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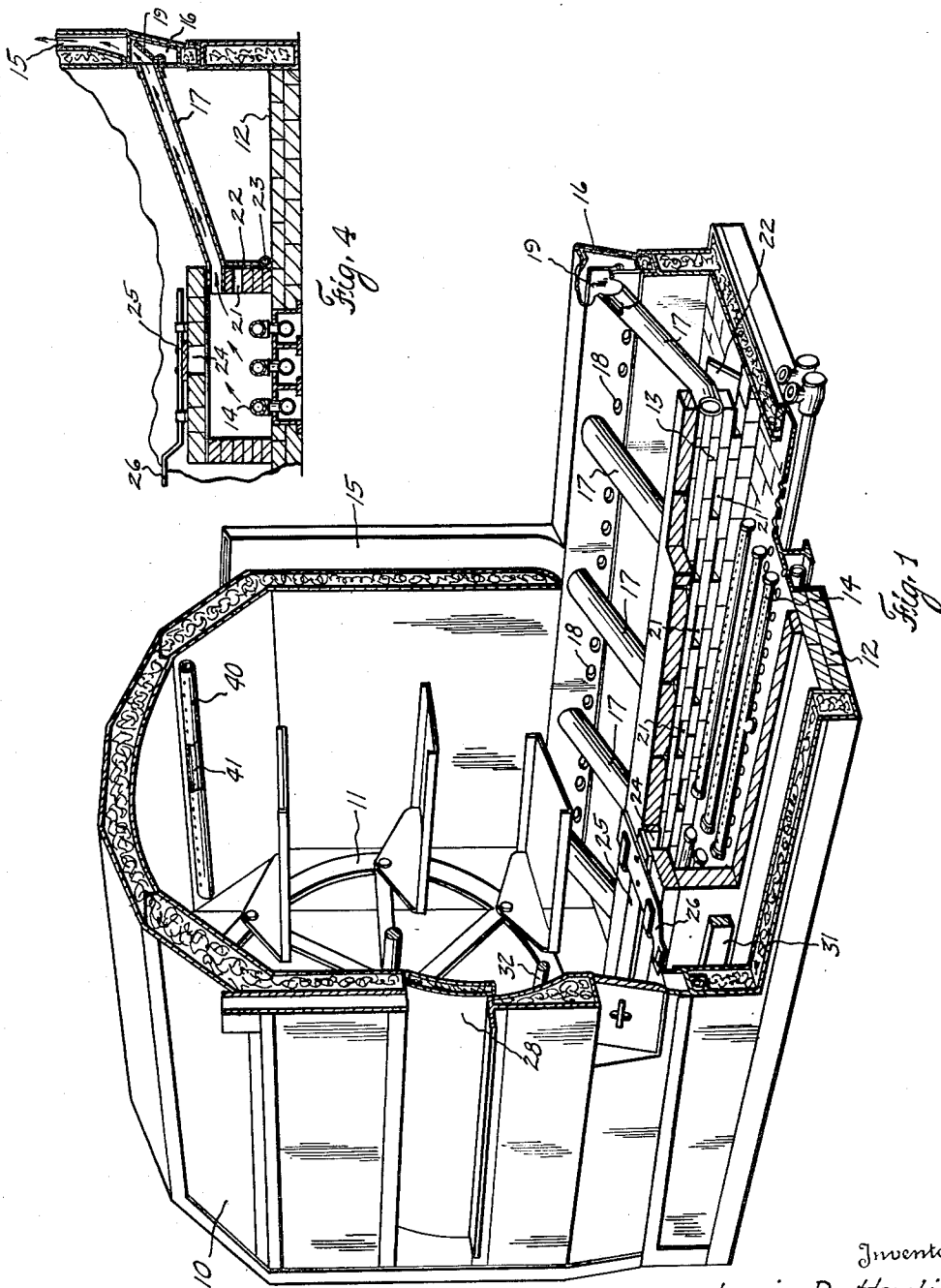
L. D. HOULIS

