G. A. BRONDER.

GAS HEATER.

APPLICATION FILED DEC. 29, 1909.

1,149,334.

Patented Aug. 10, 1915.

4 SHEETS—SHEET 1.

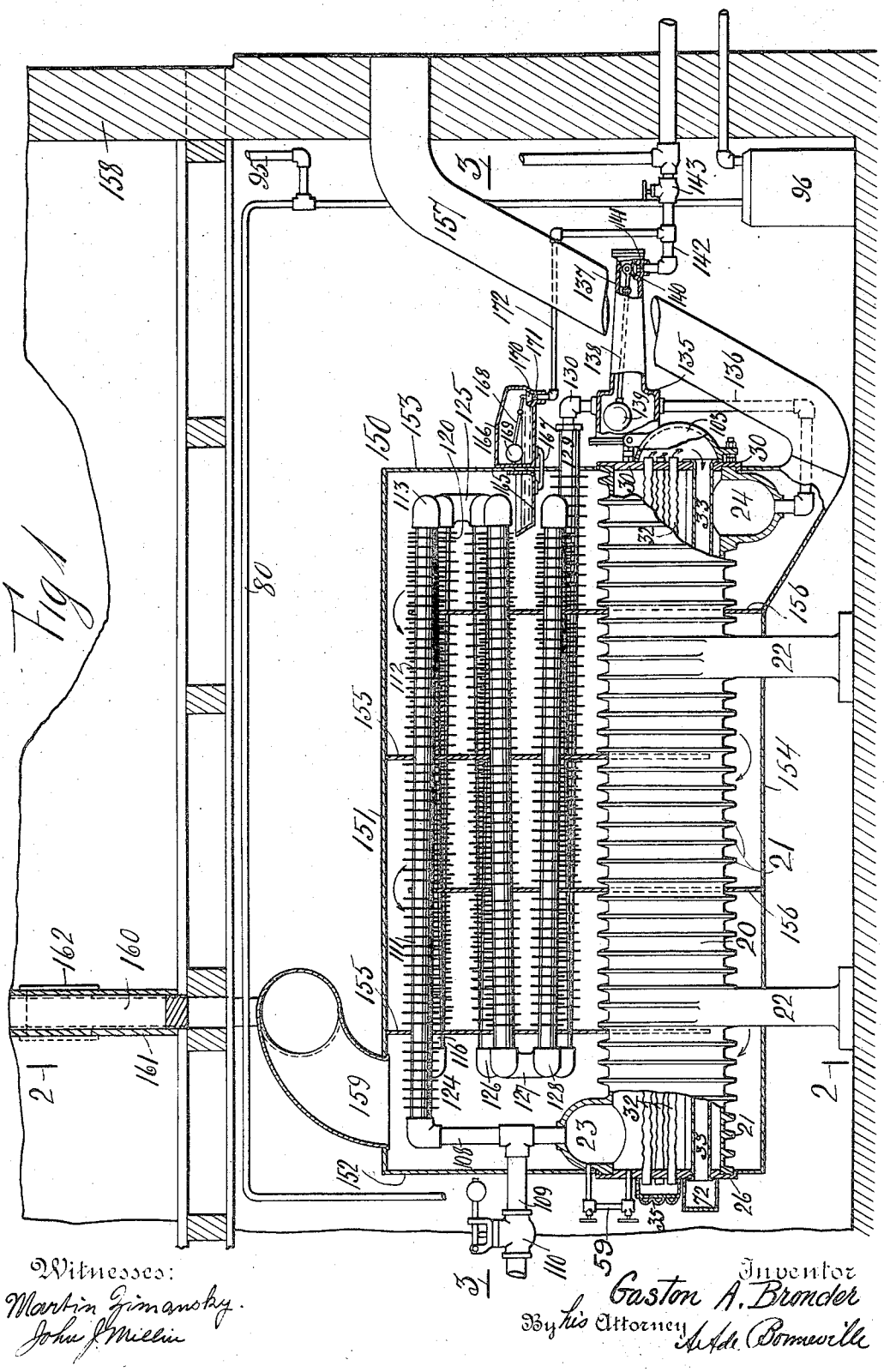


Fig 1

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GAS HEATER.

