UNITED STATES PATENT OFFICE.

HOMER HOLLAND, OF WESTFIELD, MASSACHUSETTS.

IMPROVED PROCESS FOR THE PRODUCTION OF SULPHATE AND OXIDE OF COPPER.

Specification forming part of Letters Patent No. **26,589**, dated December 27, 1859.

To all whom it may concern:

Be it known that I, HOMER HOLLAND, of Westfield, in the county of Hampden, in the State of Massachusetts, have invented a new and useful Process in the Metallurgy of Copper from its Sulphurets by means of the Nitrate of Soda, of which the following is a specification.

The manner in which the said process is conducted is as follows: A quantity of the nitrate of soda, as free as possible from any admixture with other salts, is provided together with a quantity of any sulphuret of copper, both being separately or jointly finely pulverized by means of Bogardus's eccentric mill or any other suitable mechanical contrivance, and then thoroughly mixed together in a dry state in the proportion of two hundred and ninety-one parts of the nitrate of soda to every hundred parts of the sulphur previously determined and known to exist in the sulphuret to be operated upon. About one-third part of this mixture must then be deflagrated in a large cast-iron basin, having a concave sole or hearth like that of a Clausthal cupel heated from beneath to moderate redness and at separate intervals of about half an hour each, the remaining two-thirds are to be added, while the mass in the basin is being thoroughly stirred and intermixed. Then the heat, moderate at first, is gradually to be increased until the sulphurous acid fumes have entirely passed off and full oxidation of the sulphuret is obtained. When the mass is thoroughly decomposed and resolved it is first to be cooled and then lixiviated with hot water so as to dissolve the resulting sulphates of copper and soda, from which solution the sulphate of copper may be obtained in a crystalline form or galvanic copper by displacement through scrap-iron or zinc, while the undissolved portion of the mass, consisting of the oxides of copper, may also be readily reduced to a metallic state in any furnace prepared for the reduction of copper from its oxides. An excess of the nitrate of soda can in no instance whatever either injure the process or vitiate the result; nor can likewise the degree of transmitted heat, provided, always, it be moderate at first and increased gradually. When the sulphurets are very closely concentrated and fine they should be diluted or rendered more porous and light by the addition of ground talc or other magnesium slate, which will not only augment their ignition but hasten their desulphuration and oxidation.

Having now described and particularly set forth the nature of my invention and the manner in which the same is or may be used or carried into effect, I would observe, in conclusion, that I do not confine myself to the precise details or arrangements which I have had occasion to describe or refer to, as many variations may be made therefrom without deviating from the principles or main features of my invention; but

What I consider to be novel and original, and therefore claim as my invention, is—

The production of sulphate of copper together with the oxides of copper from its various sulphurets by the use of the nitrate of soda, according to the process already herein described.

In witness whereof I, the said HOMER HOLLAND, have hereunto set my hand and seal this 7th day of May, 1855.

HOMER HOLLAND. [L. S.]

Witnesses:

STAFFORD REEVES,

J. WINCHESTER.