Oct. 30, 1945. A. BARNSTEINER 2,387,734

HEATING APPARATUS

Filed Jan. 13, 1942 3 Sheets-Sheet 1

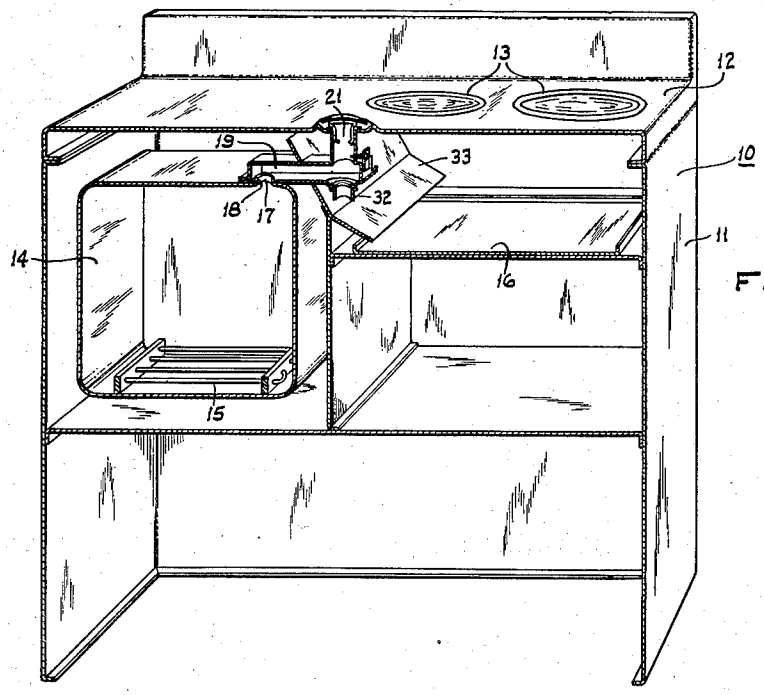


FIG. 1.

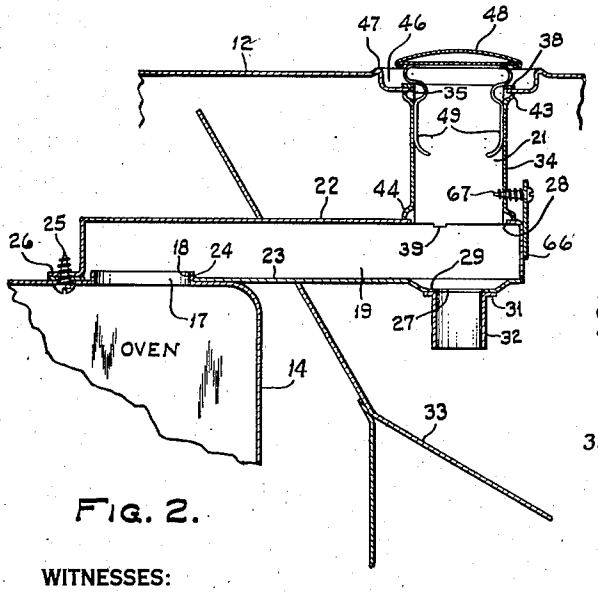
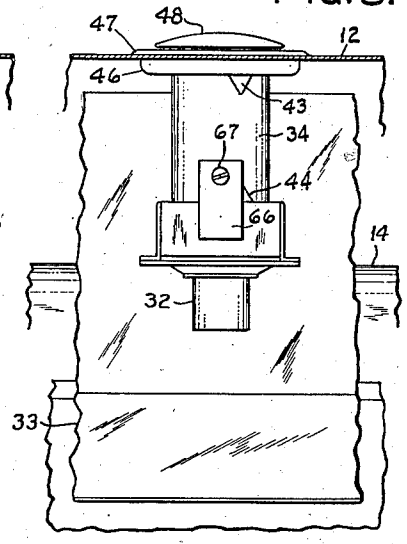


FIG. 2.

