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*Cyprien Marie Tessie du Motay*  
- Inventeur -  
*Treating Copper Pyrites -*

PATENTED OCT 18 1870

Fig. 1

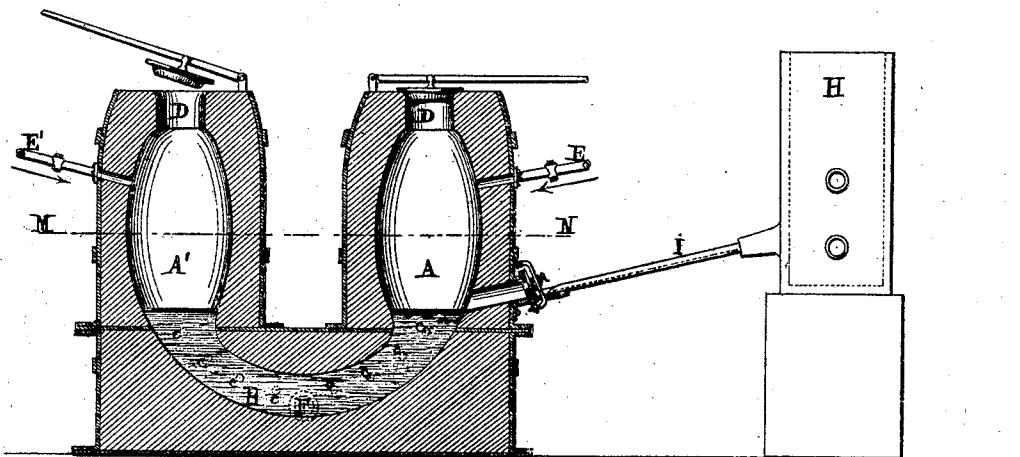
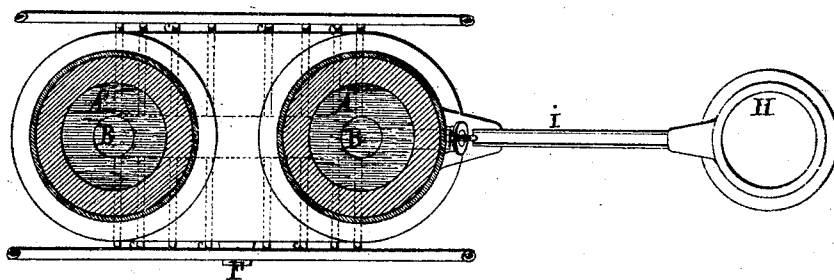


Fig. 2.

*Coupe suivant MN.*



*Witnessed*  
*J. H. Shumway*  
*A. J. Tibbitts*

Variable Scale.

*Cyprien Marie Tessie du Motay*  
*Inventeur*  
*By his Attorney*  
*Wm. Earl*

# UNITED STATES PATENT OFFICE.

CYPRIEN MARIE TESSIE DU MOTAY, OF PARIS, FRANCE.

## IMPROVEMENT IN TREATING COPPER PYRITES.

Specification forming part of Letters Patent No. 108,462, dated October 18, 1870.

To all whom it may concern:

Be it known that I, CYPRIEN MARIE TESSIE DU MOTAY, of Paris, in the Empire of France, have invented a new Improvement in Treating Copper Pyrites; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a longitudinal section, and in Fig. 2 a transverse section.

This invention has for its object a new process for the treatment of copper pyrites. This process produces a radical transformation in the operations in use for the roasting of these ores; and it consists in roasting the ore when in a melted state by means of air or oxygen, which at the same time performs a mechanical mixing of the materials in an apparatus specially designed for the purpose.

Previously introduced in a liquid state into a cupola, H, the melted ore is conveyed by a conductor, I, into the apparatus for roasting and mixing. This apparatus is composed of two chambers, A A', communicating by a passage, B, between them. A certain number of tubes, C C C, convey into the midst of the melted mass currents of air or oxygen, and, if it is necessary, simultaneously mingled currents of air and combustible gas.

The openings D D for the escape of the gas (azote, sulphurous acid, &c.) may be alternately closed, and the inlets E E' bring air under pressure into the upper part of the chambers A A', governed by suitable valves, to produce upon the melted mass a pressure sometimes upon one side and sometimes upon the other, which forces the said mass through the passage B alternately into one or the other of the chambers A and A'. This alternate compression causes a regular mechanical mixing during the passage of the mass, the more so as the difference of density of the several parts

acts concurrently to produce a close mingling and facilitate the chemical reaction produced by the air, oxygen, or gas.

The discharge is effected through the opening F when the roasting is sufficiently advanced.

The mass obtained is remelted in the cupola and again roasted in the same apparatus, and these operations are successively repeated a certain number of times. An addition of silica is employed in proper proportions, according to the nature of the ore, to scarify the oxide of iron produced during the roasting. Mattes are in this manner obtained very rich in copper, and it only remains to reduce and refine them.

The apparatus before described may be modified without changing the principle of construction.

It is understood that various means may be adopted for closing the orifices G for filling and F for discharge, and for the arrangement of the openings D D for the escape of the gas, for the nature of the materials used in the process are essentially variable, and may be treated in the way which practice may prove most advantageous.

It is optional to vary the form, material, and dimensions of the apparatus founded upon the same principle.

I claim as my invention—

The process herein described for treating copper pyrites, consisting of a simultaneous pneumatic mixing of the melted ore by means of the alternate compression of air or oxygen, with or without the presence of combustible gas, substantially in the manner herein set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

C. M. TESSIE DU MOTAY. [L. S.]

Witnesses:

GILBERT FILLENEUR,  
C. LAFOND.