

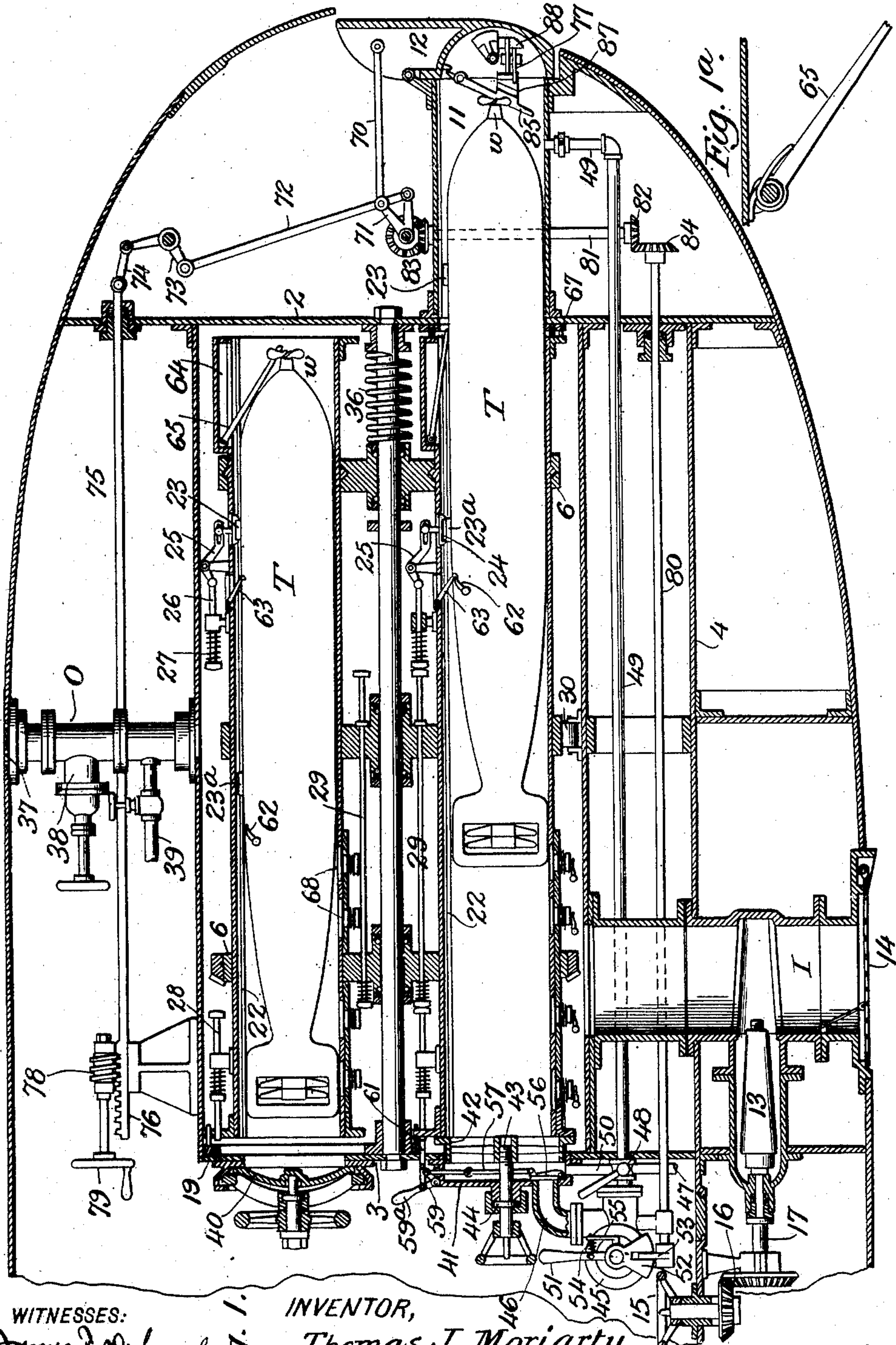
No. 868,613.

PATENTED OCT. 15, 1907.

T. J. MORIARTY.
MEANS FOR CARRYING AND HANDLING TORPEDOES ON VESSELS.

APPLICATION FILED MAY 6, 1906.

4 SHEETS—SHEET 1.



WITNESSES:
James L. O'Connell
Henry G. Rose

INVENTOR,
Thomas J. Moriarty,
BY HIS ATTORNEY

Henry G. Rose

No. 868,613.

