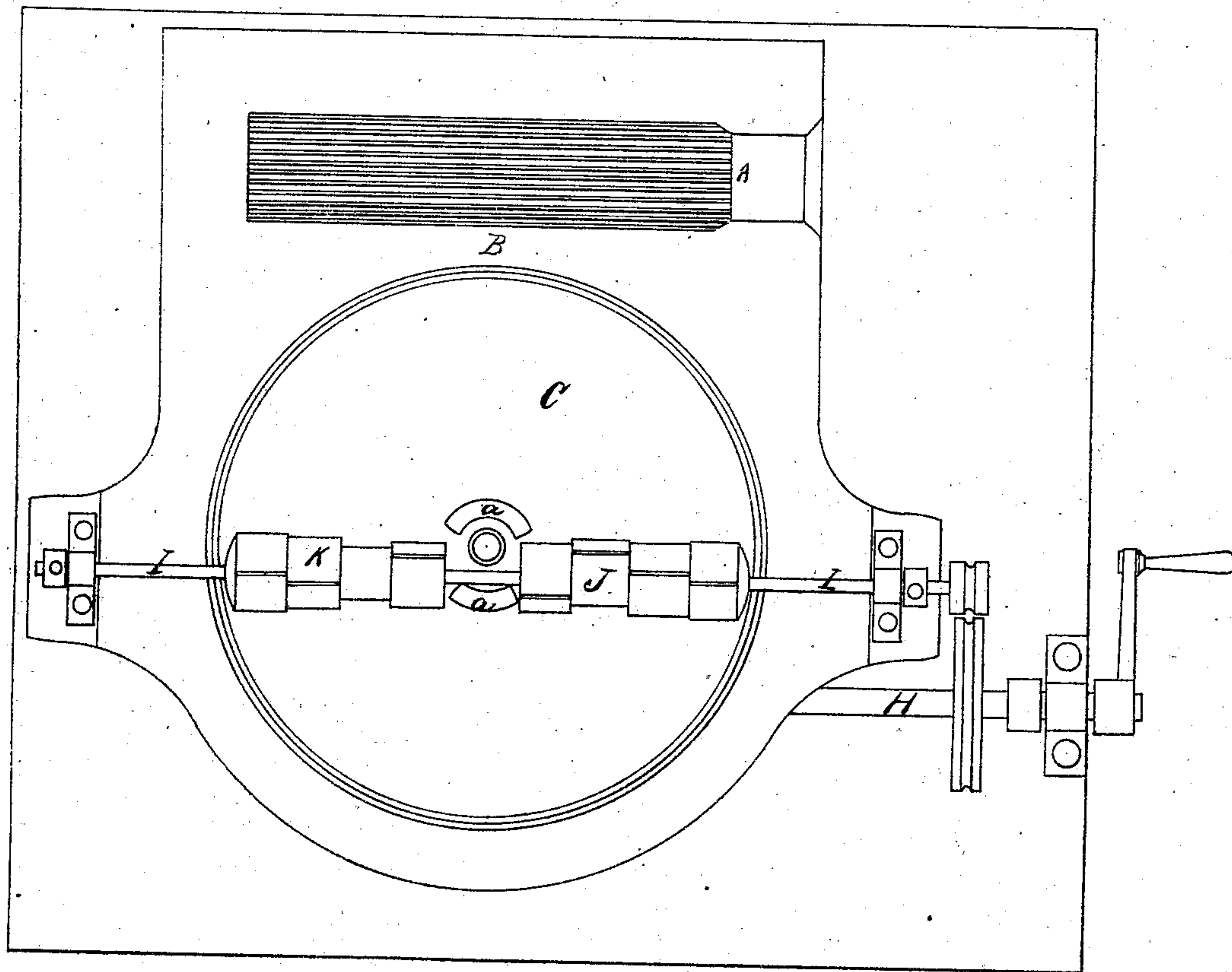
