April 2, 1957 R. L. HALLOCK 2,787,381

ADJUSTABLE BROILERS

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Fig. 1.

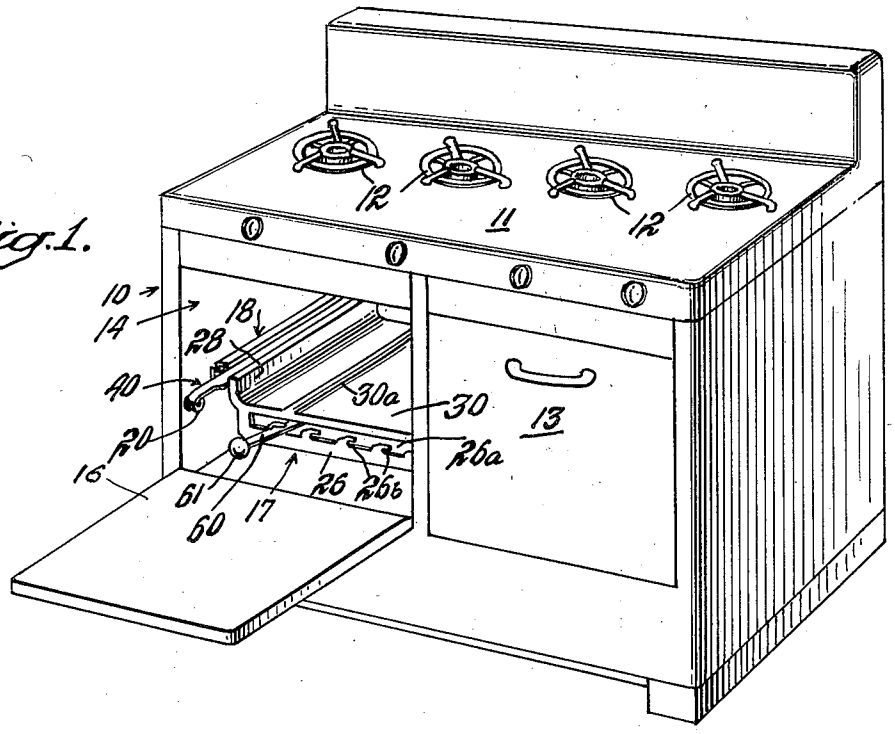


Fig. 7.

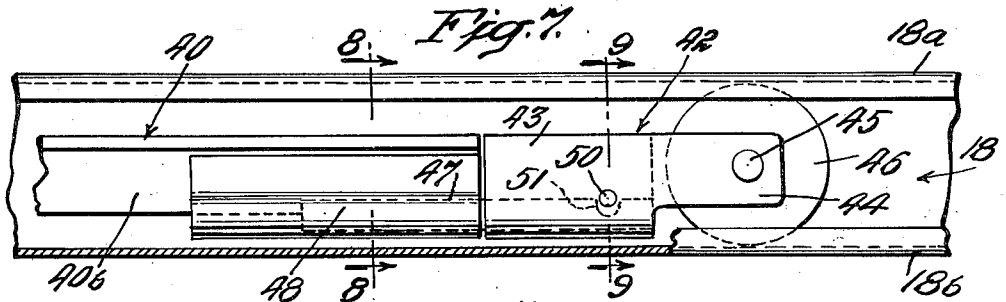


Fig. 8.

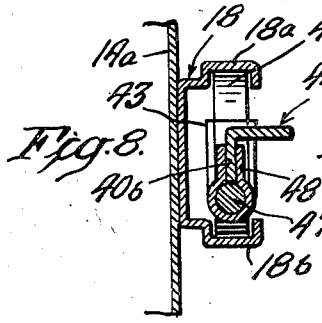
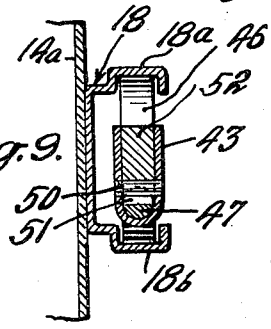


Fig. 9.



