C. BARRETT.

AERIAL TORPEDO.

APPLICATION FILED SEPT. 22, 1915.

1,228,281.

Patented May 29, 1917.

2 SHEETS—SHEET 1.

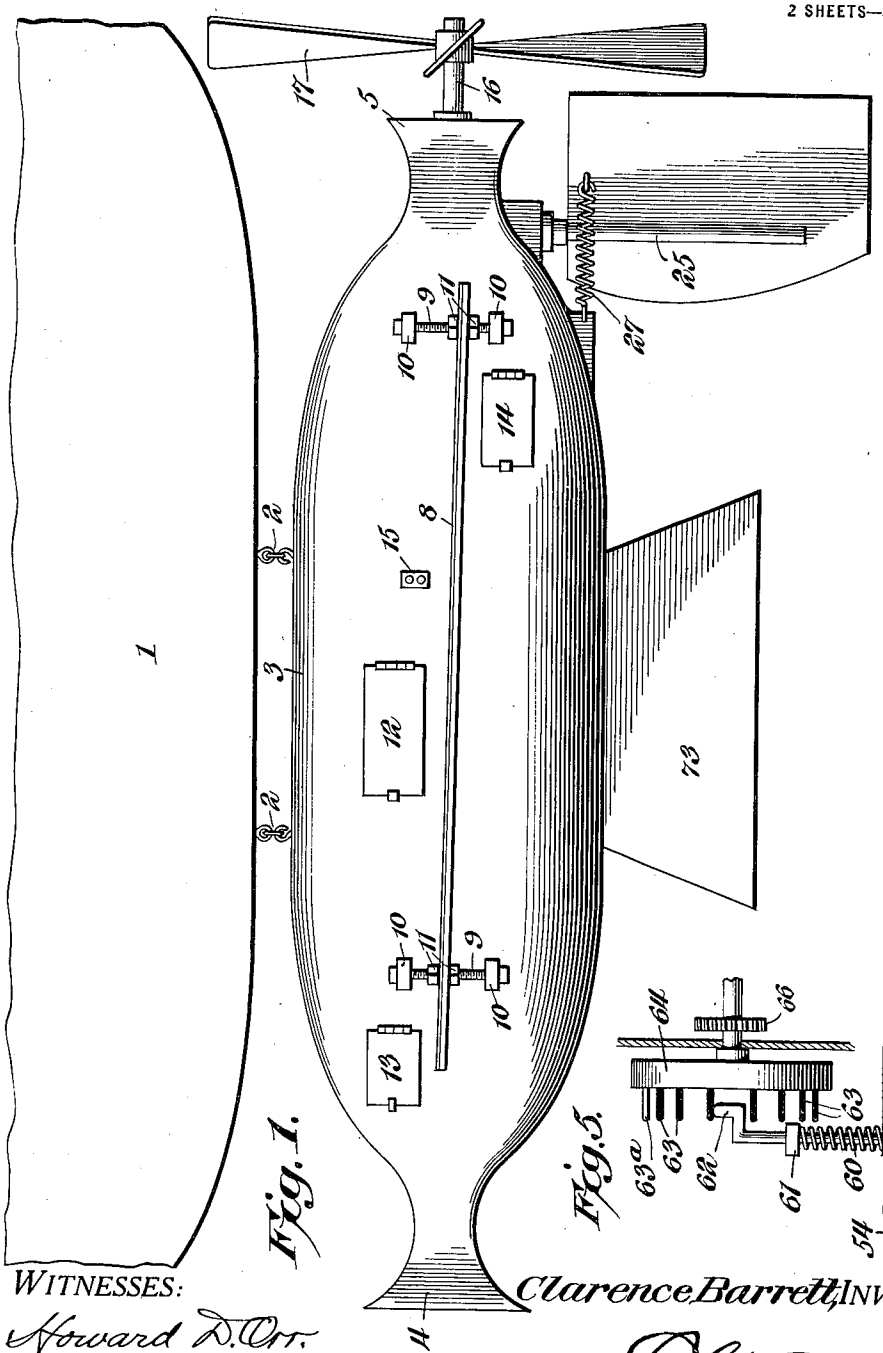


Fig. 1.

Fig. 5.

