

UNITED STATES PATENT OFFICE.

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EXPLOSIVE AND PROCESS OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 521,020, dated June 5, 1894.

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To all whom it may concern:

Be it known that I, WILBRAHAM EVELYN-LIARDËT, chemist, a citizen of Melbourne, a subject of the Queen of Great Britain, and a resident of St. Kilda Street, Elsternwick, in the Colony of Victoria, have invented a certain new and useful Improved Safety Explosive and Method or Process of Manufacturing the Same, of which the following is a specification.

This invention has been devised to provide the public with an improved safety explosive and which while being efficient in the highest degree and economical in its use may be prepared at a minimum cost.

The invention has reference to that class of explosives known as safety explosives, that is to say which do not explode by the mere application of an ordinary flame or spark.

The ingredients employed by me to make such explosive and the method or the process of manufacturing the same are substantially as follows:

To carry this invention into effect I prepare the materials preferably, but not arbitrarily in the following manner:—Tar of any approved kind is placed in a tank of any capacity said tank having beneath it a furnace to supply heat thereto, the tank is also provided with three taps or cocks on one of its sides, that is to say—one cock near the bottom, a second one higher up and a third above that again, so that were a tank three feet high to be used, one tap would be near the bottom, the second tap ten inches above and the third fifteen inches above the second and eight inches from top, so that in the event of the lighter portion of the tar boiling over, the cock at that point may be opened and such tar allowed to be drawn off into any suitable vessel. Heat having been applied in the furnace and the tar raised preferably to 120° centigrade at the level of the center cock the tar is removed and mixed in any suitable vessel with picric acid in the proportions preferably of one third of picric acid to two thirds of the tar at the aforesaid heat of about 120° centigrade or in equal parts—i. e.—half tar and half picric acid; the picric acid will then be dissolved in the tar and at ordinary temperature the mixture thus formed will be brittle and have a smooth glossy ap-

pearance like jet. Sawdust, (preferably wood meal or meal leaves of the fir) is placed in a jacketed mixer heated by boiling water. To one pound of fine sawdust, wood meal or ground fir leaves (while hot), two pounds of the mixture of tar and picric acid are added. The prepared tar should be made liquid by heating it in a suitable vessel and gradually adding it to sawdust or meal when it will mix and when cool can be sieved out fine or ground. Chlorate of potassium is then fused until resolved into a mixture of chlorid and perchlorate of potassium, and this is ground or pulverized.

The materials for my improved explosive having been thus made are mixed in the following manner and proportions: The mixture of chlorid and perchlorate of potassium is heated in a steam jacketed pan to 104° centigrade and while hot the mixture of sawdust, picric acid and tar is added, and mixed into it while hot until the mass becomes black which it does in about fifteen to twenty minutes if well mixed. The mass is then placed upon sieves, allowed to chill, shaken or rubbed through and the finished explosive will have the appearance of ordinary well manufactured gunpowder.

I do not limit myself to the use of the chlorid and perchlorate of potassium alone, but may employ as well the corresponding salts of other alkali metals. In fact I prepare a good explosive by the following formula: Chlorid of sodium or common salt, is ground fine; one pound avoirdupois of such salt is saturated with one ounce of diluted picric acid and one third, two thirds or one half, of chlorate of potassium is then added to the mixture. Then dry in a jacketed pan and add one ounce of magnesium carbonate, and when the whole is quite dry add the mixture of sawdust, picric acid and tar in the proportions preferably, but not arbitrarily, of seventy-five parts of the first named mixture to twenty-five parts of the mixture of sawdust, picric acid and tar; but before the final mixing of the ingredients I prefer to store the primary mixtures for a few days.

Both forms, hereinbefore described, can be exploded under water with the ordinary fulminate cap while in dry ground the cap can be omitted and the ordinary fuse used.

As a substitute for dynamite and nitro-
gelatin or nitroglycerin compounds it will be
found by use to possess greater strength and
to be less subject to climatic changes or ex-
5 dations and to be perfectly free from objec-
tionable fumes and is undoubtedly stable.

Having now particularly described and as-
certained the nature of my said invention and
in what manner the same is to be performed,
10 I declare that what I claim is—

1. An explosive consisting of a mixture of
tar, picric acid, sawdust, the chlorid of an al-
kali metal and the perchlorate of an alkali
metal, substantially as set forth.

15 2. The herein described method of prepar-
ing explosives which consists in first heating
tar to a temperature of about 120° centigrade,
then adding picric acid thereto, then gradu-

ally adding sawdust to the mixture thus pre-
pared, then heating the mixture of tar, pic- 20
ric acid and sawdust to a temperature of
about 100° centigrade, then cooling the mix-
ture and passing it through a sieve, then add-
ing to the sifted product a suitable propor-
tion of a mixture of the perchlorate and chlo- 25
rid of an alkali metal at the same time heat-
ing the mass until the same assumes a black
color, and finally cooling and granulating the
mixture, substantially as set forth.

Signed this 28th day of August, 1893.

WILBRAHAM EVELYN-LIARDET.

Witnesses:

A. O. SACHSE,
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