

R. F. Knox and Joseph Osborn. Roasting Furnace.

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Fig. 1.

PATENTED JUL 25 1871

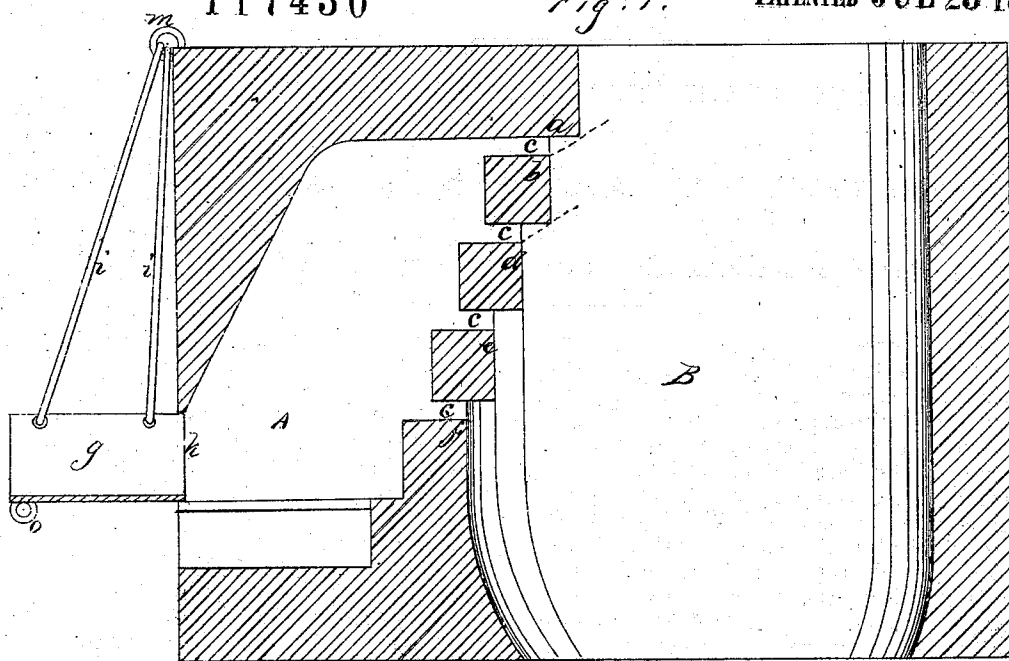
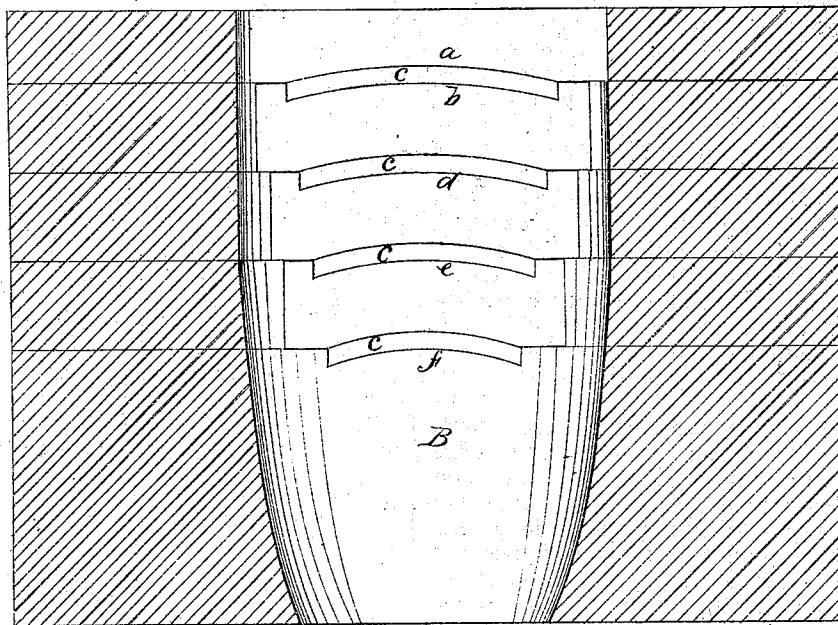


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

RICHARD F. KNOX AND JOSEPH OSBORN, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN FURNACES FOR ROASTING ORES.

Specification forming part of Letters Patent No. 117,430, dated July 25, 1871; antedated July 5, 1871.

To all whom it may concern:

Be it known that we, RICHARD F. KNOX and JOSEPH OSBORN, of the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Roasting-Furnaces; and we do hereby declare the following description and accompanying drawing 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.

Our invention relates more especially to a furnace for which Letters Patent were granted to us dated June 15, 1870.

In this furnace a series of gratings or pigeon-holes allows the heat to pass from the furnace to the ore-chamber, and on the opposite side a similar series of pigeon-holes gives egress to the fumes and volatile products of the roasting. As the furnace is filled with ore a difficulty arises, which is that the finer portions of the ore gradually work into the pigeon-holes and fill them up. In order to prevent this we construct the furnace with a series of vertical arches, each lower arch receding from the one above, so that the angle will be greater than the slope at which the ore will lie, thus preventing the filling up of the passages. Our invention further relates to a device for feeding to the fire the brush or *chaparral* used for fuel, and which burns with so intense a heat and flame that a body of it must be introduced and the door closed almost instantaneously.

Referring to the accompanying drawing, A is the fire-place, and B the ore-chamber of the furnace. In the present drawing only one side of the chamber is provided with arches, but in actual construction the arches take the place of the pigeon-holes on both sides, as shown in the former patent. The upper arches *a*, on opposite sides, are brought as near together as the desired diameter of the chamber at that point. The next arch *b* will recede from the base of the first about seven inches, or sufficiently to make a line drawn be-

tween its upper edge and the base of the arch *a* stand at an angle less than the natural slope of the ore as it lies in the chamber. The passages *c*, between the arches on this side, serve to admit the heat from the fire-place, while those on the other side allow the volatile products to pass off. The remaining arches below *b*, as *d e f*, each recede from the one above, so that when the furnace is filled with ore it can in no case rise so high as to clog the passages *c*. Any suitable number of arches may be employed, as the necessities of the work require. The feeding device for the fire consists of a short trough or tray, *g*, which is constructed with a bottom and sides but no ends, and of such a size as to just enter the fire-door *h*. This trough is suspended by rods *i* or suitable devices from above, as at *m*, so that, after being filled with *chaparral*, it can be drawn away from the door, which is then opened. The trough is allowed to swing back to the opening, and the load is instantly forced in and the door closed, thus preventing the flames from coming out, which would be the case in any other manner of feeding. The eye *o* serves to attach a rope for drawing the trough away or for raising it out of the way when not needed.

Having thus described our invention, we desire to secure by Letters Patent—

1. The ore-chamber B having the vertical arches *a b d e*, with the passages *c* at the base of each, when constructed to recede from each other, substantially as and for the purpose herein described.

2. The feeding device, consisting of the trough *g* suspended by the rods *i*, when constructed and operated substantially as herein described.

In witness that the above-described invention is claimed by us we have hereunto set our hands.

RICHARD F. KNOX.
JOSEPH OSBORN.

Witnesses:

GEO. H. STRONG,
JOHN L. BOONE.

750 words.