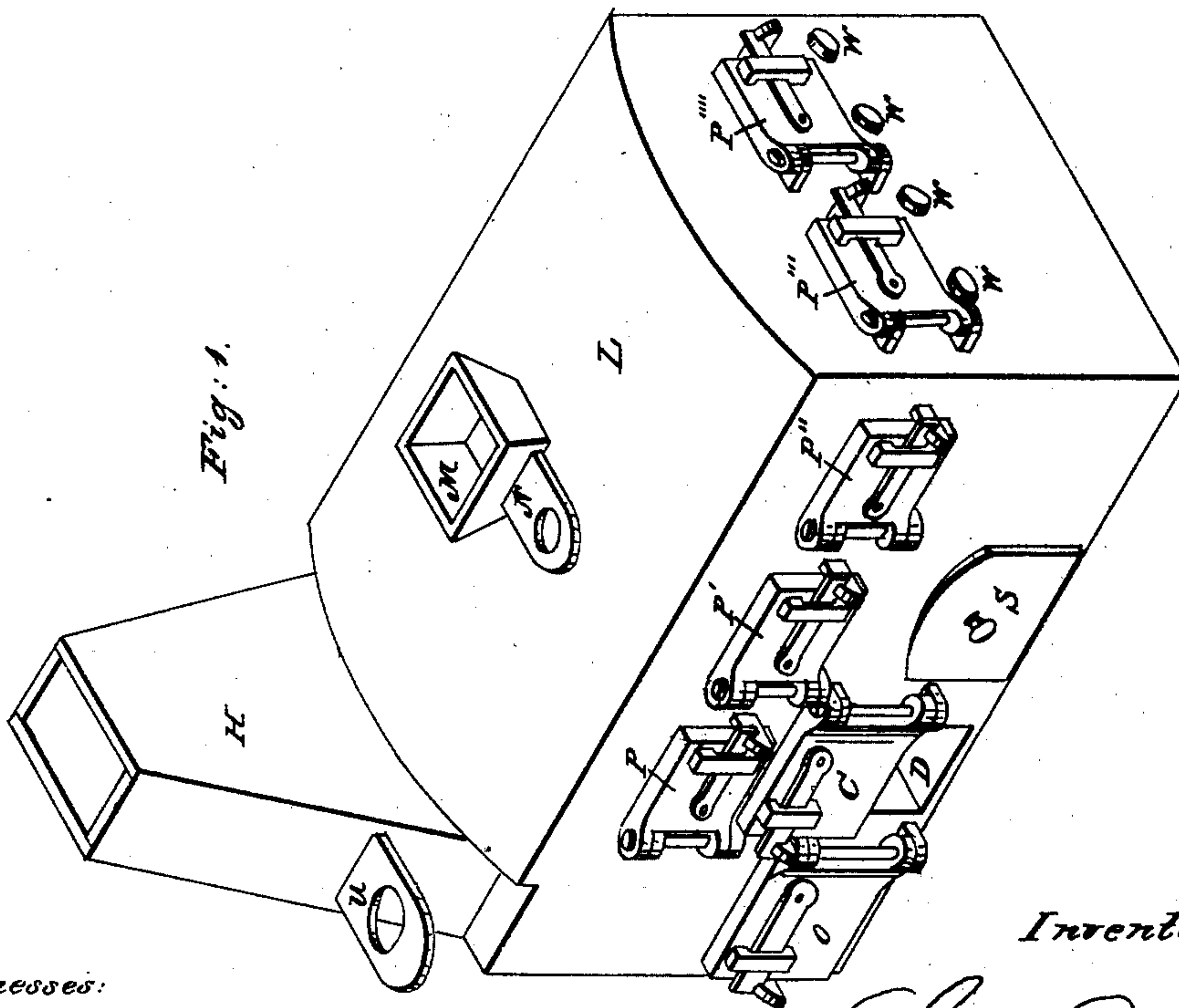
