(No Model.) 2 Sheets—Sheet 1.

A. W. SAVAGE.

MARINE TORPEDO.

No. 456,524. Patented July 21, 1891.

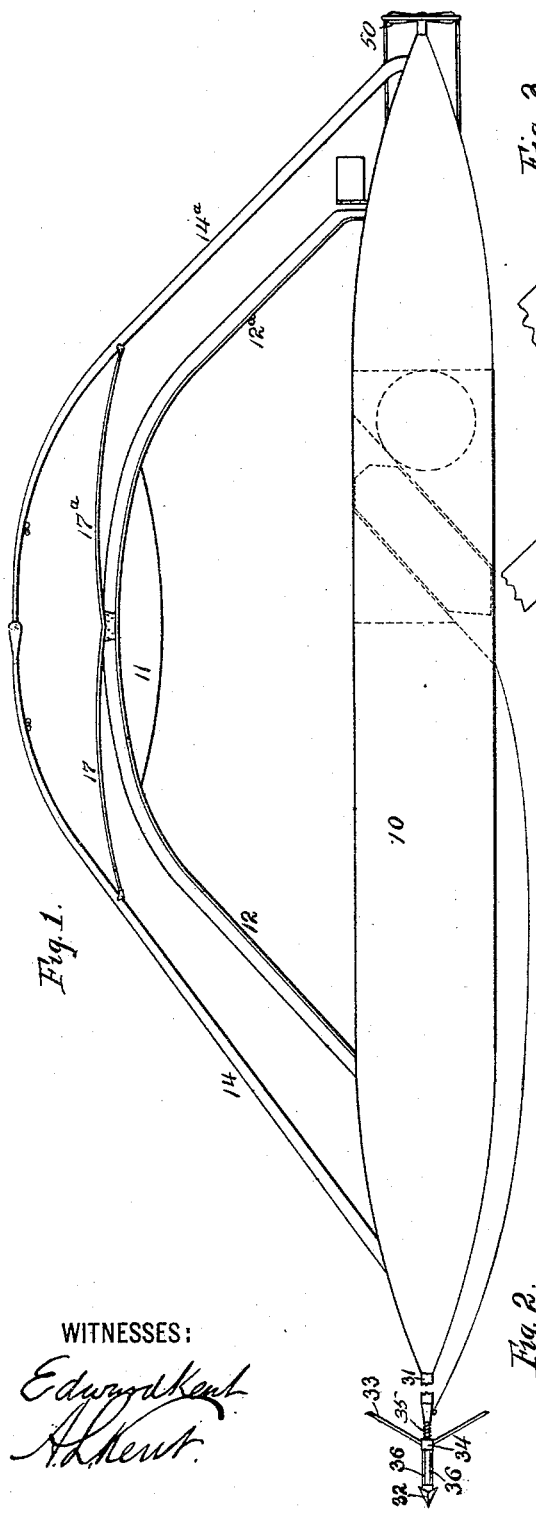

Fig. 1.

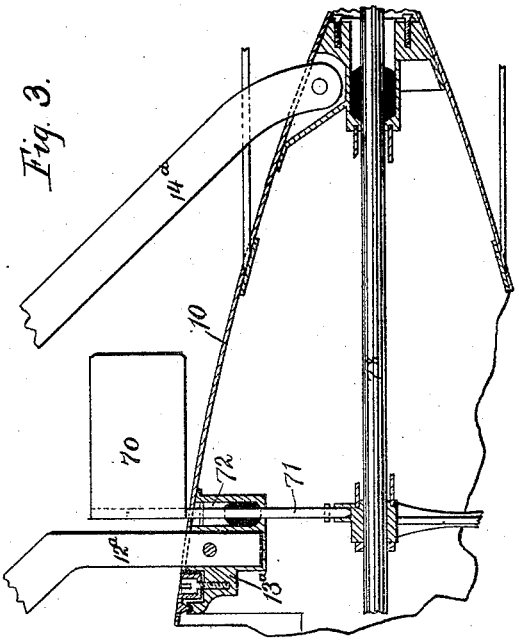

Fig. 3.

