A. F. W. PARTZ.

Roasting Sulphurets and other Ores.

No. 43.129. Patented June 14, 1864.

FIG. 1

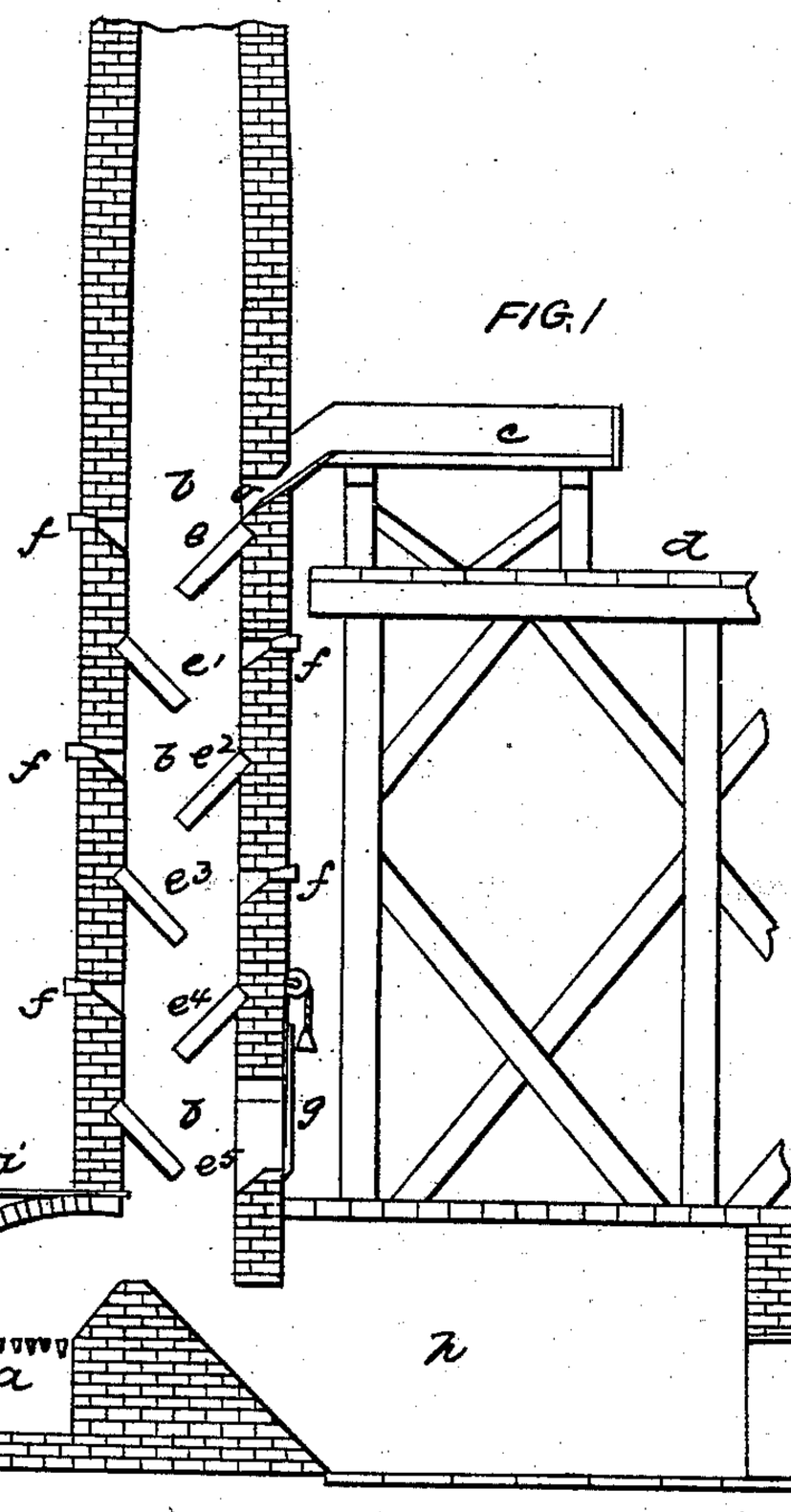


FIG. 3

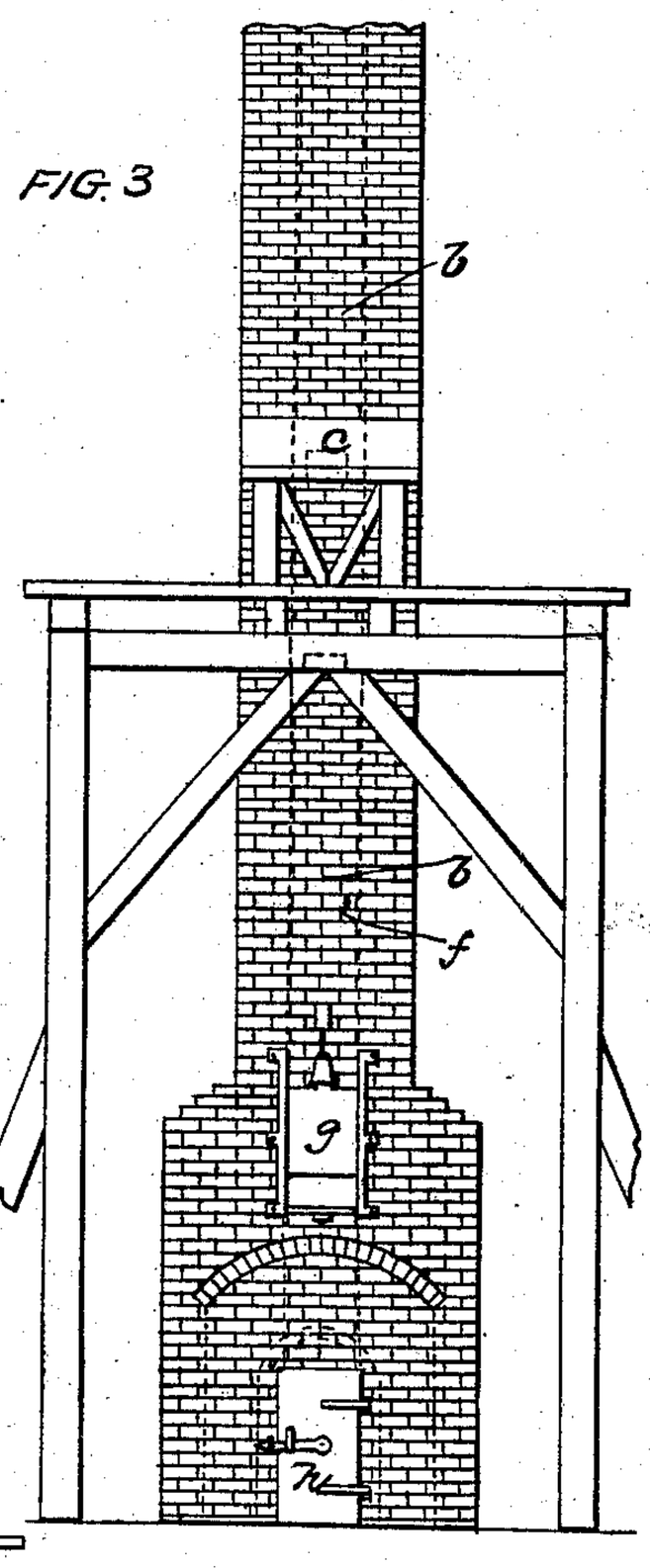