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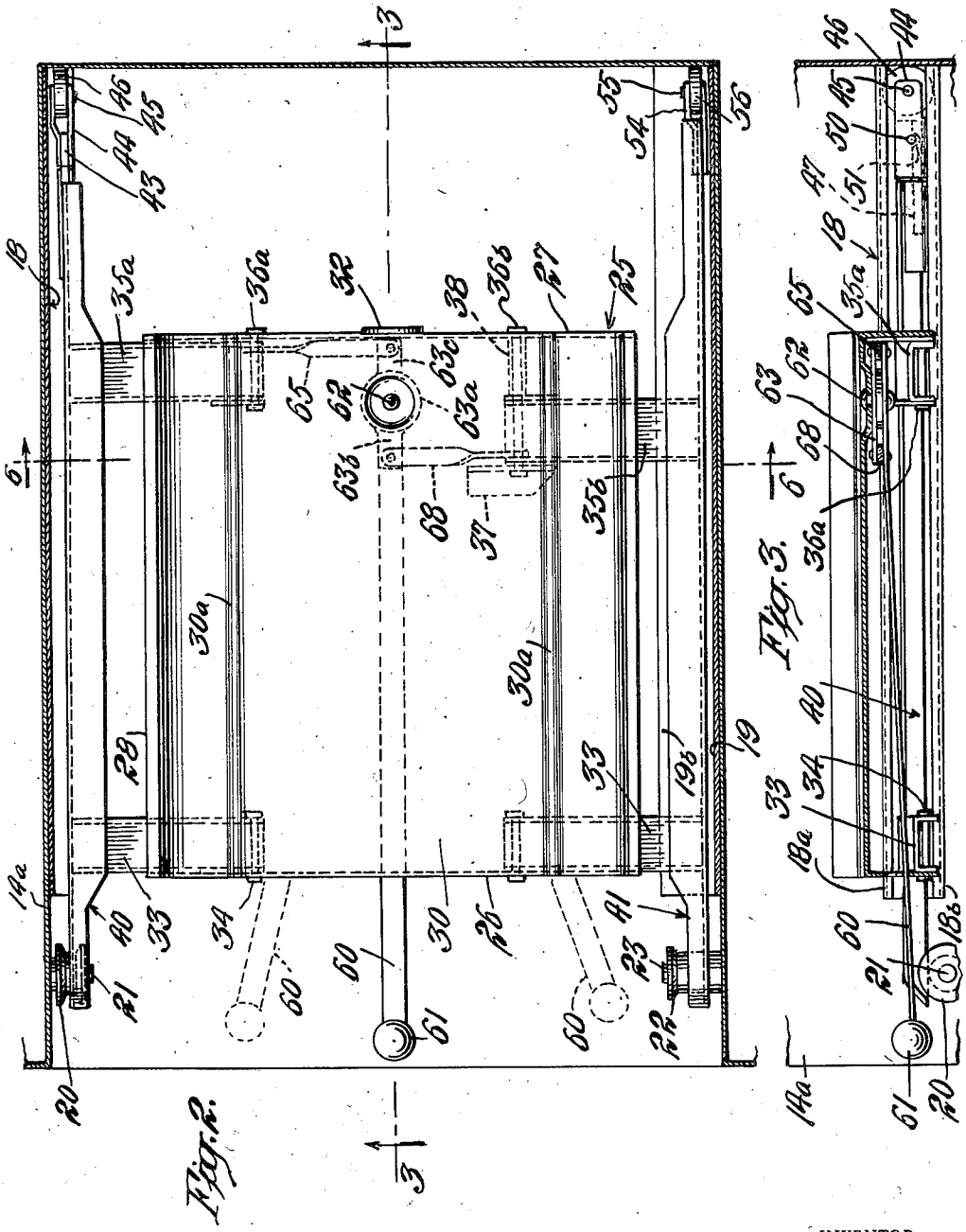


Fig. 2.