WITNESSES:

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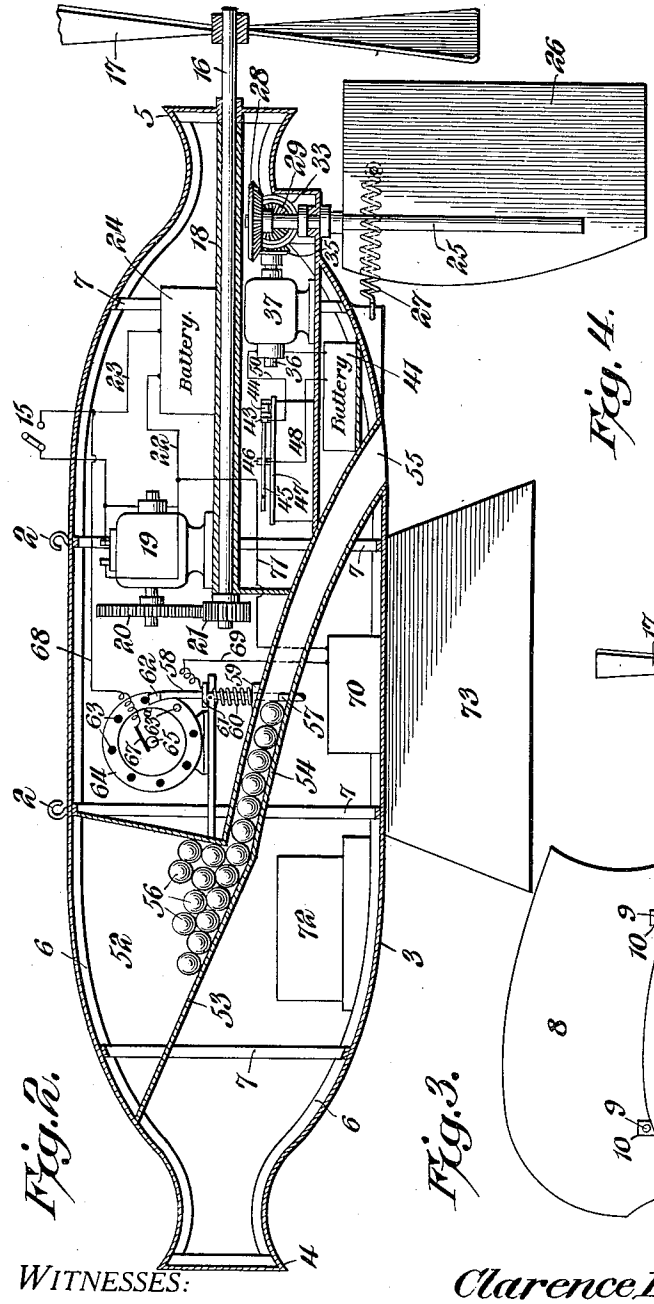


Fig. 2.

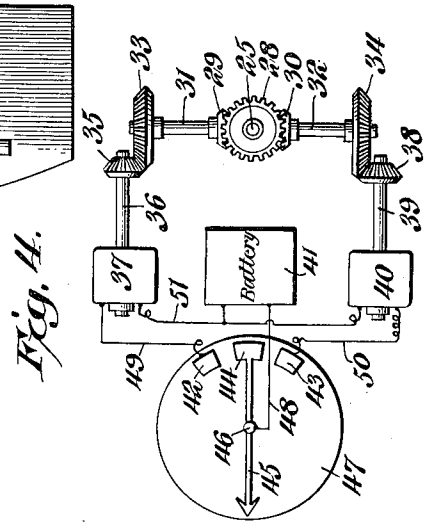


Fig. 4.

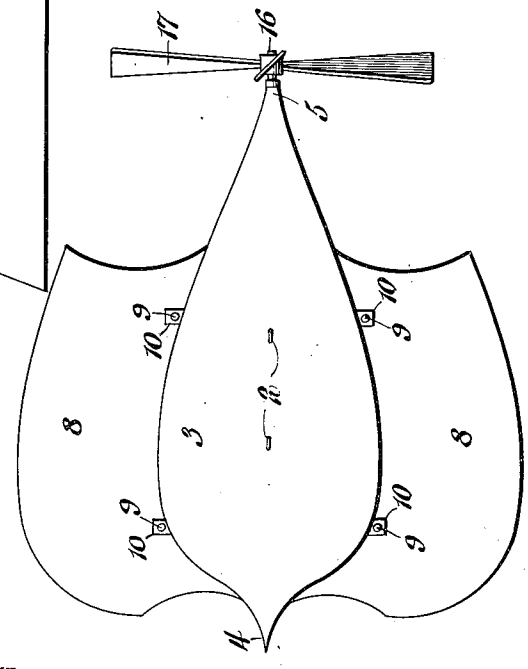


Fig. 3.

