C. F. HOVER.

MAGNETICALLY SELF CONTROLLED TORPEDO.

APPLICATION FILED MAY 15, 1917.

1,250,178. Patented Dec. 18, 1917.

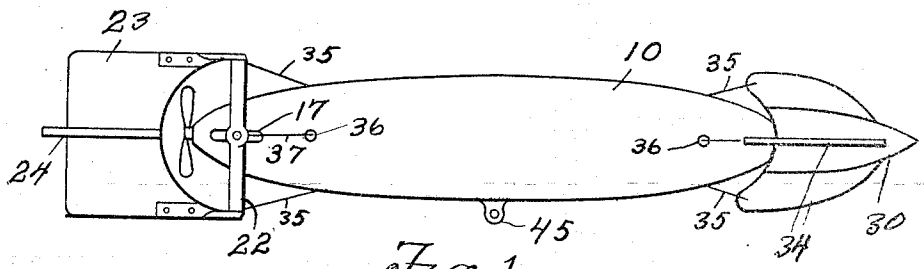


Fig 1

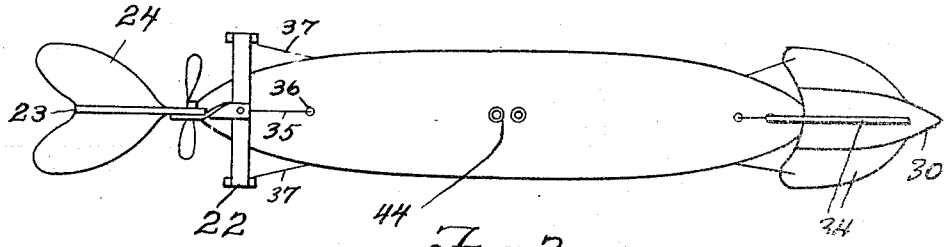


Fig 2

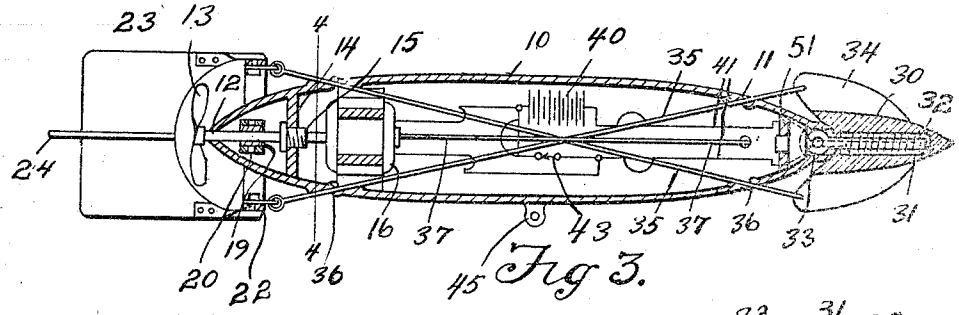


Fig 3.

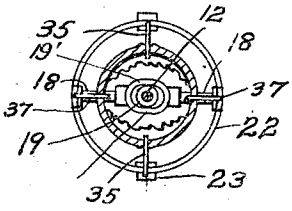


Fig 4

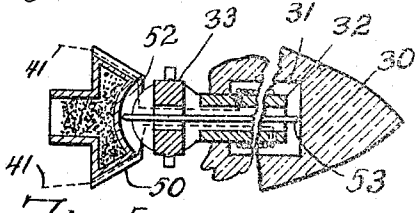


Fig 5

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UNITED STATES PATENT OFFICE.

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MAGNETICALLY-SELF-CONTROLLED TORPEDO.

1,250,178. Specification of Letters Patent. Patented Dec. 18, 1917.

Application filed May 15, 1917. Serial No. 168,783.

To all whom it may concern:

Be it known that I, CHARLES F. HOVER, a citizen of the United States, residing at Conrad, in the county of Teton, State of Montana, have invented certain new and useful Improvements in Magnetically-Self-Controlled 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.

This invention has relation to torpedoes and particularly to a means for insuring the torpedo striking the object at which it is sent when the object embodies paramagnetic material.

As is well known, there is a percentage of torpedoes that go wide of the mark, some to a great degree and others to a very slight degree and with the arrangement hereinafter described, the torpedo will be directed by the objective mark to insure a hit when the otherwise miss is within certain limits.

The invention broadly speaking resides in the provision of a nose attached to the torpedo for universal movement and within this nose is an electro-magnet so that when the torpedo approaches the objective to a proximity sufficient to bring the objective within the field of force of the magnet, the latter is swung to axially aline it with the objective. A universally movable rudder is provided for the torpedo and is connected with the movable head so as to move, reversely, with the head and thus be actuated to steer the torpedo in the direction of the axis of the electro-magnet. It may be found desirable also to provide the head itself with fins so as to constitute a forward rudder, as illustrated and thus to insure quicker response of the torpedo "to the helm".

A torpedo thus equipped will thus not only be automatically directed to the paramagnetic objective against which it is launched into the water, but when dropped from a height will be similarly directed, it being understood that when given the latter use its dimensions will be modified to correspond.

Furthermore, it will be understood that the torpedo may be tethered and used as a floating mine, at which time the nose would turn more quickly than the body of the torpedo, to bring its firing pin into position to contact with the side of the vessel.

Referring to the drawings:

Figure 1 is a side elevation of a torpedo constructed in accordance with the present invention.

Fig. 2 is a top plan view thereof.

Fig. 3 is a longitudinal sectional view.

Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 3, and

Fig. 5 is a detail sectional view of the torpedo head.