Fig. 3.

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ADJUSTABLE BROILERS

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Fig. 4.

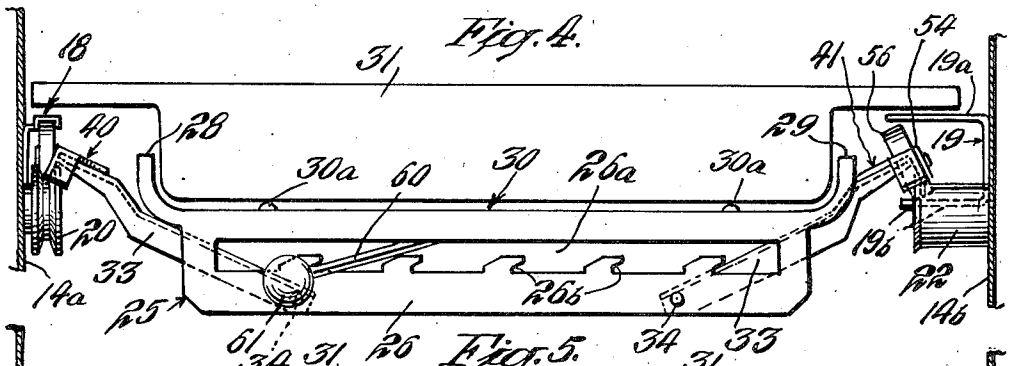


Fig. 5.

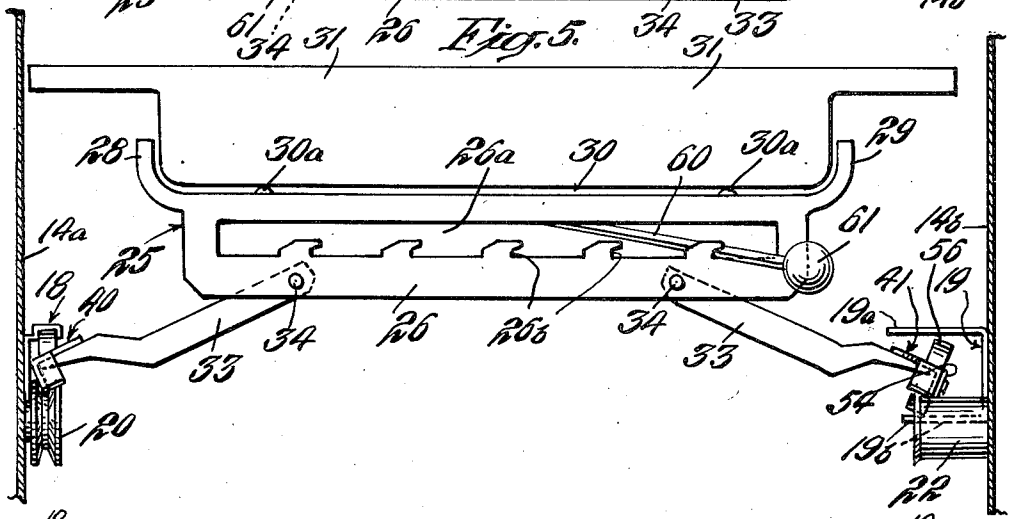


Fig. 6.

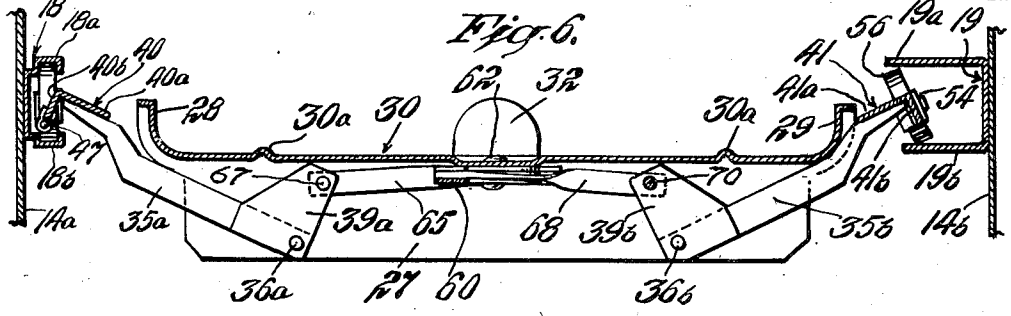


Fig. 10.

