L. J. HUSTED.

AERIAL TORPEDO STEERING MECHANISM.

APPLICATION FILED DEC. 18, 1915.

1,222,630. Patented Apr. 17, 1917.

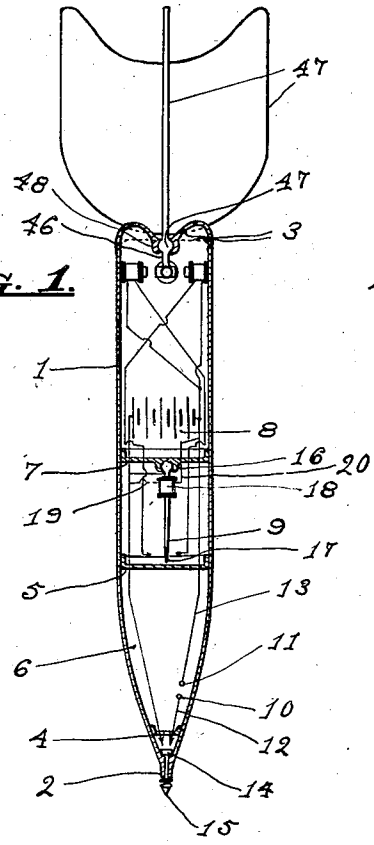


FIG. 1.

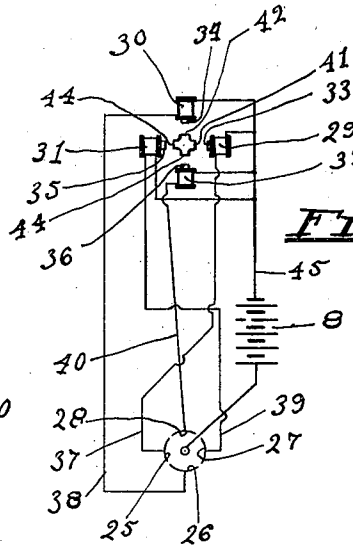


FIG. 3.

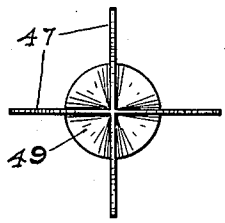


FIG. 2.

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Witnesses

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UNITED STATES PATENT OFFICE.

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AERIAL-TORPEDO-STEERING MECHANISM.

1,222,630. Specification of Letters Patent. Patented Apr. 17, 1917.

Application filed December 18, 1915. Serial No. 67,565.

To all whom it may concern:

Be it known that I, LEMUEL JOHN HUSTED, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Aerial-Torpedo-Steering Mechanisms, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to automatic steering mechanism for aerial torpedoes, bombs, projectiles and the like and seeks to provide a simple, accurate and efficient automatic steering mechanism that may be easily and inexpensively applied to any form of descending or initial velocity driven body, and more particularly to torpedoes, bombs and projectiles released and descending from aerial craft, such as aeroplanes, airships, balloons and the like.

The effectiveness of explosives released from aerial craft has not heretofore proven satisfactory to the offensive, owing to the fact that only on rare occasions and principally by chance does the missile reach the intended object.

The seeming impossibility of gaining a position truly vertical with and above the object it is desired to attack, so that the bomb may be released and descend by gravity to the object, has been fully proven by recent and extensive practical demonstration. The effect of air currents and resistance has also had a negative influence over this form of offensive operations. It is essential that an automatic steering mechanism be provided that will be attracted by the object it is desired to destroy, so that the unskilled, as well as the skilled may reach a position approximately above a cannon, metal fortification, battle ship, cruiser or submarine and release the bomb, torpedo or projectile and the steering mechanism will without fail guide the missile true to the intended object of attack.

The present invention seeks to provide an improved automatic steering mechanism for aerial bombs, torpedoes, projectiles and other missile, that will guide the missile true to any metallic body, such as a cannon, fortification, battle ship, cruiser or submarine craft.

By the employment of the improved steering mechanism a missile released from an aerial craft at a considerable distance from a true vertical position above a metal object, such as an armed vessel, cannon, fortification, or enemy aerial craft carrying explosives incased in metal, will go true to the desired object and strike it, the result being destruction of the object, providing sufficient explosives are contained in the striking missile.

With these and other objects in view the invention consists in the features of construction, applications, combinations, and arrangements of parts hereinafter set forth, and more particularly pointed out in the appended claims, an application of the invention being illustrated in the accompanying drawings.

In the drawings:—

Figure 1 is a view in elevation of a destroying missile in descending position, with the shell broken from the view side to show the arrangement of the steering mechanism.

Fig. 2 is a plan view of the destroying missile.

Fig. 3 is a diagrammatical view showing the steering mechanism magnets and the depending controller pieces, and the connections.

The term missile is employed throughout the specification and in the claims to designate any form of torpedo, projectile or other explosive or destructive material that may be employed to combat an enemy, while the term object is employed both in the specification and in the claims to designate a battle ship, cruiser, submarine, cannon, fortification or other form of combatting craft, or land fighting machine or in fact any offensive or defensive fighting equipment.

The shell 1 is shown broken open to show the steering mechanism and other equipment, and it may be made of any suitable material, but preferably of brass or other non magnetizable metal, fiber, or fabric.

