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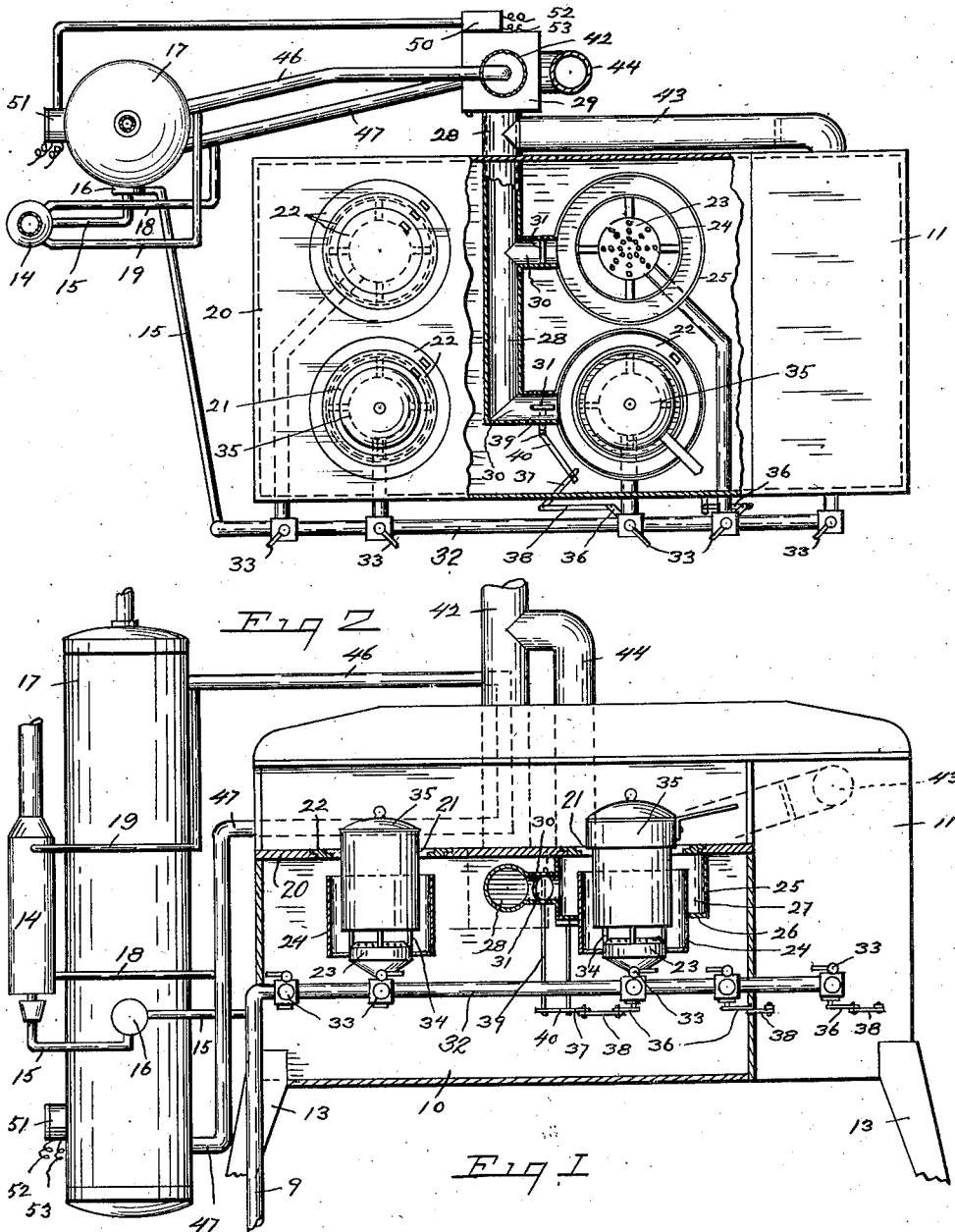
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COMBINATION GAS RANGE AND WATER HEATER

