May 9, 1967 T. WOLF 3,318,042

TETHERED BOMBER PLANE AND MECHANISM FOR RELEASING BOMBS

Filed March 29, 1965

Fig. 1.

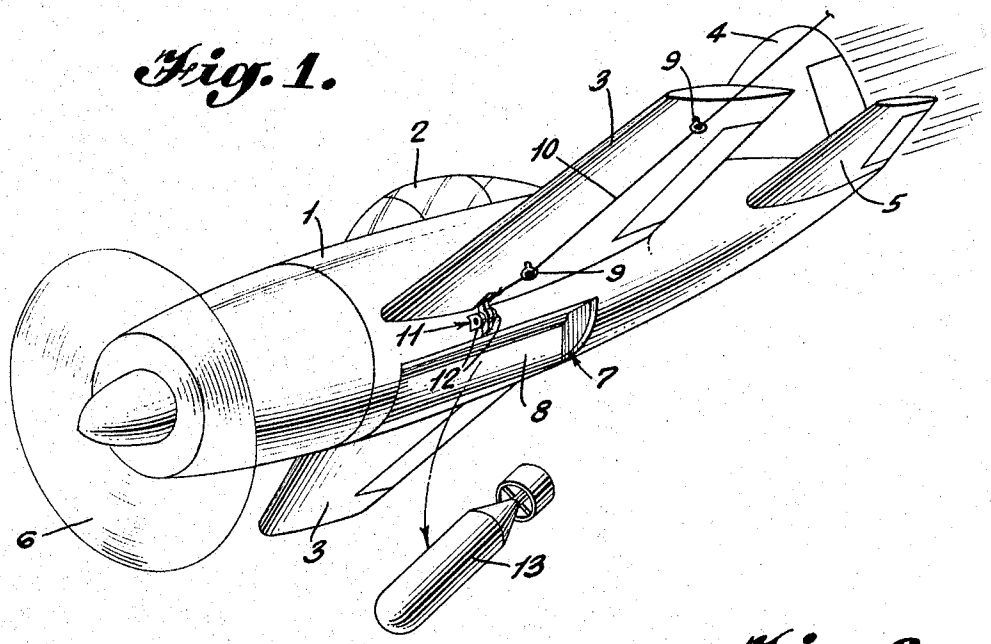


Fig. 2.

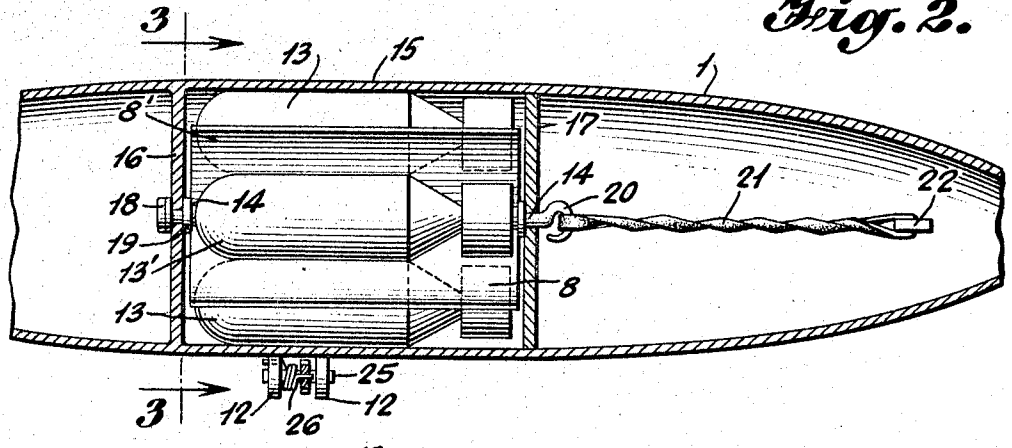
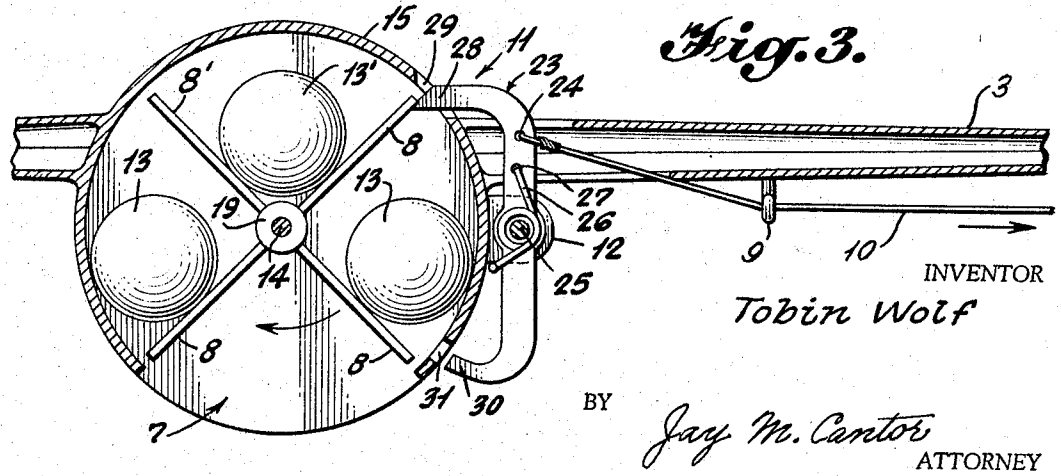


