(No Model.) 2 Sheets—Sheet 1.

T. WALKER & J. F. CARTER.

ORE ROASTING FURNACE.

No. 516,854. Patented Mar. 20, 1894.

FIG. 1.

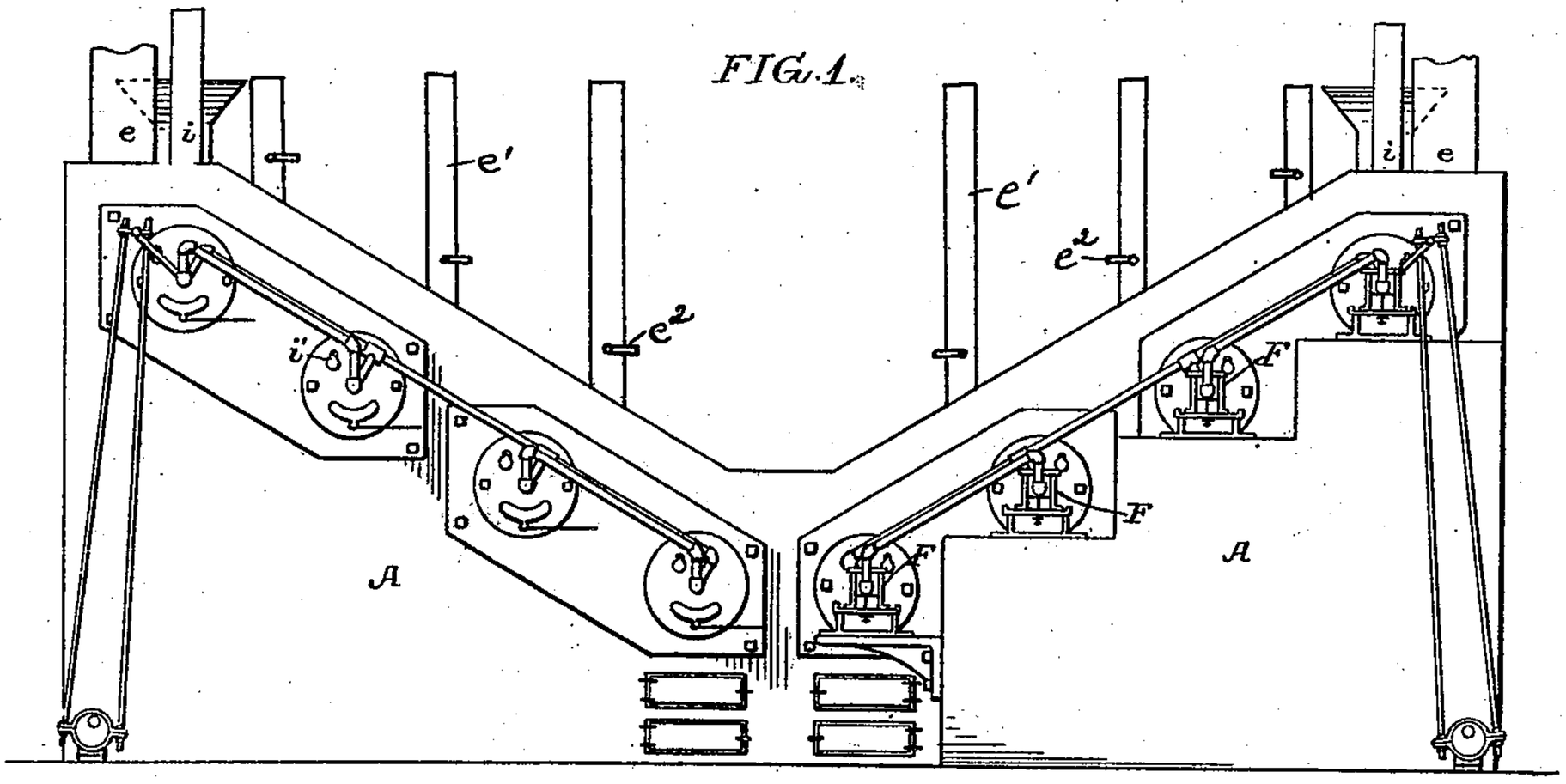


FIG. 5.