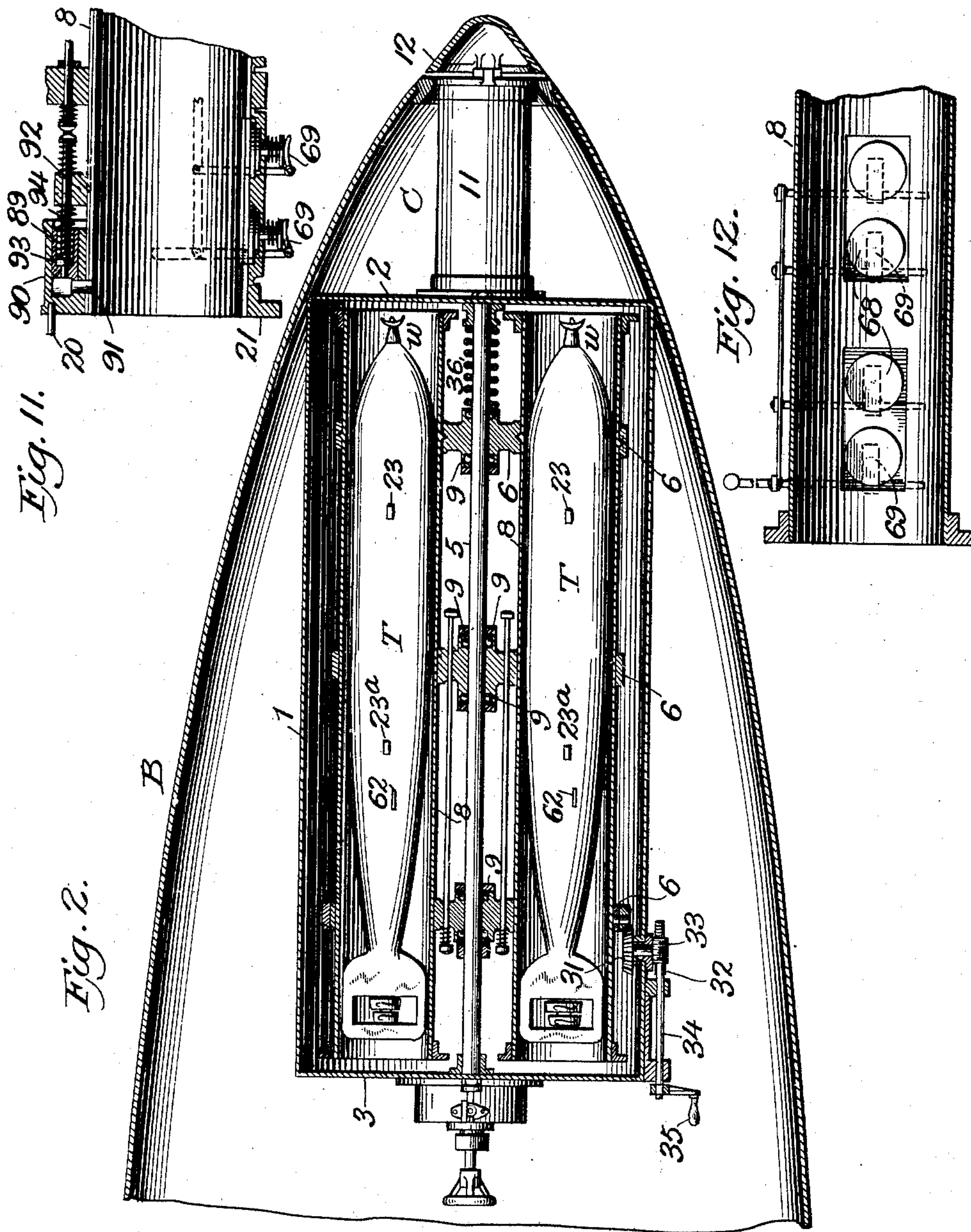
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4 SHEETS—SHEET 2.



Witnesses
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Henry G. Rose

Inventor
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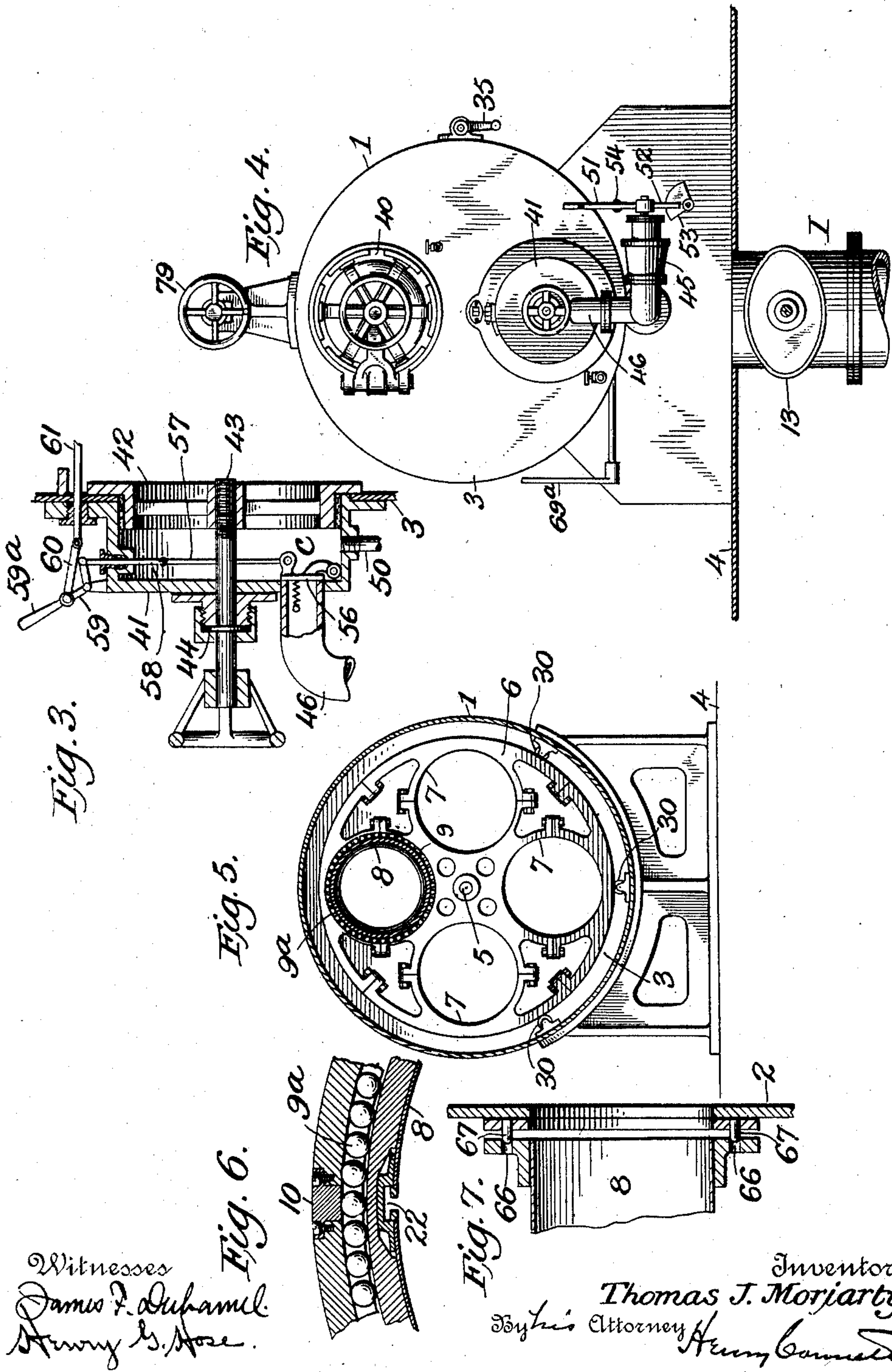
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MEANS FOR CARRYING AND HANDLING TORPEDOES ON VESSELS.