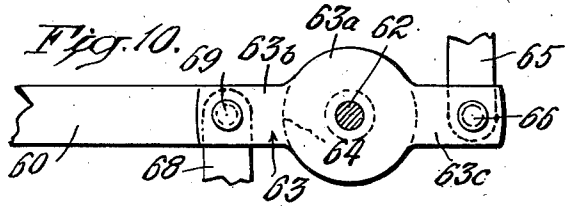
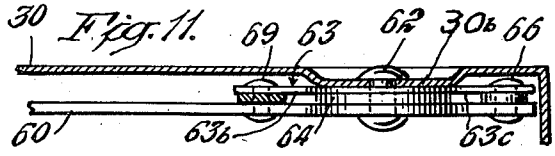


Fig. 11.



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ADJUSTABLE BROILERS

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Application August 25, 1953, Serial No. 376,330

4 Claims. (Cl. 211—143)

This invention relates to cooking stoves and more particularly to broiler constructions to be used therewith.

The principal object of the invention is to provide a simple and effective broiler construction having a food support adapted to be adjusted in elevation relative to a heating element.

Another object of the invention is to provide a self-contained broiler construction that is readily removed from and returned as a unit to the broiler compartment of a cooking stove.

A further object of the invention is to provide a broiler construction wherein lateral movement of the food support relative to the side walls of the broiler compartment is limited to one such side wall during vertical adjustment of the food support.

The invention together with its objects and advantages is set forth in more technical detail in the following description and accompanying drawing, wherein:

Fig. 1 is a perspective of a household cooking stove incorporating this invention;

Fig. 2 is a top plan of my improved broiler construction;

Fig. 3 is a longitudinal vertical section taken on line 3—3 of Fig. 2;

Fig. 4 is a front elevation of the broiler in a lower position of vertical adjustment;

Fig. 5 is a front elevation of the broiler in an upper position of vertical adjustment;

Fig. 6 is a transverse vertical section taken on line 6—6 of Fig. 2;

Fig. 7 is an enlarged detail of a caster mounting shown in Fig. 3;

Fig. 8 is a transverse vertical section taken on lines 8—8 of Fig. 7;

Fig. 9 is a transverse vertical section taken on line 9—9 of Fig. 7;

Fig. 10 is a partial bottom plan of a lever mechanism shown in Fig. 2; and

Fig. 11 is an elevation, partly in section, of the lever mechanism shown in Fig. 10.

Referring now to Fig. 1 of the drawing, I have illustrated my invention incorporated in a more or less conventional cooking stove 10. This stove includes a working top 11 having a plurality of top heating elements or burners 12, an oven compartment 13, and a broiler compartment 14. A door 16 for the broiler compartment is shown in open position and my improved broiler, indicated generally by reference character 17 is located within this compartment. The broiler is supported on the left and right side walls of the compartment by tracks or channel members 18 and 19, respectively. A heating element, either gas or electric, not shown, is located in the upper part of the broiler compartment.

As shown in Figs. 4, 5 and 6, the track or channel member 18 on the left side wall is partly closed by upper and lower flanges 18*a* and 18*b*, and the track or channel member 19 on the right side wall is open and is constructed with a top flange 19*a* that is wider than the bottom flange 19*b*, the purpose of which will be described hereinafter. A roller 20, having a substantially V-shaped periphery is mounted for rotation on a pin 21 on the left side wall 14*a* of the broiler compartment immediately in front of the channel member 18, and a second roller 22 in the form of a half-spool is mounted for rotation on a pin 23 immediately in front of the channel member 19 on the right side wall 14*b* of the broiler compartment.

