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OVEN VENT FOR RANGES

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Fig. 1.

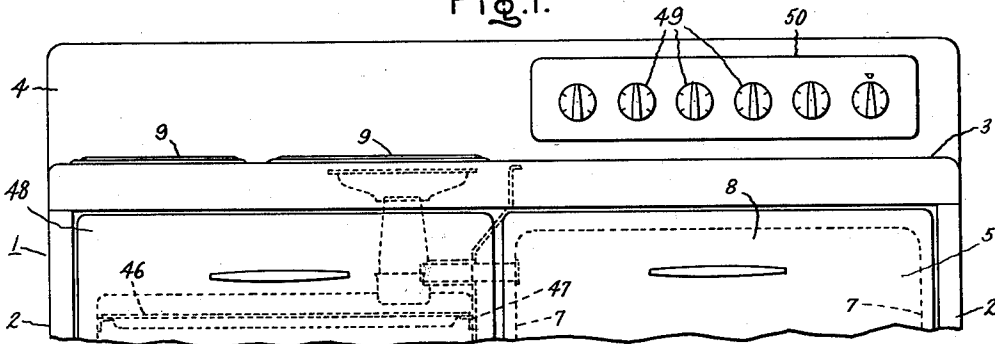


Fig. 2.

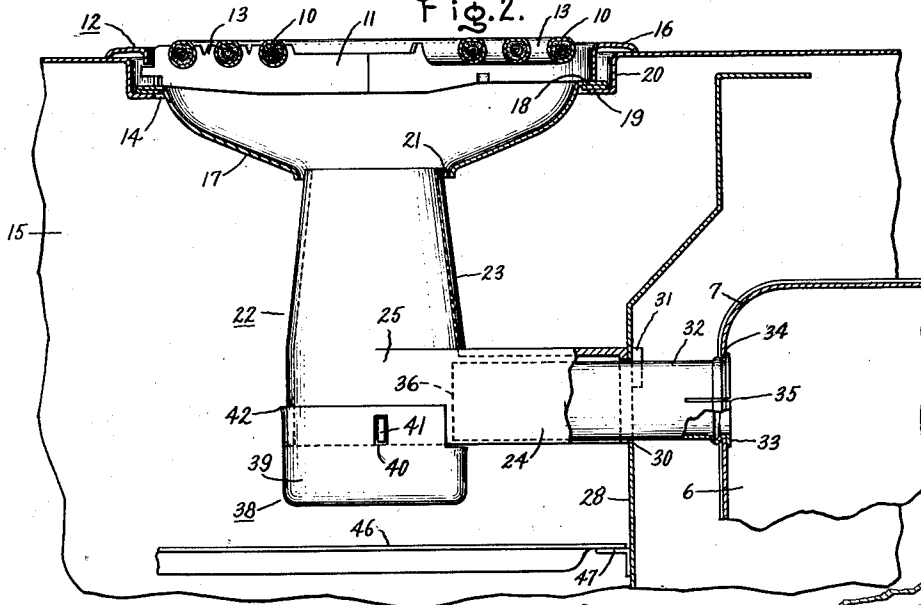


Fig. 3.

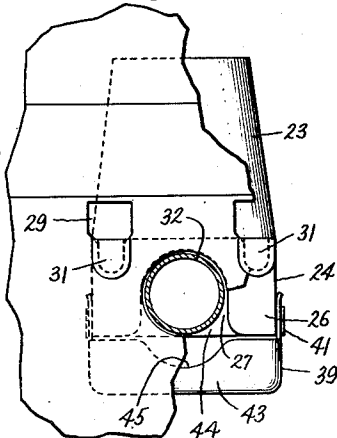
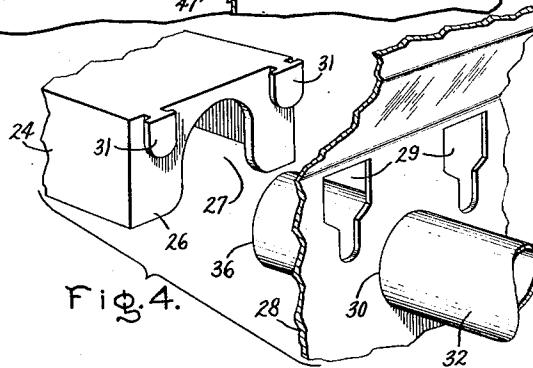


Fig. 4.