Referring more particularly to the drawings, the torpedo comprises a substantially cylindrical shell 10, the ends of which are tapered as at 11, and mounted in one of the tapered ends 11 there is a shaft 12 by which is rigidly carried the propeller blade 13. This end of the cylindrical shell is provided with a partition 14 and the shaft 12 is mounted in a stuffing position 15 in said partition, the inner end of the shaft 12 being operatively connected with the shaft of an electric motor 16.

The partition 14 is adapted to exclude water from the body portion of the shell 10, and at the rear of the partition 14 said shell is provided at diametrically opposite points with two slots 17. Upon the shaft 12 is mounted a collar 19 about which is disposed an elliptical frame 19′ which is pivoted to opposite sides of the collar by the pins 20, which pins are shown in Fig. 3. From the ends of the elliptical frame 19′ there project a pair of arms 18 that extend through slots 17 formed in opposite sides of the rear portion of the shell 10 and radiate therefrom so that when the frame 19′ is rocked on the pins 20, the arms 18 will have a fore and aft movement in the slots 17.

Pivoted upon the outer ends of the arms 18, encircling the rear end of the shell 10 and concentric with the shaft 12, is a ring 22 and fixed to this ring at diametrically opposite points in a plane at right angles to that of the arms 18 is a rudder plate 23, having forward extensions as illustrated, for

this purpose of attachment. A second rudder plate 24 is employed at right angles to the plate 23 and projecting at opposite sides thereof. It will thus be seen that if the ring 22 is oscillated on the arms 18, the rudder will correspondingly move in the plane of the plate 23 while if the frame 19′ is oscillated on its pivot pins 20, the rudder will have an oscillatory movement in the plane of the plate 24. These movements of the rudder are contributed in the manner hereinafter described.

The forward end of the torpedo is provided with a head 30 which is preferably formed of porcelain or the like, and is provided with a substantially centrally arranged recess 31 in which is mounted an electromagnet 32. This head 30 is pivotally secured to the forward end of the shell 10 by means of a universal joint 33, and said head 30 is provided with four equi-distant vanes 34 which project radially from the body portion thereof. Connecting two of the vanes 34 of the head 30 at the points of connection of the rudder plate 23, and extending through the shell 10 as shown in Fig. 3, are cables or the like 35, the cables 35 passing through suitable stuffing boxes 36 in the wall of the shell 10. Connecting the other two opposite vanes 34 of the head member 30 with the outer end portions of the arms 18, are cables 37. Thus when the head is swung in the plane of the plate 23, the ring 22 will be pivotally moved on its connection with the arms 18 and when the head moves pivotally in a direction at right angles to that just mentioned, the frame 19′ will be swung pivotally on the pins 20 to correspondingly swing the rudder in a plane at right angles to that just mentioned.

Suitably mounted within the body of the shell 10 is a battery 40 and leading from said battery 40 to the electromagnet 32 are conducting wires 41, which supply the current to the electromagnet to maintain the same energized. Also extending from the storage battery 40 are wires 42 which connect the storage battery 40 with the motor 16, and in the circuit of one of these wires 42 there is located a switch button 43. Thus it will be seen that when the switch button 43 is moved to complete the circuit from the battery to the motor, the motor will operate to drive the propeller 13 and thus propel the torpedo through the water, and at the same time the electromagnet 32 will be energized by the passage of the current therethrough.

In operation the torpedo is projected toward an object such as a vessel, with its motor in operation and said motor serves to drive the torpedo toward the object which may be a steel vessel or the like, and when the torpedo reaches a point where the object begins to exert an influence upon its electromagnet, said torpedo will be automatically directed toward said object by reason of the steel vessel serving to turn the head 30 pivotally with respect to the body of the torpedo. Upon the magnet being attracted by the object it is seen that the head 30 will be moved pivotally, and that through the medium of the cables 35 and 37, the rudder will be operated to steer the torpedo from right to left, or to raise or lower the torpedo with respect to the object. By this arrangement it will be seen that when the torpedo reaches a point in which the magnetic force of its electromagnet will extend to the object at which the torpedo is directed, said object will be caused to contact therewith.

By providing an eye or the like attaching means 45 on the outer wall of the shell 10, it will be seen that the torpedo may be tethered, and that upon the approaching of a ship to a point within the range of magnetic influence of the electro-magnet, said torpedo will be automatically drawn by said magnetic force to contact with said ship.

It will of course be understood that any desired firing mechanism may be employed but I have in order to show an operative structure, illustrated a percussion cap 50 seated in the partition 51 and having a concavity 52 in which is received a firing pin 53 that extends through the core of the electro-magnet and against the front wall of the recess in which the magnet is received. The concavity 52 is co-axial with the center of universal movement of the nose so that in whatever position the nose may be, the firing pin may strike the proper portion of the cap. When the torpedo hits, the fragile member 30 is broken and forced against the firing pin to detonate the cap.

While in the present instance, the device is shown as a marine torpedo, it will be seen that the construction of the device may be equally as efficient when used as an air bomb, the rudder and submerging planes serving to direct the path of travel of a projectile through the air equally as well as through the water.

A still further use to which such a construction is adaptable is hand grenades and bombs, the difference in construction being so slight as to not depart from the spirit of the invention.

What is claimed is:

1. A missile including a body member, a magnetic nose connected with one end of the missile and movable into and out of position to aline its axis with that of the missile, and steering means operable by movement of the nose.

2. A missile including a body member, a magnetic nose movably connected with the

body member, steering mechanism movably connected with the body member and connections between the nose and the steering mechanism for actuating the latter.

3. A torpedo comprising a body member, a magnetic nose pivotally connected at one end of its field of force with the body member, said nose having guiding fins, a rudder at the opposite end of the body and connections between the nose and the rudder for operating the latter.

In testimony whereof, I affix my signature.

CHARLES F. HOVER.