

(No Model.)

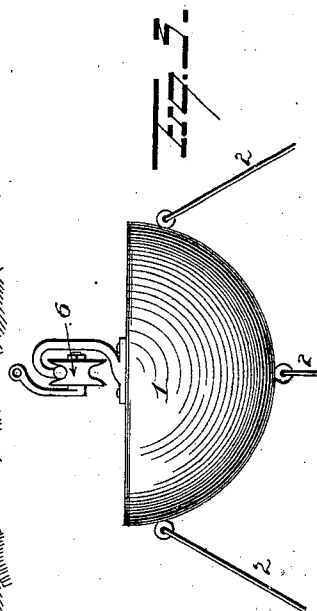
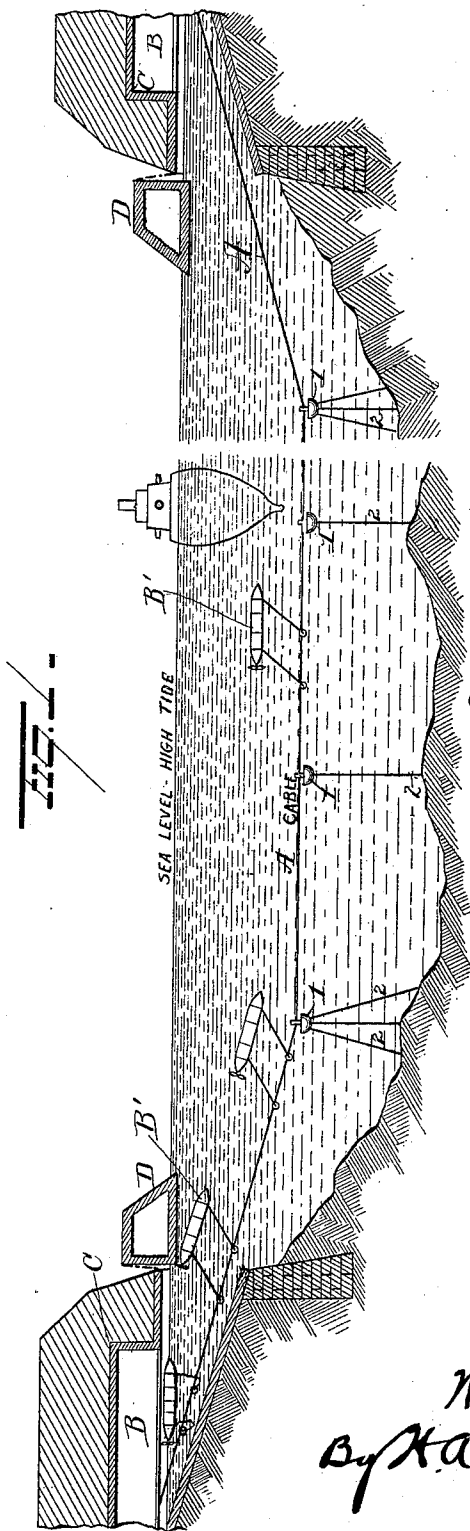
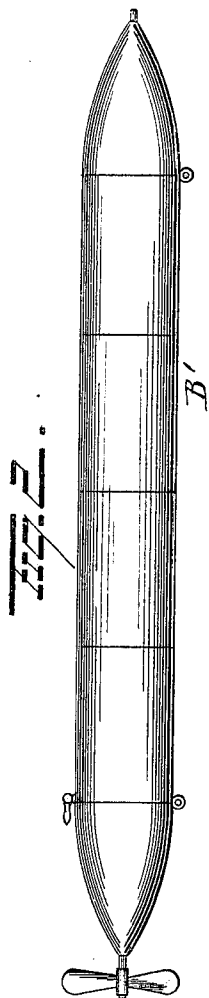
3 Sheets—Sheet 1.

W. F. BREWSTER.

APPARATUS FOR OPERATING SUBMARINE TORPEDOES.

No. 576,088.

Patented Feb. 2, 1897.



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(No Model.)

3 Sheets—Sheet 2.

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FIG. 4.

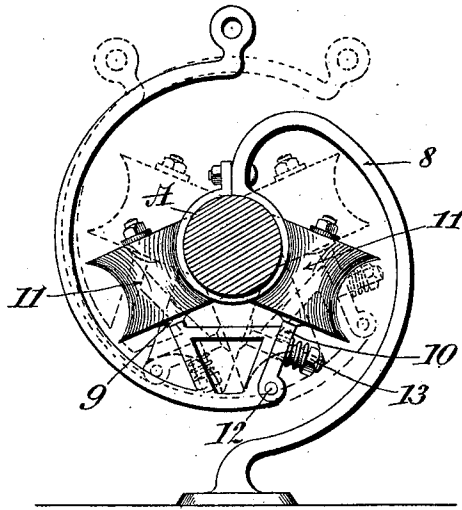


FIG. 5.