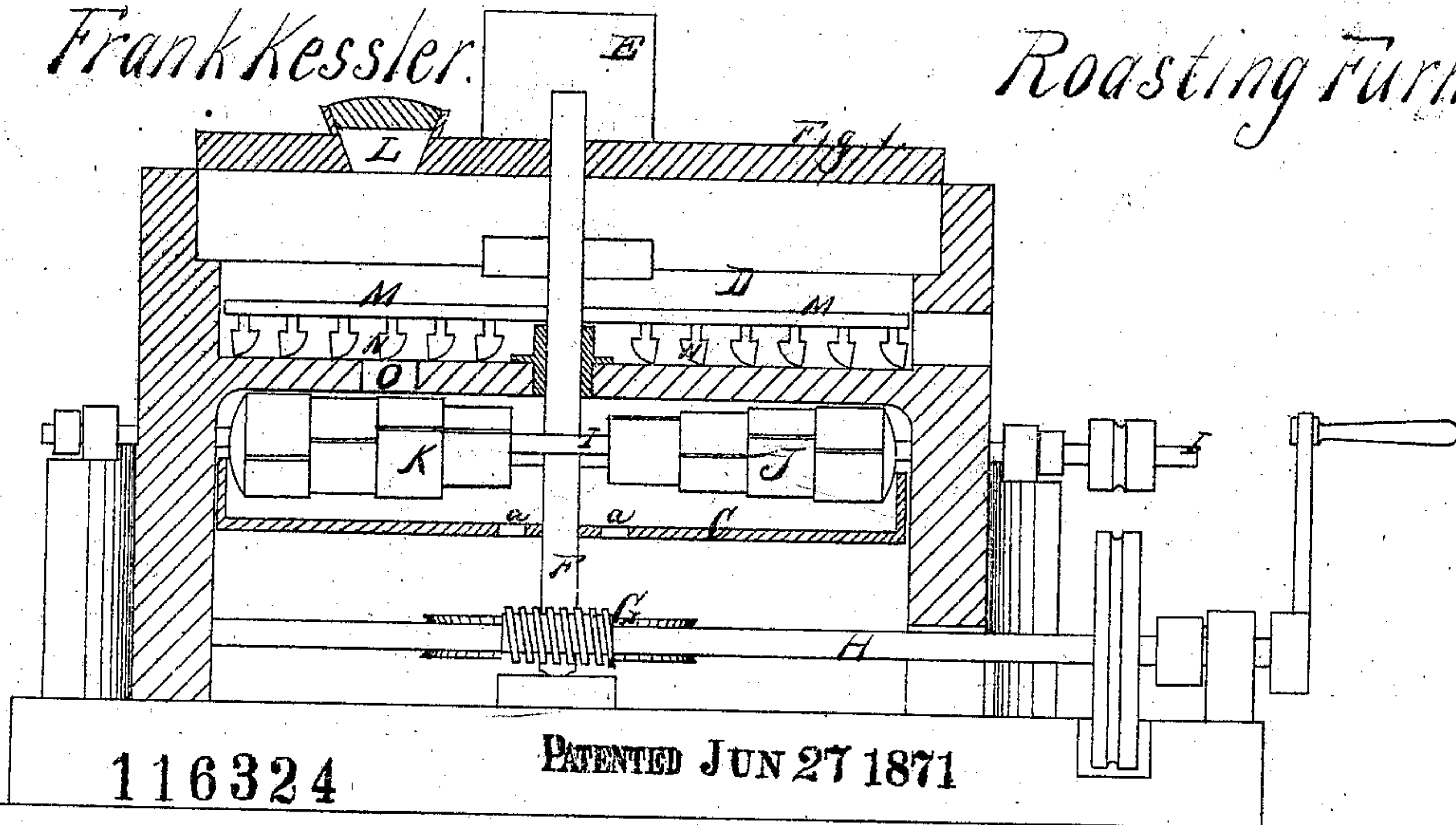


