

United States Patent

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[72] Inventor **John L. Critcher**
 Cockeysville, Md.
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 [73] Assignee **The United States of America as**
 represented by the Secretary of the Army

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Primary Examiner—Robert F. Stahl
Attorneys—Harry M. Saragovitz, Edward J. Kelly and Herbert Berl

[54] **TUNNEL WEAPON AMMUNITION**
 6 Claims, 2 Drawing Figs.

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 102/43 C, 102/91, 102/95
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 F42b 7/08
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 43 C, 94, 95

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ABSTRACT: A tunnel, or canister-type ammunition which consists of a steel cartridge case containing a tubular, a separable sabot of a plastic-type material capsulating spheroidal missiles, a hollow steel piston containing a propellant and a breech plug including a firing pin and a primer. Upon firing the primer and propellant in a gun, the piston propels the sabot which, when emerging from the gun barrel, will fall apart to free the missiles for scattering.

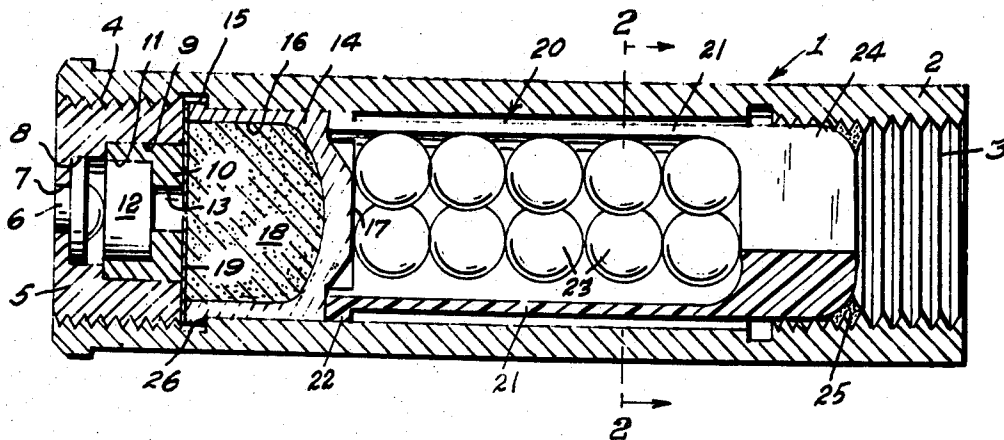


Fig. 1.

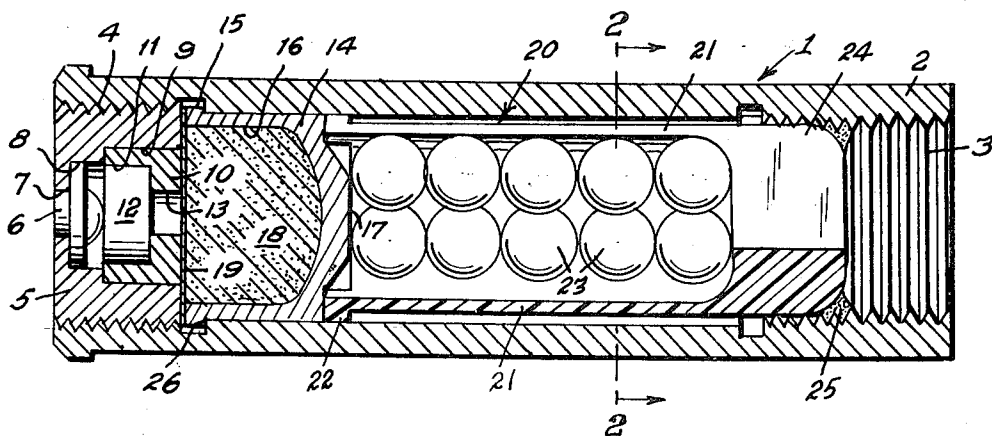
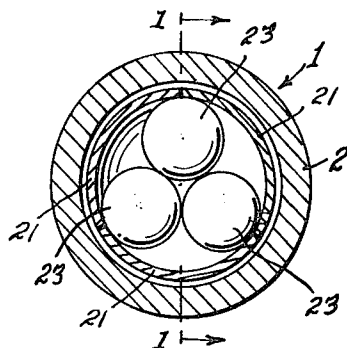


Fig. 2.



