June 6, 1944. G. J. ELTZ, JR 2,350,500

GAS RANGE

Filed March 4, 1941

Fig. 1.

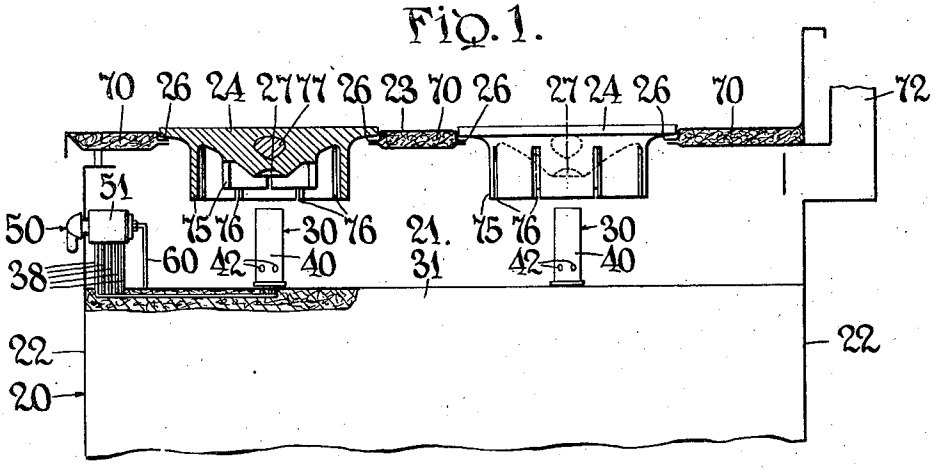



Fig. 3.

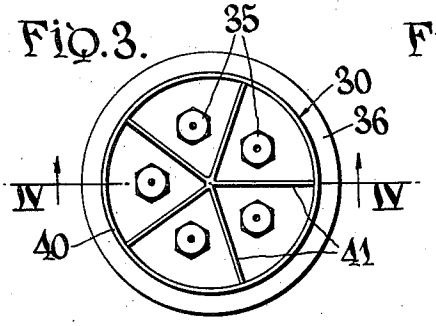



Fig. 2.

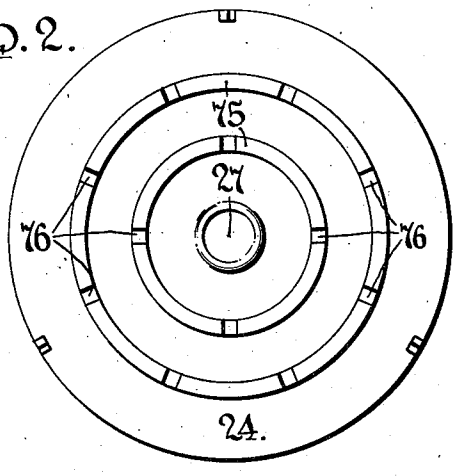
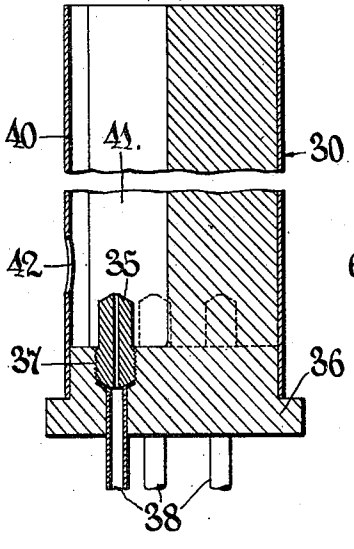



Fig. 4.



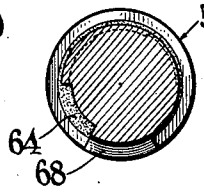




Fig. 6.

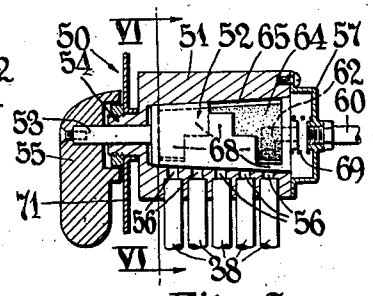



Fig. 5.

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## GAS RANGE

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Application March 4, 1941, Serial No. 381,679

4 Claims. (Cl. 158—104)

This invention relates to gas ranges, and more particularly to improvements in gas ranges for domestic cooking purposes, and the like.

One of the objects of the invention is to provide an improved gas range which will be of improved characteristics with respect to control of heat production; efficiency of useful application of the generated heat; speed of application of heat to the mounted cooking utensils; cleanliness of operation; freedom from leakage of gas and/or combustion fumes externally of the range; elimination of undesirable heating of the atmosphere of the room housing the range; and general economy of operation. More specific objects of the invention will appear from the specification hereinafter.

In the drawing:

Fig. 1 is a fragmentary vertical section through a range of the invention showing one heating plate element thereof in section and another heating plate element thereof in elevation;

Fig. 2 is a bottom plan, on an enlarged scale, of a heating plate element thereof;

Fig. 3 is a top plan, on an enlarged scale, of a burner element thereof;

Fig. 4 is a section taken substantially along line IV—IV of Fig. 3;

Fig. 5 is an enlarged view of the control mechanism of the range of Fig. 1, with portions shown in section and other portions thereof shown in elevation; and

Fig. 6 is a section, on an enlarged scale, through the valve head portion of the control mechanism, taken substantially along line VI—VI of Fig. 5.

