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2,899,255

RANGE WITH PULL-OUT SHELF

Filed Nov. 17, 1955

3 Sheets-Sheet 1

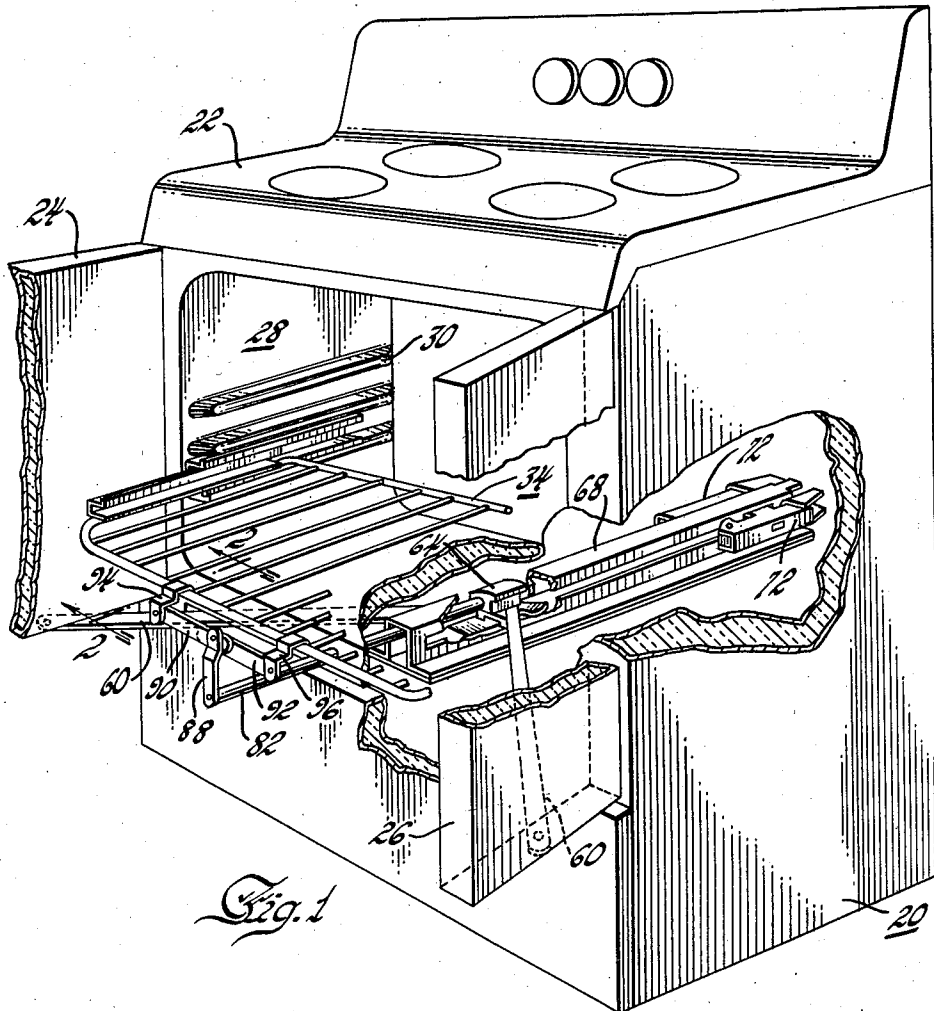


Fig. 1

