May 29, 1951 L. E. MENDEL ET AL 2,554,626

RANGE STRUCTURE

Filed April 20, 1946 2 Sheets-Sheet 1

Fig. 1

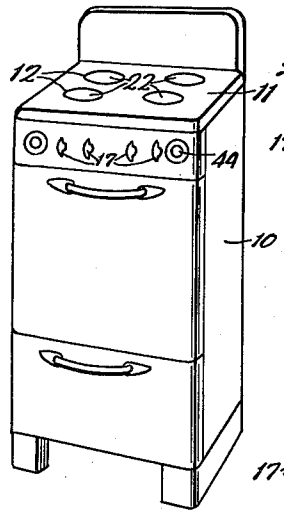


Fig. 2

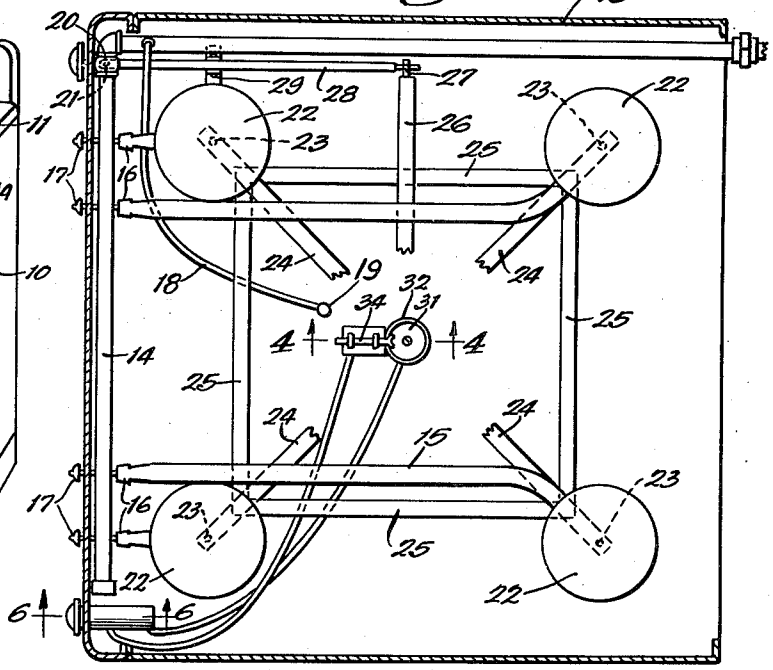


Fig. 3

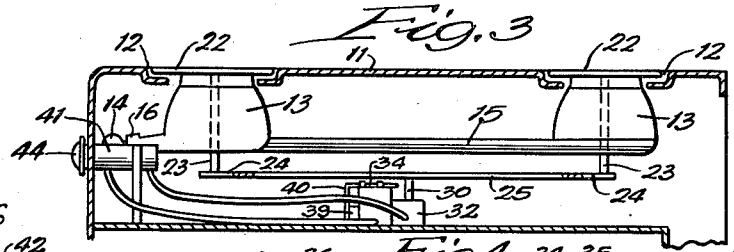


Fig. 6

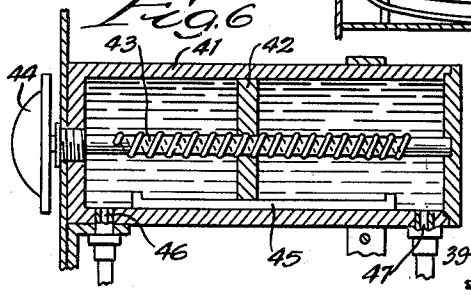


Fig. 4

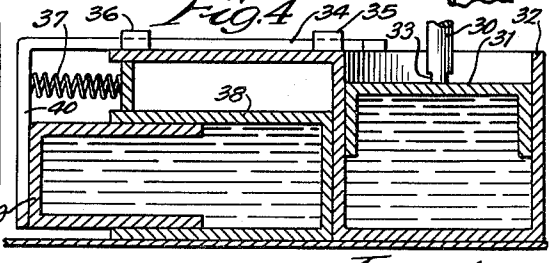
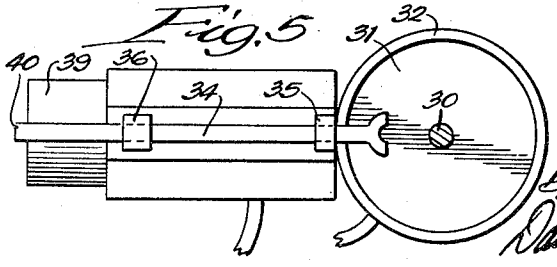


Fig. 5



Inventors:
Leo E. Mendel,
Frederick J. Port and
Charles L. Turner,
By
Dawson, Booth and Spangenberg,
Attorneys.