Filed Oct. 9, 1934

2 Sheets-Sheet 1



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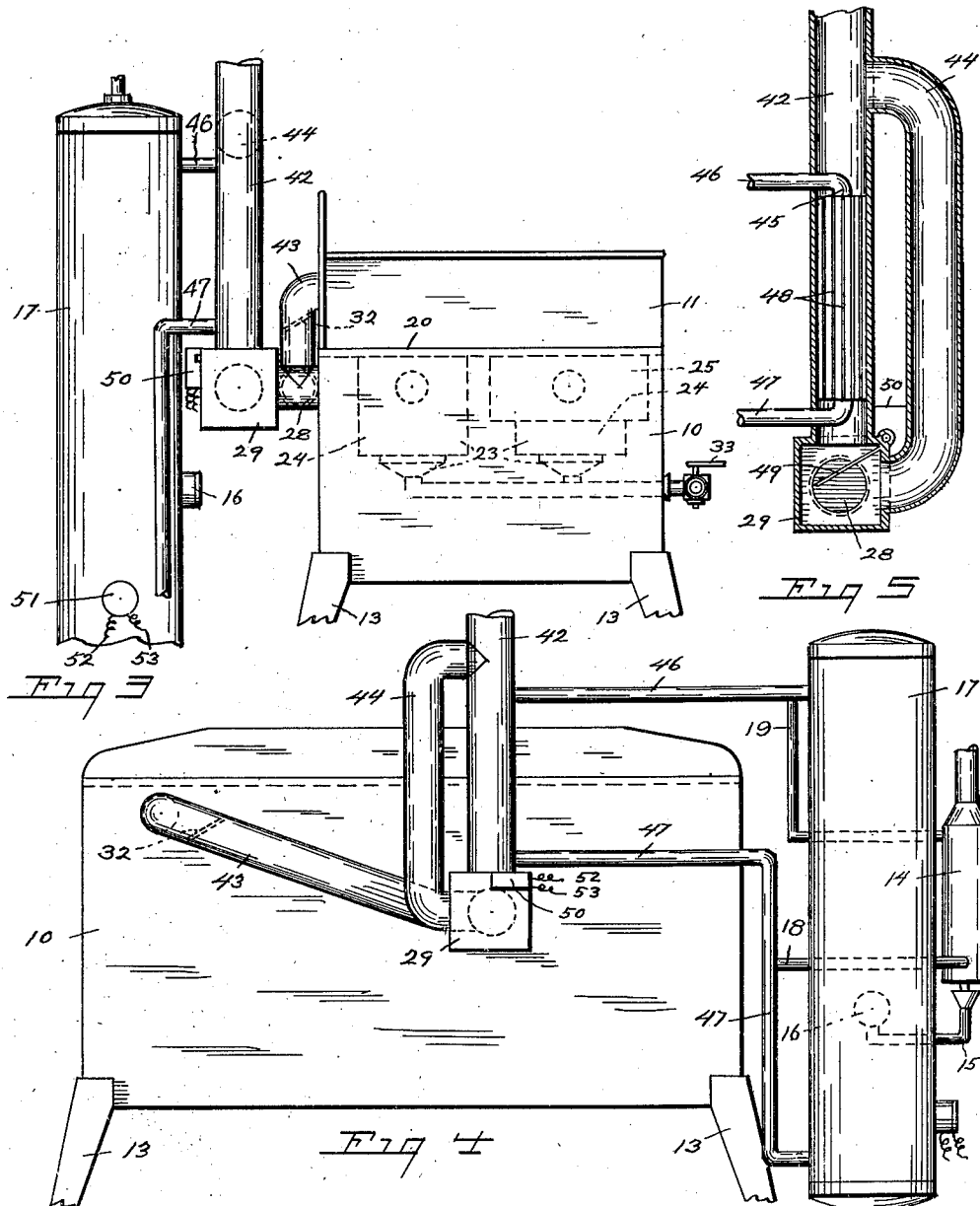
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COMBINATION GAS RANGE AND WATER HEATER