The shell 1 is preferably pointed at the end 2 and closed at the upper end by the head 3, the division walls 4 and 5 forming a chamber 6 for containing ammunition, while the division wall 7 forms a suitable support for the batteries 8 and a means of suspension for the depending controller 9. The particular arrangement of the shell and explosives contained therein is not essential to the invention, it being obvious that

the depending controller and steering mechanism may be applied to various forms of constructions of missiles.

The chamber 6 contains the usual ignition terminals 10 and 11, which are connected to opposite poles of the battery 8, by the wires 12 and 13, the wires 12 being provided with the usual switch 14 so positioned as to close the electric circuit to the ignition terminals when the end 15 of the switch strikes an object, it being well known that the explosion will occur instantly on closing the switch.

Suitably positioned underneath the wall 7 is the socket 16 from which depends the depending controller 9, the lower end of the controller 17 being free to swing as a pendulum in every direction from the central position as shown, it being understood that the shell will naturally descend in a vertical line and that the controller will hang centrally until attracted from central positoin by some force other than gravity.

Near the socket 16 in order to produce the least possible resistance to the free suspension of the controller, is the electromagnet coil 18 with the wires 19 and 20 leading to the battery 8, so that the controller may be energized by the coil and so magnetized as to form an electromagnet. It being understood that the controller may be a permanent magnet, or otherwise as desired, and that the poles of the controller may be reversed as an electromagnet by reversing the connection of the wires employed for the purpose of connecting the current.

The end 21 of the depending controller 9 serves to contact with the semicircular contact plates 25, 26, 27 and 28 and conduct electric current from the batteries 8 to the respective electromagnet coils 29, 30, 31 and 32, the coils being mounted on cores 33, 34, 35 and 36 respectively, the wires 37, 38, 39 and 40 connecting from the respective contact plates to the respective coils, the coils serving armatures 41, 42, 43 and 44 respectively and the wire 45 connecting the coils in parallel with the depending controller so that as the controller contacts with each plate the respective coil is energized and the respective armature drawn to the respective core.

The armatures 41, 42, 43 and 44 are rigidly connected to the shaft 46 which is provided with the ball portion 47 fitting in the ball socket 48, allowing the shaft to swing freely in every direction until the armatures and cores contact, the shaft being held and prevented from revolving by the raised portions 48 of the head 3, between which the blades 47 are positioned.

In operation the chamber 6 is filled with any suitable explosives and the missile released from the aerial craft, when it will descend in approximately a true vertical line until the depending controller is attracted to the object which the missile is intended to strike. The controller will make contact with the respective contact plate and the respective magnetic coil will be energized and the respective armature drawn thereto, when the blades 47 projecting from the shaft will change the course of the missile and direct it to the object at which it was aimed. It being understood that the depending controller is so magnetized that it will be effected by a body of metal sufficiently to make contact with the contact plates and then it will not be effected by the poles of the earth sufficiently to make contact therewith, the missile descending in practically a vertical line until the controller is attracted by the object of attack.

The aerial missile automatic steering mechanism is of chief importance for the guiding of missiles released from aerial craft to metallic objects on land and on and under water, and may also be advantageously employed in connection with missiles thrown by cannon, engine and by hand.

It is obvious that changes may be made in the details as set forth without departure from the essentials of the invention.

What I claim as new, and desire to secure by Letters Patent, is:—

1. In an aerial missile, a magnetized depending controller, contact plates arranged around said controller, a guiding blade, electromagnets to control said guiding blade, and connections connecting from said contact plates to said electromagnets.

2. In an aerial missile, a magnetized depending controller, blades to control the direction of said missile, and means by which said controller will control said blades and turn said aerial missile from vertical direction when said controller is attracted by magnetic influence.

3. In an aerial missile, a magnetized depending controller, means to guide said missile, and connecting means whereby said controller will control said means to turn said missile from a vertical direction.

4. In an aerial missile, a depending controller, means to charge said controller with electromagnetic energy, a plurality of blades to guide said missile, and means connecting said controller and said blades whereby said missile is directed to an object that will attract said controller.

5. In an aerial missile, a suitable shell, a plurality of steering blades connected to said shell through suitable connections, the alinement of said blades changeable from the line of travel of said shell, said blades free to normally follow the direction of the travel of said shell, electromagnets arranged to change the angle of said blades, and a magnetized depending controller arranged to close an electric circuit with said magnets

and compel said shell to follow the direction said controller may point.

6. In a steering mechanism for descending missiles, a missile, a rudder pivotally connected to said missile, an armature connecting to said rudder, electromagnets arranged around said armature, a depending controller needle, a plurality of contact plates arranged around the free end of said depending needle, said depending needle electrically connected to one pole of said electromagnets and each of said contact plates electrically connected to the opposite pole of one of said magnets so that when said depending needle contacts with one of said contact plates electrical connection is made with the corresponding electromagnet and the direction of said missile changed toward the direction of the inclination of said depending needle.

In testimony whereof I affix my signature in the presence of two witnesses.

LEMUEL JOHN HUSTED.

Witnesses:

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JEPTHA J. KENDRICK.