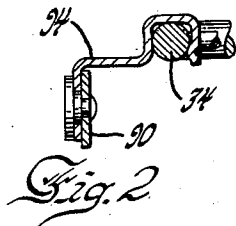


Fig. 2

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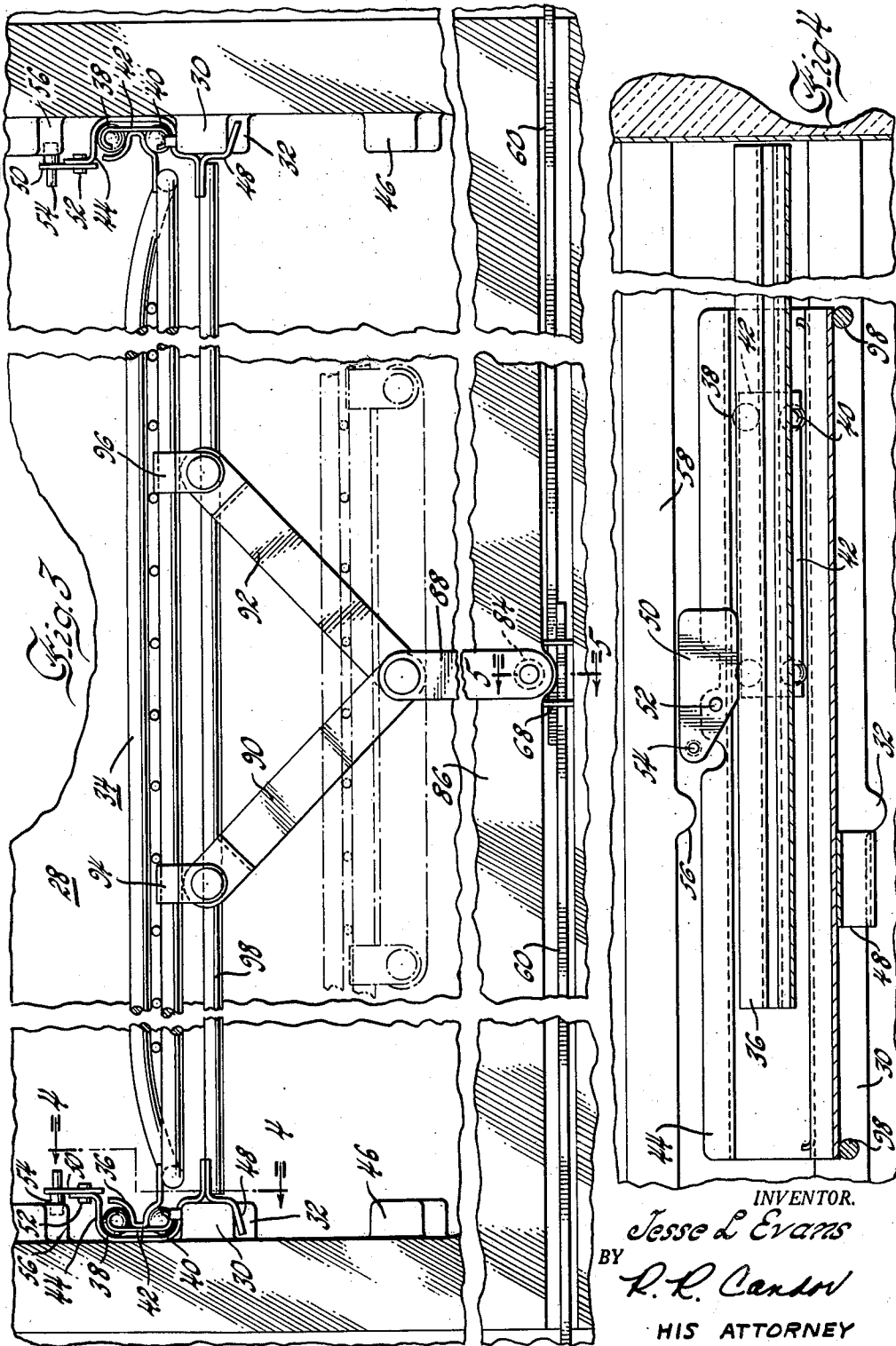
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

