

# UNITED STATES PATENT OFFICE.

HOMER HOLLAND, OF WESTFIELD, MASSACHUSETTS.

## IMPROVED PROCESS FOR MAKING SULPHURIC ACID.

Specification forming part of Letters Patent No. 26,588, dated December 27, 1859.

*To all whom it may concern:*

Be it known that I, HOMER HOLLAND, of Westfield, in the county of Hampden and State of Massachusetts, now temporarily residing at Pioneer Mills, Cabarrus county, North Carolina, have invented a new and useful Improvement in the Manufacture of Sulphuric Acid, and, as the results of the operation, ferruginous paints and common soda-ash from igniting copper and iron or other sulphides, previously ground, as obtained from the mines and intimately mixed with either nitrate of soda or nitrate of lime or of magnesia and lime combined as found native, of which the following is a specification.

I have already shown in my patent of May 29, 1855, the advantages of decomposing sulphureted ores by heating them with nitrates, and the advantages of nitrate of soda over nitrate of potash in such operation as a means of separating silver and gold from their ores, and alluded to the process as a means of manufacturing sulphuric acid of commerce. This I have now accomplished by connecting the decomposing apparatus with a suitable condensing-chamber.

To enable others skilled in the art to make and use my invention, I will proceed to describe the method of using the materials and getting the result.

If the nitrate of soda be the salt used and the ore an auriferous or argentiferous sulphide containing copper, iron, &c., the ore is to be examined for the amount of sulphur per cent. which it contains, and two hundred and ninety-one parts, by weight, of nitrate of soda for each one hundred parts of sulphur as found to be contained in the ore. These ingredients, each thoroughly pulverized and dry, are intimately mixed in an iron cylinder, such as is used in the manufacture of muriatic acid and well known in commerce, and hence not here described. Such retorts may be seen in Ure's dictionary of the arts under the term "muriatic acid." These ingredients are heated very gently at first for two or three hours below redness, then at low red heat till all of the acids have been expelled, when the heat is relaxed, and the *caput mortuum* removed, and a new charge put into the cylinder and treated as before.

Instead of adopting the ordinary condenser used in the muriatic cylinders I connect the exit vapor-pipe with the ordinary steam and vapor pipes for generating sulphuric acid in the sulphuric-acid chambers now in use.

The nitric acid of the nitrates and the sulphurous acid of the metallic sulphides freely intermingling and reciprocally acting upon each other with the presence of the steam in the sulphuric-acid chamber, the sulphurous acid is converted into the sulphuric acid at the expense of the oxygen of the nitric acid furnished by the nitrate used.

From what has been now stated it is clear that the nitrate of lime, or the nitrate of magnesia, or the nitrate of lime and of magnesia mixed, may be used to supply the oxygen in the sulphuric-acid chamber in place of the nitrate of soda here used and the proportions estimated.

In the use of any new ore or new nitrate, the amount of sulphur furnished by the ore and of nitric acid furnished by the nitrate used must be found by the chemist in charge from known chemical principles, which is easily done, always preserving the proportions as above given of the nitric acid in the nitrates used to the sulphur contained in ore.

It is proper here to state that auriferous and argentiferous ores are treated for the precious metals after the volatile portions have been driven off by heat, and that the ferruginous and earthy portions are also utilized for paints in ways and by means well understood, neither of which forms any part of the present invention.

Having now described the invention and the modes of applying the same in use, I proceed to state what I claim as my invention—

The generation of sulphuric acid by treating sulphides and nitrates commingled in close vessels in connection with the ordinary sulphuric-acid chamber, in the manner and for the purpose substantially as set forth.

In witness whereof I, the said HOMER HOLLAND, have hereunto set my hand and seal this 15th day of March, 1855.

HOMER HOLLAND. [L. S.]

Witnesses:

J. WINCHESTER,  
STAFFORD REEVES.