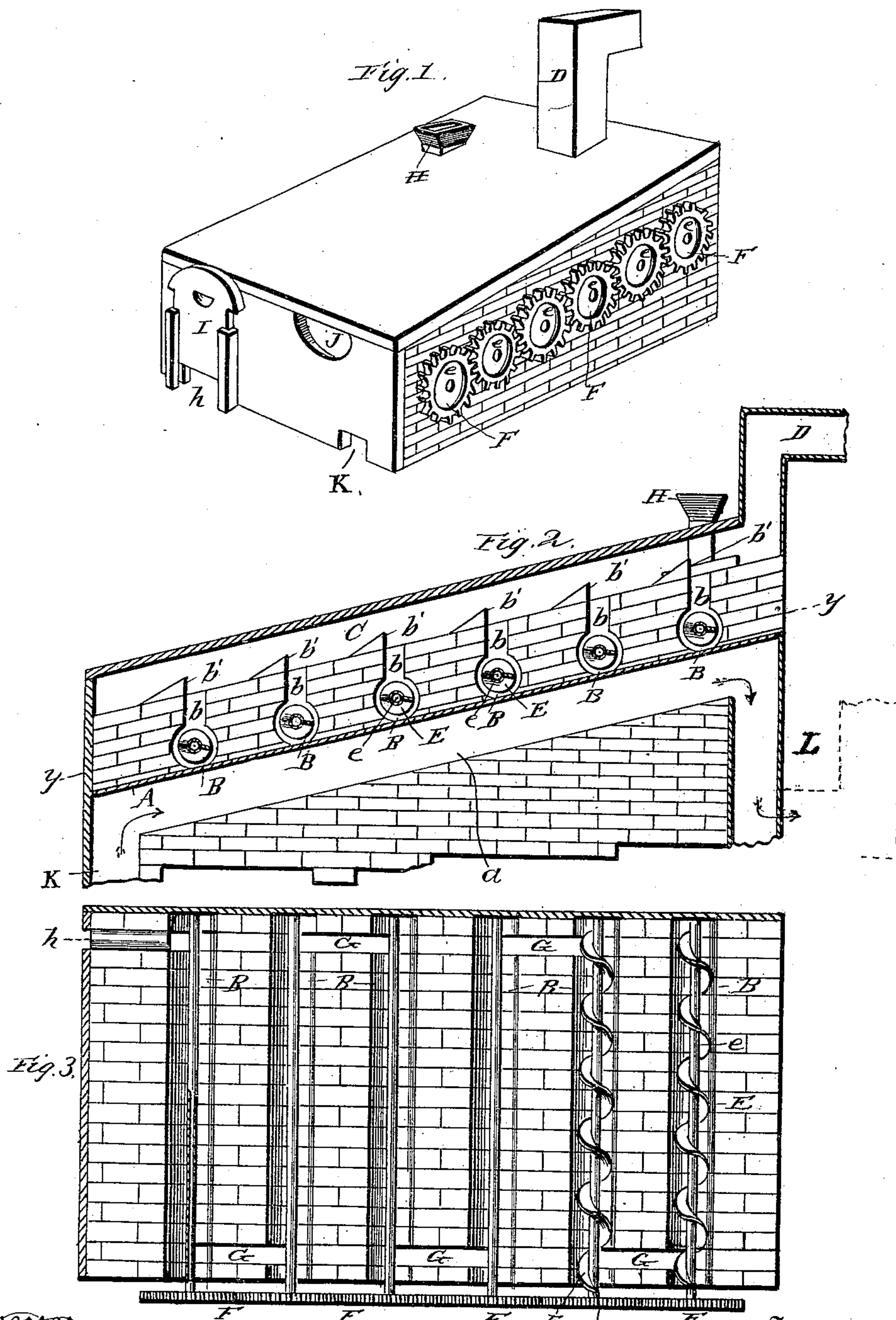


(No Model.)

F. O'BRIEN.
FURNACE FOR ROASTING ORES.

No. 464,103.

Patented Dec. 1, 1891.



Witnesses
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UNITED STATES PATENT OFFICE.

