Dec. 29, 1925. 1,567,232

H. M. BRAYTON

PERCUSSION ELEMENT FOR TIME FUSES

Filed August 20, 1924

Fig. 1.

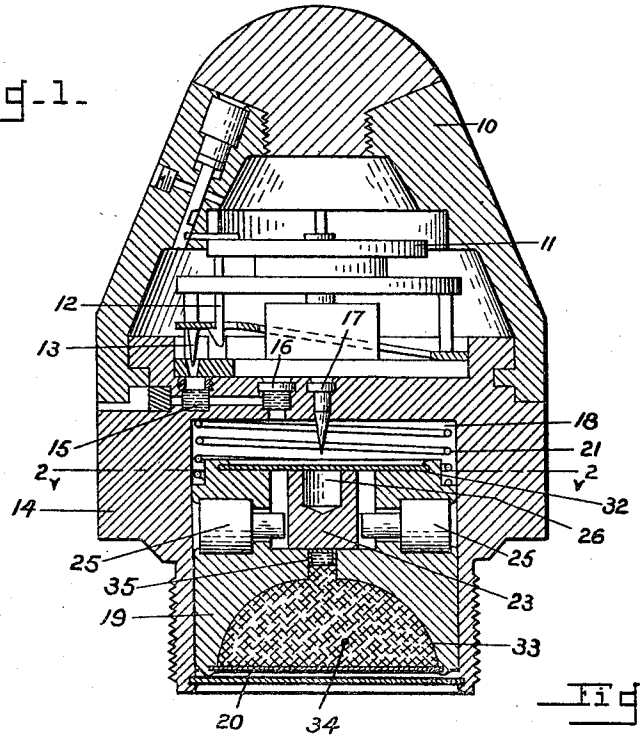


Fig. 3.

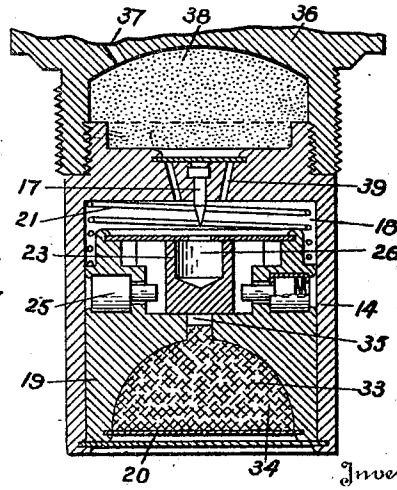
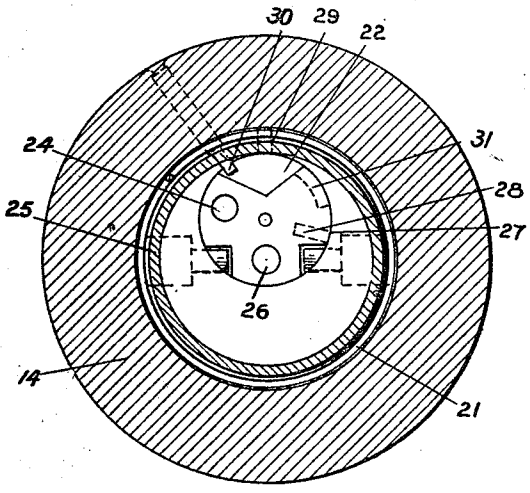


Fig. 2.



Inventor
Harold M. Brayton

By W. M. Roach.

Attorney

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UNITED STATES PATENT OFFICE.

HAROLD M. BRAYTON, OF DOVER, NEW JERSEY.

PERCUSSION ELEMENT FOR TIME FUSES.

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

To all whom it may concern:

Be it known that I, HAROLD M. 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 Percussion Elements for Time 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.

The subject of this invention is a percussion element for a time fuse.

In mechanical or powder time fuses for artillery projectiles, the fuse is designed to explode the projectile during flight after the lapse of a predetermined interval of time. However, should the projectile strike an object within a shorter time than that for which the fuse is set, the fuse is invariably deformed and rendered inoperative.

To meet this objectionable feature, it has been contemplated to associate a percussion element with the time fuse, but the combinations so devised are invariably formed as an integral unit of the time fuse, thus making for complicated structures and rendering impracticable a bore safety device for either or both the percussion element and the time element.

The present invention resides in providing a casing which carries a percussion firing mechanism and which may readily be attached to a standard mechanical or powder time fuse whereby it will be possible to quickly convert a time fuse adapted for one class of projectiles to use with other classes of projectiles in which a percussion element is essential.

The casing is provided with a detonating element, which is incapable of being moved to armed position until the projectile is in flight and as the casing is interposed between the time fuse and the main charge in the shell, the safety element provided for the percussion plunger will also serve as a safety device for the time fuse.

The invention also includes a novel plunger which carries a centrifugally released rotor and a booster charge.

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.

A practical embodiment of my invention is illustrated in the accompanying drawings, in which,

Fig. 1 is a longitudinal sectional view of a mechanical time fuse with my improved percussion firing mechanism attached;

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

Fig. 3 is a fragmentary longitudinal sectional view showing the construction of the casing for attachment to a powder time fuse.

Referring to the drawings by numerals of reference:

Referring to Figure 1, a typical mechanical time fuse includes a body 10, which is hollowed to enclose a suitable frame 11 which carries a spring mechanism functioning in a well-known manner to move a sear 12 which releases a firing pin 13 after a predetermined lapse of time.

The percussion element of the fuse which forms the subject of the invention, includes a casing 14 which is secured to the body 10 in any convenient manner and which serves as a closure therefor and also to support the elements of the mechanical time fuse.

