

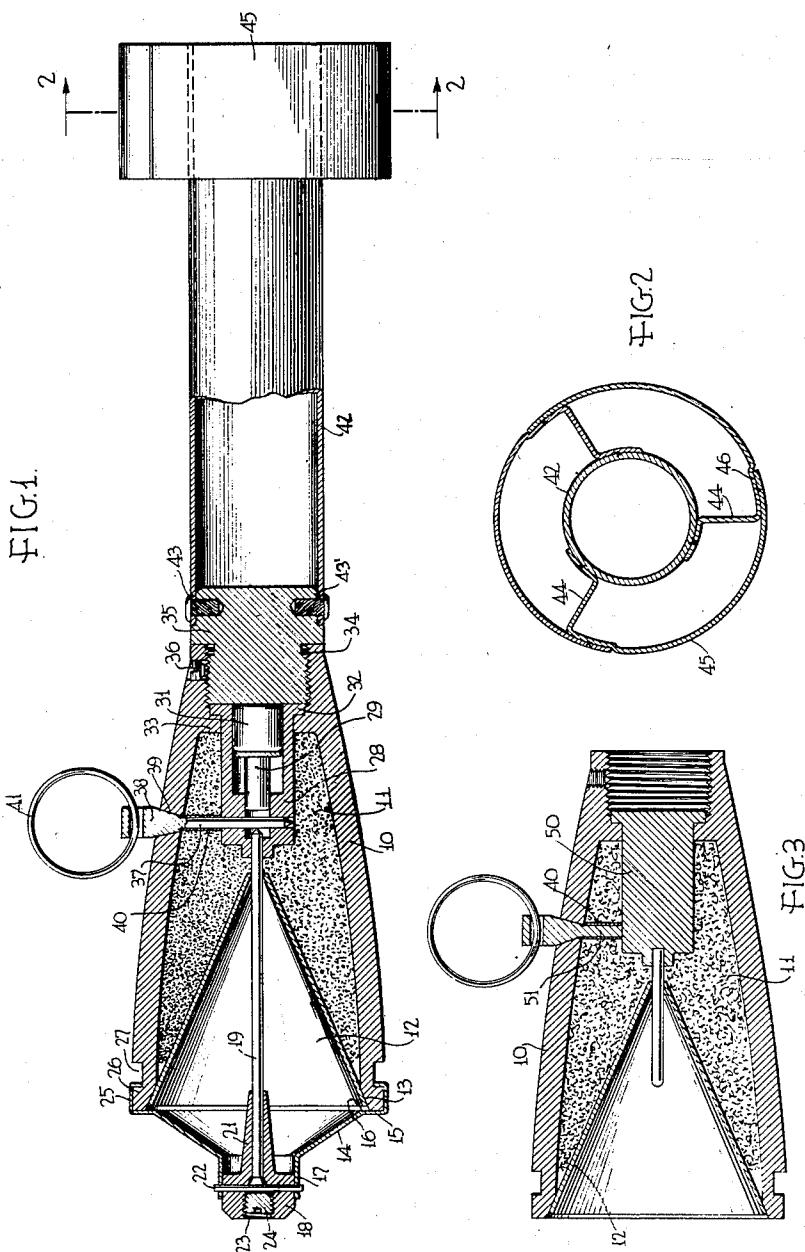
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PROJECTILE

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PROJECTILE

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This invention relates to explosive projectiles such, for example, as grenades and particularly rifle grenades of the type adapted to be fitted over a rifle barrel and projected therefrom by firing a blank cartridge in the rifle.

An object of this invention is to provide an improved construction for a projectile of this type in which the various parts are so designed and constructed as to facilitate volume production and the rapid assembly thereof.

A further object is to provide a projectile of the type set forth constructed and arranged to permit relatively safe loading of the explosive charge.

