

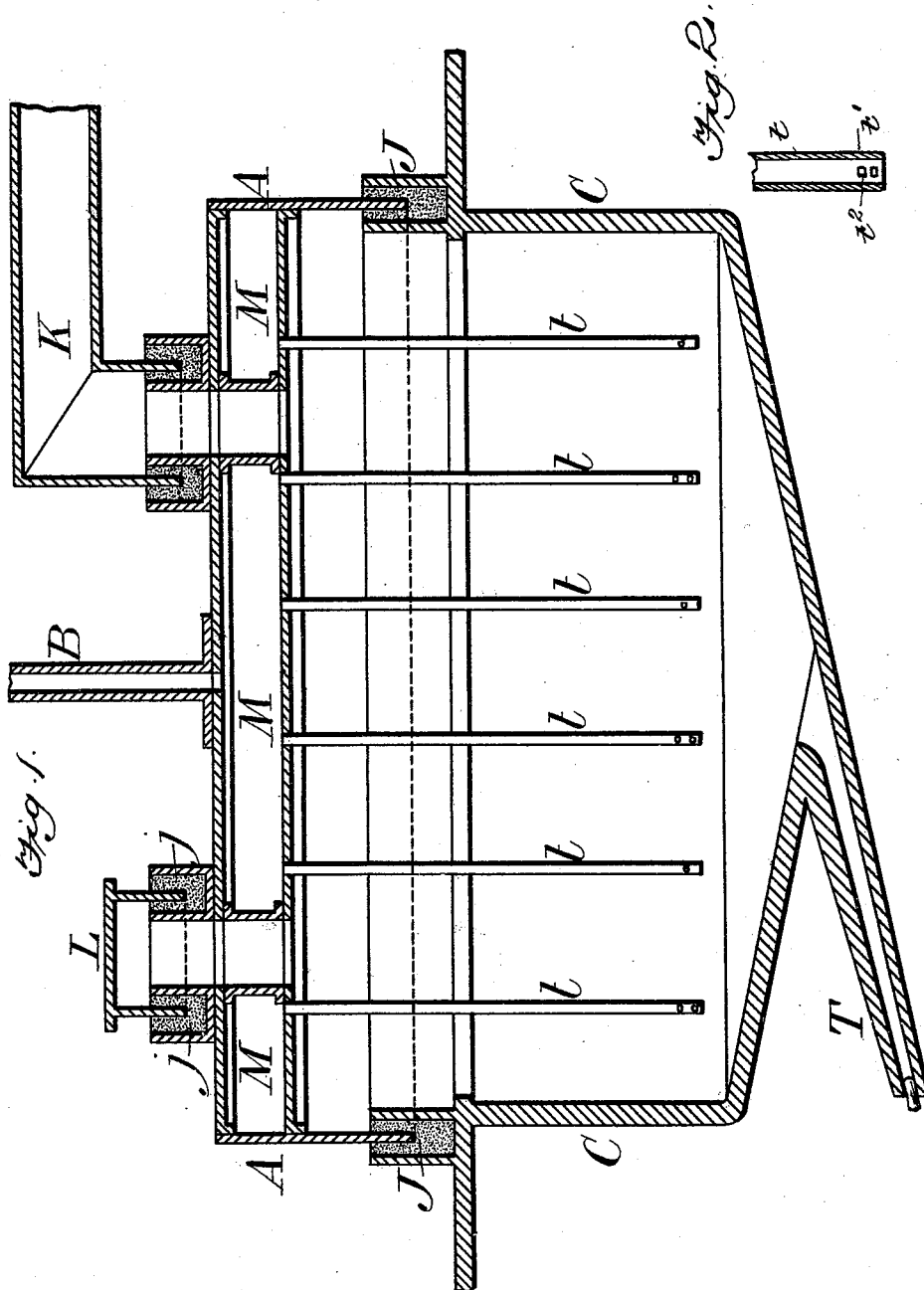
(No Model.)

M. A. J. ROUX.

PROCESS OF AND APPARATUS FOR SEPARATING METALS.

No. 543,753.

Patented July 30, 1895.



Witnesses.

L. W. Rea,

Robert Everett.

Inventor.

Marie A. J. Roux,

By

James L. Norris,

Atty.

UNITED STATES PATENT OFFICE.

MARIE A. JOS. ROUX, OF PARIS, FRANCE, ASSIGNOR OF ONE-HALF TO JEAN MARIE ALCIDE DESMAZURES, OF SAME PLACE.

PROCESS OF AND APPARATUS FOR SEPARATING METALS.

SPECIFICATION forming part of Letters Patent No. 543,753, dated July 30, 1895.