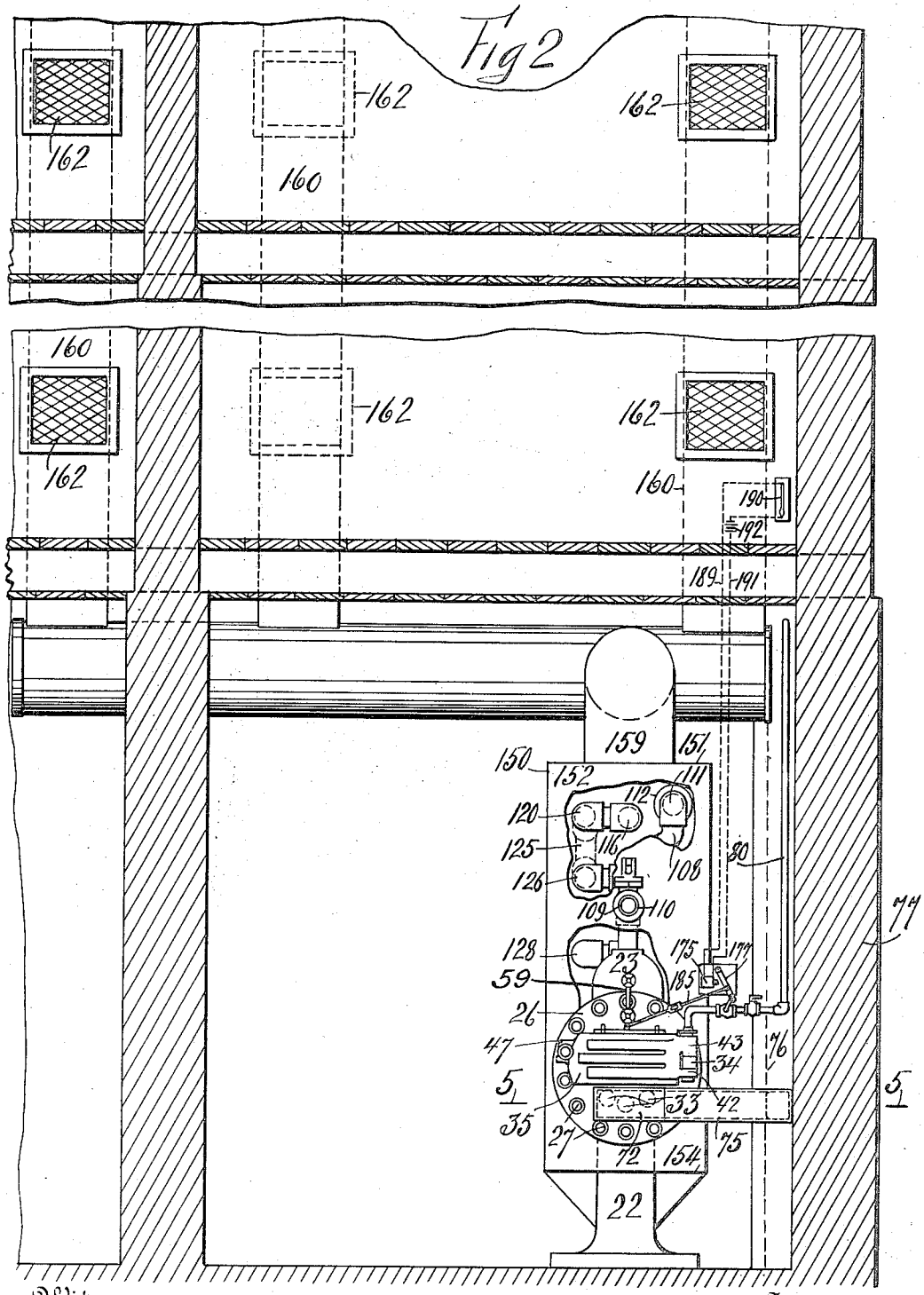
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4 SHEETS—SHEET 2.

Fig 2



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4 SHEETS—SHEET 3.