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UNITED STATES PATENT OFFICE.

CLARENCE BARRETT, OF SALT LAKE CITY, UTAH, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-THIRD TO GEORGE MORROW AND ONE-THIRD TO ROBERT W. SALISBURY, BOTH OF SALT LAKE CITY, UTAH.

AERIAL TORPEDO.

1,228,281. Specification of Letters Patent. Patented May 29, 1917.

Application filed September 22, 1915. Serial No. 52,041.

To all whom it may concern:

Be it known that I, CLARENCE BARRETT, a citizen of the United States, residing at Salt Lake City, in the county of Salt Lake and State of Utah, have invented a new and useful Aerial Torpedo, of which the following is a specification.

This invention has reference to aerial torpedoes and its object is to provide a self propelling and self controlled aerial structure which may be directed toward the desired point of attack and on reaching such point automatically drop numerous bombs.

In accordance with the present invention there is provided an aerial structure combining a sustaining gas bag, and a container provided with planes, a rudder, and a propeller, exterior thereto and with actuating and controlling mechanism and explosives within the container. By means of appropriate propelling mechanism the aerial torpedo is made to travel from some appropriate point to the point of attack, the course being automatically controlled by suitable mechanism forming part of the invention, so that, assuming that the initial aim of the torpedo is correct, it will maintain its course. There is also provided time controlled mechanism by means of which explosives, preferably in the form of bombs, or like devices, are periodically released to drop upon the enemy for destructive purposes. The invention further contemplates means for the total destruction of the aerial torpedo on the completion of its work in order that it may not fall into the possession of the enemy and such destruction is rendered doubly sure by the provision of explosives in the torpedo structure which will cause the destruction of the aerial torpedo in the event that it falls to the ground intact because the time-controlled destructive means fails to operate.

The invention will be best understood from a consideration of the following detailed description, taken in connection with the accompanying drawings forming a part of this specification, with the further understanding that while the drawings show a practical form of the invention, the latter is not confined to strict conformity with the showing of the drawings, but may be changed and modified so long as such changes and modifications mark no material departure from the salient features of the invention as pointed out in the claims.

Figure 1 is a side elevation of an aerial torpedo embodying the invention, but showing only a fragment of the gas bag;

Fig. 2 is a longitudinal central vertical section, with some parts in elevation, of the body portion of the aerial torpedo structure with the gas bag omitted;

Fig. 3 is a plan view of the body portion of the structure with the gas bag omitted and drawn on a considerably smaller scale than the preceding figures;

Fig. 4 is a plan view, with parts diagrammatically represented, of the automatically controlled steering means;

Fig. 5 is a view partly in elevation and partly in section of a portion of the time controlled release mechanism for the bombs.

Referring to the drawings, there is shown in Fig. 1, a gas bag 1, without any attempt to show the structure in correct proportions. Suspended from the gas bag 1, by flexible connections 2 or in any other suitable manner is a body in the form of an elongated shell 3. For the purpose of reducing the air resistance the shell 3 tapers at the ends into a comparatively sharp nose 4, and tail 5 respectively, while the body as viewed from above also tapers for the greater portion of its length toward the rear or tail end. The body or shell 3 may be constructed of some light, strong material such as sheet aluminum, and in order to strengthen the body it is provided with interior longitudinal ribs 6 and interior hoops 7, or the body may be interiorly braced by other means.

In order to direct the aerial torpedo, especially in rising flight, the body 3 has planes 8 on opposite sides spreading laterally and sustained at the ends by upright screws 9 supported by brackets 10 fast to the body 3 while clamp nuts 11 on each screw 9 and above and below the respective planes 8 provide for the initial adjustment of the planes. To provide for ready access to the interior of the body 3, doors 12, 13 and 14 are provided but it will be understood that a greater or less number of doors than three may be employed as may be found expedient. In the particular internal arrangement of the body 3, hereinafter described, three doors are sufficient. There is also on the exterior of the body 3, an accessible electric

circuit controlling device 15, which, as will hereinafter appear, may be utilized to start the mechanism of the structure into operation, after all the parts have been properly adjusted and the doors in the body member 3 have been closed. In Fig. 1, the controller 15 is shown as of the familiar push-button type, while in Fig. 2, the same controller is indicated diagrammatically as an ordinary switch.

