

(No Model.)

2 Sheets—Sheet 1.

J. S. HARKINS.
COOKING STOVE.

No. 469,739.

Patented Mar. 1, 1892.

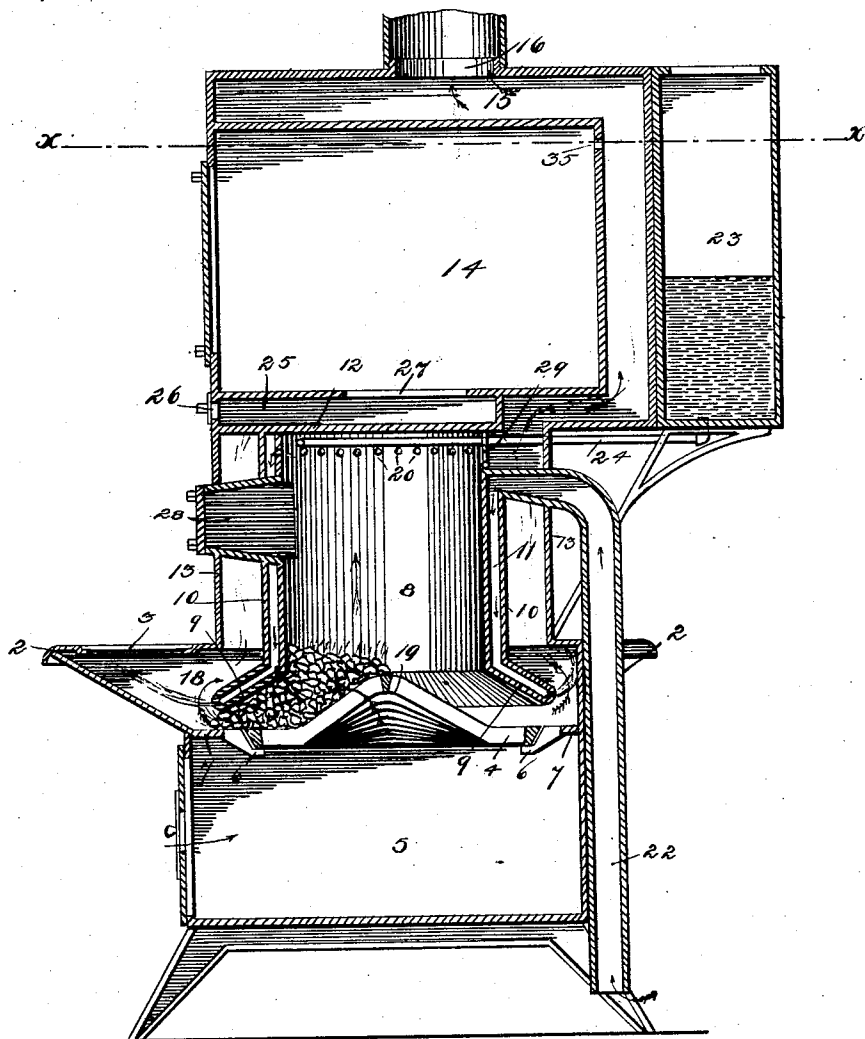
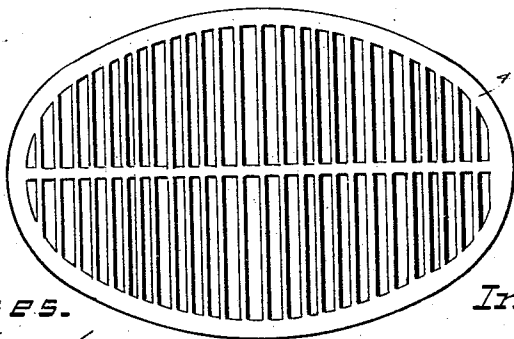


Fig. 1-



Witnesses.

C. E. Van Dorn.

Chas. Hawley

Inventor

Fig. 2. James S. Harkins.

