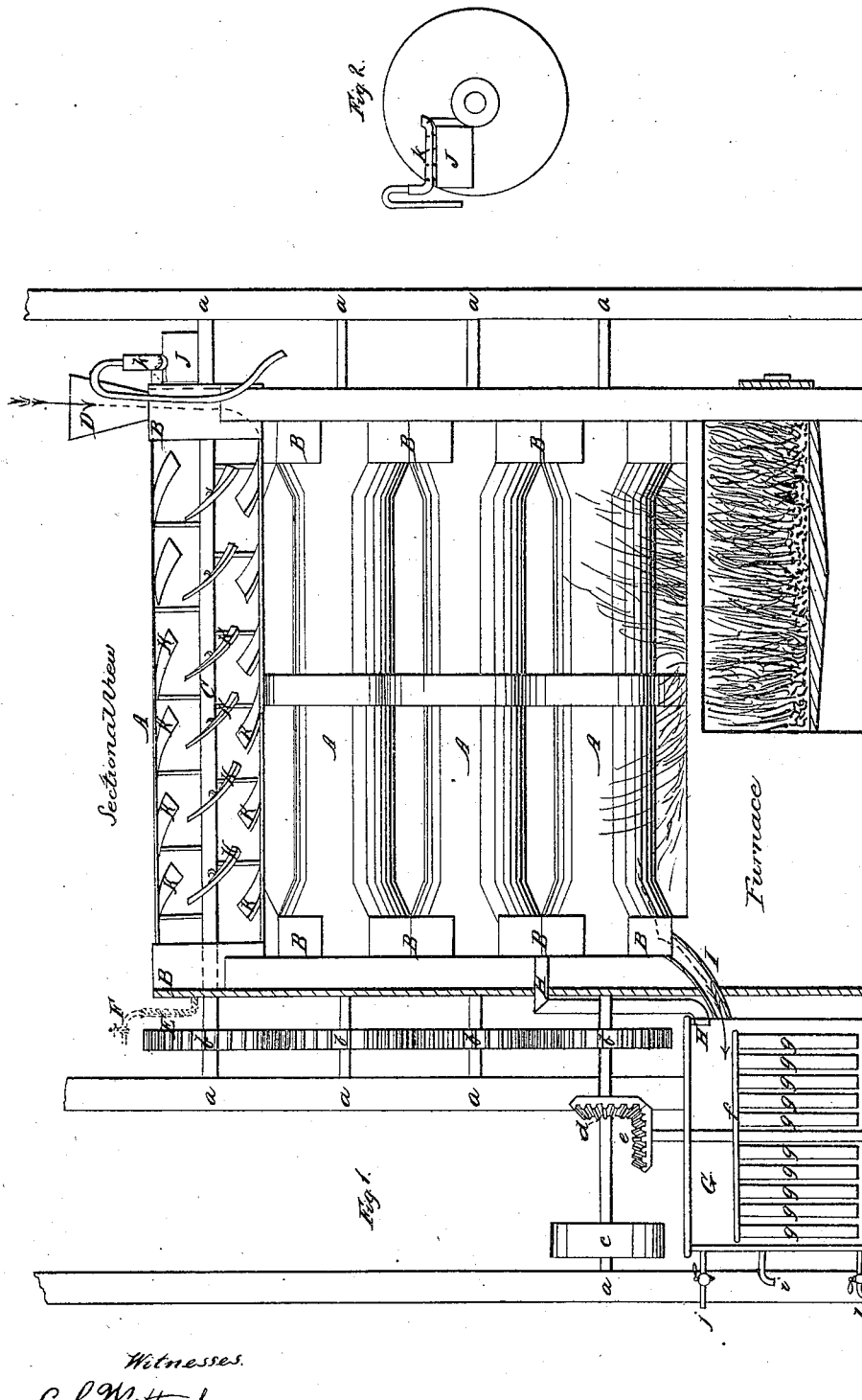


R. P. WILSON.
ROASTING AND DESULFURING ORES.

No. 46,745.

Patented Mar. 7, 1865.



Witnesses.
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RILEY P. WILSON, OF NEW YORK, N. Y.

IMPROVEMENT IN ROASTING AND DESULPHURIZING ORES.

Specification forming part of Letters Patent No. 46,745, dated March 7, 1865.

To all whom it may concern:

Be it known that I, RILEY P. WILSON, of the city and county of New York and State of New York, have invented, used, and applied new and useful improvements upon my invention known as "Wilson's Desulphurizer," (for which Letters Patent were granted unto me by the United States Patent Office on the 15th day of April, 1864, and for which Letters Patent were issued to me November 1, 1864, antedated October 5, 1864, and now known as "Wilson's Improved Desulphurizer;") and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings and the letters of reference marked thereon, making a part of this specification, in which—

Figure 1 is a sectional front elevation. Fig. 2 is a side view of the retort-head and reservoir of salt.

My invention and improvements are particularly designed for the complete desulphurization and lixiviation of all metalliferous ores, but more especially for gold and silver ores as found in California, Nevada, Idaho, Montana, Colorado, Mexico, and other mining districts, to which it will prove invaluable as a labor, fuel, and time saving process. As a *modus operandi* for the complete extraction of every metallic atom contained in the ores it may not have its equal, since it accomplishes the desulphurization and decomposition of all base elements of the matrix that inclose the more precious metals—gold or silver.

I will now proceed to describe the construction and operation, together with the improvements.

