(No Model.)

J. K. PARDEE.

Rotary Ore Roasting Furnace.

No. 235,800. Patented Dec. 21, 1880.

Fig: 1.

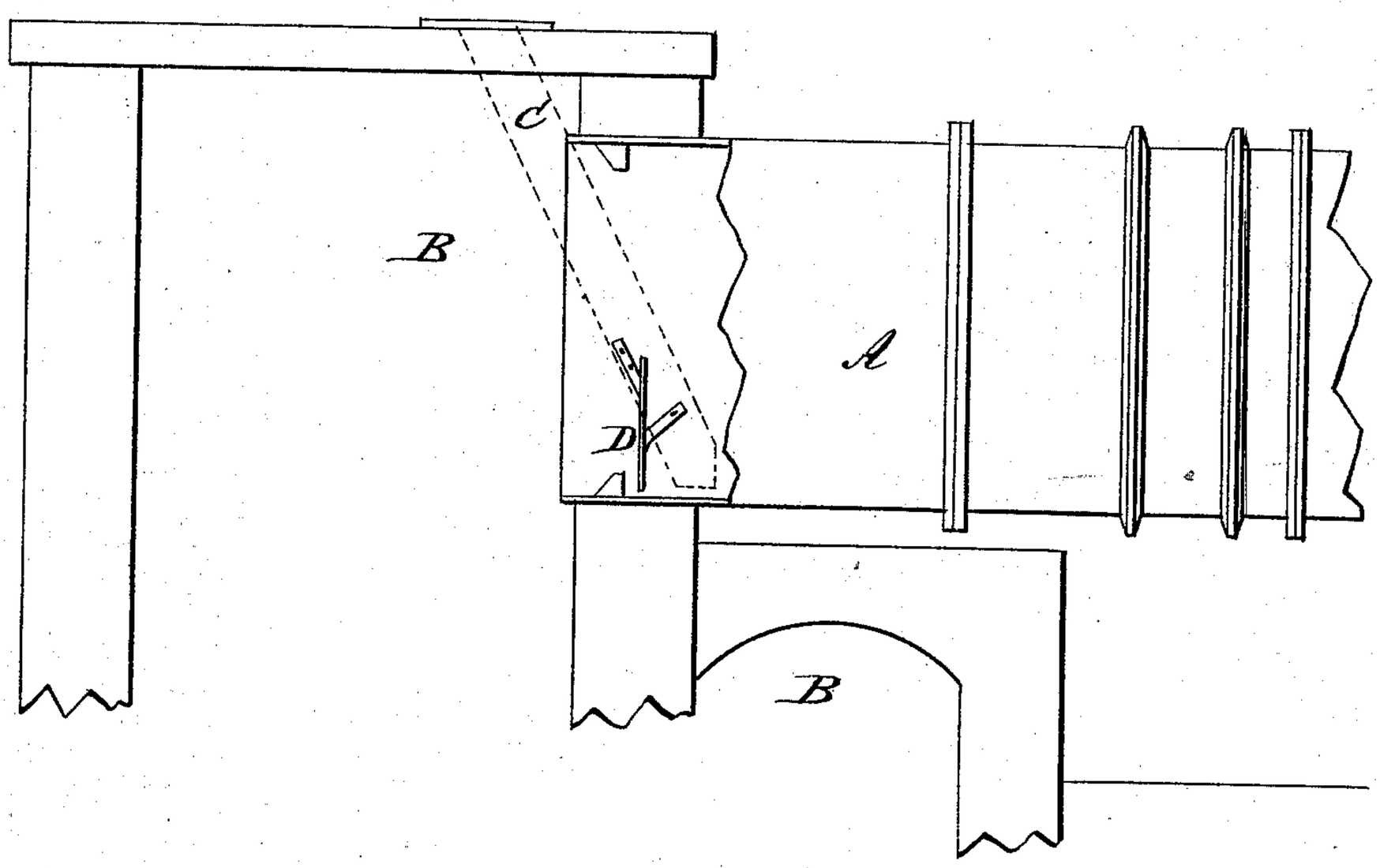


Fig: 2.

