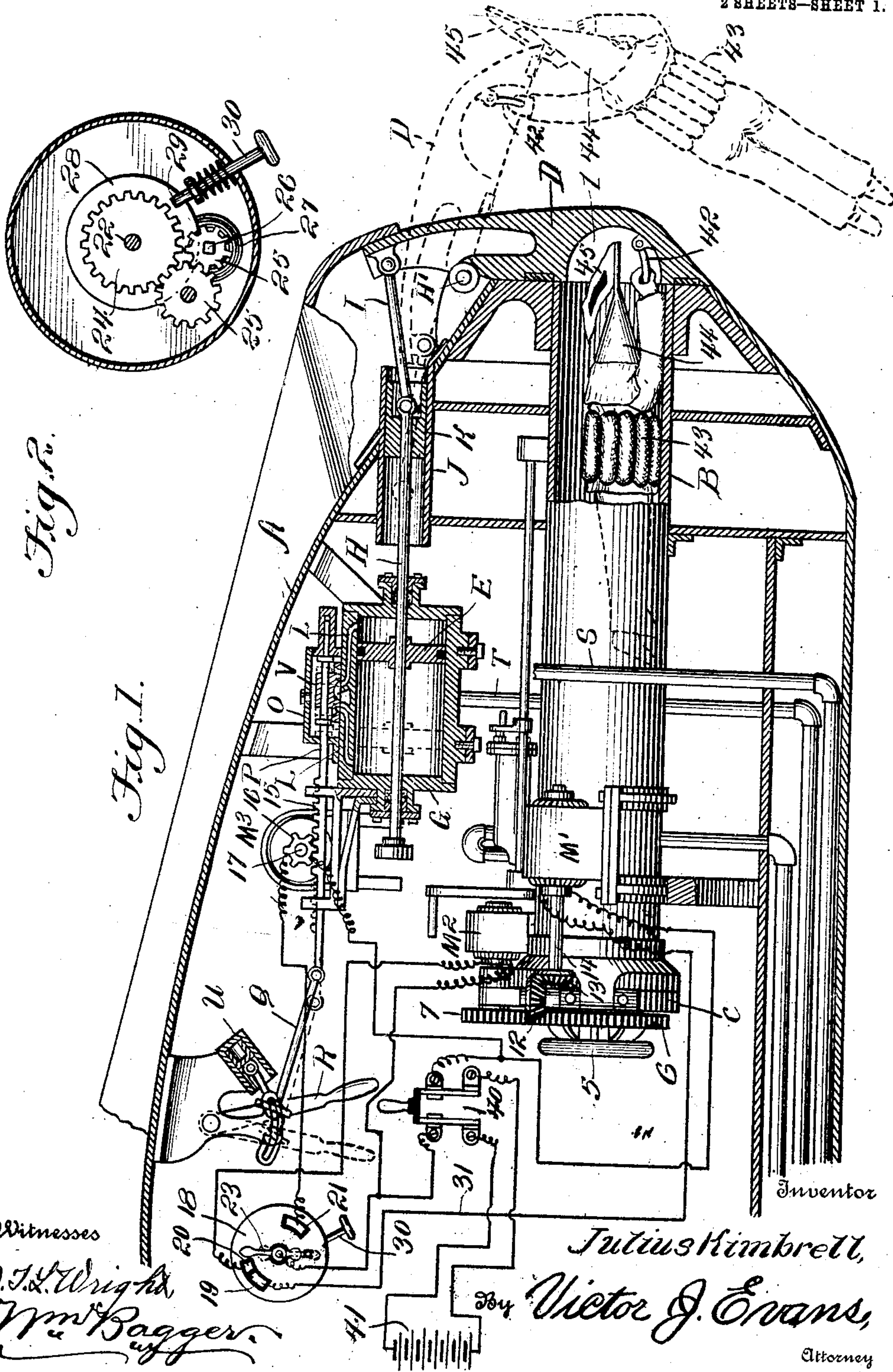


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ATTACHMENT FOR TORPEDO TUBES.
APPLICATION FILED DEC. 1, 1909.

958,650.