INVENTOR,
John L. Critcher
BY: Harry M. Saragovitz,
Edward J. Kelly &
Herbert Berl Attorneys.

TUNNEL WEAPON AMMUNITION

In modern warfare it frequently becomes necessary to employ scatter shot, wherein the missiles are sprayed to substantially increase the possibility of hitting one or more stationary or moving targets within that area. One method was in explosively shattering a projectile containing the missiles immediately prior to reaching the target. A projectile of this type usually consisted of a cartridge case containing a solid matrix of a plastic-type material in which the missiles were encapsulated, the matrix shattering when leaving a gun barrel from which it was fired. Most were ineffective due to the fact that fragments were substantially diverted from their forward flight path so that only a relatively small portion actually hit the target area. One example of this type projectile is seen in U.S. Pat. No. 3,059,578 dated Oct. 23, 1962 wherein the missiles are embedded in coaxial cylinders of a plasticlike material. Other rounds employ merely a solid matrix in which the missiles are embedded. Another method may employ a combustible matrix.

The aforesaid type of projectiles are generally fired from a weapon having a rifled barrel. The matrix of the round is provided with a rotating band, which, when engraved by the rifling causes the matrix to spin so that upon leaving the barrel it will disintegrate and allow the missiles to scatter.

However, the problem of visual and audible detection remained. The use of flash suppressors and silencers were not very practical since their use produced a heavy and bulky weapon as well as poor target hit capacity.

The present invention is designed to overcome the aforesaid disadvantages and consists briefly of a tubular sabot longitudinally sectionalized into separate segments and positioned within a cylindrical cartridge case. The sabot is composed of expendable material such as formed plastic and contains a plurality of spheroidal missiles. As the sabot is fired from a gun barrel, it falls apart to allow the missiles to scatter.

It is therefore a primary object of this invention to provide a round of ammunition that will minimize audio and visual detection when fired from a weapon.

Another object is to provide an ammunition round having improved target hit capability.

Still another object is to provide a segmented tubular sabot containing a plurality of missiles and mounted in a cartridge case, wherein the sabot will fall apart when it leaves the firing weapon and the missiles will be permitted to follow a scattering trajectory.

In the drawing:

FIG. 1 is an axial section view taken along line 1—1 of FIG. 2 of an ammunition round constructed in accordance with the invention, and,

FIG. 2 is a cross section view taken along line 2—2 of FIG. 1.

Referring now in detail to the drawing wherein reference character 1 designates generally the round of this invention. A steel cartridge case is indicated by 2 which is internally threaded at its forward end as at 3 and at its rearward end as at 4. A breech plug 5 is threadably mounted in the rearward end of cartridge case 2 and includes a firing pin 6 axially mounted in a bore 7 and a counterbore 8. Breech plug 5 is axially bored as at 9 to receive a primer retainer 10. Primer retainer 10 is axially bored as at 11 to receive a primer cap 12. Primer retainer 10 is counterbored as at 13 to provide a flash passage 13.

Abutting the forward end of breech plug 5 is a steel piston 14 which is provided with a flange 15 and which engages in the internally threaded portion 4 as shown. Piston 14 is hollow at its rearward portion to provide a chamber 16 and is further provided with a thickened nose portion 17 as shown. Chamber 16 is filled with a propellant 18. A propellant retaining disc 19 is provided at the rearward end of piston 14 as shown.