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## UNITED STATES PATENT OFFICE

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## OVEN VENT FOR RANGES

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1

My invention relates to cooking appliances known as "ranges" and more particularly to a vent construction for ovens. Most range ovens require a vent or chimney and my invention is designed to simplify and improve such vent structures.

One object of my invention is to provide an oven vent requiring the addition to a range of only a few simple parts. Another object is to provide a vent which requires virtually no alteration of the general range structure for its installation.

A further object is to design a vent which permits normal functioning of the other parts of a range, while utilizing some of these other parts, such as surface units, oven walls, etc., in the installation and operation of the vent.

Other objects are to provide a vent structure which is readily removable for inspection, cleaning, repair, or replacement, and one in which the parts of the vent themselves, as well as their design, facilitate cleaning.

Other objects and the details of that which I believe to be novel and my invention will be apparent from the following description and claims taken with the accompanying drawing in which is illustrated one example of a vent for a range embodying the present invention.

In the drawing, Fig. 1 is an elevation of the top of a conventional range with my improved vent structure applied thereto; Fig. 2 is a view on a much larger scale showing in elevation and partial cross section the vent structure with associated parts of the range; Fig. 3 is a side elevation of certain parts of Fig. 2, with portions broken away for clarity; and Fig. 4 is an exploded fragmentary perspective view illustrating details of the supporting structure for the vent.

The drawings show a range 1 having side walls 2, a horizontal cooking top surface 3, and a back splash 4. It is understood that the usual rear wall, legs or other support, and frame will also be provided as needed.

Within the range proper is an oven 5 with the usual inner wall 6 and side walls 7, with a door 8 closing the open front.

The cooking top extends to one side of the oven and above it, and is provided with heating surfaces in the form of surface units 9. I have shown the surface units in the form of sheathed tubular electrical heating devices 10 mounted on a spider or grid 11 which in turn is supported by a trim ring 12. Each of these heating units has openings 13 between the tubular heating elements, which are in communication with a main opening 14 which extends through the cooking top to a

2

space 15 which is below the cooking top and alongside the oven.

The supporting ring 12 has an outwardly extending flange 16 which engages the top cooking surface around the opening 14 in order to support the heating unit above the opening. The heating unit may be elevated or removed by lifting the ring which carries the grid and the tubular heating element.

Below the heating element is a funnel-like reflector member 17, designed to catch and direct spillage from utensils placed on the surface unit. This funnel-like reflector has an outwardly extending flange 18 at its upper edge which rests on a flange 19 which extends inwardly from a downwardly extending ring section 20 formed from the top wall. In the center of this reflector and at its bottom is a discharge hole 21 for spillage. The reflector is removable from its flange seat after the heating unit has been removed or lifted.

While the heating units just described, including the heating elements and their reflectors, primarily serve as the surface heating units of the range, one of these units also functions as a necessary part of the oven venting structure in accordance with one phase of this invention. For this purpose, the right-hand rear surface unit can be regarded as a grille, and its funnel-like reflector is used to direct vapors from the oven vent. Obviously, other forms of heating units might be used to serve the purposes of this invention.

The rest of the vent structure comprises but three separate pieces which I will call a vent stack, a flue tube, and a bottom cup.

The vent stack is shown in the form of an L-shaped member 22 having a vertical tubular riser arm 23 and a horizontal inverted channel-shaped arm 24. This part is preferably die cast. One end of the horizontal channel merges into the bottom end of the tubular portion as at 25, and the other end of the channel is provided with an end wall 26 with a notch or recess 27 which partially embraces the horizontal flue tube, as will be later described.

