

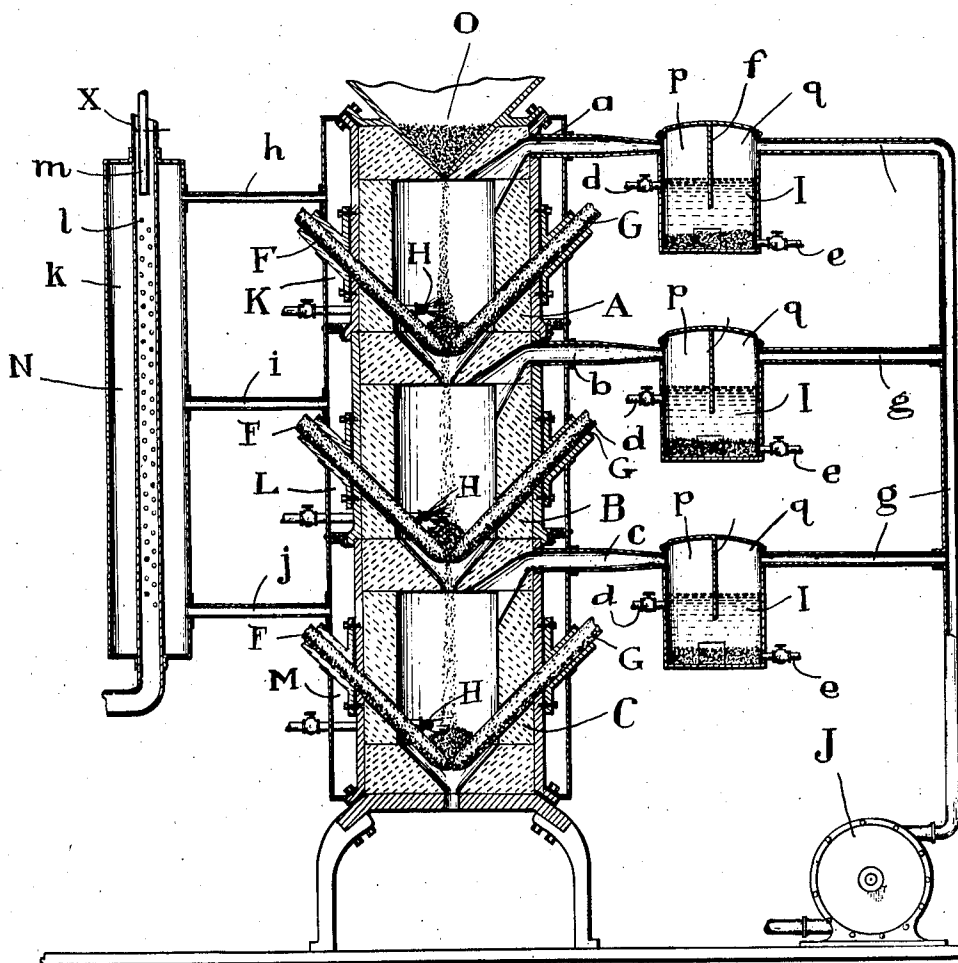
No. 896,413.

PATENTED AUG. 18, 1908.

J. H. REID.

APPARATUS FOR EXTRACTING METALS FROM ORES.

APPLICATION FILED AUG. 5, 1907.



WITNESSES.

J. H. Reid
Russell B. Smart

INVENTOR.
J. H. REID

BY

Frank O. Sutherland

ATTY

UNITED STATES PATENT OFFICE.

JAMES HENRY REID, OF NEWARK, NEW JERSEY, ASSIGNOR TO ELECTRIC SMELTERS, LIMITED, OF OTTAWA, CANADA, A CORPORATION OF CANADA.

APPARATUS FOR EXTRACTING METALS FROM ORES.

No. 896,413.

Specification of Letters Patent.

Patented Aug. 18, 1908.

Application filed August 5, 1907. Serial No. 387,221.

To all whom it may concern:

Be it known that I, JAMES HENRY REID, of Newark, in the State of New Jersey, United States of America, have invented certain new and useful Improvements in Apparatus for Extracting Metals from Ores, of which the following is a specification.