My improved broiler 17 includes a frame or chassis 25 formed of a single piece of sheet metal and provided with downturned front and rear flanges 26 and 27 and upturned side flanges 28 and 29, which unite to form a rigid structure. The top surface of the frame 25 is in the form of a tray 30 for receiving a food supporting pan 31. The pan 31, which may be of any desired construction, is slidably located between the upturned flanges 28 and 29 and it rests upon a pair of longitudinal ridges 30*a* pressed upward of the top surface of the tray 30. The pan 31 is free for forward sliding movement relative to the tray 30 and its rearward movement is limited by a stop member 32 that projects upward at the rear center of the tray.

A pair of forward arms 33, 33, in the form of channel members, are pivotally mounted upon the front flange 26 of the frame by a pair of pivot pins 34, 34, and a pair of rearward arms 35*a* and 35*b* are pivotally mounted upon the rear flange 27 by a pair of pivot pins 36*a* and 36*b*. As shown in Fig. 2, the rear arm 35*b* is spaced from the rear flange 27 and the end of the pin 36*b*, remote from the flange 27, is supported by an angle member 37, which angle member is welded or otherwise secured to the underside of the frame 25. A sleeve 38 on the pin 36*b* spaces the arm 35*b* from the flange 27. The arms 35*a* and 35*b* are provided with brackets 39*a* and 39*b*, respectively.

A pair of guide rails or runners 40 and 41 in the form of angle members having flanges 40*a*, 40*b*, and 41*a*, 41*b*, respectively, are rigidly attached to the upper-outer portion of the pair of forward arms 33, 33, and to the rear arms 35*a* and 35*b*. The forward end of the flange 40*b* of guide rail 40 fits into and is guided by the V of the V-shaped roller 20 that is mounted on the left side wall 14*a* of the broiler compartment, and the forward end of flange 41*b* of guide rail 41 rests upon and is guided by the half-spool roller 22 that is mounted on right side wall 14*b* of the broiler compartment. As will be described hereinafter, the guide rail 41 is movable transversely as well as longitudinally of the roller 22 and of the channel member 19 on the right side wall 14*b* of the broiler compartment; whereas, the guide rail 40 is movable only longitudinally relative to the V-shaped roller 20 and to the closed channel member 18 on the left side wall 14*a* of the compartment.

On the rear of the left hand rail 40 there is pivotally mounted a caster 42, which caster rides in the partly closed channel member 18. As shown in Figs. 7, 8 and 9, the caster 42 includes a U-shaped body member 43 having a forked extension 44 on the rear thereof, which extension has a transverse pin 45 mounted therein for rotatably supporting a roller 46. A longitudinal shaft 47 has a rear portion thereof located within the bottom of the U-shaped body member 43 and a forward portion thereof is fitted within and rigidly attached, as by spot welding, to the bottom portion of a modified U-shaped member 48, the upper portion of which modified U-shaped member is rigidly attached to the rear of the flange 40*b* of the guide rail 40. The U-shaped body member 43 is bored to receive a transverse pin 50, which pin is received within a slot 51 in an upper rear portion of the shaft 47. The slot 51 is somewhat deeper than the diameter of the pin 50 so that the shaft 47 and

attached guide rail 40 may have limited oscillatory movement, through approximately 50°, relative the transverse axis of the channel member 18. A block of metal 52 is fitted within and spot welded to the U-shaped body member 43 above the shaft 47. With this arrangement the U-shaped body member 43 and attached roller 46 has only limited oscillatory movement relative to the shaft 47; in other words, the body member 43 and attached roller 46 has no longitudinal or transverse movement relative to the shaft 47, and since the shaft 47 is rigidly attached to the rear of the left hand guide rail 40, the rail has limited oscillatory movement relative to the channel member 18. The roller 46 is of course free to rotate on the transverse pin 45 and to move longitudinally of the channel member 18. With this construction the left hand guide rail is mounted for longitudinal sliding movement at its front end by its flange 40*b* in the V-shaped roller 20 and at its rear by the roller 46, which roller rides in the partly closed channel member 18 that is mounted on the left side wall 14*a* of the broiler compartment.

