UNITED STATES PATENT OFFICE.

JOHN L. DONNER, OF OREGON CITY, OREGON, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO JOHN BROSNAN, JR., OF WASHINGTON, DISTRICT OF COLUMBIA.

EXPLOSIVE POWDER.

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To all whom it may concern:

Be it known that I, JOHN L. DONNER, citizen of the United States, residing at Oregon City, in the county of Clackamas and State of Oregon, have invented certain new and useful Improvements in Explosive Powders; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to explosive powders but more particularly to high explosives of the non-detonating type and to a powder particularly adapted for use in small arms and cannon and is, therefore what may be termed a propelling powder.

This invention has for its object to produce an explosive powder which can be manufactured with reasonable safety and without injurious effects on the operatives.

A further object of the invention is to provide an explosive powder which is no more sensitive than ordinary powders and which will not produce erosion in the barrels of guns when the same are treated with reasonable care.

A further object of the invention is to produce a powder which will safely withstand compression and in which the rapidity of burning in open air when ignited depends upon the relative proportions of the ingredients, and upon the extent of granulation.

A further object of the invention is to provide an explosive powder, the products of combustion of which are not poisonous.

A further object of the invention is to provide an explosive powder which when properly granulated will give desired muzzle velocity in service guns without exerting pressure in excess of that prescribed for them.

A further object of the invention is to provide an explosive powder which will not unduly heat service guns, which is practically smokeless and which will not unduly foul the bores.

A further object of the invention is to provide an explosive powder which does not require an unduly strong primer for ignition and in which the products of combustion have no injurious chemical action on metals.

A further object of the invention is to provide an explosive powder which will stand all ordinary stability tests, and in which some of the ingredients are soluble in water.

A further object of the invention is to provide an explosive powder which will permit of any desired granulation.

A further object of the invention is to provide an explosive powder which can be machine loaded and in which all of the essential ingredients can be produced in any country or locality, which is cheap and easy to manufacture and of the greatest efficiency, but it is to be understood that this invention does not contemplate the use of a relatively large proportion of an oily substance or even a sufficient proportion thereof to render the composition wet or pasty, but on the other hand, I employ such a relatively small proportion of an oily substance that the presence thereof in the composition is negligible from a physical standpoint. The presence of an oily substance in the composition in a sufficient quantity to render the same damp or wet is a positive and decided detriment to the explosive. In the first place, as far as the explosive properties of the oily substance is concerned, it can be said to be a waste product in the composition as it adds nothing whatever to the explosive properties of the mixture. On the other hand it burns with a smoke, thereby seriously interfering with the smokeless properties of the explosive. Furthermore a sufficient quantity of an oily substance to render the composition damp or pasty very seriously interferes with the quick and proper drying of the explosive.

With these objects in view the invention consists in the novel mixture of chemical ingredients as will be hereinafter fully described.

In the production of high explosives according to this invention I employ a moistening agent such as water, potassium chlorate, a water soluble organic matter, and an oily substance such as crude oil.

By certain modifications in the relative proportions of these ingredients, I am enabled to produce powders having certain characteristics which adapt them to particular uses.

According to Example 1 which is a small arms powder, I employ the following formula:

Water 1%,

Potassium chlorate 49%,
An organic matter soluble in water 49%,
Crude oil 1%.

These ingredients are brought together in the following manner:

The water soluble organic matter may be any organic matter having a high carbon content such as sugar, glucose and like organic substances preferably of a sticky character. This organic matter is mixed in 1% of water and is heated to the boiling point for several minutes. The oily substance such as crude oil is then added while the mass is still hot and the potassium chlorate is then added to the mass while still hot, the result being a stiff plastic mass which can be readily granulated in the usual manner or otherwise formed. The mass is then dried at a temperature of 80° F.

Powder produced according to Example 1 is non-detonating, not a bursting powder but a progressive burning propelling explosive.

According to Example 2, I mix the above named ingredients according to the following formula to produce a high explosive suitable for projectiles as follows:

Water 1%,
Potassium chlorate 48%,
Water soluble organic matter 49%,
An oily substance such as crude oil 2%.

Powder made according to Example 2 is non-detonating, non-explosive by contact, is very highly explosive when confined only, is not sensitive to shock and produces a powder of high propelling force.

According to Example 3 which is particularly adapted as a torpedo powder, I employ the ingredients according to the following formula:

Water 1%,
Potassium chlorate 53%,
Water soluble organic matter 45%,
An oily substance such as crude oil 1%.

Powder produced according to Example 3 is more sensitive to shock than that under Example 2 has a high bursting force and for greatest efficiency should be finely granulated and confined.

According to Example 4 which is particularly adapted as an ammunition powder for large arms, I employ the same ingredients but in the following proportions:

Water 2%,
Potassium chlorate 54%,
A soluble organic matter 43%,
An oily substance such as crude oil 1%.

Powder produced according to this example should be of large granulation and has great propelling force, will not detonate and is particularly efficient for the purpose specified.

Having thus fully disclosed the invention and the ingredients forming the explosive powder and having described several examples, it is of course, apparent that the ingredients forming this powder can be brought together in other and in varying proportions, and I do not consider myself limited to the exact proportions of the ingredients as specified in the foregoing examples, nor do I consider myself limited to the use of the exact ingredients as herein mentioned, but I do consider myself clearly entitled to any changes in the relative proportions of the ingredients and in the use of any similar ingredients having the same or like chemical characteristics. I, therefore, consider myself clearly entitled to any and all changes and modifications as fall within the limit and scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is—

1. An explosive powder including a mixture of the following ingredients: water, potassium chlorate, sugar, and crude oil, the last mentioned element being in such small proportion in relation to the composition as to allow for a quick and ready drying of the same.

2. An explosive mixture, consisting of a chlorate, sugar and crude oil.

3. An explosive mixture, consisting of particles of chlorate, sugar and crude oil, in which the crude oil forms an envelop around the individual particles of chlorate.

4. The process of producing an explosive compound which consists in mixing sugar with water and heating the same, then adding crude oil to the mass while hot, then adding potassium chlorate to the hot mass and then drying the same.

In testimony whereof, I affix my signature, in presence of two witnesses.

JOHN L. DONNER.

Witnesses:
JOHN L. FLETCHER,
C. HUGH DUFFY.