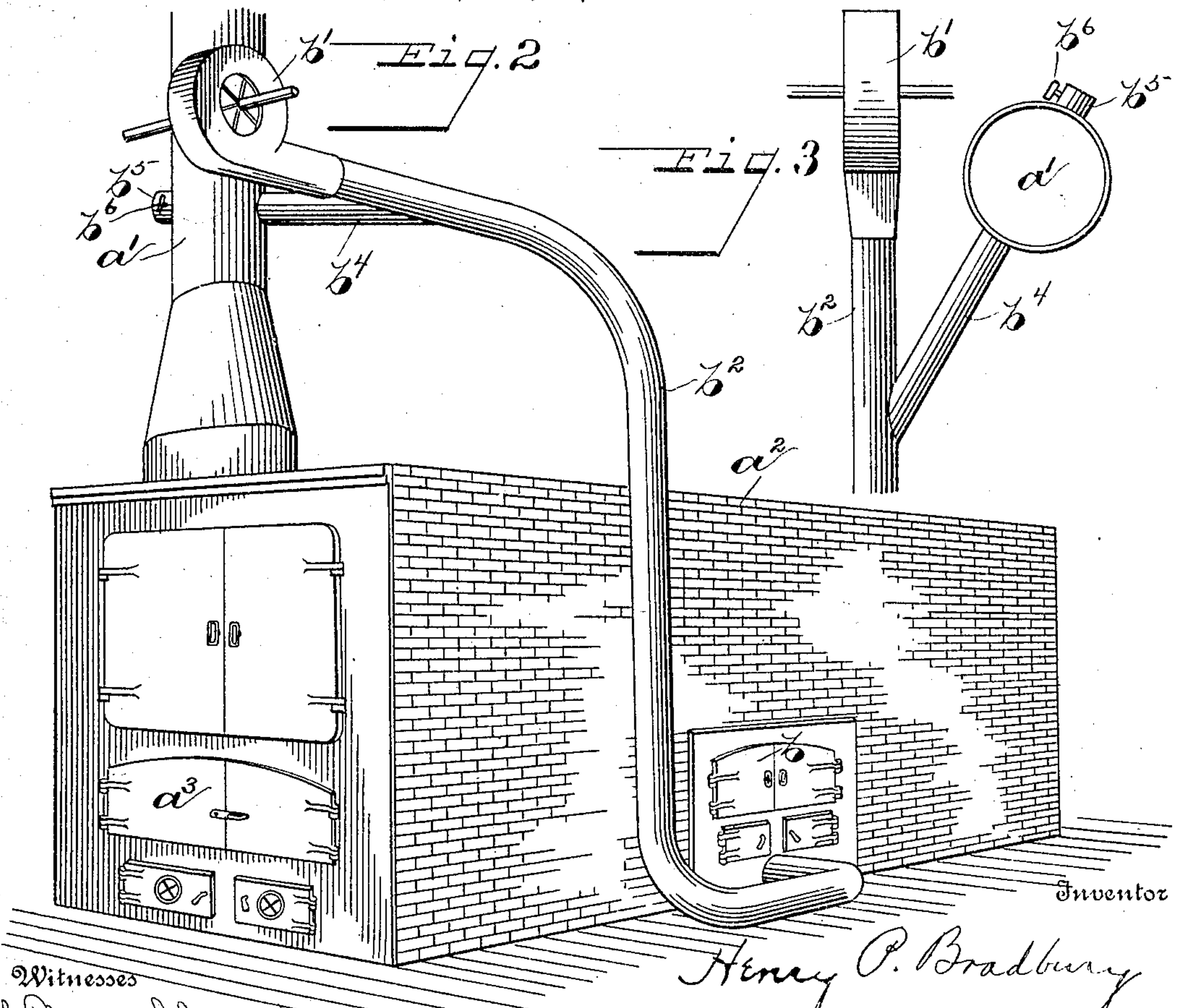
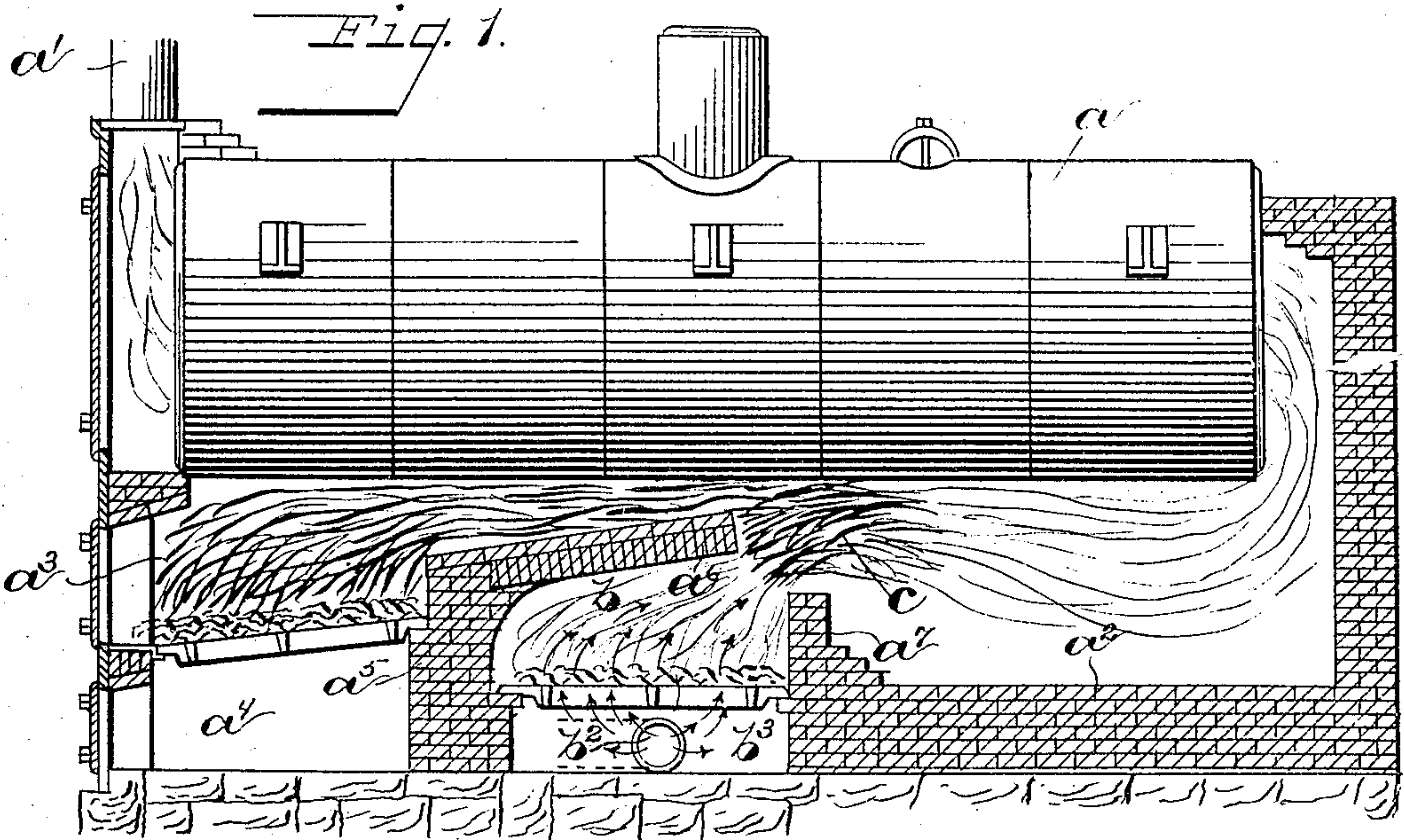