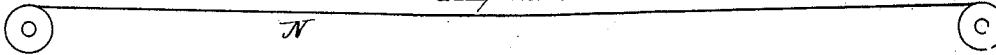


FIG. 6.

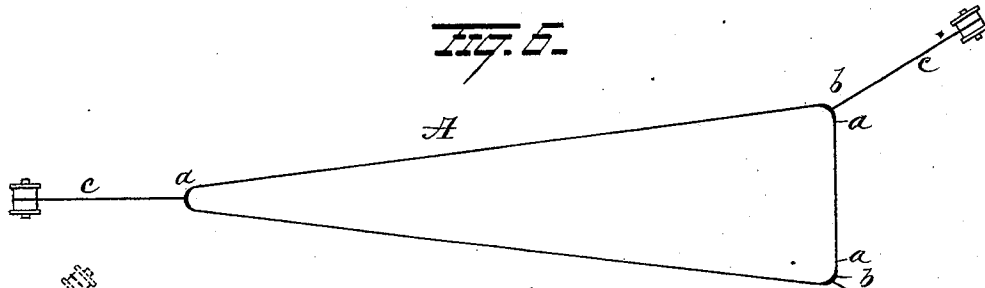
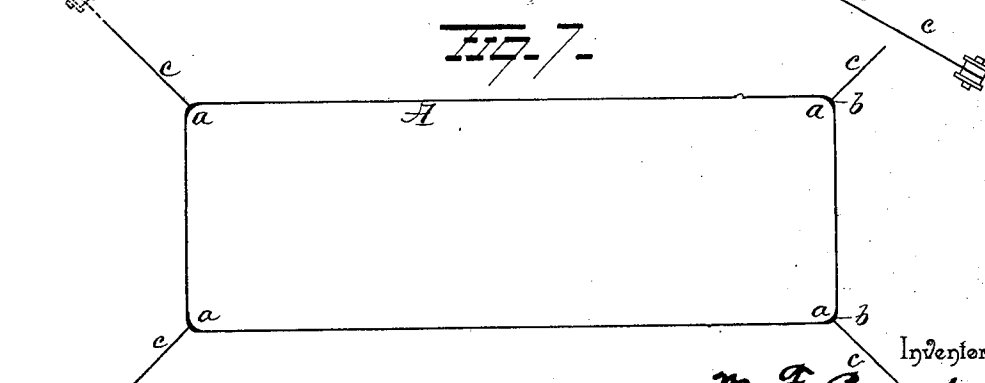


FIG. 7.



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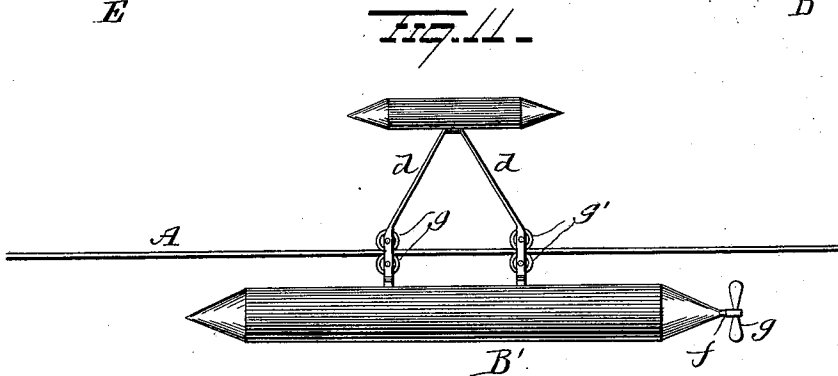
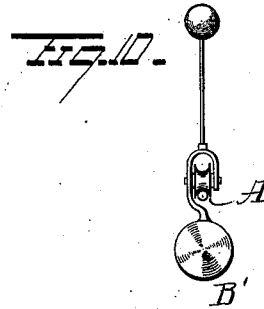
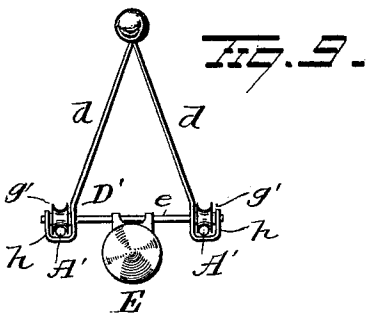
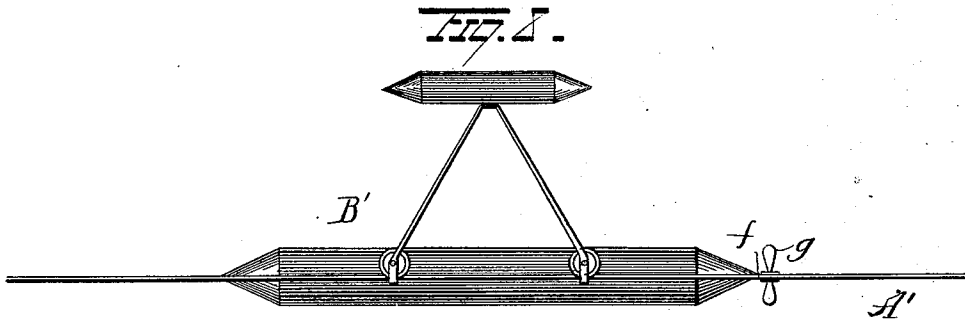
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UNITED STATES PATENT OFFICE.

