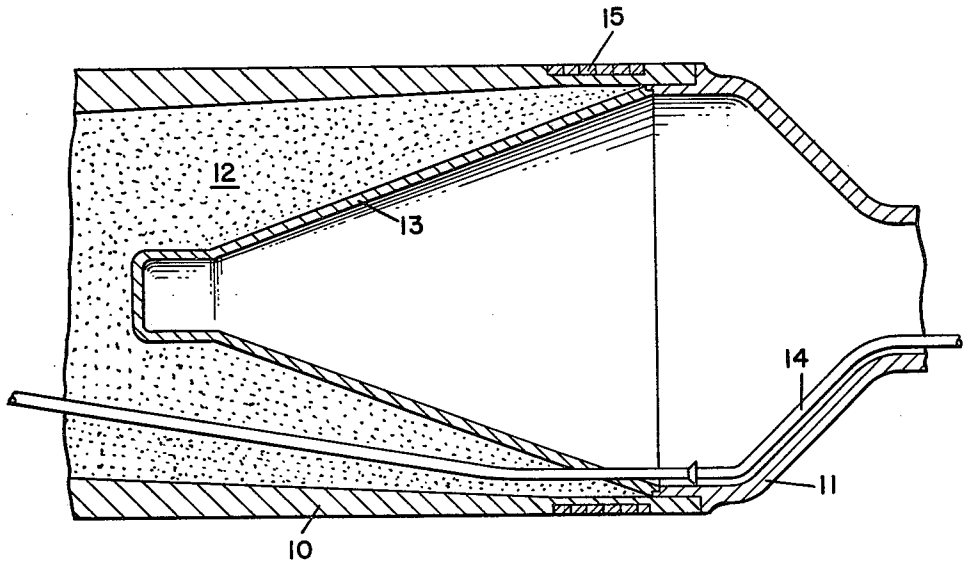
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EXPLOSIVE CONFINEMENT RING

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EXPLOSIVE CONFINEMENT RING

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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 projectile of the type carrying a shaped charge and has for an object to provide a projectile in which the shaped charge has improved penetration.

It has been demonstrated that an aluminum case body around a shaped charge does not function as satisfactorily as a steel body for penetration of an armored target, although aluminum is preferred for lightness in weight especially with recoilless guns. This invention obtains better penetration without having the weight of a steel body.

The single figure of the drawing shows a longitudinal section through a portion of a projectile embodying this invention.

For purposes of illustration this invention is shown embodied in a 90 millimeter fin stabilized projectile of a type adapted to be fired by a recoilless gun and having lightness in weight of both the projectile and gun as an important factor. Referring to the drawing this projectile includes a customary body 10 of aluminum attached to a nose portion 11 to provide a stand off distance, and having within the body a customary shaped charge explosive 12 between the body 10 and a copper conical member 13. Some usual means for firing the explosive 12 is located to the left of the illustrated portion of the projectile to be fired by an electrical or other transmission line 14 from a nose fuze, but forming no part of the present invention.

It has been found that a half dozen or more convolutions of tungsten wire 15 of rectangular cross section have been capable of providing better penetration into an armored target than with either the aluminum body or the aluminum body with a steel insert in place of the tungsten wire 15. The reason for this improvement in penetration of at least about 5%, is not known for a certainty. It is thought the body may fragment radially outward and the copper cone become atomized by some shock wave moving at a high velocity of 30,000 to 50,000 feet per second initially within the body 10 and moving through the charge 12. It is thought that the diameter and mass of the body around the explosive 12 and cone 13 are factors affecting penetration and especially are these factors just before or as such wave reaches the base of the cone 13. Since the diameter of the gun bore limits the diameter of the body and the making of the entire body heavy should be objectionable, it has been found

that adding weight of the wire 15 to the approximate length indicated of about ¾ of an inch has better penetration. Here again the precise reason is not known. For some reason it has been found that adding weight to the axial length indicated is more important than adding strength for the same distance, at least so far as penetration is concerned by the atomized particles of copper. The wire 15 need not extend for more than about 50% or 60% of the depth of the case 10 at the location illustrated, i.e., at least half the thickness of the case just behind the intersection of the case body 10 with cone 13. As shown in the drawing wire 15 extends for approximately 15 to 30 percent and preferably at least about 18% of the axial length of cone 13. The portion of the aluminum body 10 receiving the insert wire 15, is shown in the drawing as being of substantially uniform thickness, while that in rear of this wire is of gradually increasing thickness.

I claim:

1. In a projectile for use in a recoilless gun and of the type adapted for receiving and firing a shaped charge explosive, said projectile comprising

a hollow aluminum body having an outer wall of outside uniform diameter and of varying thickness tapering forwardly to a minimum thickness, thence extending forward uniformly,

a shaped charge explosive contained by said aluminum body,

a copper cone within said shaped charge explosive and intersecting said body, the combination therewith of the improvement for increasing the penetrating ability of said projectile comprising a tungsten wire of rectangular cross-section carried by said body wall within the outside diameter thereof and lying therein to a depth of about half the thickness of the body wall,

said tungsten wire having an axial length of approximately one-fifth of the outside diameter of the projectile, and said tungsten wire being located in rear of the intersection of said copper cone and said body for a distance of about 15% to 30% of the axial length of said cone.

2. A projectile according to claim 1 in which said tungsten wire is of rectangular cross section with about a half dozen convolutions set within an outer surface of said body for at least about 18% of the axial length of said cone.

References Cited in the file of this patent

UNITED STATES PATENTS

2,717,552	Brandt	Sept. 13, 1955
2,737,888	Brandt	Mar. 13, 1956
2,900,873	Wust	Aug. 25, 1959
3,021,784	Meddick	Feb. 20, 1962
3,025,794	Le Bourg et al.	Mar. 20, 1962

FOREIGN PATENTS

414,005	Great Britain	July 26, 1934
584,248	Great Britain	Jan. 10, 1947