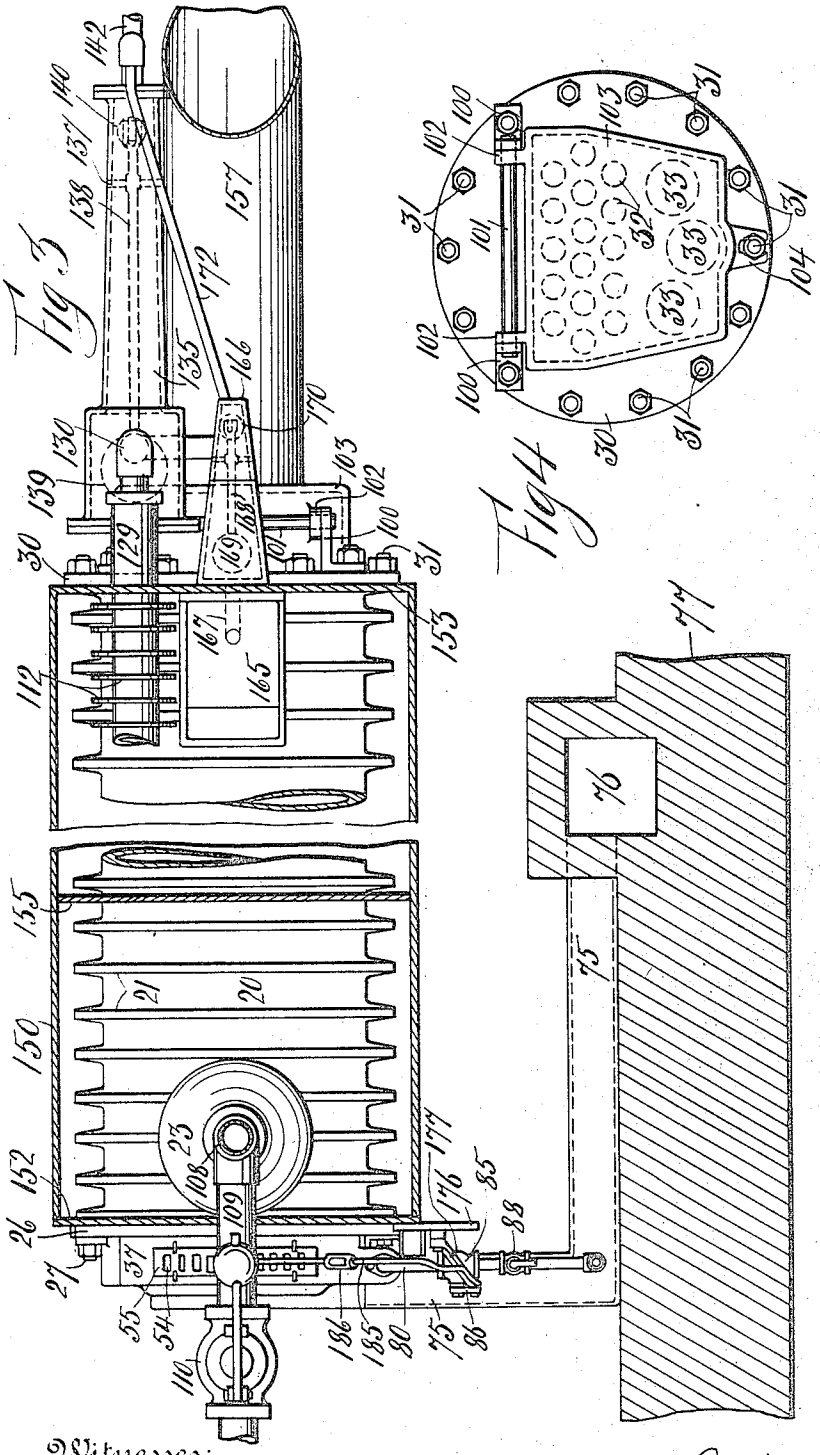


Fig 3

Fig 4

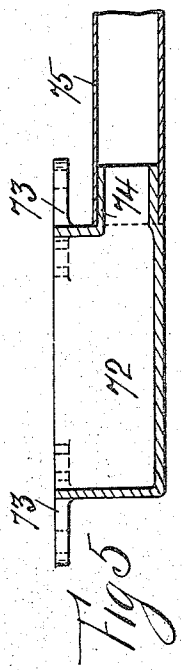


Fig 5

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