

J. B. THOMPSON.
Furnaces and Stoves.

No. 158,335.

Patented Dec. 29, 1874.

FIG. 2.

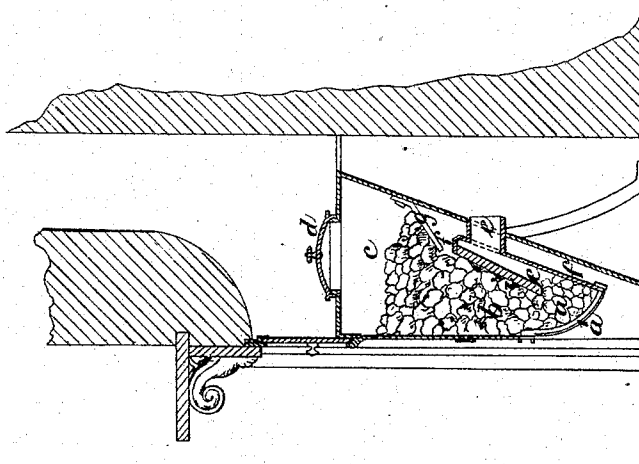
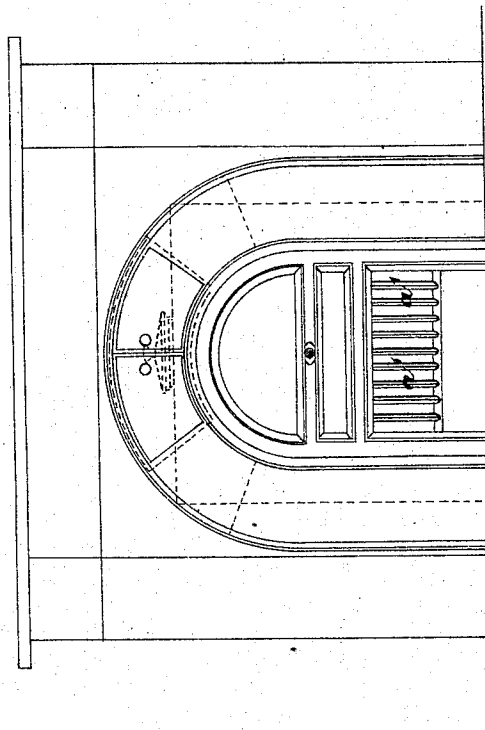


FIG. 1.



WITNESSES.

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FIG. 4.

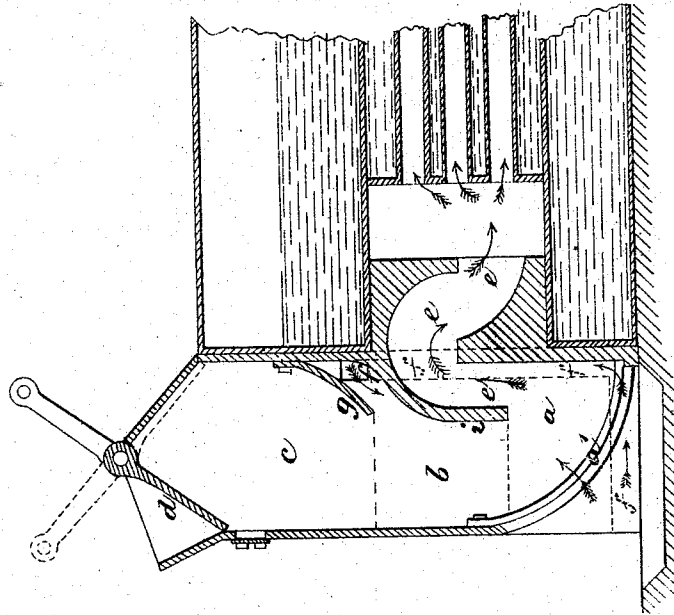
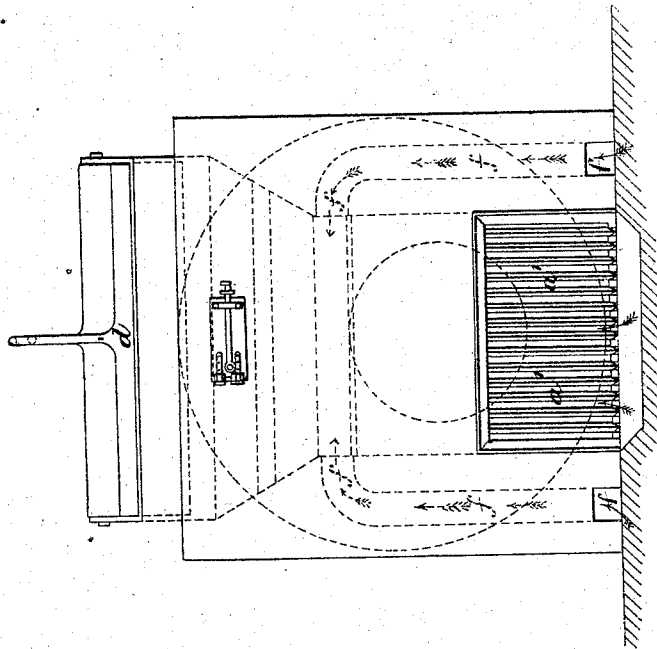


