July 29, 1947. M. E. KASPER 2,424,934

PROJECTILE

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Fig. 1.

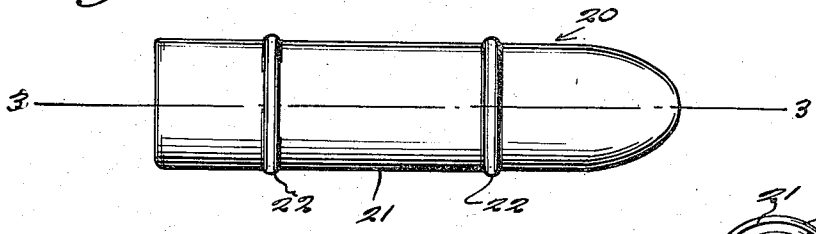


Fig. 2.

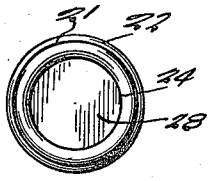


Fig. 3.

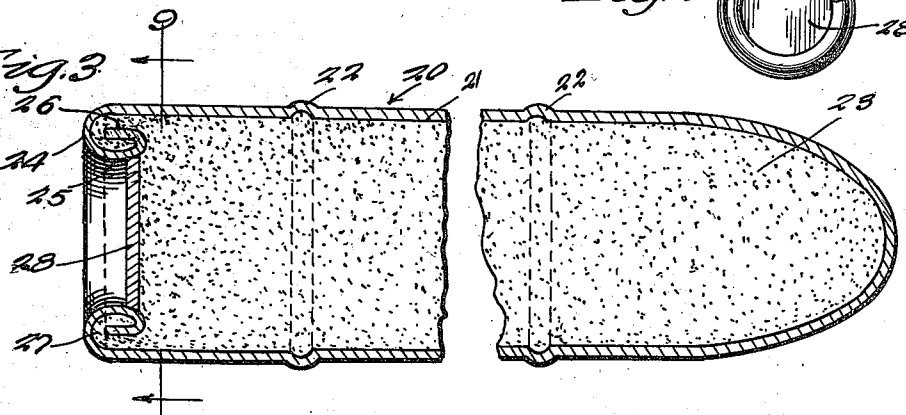


Fig. 4.

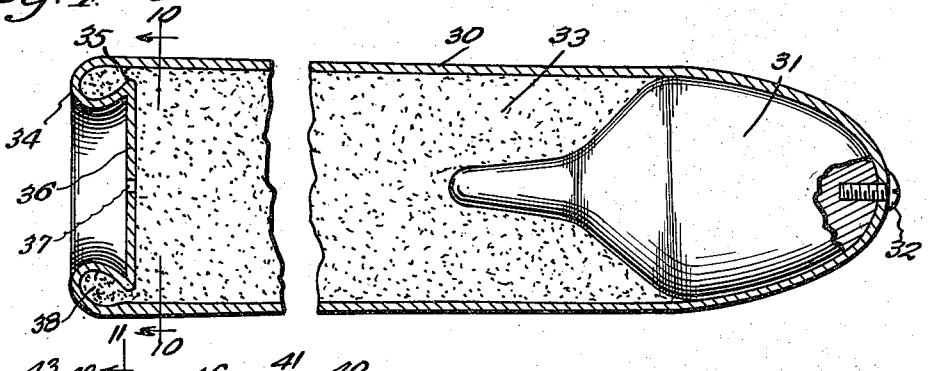
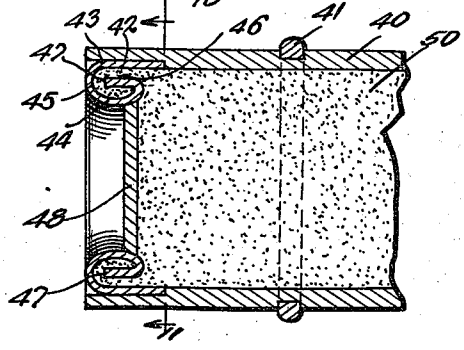


Fig. 5.



