

UNITED STATES PATENT OFFICE.

FRIEDRICH MÜLLER, STEFAN OBERLÄNDER, VICTOR HUGO FUCHS, AND
SIGMUND GOMPERZ, OF VIENNA, AUSTRIA-HUNGARY.

BLASTING-POWDER AND PROCESS OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 594,268, dated November 23, 1897.

Application filed May 3, 1897. Serial No. 634,926. (No specimens.)

To all whom it may concern:

Be it known that we, FRIEDRICH MÜLLER, STEFAN OBERLÄNDER, VICTOR HUGO FUCHS, and SIGMUND GOMPERZ, subjects of the Emperor of Austria-Hungary, residing at Vienna, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Explosive Material and Processes for Producing the Same; and we do hereby 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.

Our invention consists of an improved blasting material or compound and the process of making it. This material consists, essentially, of a nitrated coal-tar product, (carbolic acid being the product which we preferably employ,) nitrate of potassium or saltpeter, and sulfur. To this compound we prefer to add a substance which will serve as a carrier, such as cellulose in a finely-subdivided state. The blasting power of the compound will be increased if the cellulose be nitrated, and still further increased if to the compound there be added a substance which will readily yield an abundance of free oxygen, such as pyrolusite.

In the manufacture of our improved compound we proceed as follows: Into twelve parts of raw carbolic acid (ninety-five per cent.) are stirred ten parts of finely-powdered sulfur, forming a doughy mass. A second mixture is prepared consisting of eighteen parts, by weight, of concentrated nitric acid (40° Baumé) and forty parts of saltpeter. After these two mixtures are thoroughly prepared they are brought together, preferably in a vessel provided with means for keeping it cool, and are thoroughly commingled. After the reaction which takes place between the nitric and the carbolic acids has ceased the resulting compound is neutralized, for which purpose we prefer to employ calcined soda or soda-ash, about three parts, by weight, being required, which results in the formation of a salt of the nitrated carbolic acid, sodium picrate in this instance. At the same time that the soda-ash is added the substance which is to operate as a carrier may be added. As hereinbefore stated, we prefer to use cellu-

lose for this purpose, (about seven parts, by weight, being employed,) which should be in the form of wood fiber or wood meal and entirely free from rosin and all acid. To the material thus formed, which is in a moist condition, there may be added ten parts of finely-powdered pyrolusite or other oxygen-yielding material. The material thus produced is in a sufficiently moist condition to permit its being readily made into cartridges, and we prefer to employ impermeable paper for the casings of such cartridges. These are finally dried in the air at a temperature of about 35° centigrade.

We do not wish to be limited to the exact proportions of the ingredients which we have hereinbefore set forth, as a variation of at least two and one-half per cent. in either direction from the proportions given may be had without materially changing the nature of the compound or departing from our invention.

The new blasting material which we have invented has many advantageous qualities. There is little danger in its manufacture. It stands severe concussion and rough handling without danger of explosion. It withstands high temperatures and when burned in a free or unconfined state does so without explosive action. The unstable compound produced by the nitration of the carbolic acid only displays an explosive or blasting action when the material is confined, as when placed in a tamped drill-hole, where after ignition the gases of combustion produce a pressure. The material is preferably ignited by means of a fuse. The rock is not shattered by the explosion, but is broken up into fragments of comparatively uniform size.

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

1. The herein-described blasting compound composed of picrate combined with sulfur, nitrate of potassium, and a carrier, such as nitrated cellulose, substantially as set forth.

2. The herein-described blasting compound, composed of picrate, combined with sulfur, nitrate of potassium, a carrier, and a substance which readily yields free oxygen, such as pyrolusite, substantially as set forth.

3. The herein-described process of making

a blasting material, which consists in mixing sulfur and carbolic acid, also mixing nitrate of potassium and nitric acid, then combining these two mixtures, and then neutralizing
5 with an alkali, substantially as set forth.

4. The herein-described process of making a blasting material, which consists in mixing sulfur and carbolic acid, also mixing nitrate of potassium and nitric acid, then combining
10 these two mixtures, then neutralizing with calcined soda, (soda-ash,) and finally adding

a carrier, and a material which will readily yield free oxygen, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

FRIEDRICH MÜLLER.
STEFAN OBERLÄNDER.
VICTOR HUGO FUCHS.
SIGMUND GOMPERZ.

Witnesses:

HARRY BELMONT,
KARL HÜTTER.