WILLIAM F. BREWSTER, OF NEW YORK, N. Y.

APPARATUS FOR OPERATING SUBMARINE TORPEDOES.

SPECIFICATION forming part of Letters Patent No. 576,088, dated February 2, 1897.

Application filed March 11, 1896. Serial No. 582,797. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. BREWSTER, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Systems for Operating Submarine Torpedoes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improved system for operating submarine torpedoes, the object being to provide a submarine track at any point it is desired to protect which will serve to confine the movement of the torpedo within fixed and predetermined limits and render it operative without the necessity of steering or other guiding apparatus and without regard to darkness, smoke, or fog.

With this object in view my invention consists, first, in a submarine-torpedo system comprising a submarine track and a self-propelling torpedo connected therewith and adapted to be guided thereby.

My invention further consists in certain features of construction and combinations of parts, as will hereinafter be described, and pointed out in the claims.

In the accompanying drawings, Figure 1 illustrates one embodiment of my improved submarine-torpedo system. Fig. 2 shows one construction of self-propelling torpedo. Fig. 3 is a view of a float. Fig. 4 represents one suitable construction of trolley. Figs. 5, 6, and 7 represent modified embodiments of the invention, and Figs. 8, 9, 10, and 11 are views of modifications.

A represents a track or cable, which may consist of wire, rope, or other material. Track A may be a single track extending from fort to fort or from point to point across a bay or channel thereof, or a river or harbor, as illustrated in Fig. 1, wherein the track is supported by floats at different points, or it may have its ends attached to suitable drums or other devices for stretching it comparatively taut, as represented in Fig. 5, in which case the floats are dispensed with. In either construction the self-propelling torpedo, which is connected with the track and guided thereby, is

constructed to be guided by the single track as the torpedo travels to and fro across the harbor, river, or other body of water it is desired to protect. In this embodiment of my invention suitable devices will be provided for automatically reversing the propelling mechanism of the torpedo when it has reached the end of the track and thereby cause it to travel in the opposite direction.

Track A instead of being a single track, requiring the torpedo to travel back and forth, as described, may be a continuous rectangular track, as represented in Fig. 7, or a triangular track, as represented in Fig. 6, and may or may not be provided with floats, according as the conditions and circumstances may require.

As illustrated in Figs. 6 and 7, the track at the turns *a* is attached to rigid track-sections *b*, which latter have attached thereto suitable wire ropes or chains *c*, which may lead to the shore or to any structure built for their attachment, by means of which the track is stretched and forms a continuous circuit for the travel of the submerged torpedo. The launching-point B of the torpedo may be located under a bomb-proof or shot-protected room C, and suitable devices may be applied to the track at this point for checking and stopping the torpedo. The entrance to the bomb-proof room or section C may be protected at low tide by means of a floating shot-proof shutter D, which is constructed to rise and fall with the tide.

In practice the torpedo may, upon notice being given from a lookout on a parapet that an enemy's ship is coming in range, be launched so as to strike the ship as it is crossing the line of the cable or track. The speed of the torpedo may be regulated and controlled as desired.

Where a continuous track is put down, as illustrated in Fig. 6 or Fig. 7, the torpedo may at a high rate of speed patrol the waters it is intended to defend, and, if need be, it may be furnished with sufficient propulsive force to maintain it in continuous operation for prolonged periods of time—as, for instance, throughout an entire night or for a long period during a fog.

