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3,040,732

OVEN DOOR MOUNTING MEANS

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2 Sheets-Sheet 1

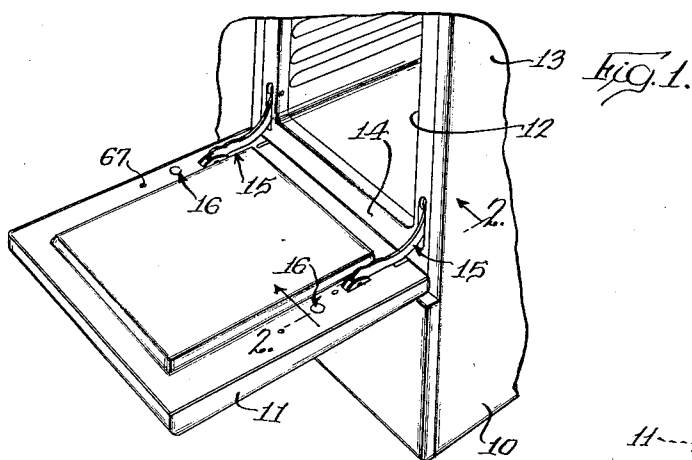
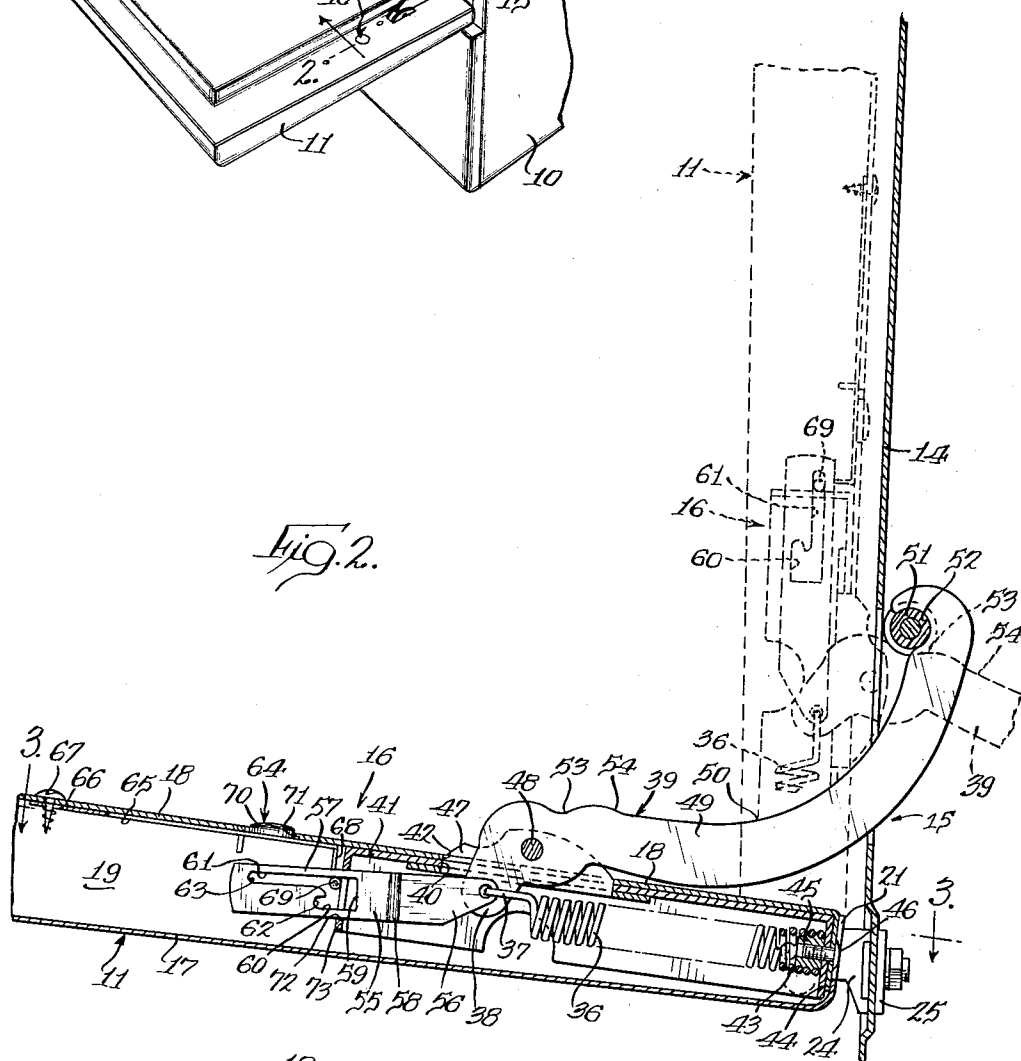
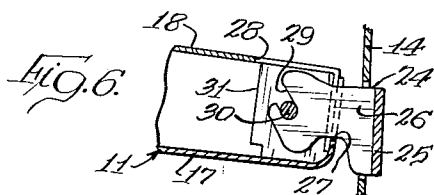


Fig. 2.