Application filed January 26, 1895. Serial No. 536,355. (No model.) Patented in England January 19, 1895, No. 1,322; in France January 19, 1895, No. 244,464, and in Belgium January 19, 1895, No. 113,713.

To all whom it may concern:

Be it known that I, MARIE ANTOINE JOSEPH ROUX, a citizen of France, residing at 262 Rue du Faubourg St. Honore, Paris, in the Republic of France, have invented a new and useful Process of and Apparatus for Separating the Metals and other Ingredients from Blendes, (for which I have obtained Letters Patent in Great Britain, dated January 19, 1895, No. 1,322; in France, dated January 19, 1895, No. 244,464, and in Belgium, dated January 19, 1895, No. 113,713,) of which the following is a specification.

This invention relates to a process and apparatus for operating in a continuous and economical manner on blendes, particularly those containing argentiferous lead, so as to recover such lead, oxide of zinc, and other products therefrom. For this purpose the blende is pulverized and mixed with lead oxide, preferably litharge. The mixture is charged into a retort and fused therein, while air is excluded. A decomposition takes place, causing such argentiferous lead as may be present to separate and sink to the bottom of the crucible, whence it is from time to time tapped off. The residue in the crucible may have added to it a flux, which may be blast-furnace slag, and when fluid, has heated air, or steam, or other oxidizing gas blown through it, causing a separation of oxide of zinc, which floats on the top and may from time to time be removed on opening the crucible. The proportions of the mixture forming the charge necessarily vary according to the nature of the blende treated. There should be sufficient litharge to give the oxygen necessary to oxidize most of the blende, while enough is left un-reduced to retain a fluid portion, separating the argentiferous lead below from the oxide of zinc, which floats above the fluid litharge. The material left in the crucible, which is mostly lead oxide, serves for admixture with another batch of blende. After several operations, the lead oxide is partially reduced by addition of carbonaceous matter—such, for example, as coal, coke, or charcoal. After a time the residue in the retort becomes a mixture of lead oxide and zinc oxide, which is ineffective for the treatment of blende, as de-

scribed. In that case the lead oxide has to be reduced by addition of carbonaceous matter and the lead separated, leaving the zinc oxide, which requires a higher temperature for its reduction.

Various forms of apparatus may be employed for carrying out the above process.

In the accompanying drawings, Figure 1 is a vertical sectional view of an apparatus well suited for carrying my invention into effect, and Fig. 2 is a detail sectional view of a portion of one of the blast-pipes.

C is an iron crucible adapted to be set over a suitable furnace and provided with a tapping-pipe T and a cover A, having its flange seating in a sand-trough J, so as to exclude air. The cover A is hollow, and has its internal cavity M supplied with heated air, steam, or oxidizing gas by a pipe B. From the cavity M blast-pipes *t* descend a certain distance, but not to the bottom of the crucible. The lower ends *t'* of the pipes *t* have lateral openings *t''*. The fumes produced by the reaction, consisting of sulphurous acid and lead sulphate, pass away by pipes, such as K, to be treated in the usual way for depositing the sulphate and producing sulphuric acid. The cover A is capable of being raised for giving access to charge the crucible or to remove its contents. When the pipes K are removed, caps L are put on to close the openings through the cover. The pipes K and the caps L are seated in sand-troughs.

As regards the lead and zinc sulphites in the ore, without taking into consideration the other ingredients, which may impede or promote, but do not alter the reactions, I believe the following formula indicates the reactions in the retort: Taking PbS to represent the lead sulphide in the ore and PbO the lead oxide added, then $2PbO + PbS = 3Pb + SO_2$, represents the first reaction; also taking ZnS to represent the zinc sulphide, $3PbO + ZnS = 3Pb + ZnO + SO_2$, represents the second reaction.

Having thus described the nature of my invention and the best means I know for carrying the same into practical effect, I claim—

1. The herein described process for separating the metals and other ingredients from

blendes by melting in a closed crucible a mixture of the pulverized blende with lead oxide, tapping off such argentiferous lead as may be thus separated adding flux and fusing, then blowing heated air or oxidizing gas through the fluid residue, and removing zinc oxide from its surface.

2. An apparatus for separating metals and other ingredients from blendes, consisting of a crucible C, having a tapping pipe T at its lower portion, and a trough J at its upper portion, a movable cover A having an internal cavity M and a flange extending into said trough, a pipe B for supplying a heating medium to the cavity in the cover, a plurality

of pendent blast tubes depending from a part of the cover and communicating with the cavity therein, and a pipe K communicating with the interior of the crucible for carrying off the fumes, substantially as and for the purposes described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 15th day of January, A. D. 1895.

MARIE A. JOS. ROUX.

Witnesses:

OLIVER IMRAY,
JNO. P. M. MILLARD.