2 Sheets--Sheet 1.

CHARLES J. WOOD.

Improvement in Cooking-Ranges.

No. 115,800. Patented June 6, 1871.

Fig. 1.

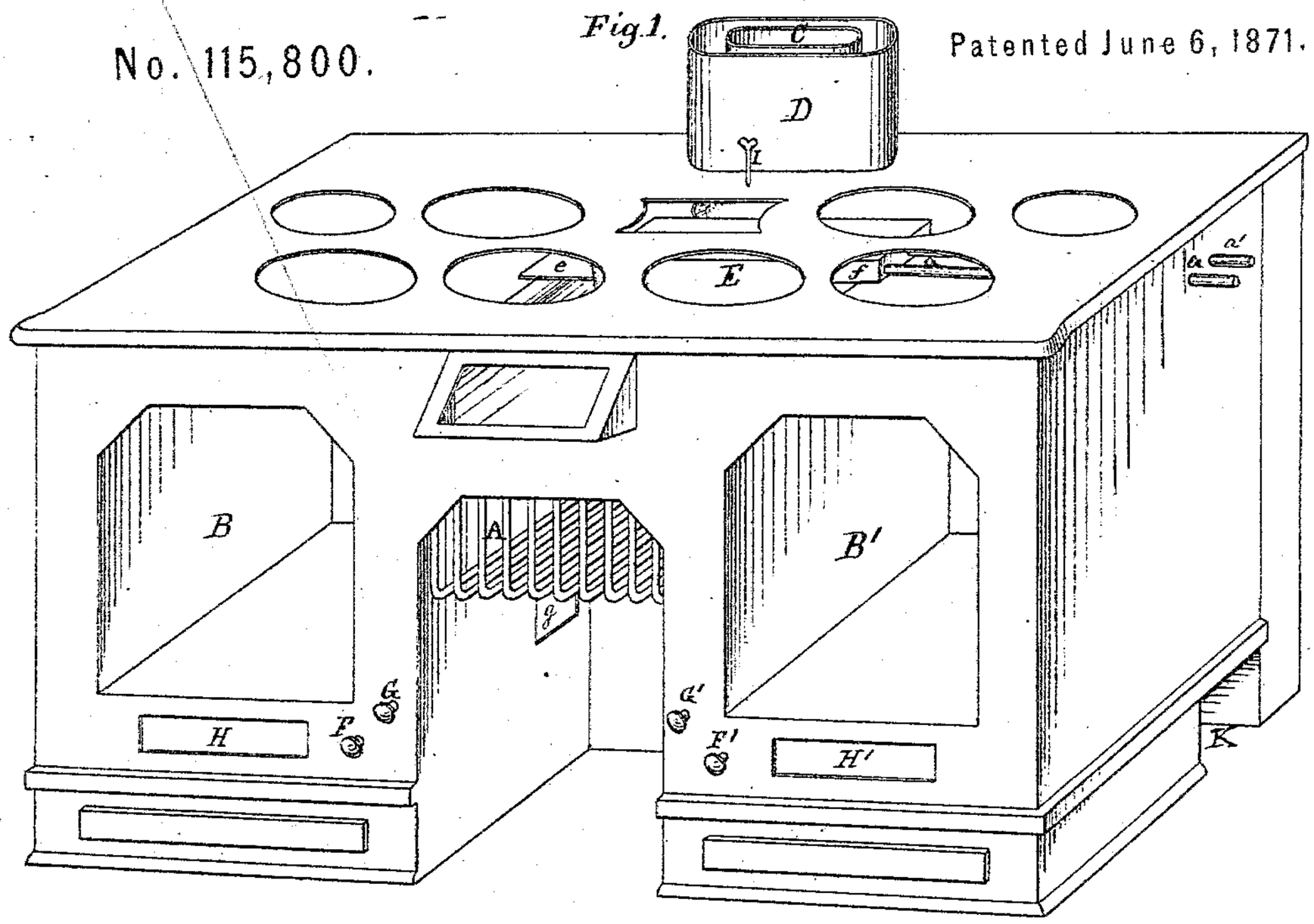
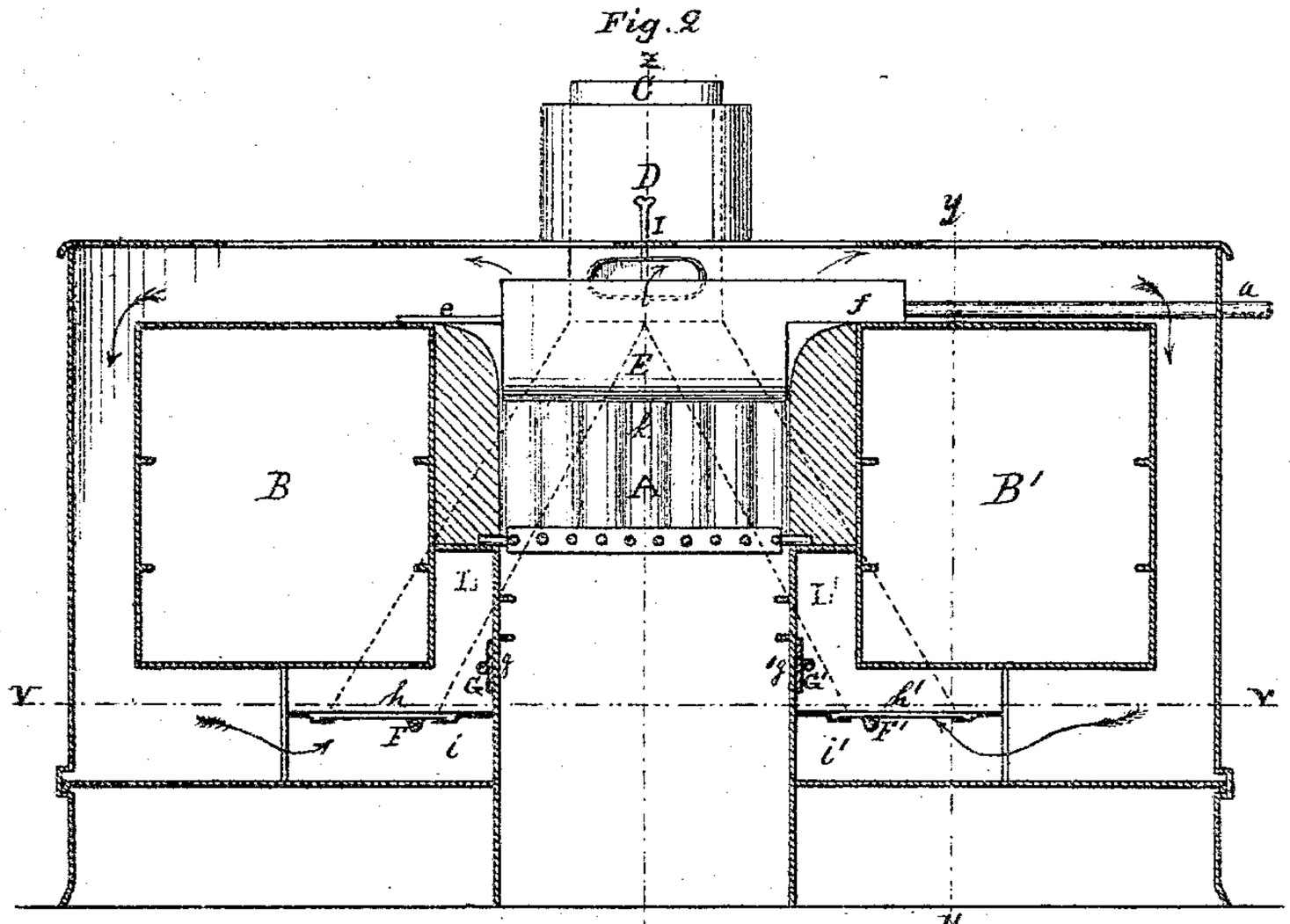