Fig. 3.



INVENTOR

Tobin Wolf

BY

Jay M. Cantor

ATTORNEY

United States Patent Office

3,318,042

Patented May 9, 1967

3,318,042

TETHERED BOMBER PLANE AND MECHANISM FOR RELEASING BOMBS

Tobin Wolf, 447 Essex Ave., Bloomfield, N.J. 07003

Filed Mar. 29, 1965, Ser. No. 443,408

6 Claims. (Cl. 46—77)

This invention relates to a toy glider plane having a ground positioned bomb releasing device, and more particularly to a toy glider plane including a lever escapement type bomb release device mechanically controllable from the ground.

The concept of providing toy glider airplanes with a mechanical device located in the glider for releasing missiles, such as bombs, parachutes and the like from a gliding airplane by means of a mechanical device positioned on the ground, has been known in the art for many years. Although several prior art mechanical bomb release mechanisms have been known, none has obtained commercial success due to many inherent difficulties therein. The prior art bomb release mechanism of the above described type have a tendency to jam and, in general, have not been capable of satisfactorily releasing their bombs upon operation of the mechanical bomb release means.

In accordance with the present invention, a patentably novel bomb release mechanism for a toy glider airplane is provided thereby a simple mechanical operation on the ground will immediately release one and only one bomb from the airborne toy glider airplane and, after operation, the mechanical bomb release mechanism will immediately be positioned for further use. The above is accomplished by providing a standard simple indexing mechanism or lever escapement which operates a vaned rotor or paddle wheel type of mechanism which comprises a magazine for storing a plurality of bombs, the vaned rotor being provided with a rotational force by a spring, rubber band or the like which will apply such rotational force to the rotor. The rotor is prevented from rotating by one member of the lever escapement which bears against one of the rotor vanes. The lever escapement is coupled to a single string, wire, or the like of light weight relative to the weight of the airplane which can be attached to a second string provided for attachment to the airplane whereby such airplane can be provided with a centrifugal force by a circular rotation thereof about the operator on the ground or, alternatively, the single string used to provide the centrifugal force could also be attached to the lever escapement. The lever escapement is rotated about its pivot by applying a sudden jerk or tug to the string sufficient to overcome the bias of the spring or the like on the lever escapement. This rotation of the lever escapement allows the vaned rotor to rotate in a direction along which the rotational force is applied through a distance of approximately 90° until the vaned rotor abuts a second protrusion of the lever escapement which terminates the travel thereof. When the force on the string is less than the force of the biasing spring, the lever escapement will return to its original position with the vaned rotor rotated 90° from its original position and with a further bomb now in position to be dropped. The above described mecanism is relatively inexpensive to manufacture, of simple construction and is capable of substantially foolproof operation.

