June 29, 1937. A. F. TEITSCHEID 2,085,053

FIRING MECHANISM FOR FUSES

Filed May 31, 1934

Fig. 1.

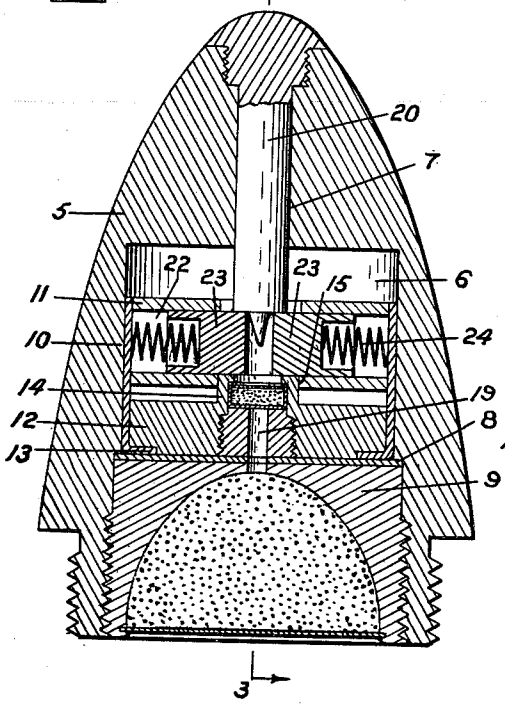



Fig. 2.

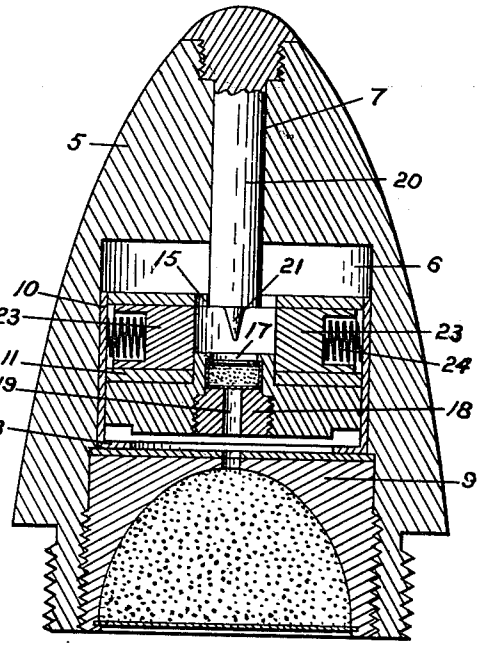



Fig. 4.

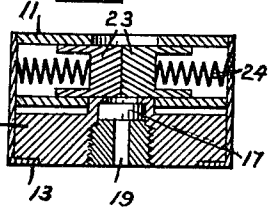
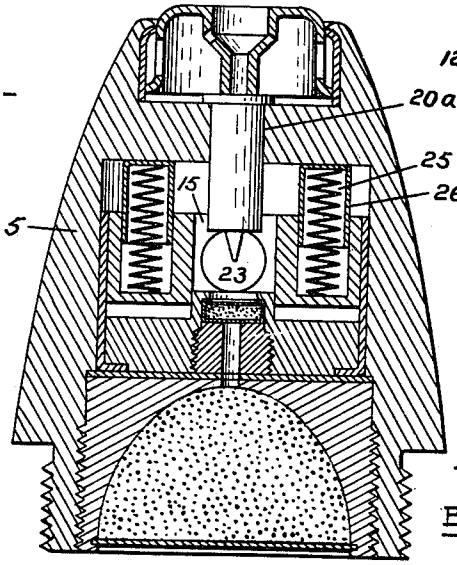



Fig. 3.




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Patented June 29, 1937 2,085,053

# UNITED STATES PATENT OFFICE

2,085,053

## FIRING MECHANISM FOR FUSES

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Application May 31, 1934, Serial No. 728,346

5 Claims. (Cl. 102—39)

(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 to a firing mechanism for a fuse.

In fuses for artillery projectiles a common practice of assuring safety of the firing mechanism consists in maintaining one or more of the elements of the mechanism in unarmed position by means of bolts or pins adapted to be moved under the influence of centrifugal force during flight of the projectile. The situation frequently occurs, especially in low angle impact, that the bolts when no longer subject to the influence of centrifugal force reengage the elements of the firing mechanism before such elements can function.

It has heretofore been proposed, as shown in Patent No. 1,326,822 of December 30, 1919, to utilize the force of inertia due to deceleration of a projectile, to move a member into a position to oppose return of a centrifugally released bolt.

The purpose of this invention is to provide a plunger of two relatively movable parts, one of which serves to oppose return of a bolt carried in the other part.

A further object is to provide a firing mechanism in which a bolt in a plunger separates a firing pin and primer.

To these and other ends, the 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 the invention is illustrated in the accompanying drawing, wherein:

Fig. 1 is a longitudinal sectional view of the improved firing mechanism showing the parts in unarmed position.

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

Fig. 3 is a sectional view corresponding to the line 3—3 of Fig. 1 and showing a movably mounted firing pin.