Fig. 2.



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2 Sheets--Sheet 2.

CHARLES J. WOOD

Improvement in Cooking-Ranges.

No. 115,800. Patented June 6, 1871.

Fig. 3.

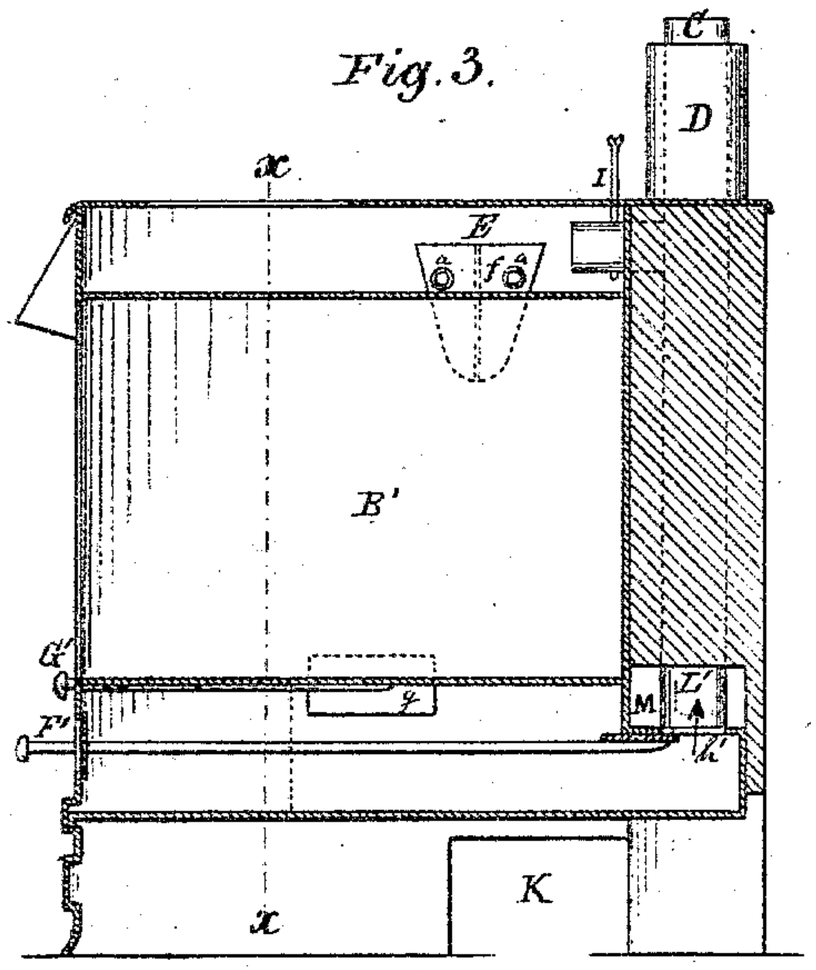


Fig. 4.

