

(No Model.)

2 Sheets—Sheet 1.

R. KÖHLER.
REVOLVING ROASTER.

No. 475,060.

Patented May 17, 1892.

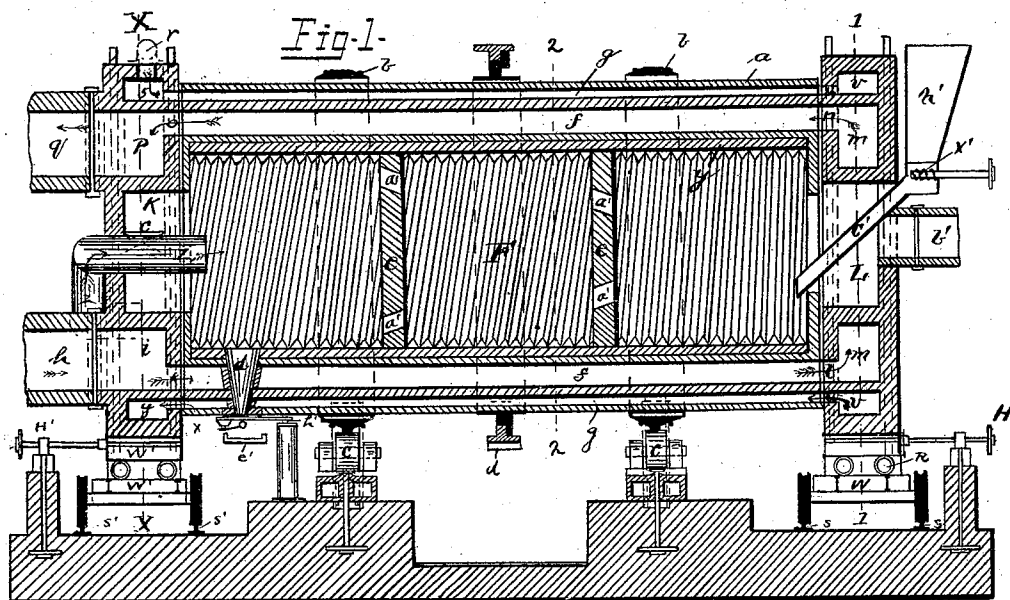


Fig-2-

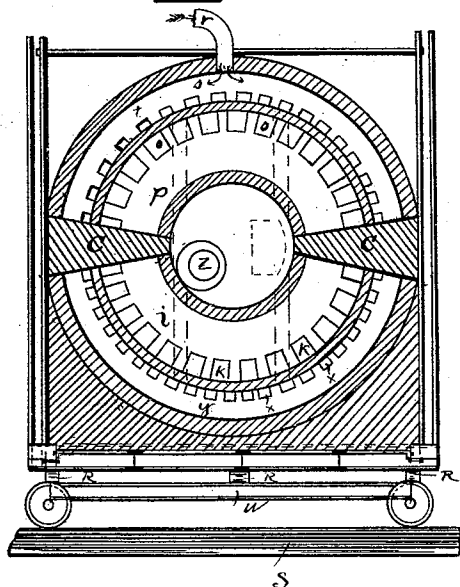
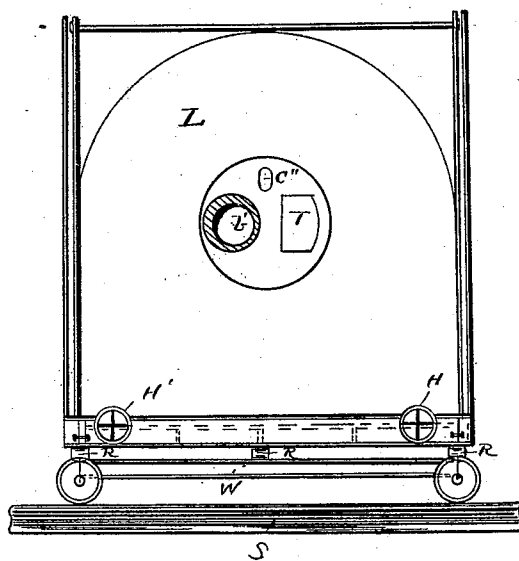


Fig-3-



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(No Model.)

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Fig. 4.

