

UNITED STATES PATENT OFFICE.

JEAN ANTOINE MATHIEU, OF PORT LEYDEN, NEW YORK.

PROCESS FOR THE MANUFACTURE OF ACETATES DIRECTLY FROM METALLIC ORES.

SPECIFICATION forming part of Letters Patent No. 305,524, dated September 23, 1884.

Application filed March 31, 1882. (No specimens.)

To all whom it may concern:

Be it known that I, JEAN ANTOINE MATHIEU, of Port Leyden, in the county of Lewis and State of New York, have invented certain new and useful Improvements in Processes for the Manufacture of Acetates Directly from Metallic Ores, whereof the following is a specification.

My improvements are specially adapted to the economical treatment of copper ores of poor quality, or of such character as to render reduction by ordinary processes commercially impracticable; but as they can be utilized in connection with the better qualities of such ores, and also for other ores—such as tin, lead, &c.—I do not desire to limit myself to their use in the instance first given, although in the following description I take that as the type. The copper ores of poor quality referred to contain varying percentages of metallic copper and oxides or salts thereof, and also combinations of the copper with other metals, and, in proportion to the quantity of such admixtures or alloys, are found to be difficult to work in the ordinary methods. I have discovered that the copper may be completely and economically separated from such ores by the use of pyroligneous or acetic acid, crude or rectified, under the conditions given below; and, as I have succeeded in producing this acid very cheaply and on a large scale by means of certain apparatus and processes recently patented to me, or for which applications for patents are now pending, I am enabled to avail myself of the present invention with great commercial advantages.

In the conduct of the process which forms the subject of my present invention I proceed as follows: The broken or ground ore is sprinkled thoroughly with pyroligneous or acetic acid, and is then spread out upon shelves or floors, so as to expose it as completely as possible to the action of the air until the acid has combined with as much of the copper as it is capable of taking up. The duration of this step of the process varies greatly—say from one to six days—depending, of course, upon the constituents of the ore and the readiness with which they are oxidized. When,

upon examination, it is apparent that the acid has ceased to act, I separate the undissolved portions and expose them upon shelves to the action of the hot vapors of the same acid, preferably employing for this purpose the apparatus described in Letters Patent No. 234,998, granted to me under date of November 30, 1880. For this step of the process I have found that an exposure of about six hours generally suffices. The separation of the acetate of copper at the end of each stage of the process is effected by adding water and then crystallizing, in which way the soluble impurities which may be present are in a great measure separated, since the acetate of copper is the first to crystallize; or the solution may be evaporated to dryness without crystallizing, if preferred. The acetate obtained may, if desired, be roasted, and the copper obtained in metallic form in any of the known modes.

As I have before observed, the foregoing improvements, though especially adapted to the treatment of copper ore of poor quality, may also be used to advantage with other ores, and I therefore do not desire to limit my claim to the type of ore above given, but include under the term ore as used in my claims the ores of tin, lead, nickel, bismuth, and antimony.

I am aware that the use of pyroligneous acid in treating the ores of precious metals preparatory to amalgamation is not new; but such treatment differs from my improvements in that it does not effect the solution of said metals by the acid, and therefore does not yield acetates, which products are the object of my invention.

I am also aware that the direct treatment of ore by means of acids, and the subsequent decomposition of the salts to obtain metallic oxides, has been proposed. While therefore I do not claim, broadly, to have discovered that acetic or pyroligneous acid will act upon metal in the state of ore, I believe that I am the first to invent a practical method of commercially manufacturing acetates by a direct treatment of the ore in such a way as to convert substantially the whole metallic portions and yield a definite product.

Having thus described the nature and ob-

ject of my improvements, what I claim as new, and desire to secure by Letters Patent, is—

The hereinbefore-described process of making metallic acetates direct from the ores, which consists in first sprinkling the ground ore with acetic acid, exposing the sprinkled ore to the air, separating the salt thus formed by the addition of water, then exposing the

residual ore to the action of acetic-acid vapors, separating the salt thus formed, and, finally, crystallizing or evaporating the solutions thus previously obtained.

JEAN ANTOINE MATHIEU.

Witnesses:

CHARLES F. ZIEGLER,
J. WALTER DOUGLAS.