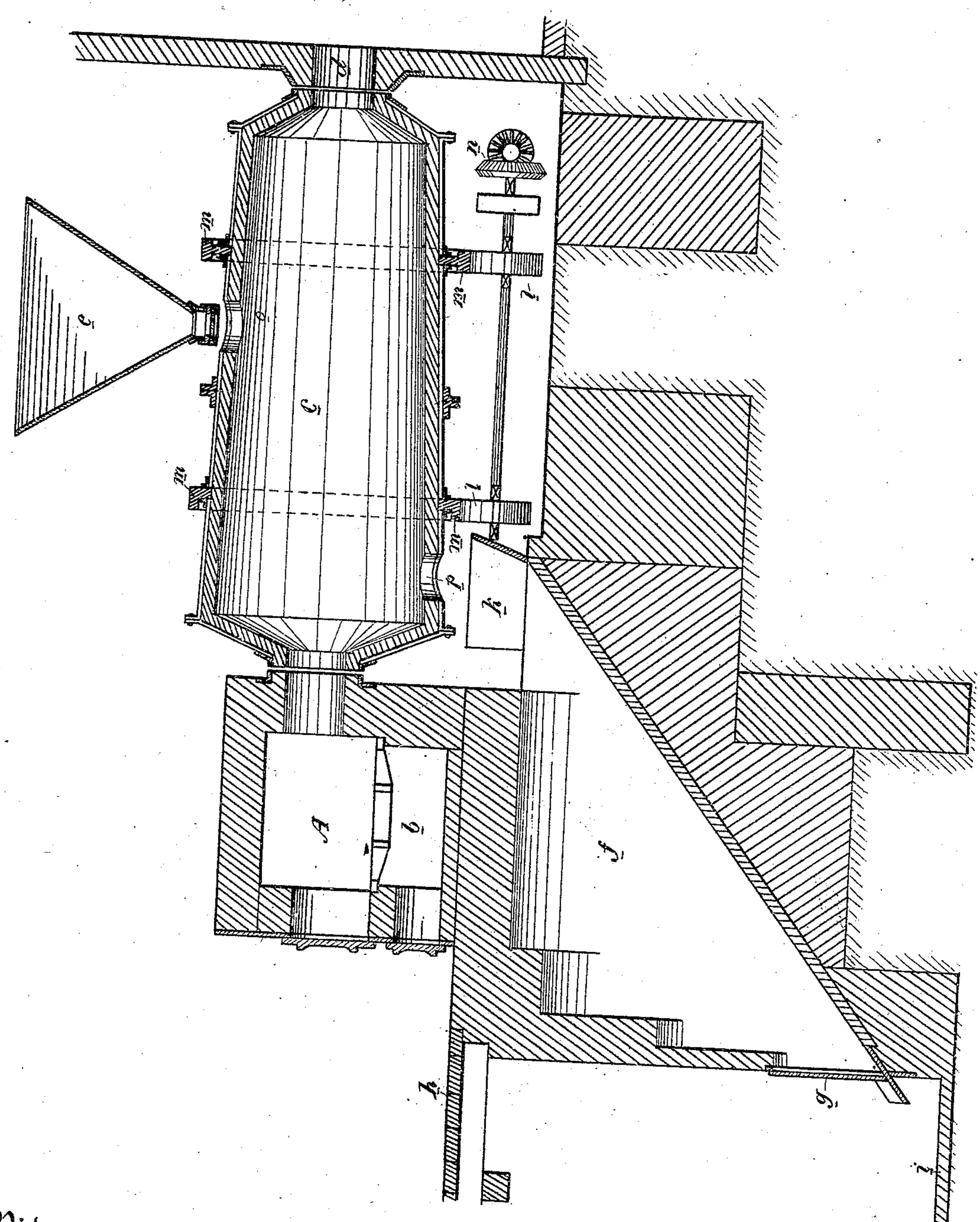
(No Model.)

A. ARENTS.

ROTARY ROASTING FURNACE.

No. 321,780. Patented July 7, 1885.



Witnesses,
Geo. H. Strong.
J. B. Howe

Inventor
Albert Arents
By Dewey & Co
Attorneys

UNITED STATES PATENT OFFICE.

ALBERT ARENTS, OF ALAMEDA, CALIFORNIA.

ROTARY ROASTING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 321,780, dated July 7, 1885.

Application filed February 28, 1885. (No model.)

To all whom it may concern:

Be it known that I, ALBERT ARENTS, of Alameda, Alameda county, California, have invented an Improvement in Rotary Roasting-Furnaces; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention consists in certain improvements of intermittent working rotary roasting-furnaces, as I shall hereinafter describe and claim.

Referring to the accompanying drawing for a more complete explanation of my invention, the figure is a longitudinal vertical section taken through the body of my furnace, showing the receiving and discharge opening, the surrounding bands or rings, fire-place, and cooling-bin.

