

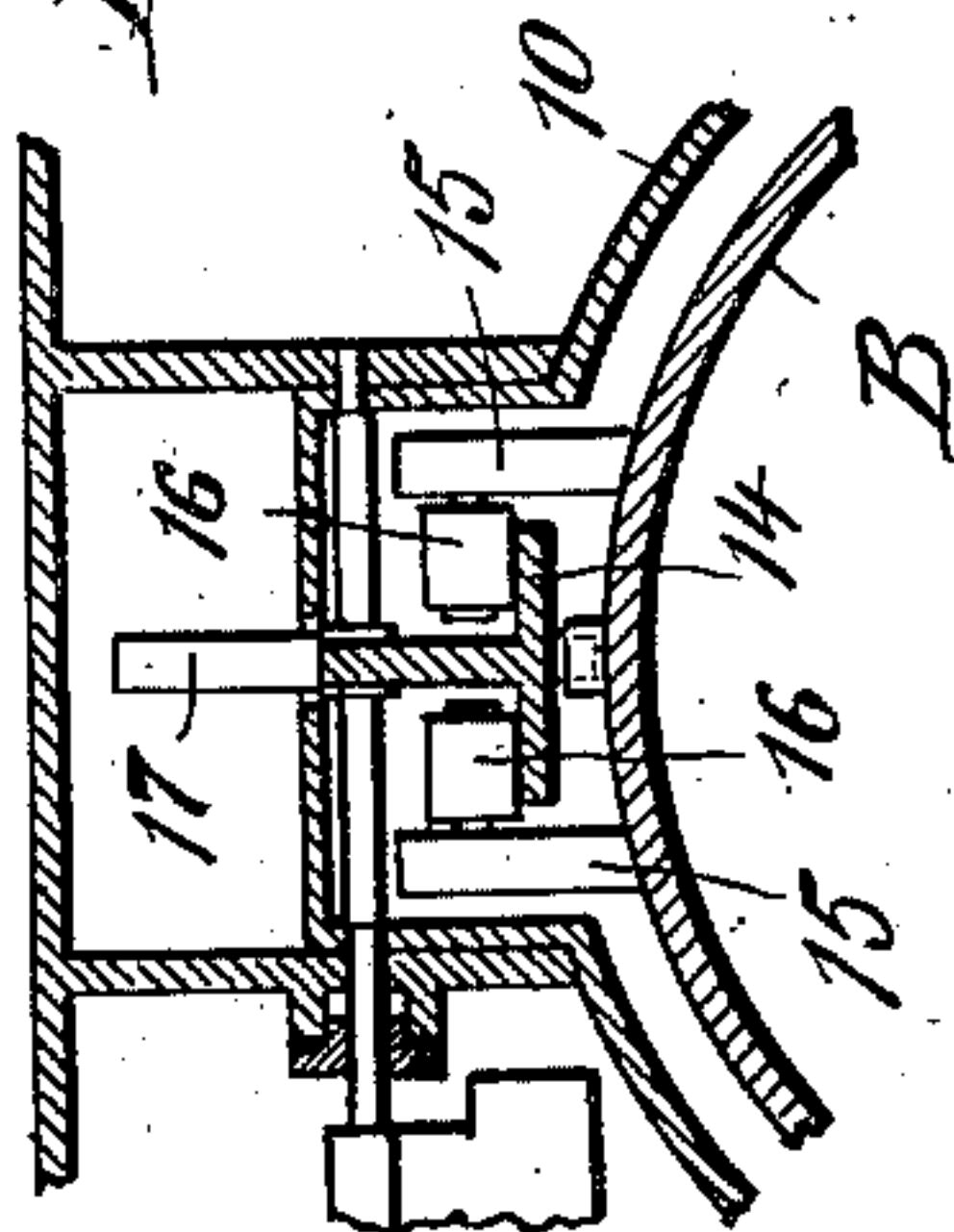