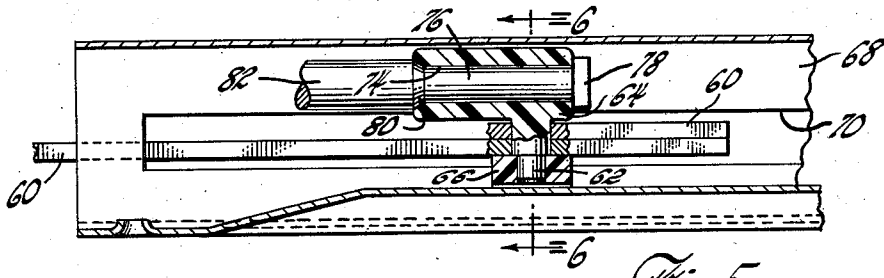


Fig. 5

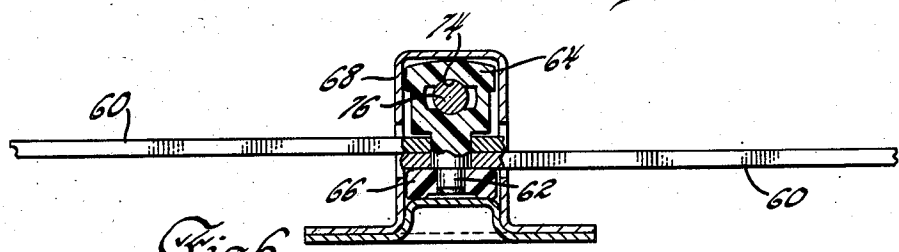


Fig. 6

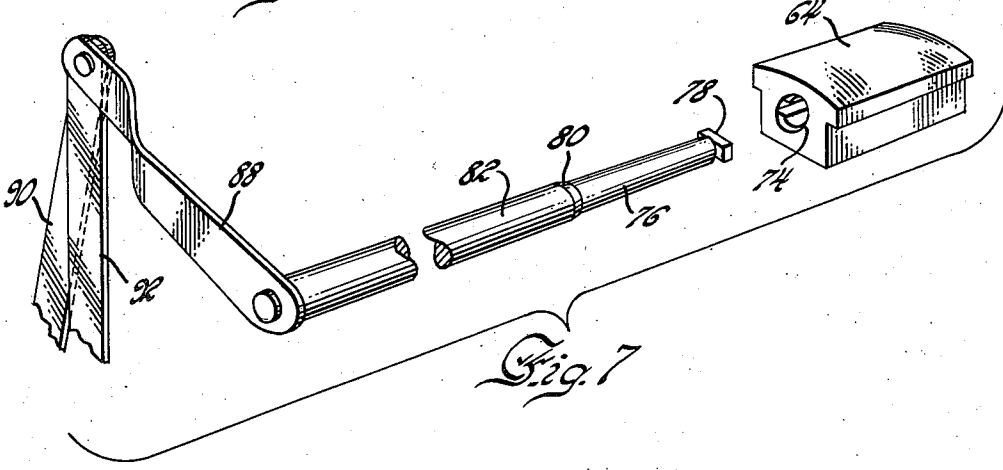


Fig. 7

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## RANGE WITH PULL-OUT SHELF

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Application November 17, 1955, Serial No. 547,403

2 Claims. (Cl. 312—274)

This invention relates to a domestic appliance, and more particularly to a compartment provided with a horizontally movable shelf which may be located at different levels in the compartment and which is pulled out by the opening of the doors.

It is an object of this invention to provide an arrangement wherein a movable ball bearing type shelf may be placed at a plurality of different levels within a compartment and to provide an easily removable attachment by which the shelf may be pulled out of the compartment horizontally whenever the door or doors of the compartment is or are opened.

This and other objects are attained in the form shown in the drawings in which an oven compartment is provided with a plurality of shelf supports capable of supporting a horizontally movable shelf. The compartment is provided with double French type doors linked to a common traveler beneath the compartment. A rod extending beneath the compartment is provided with a detachable bayonet connection with the traveler. The rod is provided with an arm extending into the door opening and having a plurality of connecting links and attaching clips which form a removable attachment to the front edge of the shelf. The opening of the doors moves the traveler, the rod, the arm, the links forwardly and the shelf also forwardly out of the compartment while closing of the doors moves the shelf back into the compartment.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

Figure 1 is a perspective view of a domestic electric range having a compartment and connections between the door and the shelf embodying one form of my invention;

Figure 2 is a fragmentary sectional view taken along the line 2—2 of Figure 1;

Figure 3 is a broken front view of the compartment with the door removed;

Figure 4 is a fragmentary sectional view taken along the line 4—4 of Figure 3;

Figure 5 is a fragmentary sectional view taken along the line 5—5 of Figure 3;

Figure 6 is a fragmentary sectional view taken along the line 6—6 of Figure 5; and

Figure 7 is a perspective view of the traveler, rod, arm and links.

