J. HUGHES.

Furnace for Burning Pyrites.

No. 199,069. Patented Jan. 8, 1878.

Fig. 1.

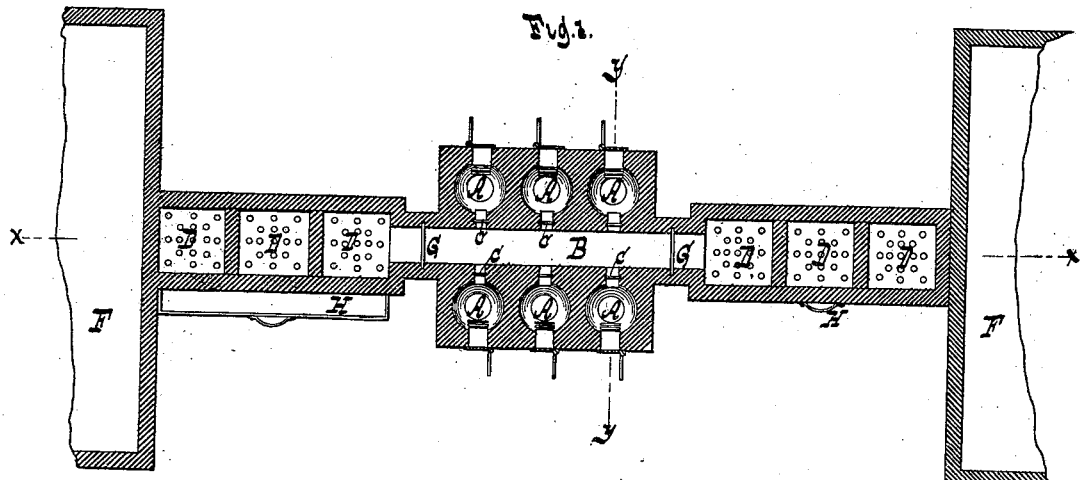


Fig. 2.

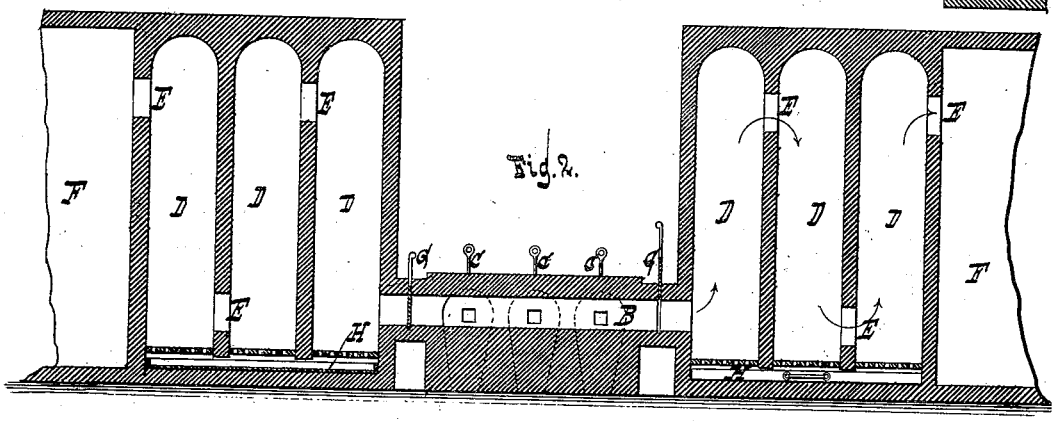
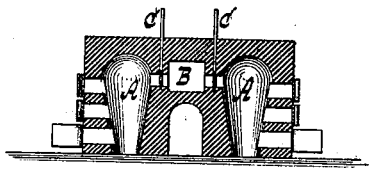


Fig. 3.



Witnesses.

Otto Hupeland.

Hugo Bruggemann

Inventor.

John Hughes

per

Van Santvoord & Hauff

Attys

UNITED STATES PATENT OFFICE.

JOHN HUGHES, OF STAPLETON, NEW YORK.

IMPROVEMENT IN FURNACES FOR BURNING PYRITES.

Specification forming part of Letters Patent No. **199,069**, dated January 8, 1878; application filed September 14, 1877.