No. 885,579.

PATENTED APR. 21, 1908.

H. P. BRADBURY.
SMOKE CONSUMER.

APPLICATION FILED OCT. 25, 1906.



Witnesses
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HENRY P. BRADBURY, OF SPRINGFIELD, OHIO, ASSIGNOR OF ONE-HALF TO L. H. PURSELL,
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SMOKE-CONSUMER.

No. 885,579.

Specification of Letters Patent.

Patented April 21, 1908.

Application filed October 25, 1906. Serial No. 340,601.

To all whom it may concern:

Be it known that I, HENRY P. BRADBURY, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Smoke-Consumers, of which the following is a specification.

My invention relates to smoke consumers and is particularly adapted for use in connection with steam boilers but may be used in connection with other devices.

The object of the invention is to greatly simplify the construction as well as the means and mode of operation of such devices whereby they will not only prevent the escape of smoke from the stack or chimney but will prevent the accumulation of soot and other products of combustion within the stack and the boiler setting.

A further object of the invention is to provide means for consuming the particles of carbon and combustible gases set free during the process of burning coal and which are usually lost by their escape through the flue or the chimney.

A further object of the invention is to provide means for burning the smoke and gas at the point of greatest advantage, that is, where the heat may be used for heating the boiler or for other purposes.

With the above primary and other incidental objects in view, as will appear from the specification, the invention consists of the means, construction, devices and mode of operation, or their equivalents, hereinafter described and set forth in the claims.

In the drawings, Figure 1 is a sectional view of a boiler setting showing the boiler, the fire-box and the auxiliary fire-box. Fig. 2 is a perspective view of the boiler setting together with a portion of the stack, the blower and conduit hereinafter described. Fig. 3 is a plan view showing the relation of the stack and conduit and blower, or rotary fans.

Referring by letter to the drawings, *a* represents the boiler, *a*¹ the stack.

*a*² is the usual boiler setting.

*a*³ is a fire-box; *a*⁴ the ash-pit below it.

