J. M. SEYMOUR, Jr.

TORPEDO.

APPLICATION FILED MAY 19, 1917.

1,265,262.

Patented May 7, 1918.

2 SHEETS—SHEET 1.

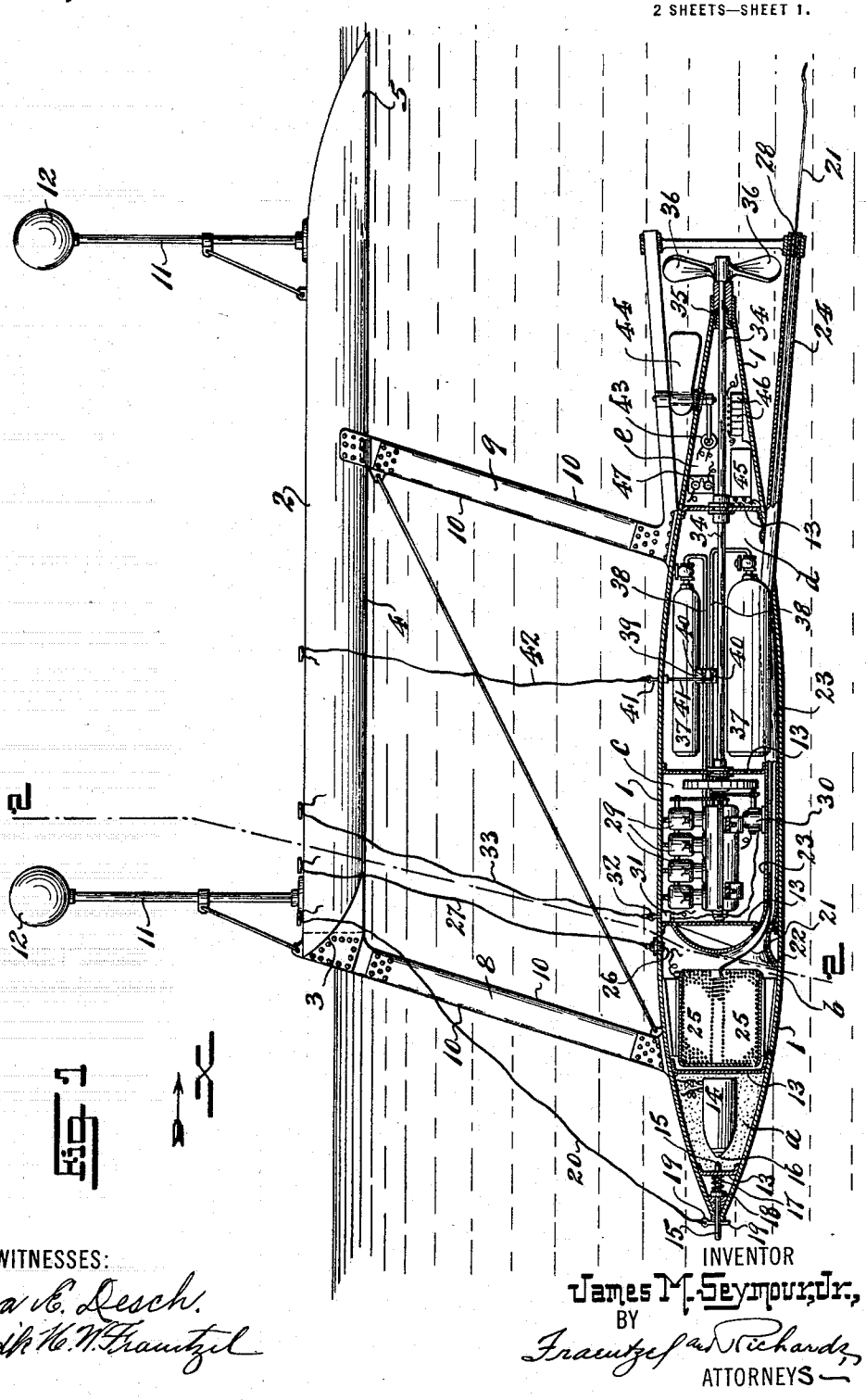


Fig. 1.

WITNESSES:

Eva C. Desch.