May 29, 1951 L. E. MENDEL ET AL 2,554,626

RANGE STRUCTURE

Filed April 20, 1946 2 Sheets-Sheet 2

Fig 7

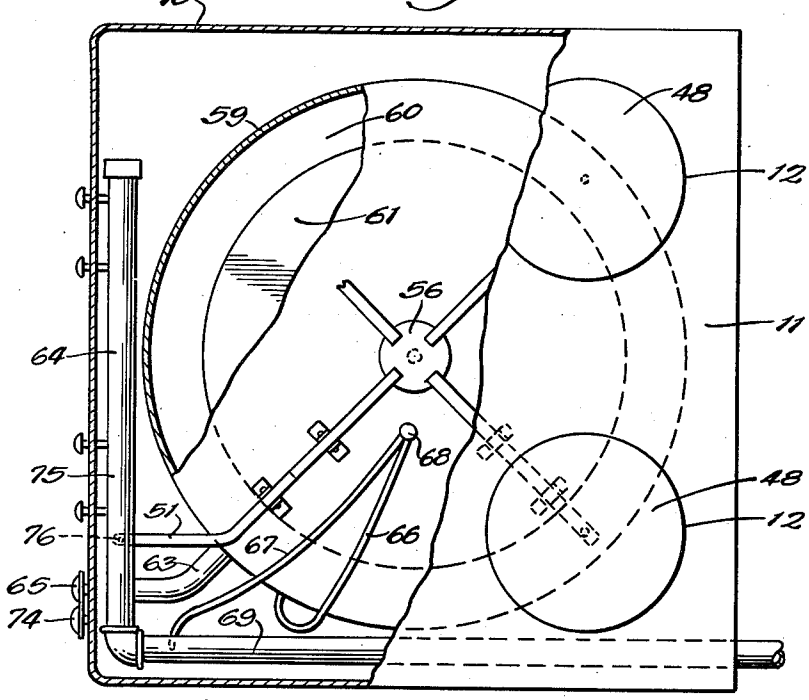
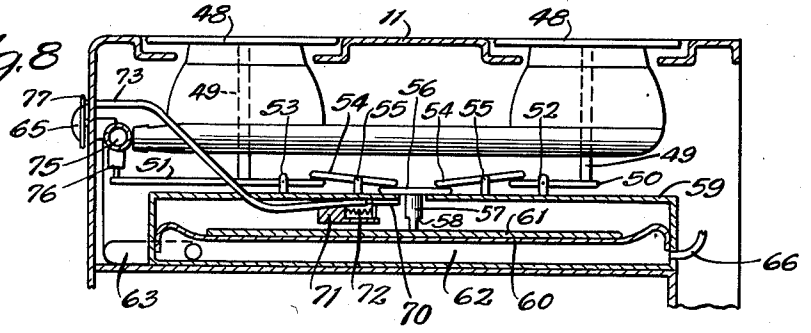


Fig. 8



Inventors:
Leo E. Mendel,
Frederick J. Port and
Charles L. Turner,
By Dawson, Booth and Spangenberg,
Attorneys.

Patented May 29, 1951

2,554,626

UNITED STATES PATENT OFFICE

2,554,626

RANGE STRUCTURE

Leo E. Mendel and Frederick J. Port, Chicago, and Charles L. Turner, Oak Park, Ill., assignors to Cribben and Sexton Company, Chicago, Ill., a corporation of Illinois

Application April 20, 1946, Serial No. 663,720

8 Claims. (Cl. 126—39)

1

This invention relates to a range structure, and more particularly to a range structure in which grates are supported above burners in a range top and in which the grate is moved with respect to the top.