2,028,748

BAKE OVEN

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2 Sheets-Sheet 1



Inventor
Louis D. Houlis

By

Jack A. Ashley

Attorney

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2 Sheets-Sheet 2

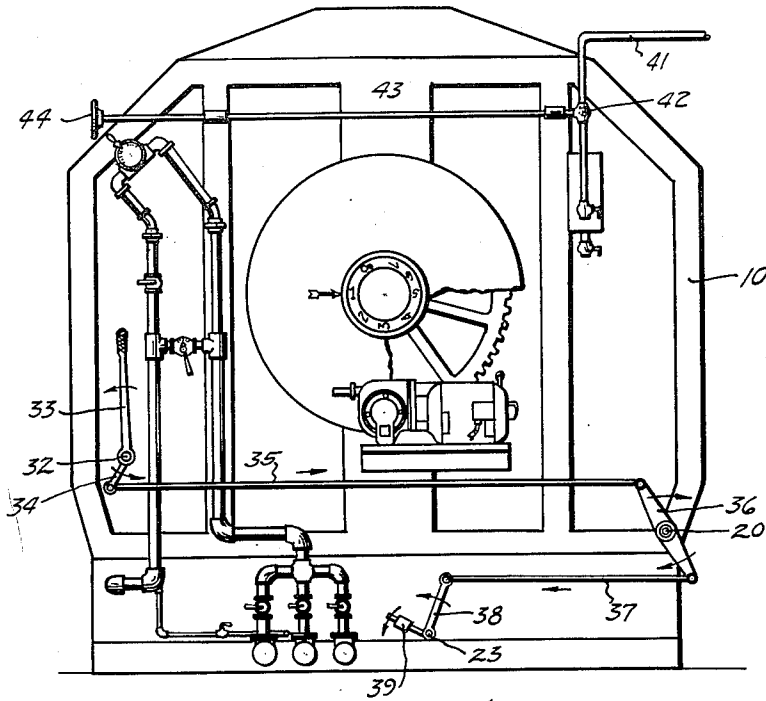


Fig. 2

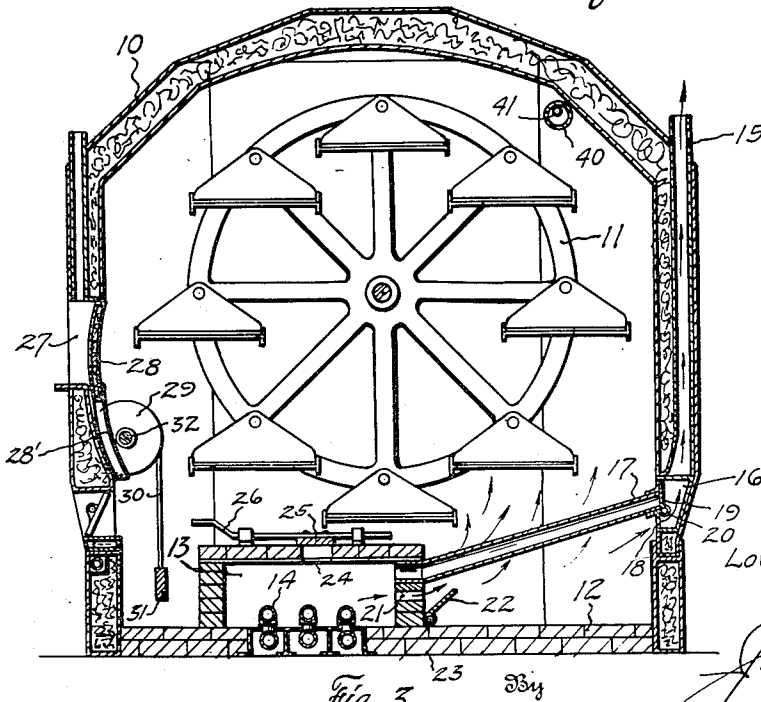


Fig. 3

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20 Inventor
Louis D. Houllis

Jack Ashley
Attorney

UNITED STATES PATENT OFFICE

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BAKE OVEN

Louis D. Houllis, Dallas, Tex.

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10 Claims. (Cl. 107—59)

This invention relates to new and useful improvements in methods of and means for baking.

