W. O. SLEEPER.

Revolving Ore-Roaster.

No. 215,301. **Patented May 13, 1879.**

Fig. 1.

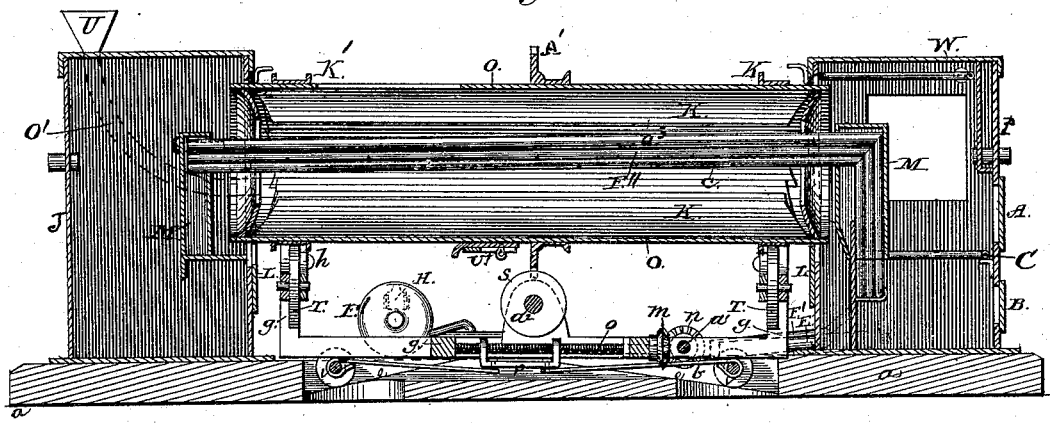


Fig. 2.

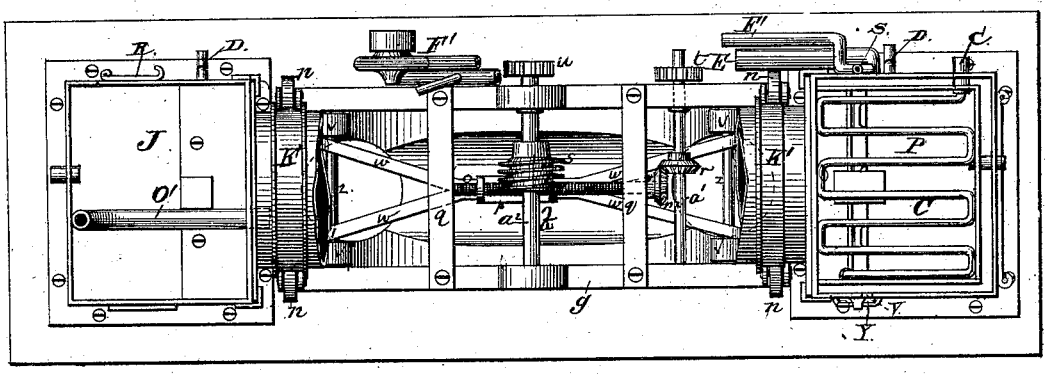
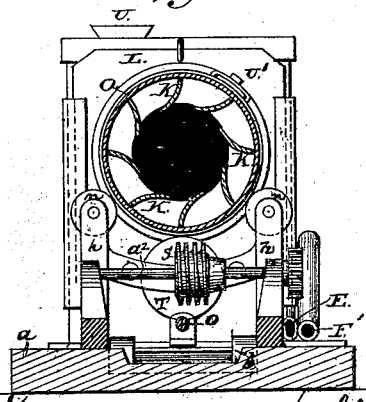


Fig. 3.



Attest:

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UNITED STATES PATENT OFFICE.

WILLIAM O. SLEEPER, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN REVOLVING ORE-ROASTERS.

Specification forming part of Letters Patent No. **215,301**, dated May 13, 1879; application filed April 18, 1878.

To all whom it may concern:

Be it known that I, WILLIAM OSGOOD SLEEPER, of San Francisco, in the county of San Francisco and State of California, have invented a new and useful Improvement in a Rotary-Cylinder Furnace, for roasting and desulphurizing the bases in gold, tin, copper, lead, zinc, and antimonial ores, and for chloridizing and treating silver ores.

My invention relates to improvements in ore-furnaces; and consists, first, in the employment of a tilting and revolving cylinder for roasting ores, connected with fire-chambers, and supported upon a frame provided with wheels, made to traverse oppositely-inclined planes in a bed-plate, whereby a tilting movement is given the cylinder.

My invention further consists in supporting the ore-cylinder on hollow rollers partly filled with water, and journaled in a reciprocating frame, whereby the hollow rollers containing water perform the functions of friction-rolls for the cylinder, and also prevent heating.

My invention also consists in the construction of the ore-cylinder with flanged guide-rings, which rest on the hollow rollers of the frame, a toothed central ring, and curved longitudinal slats.

My invention also consists in the employment of hollow standards in the fire-chambers, provided with orifices near their upper ends, for the support of a water-bridge pipe, and the passage of steam and air through perforated pipes attached to the water-bridge pipe into the ores contained in the cylinder.

Figure 1 is a vertical longitudinal section of my improved ore-furnace. Fig. 2 is a plan view of the same; and Fig. 3 is an end elevation.

