Aug. 5, 1924. 1,503,632

H. M. BRAYTON

SAFETY PLUNGER FOR ARTILLERY FUSES

Filed April 29, 1924

Fig. 1.

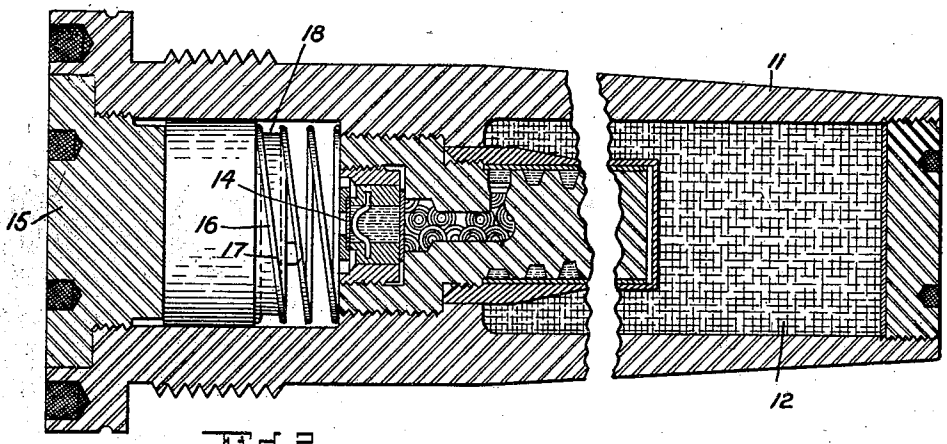


Fig. 2.

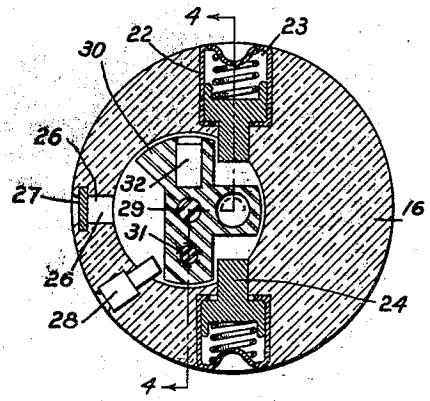


Fig. 3.

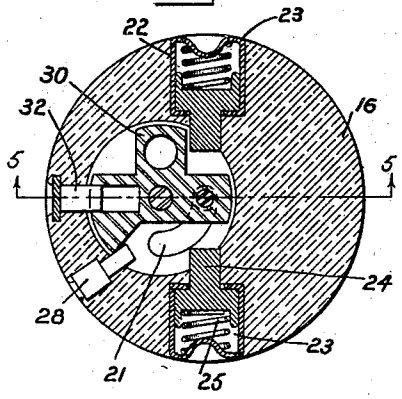


Fig. 4.

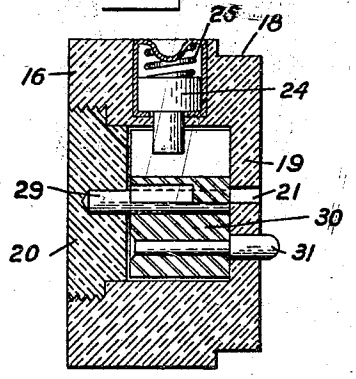
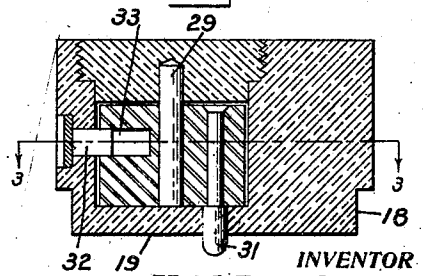


Fig. 5.



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UNITED STATES PATENT OFFICE.

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SAFETY PLUNGER FOR ARTILLERY FUSES.

