G. W. HOWES.

COMBINATION COAL AND GAS RANGE OR COOKING STOVE.

APPLICATION FILED FEB. 20, 1917.

1,242,941.

Patented Oct. 16, 1917.

2 SHEETS—SHEET 1.

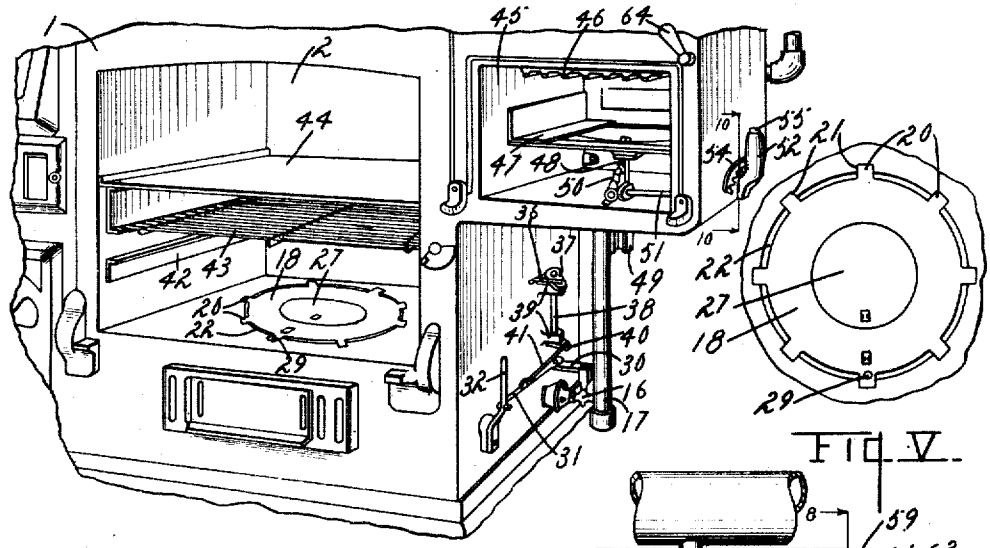


FIG. I.

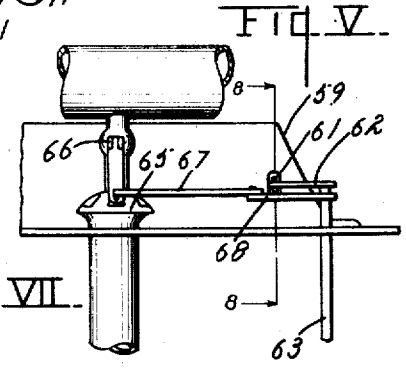


FIG. V.

FIG. VII.

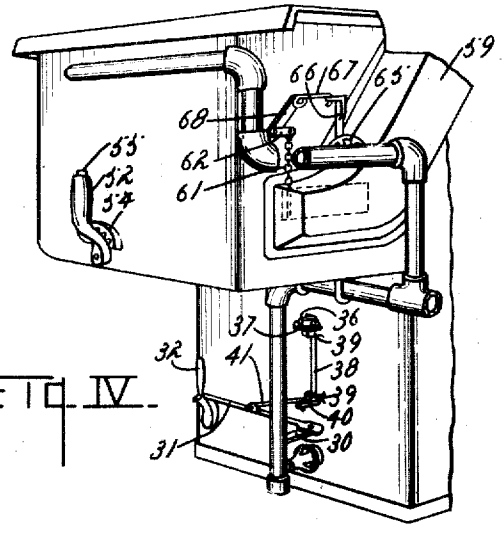


FIG. IV.

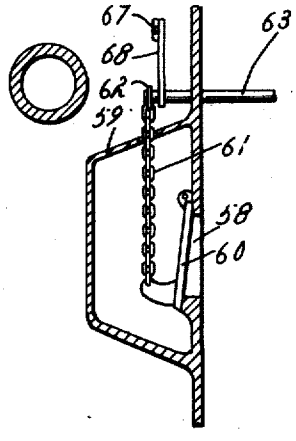


FIG. VIII.