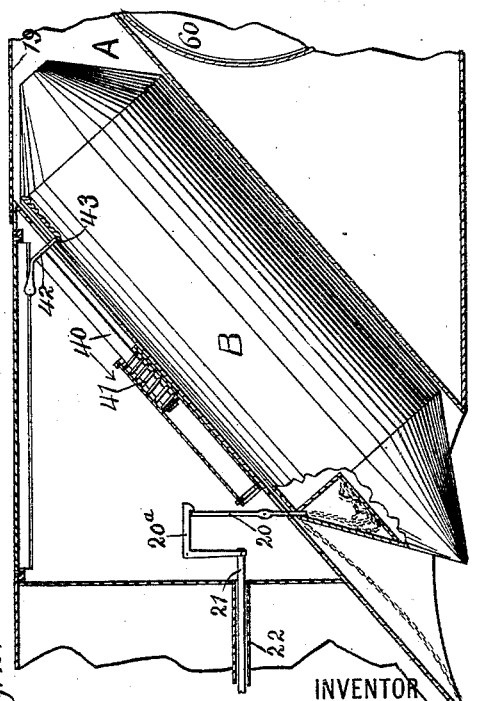

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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MARINE TORPEDO.

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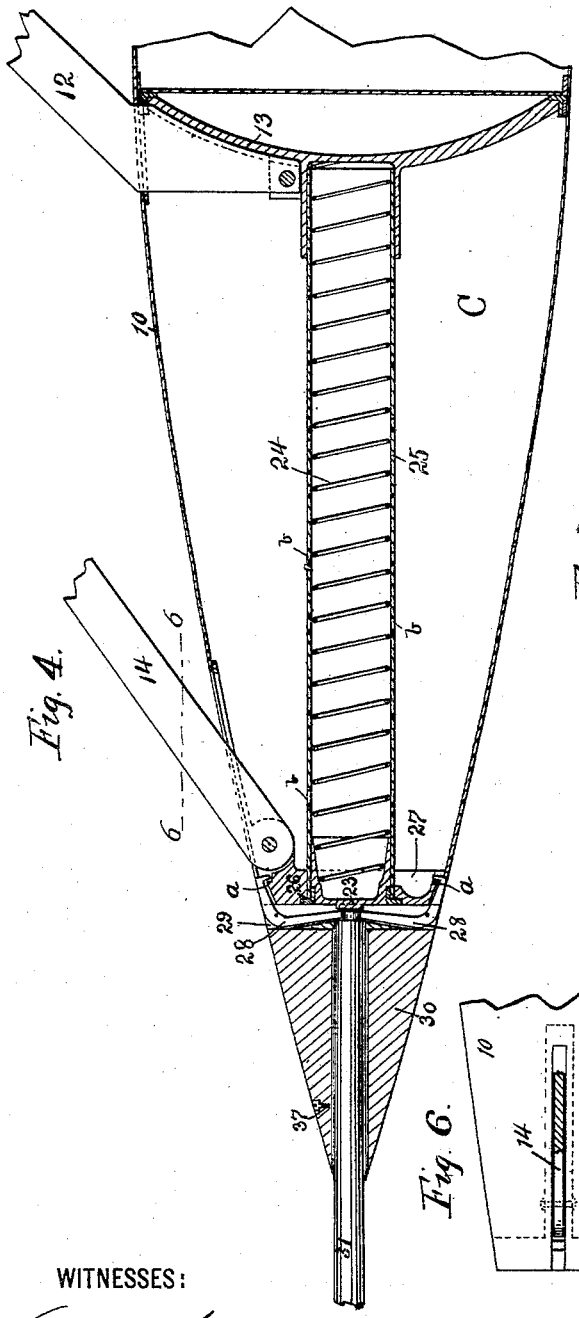


Fig. 4.

Fig. 5.