It is therefore an object of this invention to provide a release mechanism for the toy airplanes and the like which utilizes a simple indexing mechanism or lever escapement.

It is a further object of this invention to provide a simple release mechanism for a toy airplane having a mechanical link between the airplane and a ground operator.

It is a still further object of this invention to provide a

relatively inexpensive and highly foolproof release mechanism for toy airplanes.

The aforementioned objects of the invention and still further objects of the invention will become readily apparent to those skilled in the art when considered in view of the following description of a specific preferred embodiment fo the invention which is given by way of explanation and not by way of limitation, wherein:

FIGURE 1 is view in elevation of a toy airplane including the release mechanism in accordance with the present invention;

FIGURE 2 is a view in cross-section taken along the major axis of the airplane of FIGURE 1; and

FIGURE 3 is a cross-section taken along the line 3—3 of FIGURE 2.

Referring now to FIGURE 1, there is shown a toy airplane including the standard fuselage **1**, cockpit **2**, wings **3**, tail sections **4** and **5** and propeller **6**. The airplane further includes a bomb-bay **7** through which a vane **8** of a vaned rotor (to be described in detail hereinbelow) can be seen. Attached to one wing **3** of the airplane are a pair of looped screw-type members **9** or the like through which a wire, string or the like **10** passes; this wire, string or the like being sufficiently long so that it may be held by the operator of the airplane who is standing on the ground. The string, wire or the like **10** is also connected to the lever of a lever escapement mechanism **11** (FIGURES 1 and 3) secured to a pair of brackets **12** which are connected to the fuselage **1** of the airplane. A bomb, parachute or the like is shown in FIGURE 1 in its downward trajectory after having been released by utilization of the release mechanism of the present invention.

Referring now to FIGURES 2 and 3, there is set forth in more detail the release mechanism in accordance with the present invention. The release mechanism comprises a vaned rotor including four vanes **8** positioned 90° apart about a shaft **14**. It is, of course, understood that the vanes **8** could be spaced apart by angles of more or less than 90° without departing from the invention. The vaned rotor is positioned within a housing **15** which may comprise a portion of the fuselage **1** as shown in FIGURES 2 and 3. A shaft **14** passes through a wall **16** within the fuselage and is secured thereto by a pair of locking members **18** and **19** being rigidly secured to the shaft **14** for preventing lateral movement thereof but also sufficiently distantly spaced to allow the shaft to rotate within the wall portion **16**. The other end of the shaft **14** passes through wall member **17**, this end of the shaft **14** including a hooked portion **20** to receive a torsion providing member, such as a torsion spring, twisted rubber band or the like. In FIGURE 2, there is shown a twisted rubber band **21** secured at one end thereof within the hooked portion **20** of the shaft **14** and at its other extremity to a hooked member **22** or the like secured within and to the fuselage of the airplane.

Referring now more particularly to FIGURE 3, there is shown a substantially U-shaped lever escapement member **23** including an aperture **24** therein for receiving the wire, string or the like **10** which is secured thereto through the aperture in a conventional manner, for example, tying of a knot. The U-shaped member **23** is secured to the outer portion of the fuselage **1** by a securing member **25** which is secured in the brackets **12** and passes through the U-shaped member **23**. One end of a coiled spring **26** passes through a second aperture **27** of the member **23**, the other end of the coiled spring member **26** abutting the brackets **12**. This spring provides a bias to the member **23** wherein the end portion of the leg **28** thereof is normally positioned through an aperture **29** in the portion **15** of the fuselage, whereby the arm portion **28** abuts the

vane 8 to prevent clockwise movement of the vaned rotor. The portion 15 of the fuselage includes a second aperture 31 through which a second arm 30 of the U-shaped member 23 can pass when a tension is applied along the wire 10 to the member 23 sufficient to overcome the bias of the coiled spring 26. The application of a sufficient tension on the wire 10 therefore causes the arm 28 to rotateclockwise outside the fuselage and allows the vaned rotor to rotate approximately 90° until one of the vanes 8 abuts the newly positioned arm 30.

