

H. HERRENSCHMIDT.
Ore-Roasting Furnace.

No. 223,850.

Patented Jan. 27, 1880.

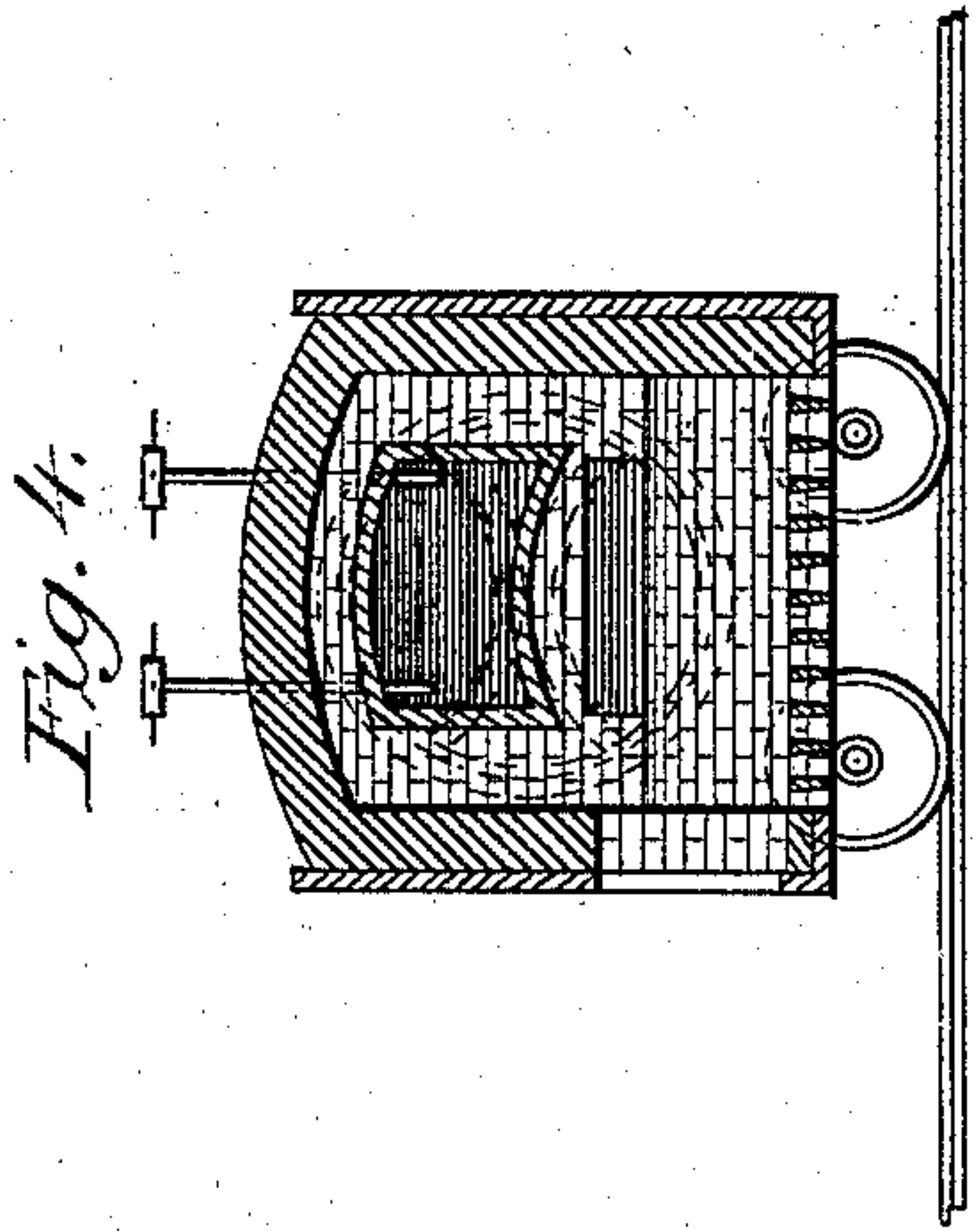


Fig. 4.

