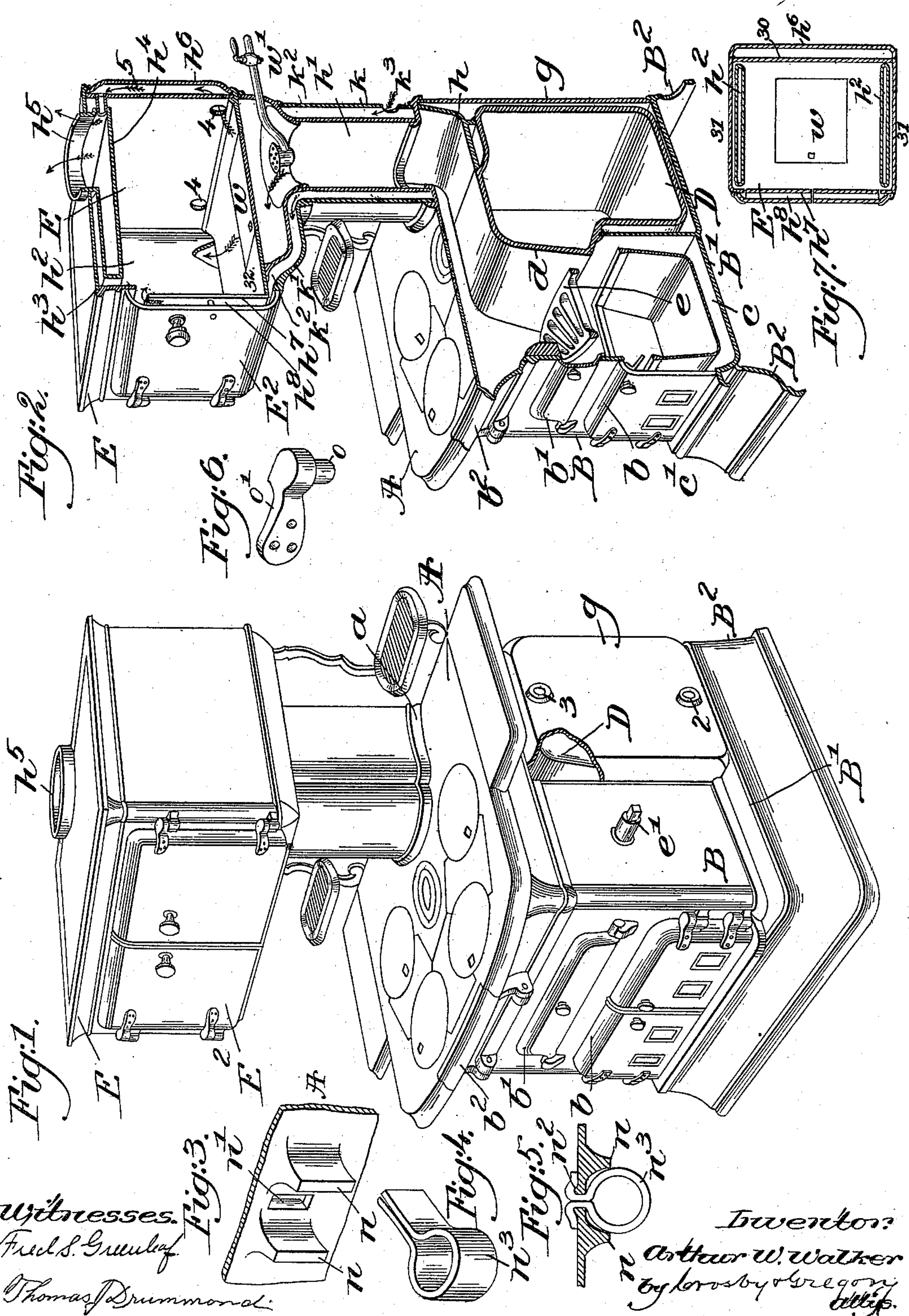


(No Model.)

A. W. WALKER.  
COOKING STOVE.

No. 561,364.

Patented June 2, 1896.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

ARTHUR W. WALKER, OF MALDEN, MASSACHUSETTS.

## COOKING-STOVE.

SPECIFICATION forming part of Letters Patent No. 561,364, dated June 2, 1896.

