J. H. SWAN.

AERIAL TORPEDO OR DROP BOMB.

APPLICATION FILED JAN. 9, 1919.

1,418,606.

Patented June 6, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

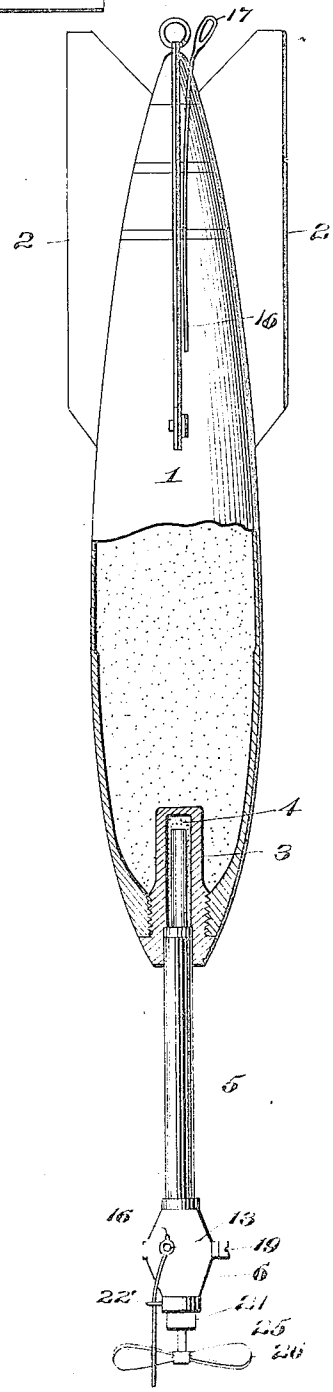
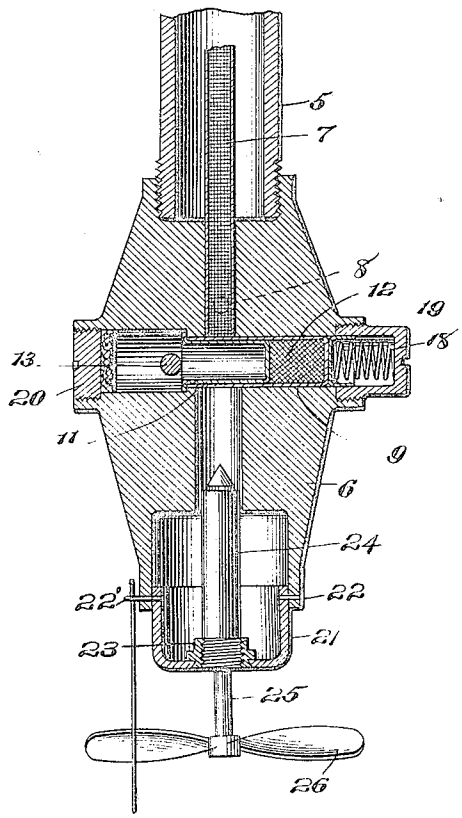


Fig. 2.



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Fig. 3.

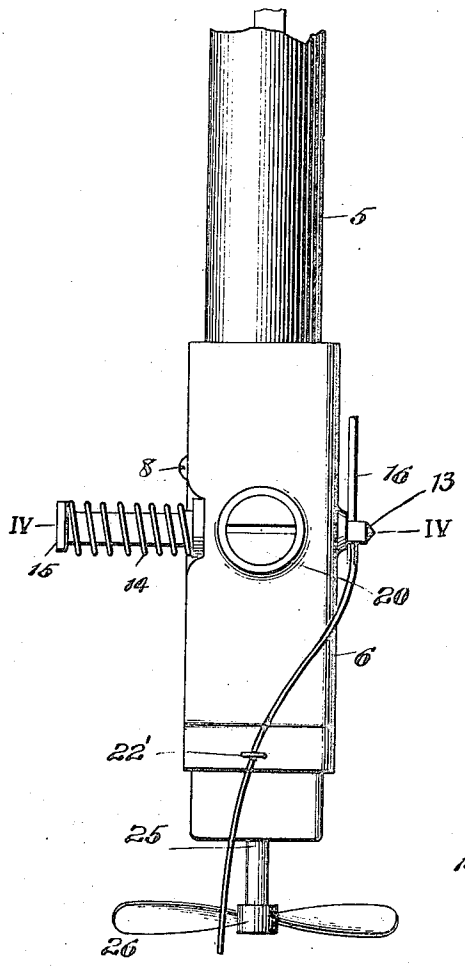


Fig. 5.