WITNESSES:

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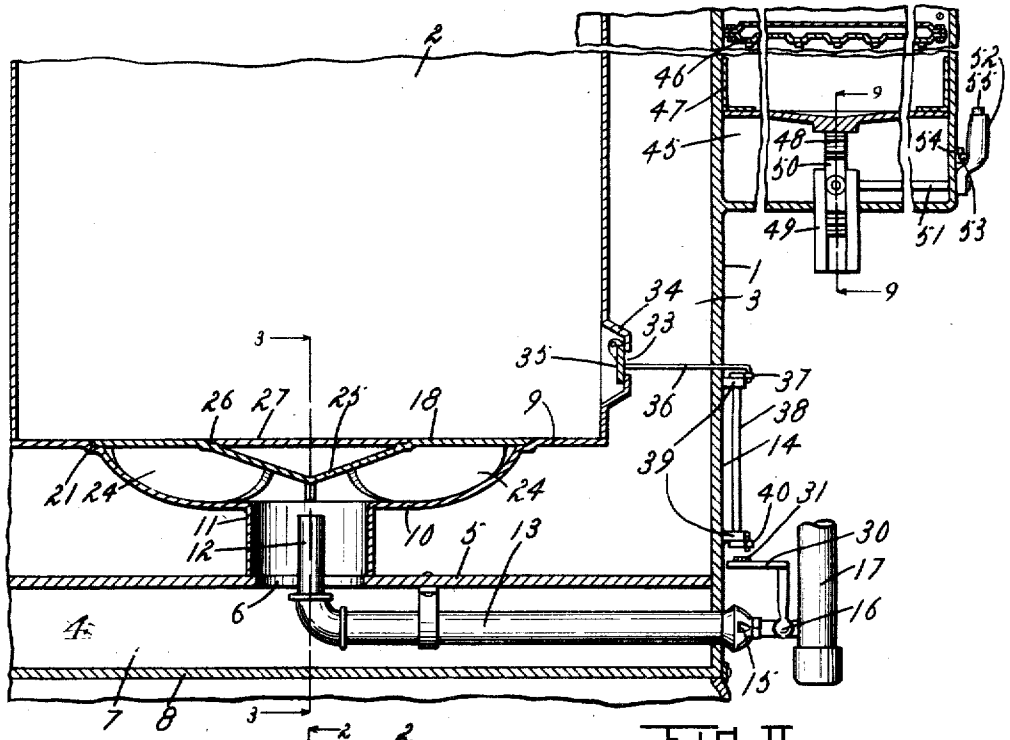


FIG. II.

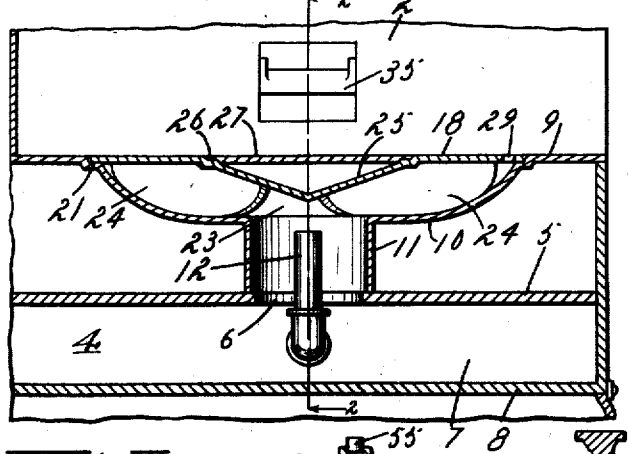


FIG. III.

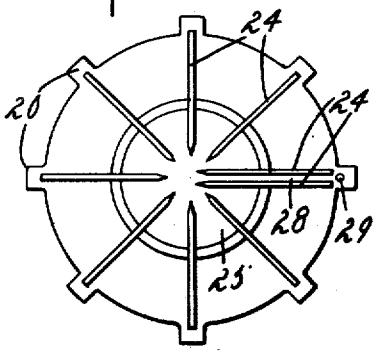


FIG. VI.

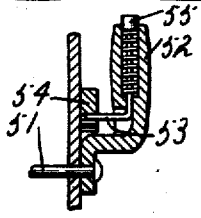


FIG. X.

