July 11, 1961 L. J. MITTER 2,991,990

DOMESTIC APPLIANCE

Original Filed July 10, 1957 3 Sheets-Sheet 1

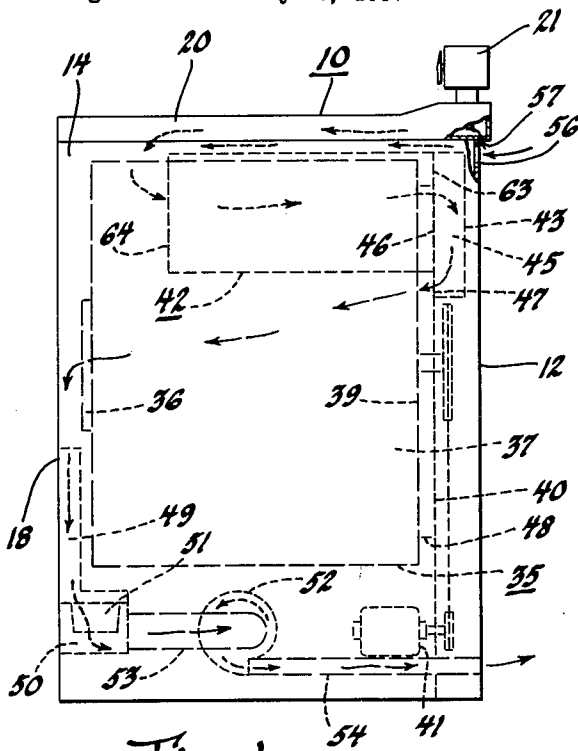


Fig. 1

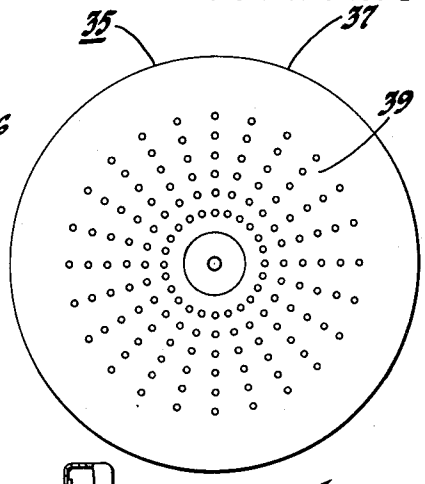


Fig. 7

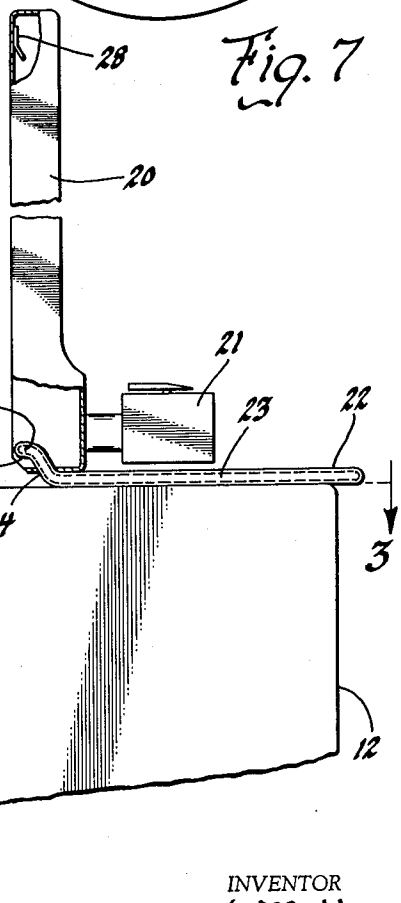


Fig. 2

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DOMESTIC APPLIANCE

Original Filed July 10, 1957 3 Sheets-Sheet 2

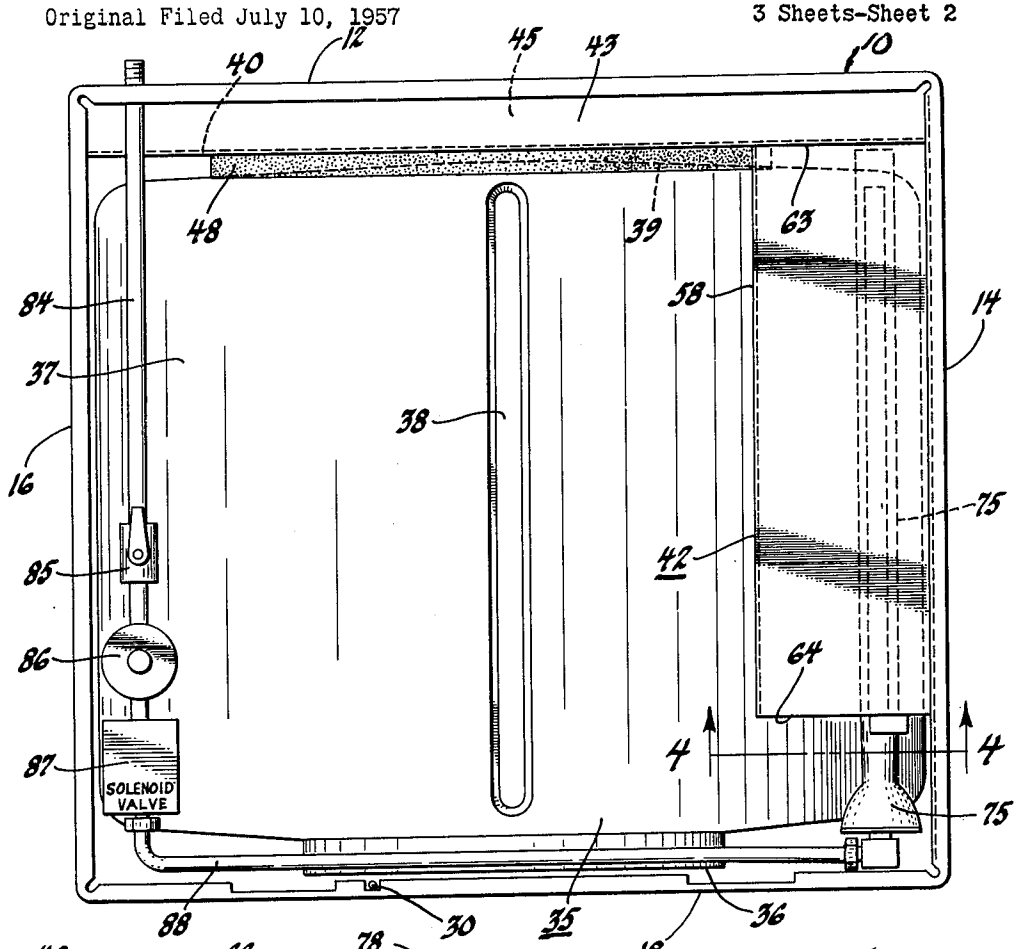


Fig. 3

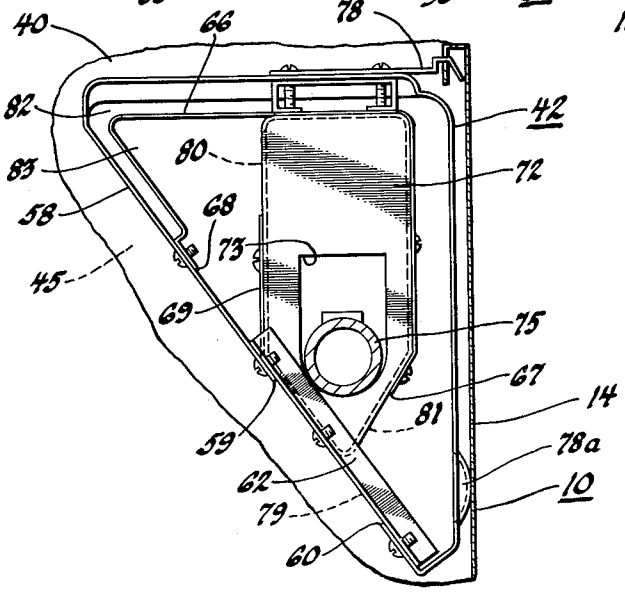


Fig. 4

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DOMESTIC APPLIANCE

Original Filed July 10, 1957 3 Sheets-Sheet 3

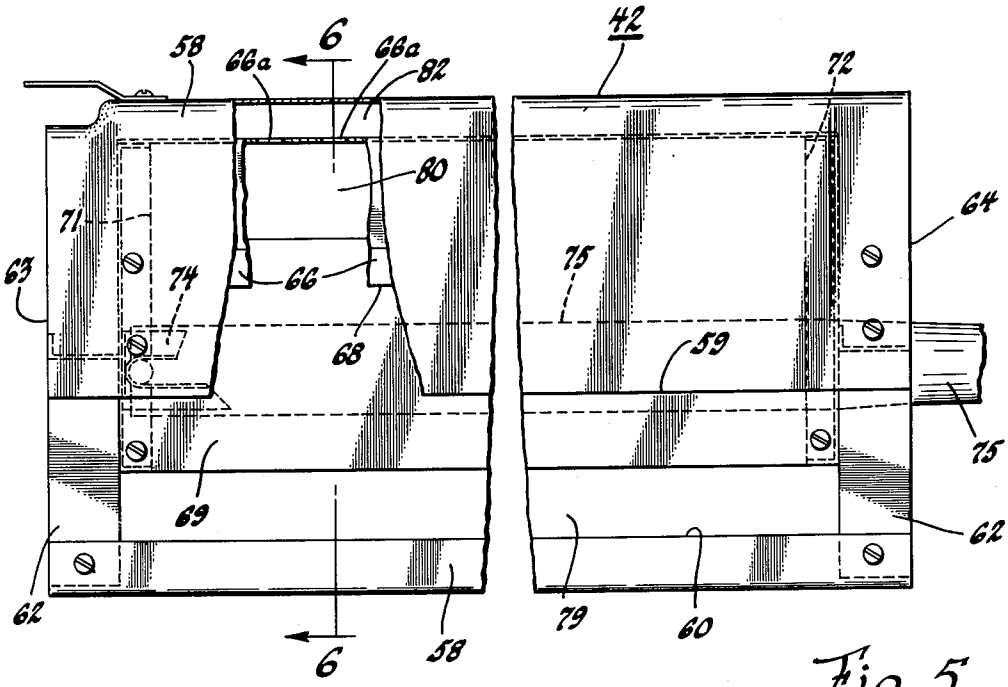


Fig. 5

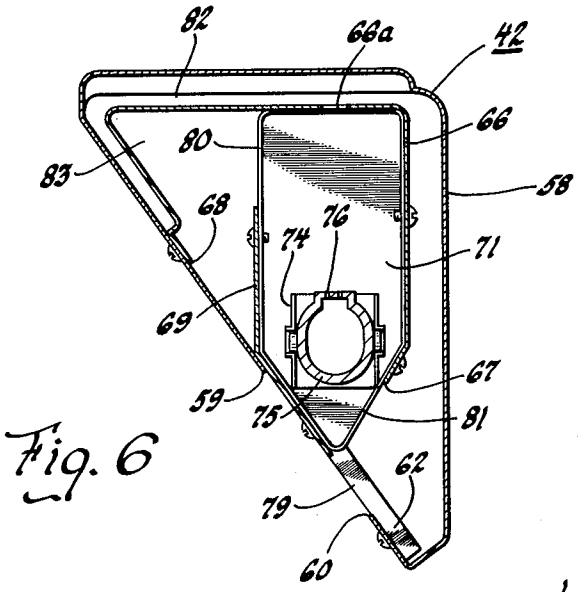


Fig. 6

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2,991,990

DOMESTIC APPLIANCE

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Original application July 10, 1957, Ser. No. 671,041, now Patent No. 2,931,687, dated Apr. 5, 1960. Divided and this application Oct. 12, 1959, Ser. No. 845,878

3 Claims. (Cl. 263—33)

This invention relates to a domestic appliance and more particularly to a clothes dryer.

This is a divisional application of my copending application Serial No. 671,041, filed July 10, 1957, now Patent No. 2,931,687.

An object of the invention is to provide a clothes dryer having a rotatable tumbling drum formed with a rear perforated wall with gas heating apparatus for supplying heated air to the tumbling drum, the gas heating apparatus including a combustion chamber that extends lengthwise of the clothes dryer and which supplies heated air to an air manifold located adjacent the rear perforated wall of the tumbling drum which, in turn, supplies heated air to the interior of the tumbling drum through the rear perforated wall thereof.

Still another object of this invention is to provide a clothes dryer including a rotatable tumbling drum with a gas-fired combustion chamber for supplying heated air to the drum, the combustion chamber having an outer housing and an air directing member disposed therein which partially encloses a gas burner, the housing and air directing member being spaced apart to form an air flow passage that is located between the gas burner and the outer housing.