When floats are required to support the cable or track, any approved form or construction of float may be utilized. One form suitable for the purpose is shown in Fig. 5, in which is shown a hemispherical air-chamber 1, flat on its top and convex on the lower surface. The object of this peculiar form is to provide as far as possible against displacement of the track by change of tide and to insure the greatest possible amount of buoyancy. The shape and construction of the floats may of course be widely varied. The number and size of floats necessary will depend on the size and length of the cable or track and the strength of the tides. These floats 1 are anchored in any convenient manner and are preferably held by one or more cables 2 2, as occasion demands.

The track or cable is attached to the floats by any suitable support—as, for instance, by a support of the construction illustrated in Fig. 4, which consists of a bar extending upwardly and curved around to form an arm and then downwardly around the track or cable. However, any other suitable support may be employed for the purpose.

The trolley 4 employed may consist simply of a grooved wheel 6, as shown in Fig. 3, arranged to travel on the track or cable and attached to the torpedo by means of short cables, or it may, for example, be constructed as shown in Fig. 4. In this form there is a curved arm 8, which extends around from a point somewhere above the track or cable to a point on the opposite side thereof. Two diverging spindles 9 and 10 extend upwardly from the lower end of this arm, and on them the sheaves 11 11 are journaled, one being disposed on each side of the cable. One of these spindles, 10, is hinged or pivoted, as at 12, for the arm as a convenient means for swinging the sheaves apart when necessary to apply or remove the trolley from the track or cable. When thus pivoted or hinged, a screw 13 or some equivalent means is employed for maintaining the normal positions of the sheaves relative to each other. Equivalent means, such as springs, might be used in any desired form to hold the sheaves in position and at the same time permit them to separate slightly in passing a supporting-arm. The main thing to be provided against in this particular form of trolley is the accidental displacement of the trolley from the track or cable. This is effectually accomplished by hollowing out the sheaves so that they overreach and embrace more than half of the circumference of the track or cable; or, in other words, this end is effected by making the greatest distance between the ends or edges of the sheaves when in their normal relations less than the diameter of the cable.

Another object is to give freedom of lateral movement subject to the pressure caused by tides, as indicated in the positions shown in dotted lines in Fig. 4. It is evident that other

means might be adopted for the accomplishment of these results, and I have no desire to restrict myself to details.

In systems where the track is stretched taut and floats are not employed no cable-supports are needed, and then the ordinary construction of closed or locked pulley, as represented in Fig. 9, for connecting the torpedo with the track or cable, may be used.

Any self-propelling torpedo B' may be employed in connection with my improved system. The propulsion force may be a primary or storage battery, or compressed air, or explosive engine, or the torpedo may be provided with an electric motor and with means whereby the current may be transmitted thereto through a conductor from shore or other point. In fact, I in no wise reduce my invention to any particular construction or type of torpedo.

In the drawings the track is illustrated as being about thirty feet below sea-level at low tide, and hence a safe distance below the keel of any-sized vessel. However, the track may be located at any desired depth below low-water level. The short cables connecting the torpedo with the track may be made adjustable in length, so that the torpedo may be made to travel from ten to twenty feet, more or less, below the surface of the water and strike the keel or hull of any vessel that should attempt to cross the path of its travel.

As has been alluded to, the path of the torpedo may be in a circuitous course, in which event it would travel around the harbor indefinitely, or the track or cable might extend directly across from battery to battery, in which event a net or some other means for catching the torpedo without exploding it would be provided, as well as a launching-room for starting the torpedoes on their course. Some device may be made for catching these torpedoes without their exploding or for reversing or stopping their propelling mechanism, but these are features of mechanical or electrical detail which need not be further described therein; also, many other details may be developed hereinafter as occasion may demand, but they do not require description herein.

Should a torpedo stop at any point, as a means for locating it a small float might be attached to it with sufficient length of rope or cable so that it would be kept under water and invisible when the torpedo is in transit, owing to the speed of the torpedo and the resistance of the water upon it, and would ride to the surface immediately upon the stoppage of the torpedo.

It may be stated that the main object sought to be accomplished by my invention is the guiding of a torpedo over a track or course so that torpedoes may be launched and made to travel in a given path without requiring any aim or without the usual hindrances incident to darkness, fogs, or smoke, the plan

of the present invention being to keep up a constant patrol in the waters around any point to be defended, whether it be a fort, battery, or a fleet merely, or a city.