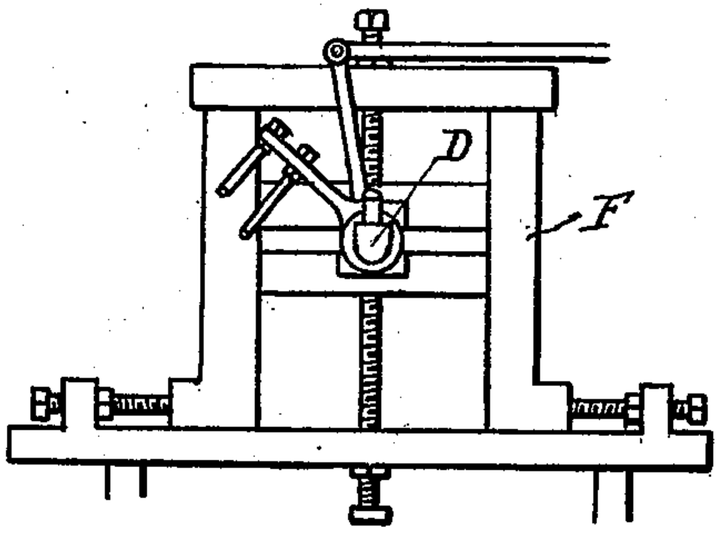
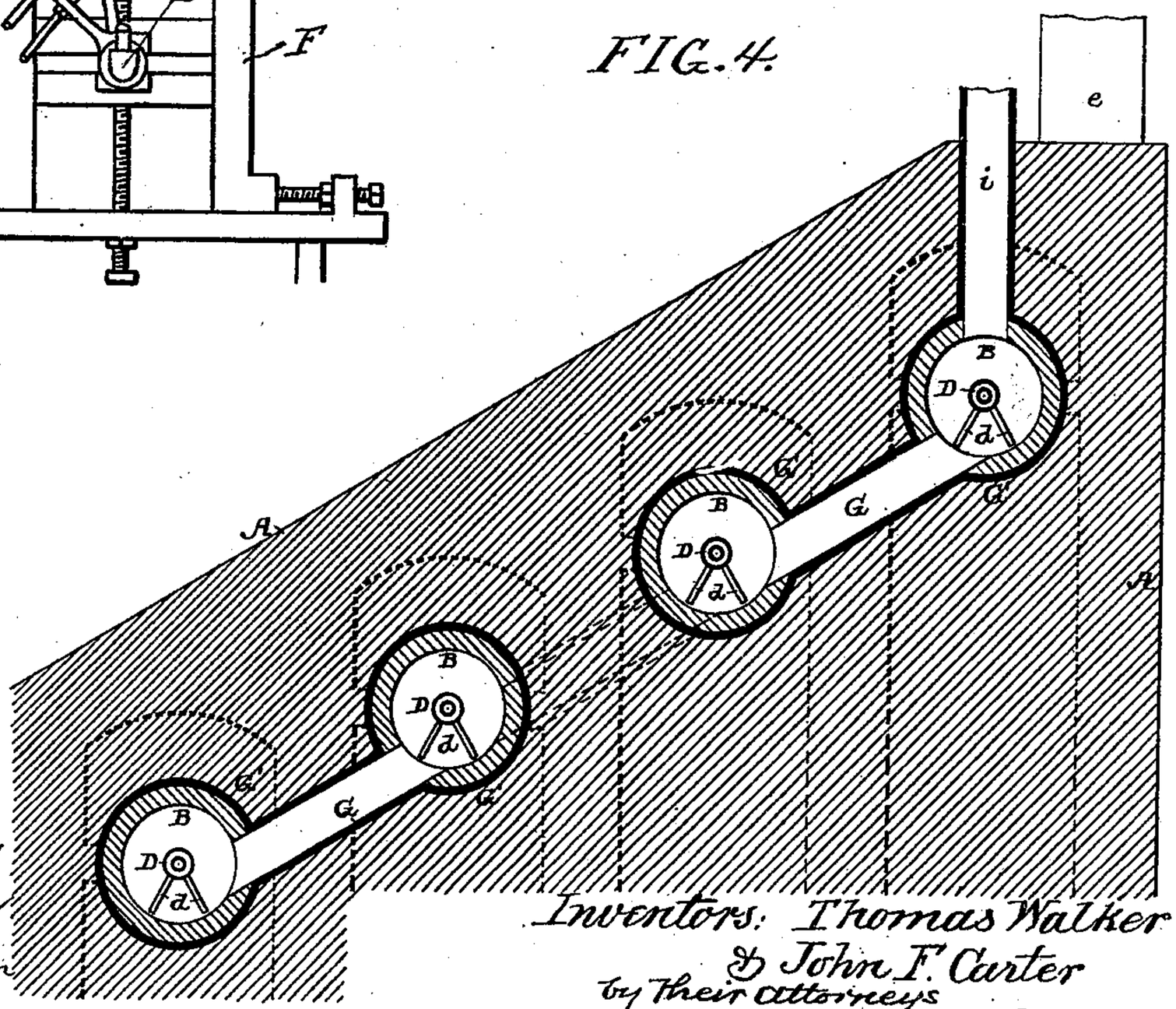


FIG. 4.



