

(No Model.)

H. DE W. SAWYER.
HEATING APPARATUS.

No. 584,749.

Patented June 15, 1897.

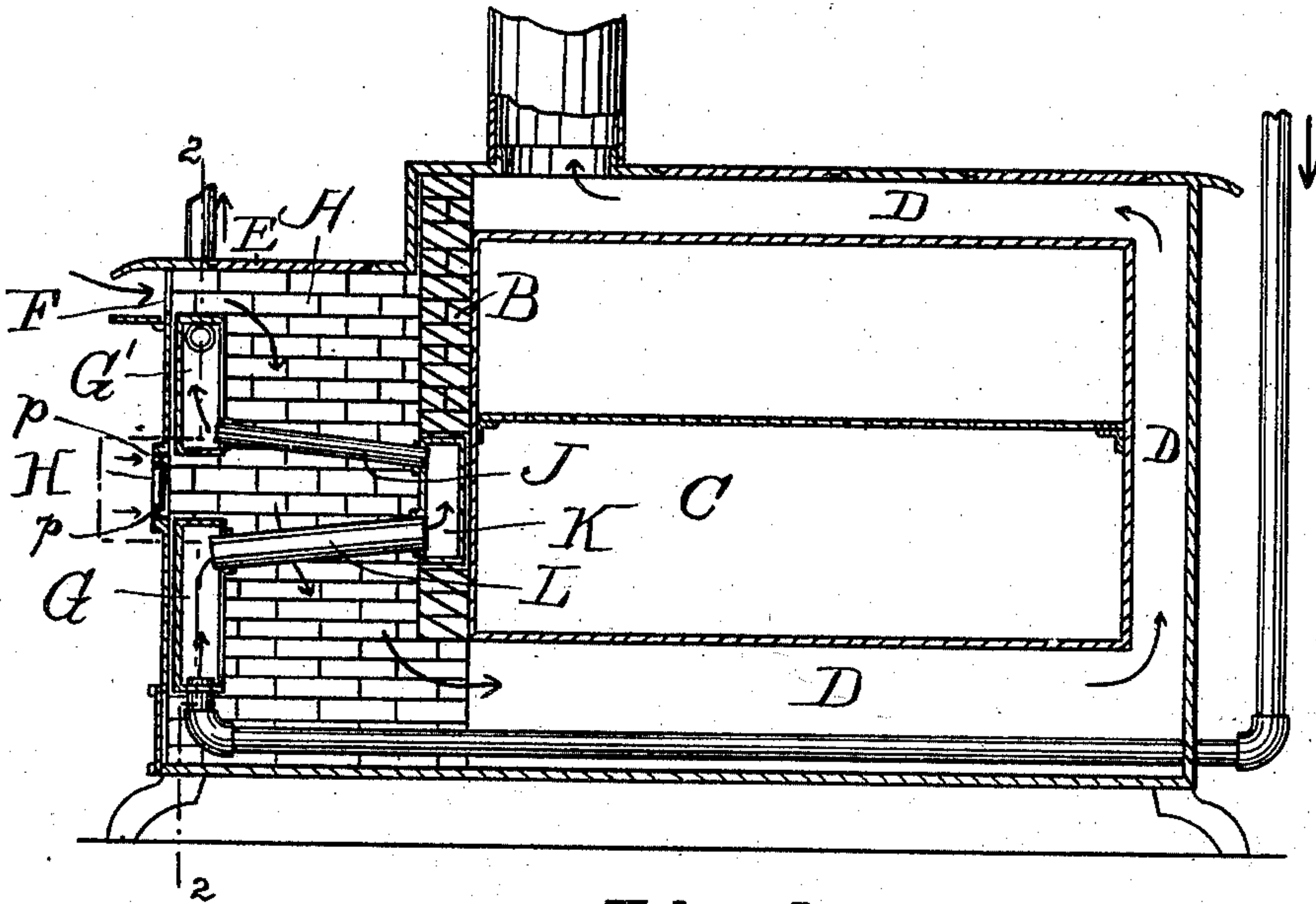


Fig. 1.

