

UNITED STATES PATENT OFFICE.

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EXPLOSIVE AND PROCESS OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 617,766, dated January 17, 1899.

Application filed November 17, 1897. Serial No. 658,825. (No specimens.)

To all whom it may concern:

Be it known that I, GERSHOM MOORE PETERS, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Processes and Products Pertaining to Explosive Compounds, of which the following is a specification.

This invention relates to a process and product pertaining to explosive compounds especially adapted for use in connection with ordnance and firearms, and this application for patent is filed in place of application Serial No. 589,764, filed April 30, 1896, by me. Commonly two classes of explosives have been applied to such uses, and these were designated "nitro-powder" and "black powder." Nitro-powder usually develops a very high velocity and is free from smoke or gas which fouls; but, on the other hand, it is liable to be set off by concussion, it is not always stable or uniform in strength, it is slow of ignition, it commonly develops a high and dangerous pressure, and it is sensitive to changes of temperature or atmosphere. Black powder is safer to handle than nitro-powder, is more uniform and reliable, and has a low pressure; but it develops excessive smoke, causes eaking or leading in the gun, and has not sufficient velocity, strength, and range for use in modern arms. The present invention is designed to secure most of the advantages of the nitro-powder and black powder and at the same time avoid the objections to each of them.

The invention will now be described, and then specifically pointed out in the claims.

As one of the ingredients for this new explosive a cellulose material is utilized, and it is within the scope of the invention to use any well-known species of cellulose material, although wood-pulp is the preferable species for the purpose. Wood-pulp is preferable to other kinds of cellulose material—as, for instance, cotton—because it is more friable and much more easily reduced to dust, so as to enable it to be more perfectly united with the other ingredients to be used. Besides, wood-pulp is not so sensitive, violent, or dangerous as other cellulose material commonly employed in nitro-powders.

The first step in the process is to reduce the

cellulose material to an impalpable dust by a mechanical process—as, for example, by means of revolving barrels containing metallic balls. The dust is then treated with an acid formed of two parts of sulfuric acid to one of nitric, or substantially these proportions. It is then thoroughly washed until it becomes neutralized, and afterward dried, and then it is ready for mixing with the other ingredients. Next saltpeter, charcoal, and brimstone are prepared in the usual way commonly employed in making black powder and then also reduced to impalpable dust by a mechanical process. The four ingredients thus prepared are then mixed together mechanically in about the following proportions, viz: saltpeter, sixty per cent.; cellulose material, twenty per cent.; charcoal, twelve per cent., and brimstone eight per cent. These proportions may of course be varied to meet the different uses of ordnance, shotguns, and rifles. The dust is preferably moistened before mixing to keep it from floating away in the air. The composition thus formed is then placed under incorporating-wheels, such as are used for incorporating black powder, and the mass remains under these wheels for several hours, being during this time kept well moistened and remaining there until the four ingredients have been worked into what is a single substance differing in quality and nature from other powders or from an aggregation of the elements of the two powders commonly known. The unskilled or ignorant would regard this a dangerous process, but followed properly as above indicated it is not especially dangerous and is entirely practical.

After the incorporation above indicated the new material is put under hydraulic pressure about equal to that used in pressing black powder and is reduced in a well-known way to cakes or slabs. It is then run through a corning-mill and granulated, the sizes resembling those of black powder. It is then thoroughly dried, rubbed smooth in tumbling-barrels, separated into the various grains, and packed. It may be glazed with plumbago for some purposes; but ordinarily it is preferable to dispense with glazing material.

The powder resulting from this process has qualities quite unlike either nitro-powder or

black powder and advantages above and beyond such powders, and it therefore forms a new and important addition to the list of explosives. It is very clean, has little or no corrosive effect upon the gun, is free from dense foul smoke, is quicker in ignition than black powder, and has a higher velocity than ordinary nitro-powder and yet with a breech-pressure very considerably less. As a rifle powder it has peculiar excellence. For example, it gives a muzzle velocity far in excess of that ordinarily possible with nitro-powder, and yet it will not cause stripping of the softest lead ball or leading of the gun or, as it is termed, "wild" shooting. It is more accurate, uniform, and reliable than either nitro or black powder. It is, indeed, a new product with its own peculiarities.

It is manifest that slight variations and modifications may be made by those experienced in the art without departing from the principle of the process and product above described.

What I claim as new, and desire to secure by Letters Patent, is--

1. The process of making an explosive compound, consisting in separately reducing to a dust cellulose, saltpeter, charcoal and brimstone; then nitrating, washing and drying the cellulose-dust; next, thoroughly mixing the dust of the four ingredients; then thoroughly incorporating the mass until it is practically worked into a single substance; and finally granulating such substance: substantially as and for the purpose set forth.

2. The process of making an explosive compound, which consists in separately reducing to a dust wood-pulp, saltpeter, charcoal and brimstone; applying sulfuric and nitric acids to the wood-pulp dust substantially in the proportions described, and washing and drying the same; mixing the nitrated dust and the dust of the saltpeter, charcoal and brimstone, substantially in the proportions described; subjecting the composition thus formed to incorporating-wheels until it is worked into a practically single substance, during which treatment it is well moistened; and finally granulating the composition: substantially as and for the purpose set forth.

3. A new semismokeless powder composed of pulverized nitrated wood-pulp and pulverized saltpeter, charcoal and brimstone, in the proportions of twenty per cent. of nitrated wood-pulp, sixty per cent. of saltpeter, twelve per cent. of charcoal, and eight per cent. of brimstone, having such materials uniformly distributed throughout and formed into a single substance with a grain uniform throughout, whereby the product is rendered semismokeless, has a high velocity but comparatively low pressure, and is stable and uniform in strength.

Signed this 13th day of November, 1897, in the presence of the subscribing witnesses.

GERSHOM MOORE PETERS.

Witnesses:

O. E. PETERS,
E. F. GARRETT.