Fig. 4 is a detail sectional view of the plunger unit.

Referring to the drawing by characters of reference, there is shown a fuse casing 5 formed with a chamber 6 and a communicating passage 7. The lower or rear end of the chamber is closed by a plate 8 and is retained in any convenient manner, as by the booster casing 9.

Within the chamber 6 is a plunger unit consisting of two relatively movable parts. The main or body part comprises a shell 10 having a block 11 fixed in one end thereof. The other part consists of a block 12 which is slidably mounted in the shell and is retained therein by means of the block 11 and by an inturned flange 13 on the rear end of the shell.

A stem 14 projecting from the front face of the block 12 is partly disposed in a centrally located aperture 15 in the block 11 when the rear face of the block 12 is in contact with the flange 13. The block 12 is formed with a central opening 16 for receiving a primer 17 which is retained by a plug 18 provided with a flash passage 19.

A firing pin 20 inserted in the passage 7 and fixed in the casing 5 as shown in Fig. 1, or movably mounted therein as shown at 20a in Fig. 3, has its rear end extending into the chamber 6 and partly disposed in the aperture 15 in the block 11. The firing pin is provided with the usual point 21.

The block 11 is formed with a diametrical passage 22 in which a pair of bolts 23—23 are slidably mounted. A spring 24 confined between each bolt and the shell 10 normally urges the bolt towards the axis of the block 11 in which position it serves to separate the firing pin 20 and primer-carrying block 12 as seen in Fig. 1. The inward movement of the bolt under the action of its spring 24 is limited by the point 21 of the firing pin.

While the firing pin acting through the bolts holds the plunger in its rearmost position, a pair of springs 25—25 (Fig. 3) each housed in a thimble 26 and in a recess of the block 11, are placed between the block 11 and the front wall 27 of the chamber 6, and serve to yieldingly hold the plunger against movement towards the firing pin.

In operation, when a projectile equipped with the fuse has been fired from a gun, and is in flight, the bolts 23—23 move outwardly under the influence of centrifugal force. The block 12, being no longer opposed by the bolts, creeps forward due to the force of inertia resulting from linear deceleration of the projectile until it engages the block 11. The block 12 is now in the position shown in Fig. 2, its stem opposing return movement of the bolts 23 and its primer 17 disposed in the immediate vicinity of the point of the firing pin. The plunger unit is held against forward creeping by the springs 25. On impact the plunger moves forward due to inertia and causes the primer to be penetrated by the point of the firing pin. Where the firing pin is movable as shown in Fig. 3 or in the conventional

time fuse it may be driven rearwardly to set off the primer.

If the range is short so that there is not sufficient deceleration to cause the block 12 to creep forward it will be driven forward on impact due to its inertia.

The arrangement of the parts of the plunger unit permits of rapid and inexpensive production and assembly both of the plunger and the fuse.

I claim:

1. In a fuse, a casing having a chamber, a plunger mounted in the chamber and comprising a shell having an inturned flange on one end, a block in one end of the shell and fixed thereto, said block formed with a central aperture and a diametrical passage, a block movably mounted in the other end of the shell and retained by the inturned flange of the shell, a stem on the movable block partly disposed in the aperture of the fixed block, a primer carried by the movable block, a firing pin having one end partly disposed in the aperture of the fixed block, and centrifugally releasable bolts mounted in the passage of the fixed block and normally separating the firing pin and movable block.

2. In a fuse, a casing having a chamber, a plunger mounted in the chamber and comprising a shell, a block in one end of the shell and fixed thereto, said block formed with a central aperture and a diametrical passage, a block movably mounted in the other end of the shell, a stem on the movable block partly disposed in the aperture of the fixed block, a primer carried by the movable block, a firing pin having one end partly disposed in the aperture of the fixed block, and centrifugally releasable bolts mounted in the passage of the fixed block and normally separating the firing pin and movable block.

3. In a fuse, a casing having a chamber, a plunger unit mounted for movement in the chamber and comprising a body having a central aperture and a diametrical passage, a primer carrier mounted for movement relative to the body and partly disposed in the aperture of the body, a firing pin having one end partly disposed in the aperture of the body, and centrifugally releasable bolts mounted in the passage of the body and normally separating the firing pin and carrier.

4. In a fuse, a casing having a chamber, a plunger unit mounted for movement in the chamber and comprising a body, a centrifugally releasable holding member in the body, a carrier mounted for movement towards the body and normally held against such movement by the holding member, the carrier displaceable forwardly to armed position upon linear deceleration of the fuse casing during flight to maintain the holding member in inoperative position, and a firing pin in the casing normally separated from the carrier by the holding member and engaging the holding member to maintain the plunger unit in safe position.

5. A plunger unit for a fuse comprising a shell having an inturned flange at one end, a block fixed in one end of the shell, said block formed with an aperture, a block movably mounted in the other end of the shell and retained by the inturned flange, a stem on the movable block partly disposed in the aperture of the fixed block, a primer carried by the movable block, and centrifugally releasable means in the fixed block normally disposed across the face of the stem and holding the movable block against movement towards the fixed block.

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