

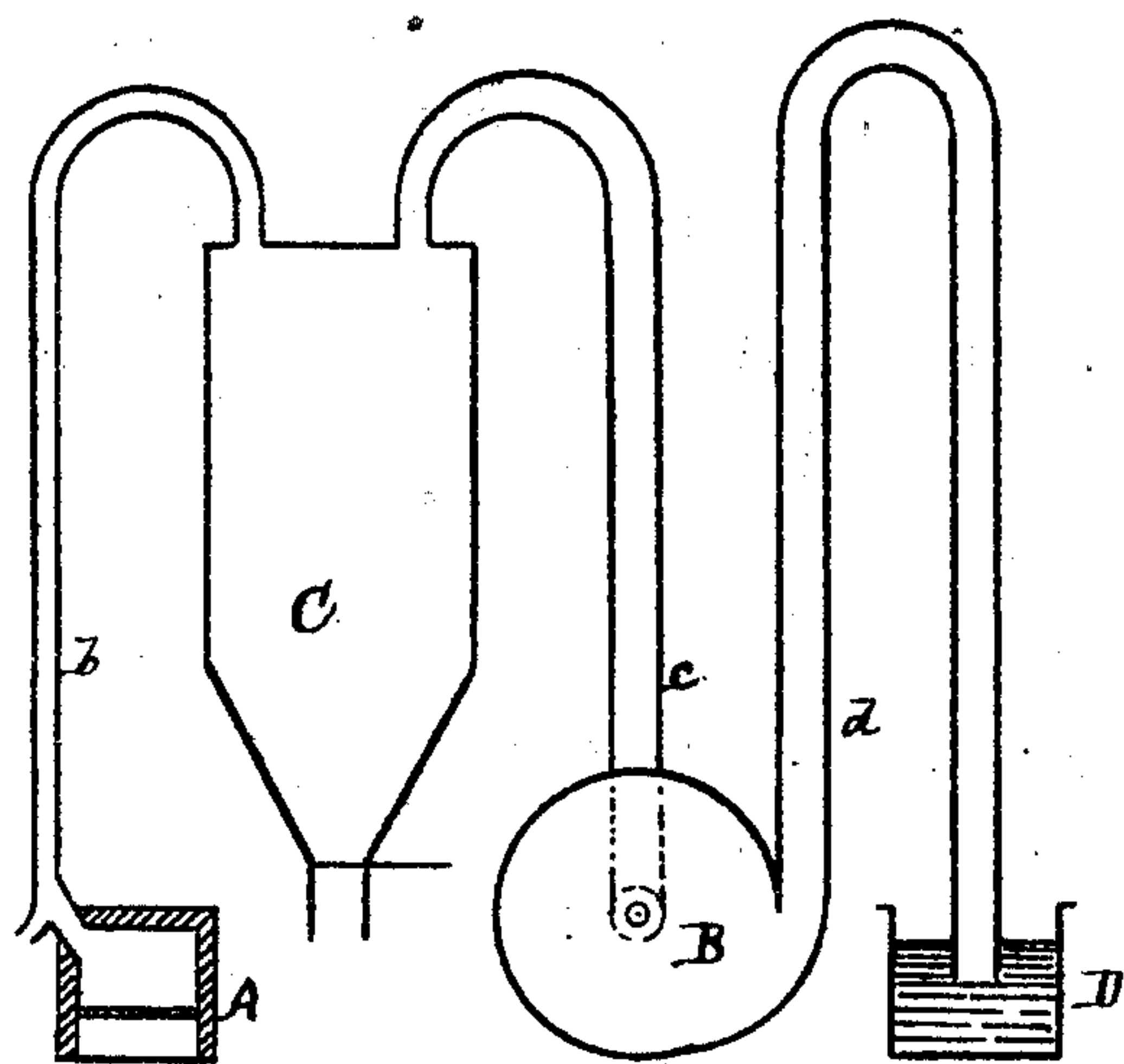