Within the body member 3, there is mounted a propeller shaft 16 extending lengthwise of the body and through and to the rear of the tail portion 5 and there carrying a propeller 17 which may be of the usual type employed in aerial craft. The propeller shaft 16 is shown as located in the longitudinal center line of the body 3 and as supported by a tube 18 constituting an extended bearing for the shaft, but it will be understood that any suitable bearings for the shaft may be provided. In order to drive the shaft 16 an electric motor 19 is mounted within the body member 3, while gearing represented by gear wheels 20 and 21 connect the armature shaft of the motor 19 with the propeller shaft 16. Here again the arrangement shown is more or less schematic. The motor 19 is coupled by conductors 22, 23 to a battery 24 which may be of suitable type adapted to the motor 19. The circuit controller 15 hereinbefore referred to is shown in Fig. 2 as included in the conductor 23.

Turning in suitable bearings in the rear or tail end of the body member 3 is a rudder post 25 carrying a rudder 26 extending below the body 3 and in the particular showing of the drawings is in front of the propeller 17. The rudder is maintained in a normal central or neutral position by equalizer springs 27 connected to opposite sides of the rudder and to appropriate points on the body 3. The top of the post 25 carries a bevel pinion 28 with which mesh other bevel pinions 29, 30 respectively on respective shafts 31, 32 each at the end remote from the pinions 29 or 30 carrying a bevel gear wheel 33 or 34 as the case may be. Meshing with the bevel gear wheel 33 is a bevel pinion 35 on one end of an armature shaft 36 extended from an electric motor 37. Meshing with the bevel gear wheel 34 is a bevel pinion 38 on one end of an armature shaft 39 extended from an electric motor 40. The electric motors 37 and 40 are so arranged that their armatures rotate in opposite directions. For instance, if the motor 37 is energized it will cause a movement of the rudder in one direction and if the motor 40 is energized, it will cause a movement of the rudder in the other direction but when neither of the two motors is energized, the rudder 26 if out of neutral position is returned to and held in such position by the springs 27. One side of each motor 37 and 40 is connected to a battery 41 and the other side of each motor is connected to a respective one of two contacts 42, 43 spaced apart and between which is located another contact 44 on one end of a magnetized arm 45 mounted to turn on a pivot support 46. The contacts 42 and 43 as well as the arm 45 are carried upon a support 47 and the pivot 46 is connected by a conductor 48 to the other side of the battery 41 from the connections of the motors to the battery. The conductor connecting the motor 37 to the contact 42 is indicated at 49 and the conductor connecting the motor 40 to the contact 43 is indicated at 50 while a common conductor 51 connects the two motors to the battery.

Within the shell or body 3 near the forward end thereof is formed a compartment 52 having a slanting bottom wall leading into a chute 54 arranged to discharge through the bottom portion of the body 3 near the rear thereof as indicated at 55, the chute slanting similarly to the bottom 53 of the compartment 52 so that bombs 56 or other form of ammunition in appropriate shape will gravitate from the compartment 52 through the chute 54 and escape through the outlet end 55 of the latter in a rearward or trailing direction. The explosive devices or bombs 56 when within the compartment 52 serve to counterbalance, more or less, the driving mechanism in the rear portion of the body 3. The escape of the bombs is normally prevented by a stop finger 57 on one end of a bar 58 having a bearing in a suitable support 59 within the body 3 and surrounded by a spring 60 at one end engaging the support 59 and at the other end engaging a collar 61 on the bar. Above the collar 61, the bar 58 being upright, the said bar terminates in an angle finger 62 in the path of pins 63 projecting from one face of a disk 64 carried by an arbor 65 controlled by suitable clock-work which, however, is not shown in its entirety, being simply indicated by a gear wheel 66. The clock-work is of the ordinary time-indicating type with a striking movement of which latter the gear 66 may be considered as an element. The pins on the disk 64, except one indicated at 63^a, are insulating or non-conducting pins while the pin 63^a is a conducting pin electrically connected to the arbor 65, while the latter is connected by a collecting brush 67, shown in Fig. 2 to a conductor 68 in turn connected to the conductor 23. The bar 58 is connected by a conductor 69 to a case 70 of explosives and the same case of explosives receives one end of another conductor 71 connected to the conductor 22. The two conductors 69 and 71 are coupled within the explosives represented by the case 70 in any suitable man-