Frank Kessler.

Roasting Furnace.



Witnesses.  
Geo. H. Strong.  
Mrs. L. Boone

Inventor.  
Frank Kessler  
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# UNITED STATES PATENT OFFICE.

FRANK KESSELER, OF SAN FRANCISCO, CALIFORNIA.

## IMPROVEMENT IN FURNACES FOR ROASTING ORES.

Specification forming part of Letters Patent No. 116,324, dated June 27, 1871.

*To all whom it may concern:*

Be it known that I, FRANK KESSELER, of the city and county of San Francisco, State of California, have invented an Improved Rotary Furnace for Roasting Ores; and I 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 my said invention or improvement without further invention or experiment.

My invention relates to certain improvements in furnaces for roasting ores previous to their amalgamation, and is a combination of a stationary and a revolving hearth, one placed above the other, over which the heat from the furnace passes.

The revolving hearth is placed below the stationary one, and first receives the heat from the grate. From the chamber in which this hearth revolves the heat is led through a convenient flue to the upper chamber, which is provided with the stationary hearth. From this chamber the heat escapes to the open air. The ore is first fed from a hopper upon the stationary hearth of the upper chamber, where it is subjected to the action of the heat, being stirred meanwhile by a series of plows, which is moved around over the hearth. After being sufficiently subjected to the action of the heat in this chamber it is passed through proper gates to the revolving hearth of the lower chamber, by which it is carried slowly around beneath a horizontal shaft, which is provided with peculiarly-shaped beaters and lifters, which consecutively mat down the ore and lift it into the air, so that, by dropping it, it is loosened up and exposed equally to the heat, thus also permitting the volatile gases to escape. After being sufficiently subjected to this process it can be removed from the hearth by suitable traps or gates.

Referring to the accompanying drawing for a more complete explanation of my invention, A is the fire-place of my furnace. From this the heat passes over the bridge-wall B and across the lower chamber over the hearth C. At the opposite side of the chamber is a flue, through which the heat and products of combustion pass to the upper chamber D. After crossing this chamber they escape by a suitable chimney, E. The furnace consists of two chambers, of brick or other suitable material, one above the other. The hearth C of the lower chamber is supported upon a hollow upright shaft, F, through which cold water or air can pass, which turns in a step at the bottom, and is driven by gearing G from

the driving-shaft H. A horizontal shaft, I, is placed across the furnace just above this rotating hearth and near the upright shaft F. Upon each end of the shaft I are fixed spirally the beaters and stirrers above mentioned. They consist simply of curved shovels or blades, as shown, the beaters J J being placed upon the shaft in a position which will cause their backs to press down upon or knead the ore as it is carried under them by the hearth, while the lifters K K, upon the opposite end of the shaft I, loosen it up and allow the heat to penetrate to every part. Openings *a a* are made near the upright shaft, through which the ore is discharged after the roasting is completed. The upper chamber D of the furnace, into which the ore is first admitted through the hopper L, has a stationary hearth, and the shaft F extends up through the center, where it is supported, turning in a bearing. A set of arms, M, arranged in the form of a cross, is keyed to the shaft and carries the plows N, which stir the ore upon the hearth until it is ready to pass through the hearth, at O, into the lower hearth, as before described. The plows upon two of these arms are arranged so as to pass the ore toward the outer edge or periphery of the hearth, while the other two move it toward the center, the operation being repeated alternately, thus constantly changing the position of the ore. Suitable openings are made in the side of the furnace, through which the ore can at any time be raked about or its discharge assisted.

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

1. A roasting-furnace, in which a stationary and a revolving hearth are employed in succession, both being heated from the same fire-place, in the manner substantially as described.
2. The beaters J J and lifters K K, substantially as and for the purpose above described.
3. The hollow upright shaft F, supported as described, and carrying the revolving hearth C, in combination with the beaters J J and lifters K K, substantially as and for the purpose above described.

In witness that the above-described invention is claimed by me I have hereunto set my hand and seal.

FRANK KESSELER. [L. S.]

Witnesses:

GEO. H. STRONG,  
J. L. BOONE.