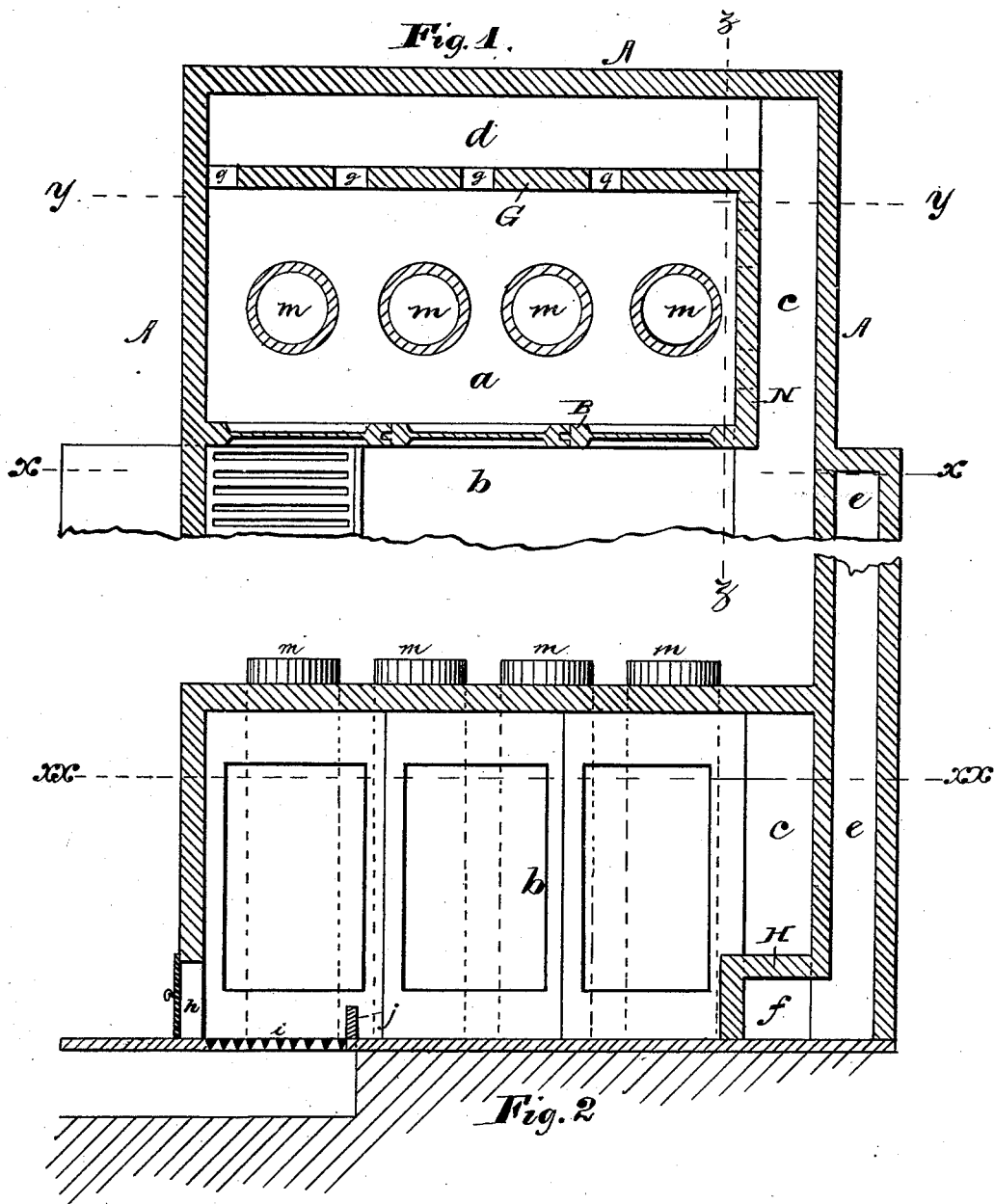


BONE AND WOOD BURNER.