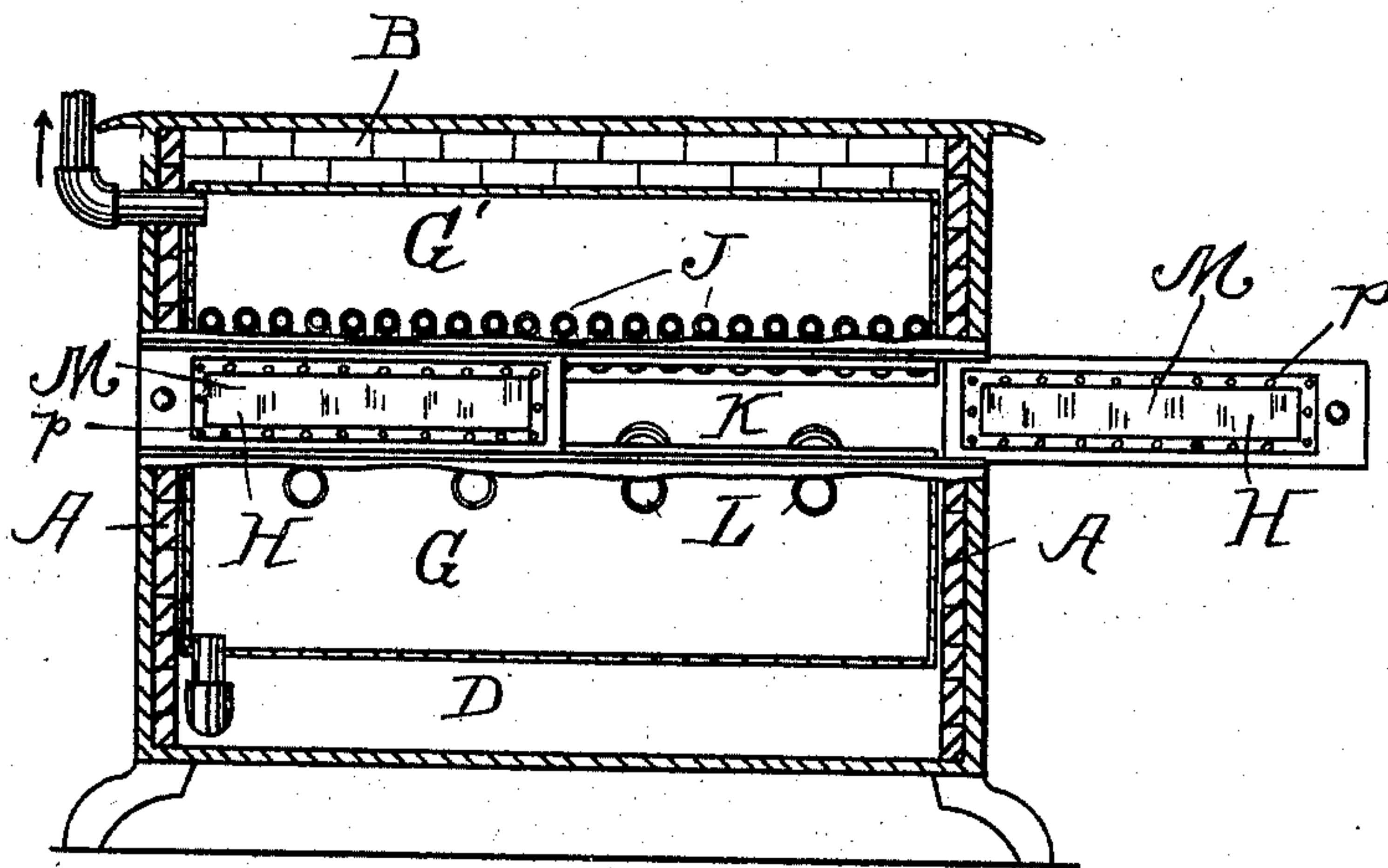


Fig. 2.

WITNESSES.

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UNITED STATES PATENT OFFICE.

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HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 584,749, dated June 15, 1897.

Application filed March 12, 1896. Serial No. 582,862. (No model.)

To all whom it may concern:

Be it known that I, HOWARD DE WOLFE SAWYER, of Revere, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Heating Apparatus, of which the following, taken in connection with the accompanying drawings, is a specification.

The object of this invention is to provide improved forms of heating apparatus, especially for household or domestic purposes, such as cooking-stoves, parlor-stoves, open grates, &c., in all of which a downward draft is maintained through the fuel resting upon a tubular grate through which a constant circulation of water is kept up, such water rising as it becomes heated and serving to heat other rooms to which it may be conducted, after which it returns or may return to the lower part of the heater to repeat its course.

