2 Sheets-Sheet 1.

T. W. Dresser,

Reducing Quicksilver and Other Ores.

No. 79,453. Patented June 30, 1868.

Witnesses:
W. B. Hanscom
Jno. C. Hanscom

Inventor.
Thomas W Dresser

2 Sheets. Sheet 2

T. W. Dresser.

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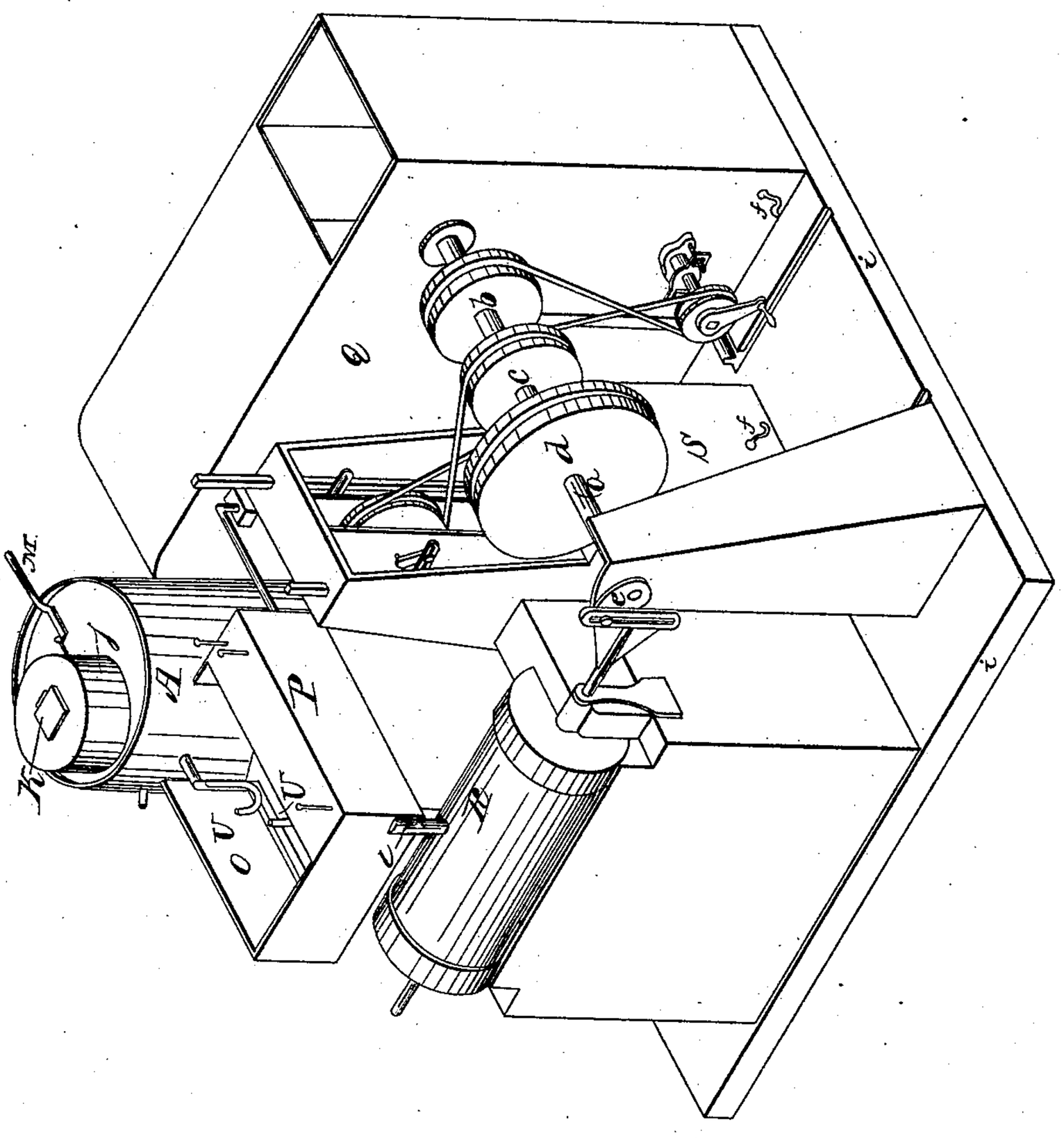

Witnesses:
Geo. H. Strong.
J. L. Boone

Inventor:
Thomas W Dresser
By his Attys Dewey & Co

United States Patent Office.

