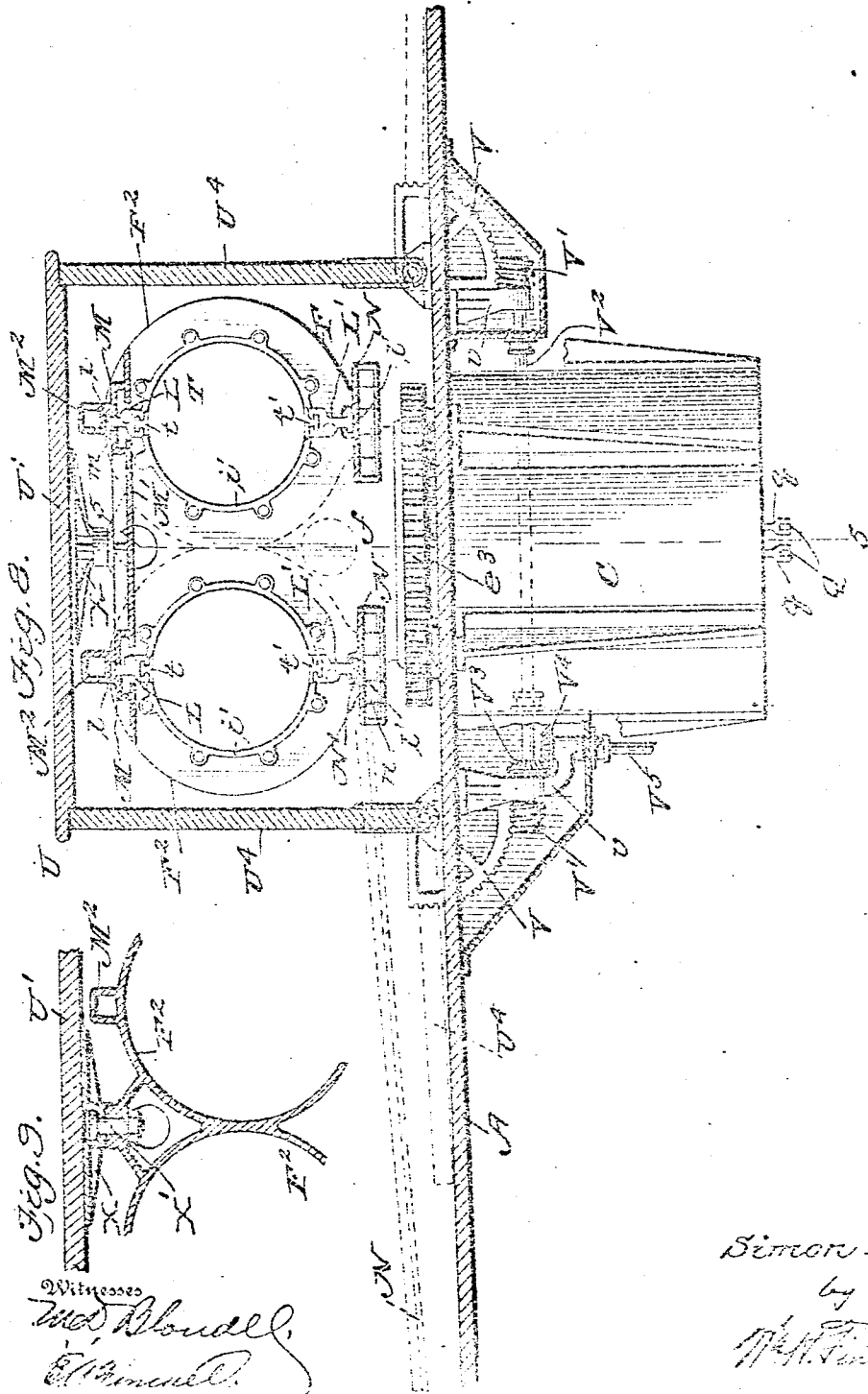
5 SHEETS—SHEET 3.



S. LAKE.
TORPEDO LAUNCHING APPARATUS.
APPLICATION FILED DEC. 19, 1908.

949,325.

Patented Feb. 15, 1910
5 SHEETS—SHEET 4.