Patented May 17, 1910.

2 SHEETS—SHEET 1.



Witnesses
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Fig. 4.

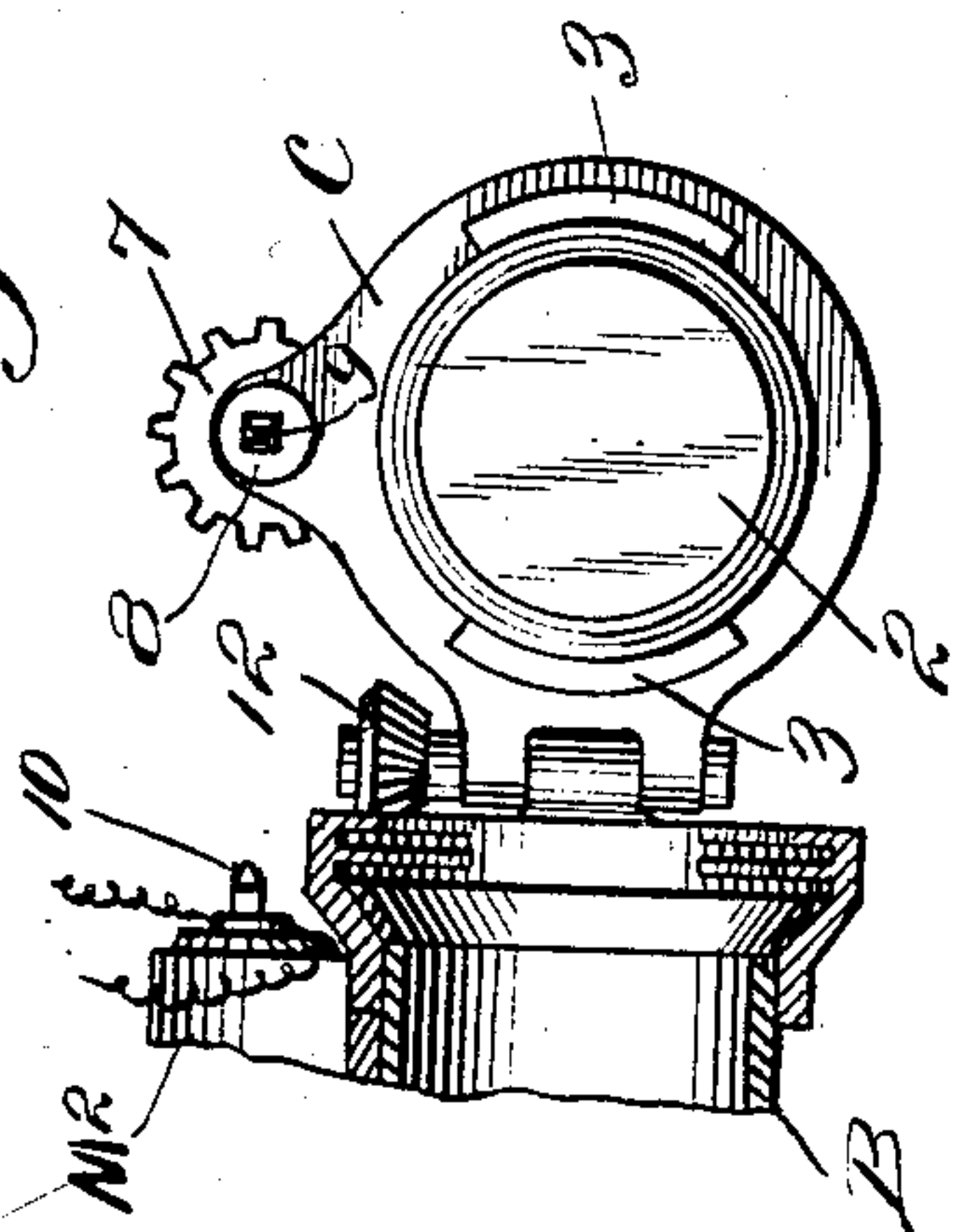


Fig. 6.

