

(No Model.)

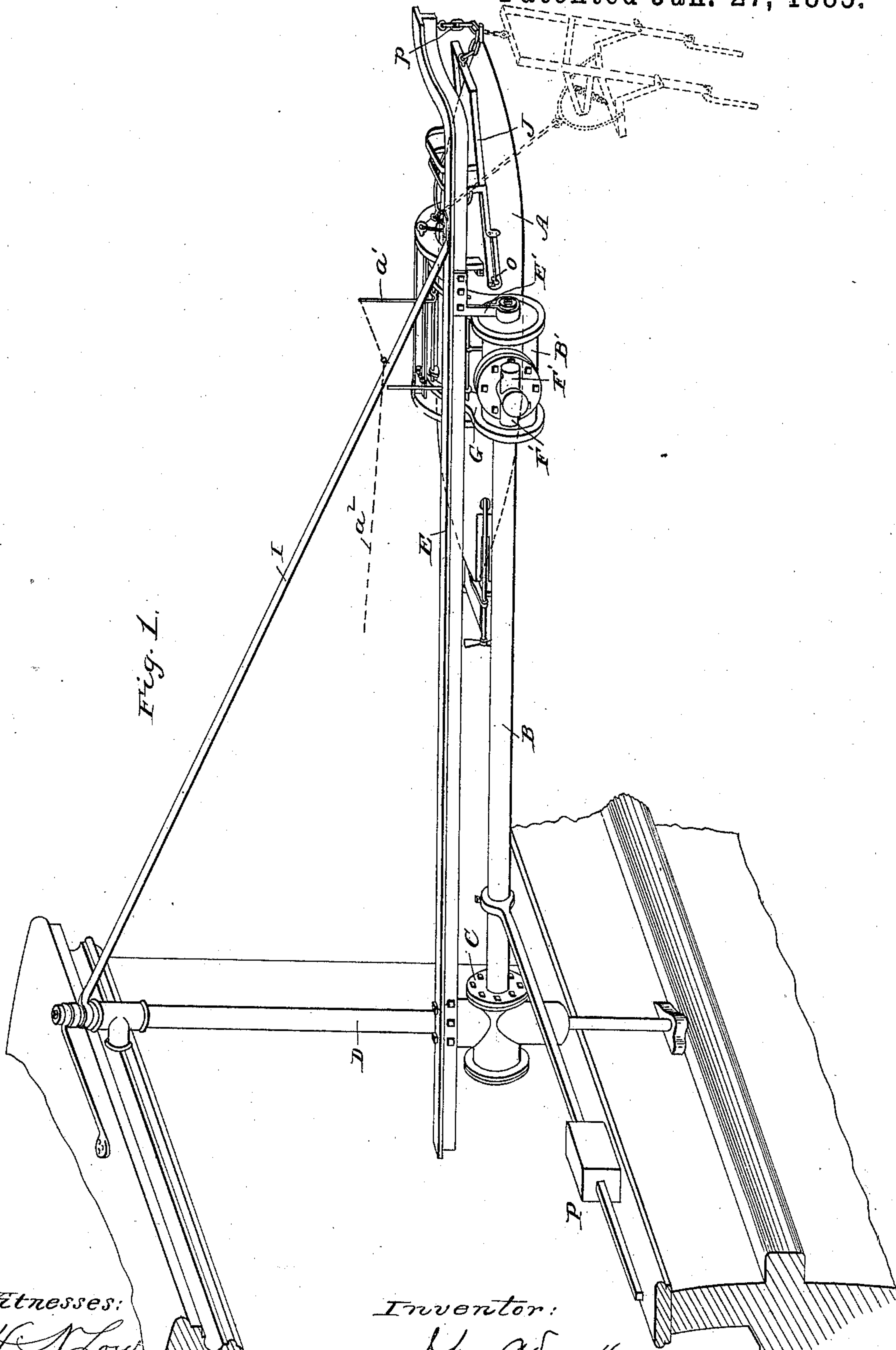
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J. A. HOWELL.

