Feb. 27, 1923. 1,447,101.

D. L. PARKHURST.

FUSE.

FILED SEPT. 12, 1922. 3 SHEETS—SHEET 1.

FIG. 1.

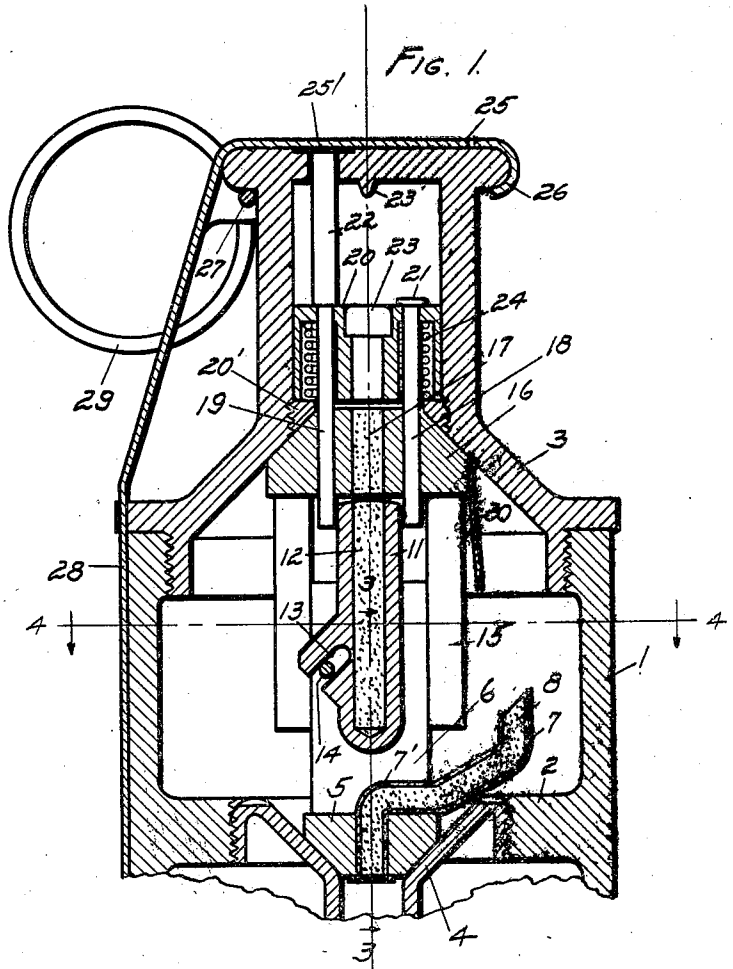
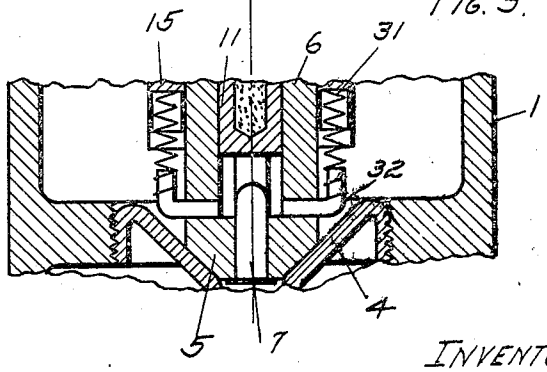


FIG. 3.



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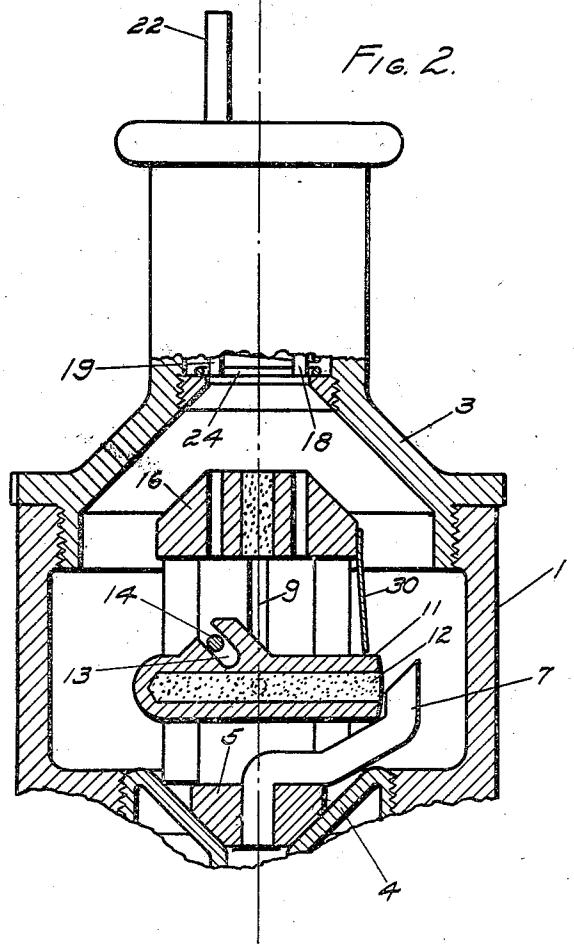


Fig. 2.