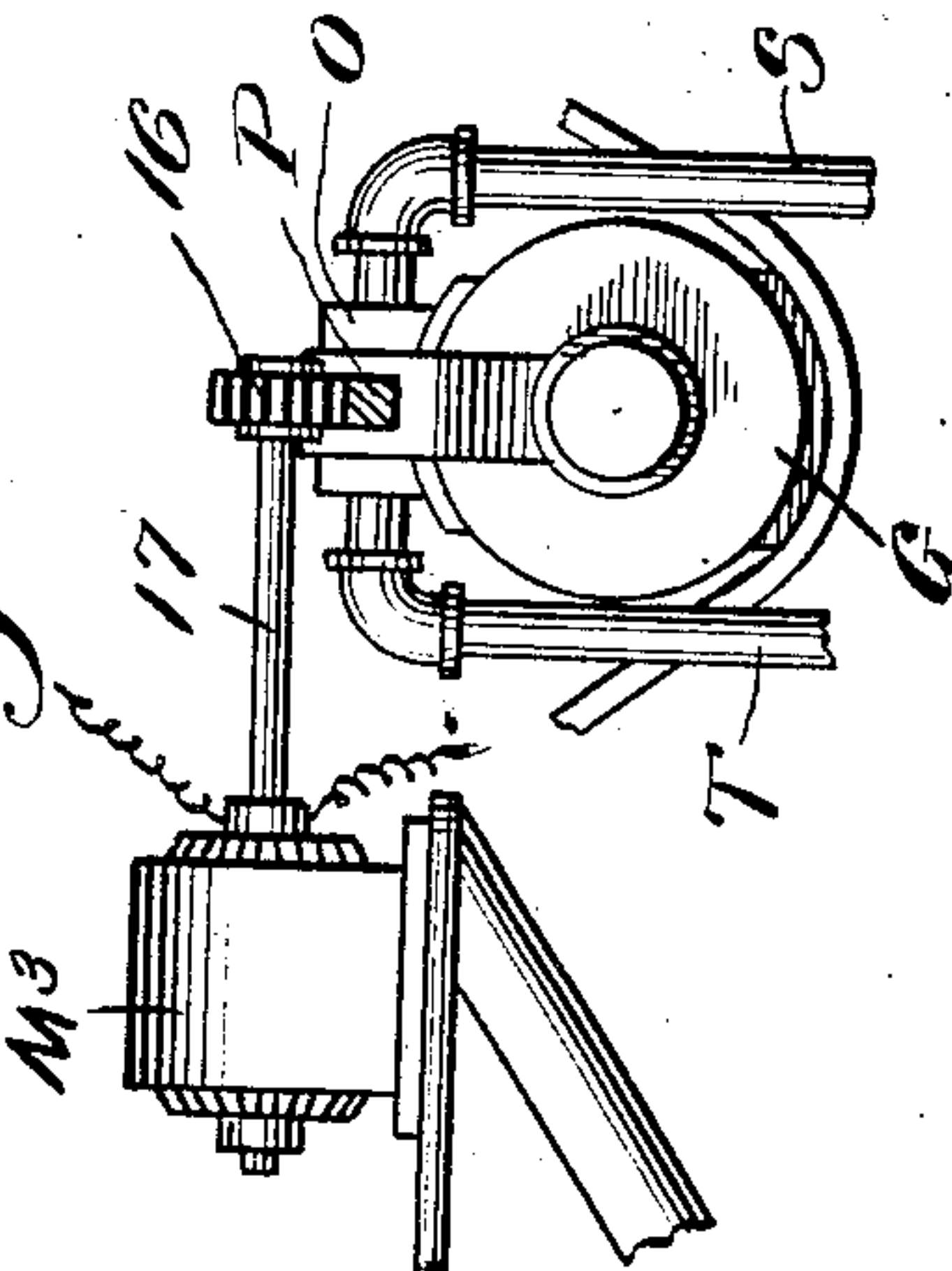


Fig. 3.

