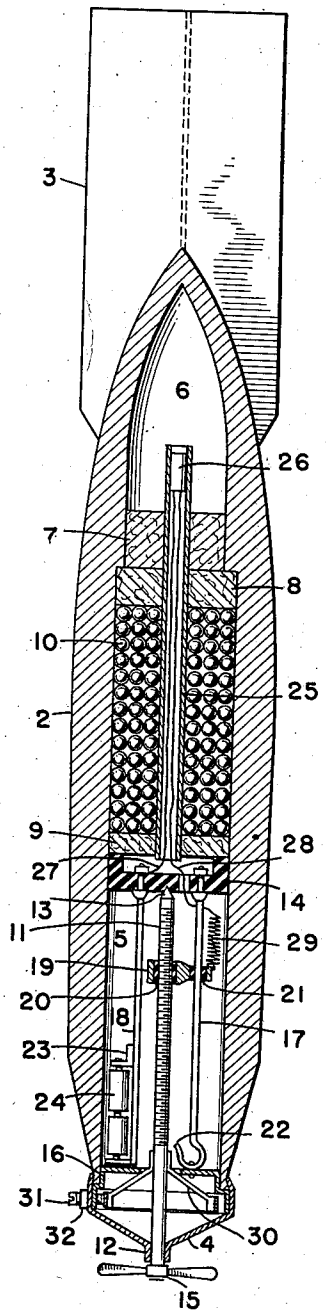
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AERIAL CANNON

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AERIAL CANNON

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1 Claim. (Cl. 102—2)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This application is made under the act of March 3, 1883, as amended by the act of April 30, 1928, and the invention herein described, if patented, may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment to me of any royalty thereon.

My invention relates to aerial bombs, and has for its object the provision of an aerial bomb for discharging a concentration of shot in a manner similar to the action of a cannon.

Other objects will appear from the following description.

In the accompanying drawing, forming a part of this specification, the figure is a vertical section of an aerial bomb embodying my invention.

As illustrated, my aerial cannon comprises a stream-lined body 2 equipped with fins 3 at one end to maintain the body 2 in a stable position during flight, adapted at the other end to receive a nose cap 4, and having a central opening extending from the end receiving the nose cap 4 throughout substantially its entire length to form a barrel 5. A portion of the barrel 5 toward the fin end of the body 2 is of reduced diameter and constitutes a powder chamber 6. Powder (not shown) is held in the chamber 6 by wads 7 and 8. Wad 8 also serves, together with a wad 9, to hold a shot charge 10 in place. A fire control assembly is arranged toward the nose end of the barrel 5. This assembly consists of a threaded shaft 11 carried by a bearing 12 in the nose cap 4 and a bearing 13 in a spacer plate 14. The plate 14 is made of electric insulating material and fits into the barrel 5 against the wad 9. The shaft 11 extends beyond the nose cap 4 a distance sufficient to allow the attachment of a propeller 15 designed for rotation by air currents when the bomb is in flight. A plate 16 is fitted on the inside of the nose cap 4, and is held in spaced relation with the plate 14 by two rods 17 and 18. A nut 19 disposed on the threaded shaft 11 has a lateral arm containing a circular opening which rides the rod 17. The nut 19 is constructed so that it is electrically insulated from both the shaft 11 and the rod 17 by annular inserts 20 and 21, but the remainder of the nut 19 constitutes an electrical conductor. The rod 17 is formed at its point of attachment to the plate 16 into a contact point 22 which is aligned with the conducting portion of the nut 19. The rod 18 is electrically insulated from the plate 16 and is fitted with a bracket 23 which contacts dry cell batteries 24 and also holds them in contact with the plate 16. A fiber tube 25 extending through openings in wads 7, 8, and 9 holds a firing cap 26 in position in the powder chamber 6 and contains circuit wires 27 and 28. The circuit wire 27 connects with the rod 18 at the plate 14 while the circuit wire 28 is led through an opening in the plate 14 and connects with the conducting portion of the nut 19.

The fire control mechanism is actuated by the turning motion imparted to the propeller 15 by air currents when the bomb is in flight. This turning motion revolves the shaft 11, and as nut 19 is prevented from turning by the lateral arm which rides the rod 17, it travels toward the nose end of the shaft 11. When the nut 19 reaches the contact point 22 formed on the rod 17, an electric circuit through the firing cap 26 is closed. This circuit runs from the firing cap 26 through the wire 27 to the rod 18, then from the rod 18 to the bracket 23 and through the batteries 24 to the plate 16, across the plate 16 to the rod 17 and the contact point 22 which is in contact with the nut 19, and then back to the firing cap 26 by way of wire 28. The wire 28 is formed into an extensible coil 29 near its point of attachment to the nut 19 to provide sufficient length for full traverse of the threaded portion of the shaft 11 by the nut 19. The closing of the circuit causes the firing cap 26 to detonate the charge in the powder chamber 6, and thus fire the shot 10 from the barrel 5 in a manner quite analogous to the action of a muzzle-loaded cannon.

It will be seen that the time necessary for the nut 19 to reach the contact point 22 will depend on the initial position of the nut 19 on the shaft 11, and on the speed of rotation of the shaft 11. Accordingly, if the speed of rotation of the shaft 11 can be made substantially constant, the timing will depend only on the initial position of the nut 19. To accomplish this result, a governing mechanism is provided. Two spring steel arms 30, which are lipped at their free ends, are attached to the shaft 11 inside the nose cap 4. A set screw 31, provided with a lock nut 32, is arranged in the nose cap to act as a retarding brush for the arms 30. Thus, by adjusting the set screw 31, a drag can be imposed on the shaft 11 to control the speed of rotation so that the timing of the bomb can be set within practical limits by proper positioning of the nut 19 at the time of assembly.

My invention is particularly adapted to ground strafing. When dropped from a considerable height, the shot will be discharged vertically, while when released from a low-flying plane, the shot will be discharged almost horizontally.

Variations between these two limits will give any intermediate angle desired. The barrel 5 can be loaded to near its bursting point, and as it is relatively short and contains a large shot charge 10, a broad fire pattern results.

Having thus described my invention, I claim:

An aerial bomb comprising a casing, a barrel formed in said casing and opening through the end of said casing which is forward in flight, a cover over the opening of said barrel, a charge of shot in said barrel, an explosive charge positioned in said barrel to exert an expelling force on said charge of shot when detonated, an electrical detonating cap adjacent to said explosive charge, a source of electrical energy mounted in said barrel, electrical conducting means forming an open circuit between said source of electrical energy and said detonating cap, a shaft rotatably mounted in said barrel, a propeller mounted externally on said casing and adapted for rotation by air currents during the flight of the bomb, means connecting said propeller for rotation of said shaft, means for regulating the speed of rotation of said shaft, screw-threads on said shaft, and a follower cooperating with said screw-threads, whereby said follower is advanced by the rotation of said shaft to close the circuit formed by said conducting means.

HARRY F. LEE.