One object of the invention is to provide a method whereby the oven is controlled so as to be directly heated when closed and indirectly heated when open for loading, thus reducing the fuel costs, eliminating flash heat when loading, and permitting the use of an ample amount of steam when desirable.

Another object of the invention is to provide means for diverting the heating means from direct to indirect, automatically operated by opening and closing the door of the oven.

Still another object of the invention is to provide manually operated means by which the door of the oven may be opened and closed and also by which the flow of the products of combustion may be controlled and directed into the baking chamber when the door is closed and diverted from said chamber when the door is opened.

A further object of the invention is to provide means automatically operated by the opening of the oven door for diverting the products of combustion from the baking chamber and preventing their escape into the face of the baker and into the room.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is shown, and wherein:

Figure 1 is a partial view of a baking oven constructed in accordance with the invention, partly in perspective and partly in section,

Figure 2 is an end elevation of the same,

Figure 3 is a transverse vertical sectional view, and

Figure 4 is a transverse vertical sectional view of the fire box and flues.

In the drawings the numeral 10 designates an oven which may be of any suitable construction and provided with the usual revolving reel 11. For illustrative purposes, I have shown a refractory floor 12 in the bottom of the oven and a refractory fire box 13 built upon said floor under the reel. The box is preferably nearer the front of the oven. Burners 14 are mounted longitudinally of the fire box. The fire box may be heated in any suitable manner and the particular means is not essential.

A vertical flue 15 is mounted in the rear wall

of the oven and rises from the center of a manifold 16 disposed longitudinally in said wall with its front side exposed in the baking chamber of the oven. Spaced transverse metallic pipes or ducts 17 lead from the upper portion of the rear wall of the fire box to the manifold. Below the ducts spaced holes or vents 18 are provided in the front wall of the manifold.

A damper 19 is hinged in the manifold longitudinally on a line along the rear side of the front wall between the vents 18 and the ducts 17. This damper is provided with a shaft 20, whereby it may be swung. When the damper is swung upwardly against the front wall, the ducts 17 are shut off from the manifold, but the vents are in communication with the flue 15, as is shown in Figures 1 and 3. Upon swinging the damper downwardly, whereby it rests upon the back wall and across the manifold, the vents are cut off from the flue and the ducts are opened, as is shown in Figure 4.

In the rear wall of the fire box 13 a plurality of openings or ports 21 are provided below the ducts 17. These ports may be any suitable shape and arranged as desired. A damper 22 is hinged along the bottom of the outer side of said wall so as to close said ports when swung upwardly against the wall, as is shown in Figure 4. When the damper 22 is open, as shown in Figures 1 and 3, the products of combustion from the fire box 13 will flow through the ports 21 into the baking chamber and upwardly through the reel 11, whereby the oven will be directly heated. In order to prevent the escape of the product through the ducts during the direct heating, the damper 19 is closed against the ends of the ducts. This permits gases and descending products of combustion to escape through the vents 18.

By swinging the damper 22 upwardly, the ports 21 are closed and the products of combustion are shut off from the baking chamber. The damper 19 being swung down, as is shown in Figure 4, opens the ducts 17 to the flue 15 and closes off the vents 18. This arrangement will indirectly heat the oven by radiation from the metal ducts. A shaft 23 is connected to the damper 22 for swinging the same. The fire box 13 may be provided with a longitudinal opening 24 in its top covered by a slide valve 25 having a handle 26. By manually adjusting the valve, the opening may be partially opened to permit a controlled flow of the products of combustion into the baking chamber; however, this feature may be omitted and it is not essential to the invention.

The oven has an opening or doorway 27 longi-

tudinally in the front thereof and through which the reel may be loaded and unloaded. The invention involves the automatic operation of the dampers 19 and 22 in conjunction with the opening and closing of a door at said doorway and any door and operating means suitable for the purpose may be used. I have shown a curved sliding door 28 for closing said doorway. At each end of the door is mounted a pulley 29 supporting a cable 30. One end of the cable is attached to arms 28' depending from the bottom of the door and a counter-balancing weight 31 is carried by the other end of said cable, whereby the door is held in its open and closed positions. The pulley is of the V-groove type so as to operate the cable when said pulley is revolved.