My invention relates to improvements in an apparatus for extracting metals from their ores, and the objects of my invention are to provide means for producing a vacuum within and without the apparatus, and to effect the withdrawal and condensation of the sublimed elements of the ore as quickly and efficiently as possible.

More specifically considered, the objects are to provide an apparatus to carry out a process which I have invented and described in an application of equal date herewith.

The apparatus is described in detail in the accompanying specifications and drawings, and the features of novelty are specifically set forth in the claims.

The drawing shows a vertical sectional view of the apparatus.

A, B and C are the three vacuum treating chambers of the apparatus, discharging into each other and forming together a single unitary structure, the structural details of which are more fully set forth and described in my earlier application, Serial No. 365,783.

Each of the treating chambers is provided with electrodes F and G, for heating purposes, and nozzles H for the introduction of reagents or steam. They are also each provided with outlet pipes *a*, *b*, and *c*, which lead to condensing tanks I, which are kept partially filled with a suitable condensing liquid, such as water, which is circulated through suitable inlet and outlet pipes *d* and *e*. A vacuum is created within each of the chambers and in the embodiment illustrated the means used to effect this also serve to withdraw the volatile metals. These means comprise an exhausting fan J which is operatively connected to each of the tanks by suitable conducting piping *g*, baffle plates *f* being disposed vertically in each of the tanks and adapted to separate the space above the liquid into two compartments *p* and *q*, of which the compartment *q* is exhausted by the fan J and the compartment *p* receives the volatile metals which are drawn down into the liquid and condensed by the vacuum created in the compartment *q*.

In order to insure the exclusion of air and thus prevent the formation of metallic salts or compounds, I surround the treating chambers with casings K, L and M, and exhaust the air from each of the casings through conducting pipes *h*, *i* and *j*, which communicate with suitable exhausting means, such as the water pump M, which in the specific embodiment illustrated, comprises an outer casing *k* and an inner perforated tube *l*, through which a column of water falls, supplied by a suitable conductor *m*. It is not necessary that each of these chambers should have a separate casing, as, if desired, a single casing might be provided inclosing the entire apparatus.

In carrying out the process in my improved apparatus, as set forth in the co-pending application, it is necessary to obtain a vacuum in the furnace during the treatment of the ore, and it is also necessary to extract separately the sublimed metals from each treating chamber. The vacuum is created in the interior of the chamber, by means of the blowing fan J operating through the condensing tank and outlet pipes *a*, *b*, and *c*. The vacuum is further maintained by the exhaustion of the inclosing casing K, L and M, thus entirely preventing the entrance of any air into the apparatus. The withdrawal of the sublimed metals is effected by the blower J which causes the volatile metals to be drawn downwardly into the liquid in the condensing tanks and there condensed. This liquid must be kept circulating by the conducting pipes shown, as its temperature will naturally be greatly raised by the volatile metals passing therein.

What I claim as my invention is:—

1. In an apparatus for extracting metals from ore, the combination with the treating chamber of inclosing means therefor, extending about the same, and means for creating a vacuum in the inclosing means.

2. In an apparatus for extracting metals from ore, the combination with a series of chambers forming a single unitary structure, of casings extending about each chamber, means for creating a vacuum in each casing, as and for the purpose specified.

3. In an apparatus for extracting metals from ore, the combination with a series of chambers, forming a single unitary structure, of casings extending about each chamber, air exhausting means, and conducting means

extending from each chamber to the air exhausting means.

4. In an apparatus for extracting metal from ore, the combination with a treating chamber, of means for creating a vacuum both within and without the same.

5. In an apparatus for extracting metal from ore, the combination with a series of treating chambers, of a series of condensing tanks partially filled with a condensing liquid, baffle plates in said tanks extending into the liquid, conducting means extending from one side of the baffle plates to the treat-

ing chamber, means for exhausting the air from the opposite side of the baffle plates, means for circulating the liquid in the condensing tanks, a casing inclosing the treating chambers, and means for creating a vacuum in the casing, as and for the purpose specified.

Signed at Ottawa, Province of Ontario, this 20th day of July, 1907.

JAMES HENRY REID.

Witnesses:

RUSSEL S. SMART,
C. W. CAMERON.