An object of the invention is to provide a range structure equipped with grates in the burner openings of a range top and in which fluid-operated means are employed for varying the distance between the grates and the range top. Yet another object is to provide such a structure in which hydraulic means are employed in the lifting operation, such means being accessible from the front portion of the range. A further object is to provide such a range structure in which the fluid-operated mechanism employs the gaseous mixture used as fuel for the burners as the pressure medium. A further object is to provide fluid-operated mechanism for the lifting of a disk grate above a burner opening in combination with releasable latching means for latching the grate or disk in its elevated position. Yet another object is to provide in combination with a plurality of burners and grates over the burners, a fluid motor for simultaneously lifting all of the grates, the fluid motor being operated from a point exterior of the range interior. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated, in a preferred embodiment, by the accompanying drawings, in which—

Figure 1 is a perspective view of a range embodying our invention; Fig. 2, a plan sectional view on an enlarged scale, the section being taken with the range top removed but with the disks in place; Fig. 3, a broken vertical sectional view of the structure shown in Fig. 2; Fig. 4, an enlarged detail sectional view, the section being taken as indicated at line 4—4 of Fig. 2; Fig. 5, a plan view of a locking structure shown in Fig. 2; Fig. 6, a transverse sectional view, the section being taken as indicated at line 6—6 of Fig. 2; Fig. 7, a broken plan sectional view of a modified form of the invention; and Fig. 8, a broken vertical sectional view of the structure shown in Fig. 7.

In the illustrations given in Figs. 1 to 6 inclusive, 10 designates a range casing and 11 a range top. The top 11 is provided with burner openings 12.

Supported below the burner openings 12 in the range top 11 and in alignment therewith are the burners 13 of the usual construction. The burners are supplied with gas or other fuel

2

through the manifold 14 and other connecting tubes 15. An air mixer valve 16 is provided for each of the ducts 15 and is controlled by a regulating knob or handle 17. A pilot tube 18 leads to the constantly burning pilot burner 19. Within the manifold 14 is a valve 20 controlled by a valve plunger 21.

Supported in the burner openings 12 and preferably flush with the range top 11 are grates 22 which may be in the form of disks or in any other desired form. The grates 22 are supported by rods 23 fixed to the ends of the diagonal strips 24. The diagonal strips 24 are connected by a square frame 25 which provides a bracing structure for the strips 24. A laterally-extending strip 26 is equipped at its end with a pin 27 engaging a perforation in the pivoted lever 28. The lever 28 is secured at its opposite end to the valve plunger 21 and is pivoted at an intermediate point upon bracket 29.

The frame provided by the diagonal members 24 and the members 25 is adapted to be raised and lowered by a fluid motor plunger 30. The plunger 30 is mounted upon a piston 31 received within a fluid-containing cylinder 32.

Latch means are provided for engaging the shoulder 33 of the plunger 30 so as to maintain the plunger in elevated position. Such means are shown best in Figs. 2, 4 and 5. In the structure illustrated, a metal bar 34 is guided in members 35 and 36 for movement toward the plunger 30, the forward end of the bar 34 being adapted to engage below the shoulder 33 to maintain plunger 30 in elevated position. Tension spring 37 normally urges the latch 34 toward the shoulder 33. In order to effect the release of the latching bar 34, we provide a fluid cylinder 38 provided with a piston 39. The latch 34 has a depending leg 40 which is welded or otherwise secured to the piston 39.

In order to supply fluid to the cylinders 32 and 38, we provide in the front panel or wall of the range a fluid cylinder 41 equipped with a movable piston 42 mounted on a threaded shaft 43. The thread on shaft 43 is in the form of a helical wire secured to the shaft and engaging corresponding threads in the piston 42. The shaft 43 extends through the front panel of the range and is fixed to an operating knob 44. In the bottom of the cylinder 41 is mounted a key 45 which engages a slot in the piston 42 to prevent rotation of the member 42 during reciprocation. At each end of the cylinder 41 is an outlet equipped with a conduit leading to one of the cylinders 32 or 38. For example, the outlet 46

may lead through its conduit to the latch release cylinder 38 while the outlet 47 may lead through its conduit to the cylinder 32.

Any suitable fluid may be employed. For example, a non-combustible liquid for filling the cylinders 41, 38 and 32, together with their connecting conduits, is found to be very satisfactory. It will be understood, however, that other liquids or fluids may be employed.

In the operation of the structure shown in Figs. 1 to 6 inclusive, the knob 44 may be rotated so as to advance the piston 42 toward the outlet 47. This operation causes the piston 31 in cylinder 32 to rise, and plunger 30 elevates the frame consisting of the members 24 and 25. The spider arms 24 raise the rods 23 and thereby the disks or grates 22. The forcing of fluid through one end of the cylinder 41 increases the quantity of fluid in the opposite end of the cylinder, and correspondingly reduces that within the cylinder 38. This action reduces the pressure upon piston 39, and tension spring 37 is thus able to draw the latch bar 34 toward plunger 30 where it seats below the shoulder 33. Thus, the plunger 30 and the structure it supports, including the grates 22, are maintained in elevated position.