The pulleys 29 are fastened upon a shaft 32 mounted in the oven and extending through the end wall thereof. An upright hand lever 33 (Figure 2) is fastened on the end of this shaft and by swinging said lever the pulleys are revolved. The lever has an arm 34 extending below the shaft 32 and pivoted to the front end of a pitman 35. A lever centrally fastened on the end of the shaft 20 of the damper 19, has its upper end pivoted to the rear end of the pitman. A link 37 pivotally connects the lower end of the lever 36 with one leg of a bell crank lever 38 fastened on the shaft 33 of the damper 22. The other leg of the bell crank lever is weighted and extends downwardly so as to swing downwardly and thus swing the damper 22 upwardly to its closed position.

When the parts are in the position shown in Figure 2, the dampers 19 and 22 are in the position shown in Figures 1 and 3, whereby the door 28 is closed and the oven is being directly heated. To open the door the baker grasps the lever 33 and pulls it forwardly, whereby the pulleys 29 are revolved in a counterclockwise direction (Figure 3) and the door 28 is lowered. This pulling of the lever 33 carries the arm 34 rearwardly and causes the pitman 35 to swing the lever 36, whereby the link 37 is moved forwardly to swing the lever 38. The swinging of the levers 36 and 38 swings the dampers 19 and 22 from the position of Figures 1 and 3 to the position of Figure 4, which causes the oven to be indirectly heated. The products of combustion being diverted into the ducts 17 when the door is opened, it is obvious that they will not flow out into the face of the baker.

In baking bread, and some other articles of food, it is desirable to provide an ample quantity of steam when loading the oven, and in some instances, for a short period after the door is closed. If the oven is directly heated, that is by burners open to the oven, thus liberating products of combustion directly thereinto, the quantity of steam admitted must be limited, because of its effect upon said burners and the extinguishing thereof. While I provide means for admitting steam and controlling the same, the invention is not to be limited thereto, as the use of steam is entirely eliminated in baking a large portion of articles of food.

Steam is supplied to a nozzle 40 by a pipe 41. The nozzle extends longitudinally of the oven, preferably along the under side of the rear portion of the roof, so as to direct jets of steam forwardly as well as downwardly in the baking chamber. A valve 42 is connected in the steam supply pipe 41 and is operated by a shaft 43 mounted on one end of the oven and provided with a hand wheel 44 above the door and within reach of the baker. When the door 28 is opened and the

dampers 19 and 22 moved to direct the products of combustion into the ducts 17, as is shown in Figure 4, the hand wheel 44 is rotated to open the valve and supply steam to the nozzle 40.

So long as the door of the oven remains open and the loaves of bread, cake or other articles of food are being loaded onto the reel 11, steam is discharged into the oven from the nozzle 40, unless the article being baked does not require such steam. When the lever 33 is pushed rearwardly to close the door and shift the dampers to the position shown in Figures 1 and 3, the oven is then directly heated. The baker may adjust the valve 42 to reduce the steam supply and finally to entirely cut it off, thus not interfering with the burners.

It is pointed out that the invention does not depend upon the particular mechanism illustrated and described. The method does involve however the control of the direct and indirect heating when the door is closed and opened, and so long as this is carried out the method will be complied with. Tying the operation of the dampers up with the operation of the door assures automatic operation of the dampers when the door is opened and closed, but the invention is not limited to any particular form of damper, operating means, or door, or to the operation of the dampers by the door.

The description which has been given recites more or less detail of a particular embodiment of the invention, which is set forth as new and useful; however, I desire it understood that the invention is not limited to such exact details of construction, because it is manifest that changes and modifications may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent, is:

1. A baking oven comprising, a movable baking support within the baking chamber, a door to said chamber, a burner, means for diverting the products of combustion from said burner into the baking chamber and for diverting said products from said burner away from said chamber, means for actuating the diverting means, means for opening and closing the door, and means for operating said actuating means operated by said door opening and closing means.