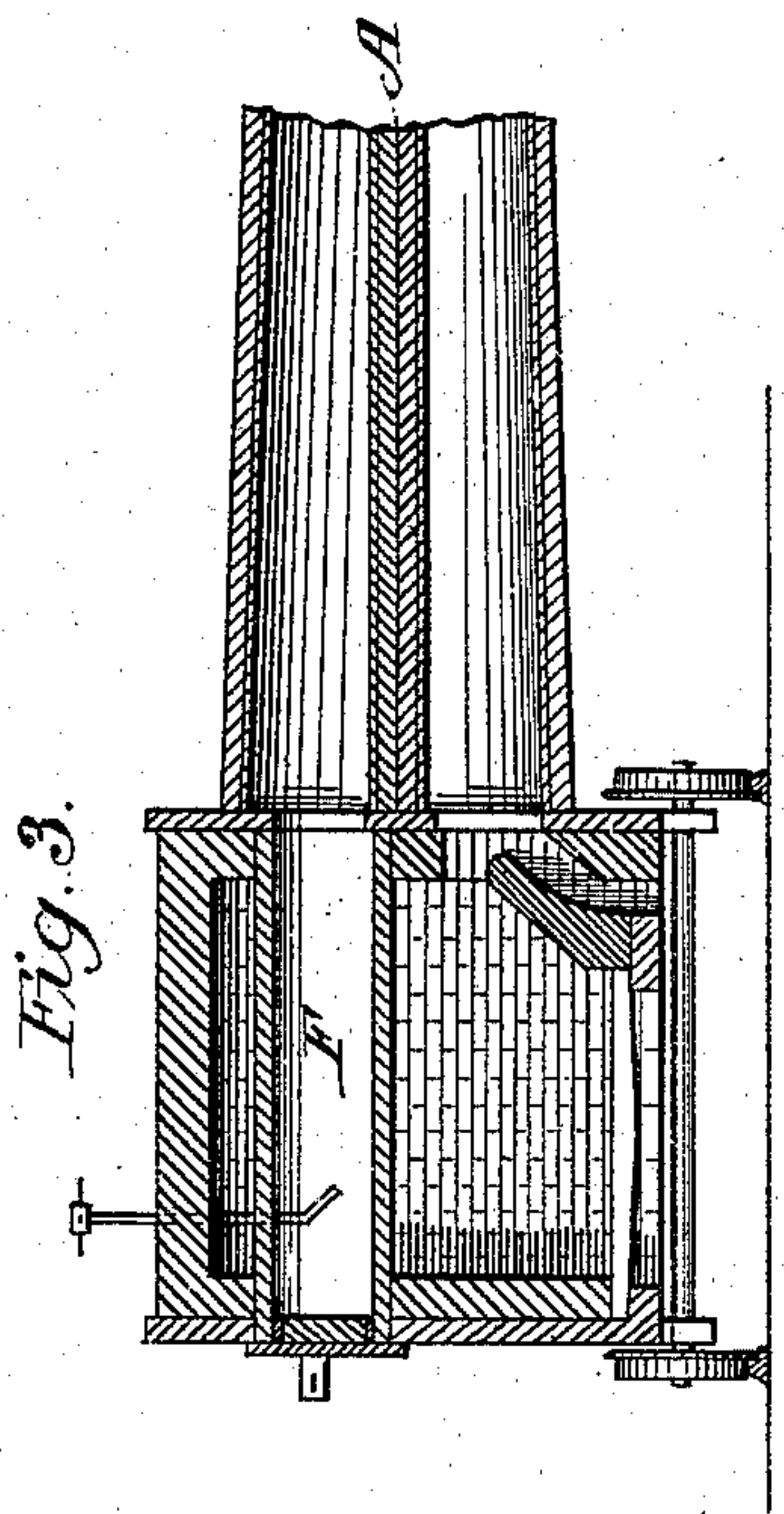


Fig. 3.

Fig. 1.

