

F. P. SCHRODER.
GAS BURNER.
APPLICATION FILED JUNE 12, 1909.

1,012,453.

Patented Dec. 19, 1911.

3 SHEETS-SHEET 1.

Fig 1

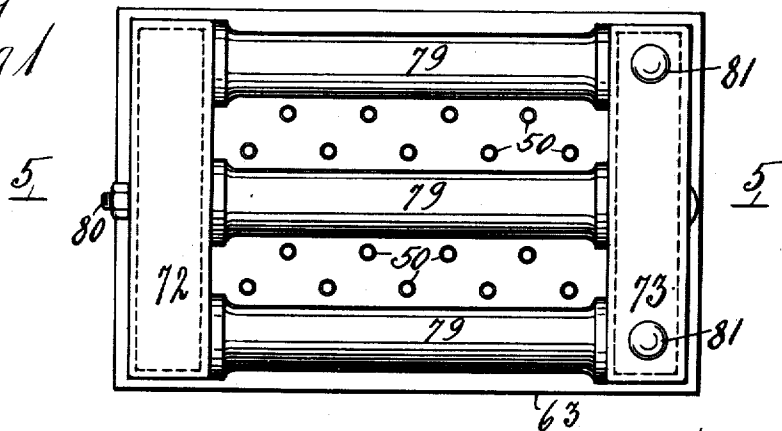


Fig 2

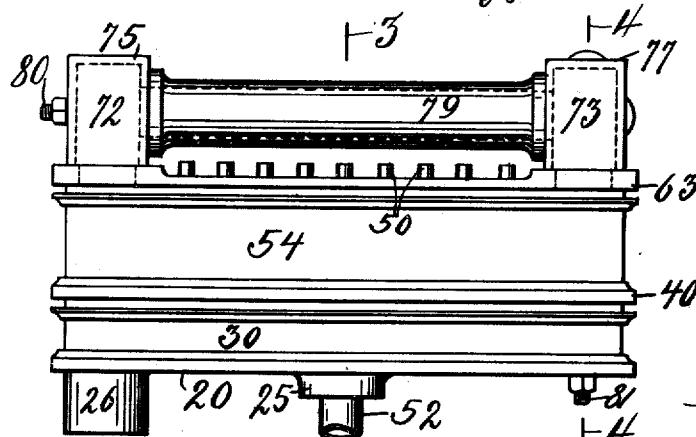


Fig 3

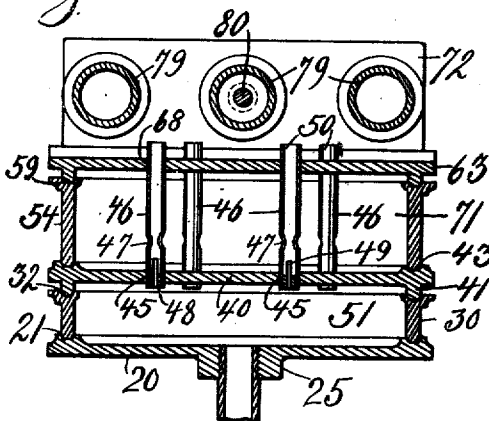
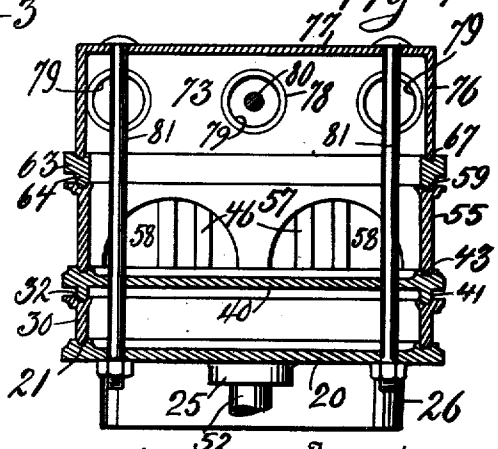


Fig 4



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3 SHEETS-SHEET 2.