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Fig. 6.

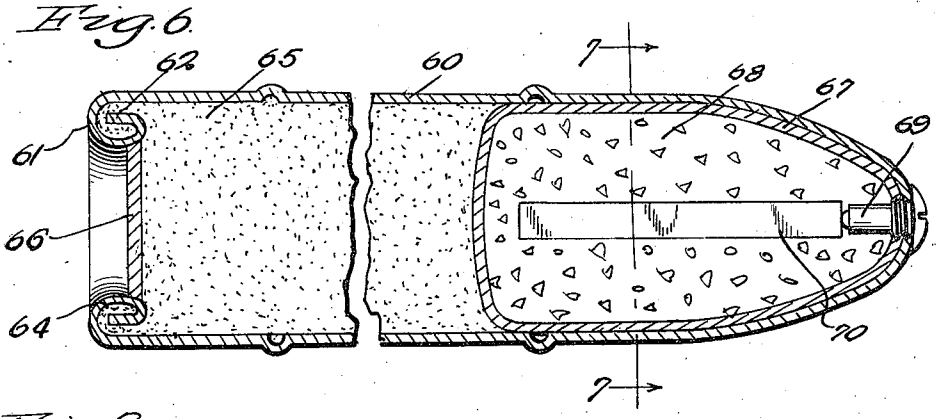


Fig. 7.

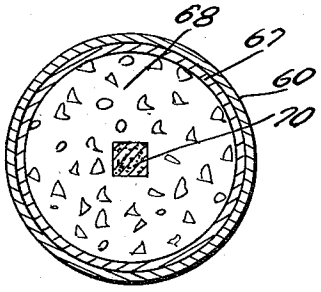


Fig. 8.

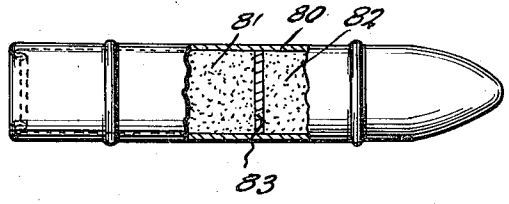


Fig. 9.

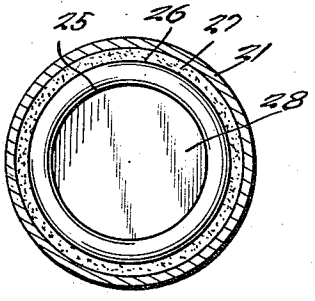


Fig. 10.

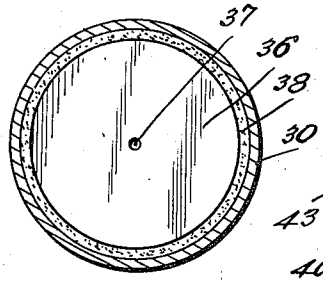
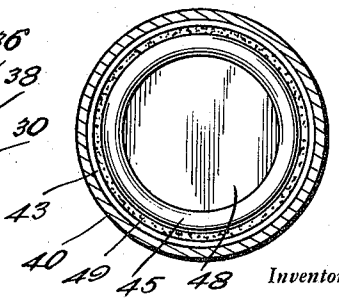


Fig. 11.



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PROJECTILE

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Application November 17, 1944, Serial No. 563,872

4 Claims. (Cl. 102—45)

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This invention relates to a projectile, and more particularly to such a projectile adapted for discharge from a rifle, gun, or the like.

A primary object of this invention is the provision of an improved projectile adapted to produce increased firing range while utilizing the same quantity of propellant charge as is normally utilized.

An additional important object of this invention is the provision of an improved projectile wherein the propellant will continue to function after the projectile leaves the barrel of the gun.

Another important object of the invention is the provision of such a projectile adapted to combine the advantages of conventional fire, with rocket propulsion.