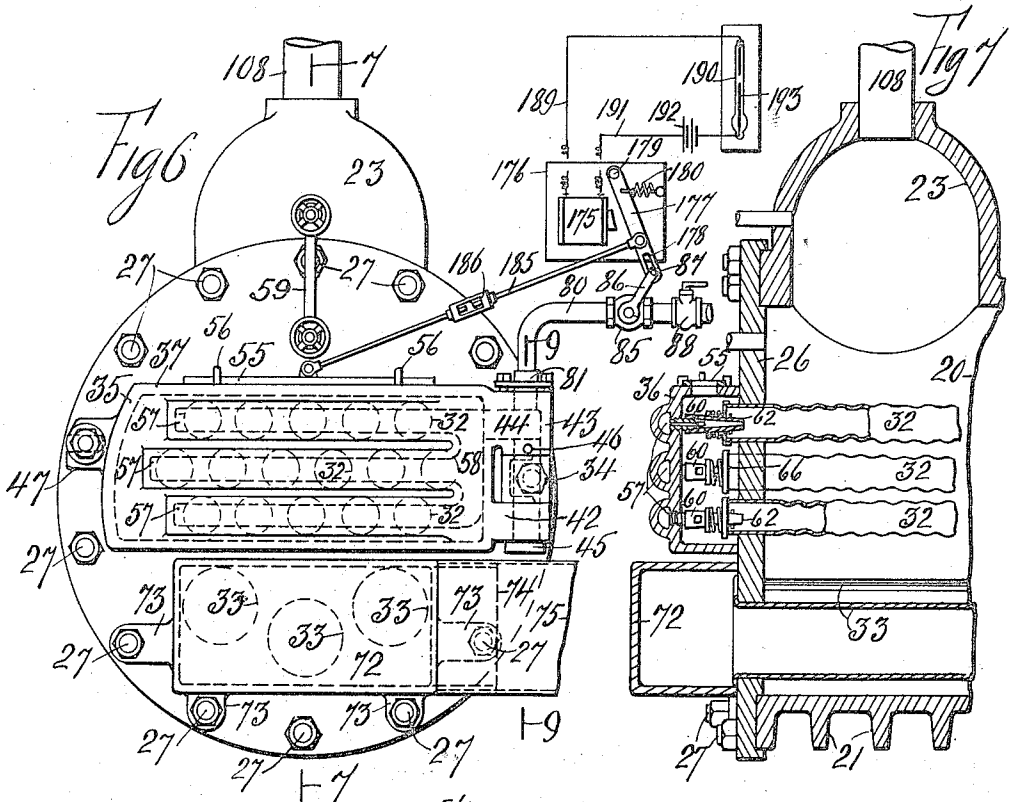
GAS HEATER.

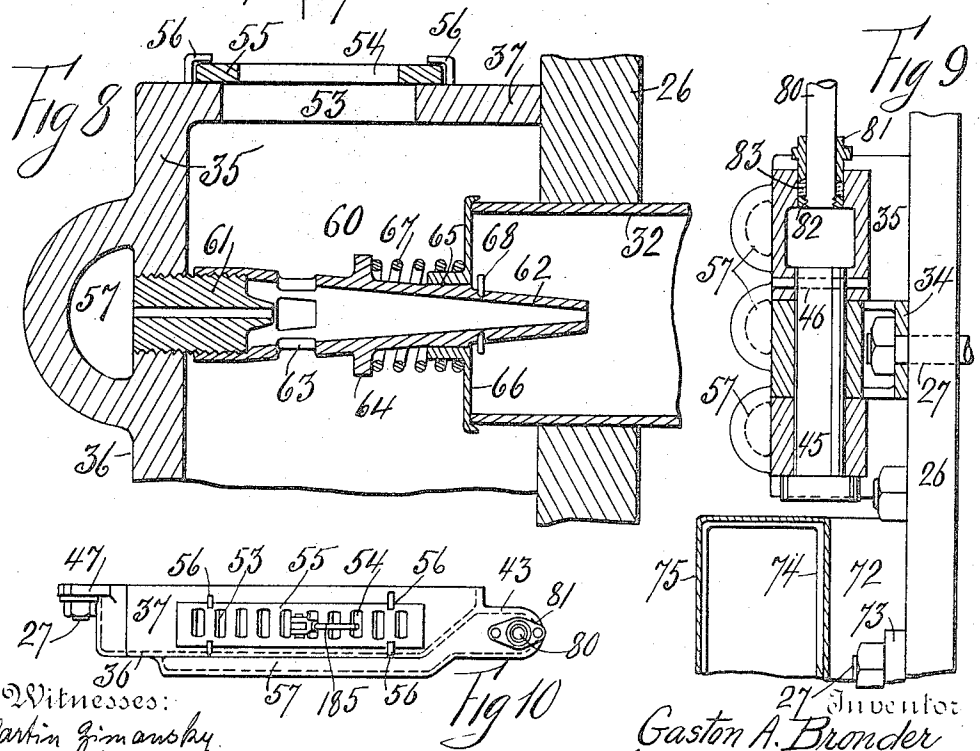
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4 SHEETS—SHEET 4.