In the illustrated example, a separable, tubular sabot indicated generally by 20 is mounted in cartridge case 2. Sabot

20 is composed, as shown, of three equal segments 21 and each segment 21 is provided with a segment of an annular rifling band 22 integral with its rearward end, as shown. Three rows of spheroidal missiles, or shot, 23 are contained in sabot 20. Sabot segments 21 are provided with thickened nose portions 24, as seen in FIG. 1. In assembly, a sealant 25 is applied at the forward portion of the round between the nose of sabot 20 and the interior wall of case 2, see FIG. 1.

While sabot 20 has been illustrated in the drawing as divided into three segments, the sabot 20 may be divided into as many segments and contain as many missiles as expedient under the circumstances and three columns of spheroidal missiles are shown by way of example only.

In assembly, sabot 20 containing missiles 23 is inserted through the rearward end of cartridge case 2, then piston 14 until flange 15 abuts a shoulder 26 formed by threads 4, and finally breech plug 5 and its firing components is threaded into threads 4 until it abuts piston 14 which is then held captive. Now sabot 20 will be pushed tightly against nose 17 of piston 14 and sealant 25 applied, as shown, to retain the sabot in the cartridge case. The round 1 is now ready for firing in a gun, not shown, having a modified barrel. (Sabots are usually used in guns in which the barrel is modified to accommodate the sabot.)

When the projectile is fired from a gun, not shown, the firing pin 6 strikes primer cap 12 to fire propellant 18 through flash passage 13 to propel the piston 14 forward. As piston 14 slides forward in cartridge case 2, flange 15 is sheared. Sabot 20 is propelled forward by piston nose 17. The diameter of piston 14 is larger than the inside diameter of threads 3, so that piston 14 will be retained in the cartridge case 2 thereby. The sabot 20 travels as a unit through the gun barrel, not shown, and due to rifling band 22 on sabot 20 imparts a spin thereto by the rifling of the gun barrel. When sabot 20 emerges from the gun barrel, it will fly apart and release missiles 23 to scatter. Piston 14 acts also to seal the powder gases. For purposes obvious, a sealant may be applied to hold the segments 21 together to retain the tubular shape of the sabot 20 while in the cartridge case 2.

What is claimed is:

1. A tunnel ammunition round for firing in a rifled gun barrel and comprising, a cartridge case having internally threaded end portions, with one such portion forming a shoulder therein, a hollow projectile formed of separable segments mounted for slidable movement in said cartridge case, a plurality of missiles in said projectile, a piston mounted rearwardly of said projectile in said cartridge case and normally held captive by said shoulder at the rearward end thereof, a propellant charge in said piston, and a firing means for said propellant secured in said rearward end of said cartridge case, whereby when said firing means and said propellant are activated, said piston will eject said projectile, and said projectile falling apart upon emerging from the rifled barrel to free said missiles to scatter.

2. An ammunition round as set forth in claim 1 wherein said projectile comprises a tubular body defining a thickened nose portion and an integral rifling band at its rearward end, said projectile being longitudinally divided into equal segments and normally forming a unitary projectile in assembly, and a plurality of rows of missiles arranged within said tubular body.

3. An ammunition round as set forth in claim 1 wherein said projectile is fabricated from a plastic-type material.

4. An ammunition round as set forth in claim 1 wherein said missiles are spheroidal in shape.

5. An ammunition round as set forth in claim 1 wherein said piston is of a cup-shaped configuration, its outer diameter being greater than the inner diameter of said forward threaded portion, and an integral shearable flange at its rearward end adapted to abut said shoulder formed by said rearward portion of said cartridge case, whereby said piston will be held captive until said propellant is fired to propel said piston forward to shear said flange and to eject said projectile and be decelerated by said forward threads.

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6. An ammunition round as set forth in claim 1 wherein said firing means comprises a base plug threadably engaged in said rearward portion of said cartridge case, an axially disposed fir-

ing pin in said plug and a primer cap axially secured in said plug, and disposed forwardly of said firing pin.

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