The invention contemplates generally an improved gas range construction wherein application of gas generated heat is more usefully applied to the cooking utensil heating operations of the range, and wherein the range is so constructed that heat generated by the gas burning operation is substantially prevented from becoming dissipated into the atmosphere of the room housing the range, and wherein an improved gas burner and burner control mechanism is provided whereby cooking temperatures may be accurately regulated with improved facility.

The range is illustrated by way of example in the drawing as comprising generally a cabinet structure 20 which may be of any desired general form and of any suitable material. The cabinet comprises generally opposite side and end walls 21 and 22, respectively, and a top cover 23 which is provided with suitable openings therethrough to receive heating plate elements 24 in nested relation thereon. The heating plates 24 may, of course, be of any desired number and arranged with respect to the plan view of the range in any manner desired. As illustrated in Figs. 1 and 2, the heating plates 24 are in the form of castings of aluminum metal or the like having plate top surfaces for support of cooking utensils thereon, and the top cover 23 of the range cabinet is formed with recessed shoulders as at 26 to support the marginal edge portions of the heating plates 24 in nested relation upon the range top. The plates 24 are generally of inverted frusto-conical form (Fig. 1), and at their bottom central portions are cupped as at 27 to receive the burner gas flame therein as will be explained more fully hereinafter.

Burners 30 are mounted upon a horizontal shelf 31 of the cabinet 20 so as to be in registry with the cupped portions 27 of the heating plates. As illustrated in Figs. 3 and 4, each burner unit comprises a plurality of gas conveying jets 35 which are mounted in a base plate 36 to direct streams of gas therethrough and upwardly toward the corresponding heating plate. The jets 35 are in the form of centrally bored tubular members which are mounted in the base plate 36 by means of screwthreaded connections at 37, and thus different jets having differently dimensioned orifices may be interchanged in the burner device. Each jet 35 is arranged to be separately fed with gas through a corresponding conduit 38 leading through the base plate 36 (Fig. 4). A burner chimney 40 of cylindrical form is mounted upon the base plate 36 to extend upwardly therefrom to enclose the gas issuing from the jets as it moves toward the heating plate, and the chimney 40 is interiorly partitioned as at 41 so as to divide the chimney into separate segments corresponding to the individual jet members. Air inlet orifices 42 are provided in side wall portions of the chimney 40 adjacent the respective jets 35 so as to permit suitable supplies of air to be induced to flow into the burner structure as required for combustion purposes, as in the manner of Bunsen burner operation.

As illustrated in Figs. 3, 4 and 5, the burner unit embodies five separate jet and chimney compartments, which are separately fed by five corresponding conduits 38, but it will be understood that this specific number and relative arrangement of burner jets is not critical, and that any other desired number of jets and jet feeding arrangements may be employed within the concept of the invention. In any case each jet supply conduit 38 will be separately fed by gas through

control means providing for selective operation of the various jet members. For example, as illustrated in Figs. 5 and 6, the control device may comprise a valve designated generally at 50 which includes a housing 51 and a valve head 52 rotatably mounted within the housing. As illustrated, the housing is conically bored and the valve head 52 is of complementing tapering form so as to be adapted to be ground-fitted therein in substantially gas tight relation. A control shaft 53 extends from the valve head 52 through a gland portion 54 of the housing 51 and into connection with a control handle 55 for convenient manual manipulation of the valve head for control of the burner by the operator of the range.

The gas burner conduits 38 are arranged to lead into the housing 51 through ports 56 extending into communication with the bore of the housing 51 at intervals spaced longitudinally thereof. An end closure plate 57 is arranged to close the housing 51 at its end opposite the control handle 55, and a gas inlet conduit 60 leads through the closure plate 57 into open communication with the interior of the housing 51. The valve head 52 is formed with a gas conduit 62 leading through the end thereof and thence radially so as to emerge at a recessed wall portion 64 of the valve head. As shown in Fig. 5, the valve head 52 is recessed at the portion 64 thereof so as to provide a gas conveying space 65 between the recessed wall portion and the valve housing 51, and the recessed portion 64 of the valve head extends longitudinally thereof in stepped relation so as to leave valve seat portions 68 disposed circumferentially in extended relation and adapted to be brought into successive registry with corresponding gas outlet ports 56 of the valve housing 51 upon rotation of the valve head 52. Thus, starting from a position of all outlet ports closed, rotation of the valve head causes the outlet ports 56 to be successively opened to the space 65, commencing with the outlet port next adjacent the right-hand end of the valve mechanism as illustrated in Fig. 5, and continued rotation of the control handle 55 provides cumulative operation of different of the burner elements 35 as fed by the conduits 38. A compression spring 69 is arranged to bear against the valve core 52 so as to maintain it in gas-sealing relation with respect to said housing at all times.