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UNITED STATES PATENT OFFICE.

GASTON A. BRONDER, OF BROOKLYN, NEW YORK.

GAS-HEATER.

1,149,334. Specification of Letters Patent. Patented Aug. 10, 1915.

Application filed December 29, 1909. Serial No. 535,434.

To all whom it may concern:

Be it known that I, GASTON A. BRONDER, a citizen of the United States, and a resident of the borough of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Gas-Heaters, of which the following is a specification.

This invention relates to a gas heater particularly adapted to indirect heating.

Its object is the production of a heater which by reason of radiating flanges extending from a drum, and radiating coils thereof, produces an apparatus of large heating capacity, that can be inclosed within a casing of comparative small dimensions.

The accompanying drawings exemplify the invention as adapted for domestic purposes in a building, and it is evident that it can be used for a variety of buildings or situations.

The heater is further characterized by means of a thermostat that automatically controls a damper and the supply of gas to the heater.

Figure 1 represents a partial section of the invention with the installation required for applying it to a building, Fig. 2 shows a left hand end view and partial section of Fig. 1 on the line 2, 2, Fig. 3 shows an enlarged partial section as on the line 3, 3, of Fig. 1, Fig. 4 is a partial right hand end view of the drum shown in Fig. 3, Fig. 5 represents an enlarged section of Fig. 2 on the line 5, 5, Fig. 6 shows an enlarged view of the front head of the heater with its appurtenances, Fig. 7 is a section of Fig. 6 on the line 7, 7, Fig. 8 is an enlarged portion of Fig. 7 showing particularly the front head of the heater with its furnace door and a burner, Fig. 9 represents an enlarged section of Fig. 6 on the line 9, 9, and Fig. 10 is a top plan view of the furnace door shown in Fig. 6.

The heater is represented to consist of the drum 20 having the encircling radiating flanges 21 and feet 22. A steam dome 23 extends from the upper portion of said drum adjacent to its front end, and a water inlet box 24 extends from the lower portion of said drum adjacent to its rear end. A front head 26 is secured to one end of the drum 20 by means of the bolts 27, and a rear head 30 is secured to said drum by means of the bolts 31. A plurality of corrugated heating tubes 32 extend through the upper portion of said drum with their open ends extending through and secured to the said front and rear heads. Return flues 33 extend through the drum below the heating tubes 32 with their open ends also secured in the heads 26 and 30. To the front head 26 is fastened a hinge lug 34 by means of one of the said bolts 27. A box shaped burner holder 35 with the front wall 36 and upper wall 37, has extending therefrom the lugs 42, 43, the latter having a cavity 44. The lugs 42 and 43 are joined with the hinge lug 34 by means of the hinge pin 45, which is held in place by means of the cotter pin 46. The said holder 35 has extending from its swinging end a bifurcated ear 47 which straddles one of the bolts 27, the nut on the latter bolt maintaining the holder in place. In the upper wall 37 of said holder 35 are formed openings 53 that register with openings 54 of a damper slide 55, that is guided between the lugs 56 extending from said upper wall 37. With the outer surface 36 of the wall of the holder 35 are formed three horizontal channels 57, that are connected by a vertical channel 58 which leads to the cavity 44. A water gage glass 59 is connected up between the head 26 and the dome 23. Burners 60 are connected up with the holder 35 and comprise the nipples 61, which extend from the inner face of the said holder 35 opposite the three horizontal channels 57. A tapering nozzle 62 is supported on each one of the nipples 61, and has formed therewith the air inlets 63 and the flange 64 on the outer surface thereof. A cylindrical bearing surface 65 on each nozzle 62 supports a sliding cap 66, which bears against its accompanying corrugated heating tube when the holder is in its closed position. A spring 67 bears between the flange 64 and the sliding cap 66, and stop pins 68 extend from the nozzle 62 to limit the movement of the said sliding cap 66 when the furnace door 35 is open.