APPARATUS FOR LAUNCHING TORPEDOES.

No. 311,326.

Patented Jan. 27, 1885.



Witnesses:

H. A. Low
J. H. Blandford

Inventor:

John A. Howell
by Marshall Bailey his atty

(No Model.)

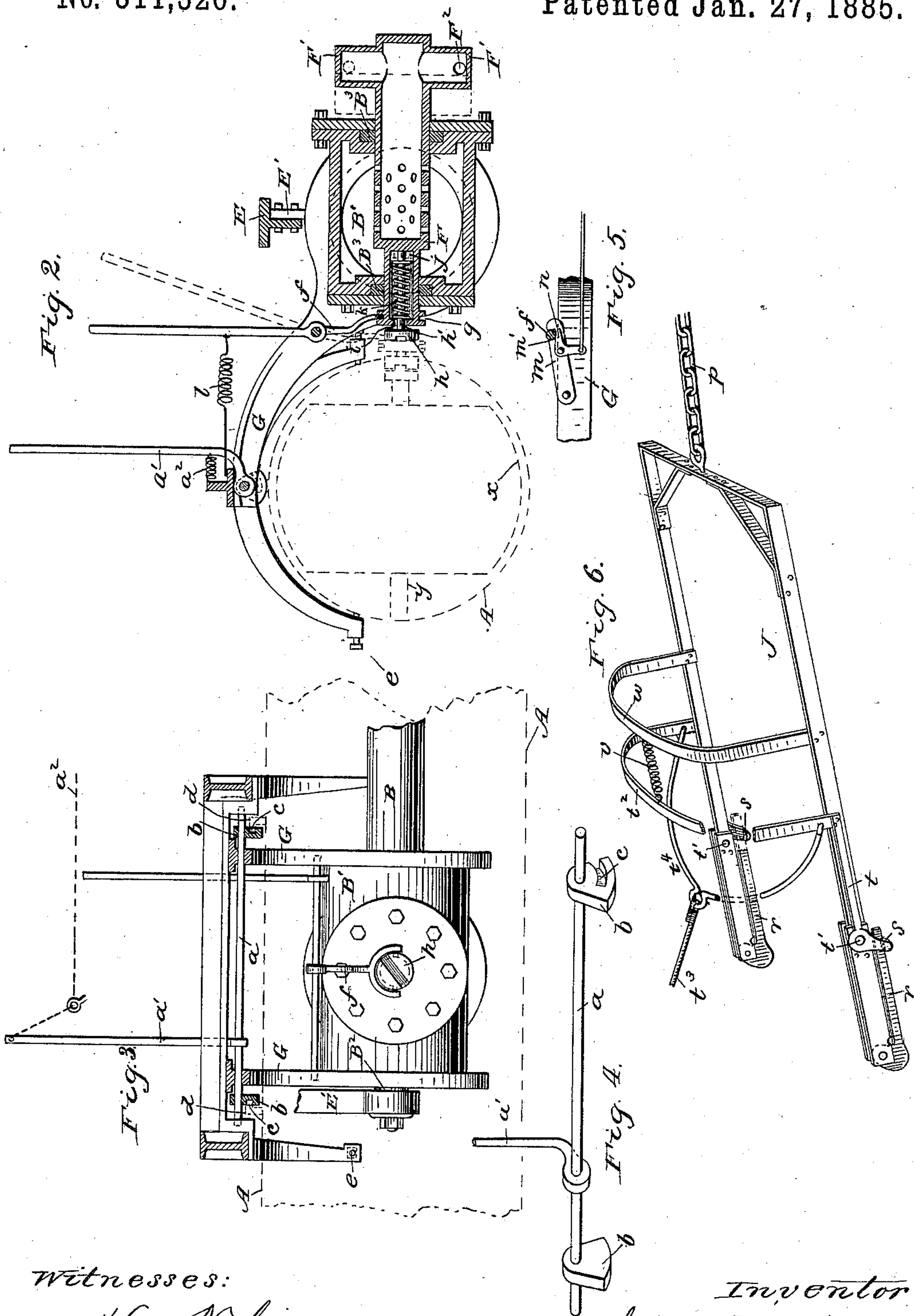
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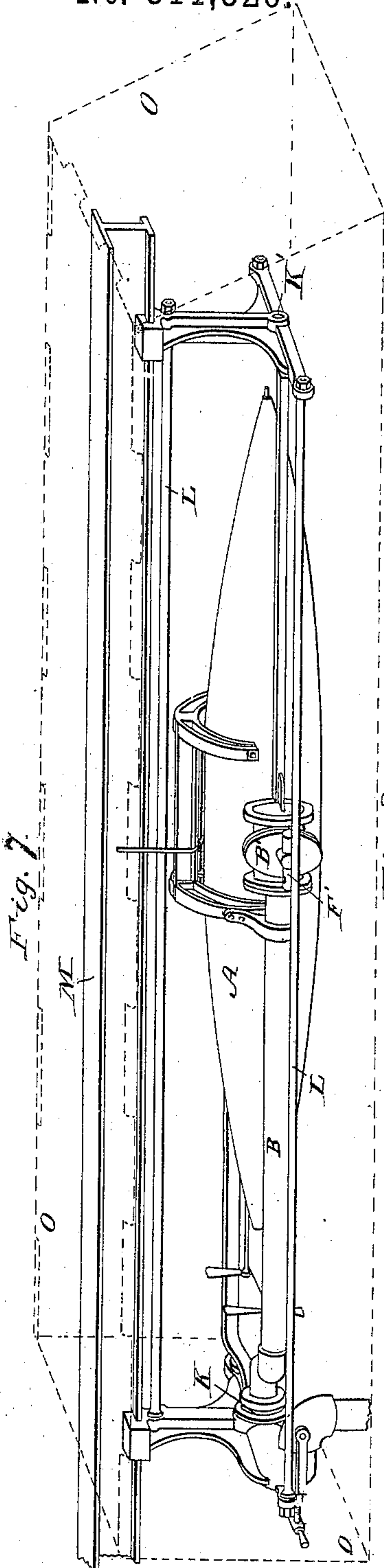


