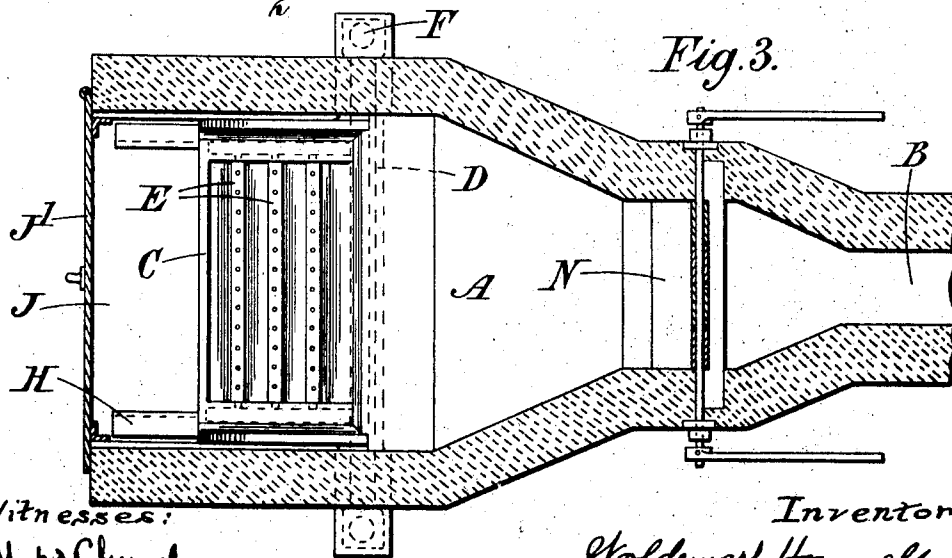
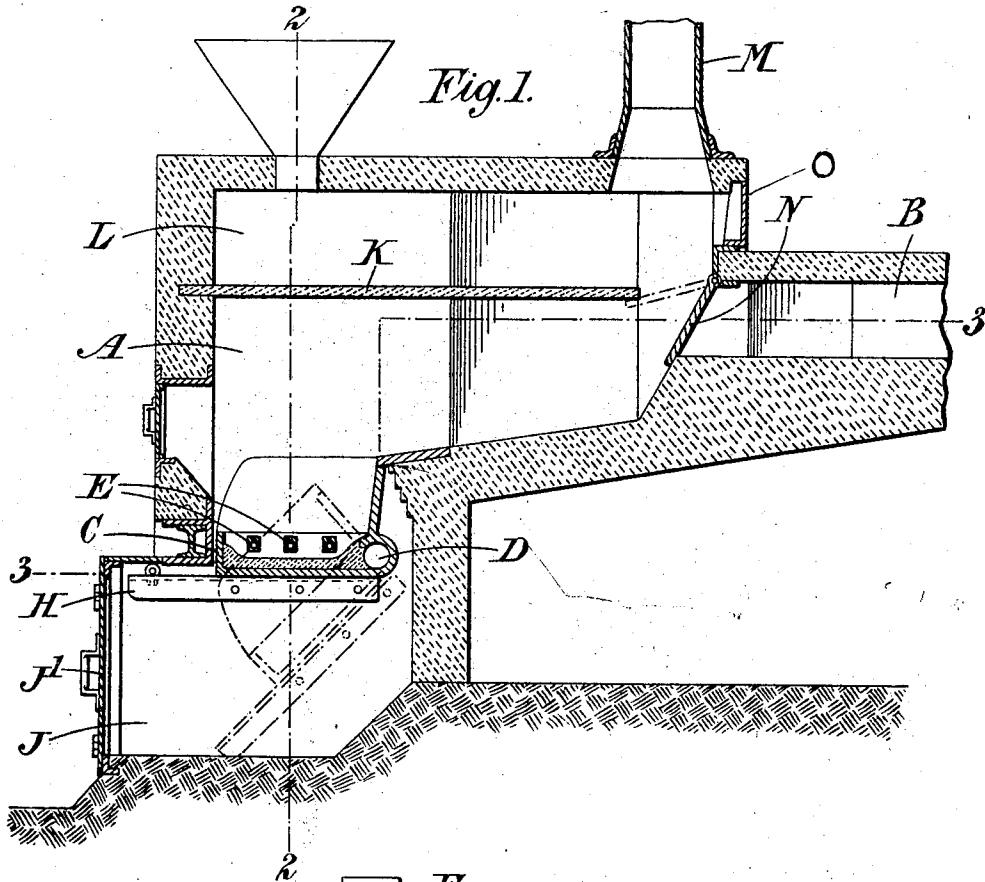


W. HOMMEL.
FURNACE FOR VOLATILE METALS.
APPLICATION FILED NOV. 30, 1908.

932,279.