The release mechanism of the present invention is operated in the following manner. First, before placing the airplane into its gliding position, the operator will cause the U-shaped member 23 to be progressively rotated to its clockwise and then counter-clockwise directions, meanwhile rotating the vaned rotor successively in a counter-clockwise direction to rotate and twist the rubber band 21 and thereby apply a clockwise rotational force or torsion to the vaned rotor. During this operation the bombs 13 are loaded into position through the bomb-bay 7. The operator on the ground will then cause the airplane to become airborne by rotating the wire, string, or the like 10 overhead. Then the operator will apply a sudden tug along the wire, string or the like 10, this tug overcoming the bias of the spring 26 and causing the U-shaped member 23 to rotate about the shaft 26 in a clockwise manner. When the U-shaped member 23 has been rotated in a clockwise direction, the arm member 28 thereof ceases to abut the vanes 8 and, since a clockwise rotational force has been applied to the vaned rotor, the vaned rotor will travel in a clockwise direction until the vane member 8 abuts the arm 30 of the U-shaped member 23 which has now been rotated so that it extends through the aperture 31. It can be seen that this 90° rotation of the vaned rotor will cause the bomb, parachute or the like 13 to be positioned at the entrance to the bomb-bay 7 and thereby be released toward the ground under the force of gravity. When the force along the string 10 is then insufficient to overcome the bias of the spring 26, this spring will cause the U-shaped member 23 to rotate in a counter-clockwise direction, thereby causing the arm 28 thereof to protrude back through the aperture 29 to the interior of the fuselage. Accordingly, the next vane member 8' will again abut the arm 28 and position the bomb 13' for further operation.

It should be understood that the distance between the end portions of the arms 28 and 30 will be slightly less than the distance between the extremities of the two adjacent vanes 8. In this manner, after a rotating vane has ceased rotation due to its abutment against the arm 30, the next succeeding vane 8 would still have to travel a slight distance before it arrives in its travel to the arm 28, thereby allowing the arm 28 to rotate in a counter-clockwise direction back to its normal position in sufficient time to prevent rotation of said succeeding vane member.

Although the invention has been described with respect to a specific preferred embodiment, many alterations, modifications and variations thereof will immediately become apparent to those skilled in the art. It is therefore the intention that the appended claims be interpreted as broadly as possible in view of the prior art to encompass all such alterations, modifications and variations.

What is claimed is:

1. A toy airplane comprising a fuselage having an opening in the lower portion thereof, a magazine for storing a plurality of bombs movably mounted in the fuselage above the opening, means for constantly urging the magazine to move to successive positions for dropping a bomb at a time through the opening, escapement mechanism for preventing movement of said magazine, a tether connected to said mechanism for swinging the plane in an orbit, and means responsive to a jerk of predetermined magnitude on the tether for operating the escapement mechanism for permitting movement of said magazine to a next successive position to drop a bomb.

2. An airplane as defined in claim 1 wherein the magazine comprises a plurality of vanes connected together for rotation about an axis parallel to the longitudinal axis of the fuselage.

3. An airplane as defined in claim 2 wherein the means for constantly urging the magazine comprises a spring.

4. An airplane as defined in claim 3 wherein the spring comprises a rubber band and means for securing the band to the fuselage and magazine whereby manual rotation of the magazine will twist the band to store energy therein.

5. An airplane as defined in claim 1 wherein the escapement mechanism comprises a pawl pivotally mounted adjacent the magazine and having fingers for engagement therewith.

6. An airplane as defined in claim 5 wherein the means responsive to said jerk comprises a torsion spring under preselected bias engaging the pawl to pivot one finger into engagement with the magazine.

References Cited by the Examiner

UNITED STATES PATENTS

2,580,405	1/1952	Byers	46—77
2,954,229	9/1960	Schumacher et al.	46—1 X

FOREIGN PATENTS

129,555	7/1919	Great Britain.

RICHARD C. PINKHAM, *Primary Examiner.*

T. ZACK, L. J. BOVASSO, *Assistant Examiners.*