

UNITED STATES PATENT OFFICE.

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GUN-CLEANING COMPOUND AND METHOD OF PREPARING SAME.

No Drawing. Original application filed September 21, 1918, Serial No. 255,087. Divided and this application filed February 15, 1919. Serial No. 277,232.

To all whom it may concern:

Be it known that I, ROBERT LAUGHLIN, a citizen of the United States, residing in Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Gun-Cleaning Compounds and Methods of Preparing Same, of which the following is a specification.

This invention relates in general to a chemical mixture of improved qualities for facilitating the removal of the metal fouling from the interior of the barrels of rifles, guns, pieces of ordnance, and the like, and is a division of my application Serial No. 255,087, filed September 21st, 1918.

The shooting of a rifle, gun or other field piece is usually attended with the deposition of an alloy known as cupro nickel or of copper upon the interior of the barrel, which in a relatively short time either clogs the barrel or at least destroys the effect of the rifling. It has been the custom in the past to send the rifles and guns at frequent intervals to be rebores to remove this deposit or incrustation with the result that the arms are withdrawn for a time from service and with the further result that after a few said operations the bore is increased to an extent that renders the piece useless. I am aware that effort has been made in the past to provide for the chemical removal or loosening at least of this deposit and this effort has been in a measure successful, that is to say, the incrustation has been effectively removed. This deposit or incrustation requires relatively violent and strong action and the chemicals used have necessitated active chemical reactions between the substances within the gun barrels themselves and have in the past required certain of the ingredients to be liquid form. By reason of the necessity, prior to my invention, of providing this substance in liquid form the cleaning of the gun barrels has been attended with considerable waste of material and considerable difficulty in obtaining proper proportions and it is a prime purpose of my present invention to provide chemicals for this purpose of a character and in a form which will permit of previous accurate measurement of the materials and which will reduce possibility of wastage to a minimum.

My invention contemplates the division of the necessary chemicals into two bodies and the provision of each of these bodies in tablet form capable of being readily dissolved in a desired amount of water and then poured in the gun barrel before the reactions are completed.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description.

A peculiarly effective combination of materials is provided in the conjoint use of ammonium sulphate, ammonium per-sulphate and sodium hydroxide or caustic soda. The materials are provided in about their combining proportions and the sulphate and per-sulphate are preferably mixed and formed into tablets and the sodium hydroxide formed into other tablets, the two tablets being furnished as a part of the necessary equipment for cleaning the barrel. The mixture is formed by dissolving one or more tablets of the ammonium salts with one or more tablets of the caustic soda, the number of tablets depending of course upon their relative size. In practice tablets of two different substances are used to form the gun cleaning compound. One of these tablets consists of a mixture of ammonium persulphate and ammonium sulphate in the proportions of one part ammonium persulphate with two parts of ammonium sulphate and the other tablet consists merely of the caustic soda or sodium hydroxide. These tablets are preferably of such relative size or used in such relative numbers that the final mixture will consist of one part sodium tablet to four parts ammonium salts tablets. That is to say, tablets formed as above and of the same size might be used as follows: four ammonium salts tablets together with one caustic soda tablet. Of course these proportions may be varied within limits, the foregoing proportions being merely selected as those at present preferred.

In making the caustic soda into tabular form, I have found it essential, to facilitate compression and cohesion, to provide a mild lubricating binder to permit movement of the particles to compressed form and to hold them in position. Among appropriate binders may be mentioned talc, stearic

acid, powdered soap and graphite. Other binders of course may be used. A highly important function of the binder is to facilitate the removal of the tablets after being formed and compressed from the mold or die in which forming and compressing operations have taken place. In other words it is the function of a binder to reduce the adherent properties of the caustic soda for the material of the mold without affecting materially or at least in such great degree the coherent properties of the caustic soda which tend to maintain the compressed mass in its attained form.

The caustic soda is an extremely active chemical agent and has a high affinity for the moisture of the atmosphere and considerable difficulty was encountered by me in providing it in tabular form. However, I provide with it a lubricating binder as above stated and grind the caustic soda with the binder to reduce the size of the particles of soda and form at the same time a powder adapted to be disposed in the interstices in forming the tablet. Incidental to the grinding action the lubricating binder is intimately mixed with the soda and acts to hold the particles of the soda together in the tablet and at the same time prevents sticking of the tablets in the tablet forming implements. The soda is preferably protected from the moisture of the air before, during and after grinding and I have found it desirable to subject the materials to two or more successive grindings. The compression and formation of the tablets is effected from this granulated or powdered form and both the binder and the alkali are preferably in granulated or powdered form and are maintained as dry as is possible. A very small percentage of binder is sufficient and I find that the best results are obtained when the binder is 3 per cent or less by weight of the caustic soda. It should be noted perhaps that the tablets after formation have not, by reason of their

compression, as great an affinity for the moisture of the atmosphere and can be exposed for relatively longer times before sufficient moisture is absorbed to have a deleterious effect.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A process or method of preparing a material resulting from an ammonium salt and an alkali for removing metal fouling, comprising the provision of the salt and alkali in solid form, dissolving the two together in water and applying the solution to the fouling during the reaction between the salt and alkali.

2. A compound for removing fouling from gun barrels and the like, comprising a plurality of reacting substances in separated tabular form, the amounts of said substances in individual tablets being appropriate to permit the obtaining of a desirous mixture by selection of predetermined numbers of tablets of said reacting substances.

3. A compound for removing fouling from gun barrels and the like, comprising tablets formed of a mixture of a salt and a per-salt and other tablets formed of a hydroxide.

4. A process or method of preparing a material for removing metal fouling, comprising the provision of tablets of measured amount of a salt and its per-salt and other tablets in measured amount of an alkali, dissolving tablets of the two groups in water and applying the solution to the fouling during the reaction of the salts and the alkali.

ROBERT LAUGHLIN.