Referring now to the drawings and more particularly to Figure 1, there is shown a domestic electric range 20 including a range top 22 extending over and down to the double doors 24 and 26 which close the door opening to the oven compartment 28 enclosed by the walls forming the oven compartment. The side walls of the oven compartment 28 are provided with a plurality of spaced shelf guides 30 each of which is provided with a

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downwardly extending projection 32 at an intermediate point as is disclosed in Figure 4.

Within the compartment 28 there is provided a horizontally movable shelf 34 having a rod extending around its perimeter and bars extending horizontally from front to rear between the front and rear portions of the rod. The sides of the rod of the shelf 34 are each provided with a channel shaped ball race 36 which extends between the upper and lower sets of balls 38 and 40 which are retained in the cage 42. The balls roll within a channel shaped outer race 44 which is supported upon the upper shelf guides 30 as shown in full lines in Figure 3 or upon the lower shelf guides 46 as suggested by the dot-dash lines. The channel 44 has a Z projection 48 welded to it which extends beneath the shelf guide 30 immediately in front of the projection 32. These projections 48 limit the rearward movement of the channel member 44 and also prevent the lifting of the shelf 34 off the supports 30.

To prevent the accidental removal of the shelves 34 and the channel 44, there is provided a latch member 50 pivotally connected by a pivot pin 52 to the upper flange of the channel 44. This latch member 50 includes a pin 54 extending in opposite directions and having one end protruding outwardly so that the projection 56 of the shelf guide 58 immediately above interferes with its free outward movement whenever the channel 44 is withdrawn forwardly. The member 50 has its center of mass to the rear of the pivot pin 52 so that the pin 54 is normally held in its uppermost position. When it is desired to withdraw the channel 44 the inner ends of the pins 54 are pushed downwardly to allow them to pass the projection 56.

The double doors are hinged at their outer edges. The bottom of each door is connected by one of the links 60 to a pin 62 in the form of a projection extending downwardly from an upper traveler 64. This upper traveler 64 is preferably made of nylon. There is also a lower traveler 66 beneath the links 60 provided with an aperture receiving the pin 62. This lower traveler 66 is likewise made of nylon and has a grooved center portion. The top of the portion 64 is a frusto-cylindrical surface. These contours for the travelers 64 and 66 make it possible for them to slide easily within the guiding housing 68 which is located beneath the oven compartment upon the bottom surface of the bottom wall of the oven compartment. The guideway 68 is provided with side slots 70 through which extend the links 60. The rear ends of the links 60 with camming projections which cooperate with the spring latch retaining members 72 located on each side at the rear end of the guideway 68. This arrangement provides a resilient latch holding both doors in the closed position. The opening of either door will cause the simultaneous opening of the other door.

According to my invention, I provide a detachable connection between the traveler 64 and the front edge of the shelf 34. The traveler 64 is provided with a bore or socket 74 having diametrically opposite grooves in the sides thereof. The bore 74 at its front end is countersunk. This makes it possible to readily insert into the bore 74 the bayonet connection 76 having a cross bar 78 at its inner end which is guided in the slots in the bore 74. The remainder of the bayonet connection 76 is cylindrical and terminates in a beveled shoulder 80 which limits the inward movement of the bayonet connection at the rear end of the rod 82. The rod 82 extends forwardly through the guideway 68 and through an aperture 84 in the downwardly extending portion 86 extending downwardly from the front edge of the bottom wall of the oven compartment 28.

In front of the flange 86, the rod 82 has fixed to it an arm 88 in the form of a metal strap which extends up-

wardly between the doors and the flange 86 when the doors are closed. The flange 86 preferably is provided with a vertical groove or depression extending upwardly from the aperture 84 to receive the arm 88. The upper end of the arm 88 is offset inwardly above the bottom wall of the compartment 28. At its upper end this arm 88 has two links 90 and 92 pivotally connected to it. Pivotaly connected to the opposite ends of these links 90 and 92 are the connectors 94 and 96 each of which are provided with an upper inverted U-shaped detachable connecting portion which hooks over the front portion of the rod which forms the perimeter of the shelf 34 as is clearly shown in Figures 1 and 2.