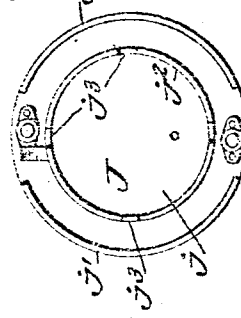
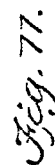
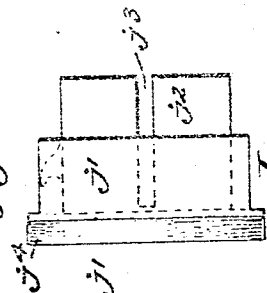
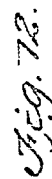
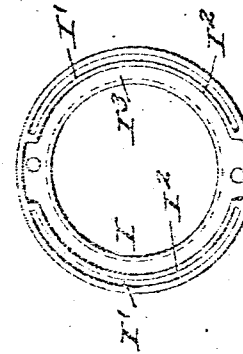
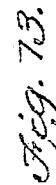
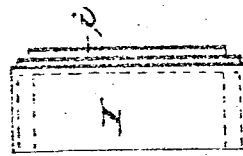
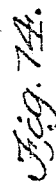
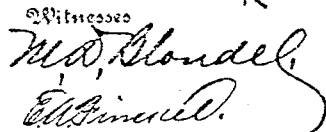


Witnessed
Wm. H. Russell
E. H. Russell

Inventor
Simor Lake
by
Wm. H. Russell
Attorney

949,325.

5 SHEETS--SHEET 5.



Simon Lake.

by
Wm. H. Finckel
Attorney

UNITED STATES PATENT OFFICE.

SIMON LAKE, OF MILFORD, CONNECTICUT.

TORPEDO-LAUNCHING APPARATUS.

949,325.

Specification of Letters Patent. Patented Feb. 15, 1910.

Application filed December 19, 1908. Serial No. 468,352.

To all whom it may concern:

Be it known that I, SIMON LAKE, a citizen of the United States, and a resident of Milford, in the county of New Haven and State of Connecticut, have invented a certain new and useful Improvement in Torpedo-Launching Apparatus, of which the following is a specification.

The object of this invention is to provide a revoluble torpedo discharging apparatus, for installation upon the deck of a surface or a submarine boat, which will permit of the discharge of the torpedoes from either broadside of the vessel when operating either above or below the surface of the water, and through such an arc that the torpedoes may be directed toward an object without changing the course of the vessel.

The invention consists in a deck structure containing the torpedo-tubes, the mechanism for controlling the position of said tubes and the mechanism for controlling the discharge of the torpedoes being arranged and controlled from below the deck, thereby avoiding exposure of the operators, and means being provided to prevent the accidental discharge of the torpedoes when the discharge tubes are in such position that the discharge of the torpedoes would be liable to cause them to contact with the deck connections of the vessel, and means for holding and guiding the torpedoes when discharged until the tails thereof are entirely free of the discharge tubes and until the oblique gears have obtained sufficient speed to control the direction of the torpedoes and sufficient velocity to carry them away from the vessel, thereby avoiding all danger of contact with the vessel or of fouling the adjacent torpedo when the first torpedo is discharged, especially should they be discharged when the vessel is under way or in the presence of a swift current.

The invention also consists of means to facilitate the handling of the torpedoes when being loaded into the tubes, and means to facilitate the removal of the torpedoes therefrom.

The invention also consists of certain other devices, and novel combinations and arrangements of parts, as will be fully set forth in the following specification and then pointed out in the claims.

In the accompanying drawings, illustrating the invention, in the several figures of which like parts are similarly designated,

Figure 1 is a vertical longitudinal section of a portion of the deck of a vessel illustrating the position of my improved apparatus on the said deck; the doors of the housing arranged over the discharging tubes being in an open position. Fig. 2 is a vertical longitudinal section drawn through one of the torpedo tubes and through a portion of the deck of the vessel. Fig. 3 is a vertical cross-section drawn on the line 3—3 of Fig. 2. Fig. 4 is a similar view drawn on the line 4—4 of Fig. 2. Fig. 5 is a detail vertical longitudinal section drawn on the line 5—5 of Fig. 8. Fig. 6 is a horizontal section drawn on the line 6—6 of Fig. 5. Fig. 7 is a detail perspective view illustrating the locking device for the firing levers. Fig. 8 is a vertical transverse section drawn on the irregular line 8—8 of Fig. 2. Fig. 9 is a detail vertical transverse section drawn on the line 9—9 of Fig. 2. Fig. 10 is a horizontal section drawn through one of the torpedo tubes. Fig. 11 is an end view of one of the pistons of the torpedo tubes, and Fig. 12 is a side view of the piston. Fig. 13 is an end view of one of the castings that are arranged at the ends of the torpedo tubes, and Fig. 14 is a side view of the same. Fig. 15 is a horizontal section showing the means for supplying pressure fluid to the torpedo tubes. Fig. 16 is a perspective view of one of the connecting devices for connecting the torpedo and its discharging piston.