Fredk W. Frantzel

INVENTOR

James M. Seymour, Jr.,

BY

Frantzel & Richards

ATTORNEYS

J. M. SEYMOUR, Jr.

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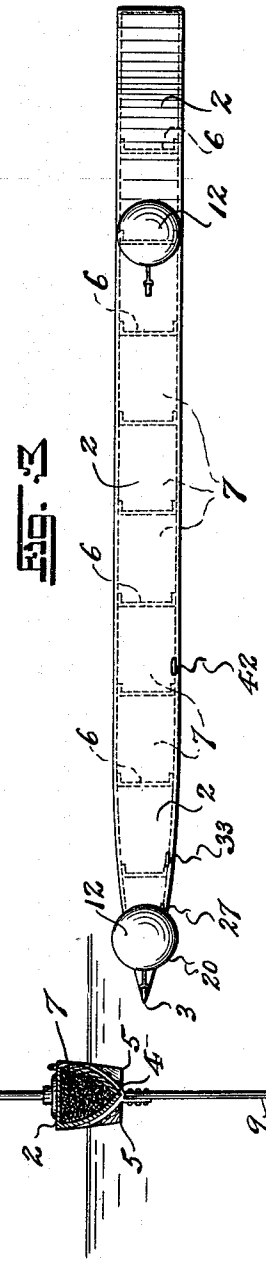


Fig. 3.

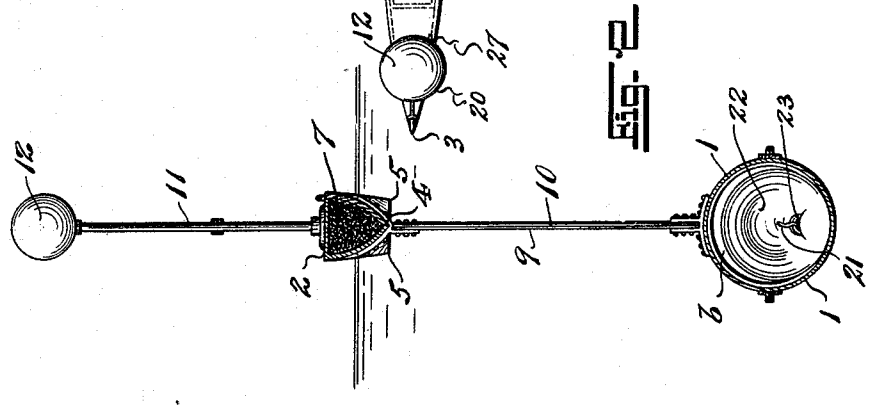


Fig. 2.

WITNESSES:

Eva E. Desch.

Fredk W. Frantzel.

INVENTOR

James M. Seymour, Jr.,

BY

Frantzel and Richards

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JAMES M. SEYMOUR, JR., OF NEWARK, NEW JERSEY.

TORPEDO.

1,265,262. Specification of Letters Patent. Patented May 7, 1918.

Application filed May 19, 1917. Serial No. 169,615.

To all whom it may concern:

Be it known that I, JAMES M. SEYMOUR, Jr., a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in 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, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

The present invention has reference, generally, to an improved construction of torpedo; and the invention relates more particularly to a novel construction of submerged dirigible torpedo.

The invention has for its principal object to provide a novel torpedo comprising a cigar-shaped hull which is interiorly subdivided into a plurality of separate compartments, each compartment being adapted to house or contain the various mechanisms and apparatus whereby the functions of the torpedo as a whole are performed, said hull being submerged beneath the surface of the water, and supported in such submerged condition by means of a surface float carrying visible identifying signals.

The invention has for its further objects to provide a construction of torpedo which is dirigible or controllable from a distance, which is driven by self contained power, and which may be fired or exploded either by contact or at will from the distant control point or station, and to this end embodies certain specific inventions covered by my copending applications for patents hereinafter mentioned and identified.

Other objects of the present invention, not at this time more particularly mentioned, will be clearly understood from the following detailed description of the same.

With the various objects of my present invention in view the same consists, primarily, in the novel construction of dirigible torpedo hereinafter set forth; and the invention consists, furthermore, in the several novel arrangements and combinations of the various devices and parts, as well as in the details of the construction of the same, all of which will be more fully described in the following specification, and then finally embodied in the claims which are appended to and which form an essential part of the said specification.