H. Paulsen Attys

(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

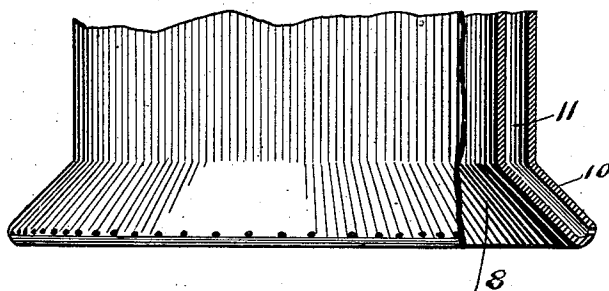
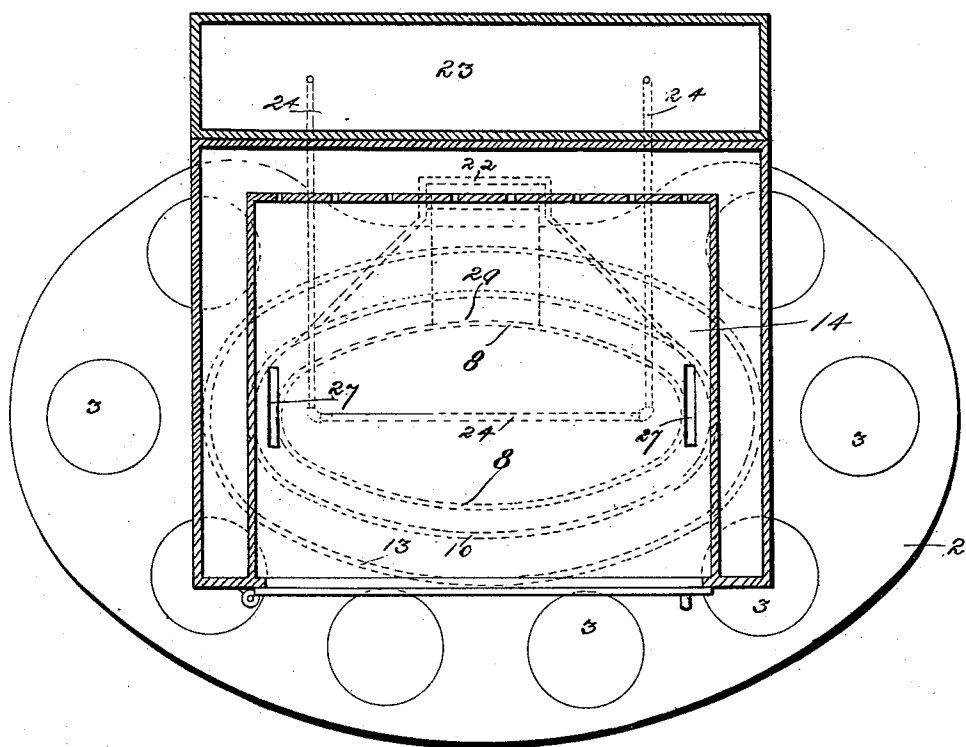


Fig. 3.



Witnesses.

C. E. Van Doren.

O. Hawley

Inventor.

James S. Harkins.

Hz Paul & Marie Azzuz.

UNITED STATES PATENT OFFICE.

JAMES S. HARKINS, OF MINNEAPOLIS, MINNESOTA.

COOKING-STOVE.

SPECIFICATION forming part of Letters Patent No. 469,739, dated March 1, 1892.

Application filed October 25, 1890. Serial No. 369,294. (No model.)

To all whom it may concern:

Be it known that I, JAMES S. HARKINS, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain Improvements in Cooking-Stoves, of which the following is a specification.

My invention relates to improvements in stoves designed especially for the consumption of lignite coal, its object being to provide means for the thorough consumption of the coal and all the gases thrown off therefrom.

To this end my invention consists in providing a stove, preferably of a circular or oval form in horizontal section, having a central fire-pot, an oven arranged above the same, a heating-top arranged around the fire-pot and near its base, and in providing double walls for the fire-pot, thus forming a surrounding superheating-chamber, a flaring bottom for the fire-pot, inlet-openings for the superheating-chamber from the top of the fire-pot, and outlet-openings at the lower edge of the fire-pot, an inlet air-flue communicating with the top of the superheating-chamber, and a conical grate extending upward within the flared portion of the fire-pot, the flaring portion of the fire-pot extending beneath the top of the stove.