On the lower portion of the front head 26 and opposite the ends of the return flues 33 is located a cap 72, having the ears 73 which are engaged by four of the bolts 27 to clamp the cap in place. A nozzle 74 extends from one end of the said cap. A discharge duct 75 connects the nozzle 74 with the chimney 76 in the wall 77 of the building.

Gas piping 80 with an axis adjacent to the lugs 42, 43 and in line with the vertical axes of said lugs leads to the cavity 44 of the

lug 43 through the stuffing box having the gland 81. A washer 82 on the end of the pipe 80 with the said gland 81 secures the packing 83 in place and prevents leakage between the said piping 80 and said cavity 44. An automatic throttle valve 85 is located in the pipe 80 and has extending from its plug the arm 86 with the pin 87. A stop valve 88 is connected up with the piping 80 and it has branch piping 95 that leads to various parts of the building in which the apparatus is located and extends from the gas meter 96. To the rear head 30 are fastened a pair of angle iron lugs 100 which support a hinge pin 101. The latter supports the lugs 102 of the rear box shaped furnace door 103. A bifurcated ear 104 straddles one of the bolts 31 to clamp said door 30 securely in place. The rear ends of the heating tubes 32 and return flues 33 lead to the interior of the said door 103. From the steam dome 23 extends the steam pipe 108 with the branch pipe 109 having connected therewith the safety valve 110. From the steam pipe 108 extends a longitudinal pipe 111 having a slight declination and the radiating flanges 112. An elbow 113 at one end of the pipe supports a nipple and a second elbow not shown from which latter extends a second pipe 116 that declines in a direction opposite to that of the pipe 111. A third flanged pipe 120 is similarly connected to the said second pipe 116 and declines in a direction parallel to the pipe 111. The three pipes 111, 116 and 120, constitute a flanged radiating coil 124. Drop piping 125 connects the said coil with a second similar radiating coil 126. Drop piping 127 connects the second radiating coil 126 with a third radiating coil 128. The lower pipe 129 of the last radiating coil 128 leads to the piping 130, that connects with the shell of a float box 135. Piping 136 connects the lower end of the float box 135 with the water inlet box 24. A hinge pin 137 in the float box 135 supports the float arm 138, which carries at one end the ball or float 139. A water inlet valve 140 is pinned to the other end of the float arm 138 and coacts with the port 141 in the lower wall of the shell of the float box 135. Water inlet piping 142 leads to the port 141 and has connected thereto the stop cock 143. A casing 150 with the roof 151, front wall 152, rear wall 153 and bottom wall 154 incloses the drum 20 and the radiating coils 124, 126 and 128 and their immediate appurtenances. Partitions 155 extend from the roof 151 of the said casing to within a short distance from the bottom wall 154 thereof. The said partitions encircle the radiating coils 124, 126 and 128 and partially encircle the drum 20. Partitions 156 extend from the bottom wall 154 to within a short distance of the roof 151. The latter partitions encircle the drum 20 and encircle the radiating coils 124, 126 and 128. A cold air inlet duct 157 extends from an opening in the rear wall 158 of the building to the lower rear portion of the casing 150. An outlet duct 159 extends from the front end of the roof 151 of the casing 150, to hot air outlet ducts 160 located in the partitions 161 of the building and which have connected thereto the registers 162. An evaporating pan 165 is fastened to the inner face of the rear wall 153, and to the outer face of said wall is fastened the float box 166. A pipe 167 connects the pan 165 with the said float box 166. In the float box 166 is pivoted the float arm 168, and has attached at one end thereof the float 169 and at the other end the inlet valve 170. The latter operates over a port 171 that connects with the branch piping 172 that leads from the piping 142. A magnet 175 with its base board 176 is located adjacent to the valve 85. An armature lever 177 with an elongated opening 178 at one end thereof, is pivoted to the said base board 176 by means of the pin 179, and the pin 87 of the arm 86 is engaged by said opening 178. A spring 180 has one end fastened to the lever 177 and the other end to the base board 176. A link 185 with the turn buckle 186 has one end thereof pinned to the lever 177 and the other end thereof is pinned to the damper slide 55. A wire 189 extends from one pole of the magnet 175 to and enters the upper end of the thermostat 190. A second wire 191 connects the magnet with the column of mercury 193 in said thermostat, and has the battery 192.

