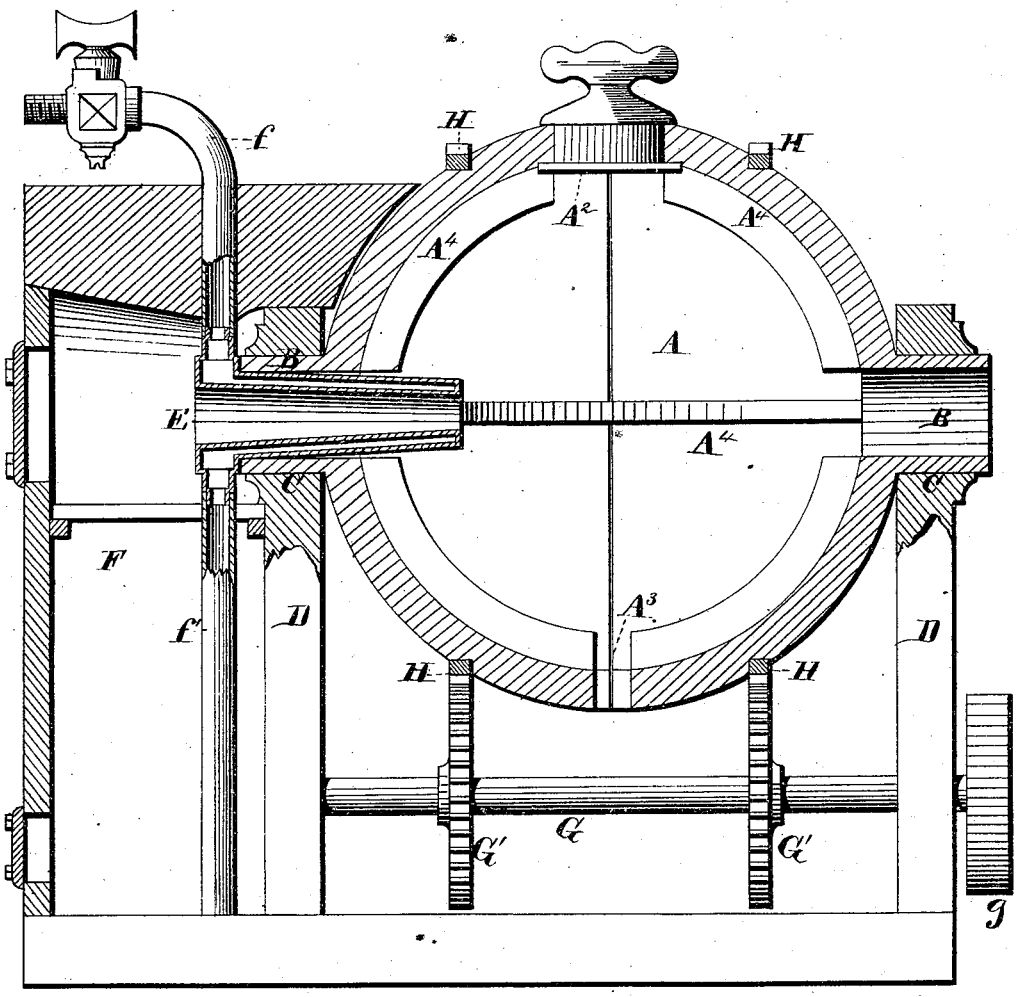
J. MANES.

Revolving-Furnace.

No. 161,620. Patented April 6, 1875.



WITNESSES

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JAMES MANES, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN REVOLVING FURNACES.

Specification forming part of Letters Patent No. **161,620**, dated April 6, 1875; application filed March 5, 1875.

To all whom it may concern:

Be it known that I, JAMES MANES, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to a new and useful improvement in revolving furnaces.

In the drawing is represented a vertical longitudinal section of my invention.

