

H. M. SMITH.
RETORTS FOR FURNACES.

No. 170,197.

Patented Nov. 23, 1875.

Fig. 1

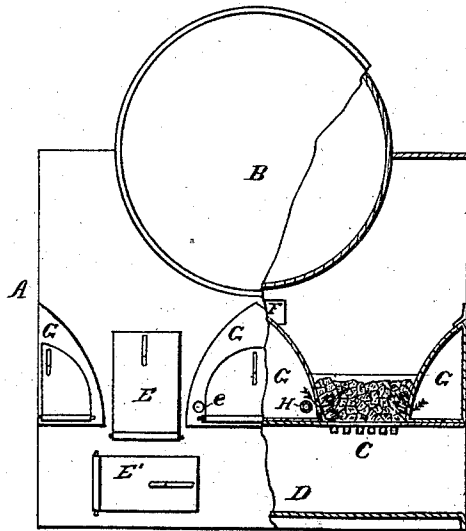


Fig. 2

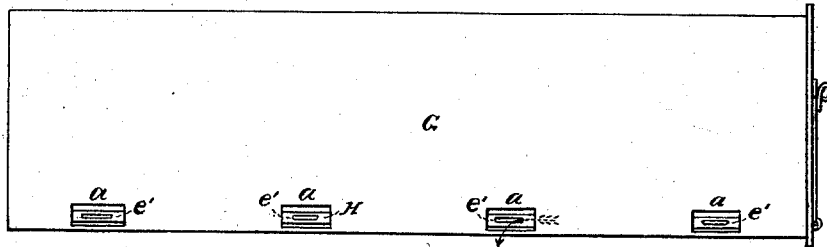
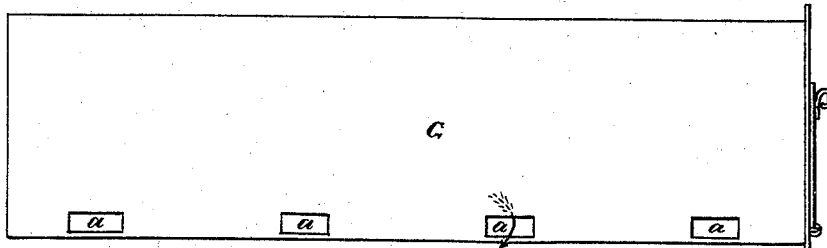


Fig. 3



WITNESSES.

F. F. Warner.
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INVENTOR.

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HORATIO M. SMITH, OF CHICAGO, ILLINOIS, ASSIGNOR OF TWO-THIRDS HIS RIGHT TO MOSES W. LESTER AND FRANKLIN LESTER, OF SAME PLACE.

IMPROVEMENT IN RETORTS FOR FURNACES.

Specification forming part of Letters Patent No. **170,197**, dated November 23, 1875; application filed November 24, 1874.

To all whom it may concern:

Be it known that I, HORATIO M. SMITH, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Retorts for Furnaces, of which improvements the following is a full, clear, and exact description, which will enable others skilled in the art to which my invention appertains to make and use the said improvements, reference being had to the accompanying drawing forming a part hereof, and in which—

Figure 1 is a front elevation of a furnace embodying my invention, a part of the front wall being broken away; Fig. 2, a side elevation of one of the retorts when provided with an air-tube or feeder; and Fig. 3, a like representation when the air-tube is removed.

Like letters of reference indicate like parts.

In the drawing, A represents the furnace, and B a boiler. C is the grate. D is the ash-pit. E is a door in the fuel-chamber, and E' is a door in the ash-pit. F is an opening entering the smoke-stack. G G are retorts resting on supports in, or nearly in, the same plane with the grate. *a a* are ports in the retorts. These ports are arranged at or near the bottoms of the retorts, and are sufficiently small to prevent the coke from falling through them from the retorts, but large enough to admit of the free escape of the gas generated in the said retorts. H H are tubes arranged in the retorts, and a little removed from the ports *a a*, so that the latter will not be obstructed by the said tubes. The forward ends of the tubes are open, and enter the outer walls of the retorts, as shown at *e e'* are ports in the tubes H H. The open ends of the tubes may be anywhere arranged to admit the outer air, and both ends may be open for that purpose.

It will be perceived from the foregoing description that all the ports lie below the upper part of the mass of fuel and near the grate.

The quantity of air entering the tubes H H may be regulated by means of dampers or stops.

The chief object of this construction is to facilitate the operation of burning soft coal

and effectually consuming its gases in such a manner that the gases will constitute a part of the fuel employed to heat the retort. The retorts may, however, be used for various other purposes—such, for example, as treating offal for the purpose of depriving it of its obnoxious gases and utilizing it as a fertilizer.

In burning soft coal a suitable quantity is arranged in the retorts. When the fire is well started the coal in the retorts becomes coked, and the gas from the coking coal escapes into the incandescent coal in the fire-pot, and is there consumed as fuel. In order to insure the ignition of this gas I feed the outer air to the ports *a a* by means of the pipes H H; but, as the furnace will be practically operative for many purposes without these pipes, I do not here intend to limit myself to them.

In treating offal, the offal is arranged in the retorts or ovens. A part or all of the retorts or ovens may be either partly or wholly filled with the offal, or offal and coal or other fuel may be placed in the same retort; or coal or other fuel may be arranged in some of the retorts and offal in others, so that the gases and vapors escaping both from the fuel in the retorts and from the offal will produce more perfect combustion of the vapors and gases arising from the offal when thus highly heated.

When the tubes H H are not employed air may be supplied to the ports *a a* through doors or dampers in the outer end of the retorts. The coke or remaining other matter, after being thus treated, is drawn from the retorts through the outer doors therein.

I am aware that gas-receiving chambers arranged at the sides of the fire-place and having gas-ports therein arranged near the grate have heretofore been employed in connection with retorts arranged above the fire-place, the retorts communicating with the said chambers by means of connecting-pipes, and I make no claim thereto; but

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

1. The retorts or ovens G G, having therein the ports *a a*, opening directly into the burn-

ing fuel in the furnace in which the retorts are placed, substantially as shown and described, and for the purposes set forth.

2. The retorts or ovens G G, having therein the ports *a a*, opening directly into the burning fuel in the furnace in which the retorts are placed, in combination with the perforated pipes or air-flues H H, lying within the re-

torts and near the ports therein, and presenting their perforations to the said ports, substantially as shown and described, and for the purposes set forth.

HORATIO M. SMITH.

Witnesses:

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