APPLICATION FILED MAY 5, 1905.

4 SHEETS—SHEET 3.



Witnesses
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No. 868,613.

PATENTED OCT. 15, 1907.

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APPLICATION FILED MAY 5, 1905.

4 SHEETS—SHEET 4.

Fig. 8.

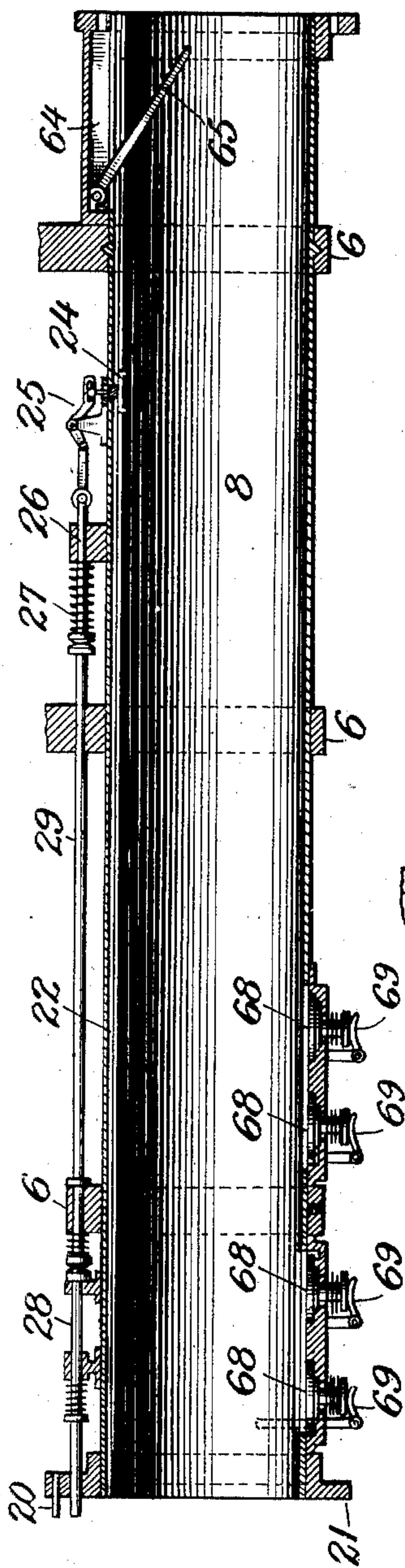


Fig. 9.

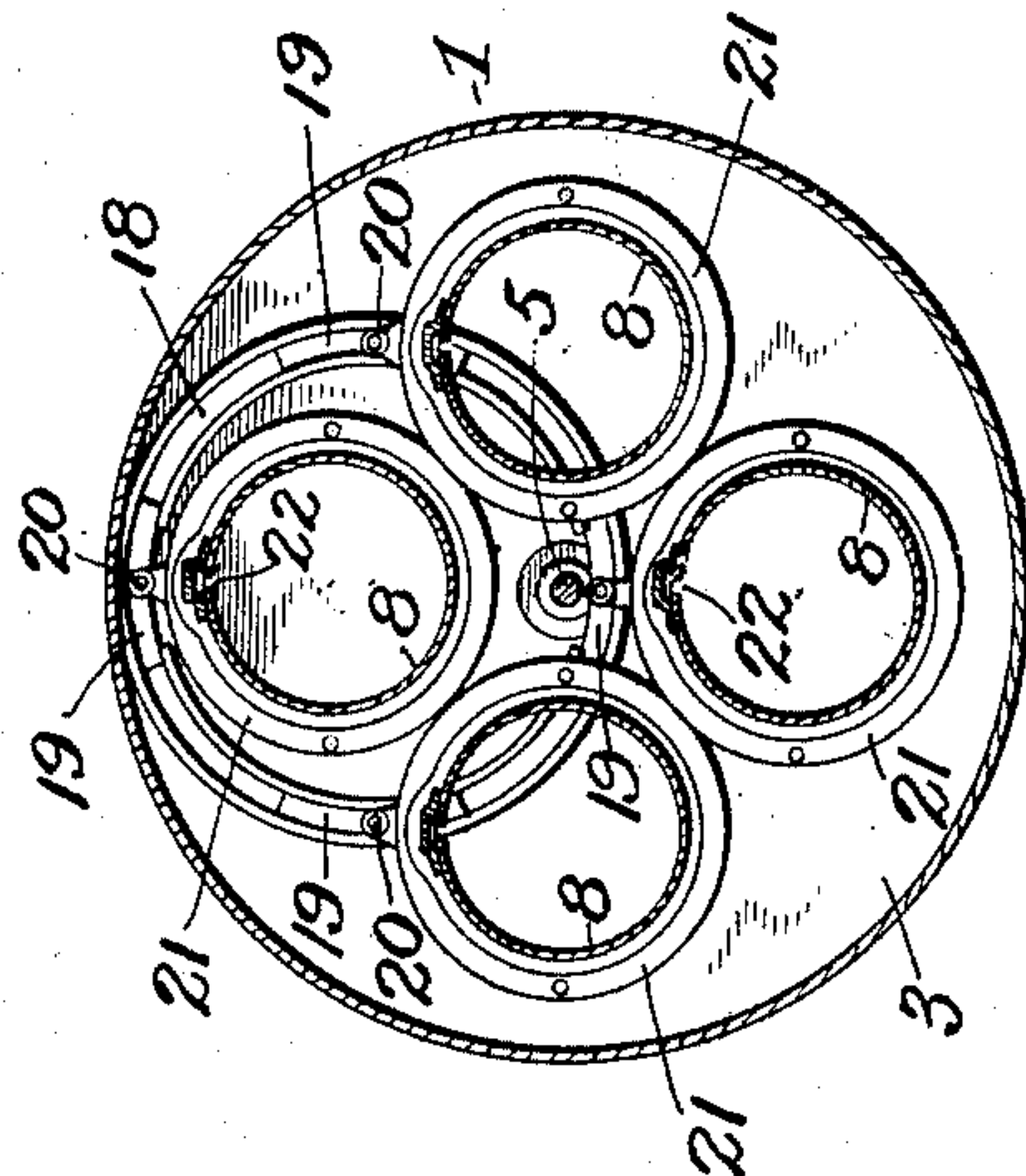


Fig. 13.