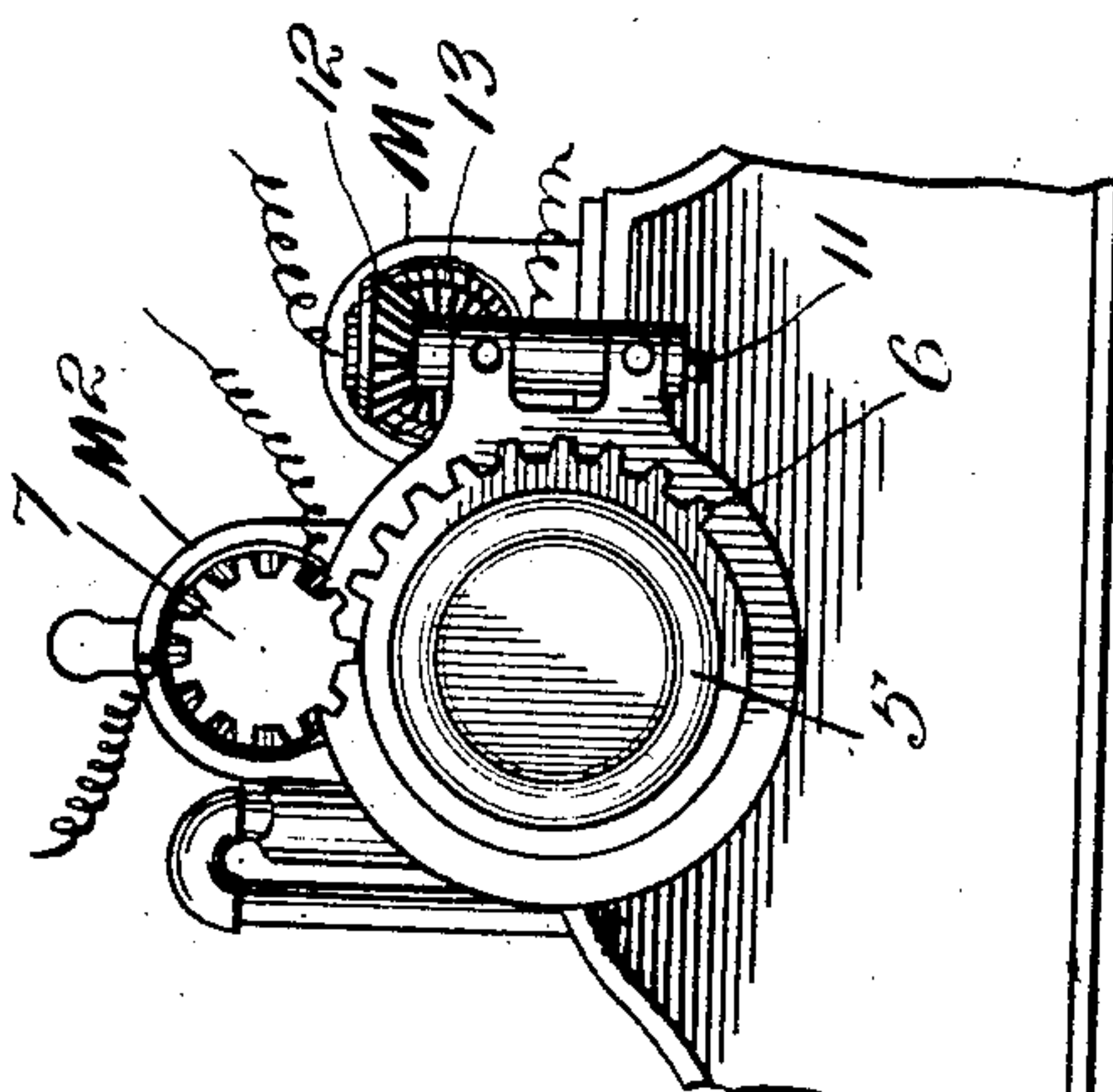
