D. W. BRUNTON.

Ore-Roasting Furnace.

No. 216,148. Patented June 3, 1879.

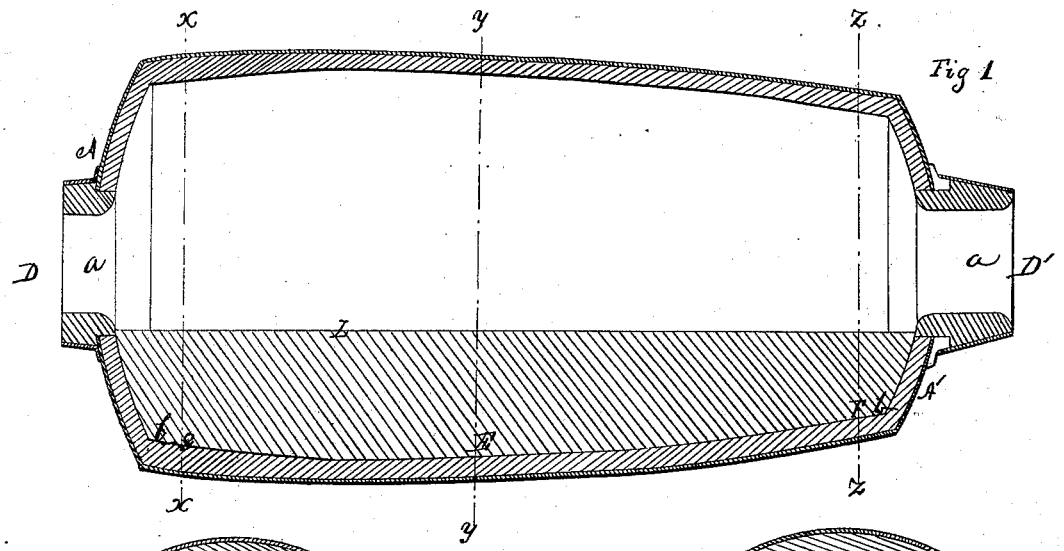

Fig 1

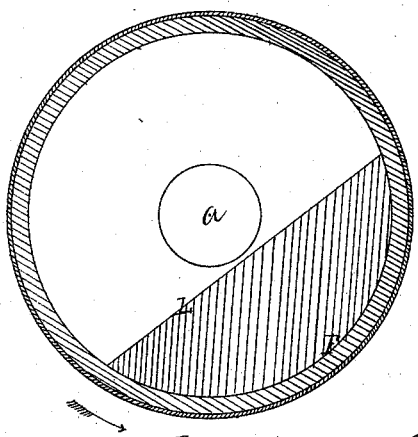

Fig 2

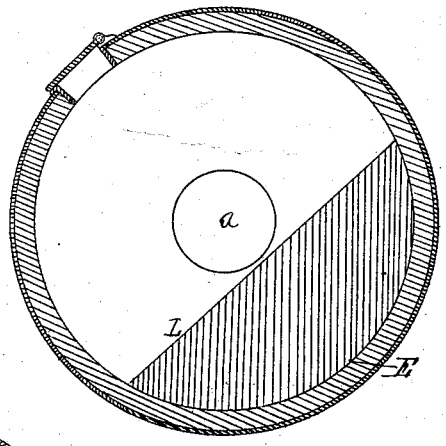

Fig 3

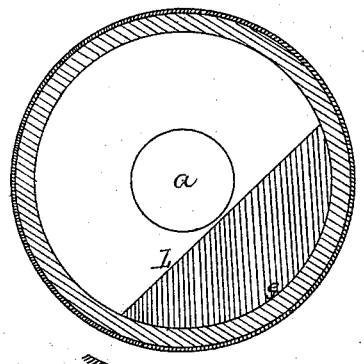

Fig 4

WITNESSES

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UNITED STATES PATENT OFFICE.