My invention consists, further, in various details of construction, and in combinations hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming a part of this specification; Figure 1 is a sectional side elevation of a cooking-stove embodying my invention. Fig. 2 is a plan view of the grate used therein. Fig. 3 is a sectional plan view of the stove shown in Fig. 1 as seen from the line thereof.

As shown in Fig. 3, the oval plate or top 2 of the stove is provided with the usual griddle holes and lids. The form of the stove is, for convenience of manufacture and use, preferably oval, though any other suitable form might be given the same. The grate is provided above the ash-pit 5, and is supported upon suitable lugs 6, provided in the bottom 7 of the fire-pot. The fire-pot 8 has the form of an inverted cup and is provided with the lower flanged edges 9, as shown in Fig. 1. A second wall 10 is arranged around the walls

of the fire-pot 8, so as to form a closed chamber 11 between the two walls. The outer wall extends down over the flanged portion and in practice may be formed in the same piece with the fire-pot. A rounded lower edge is made thereby. The top of the fire-pot and the top of the chamber 11 are both closed by the heavy plate 12, extending across over the same. The outer walls 13 of the stove are arranged at a convenient distance away from the fire-pot and are preferably extended up around the oven 14, provided above the fire-pot. A large smoke-chamber 15 is thus provided upon three sides, the top, and a portion of the bottom of the oven, thereby insuring a high temperature in the oven. The smoke-chamber 15 is connected with the chimney-flue through the opening 16, provided in the top wall 17 of the smoke-chamber 15. As shown, considerable space is preferably left between the top plate 2 and the plate 7, thus forming a direct heating-chamber 18, extending all around beneath the griddle-holes. The grate 4 may be a simple flat grate of a shape conforming to the oval form of the stove; but I preferably employ the convex form of grate, as shown in Fig. 1, in which the raise or hump 19 is provided through the middle thereof. As shown, a number of openings or holes 20 are provided in the top walls of the fire-pot 8, opening from the same into the superheating-chamber 11. Leading from the lower end of the chamber 11 are small openings. (Shown most clearly in the detail, Fig. 4.) The combined area of these openings or holes is preferably greater than that of the holes 20. The inlet-pipe 22 is connected with the chamber 11, as shown, and is adapted to convey fresh air from the room into the same. I preferably provide the hot-water reservoir 23, having the water-pipe 24 extending through the top of the fire-pot 8, through which the water from the reservoir is adapted to circulate. In order to cool the oven 14, and thus prevent the same from getting too hot, I provide the chamber 25 beneath the bottom of the oven and the top of the fire-pot 8. A damper-opening 26 is provided in front of the stove and through this air is admitted to the chamber 25 to cool the bottom of the oven. If desired, I may also provide the slots 27 in the bottom of the oven, admitting the air directly into the same from

the chamber 25. I also provide a series of openings 35 in the top of the rear wall of the oven, through which the hot air will pass from the oven directly into the smoke-chamber 15.

5 My stove is constructed in such a way as to utilize not only the heat arising from the fuel, but also the gases arising from the coal which are usually allowed to pass off with the smoke. The fuel is put into the fire-pot
10 through the door-sleeve 28 and falls upon the grate, filling up the space between the same and the flanged portion of the fire-pot and extending some distance up into the cylindrical part of the fire-pot. If the fire were
15 being kindled, the direct damper 29 would be thrown down into its horizontal position to allow the smoke to pass off quickly. After the fire is started, however, the damper 29 is thrown back into the position indicated, after
20 which the products of combustion are compelled to seek a passage to the chimney out under the lower edge of the fire-pot. The draft for the main part of the burning fuel enters through the slide in the ash-pit door
25 and passes up into the top of the convex portion of the grate, and thence between the bars thereof into the coal. A portion of the air thus enters the burning fuel at a point above the lower line thereof, thus insuring the combustion of all of the fuel. In this way the
30 whole fire-pot and the heating-chamber 11 is heated up to a high degree. The holes in the lower part of the chamber 11 being larger than those in the top of the fire-pot, the draft
35 will naturally be from the top of the fire-pot, through the opening 20, down through the chamber, and out through the gas-openings in the lower edge of the heating-chamber. Thus it will be seen that a large volume of
40 combustible gas is constantly being carried out of the chamber 11. At the same time fresh air is constantly flowing or being drawn into the said chamber through the inlet-pipe 22. This air mixes with the gas, furnishing
45 a sufficient supply of oxygen to insure practically complete combustion. As the flames arise around the lower edges of the fire-pot from the fuel therein, these jets of gas are ignited, thus forming a second "heating device,"
50 so to speak, on the lower edge of the fire-pot. A large number of the holes are provided therein, and hence a great number of gas-jets will shoot out all around the edge thereof and against the top 2 and lids 3. The smoke and
55 unconsumed gases will all pass off through the smoke-chamber between the fire-pot and the outer walls of the stove, and thence up around the oven and out through the smoke-pipe. As the stove is constructed the greatest heat
60 from the fuel is around the bottom of the fire-pot, the top of the coal in the fire-pot being barely red.