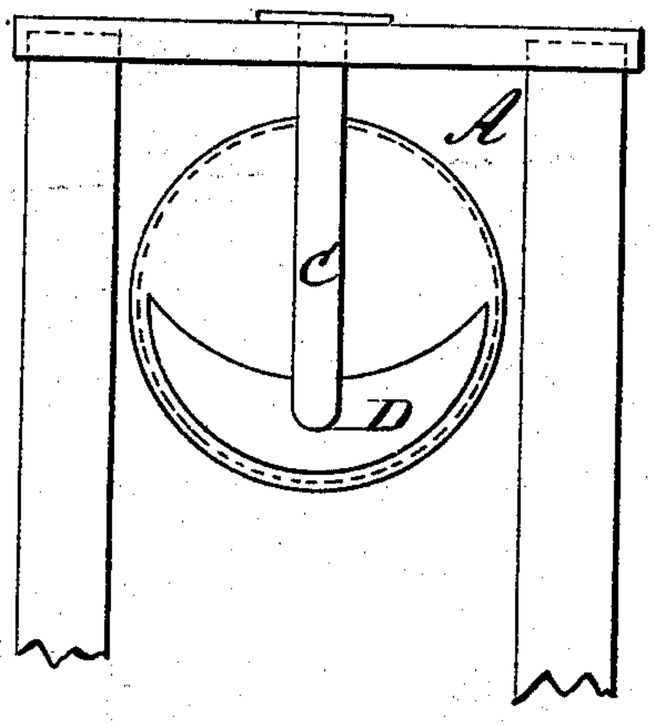
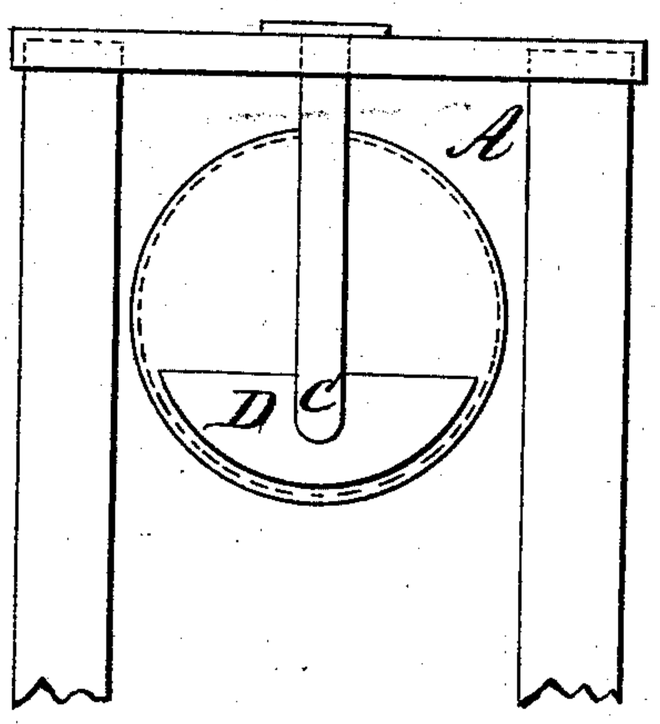


Fig: 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES K. PARDEE, OF PHILLIPSBURG, MONTANA TERRITORY.

ROTARY ORE-ROASTING FURNACE.

SPECIFICATION forming part of Letters Patent No. 235,800, dated December 21, 1880.

Application filed May 10, 1880. (No model.)

To all whom it may concern:

Be it known that I, JAMES K. PARDEE, of Phillipsburg, in the county of Deer Lodge and Territory of Montana, have invented a new and useful Improvement in Rotary Ore-Roasting Furnaces, of which the following is a specification.

The object of this invention is to increase the capacity, effectiveness, and working economies of rotary ore-roasting furnaces.

The invention is especially applicable to the Howell rotary furnace; and it consists of a diaphragm or partition fixed in rear of the furnace feed-pipe.

Figure 1 is a side elevation of the feed end of the Howell rotary furnace with parts broken away the better to exhibit my invention. Fig. 2 is an end elevation of the same. Fig. 3 is an end elevation of the same, showing a modification of my invention.

Similar letters of reference indicate corresponding parts.

