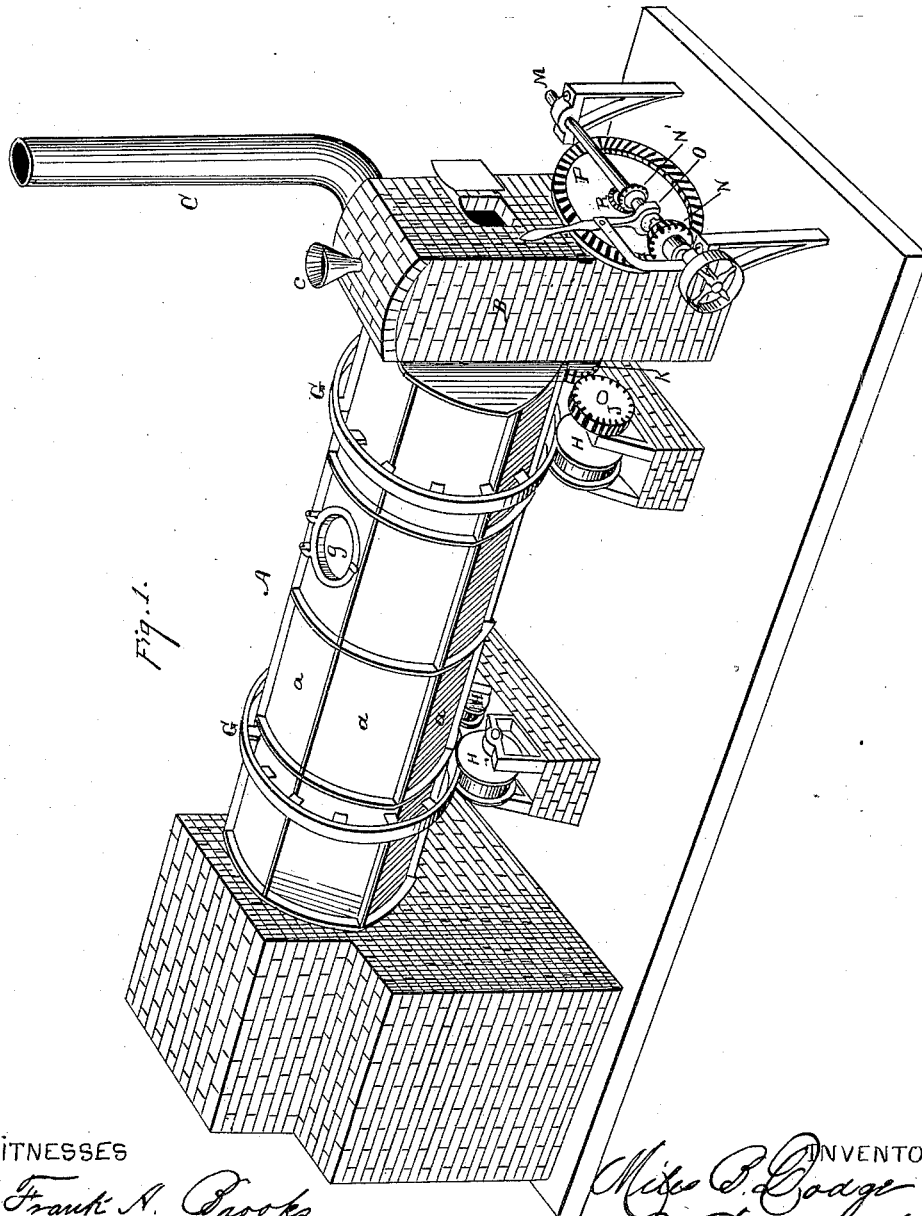


M. B. DODGE.

REVOLVING ORE ROASTING FURNACE.

No. 302,625.

Patented July 29, 1884.