The vent stack is removably supported under the cooking top and within the open space 15 by means of structures which permit the easy insertion and withdrawal of the vent stack. I have shown a supporting wall 28 which can be called a side oven wall because it constitutes the second wall in a double-walled construction for the oven. This is fixed in place within the range and has a pair of slots 29 shown as "keyholes"

3

having their larger ends above their smaller ends. This wall is also provided with a hole 30 through which the flue tube passes and is partially supported.

At the upper edge of the end wall on the channel portion of the flue stack are a pair of shouldered lugs 31 which are made to cooperate with the keyhole slots in the oven side wall to hold the stack removably in proper position. The lower portions of the end wall bear against the side oven wall below the slots further to support the stack when in operative position.

The horizontal flue tube 32 is made of suitable material, preferably metallic, and is shouldered and flanged as at 33 where it passes through the hole 34 in the inner oven wall so that it may be slipped into place and snapped into fixed position. This inner end of the flue tube may be split as at 35 to provide added resiliency to aid in fixing it in place. The free and open end 36 of this tube extends outside of the oven and into the space under the cooking top immediately below the opening 14 which is to be used as a vent opening. The outer end of the flue tube is partly surrounded by the notch 27, as shown best in Fig. 3.

It will be noted that the open top end of the tubular portion 23 of the vent stack is of smaller diameter than the hole 21 in the reflector. Because the stack is centrally disposed within this opening, an annular space 37 is thereby provided between the edges of the opening 21 and the outer end of the tubular portion 22 of the stack. It will also be noted that the entire stack is small enough to pass easily through the opening 14 in the cooking top after the grille and funnel have been lifted or removed and the stack has been disengaged from the oven wall.

The bottom cup or pan 38 is made preferably from resilient sheet metal and has side walls 39 provided with slots 40 which cooperate with lugs 41 on the vent stack to hold the cup removably in place. In order to make this cup easy to apply to the bottom of the stack, the edges of the side walls are flared as at 42 and fitted around the bottom of the vertical tubular riser section, across and below the open channel section at this end. A shorter cross wall 43 below the channel section leaves an open passage 44 between the horizontal channel and the riser section of the stack while closing the bottom of the riser section and completing the shallow cup. A notch 45 is made in this wall of a depth sufficient to allow the end of the horizontal tube to project over the edge of the cup, even when the stack is raised to the lug-disengaging position. In fact, by proper selection of dimensions, this notch is used to give a proper preliminary positioning of the stack with relation to the free end of the horizontal tube. Alignment of the lugs and keyhole slots before moving the stack toward the oven wall for engagement, is made by lifting the notch in the cup up against the lower side of the tube and then sliding the stack toward the oven wall while keeping the tube engaged in the notch.

The bottom cup snaps on and can be easily pried off because of the resilient side walls. After it has been removed, the cup can be cleaned easily, and removal of the cup leaves open and exposes the entire channel portion and both ends of the tube portion of the stack for cleaning.

Under the surface units 9 is the usual drip pan 46, slidably mounted on suitable supports 47. This drip pan collects spillage from the

4

surface units and may be removed for cleaning through the front opening of the range normally closed by the drawer front 48. Spillage from the surface unit which is used as the vent grille and opening ordinarily will flow through the annular opening 37 around the vent stack and to the drip pan. Any unusual amount of spillage from the venting surface unit which drops into the stack will be collected in the bottom cup 38.

In operation of the oven, vapors will discharge through the flue tube, flow through the horizontal channel part of the vent stack and rise through the vertical tubular part of the stack. At the top of the stack, the vapors are confined inside the funnel-like reflector under the surface heating unit and pass through the openings in the grille at the top which is formed by the heating element and its grid.

Vapors condense upon the grille if this surface unit is not heated during oven operation. However, the heater element will vaporize or burn off any deposits of moisture or grease when the surface unit is heated, thus cleaning the grille. Of course, if the surface unit is operated at the same time as the oven, vapors cannot condense on the hot surface, but will be vaporized or burned before they can deposit.

It is understood that the surface units, as well as the oven heaters (not shown) will be provided with any suitable energy controlling means, such as switches 49 of the switch bank 50.