Witnesses:
William N. Barr
F. D. Goodwin

Inventors: Thomas Walker
& John F. Carter
by their attorneys
Howson & Howson

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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FIG. 2.

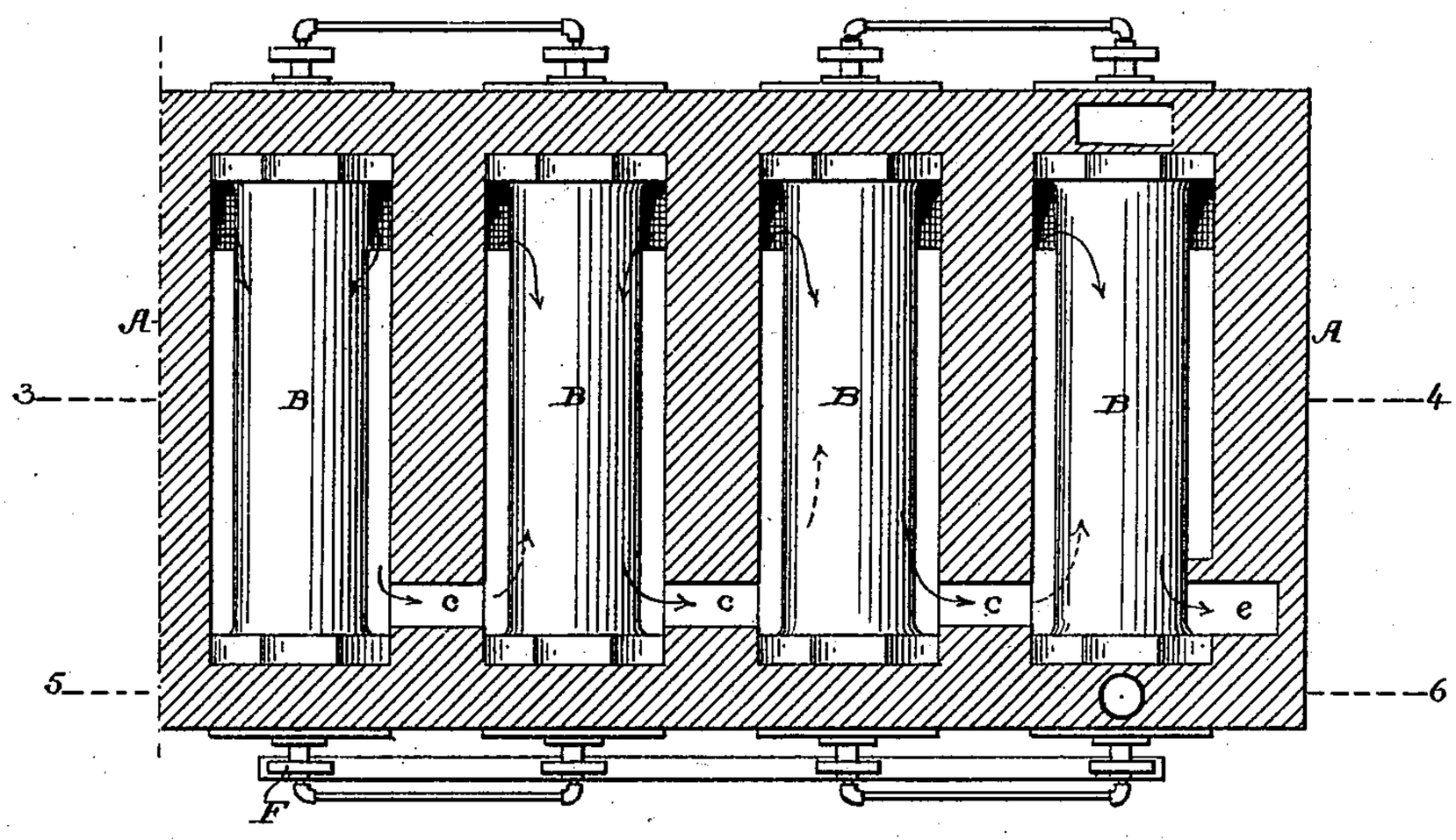
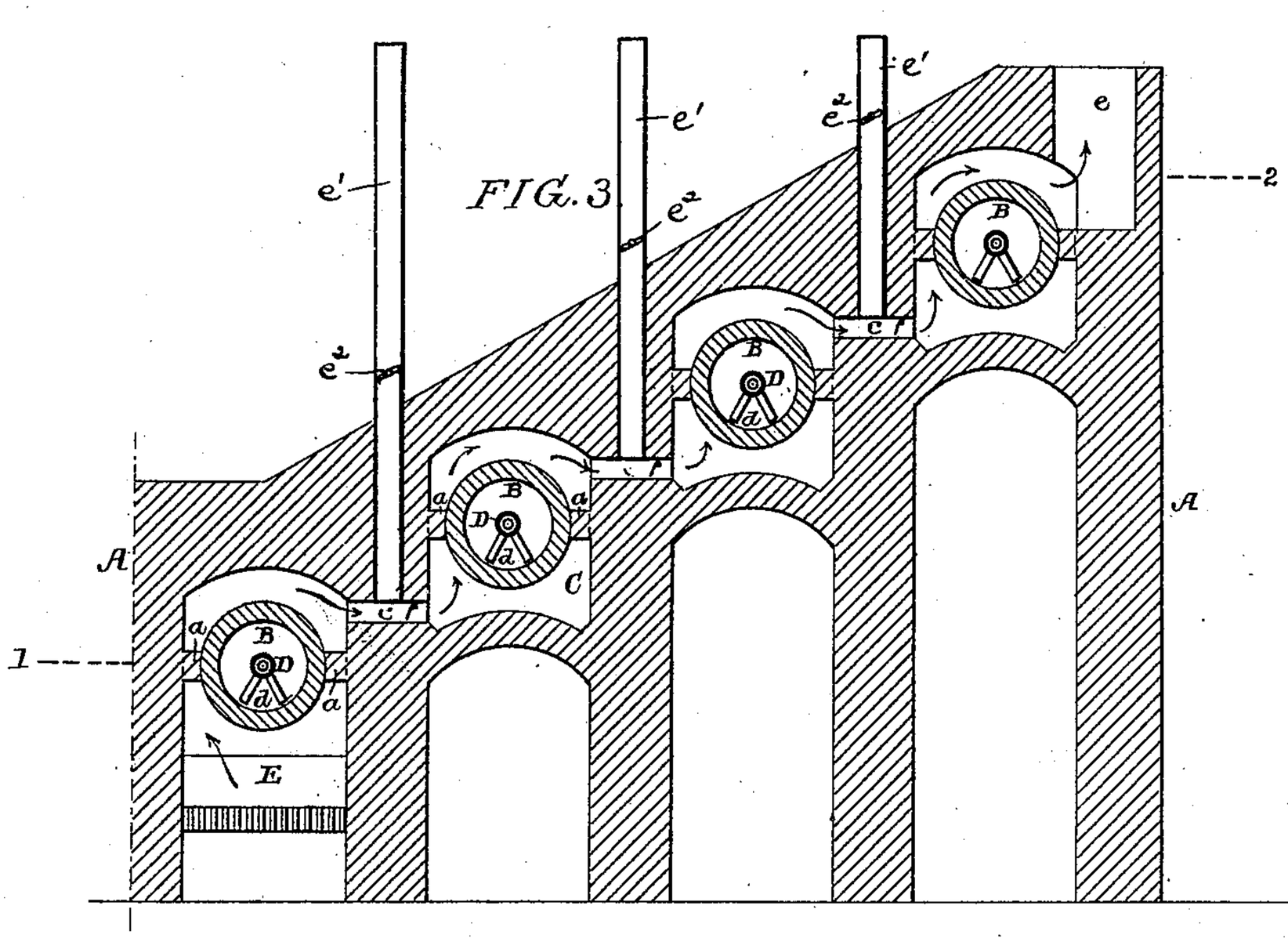


FIG. 3.



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THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS WALKER AND JOHN F. CARTER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO JOHN A. BARHAM AND JOSEPH A. VINCENT, OF SAME PLACE.

ORE-ROASTING FURNACE.

SPECIFICATION forming part of Letters Patent No. 516,854, dated March 20, 1894.

Application filed May 23, 1893. Serial No. 475,282. (No model.)

To all whom it may concern:

Be it known that we, THOMAS WALKER and JOHN F. CARTER, both citizens of the United States, and residents of Philadelphia, Pennsylvania, have invented certain Improvements in Ore-Roasting Furnaces, of which the following is a specification.