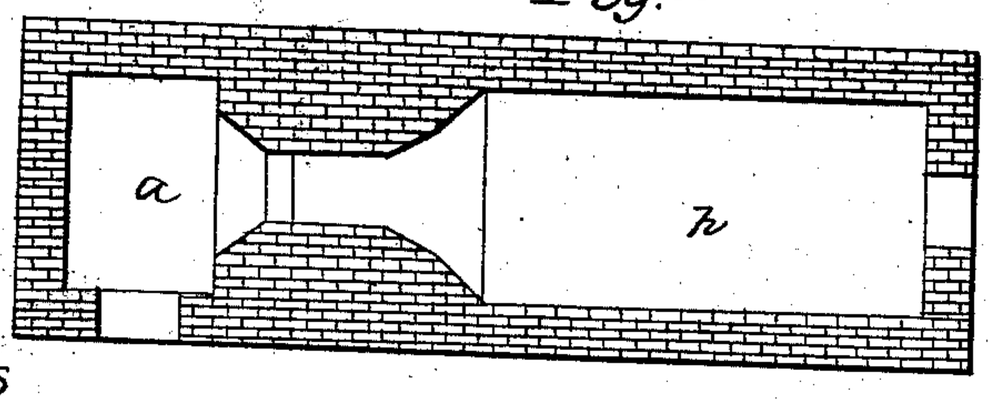


Fig. 2



WITNESSES

Samuel W. Serrell

Thos. Ewd. Hawes

INVENTOR

A. F. W. Partz

UNITED STATES PATENT OFFICE.