Fig. 7.

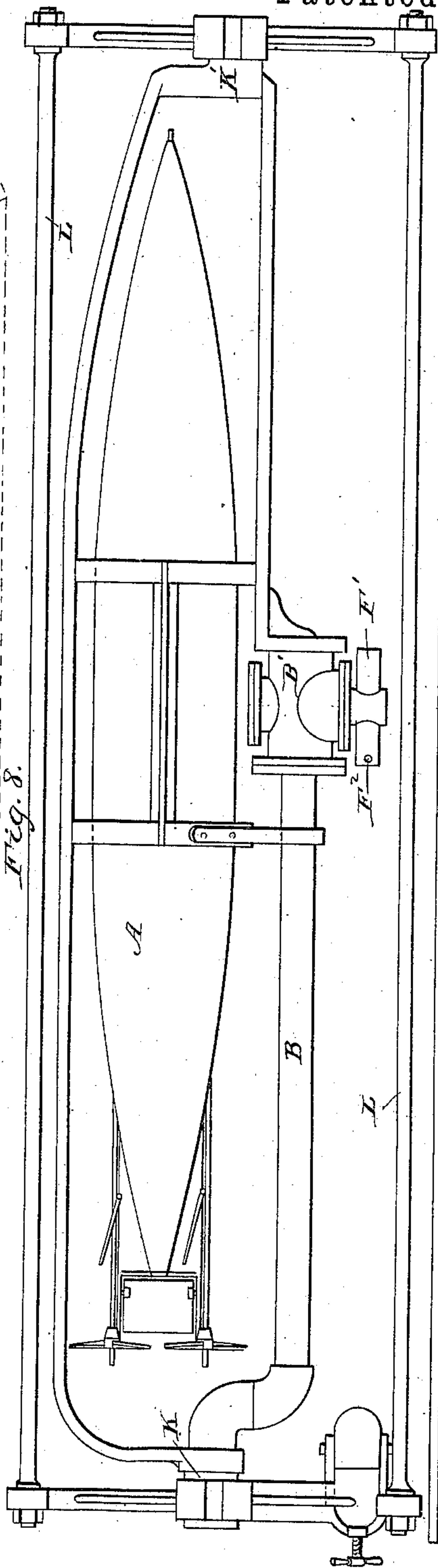


Fig. 8.