No. 265,876.

Patented Oct. 10, 1882.



Attest:
Charles N. Peck
Chas. V. Winters.

Inventor:
Adam Schafer,
by
O. Drake. Atty.

(No Model.)

2 Sheets—Sheet 2

A. SCHAFER.
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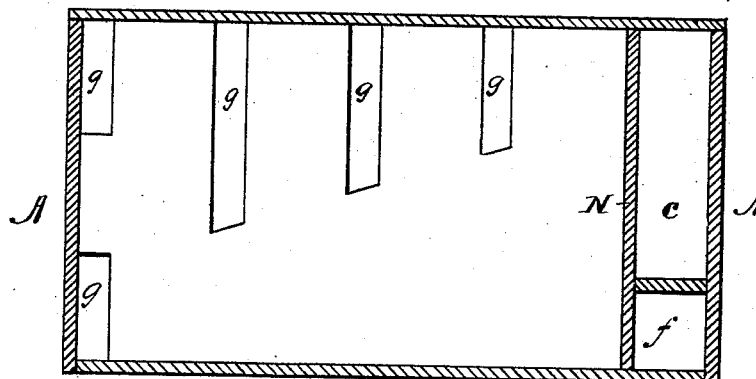


Fig. 3.

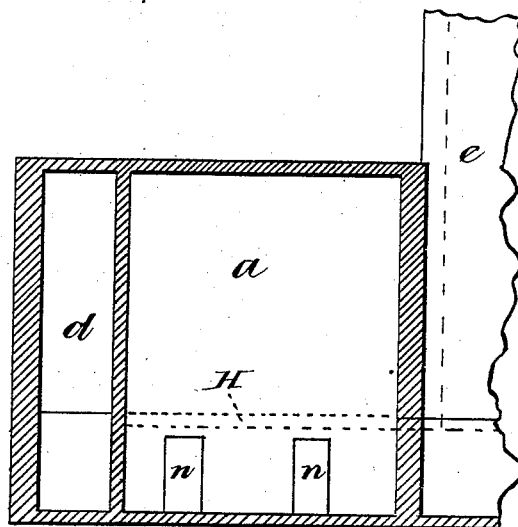


Fig. 4

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UNITED STATES PATENT OFFICE.

ADAM SCHAFER, OF NEWARK, NEW JERSEY.

BONE AND WOOD BURNER.

SPECIFICATION forming part of Letters Patent No. 265,876, dated October 10, 1882.

Application filed April 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, ADAM SCHAFER, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Bone and Wood Burners; and I do hereby 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 letters of reference marked thereon, which form a part of this specification.

The object of this invention is to provide more durable and effective means for burning bones, wood, &c., in the process of making bone-black and other products of destructive distillation; and it consists in the combination and arrangement of parts substantially as will be hereinafter set forth, and finally embodied in the claims.

Heretofore in furnaces for this purpose the fire has had direct access to the retorts, which consequently soon burned out and had to be replaced at a large expense. By means of the hereinafter-described device the heat is all retained and spread more evenly over the retorts, and at the same time doing away with the objectionable features above set forth.

Referring to the accompanying drawings, embraced in two sheets, and in which similar letters of reference indicate like parts in each of the several figures, Figure 1 is a plan view of the interior of a furnace, the line of section being taken through the portion of the furnace indicated by line *x x*, Fig. 2. Figs. 2, 3, and 4 are sections of Fig. 1, taken through, respectively, lines *x*, *y*, and *z*.

In said drawings, A indicates the outer walls of the furnace, which are constructed preferably of fire-brick, and are of requisite thickness.

G, N, and B are inner walls, which form a retort-chamber, *a*, of which walls B separates the fire-chamber *b* from the retort-chamber *a*. N separates the fire-passage *c* from said retort-chamber, and has ports *n* therein, and G is a partition or wall having openings *g* therein, preferably graduated, as shown in Fig. 3, through which the heat passes from the passage *d* into the retort-chamber *a*. The said openings are or may be graduated, so that the intenser heat is allowed ingress to the retort-

chamber in smaller quantities, the larger openings being farther from the source of heat, as will be readily understood.