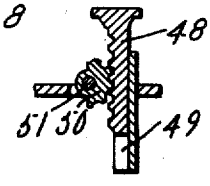


FIG. IX.

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UNITED STATES PATENT OFFICE.

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COMBINATION COAL AND GAS RANGE OR COOKING-STOVE.

1,242,941. Specification of Letters Patent. Patented Oct. 16, 1917.

Application filed February 20, 1917. Serial No. 149,723.

To all whom it may concern:

Be it known that I, GEORGE W. HOWES, a citizen of the United States, residing at Dowagiac, county of Cass, State of Michigan, have invented certain new and useful Improvements in Combination Coal and Gas Ranges or Cooking-Stoves, of which the following is a specification.

This invention relates to improvements in combination coal and gas ranges or cooking stoves.

The main objects of this invention are:

First, to provide an improved combination coal and gas range.

Second, to provide in a combination coal and gas stove or range an improved oven structure which may be very effectively heated either by coal or gas and one in which coal and gas may be simultaneously used if desired.

Third, to provide in a combined coal and gas range an improved combined warming oven and broiler.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification. The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of my invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure I is a detail front perspective view of a cooking stove or range embodying the features of my invention, the doors of the main and warming ovens being omitted.

Fig. II is a detail vertical longitudinal section centrally through the ovens on a line corresponding to line 2—2 of Fig. III.

Fig. III is a detail vertical transverse section on a line corresponding to line 3—3 of Fig. II.

Fig. IV is a detail rear perspective view showing the arrangement of the combination broiler and warming oven, flue and operating mechanisms for the burner valve, damper and other parts.

Fig. V is a detail plan view of the oven bottom.

Fig. VI is an inverted view of the oven bottom deflector plate or member.

Fig. VII is an enlarged detail of the oven burner valve and the damper actuating mechanism.

Fig. VIII is a detail section on a line corresponding to line 8—8 of Fig. VII.

Fig. IX is a detail vertical section on a line corresponding to line 9—9 of Fig. II, showing details of the broiler and pan support.

Fig. X is a detail section on a line corresponding to line 10—10 of Fig. I, showing details of the means for operating the broiler pan support.

In the drawing similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, 1 designates the stove body generally. I desire to mention that I have not, in the accompanying drawings, attempted to maintain the relative proportion of the parts nor have I attempted to show structural features of the body proper nor the joints or connections for its several parts, as such details will be readily understood by those skilled in the art to which my invention relates.

The structure is provided with a combustion chamber, fire-pot and ashpit at the left hand end, but, as the details of these parts form no part of this invention I have not illustrated them herein.

The flue from the combustion chamber extends over the main oven 2 and downwardly at 3 and under the oven at 4, this flue arrangement being well-known in the art. The bottom wall 5 of the flue is provided with an opening 6 centrally below the oven opening into a chamber 7 between the bottom wall 8 of the stove and the flue bottom. The oven bottom forms the top wall of the portion 4 of the flue and comprises a bottom member 9 having a depressed concavo-convex or pan-like portion 10 terminating in a tubular burner chamber and air conduit member 11 embracing the opening 6 in the flue bottom 5. The burner 12 is disposed centrally of the burner chamber member 11, its tube 13 being extended through the wall 14 of the stove body and provided with air inlets at 15 and a valve 16 through which it is connected to the supply pipe 17.

The deflector plate 18 is supported on the bottom member 9 by means of lugs 20 which

rest in seats 21 provided therefor at the periphery of the depressed portion 10 of the bottom member, thereby providing a series of discharge openings 22 at the periphery of the deflector plate. The deflector plate and the depressed portion of the oven bottom 9 provide a distributing chamber 23 having the discharge openings 22. The deflector plate is preferably provided with integral partition or passage members 24 disposed radially with their lower edges conformed to and resting upon the portion 10 of the bottom 9 and their inner ends projecting above the burner chamber. These partition members provide a series of passages causing the heat to be uniformly distributed from the burner and, further, they constitute heat conducting members from the oven bottom 9 with which they contact to the deflector plate.

