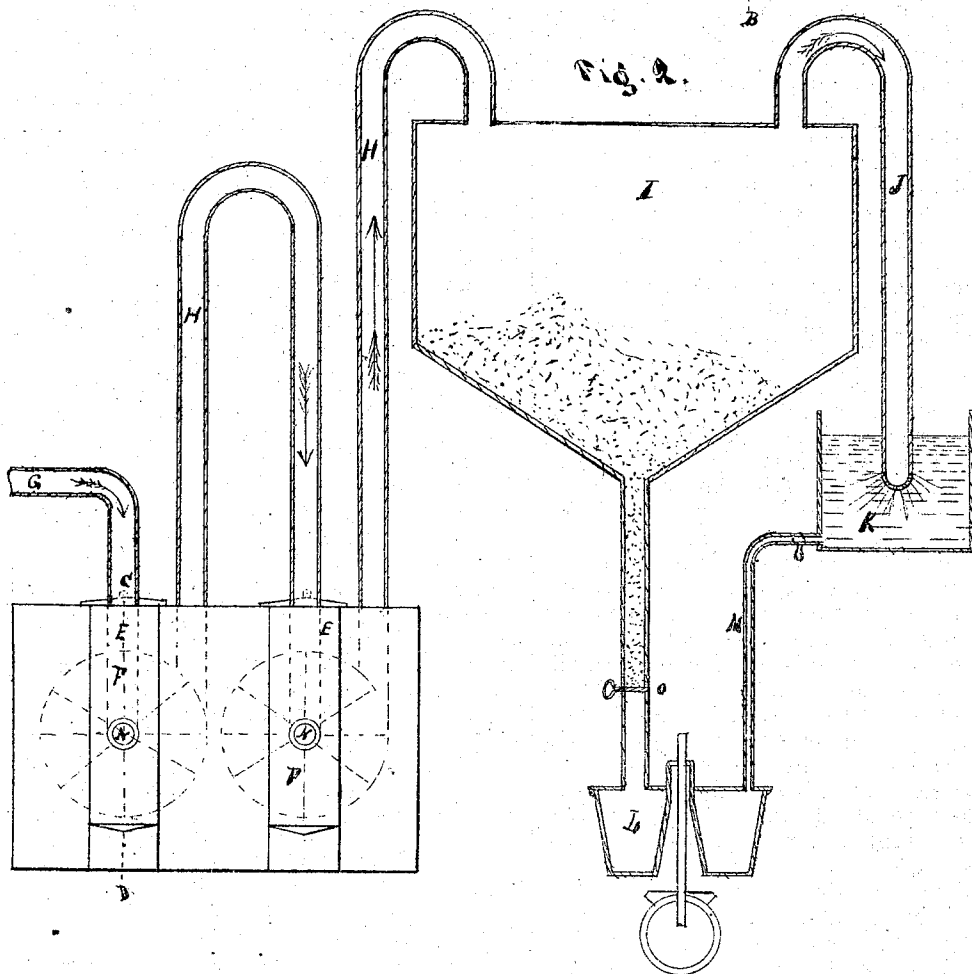
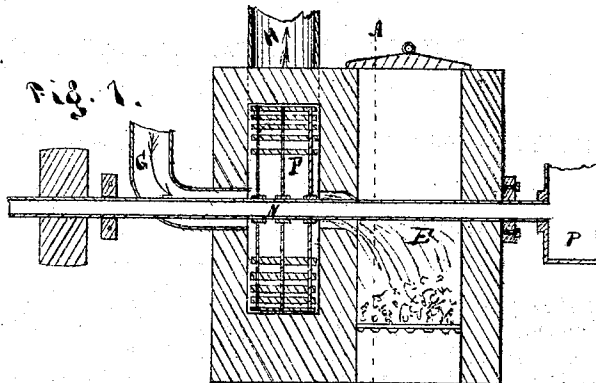


J.W. Bailey's
 - Imp'd Furnace for Roasting Ores -

117363

PATENTED JUL 25 1871



Witnesses:

W. B. Raymond
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UNITED STATES PATENT OFFICE.

JOHN W. BAILEY, OF HAMILTON, NEVADA.

IMPROVEMENT IN DESULPHURIZING AND TREATING ORES.

Specification forming part of Letters Patent No. 117,363, dated July 25, 1871.

To all whom it may concern:

Be it known that I, JOHN W. BAILEY, of Hamilton, in the county of White Pine and State of Nevada, have invented a new and useful Improvement in Furnaces for Roasting 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 to the treatment of ores for the purpose of extracting their metals; and consists, first, in an improved process of roasting the ores; and second, in certain details of construction for carrying my process into effect, as will be fully described hereinafter.

In the drawing, Figure 1 represents a vertical central sectional elevation of one of the fan and fire-chambers taken through the line C D, Fig. 2; and Fig. 2, a vertical central sectional elevation through the line A B, Fig. 1, and showing also the ore and dust-receiving chamber, the amalgamating-pan, and the tanks into which the heated air and gases are discharged.