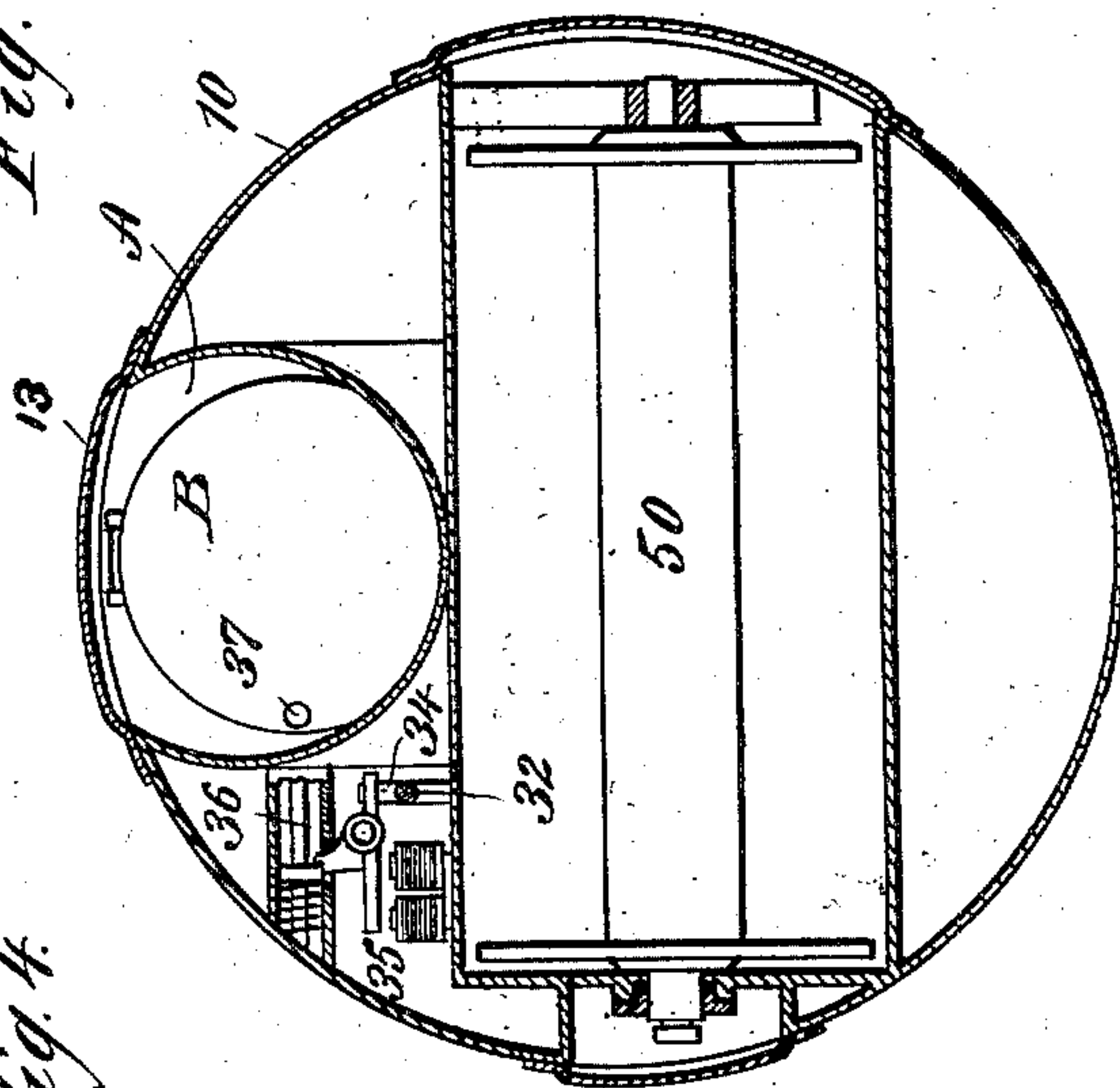
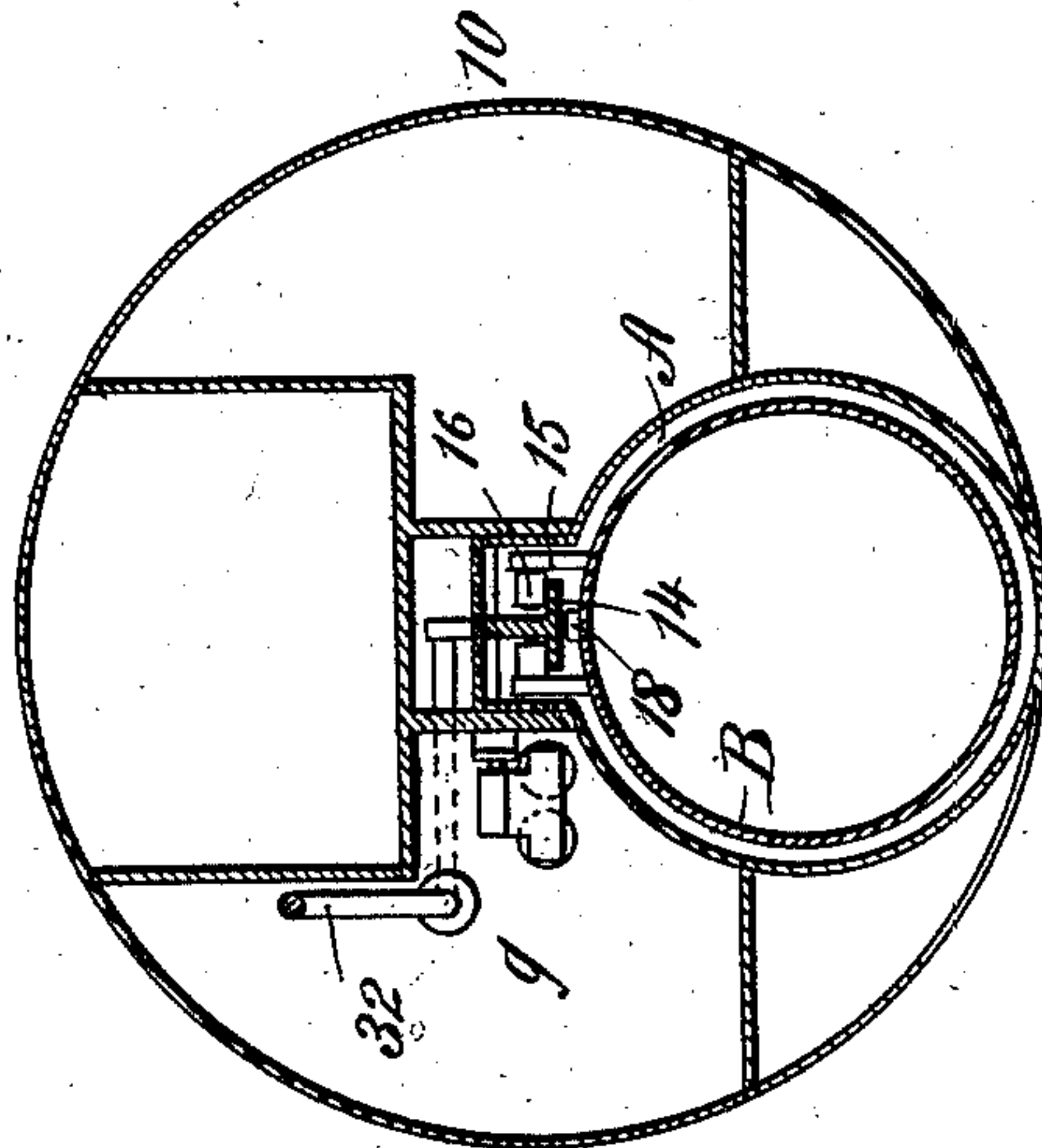