To prevent excessive heating above the burner and also to assist in even distribution of the heat therefrom the deflector plate is provided with an inverted conical depressed portion 25, the apex of which is located centrally above the burner. The deflector plate is provided with an annular seat 26 at the periphery of its depressed portion t receive the lid-like filler plate 27. This arrangement of parts provides a bottom for the oven in which the heat from the heating flue is evenly distributed and when the burner is used the heat therefrom is effectively and evenly distributed within the oven.

To facilitate lighting the burner I provide a pair of the partition passage members 24 disposed in a parallel relation and in close proximity providing a pilot conduit 28, the deflector plate being provided with a pilot opening 29 at the inner end of this conduit. The inner ends of these conduit members extend inwardly somewhat farther than the inner ends of the other passage members,—see Fig. VI, so that when the gas is turned on to the burner it is quickly conducted to the pilot opening 29 and a match may be applied thereto and the flame travels through the conduit to the burner and ignites the same without severe explosion.

The valve 16 is provided with an arm 30 connected by a link 31 to the lever 32 disposed toward the front of the stove for convenience in manipulation. The oven is provided with a vent 33 opening into the portion 3 of the flue, the vent being arranged in a housing 34 offset on the side of the oven adjusted to the flue 3. The flat damper 35 is provided for this oven. This damper is opened by the push rod 36 extending through the oven and connected with the arm 37 on the rock shaft 38 supported in ears 39 on the side of the stove. The rock shaft has an arm 40 at its lower end connected by the link 41 to the operating link 31 for the valve, so that when the valve is opened the vent damper is opened, thus permitting air to circulate more freely through the burner chamber and into the oven. It is found that this vent of the oven is desirable for most efficient operation although the vent might be otherwise arranged.

I preferably provide the oven with a plurality of shelf ledges 42 adapted to receive the oven racks 43 and the shelf or partition plate 44. The oven rack and the imperforate partition plate are adjustable on these ledges, so that by adjusting the plate the relative size of the oven compartments may be regulated, which is a desirable feature. The plate 44 may be removed entirely if desired.

The warming oven and broiler 45 is provided with an inverted burner 46 supported in the upper part of the oven. Below this burner is an adjustable support 47. This support 47 is mounted on a rack 48 reciprocating through the bottom of the oven in a sliding way 49. The rack is actuated by the segment 50 on the rock shaft 51 which projects through the side of the oven and is provided with a hand piece 52. This hand piece has a detent 53 coacting with the notched segment 54. The detent has a thumb piece 55 extending from the end of the hand piece,—see Fig. X.

The oven 45 is provided with a vent opening 58 in its rear wall opening into the flue 59 leading to the discharge flue of the stove, not shown. The vent opening 58 is provided with a flat damper 60 hinged at its upper edge and connected by the chain 61 arranged through the top wall of the flue to an arm 62 on the rock shaft 63 through the wall of the oven and provided with a hand piece 64 at its front end. The burner 46 is provided with a tube 65 projecting through the rear wall of the oven and having a valve provided with a stem 66 connected by the link 67 to an arm 68 on the rock shaft 63 so that the damper 60 is opened when the burner valve is opened.

My improved combination gas and coal range is comparatively simple in structure and is very convenient to operate and very effective in use. While I use the term coal it will be understood as comprehending any suitable solid fuel, also the burner as a burner for gas or liquid fuel. The oven 2 is effectively heated with either gas or the solid fuel and both gas and solid fuel may be simultaneously used if desired.

I have illustrated and described my improvements as I have embodied the same in practice. I have not attempted to illustrate or describe certain modifications in structural details which I contemplate and which might be desirable for certain adaptations, as I believe the disclosure made will enable those skilled in the art to which this inven-

tion relates to embody or adapt the same as may be desired.