To enable others skilled in the art to make and use my invention, I will now proceed to describe fully its construction and operation.

F F represent two fans, or other suitable means of producing a current or blast of air. These are set in suitable chambers and are connected by proper openings with the fire-chambers E, as shown in Fig. 1. G represents the pipe which connects the first fan-chamber with the battery or other point where the ores are charged, and from which the pulverized or decomposed ore is drawn by means of the air-blast created by the fan. N represents a hollow shaft, by means of which the fan is revolved, which is supplied with water from the tank P for the purpose of protecting it from the extreme heat to which it is exposed. H represents the connecting-pipe which unites the two fan-chambers, the second of which is arranged in the same manner as the first, and should be of larger size than the first fan for the purpose of accommodating the expanded volume of gases, &c. From the second chamber a pipe is extended to the ore and dust-chamber I. This chamber is provided with an inclined bottom, by means of which the accumulated pulp is conducted to the spout and delivered to the amalgamating-pan L, the discharge being regulated by the slide o. J represents a pipe which is pro-

vided for the discharge of the heated air and gases which must, of course, find vent in some direction. Its discharge end is located beneath the surface of the water in the tank K, and is provided with suitable openings for causing the discharging elements to enter the water in jets, as indicated in Fig. 2. By means of this construction the most minute particles of dust that would otherwise escape are saved. M represents a pipe for drawing water for tank K.

The operation is as follows: The battery is charged with ores in any proper manner. By the action of the fans F F, which are revolved by any suitable means, the pulverized or decomposed ores are drawn from the battery through the pipe G into the first fan-chamber where they are brought into contact with the fire, or the products of combustion drawn from the fan-chamber and conveyed through the pipe H to the second fan-chamber where they experience similar treatment, and from thence to other similar chambers or to the ore and dust-receiving chamber where the greater bulk is deposited, the small remainder that passes off with the heated air and gases through the pipe J being caught in the tank K.

This process is especially adapted for chloridizing base galena ores, rich in silver. If these ores should at first be exposed to a strong heat the lead would be precipitated like shot to the bottom. It is therefore essential that the ores should be gradually heated in order that it may oxidize, volatilize, or chloridize, and this result I accomplish in having a series of furnaces with varying temperature, the first giving out but a gentle heat, while the second and other furnaces, if used, increase regularly in temperature. It is also essential, in consequence of this liability to precipitate lead, that the ore should meet the products of combustion at the point of strongest blast, by which means the ore is carried on through the conveyer with almost absolute certainty. It is not essential, however, in all cases that two fan and fire-chambers should be employed. In ores which will bear a strong heat at once a single chamber may be employed. Any desired products of combustion may be produced in the fire-chambers to unite with the ores in the fan-chamber. If desired, steam or gases may be employed for that purpose. The salt or any other suitable chloridizing material may be placed either in the furnace or in the battery, or at any

other proper point. In the drawing the ore-laden blast of air is represented as entering the fan-chamber upon one side, while the products of combustion enter upon the other. This arrangement is not essential, as they may both be made to enter upon the same side.

The furnace should be constructed of suitable materials, the chambers being preferably made of brick and the fan of iron, suitably protected. Any proper dimensions may be given to the parts. It is proposed, in practice, to make the first fan of twenty inches diameter, the first pipe five inches, the second fan thirty inches, and the second pipe seven inches; but, of course, I do not propose to limit myself to these dimensions.

I do not claim, broadly, the process of roasting ores by forcing them in fine powder with a blast of air through a shaft, flue, or furnace; nor subjecting the ore-laden blast to successive heatings; nor the process of chloridizing by mixing salt with the ore in fine powder and subjecting the mixture to heat while floating on an air-blast through a shaft, flue, or furnace; nor the application of a current of water to the fan-wheel; nor the separation of the fine particles of ore or metal from the waste gases by passing them through water or through a spray-chamber; nor the use of a fan-blower to drive or draw the ore-laden blast through the shaft, flue, or furnace. Means intended to accomplish these things are already known, and some of them patented.

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

1. The process described of roasting ores, by exposing them to the action of a series of furnaces of gradually-increasing temperature, substantially as described.

2. The process described of treating ores, consisting in the employment of series of blasts, in connection with a series of furnaces of varying temperature, the ore being caused to come into contact with the products of combustion at the point of strongest blast, substantially as described.

3. The process described of treating ores, consisting in uniting, in a fan-chamber, an ore-laden current of air with a blast from the furnace, the combined elements being conveyed away to the receiving-chamber, substantially as described.

4. The arrangement of the fan-chamber and the furnace, the former being provided with central openings for receiving the ore-laden current and the products of combustion, as described.

5. The ore-chamber I, provided with the pipes H J and discharge-spout, constructed as described.

6. The arrangement of the pipe G, fans F F, and furnaces E E, pipes H H, chamber I, pipe J, and tank K, as described.

This specification signed and witnessed this 11th day of February, 1871.

JOHN W. BAILEY.

Witnesses:

BEN. M. BUSH,
WM. McCASKILL.