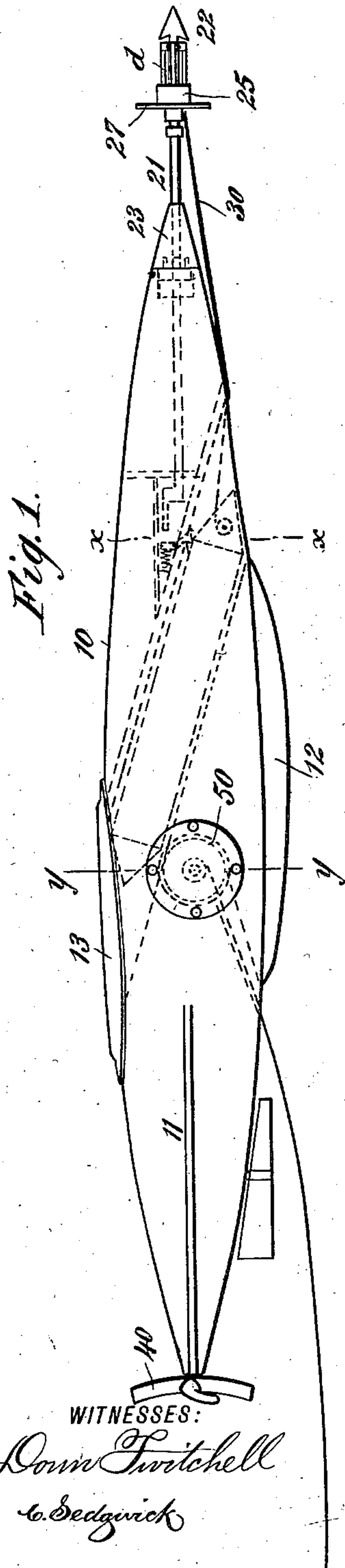
(No Model.)