FIG. 3.



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HEATING APPARATUS

Filed Jan. 13, 1942 3 Sheets-Sheet 2

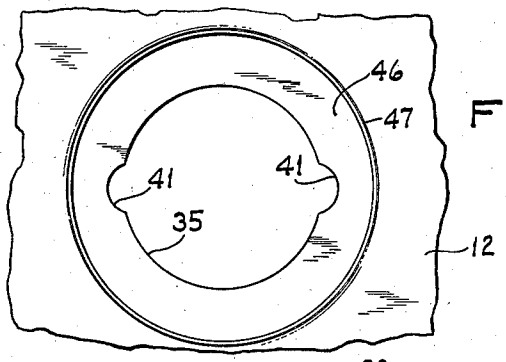


FIG. 4.

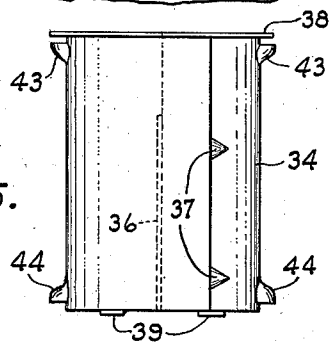


FIG. 5.

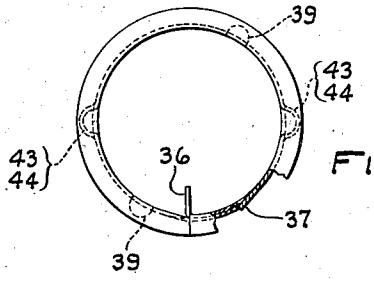


FIG. 7.

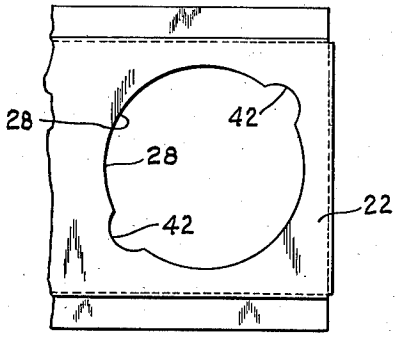


FIG. 6.

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HEATING APPARATUS

Filed Jan. 13, 1942 3 Sheets-Sheet 3

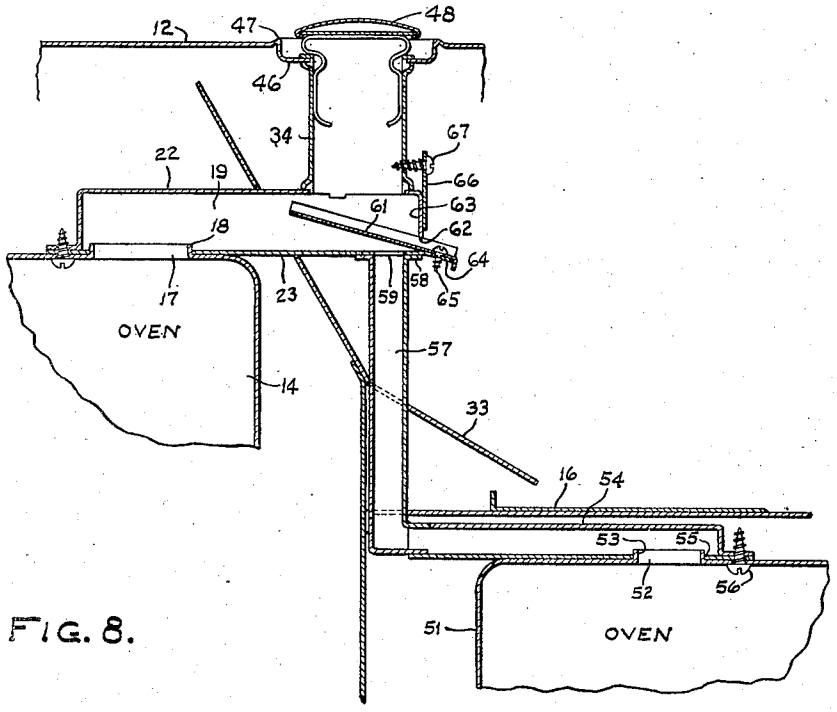


FIG. 8.

