

UNITED STATES PATENT OFFICE.

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

IMPROVEMENT IN THE MANUFACTURE OF NITRO-GLYCERINE.

Specification forming part of Letters Patent No. 121,898, dated December 12, 1871.

To all whom it may concern:

Be it known that I, EDWARD A. L. ROBERTS, of Titusville, county of Crawford and State of Pennsylvania, have invented certain Improvements in the Process of Manufacturing Nitro-Glycerine, of which the following is a specification:

My process consists in mixing about two parts sulphuric acid and one part nitric acid, and glycerine equaling one-eighth of the two acids when mixed, (the whole of the liquids to be of high specific gravity,) on a surface or surfaces kept cool by water or other known means on the one side, and the liquids above named to be applied on the other side, which may be in the same manner as beer is cooled, or by a coil; or it may be by liberating the acids and glycerine on an inclined plane with cooling water or other fluid passing on the other side. This plane may be corrugated, cascaded, or otherwise roughened.

By preference I use a revolving cylinder of suitable length, say one or more feet long and say four inches or more diameter, the said cylinder to revolve on an axis or anti-friction rollers and set up on an inclination of one inch to the foot, or constructed of greater diameter at the discharging-end, say of two inches to the foot more than at the receiving-end, so that when the fluids above named are introduced at the receiving-end and the cylinder being revolved the liquids will flow or tumble to the discharging-end. The said cylinder may have buckets, cups, corrugations, or other tumbling or cascading contrivances on the inside, so as to produce the rapid mixing of the said fluids. The outside of the cylinder may be kept cold by revolving in water, or water may be poured or dropped upon it; or it may have buckets fixed upon it, as an overshot water-wheel, for the purpose of keeping itself cool, or for revolving it, or both. These combinations of parts

for cooling may be on the inside of the cylinder and the acids may be applied to the exterior surface, or vice versa. The leading object of my invention is to have exposed in the process of uniting or mixing the least possible quantity of the acids and glycerine at any one time, so that in case of accidental decomposition safety will be accomplished and there will be comparatively but a small loss. I also employ a tube passing through cold water or otherwise suitably cooled, bent as a coil, or constructed so as to allow or cause the mixed acids and glycerine to pass through it and be tumbled or cascaded at intervals, thus producing a mixing of the liquids before they reach the discharging-end.

By preference I introduce the glycerine with the mixed acids at different places in small quantities at the same time, having in view safety by lessening the liability of decomposition.

Having now fully described the nature of my invention to enable one skilled in the arts to make and use the same, what I claim, and desire to secure by Letters Patent, is—

1. The combination of movable and immovable parts, by which the nitro-glycerine is made on a surface kept cool by cold applications on the opposite side, substantially as hereinbefore described.

2. The revolving cylinder, with the parts or attachments effecting the cooling and mixing process, substantially as hereinbefore described.

3. The mixing of the acids and glycerine in a tube so constructed as to produce the tumbling or cascading of the liquids within, substantially as hereinbefore described.

EDWARD A. L. ROBERTS.

Witnesses:

WM. V. ARCHER,
WM. H. CLARKSON.

(71)