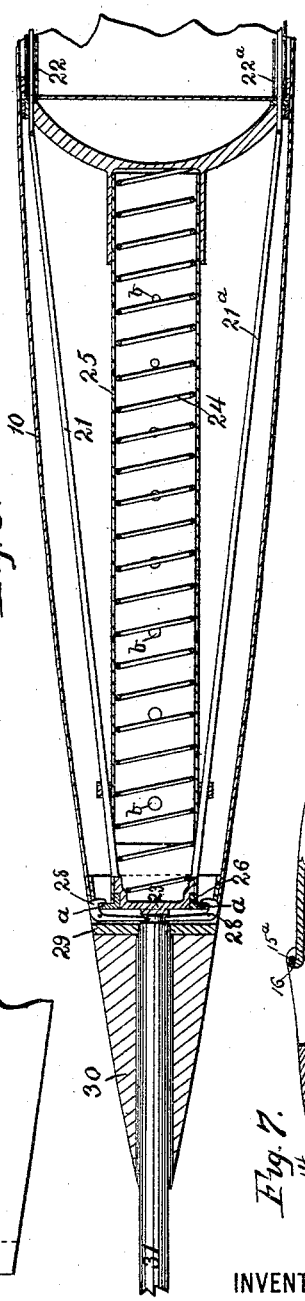
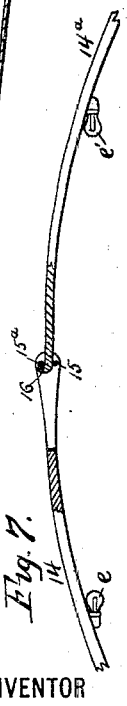


Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

ARTHUR W. SAVAGE, OF UTICA, NEW YORK.

MARINE TORPEDO.

SPECIFICATION forming part of Letters Patent No. 456,524, dated July 21, 1891.

Application filed January 15, 1891. Serial No. 377,828. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR W. SAVAGE, of Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Marine Torpedoes, of which the following is a full, clear, and exact description.

This invention relates to the mechanical construction of torpedo-boats of the class wherein the hull proper is submerged, but supported at a suitable distance below the surface by a float, and wherein the hull is formed with a chamber or passage adapted to receive the torpedo proper, provision being made for the automatic discharge of the torpedo and the reversing of the boat's motor upon impact with the vessel or other object which it is sought to destroy.

The main objects of my invention are, first, to provide for a proper discharge of the torpedo, and, second, to relieve the hull of all undue shock or jar at the time of impact.

The above and many other minor objects are sought for and obtained by means of the novel construction and combination of elements, to be hereinafter described, 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 reference letters and figures indicate corresponding parts in all the views.

Figure 1 is a side view of the torpedo. Fig. 2 is a detail view in central longitudinal section of that portion of the boat in which the torpedo-chamber is formed, the torpedo being represented in full lines, parts, however, being broken away. Fig. 3 is a central longitudinal sectional elevation of the stern of the torpedo-boat. Fig. 4 is an enlarged central longitudinal sectional view of the forward portion of the torpedo-boat. Fig. 5 is a central sectional plan view of the parts represented in Fig. 4. Fig. 6 is a sectional detail view on lines 6 6 of Fig. 4. Fig. 7 is a detail section of the upper ends of the arms 14 and 14^a.

In the drawings above referred to, 10 represents the hull, and 11 the float, said float being supported by arched bars 12 and 12^a, that are rigidly supported in castings 13 and 13^a. The float 11 is preferably formed of sheet metal and filled with any buoyant substance, such as cork or lamp-black. Just abaft the bow and just forward of the stern, I pivotally mount arms 14 and 14^a, that extend upward and over the float 11, the upper end of the arm 14 being bifurcated and provided with guide-pins 15 and 15^a, between which the end of the arm 14^a extends, said end being formed with a hook or stop 16, which prevents the arms from separating. The arms 14 and 14^a constitute a guard for the float 11, and are normally upheld by spring-arms 17 and 17^a, that are rigidly connected to the arched arms 12 and 12^a.

From the construction above described it will be seen that if any floating obstruction—such as a log or raft—be encountered as the boat is moving forward the arm 14 will be depressed against the tension of its spring 17, and will be gradually carried downward, the momentum of the boat being gradually checked and the movement of the two arms 14 and 14^a being sufficient to permit of their moving close down upon the float-supports 12 and 12^a, and consequently the boat would pass forward beneath the obstruction.