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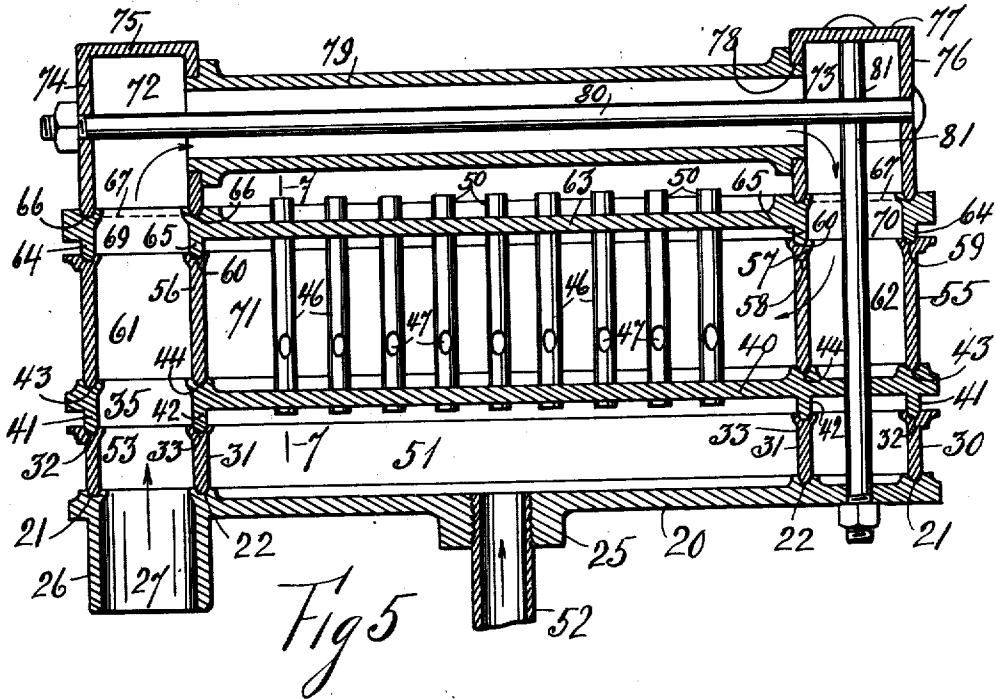
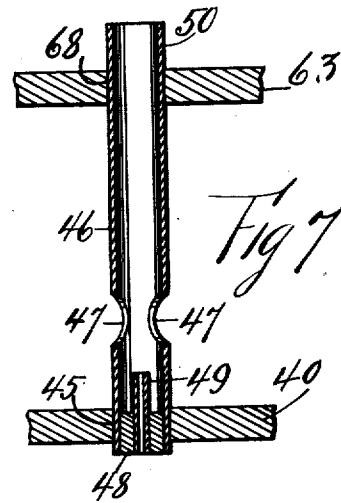
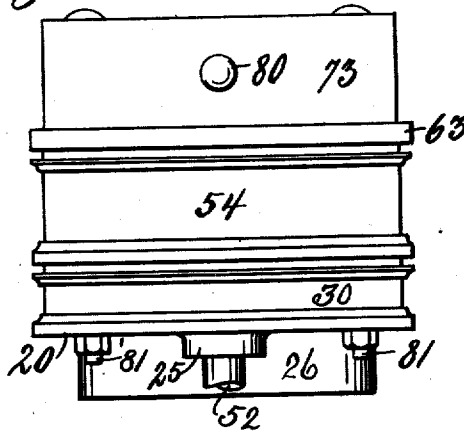