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

To all whom it may concern:

Be it known that I, HAROLD MORGAN BRAYTON, a citizen of the United States, and a resident of Dover, county of Morris, and State of New Jersey, have invented an Improvement in Safety Plungers for Artillery Fuses, 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 to me of any royalty thereon, in accordance with the act of March 3, 1883.

My invention has reference in general terms to safety plunger for artillery fuses, which is designed to retain a firing pin in unarmed position when the projectile is in storage or transportation. More particularly, my invention resides in the provision of an eccentrically bored plunger and a centrifugally released element rotatable within the plunger, whereby a firing pin may be selectively positioned in armed and unarmed position with relation to a primer.

Certain plungers heretofore known will fail to function properly if the eccentric bore of the plunger is slightly displaced from normal, due to eccentricity of the shell. The result is frequently a complete failure to fire and is especially detrimental in large caliber projectiles.

The principal objects of my invention are to provide a safety plunger, which will effectually retain the firing pin in unarmed or inoperative position until the projectile has been fired and which will positively function without regard to the position of the eccentric bore in the plunger. Other and equally important objects of my invention are: to provide a centrifugally released rotor carried by the plunger; to establish within the rotor means for locking it in operative position; and, to permit a considerable latitude in positioning the eccentric bore of the plunger.

To these and other ends, my invention consists in the construction, arrangement and combination of elements, described hereinafter and pointed out in the claims forming a part of this specification.

The preferred embodiment of my invention is illustrated by way of example in the accompanying drawings, wherein,

Fig. 1 is a longitudinal sectional view of a base detonating fuse, showing my improved plunger;

Fig. 2 is a sectional view of the plunger, taken on the line 3—3 of Fig. 5, showing the rotor in inoperative or unarmed position.

Fig. 3 is a sectional view of the plunger showing the rotor in operative or armed position.

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 2; and

Fig. 5 is sectional view taken on the line 5—5 of Fig. 3.

In the drawings wherein like characters of reference designate like or similar parts,

11 indicates the fuse body which encloses the booster charge 12, detonator stock, and primer disc 14. These elements are conventional and form no part of the present invention.

The base of the fuse body is formed by a rear plug 15 against which is seated within the fuse body a plunger 16 normally held in position by a restraining spring 17.

The plunger 16 consists of a cylinder movable within the fuse body, its forward portion being preferably turned to a smaller diameter as at 18 to accommodate the restraining spring 17. Eccentrically positioned in the plunger 16 is a bore which extends to the forward face of the plunger. The rear of the plunger is closed by a plug 20 secured in any suitable manner. The forward face 19 is provided with a quadrantal slot 21 including the longitudinal axis of the plunger and concentric with the plunger bore.

Formed in the sides of the plunger are oppositely disposed shouldered recesses 22 communicating with the plunger bore. Cups 23 firmly seated within the shouldered recesses carry collar pins 24 which are normally projected within the plunger bore by means of springs 25 mounted in the cups 23.

A recess 26 formed in the narrowest wall of the plunger is provided with a stop plate 27. Secured firmly within the wall of the plunger 16 is a stop pin 28 projecting within the plunger bore.

Pivotally mounted in the center of the

plug 20 is a pin 29 carrying a rotor 30 adapted for rotation within the bore of the plunger 16. The rotor is approximately T-shaped, the opposite wings carrying a firing pin 31 and a lock pin 32 adapted for sliding movement within a radially disposed recess 33 in the rotor 30. The firing pin 31, mounted in a plane parallel to the axis of the rotor, extends through the plunger face 19 and rides in the slot 21.

During storage or transportation of projectiles equipped with fuses embodying my safety plunger, the firing pin 31 carried by the rotor 30 will be normally held in inoperable position by means of the spring actuated collar pins 24, seated in the plunger as clearly illustrated in Figure 2. The lock pin 32 mounted in the rotor will also be held in inoperative position by the inner wall of the plunger.