Simultaneously, with the above operation, laterally-extending strap 26 is elevated, and this causes the forward end of lever 28 to depress the valve plunger 21. Downward movement on valve plunger 21 opens the valve 20 and allows the gas to flow to the manifold 16.

When the cooking operation is completed and it is desired to restore the grates to their original position, the knob 44 is turned in the opposite direction so as to move piston 42 toward the outlet 46. This causes plunger 30 to move downwardly carrying the fixed support 25 and the fixed posts 23 thereon. This operation increases the pressure within the cylinder 38 and piston 39 then retracts the latch lever 34. Simultaneously, with the release of fluid pressure in cylinder 32, the weight of the parts resting upon piston stem 30 causes the stem, together with piston 31, to fall, and therewith the grates 22.

The fluid motor structure illustrated takes up a very minimum of space and may be operated from a front panel of the range. It permits effectively cooperation of the elevating and latching members so that they work together with automatic latching and accurate releasing of the latching mechanism.

In the modification illustrated in Figs. 7 and 8, the structure is very similar to that already described except that the pressure of the fuel gas itself is employed as the means for lifting the grate structures. In the illustration given in Figs. 7 and 8, the grates 48 are supported upon rods 49 resting upon the outer ends of levers 50 and 51. The lever 50 is pivotally supported upon standard 52, and the lever 51 is pivotally supported upon standard 53. The inner ends of levers 50 and 51 engage the levers 54 which are pivotally mounted upon standards 55. The inner ends of levers 54 rest upon a disk 56 mounted upon a plunger 57. The plunger or stem 57 is provided with locking shoulders 58.

A casing 59 is provided below the disk 56 and the stem 57 passes through an opening in the casing 59. Within the casing 59 is mounted a flexible diaphragm 60 carrying a plate 61 to which the stem 57 is secured. The flexible member 60 provides with the bottom wall of the casing 59 a gas chamber 62. Communicating with the chamber 62 is a gas pipe 63 communicating with the manifold 64. The flow of gas through pipe 63 is controlled by a knob or handle 65. Knob 74 controls the flow of gas to the oven. Button 77 controls the release of spring lock 70 through the flexible wire 73.

Leading from the chamber 62 is a small outlet pipe 66 which connects with the pilot burner 68. The conduit 67 also leads to a pilot burner 68 which burns constantly and joins with the gas supply line 69 at a point before it reaches the manifold 64.

In order to latch the plunger or stem 57 in its elevated position, we provide a latch member 70 which is guided within a bracket member 71. A spring 72 normally urges the latch 70 toward the stem or plunger 57. A pull wire 73 leads to a button 77 outside of the range to permit the manual withdrawal of the latch member 70. Within the manifold 64 is a valve 75 controlled by a valve plunger 76.

In the operation of the structure, when the user desires to elevate the grates 48, he turns the knob 65 to open the valve and gas is thus allowed to flow through line 63 into the fluid chamber 62. The flexible diaphragm 60 is thus raised and the stem 57 elevates the member 56. The raising of member 56 causes, through the intermediate bars 54, the raising of the outer ends of bars 50 and 51, and thereby the rods 49 and grates 48 are elevated. At the same time, the bar 51 produces an upward motion of the plunger 76 and opens the valve 75, thereby allowing gas to flow into the manifold 64. As the stem 57 moves upwardly, the latch 70, which is urged inwardly by spring 72, moves under the shoulder 58 and thus locks the stem 57 in elevated position. By reason of the inner connecting bars, grates 48 are also maintained in elevated position. When the grates are positively latched in their elevated position, the knob 65 is turned back to its original position, thus closing the valve in line 63 and preventing any further gas from entering the chamber. In the meantime, the gas within chamber 62 flows outwardly through the pipe 66 to the conduit 67 leading to the constantly burning pilot burner 68 and the pressure within chamber 62 is thus reduced. The diaphragm 60 and the stem 57, however, remain in elevated position by reason of the latch engagement between member 70 and shoulder 58.

When it is desired to lower the grates 48, the pull wire 73 may be drawn (by pulling knob 77) so as to retract latch 70, and stem 57 then falls downwardly under its weight and the weight of the parts thereabove. At the same time, the grates 48 move downwardly to their original position. As the outer end of bar 51 moves downward, it permits the plunger 76 to move downward by gravity closing the valve 75, thus preventing gas to pass into the manifold 64 and acting as an automatic safety device for all top burners.