Patented Aug. 24, 1909.

2 SHEETS—SHEET 1.



Witnesses:

M. W. Church

Elizabeth Griffith

Inventor:

Woldemar Hommel.
by Christ & Christ
his Atty.

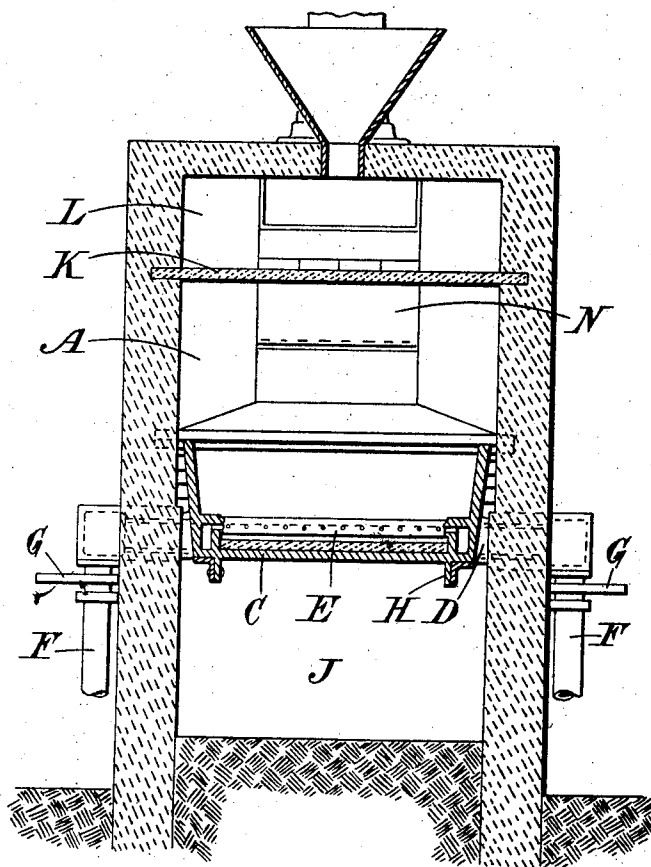
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

WOLDEMAR HOMMEL, OF LONDON, ENGLAND, ASSIGNOR TO METALS EXTRACTION CORPORATION, LIMITED, OF LONDON, ENGLAND.

FURNACE FOR VOLATILE METALS.

932,279.

Specification of Letters Patent. Patented Aug. 24, 1909.

Application filed November 30, 1908. Serial No. 465,284.

To all whom it may concern:

Be it known that I, WOLDEMAR HOMMEL, a citizen of the Swiss Republic, residing at London, in England, have invented certain new and useful Improvements in Furnaces for Volatile Metals, of which the following is a specification.

This invention relates to improvements in furnaces for volatile metals. Processes are in use in which an ore or other material containing zinc is heated with coal or other reducing agent and subjected to a blast of air or other gas so as to blow off the zinc which may be subsequently burned to form zinc oxid. The apparatus embodying this invention is intended for use in such processes, and is particularly applicable in the process described in the application of Hommel and Sulman, Serial No. 401,513, filed November 9, 1907, in which the zinc contents of a roasted or unroasted ore are blown off in the form of oxid.

A blowing furnace according to this invention comprises the combination with the furnace-chamber of a blowing hearth consisting of a rectangular trough rotatable on a horizontal axis and having a horizontal grate beneath which air or other gas under pressure can be blown in, or alternatively the air may be distributed beneath the charge by means of perforated pipes or hollow fire bars. Above the grate may be placed a convex perforated plate of iron or other refractory material for the purpose of more thoroughly distributing the air.

A further feature of this invention consists in the combination with the blowing hearth and the furnace-chamber in which the combustion of the volatilized zinc takes place, of a horizontal partition in the furnace above which is formed a chamber in which the material to be fed to the blowing hearth is heated by the gas escaping therefrom.

At the outset of a blowing operation, when coal is used, a large amount of carbonaceous gas is evolved from the blowing hearth, while, later in the operation, the furnace-chamber yields practically only zinc oxid and other metallic matter. For this reason according to the present invention, the furnace-chamber is combined with two flues, one leading to the zinc oxid condensing apparatus, and the other leading to a stack or the like, and a hinged door is arranged to put

the furnace-chamber into communication with either of the flues.

In the accompanying drawings, which illustrate one form of blowing furnace embodying this invention and specially designed for use in the process described in Hommel and Sulman's patent application, Serial No. 401,513:—Figure 1 is a central longitudinal section of the furnace; Fig. 2 is a section on the line 2—2 of Fig. 1, and Fig. 3 is a section on the line 3—3 of Fig. 1.

