Jan. 31, 1933. J. M. KING 1,895,513

FUSE

Filed Sept. 29, 1930

Fig-1-

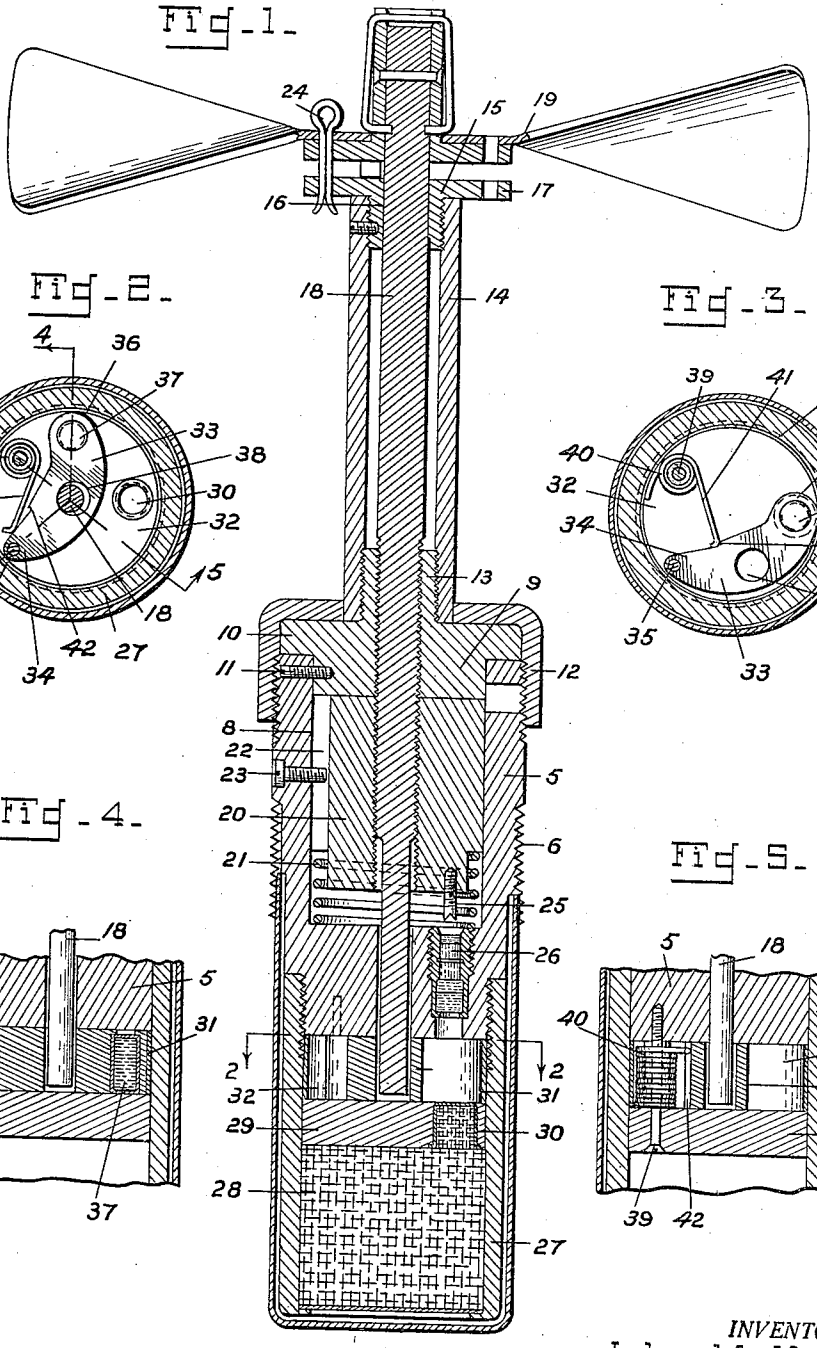


Fig-2-

Fig-3-

Fig-4-

Fig-5-

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UNITED STATES PATENT OFFICE

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FUSE

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(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.

The subject of this invention is a fuse for projectiles and is especially designed as a delay fuse for drop bombs.

The object of the present invention is the provision of a fuse in which an element of an interrupted explosive train is carried by a rotor which is held in unarmed position by an arming device and also holds a plunger in unarmed position. The rotor is arranged so that when moved into armed position it will not be counter rotated due to shocks arising from impact.