On the rear of the right hand rail 41 there is rigidly attached a forked member 54 having a transverse hole therethrough for receiving a pin 55, which pin rotatably mounts a roller 56, as best shown in Fig. 2. The roller 56 fits within the channel member 19 and is supported by the bottom flange 19*b* of such member. Thus the right hand side rail 41 is mounted for longitudinal movement relative to the channel member 19 by the flange 41*b* which rides upon the half-spool roller 22, and by the roller 56 which rides upon the bottom flange 19*b* of the channel. The right hand rail 41 is also movable transversely, to a limited extent, relative to the channel member 19, as will be described hereinafter. Forward movement of the broiler frame 25 and attached elevator mechanism is limited by suitable releasable stop mechanism, not shown, and rearward movement is limited by contact of the rollers 46 and 56 with the rear wall of the broiler compartment, as shown in Figs. 2 and 3.

The elevator or vertical adjusting mechanism for the broiler frame 25 includes a lever 60 extending from front to rear of the frame substantially on the longitudinal center line thereof, when the broiler is in the intermediate position of vertical adjustment. The lever 60 has a knob 61 at its front end and at its rear it is attached to the under surface of the tray 30 by a pivot pin or rivet 62, as best shown in Figs. 2 and 3. A reinforcing member 63 having a circular portion 63*a* and extensions 63*b* and 63*c* extending therefrom, is attached to the rear of the lever 60. A washer 64 is placed between the rear end of the lever and the circular portion 63*a* of the reinforcing member 63. The member 63 not only strengthens the lever 60, but the circular portion 63*a* affords a bearing surface which is placed in contact with a mating circular surface 30*b* that is pressed from the under surface of the tray 30. A transverse link 65 is pivotally mounted at one end on the rear of the lever 60 by a pivot pin 66 and at its opposite end is twisted 90° and mounted on the bracket 39*a* of the rear arm 35*a* by a pivot pin 67, as shown in Fig. 6. A second transverse link 68 is pivotally mounted at one end to the lever 60 by a pivot pin 69 and the opposite end of this lever is twisted 90° and pivotally mounted to the bracket 39*b* of the rear arm 35*b* by a pivot pin 70. The front end of the lever 60 projects through a slot 26*a* in the front flange 26 of the frame, and this flange is provided with a plurality of notches 26*b* for yieldably holding the lever in any position of adjustment.

In operation, when it is desired to adjust the position of foodstuff resting on the broiler pan relative to the heating element located in the top of the broiler compartment, the knob 61 of the lever 60 is first moved slightly to the right so as to release the lever from the particular notch 26*b* that happens to be holding it, then the front end of the lever is raised slightly, whereupon

the lever is free to move through the slot 26*a* to the right or left, as desired. For rapid broiling or searing of a cut of meat, for example, the lever 60 is moved to the extreme right hand position which raises the broiler to the uppermost position, shown in Fig. 5. After one side of the meat has been seared, the broiler is moved forward relative to the compartment, the meat is turned and the broiler is returned to its original position under the heating element. After the second side of the meat is seared the broiler may be lowered away from the heating element for slower cooking by releasing the lever from the particular notch 26*b* and moving it toward the left of the compartment, thereby lowering the broiler from the uppermost position shown in Fig. 5 to the lowermost position shown in Fig. 4, or to any desired position therebetween.

