

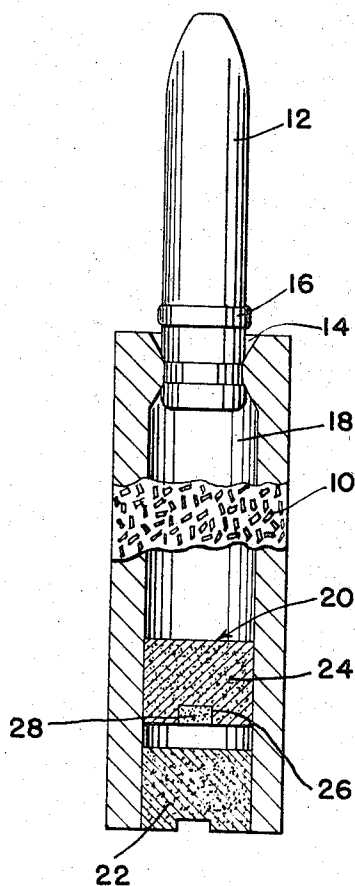
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J. B. QUINLAN

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TRAVELING IGNITION CHARGE

Filed Sept. 21, 1965



Inventor
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3,336,871

TRAVELING IGNITION CHARGE

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3 Claims. (Cl. 102—38)

ABSTRACT OF THE DISCLOSURE

An integrated, caseless molded round having an axial cavity therethrough. A projectile secured at the front end of said cavity and a primer plug secured at the rear end thereof. A movable molded charge is held in said cavity a short distance from said primer plug to act as a traveling ignition charge thereby causing complete burnout of said round and higher muzzle velocity.

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.

The present invention relates to a small charge of fast burning propellant made from molding propellant granules and primed with a conventional primer mix which acts as a traveling ignition charge in a round of 30 mm. caseless ammunition.

Caseless ammunition has in the past proved to be feasible for several calibers ranging from the experimental 3.2 mm. to caliber .30. It has been demonstrated that an integrated, molded granular propellant could be made to yield gas generation rates similar to those obtained with loose granular propellant in a conventional case.

It is believed that a 30 mm. caseless round made to meet the required ballistic requirement of 3450 feet per second muzzle velocity could be used with vehicle rapid fire weapon systems.

The main advantages of a 30 mm. caseless round are:

(1) Reduction in cartridge weight and volume,
(2) Elimination of spent cases in tanks and aircraft thus eliminating a storage problem or the need for ejection from the vehicle,

(3) Elimination of the toxic fume problem for tank ammunition,

(4) Elimination of the need for expensive tools, processing, and critical brass incidental to the use of metal cartridge cases, and

(5) A potential reduction in the unit cost of ammunition and in logistic storage and supply costs due to the reduction in weight and volume.

To achieve a 30 mm. caseless round with the muzzle velocity of 3450 feet per second the propellant must be made to break up and burn completely. There can be no unburned propellant left after firing.

An object of the present invention is the provision of a traveling ignition charge in a round of 30 mm. caseless ammunition resulting in higher muzzle velocity.

Another object is to provide a traveling ignition charge in a round of 30 mm. caseless ammunition capable of facilitating ignition and break-up of the caseless propellant charge.

The exact nature of this invention as well as other objects and advantages thereof will be readily apparent upon consideration of the following specification relating to the annexed drawing.

Referring now to the single figure of the drawing wherein a longitudinal section of a preferred embodiment of the invention is shown, a molded propellant 10 comprising

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ing granules of propellant bonded in a molded mass by a low-nitrogen nitro-cellulose binder has a projectile 12 secured in a forward recess 14. The projectile 12 is provided with a band 16 to provide the projectile 12 with spin upon its travel through the barrel of the weapon, not shown, upon firing.

An axial cavity 18 is formed within the round and is generally centrally disposed therewithin as shown. This cavity is used to provide axial ignition and to insure a means of controlling charge weight as described in patent application, Ser. No. 343,904, filed Feb. 10, 1964, now Patent No. 3,212,440.

The traveling ignition charge, indicated generally by the reference numeral 20 is secured in a rearward recess of the molded propellant 10 a short distance ahead of a standard primer plug 22 of the type described in patent application of Quinlan et al., Ser. No. 477,046, filed Aug. 3, 1965, and includes a molded solid propellant charge 24 made of a fast burning propellant. The propellant charge 24 may be solid, cored, or honeycomb to achieve desired results of ignition and breakup. The propellant charge 24 contains a primer pocket 26 which holds a conventional small arms priming mix 28. The amount of mix 28 utilized depends on the size of the solid propellant charge to be broken up.

The traveling ignition charge is made of a fast burning propellant granule, molded into an integral charge and pocketed for a priming mix. After the traveling ignition charge is primed it is inserted into the perforation of the caseless round ahead of a standard primer plug allowing enough free volume therebetween to allow the traveling ignition charge to fire at an optimum velocity. The traveling ignition charge is ignited by a standard primer blast and in turn travels the length of the perforation igniting the round.

The traveling ignition charge serves as an auxiliary ignition and breakup element for solid propellant caseless rounds.

Having thus described my invention so that others skilled in the art may be able to understand and practice the same, I state that what I desire to secure by Letters Patent is defined in what is claimed.

I claim:

1. An integrated, caseless molded round comprising granules of propellant bonded in a molded mass by a low nitrogen nitro-cellulose binder, said molded mass having a forward recess and a rearward connected by an axial cavity, a projectile secured in said forward recess, a primer plug secured in said rearward recess, and an ignition charge movable upon ignition and temporarily secured in said axial cavity a short distance from said primer plug.

2. A device of the type described in claim 1 wherein said ignition charge comprises a molded solid propellant.

3. A device of the type described in claim 2 wherein said molded solid propellant ignition charge contains a primer pocket.

References Cited

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