This and other objects which will be apparent are attained by the present invention, one embodiment of which is shown for the purposes of illustration in the accompanying drawing in which:

Fig. 1 is a view partly in longitudinal section and partly in elevation of a rifle grenade constructed in accordance with one embodiment of this invention.

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

Fig. 3 is a section showing one of the steps in loading the projectile.

As illustrated, the present invention is shown in connection with a rifle grenade having a casing 10 for an explosive charge 11. The forward end of the casing is closed by a cone 12 the base of which engages a circumferential beveled face 13 at the front of the casing. The cone is provided for forming a concavity in the front face of the explosive charge for the purpose of producing the maximum destructive effect thereon. As illustrated, the base of the cone is shown as spaced a small distance inwardly from the forward face of the casing 10. An ogive 14 is mounted on the forward end of the casing and provided with a flange 15 engaging the front face of the casing and extending slightly inwardly therefrom forming a shoulder 16 adjacent the base of the cone 12. The forwardly projecting center of the ogive is shaped to form a circular flange 17 slidably receiving a firing plug 18 supporting the forward end of a firing pin 19 slidable in the barrel 21 of the plug and extending rearwardly through the apex of the cone 12. The firing plug projects forwardly from the ogive and is normally held in position by a shear pin 22 extending through openings in the plug and ogive flange 17. The central opening 23, through which the firing pin 19 is inserted in the assembling operation, is closed by a threaded closure plug 24 or the like. The ogive is secured to the casing 10 by having its

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end 25 spun over a shoulder 26 formed by a circumferential groove 27 cut in the outer face of the casing adjacent its forward end.

The firing pin 19 extends through an opening 5 at the apex of the cone and into the body member 28 of a fuse assembly including detonator 29 and booster charge 31. The body member 28 has a flange 32 engaging an inner flange 33 for positioning the fuse assembly in the explosion chamber, the body member being easily insertable through a threaded opening 34 provided in the rear end of the container 10. After assembly this opening is closed and the fuse assembly 28 secured in place by a threaded plug 35 threaded into the opening 34 and locked in place by a radial screw threaded locking plug 36 extending through the wall of the casing 10 into engagement with the threads of the closure plug 35. Accidental firing of the detonator by the firing pin 19 is normally prevented by a safety pin 37 extending through the fuse assembly body member 28 between the end of the firing pin 19 and the detonator 29. The safety pin is normally held frictionally in position by its enlarged head 38 having a conical face engaging the similarly formed face of opening 39 in the casing 10. Preferably a protective tube 40, of paper or the like, positioned between the inner casing wall and the fuse assembly container 28 provides an opening 15 through the explosive charge 11 so that the pin 37 can be inserted or withdrawn without contacting the charge. The safety pin preferably has a pull ring 41 for quick release.

A stabilizer assembly including a stabilizer tube 42 is secured to the closure plug 35 by driven fasteners 43 and spot welds 43' and a plurality of stabilizer fins 44 are mounted at the rear end of the tube for stabilizing the flight of the projectile. As illustrated, each fin is spot welded to the tube 42 and extends radially outward therefrom to form a stabilizing fin. Each fin is bent to form a circular portion 45 concentric with the tube 42 and extending circumferentially around to the next adjacent fin 44 to which it is spot welded thereto in a depression 46, as best illustrated in Fig. 2.

As pointed out in our copending application Serial No. 455,323, filed August 19, 1942, we have found that the maximum destructive effect upon 50 a target is attained when the charge 11 is exploded while there is a certain distance between the target and the front edge of the charge. This distance depends upon the velocity of the projectile and the brizance of the explosive, which 55 can be attained either by varying slightly the po-

sition of the cone itself within the casing 10, or by varying the distance between the base of the cone 12 and the front face of the firing plug 18 which is substantially at the apex of the ogive 14.