DAVID W. BRUNTON, OF SILVER PEAK, NEVADA.

IMPROVEMENT IN ORE-ROASTING FURNACES.

Specification forming part of Letters Patent No. **216,148**, dated June 3, 1879; application filed March 12, 1879.

To all whom it may concern:

Be it known that I, DAVID W. BRUNTON, of Silver Peak, Esmeralda county, Nevada, have invented certain Improvements in Ore-Roasting Furnaces; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a longitudinal vertical section. Figs. 2, 3, and 4 are sections on lines *x x*, *y y*, and *z z*, Fig. 1.

Many roasting-furnaces have been heretofore constructed wherein the interior-dimension lines were straight lines or regular curves from end to end. All roasting-furnaces so constructed I have found in actual experience to be faulty in this, that the ore was roasted irregularly, owing to the variations of the heat in the products of combustion at various points of the length of the revolving roasting-chamber. The result is, that at some parts of the furnace, where the body of ore was shallow, the ore exposed would become fused or burned, and in other parts of the furnace where the ore was of greater depth it would not be sufficiently roasted.

In this class of furnaces the heat from the products of combustion in the roasting-chamber is greatest at the center, and decreases toward the ends, the ratio of decrease being less from the center toward the end next the furnace than from the center toward the outer end of the roasting-chamber.

Having after a long experience discovered this fact, the object of my invention is to construct a furnace wherein this variation of heat in the roasting-chamber will be compensated for by the shape of the cylinder, and avoid the objections already cited.

My invention consists in a revolving roasting-furnace having an ore-containing roasting chamber or cylinder constructed with its interior longitudinal dimension in an irregular curve, so that the interior surface is farthest from the axial line of the cylinder near its center, nearest the axial line at a point near the exit of the products of combustion, and intermediately distant from the axial line near the entrance for the products of combustion, whereby the body of ore in the cylinder is distributed throughout its length in a depth directly proportionate to the amount of heat applied throughout its length.

In the said drawings, A A′ are two ends of the roasting-chamber, being slightly concave, and having at their centers the openings *a a* for the draft from the fire-place to pass through. The body of the roasting-chamber is made with its interior surface, in its longitudinal dimension, in an irregular curve, as seen at *b* to *b*, Fig. 1. This configuration contracts the cylinder slightly from the end D to D′.

When the ore is placed in the chamber, and the surface is on a line, L, just below the openings *a a*, a perpendicular dropped from the surface of the ore to the shell of the roasting-chamber would be longest about the center of the chamber, (see E,) shortest near the outer end, (see F,) and of intermediate length at the end next to the fire-place, (see G.)

Thus it will be seen that, starting from end A at a given curve, the size of the cylinder is increased toward the center in a direct ratio to the increase of heat, and from the center toward the outer end decreases in size in a direct ratio to the decrease of heat, so that the ore is distributed directly in proportion to the heat applied by the furnace.

I am able in this furnace to thoroughly chloridize and bring the ground ore out of the roaster in an impalpable powder, whereas in all furnaces heretofore used the ore comes out in a burned red color, and containing from five to fifteen per cent. of the ore fused into lumps or balls, which have to be screened out and returned to the crusher.

I am aware that ore-roasting furnaces have heretofore been made provided with revolving ore-containing chambers having their interior surfaces in curves of various descriptions; but none of them that I am aware of are constructed in an irregular curve of such peculiar gradation as to distribute the contained ore in a depth directly proportioned to the amount of the distribution of heat from the furnace.

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

A revolving roasting-furnace provided with an ore-containing cylinder or body having its interior longitudinal surface in the irregular curve *b b*—that is to say, this surface being farthest from the axial line of the cylinder near the center, nearest the axial line at a point near the exit of the products of combustion, and intermediately distant from the axial line near the entrance for the products of combustion, substantially as set forth.

DAVID W. BRUNTON.

Witnesses:

JOHN DE WITT WARNER,

D. J. TOMPKINS.