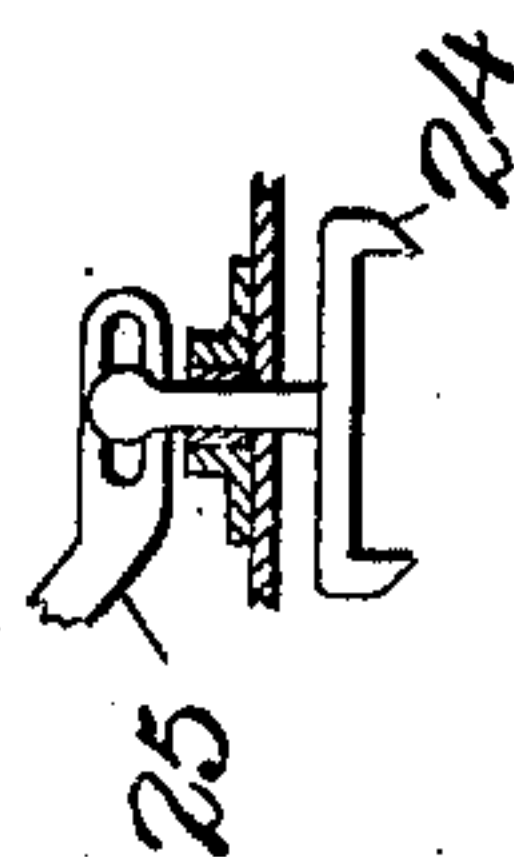
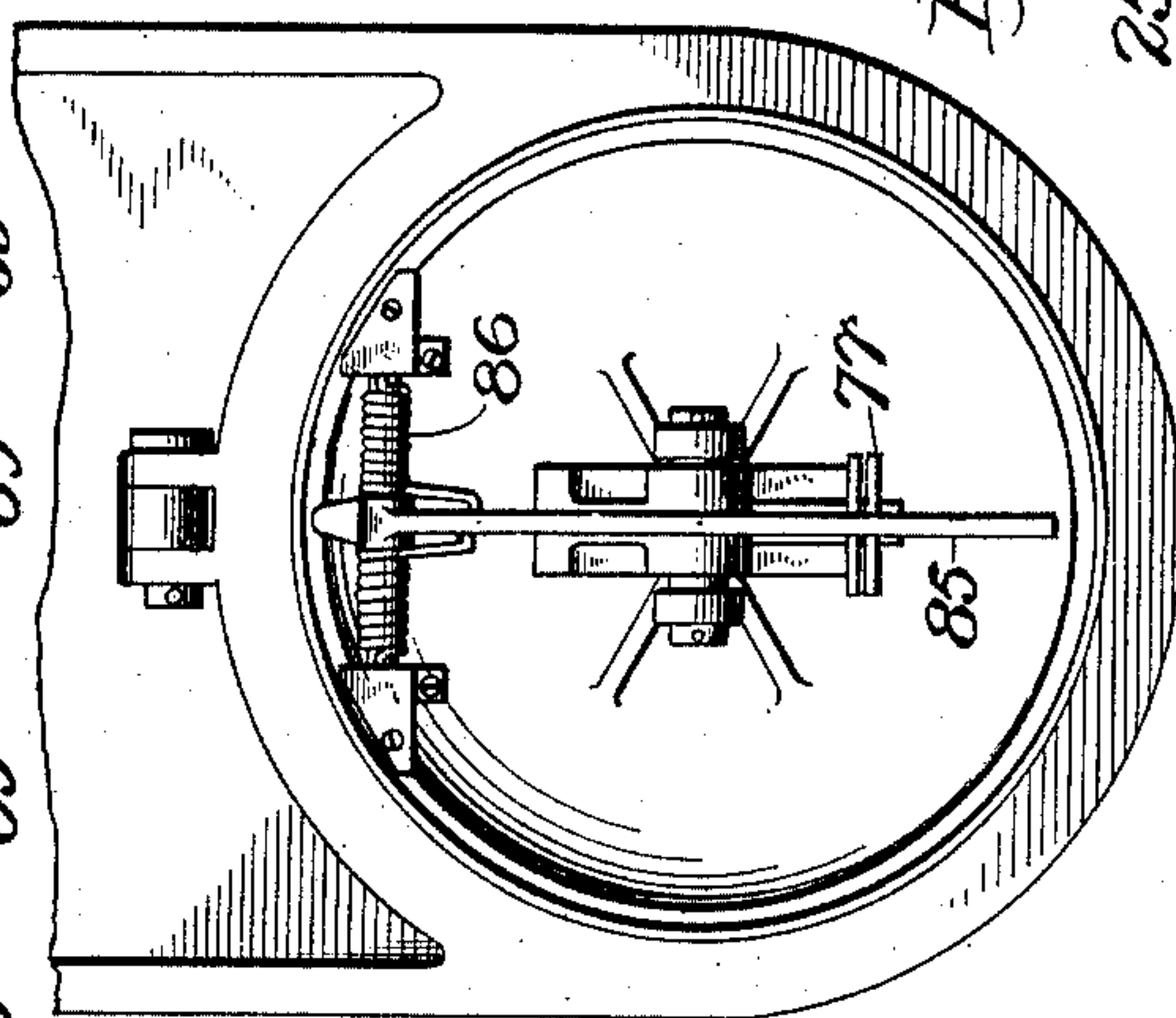


Fig. 10.



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UNITED STATES PATENT OFFICE.

THOMAS JOSEPH MORIARTY, OF NEWPORT, RHODE ISLAND.

MEANS FOR CARRYING AND HANDLING TORPEDOES ON VESSELS.

No. 868,613.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed May 5, 1905. Serial No. 259,057.

