A. E. JONES.

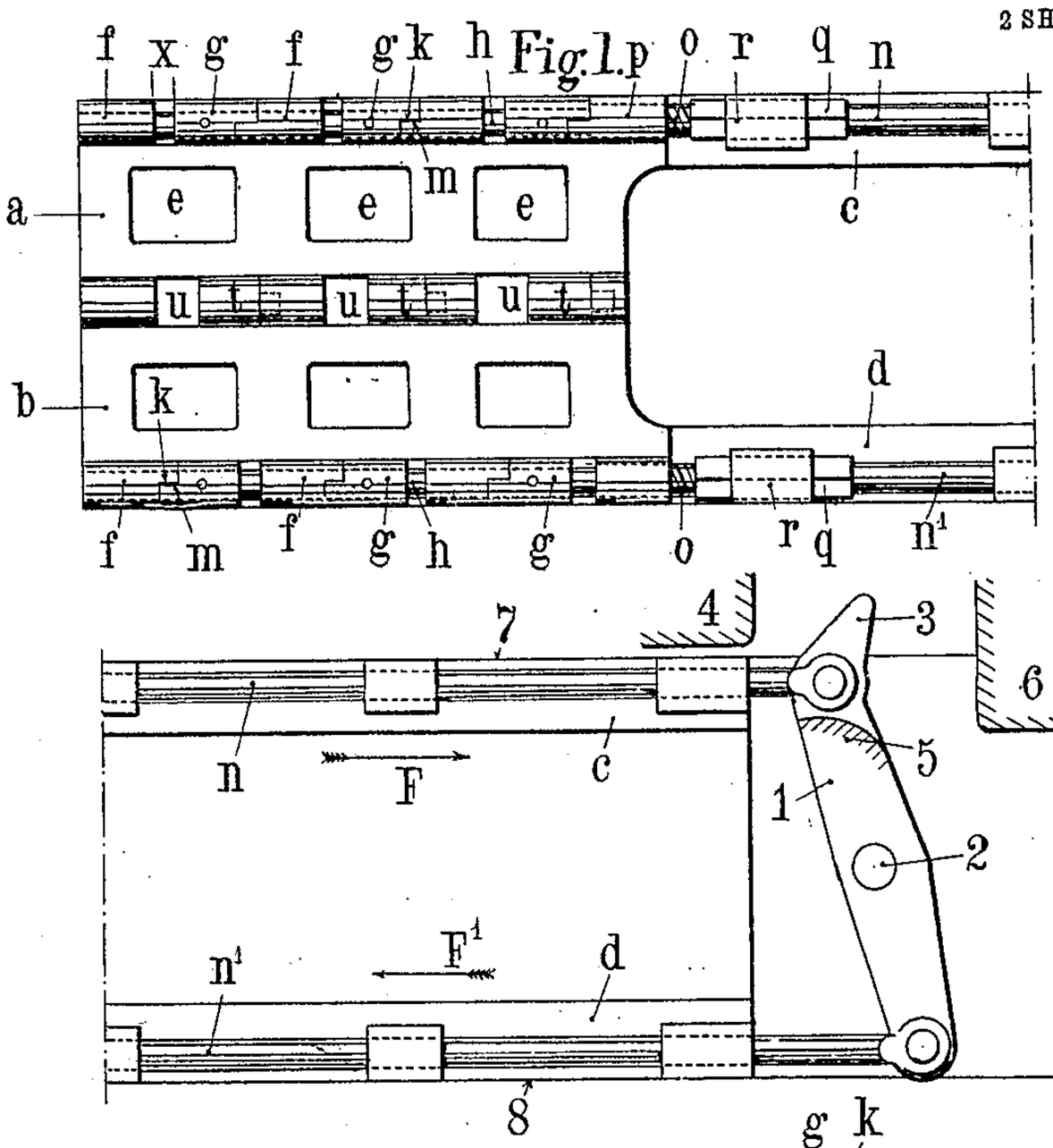
APPARATUS FOR LAUNCHING TORPEDOES UNDER WATER.

APPLICATION FILED NOV. 1, 1907.

