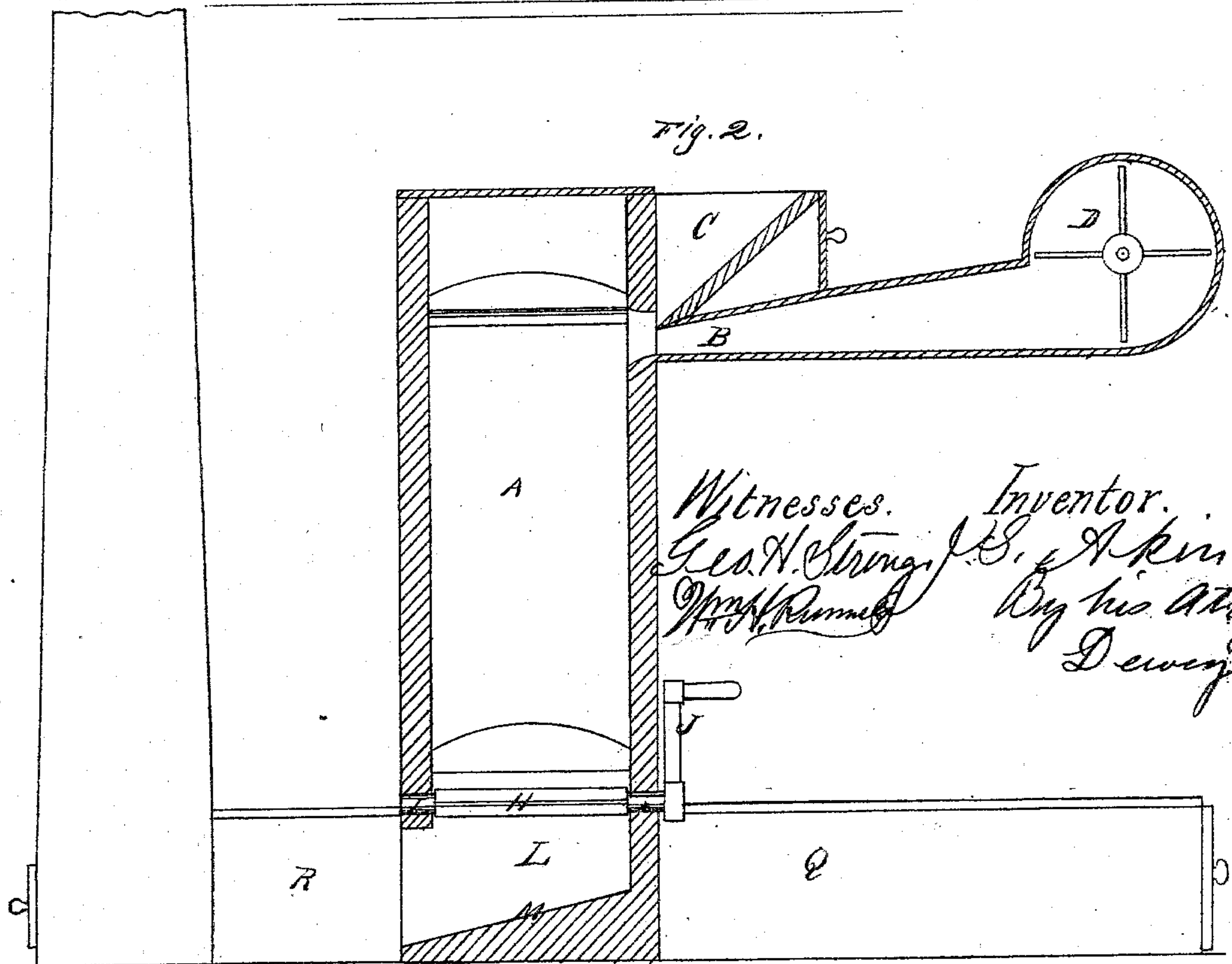
