

United States Patent Office.

JOSEPH HAFENEGGER, OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 111,642, dated February 7, 1871.

IMPROVEMENT IN EXPLOSIVE COMPOUNDS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOSEPH HAFENEGGER, of the city and county of San Francisco, State of California, have invented certain new and useful Improvements in "Explosive Compounds;" and I do hereby declare that the following description gives a full and clear statement of the names and quantities of the ingredients used, with full directions for making and using the same.

My invention relates to certain diluents or ingredients which I employ for mixing with and incorporating into the various explosive compounds which can be manufactured by the combination of chlorate of potash with sulphur, sugar, phosphorus, prussiate of potash, charcoal, and saltpeter, with the addition of fatty, oily, or resinous substances.

In this compound four oxides are used, but one or more of them can be dispensed with, if desired; and various combinations of a portion of the ingredients, with chlorate of potash as a base, can be employed, and in each case a powerful, and when sufficiently diluted with fatty, oily, or resinous substances, a perfectly safe powder to handle will be obtained.

The following table will show a number of compounds in which the oxides can be employed to advantage:

Chlorate of potash.	Oxide of lead.	Other ingredients.
1. Four (4) parts.	Four (4) parts.	Saltpeter, one (1) part.
2. Ten (10) parts.	Five (5) parts.	Venice of turpentine, two (2) parts.
3. Eight (8) parts.	Four (4) parts.	Antimony, one (1) part.

Chlorate of potash.	Oxide of zinc.	Other ingredients.
1. Ten (10) parts.	Two (2) parts.	Venice of turpentine, one (1) part.
2. Five (5) parts.	One (1) part.	Antimony, one (1) part.
3. Ten (10) parts.	Two (2) parts.	Prussiate of potash, one (1) part. Antimony, two (2) parts. Oxide of iron, one (1) part. Venice of turpentine, one (1) part.

Chlorate of potash.	Oxide of Manganese.	Other ingredients.
1. One hundred (100) parts.	One (1) part.	Ten (10) to twenty-five (25) parts of spirits of turpentine.

The chief characteristic of my present improvements

is the addition of one or more of the mineral oxides in varying proportions to the compounds or mixtures above mentioned.

I prefer the oxides of lead and manganese, the latter being especially preferable for use in blasting-powder which is to be employed in deep shafts, as it gives off no smell and very little smoke.

Any of the mineral oxides, when thus employed, gives off, when heated, a supply of oxygen, which gives a quick and powerful explosion, especially when the powder is confined.

For a better explanation I add hereto a number of compounds, upon which careful and elaborate experiments have been made.

Chlorate of potash, ten (10) parts; oxide of manganese, three (3) parts; oxide of lead, four (4) parts; sulphur, two (2) parts; prussiate of potash, one (1) part; oxide of zinc, one (1) part; antimony, one (1) part; charcoal, one (1) part; nut-galls, one (1) part; oxide of iron, one (1) part; with three (3) parts of lard dissolved in six (6) parts of bi-sulphide of carbon.

Chlorate of potash.	Oxide of manganese.	Other ingredients.
2. Ten (10) parts.	Ten (10) parts.	Antimony, five (5) parts. Olive oil, two (2) parts.
3. Eight (8) parts.	Eight (8) parts.	Saltpeter, two (2) parts, with oily, fatty, and resinous substances.
4. Five (5) parts.	Ten (10) parts.	Antimony, one (1) part. Olive oil, two (2) parts.

The quantity of oxide of manganese to be used can be regulated so as to make the explosive act quicker or slower, as desired, and the compound containing it can be subjected to great friction or concussion without exploding.

The above table will sufficiently explain the general idea of the particular ingredients upon which my experiments have been based; but the proportion of each can be varied from one to one hundred parts and a good powder obtained in most cases.

The cap which I employ consists simply of a metallic tube, which I fill with either of the compounds above described. I then press or draw together the lower end, so that it shall prevent the escape of the powder.

The fuse is inserted in the opposite end.

By thus constructing my caps the lower end of the tube opens readily and allows the force of the powder to be exerted downward into the blast or mixture to be exploded, while the cap will be much cheaper and safer than those containing fulminate of mercury.

The latter could not be used with my compounds, as they do not possess sufficient force to explode it.

Having thus described my invention,

What I claim, and desire to secure by Letters Patent, is—

The intermixture with, or addition to, explosive compounds of a mineral oxide and oily, fatty, or resinous substances, substantially as aid for the purpose above described.

In witness whereof I have hereunto set my hand and seal.

JOSEPH HAFENEGGER. [L. s.]

Witnesses:

J. L. BOONE,

WM. GERLACH.