FIG. 3.



WITNESSES.

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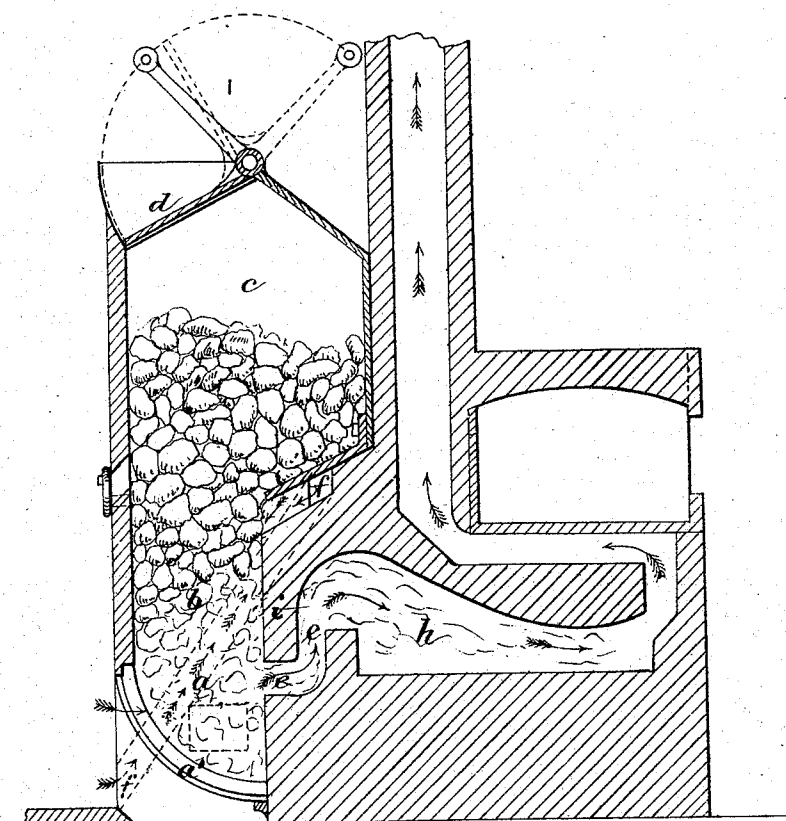
Jacob Paynes Thompson
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F I C. 5.



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UNITED STATES PATENT OFFICE.

JACOB B. THOMPSON, OF WHITEHALL, WRAYSBURY, ENGLAND.

IMPROVEMENT IN FURNACES AND STOVES.

Specification forming part of Letters Patent No. **158,335**, dated December 29, 1874; application filed June 15, 1874.

To all whom it may concern:

Be it known that I, JACOB BAYNES THOMPSON, of Whitehall, Wraysbury, in the county of Bucks, England, have invented certain Improvements in Smokeless Furnaces and Stoves, of which the following is a specification:

This invention has for its object the consumption of all the products of the fuel capable of combustion, but more especially those of coal, so as to utilize all the mixed gases that from ordinary furnaces and stoves pass up the chimney or flue, and are not only wasted, but are hurtful in polluting the air. My improvement consists in a combination of fuel-reservoir, air-inlet, front grate, and discharge-flue, as hereinafter described, whereby the gases evolved from fresh fuel are carried into close proximity with the front grate, and there consumed.