916,164. Patented Mar. 23, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



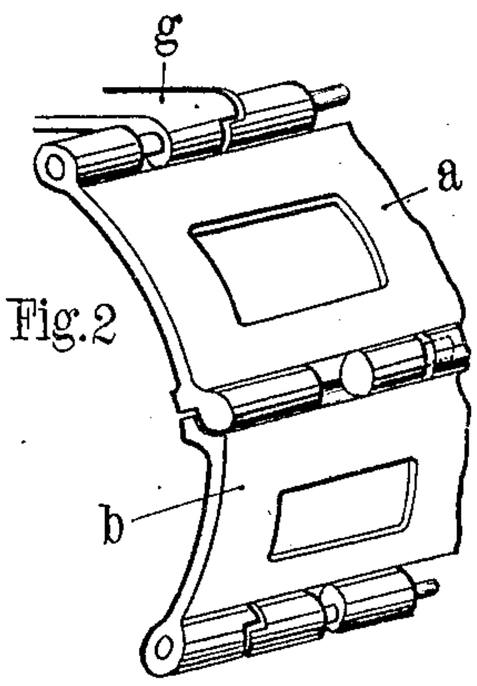


Fig. 2

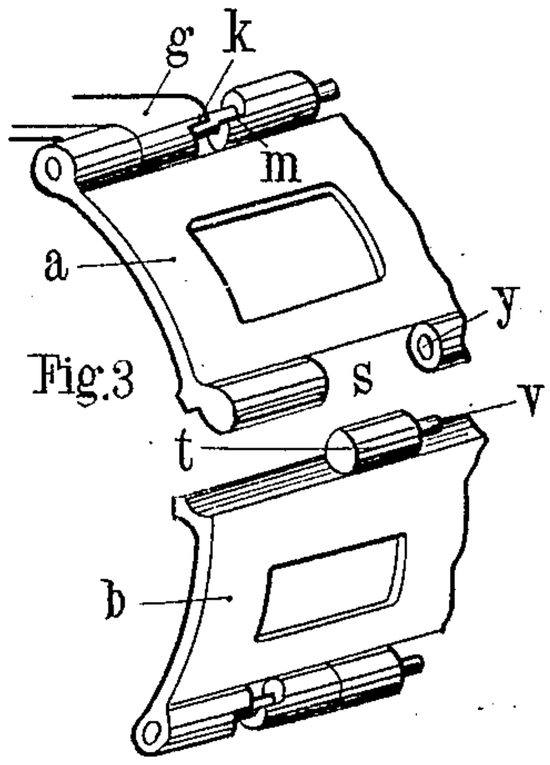
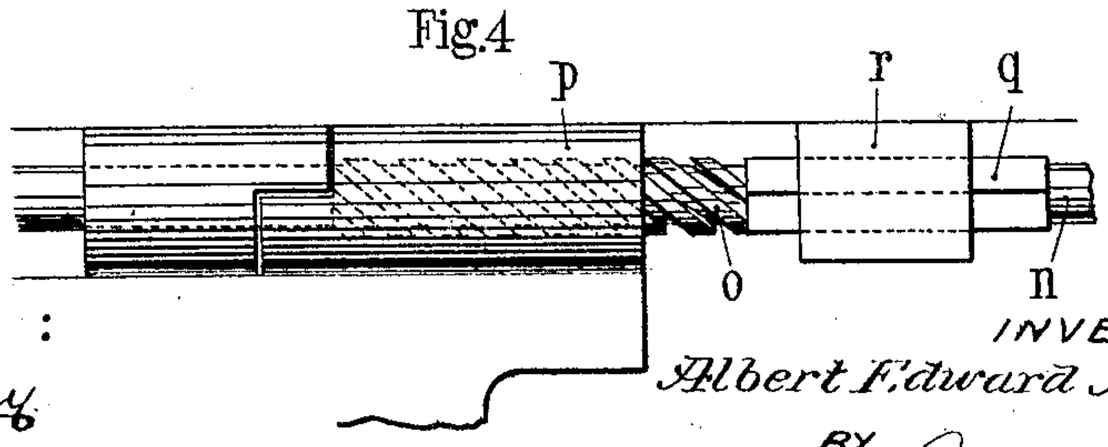


Fig. 3

Fig. 4



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2 SHEETS—SHEET 2.