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COMBINATION GAS RANGE AND WATER
HEATER

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Application October 9, 1934, Serial No. 747,489

1 Claim. (Cl. 126—53)

This invention relates to a gas range of that kind which is intended to be operated by natural or manufactured gas, for the purposes of cooking and the heating of water for domestic uses, and the invention relates more particularly to means for utilizing all of the heat from the burning gases.

In the form of gas and liquid fuel burning gas ranges now in use, the burners are placed or located at or near the level of the range top and a very large per cent of the burning gases from which the heat is derived are allowed to escape upward past the sides of the cooking utensil, and no means is provided by which these burning gases can be confined and directed directly against the surface of the cooking utensil, and also utilized either for the direct heating of water or as an additional means for connection with the automatic water heater for the water boiler.

To accomplish this, I have designed a cooking range, to be operated either by gas or other suitable fuel, and in which the burners are located below the level of the range top, and are provided with tubular casings to confine the burning gases, and the cooking utensils are placed within these casings in such a manner that all or the greater part of the burning gases are brought into contact with not only the bottom of the cooking utensil, but a very large portion of its sides as well, thus not only producing the greatest heat from the minimum of fuel, but reducing the cooking time required.

To further bring the burnt gases into contact with the sides of the cooking utensil, I have provided within this burner casing a second inner casing or tube that extends upward from the burner to within a short distance of the range top and which divides the burner casing into an inner direct heating chamber for the cooking utensil and an outer chamber or flue that I have connected by suitable flues to a heat exchanger which is mounted within the vent or stack and which is designed to heat a water pipe passing therethrough from the usual hot water storage tank, which normally is heated by the automatic gas heater.

To further help confine the burnt or burning gases to the heating chamber and in contact with the cooking utensil, I have provided the range top with a series of concentric lids or rings for each burner, whereby the opening between the lid ring and the utensil is reduced in size as much as possible, this also preventing the gases from blowing away and from being diluted and cooled by contact with the air,

I have also provided means whereby the bottom of the cooking utensil is always spaced the proper distance from the gas burner and is also supported thereby.

The object of the invention is to provide a gas range in which each of the burners and cooking utensils are confined within a heating chamber to confine the heat to the utensil.

Another object of the invention is to provide means whereby the burnt gases may be utilized for heating water, either directly or indirectly.

Another object of the invention is to provide means whereby the burning gases are confined and directed against a large surface to the cooking utensil.

Another object of the invention is to provide means whereby the direction of travel of the burnt gases may be directed in an automatic manner by the gas control valves.

Another object of the invention is to provide means whereby the automatic gas operated heater for the hot water storage tank may be controlled in an automatic manner.

With these and other objects in view, my invention consists in certain novel construction and combination of parts as will hereinafter be fully described and claimed, and further illustrated in the accompanying drawings which form a part hereof and in which like figures of reference refer to corresponding parts in all of the views, and it is understood that slight changes may be made therein without departing from the spirit of the invention.

In the drawings:

Figure 1 is a front elevation of a gas range and hot water storage tank, shown partly in section and illustrating my device.

Figure 2 is a top plan view of the same, also shown partly in section.

Figure 3 is an end view of the range.

Figure 4 is a rear view of the range.

Figure 5 is an enlarged detail view partly in section of the damper and heat exchanger.

Referring to the drawings:

The usual gas range is indicated by the numeral 10, and is provided with the oven 11, and supported on the legs 13; while adjacent thereto is placed the usual type of water boiler, supplied with the automatic gas operated water heater 14 which is fed by the pipe 15 from the gas main 9, through a thermostatic valve 16 mounted on the boiler 17; said automatic gas heater 14 being connected to the hot water storage tank 17 by the pipes 18 and 19.