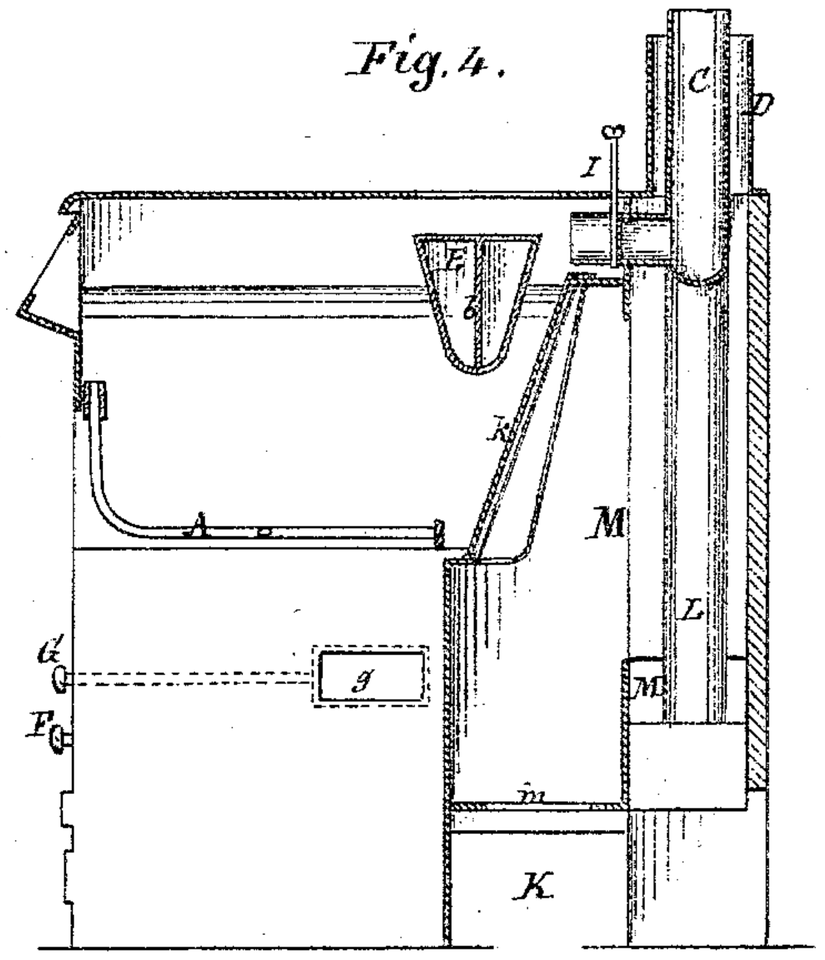


Fig 5.

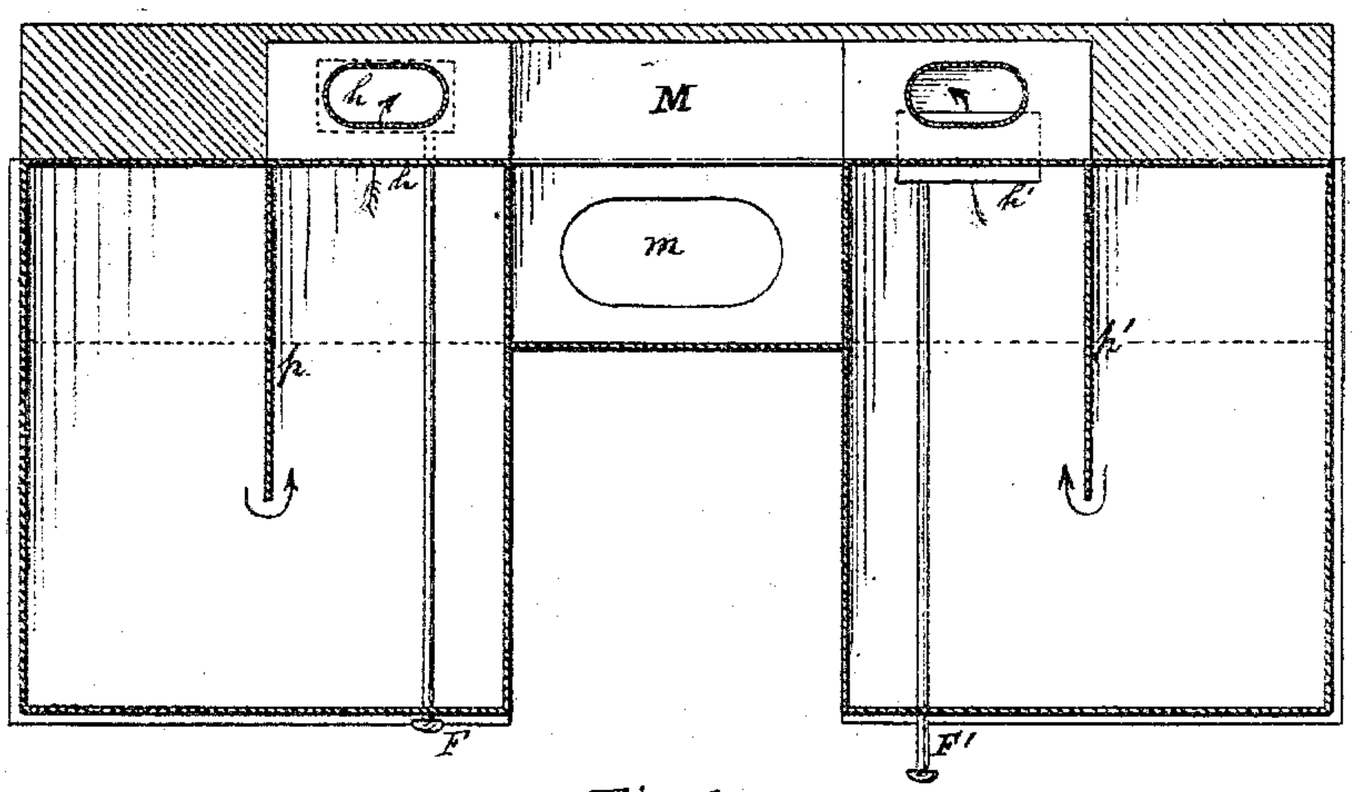
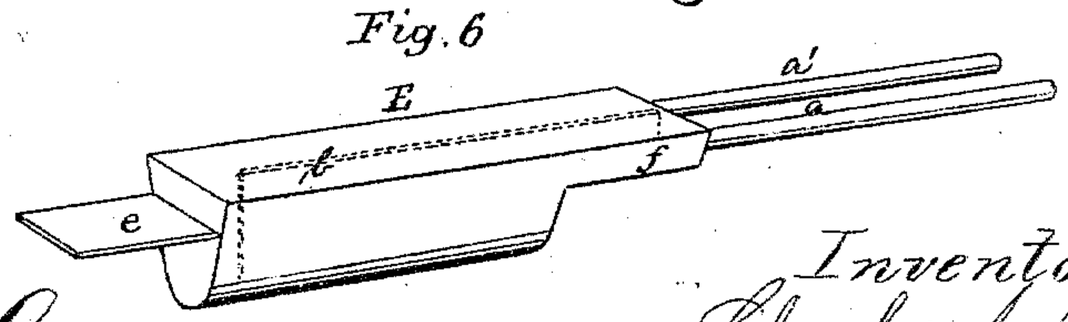