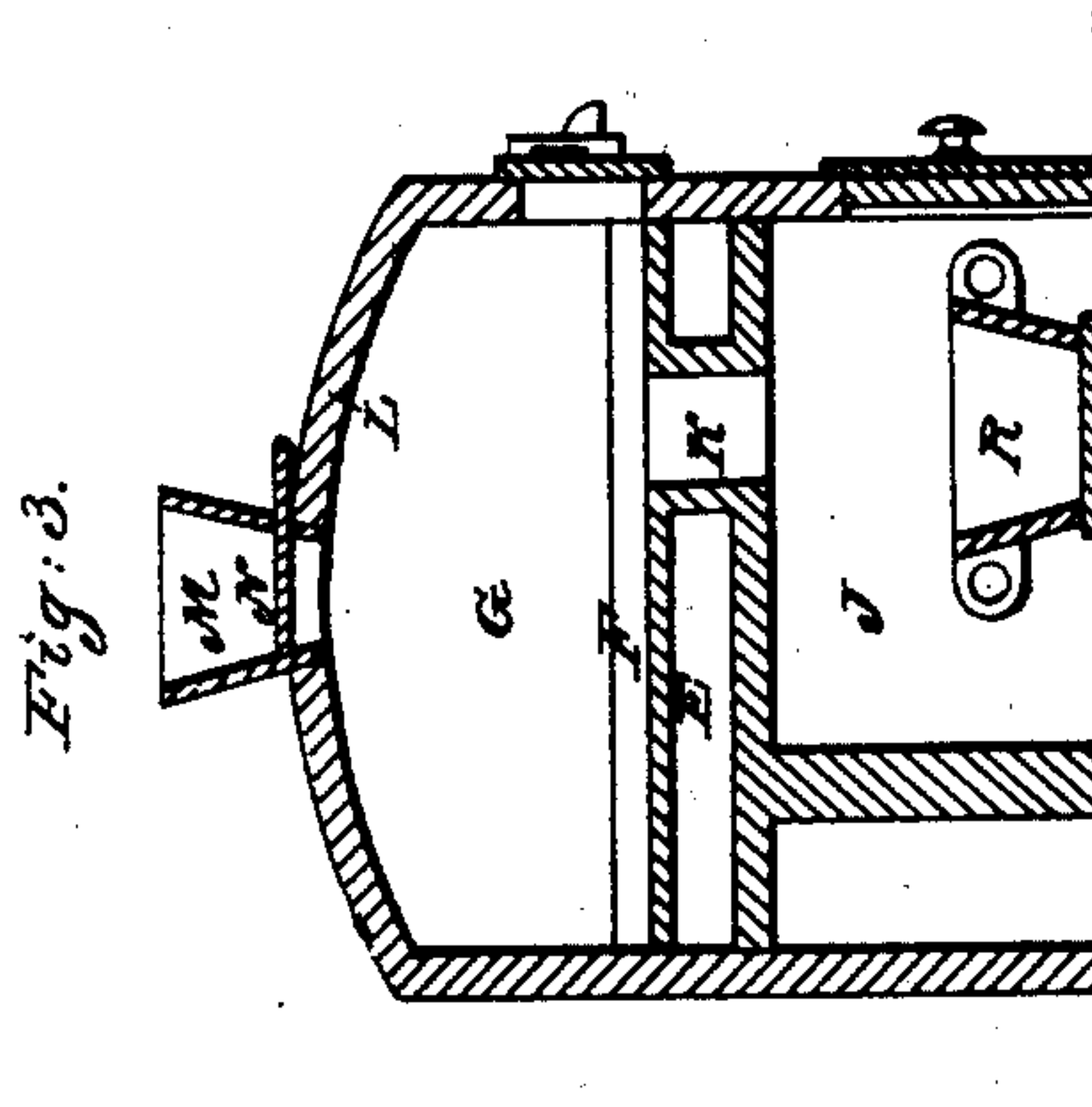