*a*⁵ is the bridge wall. The bridge wall is extended rearwardly and slightly upwardly, as at *a*⁶. Immediately back of the bridge wall, *a*⁵, intermediate said bridge wall, *a*⁵, and a supplemental bridge wall, *a*⁷, and below the extension, *a*⁸, is located an auxiliary fire-

box, *b*. The fire-box, *a*³, is adapted to burn either coal or slack, or other fuel of the ordinary type. Within the auxiliary fire-box, *b*, is preferably used coke, although other kinds of fuel may be successfully employed. A rotary fan or blower, *b*¹, is provided having a conduit, *b*², leading therefrom and discharging into the ash-pit, *b*³, below the auxiliary fire-box, *b*. A branch conduit, *b*⁴, leads from the stack, *a*¹, and discharges into the conduit *b*². Although not absolutely necessary there is preferably provided in the stack, *a*¹, at a point substantially opposite the conduit, *b*⁴, an air inlet, *b*⁵, provided with a damper, *b*⁶.

In ordinary practice the gas is set free by the burning of the coal within the fire-box, *a*³, and passes rearwardly thence through the tubes of the boiler and out the stack through lack of sufficient air to mix therewith to form a combustible mixture. The rotary fan, *b*¹, forces a constant stream of air through the conduit, *b*², to the ash-pit, *b*³, of the auxiliary fire-box, *b*, and by suction through the conduit, *b*⁴, draws from the stack, *a*¹, the hot gases and such smoke as may be passed to the stack, causing said smoke and gases to be returned through the conduit, *b*², to the ash-pit, *b*³, thence passing through the hot coke fire to again pass through the same channels as before. The hot gases and smoke drawn from the stack through the conduit, *b*⁴, will warm the air in the conduit, *b*², which has been taken in through the rotary fan, *b*¹, so that the current of air passing through the auxiliary fire box, *b*, from the conduit, *b*², will in no way chill the smoke to form soot, nor will it chill the boiler or any adjacent parts, but will supply a constant stream of oxygen to be mixed with the gases released from the coal in the fire-box, *a*³, and will form there- with a combustible mixture which will burn with intense heat at the point, *c*, the exit from the auxiliary fire box, *b*, between the rear extension, *a*⁸, and supplemental bridge wall, *a*⁷. Any gases which may escape combustion at this point will be again returned through the conduit, *b*², with an additional supply of warm fresh air.

The extension, *a*⁸, of the bridge wall, *a*⁵, as before stated, is extended rearwardly and slightly upwardly, and this extension is of such shape and thickness that it gives direction to the gases and products of combustion from both furnaces, so that they are flowing in substantially the same direction where

they come together at or near the point c. This extension of the bridge wall also becomes hot and tends to further heat the gases from the main furnace as they pass over the same, so that the combustion at this point is as perfect as can be secured.

From the above description it will be apparent that there has been produced a construction in which a constant supply of oxygen will be provided to mix with the gases released in the primary fire box to form a combustible mixture, which will burn at a most advantageous point, and that the supply of oxygen thus provided will be sufficiently heated that it will in no wise chill the smoke to form soot within the structure, nor will it chill the boiler or any adjacent parts. It is further obvious that the construction described will in no way retard the flow of the smoke or gases, nor will it interfere with or retard the draft, but to the contrary, through the conduit, b⁴, from the stack, c¹, will accelerate the draft. It is apparent that through the acceleration of the draft and the burning of the gases below the boiler that the efficiency will be greatly increased.

It is obvious that the structure is susceptible of modification in its form, proportion, detailed construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages. I do not, therefore, limit myself to the exact construction shown and described.

Having thus described my invention, I claim.

1. In a construction such as described, a plurality of fire-boxes, a dividing wall separating one fire-box from the other, one fire-box being at the rear of the other in the line of draft, a refractory roof extending rearwardly from the dividing wall and projecting over the rear fire-box, a passage-way formed by an opening in the refractory roof and near

the rear end thereof for the passage of the products of combustion, a wall formed above the opening for causing the flames from the fire-boxes to take a rearward course.

2. In a construction such as described, a plurality of fire-boxes, a dividing wall separating one fire-box from the other, one fire-box being at the rear of the other in the line of draft, a refractory roof extending rearwardly from the dividing wall and projecting over the rear fire-box, a passage-way formed by an opening in the refractory roof and near the rear end thereof for the passage of the products of combustion, a wall formed above the opening for causing the flames from the fire-boxes to take a rearward course, and means for forcing a draft through said passage-way away from the fire-boxes, substantially as specified.

3. In a construction such as described, a plurality of fire-boxes, a dividing wall separating one fire-box from the other, one fire-box being at the rear of the other in the line of draft, a refractory roof extending rearwardly from the dividing wall and projecting over the rear fire-box, a passage-way formed by an opening in the refractory roof and near the rear end thereof for the passage of the products of combustion, a wall formed above the opening for causing the flames from the fire-boxes to take a rearward course, and means for forcing a draft through said passage-way away from the fire-boxes, a stack and a fan for forcing a draft from said stack, and a passage-way connecting the fan with the rear fire-box, substantially as specified.

In testimony whereof, I have hereunto set my hand this 22nd day of October A. D. 1906.

HENRY P. BRADBURY.

Witnesses:

CHAS. I. WELCH,
CLARA GALLAGHER.