Fig. 6



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UNITED STATES PATENT OFFICE.

CHARLES J. WOOD, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN COOKING-RANGES.

Specification forming part of Letters Patent No. 115,800, dated June 6, 1871.

To all whom it may concern:

Be it known that I, CHARLES J. WOOD, of the city and county of Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Cooking-Ranges.

My invention relates generally to that class of cooking-ranges which are or may be provided with water-backs, and are also intended to serve as hot-air generators for the heating of rooms remote therefrom. My invention consists in a novel combination, construction, and arrangement of certain reverberatory flues, dampers, smoke-pipes, hot-air chamber, and water-back; and I do hereby declare that the following specification, taken in connection with the drawing furnished and forming a part of the same, is a true, clear, and exact description thereof, reference being had to the drawing.

Figure 1, Sheet 1, represents, in perspective, one of my ranges. Fig. 2 represents a longitudinal vertical section through line *x x* of Fig. 3. Fig. 3, Sheet 2, represents a transverse vertical section through line *y y* of Fig. 2. Fig. 4 represents a transverse vertical section through line *z z* of Fig. 2. Fig. 5 represents a horizontal section through line *v v* of Fig. 2. Fig. 6 represents a detached view, in perspective, of the water-back.

In all the figures the same letters of reference are used to indicate like parts.

A is the fire-box or grate. Its back *k* may be of fire-brick or cast-iron, as desired. If considerable heating be required the back would conduct a greater quantity of heat to the air-chamber (which is located at its rear) if it was made of cast-iron in the form of a simple corrugated plate. Being thus constructed, it is very inexpensive, and can frequently be renewed if requisite. B and B′ are the ovens, one on each side of the grate or fire-box. With the exception of their backs and fronts their walls are entirely available for the action of heat thereon. With the exception of a small surface next adjacent to the fire-brick of the grate or fire-box, the entire tops, sides, and bottoms of both ovens are subjected to the action of heated currents of air in course direct from the fire to the chimney, as indicated by the several arrows. C is the main smoke-pipe. It has three points of connection with the interior of the range—one near the top of grate at its rear, and two near the inner rear lower corners of the ovens B. D is the hot-air flue surrounding the smoke-pipe C, and communicating from below with the air-chamber hereafter described. E is the water back or heater, located immediately over the fire space or grate, near its rear, and is so constructed and arranged that it is entirely surrounded with heat when the range is in operation. This water back or heater rests at one end by an arm, *e*, upon the top edge of one side of the grate, and at the other end by a projection, *f*, of the heater proper upon the opposite side of the grate. The water-back proper may be constructed in any desirable form, but a configuration like that shown in the drawing is deemed desirable. Therein it will be found of oblong form with a flat top, its sides and bottom in section resembling the letter **U**, with the sides flaring. Two pipes, *a a′*, conduct water into and from the heater, communicating in the usual manner with a boiler placed at convenient distance therefrom. A partition, *b*, within the water back or heater, extends from the end to which the pipes *a* are attached nearly to the opposite end, and fills vertically the interior space of the heater. The pipe *a* enters the chamber on one side of said partition *b*, and the other pipe, *a′*, communicates with the opposite chamber. As the water is heated a complete and perfect circulation is thereby secured.