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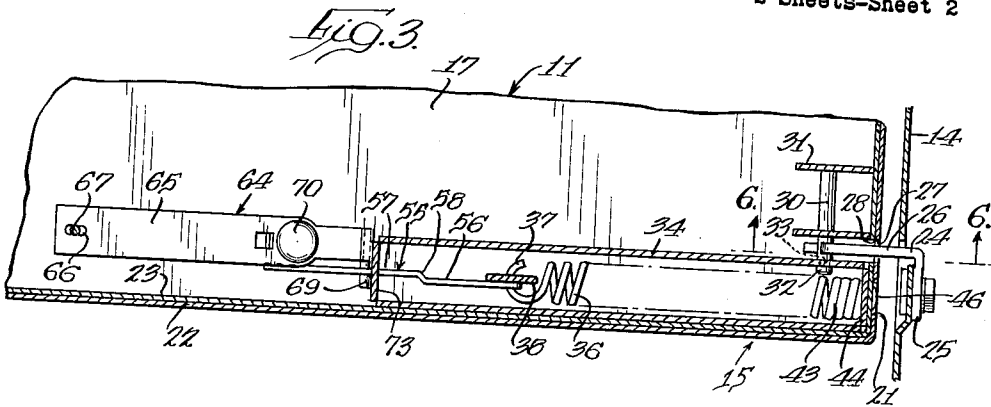
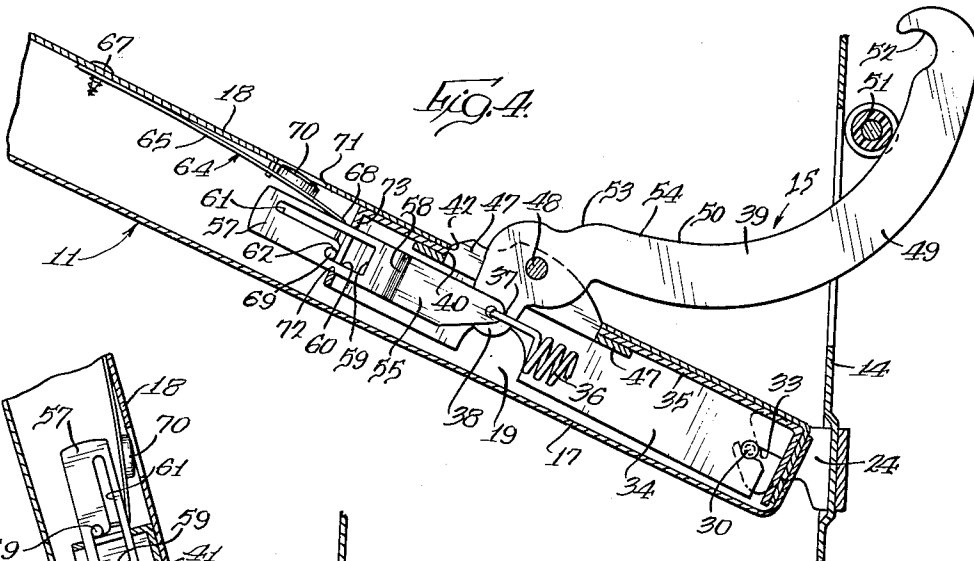
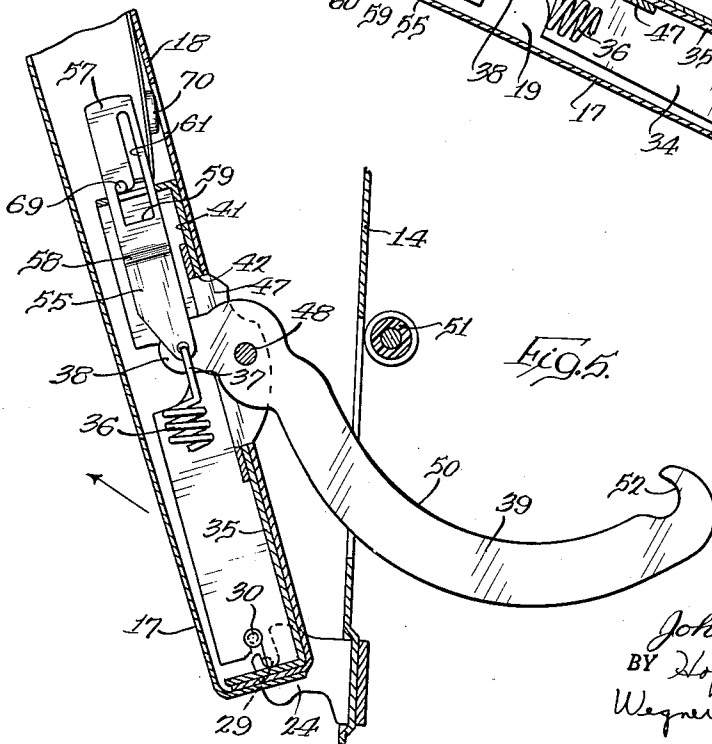
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OVEN DOOR MOUNTING MEANS