The casing 14 carries in its forward wall a primer 15, which is in line with the firing pin 13, and also a relay primer 16, adjacent its center. The forward wall of the casing also carries at its center an element of a firing mechanism, herein shown as a firing pin 17 although the same might be a primer detonator. The point end of the firing pin projects into a cavity 18, which extends to the rear of the casing.

A plunger 19, movable in the cavity 18 is held in rearward position during flight against a disc 20, by means of a creep spring 21, which is confined between the plunger and the forward wall of the casing.

The plunger is formed with an eccentric cavity 22 in which is pivotally mounted an approximately T-shaped rotor 23, carrying a detonator 24 (or a firing pin as desired) which is held off-center in safe or unarmed position by means of centrifugal pins 25 mounted in the plunger and normally projected into the cavity 22 to prevent rotation of the rotor 23. When in this position, a blind cavity 26, formed in one wing of the

rotor, is disposed axially of the fuse in line with the firing pin and a booster charge.

Referring to Figure 2, a wing of the rotor is formed with a slot 27 for the reception of a locking pin 28 which is adapted to be thrown outward through centrifugal force to engage in a slot 29 in the plunger wall whereby to lock the rotor in armed position with the detonator disposed axially of the fuse. The slots 27 and 29 are aligned by means of a stop pin 30, carried by the plunger and projecting into the cavity to engage in a recess 31 formed in a wing of the rotor.

A disc 32, held in place against the forward face of the plunger, is provided for the purpose of preventing displacement of the rotor.

The rear portion of the plunger is formed with a concentric cavity 33, in which is disposed a booster charge 34 spaced from the rotor cavity by a cup 35.

In the form shown in Figure 3, a powder time fuse 36 of standard design includes the usual time rings and powder train, which when consumed, transmits the flame to a pallet, whence it passes by means of a flash duct or by a powder column 37 to set off a charge 38 of black powder carried in the base of the fuse.

In this instance, the casing 14 is threaded to the fuse body in place of the usual base plug provided for confining the base charge 38.

Arranged about the centrally placed firing pin 17 are a plurality of converging flash ducts 39 for permitting the flame to pass to the detonator when the rotor is in armed position.

While the operation of the fuse will be apparent to those skilled in the art, it is desired to point out that the casing serves to retain or support various elements of the time fuse and that the bore safe detonating element of the percussion plunger effectually prevents a premature explosion in the time fuse from passing to the booster charge.

While in the foregoing there has been illustrated and described such combination and arrangement of elements as constitute the preferred embodiment of my invention, it is nevertheless desired to emphasize the fact that interpretation of the invention should only be conclusive when made in the light of the subjoined claims.

I claim:

1. An attachment for a time fuse including a casing forming a closure for the fuse, a percussion plunger mounted in the casing, a rotor pivotally carried by the plunger, a detonator in the rotor, means automatically released during flight for normally locking the rotor in unarmed position, and a booster charge carried by the plunger.

2. An attachment for a time fuse including a casing forming a closure for the time fuse, the forward end of said casing provided with means for transmitting ignition from the time fuse, a percussion plunger mounted in the casing, a booster charge disposed in the plunger, a rotor mounted in the plunger and adapted to normally prevent ignition of the booster, and a detonator carried by the rotor and adapted during flight to be aligned with the booster.

3. An attachment for a time fuse including a casing forming a closure for the fuse, a fixed firing pin carried by the casing, a percussion plunger mounted in the casing, a booster charge disposed in the plunger, a movable member carried by the plunger between the booster and the time fuse, an explosive charge in said member, said charge adapted to be ignited either through the time fuse or on impact, and means for releasably holding the movable member in unarmed position.

4. An attachment for a time fuse including a casing forming a closure for the fuse, a fixed firing pin carried by the casing, a percussion plunger mounted in the casing, a booster charge disposed in the plunger, a member carried by the plunger between the booster and the time fuse, an explosive charge in said member, and said charge adapted to be ignited either through the time fuse or on impact.

5. An attachment for a time fuse including a casing forming a closure for the fuse, a percussion plunger mounted in the casing, a booster charge disposed in the plunger, and a member carried by the plunger and movable during flight for positioning a detonator in line with the booster.

6. An attachment for a time fuse including a casing forming a closure for the fuse, a percussion plunger mounted in the casing, and a detonator and a booster charge carried by the plunger, the detonator normally unarmed but moved to armed position during flight.

7. An attachment for a time fuse including a casing forming a closure for the fuse, a percussion firing mechanism in said casing including a plunger carrying one element of the firing means, said element normally held in unarmed position but movable during flight to armed position.

8. A safety device for fuses including a plunger, a booster charge disposed in the plunger and an element of the firing mechanism carried by the plunger, said element normally unarmed but movable during flight to armed position.

9. A safety device for fuses including a percussion plunger, a booster charge disposed in the plunger, a rotor pivotally mounted in the plunger, an element of a firing mechanism in the rotor, means automatically released during flight for locking

the rotor in unarmed position, and means for locking the rotor in armed position.

10. A safety device for fuses including a percussion plunger, a booster charge disposed in the plunger, a rotor pivotally mounted in the plunger, an element of a firing mechanism in the rotor, and means automatically released during flight for locking the rotor in unarmed position.

11. A safety device for fuses including a percussion plunger, a booster charge disposed in the plunger, and a member rotatable with respect to the plunger for positioning an element of a firing mechanism in line with the booster.

12. A safety device for fuses including a percussion plunger, a booster charge disposed in the plunger, and means movable during flight for positioning an explosive charge in line with the booster.

HAROLD M. BRAYTON.