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COMBUSTIBLE CASELESS AMMUNITION

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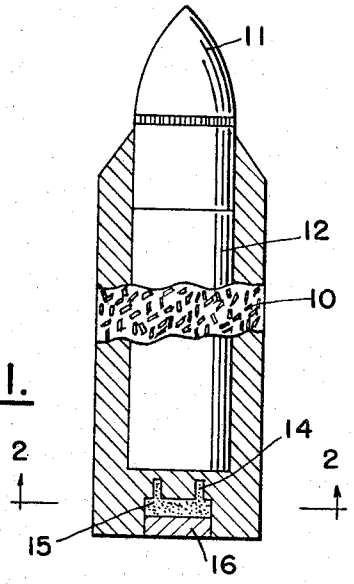


FIG. 1.

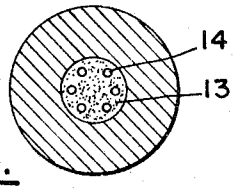


FIG. 2.

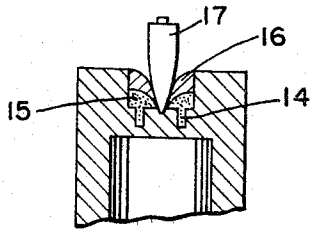


FIG. 3.

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COMBUSTIBLE CASELESS AMMUNITION

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8 Claims. (Cl. 102—38)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to us of any royalty thereon.

The present invention relates to combustible caseless ammunition and more particularly to a percussion primer for combustible caseless ammunition.

In the past combustible percussion primers included a mix comprised of a supersensitive material on top of a conventional material as disclosed in the patent application of John J. Scanlon, Jr., et al., entitled, "Primer for Consumable Round," Ser. No. 214,152, filed Aug. 1, 1962, now Patent No. 3,187,671. This type of percussion primer replaced the cup and anvil type which had been used in cased ammunition but which would not function in caseless ammunition.

It has been discovered that the use of a supersensitive mix contributed to an increase in the number of malfunctions. This was brought about, during repetitive firing, by the firing pin becoming hot whereby the mere touching of the primer by said firing pin would cause ignition before the round became properly seated in the chamber.

It was also discovered that due to the highly corrosive materials contained in a supersensitive mix, the exposed gun parts rapidly deteriorated.

An object of the present invention is the provision of a caseless round of ammunition comprising a percussion primer mix utilizing conventional non supersensitive materials.

Another object is to provide a percussion primer that will not preignite.

A further object of the invention is the provision of a percussion primer that will not corrode gun parts.

Other objects and many of the attended advantages of this invention will be readily appreciated by reference to the following detailed description considered in connection with the accompanying drawings in which like reference numerals designate like parts throughout the figures thereof and wherein:

FIG. 1 shows a longitudinal section of a preferred embodiment of the invention.

FIG. 2 shows a section of the device taken on the line 2—2 of FIG. 1 looking in the direction of the arrows.

FIG. 3 shows a section of the base portion of the embodiment of FIG. 1 as seen during firing.

Referring now to the drawings there is shown in FIG. 1 a molded propellant **10** comprising granules of propellant bonded in a molded mass by a low nitrogen nitrocellulose binder having the usual projectile **11** adhesively secured in a recess thereof. This adhesive may be of any well known combustible type, such as nitrocellulose dissolved in methyl ethyl ketone, and having no adverse affect upon the molded propellant. The projectile may partake of any small arms type, that shown being a typical jacketed type for receiving impressions of the lands and grooves to effect stabilization.

An axial cavity **12** is formed within the round and is generally centrally disposed therewithin as shown.

A primer pocket **13** is provided at the rear of the molded propellant. Six vent bores **14** are provided in the base of the primer pocket, distributed radially outward from the center thereof, and extending forward of the base short of the axial cavity. The primer pocket and vent bores are filled with a conventional primer mix **15** including therein known quantities of lead styphnate, antimony sulphide, barium nirate, tetrazine, and gum arabic. A propellant disc **16** is positioned above the primer mix and glued to the rear of the round flush with the base thereof. The propellant disc **16** may be made by adding a nitrocellulose binder to a 20 mm. powder which is mixed until it becomes tacky, and then pressed into shape on a hot platen press at 120°–180° F. at 2000 lbs. gauge pressure.

According to this invention, it has been found that to achieve the proper ignition in, for example, a 7.62 mm. round, 0.45 grain of conventional primer mix are necessary but it also requires a total of 0.90 grain of said mix to cause the densely pressed propellant base to burn properly. The primer pocket would be .030" deep thereby accounting for the 0.45 grain of mix. The extra 0.45 grain would be contained in the six vent holes, which would be .050" deep. The primer mix would account for .010" from the base of the pocket and the remaining space in the primer pocket would be filled with a propellant disc which would be .020" thick.

In operation, as shown in FIG. 3, upon initiation of a firing mechanism, not shown, a conical shaped flat headed firing pin **17**, will penetrate the propellant disc **16**, the primer mix **15** and the molded propellant **10**, thereby causing an ignition to occur.

The firing pin **17** would have to penetrate the propellent disc **16**, primer mixer **15**, and molded propellant **10** at the center and to a depth of at least 0.045" to 0.060". The firing pin upon entering the propellant **10** would cause the propellant to radially spread and the friction created thereby would effect the proper firing.

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

We claim:

1. An integrated, caseless molded small arms round comprising a molded mass having a forward recess and a rearward recess, a projectile secured in said forward recess, said rearward recess having a base containing a plurality of bores, said bores extending forward short of said forward recess, a primer mix located in said bores and in part of said rearward recess, and a propellant disc provided in the remaining part of said rearward recess.

2. An integrated, caseless molded small arms round comprising granules of propellant bonded in a molded mass by a low nitrogen nitrocellulose binder, said molded mass having a forward recess, a primer pocket and an axial cavity extending from said forward recess short of said primer pocket, a projectile adhesively secured in said forward recess, said primer pocket including therein a base containing a plurality of vent bores, said vent bores extending forward short of said axial cavity, a primer mix located in said vent bores and in part of said primer pocket, and a propellant disc provided in the remaining part of said primer pocket.

3. A device of the type as described in claim **1**, wherein said projectile is secured to said forward recess by a combustible adhesive.

4. A device of the type described in claim **1**, wherein said primer mix includes lead styphnate, antimony sulfide, barium nitrate, tetrazine and gum arabic.

5. A device of the type as described in claim **1**, wherein said vent bores are six in number and are distributed radially outward of the center of the base of said primer pocket.

6. An integrated, caseless molded small arms round comprising granules of propellant bonded in a molded mass by a low nitrogen nitrocellulose binder, said molded mass having a forward recess in which a projectile is secured, an axial cavity extending from said forward recess short of a primer pocket, said primer pocket adapted to contain a quantity of primer mix and a propellant disc therein, said primer pocket having a base, said base having means for containing additional primer mix, said caseless molded small arms round being so constructed and arranged that with a conical shaped flat headed firing pin penetrating the propellant disc, primer mix and molded propellant, ignition will occur.

7. A device of the type described in claim 6. wherein said means includes a plurality of vent bores distributed radially outward of the center of the base of said primer pocket.

8. A device of the type described in claim 6, wherein said primer mix includes lead styphnate, antimony sulfide, barium nitrate, tetrazine and gum arabic.

No references cited.

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