UNITED STATES PATENT OFFICE.

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PROCESS OF DRYING NITRATES.

SPECIFICATION forming part of Letters Patent No. 249,275, dated November 8, 1881.

Application filed August 16, 1881. (No specimens.)

To all whom it may concern:

Be it known that I, THOMAS VARNEY, of Oakland, county of Alameda, and State of California, have invented a new and useful Process for Drying Certain Nitrates, of which the following is a specification.

The purpose of my invention is to dry various nitrates, and especially those of soda and potash, and at the same time prepare them for the grinding-mill.

Niter is usually dried with heat so regulated as not to melt the crystals. This requires great care as to the temperature, and much labor in stirring, and a great deal of time. By melting niter the water is all expelled, even that of crystallization. It cools when undisturbed into a solid amorphous cake, which grinds easily and finely. The objections to this mode are that it requires a large amount of heat and great labor in breaking the cake for the mill.

I have discovered that when ordinary niter-crystals are mixed in proper proportion with molten niter the great heat of the latter (nearly 600° Fahrenheit) rapidly and throughly expels the water from the crystals, and changes them, to a great extent, from the crystalline to the amorphous state, whereby they are pulverized much more readily and finely than when crystalline, and as one part of molten niter will suddenly dry from one to two parts of crystalline niter much heat and time and labor are saved. All that is necessary is that the hot niter be well mixed with the cold. In operating on a large scale the melting-kettle is set in brick-work, and has a discharge-pipe in the bottom closed with a valve. The kettle may be filled at once and fire applied; but I prefer to first put in a moderate quantity, enough to give a depth of about six (6) inches of the melted niter, and add more from time to time, as the melting takes place, until the kettle is full. A quantity of crystalline niter convenient for working is then placed on a cement floor beneath the end of the discharge-pipe. The valve is then opened, and a stream of molten niter runs upon an inclined iron plate, by which the stream is dispersed and showered upon the undried niter, causing a hissing noise and the rapid emission of steam. The hot and cold niter are constantly and vigorously stirred and mixed together with hoes or shovels, or otherwise, so as to prevent the formation of lumps and to distribute each kind of niter evenly. In a few minutes the entire mass becomes white and ceases to give off steam, when the hot niter is shut off and the mass is removed and a new batch treated.

The stirring can be done by machinery, if desired.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The process of drying nitrates by melting a portion thereof and mixing it with an unmelted portion, substantially in the manner described.

THOMAS VARNEY.

Witnesses:
ROSS SMALL,
ALFRED RIX.