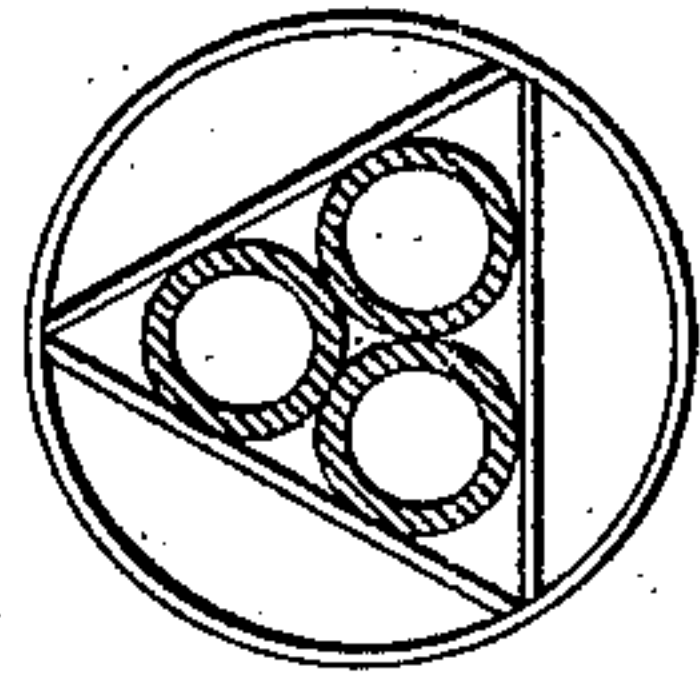
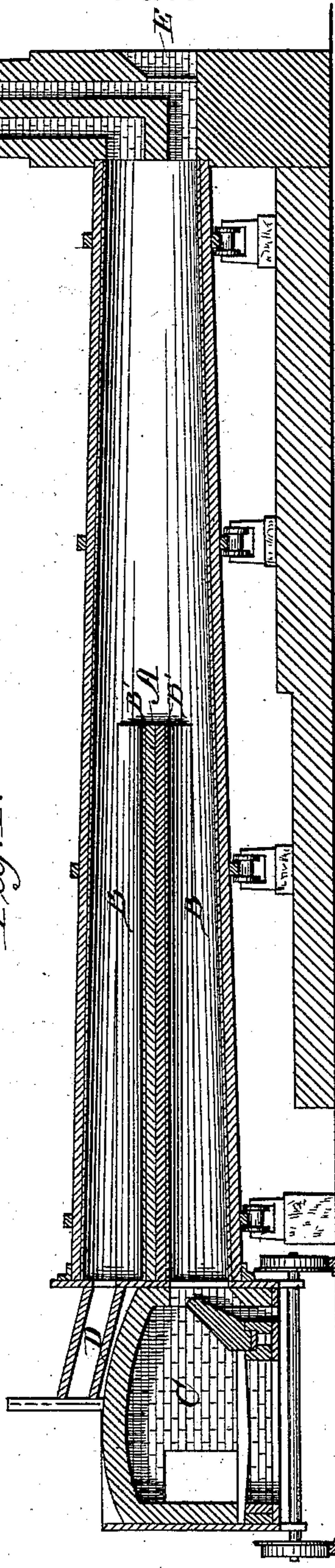


Fig. 6.