It is to be noted that in moving the lever 60 to the right or to the left through the slot 26*a* the links 65 and 68 are moved in opposite directions and the brackets 39*a* and 39*b* which are pivotally attached at 67 and 70, respectively, to the levers are oscillated about their pivot points 36*a* and 36*b*, thereby raising or lowering the inner ends of the attached arms 35*a* and 35*b*. The outer end of arm 35*a* pivots through the left side rail 40 on the shaft 47, and the outer end of arm 35*b* pivots through the right side rail 41 and roller 56 on the bottom 19*b* of channel member 19. The front arms 33, 33 which are pivoted to the front flange 26 of the broiler frame act as idler pivots and, due to the rigidity of the broiler frame 25 to which all of these arms are pivoted, are raised and lowered with the rear arms 35*a* and 35*b*. The outer end of the left front arm 33 pivots through the front end of the left guide rail 40 on the V of the V-shaped roller 20, and the outer end of right front arm 33 pivots through the front end of the right guide rail 41 on the half-spool roller 22.

With this arrangement the broiler pan 31 remains level for all positions of vertical adjustment and all side thrust or transverse movement of the broiler frame or chassis relative to the side walls of the broiler compartment is taken by the sliding movement of the right side rail 41 and attached roller 56 relative to the channel member 19 and to the half-spool roller 22; the left side rail 40 being held against transverse movement at the rear by the roller 46 within the partly closed channel member 18 and at the front by the flange 40*b* within the V of the V-shaped roller 20. Also with this arrangement the broiler chassis and attached elevator mechanism may be readily removed from the broiler compartment as a unit for cleaning or the like, and then replaced by merely entering the roller 46 within the flanges of the left channel member 18. The broiler pan 31 can, of course, be removed from the compartment independently of the broiler frame by merely sliding it forward on the ribs 30*a*.

It will be seen that the rear arms 35*a* and 35*b* with the attached brackets 39*a* and 39*b* act as bell crank levers pivoted to the rear flange of the frame at 36*a* and 36*b*, with force applied at 67 and 70, and with fulcrums at the lower edges of the flanges 40*b* and 41*b*, which fulcrums remain in the same horizontal plane while the entire broiler and elevator mechanism is being raised or lowered. With the front arms 33, 33, the pivot points 34, 34 are raised and lowered with the raising and lowering of the broiler, but the fulcrums at the front of the flanges 40*b* and 41*b* also remain in the same horizontal plane.

My invention has been illustrated and described in connection with a broiler for a household cooking stove. However, the invention may be used with equal facility with an adjustable shelf for the oven compartment of a cooking stove. Such a shelf is particularly useful in cake baking where it is desired to raise or lower the cake relative to the oven, without having to remove it from the oven; removal of a cake from the oven during the baking process may cause it to "fall." This invention may also

be used, for example, with adjustable shelves for household refrigerators, and in fact with any horizontal shelf, slab or like member, wherein vertical adjustment is desired without having to unload and reload such member in the adjustment thereof.

Having thus described my invention, I wish it to be understood that I do not desire to be limited to the particular structure illustrated and described for obvious modifications may occur to persons skilled in the art to which the invention pertains.

What is claimed is:

1. In combination, wall structure forming a chamber having substantially parallel side walls, an adjustable support in said chamber, mounting means for said support comprising guide means including cooperating elongated channel and slide members one of which is connected to said side walls, cooperating members pivotally attached to said adjustable support and engaging said guide means, at least one of said guide means including a grooved pulley and a member extending into the groove thereof for restraining transverse movement in said chamber of one of said cooperating members but permitting said adjustable support to move rearwardly and forwardly in said chamber substantially horizontally, a control lever pivoted on said support and having a portion adapted to be gripped for manual raising and lowering adjustment

of said support, lever and link means connecting said cooperating members and said control lever on opposite sides of the pivotal connection between the control lever and said support, and means on said support for retaining said control lever in one of several adjusted positions.

2. The structure of claim 1 in which elongated channel members are fixed to said side walls and with the slide members movable with the adjustable support.

3. The structure of claim 1 in which cooperating elongated channel and slide members are provided with antifriction means between the same disposed in longitudinal spaced relation.

4. The structure of claim 1 in which the guide means for the other side of said support is constructed and arranged to permit transverse movement of said other cooperating member.

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