ner so that on the passage of electric current the explosives will be ignited and the aerial torpedo will be destroyed by the explosion. In order to insure the destruction of the aerial torpedo, should for any reason the explosives within the case 70 fail to be ignited, another case 72 of explosives is provided within the body or shell 3 and this case of explosives is arranged to explode by the shock due to contact of the aerial torpedo with any fixed object, such as the ground.

The shell 3 is provided with a keel 73 of sufficient weight to maintain the device in an upright position so that air currents will not tend to upset it.

The magnetic arm or needle 45 is so mounted that it will maintain a north and south position. This position is a constant one due to the effects of earth magnetism.

In preparing the aerial torpedo for flight, the support 47 is so adjusted that irrespective of the direction of flight the needle 45 will, when the torpedo is properly aimed from the point from which it proceeds, hold the contact 44 mid-way between the contacts 42 and 43. The clock movement is assumed to be properly wound with the first one of the series of pins 63 in engagement with the finger 62 ready to actuate the rod or bar 58 when the disk 64 is rotated by the clock movement after the elapse of the predetermined time.

The aerial torpedo propeller after being properly adjusted for flight is started by means of the controller or switch 15 which may be manipulated from the exterior of the body 3. On the release of the torpedo from restraint the combined action of the gas bag and the propeller as well as the action of the planes 8 after the device has attained speed, causes a progressive and rising movement of the torpedo along a course toward the point where it is desired to drop the bombs. Should the torpedo deviate to one side or the other from the desired course, such deviation causes a like deviation of the support 47 so that since the needle 45 is constantly constrained to remain in one position, that is a north and south position, one or the other of the contacts 42 or 43 will be brought into engagement with the contact 44 whereupon the circuit of one or the other of the motors 37 and 40 will be completed and the rudder 26 is thereby turned in the proper direction to restore the aerial torpedo to the intended course. Such action takes place from time to time, as necessary to maintain the torpedo in the intended course and ultimately the torpedo becomes located over the spot to be bombarded by bombs. With the clock-work properly set, the time movement is released and the disk 64 is rotated, this resulting in the periodic depression of the bar 58 to release the bombs 54 one at a time, or if desired, two or more at a time. The dropping of the bombs continues periodically by the successive engagement of the pins 68 with the finger 62 thus depressing the rod 58 and allowing it to move back into the path of the bombs between such successive engagements. The bombs are thus automatically discharged in succession until the supply is exhausted, at or about which time the finger 63^a is brought into engagement with the finger 62 which latter may be of conducting material so that there is then established a circuit from the battery 24 through the conductor 23 to the conductor 68, brush 67, conductor 69 to and through the explosives represented by the casing 70 and back to the battery 24 by way of the conductors 71 and 22. The ignition of the explosives in the casing 70 results in the destruction of the aerial torpedo so that it may not fall into the hands of the enemy. Should, however, for some reason or other, such for instance as the piercing of the gas bag by a shell or bullet from the enemy, the aerial torpedo be caused to fall to the ground, the destruction of the apparatus is effected by the concussion of the explosives within the casing 72.

The aerial torpedo is entirely automatic in action and does not require the presence of an operator on the torpedo structure. Furthermore the automatic control, if the aim has been correct and the timing of the clock-work has also been correct, insures the bombardment of the enemy's position at relatively close range and over a considerable area.

With the exception of the motor for driving the propeller the mechanism employed may be of relatively cheap and simple construction. The motors 37 and 40 need not be at all elaborate and may be replaced by any suitable electromechanical means whereby the rudder is shifted from side to side in response to variations in the direct course of the aerial torpedo. By providing a sufficient number of pins 63, a comparatively large number of bombs may be released and if the bombs drop within the desired area the damage produced may be great and far in excess of that caused by the firing of shells from guns to an extent representing the same money outlay.

While two batteries 24 and 41 are shown for convenience of illustration, it will be understood that a single battery may be employed as the source of electric energy.

