

UNITED STATES PATENT OFFICE.

EMIL CALLENBERG, OF HALTERN, GERMANY, ASSIGNOR TO ALEXANDER JOHNSTON BROWN, OF MATLOCK, ENGLAND.

EXPLOSIVE.

SPECIFICATION forming part of Letters Patent No. 644,403, dated February 27, 1900.

Application filed April 5, 1899. Serial No. 711,765. (No specimens.)

To all whom it may concern:

Be it known that I, EMIL CALLENBERG, a subject of the Emperor of Germany, residing at Haltern, Westphalia, Germany, have invented a certain new and useful Improved Explosive, of which the following is a specification.

This invention relates to an explosive which, while possessing explosive qualities equal to "carbonite," is extremely safe for use in coal-mines and other places, owing to the fact that it is practically flameless.

In carrying out the invention I take four parts, by weight, of turpentine-oil and add thereto one part of collodion cotton. The mixture is heated in a water-bath at a temperature of about 40° centigrade, and then thirty parts, by weight, of nitroglycerin are added. Thereupon the temperature of the bath is raised to 75° or 80° centigrade. The mass in the bath gelatinizes very quickly and uniformly. The gelatin thus produced is mixed with forty parts nitrate of potash, twenty-seven parts Epsom salts, and one part soda, (which neutralizes any acetic or formic acid which may be produced through the oxidation of the turpentine-oil,) and the whole is put into a suitable ball-mill and kneaded.

The material when ready can be fed into screw conveyers, such as are at present generally used in the manufacture of explosives, and formed into the desired shapes, such as cartridges, &c.

I have merely given the above proportions by way of illustration or example, and it is to be understood that they may be varied or altered to suit the different purposes for which the explosive is to be used.

By the use of turpentine-oil I secure a con-

siderable amount of carbon without much, if any, oxygen; also, a liquid which is soluble in nitroglycerin with collodion cotton and at the proper temperature forms a very fine gelatin, which is the form of my improved explosive. Turpentine-oil reduces the temperature of explosion and also the sensibility of an explosive containing nitroglycerin, so that an explosive containing same in proper proportions will not ignite readily and can only be exploded by means of a detonator. The turpentine-oil also reduces the freezing-point to 6° Celsius, a result not heretofore attained in such explosives.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An explosive composed of turpentine-oil, collodion cotton and nitroglycerin in the proportions substantially as described, the same heated to form a jelly, and mixed with nitrate of potash, Epsom salts and soda, substantially in the manner, and for the purposes set forth.

2. An explosive composed of turpentine-oil four parts, collodion cotton one part, and nitroglycerin thirty parts, heated together to form a gelatin, and mixed with forty parts nitrate of potash, twenty-seven parts of Epsom salts and one part of soda, the whole suitably mixed and kneaded, substantially as described.

Signed at Haltern, Westphalia, Germany, this 16th day of March, 1899.

EMIL CALLENBERG.

Witnesses:

WILLIAM GALL,
THOMAS GRACE.