It is a well-known fact that the intensity of the temperature of heated gases coming from a fire-place and passing through any space of more or less extent diminishes gradually as the gases pass on, the intensity of temperature being greatest nearest the fire-place or entrance and smallest near the flue or exit. It is also a fact that in ordinary roasting-furnaces the layer of ore in the roasting-chamber is of equal depth from one end to the other, practically speaking; hence with a flame of varying temperature, as it passes through the roasting-chamber, the ore is usually overheated at one end, near the fire-place, while it remains "underdone" or insufficiently heated and roasted at the other end, near the flue. My improvements obviate this bad feature entirely, or at least to a great extent, for by it I secure a layer of ore through the length of the roasting chamber or "hearth" of graduating thickness or depth, in conformity with the varying or graduating intensity of temperature of the gases passing through it—that is to say, where the greatest heat is the layer of ore is deepest, and vice versa.

I make the diameter of my roasting chamber or cylinder gradually decreasing from the end nearest the flue—or, in other words, I do not use a true cylindrical roasting-chamber, but the frustum of a cone revolving horizontally around its own axis, the base of the frustum being placed toward the fire-place, the top or the end having the smallest diameter being placed toward the flue, through which the products of combustion or gases escape into dust-chambers and a chimney.

When such a furnace or roasting-chamber is charged with pulp or crushed ore, and the chamber is rotated around its horizontal axis, the material seeks a level, and its surface soon lies parallel with the horizontal axis of the chamber; hence it is necessarily thickest or deepest toward the greatest diameter of the chamber, graduating in thickness or depth toward the smallest diameter of the opposite end, at or near which the layer of material is thinnest or most shallow. If, now, the chamber is continued to rotate, the pulp changes its surface, continually falling or tumbling sidewise, keeping its place in reference to the length of the chamber; and if a flame is passed through this chamber from the widest toward the smallest end, said flame finds more pulp to heat where itself it is hottest, and correspondingly less where it is coolest—in this chamber deepness of layer of ore and intensity of temperature conforming—and thus securing a more simultaneous and equal heating, roasting, and finishing of the charge throughout the length of the chamber, as first stated above.

A is the fire-place; *b*, its ash-pit. *c* is the roasting-chamber, in the form of the frustum of a cone. *d* is the flue, through which the products of combustion escape into any suitable series of dust-chambers and chimney. *e* is a sheet-iron hopper receiving the charge of ore prior to its introduction into the roasting-chamber. *f* is a bin of masonry located underneath the fire-place, and receiving the roasted ore when discharging of the chamber takes place. *g* is a sliding door of cast-iron, through which the ore is removed to the cooling-floor *i* after it has remained in the bin for several hours, and has gone through what is termed "banking." *h* is the fireman's floor. *k* is the sheet-iron extension of the bin *f*, in the form of a removable funnel. *l* are friction-rollers upon which the chamber is mounted and revolved. *m* are cast-iron rings, tires, or bands of equal exterior, but unequal interior diameter, fastened to the roasting-chamber and receiving their motion through friction on the

driven rollers *l*. *n* is the gearing, of any suitable arrangement, transmitting power to the rollers from any suitable motor. *o* and *p* are openings, serving, respectively, for charging and discharging the ore, which are closed at proper times by cast-iron hinged doors, usually applied for charging and discharging this class of furnaces.

The difference between the largest and smallest diameter of the roasting-chamber proper is from twelve to eighteen inches, according to the length of flame any local fuel may give. The larger the flame, the less difference should be in the two diameters; the shorter said flame, the greater should be this difference.

The roasting-chamber consists of a heavy sheet-iron shell, and is lined with four inches of common fire-brick or any suitable lining. Rollers and support-rings are made of chilled cast-iron. The two ends closing the chambers have of course central openings for the admittance and escape of the flame and gases, as is usual in rotary intermittent furnaces, and as shown in the drawings.

I am aware that conical roasting-chambers are old, and that revolving roasters have been arranged to discharge into a feeding-bin having an inclined floor and a discharge-gate, and such I do not claim, broadly; but

The specific construction and arrangement which I believe to be new and desire to claim is—

In a roasting-furnace, the combination, with a horizontal conical ore-chamber having axial end passages or openings, as described, rings or flanges surrounding the chamber, and rollers upon which they rest and by which the chamber is caused to rotate, of a fire-box connecting with the axial openings in the larger end of the chamber, a chimney with which the opening in the smaller end communicates, ore-discharge openings in the periphery of the chamber near its larger end, a receiving-bin beneath the furnace having an inclined floor with a discharge-gate at its lower end, and a removable guide or funnel between the floor and the cylinder, substantially as herein described.

In witness whereof I have hereunto set my hand.

ALBERT ARENTS.

Witnesses:
VICTOR FERNBACH,
JUL. FREY.