In order to prevent the gases from the fire-pot making their exit into the room when the
65 stove-door is opened, I may connect the door with the direct-draft damper, so that when the door is opened the said damper is swung

open, thereby allowing the gases to pass off freely. This, however, as a usual thing, is unnecessary, owing to the fact that as the
70 door is opened the cold air is immediately drawn through the same and down through the coals.

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

1. The combination, in a cooking-stove, of the fire-pot 8, having openings 20, with the walls 10, forming the chamber 11, said chamber having outlet-openings arranged in its
80 lower walls, the outer walls 13 of the stove forming a smoke-chamber between the walls of the chamber 11 and the walls 13, the top plate provided with the griddle-holes, the chamber 18, arranged beneath the same, and a suitable
85 smoke-outlet arranged in connection with said smoke-chamber, substantially as described.

2. In a stove, the combination of a fire-pot having double walls forming a chamber, the
90 inner walls thereof being provided with openings leading into said chamber, with an air-flue communicating with the top of said chamber, said chamber provided at the lower edge of the fire-pot with outlet-openings, a flat
95 stove-top and lower walls extending down therefrom and forming therewith a chamber surrounding the bottom of the fire-pot and communicating therewith, substantially as described.

3. In a stove, the combination of a fire-pot having a flaring bottom with double walls for said fire-pot, forming a superheating chamber, the inner walls thereof provided with
100 openings leading from thence into said chamber, the lower edge walls of said chamber provided with gas-outlets of greater capacity than the openings first mentioned, a grate beneath the flaring part of the fire-pot, and air-inlets beneath said grate and at the top
105 of the superheating-chamber, substantially as and for the purpose set forth.

4. In a stove, the combination, with the inverted cup-shaped fire-pot having a closed
110 top, of an oven arranged above the same, and an intermediate air-chamber having an inlet communicating with the outer air and an outlet of less area communicating with the smoke-flue, substantially as and for the purpose set forth.

5. In a stove, the combination of the inverted cup-shaped fire-pot having the closed
115 top, with a grate beneath the open lower end of said pot, a coal-door in the side of said pot, a closed smoke-chamber arranged about said
120 fire-pot and grate, means for creating an upward draft through said fire-pot, whereby the coal is made to burn therein, an oven arranged in the upper part of said smoke-chamber and directly over said fire-pot, whereby it
125 is subjected to the greatest possible heat, an air-chamber arranged between the top of said pot and the floor of the oven, and an opening through the walls of the stove and into said
130

air-chamber, whereby cool air is introduced and circulated therein to prevent the heating of the oven-floor to a disastrous degree, substantially as described.

5 6. The combination, with the fire-pot 8, of walls forming a superheating-chamber about the same, the walls thereof provided with gas inlet and outlet openings, the top 12 of said fire-pot, the bottom flared out at an abrupt
10 angle, a smoke-chamber arranged about the

same, a grate beneath the fire-pot, and a direct flue connection through said fire-pot, provided with a damper 29, as described.

In testimony whereof I have hereunto set my hand this 21st day of October, 1890.

JAMES S. HARKINS.

In presence of—

A. M. GASKILL,
C. G. HAWLEY.