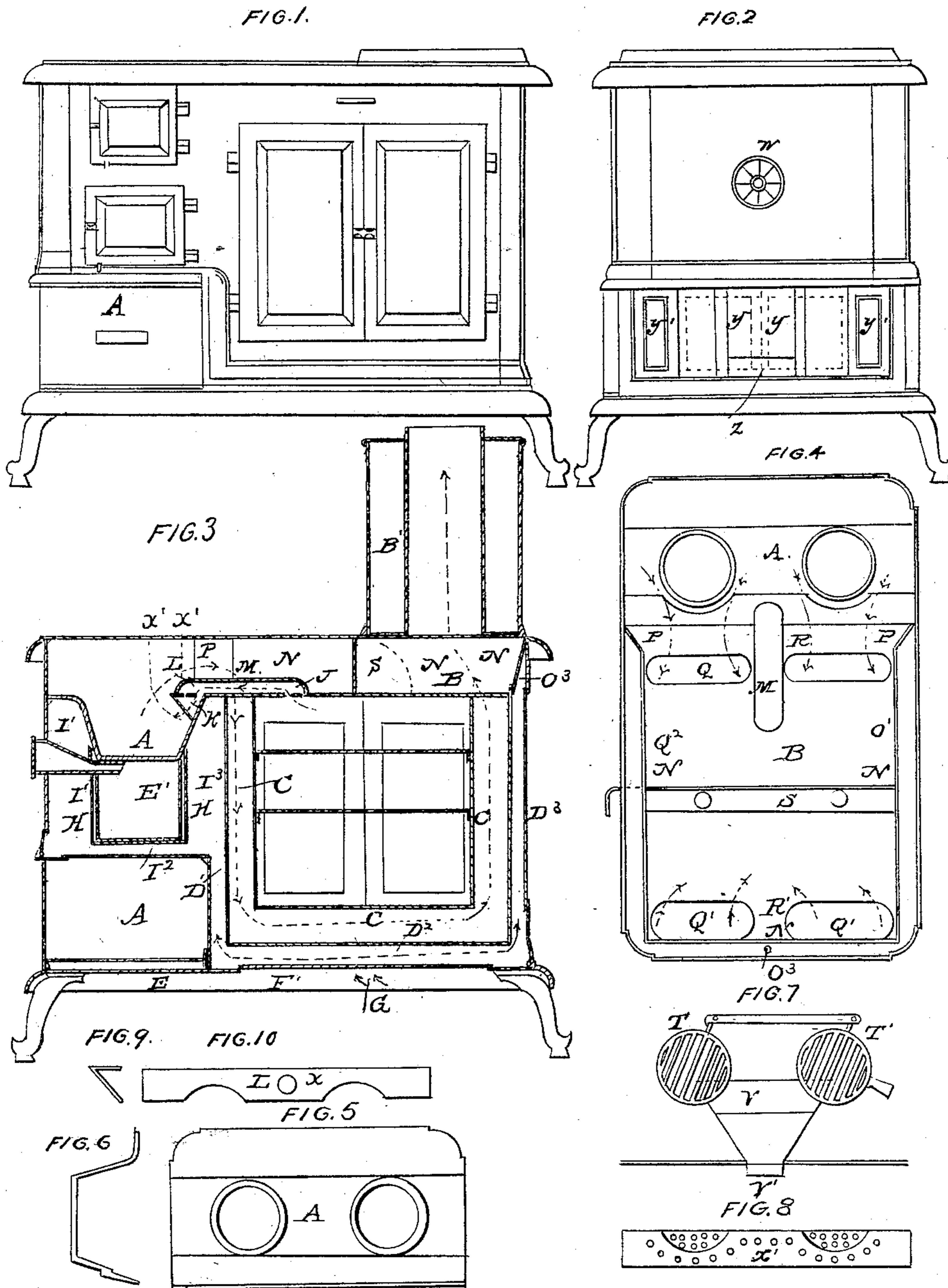


C. J. PAINE.
Cooking Stove.

No. 50,268.

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WITNESSES
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IMPROVEMENT IN COOKING-STOVES.