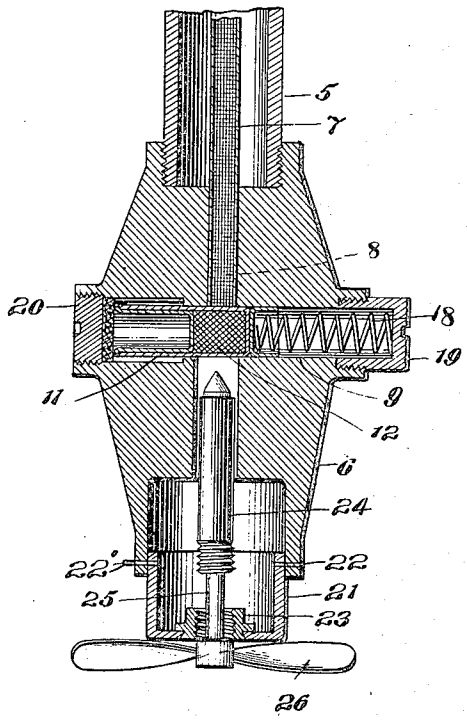
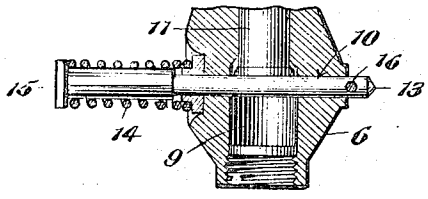


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN H. SWAN, OF THE UNITED STATES ARMY, ASSIGNOR TO NEWTON D. BAKER, SECRETARY OF WAR, TRUSTEE.

AERIAL TORPEDO OR DROP BOMB.

1,418,606. Specification of Letters Patent. Patented June 6, 1922.

Application filed January 9, 1919. Serial No. 270,339.

(FILED UNDER THE ACT OF MARCH 3, 1883, 22 STAT. L., 625.)

To all whom it may concern:

Be it known that I, JOHN H. SWAN, lieutenant, Ordnance Department, United States Army, a citizen of the United States, stationed at Washington, District of Columbia, have invented an Improvement in Aerial Torpedoes or Drop Bombs, of which the following is a specification.

The invention described herein may be used by the Government, or any of its officers or employees in prosecution of work for the Government, or by any other person in the United States, without payment of any royalty thereon.

This invention relates to the art of making aerial torpedoes or drop bombs adapted to be dropped from aeroplanes or other aircraft and deals specifically with improvements in the construction of a firing mechanism usually contained in the nose of such projectile.

The invention contemplates an arrangement whereby the charge contained in the projectile will be positively exploded, instantaneously, upon the mechanism striking the ground or other target. The firing mechanism is arranged at the end of a tube extending forwardly of the projectile proper, and thus assures that the contents of the missile is scattered over the obstacle struck, when the body of the projectile is a desired distance above the same.

The invention also contemplates means for retaining the firing mechanism in unarmed position during the ordinary handling of the projectile.

A practical embodiment of the invention is illustrated in the accompanying drawings, wherein:—

Fig. 1 is an elevation, partly in section, of a drop bomb provided with a firing mechanism, according to this invention;

Fig. 2 is an enlarged longitudinal section on the principal axis of the lower portion of the bomb containing the firing mechanism, showing the parts in safe position;

Fig. 3 is an enlarged detail in elevation, partly in section, of the firing mechanism;

Fig. 4 is a section taken on the line IV—IV of Fig. 3;

Fig. 5 is an enlarged detail sectional view of the firing mechanism showing the parts in armed position.

Referring to the drawings by numerals of reference, the torpedo or bomb body 1 has the usual fins 2 to assure its dropping point downward. The forward end of the body 1 is apertured to receive a member 3, which forms a chamber for the reception of the booster-charge 4, and also acts as an adapter or reducing joint for the reception of one end of the tube 5, which tube extends forwardly of the body 1.