When the projectile has been fired, it is rotated by the rifling in the bore of the gun barrel and after the desired speed has been attained the collar pins 24 will be thrown outwardly through the action of centrifugal force against the springs 25. The rotor thus being released will revolve under the action of centrifugal force on its axis until it engages the stop pin 28, when the lock pin 32, being aligned with recess 26, will be thrown by the action of centrifugal force into such recess 26 until it engages the stop plate 27. The wing of the rotor carrying the firing pin will thus be moved counter-clockwise until the firing pin 31 is centered in the longitudinal axis of the plunger 16 in armed position to the primer disc 14, so that upon impact of the projectile, it will be in proper position to prime the primer and to detonate the detonator.

The arming speed may be determined by the strength of the springs and the weight of the collar pins.

Having thus described my invention, what I claim is:

1. A safety plunger for fuses including an approximately T-shaped rotor carried by the plunger and rotatably mounted with respect thereto, a firing pin depended from one wing of the rotor through the face of the plunger, a horizontally disposed recess formed in the other wing, and a locking pin slidably carried in the recess.

2. A safety plunger for fuses including an approximately T-shaped rotor carried by the plunger, and rotatably mounted with respect thereto, a firing pin depended from one wing of the rotor through the face of the plunger, and a locking pin enclosed in the other wing.

3. A safety device for fuses embodying a plunger, a rotor including a firing pin carried by the plunger and rotatably mounted with respect thereto, said plunger and rotor formed with recesses, means for aligning said recesses, and centrifugally operated means carried by the rotor recess and engageable with the plunger recess to lock the firing pin in operative position.

4. A safety device for fuses embodying a plunger, a primer actuating means carried by the plunger and rotatably mounted with respect thereto, said plunger formed with recesses communicating with the plunger bore, cups firmly embedded in the recesses, and spring actuated collar pins carried by cups and normally projected within the plunger bore to retain the primer actuating means in inoperative position.

5. A safety device for fuses embodying a plunger, a primer actuating means carried by the plunger and rotatably mounted with respect thereto, said means rotatable about an axis parallel to the axis of the plunger, said plunger formed with recesses and communicating with the plunger bore, and means carried in the recesses for normal retention of the primer actuating means in inoperative position.

6. A safety device for fuses embodying an eccentrically bored plunger, the face of the plunger formed with a curved slot, a rotor carried by the plunger and rotatably mounted with respect thereto, a firing pin carried by the rotor and extending through the slot, and means for locking the firing pin in operative position.

7. A safety device for fuses embodying an eccentrically bored plunger, the face of the plunger formed with a curved slot, a rotor carried by the plunger and rotatably mounted with respect thereto, a firing pin carried by the rotor and extending through the slot and means for retaining the firing pin in inoperative position.

8. A safety device for fuses embodying an eccentrically bored plunger, the face of the plunger formed with a curved slot including its longitudinal axis, and means for actuating a primer carried by the plunger and rotatably mounted with respect thereto and adapted to extend through the slot.

9. A safety device for fuses embodying a plunger, means carried by the plunger and rotatably mounted with respect thereto for actuating a primer, said means rotatable about an axis parallel to the axis of the plunger, and means carried by the plunger and the actuating means for locking said actuating means in operative position.

10. A safety device for fuses embodying a plunger, means carried by the plunger and rotatably mounted with respect thereto for actuating a primer, said means rotatable about an axis parallel to the axis of the plunger, and means mounted in opposite walls of the plunger for retaining the actuating means in inoperative position.

11. A safety device for fuses embodying a plunger, means carried by the plunger and rotatably mounted with respect thereto for

actuating a primer, said means rotatable about an axis parallel to the axis of the plunger, and means for locking the actuating means in operative position.

12. A safety device for fuses embodying a plunger, means carried by the plunger and rotatably mounted with respect thereto for actuating a primer, said means rotatable about an axis parallel to the axis of the plunger, and means for retaining the actuating means in inoperative position.

13. A safety device for fuses embodying a plunger and means carried by the plunger and rotatably mounted with respect thereto for actuating a primer, said means rotatable about an axis parallel to the axis of the plunger.

HAROLD MORGAN BRAYTON.