

No. 68,406.

PATENTED SEPT. 3, 1867.

J. AGRELL & J. KLEPZIG.  
FURNACE FOR ROASTING ORES.

Fig. 2.

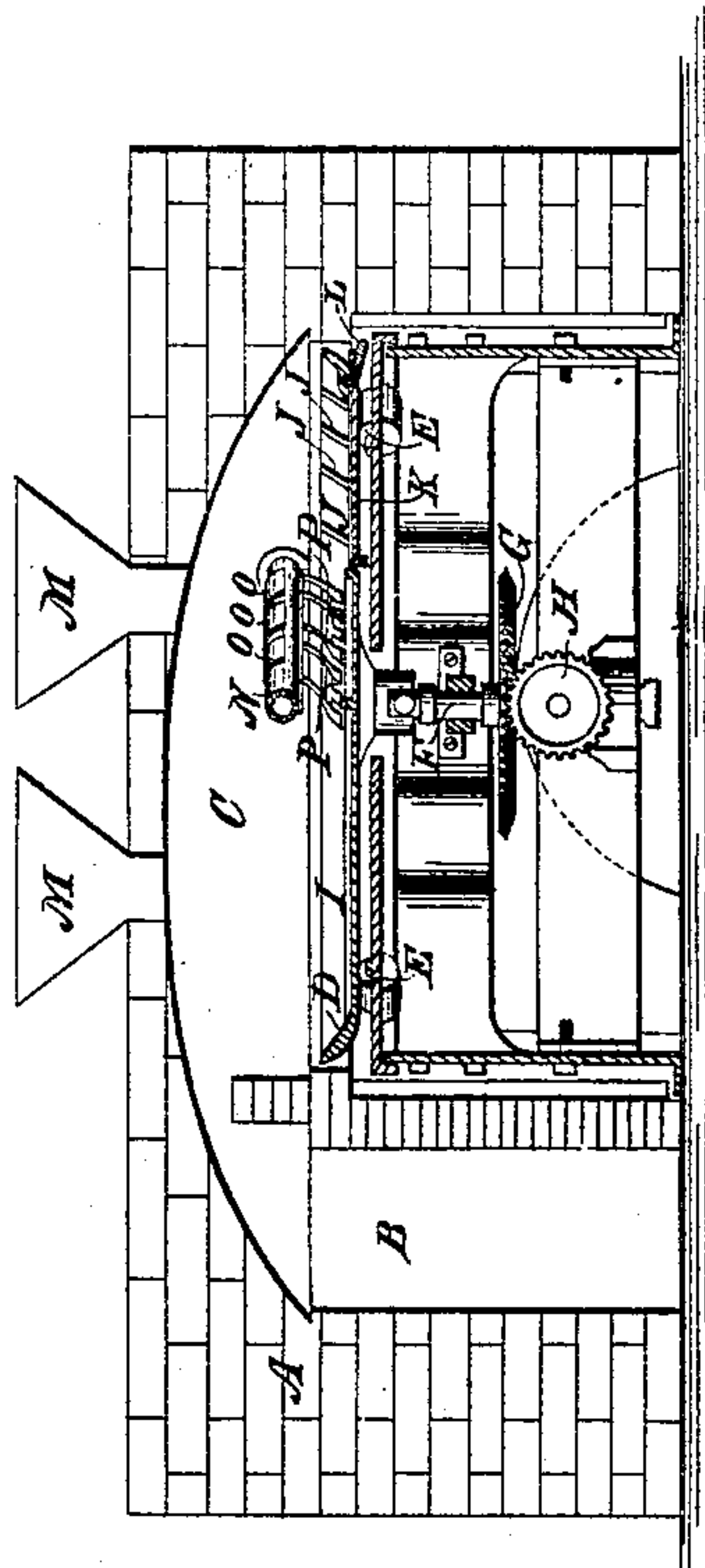
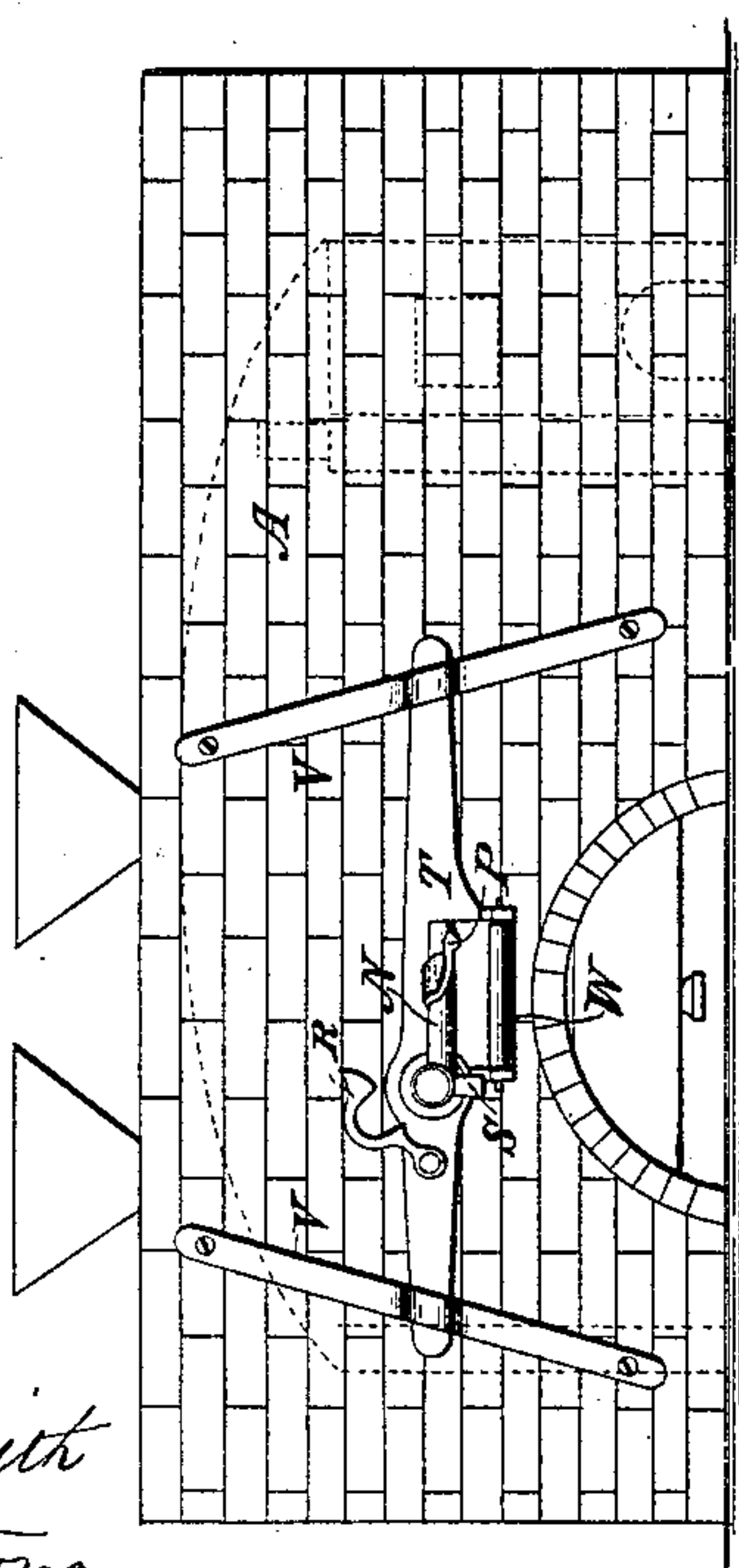