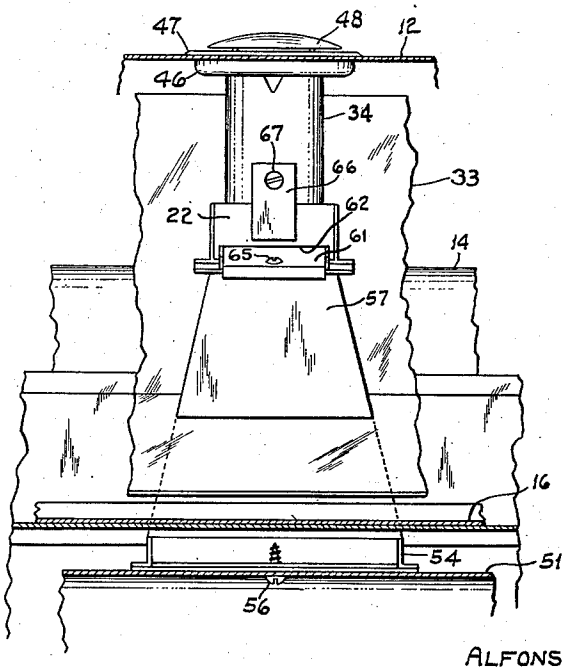


FIG. 9.

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Patented Oct. 30, 1945

2,387,734

UNITED STATES PATENT OFFICE

2,387,734

HEATING APPARATUS

Alfons Barnsteiner, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania

Application January 13, 1942, Serial No. 426,582

13 Claims. (Cl. 126—21)

This invention relates to heating apparatus and particularly to cooking ranges and it has for an object to provide an improved venting means for the ovens of such ranges.

It is a feature of the present invention to locate the discharge end of a range oven vent in the platform or cooking surface of the range, preferably closely adjacent the surface units thereof. This location is desirable inasmuch as the user of a range finds it necessary to frequently clean the platform of spillage near the surface units and while doing so may, with the present invention applied to the range, clean off any deposits such as the condensates from the oven vapors which may form on the platform adjacent the oven vent.

In the past, some ranges have had the oven vent discharge through an opening in the back splasher, with the result that the back splasher would be stained or discolored. The removal of such stains on the back splasher was often neglected due to the fact that they were difficult to reach and especially so with pots or pans on the surface units. With the present oven venting arrangement, this disadvantage is overcome.

It is a further feature of the invention to drain any condensates formed within the oven vent to the crumb tray of the range and thereby prevent them from flowing back into the oven. The crumb tray is, of course, readily removable from the range so that these deposits may be cleaned therefrom.

It is still another feature of the invention to provide the discharge end of an oven vent, which opens on the range platform, with a cap member which projects above the plane of the platform to prevent the vent from being closed by a kettle or pan placed over the vent.

It is a further object of the invention to provide an improved oven vent which may be easily assembled and which requires a minimum of separate fastening means.

These and other objects are effected by my invention as will be apparent from the following description and claims taken in connection with the accompanying drawings, forming a part of this application, in which:

Fig. 1 is a vertical section, in perspective, of a range in which the present invention is incorporated;

Fig. 2 represents a portion of Fig. 1 on an enlarged scale;

Fig. 3 is a view looking from the right of Fig. 2;

Fig. 4 is a partial plan view of the range platform showing the opening which receives a vertical pipe of the oven vent;

Fig. 5 is a front view of a vertical pipe forming a part of the present invention;

Fig. 6 is a top plan view of a portion of a horizontal pipe or channel forming a part of the present oven vent;

Fig. 7 is a top view of the pipe shown in Fig. 5, a portion being broken away to show certain details of construction;

Fig. 8 is a view corresponding to Fig. 2 but showing the invention adapted to a range having two ovens; and

Fig. 9 is a view looking from the right of Fig. 8.

