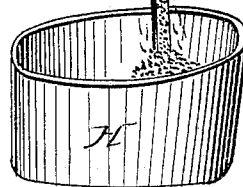
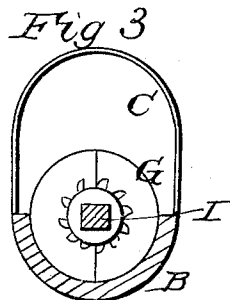
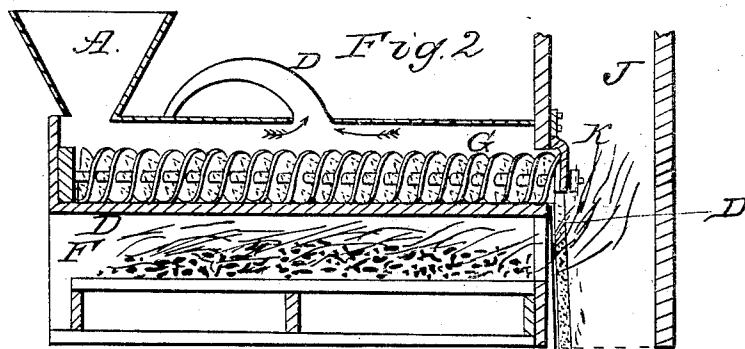
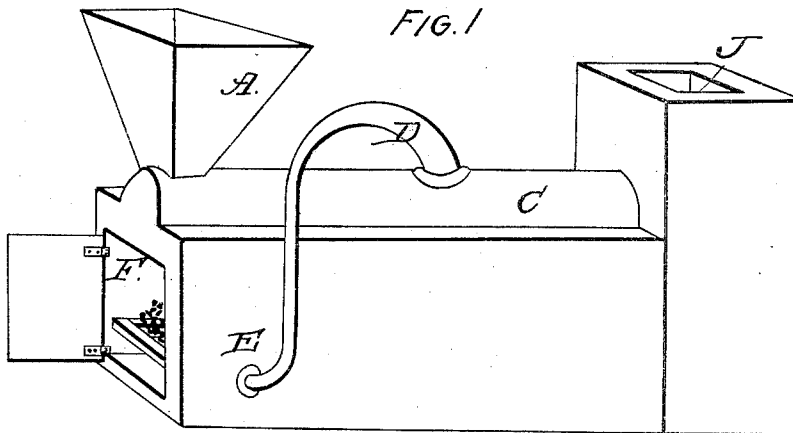


R. P. WILSON.

Roasting and Desulphurizing Ores.

No. 44,906.

Patented Nov. 1, 1864.



WITNESSES

Owen G. Warren
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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. **44,906**, dated November 1, 1864; antedated October 15, 1861.

To all whom it may concern.

Be it known that I, RILEY P. WILSON, of the city, county, and State of New York, have invented a new and useful Improvement in Roasting and Desulphurizing Apparatus; and I hereby declare that the following is a full and exact description thereof.

To enable others skilled in the business to make and use my invention, I proceed to describe its construction and operation, reference being had to the drawings hereunto annexed and making part of this specification.

Figure 1 is a side elevation of a furnace for roasting and desulphurizing ores. Fig. 2 is a longitudinal section of the same. Fig. 3 is a diagram enlarged, showing the transverse section of the retort and spiral conductor with elevators or stirrers.

The same letters refer to the same things in all the figures.

A is the hopper or inlet of quartz or ore in a comminuted condition; B, the retort in which lies the spiral conductor; C, the upper part or chamber of the retort, used to receive and hold the escaping gases till they can be drawn out; D, a pipe or flue from the top of the retort, leading to the furnace or to a blower for conveying the gases sublimed by heat to the fire; E, the inlet of the gases when conveyed directly to the furnace; F, the furnace, which may be of any form, so that it will heat the retort; G, the spiral conductor, an auger-shaped shaft, and elevators made to turn in the retort and convey along and mix up the quartz or ore to be acted on. H represents a vat, (containing water and quicksilver,) into which the ores falling from the spiral conductor or mill are received; I, the shaft on which the sections of the spiral conductor are set; J, smoke-flue of the furnace; K, the pulley on the shaft of the spiral conductor. It is adapted to receive a chain-band.

The purpose of this invention is to desulphurize ores in the process of roasting in a systematic and economical manner and deliver them into water (or mill for the purpose of regrinding) kept hot, either by the hot ores falling into it or by other means, and in the operation to stir them continually by the action of the spiral conductor and elevators, so that all the parts shall have an opportunity to be acted upon.

The furnace may be of any shape or con-

struction; but it should have a blower or a suction-draft at the smoke-flue, and it should receive and consume the gases emanating from the roasting ores in the retort.

Within the furnace is placed the retort B, or many such if the works are extensive. The retort may lie horizontal, as shown; or it may be inclined to the horizon. The retort is a cylinder of cast-iron.

Within the retort is the spiral conductor with elevators G. This is a shaft with a spiral wing or a twisted flat bar with elevators. It is best made in sections, each forming one thread of the screw, and put on a square or circular shaft; but as the rapidity of motion required for the ores to pass through the furnace depends on many circumstance, the twist may have one, two, or more threads. If it is made very long, there may be more threads. If it be made short or its revolution be fast, it may have but one thread. Any size and any form of screw will serve by varying its length and rotary motion. Its office is to convey along the granulated ores from the inlet or hopper A, mixing and stirring them all the time, and deliver them at its outlet, that they may fall through the furnace flame or mill, as desired, into the water beneath.

The hopper A is supposed to receive the granulated or pulverized ore—such as tailings—in proper quantity, either direct from a mill grinding it or furnace heating it, or otherwise.

The vat H represents the quicksilver bath. It is kept full of boiling water, and the ores falling in are stirred by proper apparatus, and the vats changed when necessary by moving them along on a circular rail or by drawing off the water by a siphon.

The principles which I have aimed to develop in this invention are to heat the quartz or ore after being pulverized to a high degree, abstract from it the impure gases which are sublimed by the heat by using a draft discharging the ore into a mill for regrinding, thence into water to make it friable and make the metal it contains accessible, and by the use of combined heat, regrinding, and water to render it possible to abstract the whole of the metal.

My apparatus is intended to be portable, so that it can be taken from place to place where miners have left tailings of crushed quartz,

which will often yield more gold by this process than had previously been taken from them. It is also easier to pulverize the quartz while hot, and the revolution of the spiral conductor besides, conveying the quartz along, is all the time grinding it at red heat, and, moreover, the ore thus confined does not lose in the flume the finer particles of the metal.

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

1. Conducting ores in a retort through a furnace and stirring and grinding them in the passage by means of a screw-shaft and elevators, G, in the manner substantially as described, and for the purposes set forth.

2. The regrinding to an impalpable powder the desulphurized material in a dry state, when such material is what is termed the "tailings" of quartz-mines or other previously-pulverized quartz, after being desulphurized.

3. Conveying in a flue, D, from the retort the gases evolved from the ores by the heat, and causing thereby a supply of air to take their place by means of the furnace-draft.

RILEY P. WILSON.

Witnesses:

OWEN G. WARREN,

J. D. STURTEVANT.