Fig 6



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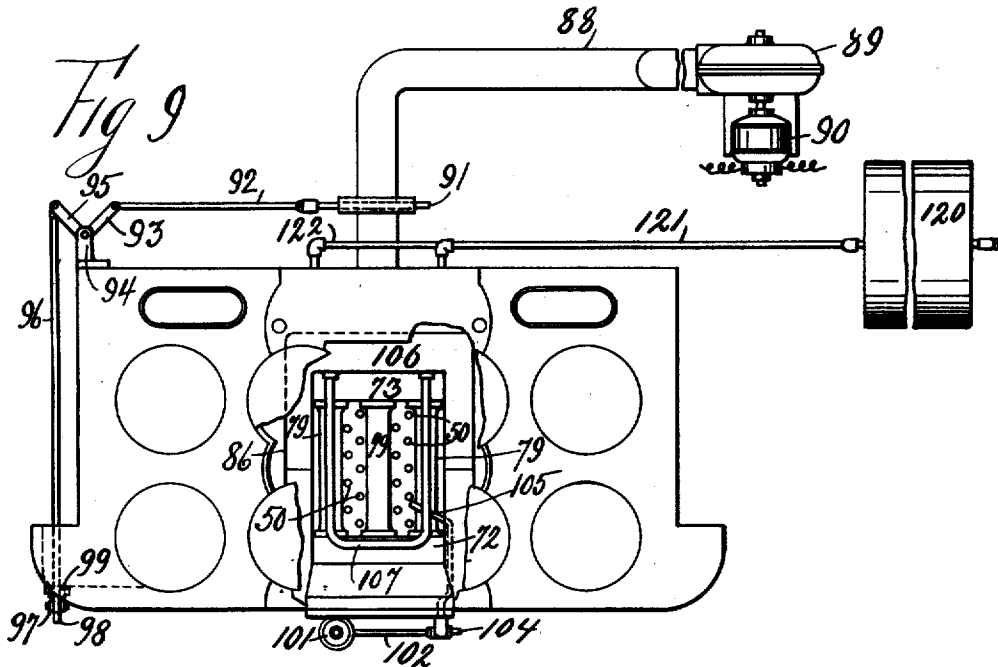
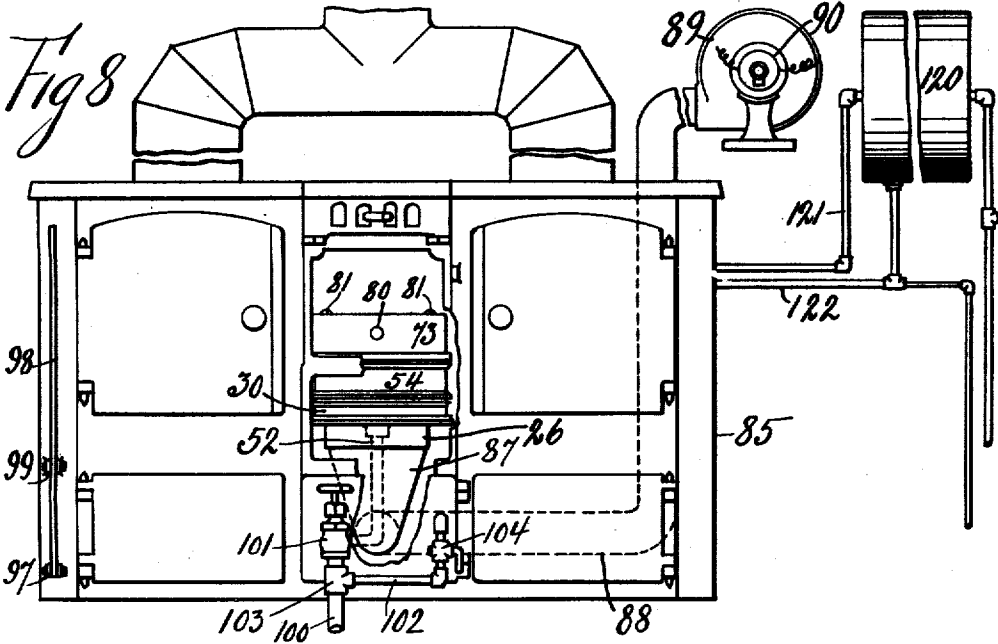
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3 SHEETS-SHEET 3.



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UNITED STATES PATENT OFFICE.

FRANK P. SCHRODER, OF JERSEY CITY, NEW JERSEY.

GAS-BURNER.

1,012,453.

Specification of Letters Patent.

Patented Dec. 19, 1911.

Application filed June 12, 1909. Serial No. 501,684.

To all whom it may concern:

Be it known that I, FRANK P. SCHRODER, a citizen of the United States, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Gas-Burners, of which the following is a specification.

This invention relates to a gas burner and its combination with a heating range. It is particularly adapted for use with illuminating gas, but may be used with any hydrocarbon.

In the accompanying drawings which exemplify the invention, Figure 1 represents a plan view of the burner, Fig. 2 shows a front elevation of Fig. 1, Fig. 3 is a section of Fig. 2 on the line 3, 3, Fig. 4 shows a section of Fig. 2 on the line 4, 4, Fig. 5 represents an enlarged section of Fig. 1 on the line 5, 5, Fig. 6 is a right hand side view of Fig. 2, Fig. 7 shows a partial enlarged section of Fig. 5 on the line 7, 7, Fig. 8 represents a front elevation of the invention applied to a range, and Fig. 9 is a top plan view of Fig. 8.