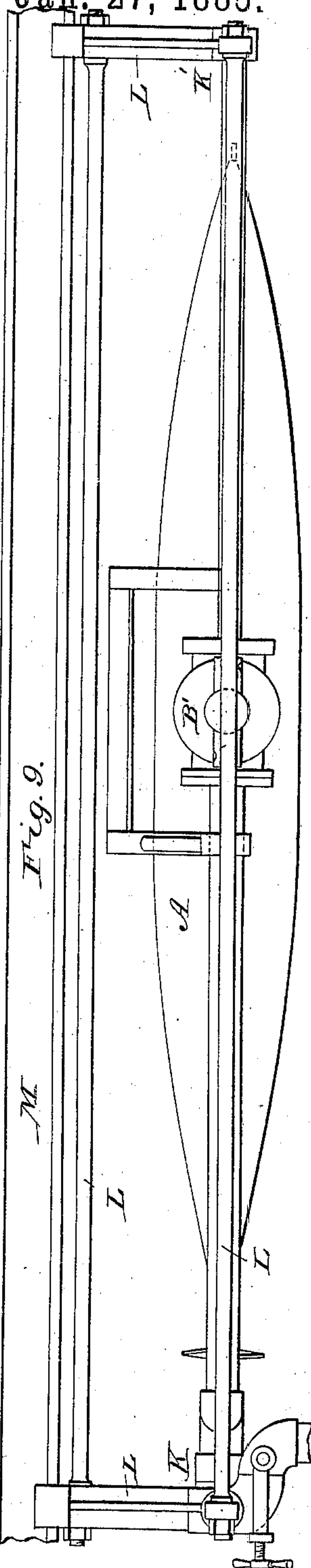


Fig. 9.

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Inventor: John Adams Howell
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UNITED STATES PATENT OFFICE.

JOHN ADAMS HOWELL, OF THE UNITED STATES NAVY.

APPARATUS FOR LAUNCHING TORPEDOES.

SPECIFICATION forming part of Letters Patent No. 311,326, dated January 27, 1885.

Application filed October 27, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN ADAMS HOWELL, of the United States Navy, have invented a certain new and useful Apparatus for Launching Torpedoes, of which the following is a specification.

The apparatus in which my invention is embodied has been designed with particular reference to launching what may be termed a "fly-wheel torpedo"—that is to say, a marine torpedo in which the power to drive or to steer it, or both to drive and to steer it, is furnished by a fly-wheel to which a very rapid movement of rotation is in the first instance imparted by any power extraneous to the torpedo. A torpedo of this kind is illustrated in my Letters Patent, No. 121,052, of November 21, 1871, and more completely in my pending application for Letters Patent filed October 6, 1884, bearing Serial No. 144,843.

The characteristic feature of my invention is that the launching apparatus, or that portion of it which is connected to and supports the torpedo, is free to move upon an axis at right angles to the position assumed by the axis of the fly-wheel when the torpedo is in place in the apparatus. The fly-wheel of course must be speeded up to the proper point before the torpedo is dropped or launched, and by permitting it freedom of motion about two axes at right angles to each other—the one its rotation-axis and the other the axis of motion of that part of the launching apparatus in which the torpedo is hung or supported—it will not be injuriously affected by the motion of the vessel from which the torpedo is launched, and the strain which otherwise would come upon the fly-wheel and its bearings by reason of that motion is entirely removed.