The invention is clearly illustrated in the accompanying drawings, in which:—

Figure 1 is a longitudinal vertical section of the novel torpedo made according to and embodying the principles of my present invention, the supporting float therefor being shown in side elevation.

Fig. 2 is a vertical cross section taken on line 2—2 in said Fig. 1, looking in the direction of the arrow *x*.

Fig. 3 is a plan view of the supporting float for said torpedo.

Similar characters of reference are employed in all of the hereinabove described views, to indicate corresponding parts.

Referring now to said drawings, the reference character 1 indicates the hull of the torpedo, which consists of an air and water tight cigar-shaped hollow-body, which may be constructed of metallic plates or cylindrical sections, or in any other suitable manner. The reference character 2 indicates a suitable surface float or buoyant body for supporting said hull in submerged condition. Said float 2 is preferably made of sheet metal in the form of a hollow body sharpened to provide a cutwater 3 at the bow, and having a V-shaped bottom 4, gradually developing into a broad flat bottom 5 at the stern, such flat bottom construction at the stern preventing burying of said stern in the water, which would tend to cause the torpedo to incline upward and rise to the surface, instead of maintaining its proper submerged position. Said float 2 is divided in its interior by bulkheads 6 into a plurality of separate water-tight compartments 7, which are preferably filled with lamp-black, or any other suitable substance which will not mix with water, so that should the float be perforated by shot, it would still retain its buoyancy for a long period of time, or until so badly riddled as to allow the filling to escape from confinement within the compartments 7. Said float 2 is operatively connected with the hull 1 of the torpedo by means of hanger-members 8 and 9, which are respectively riveted to the hull 1 just astern of the bow end and forward of the stern end thereof, and which are respectively riveted at their upper ends to the bow and abaft of the midships portion of the float 2. Said hangers incline rearwardly so as to permit the nose or bow of the torpedo

to project beyond the bow of the float 2. Said hanger-members are preferably constructed of steel, very strong and thin, and are sharpened at their fore and aft edges, to provide knife-like edges 10, so as not to create great resistance in passing through the water, and so that the same would easily shear or cut through small rope, seaweed or other similar obstacles with which they might come in contact when said torpedo is under way.

Mounted on said float 2, so as to project upwardly therefrom, are two masts 11, the same being properly spaced one from the other, and being adapted to carry signals, such as the balls 12, or other devices, which may be brightly colored and of sufficient size to be readily observable at a great distance, thus enabling the operator to note the position and course of the torpedo, and thereupon to control and direct the same.

The interior of said hull 1 of the torpedo is transversely subdivided by bulk-heads 13 into several separate and independent watertight compartments, to wit, compartments *a*, *b*, *c*, *d* and *e*, successively located from bow to stern. The forward or bow compartment *a* is adapted to contain the explosive charge 14 of the torpedo. Located in the bow or nose of the hull 1 is the firing pin 15, which is adapted to explode the charge 14 by impact when the torpedo strikes an object such as a vessel, submarine or the like against which it is directed. The charge 14 is also subject to independent firing control by the operator from a distant control point or station according to the principles and by means of the devices disclosed in my copending application for United States Letters Patent, Serial Number 164,605, filed April 26, 1917. Said firing-pin 15 is mounted so that its free outer end projects forwardly beyond the bow or nose of the torpedo, the same being longitudinally movable rearwardly into the compartment *a*, in such a manner that it may be driven against the detonating cap 16 of the charge 14. Said pin 15 is maintained in normal forwardly projecting position by means of a spring 17 which presses against the annular shoulder 18 formed on said pin, said shoulder 18 also serving as a stop for limiting the forward movement of said pin under said spring pressure. In order to render the torpedo safe against firing through accidental impact when handling, towing or otherwise manipulating the same preparatory to launching and operating the same, I provide, in connection with said firing-pin 15, a safety pin 19, which normally passes through the outwardly and forwardly projected portion of said firing-pin, and which by engagement with the exterior of the nose of said torpedo prevents any backward movement of said firing-pin until said safety pin is removed. Attached to the eye of said safety-pin 19 is a hand or pull line 20 which is lead to the surface and attached to the float 2 in any suitable manner. When the torpedo is launched and ready to be sent away to an attack, the hand or pull line 20 is grasped and pulled upward to withdraw said safety-pin 19 and thus free said firing-pin 15 so that it may operatively perform its function.