Fig. 1.



WITNESSES:

Chas. Smith  
Geo. H. Strong

Fig. 4.

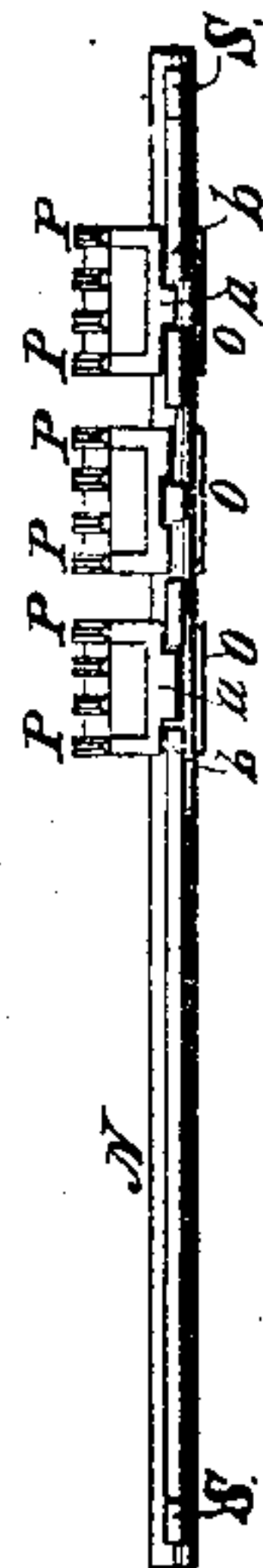
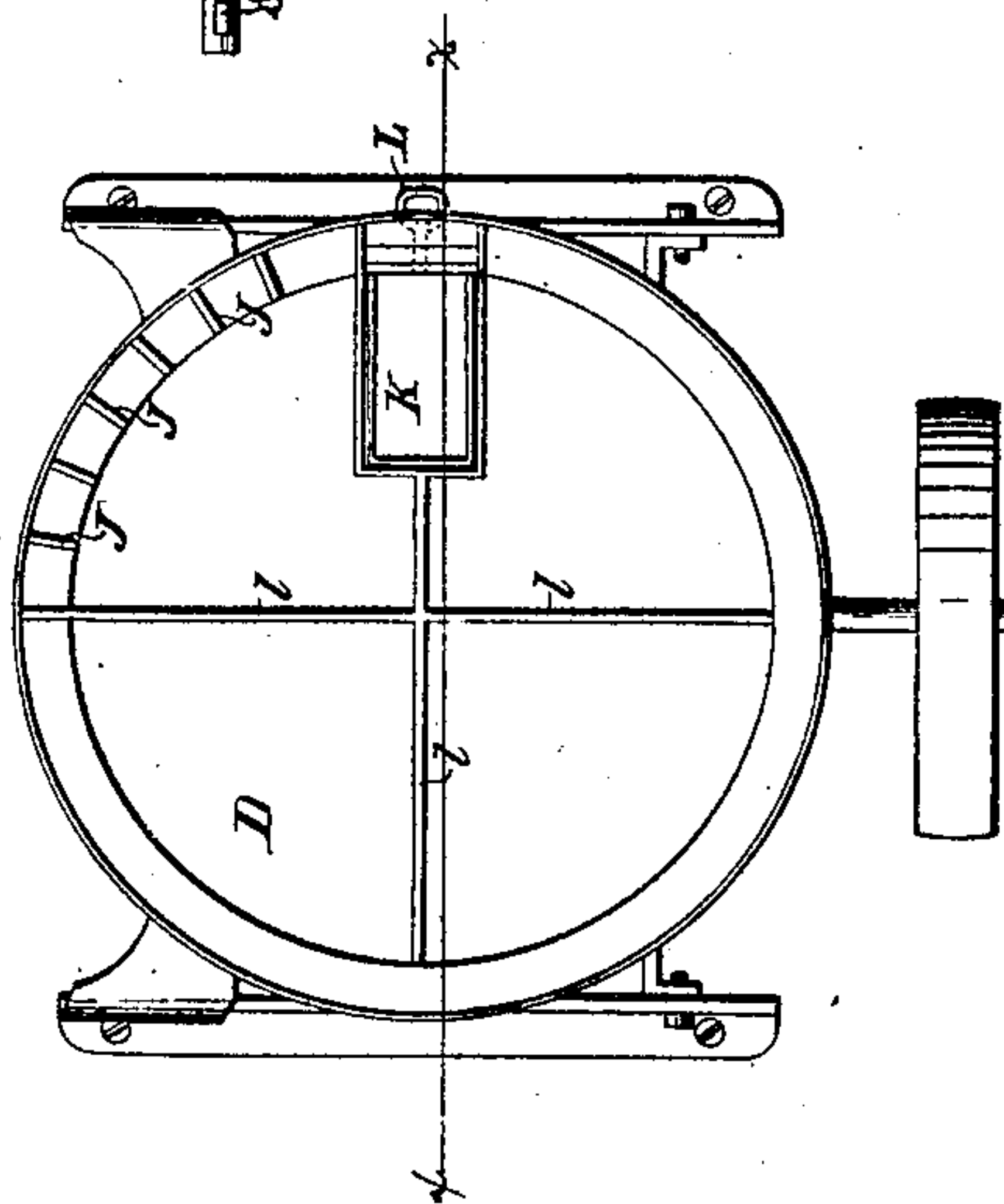


Fig. 5.