The range 10 is formed with a closed top 20 formed with the openings 21 for each burner, and each of these openings are provided with a series of concentric lids or rings 22 to vary the size of the openings in the top 20 above the burners.

Below each right hand burner opening in the top 20 is mounted a burner which is located on a lower plane from said top 20 and as shown in Figure 2 of the drawings, the two right hand burners 23 are provided with annular tubular casings 24 which extend upward from the burner 23 to within a short distance of the top 20, and embracing this casing 24 and spaced therefrom is a second or outer casing 25 which is attached to the inner casing 24 by a ring bottom 26 and extends upward to the under side of the top 20, thus forming a flue 27 between the walls of said casings 24 and 25, which communicates with a transverse flue 28 extending back and communicating with and attached to the valve box 29, the short flues 30 from the annular flues 27 to the transverse flue 28 being provided with the dampers 31.

The burners 23 may be of any suitable type and are mounted upon the gas feed pipes 32 from the main 9, and each is provided with its own cock 33, and the upper face of each burner 23 is formed with the supporting ribs 34 extending upward and upon which the bottom of the cooking utensil 35 rests.

Two of these cocks 33 have their stems elongated and projecting from the bottom thereof, and to them are secured the arms 36 which are secured to one arm of a bell-crank 37 by the link 38, while the other arm of the bell-crank 37 is attached by a link 40 to the vertical rod 39 of the flue damper 31, in such a manner that when the gas is turned on for the burner, the damper 31 will be opened in the flue from that particular burner.

The tubular casings 24 of the two left hand burners as shown in Figure 2, are not provided with an outer casing and these burners do not have any connection with the means for heating the water.

To the rear of the range and attached to the transverse flue 28 is placed a valve or damper box 29, from the upper side of which extends the main smoke or vent flue 42 which is carried to the chimney in the usual manner; and from the oven and broiler is a vent pipe 43 which is connected to the transverse pipe 28 between the back of the range and the damper box 29.

From one side of this damper box 29 is car-

ried a by-pass pipe 44 which is connected into the main flue 42 upon a higher level.

Within this main flue 42 is mounted the heat exchanger which comprises the water pipe 45 which is connected to the hot water storage tank 17 by the pipes 46 and 47, and which within the main flue 42 is provided with a series of radial fins 48 which are in contact with the passing burnt gases and heated thereby to heat the water passing therethrough and circulating through the hot water storage tank 17.

The damper box 29 is provided with a two-way damper 49 which is operated by a solenoid 50 which is controlled by a thermostat 51 attached to the water boiler 17 and connected in an electrical circuit with said solenoid 50, the purpose of this being that when the water in the hot water storage tank 17 has reached its maximum temperature, the heat and burnt gases from the range will be diverted to the stack by the by-pass 44; while if the temperature of the water in the storage tank is low, the burnt gases from the range will pass through the heat exchanger and raise the temperature of the hot water storage tank, thus utilizing the heat and burnt gases from the range burners in place of the heat from the automatic gas heater and in this manner effecting a great saving of fuel required for heating the water.

The flue 43 from the oven is also provided with a damper 32 which is operated by the gas cut off that controls the flow of gas to the burner in the oven.

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

In a combination gas cooking range and water heater including a range top, a series of burners located below and spaced from the range top, an inner tubular casing open at the top and surrounding each burner and spaced below the range top, an outer tubular casing of greater diameter mounted in axial relation to the inner tubular casing and spaced therefrom to form an annular flue, said outer casing being closed at its upper end by the range top and at its lower end by a spacing ring secured to the inner casing, a heat transmitting flue connecting said outer casing and said annular flue and said water heater for conveying the heat from the burner to the water heater, means for selectively closing off any of said heat transmitting flues and means for controlling simultaneously both the supply of fuel to a burner and the closure of the flue of a burner.

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