3 Sheets—Sheet 1.

N. J. HALPINE.  
MARINE TORPEDO.

No. 453,861.

Patented June 9, 1891.



**INVENTOR**

N. J. Halpine

BY

Munn & Co.  
ATTORNEYS

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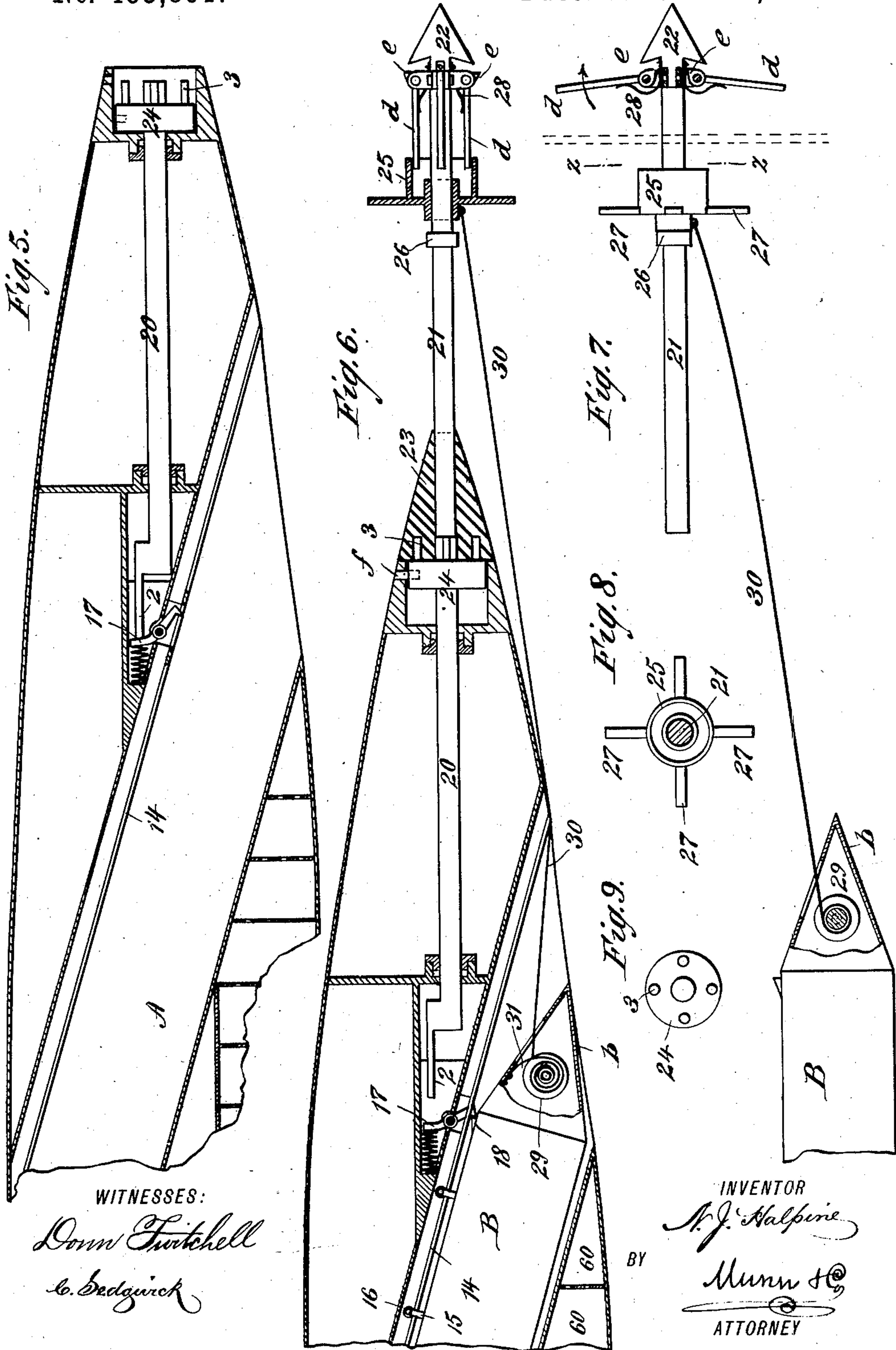
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3 Sheets—Sheet 2.

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3 Sheets—Sheet 3.

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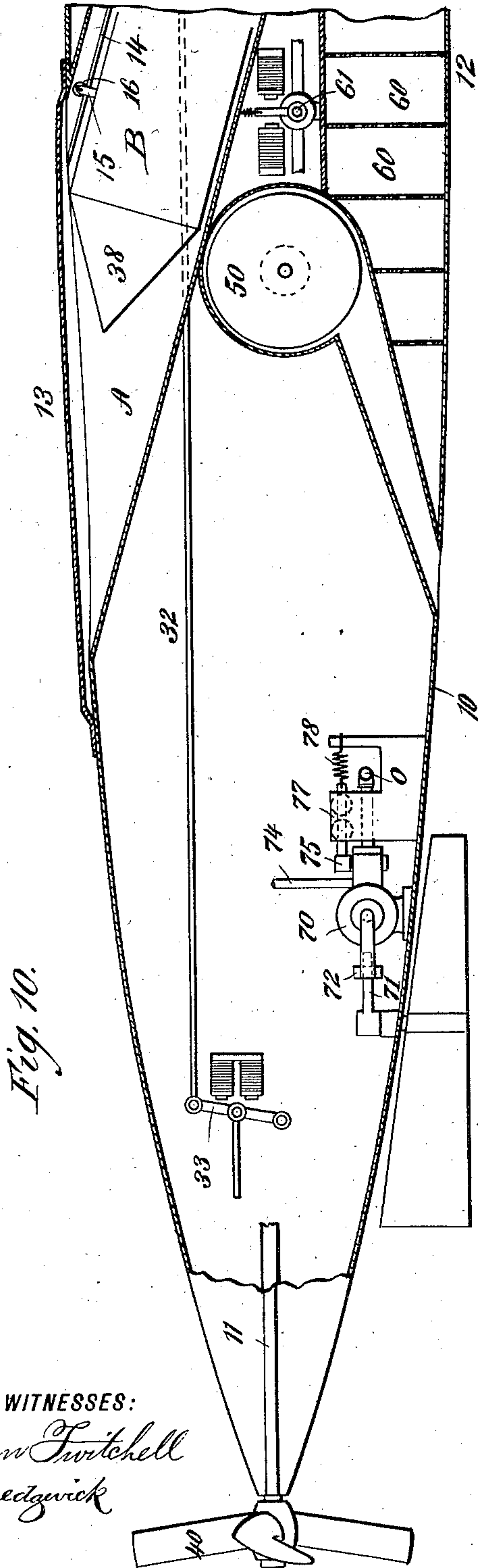


Fig. 10.

WITNESSES:  
*Donn Twitchell*  
*C. Sedgwick*

Fig. 12.