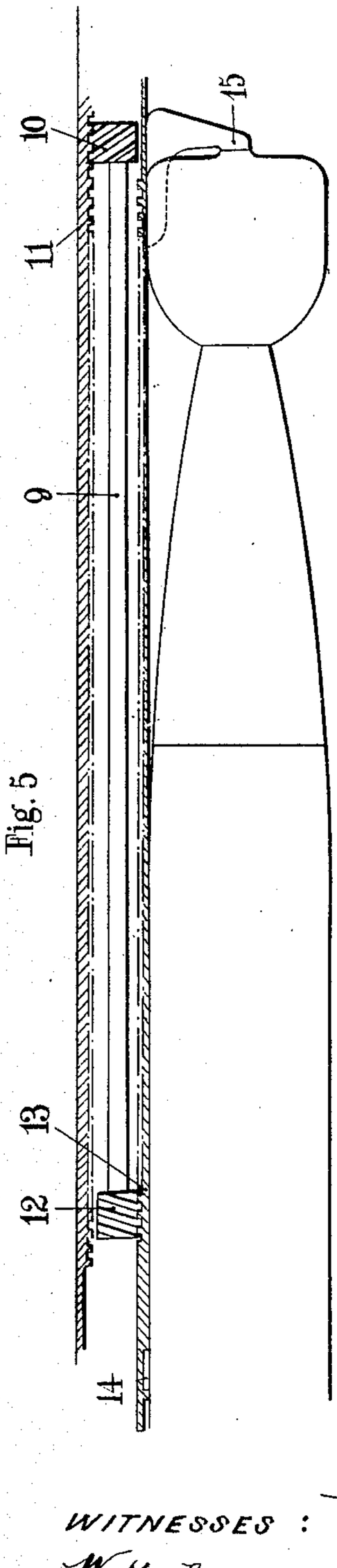

Fig. 5

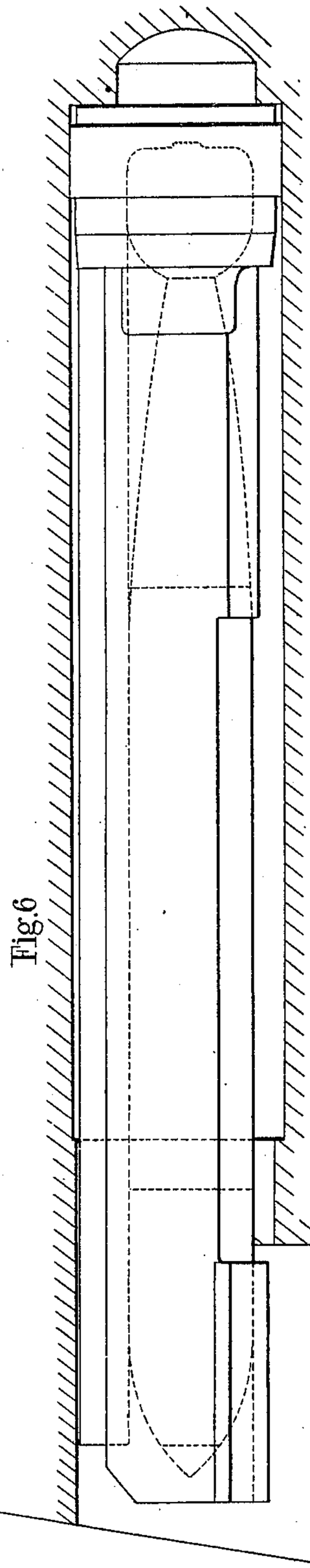

Fig. 6

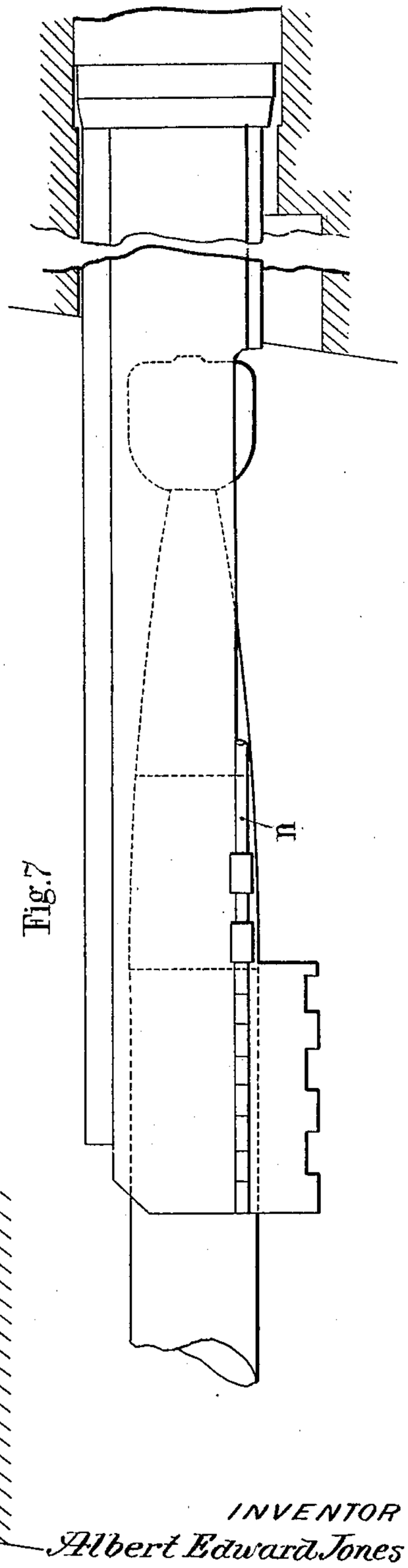

Fig. 7

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APPARATUS FOR LAUNCHING TORPEDOES UNDER WATER.