Note that an essential part of the range, namely, a surface heating unit element, functions to conceal completely the vent structure so that it cannot be seen from outside the range. Furthermore, because of the location of the surface unit, vapors are kept away from the back of the range and therefore cannot stain or discolor a wall against which the range might be mounted. In addition, and with the surface unit and reflector pan made removable, this unit provides an opening through which the vent stack may be removed.

Another essential part of the range, the side oven wall, is used as a support, not only for the removable vent stack, but also for the horizontal fixed flue tube.

All of the added functions of the essential range parts noted above are accomplished with no alteration of the usual parts of the range except for the addition of the holes for the flue tube and the keyhole slots in the oven wall. These holes and slots provide the necessary supports for the added parts, and these added parts function without interference with the normal operation of the range.

It will also be noted that, with the stack opening inside of the funnel-like reflector, vapors cannot spread readily to the open area under the cooking top, where such vapors might "gum up" the wires, the bottoms of the reflector pans, and other parts of the surface units or back splash equipment which are in or around this area. Instead, the open top of the vent stack above the bottom of the funnel-like member will encourage good and proper draft in the vent, and prevent the undue formation of condensate.

Although I have spoken of the keyhole slots in the oven wall and the shouldered lugs on the stack, it is obvious that these parts could be reversed, and slots made in the end of the stack with lugs on the oven wall. However, this construction would be more expensive and require

greater alteration of the oven wall than the one shown.

Also, although I have chosen the right-hand rear surface unit as the one through which the vent will operate, the location of this unit relative to the other units is not of importance if the horizontal flue tube is kept as short as possible, and preferably straight, for economy's sake. It is known that in some ranges the surface units are directly above the oven, and in other ranges, the surface units are located on both sides of the oven on the cooking top.

As will be evident from the foregoing description, certain aspects of my invention are not limited to the particular details of construction of the example illustrated, and I contemplate that various and other modifications and applications of the invention will suggest themselves to one skilled in the art. It is my intention, therefore, that the appended claims will cover such modifications and other applications as do not depart from the spirit and scope of my present invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a range having an oven and a cooking top surface at one side of the oven with a space thereunder, said top having a vent opening therein, vent structure for said oven comprising a single, fixed, substantially horizontal flue tube extending from said oven to the space under said cooking top and terminating in a free and open end under said vent opening, a fixed vertical supporting wall for said flue tube, a removable L-shaped vent stack with its vertical arm in the form of a tube discharging below the vent opening and its horizontal arm in the form of an inverted channel communicating with the bottom of the vertical tubular arm at one end of the channel, the other end adapted to communicate removably with the free end of the fixed flue tube, a disengageable support for said vent stack independent of said flue tube and in the form of a keyhole slot and shouldered lug connection between said vertical supporting wall and the stack, and said stack being of such a size as to be removed readily through the vent opening when disengaged from the supporting wall.

2. In a range having an oven and a cooking top surface, said top surface having an opening therein for a surface heating unit, a heating unit removably covering said opening formed to define a grille substantially filling the opening but having apertures for the passage of vapors therethrough, and a removable funnel-like member supported in said opening below said heating unit, said member having a spillage discharge hole in its bottom, a vent structure for said oven including a vent stack removably mounted under said top surface opening and of such a size as to be removable readily through said opening, a vertical tubular arm on said stack with an open top end substantially smaller in cross section than the discharge hole in said funnel-like member, the top end of said arm extending centrally through said discharge hole in spaced relation with said funnel-like member and under the heating unit grille, a fixed horizontal flue tube extending from said oven to a point below said top surface opening, a disengageable supporting structure removably holding said stack above and in communication with and independently of said flue tube, and a bottom cup closing the bottom of the vertical tubular arm of the vent stack.

3. In a range having interior walls forming

an oven and an exterior cooking top surface, said top surface having a vent opening therein, vent structure for said oven comprising a single, fixed substantially horizontal open-ended flue tube supported by an oven wall and extending from said oven directly to an open free end below said cooking top surface and under said vent opening, a vent stack removably mounted with respect to said flue tube and independently thereof and under said top surface and of such a size as to be passed readily through said vent opening, a vertical tubular portion on said stack with an open top end communicating with said vent opening, and a lower end communicating with the free end of the flue tube, the removable mounting for said stack including a shouldered lug on said stack, said oven wall having a keyhole shaped slot for engagement with said lug adjacent the place where said wall supports said flue tube.