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

1. In an oven, the combination of a bottom having a depressed central concavo-convex portion terminating in a depending tubular burner chamber, said bottom having deflector plate supporting lug seats at the periphery of its said depressed portion, a burner disposed centrally of said burner chamber, a deflector plate having an inverted conical depressed portion disposed centrally above said burner chamber and nte al passage members disposed radially with their inner ends projecting above said burner chamber, there being a pair of said passage members disposed parallel and with their inner ends extending inward farther than the inner ends of the other passage members providing a pilot conduit, said deflector plate having a pilot opening at the outer end of said conduit, said deflector plate being provided with lugs alined with said passage members arranged in said seats in said bottom to provide discharge openings at the periphery of said deflector plate, said deflector plate having an annular center plate seat at the periphery of its depressed portion, and a center plate arranged in said seat.

2. In an oven, the combination of a bottom having a depressed central concavo-convex portion terminating in a depending tubular burner chamber, said bottom having deflector plate supporting lug seats at the periphery of its said depressed portion, a burner disposed centrally of said burner chamber, a deflector plate having an inverted conical depressed portion disposed centrally above said burner chamber and integral passage members disposed radially with their inner ends projecting above said burner chamber, said deflector plate being provided with lugs alined with said passage members arranged in said seats in said bottom to provide discharge openings at the periphery of said deflector plate, said deflector plate having an annular center plate seat at the periphery of its depressed portion, and a center plate arranged in said seat.

3. In an oven, the combination of a bottom having a depressed central portion provided with a central depending tubular burner chamber, said bottom having deflector plate supporting lug seats at the periphery of its said depressed portion, a burner disposed centrally of said burner chamber, a deflector plate having an inverted conical depressed portion disposed centrally above said burner chamber, said deflector plate being provided with lugs arranged in said seats in said bottom to provide discharge openings at the periphery of said deflector plate, said deflector plate having an annular center plate seat at the periphery of its depressed portion, and a center plate arranged in said seat.

4. In an oven, the combination of a bottom constituting the top of a flue and having a depressed central portion provided with a central depending tubular burner chamber, said bottom having deflector plate supporting lug seats at the periphery of its said depressed portion, a burner disposed centrally of said burner chamber, a deflector plate flush with said bottom provided with lugs arranged in said seats in said bottom to provide discharge openings at the periphery of said deflector plate.

5. In an oven, the combination of a bottom having a depressed portion constituting a distributing chamber, said bottom having deflector plate supporting lug seats at the periphery of its said depressed portion, a burner disposed centrally relative to said chamber, a deflector plate having a depressed portion disposed centrally above said burner, said deflector plate being provided with lugs arranged in said seats in said bottom to provide discharge openings at the periphery of said deflector plate, said deflector plate having an annular supplemental plate seat at the periphery of its depressed portion, and a supplemental plate arranged in said seat.

6. In an oven, the combination of a bottom having a depressed central concavo-convex portion provided with a central burner chamber, a burner disposed centrally of said burner chamber, and a deflector plate having an inverted conical portion disposed centrally above said burner chamber and integral passage members disposed radially with their inner ends projecting above said burner chamber and their lower edges conformed to rest on said bottom, there being a pair of said passage members disposed parallel and with their inner ends extending inward farther than the inner ends of the other passage members providing a pilot conduit, said deflector plate having a pilot opening at the outer end of said conduit.

7. In an oven, the combination of a bottom having a depressed central concavo-convex portion provided with a central burner chamber, a burner disposed centrally of said burner chamber, and a deflector plate having an inverted conical portion disposed centrally above said burner chamber and integral passage members disposed radially with their inner ends projecting above said burner chamber and their lower edges conformed to rest on said bottom.

8. In an oven, the combination of a bottom having a depressed central portion constituting a distributing chamber, a burner disposed centrally relative to said distributing

chamber, and a deflector plate constituting a top for said distributing chamber provided with radially disposed passage members resting on said bottom, there being a pair of said passage members disposed parallel and with their inner ends extending inward farther than the inner ends of the other passage members providing a pilot conduit, said deflector plate having a pilot opening at the outer end of said conduit.

9. In an oven, the combination of a bottom constituting the top of a flue and having a depressed central portion constituting a distributing chamber, a deflector plate constituting a top for said distributing chamber and provided with radially disposed passage members, there being a pair of said passage members disposed parallel providing a pilot conduit, said deflector plate having a pilot opening at the outer end of said conduit, and a burner disposed centrally relative to said chamber.