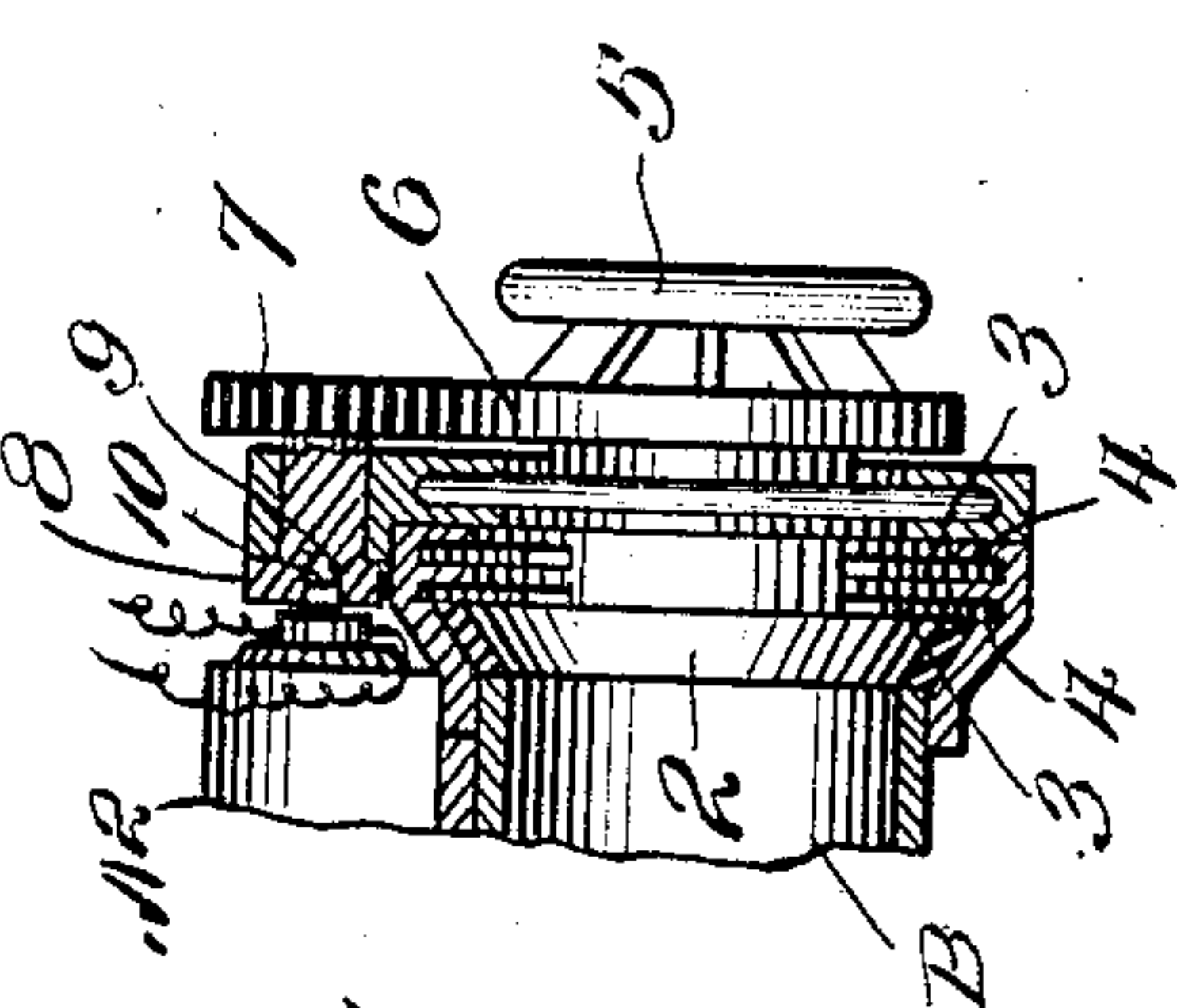


