R. BAILEY.

COAL STOVE.

No. 48,252. Patented June 20, 1865.

Fig: 1.

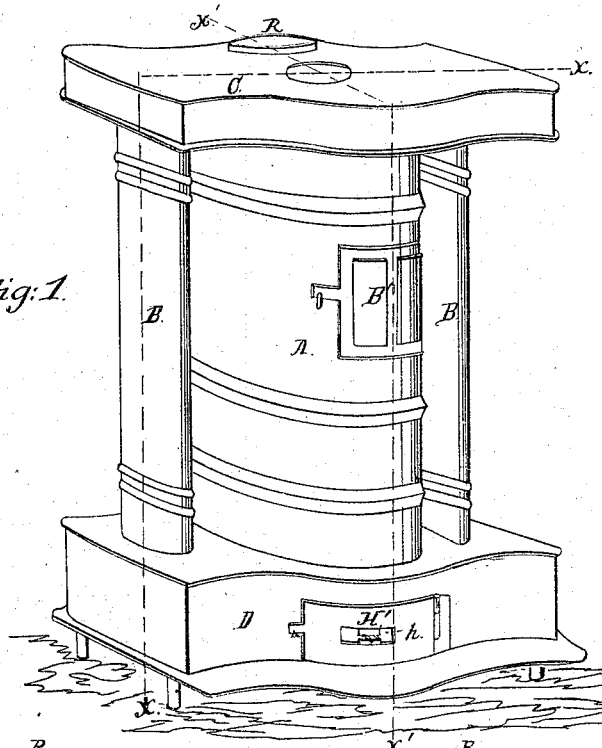


Fig: 2.

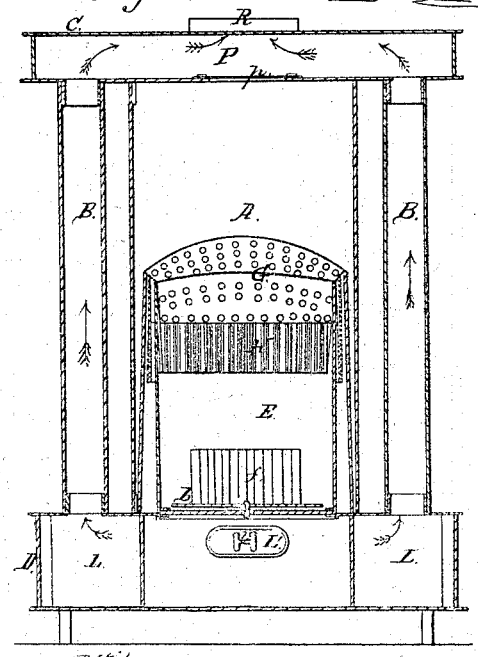
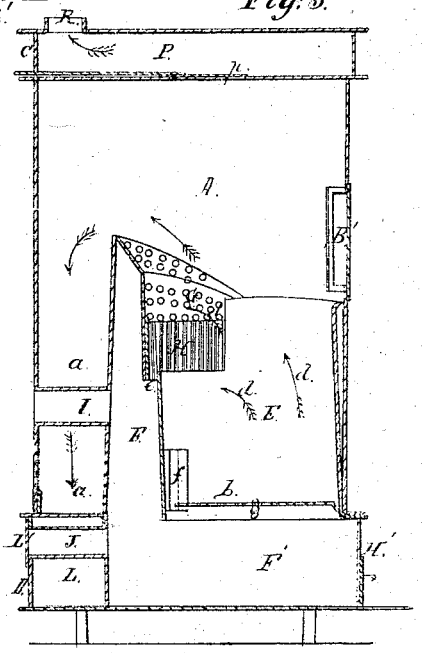


Fig: 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

ROBERT BAILEY, OF CLEVELAND, OHIO.

IMPROVEMENT IN COAL-STOVES.

Specification forming part of Letters Patent No. **48,252**, dated June 20, 1865.

To all whom it may concern:

Be it known that I, R. BAILEY, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Stoves; and I do hereby declare that the following is a full and complete description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of the stove. Fig. 2 is a vertical section in the direction of the lines *x x* in Fig. 1. Fig. 3 is a vertical section in the direction of the lines *x' x'* in Fig. 1.

Like letters of reference denote like parts in the several views.

My improvement in this class of stoves relates to constructing a stove for the purpose of obtaining the more perfect combustion of fuel and consumption of the inflammable gases and have the greatest amount of surface for the radiation of heat.