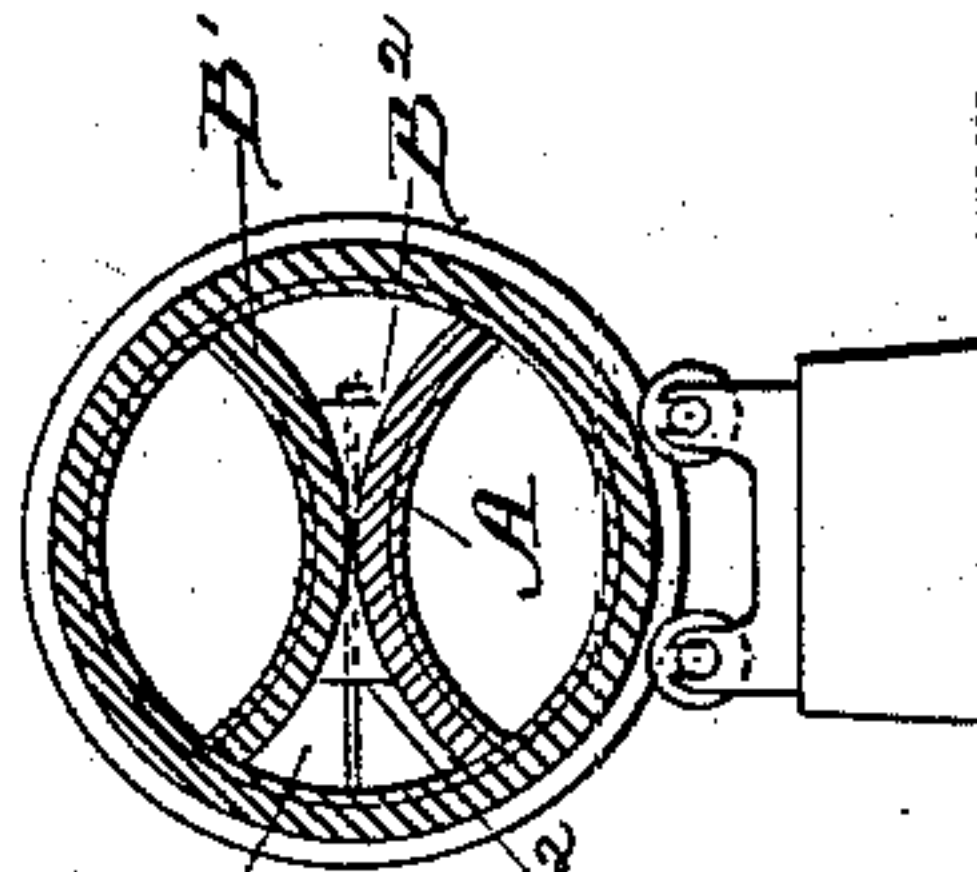


Fig. 2.

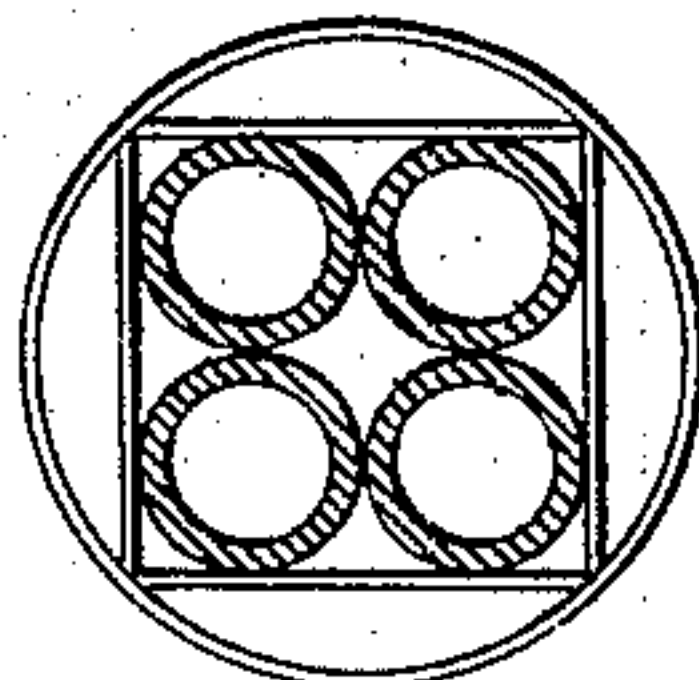


Fig. 5.

Witnesses:
Edw^d Waters.
W. S. Bayston

Inventor:

H. Herrenschmidt

UNITED STATES PATENT OFFICE.

HENRI HERRENSCHMIDT, OF MELBOURNE, VICTORIA, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO JAMES WHITE AND WILLIAM GEORGE LEMPRIERE, OF SAME PLACE.

ORE-ROASTING FURNACE.

SPECIFICATION forming part of Letters Patent No. 223,850, dated January 27, 1880.

Application filed October 12, 1878.

To all whom it may concern:

Be it known that I, HENRI HERRENSCHMIDT, of Melbourne, in the Colony of Victoria, civil engineer, have invented new and useful Improvements in Furnaces for Roasting Ores, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

This invention consists, mainly, in the combination, in a furnace, of a revolving tapering portion with a removable fire-chamber, as will be fully described hereinafter.

The roasting-chamber is set horizontally, the feed being at the smaller end and the discharge at the larger end. The fire-place is at the latter end, and the chimney-stack at the former end.