As conducive to a clearer understanding of this invention, it may here be pointed out that in normal rifle or gun fire, the propulsive effect of a large quantity of the gases generated by the explosion is lost immediately after the bullet or projectile leaves the barrel of a gun.

Conversely, in rocket propulsion the effect of a material quantity of the gases of combustion is utilized in overcoming the initial inertia of the rocket shell. A primary object of this invention, therefore, is the provision of an improved projectile adapted to overcome both these disadvantages, and combine the best propulsive features of both gun-projected bullets and rocket-propelled shells.

Other objects will in part be obvious and in part be pointed out as the description of the invention proceeds.

Still other objects reside in the combinations of elements, arrangements of parts, and features of construction, all of which will be more fully pointed out hereinafter and disclosed in the accompanying drawings, wherein there are shown several preferred embodiments of this inventive concept.

In the drawings:

Figure 1 is a side elevational view of one form of projectile constructed in accordance with this inventive concept.

Figure 2 is an end elevational view of the device of Figure 1, as viewed from the left.

Figure 3 is an enlarged sectional view taken substantially along the line 3—3 of Figure 1, certain parts thereof being broken away.

Figure 4 is a sectional view of a modified form of construction.

Figure 5 is a fragmentary sectional view of a still further constructional modification.

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Figure 6 is a side sectional view of a still further modified form of projectile.

Figure 7 is a sectional view taken substantially along the line 7—7 of Figure 6.

Figure 8 is a view partially in elevation and partially in section disclosing a still further modified form of the construction.

Figure 9 is a sectional view taken substantially along the line 9—9 of Figure 3.

Figure 10 is a sectional view taken substantially along the line 10—10 of Figure 4, and viewed in the direction indicated by the arrows, and

Figure 11 is a sectional view taken substantially along the line 11—11 of Figure 5, as viewed in the direction indicated by the arrows.

Like reference numerals refer to like parts throughout the several views of the drawings.

Having reference now to the drawings, and more particularly to Figures 1 to 3, inclusive, there is generally indicated at 20 a projectile comprised of a hollow casing 21 which may have rifling rings 22 integrally formed therewith. The casing 21 is adapted to contain a propulsive charge of powder 23, or the like. The rear end of the casing is open and is formed to provide a looped flange 24 which extends inwardly of the casing, as at 25, interiorly of the fold 25 back toward the rear of the projectile, as at 26, the portion 26 forming a detonating anvil. The spaces within the folds formed by the flanges 24, 25 and 26 are filled with an explosive 27 comprising a detonating charge. A powder ring of readily frangible material 28 is adapted to retain the propulsive charge until blown out by the detonation thereof.

From the foregoing it will now be seen that when a firing pin strikes the ring 24, the detonating charge 27 is struck against the anvil 26, which detonating charge fires the main propulsive charge 23 of the projectile. Thus, the projectile is immediately propelled forwardly in the barrel of the gun, or the like, the explosive charge continuing to burn and increase the propulsive effect thereof after the same has left the barrel; one method of loading the projectiles 20 illustrated in Figures 1, 2 and 3 inclusive, comprises the forcing of the detonating charge 27 into the folds formed by the flanges 24, 25 and 26 at the inner open end of the projectiles by suitable means, such as by blowing the charge into the interior of the projectiles while being held in a vertical position, the nozzles of the filling means forming substantially tight fits with the inner edges of the flanges 25. After the detonating

charges have been blown into the folds at the inner ends of the projectiles, the nozzles through which the detonating charges were blown will be withdrawn, and nozzles through which the propulsive powder will be blown will be substituted therefor and the projectiles completely filled with said propulsive powder, after which the powder rings 28 may be placed in position to close the ends of the projectiles.