A further object of this invention is to provide a clothes dryer including a cabinet with a top cover member that may be pivoted to a position wherein the top end of the cabinet is open for access to the interior of the cabinet.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

FIGURE 1 is a diagrammatic side view of a clothes dryer made in accordance with this invention;

FIGURE 2 is a side view of the clothes dryer of this invention showing the structure for slidably and pivotally supporting the top cover member of the colthes dryer;

FIGURE 3 is a top view of the clothes dryer of this invention with the top cover member removed, taken along the line 3—3 of FIGURE 2;

FIGURE 4 is a vertical sectional view taken along line 4—4 of FIGURE 3;

FIGURE 5 is a side view, with parts broken away, of the gas heating apparatus of this invention;

FIGURE 6 is a sectional view taken along line 6—6 of FIGURE 5; and

FIGURE 7 is a plan view of the rear perforated wall of the clothes dryer tumbling drum.

Referring now to the drawings and more particularly to FIGS. 1 and 3, the clothes dryer of this invention includes a cabinet generally designated by reference numeral 10. The cabinet is formed by a rear wall 12, sidewalls 14 and 16, and by a front wall 18. The upper open end of the cabinet is covered by a top cover or panel member 20. The top cover or panel member 20 is slidably and rotatably supported by the cabinet of the clothes dryer in order that the cover member may be pivoted to a substantially vertical position, as shown in FIG. 2. To this end a pair of channel-shaped track members 22 are

respectively secured to opposite sidewalls of the cabinet 10. Each track member has a substantially horizontally extending portion 23, and an upwardly extending portion 24 that merges into a relatively short horizontally extending portion 25. The top panel member 20 is provided with lug members 26 that are secured to the panel and which slide in tracks 22. The panel 20 has a keeper slot 28 that cooperates with a spring-biased bolt 30 to hold the panel 20 in a fixed position when the top panel is resting on the dryer cabinet. The bolt 30 normally projects into the keeper slot 28 to prevent sliding movement of the top panel 20 relative to the cabinet 10. When it is desired to pivot the panel 20 to the position shown in FIG. 2, the bolt 30 is grasped at 32 and pulled downwardly against the spring-bias of spring 34 to release the top panel member 30 for sliding movement. The panel 20 may then be slid forwardly with the lug members 26 riding in the tracks 22. When the lug members ride up onto the horizontal portions 25 of tracks 22, the panel 20 may be pivoted to the vertical position, thus providing complete access to the interior of the cabinet 10. In this way the control housing 21 for the dryer, which is attached to the top panel 20, does not interfere with pivoting of the top panel to a vertical position. With the pivotal and slidable arrangement for the panel 20, the dryer may be placed in a room with the rear wall of the dryer flush with the rear wall of the room, without the room rear wall interfering with the movement of the panel to the vertical position shown in FIG. 2.

The clothes dryer of this invention includes a cylindrical tumbling drum generally designated by reference numeral 35. The tumbling drum has a front access opening 36, an imperforate peripheral wall 37 formed with tumbling vanes 38, and a rear perforated wall 39, as more particularly shown in FIG. 7. The tumbling drum is supported for rotation by a vertically extending bulkhead 40 that extends entirely across the dryer parallel to but spaced from the rear wall 12 of the dryer. The tumbling drum is preferably driven by an electric motor 41 through suitable pulley-and-belt mechanism, as shown.

The tumbling drum is supplied with heated drying air by a gas-fired heating device generally designated by reference numeral 42. This heating device is located in the upper right corner of the dryer cabinet and extends axially of the cabinet, as is evident from the drawings. The heating device supplies air to a transversely extending sheet metal manifold member 43 that is secured to bulkhead 40. The sheet metal manifold member 43 and bulkhead 40 form a chamber 45. The bulkhead 40 has an opening at 46 which is of a shape conforming to the cross-sectional shape of heating device 42 and which provides for communication between the heating device 42 and the chamber 45. The bulkhead 40 has a second transversely extending opening at 47 to provide for communication between the chamber 45 and the space between the rear wall 39 of the tumbling drum and the bulkhead 40. This space is sealed off by a felt seal 48 which circumscribes the perforated area of the rear wall 39 of the tumbling drum and which is secured to bulkhead 40.