Application filed April 30, 1894. Serial No. 509,481. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR W. WALKER, of Malden, county of Middlesex, State of Massachusetts, have invented an Improvement in Cooking-Stoves, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 Cooking-stoves as now most commonly made have their ovens located below the stove-top, and the products of combustion pass across the top of and about the oven and then into the stovepipe to the chimney, and this

15 class of stove when it is to be used to maintain heated water in a bath-boiler for distribution under pressure at different places by pipes is customarily provided with what is known as a "water-back" or a "water-front,"

20 it consisting of a casting having passages for the circulation of the water to be heated, said water back or front containing but a small amount of water at any time, and being connected by circulating-pipes with the bath-boiler set up at a greater or less distance from the stove. This usual construction is objectionable not only because of the space taken up by the bath-boiler and its usual stand, and their cost, but also because in cold weather,

30 when hot water is most needed, the water cools so rapidly by radiation from the large surface removed from external heat that enough hot water is not always obtainable, while in warm weather the bath-boiler, by giving up its heat to the atmosphere, overheats the kitchen. The use of an ordinary water back or front, it having small circulating capacity, is further objectionable because the sediment, &c., collecting and settling in the

40 passages therein and in the pipes connecting it with the boiler at a distance therefrom obstruct the same and sometimes the circulatory passages are almost closed. The obstruction of these passages greatly impairs the efficiency of the water-back, or it may be the water-front, as a water-heater, and it or the pipes have frequently to be removed and cleansed; while complete stoppage, should it occur, would result in an explosion. Again,

50 because of the restricted passages for the water in the usual water-back, or in the pipes between it and the boiler, it frequently hap-

pens that a small part of the water in the said back is converted into steam, causing snapping and hammering noises. I have aimed 55 to overcome these difficulties, and to produce a stove having the maximum efficiency both as a cooking-stove and as a heater of water for distribution through pipes under pressure, and at the same time I have aimed to economize space, and consequently I have devised the novel cooking-stove to be herein described, it being of such shape as to itself contain a bath-boiler, a portion of the surface of the boiler being exposed to the direct 65 action of the fire or of the products of combustion, one or both, I preferring to use a wall of the said bath-boiler as a part of the wall or walls of the fire-pot. This bath-boiler takes the place of the usual bath-boiler, water back 70 or front, and intermediate connections.

I locate the bath-boiler below the flue-space just under the stove-top having the usual kettle-holes and in the space commonly occupied by the oven, and as to the oven I elevate it above and away from the top of the stove and above the bath-boiler, where said oven is easily accessible. 75

The oven shown is adapted to receive a current of heated air, said current being utilized 80 to heat the oven-doors to obviate loss of heat, which otherwise would occur at the oven, due to radiation, and the products of combustion from the fire-pot after heating the water in the bath-boiler are made to circulate about 85 the oven in suitable flues and heat the same.

I have provided the stove with a novel grate, and I have also provided novel hinges to increase the durability of the stove.

To prevent not only loss of heat in winter 90 from the bath-boiler by radiation, but also the overheating of the kitchen in summer, said bath-boiler may be provided, as will be described, with an outer casing or jacket, which may, if desired, be detached, said jacket 95 having, it may be, between it and the bath-boiler a space which may be utilized as an air-space or be filled with some suitable non-conductor of heat.

Figure 1, in perspective, represents a cooking-stove embodying my invention; Fig. 2, a vertical section thereof. Fig. 3 shows part of a stove-casting at the point where the pintle-receiver is to be applied. Fig. 4 shows the 100



pintle-receiver detached. Fig. 5 shows the said receiver in place. Fig. 6 shows the pintle-plate detached, and Fig. 7 a sectional perspective detail of the oven.

5 Referring to the drawings, A represents the stove top or plate, it having usual or desired holes and covers and a pipe-collar.

B represents the body of the stove; B', the bottom plate; B<sup>2</sup>, the base, and *b b'* b<sup>2</sup> doors, 10 door *b* leading into the ash-pit *c*, while doors *b'* b<sup>2</sup> lead into the fire-pot, door *b'* serving for the use of a poker to reach the coal or fuel on the grate, and door *b*<sup>2</sup> to enable broiling to be done in usual way.

15 The fire-pot has a grate *e*, pivoted at its ends in usual manner, the grate-journals being exposed, as at *e'*, for the reception of a shaking-handle.

The grate shown is peculiar in that the slots 20 or spaces therein are wider at their inner than at their outer ends, thus enabling the rear part of the fire, the part which is more apt to collect ashes, to be more easily reached to be poked, and to afford more air-space at that 25 point to insure better draft.

The bath-boiler D, located below the top A in the usual oven-space, has part of its wall extended or shaped, as at *d*, in such manner as to constitute a wall of the fire-pot, so that 30 the fire or products of combustion may act directly against the said boiler, thus enabling the heat generated in the fuel used to be better utilized for heating the water which is to be distributed by pipes from the bath-boiler 35 under pressure, the said boiler having a suitable inlet and an outlet, preferably at one end, in line with the holes 2 and 3 of the jacket *g*, to be described.