AUGUST F. W. PARTZ, OF WURTSBOROUGH, NEW YORK.

IMPROVEMENT IN ROASTING SULPHURETS AND OTHER ORES.

Specification forming part of Letters Patent No. **43,129**, dated June 14, 1864.

To all whom it may concern:

Be it known that I, AUGUST F. W. PARTZ, of Wurtsborough, in the county of Sullivan and State of New York, have invented and made certain Improvements in the Roasting of Sulphurets and other Ores and Minerals; and I do hereby declare the following to be a full, clear, and exact description of my said invention, reference being had to the annexed drawings, making a part of this specification, wherein—

Figure 1 represents a vertical section of my improved apparatus. Fig. 2 is a ground plan, and Fig. 3 a front elevation of the same.

Similar marks of reference denote the same parts.

Sulphuret ores in a more or less finely-divided state have heretofore been desulphurized and oxidized by the joint application of heat and air in a regulated manner, with the aid of various apparatus and contrivances.

My invention relates to the use for this purpose of a vertical or nearly vertical shaft, bearing resemblance to a chimney, through which the ore is allowed to fall, while at the same time heat is caused to ascend, together with a volume of air sufficient to burn during the descent of the ore the sulphur with which it is combined, and which escapes in a gaseous form, and also to oxidize the metalliferous portion of the ore, which falls to the base of the shaft, ready for subsequent metallurgical treatment.

In order to check the ore in its descent through the shaft and insure its becoming sufficiently heated, I provide a series of alternating inclines. I also make use of a jet of steam, introduced near the bottom of the shaft, to promote the desulphurizing operation.

In the drawings, *a* is a furnace of any suitable construction, by means of which the shaft *b* can be heated to the necessary temperature.

d is a platform sustaining the feeding-slide *c*, from which the ore is supplied, through the orifice *o*, into the shaft *b*, in the regulated quantity required, and passes upon the incline *e*, whence it falls upon the incline *e'*, and so on from one to the other until it arrives at the incline e^5, whence it falls into the chamber or receptacle *h*. The necessary air may be admitted to the shaft either through the furnace, or also through the air door or slide *g*.

i is a steam-pipe, through which the required quantity of steam is introduced, and the air introduced at *g* also aids in regulating the temperature of the shaft.

Between the inclines I provide holes in the shaft, with stoppers *f f*, by the removal of which the operation may be observed, or the inclines scraped or cleaned in case of the ore adhering to them.

The inclines *e e* may be omitted and the ore allowed to fall vertically through the shaft if the latter is of sufficient height, so that the time required for the desulphurization of the ore elapses during its fall.

While by the process above set forth the so-called baser metals are oxidized, the particles of gold and silver contained in auriferous and argentiferous ores will be partially fused and fall down in a granular metallic state, which greatly facilitates their collection by amalgamation. If the sulphurets are not associated with too large a proportion of veinstone or earthy matter, the heat produced by the combustion of the sulphur will be sufficient to keep the apparatus in operation without further supply of heat from the furnace after the shaft has once acquired the necessary temperature.

Ores containing phosphorus, arsenic, and other volatile elements may be treated essentially in the same manner and with the same effect as sulphurets.

In order to prevent portions of the ore from escaping with the gases into the atmosphere, or to make the gases themselves useful by arresting and converting them into articles of commerce or otherwise, the upper end of the shaft may be made to communicate with collecting or condensing chambers similar to those generally employed for such purposes, or especially designed in accordance with the particular end in view. By my improvement it will be seen the separate particles of the ore are presented to the action of heat and air in a much more thorough manner than by the methods of roasting heretofore in use, while it presents material advantages over other devices intended to accomplish the same result, on account of the fact that no motive power is required in the operation, and crushed ores or "tailings" may be worked without the aid of machinery for effecting their intimate contact with heat and air.

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

1. An upright shaft or chamber through

which heat and air are passed, in combination with a series of inclines applied in such shaft to check the descent of the ores, as set forth.

2. A shaft in which the heat and air ascend as the ores descend, in combination with a receiving-chamber, substantially as specified.

3. A vertical shaft or chamber in which the heat and air ascend as the ores descend, in combination with a door or damper for admitting a supply of air for regulating the temperature, as set forth.

In witness whereof I have hereunto set my signature this 4th day of March, A. D. 1864.

A. F. W. PARTZ.

Witnesses:

LEMUEL W. SERRELL,

THOS. GEO. HAROLD.