The nature of my invention and the manner in which it is or may be carried into effect will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of so much of a torpedo-launching apparatus as needed for the purposes of explanation. The apparatus in this figure is represented as arranged to launch torpedoes from the broadside of the vessel. Figs. 2, 3, 4, 5, and 6 are views of details of the apparatus. Figs. 7, 8, and 9 represent,

in perspective, plan, and side elevation, respectively, a modified form of apparatus.

The main difference between the apparatus shown in Figs. 7, 8, and 9 and that shown in Fig. 1 is that in the latter a counter-balance is employed to offset the weight of the torpedo when placed in its rocking supporting-frame, while in the former the rocking frame is so made as to be balanced by the weight of the torpedo.

In the torpedo A (shown in the drawings) the axis of rotation of the fly-wheel is at right angles to the longitudinal axis of the torpedo, and is horizontal when the torpedo is in place in the launching apparatus, as indicated by dotted lines in Fig. 2, where the fly-wheel is represented at x and its axis of rotation at y . The supporting-frame of the torpedo consequently is so arranged as to be free to move about an axis, B, at right angles to the rotation-axis y . The motor or accelerator used to speed up the fly-wheel is in this instance a Barker mill, which is carried by and moves with the rocking supporting-frame. This mill is shown more clearly in Fig. 2, which is a vertical axial section of the same, together with the parts inwardly adjacent.

In order to supply steam to this device, the part B is a pipe taking a bearing at its inner end in a stuffing-box, C, through which it is in connection with a steam-supply pipe, D. At its outer end it is fast to and opens into a steam-chamber, B', from whose outer end projects a journal, B², taking its bearing in a hanger, E', fast to the supporting-beam E.

The tubular driving-shaft F of the mill has its bearings in two stuffing-boxes, B³, in chamber B', and is so placed that it will be in line with the rotation-axis y of the fly-wheel. At the outer end of the shaft F (outside of chamber B') are the two hollow arms F' F', communicating with the interior of the shaft, and provided each near its outer extremity with an escape-hole, F². The steam supplied through pipe B and chamber B' enters shaft F through the perforations therein, and thence passes out and escapes from holes F², with the result of putting the shaft in rapid rotation.

This engine, being well known, requires no further description.

The portion of the frame in which the tor-

pedo is held consists of arched arms G, which are connected rigidly to the chamber B' and overhang the torpedo, and at the top are united together by a longitudinal beam or
 5 brace, as shown more clearly in Fig. 3, which is a longitudinal vertical section of that portion of the frame which overhangs the torpedo, showing also in elevation the clutch end of the Barker mill. In this overhanging portion
 10 of the frame is mounted longitudinally a rock-shaft, *a*, (shown detached in Fig. 4,) provided with two sectors, *b*, each grooved or flanged, as indicated at *c*, Figs. 3, 4, to engage hooks *d*, properly placed for that purpose on the
 15 torpedo. A handle, *a'*, is provided for the purpose of operating the rock-shaft against the stress of a spring, *a''*, Fig. 2, which latter tends to turn the rock-shaft in a direction to bring the sections into engagement with the
 20 hooks on the torpedo.

At each end of the overhanging frame in which the torpedo is hung set-screws *e* may be provided to prevent the torpedo from swinging on its hooks. They should of course bear
 25 upon the torpedo at points above its longitudinal axis, so as not to obstruct its fall when the handle *a'* is moved in a direction to disengage the sectors *b* from the torpedo-hooks.

The shaft F of the Barker mill projects at
 30 each end through its stuffing-boxes B³. On its inner end it carries a clutch, *h*, to engage a corresponding clutch on the axle of the fly-wheel of the torpedo, and the parts necessarily must be so arranged that the two can be
 35 engaged, so as to put the fly-wheel in rotation, and then disengaged as soon as the latter has been speeded up sufficiently. This result is obtained in the present instance by making the shaft F capable of sliding lengthwise in its
 40 stuffing-boxes, it being actuated to thus move by a suitable pivoted shipper-lever, *f*, whose forked end straddles the inner end of the shaft F, and enters an annular groove, *g*, therein.