No. 916,164. Specification of Letters Patent. Patented March 23, 1909.

Application filed November 1, 1907. Serial No. 400,197.

To all whom it may concern:

Be it known that I, ALBERT EDWARD JONES, a subject of the King of Great Britain, residing at Fiume, Austria-Hungary, engineer, have invented certain new and useful Improvements in Apparatus for Launching Torpedoes Under Water, of which the following is a specification.

This invention has for its object improvements in movable shutter apparatus for launching torpedoes beneath the level of the water through the sides of a vessel in movement, and it relates more particularly to the arrangement of the shutters forming the torpedo support, their locking, opening and closing mechanism.

In the accompanying drawing: Figure 1 is a side elevation of the launching apparatus as a whole; Figs. 2 and 3 are perspective views of a portion of the shutters showing the locking and opening devices in two different positions; Fig. 4 is a detail view of a portion of a shutter. Fig. 5 shows the arrangement for operating the launching apparatus. Fig. 6 shows the launching apparatus in position in the interior of the tube, the torpedo being represented by dotted lines. Fig. 7 shows the arrangement in launching position at the moment the torpedo is set free.

In accordance with this invention the shutters or leaves which support the torpedo rearwardly relatively to the movement of the vessel, instead of extending throughout the whole length, are provided only at the outer or extreme part of the launching apparatus and are preferably reduced to a single pair. These shutters *a*, *b* (Fig. 1) are arranged at the extremity of the sides *c*, *d* of the movable apparatus, and comprise recesses *e* in order to diminish their weight and the effects of the pressure of the water. They are hinged in such a manner that they are capable of a certain longitudinal displacement on their pivots. To this end the hinges *f* of the shutters and the hinges *g* fixed to the framework are separated by spaces, which spaces are designated by the reference character *x*. In addition, on two of their opposite faces these hinges *f* and *g* present notches *k* and *m* respectively constituting a sort of clutch assemblage.

The pivots of the hinges are indicated by *h*. In line with the pivot *h* of the upper shutter, there is arranged a rod *n* presenting at one of its extremities an elongated screw thread *o* which engages in a part *p* of the shutter which forms a nut. This screw thread is followed by a square *q* guided in a support *r* fixed to the framework. The same arrangement is adopted for the lower shutter *b*, with this difference that the notches *k* and *m*, forming clutches, are inverted.

For the assemblage of the two shutters *a* and *b*, that is to say for locking them, the shutter *a* is formed with apertures *s* (Fig. 3) in which studs *t* of corresponding form on the shutter *b* enter; these studs are of such a length that between the hinges *s* and *t* play equal to at least twice the space *x* is provided, that is to say twice the play left between the hinges *f* and *g* on which the shutters are hung. The parts *t* of the shutter *b* are provided at one extremity with studs *v* equal in length to *x* entering holes *y* (see Fig. 3) formed in the corresponding faces of the hinges *s*. The rods *n* and *n'* are connected to the two extremities of a beam 1 pivoted at 2 and provided with two noses, of which the nose 3 is adapted to engage with a fixed stop 4 while the nose 5 is able to engage with another fixed stop 6.

In the drawing the sides of the launching apparatus have been marked 7 and 8. The mechanism for the forward movement of the launching arrangement comprises a horizontal shaft 9, furnished with suitable operating means, not shown, on which is keyed (1) a helicoid wheel 10 engaging with a rack 11 rigidly secured to the exterior tube, and (2) another helicoid wheel 12 toothed in a contrary sense engaging with a rack 13 rigidly secured to the launching frame, which holds the torpedo in position by means of (1) its projection or key 14, and (2) by a stop 15 which then presses along the tail part of the torpedo.