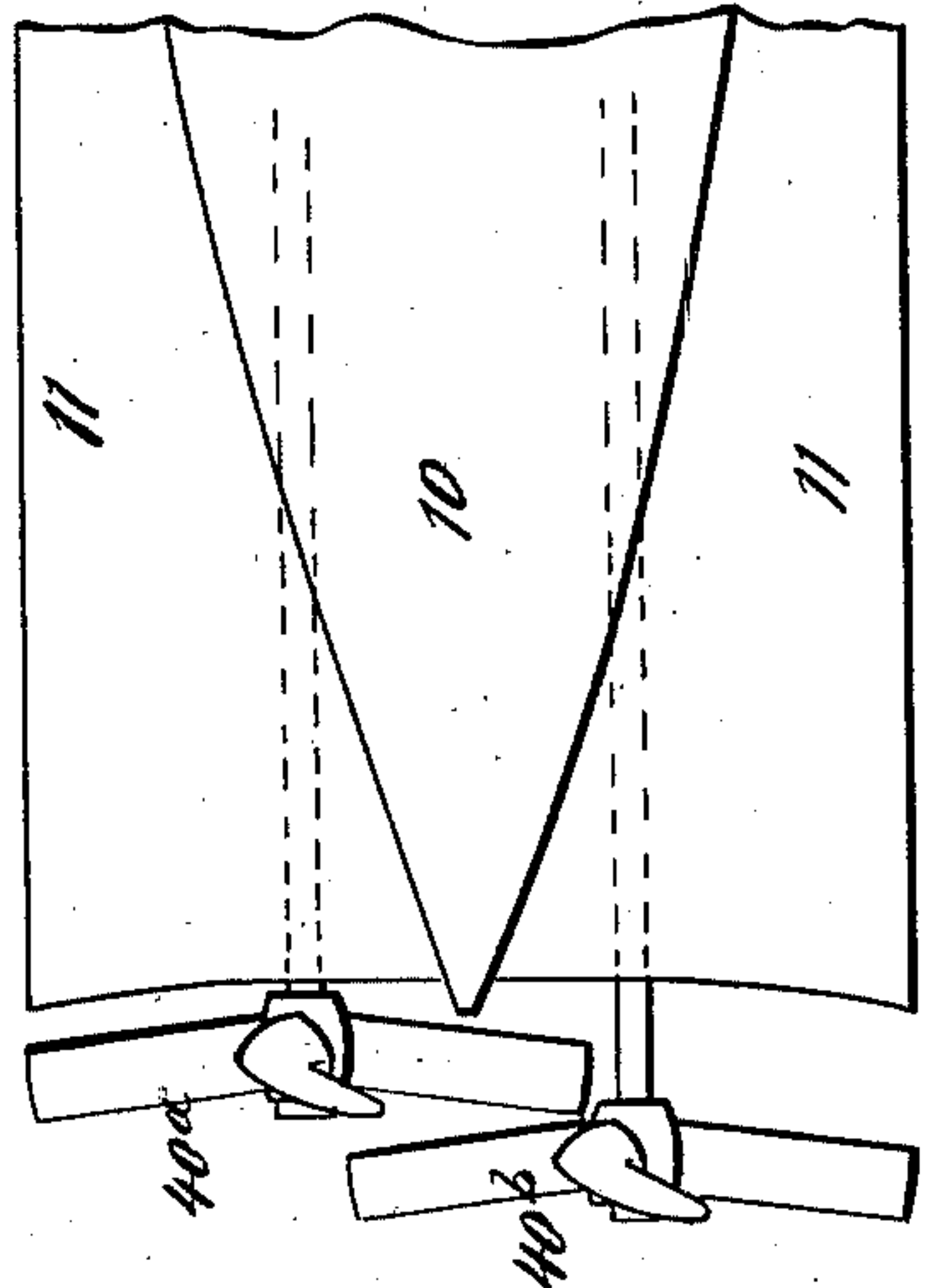
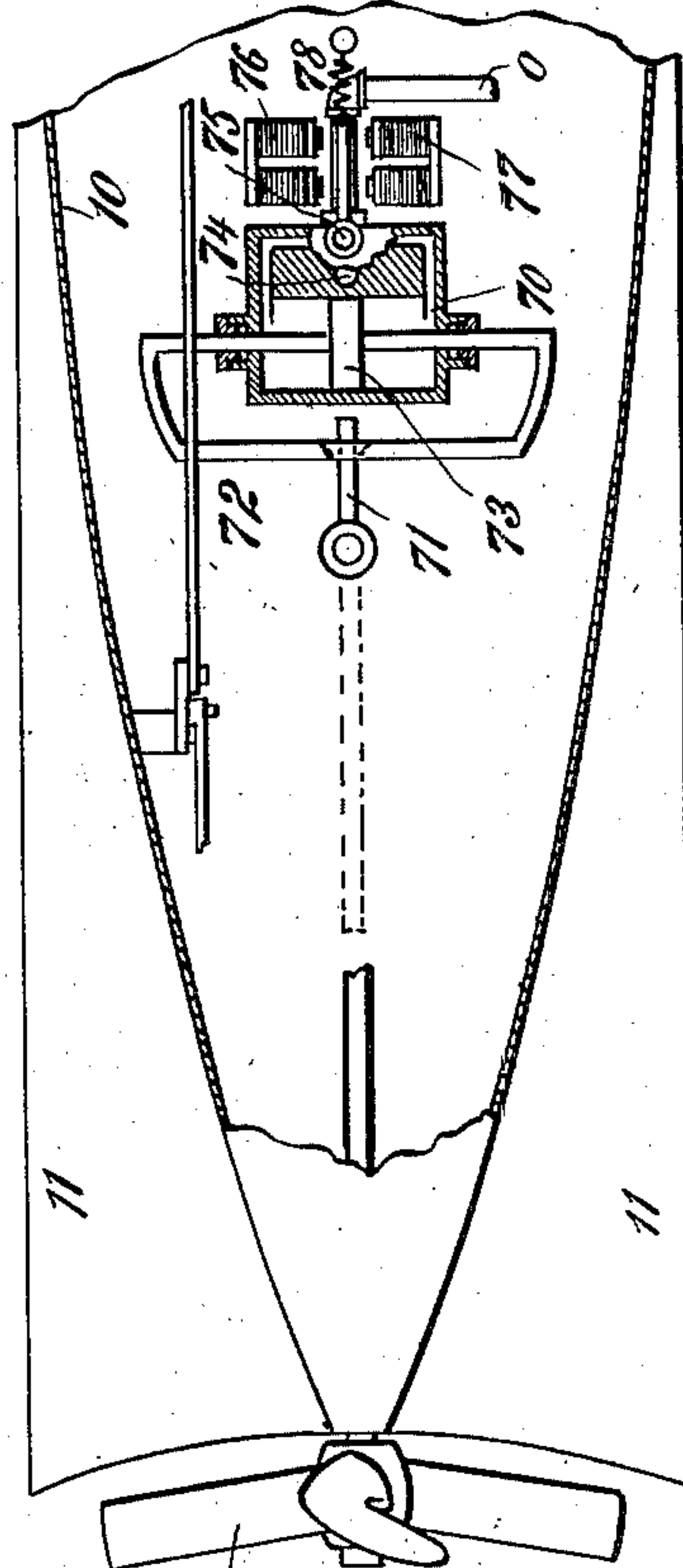