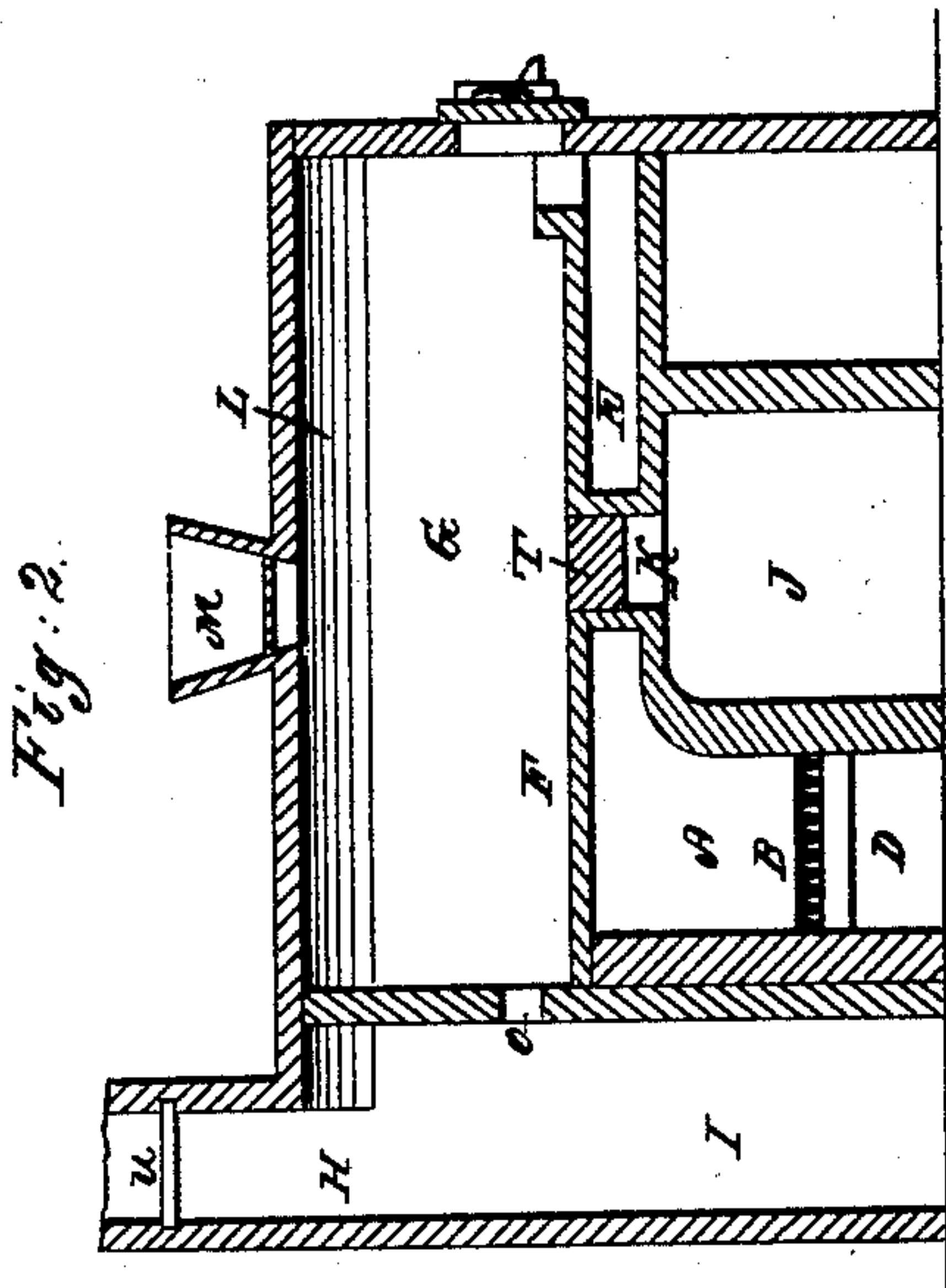