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FIG. 4.

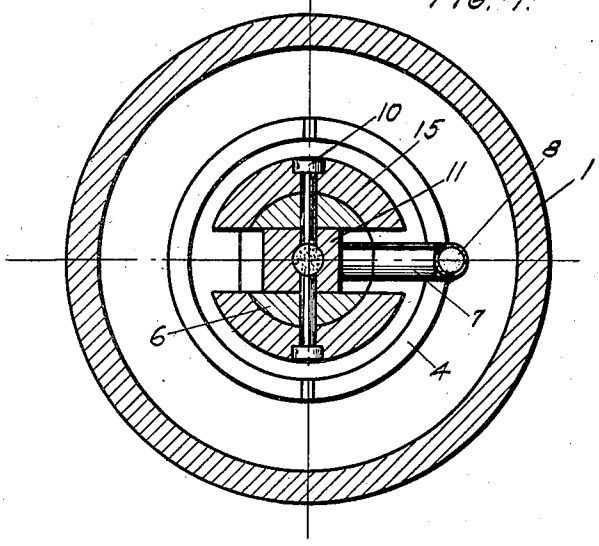


FIG. 5.

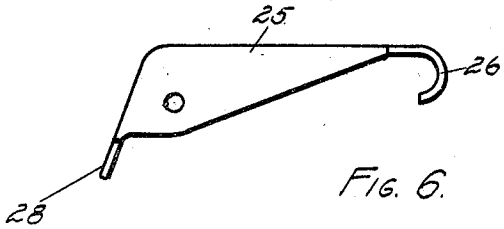
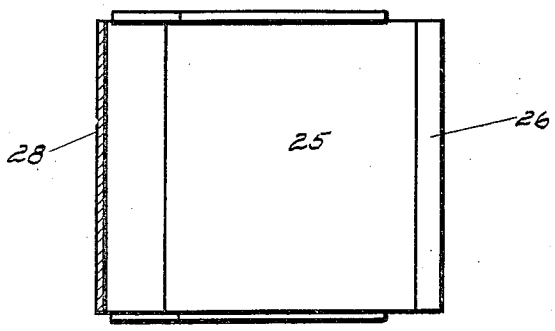


FIG. 6.



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UNITED STATES PATENT OFFICE.

DOUGLAS L. PARKHURST, OF SPRINGFIELD, MASSACHUSETTS.

FUSE.

Application filed September 12, 1922. Serial No. 587,799.

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

To all whom it may concern:

Be it known that I, DOUGLAS L. PARKHURST, a citizen of the United States, and a resident of Springfield, county of Hampden, and State of Massachusetts, have invented an Improvement in 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.

The subject of this invention is a fuse intended for use in projectiles but designed primarily for use in grenades.

The main object of the invention is the provision of a fuse that will not function until a predetermined time has elapsed and will then only function upon striking the ground or target.

I attain these objects by providing an interrupted train or cord between the primer and booster or explosive charge, and means for bridging the interruption upon impact of the projectile.

With these and other objects in view my 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 herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

One practical embodiment of the invention is illustrated in the accompanying drawings, wherein:

Fig. 1 is a view in longitudinal section of a fragment of the grenade with a fuse constructed in accordance with the invention in place therein;

Fig. 2 is a similar view, parts in elevation, showing the fuse in functioning position;

Fig. 3 is a fragmentary sectional view taken on the lines 3—3 of Fig. 1;

Fig. 4 is a cross section on the line 4—4 of Fig. 1;

Fig. 5 is a side elevation of a fragment of the safety lever; and

Fig. 6 is a bottom plan view of the same.

Referring to the drawing by numerals of reference:

The grenade body is indicated by the numeral 1, which body is provided with a diaphragm or transverse wall 2 separating the fuse or end chamber from the main explosive chamber. The fuse end of the grenade is closed, conveniently by means of a screw cap 3 and the diaphragm or partition wall 2 is apertured and threaded to receive the frusto-conical upper end of the booster casing 4. Seated in the conical end of the booster casing is the lower frustro-conical block 5 from which the spaced apart guide walls 6 extend. The block 5 is centrally apertured to receive the lower end of the angular tube 7 adapted to be filled with explosive 8. The guide walls 6 are provided with longitudinal slots 9 (see Fig. 2) extending from the top of said walls for a portion of their length, in which slots are positioned pivot pins 10 upon which is pivotally mounted a casing 11 open at one end and adapted to be filled with explosive 12. The casing 11 has an offset portion formed with a slot 13 in which is positioned a pin 14 the ends of which pin are secured in the walls 6. The guide walls 6 are slidable between spaced apart guide walls 15 each depending from a frusto-conical block 16 seated in the conical portion of the screw cap 3. The block 16 is formed with a central aperture 17 for the reception of the train of explosive and the block is normally held against relative movement by pins 18 and 19 which pass through apertures formed in the block and the lower ends of which extend below the block and normally retain the casing 11 from rocking upon its pivots 10.