The furnace comprises a long substantially horizontal chamber A terminating in a flue B leading to the zinc oxid condensing apparatus. At the front of the furnace-chamber A is a partially rotatable blowing hearth C consisting of a rectangular trough formed of suitable refractory material and rotatably mounted on horizontal trunnions D. The blowing hearth C is provided with a horizontal grate E on to which the metaliferous matter (generally roasted ore) is fed in admixture with coal or other fuel. The trunnions D are connected through a blast pipe F controlled by a valve G with an air-pump or other means of blowing air through the blowing hearth, and the air may be conducted from the hollow trunnions through hollow perforated grate bars E, or by other means air is blown through the ore on the hearth. The blowing hearth is held in position by supports H and means are provided for lowering or raising the supports so that the blowing hearth may be tilted down, as shown in dotted lines in Fig. 1 to discharge the contents of the hearth into a lower chamber J. The chamber J is provided with a door J' which is closed during the operation of the furnace.

Some distance above the blowing hearth is a horizontal wall or partition K of refractory material, extending across the furnace-chamber A and toward the flue B, and above this wall or partition is a second chamber L. The zinc evolved from the converter takes fire on leaving the converter and the flame produced gives rise to intense heat in the furnace-chamber, whereby the floor of the upper chamber L is also highly heated.

At the rear of the upper chamber L is a flue M leading to a stack or the like; a door N is hinged in the front and so arranged that the furnace-chamber A can be cut off completely from the zinc-condensing cham-

bers and put into communication with the stack, or may be cut off from the stack and put into communication only with the zinc-condensing chambers.

5 The normal operation of the apparatus is as follows:—There is one charge of ore in the blowing hearth. Another charge is banked up in the furnace chamber between the blowing hearth and the flue, and other charges
10 are placed in the upper chamber above the partition, means being provided for feeding the charges into the upper chamber and for shifting them along both chambers and from the upper chamber to the lower chamber.
15 The blowing hearth having been emptied, a fresh charge is introduced therein from the furnace-chamber and a suitable quantity of coal is added thereto. During the blow, the combustion of the coals supplies the preliminary heat and reduces the zinc to the metallic form when it volatilizes and is burned
20 above the blowing hearth to form zinc oxid. At first the carbonaceous gas is evolved from the coal, and for this reason the furnace-chamber is put into communication with the
25 stack, but when the zinc is evolved and ignited to form zinc oxid, the furnace-chamber is put into communication with the condensing chambers. Each time the blowing
30 hearth is re-charged, a charge from the upper chamber is brought down into the furnace-chamber and the charges in the upper chamber are shifted along to leave room for a fresh charge to be fed in through the charging
35 opening.

A door O is provided in the upper part of the furnace above the level of the horizontal partition K so that a rabble may be inserted
40 by which to work the charges from the upper chamber L into the lower chamber A. Similarly the charge is moved from the rear portion of the chamber A on to the blowing hearth by means of a rabble inserted through the door in the front of chamber A shown
45 in Fig. 1 and situated above the blowing hearth.

This invention has been described in its application to the treatment of zinc ore, but it is to be understood that it is applicable to

any other ore especially to complex ores. 50
The material remaining on the blowing hearth becomes sintered or agglomerated and the furnace according to this invention is suitable for sintering or agglomerating certain charges such as copper pyrites. 55

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a blowing furnace the combination of a furnace-chamber, and a blowing hearth consisting of a rectangular trough rotatable
60 on a horizontal axis, and a horizontal grate in the trough through which gas can be blown under pressure.

2. In a blowing furnace the combination of a furnace-chamber, and a blowing hearth
65 consisting of a rectangular trough, hollow trunnions supporting the trough and connected to a compressed-air supply, and a horizontal grate in the trough through which air can be blown under pressure. 70

3. In a blowing furnace the combination of a furnace-chamber, a blowing hearth in said chamber consisting of a rectangular trough rotatable on a horizontal axis, a horizontal
75 partition in the furnace-chamber above which is formed a chamber in which the material to be fed to the blowing hearth is heated by the gas escaping therefrom.

4. In a blowing furnace for volatilizing zinc and burning the same to form zinc-oxid, the
80 combination of a furnace-chamber, a blowing hearth in said chamber consisting of a rectangular trough rotatable on a horizontal axis, two flues at the end of the furnace-chamber one leading to the zinc oxid-condensing apparatus and the other leading to a
85 stack, and a door hinged at the junction of the flues by which the furnace-chamber may be put into communication with either of the flues. 90

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WOLDEMAR HOMMEL.

Witnesses:

PERCY W. H. HIGGINSON,
J. B. BUSS.