To all whom it may concern:

Be it known that I, THOMAS JOSEPH MORIARTY, a citizen of the United States, residing at Newport, in the county of Newport and State of Rhode Island, have
5 invented certain new and useful Improvements in Means for Carrying and Handling Torpedoes on Vessels, of which the following is a specification.

This invention relates to such vessels or boats, and particularly submarine boats, as are adapted for carry-
10 ing and expelling torpedoes; and more particularly to such a boat having a torpedo-magazine which is open to the water of flotation, normally, the torpedoes therein being submerged or afloat. The purpose of this feature is to obviate a difficulty which arises in the navi-
15 gation and use of submarine boats, that the addition or expenditure of torpedoes disturbs the buoyancy, center of gravity and total weight of the boat, and must, therefore be carefully compensated.

The present invention employs a magazine open nor-
20 mally to the water of flotation, but the torpedoes are mounted in a rotary carrier and are adapted to be brought one by one into alinement with the expulsion tube, or the fixed portion of the said tube.

The invention will be hereinafter minutely described
25 with reference to the accompanying drawings, and the novel features thereof carefully defined in the claims.

In the said drawings, which illustrate an embodiment of the invention—Figure 1 is a vertical, axial longitudinal section through the forward part of a submarine
30 boat, and through a magazine therein embodying the present invention; and Fig. 1^a is an enlarged detail view of a controller such as that illustrated in Fig. 1. Fig. 2 is a horizontal section of the forward part of the boat on a slightly smaller scale than Fig. 1, taken along
35 the axis of the magazine. Fig. 3 is a sectional detail view of the chamber and adjacent parts connected with the firing valve. Fig. 4 is an elevation, on the same scale as Fig. 2 of the inboard end of the magazine. Fig. 5 is a cross-section of the magazine, and of one of
40 the tubes of the carrier, showing the ball-bearing. Fig. 6 is an enlarged sectional detail of the ball-bearing for the tube. Fig. 7 is a sectional detail view of the forward end of a torpedo-tube and the bulkhead, showing the alining means. Fig. 8 is a longitudinal section on
45 a larger scale than the principal views, of one of the torpedo-tubes. Fig. 9 is a transverse section of the magazine showing the inner face of the inboard head thereof and parts mounted thereon. Fig. 10 is an enlarged detail view of the inner face of the outer cap of
50 the expulsion tube, showing the war-head controller mounted thereon. Fig. 11 is a modification of the torpedo-locking device seen in Fig. 8. Fig. 12 is a sectional view of the torpedo-tube showing the mechanism for operating the relief valves. Fig. 13 is a detail
55 view of the locking device of the torpedo.

The submarine boat is designated, as a whole, by B. The magazine consists of a fixed sheet-metal casing 1, preferably of cylindrical form, situated as herein shown at the forward end of the boat and extending fore and aft, its forward end being closed by a bulkhead 2, and
60 its inboard end by a head 3. The casing is supported on a deck or floor 4 in the boat. Extending through the axis of the chamber in the casing 1 is an arbor 5, fixed at its respective ends in the heads which close the ends of the casing; and about this arbor rotate carrying
65 rings 6 (see Fig. 5) provided with apertures 7 to receive torpedo-tubes 8. Four tubes are shown in the drawings, and three rings. These latter form a carriage for the tubes, and are shown in Figs. 1 and 2 as provided with ball-bearings 9 on the arbor 5. The tubes 8 are
70 also each mounted in ball-bearings 9^a in the rings 6, as seen in Figs. 5 and 6. In Fig. 6 is seen a block 10, which closes an opening where the balls are admitted one-by-one to the race, said block being secured in place by screws or other suitable means. 75

In Figs. 1 and 2, T designates the spare torpedoes in the tubes, the lower one being alined with the expulsion tube 11, which is mounted in a stationary manner in the boat and secured at its inboard end firmly and tightly to the bulkhead 2, and closed by the hinged
80 outboard cap 12. The water of flotation has access to the chamber C in the boat forward of the bulkhead 2, and has access also, under normal conditions, to the chamber in the casing 1, through an inlet I, controlled by a gate-valve 13, and covered by a hinged grid 14. 85 The gate-valve may be operated through the medium of a hand-wheel 15, bevel gears 16, and a screw-stem 17, which passes through and rotates in the valve. Obviously, when the rings or carriers 6 rotate they carry
90 the tubes 8 about with them, the object being to bring each tube 8, in succession, into alinement with the fixed expulsion tube 11, so that said tube 8 will form an inboard extension, for the time being, of the tube 11. As herein shown, the construction is such that it
95 is the lowermost tube in the magazine which comes into alinement with the tube 11. Means are provided whereby, when the set of magazine tubes 8 are carried around the arbor 5, each tube will rotate in its carriers 6 in such a manner that the same side of the tube shall
100 always be uppermost, and this means will now be described with especial reference to Fig. 5.

On the inner face of the head 3 is secured a grooved guide-ring 18, set eccentrically to the arbor 5, with its center directly above said arbor. In the groove in this guide-ring are slidably mounted segments 19, one
105 for each tube 8, and to these segments are pivotally secured at 20, the respective flanged end-rings 21, on the tubes. It will be seen that the ring 18 is of such diameter that the distance, measured diametrically, between two pivot-points 20, is the same as the distance,
110

measured diametrically, between the centers of two of the tubes 8. The ends of the tubes 8 do not, normally, touch the plates which close the ends of the magazine. Along the top of the tube 8 is formed a T-shaped channel or way 22, and this channel forms a guide for two lugs 23 and 23^a (Figs. 1 and 2) on the back of the torpedo.

To hold the torpedo against endwise movement when in the position of "spare" torpedoes, and also when advanced into the expulsion tube (Fig. 1) there is a locking latch-piece 24, (Fig. 13) which when the torpedo is "spare" (or back wholly within the tube 8), engages or embraces the forward lug 23 on the torpedo; and when the torpedo is advanced into the expulsion tube, as seen below in Fig. 1, said latch-piece engages the rear lug 23^a. The locking-latch is coupled by its stem, through the medium of a slot, to one arm of a lever 25, the other arm of which is coupled, through a link, to a slide-rod 26, on the tube, provided with a spring 27 adapted through the parts described, to hold the latch 24 in its locking position. In order to actuate the locking latch 24 to release the torpedo at the proper time, there is a slidable operating rod 28, mounted in suitable bearings and disposed near the inboard end of the tube 8, and an intermediate rod 29, slidable in the carrier, the three rods 26, 28 and 29 being axially aligned at the proper time, so that motion to the rod 26 may be communicated through the rod 29.