It will be apparent that the construction of parts above described is conducive to volume production with simple manufacturing operations, and also to easy and rapid assembly. The cone 12 is positioned against the face 13 of the casing, and the ogive secured to the casing by a simple spinning operation. The firing pin and the supporting plug are secured in place by the shear pin 22. The firing assembly container is inserted in the opposite end of the casing 10, and the casing and stabilizer assembly are threaded together by threading the plug 35 into the opening in the end of the casing, this in turn locking the fuse assembly body member 28 in place. Loading of the explosive charge may either be done when the parts are first assembled or, if loading is accomplished in a different place than the point of manufacture, it is a simple matter to disassemble the parts for loading purposes.

The present construction greatly increases the safety factor in loading which is effected through open front end of the casing before the cone 12 is put in place. In the loading operation a dummy plug 50 is inserted in the rear end of the casing in place of the fuse assembly container 28 while the tube 40 and a dummy safety pin 51 are placed in position, as shown in Fig. 3. The heated molten charge is then poured into the casing in such an amount as to approximately fill the casing when the cone 12 is inserted, which is done while the charge is molten. The plug 50 has a pin 52 which is adapted to enter the opening at the apex of the cone to position the latter and to form an opening through the explosive charge for receiving the firing pin 19 when it is later put in place. In effect, the charge is cast in the casing resulting in an integral unitary product. When the charge has cooled and solidified the dummy pin 51 is removed leaving the tube 40 in place. The dummy plug 50 is then removed leaving a cavity shaped exactly to receive the fuse assembly casing 28 which is then inserted in place after which the safety pin 37 can be inserted through the tube 40 without contacting the explosive charge.

In operation, the stabilizer tube 42 is placed over the end of a rifle barrel from which it is projected at a high velocity by firing a blank cartridge in the rifle. Upon impact on the target the plug 18 is driven inwardly shearing the pin 22 and driving the firing pin 19 into the detonator 29, the safety pin 37 having been extracted prior to firing the rifle. The resulting explosion occurs while there is still the requisite distance between the target and the base of the cone 12 so that maximum destructive effect is produced. At the same time, the explosion causes the material of the cone 12 to penetrate the target somewhat in the manner of a projectile, increasing the total destructive effect.

It will be apparent that the present invention can be variously modified and adapted within the scope of the appended claims.

What is claimed is:

1. An article of manufacture comprising in combination, a casing for an explosive charge, said casing having leading and trailing ends, a fuse assembly body member having a detonator and a booster charge, supported at the trailing end of said casing and extending inwardly there-

of, a charge positioning cone extending inwardly from the leading end of said casing, an ogive secured to the leading end of said casing, a firing pin slidably supported at one end in said ogive and extending through said cone and into said body member to a point adjacent said detonator, a safety pin extending through said casing and through said body member between said detonator and said firing pin, and means protecting a charge in said casing from contact by said safety pin.

2. An article of manufacture comprising in combination, a casing for an explosive charge, said casing having leading and trailing ends, a fuse assembly body member having a detonator and a booster charge, supported at the trailing end of said casing and extending inwardly thereof, a charge positioning cone extending inwardly from the leading end of said casing, an ogive secured to the leading end of said casing, a firing pin slidably supported at one end in said ogive and extending through said cone and into said body member to a point adjacent said detonator, a safety pin extending through said casing and through said body member between said detonator and said firing pin, and a tubular member surrounding said safety pin to protect a charge in said casing from contact by said pin.

3. An article of manufacture comprising in combination, a casing for an explosive charge, said casing having leading and trailing ends, a fuse assembly body member having a detonator and a booster charge therein and supported at the trailing end of said casing, an ogive secured to the leading end of said casing and having a central circular flange projecting forwardly thereof, an annular firing plug slidably supported within said flange, a firing pin extending through said plug and into said body member to a point adjacent said detonator, the head of said pin being located within said plug, a shear pin extending through said flange and firing plug adjacent the head of said pin, and a closure member in said plug engaging said shear pin to hold said shear and firing pins in place, whereby impact on said plug drives said firing pin into said detonator.

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