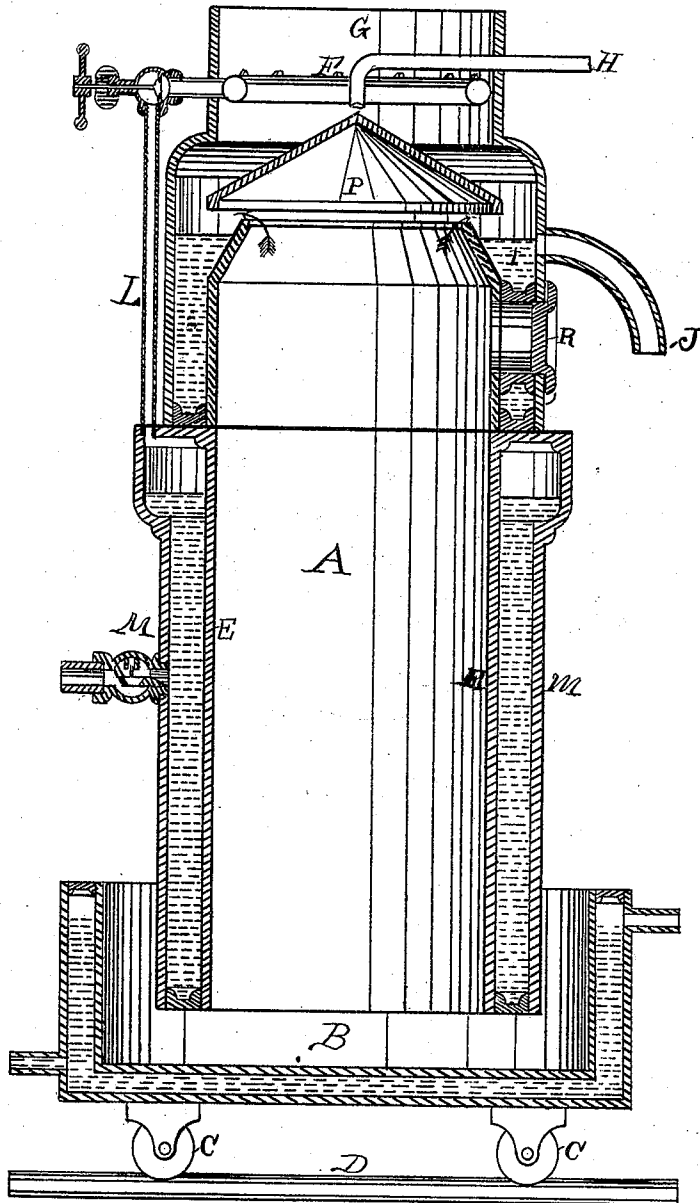


R. M. FRYER.

APPARATUS FOR ROASTING GOLD AND SILVER ORES.

No. 170,625.

Patented Nov. 30, 1875.



WITNESSES

J. O'Meara
Robert L. Hall

Robert M. Fryer
INVENTOR.

UNITED STATES PATENT OFFICE.

ROBERT M. FRYER, OF NEW YORK, N. Y., ASSIGNOR TO THE FRYER NOBLE
METAL-MINING COMPANY, OF NEW YORK.

IMPROVEMENT IN APPARATUS FOR ROASTING GOLD AND SILVER ORES.

Specification forming part of Letters Patent No. **170,625**, dated November 30, 1875; application filed
May 20, 1875.

CASE B.

To all whom it may concern:

Be it known that I, ROBERT M. FRYER, of the city, county, and State of New York, have invented a Roasting Apparatus for Gold and Silver Ores, of which the following is a specification:

The object of this invention is to provide an apparatus by means of which gold and silver ores can be cheaply and rapidly roasted to expel sulphur, &c., without the loss of the precious metals by volatilization and absorption, hence rendering it practical to work the most refractory ores, though of comparatively low grade.

The apparatus consists of a metallic furnace surrounded with a water-chamber, constituting a steam-boiler, at the top of which is a condensing device, whereby the products of combustion are so treated as to separate the auriferous and other noble metallic vapors. I will, however, begin at once with the general description, having reference to the accompanying drawing, which represents a vertical section of the entire apparatus, with letters of reference marked on the several parts corresponding with similar letters used in their description.

A is the furnace, which is suspended to leave the bottom B free. The said bottom consists of a double metallic tub mounted upon wheels C, fitting track D leading to other apparatus. The said track at this point is located upon a drop-table to permit of being lowered to clear the bottom of furnace. The said bottom B, or car, as it may be called, is provided between the double casings with water to prevent rapid oxidation. The furnace A is composed of two casings, M and E. Between is a water-space, as shown, which keeps the shells cool, besides furnishing steam (during one portion of the following operation) to operate, through pipe L, a steam-blower, F, located in the stack

G. Underneath said blower is located a cone, P, upon which runs a stream of water, which flows through pipe H. From the cone the water falls into the annular chamber I, from which, through the overflow-pipe J, it flows to any desired reservoir. The object of this device is to bring the products of combustion in their upward ascent, indicated by arrow K, directly in contact with water to arrest the volatile precious metals carried up with said products. R is the door, through which the furnace A is charged with fuel and other material.

The operation of the apparatus is as follows: Fuel and quartz are placed in the furnace and the former ignited. Steam is soon generated, the blower set in operation, when the draft is greatly increased. When the heat becomes very intense water is applied to the cone, as above described. The result of the charge is that some of the precious metals are collected at the chamber I, while the greater portion is delivered at the bottom or car B with desulphurized quartz. The said car is then lowered to clear the bottom of the furnace, and then run along the track to a proper delivery, where the material is deposited for further treatment. The car is returned to its original position, when the furnace is again ready for operation.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

The combination of furnace A, portable bottom B, conical condenser and chamber I, substantially as described and operated, for the purpose above set forth.

ROBT. M. FRYER.

Witnesses:

ROBT. L. S. HALL,
T. O'MEARA.