Specification forming part of Letters Patent No. 50,268, dated October 3, 1865.

To all whom it may concern:

Be it known that I, CLINTON J. PAINE, of Painesville, in the county of Lake and State of Ohio, have invented certain new and useful Improvements in Cooking-Stoves; and I do hereby declare the following is a full and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the exterior appearance of my improved stove; Fig. 2, a front elevation of the same; Fig. 3, a central longitudinal section of the same, showing its interior construction and arrangement; Fig. 4, a view of the upper portion of the stove immediately under the top plate. Fig. 5 represents a top view of the fire-box, and Fig. 6 an end view thereof. Fig. 7 shows the yoked grates fitting into the bottom of the said fire-box; also the construction and position thereto of my improved draft device. Fig. 8 is a front view of my improved gas-burner arrangement; and Figs. 9 and 10 represent the end and top view of the same, the letters of reference marked thereon indicating similar parts in all the figures.

The nature of my invention consists of the following improvements:

First. In the novel construction of the oven, by occupying the space intended therefor with a flue leading directly from the fire-box, the same being of peculiar construction, as will be shown, and is made correspondingly broad with the depth of the oven, and turned at right angles, so as to form the two sides and bottom of the usual square-formed oven proper, and so that the passing heat therefrom is radiated from both its sides into the oven-space, the draft-channel being directly continuous from the fire-box to the exit-pipe of the stove, having no return or diving flue in its construction. By this arrangement the heat of the oven is more direct, certain, and equally diffused.

Second. A fire-draft device for conveying, concentrating, and equally distributing the draft to the combustion of the fuel, so that the fire is made to act directly on the bottoms of the kettles, &c.

Third. Forming the outside plates of the stove—to wit, the rear end plate, that portion of the bottom plate immediately under the oven, the plate under the fire-box, and the doors of

the oven—of skeleton or open frame-work filled with surfaces of galvanized sheet-iron for the purpose of retaining the heat within the body of the stove, particularly in the oven-space, the said galvanized sheet-iron possessing the power of absorbing and retaining heat and not throwing it off.

Fourth. Constructing the plates of the stove so that the space under the bottom and at the sides of the fire-box, and the space outside the said angular flue, (constituting the oven as stated,) is inclosed air-tight, thereby retaining the heat to act in conjunction with the heat from the said flue for the purpose of being used within the oven; also, in providing the means for tempering said retained heat with a current of pure air taken from near the surface of the floor through an aperture placed in the bottom plate of the stove.

Fifth. The use and employment of a gas-burner (constructed as will be hereinafter explained) connecting with an inlet placed in the top of the oven by a covered channel or passage, so that the gases evolved in the process of baking are drawn away from the oven through said inlet to the said gas-burner, from whence it issues in burning jets directly against the sides and under the bottoms of the kettles, &c., thereby lessening the consumption of fuel by creating additional heat.

Sixth. Providing additional baking-space by covering or inclosing the space between the under side of the projecting portion of the stove in front directly under the fire-box, &c., and the base or bottom plate of the stove, with a reflecting-baker, constructed of bright tin plate, the heat within said space being increased at pleasure by opening one or both doors within said inclosed space, as will be explained, the said reflector being removable when not required for use.

Seventh. The employment of two or more circular gratings placed in corresponding holes in the bottom of the fire-box, and so yoked with a coupling-bar as to be easily worked for discharging the ashes from the fire-box without interfering with the draft device before mentioned.

To enable others skilled in the art to make and use my said improved cooking-stove, I will proceed to describe its construction and operation.

The drawings, Figs. 1 and 2, will, it is presumed, be sufficient to explain its construction so far as relates to its exterior. The sectional drawing, Fig. 3, gives a view of the whole of its interior economy.

A is the fire-box, supported in the usual way on ledges projecting from the sides of the plates of the stove.

B is the inside top plate. (Shown more particularly in Fig. 4.)