A designates the deck of a vessel, of any character, and either for surface or submarine operation. In this deck is arranged a circular opening B, Fig. 5, in which is fitted the upper end of a cylindrical tank or drum C having heads C' and C'' fitted airtight therein near its ends, and adapted to contain compressed air. Secured to the upper end of the said tank is an annular T-shaped casting D, which forms a support for a turn-table E. This turn-table has a short cylindrical sleeve E' provided with an annular flange e adjacent to its lower end, which rests upon a horizontal portion d of the T-shaped casting D. Secured to the extreme end of the sleeve E' is an L-shaped retaining bracket e', which bears against the lower side of the portion d of the casting and securely holds the said turn-table in position. The upper end of the sleeve E' is formed with a flange e' whose peripheral edge is provided with rack teeth e'' which are engaged by a pinion e' carried at the

upper end of a vertically arranged shaft e^1 that is journaled at its upper end in a bearing e' projecting rearwardly from the upper end of the tank or drum C, and is supported at its lower end in a bearing e^2 secured to the lower end of the said tank or drum. A stuffing box c is formed in the bearing e' to prevent water entering the vessel around the shaft. The lower end of the shaft is shown provided with a crank handle e^3 by which it is revolved, but in practice it may be provided with a gear or a worm-wheel that is geared to and operated by a suitable motor.

Mounted upon and securely fastened to the turn-table E is a casting F, having a base portion F' and two parallel sleeve members F^2 which are connected to the base portion F' by webs f and also connected to each other at their abutting peripheral surfaces, as shown most clearly in Figs. 5 and 9. Depending from the base portion F' is a hollow shaft G having a flange at its upper end by which it is connected to the said base portion, said flange surrounding an opening formed centrally in the base. The shaft G extends downwardly through bearings G' and G^2 respectively in the heads C' and C^2 of the tank or drum C. Gland rings g' surround the shaft and fit into stuffing boxes formed in the bearings G' and G^2 to prevent the escape of air from the tank or drum. That portion of the shaft which is within the tank is provided with a series of perforations g^2 through which the air in the tank passes into the shaft and thence to the torpedo tubes, as will be explained later on.

A torpedo tube H is held at its forward end in each of the sleeve members F^2 , and each tube has its rear end closed by a head H' . In the forward end of each sleeve member and abutting the end of the tube therein is fitted a cylindrical casting I, which is provided with opposite segmental recesses I' formed by concentrically arranged flanges I^2 that project from an inwardly extending flange I^3 formed at the front end of the casting. The flange I^3 of each casting has an annular forwardly extending flange i which carries a packing-ring i' that snugly fits the torpedo to provide a water-tight joint to prevent any water entering the tube when the torpedo is in position, and when the apparatus is installed upon a submarine boat.

Operating in each torpedo tube H is a piston J, having a head j , segmental rim portions j' extending forwardly therefrom and a concentric ring j^2 provided with slots j^3 arranged in the vertical and horizontal planes of the center of the piston and designed to receive the fins of the tail of the torpedo (Figs. 2 and 11) to assist in restraining the torpedo from revolving in the tube and when being discharged therefrom. Each piston is provided with a packing-ring j^4 at its rear side, held in position and in en-

gagement with the tube by a flanged ring j^5 , to provide an air-tight joint to prevent the escape of air admitted in the tube back of the piston. The rims j' of the piston are designed to enter the recesses I' of the casting I when the piston is moved to its extreme forward position. Thus these rims and recesses form dash-pots to cushion and limit the forward movement of the piston when the torpedo is discharged. Each piston has two forwardly extending piston rods K, K, and these rods extend from diametrically opposite points slightly to one side of the vertical plane of the center of the piston. Each piston rod operates through a stuffing box k^2 formed in the flange I^3 of the casting I, and each upper rod carries a shoe L at its forward end having a slot in its lower side that is open only at the front end of the shoe and fits over a T-shaped lug t carried by the torpedo T. Each shoe is also formed with a flanged head l that fits in a guide slot m arranged in a supporting and guiding arm M projecting from the forward edge of its adjacent sleeve member F^2 of the casting F. The arms M are preferably formed integral with the said sleeve members and are connected together by a web M' , and each arm is formed with a lateral flange upon its outer side, and with a hollow strengthening rib M^2 upon its upper side that extends throughout its length. The lower piston rods K are also provided with guide shoes L' , at their forward ends, which have their lower surfaces provided with lateral flanges l' which snugly fit in guide slots N' formed in the upper surfaces of guide arms N that are pivotally connected at their rear ends to lugs or ears n extending from the forward side of the base F' of the casting F. The upper surfaces of the shoes L' are also provided with slots that are open at the forward ends of the shoes and fit over lugs t' depending from the lower sides of the torpedoes.