With a view to provide the shaft with a
 45 clutch which may have slight lateral movement, so as to engage the clutch of the fly-wheel, even if the two be not exactly in line, I form the inner portion of the shaft, as shown in Fig. 2, into a chamber, which receives
 50 through an opening, *i*, the stem *h'* of the clutch *h*. The rear end of the clutch has a T-head, *j*, which enters a corresponding groove in the rear end of the chamber. The opening *i* is, as shown, somewhat greater in diameter than
 55 the stem *h'*, and a spiral spring, *k*, encircling the stem, bears at one end against the front head of the chamber and at the other end against the T-head of the stem. The clutch in this way is held always in engagement with the shaft F,
 60 while at the same time its stem may incline slightly from the axial line of the shaft, if need be. The shipper-lever, as shown in Fig. 2, is by a spring, *l*, held normally in a position in which the shaft F is withdrawn from en-
 65 gagement with the axle of the torpedo fly-wheel.

To throw the shaft into engagement with the axle of the fly-wheel, the lever is moved by hand against the stress of the spring, so as to bring the parts to the position indicated by
 70 dotted lines in Fig. 2. In this position the lever is retained by any suitable means—as, for instance, by a latch, *m*, on the adjoining arched arm G. Such a latch is represented
 75 in Fig. 5, which is a plan view of the same and that portion of the arm G to which it is attached, the lever being shown in cross-section. The latch is pivoted to the arm, and is provided with a retaining-notch, *m'*, to receive
 80 and hold the lever.

To disengage the latch from the lever at a time when the torpedo-carrying frame is swung or projected out from the vessel, I make use of a tripping angle-lever, *n*, pivoted at its elbow
 85 to the latch. One arm of this lever rests against the shipper-lever *f*, and to the other is made fast a cord which extends inboard through proper guides or eyes. A pull on this
 90 cord will result in throwing back the latch, thus releasing the shipping-lever and permitting the spring *l* to draw back the shaft F out of engagement with the fly-wheel.

The parts B B' and the overhanging frame in which the torpedo hangs are all rigidly connected together and adapted to rock on
 95 the axis of pipe B, a weight, P, Fig. 1, being used to counterpoise the weight of the torpedo. The stuffing-box C and steam-pipe D swivel on a vertical axis, and are preferably located on the broadside of the vessel, as
 100 indicated in Fig. 1. The pipe D and stuffing-box C, as well as the beam E and brace or braces I, together virtually constitute a swinging crane which supports the rocking system and permits the latter to be swung inboard or
 105 outboard, as desired.

The operation of the parts thus far described is as follows: The torpedo is hung in its frame when the crane is inboard, and the
 110 clutch-shipper is by hand moved to a position in which the clutch of the Barker mill engages the axle of the fly-wheel of the torpedo. The crane is then swung outboard to the desired position, and steam is turned onto the
 115 Barker mill. As soon as the fly-wheel is speeded up to the requisite extent, the cord which controls the shipper-lever latch is pulled, so as to disengage the latter from the lever, which by its spring is at once moved to a position to
 120 disengage the driving-clutch from the fly-wheel. The torpedo is then disengaged from its supporting-frame by pulling on the handle *a'* through the instrumentality of a cord, *a''*, leading from it inboard through suitable guide-eyes, *l*, and as soon as released it will drop
 125 into the water. Under the arrangement thus far described the torpedo, when released, will drop vertically. I prefer, however, to combine with its supporting-frame means by which it will be caused to shoot forward before reach-
 130 ing the water, and thus to obtain an initial impetus to start it on its course. The means