Fig. 11.



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# UNITED STATES PATENT OFFICE.

NICHOLAS J. HALPINE, OF THE UNITED STATES NAVY.

## MARINE TORPEDO.

**SPECIFICATION** forming part of Letters Patent No. 453,861, dated June 9, 1891.

Application filed March 2, 1889. Serial No. 301,756. (No model.) Patented in England March 15, 1889, No. 4,572; in France March 19, 1889, No. 196,816, and in Germany September 27, 1889, No. 48,918.

*To all whom it may concern:*

Be it known that I, NICHOLAS J. HALPINE, a lieutenant in the United States Navy, domiciled and at present residing in the city, county, and State of New York, have invented a new and Improved Marine Torpedo, (for which I have obtained Letters Patent in Great Britain March 15, 1889, No. 4,572; in France March 19, 1889, No. 196,816, and in Germany September 27, 1889, No. 48,918,) of which the following is a full, clear, and exact description.

Prior to my invention marine torpedoes of the self-propelling class, to which class my invention relates, have been so constructed that the explosion of the charge destroyed the torpedo-hull, and consequently such torpedoes have been exceedingly expensive and experimental drills have been practically out of the question.

The main object of my invention is to so construct a torpedo that just prior to the explosion the explosive will be delivered from the hull and the hull removed from close proximity thereto.

To the end named the invention consists, essentially, of a torpedo-hull formed with an open-mouthed chamber adapted to receive an explosive-carrying case, a means for holding the case within the chamber, and a tripping mechanism, all as will be hereinafter more fully explained, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a side view of a torpedo embodying my invention. Fig. 2 is an enlarged cross-sectional view on line *x x* of Fig. 1. Fig. 3 is an enlarged cross-sectional view on line *y y* of Fig. 1. Fig. 4 is an enlarged detail view representing a construction whereby the retaining-catch of the explosive-carrying case may be actuated by an electric current. Fig. 5 is a central longitudinal sectional view of the forward portion of the hull, the parts being represented as they appear after the explosive-carrying case has left its receiving-chamber. Fig. 6 is a central longitudinal

sectional view of the forward portion of the hull, the explosive-carrying case being represented in its position within the chamber. Fig. 7 is a side view in partial section of the detachable arrow-headed stem, a portion of the explosive-carrying case being shown in connection therewith, the forward end of said case being shown in section. Fig. 8 is a cross-sectional view on line *z z* of Fig. 7. Fig. 9 is a detail view of the forward end of the plunger to which the stem shown in Fig. 7 is connected. Fig. 10 is a central longitudinal sectional view of the rear portion of the torpedo. Fig. 11 is a sectional plan view of said rear portion, and Fig. 12 is a plan view of a portion of a torpedo representing a modified construction.

In the specific construction illustrated in the drawings above referred to, 10 represents a hull, which is provided with side guiding-fins 11 and with a heavy keel 12. The hull 10 is formed with a chamber A, which extends downward and forward through the hull, a cover 13 being arranged to close the upper end of the passage forming the chamber, the lower end of the passage, however, being open.