When the apparatus is lying in its normal position, that is to say, when lying parallel with the longitudinal axis of the vessel, the outer ends of the arms N are supported upon a bracket N^2 extending from the deck of the vessel. In order to prevent the weight of the arms falling upon the shoes L' when the apparatus is adjusted to a firing position, at which time the arms will be swung free of the said bracket, I employ supporting rods O, O shown most clearly in Fig. 4. These rods have hooks o at their ends, the upper hooks inserted through short slots formed in the web M' connecting the arms M, and into slots formed in the flanges extending from the outside of said arms and engaging the tops of the said web and flanges, and the lower hooks caught under the sides of the arms N, thereby holding said arms N elevated until engaged by the torpedoes, as will be understood from the de-

scription of the operation of the apparatus. The rods O of each arm N are connected by a cord or fine wire o' which holds them from accidental displacement which otherwise might occur through the vibration of the vessel when the latter is in motion, or through contact with the water. These cords or wires also serve to hold the propeller blades at the noses of the torpedoes from revolving, thereby preventing the accidental "setting" of the torpedo firing mechanism until the torpedoes have been launched.

P designates an air conduit through which the compressed air is conducted from the compressed air tank or drum C to the rear end of the torpedo tubes H back of the pistons. The forward end of the conduit is connected with a short pipe P' secured to or formed integral with the base of the casting K and surrounding the opening therein which communicates with the hollow shaft G that extends through the tank C. To the rear end of the conduit P is connected a cap P² having laterally extending pipe sections p² whose ends are connected to and surround openings formed in the heads H' of the tubes H, and within the cap is a partition p³ having openings that communicate with each pipe section p² which are controlled by valves p⁴ whose stems p⁵ are extended forwardly through the conduit P and are connected to one end of elbow levers p⁶ pivotally held in the pipe section P' adjacent to the central opening therein. Rods p⁷ are connected to the opposite ends of the levers p⁶ and extend downwardly through the shaft G and through the head q² thereof and have their lower ends connected to levers Q which are pivotally connected at one end to brackets q' depending from the head q² of the said shaft, and at their opposite or handle ends they are provided with upwardly and forwardly extending arms Q' which terminate in nose portions q'' that are designed to engage wedge shaped blocks R' carried by a segmental slide bar R. This slide-bar is held in a race-way formed in a ring R² secured to the lower end of the tank C. These blocks R' provide a locking arrangement for one or the other of the levers according to the direction in which the torpedo-tubes have been revolved, and thereby permits the discharge of the torpedoes in sequence only. In other words, should the tubes be adjusted to discharge from the port side of the vessel, the left hand torpedo, which then becomes the rear one, is always fired first, in order to avoid any possibility of the first torpedo fouling the remaining one, and by the use of the sliding blocks it will be readily understood that as the tubes are swung around to a firing position, one or the other of the levers will be freed from its block, but the other lever will ride up on its block until sufficient frictional contact has

been secured, when it will push the block around in the guide way and thereby prevent the lever being accidentally operated. After the first torpedo has been discharged the block is knocked from engagement with its lever which then leaves it free to be operated. To prevent any possibility of the levers being operated when the tubes are lying in an inactive position, I provide each lever with an extension S, which extensions have their ends terminating in short nose portions s which fit over a segmental bar S' suspended from the lower head of the tank or drum C and of such length that the nose portions will not be disengaged therefrom until the said levers have been moved through a certain arc.

The entire portion of the apparatus above the deck of the vessel is inclosed by a housing U, when in a position parallel with the longitudinal axis of the vessel. This housing is constructed with a top portion U' and sides U² which converge at their front and rear ends to a point, and the sides are provided with openings U³ closed by doors U⁴ which are hinged at their lower ends to open downwardly. The pintles of the hinges of the doors are provided with segmental rack bars V which are meshed by worm wheels V' carried by a transversely arranged shaft V² journaled in brackets v depending from the deck of the vessel. Adjacent to one end of the shaft is a bevel gear V³ which is meshed by a similar gear V⁴ carried at the upper end of a vertically arranged shaft V⁵ whose upper end is journaled in an extension of the bracket v and its lower end in a bracket depending from the deck of the vessel. The shaft V⁵ may be driven by any suitable motor, but for convenience of illustration I show it provided with a crank handle e' Fig. 1 for this purpose.