I employ for the purpose are illustrated in Figs. 1 and 6, and consist of a downwardly and outwardly swinging frame having its center of motion outboard beyond the torpedo, adapted to be connected with the torpedo at the center of gravity of the latter, and combined with means whereby at the proper point (after it has imparted to the torpedo movement away from the vessel) it will be disconnected from the torpedo. The frame is shown at J. It straddles the torpedo and engages pins *o*, which are secured to the torpedo at its center of gravity. The forward end of the frame J is secured to a prolongation of the supporting-frame of the torpedo by a chain, *p*, or other means which will permit the frame J freedom of movement. The pins *o* are held in sockets formed between the under sides of the frame and hinged arms *r*, which are held up by means of hooks or latches *s*, attached to bent levers *t*, pivoted at *t'* to the frame. These levers, by spring *v*, attached at one end to their connecting-strap *t''* and at the other end to the arched cross-brace *w* of the frame, are pulled in a direction to cause the hooks or latches *s* to pass under and uphold the free ends of the arms *r*. A bail, *t''*, on the strap *t''* is connected to the main frame of the apparatus by a cord, *t'''*, of such length that when the frame has dropped to a vertical or nearly vertical position the cord will pull the levers *t* far enough against the stress of their spring to disengage the latches *s* from the arms *r*, which latter will at once drop and permit the torpedo to fall. The position of parts at this time is indicated by dotted lines in Fig. 1. It will be noticed that as the frame J swings outwardly in the arc of a circle the torpedo, instead of dropping vertically, follows the path of movement of the frame, (still preserving substantially its horizontal position,) and consequently before quitting the frame has received a decided impetus away from the vessel, which materially aids in starting it on its course.

The arrangement shown in Figs. 7, 8, 9 does not differ in principle from that illustrated in Fig. 1.

Like letters in all the figures indicate similar parts.

The rocking frame which supports the torpedo in the modified arrangement is hung on trunnions K K', and is counterbalanced by the weight of the torpedo.

The steam for the Barker mill is supplied through trunnion K.

Instead of using a crane to swing the torpedo outboard or inboard, I in this arrangement mount the rocking frame in a frame, L, hung from and adapted to slide on the stationary rail M. This arrangement is to be preferred on some accounts, inasmuch as with it it is easy to shield the apparatus on top and

at the sides and front by armor, as indicated by dotted lines at O, Fig. 7.

I have described what I now believe to be the best way of carrying my invention into effect. I do not, however, restrict myself to the mechanical details hereinbefore described and shown, for the same can be widely varied without departure from the principle of the invention. A variety of means manifestly can be employed in order to speed up the fly-wheel. The motor for that purpose can be mounted on the rocking frame, or it may be placed elsewhere, and suitable gearing or equivalent transmitting mechanism can be used to connect it with the fly-wheel. The arrangement shown in the drawings is one suitable for a torpedo in which the axis of the fly-wheel is transverse to the length of the torpedo. In case, however, the rotation-axis of the fly-wheel should be lengthwise of the torpedo, the axis of the rocking frame should be correspondingly shifted, so as to bring it at right angles thereto.

What I claim as new and of my own invention is—

1. In an apparatus for launching fly-wheel torpedoes, a torpedo-supporting frame mounted therein to rock freely upon an axis at right angles to the axis of the fly-wheel when the torpedo is in its place in the frame, substantially as and for the purposes hereinbefore set forth.

2. The combination of a carrier movable outboard or inboard with a rocking torpedo-supporting frame mounted in said carrier on an axis at right angles to the axis of the fly-wheel of the torpedo when the latter is in its place in said frame, substantially as and for the purposes set forth.

3. The combination, with the rocking torpedo-supporting frame, of means, substantially as described, carried by said frame for speeding up the fly-wheel of the torpedo held in said frame.

4. The combination, with the rocking torpedo-supporting frame, of a motor carried by said frame, having the rotation-axis of its driving-shaft at right angles to the axis of motion of the frame, and in line with the axis of the fly-wheel of the torpedo when the latter is in place in the frame.

5. The combination, with the torpedo-supporting frame, of the swinging yoke carried by said frame, and arranged and operating, substantially as hereinbefore set forth, to impart to the torpedo at the time it is dropped a movement away from the vessel.

In testimony whereof I have hereunto set my hand this 25th day of October, 1884.

JOHN ADAMS HOWELL.

Witnesses:

F. H. PAINE,
E. A. DICK.