The revolving cylinder of the Howell furnace is made of cylindrical cast-iron sections, bolted together, the lower or discharging end being of greater diameter than the upper or feed end thereof. The large end is lined with fire-brick, while the smaller end is not lined, but has cast-iron curved ribs bolted inside, which serve to lift the crushed ore when the furnace is revolving and to permit it to fall through the flames. The furnace or cylinder revolves on friction-wheels, and its small or feed end is several inches higher (taking a central line longitudinally through the furnace) than the discharging end, so that the ore works through the furnace by gravitation.

In operating the furnace the main fire is built in a fire-box at the large end of the cylinder, and the heat and products of combustion from said fire pass through the cylinder and into suitable dust chambers and flues at the smaller or feed end of the cylinder, and then discharge through a smoke-stack. An auxiliary fire is also built at or under the feed end of the cylinder, which fire, it is claimed, roasts or chloridizes the crushed ore that is carried out of said cylinder by the draft through it.

This furnace is especially designed for roasting and chloridizing silver ores; and to this end the stamped or pulverized ore, mixed with a suitable amount of common salt, is introduced into the feed end of the revolving cylinder through a suitable feed-pipe.

In operating a furnace of this kind of the capacity of one ton of ore an hour it was found that for the best work the two fire-places (one at each end of the revolving cylinder) consumed about ten cords of wood every twenty-four hours, and that about twenty-four tons of silver ore were introduced through the feed-pipe. It was also found that of the amount of ore fully one-third did not go through the revolving cylinder, but went into the dust-chambers about the feed end of the furnace or cylinder, and this ore going into the dust-chambers was found not to be sufficiently chloridized for amalgamation, but had to be reroasted. I then caused to be made out of boiler-plate iron a segment of a circle, the height of which was about one-third of the diameter of the cylinder or furnace, and the circumference of the circle being smaller than the circumference of the furnace, so that about a half-inch space would be left between the plate and the furnace when said plate or segment was in position. This segment or plate of iron was then fastened to the bottom of the feed-pipe, as shown in the drawings, wherein—

A represents the revolving cylinder or furnace; B, the fire-place and dust-chambers at the feed end of said furnace; C, the inclined feed-pipe, and D the diaphragm, partition, or plate fixed within said furnace A. With the diaphragm or plate D in the position shown, the furnace was run for about a month, and it was found that with the furnace in best working condition only four cords of wood every twenty-four hours were consumed, that no fire was required at the feed end of the furnace, that not one-twelfth of the ore passed into the dust-chambers, and that the chloridization of the ore was more complete than ever before.

The advantages of this device are that when the diaphragm or plate D is placed in position within the furnace A the cold crushed ore introduced through the feed-pipe C drops into an eddy in the cylinder, and is not for some time exposed to the flame and draft, said flame

and draft being directed toward the upper part of the furnace A by the said diaphragm D. The said crushed ore therefore has time to become heated and its particles to become aggregated before it is carried up high enough by the rotary movement of the furnace to drop through the moving current of flame and air, so that the danger of being carried by the draft into the dust-chambers is avoided. By the use of this diaphragm D the auxiliary fire for roasting the air-floated crushed ore is also dispensed with, as the heat and products of combustion from the main fire-box are retained longer and made more effective in the furnace. Consequently the expense of building and attending to an auxiliary fire-chamber is avoided. This diaphragm D also prevents, as has been set forth, the making of an excess of flue-dust, not more than one-tenth or one-twelfth of the amount of ore passing through the furnace, thus preventing what has hitherto been a great expense and loss in the working of ore-roasting furnaces. This diaphragm D may be constructed of wrought or cast iron, and may be made in several forms, as a segment of a circle, as shown in Fig. 3, or as a lune, as shown in Fig. 2, or in other convenient form. It can be fastened to the feed-pipe C, as shown in Fig. 1, or to a suitable iron frame, and be suspended from above and be braced and held in the desired position by suitable braces, and can be arranged to be raised or lowered by suitable devices.

Having thus described my invention, I claim as new and desire to secure by Letters Patent--

The combination, with the rotary furnace A and feed-pipe C, of the diaphragm or partition D, substantially as herein shown and described.

JAMES K. PARDEE.

Witnesses:
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THOMAS W. FISHER.