A primer casing 20 is positioned in the neck of the screw cap 3 and is held in spaced relation to the block 16 by means of a ring 20′ which is threaded into the screw cap 3. The primer casing 20 is normally held seated on the ring 20′ by means of the enlarged portion 22 of the pin 19 contacting the upper face of the casing and sealing disc 25′. The pin 18 also passes through an aperture in the primer casing and is retained in position in the primer casing and the block 16 by means of a head 21 formed on said pin. The primer casing 20 is centrally apertured and countersunk to receive the primer at 23. A coiled spring 24, positioned in an annular recess formed in the primer casing and interposed between the head of the casing and the ring 20′, normally tends to force the primer casing away from the ring and bring the

primer 23 into contact with a pin 23′ formed on the head of the screw cap 3.

For the purpose of normally retaining the pin 19 in place a safety lever 25 overlies the head of the screw cap 3, which head is apertured to permit the passage of the pin 19 thereto and, said lever has a hooked or curved portion 26 which contacts with the rim or flange of the head, and is further provided with ears apertured to receive a pin 27 which passes under the flange or rim of the head at a position diametrically opposite to that of the hooked portion 26 thereby locking the safety lever firmly in place. The pin may be provided with a ring 29 through which the pin may be readily withdrawn to release the lever. The lever is provided with a handle 28 which lies against the side of the grenade and through which the safety lever is maintained in place after the pin 27 has been removed and until the grenade is discharged or thrown.

A retaining spring 30 may be provided on the block 16 from which it depends in position to hold the casing 11 locked in its rocked or horizontal position.

In order to retain the guide walls 15 and block 16 in their proper position coiled springs 31 may be provided, the upper ends of which seat in recess formed in the lower faces of guide walls 15 and these springs are preferably carried on the guide pins 32, which are secured in apertures formed in guide walls 6.

The operation of the device is as follows:

When the grenade is to be used the same is grasped in one hand in such a way that the lever arm 28 is held in position against the side of the grenade and the ring 29 is grapsed with the other hand and the pin 27 is withdrawn from the apertures in the safety lever. The grenade may then be thrown, or discharged in the usual way, and when thrown or discharged the lever 28 will be displaced from its position upon the screw cap by reason of the spring 24 forcing the primer casing 20 and pin 19 outwardly.

When the primer casing 20 has been forced outwardly by the spring 24 the primer 23 will be brought into contact with the hammer or firing pin 23′ thus discharging the primer. At the same time the pins 19 and 18 will have been withdrawn from the apertures in the block 16. The firing of the primer will ignite the explosive charge in the aperture 17 which charge consists of a powder which will burn for a predetermined interval of time. The burning of the powder charge in the aperture 17 will ignite the charge 12 in the casing 11. When the grenade strikes the blocks 16 and 5 will be forced toward each other and pin 14 will bear against the side of slot 13 in block 11 and rotate the block around its pivot pins 10 to bring the same into the position shown most clearly in Fig. 2, in which position it will be held by the spring 30. This movement will take place regardless of the direction in which the grenade strikes the ground or target. When the casing has been rocked to the position shown in Fig. 2 the powder 12 being ignited will ignite the charge 8 in the tube 7, which charge will in turn ignite the booster charge in the booster casing 4.

Should the grenade be accidentally dropped after the pin 27 has been withdrawn the fuse will not function to detonate the explosive charge for the reason that the casing 11 upon impact of the grenade with the ground will be thrown into the position shown in Fig. 2 and this will take place before the powder contained in the aperture 17 can have burned through the length of said aperture to ignite the charge 12 in the casing 11.

I claim:

1. A fuse including a casing, a primer in the casing, means for functioning the primer, a powder train adapted to be ignited by the primer, a booster, and means ignited by the powder train movable upon impact with a target to ignite the booster or to render ignition of the booster impossible if the target is struck before the powder train is consumed.

2. A fuse, including a casing, a primer carried in the casing, a powder train in position to be ignited by the primer, a booster, means ignited when the powder train is consumed moved upon impact with a target to ignite the booster and means for holding the first mentioned means in moved position.

3. A fuse, including a casing, a primer carried in the casing, a powder train in position to be ignited by the primer, a booster, means communicating with the powder train moved upon impact with a target to communicate with the booster, said means when in normal position ignited by the powder train when the train is completely consumed and means for holding the first mentioned means in normal position.

4. The combination with a projectile, including a booster and a screw cap, of a fuse having elements movable toward each other and seated in the booster and screw cap respectively, a powder train carried by each of said elements, a casing for explosive movable to positions to communicate with either of said trains, normally communicating with one of said trains, a primer casing slidable in the cap, a primer carried by the casing, means for locking the primer casing in unarmed position and explosive casing in normal position, means for functioning the primer to ignite the powder train with which the explosive casing normally

communicates and means, including the movable elements, for moving the explosive casing to communicate with the other train upon impact of the projectile.

5. The combination in a fuse, including a primer and means for functioning the primer, of interengaging elements movable toward each other, a powder train carried by each of said elements, one communicating with the primer and the other adapted for communication with a booster, said powder trains separated by a safety gap, means interposed in said gap, normally communicating with the first of said powder trains, moved by movement of the elements toward each other to communicate with the other of said powder trains and an explosive carried by said means.

DOUGLAS L. PARKHURST.