The burner tips 35 may be provided of any desired bore dimension so that initial movement of the control handle 55 will cause one of the burners to come into operation so as to provide any desired amount of gas flow therethrough; it being understood that any suitable kind of pilot flame device may be employed in conjunction with the burner outlets to initially ignite the gas issuing from the burners. Further rotation of the control handle 55 will similarly bring into operation additional of the burners 35, depending upon the degree of rotation of the control handle 55 away from burner-off position. Any suitable type of index device 71 may be arranged in conjunction with the control handle 55 so as to provide a convenient visible indication of the selective positions of the control handle and the corresponding rate of gas flow through the various burner elements, whereby the operator of the range will be enabled to set the control handle 55 at the position corresponding to the desired heating plate temperature by reference to the index device.

It will be understood that by reason of the features of the burner control mechanism, the rate of heat supply to the heating plate members of the range may thus be regulated at will, and that the fineness of such regulations are limited only by practical considerations relating to determination of the number of burner elements 35 to be included in any one burner device adjacent the corresponding heating plate.

Thus, it will be understood that a gas burner arrangement is provided which involves multiple gas burning jets, each of which are separately and selectively brought into operation by manipulation of a single control member which may be adjusted to provide any desired heat producing operation through means of selective and/or cumulative operation of the various burner elements of the device. Thus, any adjusted heat producing operation is available while at all times the gas combustion process is so conducted as to provide maximum efficiency of transmission of the heat of combustion to the point of useful application thereof.

Preferably, the cover plate 23 of the range top will be heat insulated as at 70 by means of any suitable heat insulation material, and the heating plate members will be arranged to closely fit thereagainst in substantially air-sealing relation so that no heated air or gaseous products of combustion will be permitted to move through the range top plate and into the atmosphere of the room about the range. For similar purposes the end and side wall portions of the range will be preferably of gas-tight construction and a flue 72 will be arranged to conduct the gaseous products of combustion from around the burner units to the atmosphere outside of the room housing the range.

As illustrated in Figs. 1 and 2, the bottom surfaces of the heating plates 24 are of inverted frusto-conical form having their centers disposed above and in line with corresponding burner devices 30. The apex portions of the plates 24 are concaved as at 27 to receive the blast of flame from the corresponding burner units in centrally focused relation thereon. Thus, the flame is adapted to move from the center concave portion radially and upwardly against the tapering wall portions of the plates, and in order to somewhat retard the movement of the heating gas, a series of baffle walls 75 are arranged to extend below the plates 24 as integral portions thereof. The baffle walls 75 may be occasionally slotted as at 76 so as to allow a limited amount of heated gas flow directly through the baffle walls, whereby the heating plates are adapted to efficiently transmit the heat to the cooking utensils. Thus, increased heat absorption by the heating plate is provided, and the burner and heating plate arrangement results in optimum efficiency of combustion and of useful application of the generated heat to the cooking utensil supported upon the heating plate.

As shown in Fig. 1, the heating plate 24 is preferably provided with an insert 77 comprising a mass of heat insulating material adapted to function as a baffle against uneven transmission of heat through the heating plate. Thus, direct transmission of the majority of the burner heat through the center portion of the heating plate such as would provide a so-called "hot spot" at the center of the utensil supporting upper surface thereof, is avoided. It will be understood that the material of the insert 77 may be of any suitable character such as dead air or sand as would remain therein upon casting of the heating

plate 24 of molten metal while positioning a core of sand in the location of the insert 77. Thus, the core sand may or may not be removed subsequent to cooling of the casting, and an effective heat insulating insert will thus be provided at 77.

Although only a single form of the invention is shown and described in detail, it will be understood that various changes may be made therein without departing from the spirit of the invention and the scope of the appended claims.

I claim:

1. A substantially cylindrical tubular gas burner having a plurality of radially extending walls therein forming a plurality of sectoral mixing chambers, and gas inlet means at the bottom of each chamber, said burner having openings in its periphery providing an air admitting opening for entrainment of air with the gas passing upwardly in each of said chambers for ultimate combustion at the upper end of said burner.

2. An upright tubular gas burner having a plurality of radially extending walls therein forming a plurality of sectoral mixing chambers, and gas inlet means at the bottom of each chamber, said burner having openings in its tubular wall providing an air admitting opening for entrainment of air with the gas passing upwardly in each of said chambers for ultimate combustion at the upper end of said burner.

3. An elongate tubular gas burner having a plurality of radially extending walls therein extending lengthwise to form a plurality of sectoral mixing chambers extending through said burner, and gas inlet means at one end of each chamber, said tubular burner having openings providing an air admitting opening for entrainment of air with the gas passing through each of said chambers for ultimate combustion at the other end of said burner.

4. An elongate tubular gas burner having a plurality of radially extending walls therein extending lengthwise to form a plurality of sectoral mixing chambers extending through said burner, gas inlet means at one end of each chamber, said tubular burner having openings providing an air admitting opening for entrainment of air with the gas passing through each of said chambers for ultimate combustion at the other end of said burner, and valve means for opening any selected number of said gas inlet means whereby each operative mixing chamber operates at full capacity and maximum efficiency at all degrees of burner operation.

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