THOMAS W. DRESSER, OF SAN JOSÉ, CALIFORNIA.

Letters Patent No. 79,453, *dated June* 30, 1868.

IMPROVED FURNACE AND CONDENSER FOR REDUCING QUICKSILVER AND OTHER ORES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, THOMAS W. DRESSER, of San José, county of Santa Clara, State of California, have invented an Improved Furnace and Condenser for Reducing Quicksilver and other Ores; and I do hereby declare the following description and accompanying drawings 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 nature of my invention is to provide an improved furnace and condenser for treating ores containing volatile substances principally contained in quicksilver ores.

My invention consists of an upright furnace, with a vapor-tight hopper, and a continuous-discharging opening, with a suction-pump or pumps leading from it, for drawing the vapor from the heated ore and forcing or drawing it under water, where it may be condensed and saved.

To more fully illustrate and describe my invention, reference is had to the accompanying drawings and letters marked thereon, of which—

Figure 1 represents an elevation of my furnace.

Figure 2 is a vertical section, showing the device for removing the debris or slag after the fire has passed through it and the valuable portion saved.

Figure 3 is a sectional view of the tank and box-flue.

Figures 4, 5, and 6 are vertical sections through different kinds of pumps, either of which may be employed for the purpose designed.

The furnace is constructed of two shells of boiler-iron, having an annular water and steam-space between.

Above the fire-grates B B are two tube-sheets, C C′, on which the ore rests, and through which are conical tubes, D D, with the small end up, to prevent clogging. The space between the two tube-sheets is filled with water, to prevent the action of the fire.

A central tube, E, projects downward from the top tube-sheets C′ to the bottom of the grates, where a slide, G, is placed, to allow the burned ore to fall through upon the endless-chain car F, by the turning of which it is discharged at one end.

A circular division-plate, H, is placed on the grates, reaching to the lower tube-sheet, so that a fire may be kept near the circumference or centre of the furnace, as may be desired.

At the top of the furnace is a tube, I, projecting a short distance through the outer top shell, and is covered by the vapor-tight hopper J, K K′ being the two valves or covers for the same. L is the point on which it rotates, by the handle M.

N is a flue leading to the tank O, through which pass the vapors into the flue or box P, from whence they are taken or drawn through a pipe-connection to either of the suction-pumps and forced under water, where the quicksilver is condensed and saved, the air and other gases escaping through the sieve-plates T T T, shown at fig. 6.

U U are siphons, for admitting water to the flue N, through which it passes with the vapor to the pumps, and assists in making a packing or seat vapor-tight for the valves.

The operation of my apparatus is as follows: The door or slide G being closed, the proper quantity of ore is put into the furnace through the hopper J, which is then closed, and the fire lighted on the grate B. The suction-pump being started, the generated vapors are carried through the flue N, water-tank O, and box-flue P to the pump, then forced under water, and immediately condensed, falling to the bottom of the water-tank, from whence the quicksilver may be withdrawn.

When the lower part of the ore in the furnace has been subjected long enough to the action of the fire, the door or slide G is opened, and the ore drops in a column on the endless carriage or car F; this column will remain, closing the tube E, until the carriage is moved slightly forward, when a quantity of ore falls, governed by the movement of the car, which is controlled by the time required for properly burning the ore.

When it becomes necessary to put more ore in the furnace, the handle M of the hopper is depressed, and the lower valve, K′, is raised from off the projecting tube I, and partly turns on the pivot formed by the pipe L.

The upper valve, K, is then opened, and the necessary quantity of ore is placed in the hopper, when the valve is closed, and the hopper is again turned to its former position over the tube I, and the lower valve is drawn, when the ore drops into the furnace.

A sufficient quantity of water should be kept on the top of the furnace in the cavity in which the hopper rotates, and the lower projecting rim of the hopper, resting in the water, makes an air-tight joint around the said hopper, and thus prevents the escape of any vapor during the operation of feeding or charging the furnace, as well as the danger of salivation and injury to the workmen employed.

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

1. The vapor-tight hopper J and siphons U U, in combination with this or other smelting-furnaces, substantially as described.

2. The division-plate H H, and the endless carriage F, constructed and arranged to operate substantially as and for the purpose described.

3. In combination with a vapor-tight furnace, A, provided with a hopper, J, either of the pumps Q R S, substantially as and for the purpose specified.

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

THOMAS W. DRESSER. [L. S.]

Witnesses:

C. W. M. SMITH,

J. L. BOONE.