By this arrangement the opening of either door will simultaneously open the other door and pull the travelers 64 and 66 forwardly. The forward movement of the travelers 64 and 66 will move the rod 82, the arm 88, the links 90 and 92, the connectors 94 and 96 and the shelf 34 forwardly. The ball bearing support for the shelf 34 makes it possible for this movement to be very smooth. In the lower position the links 90 and 92 extend outwardly substantially horizontally, while in the upper position of the shelf the links 90 and 92 extend upwardly at an angle of about 45°. In either position the connectors 94 and 96 provide a firm connection with the perimeter rod at the front edge of the shelf 34.

If it is desired not to have the shelf 34 move outwardly with the opening of the doors, the connectors 94 and 96 are lifted off the perimeter rod at the front edge of the shelf 34 and the arm 88 and the rod 82 is turned 90° to the position shown in Figure 7 aligning the cross bar 78 with the grooves or notches in the bore 74 and then withdrawing the assembly forwardly to detach the rod 82 from the traveler 64. The rod 82 and the connected arm 88 and links 90 and 92 are then removed from the range, thereby preventing the shelf 34 from being moved whenever the doors are opened.

The shelf 34 continues to be useful as a ball bearing supported shelf which is readily movable horizontally. The shelf 34 with the channels 44 can be readily removed or changed in position by pulling the assembly outwardly and depressing the pins 54 to pass projections 56 or 32. The channels 44 are connected by front and rear cross bars 98 as shown in Figures 3 and 4. The shelf 34 and the channels 44 may be replaced by a reverse procedure. The shelf 34 may be reconnected to the traveler 64 by reinserting the rod 82 into the traveler 64 and turning it 90° to complete the bayonet type connection and reconnecting the connectors 94 and 96 to the shelf 34 in either its upper or lower positions.

This application is a continuation-in-part of my co-pending application Serial No. 365,142, filed June 30, 1953, which issued on June 19, 1956, as Patent 2,751,486.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, as may come within the scope of the claims which follow.

What is claimed is as follows.

1. An enclosure including walls enclosing a compartment and having a door opening, a shelf within the compartment, shelf guide means at two different levels connected to said walls for movably mounting said shelf for lateral movement at two different levels in and from said compartment out said door opening and return, double doors for closing said door opening, a horizontally

movable traveler outside said walls below and separate from said shelf, a horizontal guide means outside said walls for guiding said traveler horizontally along the outside of one of said walls, links connecting each of said doors with said traveler, a flange extending outwardly from said one wall adjacent said door opening, said flange having an aperture therein, a horizontal rod extending through said aperture and provided adjacent one end with a rotatable detachable connection with said traveler, said rod extending within and substantially parallel to said horizontal guide means, the opposite end of said rod being provided with a radially extending rigid arm in front of said flange extending into said door opening, a second set of links each connected adjacent an end portion to the end portion of said arm and provided at the opposite end portion with a detachable connection with the front of said shelf at either of said levels, the opposite end portions of said second links being normally spread apart, said arm and second links normally extending in the shape of a Y between the rod and the shelf, said arm and rod being rotatable in opposite directions to detach or attach said rod from or to said traveler.

2. An enclosure including walls enclosing a compartment and having a door opening, a shelf within the compartment, shelf guide means at two different levels connected to said walls for movably mounting said shelf for lateral movement at two different levels in and from said compartment out said door opening and return, door means for closing said door opening, a horizontally movable traveler outside said walls below and separate from said shelf, a horizontal guide means outside said walls for guiding said traveler horizontally therealong, link means connecting the door means and the traveler, said traveler being provided with a socket having its axis parallel to said horizontal guide means, a flange extending outwardly from one wall adjacent said door opening, said flange having an aperture therein, a horizontal rod extending through said aperture and into said socket and provided with an interengaging detachable connection with said socket in said traveler, said rod extending within and substantially parallel to said horizontal guide means, the opposite end of said rod from said socket being provided with a radially extending rigid arm in front of said flange extending into said door opening, a plurality of links each having one end portion pivotally connected to a portion of said rigid arm within said door opening on a pivoting axis parallel to said rod, said links having their other end portions spread apart, and clips removably connecting the front edge of said shelf at either of said levels to the other end portion of said links, said clips being detachable from said front edge of said shelf.

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