The burner as shown is made in detachable tiers or sections, which engage with each other and are bolted together, so that parts of the burner can be easily erected in place and replaced for repairs.

A bottom plate 20 has formed on its upper face the perimetrical groove 21, and the cross grooves 22 adjacent to the sides of said plate, joining with the groove 21 in the front and rear members thereof. A threaded boss 25 extends from the bottom face of said plate 20 at about the central portion thereof. An elongated flange 26 forms an inlet opening 27 at one end of said plate between one end member of the groove 21 and its accompanying cross groove 22. A frame section with the perimetrical wall 30 and cross walls 31 is located on the bottom plate 20, with the wall 30 in engagement with the groove 21 and the walls 31 in engagement with the grooves 22. The lower edges of the walls 30 and 31 are curved to nicely fit the grooves of the said plate 20. A perimetrical groove 32 is formed in the top face of the wall 30 and cross grooves 33 are formed in the top faces of the walls 31. A conduit 53 is formed between longitudinal members of the wall 30 and one of the cross walls 31.

A cover plate 40 has extending from its

lower face the perimetrical wall 41 curved on its lower face to engage the groove 32 and cross walls 42 curved at their lower surfaces engage the cross grooves 33. A perimetrical groove 43 is formed in the upper face of the cover plate 40 and cross groove 44 parallel to the ends of said cover plate are also formed therein. A conduit 53 is formed over the conduit 53 between one member of the wall 41 and its adjacent cross wall 42. Openings 45 are formed in the said cover plate for the burner tubes 46. Each of the burner tubes 46 has the opening 47 formed in the body thereof, and in its lower end is inserted an annular plug 48 with the gas conduit 49. The nozzle ends 50 of the burner tubes extend through the plate 63 of the air reservoir to be described. A gas chamber 51 is formed between the bottom plate 20, cover plate 40, the longitudinal members of the wall 30 and the cross walls 31. A gas inlet pipe 52 connects with the said chamber 51 through the threaded boss 25.

A central frame section 54 is located on the cover plate 40, and comprises the perimetrical wall 55 curved on its lower edge, which engages the groove 43 of the plate 40, and the cross walls 56, 57 which engage the grooves 44 of the said plate 40. In the cross wall 57 are formed openings 58. A perimetrical groove 59 is formed in the top face of the said central frame section and cross grooves 60 are also formed in said face. A conduit 61 is formed with three members of the wall 55 and the cross wall 56, and an air duct 62 is formed with three members of the wall 55 and the cross wall 57. A roof plate 63 is located on the central frame section and has extending from its lower face the perimetrical wall 64 and the cross walls 65. The wall 64 engages the groove 59 and the cross walls 65 engage the cross grooves 60. Cross grooves 66 joined with the short longitudinal grooves 67 are formed at the ends of the upper face of the roof plate 63. Openings 68 are formed in the roof plate 63 for the burner tubes 46. Conduits 69 and 70 are formed in the roof plate 63. An air reservoir 71 is formed between the cover plate 40, roof plate 63, cross walls 56, 57 and the front and rear members of the wall 55.

End top chambers 72 and 73 are located at the ends of the upper face of the roof plate 63. The chamber 72 comprises the

perimetrical wall 74 with the roof 75, and the chamber 73 comprises the perimetrical wall 76 with the roof 77. The lower edges of the walls 74 and 76 engage the grooves 66, 67 of the roof plate 63. Openings 78 are formed in the walls of the chambers 72 and 73 and which support heating tubes 79. A bolt 80 extends between the outer end faces of the walls 74, 76 of the chambers 72 and 73, passing through one of the said heating tubes 79, and bolts 81 extend from the roof 77 of the chamber 73 to and through the bottom plate 20. The bolts 80 and 81 hold the members of the burner together, cement being interposed at the joints of members when the burner is located in place for use.

The opening 27 of the bottom plate 20, conduit 53, conduit 35, conduit 61, conduit 69 and top chamber 72 constitute a continuous air duct to the heating tubes 79. Also the top chamber 73, conduit 70, conduit 62 and openings 58 constitute a continuous air duct to the air reservoir 71.