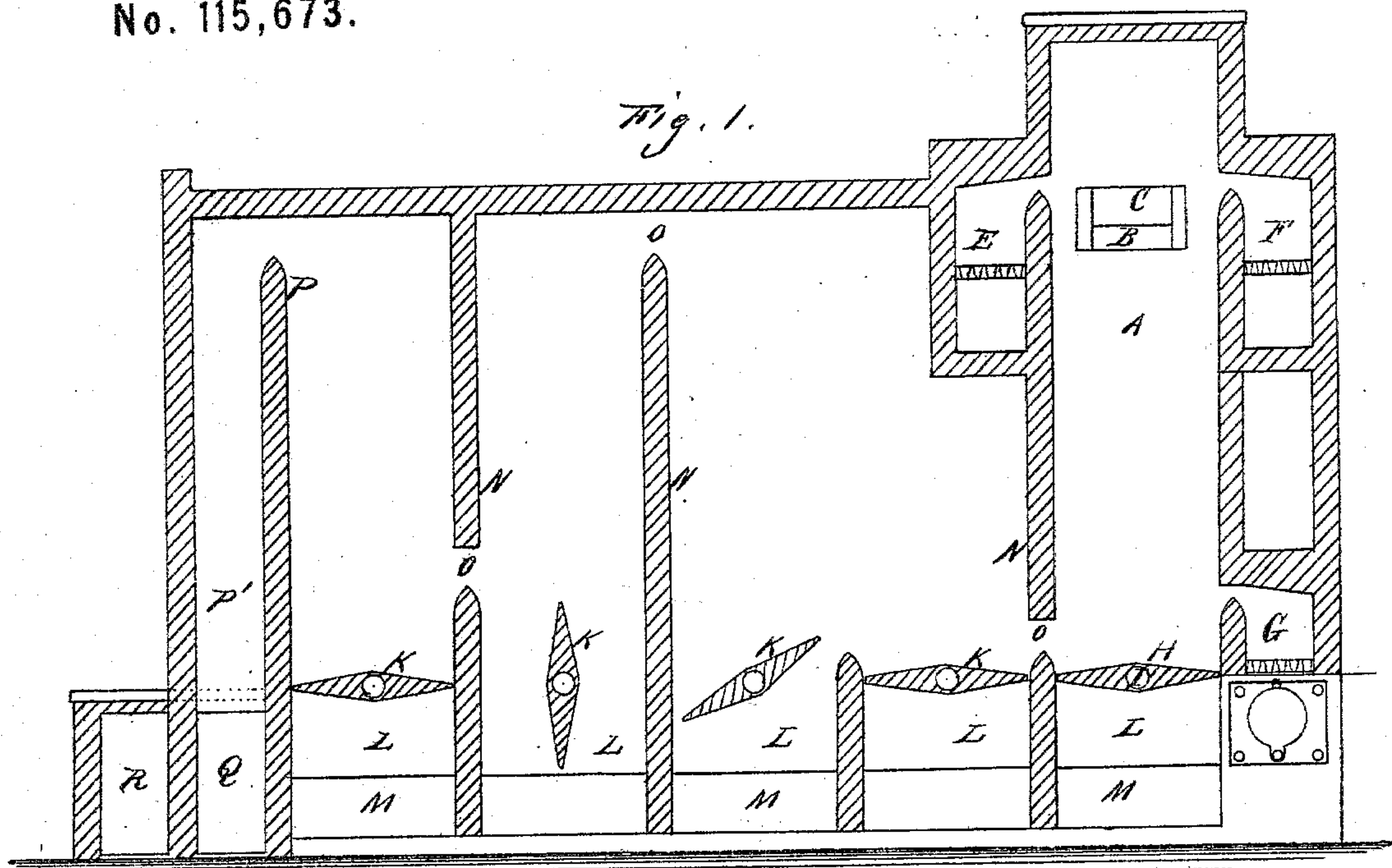