40 The bath-boiler, located below the top plate, is out of the way, and the water therein gets the full benefit of the heat in the coal. The usual great loss of heat in the water by radiation in cold weather is largely obviated, and the said boiler will furnish a greater supply 45 of hot water than can be had from the old form of bath-boiler removed from the stove and connected to a water back or front.

To avoid the overheating of the kitchen in summer, as well as loss of heat by radiation, 50 I have added to the stove a casing or jacket *g*, there being a suitable space between it and the bath-boiler to constitute a dead-air space or to be filled with lime putty, asbestos, or other non-conductor of heat.

55 The casting *h*, interposed between the bath-boiler and collar *a*, forms part of the flue-space to conduct the products of combustion passing from the fire-pot between the stove-top and its kettle-holes and across the bath-boiler into the pipe *h'*, leading to the oven. 60

The oven E is elevated and is bounded by a top wall, a back 30, two side walls 31 31, a bottom wall 32, and suitable doors E<sup>2</sup>.

65 The bottom wall substantially fills the space between the inner sides of the back and side walls, and said bottom wall has holes, and it has connected to it at said holes pipes *h*<sup>2</sup>,

which at their upper ends communicate with a flue-box *h*<sup>3</sup>, having a smoke-outlet *h*<sup>5</sup>, extended through the oven-wall, preferably the 70 top wall, so that the products of combustion passing beyond the bath-boiler and through the pipe *h'* pass directly up through the pipes *h*<sup>2</sup> near the ends of the oven and through the flue-box near the top of the oven and then 75 through the smoke-outlet.

Carrying the pipes *h*<sup>2</sup> and flue-box through the oven affords for the oven the maximum extent of flue-surface for heating purposes, and in this way substantially all the heat in 80 the products of combustion is utilized in the oven, and said heat is not dissipated or radiated unduly into the room.

The smoke-outlet will be controlled by any usual or suitable damper. 85

The rear wall of the oven has a jacket-plate *h*<sup>6</sup>, and the oven-doors E<sup>2</sup> have each an attached plate *h*<sup>7</sup>, removed sufficiently from the body thereof to leave a space *h*<sup>8</sup> between the plate and door for hot air to pass therethrough 90 into the oven.

The pipe *h'* is surrounded by an auxiliary pipe *k*, entering an extension-plate *k'*, extended up to the plate 32 and to the oven-door, where it has an opening, as shown, thus leaving an 95 air-space *k*<sup>2</sup>, which may be supplied with air at suitable openings, as *k*<sup>3</sup>, so that air heated in said air-space may rise therein and enter the space *h*<sup>8</sup> of the oven-doors, heating the oven-door and then entering the oven, the 100 hot air passing from the oven, through suitable openings 4, into the air-space 5 and out therefrom, as indicated, through a suitable passage to commingle, preferably, with the products of combustion leaving the stove. 105

The hinges used to unite the ash-pit doors to the stove-body and the oven-doors to the oven are subjected to considerable rough usage, and as those doors are usually mounted it is not uncommon to break the hinge off 110 from the door or from the stove-body or from the oven by a careless blow. To obviate this, I have provided the body and the oven, where the doors are to be connected to them, with suitable supports *n*, with slots *n'* between, 115 (see Figs. 3 and 5,) and the castings or plates of the body or oven at the inner ends of said slots may have lugs *n*<sup>2</sup>, and into these slots I pass wrought-metal pintle-receivers *n*<sup>3</sup>, shown as strips of metal bent to leave eyes to receive 120 the pintle-pins *o* of the pintle-plates *o'* and riveted or otherwise confined to the doors.

The pintle-receivers when inserted in place, as shown in Fig. 5, may have their inner ends turned over or bent onto the lips *n*<sup>2</sup>. This 125 makes a very strong, durable hinge connection—one that cannot be broken off by blows such as a stove meets with in use.

The employment of wrought-metal receivers obviates drilling the usual cast-metal lugs 130 on the plate for the pintles carried by the door.

The supports *n* assist materially in keeping the wrought-metal receivers in place, and



their upper ends may support the weight of the doors.

In Fig. 2 I have shown a pipe  $t$  for the reception of gas from a suitable source of supply, and  $t'$  suitable gas-burners, they being to aid in quickly getting up heat in the oven. These burners are located in the line of direct draft above the fire-pot, so as to aid the draft in quickening the fire, particularly when the fire is first started.

The supply of gas may be so controlled as to enable the gas to be used to supplement the heat coming from the fuel in the fire-pot or to heat the oven for cooking on a very hot day when it is not desired to use coal or other fuel in the fire-pot.