4. A vent structure for an oven in a range having a cooking top surface above and to one side of the oven, said vent comprising a movable grille on said cooking top, said top having an opening covered by said grille when it is in one position and uncovered by said grille when it is in another position, a fixed flue extending from said oven with a free end projecting into the area below the said opening in the said cooking top, an L-shaped stack removably positioned to communicate with the grille and opening at one end and with the free end of said flue at the other end, said stack being of such size as will pass readily through the opening when the grille is moved to uncover the opening, said stack comprising a vertical tubular arm and a horizontal inverted channel arm communicating with the bottom of the tubular arm at one end, a wall closing the other end of the channel arm, said wall having a notch in its lower edge partially surrounding the free end of the flue when the stack is in operative position, and disengageable means for removably supporting said stack in its operative position independently of said flue and under said opening and in communication with said flue.

5. In a range having interior walls including a side wall forming an oven, an exterior cooking top surface, said top surface having an opening therein for a surface heating unit, a heating unit removably covering said opening formed to define a grille substantially filling the opening but having an aperture therethrough, and a removable funnel-like member supported in said opening below said heating unit, said member having a spillage discharge hole in its bottom, a vent structure for said oven including a vent stack removably mounted under said top surface opening and of such a size as to be passed readily through said opening when said heating unit is moved to uncover the opening and said funnel-like member is removed, a vertical tubular arm on said stack with an open top end substantially smaller in cross-section than the discharge hole in the funnel-like member, the top end of said tubular stack arm extending through said discharge hole in spaced relation to said funnel-like member and therethrough under the heating grille when the grille, funnel-like member, and stack are in place, a horizontal flue tube fixedly supported by a side wall of the oven and extending from the oven to a point below the top surface opening, a disengageable support for said stack with cooperating elements on said stack and on said side wall of the oven,

7

said support removably holding said stack above and in communication with said flue tube and independently thereof and in its proper position with respect to the other parts as aforesaid.

6. In a range having an oven and a cooking top surface with an oven vent opening therein, vent structure within the range for the oven comprising a fixed, substantially horizontal flue tube extending from said oven to a free and open end under the vent opening, a removable vertical tubular vent stack with an open top adapted to communicate with said vent opening and a lower end adapted to communicate with the free end of said flue tube, a disengageable support for said vent stack independent of said flue tube, a cup removably mounted on and closing the lower end of the stack, said cup having a notch therein which will clear the free end of the flue tube when the stack is engaged upon its support, said notch bearing on the flue tube to align the stack with its support when the stack is disengaged from the support.

7. In a range having interior walls including a side wall forming an oven, an exterior cooking top surface with an opening therein for a surface heating unit, a heating unit removably covering said opening and formed to define a grille across the opening but having an aperture therethrough, and a removable funnel-like reflector member supported in said opening below said unit with a spillage discharge hole in its bottom, that improvement in vent structure for the oven of such a range comprising a substantially L-shaped vent stack removably mounted on a side wall of the oven, the vertical arm of the stack being in the form of a tube with a top end substantially smaller in cross section than the discharge hole in the funnel-like mem-

8

ber, said top end extending through said hole in spaced relation to said funnel-like member and into the funnel under the grille, the horizontal arm of the stack being in the form of an inverted channel which communicates with the tubular arm at one end and extends toward the side wall of the oven at its other end, a cup removably carried by the elbow of the stack and covering that end of the tubular arm, said assembled stack and cup being of such a size as to be passed readily through the opening in the top surface of the range, and a horizontal flue tube extending from the side wall of the oven to an end under the top surface opening, the end of said flue tube communicating with the inside of the channel arm of said stack when said stack is mounted on the side oven wall, the support of said stack on the side oven wall by the removable mounting being independent of said flue tube.

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