The middle carrying ring 6 is supported and moves over anti-friction rollers 30 secured to the inner wall of the cylindrical magazine. These are best seen in Figs. 1 and 5. To rotate the carriers and tubes, the inboard carrying ring 6 (seen at the left in Figs. 1 and 2) is provided with teeth like a bevel wheel, and these teeth gear with the teeth of a bevel pinion 31, the shaft of which passes out of the magazine through a stuffing-box and carries a worm-wheel 32, gearing with a screw 33, on a rotatively mounted shaft 34, provided with a suitable crank 35. By means of this device the series of tubes 8 may be brought one-by-one into alinement with the tube 11. The two rings of the carriage that are farthest inboard, are collared on the arbor 5 and the tubes 8 are slidable in them, but the ring 6 at the outboard end of the carriage has only a stop-collar at its inboard side and is pressed up to this collar by a spring 36. The tubes are not slidable in this ring. The spring 36 embraces the arbor 5 and is embraced endwise between said ring or carrier and the bulkhead 2. The purpose of this construction will be herein after explained.

As before explained the magazine is connected normally with the water of flotation through the inlet I, and the water also fills the tubes 8 about the torpedoes therein; but there is also an upper outlet O, from the top of the magazine through the shell of the boat at 37, where the aperture is covered by a grid or the like to keep out floating matter. This with the two connections I and O, with the sea, it will be obvious that the weight of the torpedoes need not be considered in operating the boat, as the expulsion of a torpedo will not in any way affect the buoyancy or center of gravity of the boat.

In the outlet O is a controlling valve 38, to close it when it is desired to blow the water out of the magazine. This latter may be effected by admitting com-

pressed air to the magazine through a valve-controlled pipe 39. The air will be supplied from a tank, not herein shown; but such air-tanks are common in this class of boats. It may be stated that when it is desired to blow the water from the magazine the valve 38 is closed, the compressed air admitted through the pipe 39, and the water blown out through I. The gate-valve 13 may then be closed. This permits of access to the magazine from the boat for any purpose desired.

In the inboard head 3 of the magazine and opposite the inboard end of the uppermost tube 8, is a manhole closed by a hinged cover 40, in the usual way. This cover is seen in Figs. 1 and 4, and the manhole affords access to the magazine when the water shall have been blown out therefrom as explained. There is also an opening in the head 3 opposite to the lower tube 8 which is aligned with the expulsion tube. This opening is closed by a cover 41 (Figs. 3 and 4), and has slidably mounted in it a flanged and packed ring 42, the flange of which is adjacent and opposite to the inboard end of the aligned tube 8. A screw 43, having a hand-wheel or crank on its outer end, is mounted rotatively in the cover 41, and screws through the boss of the ring 42, whereby through the medium of this screw, the ring may be driven inward against the end of the aligned tube 8 and the latter be pushed forward until its outboard end bears tightly against the forward bulkhead 2. Said screw is provided with a collar 44, by means of which the screw is held against longitudinal movement in the cover 41, but is permitted to rotate freely therein.

It may be explained here that this movement of the tube is only effected when the aligned torpedo is to be driven forward into the expulsion tube, and in order to assure the accurate alinement of the tubes, a device seen in detail in Fig. 7 is employed. On the outboard end of each tube 8 is a flanged ring having in it sockets or holes 66, to receive pins 67, having rounded ends, said pins being mounted in the bulkhead 2, about the opening therein leading to the expulsion tube. When the tube is being pushed forward—as seen in Fig. 7,—these pins 67 engage the sockets 66 and bring the tube into accurate alinement and hold it against movement. This endwise movement of the tube will be very slight and will not suffice to disturb the operation of the working parts in any way.

The torpedo is moved forward, and is expelled by compressed air; and a device 45, commonly called the firing valve, controls the admission of compressed air (for expelling the torpedo) through a pipe 46, which taps the cover 41. The air is supplied to the firing valve from any suitable air reservoir or holder, not shown, through a pipe 47, a three-way cock 48 controlling its flow to said valve. This three-way cock determines the flow of the compressed air to the valve 45, or to the forward end of the expulsion tube by a pipe 49, or to the chamber (c in Fig. 3) under the cover 41, by a pipe 50. The object of this distribution of the air will be explained later herein.

The firing-valve and three-way cock may both be of known constructions, and detailed illustration and description thereof will not be necessary herein; but it may be explained that the firing valve is operated by a lever 51, which has a depending slotted segment 52, and is locked through the medium of a segmental plate 53 disposed at right-angles to the segment 52 and play-

ing in the slot therein. A spring 54 connects the lever 51 with an upright arm 55, and returns the lever to its normal position after the firing valve shall have been actuated. The firing valve cannot be operated until the outer cap 12 is opened, and the means for bringing this about as well as for opening the cap will be hereinafter described.

When the valve 45 is opened and the air rushes through the pipe 46 to the chamber *c*, it forces open a hinged check-valve 56, seen best in Figs. 1 and 3. This valve has a lug on it near its free end which is coupled by a link 57, with a rod 58, that plays through a stuffing-box and is coupled at its outer end to one arm of a bell-crank lever 59. The other arm of this lever is coupled by a link 60, with a slide-rod 61, which plays through a stuffing-box and passes into the magazine. This rod 61 will be found at this time, in alinement with the rod 28, and when the valve 56 swings inward and opens, the effect is to cause the rods 26, 28 and 29 to rock the lever 25 and disengage the latch-piece 24 from the lug on the torpedo, and permit the latter to move forward. It should be borne in mind that the rods 29, which are intermediate, rotate with the carrying rings 6; the rods 28 turn with the tubes 8, and the rod 61 is mounted in a stationary part. Hence they will only be in alinement under certain conditions and when the tubes are in certain positions.