Fig. 3.



INVENTORS:

John Agrell  
John Klepzig

# United States Patent Office.

JOHN AGRELL AND JOHN KLEPZIG, OF SAN FRANCISCO, CALIFORNIA.

*Letters Patent No. 68,406, dated September 3, 1867.*

## IMPROVED FURNACE FOR ROASTING ORES.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that we, JOHN AGRELL and JOHN KLEPZIG, of San Francisco city, San Francisco county, State of California, have invented certain new and useful Improvements in "Furnaces" for Roasting Ores; and we 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 our said invention or improvements without further invention or experiment.

The nature of our invention is to provide an improved furnace for roasting ores, by the use of which much labor which is now necessary may be dispensed with, and the furnace be rendered mechanical, while the ore is thoroughly roasted. To effect this we provide a reverberatory furnace, but instead of having the hearth stationary it is so constructed as to revolve horizontally, while a series of stationary stirrers expose the ore to the action of the heat, so that all parts of it will become thoroughly roasted. To more fully explain our invention reference is had to the accompanying drawings, forming a part of this specification, of which—

Figure 1 is a side elevation.

Figure 2, a side sectional elevation.

Figure 3, a top view of the hearth.

Figure 4, a bottom view of the stirrers

Figure 5, an end view.

Similar letters indicate like parts in each of the figures.

A is the body of the furnace, having the fire-place B, connecting over the bridge with the space C, having an arched roof to reflect the heat and flame down upon the hearth D and its contents. This hearth may be made of iron and lined with brick, stone, clay, or any other substance that will resist the action of the heat. The hearth is provided with the low partitions I I across the bottom and J J at the sides to keep the lining in place, the spaces between J J being sufficient to admit a brick. The hearth is supported on the rollers E E, and is revolved by the upright shaft F and the bevelled wheels G and H. The rollers set in a groove in the bottom of the hearth, which keep it in place. K is a sliding-door or plate in the bottom of the hearth by which the roasted ore is discharged, and is kept in its place, when closed, by the lever-like handle L, the outer end of which is heavy enough to keep the inner end pressed into an opening in the side of the hearth. When it is necessary to open the slide the handle L is simply raised by means of a hook and the whole drawn out. A shaft, N, extends over the hearth diagonally at a little distance from the surface of the ore. This shaft supports the cylindrical pieces O, to which are attached the stirrers P. The stirrers are kept in place by the projections *a*, fig. 4, and permanent feathers *b*, but when it is necessary to remove them, by simply turning the pieces O till the projections *a* are disengaged, they may be slipped off over the end of the shaft N. This shaft is made hollow, so that by making jet-holes in it steam can be introduced at pleasure to assist the process. The bottoms of the stirrers P are made convex so as to pass over any resistance that might break them in lifting up and passing over it. M M are the hoppers, through which the furnace is fed or charged. S S are projections on each end, which serve to keep the shaft from turning. R is a hook or catch, which holds one end, and which being raised allows the shaft to be removed in case of breakage or wear. The bar T, which holds the catch R, and also the roller W, is secured by the strengthening straps of the furnace V V. The roller W is used to support the rake used in discharging the ore after the process is completed.

In using this furnace, it is heated up and the hearth set in motion. The ore to be roasted is then fed in through the two hoppers M M till the hearth is charged. It may then be left with very little attention till the roasting is completed, when the hearth is stopped with the opening in the position toward the side shown in fig. 1, and the ore raked out, when a new charge can be introduced and the work go on. One man can easily attend to four of these furnaces, and the work will be much more thoroughly done than when the ore is stirred by hand and at intervals, as is done at present.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

A furnace for roasting ores, etc., provided with a rotating hearth, with the fire acting on its upper surface, as described.

We also claim providing a rotary hearth with a door to discharge the ores or contents acted on by the fire.



We claim mounting the rotating hearth of a reverberatory furnace on rollers, substantially as described.

We also claim providing the revolving hearth with partitions to hold the brick lining in place.

And, in combination with the rotating hearth, we claim the stationary stirrers.

We also claim making the shaft which holds the stirrers hollow for the purpose of supplying steam to the ores roasted on the hearth.

In witness whereof we have hereunto set our hands and seals.

JOHN AGRELL. [L. s.]

JOHN KLEPZIG. [L. s.]

Witnesses:

C. W. M. SMITH,

GEO. H. STRONG.