The tank or drum C is supplied with compressed air through a pipe W which extends from a suitable pump (not shown) carried by the vessel.

An opening is formed in each of the torpedo tubes H opposite to the charging valves of the torpedoes, so that access to the valves may be had without withdrawing the torpedoes from the tubes; and a hatch is also constructed in the top of the housing opposite to or in alinement with the openings so that access may be had to the openings without adjusting the said tubes. The openings in the tubes are closed air tight by suitable covers h'.

In the rear end of each torpedo tube is a spring buffer h² to cushion and limit the rear movement of the pistons J.

In loading the torpedoes into the tubes, the doors of the housing are first lowered and the tubes then swung around so that their ends will be easily accessible, air is then admitted into the tubes back of the pistons

forcing them to the forward ends of the tubes. A torpedo is then lowered (preferably by means of a derrick) and adjusted into alignment with either one of the tubes, the lugs upon the upper and lower sides of the torpedo are then fitted into the slots in the shoes L and the torpedo pushed back into the tube until the fins of its tail enter the slots formed in the ring j^2 of the piston. The air in the tube is then released through a valved nipple h^5 screwed into the head of the tube H. The torpedo is then pushed farther into the tube until the sides thereof come into close contact with the packing strip carried by the inwardly projecting flange of the casting I and an air tight joint is secured. The nipple h^5 is then connected by a hose extending from a suitable pump (not shown) and enough air is withdrawn from the tube to create a partial vacuum which draws the torpedo farther into the tube and into its discharging position, and then the valve in the nipple is closed. Prior to the insertion of the torpedo into the tube the tripping link h^2 , for tripping the starting lever of the propelling mechanism of the torpedo, is elevated into a recess formed in a plate h^3 which surrounds an opening formed in the torpedo tube, and after the torpedo has reached its rearmost position, the link is allowed to drop down into engagement with the torpedo in front of the tripping lever, with which the latter will engage when the torpedo is ejected. The operation just described is then repeated in loading the remaining tube, after which the tubes are swung around to a position parallel with the longitudinal axis of the vessel, when they and the torpedoes will be completely within the housing, in which position the safety catches or nose portions s of the levers Q will be brought into engagement with the segmental locking bar S' and the levers thereby prevented from being operated, so long as the tubes are within the housing. The doors of the housing are then closed to completely incase and protect both the tubes and the torpedoes.

When it is desired to discharge one or both of the torpedoes the tank is charged with air, the doors of the housing are first lowered, and the tubes then swung around to either side of the vessel from which the torpedoes are to be discharged. The initial movement of the tubes will cause one of the nose portions of the levers to ride up on its block R' and the other lever to be disengaged from its block, thereby freeing only one of the levers; and as the tubes are further revolved, the nose portions s of the levers will be disengaged from the segmental bar S' , leaving the lever that has been disengaged from the block R' free to be operated the moment the command is given, but the other lever will push its block around in

the guideway and hold it locked until the block has been knocked from position. When the tubes have been moved to the position for discharging, (which is indicated to those below the deck of the vessel by an indicator hand g^3 carried by the lower end of the shaft G and which operates around an indicator dial r projecting from the ring R^2 .) the lever of the rear or after tube is pulled down, which opens its valve and allows the air to escape into the rear end of the tube and push the piston outwardly causing the shoes to engage the lugs t and t' of the torpedo and forcibly eject the torpedo. During the first movement of the torpedo, the tripping lever controlling the propelling mechanism, will be set, and the string holding the propeller at the nose of the torpedo will be broken, and upon further movement the sides of the torpedo will strike against the supporting rods for the lower arm and knock them from position, which will permit the said arm to drop down out of the way and avoid any possibility of its fouling the torpedo. Thus, it will be seen, that the said arm is held in a true horizontal position until the lower guide shoe has traveled to a position to support the arm without its binding in the slot of the arm, thereby permitting it to slide freely in the said slot. In order that the lower arm may drop down as described, the lower rods are made in sections and connected together as shown at x Fig. 10, which permits the rods to break and their outer ends drop down with the said arms.