The compartment *b* is adapted to contain the electric control cable or wire 21 which is to be fed out astern of the torpedo as it proceeds outward to its attack. Connected with and communicating with this compartment *b* is the bell-shaped mouth 22 of the cable guiding tube 23, the latter running along through the interior of the hull 1 and emerging through said hull forward of its stern, the outer rear end 24 of said tube inclining slightly downward, and extending astern to a point beyond and beneath the driving propeller of the torpedo. The control cable is wound in a hollow coil 25, somewhat similar to the winding of a hollow ball of twine or cord, so that the rearwardly traveling line thereof emerges from and feeds from the center convolutions thereof. The cable is of very small gage or fine wire properly insulated, and the windings thereof in the coil 25 are treated with a suitable adhesive mixture, such as insulating shellac, applied to the surface of the cable or wire when being coiled, so that the coils adhere together when the shellac dries, and which will hold the windings together and which prevents the walls of the coil, as the same are reduced by the feeding out of the cable, from collapsing or dropping down with the consequent danger of kinking or snarling the control cable. The adhesive used must be sufficient to hold the windings against falling of their own weight, and yet not of such a tenacious character as will prevent the windings from gently tearing away as the cable feeds or pulls out from the center of the coil while the torpedo moves away to its attack. To maintain the proper buoyancy of the torpedo, when the cable plays out from the compartment *b*, and the torpedo is lightened of its dead weight, I provide a removable plug 26 in the hull 1 which normally stops an opening communicating with said compartment *b*. Said plug may be withdrawn by the hand or pull line 27 attached thereto, when the torpedo is put in operation, so that water may enter the compartment and replace with its weight the weight of cable fed out of the compartment. In the discharge end of the tube 23 is placed a soft rubber gasket 28 through which the cable passes and which normally prevents water from backing up through the tube. When, however, the cable begins to pay out after the torpedo is started in motion, this

gasket 28 soon wears away, thus allowing the water to circulate freely through the compartment *b*.

The next compartment *c* is adapted to contain the power plant of the torpedo. This power plant comprises, preferably, an internal combustion engine 29 substantially of the type shown and described in my copending application for United States Letters Patent, Serial Number 165,056, filed April 28th, 1917, which is adapted to be run on a fuel consisting of hydrogen and oxygen such as is described in my application for United States Letters Patent, Serial Number 161,555, filed April 12, 1917. When the internal combustion engine is thus used, the same is also provided with a self-starting motor 30 which is geared thereto so as to impart an initial motion to the crank-shaft of the engine to start the same. The motor 30 may also be adapted to operate as a generator, when the same is driven by the engine, so that the current generated thereby may be utilized to recharge storage batteries. The energizing circuit of said starting motor 30 may include an automatic cut-in switch 31, which is provided with an operating arm 32 which projects exteriorly from the hull 1, and to which the hand or pull line 33 is attached, so that when starting the torpedo to an attack the pulling of said line 33 will operate the cut-in switch to turn the current into the starting motor whereby the engine is cranked. Connected with the engine crank-shaft so as to be driven thereby is the propeller shaft 34 which extends rearwardly through the remaining compartments *d* and *e*, and thence through the stuffing-box 35 at the stern of the hull 1 so that a suitable propeller 36 may be connected upon its rearwardly projecting exterior end.

In place of the internal combustion engine I may use a steam engine, supplied with steam produced by burning a mixture of hydrogen and oxygen, or other suitable combustible fuel, in an internally fired gas burning boiler, such as is described and patented by my United States Letters Patent, Number, 1,178,956, dated April 11th, 1916. The exhaust from such a steam engine could be either condensed and returned to said boiler, or allowed to exhaust into the sea, when it would be immediately condensed and disposed of.

The next compartment *d* is adapted to contain the fuel storage tanks 37 in which are contained the supply of gases ready for mixture to produce the fuel for service to the engine. The supply pipes 38 leading from the tanks to the engine apparatus, may be provided with suitable valves 39 to the operating levers 40 of which is connected a pull rod 41 the free end of which projects exteriorly of said hull 1, and to which is attached a pull or hand line 42, so that when the torpedo is put in operation all that is necessary to be done is to pull said line thus opening the said valves to permit the continued flow of gases to the engine apparatus.