The front end of the tumbling drum is supported by a ring member (not shown), which is of the type shown and described in copending application Ser. No. 595,437, filed July 2, 1956, now Patent 2,843,945. The dryer is also preferably provided with a door (not shown) that directs air from the access opening 36 of the tumbling drum into a vertically extending duct 49. This air directing arrangement is preferably like that shown in the above-mentioned copending application. The vertically extending duct 49 is connected with an air-box 50 that contains a lint filter element 51. The air-box 50 is connected with a blower 52 by a conduit 53. The blower may be driven by an electric motor 41 or may

be driven by a separate electric motor. The outlet of blower 52 is connected to the exterior of the dryer cabinet by a conduit 54 that extends through bulkhead 40 and rear cabinet wall 12. Inlet air is supplied to the heating device 42 by openings 56 and 57 formed respectively in the rear wall 12 and in the top panel of the clothes dryer. The direction of air flow through the clothes dryer is depicted by the arrows in FIG. 1. Thus, air enters the front end of air heating device 42, flows through bulkhead 40 into chamber 45, then flows through opening 47 in bulkhead 40, thence through the rear perforated wall of tumbling drum 35, thence through access opening 36 into vertically extending duct 49, and then through blower 52 to a point exterior of the dryer cabinet. It can be seen that the interior of heating device 42 is at a negative pressure due to the provision of the blower 52 which constantly pulls air through the heating device and through the remainder of the clothes dryer.

The heating device 42 comprises a sheet metal outer housing 58 that is triangular in cross-section and which extends between points 59 and 60. The terminal points 59 and 60 are connected by brackets 62 located at opposite ends of housing 58. The housing is made triangular in cross-section so that it readily fits within the space formed by the tumbling drum, top wall and one sidewall of the cabinet. As shown, the housing 58 has a right triangular cross-section with the legs of the triangle being located respectively parallel with the top panel 20 and one sidewall 14 of the cabinet and with the hypotenuse of the triangle facing the tumbling drum. The housing 58 is open at its rear end 63 which communicates with chamber 45 and is open at its front end 64. A sheet metal air directing member or baffle 66, which terminates at points 67 and 68, extends lengthwise of the housing 58. A third sheet metal member 69 is fixed to housing 58 and to a pair of end caps 71 and 72 that are secured to air directing member 66. The front end cap 72 is provided with an opening 73 having a lower cylindrical cross-section, while the rear end cap 71 carries gas burner supports 74. A tubular gas burner 75 having top ports 76 rests within the opening 73 and on the supports 74. The gas burner may be of any conventional type having a longitudinal bore that is supplied with gas and primary air from its rear end and wherein the bore communicates with ports 76. The gas burner is located between sheet metal member 69 and one sidewall of air directing member 66. The air directing member 66 has openings 66*a* which aid in gas combustion when the blower 52 is not operating. The entire burner assembly 42 is supported in the upper right-hand corner of the dryer cabinet between the tumbling drum of the dryer and the top panel 20 of the dryer. The burner assembly 42 is secured to one sidewall 14 by a bracket 78 that fits through a slot formed in a channel-shaped portion of sidewall 14. The burner is spaced from the sidewall by a bump 78*a*.

It should be noted that the particular construction of the gas heating device 42 provides for a longitudinally extending opening at 79 that is disposed below burner 75. A longitudinally extending opening is also provided at 80, defined by the top edge of sheet metal member 69 and the top wall of air directing member 66. A longitudinally extending opening is also provided at 81 due to the fact that the air directing member 66 terminates at point 67.

By reference to FIGS. 1, 4 and 6 it can be seen that air entering the dryer cabinet through passages 56 and 57 will be supplied to the front open end 64 of heating device 42. This air flows longitudinally through space 82 formed by outer housing 58 and air directing member 66 into chamber 45. Air will also flow through space 83 and will be heated by combustion of gas issuing from ports 76 and then passes into chamber 45. Air will also flow upwardly through opening 79, thence through opening 81, then around gas burner 75 and thence through opening 80 into the space 83 where the heated air is conveyed through the heating device 42 into chamber 45. The air passing through space 82 serves to cool the outer housing 58, as does the air sweeping along the outside of the housing 58 and passing leftwardly in FIG. 1 from passages 56 and 57 to the open end 64 of the heating device 42. It can thus be seen that a counter-flow of air is set up in that the air flows forwardly to the open end 64 of heating device 42 and thence rearwardly into chamber 45. It can be seen that the products of combustion are supplied to the tumbling drum with the construction of this dryer.