I construct a suitable furnace, of brick or other material, for the reception of one or more of fire-clay retorts, A A A, the lower part of which shall contain the fire-place and grate, suitable for any kind of fuel. The construction of said furnace may be so arranged as to allow said retorts to be placed side by side or one above the other, as shown in the drawings, but always in a horizontal position.

I provide journals or blocks B, also prepared of fire-clay, having openings or holes which communicate with similar openings at the ends of the retorts A, so as to allow the desulphurized material as conveyed to said open-

ings into the under retorts A, as shown by the dotted line and arrow. The middle blocks or journals merely serve as rests or stays for the retorts.

I construct conveyer C, using copper or gun-metal for every part thereof, the shaft of which may be solid or hollow, either as a whole or in sections, upon which I place or attach a series of conveying-flanges, as attached to rods, having the shape of a quarter of a circle, (more or less,) so as to conform to the inner surface of retorts A, and these are placed equidistant from each other at about an angle of between twenty degrees to forty-five degrees, consisting of four or more rows, the material to be of sufficient thickness—the whole as designed for the retorts. Its peripheries shall have from a quarter to a half inch play room or space, so as not to come in contact with the inner surface of said retorts. The ores or material for desulphurization is introduced into the hopper D, communicating with the aperture into the upper retort A. Into said retort I introduce an elbow-shaped pipe, (of a suitable dimension,) E, the upper or outer end of which shall receive a smaller steam-pipe, F, communicating with the propelling-power boiler, thus allowing sufficient room where the mouths of both pipes join to admit of a current of air, as well as a powerful jet of steam. This addition materially hastens and aids the decomposition of the material to be treated.

I construct the shafts of the conveyers C of sufficient length so as to admit of their running in journals *aa*. I provide geared wheels *b b b* of the required dimensions to each conveying-shaft, as a propelling-motion, as shown in the drawings, and to the lower shaft I attach the belt-pulley *c*; also the mitered pinion *d*, which latter couples with the corresponding mitered pinion, *e*. Upon this perpendicular shaft of pinion *e*, I attach a cross-bar, *f*, nearly the length of the diameter of chamber or reservoir G, the same being of wood or other suitable material, through which I attach firmly a given number of upright bars, *g*, which act as mullers or stirrers, which latter should have play-room between the bed of mercury placed in said reservoir G, as represented in the drawings. Above the cross-bar space should be allowed for the generated steam and gases to escape through the flue H in said chamber G. This latter vessel receives the desulphurized

material from the retorts through the siphon I. The stirrers agitating the material will bring the metallic atoms in contact with the mercury, forming an amalgam, which may be drawn off by the faucet *h*. The refuse débris or earthy matter passes through the cock *i*, and the surplus water through faucet *j*. I construct a flue or introduce a pipe, *H*, communicating with the furnace just above the lower and middle retorts *A*, as shown, and the vat or vessel *G* near its upper periphery. Said flue or pipe is designed to convey the latent heat and generated gases to the furnace, forming ostensibly superheated steam. The vat or vessel *G* may be constructed in any manner, dimension, and of suitable material.

I construct a vessel or box, *J*, of the required dimensions, in such manner that the pipe *k* shall pass through the same, the pipe being provided with openings in its sides of so much of its length as is inclosed within said box *J*. Said pipe is turned or bent at one end, so as to communicate with the retort-head, (and both box and pipe *J* and *k* should be on that end of the retort immediately under the hopper *D*.) The other end of said pipe *k* is bent in elbow shape, for the reception of a steam-pipe of smaller dimension, the mouths of pipes forming a joint similar to that represented by *E F*. The steam introduced is also derived from the engine-boiler. In said vessel *J*, I place common salt or brine. The jet of steam and air forces this material into the retort, and is disseminated through ores, thus producing rapid calcination.

My improvements mainly consist in the reconstruction of a conveyer differing from the one for which Letters Patent were granted, and the addition of a vessel containing the salt or brine, with the application of steam-pipes. I therefore disclaim so much of the claims grant-

ed me on the 15th of April, 1864, as relates to the conveyer shown and described therein.

What I claim as my improvements, and desire to secure by Letters Patent, is—

1. Fire-clay retorts *A*, in combination with the conveyers *C*, as a whole or in sections, for the purpose of desulphurizing gold, silver, and other metalliferous ores.

2. The construction of a furnace in such manner that a series of clay retorts, *A*, may be placed in a horizontal position, side by side, or one above the other, so that the desulphurized ores may be conveyed back and forth during the process of calcination.

3. The hollow shaft *C*, in combination with the retorts *A*, as shown herein.

4. The flanges or wings *K* of the conveyers as adjusted to the shaft, for the use and purpose herein stated.

5. The use and application of copper or gun-metal, or its equivalent, both for a sheathing for the shafts of the retorts and also for the flanges or wings *K*.

6. The introduction of a jet of steam into the retorts, in combination with the air; also the box or vessel *J*, containing the salt or brine, substantially for the uses and purposes herein described.

7. The use of a receiving vessel or vat, *G*, in combination with the mullers or stirrers *g*, into which the desulphurized ores collect, said vat being partly filled with water, having a flue or pipe for the egress of the steam into the furnace, a faucet, *j*, for the extraction of surplus water, a siphon, *i*, for the discharge of the débris or refuse-material, and the faucet *h* for drawing the amalgam.

RILEY P. WILSON.

Witnesses:

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