In a forty-foot chamber the larger end should be about two feet more in diameter than the smaller end. The said chamber revolves on friction-rollers supported on suitable piers. The material is fed through an inclined chute. Allowance must be made in the brick-work for the expansion of the roasting-chamber by heat. The said chamber may be divided into two or more longitudinal compartments, and the outer casing may be triangular, square, or polygonal. Passages are provided for the admission of air to either the upper or lower half of the said chamber. When the material requires to be treated with hydrogen gas, the divisions must extend the whole length of the chamber and terminate in separate ascending flues.

The fire-place is carried on wheels running on rails, to admit of its easy removal in the event of its becoming necessary to obtain access to the body of the roasting-chamber, or to substitute one with a hydrogen-gas generator for a fire-place without one, or vice versa.

The revolving motion is very slow—say one revolution in five minutes—and it may be either continuous or intermittent, the object being to subject the material under treatment to the action of heat and atmospheric air or heat and hydrogen gas alternately.

Referring to the drawings hereto attached, Figure 1 shows a longitudinal section of a furnace constructed according to this invention,

in which only two longitudinal compartments are made in the roasting-chamber, this being the number I prefer. Fig. 2 shows a cross-section thereof. Fig. 3 shows the same roasting-chamber, but with a hydrogen-gas generator over the fire-place, so as to supply hydrogen when required instead of atmospheric air. Fig. 4 shows a cross-section thereof. Figs. 5 and 6 show cross-sections of other tapering tubular roasting-chambers with more than two longitudinal compartments, being modifications of my invention.

A is the longitudinal division, which consists of two concave surfaces, the crown of each meeting that of the other, while the end of space B is provided with a head consisting of an iron plate, by means of which communication with the space is cut off, so that it cannot serve as a passage for the heated air or gas. This division is made of brick or brick-earth, and is supported by wrought-iron plates or backing B', which are pressed against the back of said division-walls by means of wedges B², screwed tight. Air-holes are left at intervals to cool these wedges and plates.

C is the fire-place, and D the opening for the entrance of the atmospheric air. These also act as sight-holes.

E is the feeding chute or hopper.

The roof of the fire-place must be built on a level with the division, so as to compel the heat to pass through that half of the revolving roasting-chamber which for the time being is the lower, although, of course, either compartment can be made the heating one at pleasure by revolving the roasting-chamber.

In Fig. 3, F is the hydrogen-gas generator. In any case the fire-place is made removable, as shown.

The mode of operation is as follows: The material to be treated is supplied through the chute E, the atmospheric air holes D opened, and the fire lighted in the fire-place C. The roasting-chamber is then slowly revolved at a regular speed or by a constant succession of partial revolutions, or it may vary in speed during each revolution, moving very slowly so long as the compartments are fairly exposed to the action of the heat, atmosphere, or hy-

drogen, as the case may be, and traveling much quicker from one position to the other, or it may stop altogether while being thus exposed, so as to make it an intermittent motion.

5 When the material reaches the commencement of the divisions A it distributes itself between the two compartments, part entering one half and part entering the other half of the chamber, each half being alternately the
10 upper and lower one respectively. Whichever is the upper one has its contents exposed to the action of the atmosphere. During the process of revolution; however, both compartments are at times exposed to the heat of the
15 furnace.

When treating sulphurets, which are difficult to roast and easy to smelt, such as antimony sulphuret, I use a fire-place with hydrogen-gas generator, as shown in Fig. 3.
20 I produce the gas by means of steam admitted into the retort F, containing iron, the result of which is (as is well-known) the retention of the oxygen of the steam by the iron, and the setting free of the hydrogen. This is then

conducted into the upper half of the revolving 25 roasting-chamber, the atmospheric-air entrances D having been previously closed. It is obvious that the hydrogen might be conducted into the lower compartment, if so desired, by altering the arrangement of the fire- 30 place. In the event of triangular or polygonal roasting-chambers being used, I should provide them with a circular framing to support them, and from which to impart the necessary motion. 35

Having thus fully described the said invention, and the manner of performing the same, I wish it understood that I claim—

In the described furnace, the combination of the revolving tapering portion B, having 40 partition A, with the removable fire-chamber C, constructed and arranged as and for the purpose described.

H. HERRENSCHMIDT.

Witnesses:

EDWD. WATERS,
W. S. BAYSTON.