The next and last or stern compartment *e* is adapted to contain the electrical steering appliances 43 for operating the rudder 44, the storage batteries 45 for supplying current to operate the steering appliances, and the dry cells 46, and galvanometer relay devices 47 all controlled by the weak electric current sent over the control cable or wire 21 from the shore or control station in the manner and by the means fully described in my said pending application for United States Letters Patent, Serial Number 164,605, filed April 26, 1917.

It will be apparent from the above description that my present invention provides a very novel construction of torpedo, which may be driven at high speeds by means of a self-contained power plant, and which may be steered and controlled or fired at will from a distant point by the aid of a comparatively weak electric current, sent out over the light trailing cable or wire 21. The control cable or wire 21 being very small or fine may be carried in sufficient quantity, in the novel hollow coil above described, to provide a very great length thereof so that the range of the torpedo may be greatly increased, and in fact may be effectively controlled within a radius of from ten to twenty miles.

I claim:—

1. The combination with a dirigible torpedo of an electric control cable, said cable being stored in the interior of said torpedo in the form of a hollow coil adapted to feed out the cable from its center, and the windings of said coil being secured together by adhesive material to hold the same against collapsing and tangling within the interior of the coil, said adhesive material yielding to the pull of said cable so that the windings of said coil are successively torn away and freed from their fellows as the cable issues from said torpedo when in motion.

2. A torpedo comprising a hollow hull provided with a compartment in its bow, a charge of high-explosive contained in said compartment, an impact firing-pin longitudinally movable through the nose of said torpedo into said compartment for detonating said explosive charge, spring means for maintaining said firing-pin in normal outwardly thrust position, a safety-pin passing transversely through the exterior projecting end of said firing-pin to restrain the same by engagement with the nose of said torpedo against rearward firing movement, and a hand-line connected with said safety-pin whereby the same may be withdrawn from said firing-pin to operatively free the latter for service.

3. A propeller driven dirigible torpedo comprising a hollow hull containing a primary mover for driving the propeller and a fuel supply for said primary mover, an electric starting means for said primary mover, a cut-in switch for energizing said starting means, and a hand-line extending from said switch exteriorly from said torpedo for operating said switch from without said torpedo to put the latter in motion.

4. A torpedo comprising a hollow hull provided with a surface float for supporting the same in submerged position, said hull having a compartment for storing electric control cable, a guide-tube arranged within said hull, said guide-tube having a bell-shaped receiving end positioned within so as to communicate with said compartment, the rearward end of said guide-tube projecting exteriorly of said hull and terminating at a point to the rear of and beneath the stern of said hull, an electric control cable, said cable being stored in said compartment in the form of a hollow coil adapted to feed out the cable from its center, the windings of said coil being secured by adhesive material against collapsing, said adhesive material yielding to the pull of said cable so that the windings of said coil are successively freed as the cable issues from the exit end of said guide-tube, a soft gasket secured in the exit end of said guide tube through which the cable passes, a removable plug adapted when withdrawn to admit water into said cable compartment, and a hand line extending between said plug and said surface float.

5. A torpedo comprising a hull carrying an explosive charge, propelling power plant and steering apparatus, and contact cable adapted to issue from said hull and trail back to a control point, a surface float for supporting said hull in submerged position, and hanger-members interconnecting said float with said hull, said hanger members having sharpened knife-like edges fore and aft, said surface float having a sharpened cut-water and a V-shaped bottom which broadens at the stern into a flat-bottom.

6. A torpedo comprising a hull carrying an explosive charge, propelling power plant and steering apparatus, and control cable adapted to issue from said hull and trail back to a control point, a surface float for supporting said hull in submerged position, hanger-members interconnecting said float with said hull, said surface float having a sharpened cut-water, and a V-shaped bottom which broadens at the stern into a flat-bottom.

In testimony, that I claim the invention set forth above I have hereunto set my hand this 18th day of May, 1917.

JAMES M. SEYMOUR, JR.

Witnesses:
FREDK. C. FRAENTZEL,
FREDK. H. W. FRAENTZEL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."