The torpedo is provided with the usual starting lever 62, which puts in motion the engine of the torpedo, and this lever 62 is tripped or actuated by a hook-lever 63 when the torpedo is expelled. This lever 63 is disposed in the tube 8, in the path of the lever 62.

In the upper side of each tube 8, at its forward end, is a recess 64, into which may fold out of the way a spring controller 65; but a spring about the pivotal axis of this controller presses the latter inward and across the interior of the tube in such a manner as to cause its free end to engage or take between the blades of the propeller of the war-nose *w* of the torpedo and hold said propeller against rotation while the torpedo is back and wholly within the tube 8. There is a liability of the said propeller to be rotated when the carriers are being turned to bring a torpedo into alinement with the expulsion tube, and this controller prevents it. When the torpedo is moved forward into the expulsion tube this controller is folded or pressed upward by the body of the torpedo. There is another controller forward at the cap of the expulsion tube, and this controller will be hereinafter described and its functions fully explained.

In each of the tubes 8, near its inboard end and at its lower side, are relief valves 68; four of these are shown, but a greater or lesser number may be employed. The purpose of these valves is to allow water to flow into the tube instantly behind the torpedo and thus compensate promptly for the weight of the torpedo expended. It will be noted that when a torpedo has been advanced to a certain predetermined extent and the air-pressure behind it is reduced, an inrush of water may result, and this will tend to retard its movement and perhaps disturb the accuracy of its aim. The opening of the valves 68 will have the effect to counteract the inrush of the water. These valves are operated from outside the magazine by means of one or more arms 69, adapted to take under

the respective valves, and secured to shafts which extend into the magazine through stuffing-boxes. The shafts are provided at their outer ends with an operating handle 69^a. This handle is seen in Figs. 4 and 12.

The drawings illustrate a submarine boat of comparatively small beam and in consequence of this construction a short expulsion tube is employed to connect the bulkhead 2 with the stem where the outboard cap is situated; and it is with the view of effecting a perfect alinement of the lower torpedo tube 8 with this tube 11, that the device is employed provided with the alining studs and sockets, as already described. It is also to perfect this alinement that the construction shown in Fig. 9 is employed.

The outer cap 12 is operated through the medium of a rod 70, coupled at one end to the cap above its hinge, and at the other to one arm of a bell-crank 71. A rod 72 couples the other arm of said bell-crank to an arm of another bell-crank 73, and the other arm of this last-named bell-crank is coupled by a link 74 to an operating rod 75, which plays slidably through a stuffing-box in the bulkhead 2, and extends back to the inboard end of the magazine, where a rack 76 on the operating rod, gears with a screw 78, rotatably mounted and provided with a crank 79. By means of this crank the cap 12 may be opened and closed.

In order that the firing valve 45 may be automatically unlocked, at the pivotal axis of the bell-crank 71 is a bevel wheel which, when said crank is rocked, acts to rock a shaft 80, through the medium of a shaft 81, and bevel-gears 82, 83 and 84. The rock-shaft 80 extends back to a point near the firing valve, and carries at this end the segment plate 53 which locks the firing valve. The opening of the cap 12 causes the plate 53 to be moved out of engagement with the slot in the segment 52 and permits the valve-lever 51 to be shifted.

The air-pipe 49, leading from the three-way cock 48 forward to the expulsion tube 11, has for its object to provide, in connection with the pipe 50, means for moving the torpedo forward or aft in the tube by means of compressed air.

The operation may be now explained. The carrier is charged with torpedoes through the upper manhole in the inboard head 3, the carrier being turned to bring the tubes 8 successively into alinement with said manhole. When a torpedo is inserted and pushed forward into the tube, the forward lug 23 will move up the latch-piece 24 and snap into engagement therewith. This notifies the operator that the torpedo is in position. When the circumstances call for it—as an impending engagement—the operator presses forward the alined tube 8, lifts the latch-piece 24 by means of a hand-lever 59^a on the bell-crank 59, and admits compressed air to the chamber *c* through the pipe 50. This moves the torpedo in the alined tube forward to the position seen in Fig. 1, when the latch 24 will snap over and engage the after lug 23^a on the torpedo and hold the latter in the position attained. The hook-lever 63 will now be in position to engage the starting lever 62 of the torpedo, and the propeller of the war-nose of the torpedo will be in engagement with the forward controller of the device, to be hereinafter described. To expel the torpedo, the outer cap 12 of the expulsion is first opened and the firing valve then opened to drive the torpedo out. In

case-it is desired to move the torpedo back into the alined tube 8 again and not expel it, this may be done by lifting the latch-piece 24, and admitting compressed air to the expulsion tube through the pipe 49.

- 5 The forward, spring controller, 85, is hinged to the outer cap 12. This particular construction of the controller is embodied in my pending application Ser. No. 251,251 filed March 21, 1905, but it may be briefly described here, with especial reference to Figs. 1 and 10.
- 10 The controller is advanced to the position of engagement seen in Fig. 1 by a spring 86 (Fig. 10) at its hinge-axis. There is a lug 87 on the back of the controller, and back of this lug is a pair of spring nippers 77 to grip said lug. A weight 88, pivoted in the cap has a wedge
- 15 at its lower part which, when the cap is closed, wedges open the nippers. When the cap is thrown open the weighted wedge is thrown back, and the spring nippers are in position to grasp the lug and hold the controller up when the latter is thrown up by the body of the expelled torpedo.

- 20 In Fig. 11 is illustrated a slightly modified construction of the means for disengaging the latch-piece 24 from the lug 23^a. In this construction of Fig. 11 the device is the same as that already described except that
- 25 the inboard end of the rod 28 enters a hollow in a piston 89, playing in a small cylinder 90, on the tube 8, said cylinder being connected with the tube by a port 91. The compressed air admitted to expel the torpedo, enters the cylinder through port 91 and drives the piston
- 30 89 forward, and the latter thus performs the same function as the rod 61. The rod 28 in Fig. 11 plays through a bearing bracket 92 on the tube 8 and has a head 93 on its end which engages the piston. Between the bracket and said head is a strong spring 94, which serves
- 35 to return the piston to the position seen in Fig. 11 after the air-pressure is relieved.