In Figure 4, a modified construction is disclosed, wherein a hollow shell casing 30 has positioned in the extremity thereof a solid metal member 31 secured in position, as by a screw 32, to form an armor-piercing projectile. The body portion of the shell back of the member 31 is provided with a propulsive charge 33, and the rear end of the projectile is provided with an arcuate portion 34 curving back upon itself to form a projecting point 35 serving as an anvil, the space between the annular rim formed by the anvil 35 being closed by an integral plate 36 having an aperture 37 therethrough. In this modification, the firing pin is adapted to strike the ring 34 to explode the detonating charge 38 against the anvil 35, which in turn ignites the propellant charge 33 and propels the projectile in the manner previously discussed. With reference to Figure 5, a similar construction is shown comprised of a casing 40 having shrunk rifling rings 41 thereon, and being provided at its rear extremity with an interiorly positioned annulus or groove 42 within which is welded or otherwise secured a flanged member 43 provided with an interiorly extending portion 44 forming a ring 45, and a reversely extending portion 46 providing an anvil 47. A powder ring 48 closes the open space between the interior periphery of the portion 44, and a compression charge or detonating charge 49 is adapted, when the ring 45 is struck by a firing pin, to ignite a propulsive charge 50.

In the modification disclosed in Figures 6 and 7, a shell casing 60 is provided at its extremity with an inwardly turned flange 61 forming an anvil 62 in the manner previously described in connection with the structure shown in Figures 1 to 3, a detonating charge 64 being provided, as well as a propulsive charge 65 contained in the shell body by a powder ring 66. The forward or nose portion of the shell 60 contains an interior casing 67, within which is positioned a charge of shrapnel 68, or the like, adapted to be detonated by a suitable time or other percussion fuse 69 adapted to ignite a bursting charge 70.

In Figure 8, a still further modification is disclosed similar in all respects to Figure 1, except that the casing 80 is of substantially greater length, and contains in addition to a detonating charge two propulsive charges 81 and 82 separated by a frangible powder ring 83. In this modification, when the firing pin ignites the detonating charge, the propulsive charge 81 is also ignited and drives the projectile from the barrel of a gun or the like, the powder ring 83 serving to preclude the ignition of the additional charge 82 until the charge 81 has been completely

burned, whereupon the additional charge 82 will continue to impart propulsion to the shell long after the same has left the barrel of the gun.

Now, from the foregoing, it will be seen that there is herein provided an improved projectile accomplishing all the objects of this invention and others including many advantages of great practical utility and commercial importance.

As many embodiments may be made of this inventive concept, and as many modifications may be made in the embodiment hereinbefore shown and described, it is to be understood that all matter herein is to be interpreted merely as illustrative and not in a limiting sense.

I claim:

1. In a device of the character described, a hollow shell open at its rear end, a propulsive powder charge in said shell, a flange inwardly turned to form a receptacle at the open extremity of said shell, and then folded outwardly within said inwardly turned portion to form a detonating anvil, and a detonating charge in said receptacle.

2. In a device of the character described, a hollow shell open at its rear end, a propulsive powder charge in said shell, a flange inwardly turned to form a receptacle at the open extremity of said shell, then folded outwardly within said inwardly turned portion to form a detonating anvil, a detonating charge in said receptacle, and a frangible powder ring closing the aperture in the interior of said flange to retain said propulsive charge.

3. In a device of the character described, a hollow shell open at its rear end, a propulsive powder charge in said shell, a flange inwardly turned to form a receptacle at the open extremity of said shell, then folded outwardly within said inwardly turned portion to form a detonating anvil, a detonating charge in said receptacle, a frangible powder ring closing the aperture in the interior of said flange to retain said propulsive charge, and a second powder ring interiorly positioned within said shell between portions of said propulsive charge, dividing the same into two separate charges.

4. In a device of the character described, a hollow shell open at its rear end, a propulsive powder charge in said shell, a flange inwardly turned to form a receptacle at the open extremity of said shell, the extremity of said flange being turned toward the inner wall of the shell to form a detonating anvil, and a detonating charge in said receptacle.

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The following references are of record in the file of this patent:

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