Referring to the drawings and particularly to the modification illustrated in Figs. 1 to 3, inclusive, there is shown a range generally indicated 10. The range as shown in Fig. 1 has been cut by a vertical plane passing substantially through the longitudinal center thereof. This range may be of any desired construction and is here shown as comprising a body 11 having a platform 12 in which are supported a plurality of surface units 13. The structural details of the range 10, except for the oven venting arrangement to be hereinafter described, are not important to the present invention and it is to be understood that the invention is not limited in its application to the particular range shown in the drawings.

An oven liner 14, which is preferably enclosed by suitable heat-insulating material (not shown), as is well understood in the art, is provided with one or more heating elements such as indicated at 15. These heating elements are connected to a suitable source of electrical energy and the operation thereof is preferably controlled by a thermostatic switch (not shown).

When the oven is in use, the air within the oven expands and the liquid portions of the food cooked therein are evaporated to a certain degree. It is, therefore, necessary to provide a vent for allowing this expanded air and the steam and vapors formed therein to escape from the oven. The present invention provides an inexpensive and efficient vent which, as pointed out above, discharges such air and steam through the platform of the range and preferably adjacent the surface units thereof while draining any condensates formed within the vent to the removable crumb tray 16 of the range.

In the particular embodiment shown in the drawings, the oven 14 is provided with a vent opening 17 in its upper wall. The margin of the oven wall surrounding this opening is preferably flanged outwardly as indicated at 18 to prevent

any condensate formed in the vent passage from draining back into the oven and to aid in assembling and fixing the oven vent structure to the oven.

The oven vent comprises a horizontal passage 19 and a vertical passage 21. The horizontal passage 19 is conveniently formed of an inverted, trough-shaped member 22 which is secured, as by spot welding, to a bottom plate 23. The plate 23 is provided with an opening 24 of a size to receive the flange 18 at the opening 17 and may be secured to the oven liner by means of a screw 25 extending through the oven wall and into flanges 26 formed on the member 22 and plate 23.

The end of the plate 23, remote from the opening 24, is provided with a drain opening 27 located immediately below an opening 28 provided in the top wall of the member 22. The margin of the plate 23 surrounding the opening 27 is formed to provide a downwardly offset flange 29 to the undersurface of which is secured, as by spot welding, a flange 31 of a drain pipe 32. The pipe 32 drains any condensates formed in the vent passage to a deflector plate 33 which directs such condensates to the removable crumb tray 16.

The opening 28, overlying the drain opening 27, receives the lower end of a vertical vent pipe 34, which forms the vertical passage 21, the pipe being detachably secured to the upper wall of the member 22 in a manner to be hereinafter set forth. The upper end of this pipe 34 is received in an opening 35 formed in the range platform, the opening 35 overlying the openings 27 and 28.

The pipe 34, as shown in Figs. 5 and 7, is preferably cylindrical and formed of a strip of sheet metal having one end turned in to provide a flange 36 engageable by the jaws of a forming mandrel (not shown) as is well known in the art. A pair of struck-out bosses 37, spaced a predetermined distance from the outer end 38 of the pipe forming strip serve as abutments for the outer end of the strip to facilitate manufacture and insure production of pipes of substantially uniform diameter. The overlapping ends of the strip may be spot welded to complete the body of the pipe.

The upper end of the pipe 34 is provided with a horizontal flange 38, which, as will appear hereinafter, extends over the upper surface of the platform about the opening 35 when the pipe is finally assembled on the range. The lower end of the pipe is provided with diametrically-opposed outwardly-turned ears 39 which are slightly smaller than reentrant notches 41 and 42 formed in the range platform 12 and member 22, at the openings 35 and 28, respectively, so that these ears may pass freely through these reentrant notches. As shown in Fig. 2, the ears 39 engage the under surface of the member 22 so the pipe 34 and its flange 38 support the right end of the vent member 22 from the platform.