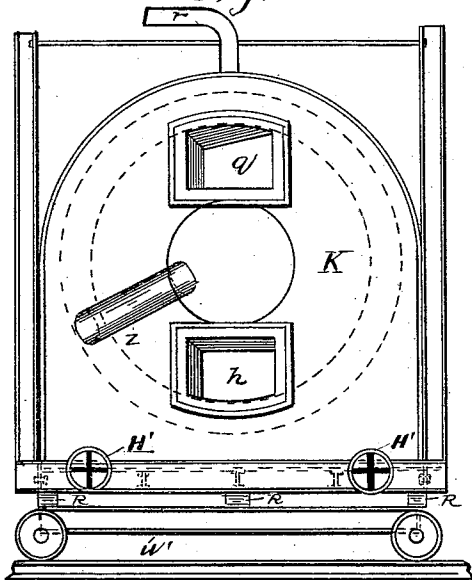


Fig. 5.

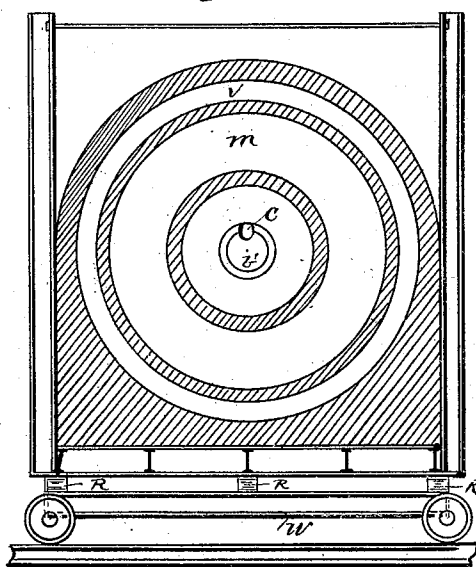


Fig. 6.

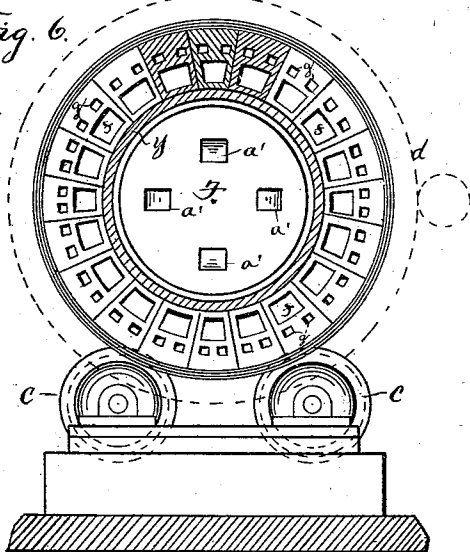
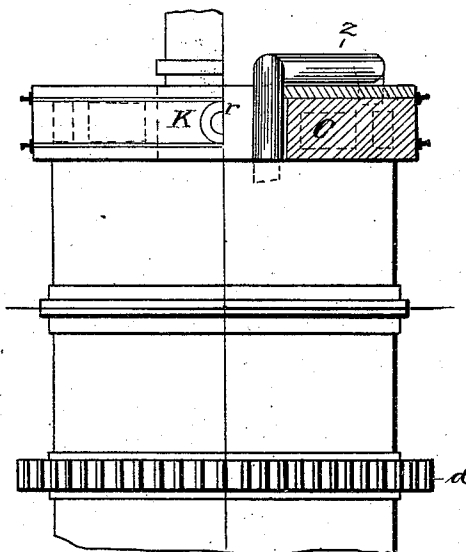


Fig. 7.



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UNITED STATES PATENT OFFICE.

RUDOLPH KÖHLER, OF LIPINE, GERMANY.

REVOLVING ROASTER.

SPECIFICATION forming part of Letters Patent No. 475,060, dated May 17, 1892.

Application filed January 6, 1891. Serial No. 376,892. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH KÖHLER, foundry-owner, a subject of the Emperor of Germany, residing at Lipine, Silesia, in said Empire, have invented a certain new and useful Improvement in Revolving Roasters, of which I declare the following to be a full, clear, and exact description.

This invention relates to a revolving assay-furnace for the drying, calcination, or roasting of pulverized material in general and for the roasting of sulphide of zinc in particular.

In the accompanying drawings, Figure I shows a longitudinal section through the furnace and its front part K and back part L; Fig. II, a section on line *xx* of Fig. I; Fig. III, the front view of part L; Fig. IV, the front view of part K; Fig. V, a section following line 1 1 of Fig. I; Fig. VI, a section following line 2 2 of Fig. I; Fig. VII, a top view of the front part K, with a section through the fire-brick C, Fig. II, as also a part of a rotating retort with heating of the air for the roasting of sulphide of zinc.