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 longitudinal sectional view of the improved fuse, showing the parts in the safe or unarmed position;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1;

Fig. 3 is a view similar to Fig. 2 showing the parts in the armed position;

Figs. 4 and 5 are sectional views on corresponding lines of Fig. 2.

Referring to the drawing by characters of reference:

The fuse comprises a hollow body 5 having the usual threaded portion 6 whereby it is attached to a projectile 7. The chamber 8 of the body is closed by a cover 9 partially inserted in the body and having a flange 10 resting on the brim of the body. The cover is held securely to the body by means of a pin 11 and also by means of a cap 12 threaded exteriorly to the rim of the body.

The cover is formed with an annular extension 13 to which is threaded a tube 14 whose upper end receives a plug 15 having a central aperture 16 and a flange 17. Inserted through the aperture 16 of the plug is the arming rod 18 of a conventional vane assembly 19. The rod passes through and is in threaded engagement with the cover 9 and also with a plunger 20 which is thereby positively held in the safe or outer position of the chamber 8. A spring 21 is also provided to hold the plunger in the safe position in the absence of the arming rod.

The plunger is provided with a longitudinal slot 22 for receiving a pin 23 fixed in the body and holding the plunger against rotational movement. This provision is made so that the arming rod may be unthreaded from the plunger during rotation of the vane assembly in flight of the projectile. The vane assembly is normally secured by a cotter pin 24 which when the projectile is placed in the rack or carrier of an airplane is replaced by a release wire (not shown) withdrawn in the customary manner when the projectile is launched.

The plunger eccentrically carries a firing pin 25 which is in line with an explosive train 26 in the fuse body 5.

The lower or inner end of the fuse body is reduced to threadedly receive a cup 27 in which is a booster charge 28 confined by a disk 29 eccentrically carrying a relay booster charge 30. A thin sleeve 31 fitted into the cup is confined between the disk and the fuse body when the parts are assembled and serves to define a chamber 32 as well as to securely hold the disk in spaced relation with respect to the body.

Within the chamber 32 is a rotor 33 having a pointed extremity 34 provided with an aperture for receiving a pivot pin 35 fixed in the body. The other extremity 36 of the rotor is offset and rounded and carries a detonator 37. The rotor is provided centrally with an aperture 38 designed to receive the inner end of the arming rod 18. When thus engaged the rotor 33 is held in the unarmed position with its detonator 37 out of line with the explosive train 26 and the relay booster charge 30.

A screw 39 having its head engaged in the

disk 29 and threaded in the body serves as a guide for the torsion spring 40 whose arm 41 presses against the rotor adjacent the pivot 35. The rotor is provided with a shoulder 42 so placed that it will be engaged by the end of the spring when the rotor is in the armed position against the sleeve 31 as shown in Fig. 3. In this position the arm of the spring is substantially perpendicular to the rotor and at such an angle that it will oppose counter rotation of the rotor.

When the projectile equipped with the fuse is launched the vane assembly functions in the customary manner to unthread the rod 18 and withdraw it from the fuse to first release the rotor 33 and then the plunger 20. On impact the plunger, in the case of a tail fuse, is forced home by its inertia and the firing pin 25 actuates the explosive train.

I claim:

1. A fuse including a body, a plunger in the body, an element of an ignition train carried by the body and the plunger, a cup secured to the inner end of the body, a booster charge in the cup, a disk over the booster charge, means for spacing the disk from the body to form a chamber, a rotor in said chamber having a pointed end and an offset rounded end and a notched face intermediate the ends, a detonator in the rounded end, means for pivotally mounting the rotor at its pivoted end, means removable during flight for holding the plunger and rotor in unarmed position, and a torsion spring having an arm engaging the rotor to move it to armed position, the arm engaging in the notched face of the rotor to hold the rotor against counter movement.

2. In a fuse, a rotor having a pointed end, an offset rounded end and a notched face intermediate the ends, an element of an explosive train in the rounded end of the rotor, means for pivotally mounting the rotor at its pointed end, means removable during flight for holding the rotor in unarmed position, a torsion spring having an arm engaging the rotor to move it to armed position, and means for stopping the rotor in armed position with the arm engaging in the notched face to hold the rotor against counter movement.

3. In a fuse, a rotor having a notched face, means for pivotally mounting the rotor at one end, an element of an explosive train in the other end of the rotor, means removable during flight for holding the rotor in unarmed position, a torsion spring having an arm engaging the rotor to move it to armed position, and means for stopping the rotor in armed position with the arm engaging in the notched face to hold the rotor against counter movement.

JOHN M. KING.