5 Torpedoes of minimum weight and cost may be employed in this system, because they require no steering apparatus, which is of necessity complicated in construction and uncertain in its operation. Again, the torpedoes cannot be deflected from their course by tides or currents and will not be lost provided they miss their target and become a hidden source of danger.

15 It will be evident that the system is extremely simple in its construction and of small initial cost, because a track of wire cable of sufficient length to protect almost any harbor or river will cost but a comparatively small amount, and, as heretofore stated, the torpedoes do not require steering apparatus of any description, and hence can be furnished at a minimum price. Another important advantage of my improved system is portability and the fact that it may be very quickly installed at any point it is desired to protect temporarily.

25 In view of the fact that a high rate of speed may be given the torpedo it will be practically impossible for an enemy to grapple and pull up or otherwise destroy the track, because of the almost certain destruction of any vessel that should make the attempt.

35 Instead of employing self-propelling torpedoes of sufficient buoyancy to carry their own propelling mechanism they may be made in two sections, one section carrying the explosive charge and the other carrying the propelling mechanism, and the entire structure may be supported upon and guided by suitable cables. Embodiments of a torpedo of this type are represented in Figs. 8, 9, and 11.

45 A' A' represent two wire cables which may be stretched taut from point to point and be arranged so that the torpedo will move backward or forward, or they may be arranged to form a continuous track upon which the torpedo will travel continuously in the same direction. These cables may be provided with suitable floats, if desired, in which case the supporting wheels or pulleys of the torpedo carriage or frame will be suitably constructed to pass over the support connecting the float and cable.

55 D' is a frame consisting of uprights *d* of any desired number and preferably inwardly inclined at their upper ends. To the upper ends of these uprights is secured in any desired manner any suitable construction of torpedo, which may comprise simply a shell filled with the explosive charge, and hence will be comparatively small and light. The lower ends of the uprights *d* are connected by one or more tie-rods or cross-pieces *e*, from which the motor-casing E is suspended. Within casing E is placed any suitable motor, which is connected with a propeller-shaft *f*, provided with

a propeller *g*, or the shaft may have a propeller at each end, if desired. A primary battery or storage battery may be placed within casing E, or, instead of a battery, current may be transmitted by a conductor to an electric motor in the casing, or any other motive power may be employed within the casing.

70 Upon cables A' A' are mounted supporting-wheels *g'*, which are provided with housings or guides *h* to retain them against displacement. To the guides *h*, at points preferably below the cables, are secured the lower ends of the uprights *d* or the frame connected therewith. Hence it will be observed that in this construction of torpedo the motor for propelling it is supported and guided by the two tracks or cables, which may be located at a safe depth to prevent them from being tampered with or from being grappled by the enemy, while the explosive charge of the torpedo is carried at any desired height above the motor-casing. If desired, suitable means might readily be provided for adjusting the height of the torpedo-casing above the cables. At the shore end of the cable or torpedo-launching station the cables may extend over an adjustable float or support, whereby when it is desired to stop the torpedo the cables may be elevated to such a distance that the motor-casing and propeller will be raised out of the water, and thus the torpedo brought to a state of rest. This adjustable float may also be utilized in launching the torpedo.

100 It is evident that other slight changes might be made in the form and arrangement of the several parts described without departing from the spirit and scope of my invention, and hence I do not wish to limit myself to the exact construction herein set forth; but, Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a submarine-torpedo system, a submerged cable constructed and adapted to constitute a track for guiding and controlling a torpedo in transit, and a torpedo connected thereto, substantially as set forth.

2. In a torpedo system, the combination with a submerged track or cable, of a self-propelling torpedo connected with the track and guided thereby.

3. In a torpedo system the combination with a submerged continuous track, or cable, of a self-propelling torpedo connected with the track and guided thereby.

4. In a torpedo system, the combination with a submerged track or cable, of a trolley adapted to travel thereon, and a torpedo to which the trolley is connected, substantially as set forth.

5. In a torpedo system, the combination with a submerged track or cable, of an automobile torpedo, and a trolley connected with the torpedo and traveling on the track or cable, substantially as set forth.

6. The combination with a series of sub-

merged floats, of a track or cable secured to and supported by these floats, substantially as set forth.

- 5 7. The combination with a cable, and a buoyant torpedo, of a trolley attached to the torpedo and held against the lower side of the cable by the buoyancy of the torpedo, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIAM F. BREWSTER.

Witnesses:

GEO. F. DOWNING,
VERNON E. HODGES.