FRANCIS O'BRIEN, OF ELIZABETH, NEW JERSEY.

FURNACE FOR ROASTING ORES.

SPECIFICATION forming part of Letters Patent No. 464,103, dated December 1, 1891.

Application filed July 22, 1889. Serial No. 318,226. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS O'BRIEN, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Pyrites-Furnaces; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to furnaces for burning pyrites ore, and has for its object the production of sulphurous acid. It consists in the construction and devices perfectly described whereby the ore is manipulated and the gases evolved therefrom during the process of roasting, all of which will be hereinafter more fully described and claimed.

Figure 1 is a perspective, and Fig. 2 a vertical longitudinal section, of a furnace constructed according to my invention. Fig. 3 is a horizontal section on line *y y*, Fig. 2.

The hearth A is inclined from its upper to its lower end, and underneath it I form a fire-passage *a*, so it may be heated from end to end. I have not thought it necessary to show any form of fire-place or hearth, because the specific form of same does not enter into my invention and any desired form may be used. However, it may be well to state that the furnace or hot-air entrance is located at the end K and the heated gases and products of combustion pass through the said passage *a* in the direction of the arrows and escape into the stack indicated by the dotted lines L.

The calcining-chamber is divided into a series of retorts B, each one slightly lower than the one above it and all arranged in a gradually inclined plane, as will be understood most clearly from Fig. 2. The gas passage or flue C is arranged above this series of retorts and is connected with each of same by short vertical flues *b*. At the upper end of passage C a suitable pipe D connects it with the acid-chamber, of which illustration is not necessary. On the rear side of the flues *b* and extending the full width of the same I build projecting or deflecting guards *b'*, which are

inclined on their rear sides upward from the base of passage C to the line of the rear wall of the flues *b*. The object of these deflectors is to prevent the draft through passage C from entering the short flues *b* and creating disturbance of the dust in the several retorts, as will be readily understood. The retorts B are supplied each with an Archimedean screw E, the shafts *e* of which are preferably made hollow and open to the atmosphere, as shown in Fig. 3, so as to prevent injurious overheating of said shafts. These shafts *e* have meshing gear-wheels F at their ends. The adjacent screws will be revolved in opposite directions, thus feeding the dust in the adjoining retorts toward opposite sides of the furnace. These several retorts B are connected together by passages G, connecting the discharge end of each retort with the receiving end of the one next below it.

A suitable hopper H is arranged to deliver the dust into the receiving end of the uppermost retort, and it is thence fed by means of the Archimedean screws through the several retorts until it is discharged at *h*, at which point I prefer to use a door I, as shown in Fig. 1.

In practice I prefer to provide an opening J, leading into the lower end of the gas-passage C, so as to allow gas from other furnaces to be conducted through said passage in order to increase the heat to insure a more complete desulphurization of the ores.

When desired, a number of furnaces constructed as above may be connected so the gases evolved in one will serve to assist the others, or the furnaces may be used singly, as described.

It will be noticed that by the arrangement of the retorts in an inclined plane the dust will be passed from one to the next lower one and is made to traverse all the retorts before it is finally discharged. By this construction and the location of the retorts on practically a roasting-hearth, where they are heated approximately equally, I secure the burning of all the sulphur from the ores, as will be appreciated from the drawings and the description before given.

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

1. The herein-described furnace, having a

gas-passage C and a series of connecting retorts arranged in an inclined plane and provided with Archimedean feed-screws and connected with the gas-passage by short flues, 5 and the deflecting projections arranged on the rear side of said short flues and extended into the gas chamber or passage, all substantially as and for the purposes set forth.

2. A furnace having an inclined roasting- 10 hearth, a series of retorts arranged transversely on the hearth and having the adjacent retorts connected at alternate opposite

ends, a gas-passage arranged above the said retorts, flues connecting the retorts with the said passage and extending the full length of 15 the said retorts, and feeders within the retorts to feed the ore in opposite directions in adjacent retorts, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANCIS O'BRIEN.

Witnesses:

JOHN T. DUNN,

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