By reference to Fig. 6 it will be seen that the segmental bar S' is of such length that it will be necessary to revolve the tubes through an arc of 30 degrees to either side of the longitudinal central line of their normal or inactive position, which thus leaves 60 degrees ahead and astern where it will be impossible to discharge the torpedoes, and an arc of 120 degrees on either broadside of the vessel through which the torpedoes may be discharged, thus avoiding all danger of the accidental discharge of the torpedoes when the tubes are in such position that the torpedoes would be liable to come into contact with the deck connections of the vessel.

Should it be desired to slowly remove the torpedoes from the tubes, without fear of the danger incidental to the use of air, I provide means whereby they may be withdrawn from the tubes by hydraulic pressure, and to this end I connect a hose to the nipple h^5 and then force enough water into the tubes until sufficient pressure has been brought to bear upon the pistons to force them forwardly and gradually push the torpedoes from the tubes. The tubes H are provided with drain cocks h^{10} by which the water thus forced into the tubes may be withdrawn.

X designates a bracket secured to the un-

derside of the top of the housing U, and having a stud bolt X', Fig. 9, swiveled therein, and arranged in vertical alinement with the center of the turn-table E and connected to a bracket carried by the casting F at the top thereof. This arrangement provides a steadying support for the tubes and prevents all the strain being imposed upon the turn table when the tubes are revolved.

From the foregoing it will be seen that I provide an exceedingly simple apparatus that is equally adaptable for use upon surface or submarine torpedo boats, and when installed upon the latter the housing U will protect that portion of the mechanism arranged above the deck from the strain imposed thereon by the movement of the vessel through the water, and by the currents, which would be apt to injure the gearing or other parts of the mechanism.

What I claim is:—

1. A torpedo discharging apparatus, comprising a torpedo tube, a piston operating in said tube, means carried by said piston to engage the body of a torpedo held in the tube, and means to supply fluid pressure back of said piston solely and confine such pressure within the tube back of the piston for the full length of the stroke of said piston in ejecting the torpedo.

2. A torpedo discharging apparatus, comprising a torpedo tube, a piston arranged in said tube, means carried by said piston to engage the body of a torpedo placed in the tube, means to guide the said torpedo body engaging means, and means to supply pressure back of the piston only, such pressure being confined within the torpedo tube back of the piston for the full length of the stroke of the piston in ejecting the torpedo from the tube.

3. A torpedo discharging apparatus, for use on deck, comprising a torpedo tube, a piston operating in said tube and adapted to engage the fins of a torpedo, means carried by said piston for engaging the body of a torpedo to aid in ejecting it from said tube, guides for the said means, and means for admitting a fluid under pressure into the tube back of the said piston and confining it therein during the full stroke of the piston to move said piston and its attached torpedo-engaging means to discharge the torpedo from the tube into the water.

4. A revoluble torpedo discharging apparatus, for use on deck, comprising a torpedo tube, a piston operating therein and adapted to engage the fins of a torpedo, means carried by said piston for positively engaging the body of a torpedo to aid in introducing it into and ejecting it from the tube, means for admitting a fluid under pressure into the tube back of the said piston to force the torpedo from the tube, and means for actuating the tube arranged below the deck.

5. A revoluble torpedo discharging apparatus, comprising a torpedo tube, a piston operating therein, means carried by said piston to engage a torpedo in said tube, means for admitting a fluid under pressure into the tube back of said piston to eject the torpedo, a cushioning means for limiting the forward movement of the said piston, and means for revolving the said tube.

6. A revoluble torpedo discharging apparatus, comprising a torpedo tube, a piston operating therein, means carried by said piston to engage a torpedo in said tube, means for admitting a fluid under pressure into the said tube back of the piston to force the torpedo from the tube, a dash pot at the forward end of the torpedo tube adapted for engagement by the piston, and means for revolving the tube.

7. A revoluble torpedo discharging apparatus, comprising a torpedo tube, a piston operating therein, rods extending from said piston, means at the outer ends of the rods adapted to engage a torpedo held in said tube, guiding and supporting arms for the said means, means for admitting a fluid under pressure into the said tube back of said piston to force the torpedo from the tube, and means for revolving the tube.

8. A revoluble torpedo discharging apparatus, comprising a torpedo tube, a casting arranged at the forward end of the tube and having a packing ring adapted to snugly fit the body of a torpedo held in the tube, a piston operating in said tube, rods carried by said piston which operate through stuffing boxes in the casting, guiding and supporting shoes carried by said rods, supporting and guiding arms having guide slots in which the said shoes operate, means for admitting a fluid into the said tube back of the piston to eject the torpedo, and means for revolving the tube.

