United States Patent Office.

JOSEPH A. TATRO, OF HARTFORD, CONNECTICUT.

Letters Patent No. 106,233, *dated August* 9, 1870.

IMPROVEMENT IN REFINING PETROLEUM.

The Schedule referred to in these Letters Patent and making part of the same

I, JOSEPH A. TATRO, of Hartford, in the county of Hartford and State of Connecticut, have invented an Improved Process for Converting the Whole Product Arising from the Distillation of Crude Petroleum into a Safe Burning-Oil, of which the following is a specification.

Nature and Objects of the Invention.

The process claimed as new herein is identical with the process covered by my patent dated February 8, 1870, and reissued March 1, 1870, with the exception that, in the place of the "dry-slaked lime" mentioned in those patents, I use herein the chloride of lime in somewhat different proportions.

General Description.

To show the nature and importance of my invention, as distinguished from the processes already in use, I will explain that, when crude petroleum is distilled in the common way, the first product is gasoline, the second benzole, the third benzine, the fourth a light oil, the fifth the common burning-oil, then paraffine-oil, and last a dark heavy oil. The only one of these parts fit for burning in the family lamp is the fifth product just specified. By my process I am enabled to take all the above products, mix them together, and make of the whole a safe and reliable oil. The difficulty to be overcome is to raise the fire-test—that is, the temperature at which flame will ignite the oil—to such a point as will make the oil safe for family use, and this I accomplish perfectly.

My process is as follows:

Having distilled the crude oil, and driven over everything that will go over in the worm of the still, and having, say, one hundred gallons of the distillate, take from one sixty-fourth ($\frac{1}{64}$) of one per centum of sulphuric acid (I have heretofore used acid of 66° gravity) to two per centum, the quantity being regulated as hereinafter shown; mix it with the distillate, and agitate the whole most thoroughly. (I have heretofore used a mechanical agitator for this purpose, and have found from five to ten minutes' agitation long enough to thoroughly mix the distillate and the acid.) Then add from one sixty-fourth of one per centum to four per centum of chloride of lime, sprinkling it over the distillate, and continue the agitation till the desired fire-test is reached. The quantity of chloride of lime is regulated as hereinafter shown.

The fire-test can be raised to a perfectly safe degree, almost anywhere from 110° to 160° Fahrenheit, and the longer the agitation the higher the fire-test. I have found from thirty to forty-five minutes long enough.

The amount of acid and of lime used is determined by the specific gravity of the distillate, using the greater quantity for the lighter gravity.

To commence with, the agitation must be perfect and thorough.

A fair average gravity for the distillate is 43° or 52°, measured by any standard hydrometer. No crude oil that will yield a distillate below 40° gravity is likely, in the present state of the art, to be used for the manufacture of burning-oil; neither is a crude oil likely to be used that will yield a distillate of above 52° gravity, so that from 40° to 52° may be taken, practically, as the range of gravities in the distillate to be treated.

Premising once more that the agitation is perfectly done, about one-fourth of one per centum of sulphuric acid will do for a distillate of 40° gravity, and the percentage increases regularly as the gravity rises, till about two per centum of acid are required for a distillate of 52° gravity.

As to chloride of lime, for a distillate of 40° gravity, from one sixty-fourth to one-fourth of one per centum will do, and the percentage rises with the gravity till it needs about four per centum for a distillate of 52° gravity.

The quantities of acid and chloride to be used for gravities lower than 40° or higher than 52° can be determined by the proportions already given.

The process described herein is claimed simply as an improvement on the process described in my said former patent.

Claim.

I claim as my invention—

The process described of applying the said ingredients, in about the proportion specified, to the whole product arising from the distillation of crude petroleum, substantially in the manner and for the purpose set forth.

JOSEPH A. TATRO.

Witnesses:

CHARLES E. FELLOWS,

THEO. G. ELLIS.