My invention has for its object the construction of a simple, cheap, and effective furnace for reducing ores, annealing, smelting, extracting mercury, roasting, drying, and general purposes; and consists in a revolving globe or sphere made of sheet metal, and lined within with fire-brick, heat being supplied to the interior of the sphere from furnaces situated on one or both sides thereof, the heat being directed or forced inward through tuyeres placed in hollow journals of the sphere, as hereinafter more fully set forth and shown.

A is a globe or sphere, constructed of sheet metal boiler-plates, and lined in the interior with fire-brick A^1. B B are hollow axles of the globe A, supported in journals C C, in a supporting-frame, D D. Within the hollow journal B is a water tuyere, E, leading from a furnace, F, into the interior of the sphere A. This tuyere is supplied with water through the pipe f, f', being the water-exit pipe. Beneath the machine is a shaft, G, journaled in the frame D D, provided with gear-wheels G′, which engage with circular racks H H, secured around the globe A. On the end of this shaft is a wheel or crank, g, by which motion is communicated to the shaft and globe. The globe A is provided with a man-hole, A^2, and a discharge-vent, A^3, and around the interior of the globe are shelves A^4.

I have represented the machine as supplied with only one heat-supplying furnace at one side; but the same arrangement of tuyeres and furnaces may be employed on both sides when desired, and the whole globe covered by brick-work and supplied with a chimney, the man-hole being used as the outlet through the globe into the chimney. When thus constructed the globe is stationary, and the tuyeres are curved and direct the heat toward the bottom of the furnace, and a blast is used.

As will be perceived, this furnace may be used for a number of different purposes with very little alteration or addition, and without departing from my invention.

The operation of this machine is as follows: The charge, of whatever nature it is desired to act upon—if ores, they are first ground fine and mixed with flux and fuel—is placed in the globe through the man-hole A^2, the globe being tipped over for this purpose. The man-hole is then closed and secured, and the furnace started, the heat from which, being either by draft or blast, is caused to enter the globe through the water tuyeres E, and, after passing through the charge, escapes through the opposite hollow axle; or, in case two heat-supplying furnaces are employed, the globe remains stationary, and the man-hole is left open and brought opposite the chimney, the heat passing down through the charge in the globe, and out through the man-hole into the chimney. When only one furnace is used, as here shown, the man-hole is kept closed, and all the while that heat is entering the globe, the globe is revolved at any desired rapidity, and the charge is thereby agitated and broken up by coming in contact with the shelves A^4, thus allowing the heat to pass through and act upon every part of the mass. When acted upon sufficiently the globe is emptied by being tipped over through the man-hole A^2, or, when necessary or desirable, through the aperture A^3. A stream or streams of water, gas, acid, steam, &c., may be directed into the globe A through suitable pipes entering through or from the tuyere and hollow axle, when the apparatus is used as a drying or evaporating furnace.

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

1. The globe or sphere A, constructed of sheet metal boiler-plates, and lined in the interior with fire-brick A^1, provided on both sides

with hollow axles B B, through one or both of which project water tuyeres E, a man-hole, A^2, discharge-vent A^3, and shelves A^4, secured in the interior of the globe, in circles at right angles to each other entirely around its central portion, as and for the purposes described.

2. In combination with the globe A and furnaces F, constructed as described, the tuyeres, E, supplied with a constant stream of water through pipes *f f'*, as and for the purposes described.

3. In combination with sphere or globe A, the shelves A^4, secured entirely around the interior of the globe, in circles at right angles to each other at its central or large portion, as and for the purposes described.

4. The combination, in a furnace for general purposes, of the globe A A^1 A^4, revolving on hollow axles B B, one or more furnaces, F, placed on the sides and communicating through the hollow axles, water tuyeres E, and revolving mechanism G G' *g* H, all constructed and adapted to operate substantially as and for the purposes described.

In testimony that I claim the foregoing I have hereunto set my hand this 2d day of February, 1875.

JAMES MANES.

Witnesses:
F. M. MACHUGH,
ROBT. S. FRAZER.