The gas burner 75 is supplied with gas from an inlet pipe 84 connected with a suitable supply of gas and is supplied with primary air through openings in the rear end of burner 75. The inlet pipe 84 is connected with a shut-off valve 85 and with a conventional pressure regulating valve 86. The pressure regulating valve is connected with a conventional solenoid valve structure 87 having an outlet connected with a pipe 88 that is directly connected with gas burner 75. It should be noted that the gas supply apparatus for the gas burner as well as the combustion chamber 42 are all located above the axis of the tumbling drum 39 and above a major portion of the tumbling drum. The gas supply apparatus and the gas heating device 42 are placed in this position in order that they may be easily serviced when the top panel 22 is moved to an open vertical position. Thus, when the top panel 20 is moved to the position in FIG. 2, easy access to the gas supply apparatus 84, 85, 86 and 87 and to the gas heating device 42, is afforded.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, as may come within the scope of the claims which follow.

What is claimed is as follows:

1. A gas heated clothes dryer comprising, a cabinet having a horizontal top wall, a vertically extending sidewall, a substantially vertically extending rear wall, a vertically extending bulkhead spaced from said rear wall, a tumbling drum having a substantially imperforate peripheral wall, a perforate rear wall, and a front wall formed with an access opening, a vertically extending front duct connected to said access opening, said tumbling drum being supported for rotation by said bulkhead and being positioned with its rear wall spaced from said bulkhead, a sealing member secured to said bulkhead and engaging the rear wall of said tumbling drum, said sealing member being positioned to circumscribe the perforated portion of said tumbling drum rear wall, an aperture in said bulkhead located within the outline of said sealing member, a member attached to the rear side of said bulkhead and spaced therefrom to form an air manifold, said member extending over said aperture whereby said manifold is in communication with the space formed by the bulkhead and rear wall of the tumbling drum, a gas fired combustion chamber in said cabinet having an air inlet at one end thereof, said combustion chamber extending lengthwise parallel to and spaced from the juncture of said top wall and said sidewall of said cabinet and having an air outlet on the other end thereof at said bulkhead in communication with said manifold, said cabinet rear wall having an inlet air opening adjacent said other end of said combustion chamber, and blower means having an inlet connected with said tumbling drum access opening by way of said front duct for pulling air from said cabinet air inlet opening around the outside of said combustion chamber and through said combustion chamber, air manifold, perforate rear wall and tumbling drum.

2. A gas heated clothes dryer comprising, a cabinet having a vertically extending rear wall, a vertically extending bulkhead spaced from said rear wall, a horizontal tumbling drum in said cabinet having a rear perforated wall and a front access opening connected to the atmos-

phere, a member secured on one side of said bulkhead and having a portion spaced rearwardly therefrom to form an air manifold, an opening in said bulkhead in alignment with rear perforated wall of said tumbling drum and communicating with said manifold, a gas heating device on the other side of said bulkhead and including a housing extending lengthwise of said cabinet in an upper corner thereof and having a first open end communicating with said manifold and a second open end communicating with the space between said tumbling drum and cabinet, an opening in said cabinet connecting the interior thereof to said atmosphere, and a gas burner in said housing.

3. The combination of claim 1 wherein said combustion chamber includes an outer sheet metal longitudinally extending triangular housing having a horizontal top portion, a vertical side portion, and a sloping side portion interconnecting said top and vertical side portions and having a first longitudinal opening forming said air inlet to said combustion chamber, an inner sheet metal air directing baffle longitudinally coextensive with said housing and having a top and a side spaced from said housing top and vertical side portions respectively to form a cooling air space therebetween interconnecting said first longitudinal opening and said air outlet, said baffle side terminating above said sloping side portion to form a second longitudinal opening connected to said first longitudinal opening, a sheet metal member fastened to said sloping side portion adjacent said first longitudinal opening and having a vertical wall in spaced parallel relationship to said baffle side and terminating below said baffle top to form a third longitudinal opening above and laterally disposed from said second longitudinal opening and connected to said air outlet, a pair of end caps fastened to said baffle side and said vertical wall of said sheet metal member to form a burner chamber, and a gas burner interposed in said burner chamber between said second and third longitudinal openings.

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