

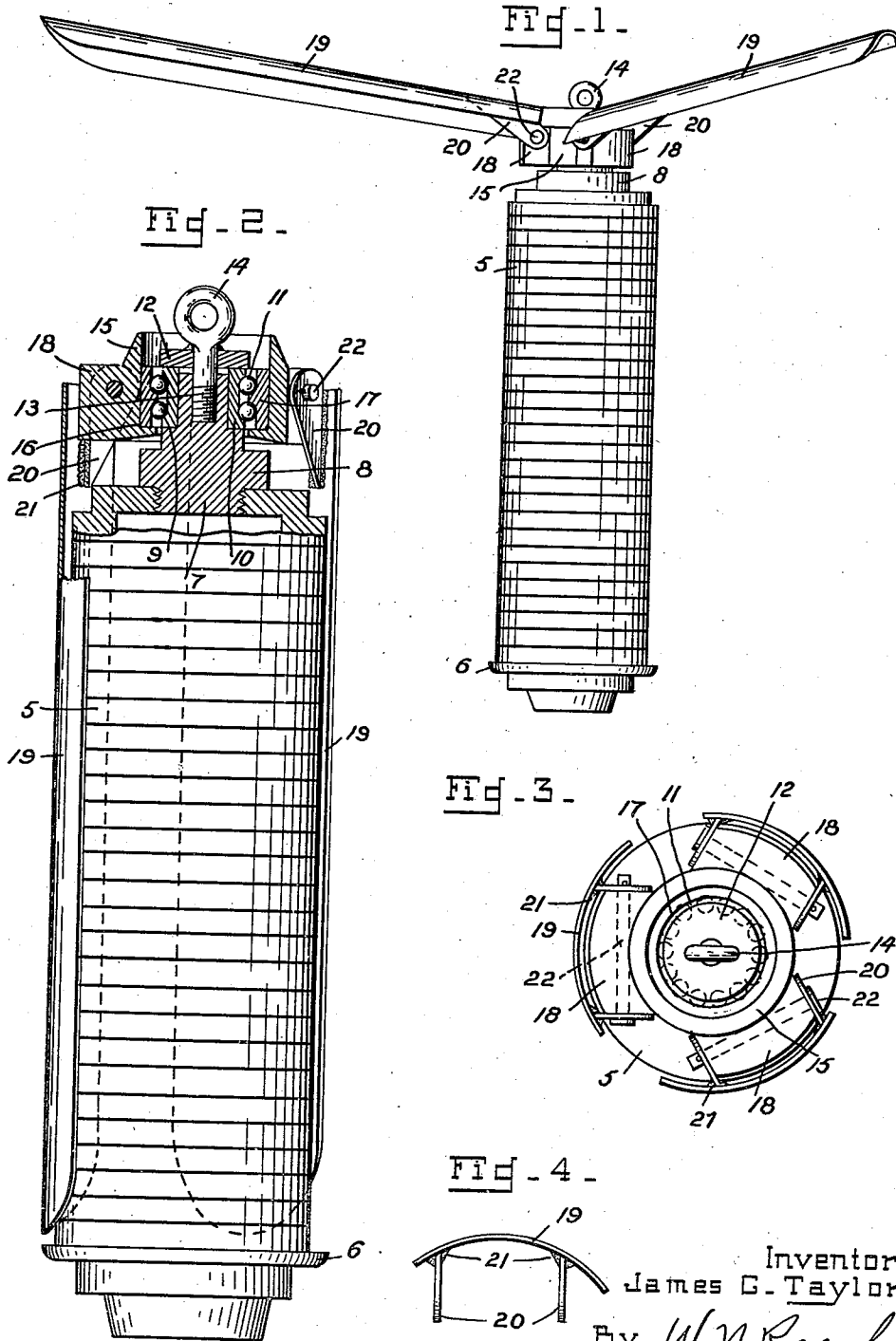
June 23, 1936.

J. G. TAYLOR

2,044,819

PROJECTILE

Filed Oct. 27, 1933



Inventor
James G. Taylor
By *W. N. Roach*
Attorney

UNITED STATES PATENT OFFICE

2,044,819

PROJECTILE

James G. Taylor, Dayton, Ohio

Application October 27, 1933, Serial No. 695,495

3 Claims. (Cl. 102—2)

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

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates generally to projectiles and more particularly it has reference to a projectile such as a bomb or other missile adapted to be launched from aircraft.

The purpose of the invention is to provide a vane wheel on a bomb for checking or retarding its descent. The vane wheel is intended to replace the conventional parachute which is composed of a material such as silk that is difficult to procure in wartime. While this substitution has previously been proposed in Patent No. 1,003,082 of September 12, 1911, and Patent No. 1,077,990 of November 11, 1913, the present invention deals with a different problem, namely, that of launching the bomb from a low-flying aircraft and retarding its flight and delaying its impact for such an interval of time as will permit the aircraft to travel out of the danger zone.