To all whom it may concern:

Be it known that I, JOHN HUGHES, of Stapleton, in the county of Richmond and State of New York, have invented a new and useful Improvement in Furnaces for Burning Pyrites, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a horizontal section of a furnace containing my improvement. Fig. 2 is a longitudinal vertical section thereof in the plane of the line *x x*, Fig. 1. Fig. 3 is a vertical cross-section thereof in the plane of the line *y y*, Fig. 1.

Similar letters indicate corresponding parts.

My improvement relates to that class of furnaces for which Letters Patent of the United States were granted to me June 18, 1867, No. 65,914, to which reference is made; and it consists in the combination of a block of kilns which communicate with a common escape-flue, provided with cut-offs near each end, two sets of cooling-chambers which communicate with the escape-flue at opposite ends thereof, and through which the vapors escaping from the kilns are compelled to circulate in a zigzag course, and condensing-chambers in which the vapors are finally condensed, so that the vapors from either or all of the kilns are partially condensed in their passage through the cooling-chambers, the products of such condensation being deposited on the bottoms of the cooling-chambers in the form of crude sulphur, while from the condensation of the vapors in the condensing-chamber flowers of sulphur is obtained. The cooling-chambers have perforated bottoms, beneath which are suitably-supported drawers or trays for the reception of the crude sulphur resulting from the condensation of the vapors in these chambers, said tray being situated beneath the bottoms of the chambers, and being removable, so that it can be emptied of its contents at any desired time.

In the drawing, the letter A designates a block of six kilns, more or less, the fronts of which are opposite each other, and which communicate with a common escape-flue, B. In order to permit of shutting off the communication of either of the kilns A with said escape-flue B, I provide each of the kilns with a damper, C, of any suitable form. The escape-flue B communicates with a set of three (more or less) cooling-chambers, D, which are arranged side by side, and in the walls of which are openings E, which are alternately near the tops and bottoms of the chambers, as seen in Fig. 2. The last or outer cooling-chamber D communicates, by the opening E in its wall, with what I term the "condensing-chamber" F, the same being of ordinary form.

The cooling-chambers D and condensing-chamber F are duplicated—that is to say, a set of cooling-chambers and a condensing-chamber are arranged on opposite sides of the block of kilns A, both sets of cooling-chambers being made to communicate with the escape-flue B. When the parts are duplicated, as last described, I provide the escape-flue B with two dampers, G G, by which the communication of either set of cooling-chambers with said flue can be shut off. I am thus enabled to use one set of cooling-chambers and a condensing-chamber while the other chambers are being cleaned, and consequently my apparatus can be worked continuously, if desired.

In charging the kilns the fire in each is started with coke or other suitable kindling-stuff, and after a kiln has become highly heated the pyrites are introduced at the top by light and gradual charges until the combustion is regular and well established. I then close and lute the charging-door of the kiln, and the vapors discharging therefrom pass into the escape-flue B, thence through the cooling-chambers D, through which they are compelled to pass in a zigzag course, and finally into the condensing-chamber F. In their passage through the cooling-chambers D part of said vapors is condensed, and the products resulting therefrom collect on the bottom of the chambers in the form of crude sulphur, while in the condensing-chamber F the vapors are wholly condensed, and from this condensation flowers of sulphur is obtained.

In order to permit of removing the crude sulphur from the bottoms of the cooling-chambers D with facility, I perforate such bottoms, and arrange beneath each of them a sliding or removable tray, H. The products of condensation in the cooling-chambers D are thus caught on said perforated bottoms of the chambers,

and, since such product is in liquid form when deposited, it falls down into the trays H, whence it can be readily removed by withdrawing said trays from time to time.

It may be remarked that by the use of the several dampers which I have described, and especially the dampers of the kilns, I am enabled to cut out either of the kilns or either set of cooling-chambers, and the operation of my furnace can be kept up without interruption.

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

1. The combination of kilns A, common flue B, connected at opposite ends to separate sets of cooling-chambers D, and the dampers or cut-offs G, whereby one set of said chambers may be disconnected from the kilns without interrupting the operation of the other set, substantially as set forth.

2. In a furnace for burning pyrites, the cooling-chambers D, provided with perforated bottoms and suitable devices for supporting pans or drawers thereunder, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 13th day of September, 1877.

JOHN HUGHES.

Witnesses:
W. HAUFF,
E. F. KASTENHUBER.