

UNITED STATES PATENT OFFICE

2,231,946

PROPELLENT POWDER FOR AMMUNITION

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Philadelphia, Pa.No Drawing. Application March 30, 1940,
Serial No. 327,004

5 Claims. (Cl. 52—1)

(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

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

5 The subject of this invention is a propellant powder for ammunition.

The corrosion of gun barrels after firing is generally attributed to the primer residues deposited on the bore of the barrel. Primers containing potassium chlorate yield potassium chloride and hydrochloric acid and these substances cause a prompt initiation of the rusting process which then proceeds rapidly. Previous attempts to overcome this difficulty have been directed toward the development of so-called non-corrosive primers in which the potassium chlorate has been eliminated and in which other compositions of suitable sensitivity have been substituted. Such primers, however, do not completely overcome the rusting which normally appears in a barrel stored at a high relative humidity without cleaning. If this rusting is allowed to proceed long enough, even with non-corrosive primers, the barrel will become seriously pitted and its accuracy will be lost.

It has been found that if a small quantity of red phosphorus be added to the powder, the combustion of the phosphorus yields a sufficient quantity of phosphoric acid to form a rust resistant coating in the bore of the gun. Even when chlorate primers are used, the amount of corrosion is so greatly reduced that practically no pitting occurs when the fouled barrels are exposed to 90% relative humidity for 1000 hours. With the so-called non-corrosive primers, the protection afforded is correspondingly greater.

Any other form of phosphorus or compound of phosphorus which gives phosphoric acid when the propellant burns will provide the same rust resisting residue and will prolong the life of the barrel no matter what type of primer is used. Compounds of phosphorus are more practical for this purpose than any form of the element phos-

phorus as they may be selected so as to be capable of being incorporated in the powder itself during manufacture. Certain of the organic phosphates such as tricresyl phosphate, triphenyl phosphate and tributyl phosphate may be used to serve a double function as both rust preventive and plasticizer. Some of the inorganic phosphates, such as one of the potassium phosphates, primary sodium phosphate, sodium phosphite, and sodium hypo phosphite may similarly serve doubly as both rust preventive and flash reducer. The compounds mentioned above are only illustrative and are not to be construed as limiting the scope of the invention as the discovery lies in the fact that phosphorus or compounds of phosphorus yielding phosphoric acid on combustion when added to propellant powder will form a rust resisting coating in the bore of the gun.

These rust preventing substances may be incorporated in the propellant in amounts of 2% to 10% depending upon the nature of the gun, the nature and grain size of the powder, the nature of the rust-preventer employed and the amount of corrosive residue yielded by the powder.

We claim:

1. A propellant powder containing an organic compound of phosphorus yielding phosphoric acid on combustion.

2. A propellant powder containing an inorganic compound of phosphorus yielding phosphoric acid on combustion.

3. A propellant powder containing phosphorus.

4. A propellant powder containing 2% to 10% of an agent selected from the class consisting of phosphorus and its compounds and yielding phosphoric acid on combustion.

5. A propellant powder containing an agent selected from the class consisting of phosphorus and its compounds and yielding phosphoric acid on combustion.

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