The pipe 34 is also provided with pairs of diametrically-opposed struck-out louverlike lugs 43 and 44 in spaced adjacent relation to the upper flange 38 and the ears 39, respectively. The flange 38, ears 39 and lugs 43 and 44 as well as the bosses 37 are preferably formed on the pipe-forming strip before coiling it into cylindrical shape.

By reference to Fig. 7, it will be noted that the ears 43 and 44 are longitudinally aligned but are angularly offset relative to the ears 39. It will be noted by reference to Figs. 4 and 6 that the reentrant notches 41 and 42 of the openings 35 and 28 are also angularly offset relative to each other, but at an angle somewhat less than the offset between the ears 39 and lugs 43—44.

After the horizontal passage 19 of the oven vent has been installed in the range in the manner shown in Figs. 1 and 2, the vertical vent pipe 34 is assembled in the range by inserting it down through the opening 35 in the range platform. The manner of assembly is as follows: The pipe 34 is turned so that the ears 39 are aligned with the reentrant notches 41 (Fig. 4) permitting the pipe to be lowered slightly through the opening 35 until the lugs 44 strike the upper surface of the platform. The pipe 34 is then turned in a counterclockwise direction until the lugs 44 are aligned with the reentrant notches 41 to allow these lugs to clear the notches 41 and permit the pipe to be lowered still further into the opening 35.

The pipe may then be turned clockwise, as viewed from above the platform, to bring the ears 39 into alignment with the reentrant notches 42 in the member 22. With these ears aligned with the notches 42, the free end of member 22 is raised slightly and the pipe inserted into the opening 28. A slight turn of the pipe in a counter-clockwise direction as viewed in Fig. 6, brings these ears under the margin of the member 22 at the opening 28 to latch the pipe to the member 22. The pipe 34 is turned sufficiently to bring the lugs 43 into alignment with the notches 41 permitting the pipe 34 to drop into the position shown in Fig. 2. A further turn of the pipe latches the pipe to the platform 12 since the lugs 43 will have been moved out of alignment with the reentrant notches 41 so that the margin of the platform 12 at the opening 35 is disposed between the pipe flange 38 and the lugs 43.

If desired, the lugs 43 may be spaced below the flange 38 a sufficient distance to permit the lugs 43 to be inserted through and to clear the notches 41 before the pipe 34 is lowered to its final position; that is, while the ears 39 are still above the member 22. It is also within the purview of the invention to have the notches 41 and 42 in alignment and to also have the ears 39, and lugs 43 and 44 in alignment so that the pipe 34 may be dropped into the openings 28 and 35 and latched to the platform and to the member 22 by a single turn of the pipe.

As shown particularly in Fig. 2, the margin of the platform at the opening 35 is formed to provide a well 46 which is surrounded by a raised annular rib 47. The rib 47 prevents any liquid accidentally spilled on the platform from running into the vent pipe 34.

A domed cap 48 is removably received in the upper end of the vertical vent pipe 34. This cap is provided with resilient spring fingers 49, which may be formed of wire, and adapted to be frictionally received in the vent pipe 34. These fingers are shaped to support the edge of the cap in spaced relation to annular rib 47 to permit free escape of gases from the oven, and with the top of the cap spaced above the plane of the platform 12. This cap not only serves to deflect the gases discharging from the oven vent but also prevents the vent from being accidentally closed by a kettle or pan resting thereon.

When the oven is in use, the gases and vapors entering the oven vent flow through the horizontal passage 19 and up through the vertical passage 21 to the cap and out over the platform 12. Any condensates from these vapors deposited on the platform may be readily cleaned therefrom since the region of the oven vent is readily acces-

sible to the user of the range. Any condensates formed within the oven vent drain through the pipe 32, over the deflector plate 31 to the removable crumb tray 16.