If the ordinary small vane wheel is employed it will not afford sufficient retardation and delay of impact and if a large vane wheel is associated with the bomb it is not only bulky and difficult to house but produces a soaring or glider action which is a variable factor and cannot be calculated and compensated for in aiming at a definite target. In addition such soaring action may result in the bomb following the general course of the aircraft in a trajectory that is closer to the horizontal than the vertical and in this event the aircraft will not clear the danger zone.

In order then to meet the requirements of size and compactness, low rate of descent, accuracy, and a nearly vertical trajectory, the improved vane wheel comprises curved blades conforming to the curvature of the bomb body and having a novel manner of providing a large angle of incidence.

With the foregoing and other objects in view, the invention resides in the novel arrangement and combination of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

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

Fig. 1 is a view in side elevation of the improved

bomb showing the vanes in open or extended position.

Fig. 2 is a view in side elevation, and partly in section showing the vanes in the folded position.

Fig. 3 is a plan view of Fig. 2.

Fig. 4 is a view in end elevation of one of the blades.

Referring to the drawing by characters of reference there is shown a bomb body 5 having an annular flange 6 on its nose end and threadedly carrying a spindle 7 in its tail.

The spindle is provided with a collar 8 for engaging the body 5 and limiting its threaded engagement. The outer extremity of the spindle is reduced to form an annular seat 9 for the inner race 10 of an anti-friction bearing unit 11. The inner race is retained by a collar 12 on a bolt 13 that is threadedly connected to the spindle and terminates in an eye 14 which provides a means for suspension of the bomb.

A hub 15 having an annular seat 16 on its lower end to seat the outer race 17 of the bearing unit and to be retained thereby is provided with a plurality of radially projecting supports or ears 18, three being shown.

A wing or blade 19 is associated with each ear 18 and has a curvature in cross-section preferably conforming to the curvature of the body so that when in folded position as seen in Figs. 2 and 3 it will lend itself to the formation of a compact unit requiring a minimum of storage space. In the preferred embodiment of the invention a pair of spaced ears 20—20 is secured as by welding 21 to one end of the blade. The center line of the spaced ears is offset relative to the center line or longitudinal axis of the blade (Fig. 4) in order to provide the blade with an angle of incidence when open and increase its efficiency.

The connection between the ears 20 of the blade and an ear 18 of the hub is effected by means of a pin 22 passing through the ears.

The bomb is stored and also carried in the launching tube of an aircraft with its wings or blades folded alongside the body as seen in Fig. 2. The flange 6 on the nose end of the bomb extends outside the trace of the blades and provides a clearance between the blades and the launching tube.

When the bomb is launched the air pressure causes the blades to be rotated about their pivots until they assume a generally horizontal position, with the inner end of each blade brought up against the hub to limit the opening movement.

Because of the pitch or angle of incidence of the blades the vane wheel will be rotated and serve to check the descent of the bomb in the manner of a parachute and similar to an autogiro. The relatively small blades rotating rapidly by virtue of the anti-friction bearing and having high efficiency because of their curvature and angle of incidence give a nearly vertical trajectory and sufficient retardation to enable the aircraft to clear the danger zone.

While the invention has been illustrated and described in connection with a bomb its adaptability to velocity and trajectory control of falling bodies will be readily apparent.

I claim:

1. A projectile including a cylindrical body, a spindle in one end of the body, an anti-friction bearing unit on the spindle, a hub carried by said unit, radially projecting ears on the hub, a plurality of blades each having a curvature in cross-section conforming to the curvature of the cylindrical body, a pair of spaced ears at one end of each blade, the medial plane between the ears being offset relative to the plane passing through the axis of the bomb and the longitudinal axis

of the blade, and a pivot pin passing through the ears of the blade and hub.

2. A projectile including a cylindrical body, a support rotatably mounted on the tail end of the body, a plurality of similar blades each having a curvature conforming to the curvature of the cylindrical body and pivotally mounted on the support for movement from a folded to an extended position, substantially perpendicular to the body said pivotal mounting having the plane normal to its axis at its mid-point offset relative to the plane passing through the axis of the bomb and the longitudinal axis of the blade.

3. A projectile including a body, a support rotatably mounted on the tail end of the body, a plurality of blades curved in cross-section and pivotally mounted on the support for movement from a folded to an extended position, substantially perpendicular to the body said pivotal mounting having the plane normal to its axis at its mid-point offset relative to the plane passing through the axis of the bomb and the longitudinal axis of the blade.

JAMES G. TAYLOR.