Figure 1 is a front view, and Fig. 2 is a sectional view, showing my improvements applied to a stove or grate for ordinary household fire-places. Fig. 3 is a front view, and Fig. 4 is a sectional view, showing my improvements applied to the furnace of a steam-boiler; and Fig. 5 is a sectional view, showing my improvements applied to a reverberatory furnace.

In the several figures of the accompanying drawings similar parts are marked with similar letters of reference.

According to my improvements I construct a combustion-chamber, *a*, with bars in front and at bottom, or with vertical bars *a'* extending in a curve round the front and bottom. This chamber *a* I extend upward, but inclosed on all sides to form a gas-generating chamber, *b*, and above that is the fuel chamber or reservoir *c*, which is shut in by means of a cover, *d*. The combustion or outlet flue *e* for the combustion-chamber commences on or about the level of the top of the combustion-chamber *a*, as shown, but not above it. The outlet or combustion flue *e*, it will be also seen, passes up behind the diaphragm or plate *i*, forming the back of the gas-generating chamber, and thereby affords an extra heating-surface to such gas-generating chamber. There is also a flue or passage, *f*, for supplying air to the gas-generating chamber *b*, which flue or passage *f* may pass up behind the combustion or

outlet flue, as shown at Figs. 1 and 2, or at the sides of the combustion-chamber *a*, as shown at Figs. 3, 4, and 5, and from below the combustion-chamber *a*, terminating at the top of the gas-generating chamber *b* under a protecting ledge or guard, *g*, of the fuel chamber or reservoir *c*. To this flue *f* there may be a valve below the outlet-flue *e*, midway between that and the bottom of the combustion-chamber *a*, which, by being turned, opens the air or gas flue into the combustion-chamber, and, at the same time, closes its communication with the external air. The fuel-chamber *c*, it will be seen, is simply a reservoir for fuel, which is fed to the gas-generating chamber *b*, and thence to the combustion-chamber *a*, by gravity only, such three chambers being portions of one general chamber.

The action of furnaces constructed according to my invention is as follows: As soon as the fuel in the combustion-chamber *a* is in an incandescent state, (which takes place in from about five to twenty minutes from the time of lighting, according to the dimensions of the furnace,) the furnace ceases to smoke, and gas is generated in the gas-generating chamber *b*.

The influx of air through the air-flue *f* into the gas-generating chamber *b* causes the hydrocarbons generated by the heat of the combustion-chamber *a* to be decomposed, thereby forming mixed inflammable gases, which are driven downward through the incandescent coke in the combustion-chamber *a*, there meeting and mixing with the draft of air entering such chamber between the bars *a'*, and thence passing out at the outlet-flue *e* in the form of highly-heated flame and gases, to be utilized as may be required.

When this invention is applied to reverberatory furnaces especially, the valve in the air or gas flue may be brought into use to cause more of the mixed gases to be burned in the chamber *b* of the furnace, thereby creating more direct heat on the material to be acted upon, and varying the chemical properties of the flame directed upon such material; but the furnace must be first thoroughly heated with the air-flue *f* in communication with the external air, or the hydrocarbons will not be thoroughly consumed—consequently will deposit soot and emit smoke.

I am aware that magazine-stoves have been made in various forms with a downward draft and air-supply passages admitting the air to support combustion at a point above the discharge-flue. This therefore I do not claim; but my device operates in a novel manner by causing all the gases evolved from the new fuel to be carried through the body of incandescent fuel in close proximity to the front grate, where there is sufficient access of air to insure their complete combustion. This I effect by locating the mouth of the discharge-flue in close proximity to the front grate, and in the hottest portion of the fire. This peculiar combination of the parts is valuable, also, in that it maintains the most active and bright combustion in the lowest part of the fire-place,

close to the front grate, from which there is a direct radiation of light and heat into the room.

What I claim as new is—

The combination of the open front grate *a'*, for supplying draft to the fire, the fuel and gas chamber *c b*, and the outlet *e*, communicating with the fire at or below the level of the top of the grate *a'*, as and for the purpose set forth.

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Witnesses:

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