C is a direct heating-flue. This may be constructed of thick sheet-iron or thin cast-iron plates. The said flue is made broad, and occupies what may be termed the "oven-space" of the stove. It is secured to and suspended from the inside top plate, B, as shown. The breadth of said flue is to correspond to the depth of the oven. Its continuous length is broken into right angles, so as to form a square oven-space, as seen in the figure. Spaces D' D^2 D^3 are left between its sides and the exterior plates of the stove.

E is the bottom or base plate of the stove. It will be seen that so much of it as lies under the flue before mentioned is constructed with a border or frame-work, so as to leave a space to be filled in with a surface of galvanized sheet-iron, F, as will be further explained in connection with similar surfaces in other parts of the stove. In the center of this surface F is an aperture, G.

H is an inclosed ash-pit, constructed of cast-iron plates and secured to the sides of the fire-box A, as shown, leaving hollow spaces I' I^2 I^3 . Through the top plate, B, which forms the top of the oven, is an escape-hole, J.

K is a gas-burner. It consists of a top plate, X, Fig. 10, and a front plate, X', Fig. 8, both cast in one piece, as shown in the end view, Fig. 9. The plate X' stands angularly to the top one as seen in Fig. 9. It has two circular depressions, as seen in Figs. 8 and 10, and is perforated with small holes distributed over its surface. Said gas-burner is supported in a longitudinal groove in the fire-box A, as seen, its upper part being secured to the top plate, B. It is provided on its upper surface, at its middle, with a hole, L.

M is a half-round hollow device closed at both its ends for the purpose of forming a channel covering the said holes J and L and communicating with the oven and gas-burner before mentioned. The top plate, as will be seen in Fig. 4, has a raised edge, N, around its two sides and back end, reaching up to the under side of the exterior top plate of the stove, so as to leave air-spaces between it and the side plates of the stove. These air-spaces are marked O' O^2 O^3 , and are additions to the other air-spaces before mentioned. This edge is seen in Fig. 3; and P, Fig. 4, shows the turned ends thereof.

The inlet and exit openings Q Q and Q' Q' of the direct heating-flue before mentioned have, as will be seen, solid divisions R and R' between them for the purpose of dividing the

stream of heat as it passes into them from the fire-box, so that it shall be properly equalized in its passage. A damper, S, provided with two holes, as seen, is placed across the top plate, B, in the position shown.

T and T' are two circular grates fitting into the holes seen in the bottom of the fire-box. Said grates are coupled with a yoke-bar, U. The grate T' has a socket cast on its rim for the purpose of inserting the handle used in connection therewith.

V represents the draft device before mentioned. It consists of a hollow flaring tube with a neck, V'. Fig. 7 shows its form and also its position when placed below the grates. The said neck comes through the front plate of the stove, as seen in Fig. 2. It is covered with a register, W. The lower part of the stove in front is closed by two sliding doors, Y Y, which slide behind the stationary plates Y' Y', Fig. 2.

Z is an opening in the direct flue C, before mentioned, and is kept closed by a cover.

A', Fig. 1, is a reflector-baker constructed so as to inclose the space between the projecting front of the stove and its base-plate, as seen in Fig. 1, and when in use is slid in and supported on the said base-plate.

The doors of the oven are of skeleton framework filled with galvanized sheet-iron surfaces riveted or otherwise fastened thereto. The upright end plate of the stove, as well as a portion of the bottom plate, as before mentioned, and the plate under the fire-box, are similarly formed and filled.

B is the usual hot-water tank, having the exit-pipe in its center communicating with the direct heat-passage of the stove. This tank, however, can be dispensed with when not required, and the said exit-pipe placed over a hole on the stove in the common manner.

The long ash-box E', with which the ash-pit H is provided, is a convenient arrangement for the deposit and removal of ashes.

I will now explain the manner of using my said improved cooking-stove and the advantages of my improvements.

After the fire is started it will be observed that the heat is drawn into the direct flue through the openings Q Q, Fig. 4, as indicated by the arrows. The said flue, as before stated, by means of its peculiar angular construction, forms the oven-chamber, and being an independent construction in itself and located as explained radiates the heat from both its sides or surfaces into the oven-space throughout its whole length, and its channel being constructed broad and directly continuous, and having no return or diving passages to divert the current of heat, obviously tends to its more equal and direct distribution over the whole oven-space, aided by the inlet and outlet openings Q Q and Q' Q', and also in economizing its consumption by means of its said direct application and double radiation.