J. S. AKIN,

Improvement in Furnaces for Roasting Ores of the Precious Metals.

No. 115,673.

Patented June 6, 1871.





# UNITED STATES PATENT OFFICE.

JONAS SELY AKIN, OF RYE PATCH, NEVADA.

## IMPROVEMENT IN FURNACES FOR ROASTING ORES OF THE PRECIOUS METALS.

Specification forming part of Letters Patent No. 115,673, dated June 6, 1871.

*To all whom it may concern:*

Be it known that I, JONAS SELY AKIN, of Rye Patch, county of Humboldt, State of Nevada, have invented an Improved Roasting-Furnace; 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 improvements without further invention or experiment.

The object of my invention is to provide an improved furnace for roasting, chloridizing, and desulphurizing ores of precious metals; and it consists in placing at the bottom of the feeding-stack a revolving hearth, which is capable of being quickly upset to discharge its contents when sufficiently roasted.

A series of similar hearths is arranged side by side through the furnace and separated by walls or diaphragms, which are pierced at different heights, so that as the pulverized ore enters the furnace it will be distributed in varying quantity over these hearths, and, while remaining thereon, will receive the full effects of the heated air which passes over it for the purpose of chloridizing, which is effected by mixing salt with the ore, or otherwise in the usual manner. When, by test, it is ascertained that the contents of any hearth are sufficiently roasted, the revolving hearth is quickly turned and the ore discharged into an inclined pit below, from which it is conveyed to the amalgamating-pans. The heated air and gases are led over a high bridge-wall, and thence through flues to the chimney, without the necessity for using water-spray, as is usual in other furnaces.

Referring to the accompanying drawing for a more complete explanation of my invention, A represents the feeding-stack of a furnace, the whole of which may be built of brick, stone, or other suitable material. This stack is covered at the top, and has an opening, B, leading into it at one side, near the top, and communicating with the feeding-hopper C, and also with the fans D or other means of producing a blast. The hopper is inclined, and its mouth opens into the upper part of the passage B, and close to the stack. The ore is crushed by batteries conveniently situated,

and then conveyed by a screw and elevator to the hopper C. As it passes down it is caught by the blast of air from the passage B, and finely distributed through the interior of the upper part of the stack, and thence falls slowly to the bottom. Two fire-places, E and F, are situated at either side of the stack, and their heated air and gas are conveyed by flues directly into the upper part of the stack, so as to descend with the falling ore. Another fire-place, G, near the bottom, may add its heat at this point. At the bottom of the stack is a revolving hearth, H, formed of iron or fire-brick, and supported by a shaft, I, which passes through the center from front to rear. A crank or lever, J, on the outside of the furnace-wall, serves to quickly rotate the hearth and discharge its contents when sufficiently roasted, and again immediately close the aperture air-tight, so as to preserve the downward draft. A series of similar revolving hearths, K K, is arranged on the same level as the hearth H, and beneath each is a pit, L, with an inclined bottom or cooling-floor, M, so that the discharged contents of the hearths can be easily raked out and cooled and thence fed to the amalgamators. The hearths are separated by diaphragms or party-walls N, which are pierced by openings o at different heights. Only the heavier portions of the ore will fall upon the hearth H. The lighter parts will be carried by the draft into the different chambers over the hearths K, the finest ore being deposited the furthest from the stack. Small openings may be made in the furnace-wall, and through these the progress of the roasting can be tested from time to time. When finished, the contents of any hearth can be discharged into the pit below. The heated air and gases escape over a bridge-wall, P, and at the bottom of the flue P' will enter a horizontal flue, Q, through which they pass, and then return by a similar flue, R, to the chimney. Any small portion of finely-pulverized ore which may be carried over the wall P will be deposited at the bottom of the flue P', and in the passage Q, from which it can be afterward removed by suitable doors. The tops of the flues Q and R are so constructed as to serve as a drying-hearth for the ore before it is placed in the battery.



I do not claim the process of roasting and chloridizing ores by blowing them or letting them fall through a shaft, nor the combination of settling-chambers with a shaft-furnace, as these are described in the patents of James D. Whelpley and Jacob I. Storer, January 12, 1864, No. 41,250, and November 13, 1866, No. 59,696.

What I claim as a new improvement on roasting and chloridizing furnaces, and which I desire to secure by Letters Patent, is—

The rotating or discharging hearths H K, constructed with reference to a roasting and chloridizing furnace, in combination with the pits L and cooling floor M, substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand and seal.

JONAS SELY AKIN. [L. s.]

Witnesses:

WM. H. RUNNELS,  
GEO. H. STRONG.