Fig. 5.



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UNITED STATES PATENT OFFICE

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ATTACHMENT FOR TORPEDO-TUBES.

958,650.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed December 1, 1909. Serial No. 530,752.

To all whom it may concern:

Be it known that I, JULIUS KIMBRELL, a citizen of the United States, residing at Needles, in the county of San Bernardino and State of California, have invented new and useful Improvements in Attachments for Torpedo-Tubes, of which the following is a specification.

This invention relates to attachments for torpedo tubes of submarine boats.

It has been demonstrated that when a submarine boat has sunk and for any reason becomes disabled and unable to rise to the surface, the crew of such boat may escape through the torpedo tube, with the exception of the last man who, in the absence of some one to operate the mechanism controlling the doors of the torpedo tube must remain behind.

The present invention has for its object to provide means whereby the door actuating mechanism may be automatically operated when previously set and adjusted by the last man of the crew, who may thus enter the tube and find his way to safety therethrough.

Further objects of the invention are to simplify and improve the construction and operation of devices of the general character outlined above.

With these and other ends in view which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the invention may be resorted to when desired.

In the drawings,—Figure 1 is a sectional elevation, showing the interior upper portion of a submarine boat equipped with the invention. Fig. 2 is a sectional detail view of a timing device which forms a part of the invention. Fig. 3 is a rear end view of the torpedo tube and related parts. Fig. 4 is a sectional elevation of the rear end of the torpedo tube, showing the door of the same in open position. Fig. 5 is a sectional view, showing the door shut. Fig. 6 is a detail view

in elevation of the means for actuating the outer door of the torpedo tube and the motor for operating said door-actuating mechanism.

Corresponding parts in the several figures are denoted by like characters of reference.

The invention has been shown applied to a submarine boat, a portion of the hold of which appears at A, the same being equipped with a torpedo tube B of ordinary construction, and the same being also equipped adjacent to its rear end with the inner door C and adjacent to its outer end with the door D, the latter being formed with a recess 1 to accommodate the nose of the torpedo.

The inner door C is equipped with the customary locking dial 2 having flanges 3 adapted to engage between flanges 4 formed interiorly upon the torpedo tube adjacent to the enlarged rear end of the latter. The locking dial is equipped with the handle 5, whereby it is usually manipulated, and in addition to said handle, the locking dial is under the present invention provided with a segment rack 6 and meshing with a pinion 7 which is supported for rotation upon the lid or cover C. The hub 8 of the pinion 7 has a non-circular recess 9 adapted to engage the end of the driven shaft 10 of an electric motor M² which is suitably supported upon or adjacent to the torpedo tube.

The shaft or pintle 11, which supports the door C, is provided with a beveled pinion 12 meshing with a corresponding beveled pinion 13 carried upon the driven shaft 14 of an electric motor M' which is suitably supported upon or adjacent to the torpedo 2.

The outer door D of the torpedo is adapted to be actuated by a piston F reciprocating in a cylinder G, the stem or rod H of said piston being connected with the door D at a suitable distance from the hinge H' supporting said door by means of a link I. The piston stem or rod H is guided through a tube J and is provided with a piston K operating in said tube for the purpose of excluding the sea water. The piston E may be actuated by any suitable fluid, such as compressed air, which may be admitted to either end of the cylinder through suitable passages L, the admission, as well as the exhaust being controlled by means of a valve V operating in a valve chest O; the said valve being provided with a stem P which is connected by a link Q with a hand lever R by means of which the valve may be man-

usually operated under ordinary circumstances. The inlet and exhaust tubes will be best seen at S and T in Fig. 6 of the drawings. A dash pot U has been shown in connection with the hand lever, for the purpose of suitably retarding the motion.

The valve stem P is under the present invention provided with teeth 15 forming a rack which meshes with a pinion 16 supported upon the driven shaft 17 of an electric motor M^3 which is suitably supported adjacent to the cylinder G.

A suitably supported dial 18 is provided with suitably spaced contacts 19, 20 and 21. A shaft 22, which is supported for rotation centrally of the dial, carries a hand or pointer 23 which during the rotation of the shaft is adapted to successively engage the several contacts. The shaft 22 carries a spur wheel 24 which is connected through a train of gears 25 with a winding post 26 actuated by a spring 27. The shaft 22 also carries a disk 28 having a peripheral notch 29 adapted to be engaged by a spring-actuated stop member 30.

The contact 19 is electrically connected with the motor M' by means of a conducting wire 31; the contacts 20, and 21 are in like manner electrically connected with the motors M^2 and M^3 , respectively, and each of the several motors is electrically connected with the shaft 22 carrying the hand 23. A switch 40 is provided whereby the several motors and the dial may be placed in a circuit including a battery 41.