A represents the body or drum of the stove that contains the fire-box; B B, columns or flues on each side, that communicate with chambers in the top C and base D of the stove. The entire stove is susceptible of other forms and configurations different from that represented in the drawings.

The internal structure of the stove is shown in Figs. 2 and 3, in which E is the fire-box, extending up from the base D till about the center of the drum A, the back part being curved up higher, as represented. The fire-box tapers gradually toward the top, being a little narrower across the upper end than at the base, leaving a space between it and the outer casing. In the rear of the fire-box there is a hot-air chamber, F, that extends down into the ash-pit F'. In front of the chamber F and rear of the fire-box, at the lower end, there is a grate, *f*, through which there is a draft into the fire-box.

H is a corrugated plate, that is placed in a space, *e*, between the upper back edge of the fire-box and perforated plate G of the chamber F, and extends about half-way round the fire-box, and being corrugated the same radiating-surface is obtained as if the plate were plain and extended all the way round. The corrugations admit the heated air from the chamber F into the fire-box in the desired manner, and said plate will resist the influence of the heat better than if it were plain. Air is also admitted through the perforated plate G into the fire-box.

I and J are draft or induction pipes in the rear of the stove, that extend from the outside and enter the chamber F, the pipe J a short distance below the fire-box, so as to produce the desired draft, and the pipe I above, as shown in Fig. 3, designed especially to furnish the hot-air chamber with air. Over the outer end of the pipe J, in the rear of the base of the stove, there is a door, L', with a damper, *l*, in it, by which the draft is regulated.

b is a vibrating grate between the fire-box and ash-pit.

H' is a door in front that opens into the ash-pit, and is provided with a damper, *h*, by which draft can be produced from the front of the stove. The ashes are removed through this door.

B' is a door in the body of the stove, by which the fire-box is provided with fuel.

It will be observed from the arrangement of the pipe J, grate *f*, &c., that the draft is principally at the rear or the stove; consequently the fuel will ignite more rapidly and burn from the rear to the front of the fire-box. The greatest heat from the more rapid combustion of the fuel being at the rear, the smoke and unconsumed inflammable gases will rise principally from the front and pass up through the fire-box in the direction of the arrows *d* in Fig. 3, and in passing over they come in contact with the more intense heat rising from the rear of the fire-box, and also with the hot air from the chamber F through the corrugated and perforated plates, admitting sufficient oxygen to cause the smoke and inflammable gases to be more perfectly consumed. The entire body of heat then passes down through a diving-flue, *a*, in the rear of the stove, around the hot-air chamber F, round the pipes I and J, heating them, into a chamber, L, in the base D of the stove, which extends around the rear and sides of the ash-pit F'. From this chamber it ascends through the columns or pipes B B into the chamber P in the top of the stove, as indicated by the arrows, and out through the pipe R. Thus the heat from the fire-box, arising from the burning of the fuel in the manner described,

producing the most perfect combustion of the fuel and inflammable gases, can be disseminated through the entire stove and pipes, presenting so much surface from which heat can be radiated that will keep a room at the desired temperature with the least amount of fuel.

By means of a damper, *p*, in the top of the stove there can be a direct draft through the body of the stove when desired.

The air-chamber F being next the hottest part of the fire-box, and a constant current of hot air passing down round on the outside, the air in the chamber becomes very much heated, thereby causing combustion of the gases with which it comes in contact—the object for which it is principally designed—and a great amount of heat is saved in this way. The hot air surrounding the pipes I and J also heats the air passing through them before it reaches the chamber F, heating the air that produces the draft before it enters the fire-box. The induction-pipe I supplies the chamber F with sufficient air, so as to consume the gases that may be generated in the fire-box when the draft is shut off from below. The back-draft, carrying the heat from the front to the rear of the stove, leaves the mica in the door clear and prevents it from being darkened by the smoke and soot.

The induction-pipes I and J may be arranged at the sides of the stove, in connection with a chamber similar to F or without said chamber; but I prefer the arrangement as set forth.

The principle involved in the construction of this stove may be employed in hot-air and smelting furnaces.

What I claim as my improvement, and desire to secure by Letters Patent, is—

1. So constructing the fire-box that the fuel is consumed first in the rear of the same when said chamber is arranged in relation to the ash-pit F′, air-chamber F, and dampers L′ and H′ substantially as set forth.

2. Arranging the fire-box E in front of the stove, in combination with the hot-air chamber F, the draft-pipe J, and diving-flue *a*, as and for the purpose set forth.

R. BAILEY.

Witnesses:
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