To light the gas, open the oven-door, remove the lid  $w$ , and turn the cock  $w'$ , after which the gas may be lighted by a match.

The bath-boiler as a means for heating water and distributing it under pressure is not to be confounded with an open accessible receptacle for hot water, nor is it to be confounded with an ordinary steam-boiler.

By the term "bath-boiler" I mean a boiler of large capacity to hold hot water and deliver the same under pressure through pipes at a distance.

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

1. A cooking-stove having a fire-pot, combined with a bath-boiler having its front upright wall bent toward the grate to constitute the rear upright wall of the fire-pot and be heated directly by the fire in the fire-pot, substantially as described.

2. A cooking-stove having a bath-boiler immediately adjacent to and at the rear of the fire-pot, said boiler being removably inclosed within said stove and of a size to fill the space occupied ordinarily by the oven, the structure being such that when the boiler is removed, the stove may be complete, said space then constituting an oven, substantially as described.

3. A cooking-stove having a fire-pot, a top plate, a closed bath-boiler arranged below said top plate to supply hot water by pipes directly to faucets for use, said bath-boiler forming one wall of the fire-pot and the under side of the flue leading from the fire-pot under the top plate, whereby the direct heat of the fire-pot generates power to force the heated water directly to the faucets without an intermediate stand-tank, substantially as described.

4. A cooking-stove having a fire-pot, and a closed bath-boiler heated directly by the fuel in the fire-pot and located below the top plate of the stove and inclosed within the stove, combined with an outer jacket for the said holder to retain the heat therefrom within the stove, whereby the heated water may be distributed directly therefrom for use, without the free radiation of the heat from the body of water within the room, substantially as described.

5. A cooking-stove having a fire-pot, and a top plate, combined with a bath-boiler formed as an integral part of said stove, located below said top plate, the top of the boiler constituting a continuous part of the bottom of the flue extending from said fire-pot under the top plate, substantially as described.

6. A cooking-stove having a fire-pot below its top plate, a bath-boiler constituting a part of the stove arranged below said top plate and heated directly by the heat generated by the fuel, and an elevated oven located above the top plate and over the bath-boiler, and flues partly formed directly from the fire-pot by the wall of said boiler to conduct the heat of the fuel about said oven after heating the bath-boiler, whereby the temperature of said oven is rendered even by the radiation from the large body of heated water in said boiler, substantially as described.

7. A cooking-stove having a fire-pot and a top plate within the stove, and a bath-boiler located below the said plate, and an oven elevated from said top plate and located above said bath-boiler, so as to receive the tempering heat from said boiler, combined with a connecting-pipe between the fire-pot and oven, and a jacket surrounding said pipe and having an air-space in which atmospheric air may enter and be heated said air being then delivered into the interior of said oven, substantially as described.

8. In a cooking-stove, a top plate, an oven elevated above the top plate, and having a hollow oven-door, combined with a connecting-pipe between the top plate and oven, and a jacket surrounding said pipe to form an air-space in which atmospheric air may enter and be heated, said air being then delivered into said oven-door and thence into said oven, substantially as described.

9. The oven, and its hollow door, combined with flues in communication therewith to supply previously-heated air to the oven-door, substantially as described.

10. The oven, combined with the independent vertical pipes  $h^2$  extended within and through said oven and through which the products of combustion pass before crossing the top of the oven, substantially as described.

11. The oven having pipes  $h^2$  extended therethrough, and air-outlets and a jacket  $h^6$ , combined with a hollow oven-door, and with pipe  $h'$  and jacket  $k$  to constitute an air-chamber in communication with the oven-door, to operate, substantially as described.

12. The slotted stove-plate having a support  $n$ , combined with wrought-metal band inserted therein and constituting the receiving portion for the pintle carried by the door, substantially as described.

13. The slotted stove-plate having supports  $n$ , combined with the wrought-metal band inserted therein and constituting the receiving portion for the pintle carried by the door, and with a door having a detachable pintle, to operate, substantially as described.



14. The stove-body having a fire-pot, an oven elevated above the top plate of the stove, and a pipe between the top plate and bottom of the oven to lead the products of combustion passing under the top plate to do work, to and under the oven, combined with a gas-burner located below the bottom plate of said oven and in the upper portion of said pipe, to heat the oven and aid the draft of the stove, and a cover or lid to effect access to the gas-burner, substantially as described.

15. In a cooking-stove, an oven surrounded on all sides by hot-air jackets, the external walls of said jackets being imperforate, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ARTHUR W. WALKER.

Witnesses:

FREDERICK L. EMERY,  
THOMAS J. DRUMMOND.