Referring to Figs. 8 and 9, the invention to show its application is represented with a range 85, the burner being located and cemented in the fire pot 86 thereof as shown, taking the place of the ordinary grate with its fuel. The elongated flange 26 of the burner has connected thereto the tapering duct 87 which latter is connected with the discharge pipe 88 of a blower 89. The latter is driven in the present instance by means of an electric motor 90. In the pipe 88 is located the cut off valve 91, which is pinned to one end of the rod 92, the other end of which latter is pinned to one of the arms 93 of a bell crank. The said bell crank is pivoted on a bracket 94 extending from said range 85. The other arm 95 of said bell crank is pinned to the connecting rod 96 having a forked end 97. An operating lever 98 is pinned to a bracket 99 extending from the said range, and the lower end of said operating lever is pinned to the forked end 97 of the said connecting rod 96. A gas supply pipe 100 is shown with the gas supply valve 101 and from the latter extends the pipe 52 which leads to the burner as already described. A pipe 102 leads from a T 103 in the pipe 100, and has connected thereto a stop cock 104 from which latter extends a pipe 105 for a pilot light. In the fire pot 86 is shown a water back 106 having extending therefrom the U shaped heating and circulating pipe 107. A hot water boiler 120 is connected to the water-back 106 by means of the piping 121 and 122.

To use the invention the operator lights the pilot light by opening the stop cock 104 and then the electric motor 90 is started. Next the gas valve 101 is opened to admit gas to the burner, and directly thereafter the cut off valve 91 is opened by means of the lever 98 for the admission of air with

said gas. The gas which is delivered to the burner from the pipe 52 first enters the gas chamber 51, is led through the gas conduits 49 of the burner tubes 46 travels up the latter and is ignited at the nozzle end 50 of the said burner tubes. While the gas is thus traveling up the tubes, the air with a predetermined pressure is led from the pipe 88 to and through the opening 27, conduits 53, 35, 61, 69, chamber 72, heating tubes 79 in which latter the said air is heated by the flames of the burner tubes 46. From the heating tubes 79 the air enters the chamber 73, conduits 70, 62 and from thence through the openings 58 in the cross wall 57 and into the air reservoir 71. The air from the latter enters the openings 47 of the burner tubes 46 to mix with the gas in the latter and produce blue flames at the nozzle ends 50 of said burner tubes.

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

1. The combination in a burner of detachable sections, means to clamp the sections together, a gas chamber formed with the sections, an air reservoir above the gas chamber, air ducts on the sides of the air chamber, one of said ducts leading into said air reservoir, heating tubes interposed between said ducts and gas burners and having openings in their sides, said tubes extending from the gas chamber up through said air reservoir.

2. In a burner the combination of a gas chamber, a gas inlet pipe connecting with said chamber, an air reservoir adjacent to the gas chamber, air ducts connecting with the air reservoir, air heating tubes interposed between said air ducts to conduct air from the first duct through the heating tubes to the second duct, then into the air reservoir, burner tubes having openings in the sides thereof extending through the air reservoir with their lower ends extending into the gas chamber and their nozzle ends adjacent to the air heating tubes to heat the air in the latter on its way to the burner tubes.

3. In a burner the combination of a gas chamber, an air reservoir above the gas chamber, air ducts on the sides of the air chamber, one of said ducts leading into said air reservoir, a chamber capping each of said ducts, a heating tube connecting the chambers capping the ducts and gas burners having openings in their sides, extending from the gas chamber up through the said air reservoir.

4. In a burner the combination of a bottom plate, a gas supply connected with the plate, an elongated flange forming an opening for air extending from one end of said plate, a frame on said bottom plate, a perimetrical wall for said frame and a pair of

cross walls connecting the longitudinal members of said wall, a conduit formed with the longitudinal members of said wall and one of said cross walls the conduit located over
5 the opening in the bottom plate, a cover plate over said frame, a conduit in said cover plate over the conduit of said frame, a central frame over the cover plate, a perimetrical wall for the central frame, cross walls connecting the longitudinal members of the wall
10 of the central frame and one of the latter walls having openings, conduits formed with the walls of the central frame with one of them over the conduit of the cover plate, a
15 roof plate over the central frame, a conduit

formed at each end of the roof plate and over the conduits of the central frame, a chamber over each conduit of the roof plate, heating tubes connecting the chambers, a bolt connecting the chambers and passing
20 through one of the heating tubes, and bolts connecting one of the chambers and the bottom plate.

Signed at Jersey City in the county of Hudson and State of New Jersey this 9th
25 day of June A. D. 1909.

FRANK P. SCHRODER.

Witnesses:

JEROME FISCHER,
H. T. NUGENT.