What is claimed is:

1. An aerial torpedo provided with means for sustaining it in the air, means for propelling the torpedo structure progressively, means responsive to earth magnetism for maintaining a predetermined course of the torpedo structure, means for releasing destructive devices at a predetermined point

in the progressive movement of the torpedo structure, and means for causing the destruction of the torpedo structure.

2. An aerial torpedo comprising a container, means for sustaining the container in the air, propelling and steering mechanism for the torpedo in part within the container, a reservoir for explosive devices within the container, and releasing means for the explosive devices within the reservoir, said releasing means having propelling means therefor independent of the propelling means for the torpedo, whereby the explosive devices may be automatically and intermittently released at predetermined times irrespective of the progress of the torpedo under the action of its propelling means.

3. An aerial torpedo comprising a container, means for sustaining the container in the air, propelling and steering mechanism for the torpedo in part within the container, a reservoir for explosive devices within the container, and releasing means for the explosive devices within the reservoir, said releasing means having propelling means therefor independent of the propelling means for the torpedo, whereby the explosive devices may be automatically and intermittently released at predetermined times irrespective of the progress of the torpedo under the action of its propelling means, said reservoir having a slanting bottom with a slanting chute leading downwardly therefrom through the bottom of the container toward the rear of said container to discharge the explosive devices by gravity in a rearward or trailing direction with relation to the progress of the container.

4. An aerial torpedo structure comprising a body member with means for sustaining the body member in the air and causing its progressive movement through the air and means for causing the release of destructive devices at a certain predetermined point in the flight of the torpedo and continuing the release of the destructive devices for a predetermined period of time, the torpedo being also provided with means for the destruction of the torpedo structure after the escape of the supply of the destructive devices.

5. An aerial torpedo structure comprising a body member with means for sustaining the body member in the air and causing its progressive movement through the air and means for causing the release of destructive devices at a certain predetermined point in the flight of the torpedo and continuing the release of the destructive devices for a predetermined period of time, the torpedo being also provided with means for the destruction of the torpedo structure after the escape of the supply of the destructive devices, and said torpedo structure having other means for the destruction of said torpedo structure, said last named means being responsive to the effects of shock.

6. An aerial torpedo having means for sustaining it and propelling it in the air, means for automatically constraining the torpedo to a set course irrespective of deviating forces acting thereon, and automatic means separate from and independent of the torpedo propelling means for discharging explosive devices at intervals with the discharge beginning at a predetermined time irrespective of the travel of the torpedo.

7. An aerial torpedo structure provided with means for sustaining it in the air, means for causing its progressive movement through the air, and means for causing the discharge from the torpedo structure of destructive devices comprising a receptacle for the destructive devices, means for conducting the devices from the receptacle to the exterior of the torpedo structure, restraining means associated with the conducting means for arresting the movement of the destructive devices and for releasing said destructive devices, and means operable at a predetermined time for causing the actuation of the restraining means to cause the successive release of a plurality of the destructive devices, said time controlled operating means being provided with electrical connections and the aerial torpedo being provided with explosive means responsive to electric currents traversing the electric connections for causing the destruction of the aerial torpedo after the discharge of the predetermined number of destructive devices.

8. An aerial torpedo structure provided with means for sustaining it in the air, means for causing a progressive movement of the torpedo structure through the air, means for automatically discharging destructive devices from the aerial torpedo structure at a predetermined time in its flight, and means for effecting the destruction of the aerial torpedo.

9. An aerial torpedo structure provided with means for sustaining it in the air, means for causing a progressive movement of the torpedo structure through the air, means for automatically discharging destructive devices from the aerial torpedo structure at a predetermined time in its flight, and means for effecting the destruction of the aerial torpedo, said destroying means comprising means controlled by the means for discharging destructive devices.

10. An aerial torpedo structure provided with means for sustaining it in the air, means for causing a progressive movement of the torpedo structure through the air, means for automatically discharging destructive devices from the aerial torpedo structure at a predetermined time in its flight, and means for effecting the destruc-

tion of the aerial torpedo, said destroying means comprising means controlled by the means for discharging destructive devices, and also means responsive to shock, whereby the torpedo structure is destroyed either after its supply of destructive devices is exhausted or by impact with some object.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of a witness.

CLARENCE BARRETT.

Witness:
MILDRED LANGE.