By the peculiar and novel construction of this water back or heater it, as a separate and distinct device, is adaptable for use with any kind of range already in operation; provided only that the fire-space of such range be at least a little longer than the outside length of the heater, not counting the projections *e* and *f*, in order that it may be suspended over the fire as stated. It often occurs that it is desirable to locate the hot-water boiler at one particular end of the range. With this improved water-back it is only necessary to have both end plates of the range perforated (when being manufactured) for the passage of the pipes *a*, and then the water-back may be placed in position with said pipes extending in either direction. In such case a pair of metallic plugs need be provided for closing the apertures not used. It is deemed practicable to make the entire water back or heater of cast-iron, in one

piece, or provided with a hand-hole plate secured by rivets. Castings being comparatively inexpensive, and the heaters requiring no expensive fitting, they could practicably be frequently renewed.

F and F′ are heat damper-rods, which communicate with dampers *h h′*, located in projecting boxes *i* and *i′*, at or near the right and left rear lower corners of the ovens. These dampers operate horizontally at right angles to the dust-dampers *g*. Upon each of the boxes *i* and *i′*, over the dampers *h* and *h′*, the conducting-pipes are mounted, which communicate with the chimney or smoke pipe C, hereafter more fully described. G and G′ are rods which control the dust-dampers *g g′*, placed immediately below the grate and on each side. They communicate with oven-flues adjacent to the dampers *h*. H and H′ are openings in the face of the range below the ovens, provided with suitable doors, through which the dust and soot which may therein collect can be from time to time readily removed. In this connection it will be observed that the dampers *h* are so placed with relation to the base-plate of the range as to cause soot and other similar matter to remain on the base-plate near said dampers—in other words, there is a quick vertical change of direction, by which the soot would naturally be deposited near the rear wall of the range. I is a smoke-damper placed in a short piece of pipe communicating from the top and rear of the fire-chamber direct into the smoke-pipe C. This damper is operated by the damper-rod in front of air-passage D on top of the range.