By reference to Fig. 3 it will be seen the construction of the stove is such that a certain

amount of confined hot-air space—to wit, $I' I^2 I^3 D' D^2 D^3$ —is obtained, and which is prevented from escaping into the apartment from the absorption and retention of heat by the galvanized sheet-iron surfaces. Having found by actual experiment that such galvanized surfaces possessed the quality of absorbing and retaining heat and throwing off none, I employ such for the outside plates of my stove in such a way as to interpose a wall between the whole open interior space of the stove and the outside air of the apartment. This confined heat is mainly used in the oven, and must, therefore, necessarily add to the economy of heating it. It is, moreover, tempered and mixed with pure cold air admitted from near the floor of the apartment through the aperture in the bottom plate of the stove. Provision is made against overheating by means of the register W and the damper S . Another feature in the economy of heating is the consumption of the gases of the oven during the process of baking, which is carried to the gas-burner and there made available, as explained.

The mode adopted for conveying, concentrating, and distributing the draft to the fire-box is considered an advantageous improvement over the usual method of admitting the draft at its end, and without the means of such concentration and distribution. The ends of the flaring exit-opening show at a glance that the draft is concentrated under each pot or kettle, besides tending to its proper distribution over all parts of the fuel.

This stove is intended for either wood or coal, and by the use of the pair of yoked grates, the operation of which is sufficiently obvious, the fire-box can be easily freed from ashes.

The tin reflector-baker fitting and occupying the space under the projecting front of the stove, as before explained, affords additional baking or warming room, the heat inside of which is raised or lowered at pleasure by means of the doors $Y Y$. It can be removed and set aside when not in use, so that the space it occupied is left open for any other use for which it may be adapted.

Having explained the nature, construction, and operation of my improvements, I do not claim a broad flue in itself, as such has often been employed to surround the oven of a stove. Neither do I claim the use of galvanized sheet-iron surfaces for reflecting heat into oven-spaces, as in the case of Blodgett & Sweet's oven, patented December 5, 1854; nor do I claim its use as a jacket for covering other surfaces, as this has often been done; but

What I claim therein as new, and desire to secure by Letters Patent, is—

1. The special use of the direct heating and directly continuous flue $C C C$, constructed as shown in Fig. 3, so that the same is double-radiating, or so that radiation of heat into the oven space or spaces is obtained from both its sides or surfaces, the same being constructed with angular or other turns so as to form within its interior space a rectangular or other shaped chamber constituting the oven proper, and located within the oven-space of the stove in the manner shown and for the purposes set forth.

2. The divided inlet and exit openings $Q Q$ and $Q' Q'$ in the plate B , in combination with the said flue C , as described, and for the purpose set forth.

3. The special construction and use of the fire-draft device V , as described, and for the purposes set forth.

4. Adapting the heat-absorbing and heat-retaining principle of galvanized sheet-iron for forming the outside plates of my stove by filling skeleton cast-iron frames therewith and using them as walls interposed between the interior space thereof and the outer air, for the purpose of preventing the escape of the heated air therefrom, as herein explained.

5. Constructing the stove in the manner described, and in combination with the said galvanized sheet-iron surfaces, so that the spaces $I' I^2 I^3$ and $D' D^2 D^3$ are made available for the retention of hot air to act in conjunction with the heat of the direct flue C , as explained, and for the purpose stated.

6. The aperture G , in combination with the foregoing hot-air spaces, for the purpose set forth.

7. The gas-burner K , constructed with the depressions as described, and in combination with the aperture J of the oven, channel M , and aperture L , and operating as and for the purpose set forth.

8. The removable reflector-baker A' , constructed as described, located and used in the manner and for the purpose set forth.

9. The use of the circular gratings T and T' when yoked or coupled with the bar U , as and for the purpose described.

CLINTON J. PAINE.

Witnesses:

J. F. SINGLE,
WM. H. FOWLER.