Toward the stern of the hull 10 there is formed a chamber or passage A, that is normally closed by a trap or cover 19, and within this chamber the torpedo B is held, all downward movement of the torpedo being prevented by a catch 20, that is arranged as best shown in Fig. 2, the catch 20 being engaged by a catch 20^a, that is, in turn, connected by a rod 21, said rod extending forward through a tube 22 to a point just to the rear of a follower 23. The follower 23 is normally held in the position in which it is shown in Figs. 4 and 5 by a heavy spring 24, that is coiled within a tube 25, said tube being fixed in the forward compartment C of the hull 10, and all movement in advance of the position in which the follower is shown in the figures referred to being prevented by a gasket 26, that is screwed or otherwise held within the forward end of the tube 25.

As before stated, the guard-arm 14 is pivotally connected to the hull 10, in close proximity to the bow, the direct connection of the arm being with a casting 27, that is formed with a number of shoulders *a*, that are nor-

mally engaged by bell-crank catches 28, the said catches being pivotally supported in slots formed in a casting 29, constituting a portion of a conical block 30, that is centrally apertured.

Within the aperture of the block 30 there is fitted a stem 31, that extends outward and forward from the bow of the hull and carries at its end by preference a harpoon-point 32 and laterally-extending arms 33, said arms being supported by a sleeve 34, that is normally held in the position in which it is shown in Fig. 1 by a spring 35. The sleeve 34 acts as a retaining attachment for spring-pressed arms 36, which, when the sleeve 34 is pressed backward against the tension of its spring 35, would fly outward.

The inner end of the stem 31 bears against the follower 23 and also against the inner ends of the catches 28, and the stem is held from accidental displacement by a brake pin or screw 37, carried by the block 30, and arranged to bear upon the stem, the arrangement being such that the stem will be held against any ordinary shock or jar, but in case a heavy obstruction, such as a vessel, is encountered the stem will be forced backward, and in moving backward will carry with it the follower 23. As before stated, the rod 21, which controls the torpedo-retaining catches 20 and 20^a, extends forward from side catches to a point so that it will be borne upon by the follower 23, and, consequently, as said follower is moved to the rear the rod 21 will be carried backward and the torpedo will be released. At this time it is desirable that an impulse of considerable force be imparted to the torpedo, and to this end I provide a plunger 40, in connection with which there is arranged a spring 41, which tends to throw the plunger in the direction of the arrow shown in connection therewith in Fig. 2. To the upper end of the plunger I secure an arm 42, which bears upon a shoulder 43, formed on the torpedo B, so that when the catch 20 is released the spring 41 is free to move its plunger downward, and as the plunger is so moved downward the torpedo will be expelled from the chamber A. Other means, such as a charge of rocket-powder, might be employed to aid the downward movement of the torpedo.

It is intended that the torpedo-boat above described shall be driven by means of a screw-propeller 50, actuated by a compressed air, electric, or any proper form of motor, (not shown in the drawings,) and it is intended that the boat should be controlled by means of a current and proper coils, located in connection with the various actuating mechanisms carried thereby, and it is also intended that the boat should be driven at an exceedingly high rate of speed, so that it becomes necessary to provide some means for relieving the hull of all undue shock or jar incident to the checking of the momentum thereof upon impact with the vessel which it is sought to destroy. To the end last above named I have provided the heavy spring 24; but as an auxiliary device I form the tube 25 with a series of apertures *b*, said apertures decreasing in size from the forward to the rear end of said tube. It will be noticed that the chamber C is in free communication with the surrounding water, and consequently the tube 25 would be normally filled with water. It will also be noticed that the follower 23 fits closely within the tube, and consequently when the stem 31 strikes an obstruction of sufficient stability to cause it to be driven backward, the follower will offer a gradually-increasing resistance to the backward movement of the stem, and the hull will thus be relieved from the injurious effect of an instantaneous checking of its momentum.

The torpedo B is connected to the stem 31 by a flexible connection, and the stem 31 is arranged so that it will engage either the hull of the vessel or net by which the vessel is surrounded, and then as the torpedo is ejected it will pass downward to a point beneath the vessel-hull, there to be exploded by any proper mechanism.