9. A revoluble torpedo discharging apparatus, comprising a torpedo tube, a casting arranged at the forward end of the tube and having a packing ring adapted to snugly fit the body of a torpedo held in the tube, a piston operating in said tube, rods carried by said piston which operate through stuffing boxes in the casting, guiding and supporting shoes carried by said rods and provided with slots adapted to fit over flanged lugs carried by the torpedo, guiding and supporting arms for the said shoes, means for admitting a fluid under pressure into the said tube back of the said piston to eject the torpedo, and means for revolving the tube.

10. A revoluble torpedo discharging apparatus, comprising a torpedo tube, a piston operating therein, means carried by said piston adapted to engage a torpedo held in the tube, means for conducting a fluid under pressure to the tube back of the said piston to eject the torpedo, means for controlling

the admission of the fluid to the tube, means to prevent the operation of the said controlling means when the tube is in an inactive position, and means for revolving the tube.

11. A revoluble torpedo discharging apparatus, comprising a torpedo tube, a piston operating therein and having a peripheral flange rim, a ring carried by the piston and having slots adapted to receive the fins of the tail of a torpedo when in position in the tube, a casting arranged at the forward end of the said tube and provided with recesses adapted to receive the rim of the said piston when the latter is moved to its extreme forward position, an inwardly extending flange at the forward end of the said casting and having a packing ring adapted to snugly fit the body of the torpedo, rods carried by the said piston which operate in stuffing boxes on the said inwardly extending flange of the said casting, guiding and supporting shoes carried by the said rods and adapted to engage lugs carried by the torpedo when the piston is moved forwardly in the tube, means for conducting a fluid under pressure to the tube back of the piston to force it forwardly in the tube, means for controlling the admission of the fluid to the tube, and means for revolving the tube.

12. A revoluble torpedo discharging apparatus, comprising a support, a turntable mounted thereon, a casting mounted upon the turntable, a torpedo tube carried by the casting, a piston operating in said tube, rods projecting from the piston and having shoes at their forward ends adapted to engage lugs carried by a torpedo, a guiding and supporting arm for one of the said shoes, a guiding arm for the other shoe, means for conducting a fluid under pressure to the rear end of the tube back of the piston, a valve for controlling the admission of the fluid to the tube, means for operating the valve, means for preventing the operation of the valve when the said tube is in an inactive position, and means for revolving the said turntable.

13. A revoluble torpedo discharging apparatus, comprising a support, a turntable mounted thereon, a casting carried by said turntable, a torpedo tube held by the casting, a piston operating in said tube, a guiding and supporting arm extending from the upper forward edge of the said casting and having a guiding slot in its lower surface, a guiding arm pivotally held at its rear end to the lower forward edge of the said casting and having a guide slot in its upper surface, rods carried by the said piston, shoes secured to the ends of the rods and adapted to operate in the slots of the said arms and provided with slots adapted to fit over flanged lugs carried by a torpedo held in the said tube, means for applying pres-

sure back of the piston to eject the torpedo, means for supporting the outer end of the pivoted arm and adapted to be engaged by the torpedo to permit the said arm to drop as and for the purpose specified, and means for revolving the said turntable.

14. A revoluble torpedo discharging apparatus, comprising a support, a turntable mounted thereon, a casting connected to the turntable, a torpedo tube carried by the said casting, a hollow shaft connected to the casting, a conduit communicating at one end with said hollow shaft and at its opposite end with the said torpedo tube, a piston operating in the said tube, means carried by said piston for engagement with a torpedo held in said tube, means for supporting and guiding the said engaging means, means for conducting a fluid under pressure to the said hollow shaft from which it passes through the said conduit to the rear end of the said tube, a valve for controlling the admission of the fluid to the tube, a lever operatively connected to the valve, means for locking the lever when the said tube is in an inactive position, and means for revolving the turntable and thereby disengaging the locking means of the said lever when the said tube has been adjusted to an active position.

15. A revoluble torpedo discharging apparatus, comprising parallel torpedo tubes, a revoluble support for the said tubes, a piston operating in each tube, rods carried by said pistons, a shoe carried by each of the said rods and adapted to engage a torpedo held in each of the tubes, guiding and supporting arms for the shoes, means for conducting a fluid under pressure to the rear ends of the said tubes back of the said pistons, valves for controlling the admission of the fluid to the tubes, levers operatively connected to the said valves, means to prevent the operation of the levers when the said tubes are in an inactive position, and means engaging one of the said levers when the said tubes have been adjusted to an active position, thereby permitting the discharge of the torpedoes in sequence only.