In Figs. 8 and 9 the invention has been shown applied to a range having two ovens. In this construction, substantially the same venting arrangement described above may be used for one of the ovens so that the horizontal passage 19, with a slight change to be hereinafter described, and the vertical oven vent pipe 34 may be standard for either a single oven or a two oven range.

Referring particularly to Fig. 8, it will be noted that in addition to the oven 14 there has been shown, fragmentarily, a second oven 51. The upper wall of the oven 51 is provided with an opening 52 having a vertical flange 53 surrounding the same as in the case of the opening 17 in the oven 14. A passage-forming member 54, which may be constructed similar to the horizontal passage-forming member 19, is provided with an opening 55, in its lower side, of a size to receive the flange 53, and is secured to the oven 51 as by means of a screw 56. The member 54 differs from the member 19 in that the left end thereof, as viewed in Fig. 8, is open to provide communication with the interior of a vertically-extending tapered tube 57. The lower open end of the tube 57 is provided with horizontally-extending flanges which are connected to the member 54, as by spot welding. The upper end of the tube 57 is provided with an outwardly-turned flange 58 which is spot-welded to the lower plate 23 of the horizontal passage member. The open upper end of the tube 57 opens into the horizontal passage 19 and vertical passage 21 through a rectangular opening 59 provided in the plate 23.

From the construction described above, it will be understood that the gases and vapors from the oven 51 will pass through the opening 52 into the member 54 then up through the tube 57 through the member 19 and into the vertical vent tube 34. Venting of the oven 14 will be the same as with the construction illustrated in Figs. 1 to 3.

In order to prevent any condensates formed within the vertical vent pipe 34 from draining back into the tube 57, a trough-shaped baffle plate 61 may be inserted in the member 19 in a position to extend over the opening 59. This baffle plate extends through an opening 62 provided in the member 19, as by cutting off a portion of the end wall 63 of the trough-shaped member 22. The plate 23 is preferably provided with a downwardly-inclined extension 64 to support the baffle plate, the baffle plate being connected to the extension as by means of a screw 65.

As will be clear from an inspection of Fig. 8, any condensates falling on the baffle plate 61 will drain to the deflector 33 and then to the crumb tray 16.

As shown in each of the modifications of the invention, a plate or strip 66 may be spot welded or otherwise secured to the end wall of the trough-shaped member 22 for receiving a screw 67 threaded into the pipe 34. The plate 66 and screw 67 serve to provide a more rigid connection between the member 22 and the pipe 34 and tend to relieve some of the strain on the ears 39.

While I have shown my invention in several forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. A range comprising a body having a platform, an oven disposed within said body below said platform, said platform having an opening therein, said oven having an opening therein, a conduit connecting said openings, said platform having a raised portion formed thereon circumscribing the opening therein to prevent matter spilled on said platform from draining into the range through said platform opening, and means extending at least partly above the plane of said platform and overlying said platform opening in spaced relation to said raised portion to prevent accidental closing of said opening by a kettle or the like.

2. A range comprising a body having a platform, an oven disposed within said body below said platform, said platform having an opening therein, said oven having an opening therein, a conduit connecting said openings, said platform having an annular, upwardly-projecting rib thereon circumscribing the opening therein, and a tray removably supported within said body below said platform, and means for draining condensates and the like from said conduit to said tray.

3. A range comprising a body including a platform and having an oven therein disposed below said platform, a removable tray supported in said range body, a conduit communicating with said oven and opening on said platform, means for draining condensates or the like from said conduit to said tray, and means overlying said conduit at the platform end thereof to prevent accidental closing of said conduit by a kettle or the like.

4. A range comprising a body having an oven therein, said body having a platform provided with a recessed portion, said platform having an opening through the bottom of said recessed portion, a conduit connecting said opening with the interior of said oven, and a cap member removably supported over said opening in closely spaced relation thereto and with the edge of said cap member spaced inwardly of the edge of said recessed portion, at least a portion of said cap member extending above the plane of said platform.

