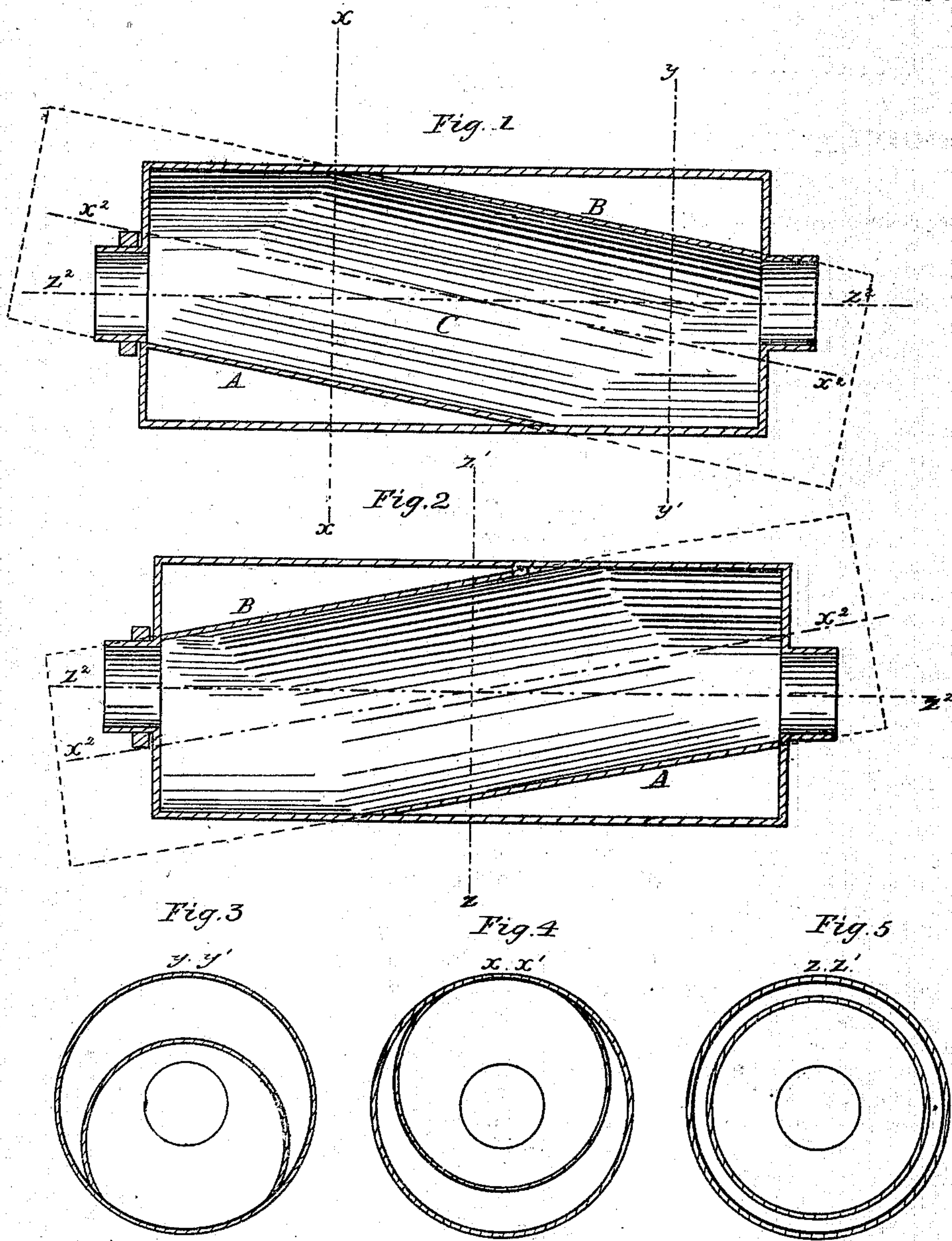


W. Bruckner.

Furnaces for Roasting Ores.

N<sup>o</sup> 71448

Patented Nov. 26, 1867.



Witnesses

Charles A. Martin  
Julius Hurty.

Inventor

William Bruckner



# UNITED STATES PATENT OFFICE.

WILLIAM BRUCKNER, OF CENTRAL CITY, COLORADO.

## IMPROVEMENT IN FURNACES FOR ROASTING ORES.

Specification forming part of Letters Patent No. 71,448, dated November 26, 1867.

