

UNITED STATES PATENT OFFICE.

MANUEL VALERIO ORTEGA, OF MEXICO, MEXICO.

PROCESS OF TREATING GOLD AND SILVER ORE.

SPECIFICATION forming part of Letters Patent No. 512,563, dated January 9, 1894.

Application filed January 6, 1893. Serial No. 457,521. (No specimens.) Patented in Mexico July 12, 1892, No. 311.

To all whom it may concern:

Be it known that I, MANUEL VALERIO ORTEGA, of the city of Mexico, Mexico, have invented a new and useful Improvement in Processes of Treating Gold and Silver Ores, (for which I obtained a patent in Mexico under date of July 12, 1892, No. 311,) of which the following is a full, clear, and exact description.

10 The object of the invention is to provide a new and improved process for the treatment of gold and silver ores, to rapidly and economically amalgamate the precious metals without the use of chloride of sodium or other chloride as heretofore employed. The process consists in subjecting the ore to the action of a mixture of sulphate of copper and hyposulphite of sodium or calcium, with the proper amount of mercury.

20 In carrying out this process I proceed in the usual manner of amalgamation, but substitute a mixture of sulphate of copper and hyposulphite of sodium or calcium, for the chloride of sodium or other chloride now employed to amalgamate the precious metals contained in the ore.

The effect which my mixture of sulphate of copper and hyposulphite of sodium has upon the process of amalgamation is as follows: 30 The cupric salt as soon as mixed with the sodium hyposulphite is converted into a cuprous salt by passing some of its acid to a portion of the hyposulphite of sodium which is changed into sodium sulphate. All cuprous salts have a great affinity for oxygen; this being the principle I utilize in my process, since all the oxygen absorbed by the cuprous salt in presence of the sulphides of silver is combined with the sulphur of these same sulphides forming sulphuric acid anhydride leaving the silver alone, which in *statu nascenti* and in the presence of the mercury combines with part of it forming an amalgam, which is the chief object of the whole process. 45 We have two sources to get the oxygen re-

ferred to viz: the atmosphere and the water in the pulp, but I am inclined to believe that the first is the principal if not the only one, since it is not difficult to conceive that the cuprous salt acts in this process very much 50 the same as nitrous acid in the manufacture of sulphuric acid.

Supposing we were to treat simple sulphides of silver which would be classified in mining terms as "free milling ore" I would use ten 55 pounds of hyposulphite of sodium or calcium and five pounds of copper sulphate per ton of ore. The amount of ingredients however would be increased for other kinds of refractory ores but the proportion of the mixture 60 would always remain the same.

With my process it is not necessary to previously roast the ore or inject steam to assist amalgamation.

It is understood that ores treated with the 65 mixture above mentioned are amalgamated in a few hours, a high percentage of the assay value of the precious metal contained in the ore is obtained, and very little mercury is lost.

The apparatus used in this process may be 70 of any kind already in use, such as pans, barrels, &c., or any other device for carrying out amalgamation may be employed.

The proportion of the mixture relative to the ores under treatment depends on the 75 quality of the ore.

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

The herein described process for the treat- 80 ment of gold and silver ores, consisting in amalgamating the precious metals by subjecting the ore to the action of a mixture of sulphate of copper and hyposulphite of sodium or calcium, with the proper amount of mercury, substantially as shown and described. 85

MANUEL VALERIO ORTEGA.

Witnesses:

PEDRO REQUENA Y ABREN,
SEVERINO GARCIA.