5. A range comprising a range body including a platform and having an oven therein, a tray removably supported within said body below said platform, said oven having a vent opening therein, a horizontally disposed conduit communicating with said oven vent opening, a vertically-extending conduit communicating with said first-mentioned conduit, said vertically-extending conduit opening on said platform, a member supported over said vertically-extending conduit and with at least a portion thereof located above the plane of said platform and means for draining condensates and the like from within said conduits to said removable tray.

6. A range comprising a range body including a platform and having an oven therein, a crumb tray removably supported within said body below said platform, said oven having a vent opening therein, a horizontally-disposed conduit communicating with said oven vent opening, a vertically-extending conduit communicating with said first-mentioned conduit, said vertically-extending conduit opening on said platform, and means for draining condensates and the like from within said conduits to said crumb tray.

7. A range comprising a body portion having a platform, an oven in said range below said platform, a passage-forming member communicating with the interior of said oven and extending below said platform, said passage-forming member having an opening in a wall thereof, said platform having an opening therein, a tubular member, means for securing said tubular member to said passage-forming member and said platform with the tubular member extending into each of said mentioned openings, said securing means comprising outwardly-extending portions at each end of said tubular member adapted to overlie the margin of said platform at said platform opening and to engage the inner surface of said wall respectively, and outwardly-extending lugs on said tubular member in spaced relation to said outwardly-extending portions, said margin of said platform and of said wall at said first-mentioned opening being received between said lugs and their respective outwardly-turned portions, said margin of said platform having notches therein to pass said lugs in assembling said tubular member in the range.

8. A vent structure for use in ranges or the like comprising a passage-forming member having an opening in a wall thereof, and a tubular member having outwardly-extending ear-like members at one end thereof, said wall having reentrant notches in the margin thereof surrounding said opening of a size to permit said ear-like members to be moved therethrough, whereby said ear-like members may be inserted through said notches and said tubular member thereafter rotated relative to said wall to move said ear-like members clear of said notches, said tubular member having outwardly-projecting lugs thereon adjacent said one end and adapted to cooperate with said ear-like members for latching said tubular member to said wall.

9. An oven vent comprising a passage-forming member, said member having a pair of spaced openings in a wall thereof, said member having an opening substantially aligned with one of said mentioned openings and disposed in an opposed wall thereof, and a vent pipe connected to said member with the passage thereof communicating with said last-mentioned opening.

10. An oven vent comprising a tubular member having outwardly-turned portions at each end thereof and lugs carried by said tubular member disposed in spaced adjacent relation to said outwardly-turned portions.

11. A range comprising a body having a platform, a plurality of ovens in said body, each of said ovens having a vent opening therein, said platform having an opening therein, a conduit connecting said oven vent openings with the opening in said platform, a tray removably supported within said body below said platform and means for draining condensates and the like from said conduit to said tray.

12. A range comprising a body having a platform, a plurality of ovens within said body and disposed below said platform, each of said ovens having a vent opening therein, a conduit communicating with said ovens through said openings, a conduit opening on said platform and communicating with said first-mentioned conduit, said last-mentioned conduit extending vertically from said first-mentioned conduit, and means including a drainage opening and a baffle plate supported below said vertically-extending conduit to drain any condensates or the like formed within said vertical conduit to a point outside of said conduits.

13. A vent structure for use in a cooking appliance or the like which includes a body portion having a top wall provided with an opening and an oven spaced below said top wall, comprising a passage-forming member adapted to communicate with the interior of said oven and to extend below said top wall, said passage-forming member having an opening in a wall thereof, a tubular member, means for securing said tubular member to said passage-forming member and to said top wall with the tubular member aligned with the openings in said top wall and said passage-forming member, said securing means including outwardly-extending portions at each end of said tubular member adapted to overlie the margin of said top wall at the opening therein and to underlie the margin of said wall of said passage-forming member at the opening therein, respectively, and outwardly-extending lugs on said tubular member in closely spaced relation to said outwardly-extending positions, said margins of said top wall and of said wall of said passage-forming member being adapted to be received between said lugs and their respective outwardly-turned portions.

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