WITNESSES

Frank A. Crooks
John H. House

INVENTOR

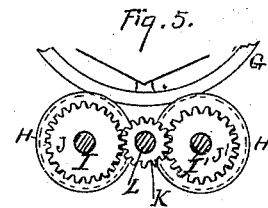
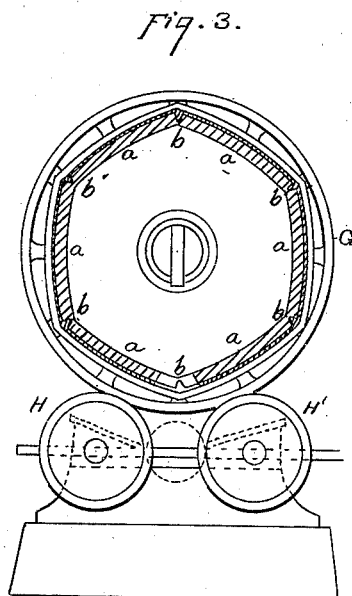
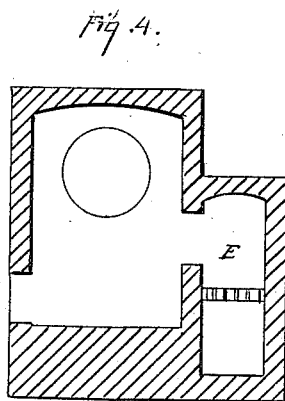
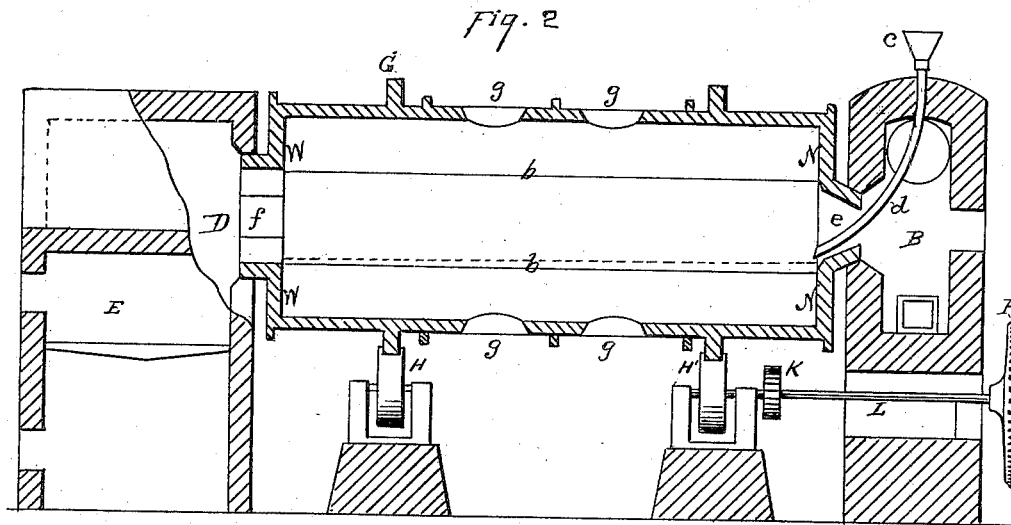
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UNITED STATES PATENT OFFICE.

MILES B. DODGE, OF SAN FRANCISCO, CALIFORNIA.

REVOLVING ORE-ROASTING FURNACE.

SPECIFICATION forming part of Letters Patent No. 302,625, dated July 29, 1884.

Application filed October 13, 1879.

To all whom it may concern:

Be it known that I, MILES B. DODGE, of the city and county of San Francisco, and State of California, have invented an Improved Ore-Roasting Furnace; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in that class of ore-roasting furnaces in which the body of the furnace is rotated during the process of roasting; and the invention consists of a roasting-chamber having its interior composed of parallel surfaces extending from end to end, provided with flanges, and means for revolving the chamber, combined with a fire-box, a dust-chamber, and chimney, all as hereinafter fully described and particularly claimed.

Figure 1 is a perspective view of my furnace. Fig. 2 is a longitudinal section. Fig. 3 is a transverse section. Fig. 4 is a transverse section through the furnace. Fig. 5 is a view of the gearing.