10. In an oven, the combination of a bottom having a depressed central portion constituting a distributing chamber, a deflector plate constituting a top for said distributing chamber, and a portion of the oven bottom, a pair of spaced members disposed to provide a radial pilot conduit, said deflector plate having a pilot opening at the outer end of said conduit, and a burner disposed centrally relative to said chamber.

11. A combination stove comprising an oven, a heating flue the walls of which include a bottom wall with an opening therein centrally below said oven and an oven bottom having a depressed central concavo-convex portion terminating in a depending burner chamber embracing said opening in said flue bottom, a burner disposed centrally of said burner chamber, a deflector plate mounted on said bottom and having an inverted conical depressed portion disposed centrally above said burner chamber and integral passage members disposed radially with their inner ends projecting above said burner chamber and their lower edges conformed to rest on said bottom, there being a pair of said passage members disposed parallel and with their inner ends extending inward farther than the inner ends of said passage members providing a pilot conduit, said deflector plate having a pilot opening at the outer end of said conduit, and a filler plate disposed above said depressed portion of said deflector plate.

12. A combination stove comprising an oven, a heating flue the walls of which include a bottom wall with an opening therein centrally below said oven and an oven bottom having a depressed central portion terminating in a depending burner chamber embracing said opening in said flue bottom, a burner disposed centrally of said burner chamber, a deflector plate mounted on said bottom and having an inverted conical depressed portion disposed centrally above said burner chamber, passage members disposed radially with their inner ends projecting above said burner chamber, and a filler plate disposed above said depressed portion of said deflector plate.

13. A combination stove comprising an oven, a heating flue the walls of which include a bottom wall with an opening therein centrally below said oven and an oven bottom having a depressed central portion constituting a distributing chamber, a burner chamber embracing said opening in said flue bottom and opening centrally to said distributing chamber, a burner disposed centrally of said burner chamber and a part of the oven bottom, and passage members disposed radially of said distributing chamber, there being a pair of said passage members disposed parallel providing a pilot conduit, said deflector plate having a pilot opening at the outer end of said conduit.

14. A combination stove comprising an oven, a heating flue the walls of which include a bottom wall with an opening therein centrally below said oven and an oven bottom having a depressed central portion constituting a distributing chamber, a burner chamber embracing said opening in said flue bottom and opening centrally to said distributing chamber, a burner disposed centrally of said burner chamber, a deflector plate constituting a top for said distributing chamber and a part of the oven bottom, and passage members disposed radially of said distributing chamber.

15. A combination stove comprising an oven, a heating flue the walls of which include a bottom wall with an opening therein centrally below said oven and an oven bottom having a depressed central portion constituting a distributing chamber, a burner chamber embracing said opening in said flue bottom and opening centrally to said distributing chamber, a burner disposed centrally of said burner chamber, and a deflector plate constituting a top for said distributing chamber and a part of the oven bottom.

16. A combination stove comprising an oven, a heating flue extending below the oven, said oven being provided with a bottom having a pan-like portion constituting a distributing chamber and provided with an air inlet through said heating flue, a burner disposed centrally relative to said chamber, and a deflector plate constituting the top of said distributing chamber and a portion of the oven bottom, said deflector plate being provided with an inverted conical portion disposed centrally above said integral burner chamber and radially disposed passage members.

17. A combination stove comprising an

oven, a heating flue extending below the oven, said oven being provided with a bottom having a pan-like portion constituting the top of the flue and forming a distributing chamber and provided with an air inlet through said heating flue, a burner disposed centrally relative to said chamber, a deflector plate constituting the top of said distributing chamber and a portion of the oven bottom, and radially disposed passage members.

18. A combination stove comprising an oven, a heating flue extending below said oven, said oven being provided with a bottom having a pan-like portion constituting the top of the flue and forming a distributing chamber and provided with an air inlet through said heating flue, a burner disposed centrally relative to said chamber, and a deflector plate constituting the top of said distributing chamber and a portion of the oven bottom.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

GEORGE W. HOWES. [L. S.]

Witnesses:
CHARLES A. DE MERITT,
WINFRED H. JONES