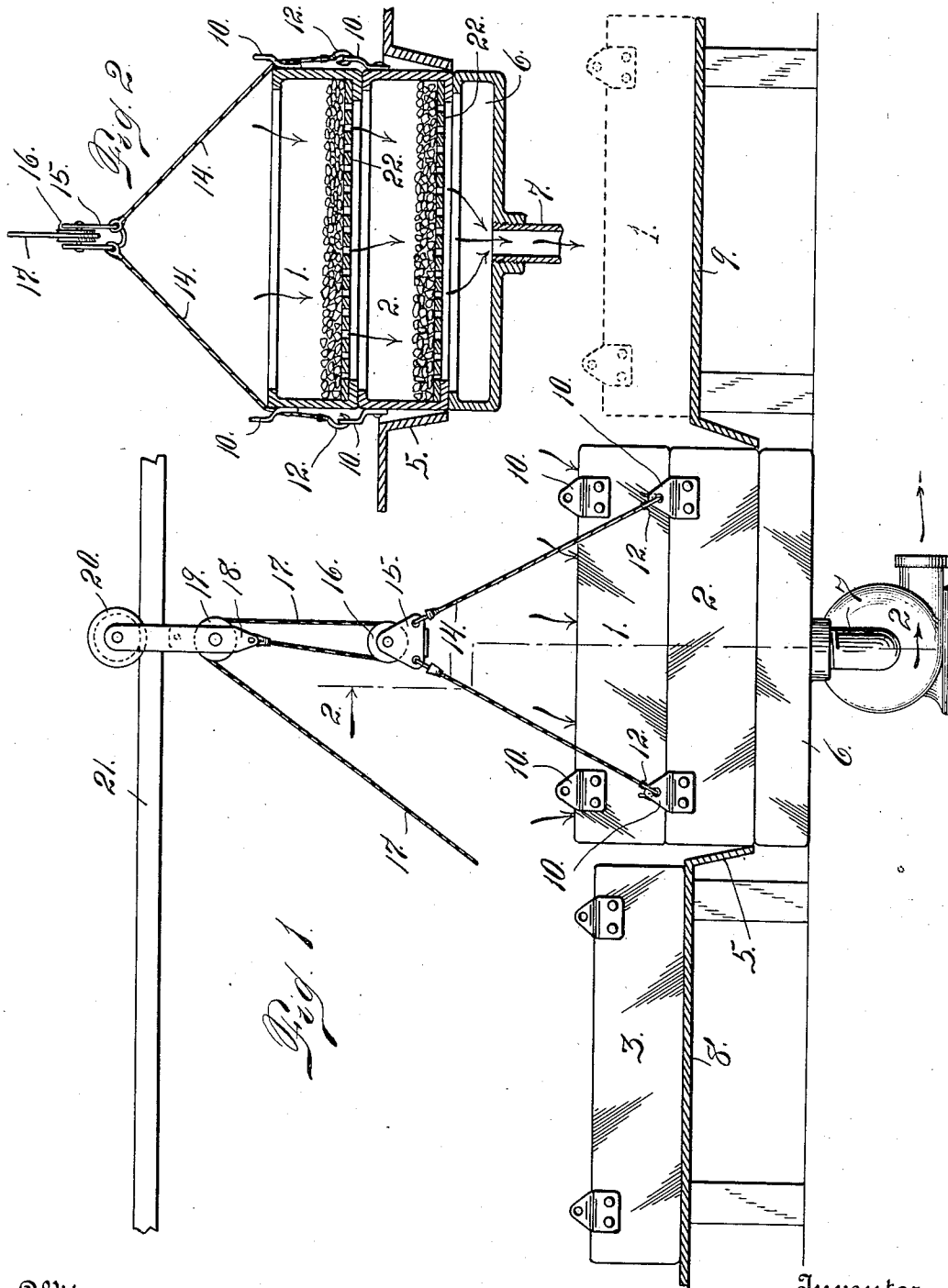


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SINTERING OR ROASTING FURNACE.
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1,050,079.

Patented Jan. 7, 1913.



Witnesses
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UNITED STATES PATENT OFFICE.

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SINTERING OR ROASTING FURNACE.

1,050,079.

Specification of Letters Patent.

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Application filed March 18, 1912. Serial No. 684,427.

To all whom it may concern:

Be it known that I, MILTON H. KAUFFMAN, citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Sintering or Roasting Furnaces; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in sintering or roasting furnaces, of the character set forth in a simultaneously pending application Serial No. 684,426.

In my present construction, I prefer to employ two pans arranged one above another, the two pans fitting closely together. The lower pan rests upon an air-box or receptacle with which an exhaust-fan or other suction-producing device is connected, in order to produce a down-draft through the ore charges of the two pans. In this case the charge of the uppermost pan is sintered first while that of the lowermost pan is only partially sintered. As soon as the sintering operation is completed in the uppermost pan, the two pans are removed, a third pan placed upon the air-box or in the lowermost position, while the pan which was originally lowermost is placed on the top, after which the operation is continued until the process of sintering the charge in the top pan is completed, when the operation heretofore described is repeated.

This invention is intended for carrying out what is known as a sintering process as distinguished from ordinary roasting, where rabblers or stirring devices are employed for exposing new surfaces to the action of the heat. In the sintering process the charge of ore is undisturbed and when the sintering is completed, the pulverized ore-particles are caused to cling together, the impurities such as sulfur having been removed, the mass being in a porous condition and easily broken up for smelting purposes.