Upon lighting a fire in a large range on a cold or damp day, especially with a chimney of ordinary capacity for draft, it is seldom that the smoke will pass freely by the various circuitous channels desired and known to be essential, but pour out into the kitchen. The soot and fouling immediately following the lighting of such fire generally are much greater than would result from several hours' subsequent burning. The cold metal of the oven-flues condenses the smoke and forms a sweat on every surface exposed, which collects and holds all soot and dust which comes in contact therewith, and prevents the ovens from being quickly and effectually heated. By having this smoke-damper I placed immediately in the rear of the grate and between the two ovens the earlier and objectionable products of combustion are not only conducted at once and directly to the smoke-pipe, but the kindling and progress of the fire to a heating and desirable capacity are secured without unnecessary delay. Meantime the fire, by direct radiation, is warming the parts adjacent, so that when the dampers *h* are opened and the damper I closed the heat is promptly available to its fullest capacity. In having this smoke-damper arranged with relation to the oven and the water-back, as described, it peculiarly adapts this range for general summer use, for the fire, being required for heating water or for cooking other than baking, may be operated as well or better directly through this damper than would be the case without it. By the combination and arrangement of the dampers *h* and I it is an easy matter to maintain any desired degree of heat in the ovens by opening and closing them respectively, according to the condition of the fire from time to time. K is a cold-air flue extending from each end of the range below the ovens inward to a point below and in the rear of the fire-box or grate. L and L′ are conducting-pipes, extending from the dampers *h* upward, and converging into the smoke-pipe C at a point slightly below and in the rear of the top of the fire-box or grate. M is the hot-air chamber. Its space encircles the pipes L and is adjacent to the rear surface of the plate *k* at the back of the grate. This chamber converges as it extends upward, as is indicated by dotted lines in Fig. 2, and communicates at its top with the interior of hot-air pipe D. The outer walls of this chamber may be made of masonry, or they may be constructed of metal, in which latter case it is practicable to set the range, without disturbing a chimney already constructed, by conducting the smoke-pipe into the chimney at a proper height in a suitable manner. The cold-air passage K enters the chamber M at the bottom, through the opening *m*, below and in the rear of the plate *k*. For heating upper rooms the hot-air pipe D is continued upward to the required height; thence at right angles through a suitable register. It frequently occurs that dining-rooms, when located in basements, are on the same level and in front of the kitchen. In such cases a pipe leading horizontally from the pipe D, through the most convenient wall of the dining-room, will readily convey heated air.

The operation of the range is as follows: A fire having been kindled, the smoke-damper I is opened until the fire is well under way, the dampers *h* being closed meanwhile. Then these latter dampers are opened and the smoke-dampers are closed, which causes the current of heat to divide, passing to the right and left over the top of each oven, thence downward, thence under them, as indicated by the arrows. To produce a horizontal reverberating effect upon the current of heat below the ovens, partitions *p p′* are placed below the center of each, filling vertically the space between the bottom of the oven and the bed-plate of the range, and extending from the rear wall or plate to a point near the front of the range. Around these front ends the heat is forced to pass on its way to the damper *h*. If but a single oven be required, one of the dampers *h* may be closed and the whole volume of heat conveyed around the oven desired; or if neither be required, both dampers *h* may be closed and the smoke-damper opened if it be only desirable to heat water or to cook on top of the range. If at any time the ovens should be found too hot for the reception of any article of food which should be baked gradually when first

introduced, it is only necessary to open the dust-dampers *g*, close the draft-dampers *h*, and open the smoke-dampers I, by which means a reverse current of cold or comparatively cold air is made to encircle the oven, which will rapidly lower the temperature to any desired degree, after which the dampers *h* may be opened, smoke-damper I closed, and the dust-dampers *g* closed gradually, which will slowly raise the temperature of the ovens to their fullest capacity. By this possibility of reversing the currents of air in the oven-flues the walls thereof may be kept much cleaner from extraneous accumulation than if but one current were flowing continuously in the same direction. If but a single oven should be required, all the advantages derived from the several arrangements of flues and dampers may be as well secured by this simple non-use of one of the ovens and its surroundings, and by having a solid plate at one end for the support of that end of the grate and the top of the range.

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

1. The improvement in that class of ranges which is provided with side ovens on a line with or below the fire-box, which consists in connecting the main flue with the oven-flues at a point below and in rear of the fire-box, and also with the fire-box direct, in order that by opening or closing the dampers *h*, *h'*, and I, the draft of hot air may be made to encircle one or both ovens, or be discharged direct from the fire-box to the flue, without coming in contact with the walls of either oven, substantially as described.

2. The peculiar location, combination, and arrangement of the dampers *h h'*, *g g'*, and I, and the several flues with which they are respectively connected, by means of which a current or draft of cold air will, when desired, be made to encircle the ovens and flow in a reverse direction to that taken by the heated air, substantially as shown and described.

3. The water-heater E, provided with the end projections *e* and *f*, the interior partition *b*, and so arranged that both the induction and eduction-pipes may be attached thereto at one of its ends, as described.

4. The improvement in combined cooking and heating-ranges, which consists in the peculiar location, construction, and arrangement of the rear plate of the fire-box, the branching-flues L L', main flue C, and air-chamber M, all substantially as described, for the purpose of utilizing the direct heat radiated from the rear of the fire-box and the flues.

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