2. A baking oven comprising, a movable baking support within the baking chamber, a door to said chamber, a burner, a conductor for discharging the products of combustion from the burner directly into the baking chamber, a damper for controlling the passage of said products to said chamber, a radiant duct conveying the products from the burner across the oven to a point of exterior discharge and diverting said products from the oven, a damper for controlling the passage of said products through said duct, means for conjointly actuating said dampers to open one and close the other, whereby said products are conducted into said baking chamber to directly heat the same or are conducted across said oven and not into it for indirectly heating said oven, and actuated by opening and closing said door for operating said damper actuating means.

3. A baking oven comprising, a movable baking support within the baking chamber, a door to said chamber, a burner, a conductor for discharging the products of combustion from the burner directly into the baking chamber, a damper for controlling the passage of said prod-

ucts to said chamber, a radiant duct conveying the products from the burner across the oven to a point of exterior discharge and diverting said products from the oven, a damper for controlling the passage of said products through said duct, means for conjointly actuating said dampers to open one and close the other, whereby said products are conducted into said baking chamber to directly heat the same or are conducted across said oven and not into it for indirectly heating said oven, and means for opening and closing said door and connected with the damper actuating means for operating the latter.

chamber or away from said chamber, means for opening and closing the door, means co-acting with the door for operating said diverting means to divert the products of combustion away from said chamber when the door is opened and to divert said products into the chamber when the door is closed, means for discharging steam in the baking chamber, and means for controlling the discharge of steam co-acting with the door, whereby steam is discharged into the baking chamber when the door is opened.

8. An oven for baking articles of food comprising, a baking chamber, means for producing products of combustion, a door for loading and unloading the baking chamber, means for diverting the products of combustion into the baking chamber or away from said chamber, means for opening and closing the door, means for jointly operating the door and the diverting means to divert the products of combustion away from said chamber when the door is opened and to divert said products into the chamber when the door is closed, and means for utilizing the diverted products of combustion when the door is opened to indirectly heat the baking chamber.

9. A baking oven comprising, a movable baking support within the baking chamber, a door to said chamber, a burner, means for diverting the products of combustion from said burner into the baking chamber and for diverting said products from said burner away from said chamber, means for actuating the diverting means, means for opening and closing said door, and means for jointly operating said actuating means with said door operating means, whereby the diverting means is actuated in conjunction with the opening and closing of said doors.

10. A baking oven comprising, a movable baking support within the baking chamber, a door to said chamber, a burner, a conductor for discharging the products of combustion from the burner directly into the baking chamber, a damper for controlling the passage of said products to said chamber, a radiant duct conveying the products from the burner across and within the oven to a point of exterior discharge and diverting said products from the oven, a damper for controlling the passage of said products through said duct, means for opening and closing said door, and means jointly operating the door operating means and the dampers to open one and close the other, whereby said products are conducted into said baking chamber to directly heat the same or are conducted across said oven and not into it for indirectly heating said oven.

4. A baking oven comprising, a movable baking support in the baking chamber, a door to said chamber, a fire box in the chamber below said support, a burner in said box, said box having an outlet for discharging products of combustion directly into said chamber, radiant ducts leading from said box across said chamber, a flue connected with said ducts, a damper for opening and closing the outlet from said box, a second damper for opening and closing said duct, and means actuated by the opening and closing of the oven door for operating said dampers.

5. A baking oven comprising, a movable baking support in the baking chamber, a door to said chamber, a fire box in the chamber below said support, a burner in said box, said box having an outlet for discharging products of combustion directly into said chamber, radiant ducts leading from said box across said chamber, a flue connected with said ducts, a damper for opening and closing the outlet from said box, a second damper for opening and closing said duct, means for conjointly operating the dampers, means for opening and closing the door, and means for jointly actuating the damper and door operating means.

6. An oven for baking articles of food comprising, a baking chamber, means for producing products of combustion, a door for loading and unloading the baking chamber, means for diverting the products of combustion into the baking chamber or away from said chamber, means for opening and closing the door, and means for jointly operating the door and said diverting means to divert the products of combustion away from said chamber when the door is opened and to divert said products into the chamber when the door is closed.

7. An oven for baking articles of food comprising, a baking chamber, means for producing products of combustion, a door for loading and unloading the baking chamber, means for diverting the products of combustion into the baking

LOUIS D. HOULIS.