To the forward end of the tube 5 is threaded or otherwise secured a casing 6, in which the firing mechanism is housed. The casing 6 is provided with a longitudinal bore into which projects the forward end of the fuse 7, which fuse may be bound in place in the bore of the casing by a set-screw 8 or otherwise. The fuse, as shown, extends longitudinally of the tube 5 and enters the booster chamber 3.

The casing 6 is provided with communicating transverse bores 9 and 10, the former of which is also in communication with the longitudinal bore of the casing. Mounted in the bore 9, to slide longitudinally thereof, is a detonating member 11 carrying a percussion cap 12, and normally held toward one end of the bore 9, with the cap 12 out of alignment with the fuse 7, by means of a pin 13 inserted in the bore 10.

The pin 13 is normally urged out of the bore 10 by a coil compression spring 14, which surrounds a projecting end of the pin and is confined between the head 15 of the pin and the casing 6. The pin is normally retained against ejection by the spring 14 through means of a release wire 16, one end of which passes through an aperture formed in an extending end of the pin and the other end of which is looped, as at 17, for connection to a suitable portion of an aeroplane or other aircraft.

A coil compression spring 18 is located in one end of the bore 10 and is confined between an end of the detonator 11 and a screw-cap 19, which is threaded into one end of the bore 10 and normally urges the detonator toward armed position to bring the percussion-cap 12 in alignment with the fuse 7. The other end of the bore 10 may be closed by a screw-plug 20 or in any other suitable manner.

The forward end of the longitudinal bore

of the casing 6 is enlarged for the reception of a cap 21 which is adapted to slide within said enlarged end of the bore, but is normally held from sliding therein by the shear-pins 22—22′ which are designed to shear and release the cap upon impact of the bomb.

The cap 21 is centrally apertured to receive a thimble 23 into which is threaded a firing pin 24, which has a sliding fit in the longitudinal bore of the casing and which is held by the cap 21 in unarmed position. The firing pin 24 has a forwardly extending stem 25 on the end of which is mounted an air-wheel 26, the object of which is to rotate the pin during the flight of the bomb to unscrew it from the thimble and place it in armed position.

In practice the bomb is hung from the aeroplane in any usual and ordinary manner, and the loop 17 of the release wire is caught on a suitable element of the plane. When the bomb is released it will drop, causing the release wire to be withdrawn from the aperture in the pin 13 and release the pin for ejection under the force of the spring 14. Ejection of the pin 13 will release the detonator 11 to move to armed position under the force of the spring 18.

As the bomb drops, impact of the air will cause the air-wheel 26 to rotate, thereby unscrewing the pin 24 to move to armed position.

Upon impact of the bomb, the shear-pins 22—22′ will be severed and the cap 21 and firing-pin 24 will move longitudinally of the casing 6 and permit the pin to contact the percussion-cap 12 and fire the fuse and high explosive charge of the bomb. This explosion will take place while the body of the bomb is still above the ground or other target because of the forwardly extending tube 5.

Having described the invention what I claim as new and desire to secure by Letters Patent is:—

1. A bomb, torpedo or like projectile comprising a body member carrying an explosive charge; a hollow elongated member attached to the nose of the body inclosing an instantaneous fuse, consisting of a column of high explosive material forming a continuation of the charge; a firing mechanism secured to the end of the elongated member, comprising a movable firing-pin in alignment with the end of the column of explosive; a detonator slidable between the pin and column, the charge of which is normally out of alignment with the end of the column; means to move the detonator with the charge between the explosive column and firing-pin; and a spring ejectable means releasable when the bomb is cast from an aeroplane or other aircraft to maintain the parts in normal safe position.

2. In a drop bomb or the like, an explosive charge in the body thereof, a tube extending from the nose of the body, and an elongated column of fuse material in the tube for communicating ignition to said charge, a detonator normally out of alignment with the fuse, means to move the detonator into alignment with the fuse when the bomb is launched, a firing pin and means for moving said firing pin into proximity to the detonator during the flight of the bomb.

JOHN H. SWAN