16. A revoluble torpedo discharging apparatus, comprising a support, a turntable mounted thereon, a casting having a base portion connected to said turntable, torpedo tubes carried by said casting, castings connected to the first mentioned casting and arranged at the ends of the torpedo tubes, packing rings carried by said second mentioned castings which are designed to engage the sides of torpedoes held in their adjacent tubes, pistons operating in said tubes, rods carried by the pistons, a shoe connected to the end of each rod and adapted to engage the torpedo in its tube, a hollow shaft connected to the base of the said first mentioned casting and surrounding an opening therein, a conduit communicating

at one end with said shaft, a cap connected to the opposite end of the conduit and having branch pipes connected with the ends of the said tubes, means for conducting a fluid
 5 under pressure to said hollow shaft, valves for controlling the admission of the fluid to the branch pipes of the said cap, levers operatively connected to said valves, means for preventing the operation of the said levers
 10 when the said tubes are in an inactive position; and means engaging one of the levers when the said tubes have been adjusted to an active position to permit of the operation of the said levers to discharge the torpedoes
 15 in sequence only as specified.

17. A revoluble torpedo discharging apparatus, comprising parallel torpedo tubes, a piston operating in each tube, rods carried by each piston, shoes carried by said rods
 20 and adapted to engage a torpedo in its tube, guiding and supporting arms for the shoes, means for conducting a fluid under pressure to the said tubes back of the said pistons, valves controlling the admission of the fluid
 25 to the tubes, levers operatively connected to said valves, extensions formed upon the levers, a slide bar having wedge shaped blocks which are engaged by the said extensions, a support for the said slide bar, nose
 30 portions formed on the extensions of the levers, a segmental bar adapted for engagement by the said nose portions when the tubes are in an inactive position, and means for revolving the said tubes to release the
 35 said levers as specified.

18. A revoluble torpedo discharging apparatus, comprising a compressed air receiving tank, a turntable mounted thereon, a casting having a base connected to the said
 40 turntable, a hollow shaft depending from the base of the said casting and surrounding an opening therein and which extends through the heads of the said tank, bearings for the shaft secured to the heads of said tank,
 45 torpedo tubes connected to the said casting, a piston operating in each tube, means carried by each piston to engage a torpedo in its tube, guides for the said means, a conduit communicating at one end with the said
 50 hollow shaft and having a cap at its opposite end, branch pipes extending from said cap and connected to the ends of the said torpedo tubes, means for conducting air under pressure to said tank from which it
 55 passes into the said hollow shaft through a

series of perforations formed therein, valves for controlling the admission of the air to the said torpedo tubes, levers operatively connected to said valves, means to prevent the operation of the levers when the torpedo
 60 tubes are in an inactive position, and means for revolving the said turntable to adjust the torpedo tubes to an active position, which movement also releases the locking means of the levers as specified. 65

19. A revoluble torpedo discharging apparatus for torpedo boats, comprising parallel torpedo tubes, pistons operating in said tubes, means carried by each piston adapted to engage a torpedo held in its tube, means
 70 for conducting a fluid under pressure to the said tubes, means for controlling the admission of the fluid to the said tubes, a housing adapted to inclose the tubes and having openings in the sides thereof, doors for the
 75 openings, means for opening and closing the doors, and means for revolving the said tubes so that their ends will project through the said openings.

20. A revoluble torpedo discharging apparatus for torpedo boats, comprising parallel torpedo tubes, pistons operating in said tubes, means carried by each piston adapted for engagement with a torpedo held in its tube, means for conducting a fluid under
 80 pressure to the rear ends of the said tubes, means for controlling the admission of the fluid to the tubes, a housing adapted to inclose the tubes when said tubes are in an inactive position, door openings in the sides
 90 of the housing, doors for the openings, a segmental rack bar connected to the pintle of the hinge of each door, a shaft having worm wheels which mesh with the said rack bars, a beveled gear carried by the shaft, a
 95 shaft having a beveled gear which meshes with the first mentioned beveled gear, means for operating the last mentioned shaft, and means for revolving the said torpedo tubes to project their ends through the openings
 100 in the sides of the housing when the said doors have been opened.

In testimony whereof I have hereunto set my hand this 14th day of December A. D. 1908.

SIMON LAKE.

Witnesses:

MERCER D. BLONDEL,
 FRED B. WHITNEY.