In using the invention the drum 20 is automatically fed with the required amount of water from the piping 142. The amount of water entering the drum is controlled by the water inlet valve 140 and its appurtenances in the usual way. Then the gas cock 88 is turned on and the furnace door 35 is opened to light the burners 60 extending therefrom. Then the said door 35 is closed and the heater starts its operations, the water level being controlled by means of the valve 140 with its float 139. The water of condensation in the radiating coils 124, 126 and 128 gravitates to the float box 135, and then enters the piping 136, from which it is led to the water inlet box 24. From the latter the water of condensation enters the drum 20 and surrounds the return flues 33 before coming in contact with corrugated heating tubes 32. The water admitted through the port 141 of the inlet valve 140 enters the float box 135, then enters piping 136 and mixes with the water of condensation. The water of condensation and the water admitted by the valve 140 both coming in contact with the return flues 33, before coming in contact with the tubes 32 are both

preheated before reaching the latter tubes. The volume of gas is controlled by the throttle valve 85, which latter is automatically controlled by the thermostat 190, that is located in one of the rooms of the building. When the temperature in said room rises above a predetermined point, the column of mercury 193 makes contact with the end of the wire 189 and closes the electric circuit of the magnet 175. The armature lever 177 is thereby drawn to the core of the magnet 175 which partially closes the throttle valve 85 and also the damper slide 55 located on the upper wall 37 of the furnace door 35. Should the temperature fall below the desired point the column of mercury 193 separates from the end of the wire 189 which breaks the electric circuit of the magnet 175, by reason of which the spring 180 pulls the armature lever 177 from the core of the magnet which increases the opening through the throttle valve 85, and also the amount of opening between the openings 54 of the damper slide and the openings 53 in the upper wall 37 of the furnace door 35.

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

1. In a gas heater the combination of heating tubes, a burner holder for the heater, burners extending from said holder into said heating tubes and a sliding cap connecting each burner and its accompanying heating tube when said holder is located in operative position.

2. In a heater of the character described the combination of heating tubes, a burner holder for the heater having channels formed therewith, burners for the holder coacting with the channels therein, each burner normally extending into one of said heating tubes, a sliding cap with each burner on a bearing surface thereof and normally bearing against the accompanying edge of its accompanying heating tube, and flexible means to maintain said cap in its normal position when said holder is located in its normal position.

3. In a heater of the character described the combination of a drum, heads for the drum, heating tubes connecting said heads, a hinge lug extending from one of said heads, a burner holder hinged with said hinge lug and having a cavity, means to conduct a fuel to said cavity, channels in said holder connecting with said cavity and burners extending from said holder coacting with said channels.

4. In a heater of the character described the combination of a drum, a front and a rear head for the drum, heating tubes connecting and extending through said heads, a door for the rear head over the ends of the tubes extending through said rear head, a burner holder hinged to the front head, piping for fuel with its longitudinal axis coincident with the hinged portion of the burner holder, channels in the burner holder coacting with said piping and a damper slide for openings in said holder, said openings coacting with said channels.

5. In a heater of the character described the combination of heating tubes, a burner holder for the heater having channels formed therewith, burners connected with the said holder, each burner comprising a nipple in threaded engagement with the holder and coacting with one of said channels in the holder, a nozzle with air inlets, flange and bearing surface connected to each nipple, a sliding cap supported on the said bearing surface, a spring interposed between the flange on the nozzle and said sliding cap and a stop pin on the nozzle coacting with said cap.

Signed at the borough of Manhattan in the county of New York and State of New York this 20th day of December A. D. 1909.

GASTON A. BRONDER.

Witnesses:

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MARTIN ZIMANSKY.