While in the foregoing specification we have set forth the structure in considerable detail for the purpose of illustrating two embodiments of the invention, it will be understood that such details are given for the purpose of illustration and may be modified widely by those skilled in the art without departing from the spirit of our invention.

We claim:

1. In a range, a frame providing a top wall provided with burner openings, burners aligned with said openings, grates movably mounted over said burners and substantially closing said open-

ings when in lowermost position, a fluid motor, means actuated by said fluid motor having a plunger for elevating said grates, manually-operated means accessible at the front of said range for actuating said fluid motor, and movable latch means actuated by the plunger automatically operative on completion of a grate-elevating operation releasably to secure said grates in an elevated position and operative on reverse movement of the plunger to release the grates and allow them to drop to closed position.

2. In a range, a frame providing a top wall provided with a plurality of burner openings, burners aligned with said openings, grates over said burners, a spider frame below said burners, rods secured to said spider frame and extending through said burners to support said grates, a fluid motor, means actuated by said motor for elevating said spider frame, and manually-operated means accessible outside of said range for actuating said fluid motor.

3. In a range, a frame, a burner supported at the top thereof, a grate over said burner, a fluid motor, means actuated by said motor for elevating said grate, spring-urged latching means for locking said grate in an elevated position, a second fluid motor, and means actuated by said second fluid motor for rendering said latching means inoperative.

4. In a range, a frame, a burner supported at the top thereof, a grate over said burner, a fluid motor, means actuated by said motor for elevating said grate, spring-urged latching means for locking said grate in an elevated position, a second fluid motor, means actuated by said second fluid motor for rendering said latching means inoperative, and manual means accessible from outside of the range for selectively actuating said motors.

5. In a range, a frame providing a top wall having a plurality of burner openings, burners aligned with said openings, grates over said burners, a spider frame below said burners, rods secured to said spider frame and extending through said burners to support said grates, a fluid motor, means actuated by said motor for elevating said spider frame, manually operable means accessible outside of said range for actuating said fluid motor, and latch means actuated by said elevating means operative on completion of a grate-elevating operation releasably to secure said grates in an elevated position.

6. In a range, a frame providing a top wall having a plurality of burner openings, burners aligned with said openings, grates over said burners, a spider frame below said burners, rods secured to said spider frame and extending through said burners to support said grates, a fluid motor, means actuated by said motor for elevating said spider frame, manually operable means accessible outside of said fluid motor, and means actuated responsively to operation of said

fluid motor for admitting fuel to the burner when the grates are elevated and for shutting off such fuel from the burner when the grates are retracted.

7. In a range, a frame providing a top wall having burner openings, burners aligned with said openings, grates movably mounted over said burners and substantially closing said openings when in lowered position, a fluid motor having a plunger, means actuated by said fluid motor for elevating said grates, manually operable means accessible at the front of said range for actuating said fluid motor, movable latch means actuated by the plunger automatically operative on completion of a grate-elevating operation releasably to secure said grates in an elevated position, reverse movement of said plunger being operative to release the grates and allow them to drop to closed position, and means actuated by said fluid motor operative to shut off the flow of fuel to the burners when the grates are lowered and to admit fuel to such burners when the grates are elevated.

8. In a range, a frame providing a top wall having a plurality of burner openings, burners aligned with said openings, grates over said burners, support means mounted below said burners, rods secured to said support means and extending through said burners to support said grates, a fluid motor, means actuated by said motor for elevating said support means, and manually operted means accessible outside of said range for actuating said fluid motor.

LEO E. MENDEL.
FREDERICK J. PORT.
CHARLES L. TURNER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
985,038	Kennedy	Feb. 21, 1911
990,102	Brewer	Apr. 18, 1911
1,025,843	Stanley	May 7, 1912
1,057,814	Erickson	Apr. 1, 1913
1,127,652	Lindemann	Feb. 9, 1915
1,484,805	Whalen	Feb. 26, 1924
1,709,529	Heynis	Apr. 16, 1929
2,007,679	Glynn	July 9, 1935
2,429,638	McKellar	Oct. 28, 1947
2,447,364	Renshaw	Aug. 17, 1948

FOREIGN PATENTS

Number	Country	Date
286,800	Germany	July 24, 1917
485,854	Germany	Nov. 7, 1929
323,530	Great Britain	Jan. 1, 1930
158,766	Switzerland	Mar. 1, 1933