Within the chamber A, I arrange a track or way 14, such track or way serving as the support for a case B, formed to receive a charge of explosive material and provided with upwardly-extending arms 15, which carry small wheels or rollers 16, that ride upon the track or way 14.

In order that the case B may be held within the chamber A, I arrange a spring-actuated catch 17, which is normally held in position to engage a lug 18, formed on the case, and in order that the case B may be released when the torpedo approaches the vessel or other object to be destroyed I mount a plunger 20 in the manner best shown in Figs. 5 and 6, said plunger being provided with a stem 2, which when the plunger is forced inward, as will be hereinafter explained, will strike against the upwardly-extending arm of the catch 17 and throw said catch out of engagement with the case-lug and to the position in which it is shown in Fig. 5.

In order that the plunger 20 may be forced in, as just described, I provide a forwardly-



extending stem 21, formed with a harpoon or arrow head 22, the rear of the stem fitting in a conical block 23, that is apertured to receive projections 3, that are formed upon a piston-head 24, which is carried by the plunger 20.

If vessels or objects unprotected by nets were alone to be attacked, the stem and harpoon-head would be all that would be required for a proper operation of the parts; but as many vessels are protected by nets, so that the harpoon-head could not reach the vessel's hull, it becomes necessary to provide an attachment which will bear against the net and force the stem 21 inward. To this end I mount a cage 25 upon the stem 21, the cage being held to place by frictional contact with the stem and its rearward movement being limited by a collar 26, that is rigidly connected to the stem.

To the cage proper I secure radially-extending arms 27, which bear against the net-stands, and in order that the stem may be held by the net after the head has passed through the net-meshes I pivotally mount arms *d* about the end of the stem, just to the rear of the harpoon-head, and in connection with these arms I arrange springs 28, which tend to throw the arms to the position in which they are shown in Fig. 7, the arms, however, being normally held in the position in which they are shown in Fig. 6 by the cage 25.

In the conical head *b* of the case B, I mount a drum 29, upon which there is coiled a metallic ribbon or chain 30, the end of said ribbon or chain being carried forward in order that it may be connected to the cage 25 or to any other convenient point of attachment upon the stem 21. This chain or ribbon 30 is held taut by the action of a weak spring 31, that is arranged as shown in Fig. 6.

The plunger 20 is provided with a laterally-extending arm, to which there is connected a rearwardly-extending rod 32, said rod being connected to a reversing-lever 33, and being provided with a cam-face 34, which acts upon a trigger 35, (see Fig. 3,) said trigger being arranged to release the firing-pin 36, and the parts being so timed that the firing-pin will be released and forced forward by its spring against a primer 37, which is arranged in connection with a conical fuse-chamber 38, that is carried at the rear end of the case B, just prior to the time when the stem 2 of the plunger acts to throw the catch 17, and thus release the case B.

It is intended that the torpedo above described shall be driven by means of a screw-propeller 40, actuated by a compressed air, electric, or any proper form of motor, (not shown in the drawings,) and it is intended that the torpedo should be controlled by means of a current and proper coils located in connection with the various actuating mechanisms carried by the torpedo.

To convey the current to the torpedo, I mount a reel 50 within a proper casing, ar-

ranged as best shown in Figs. 3 and 10, and upon the reel I wind a proper conductor which is paid out as the torpedo advances, the various connections between the conductor and the operating-magnets being established as may be deemed advisable.

In attacking a vessel or other object unprotected by nets the harpoon-head upon striking the vessel's hull will become embedded therein, and the stem 21, acting upon the plunger 20, will force said plunger to the rear, the firing-pin will be tripped, the catch 17 thrown, the case B freed, and the motor reversed. Immediately after the tripping of the catch 17 the case B will move downward and forward, the reel or drum 29 will pay out, and the case B drop to a position below the vessel, thus reaching a more vulnerable point of attack, the fuse being so timed as to provide for this downward movement of the case. If a vessel protected by nets is to be attacked, the harpoon-head will pass through such netting, the arms 27 will bear against the meshes of the net, and the cage 25 will be forced against the collar 26, thus releasing the arms *d* and permitting their springs 28 to throw them to the position in which they are shown in Fig. 7, in which position they are held against any movement in the direction of the arrow (shown in Fig. 7) by shoulders *e*, as will be readily understood. In case of an armor-protected vessel, the torpedo-hull would be guided so as to strike the vessel well forward near the cut-water, so that the explosive charge will pass under the vessel in a fore-and-aft line, the fuse being timed so that the charge will explode when in the most effective position, and at this point I desire to state that the explosion may be brought about by means of time, electric, contact, or immersion fuses.

The construction hereinbefore described produces an exceedingly safe torpedo, as the loading need not be brought about until just before the torpedo is to be started, and such loading can always be under the direct supervision of a torpedo expert; and in practice the case B would probably be so constructed that the fuse-cap would be made to screw upon or be otherwise fitted to the cage proper. The cover 13 is provided with turn-buttons or other fastening devices which may be quickly manipulated, so that after the case B has been adjusted to the position in which it is shown in Fig. 6 the cover may be quickly applied to the hull to close the opening at the upper end of the passage forming the chamber A. One of the greatest advantages of this construction is that as the hull is not destroyed when the explosion takes place the torpedo corps may be thoroughly familiarized with the use of this particular form of torpedo, which would be a great advantage in case of actual hostilities.