The object of our invention is to construct an ore roasting furnace in such a manner that the ore under treatment will flow from one retort to the other by gravity, and the fumes will readily escape without passing through the body of ore, and in which the products of combustion will pass from one chamber to another, and heat the retorts to the proper degree. Our invention is a modification of that described and claimed in the application filed by us on the 14th of December, 1892, Serial No. 455,165.

Referring to the accompanying drawings:—Figure 1, is a front view of the furnace. Fig. 2, is a sectional plan view on the line 1—2, Fig. 3. Fig. 3, is a sectional elevation on the line 3—4, Fig. 2. Fig. 4, is a section on the line 5—6, Fig. 2. Fig. 5 is a view of one of the adjustable bearings.

A is the body of the furnace; B the retorts mounted on the walls of the furnace and resting in independent chambers C. The retorts are arranged on an incline side by side so that the ore will flow from one retort to the retort below it by gravity. Each chamber C is divided by a longitudinal partition *a*, and passages *c* form communication between the upper portion of one chamber with the lower portion of the one beyond it as clearly shown in Fig. 3, and as the fire box E is situated under the lower retort, its products of combustion pass under and over the several retorts until they pass out finally through the passage *e*. We have shown stacks *e'* communicating with the several cross passages *c*. These stacks have suitable valves e^2 so that they can be closed or opened as required, to cut off one or more of the retorts from the heat.

In each retort is mounted a shaft D having blades *d* arranged in two rows in the present instance; each shaft has an arm at one end connected to a rod to which reciprocating motion is imparted, so that the shafts with the rakes attached vibrate in the retorts, and the blades are so formed that they not only move the ore laterally in the retorts but feed the ore forward through the retort. The inclined passage G is formed in a casing G' at each end of the furnace. The ore is fed in one direction through one retort, passes down the inclined passage G, and then is fed in the opposite direction through a second retort down the inclined passage at the opposite end of the furnace into the third retort, and then fed forward through the said retort to a third inclined passage into the lowermost retort, and from there it is carried to the outlet. The fumes as they arise from the ore pass through the upper portions of the several retorts and through the upper portions of the passages to the flue *i*. Air can be admitted to the several retorts through air valves *i'*. Independent fume flues may communicate with each retort if desired. By the arrangement above described, the several retorts are independently mounted in separate chambers, and one retort can be detached and removed from the furnace without interfering with the other retorts. The bearings F' for the shafts are supported by suitable steps as shown in Fig. 1, and can be adjusted thereon to properly align the shafts in the retorts, as shown in Fig. 5. By the arrangement of parts as shown, we avoid the complicated passages for the flow of the ore from one retort to the other, and also avoid the use of mechanical appliances for conveying the ore from one retort to another.

We claim as our invention—

1. The combination in an ore roasting furnace, of the body of the furnace, combustion chamber therein, with a series of retorts arranged on an incline side by side in the combustion chamber, inclined fume passages alternately arranged at each end of the furnace forming communications between the retorts, inclined planes in the passages for the ore and mechanism for feeding the ore through the retorts so that the ore will be fed mechanically therethrough, and flow by gravity from one retort to the retort below it without dusting, substantially as described.

2. The combination in an ore roasting furnace, of the body of the furnace, combustion chamber therein, with a series of retorts arranged on an incline side by side in the combustion chamber, each retort in a separate chamber, passages forming communication with the several chambers, inclined fume passages alternately arranged at each end of the furnace forming communications between the retorts, inclined planes therein for the ore and mechanism for feeding the ore through the retorts so that the ore will be fed mechanically therethrough and flow by gravity from one retort to the retort below it without dusting, substantially as described.

3. The combination in an ore roasting furnace, of the body portion having within it a series of combustion chambers, communicating with each other, said chambers being arranged on an incline side by side, a fire box communicating with the lowest chamber, and a stack communicating with the upper chamber, a retort mounted in each combustion chamber, and inclined end passages whereby communication is formed between adjoining retorts, an ore inlet communicating with the upper retort, air inlets for each retort, fume outlet for the upper retort, the parts being so arranged that the ore will travel through the furnace without dusting, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of subscribing witnesses.

THOMAS WALKER.
JOHN F. CARTER.

Witnesses to the signature of Thomas Walker:

HENRY JUNKIN,
R. CAMPION.

Witnesses to the signature of John F. Carter:

JOSEPH H. KLEIN,
HENRY HOWSON.