

United States Patent Office.

EDWARD A. L. ROBERTS, OF TITUSVILLE, PENNSYLVANIA.

Letters Patent No. 112,848, dated March 21, 1871.

IMPROVEMENT IN THE MANUFACTURE OF NITRO-GLYCERINE.

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, EDWARD A. L. ROBERTS, of Titusville, in the county of Crawford and State of Pennsylvania, have invented a new and useful Improvement in the Manufacture of Nitro-Glycerine; and I do hereby declare that the following is a full, clear, and exact description thereof.

Nitro-glycerine is manufactured by mixing nitric acid and glycerine, which, on combining, form that article. The process is most conveniently carried on by pouring the glycerine into a bath of mixed acids composed of nitric acid one part, and sulphuric acid from two to two and six one-hundredth parts. To this acid bath is added gradually the glycerine in the proportion of about one part glycerine to nine parts of the mixed acids.

In this process water is generated, as is supposed, partly by the combination of oxygen and hydrogen set free in the process, and partly by the liberation of the water held by the glycerine.

My invention consists in reducing the proportionate amount of sulphuric acid used in the first instance in the acid bath, and gradually adding the amount thus withheld of sulphuric acid during the process of manufacture.

The result obtained by this change of process is to increase the yield of nitro-glycerine from a given amount of glycerine and acids.

To enable others skilled in the art to use my improvement, I will proceed to describe the process more fully.

The apparatus employed may be of any desired construction, consisting substantially of a leaden or lead-lined vessel or mixing-tank, with suitable devices for mixing the glycerine and acids by agitation or by creating a rapid circulation of the contents of the tank.

There should also be suitable means for cooling the

contents of the mixing-tank, so as to prevent decomposition by reason of the generation of heat in the process.

In this mixing-tank is poured the mixture of nitric and sulphuric acids in the proportion of two parts of nitric acid to from two and a half parts to three and a half parts of sulphuric acid, or thereabout. The glycerine is then slowly poured into the acid bath in a continuous stream, and, at the same time, there is poured into the mixing-vessel, in a separate stream, at least so much of sulphuric acid as the acid bath lacked of being in the ordinary proportion before stated.

During the process the contents of the mixing-vessel are kept in rapid motion, and the result is that the amount of nitro-glycerine produced will be greater in proportion to the amount of glycerine and acids used than when the whole amount of sulphuric acid is mixed with the nitric acid at the beginning of the process.

This result I suppose to be owing, at least in part, to the fact that, as the process is carried on, the amount of water generated increases and the nitric acid becomes more dilute, so that the gradual addition of fresh acid takes up the water thus generated and keeps the nitric acid sufficiently strong to act on the glycerine.

Having thus described my improved process,

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

The process hereinbefore described of making nitro-glycerine by gradually increasing the amount of sulphuric acid in the acid bath simultaneously with the pouring in of the glycerine, substantially as described.

E. A. L. ROBERTS.

Witnesses:

TAL. P. SHAFFNER,
T. C. BRECHT.