*To all whom it may concern:*

Be it known that I, WILLIAM BRUCKNER, of Central City, Gilpin county, Colorado Territory, have invented certain new and useful Improvements in Furnaces for Roasting Ores, &c.; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvements without further invention or experiment.

The nature of my invention and improvements consists in making the interior of the box or cylinder, or a portion of it, at an angle of about twenty degrees from the axis of revolution, so that, as the cylinder or box is turned, the ore will, by its own gravity, roll alternately from one end toward the other at every revolution of the cylinder; and in arranging the journals of the cylinder or box diagonally opposite to each other; also, in making openings in the ends of the box or cylinder or hollow journals, for supplying and discharging the ores and for the blaze and heat of the fire to enter and roast the ores or contents of the cylinder.

In the accompanying drawings, Figures 1 and 2 show a cylinder with my improvements cut longitudinally through the center. Fig. 3 is a cross-section on the line  $y y'$  of Fig. 1. Fig. 4 is a cross-section on the line  $x x'$  of Fig. 1. Fig. 5 is a cross-section on the line  $z z'$  of Fig. 2.

In these drawings, C is the outside of the cylinder; and D D the ends, and E E the hollow journals, of the cylinder. A is a wedge-shaped cylindrical incline, on the lower side of the cylinder C, beginning just below the opening in the journal E and extending about two-thirds of the length of the cylinder, at an angle of about twenty degrees to the axis of the cylinder C. A section of this on the line  $x x'$  is shown in Fig. 4. This incline A, when the cylinder is in the position shown, causes the ores being roasted to roll from the high part of the incline next to journal toward and to the opposite end of the cylinder as the cylinder is turned in the process of roasting the ore. The incline B is similar to the incline A, and arranged diagonally opposite to it in the cylinder C, as shown in the drawings, and Fig.

3 is a cross-section of it on the line  $y y'$ . This incline B causes the ores being roasted to roll in a direction opposite to that they roll on the incline A as the cylinder is turned, so that the ore is kept constantly in motion as the cylinder is turned, rolling or sliding alternately in each direction from both ends of the cylinder.

My improved cylinder may be made of cast or wrought iron, or partly of both, and the inclines A and B may be made of the same materials, or such others as will answer the purpose, as brick or cement, proper brackets or stays being provided to hold the brick and cement in place. This cylinder may be made of iron without the parts represented outside of the inclines A and B, if it is supported by the journals; or, if not supported by the journals, it may be provided with ribs or flanges on the outside concentric with its axis of revolution, which ribs may be grooved for the chains running over pulleys, which turn and hold up the cylinder, which may be steadied by friction-rollers; or the cylinder may be turned by wheels or pulleys arranged under it, which pulleys may have ribs working in the grooves in the ribs on the cylinder, so as to turn it without chains. This cylinder may be provided with a furnace to roast the ores in it and a chimney to conduct off the smoke, such as are shown and described in my Patent No. 60,134, and dated December 4, 1866, or such other kind of furnace or chimney as will answer the purpose. The cylinder may also be provided with a door on the side, for charging and discharging the cylinder, when required; or it may be charged and discharged through the journals or openings in the ends.

In operating this cylinder, a charge is put in, and, as the cylinder is turned, all the ore is caused to roll or slide down the incline A in the first half of the revolution, and in the next half-revolution the ore rolls or slides back again on the incline B, so that all the pieces or particles of ore are kept constantly in motion, backward and forward, and perfectly exposed to the oxidizing influence of the heat and air in the cylinder.

What I claim as my invention and improvement in cylindrical rotary furnaces for roasting ores, &c., is—



1. Making or arranging the interior of the box or cylinder at an angle with or to the axis of revolution, substantially as described, so that, as the cylinder or box is turned, the contents will, by their own gravity, roll or slide alternately from one end toward the other at each revolution of the cylinder.

2. Making the journals at the ends of the cylinder diagonally opposite to each of the inclines or interior working-surfaces of the cylinder.

3. In combination with a box or cylinder having its journals arranged diagonally to its interior inclines or working-surfaces, as described, making openings in the ends or hollow journals for the blaze and heat to enter the cylinder to roast the ores, or for supplying and discharging the ores to be roasted.

WILLIAM BRUCKNER.

Witnesses:

HENRY GRANNIS,  
ED. C. PARMELEE.