The principal parts of this retort are, first, the rotating cylinder F; second, the front door K, and, third, the rear door L. The last-named two parts are on movable trucks W W', (on the tracks S S',) and are movable, as well sidewise from the oven as also to the front, by means of the hand-screws H H and rollers R R, so that a space is formed between the furnace proper and these doors, which construction can be used for cleaning purposes.

The retort F consists of an inner easily-changed fire-brick cylinder Y in the form of a muffle, with the dividing-walls *ee*. This cylinder is surrounded with fire-brick, Fig. VI, in which the heating-canals *f* and air-canals *g* are arranged. Exteriorly the furnace is inclosed by an iron casing *a* with stiffening-rings *b b*, and these latter rest on rollers *c c*. (See Figs. I and II.) The whole cylinder F is given slow rotatory movement by means of a driving-gear *d*.

The retort is closed by the front furnace-door K and the rear one L. They have the purpose of effecting the continuous connection of the lower and upper gas and air canals with the corresponding chambers in K and L. Tight joints between these doors and the cylinders are made by pressing them against the

cylinder by means of the hand-screws H H'. They therefore remain stationary while the furnace rotates. If the inner furnace is to be repaired, the doors K and L are screwed back and rolled to the side on the tracks S.

The process of roasting is as follows: From any desired fuel the heating-gases pass through the heating-canal *h* into the lower heating-gas chamber *i*, and from here they flow in the direction shown by the arrows through the openings *h* into the lower heating-canal *f*, through the openings *l* into the rear heating-gas chamber *m*, through the openings *n* into the upper heating-canals *f*, and flow then through openings *o* into the upper collecting chamber *p* and the flue *q* to the chimney. The combustion air, which is furnished under a slight pressure by an air compressor or ventilator, goes through the pipe *r* into the upper air-collecting chamber *s*, flows through the openings *t* into the upper air-canals *g*, through the openings *u* into the rear air-collecting chamber *v*, through openings *w* into the lower air-canals *g*, and goes in a heated condition through the openings *x* into the lower air-collecting chamber *y* and pipe *z* into the furnace-cylinder F. The crude sulphide is fed through the opening *c'* from the hopper *h'* into the last chamber, goes from one chamber into the other through the overfall openings *a*, and is finally discharged in a perfect roasted condition through the discharge-opening *d'* onto a loading-board *e'*, running transversely to the direction of the furnace. During the process of roasting the cylinder F rotates and the roasting material is carried through the screw-like-arranged passages from the receiving-place to the discharge-opening. The gases generated during the roasting go through the openings *a* of the dividing-walls *e* from one chamber into the other, and finally flow in an enriched condition through pipe *b'* to the dust-chamber to be further treated.

The roaster is a retort in which the roasting material is heated in a closed space from the outside by the heating-gases in the canals *f* in one operation, so that the gases resulting from the roasting are kept separate from the heating-gases, and the former gases isolated in this wise are obtained to be used, for instance, in making sulphuric acid. The feed-

ing, stirring, moving, and discharging of the sulphide are effected by the rotation. Through the constant renewal of the surface of the roasting material under the influence of heated air the process of roasting is a very energetic one.

In consequence of the division of the furnace into several chambers the enriched gases which are in the rear chambers are hindered from flowing back.

Through the induction under slight pressure of the air through the tube *r* into the upper chamber *s*, Figs. I and II, and from here through canals *g* (in the direction of the arrows) the walls of the furnace are cooled off, and the air is then heated by the heating-canals *f*. The course of the roasting can also be regulated, according to whether more or less pressure is given.

In Fig. II two fire-bricks *C C* are shown. These are as broad as the open breadth of the chamber of the front part *K*. (See, also, Fig. VII, where this fire-brick is shown in section.) These stones *C C* separate the upper and the lower air and heating chambers.

No special value is laid on the feeding of the roasting material through hopper *h'* and

pipe *c'*, which is effected by a mechanically-actuated worm *x'*, nor on the discharge through *d'*.

I claim—

In a revolving roaster, the combination of a hollow rotating cylinder having longitudinal air and gas passages in its walls, doors *K* and *L*, closing the ends of said cylinder, door *K* being provided with air inlet and exhaust chambers *p i*, arranged to communicate with the air-passages in the cylinder, and gas inlet and exhaust chambers arranged to communicate with the gas-passages in the cylinder, door *L*, provided with passages arranged to connect the air and gas passages, respectively, means for conveying the heated air from the exhaust-chamber *i* to the interior of the cylinder, and an escape-flue leading from the cylinder, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

RUDOLPH KÖHLER.

Witnesses:

M. DUNLAP,
NELLIE B. DUNLAP.