Similar letters indicate like parts in all the figures.

In the accompanying drawings, *a* is the base-plate or support of my improved furnace, provided with a central recess, *b*, (see Fig. 1,) having oppositely-inclined planes *e e*. *g* is a rectangular frame, provided with the four corner posts, *h*, having slots in their upper ends, in which are journaled the hollow rollers *n n*, partly filled with water, to prevent their heating. T are rollers, journaled in cross-beams connecting the end posts *h*, said rollers being also hollow and partly filled with water, to prevent heating. *q q* are cross-ties connecting the longitudinal sides of the frame *g*. *o* is a screw-shaft, having its bearings in the cross-ties *q q*, and provided at one end with a pinion, *m*, which meshes with a pinion, *r*, on the cross-shaft a^1, having its bearings in the longitudinal sides of the frame, and provided at its outer end with the pinion *t*. *p* is a block, provided at its end with upright ears, having screw-threaded perforations, through which the screw-threaded shaft *o* passes. *z* are axles, on the outer end of which are sleeves turning loosely on said axles, which latter are provided with wheels *v v*. *w w* are hounds attached to the axles, and pivotally connected with the block *p*. a^2 is a transverse shaft, journaled in ears in the frame *g*. The axle a^2 is provided with a central worm, *s*, and end pinion *u*.

O represents a hollow cylinder, resting on the wheels T, and supported laterally by the wheels *n n*. The cylinder O is provided near its ends with flanged rings K′, which receive the rollers or wheels T *n n*, and guide the cylinder in its revolution. A′ is a toothed ring surrounding the cylinder O and gearing with the worm *s*. The ends of the cylinder O open into the chamber J, connected with the smoke-stack, and into the fire-chamber P, where the ore in the cylinder is discharged through the opening Y in the lower part of the fire-box, provided with a door.

K K represent curved metallic slats extending lengthwise of the cylinder, and preferably made fire-proof, which raise the ore as the cylinder revolves. U represents the feed-hopper, provided at its lower end with a bent tube, *o′*, leading into the cylinder O. U′ is a door in the side of the cylinder. L L represent sliding plates, provided with orifices for the reception of the ends of the cylinder O. These plates slide up and down in grooves as the cylinder is tilted to close the openings in the walls.

Power being applied to the shaft a^1, the frame *g* is moved forward, the wheels *v v* on one side passing up the inclined plane on one side, and the opposite set of wheels *v v* passing down the opposite inclined plane, the friction-

sleeves on the ends of the axles resting and revolving on side strips attached to the inclined planes.

By this construction the cylinder may be adjusted to any inclination to facilitate the working and discharge of the ore.

Power applied to the shaft a^2 to rotate it will cause, through the worm *s* gearing into the toothed ring A′, a revolution of the cylinder O.

M M are hollow iron standards situated in the chambers J P, and provided near their upper ends with orifices, for the support of the water-bridge pipe a^3, and the passage of steam and air through the perforated pipes C F into the cylinder.

The perforated steam and air pipes are banded to the water-bridge pipe a^3, which supports them, and a current of water is forced through one of the pipes D into the bridge-pipe a^3 to prevent it from heating, and after passing through the bridge-pipe is discharged through the other pipe D, both the feed and discharge pipes D passing through the hollow standards M, and connecting with the water-bridge pipe a^3.

E is a pipe for conveying air to the blower F′, and thence through a pipe in the standard M into the perforated pipe F″ in the cylinder.

If cold air is desired, the hot air in the pipe E is shut off, and cold air is admitted through the blower.

The fire-chamber is lined with steam-superheaters; or the exhaust-steam from the engine may be conveyed by a tortuous pipe, C, up through the hollow standards M, and thence to the perforated pipe *c*, attached thereto, and mingled with the ore.

The perforations in the pipe are all on the under side, and the pipes are coated with a fire-proof material.

S is the escape-steam pipe, that leads from the end of the superheater in case the steam is not wanted in the cylinder.

I claim as new and of my invention—

1. The base *a*, provided with a recess, *b*, having oppositely-inclined planes *e*, in combination with the frame *g*, screw-shaft *o*, block *p*, hounds *w*, axles *z*, and wheels *v*, substantially as described, and for the purpose set forth.

2. The frame *g*, provided with the hollow rollers *n* T, partly filled with water, and transverse worm-shaft a^2, in combination with the cylinder O, provided with the flanged rings K′, toothed ring A′, and curved slats K, substantially as and for the purpose set forth.

3. The frame *g*, provided with the hollow rollers *n* T, partly filled with water, in combination with the revolving cylinder O, substantially as described, and for the purpose set forth.

4. The hollow standards M M, having orifices near their upper ends, in combination with the pipes *c* F a^3 and cylinder O, substantially as described, and for the purpose set forth.

5. The cylinder O, provided with the flanged rings K′, toothed ring A′, and curved slats K, in combination with the pipes *c* F a^3, passing longitudinally through the cylinder, substantially as described, and for the purpose set forth.

WILLIAM OSGOOD SLEEPER.

Witnesses:
TRUE PAGE SLEEPER,
CHARLES SLEEPER.