L. SOLOMON.

Furnace for Roasting Ores.

No. 24,828.

Patented July 19, 1859.



Witnesses:  
Lionel Solomon  
Edward Joseph.

Inventor:  
Lewis Solomon



# UNITED STATES PATENT OFFICE.

LEWIS SOLOMON, OF NEW YORK, N. Y.

## IMPROVEMENT IN FURNACES.

Specification forming part of Letters Patent No. 24,828, dated July 19, 1859.

*To all whom it may concern:*

Be it known that I, LEWIS SOLOMON, of New York, in the county and State of New York, have invented a new and Improved Furnace for Roasting and Desulphurizing Ores; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, through letters of reference marked thereon, forming part of this specification, in which—

Figure 1 represents an isometrical view of my furnace; Fig. 2, a longitudinal section, and Fig. 3 a transverse section, of the same.

The same letters of reference occurring in the several figures indicate corresponding parts.

My invention consists in constructing a furnace in such manner that the heat and flame from the fire shall pass first under and then over a layer of the pulverized ore, which is thereby more speedily and thoroughly roasted for desulphurization, without injury to the precious metals contained in it and with less consumption of fuel than in any other furnace used for the same purpose; also, in arranging and combining therewith a chamber, over which the heat and smoke, &c., pass into the chimney, for the reception of such fine particles of the roasted ore as would otherwise be carried off by the draft through the chimney, thereby effecting a great saving of the precious metals contained in it.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

The furnace is built of brick or other suitable material, in form similar to that represented in the drawings, Fig. 1, in which A represents the fire-place; B, the grate-bars; C, the fire-door; D, the ash-pit, and E the flues under the sole F of the roasting-chamber G; O, the flue-passages into the chimney H. I represents a chamber in the base of the chimney, and Q the door or entrance to the same. J is a compartment under the center of the roasting-chamber, into which the roasted ore is discharged through an opening, K, in the sole F, which opening may be closed by a trap-piece, T, and the compartment provided with a door, S. L represents the arch or other covering of the roasting-chamber G, and which is provided with a funnel-shaped aperture, M, at or near its center, for the introduction of

the pulverized ore, and which is closed by a sliding bottom, N. P P' P'' P''' P'''' are doors arranged on two sides of the roasting-chamber G, to afford an opportunity to stir the ore thoroughly during the process of roasting. R is a box to be placed in the compartment J as a receptacle for the roasted ore. U is a damper in the chimney to regulate the draft of the furnace. Plugs W are arranged at the end to afford access to the flues for the purpose of cleaning them out.

The pulverized ore when ready for roasting is passed through the funnel M onto the sole F of the furnace, over which it is spread to a suitable thickness for the purposes of this process, after which the fire in the furnace may be kindled, the heat and flame from which is made to pass through the flues E in the direction indicated by the arrows, both under and over the layer of ore, and thence into the chimney H through the egress-apertures O. When first kindled, great care must be exercised in the management of the furnace, so that too high a degree of heat shall not be brought to act upon the ore, as such would result in volatilizing a portion of the precious metals and in driving it off through the chimney. It may, however, be gradually increased as the process advances without fear of incurring such loss, for the more effectual and thorough completion of the process; but as there will still be a portion of the precious metals volatilized, notwithstanding the utmost care that may be exercised in the regulation of the heat during the process of roasting, and as the density of the particles will gradually increase the farther they recede from the action of the fire and near the cooling influence of the atmosphere, and that to an extent sufficient to overcome the upward-propelling force of the rarefied air, &c., and hence by virtue of their increased specific gravity be precipitated to the bottom of the chimney, I there arrange a chamber, I, for their reception, and for the reception of other heavy and extraneous particles that may be driven off from the ore by the heat of the furnace, whose specific gravity is too great to be expelled from the chimney by the ascent of the heated air, smoke, sulphurous and muriatic vapors, &c., which result from the process, from which, fater the process is completed, or when a large amount has accumulated, it may be recovered



by opening the door S in the bottom of the chimney I, and treated in any suitable manner for the reclamation of the precious metals. For the purpose of carrying these instructions into effect, the doors P P', &c., are occasionally opened and the ore stirred to prevent too rapid an accumulation of heat, especially during the first part of the process, after which, however, there will be less necessity for such, as the temperature can then be gradually raised to a much higher degree of heat, and there maintained until all the sulphurous and muriatic or hydrochloric vapors have been expelled, a damper, U, being arranged in the chimney, by means of which the temperature of the roasting-chamber can be raised or lowered, as desired.

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

So constructing a desulphurizing-furnace for roasting the ores of precious metals as that the heat shall be applied first beneath the sole of the furnace and afterward on the surface of the ore, when the same is combined with a chamber arranged in the base of the chimney for the reception of such volatilized particles of ore, &c., as may be driven off by heat or carried over by the draft, substantially as described.

In testimony whereof I have hereunto set my hand, before two subscribing witnesses, this 27th day of April, A. D. 1859.

LEWIS SOLOMON.

Witnesses:

DANL. SEIXAS,

JOSEPH SOLOMON.