The part of the furnace between the partitions N A is subdivided by a partition, H, forming an egress-flue, *f*, leading from the retort-chamber *a* to the smoke-stack or chimney *e*. Said egress-flue *f* receives the heat through the ports *n*, as will be plainly understood upon reference to Figs. 1 and 4.

It will thus be evident that the heat, in its passage from the bed *i*, carrying the heat-producing material, passes through the fire-chamber *b* and passages *c* and *d*, which encircle the retort-chamber *a*, and by the time the openings *g* are reached the heated air is devoid of flame, which would tend to consume the retorts and an even temperature produced throughout the chamber. The heated air, which would otherwise tend to remain in the upper part of the chamber, is forced downward, so as to heat the lower portion of the retorts *m* by having the exit-ports *n* in close proximity to the floor, as shown in Fig. 4.

I prefer to construct the partition B between the chambers *a b* in such a manner as that the heat can pass therethrough from the fire-chamber without allowing a passage to the flame. To this end I construct the said wall of thin tile (preferably of fire-clay) so formed as that the edges are of sufficient thickness to be substantial and support the roof of the furnace, while the center of the tile is comparatively thin, so as not to form too great a barrier to the heat. The edges of said tile may be, and preferably are, tongue-and-grooved, as shown in Fig. 1, to form a substantial joint.

The retorts are so arranged in relation to the furnace as that the bones, &c., may be dumped in quantity into the upper end, while the lower extremity is provided with a cut-off valve adapted to be opened to allow the burnt matter to fall to the ground when the process of burning is completed.

Although I may construct a furnace singly, as described, I prefer to build them in pairs, one fire-pit being sufficient for the two.

By means of my device a smaller amount of coal is required to do a given amount of work, as the heat is retained in the furnace for a longer time before escaping into the open air, the heat is equalized to a greater extent, and

cracking of the retorts caused by sudden drafts prevented. Finally, burning of the retorts caused by direct contact with the flame is greatly hindered, if not done away with.

5 The retorts may be formed from sheet-iron (boiler-iron) at a great saving of expense, instead of being cast, as was heretofore necessary.

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

10 1. In a furnace, the graduated openings, arranged and operating for the purpose set forth and shown.

2. In a furnace, the partition B, formed of tile, having thin panels or centers, as herein
15 set forth and shown.

3. In a furnace, the partition B, separating the fire-chamber *b* from the retort-chamber *a*, formed of tongue-and-grooved tile, the panels or central portions being comparatively thin,
20 as herein set forth and shown.

4. In a furnace for burning bone, &c., the chamber *a*, having retort *m* therein, the fire-chamber *b*, passages *c d*, leading from chamber *b* to chamber *a*, ingress-openings *g*, and exit-
25 ports *n*, leading the flame into and from said retort-chamber, all being arranged substantially as shown and described.

5. In a bone or wood burner, the chamber *a*, with retort *m* therein, fire-chamber *b*, passages *c d f*, and chimney *e*, all being arranged substantially as shown, for the purpose set forth. 30

6. An improved furnace for burning bone, wood, &c., composed of an outer wall, A, inner walls, G N B, and partition or wall H, the walls G N having respectively openings *g* and
35 ports *n* therein, the walls G N B H forming passages or chambers *b c d f* and chimney *e*, all being arranged substantially as shown, for the purpose set forth.

7. A furnace composed of walls forming the retort-chamber, fire-chamber, passages leading
40 from said fire-chamber to said retort-chamber and from said retort-chamber to the chimney, the exit-ports of the retort-chamber being approximately near the floor, and said retort-
45 chamber having retorts *m* arranged therein, all substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 24th day of February, 1882.

ADAM SCHAFER.

Witnesses:

CHAS. T. WINTERS,
CHARLES H. PELL.