The operation is as follows: Before the torpedo is launched, the various parts occupy the respective positions represented in Fig. 1. The shutters *a* and *b* are locked together, and the clutches *k m* are in engagement. In order to bring the torpedo into launching position, the shaft 9 is placed in rotation in the desired sense, the wheel 10 supported on the rack 11 causes the displacement of the shaft 9, and the wheel 12 sets the rack 13 in very rapid movement, and the apparatus is forced out to accompany the torpedo. When it has reached the ex-

tremity of its travel, the nose 3 is engaged by the stop 4 in such a manner that the beam 1 is reversed, thereby producing a tractive effort on the bar n in the direction indicated by the arrow F and simultaneously a thrust on the bar n' in the direction indicated by the arrow F'. As the clutches k m do not permit of a rotary movement of the shutters a b, these latter participate in the movement of the bars n n' in such a manner that the shutter a moves toward the right hand, while the shutter b moves toward the left hand by the same amount. This first movement corresponds to the unlocking of the shutters; the studs v of the shutter b become disengaged from the holes y of the shutter a. At this moment, the hinges f and g have respectively assumed the positions represented in Fig. 3, which shows that when each shutter has been displaced by a length corresponding to the play x, the clutches k m are disengaged and the movement of rotation of the shutters becomes possible. The shutters a b being prevented from longitudinal movement by the hinges g, if the rods n n' continue to move in the direction indicated by the arrows F F', the shutters are obliged to open, owing to the screw assemblage with the rods n n'. The degree of aperture is calculated in such a manner as to release the torpedo entirely and in particular to prevent its screw or other parts from striking against the shutters.

When the launching apparatus is withdrawn into the vessel, the beam 1 is reversed into its initial position owing to the inclined surface 5 encountering the stop 6 and sliding under the lower part of said stop. The inverse movements then take place: the displacement of the rods n n' will first of all cause the closing of the shutters a b which are prevented from longitudinal movement by the hinges g. As soon as the shutters are closed, they participate in the longitudinal movement of the bars n n', the clutches k m reëngage, and simultaneously the locking by the studs v takes place automatically.

The advantages are as follows:

Owing to the fact that the support for the torpedo is reduced to a single pair of slotted or openwork shutters arranged at the extremity of the launching apparatus, while the torpedoes are supported under as good conditions as in the known guard apparatus, departure of the torpedo is facilitated, even when the vessel is moving slowly through the water, and a greater degree of liberty is given to it on launching.

The mechanism insures efficient operation, owing to the fact that merely by the forward movement of the apparatus in the first place the unlocking of the shutters is produced, and then a sufficient degree of aperture for them, preventing any possibility of the striking of the screws of the torpedo against these shutters, and consequently any deformation of these screws, and likewise any initial deviation in the course of the torpedo.

It will of course be understood that the framework and accessories of the launching apparatus may be of the usual form, the invention relating more particularly to the mechanism for unlocking and opening the shutters. The form of the shutters may likewise vary in accordance with requirements.

The invention is applicable to all ships from which it is intended to launch torpedoes under water.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. In combination with a torpedo launching apparatus, shutters having hinges adapted to move longitudinally on pivots, hinges fixed to the framework of the apparatus and adapted to clutch in opposite directions with the hinges of the shutters, rods attached to the pivots of the shutters, and provided with means for opening and closing the shutters, and means for displacing said rods longitudinally in opposite directions.

2. In combination with a torpedo launching apparatus, shutters movable upon pivots and connected to hinges adapted to form clutch assemblages with hinges fixed to the framework, rods attached to the pivots, incapable of rotation but capable of a movement of translation, said rods being provided with screw-threads engaging with corresponding screw-threaded hinges of the shutters, and means for displacing the rods automatically in opposite directions for opening and closing the shutters.

3. In combination with a torpedo launching apparatus, shutters movable upon pivots and connected to hinges adapted to form clutch assemblages with hinges fixed to the framework, rods attached to the pivots, incapable of rotation but capable of a movement of translation, said rods being provided with screw-threads engaging with corresponding screw-threaded hinges of the shutters, a beam connected to the extremities of the rods and pivoted to the framework, said beam being provided with noses adapted to be arrested by stops on the launching apparatus for reversing the movement of the rods, and means for locking and unlocking the shutters.

4. In combination with a torpedo launching apparatus, shutters movable longitudinally upon pivots and provided with hinges adapted to form clutch assemblages with hinges fixed to the framework, rods engaging with hinges of the shutters by the intermediary of elongated screw-threads, means for automatically reversing the movement of the rods by the displacement of the supporting

device, and studs on one shutter adapted to engage holes of the other shutter for locking and unlocking said shutters.

5. In combination with a torpedo launching apparatus, a supporting device, comprising openwork shutters provided only at the free extremity of the device, means for clutching said shutters with fixed members of the framework, rods engaging the shutters by means of elongated screw-threads said rods being incapable of rotation but capable of a movement of translation, means for automatically reversing the movement of said rods, and means for locking and unlocking the shutters.

In testimony whereof I have hereunto placed my hand and seal at Birmingham England this ninth day of October 1907.

ALBERT EDWARD JONES. [L. S.]

In the presence of two witnesses:

ARTHUR WRIGHT, Junior,

HOWARD JONS ASHBY.