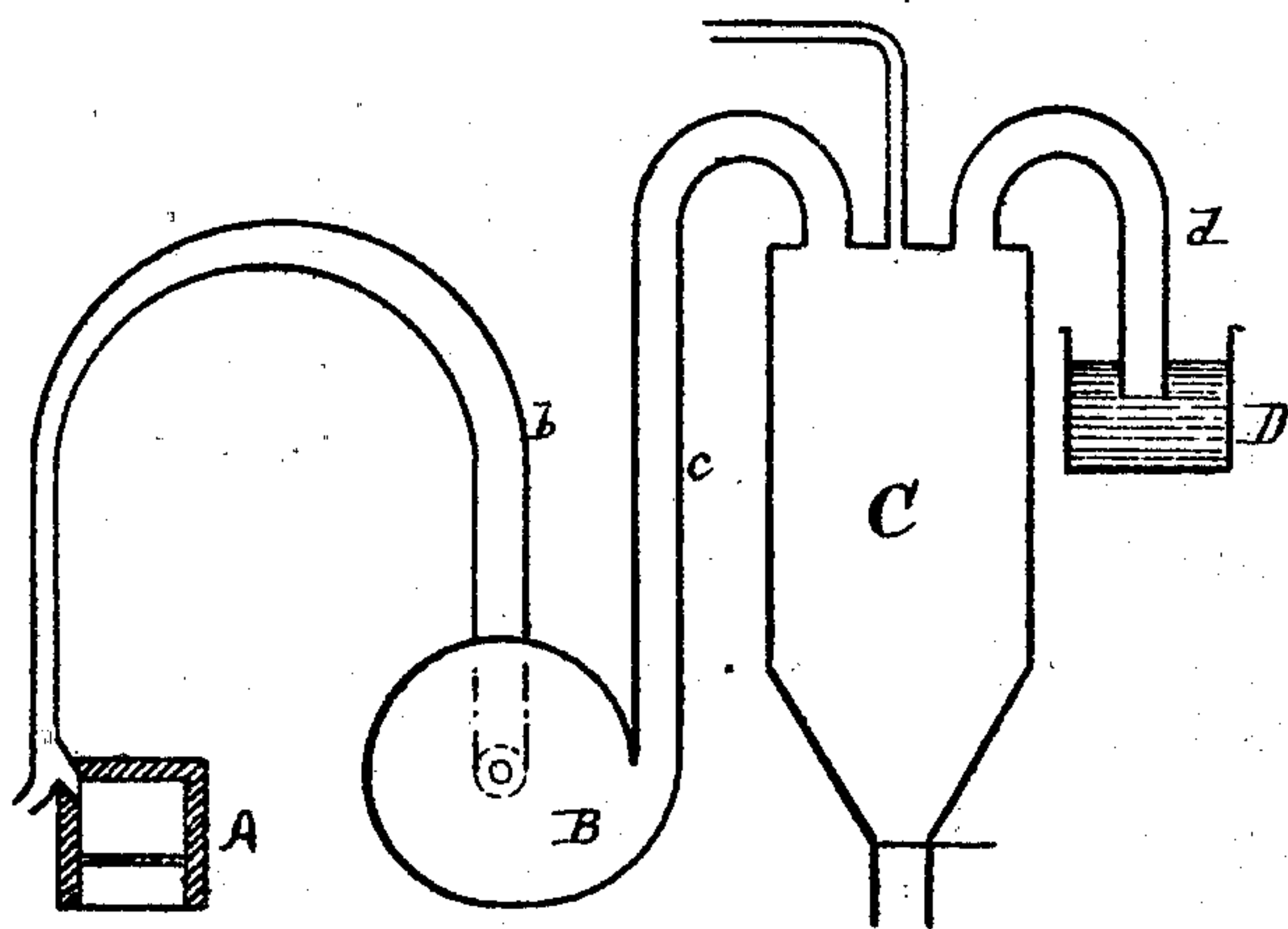
J. W. BAILEY.