The body of the furnace A is set on a horizontal plane, and is not made cylindrical in form, as is usual in this class of furnaces, but is made with six or eight sides, as shown. Each of the sides *a* is slightly rounded, but only sufficiently so to form arch enough to hold the brick lining in place properly. A corner, *b*, is formed at the point of junction of each of the sides from the peculiar construction which answers the purpose of turning the ore, as hereinafter described. At each end of the roasting-cylinder are flanges W and N, provided with central openings, *e* *f*, the feed-opening *e* in flange N being smaller than the discharge-opening *f* in the flange W. A dust-chamber, B, is formed at the outer end of the furnace, connecting with the stack C, and on top of this dust-chamber is a hopper, *c*, connecting with a curved pipe, *d*, leading through said dust-chamber into the furnace, as shown, through the opening *e*. When the furnace is to be used for continuous work on light ores, the ore is fed through this hopper and pipe. At the opposite end is the discharge-chamber D, and separated from it by a fire-wall is the fire-place E, which supplies the nec-

essary heat. The discharge-opening *f* of the furnace is larger than the feed-opening *e*, in order that the ore in the furnace, when being fed continuously, will be discharged automatically without the necessity of any conveyers, inclined flanges, or other internal obstructions to the free action of the ore. On the sides of the furnace are the charging and discharging doors *g*, which are used when the furnace is run by charges and not continuously, as hereinafter described. As the body of the furnace is rotated the heat and flame pass through the opening *f* over the ore and out of the opening *e* into the stack. The ore travels in the opposite direction, coming in through the hopper and feed-pipe, and through the furnace, passing out of the opening *f*. The rotation of the furnace tends to bring the ore to a level, and it will remain at about the line shown by the dotted lines. By having the entering-opening *e* smaller than the discharge-opening *f* the ore will continuously discharge, since the constant addition of ore keeps the mass enough above the edge of the larger opening *f* to admit of the ore continually passing out of the discharge end as it is fed in at the other end. As the rotation tends to bring the ore to a level at all times, it must necessarily pass out of the larger opening. I therefore obtain a continuous discharge and passage of the ore through the furnace without having to set the furnace on an incline, or providing conveyers or screw-flanges to pass it through. In case the ore is of such a character as to require a very long roasting to desulphurize it, I can work said ore by charges instead of continuously. In this case the ore may be charged into one of the side doors, *g*, instead of through the hopper, and after being thoroughly roasted is discharged through one of the side doors when said door is at the bottom. The ore can then be left in the furnace for any desired length of time. The bands G around the furnace rest in the oppositely-placed grooved rollers H H'. The shafts I I' of one pair of these rollers are extended past the bearings, and in their ends are the pinions J J'. Between these pinions is the gear K, mounted on a shaft, L, at the oppo-

site end of which is a crown-wheel, P. Motion being imparted to the crown-wheel, the center gear, K, rotates the pinions J J' both in the same direction, thus moving the rollers H H' in the same direction and rotating the cylinder, applying the power on both sides.

It is sometimes necessary to run the furnace faster than at others. When continuously working, a slow speed is maintained; but when by charge it may be rotated more rapidly when it is desired to throw the charge out rapidly.

On the line or power shaft M are the loose pinions N N', and between them a lever-clutch, O. At the center of the crown-wheel, and attached to it, is a small pinion, R. For a slow motion the clutch throws the pinion N into gear with the crown-wheel P, while for a more rapid motion the clutch throws the pinions N' and R into contact. The motion is thus changed without altering the speed of the motor.

I am aware that horizontal rotating furnaces provided with ribs or flanges for showing and passing the ore along have been in

use, and I am aware, also, that horizontal rotating cylinders without these ribs or flanges, but set on an incline, have been used for roasting ores.

I am aware, too, that furnaces of this character have been made to operate continuously, and others, again, to operate with separate charges. I do not, therefore, claim a furnace constructed or operated in either of said ways; but

What I do claim as new, and desire to secure by Letters Patent, is—

In an ore-roasting furnace, a roasting-chamber, A, having its interior composed of parallel surfaces extending from end to end, flanges W and N, and means for revolving said chamber, in combination with a fire-box, E, a dust-chamber, B, and chimney C.

In witness whereof I have hereunto set my hand.

MILES B. DODGE.

Witnesses:

S. H. NOURSE,
FRANK A. BROOKS.