The stop member 30 is so arranged with reference to the hand or indicator that when the stop member engages the notch 29 the hand or pointer will be approximately in the position indicated in dotted lines in Fig. 1, and the speed of said hand under the impulse of the actuating spring 27 is so regulated that the hand will occupy several minutes in traveling from the dotted position to the contact 19, giving ample time for an operator to enter the torpedo tube. A handle 42 adapted to be grasped by a person within the torpedo tube is hingedly connected with the outer door D within the recess 1 in a position where it may be readily grasped by a person within the tube but without interfering with the use of torpedoes for which the tube is primarily intended.

In the operation of this device, the members of the crew who desire to escape through the torpedo tube are preferably provided with a suitable suit for the occasion, including a life preserver 43 and a pointed head-protecting helmet 44 to which a signal 45 may be attached. As each man enters the torpedo tube, the door C is closed behind him, and the door D is then actuated to swing outward, thus causing the man to be dragged out of the tube by the handle 42 which he grasps firmly for this purpose.

As soon as he leaves the tube he releases the handle and will then be floated or carried to the surface by the life preserver 43. After each man, but one, has escaped in this manner, the last man left behind will wind the actuating spring of the hand 23 and set the switch 40 so as to include the several motors and the dial members in the circuit of the battery 41. Quickly opening the door C, (the door D having previously been closed) he enters the torpedo tube, having previously actuated the stop member 30 to release the hand-carrying shaft 22. As soon as the hand reaches the contact 19 the motor M' becomes active and operates to swing the door C shut. The hand 23 presently travels from the contact 19 to the contact 20, thus cutting out the motor M' and energizing the motor M^2 , whereby the dial 5 of the door will be partially rotated to place the locking flanges 3 in engaging position, the rack segment 6 being of an extent only sufficient to accomplish this result so that if the pinion 7 carried by the driven shaft of the motor M^2 should continue to rotate the dial will not be carried past the door locking position. The contact 21 is sufficiently spaced from the contact 20 to enable the man within the torpedo tube to work his way up to the door D and to grasp the handle 42 before the motor M^3 becomes active to actuate the valve controlling the admission of compressed air within the cylinder G; the piston E of which thus actuated to throw the door D open to the position shown in dotted lines in Fig. 1, thus enabling the last man to escape.

Having thus described the invention, what is claimed as new, is:—

1. A torpedo tube, a rear door for the same having a locking dial provided with a rack segment, motor driven means for closing the door, motor driven means for locking the door including a pinion engaging the rack segment and a driven shaft with which said pinion is detachably connected, and means for timing the starting of the motors whereby the closing and the locking are effected.

2. A torpedo tube, a hingedly supported outer door for the same, a handle connected with said door, motor driven means for opening and closing the door, means for starting the door actuating motor including an auxiliary motor, and means for timing the starting of the auxiliary motor.

3. A torpedo tube, inner and outer doors for the same, motor driven means for closing the inner door, motor driven means for locking the inner door, a motor controlling the opening and closing of the outer door, means including an auxiliary motor for starting the door operating motor, and means for timing the starting of the motors, whereby the closing and locking of the in-

ner door are effected and of the auxiliary motor controlling the starting of the motor governing the opening and closing of the outer door.

5 4. The combination with a torpedo tube, of means forming doors or closures at the inner and outer ends of said tube, mechanical means for successively closing and locking the inner door and for opening the
10 outer door, and means for timing said operations.

5. A torpedo tube, doors or closures for the inner and outer ends of said tube, means including independent motors for closing
15 and locking the inner door, means including a motor and an auxiliary starting motor for

opening the outer door, and means including an electrical circuit, a dial having contacts, and a spring-actuated hand movable over the dial for successively starting the
20 motor governing the closing of the inner door, the motor governing the locking of the inner door and the motor governing the starting of the motor for opening the outer door, the starting of said motors being
25 timed at predetermined intervals.

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

JULIUS KIMBRELL.

Witnesses:

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J. T. WHITE.