The construction peculiar to my present invention embraces a fire-pot having an inclined water-grate and reversely-inclined supply-pipes communicating with and diverging from a water-box or vertical table at the back or inner end of the fire-box, in combination with a front water-wall made in two separate sections, one above the other, connected for water circulation only through said supply-pipes, water-box, and grate-tubes, the supply-pipes rising obliquely from the upper part of the lower section of said wall and the grate-tubes rising obliquely to the lower part of its upper section, so that effective circulation is at all times maintained. By a door or doors closing the open space between the sections of this front water-wall access is had between said pipes and tubes to the under surface of the grate, which slopes downwardly away from said door, giving opportunity to rake the fire, if desired. A mica or tough-glass panel may be inserted in this door to make the interior visible, and minute air-inlets may admit jets of oxygen to the gas-flames. An ash-door at bottom of the front wall permits removal of ashes when required. A fire-brick back, side walls, and bottom flue are provided. The draft-inlet is above the grate, through griddle-holes in the top, or by a broiler-opening at the upper edge of the front wall, and the descending caloric current passes in an

open flue entirely around the oven in cooking-stoves, giving with a moderate fire the most effective results. In heaters without ovens the current will take a more direct course upwardly after passing under the fire-brick or other back.

I propose to build heaters complete according to my present invention or to furnish the water-front sections and the grate, supply-pipes, and water-box, suitably arranged for insertion in ordinary stoves, in place of the usual front and fire-box. The water-supply will enter the bottom of the lower section of the water-front and the flow will be from the top of its upper section to a tank for domestic purposes or to radiators for return to the stove and repeated circulation, or to both tank and radiators.

The drawings show in Figure 1 a vertical longitudinal section through a cooking-stove embodying my invention. Fig. 2 is a transverse vertical section on the irregular line 2 2 of Fig. 1.

A represents the side wall, and B the fire-brick back, of the fire-pot. C is the oven in rear thereof, and D the caloric passage beneath and around the oven. Griddle-holes in the top of the fire-pot and furnished with covers E serve to admit fuel and constitute draft-openings. When these holes are closed by the covers or by kettles, the draft is through the broiler-opening F at top of the front, furnished with a suitable door. Other griddle-holes are formed in the stovetop over the oven.

G G' are the two independent sections of the hollow water-containing front wall, arranged vertically and at some distance apart, so as to afford access by sliding or swinging doors H to the space between them. The grate J extends obliquely downward from the lower part of the upper section G' of this water-wall. It is composed of parallel closely-set water-tubes screwed at front into said section G' and at the rear or lower end into the transverse water-box K, which lies nearly in contact with the side of the oven or of the back B, allowance being made for expansion when heated. The lower section G is connected at its upper portion with the water-box K by two or more enlarged water-supply pipes

L, which run obliquely to facilitate water circulation. It will be seen that the heated water rising from the lower section G must pass through the supply-pipes L, the water-box K, and the grate-tubes J, and hence that when in use the water necessarily circulates through these parts and cannot short-circuit directly upward, as is possible under other constructions. The tubular grate and supply-pipes are therefore protected from the intensity of the heat by the constant flow of water through them.

The door H, opening between the grate and water-supply tubes, is kept closed except when it may be necessary to rake the fire, the under surface of the grate being readily accessible when such door is open. One or more panels of mica or tough glass M may occupy its central portion, around which a series of small perforations *p* admit jets of air to mingle with the gas-flames shooting downward through the grate, thus promoting combustion without destroying the downward draft.

I claim as my invention--

1. In a downdraft heating apparatus, the fire-pot having a hollow, water-containing front made in two independent sections, one above the other, in combination with the tubular water-grate extending obliquely down-

ward from the lower part of the upper section, the water-supply pipes beneath the grate, inclined in the opposite direction and entering the upper part of the lower section, and with the water-box at the inner or back end of the fire-box into which the converging supply-pipes and grate-tubes enter, substantially as set forth.

2. In a downdraft heating apparatus, the front wall formed of two independent water-containing sections and a door closing the open space between them, with a draft-inlet above and an ash-door below said sections, in combination with a water-box at the rear end of the fire-box and with reversely-inclined grate-tubes and supply-pipes connecting respectively the upper and lower sections to said water-box, whereby circulation is enforced through the several parts, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 20th day of February, A. D. 1896.

HOWARD DE WOLFE SAWYER.

Witnesses:

A. H. SPENCER,
D. W. WORMWOOD.