Having thus described my invention, I claim—

1. A vessel, having means for expelling a torpedo, a torpedo magazine open normally to the water of flotation, and a rotating carrier for torpedoes in said magazine, said carrier being so disposed with respect to the expelling means that the torpedoes in the carrier may be brought successively into alinement for expulsion.

2. A vessel, having means for expelling a torpedo, a torpedo magazine open normally to the water of flotation, a carrier having rotatable tubes to receive the torpedoes, means for maintaining the tubes in proper upright position when the carrier rotates, and means for rotating the carrier to bring the torpedoes successively into expelling position.

3. A vessel, having a fixed magazine, an expulsion tube connected therewith, a rotating carrier in said magazine provided with torpedo tubes adapted to be brought successively into alinement with said expulsion tube to form an inboard extension thereof, means for moving the alined torpedo tube endwise before the torpedo is advanced, and means for compelling the accurate alinement of said torpedo tube with the expulsion tube.

4. A vessel, having a fixed magazine open normally to the water of flotation, a fixed expulsion tube connected at its inboard end with said magazine, a rotating carrier in said magazine, a plurality of torpedo tubes mounted rotatably in said carrier and disposed symmetrically about its axis, said carrier being so disposed with respect to the expulsion tube that the tubes of the carrier may be brought successively into alinement therewith, an air-chamber alined with the expulsion tube, and means for introducing compressed air to said chamber for moving forward the torpedo therein.

5. A vessel, having a torpedo magazine open normally

to the water of flotation, an expulsion tube connecting said magazine with the water of flotation, a cap closing the outboard end of said tube, a rotating carrier in the magazine, a plurality of torpedo tubes in said carrier and disposed symmetrically about its axis, the said expulsion tube and carrier being relatively disposed in such a manner that the torpedo tubes are brought successively into alinement with the expulsion outlet by rotation of the carrier, means for preventing endwise movement of the torpedoes in their tubes, and means for releasing the torpedo when it is to be moved forward.

6. A vessel, having a torpedo magazine open normally to the water of flotation and having an outlet in its forward end for the expulsion of a torpedo, a rotatively mounted carrier in said magazine, means for rotating said carrier from the interior of the vessel, torpedo tubes mounted in said carrier and disposed symmetrically about the axis of the same, said carrier being so disposed with respect to the expulsion outlet that each torpedo tube may be brought in succession into alinement with said outlet, and automatic means for maintaining said tubes in upright position when the carrier is rotated.

7. A vessel, having a fixed torpedo magazine open normally to the water of flotation and having in its forward end an expulsion outlet, a relatively short expulsion tube connecting said outlet with the water of flotation, a rotating carrier in said magazine, a plurality of torpedo tubes mounted slidably and rotatively in said carrier and adapted to be brought in succession into alinement with the said expulsion outlet, means for moving the alined tube into close relation with the expulsion tube to form an inboard extension thereof, an air-chamber at the inboard end of the magazine and alined with the expulsion outlet, means for closing the space between said chamber and the inboard end of the alined torpedo tube, and means for admitting air to said chamber for moving the torpedo forward in the tube.

8. A vessel, having a torpedo magazine open normally to the water of flotation and provided with an expulsion outlet, a rotating carrier in said magazine, a plurality of torpedo tubes mounted rotatively in said carrier and disposed symmetrically about its axis, each of said tubes being provided with a guiding channel 22, and automatic means for maintaining said channel at the upper side of the tube during the rotation of the carrier.

9. A vessel, having a torpedo magazine open normally to the water of flotation and provided with an expulsion outlet, a rotating carrier mounted in said magazine, and a plurality of torpedo tubes rotatively mounted in said carrier and disposed symmetrically about the axis thereof, each of said tubes being provided with a controller 65 to engage the propeller on the war-nose of the torpedo.

10. A vessel, having a fixed torpedo magazine open normally to the water of flotation, and provided with an expulsion outlet, a rotating carrier in said magazine, a plurality of torpedo tubes mounted in said carrier and slidable endwise, a spring tending to press said tubes inboard, an air-chamber *c*, a slidable flanged ring 42 at said chamber and adapted to be moved into contact with an alined tube in said carrier, and the screw 43 for operating said ring.

11. The combination with the magazine and the rotating carrier therein, of the torpedo tubes rotatively mounted in said carrier, the fixed guide-ring 18, and the segments 19 in the groove of the guide-ring, said tubes being pivotally connected to the respective segments.

12. In a submarine torpedo boat, the combination with a torpedo launching tube opening outwards through the hull of the boat, of a rotary magazine drum provided with a plurality of torpedo chambers adapted to register with said launching tube, hand operated means for rotating said drum, and hand operated means for releasing said torpedoes from said chambers when desired, substantially as described.

13. In a submarine torpedo boat, the combination with a fixed torpedo launching tube opening outward through the hull of the boat, of a rotary magazine drum provided with a plurality of torpedo tubes or chambers adapted to register *seriatim* with said launching tube, worm gearing

for rotating said magazine drum, and a hand rod adjacent to each chamber provided with an arm for releasing the torpedo from said magazine chambers, substantially as described.

5 14. In a torpedo boat, the combination with a torpedo launching tube opening outward through the hull of the boat, of a rotary magazine drum provided with a plurality of torpedo tubes or chambers adapted to register *seriatim* with said launching tube, means for rotating said magazine drum, means for clamping torpedoes in said chambers

and means operated by hand for releasing the torpedoes from said chambers, when desired.

In witness whereof I have hereunto signed my name this 24th day of April 1905, in the presence of two subscribing witnesses.

THOMAS JOSEPH MORIARTY.

Witnesses:

HENRY CONNETT,
HENRY G. HOSE.

It is hereby certified that in Letters Patent No. 868,613, granted October 15, 1907, upon the application of Thomas Joseph Moriarty, of Newport, Rhode Island, for an improvement in "Means for Carrying and Handling Torpedoes on Vessels," an error appears in the printed specification requiring correction, as follows: Page 4, lines 46 and 47 should be transposed; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of November, A. D., 1907.

[SEAL.]

E. B. MOORE,
Commissioner of Patents.