It is desirable that the motor employed in driving the boat should be automatically reversed the moment the stem 31 strikes an obstruction; and to this end I provide a rod 21^a, the forward end of which is borne upon the plunger 23 while the rear end is connected to a reversing-lever. (Not shown in the drawings.) Although, as before stated, any proper motive element might be employed for the purpose of driving the boat forward, I greatly prefer to employ storage-batteries, that are carried by the hull. These batteries I have not shown in the drawings, and although any proper means might be employed to convey a controlling-current from the operating-station to the torpedo-boat, I prefer to convey said current to the boat by means of a conductor that is wound upon a reel 60, mounted in a proper casing, arranged as indicated in Fig. 2, the various connections between the conductor and the operating-magnets being established, as may be deemed advisable.

Any proper steering mechanism might be employed in connection with the boat, but in practice I prefer to arrange a rudder 70 above the hull and just to the rear of the arm 12^a, such rudder being supported by a post 71, that enters the hull through a stuffing-box 72.

In case operations are carried on at night it is desirable that some provision be made for the tracing of the course of the boat, and to this end I mount signal-lights *e e'* beneath the guard-arms 14 and 14^a, and I find in practice that this arrangement has many advantages over the ordinary signal-staff employed in other submarine torpedoes.

With such constructions as those above described, the motor of the torpedo-boat will be automatically reversed upon impact with the vessel it is sought to destroy, and at the same time the torpedo will be automatically

discharged and will leave the boat at an angle such that it will pass downward and beneath the net by which vessels are usually surrounded when in action, and then, drawing upon the chain by which it is connected to the stem, the torpedo will rise and will explode at a point directly beneath the vessel's hull.

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

1. In a torpedo-boat, the combination, with the hull, of a stem extending forward therefrom, a block through which the stem passes, a fragile connection between the stem and block, and catches carried by the block and arranged to engage the hull, substantially as described.

2. In a torpedo-boat, the combination, with the hull, of a stem extending forward therefrom, a block through which the stem passes, a brake-pin by which the block and stem are connected, and bell-crank catches carried by the block borne upon by the stem and arranged to engage the hull, substantially as described.

3. In a torpedo-boat, the combination, with the hull formed with a chamber adapted to receive a torpedo, of a catch adapted to engage the torpedo, said torpedo, a rod arranged to operate the catch, a follower which bears upon the rod, a stem which operates the follower and extends forward from the hull-bow, a connection between the hull and the stem, and a connection between the stem and the torpedo, substantially as described.

4. In a torpedo-boat, the combination, with the hull, of a spring-guide arranged in the forward part thereof, a spring arranged within the spring-guide, a follower which bears upon the spring, and a stem which extends forward from the hull-bow and bears upon the follower.

5. In a torpedo-boat, the combination, with the hull, of a tube arranged in the forward part thereof and formed with a series of apertures, a follower mounted within the tube, and a stem which extends forward from the hull-bow and bears upon the follower.

6. In a torpedo-boat, the combination, with the hull, of a tube arranged in the forward part thereof and formed with a series of graduated apertures, a follower mounted within the tube, and a stem which bears upon the follower and extends forward from the hull-bow.

7. In a torpedo-boat, the combination, with the hull, of a tube arranged in the forward part thereof and formed with a series of apertures, a follower mounted within the tube, a spring arranged within the tube and bearing against the follower, and a stem which bears upon the follower and extends forward from the hull-bow.

ARTHUR W. SAVAGE.

Witnesses:
H. J. BENSON,
W. A. PROESCHOLDT.

Correction in Letters Patent No. 456,524.

It is hereby certified that Letters Patent No. 456,524, granted July 21, 1891, upon the application of Arthur W. Savage, of Utica, New York, for an improvement in "Marine Torpedoes," was erroneously issued to the said Savage as owner of said invention; that said Letters Patent should have been issued to *Thomas H. Thomas, of Bay Ridge, New York*, said Thomas being assignee of the entire interest in said invention as shown by the assignments of record in this office; and that 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, countersigned, and sealed this 11th day of August, A. D. 1891.

[SEAL]

CYRUS BUSSEY,
Assistant Secretary of the I[illegible]

Countersigned:
W. E. SIMONDS,
Commissioner of Patents.

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[SEAL]

CYRUS BUSSEY,
Assistant Secretary of the Interior.

Countersigned:

W. E. SIMONDS,
Commissioner of Patents.