In the beginning of the operation, it is preferred to place a pan in the lowermost position with a full charge of ore while the uppermost pan contains a mass of coals for igniting purposes. The air-blast is then

turned on causing a down-draft which is continued until the ore-charge in the lowermost pan is well ignited. After this has been accomplished the pans are removed, the third pan with a fresh charge of ore put in the lowermost position and the pan containing the previously ignited charge placed in the uppermost position, when the operation is continued, as heretofore explained.

Having briefly outlined my improved construction as well as the manner of carrying out the sintering process by its employment, I will proceed to describe the same in detail, reference being made to the accompanying drawing, in which is illustrated an embodiment thereof.

In this drawing: Figure 1 is a side-elevation partly in section illustrating my improved construction. Fig. 2 is a vertical cross-section taken on the line 2-2 Fig. 1.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a guide-frame located above and surrounding an air-box 6, connected by means of a pipe or conduit 7, with an exhaust-fan or other suction-producing apparatus. At the opposite ends of the frame 5 there are platform extensions 8 and 9, the extension 8 being at the front end, while the extension 9 is at the rear end of the frame.

As illustrated in the drawing, three pans or ore receptacles are employed, the same being designated by the numerals 1, 2 and 3 respectively. Each of these pans is provided on opposite sides with ears or lugs 10, adapted to receive hooks 12, respectively connected with the two members 14 of a hoisting device, the said cable members being connected at their upper extremity with a sort of block 15, carrying a pulley 16 which is engaged by a cable 17, having one extremity connected with a block 18 carrying a pulley 19 over which the cable 17 passes, its opposite extremity leading to a rotary drum or other suitable hoisting apparatus (not shown).

The block 18 constitutes a sort of trolley construction, a wheel 20 being journaled in its upper extremity and resting on an overhead track 21. By reason of this trolley construction, the pan or pans lifted may be moved along in either direction for dumping or other purposes.

The pans employed are substantially identical in construction and are only given dif-

ferent reference characters for convenience of description.

In describing the operation, it may be assumed that the pan 2 is in the lowermost position or in direct engagement with the top of the air-box 6, the latter being open at the top. Each pan is provided with a perforated bottom 22. These perforations may be of any suitable shape so long as they permit the passage of the necessary quantity of air, the bottoms at the same time being sufficiently rigid to sustain the ore charges under treatment. Each pan is open at the top, as best illustrated in Fig. 2. If it be assumed that the pan 2 is in the lowermost position, as illustrated in Fig. 1, and contains a charge of ore to be treated, if I am beginning the operation, the pan 1 which occupies a position above the pan 2, should contain a quantity of live coals. The air-blast is then turned on and the suction produced through the pipe 7 will cause a down-draft through both pans 1 and 2 whereby the ore-charge in pan 2 is shortly ignited. The two pans are then removed through the instrumentality of the hoisting apparatus just described. The pan 1 is placed at the rear of the apparatus or in the position indicated by dotted lines at the right of Fig. 1. The pan 3 containing a charge of ore is then placed in the lowermost position and the pan 2 in the uppermost position, after which the air-blast is continued until the charge of ore in the uppermost pan is completely sintered. This pan, as well as the lowermost pan, is then removed and the pan containing a fresh charge of ore placed in the lowermost position, while the pan containing the partially-sintered charge is placed in the uppermost position. The process is then continued until the charge in the uppermost pan is sintered.

The relative position of the two pans when both contain charges of ore, is well illustrated in Fig. 2 of the drawing, and need not be explained further in detail.

Having thus explained my invention, what I claim is:

1. The combination with an air-box or receptacle and means connected with the bottom of the box for producing a down-draft through the said box, of pans adapted to contain charges of ore, arranged one above another, above the said box, the pans fitting closely together, both pans being open at the

top and having bottoms open to the passage of air but adapted to sustain charges of ore, substantially as described.

2. The combination of an air-box or receptacle, a conduit connected with the bottom of said box means located in said conduit for producing a down-draft through the box which is open at the top, and a number of ore pans arranged one above another, the lowermost pan fitting the top of said box closely forming an air-tight joint, the bottoms of the pans being perforated, any two adjacent pans fitting closely together also to form an air-tight joint, the pans being open at the top to allow the air to pass freely downward therethrough in response to the suction from below, substantially as described.

3. The combination with a suitable support of a plurality of pans adapted to contain charges of ore mounted on said support and arranged one above another, the lowermost pan forming an air-tight joint with the support, and the adjacent pans forming an air-tight joint with each other, the pans being open at the top, and suitable means connected with the support for producing a current of air which is caused to pass downwardly through the pans and the charges of ore therein, substantially as described.

4. The combination of an air-box mounted on a suitable support, a frame extending above the said box and having platform extensions both forwardly and rearwardly therefrom, the pans arranged one above another, the lowermost pan fitting the air-box which is open at the top, the said pan forming an air-tight joint with the top of the box, the pans adjacent each other also forming an air-tight joint where the top of one pan engages the bottom of the other, the several pans being perforated for the passage of air but sufficiently rigid to sustain charges of ore, the pans being open at the top, and suitable means connected with the air-box for producing a down-draft through the pans and the charges of ore therein, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

MILTON HENRY KAUFFMAN.

Witnesses:

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