Improvement in Roasting and Treating Ores.

No. 120,695.

Patented Nov. 7, 1871.

—FIG. I.—



—FIG. II.—

WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN W. BAILEY, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN ROASTING AND TREATING ORES.

Specification forming part of Letters Patent No. 120,695, dated November 7, 1871.

To all whom it may concern:

Be it known that I, JOHN W. BAILEY, of San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Process and Machinery for Obtaining Metals from Ores; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

This invention relates mainly to a process for treating ores for obtaining metals therefrom, which process consists in drawing the ores from the furnace by the power of suction to a certain point, and forcing the ores from that point against strong pressure either into a receiving-chamber or water-tank. The invention further consists in the arrangement of certain machinery for carrying the process into effect, the details of which will be fully described hereinafter.

In the drawing, Figure 1 represents a sectional elevation of my improved arrangement of machinery for treating ores, and Fig. 2 a modification of the same.

To enable others skilled in the art to make and use my improved machinery for carrying out my process, I will now proceed fully to describe its construction and manner of operation.

In the treatment of certain kinds of ores it is essential that a strong blast shall be employed for the purpose of obtaining the necessary degree of heat, and also for the purpose of conveying the pulverized ore into and from the furnace. It is also desirable that after the ores have been subjected to the heat of the furnaces, that all combustion shall cease at a certain point, in order that steam may be introduced to aid in the further treatment of the ore. It is furthermore desirable that the pulp or pulverized ore after being treated should be all or nearly all deposited in a suitable receiving-chamber for convenience of removal. These results perhaps have been imperfectly accomplished in some of the processes already patented; but with none of them is it possible to produce such perfect results with absolute certainty as with my process.

My process consists in drawing the ores from the furnace or furnaces, as the case may be, by the power of suction to a certain point, and by forcing the ores from that point against strong pressure either into a receiving-chamber or into

a tank of water. The point at which the blast should change from a drawing force to a driving force should be that point first reached by the ores after having been sufficiently acted upon by the heat. The ores for which this process is especially designed having been sufficiently acted upon by the heat should then be so treated as to cause all combustion to cease, in order that the pulp may not be baked in the receiving-chamber, if such a chamber be used; and also in order that steam may be introduced to moisten the pulp and assist the further action of the chlorine gas on particles of ore that may have escaped the action of the gas while passing through the pipes. The combustion in the pipes is caused to cease by changing the blast from a suction or drawing force to a force driving against strong pressure, by which pressure, of course, all fire is instantly smothered. Another effect also of this process is to compel all or nearly all the pulp to settle in the receiving-chamber—for a strong pressure being exerted to drive the pulp into the chamber, and a strong resistance being made, which prevents it from passing out, it is consequently forced to settle in the chamber.

The machinery for carrying this process into effect will now be described:

A represents a furnace of any proper construction, and, if desired, two or more may be employed. B represents a fan of proper size, which is connected to the furnace by a suitable pipe, *b*, and also to the receiving-chamber C by a pipe, *c*, as shown. This chamber is also connected to a water-tank, D, by the pipe *d*, as shown. If desired the receiving-chamber may be located next to the furnace, as shown in Fig. 2; but this arrangement is not believed to be as desirable as that shown in Fig. 1.

The operation is as follows: The ores to be treated are drawn from any proper receptacle by the fan B by or through the furnace A, the products of combustion being in this manner united with them, and through the pipe *b* to the fan-chamber, from whence they are forced into the chamber C, in which all or nearly all the pulp is compelled to settle, the waste-gases, &c., passing out through the pipe *d* into the tank D, from whence they escape into the open air, all volatilized metals, of course, being condensed in the tank. The pulp is drawn from the furnace into the fan-chamber, and from thence forced into the

receiving-chamber. By drawing the pulp from the furnace the fire is relieved from all pressure, and it consequently burns with great freedom. By forcing the pulp from the fan-chamber into the receiving-chamber, a great resistance is encountered in consequence of the location of the discharge end of the pipe *d* beneath the surface of the water in the tank D; and consequently all combustion of the ore is instantly checked by being smothered. It follows, therefore, that if combustion ceases at the fan-chamber, moist steam can be used with impunity in the receiving-chamber to aid the further operation of the chlorine gas upon the ore. By rendering combustion impossible also in the receiving-chamber, all difficulty that might occur from having the ore bake into a lump is avoided. All or nearly all the pulp must settle in the receiving-chamber, (from whence it is easily removed,) in consequence of the strong pressure from the fan forcing it into the chamber, and also the strong resistance created by the pressure which prevents it from leaving the chamber.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The process described of treating ores, consisting in conveying them by a suction or drawing force until they are sufficiently acted upon by the heat of the furnace or furnaces, and then

forcing them against strong pressure into a receiving-chamber, as described.

2. The combination of a furnace, a fan, and a water-tank, connected by suitable pipes, the fan being located between the furnace and the tank, and the end of the discharge-pipe being located beneath the surface of the water, as described.

3. The combination of a furnace, a fan, a receiving-chamber, and a water-tank, connected by suitable pipes, the fan being located between the furnace and tank, and the end of the discharge-pipe being located beneath the surface of the water, as described.

4. The combination of a receiving-chamber, fan, and tank, the receiving-chamber being located between the tank and fan, and being connected thereto by suitable pipes, one of which discharges beneath the surface of the water in the tank, as described.

5. The arrangement of the furnace A, fan B, receiving-chamber C, and tank D with their connecting-pipes, as shown in Fig. 1.

6. The arrangement of the furnace A, receiving-chamber C, fan B, tank D, and their connecting-pipes, as shown in Fig. 2.

This specification signed and witnessed this 6th day of July, 1871.

Witnesses:

JOHN W. BAILEY.

F. J. THIBAUT,

J. P. GAILLARD.

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