As before stated, any form of motor may be employed to drive the torpedo, and such motor may be coupled with a single propeller



40, as shown in the main figures of the drawings, or the motor may be coupled with two propellers 40<sup>a</sup> and 40<sup>b</sup>, as shown in Fig. 12, and although any form of steering mechanism might be employed I prefer such mechanism as is shown in Figs. 10 and 11, wherein 70 represents a cylinder, in which there is arranged a piston 73, that is connected to a frame 72 by its rods, said frame being slotted to receive the tiller 71. Compressed air is led to the cylinder through a pipe *o* and admitted, as desired, through a valve 75, that is controlled by electro-magnets 76 and 77, the exhaust being through the pipe 74. An inspection of the figures last referred to will show that by charging the proper one of the magnets 76 or 77 the tiller may be moved as desired.

In order that the buoyancy of the torpedo-hull may be within control of the operator, I provide a series of compartments 60, that are separated by perforated partitions, as shown in Figs. 6 and 10, the amount of water admitted to these compartments being regulated by a valve 61, that is controlled by opposing electro-magnets, as indicated, the valve admitting a supply of compressed air when moved in one direction and water when moved in another direction, as will be readily understood.

In certain instances it might be desirable to explode the primer 37 by means of an electric current, and to that end I arrange an electro-magnet in connection with the trigger 35, as shown in Fig. 3, and I also provide for the throwing of the catch 17 by means of an electro-magnet, as shown in Fig. 2.

In practice it might and probably would be desirable to bring about the return of the torpedo-hull by forcing it forward and turning it in its course after the primary backing from the vicinity of the explosion had taken place, and to this end I could arrange an electro-magnet in connection with the reversing-lever, as indicated in Fig. 10.

In order that the plunger 20 may be held against accidental displacement, I provide a break-pin *f*, which is arranged as shown in Fig. 6, such pin being made of soft metal or other material which will readily cut or break when the stem 21 is subjected to any severe shock; but the pin should be of sufficient strength to hold the plunger against any accidental displacement.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A torpedo-boat formed with a chamber or passage open at each end and extending diagonally through the skin of the boat on opposite sides, substantially as described.

2. A torpedo-boat formed with a chamber or passage open at each end and extending diagonally through the skin of the boat on opposite sides, in combination with a detachable cover adapted to close the upper end of

the passage or chamber, substantially as described.

3. A torpedo-boat formed with an open-mouthed chamber adapted to receive an explosive-carrying case and provided with a plunger and a catch operated thereby, in combination with a stem which bears upon the plunger and is arranged for detachable connection with the hull, substantially as described.

4. A torpedo-boat formed with a chamber adapted to receive an explosive-carrying case and provided with a plunger and a catch operated thereby, in combination with a stem which bears upon the plunger and is arranged for detachable connection with the hull, an explosive-carrying case distinct from the hull and arranged to fit within the hull-chamber and to be engaged by the catch, and a connection between the explosive-carrying case and the stem, substantially as described.

5. A torpedo-boat formed with a chamber adapted to receive an explosive-carrying case and provided with a plunger and a catch operated thereby, in combination with a stem provided with an attachment adapted to engage a ship's protecting-net and arranged for detachable connection with the hull, an explosive-carrying case arranged to fit within the hull-chamber and to be engaged by the catch, and a flexible connection between said case and the stem, substantially as described.

6. A torpedo-boat formed with a chamber adapted to receive an explosive-carrying case and provided with a plunger and a catch operated thereby, in combination with an arrow or harpoon headed stem, which bears upon the plunger and is arranged for detachable connection with the hull, and a connection, substantially as described, between the stem and the explosive-carrying case, as and for the purpose stated.

7. A torpedo-boat formed with a chamber adapted to receive an explosive-carrying case and provided with a plunger and a catch operated thereby, in combination with a stem which bears upon the plunger and is arranged for detachable connection with the hull, a connection between the explosive-carrying case and the stem, a cage formed with extending arms, loosely mounted on the stem, a collar rigidly connected to the stem to the rear of the normal position of the plunger, arms pivotally mounted upon the stem in advance of the cage, and springs arranged in connection with the arms, substantially as described.

8. A torpedo-boat formed with a chamber adapted to receive an explosive-carrying case and provided with a plunger and a catch operated thereby, in combination with a rod connected to the plunger, a reversing-lever connected to the rod, a stem which bears upon the plunger and is arranged for detachable connection with the hull, and a connection between the stem and the explosive-carrying case, substantially as described.



9. A torpedo-boat formed with a chamber adapted to receive an explosive-carrying case and provided with a plunger and a catch operated thereby, in combination with a rod provided with a cam-faced projection and connected to the plunger, a firing-pin, a trigger arranged in connection therewith and mounted in a position to be borne upon by the cam-faced projection of the rod, a stem arranged

for detachable connection with the hull, and a connection between the stem and the explosive-carrying case, substantially as described.

NICHOLAS J. HALPINE.

Witnesses:

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C. SEDGWICK.