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This invention relates to door structures and in particular to mechanisms for removably mounting doors in home appliances such as ovens.

In one form of removable oven door known in the art, the door is provided at its lower end with a pair of hinge pins mounted in recesses capable of receiving a corresponding pair of notched or slotted brackets mounted adjacent the front of the oven. The door is provided with a pair of quadrant lever arms each of which is pivotally mounted adjacent one end on the door with the opposite end of the quadrant lever arm engaging a roller mounted in the oven side wall. A spring is connected between the one end of the quadrant arm and the lower end of the door so as to urge the opposite end of the quadrant arm against the roller and, as a result, urge the hinge pins on the lower end of the door into the notched or slotted brackets.

The instant invention comprehends a new and improved means for disabling the spring bias on the quadrant arm when desired to permit a separation of the quadrant arm from the roller and a movement of the hinge pins outwardly from the notched door supporting brackets whereby the door may be removed from association with the oven wall. Thus, a principal feature of the invention is the provision of a new and improved means for effecting removable association of a door on a wall support.

Another feature of the invention is to provide such means disposed substantially fully within the door.

A further feature of the invention is to provide such means arranged for facilitated manual operation.

Still another feature of the invention is the provision of such means arranged to control the bias exerted by the spring on the quadrant lever arm of the door mounting mechanism and comprising a catch member having a first portion connected to the spring and to the quadrant arm and a second portion defining a pair of slots having different extents in the direction of action of the spring, a detent pin movable into either of the slots, and manually operable means for adjustably positioning the detent pin in a selected one of the pair of slots to alternatively permit free movement of the catch member with the spring or to hold the catch member against movement and thereby eliminate the bias force exerted by the spring on the quadrant arm.

Other features and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings wherein:

FIGURE 1 is a fragmentary isometric view of a range oven having a door pivotally mounted on the oven wall by a hinge mechanism including means embodying the invention.

FIGURE 2 is an enlarged fragmentary vertical section taken substantially along the line 2-2 of FIGURE 1.

FIGURE 3 is a fragmentary horizontal section taken substantially along the line 3-3 of FIGURE 2.

FIGURE 4 is a vertical section generally similar to that of FIGURE 2 but with the door in an intermediate position preparatory to removal of the door from its supporting brackets.

FIGURE 5 is a vertical section generally similar to that of FIGURE 4 but with the door disassociated from its supporting brackets.

FIGURE 6 is a fragmentary vertical section taken

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substantially along the line 6-6 of FIGURE 3 and illustrating the mounting of the door on a support bracket.

In the illustrative embodiment of the invention as disclosed in the drawings, a range 10 is provided with a door 11 for closing the opening 12 of an oven portion 13 of the range. The door 11 is pivotally mounted adjacent the front wall 14 of the oven 13 by a hinge mechanism generally designated 15 including a control means generally designated 16 for arranging the hinge mechanism for disassociation of the door from the oven wall when desired. As seen in FIGURE 1, a pair of such hinge mechanism 15 and control means 16 is provided. The following detailed description is limited to the right-hand mechanism and control means, it being understood that the left-hand mechanism and control means are reversely identical.

Referring now more specifically to FIGURES 2 through 6, door 11 is shown to comprise an outer panel 17, and an inner panel 18 spaced inwardly from the outer panel to define a cavity 19 therebetween. At the lower end of the door, the outer panel 17 is turned to define an end wall 20 and the inner panel 18 is turned to define an end wall 21 inwardly juxtaposed to end wall 20. As best seen in FIGURE 3, at the side of the door, the outer panel 17 is turned to define a side wall 22 and the inner panel 18 is turned to define a side wall 23 juxtaposed inwardly of side wall 22.

As shown in FIGURES 3 and 6, the door is pivotally mounted at its lower end adjacent the front oven wall 14 by a pair of supports or brackets 24 each having a first portion 25 secured to wall 14 and a second portion 26 extending in a vertical plane outwardly from the wall 14 and through a slot 27 in outer panel 17 and an aligned slot 28 in inner panel 18. At its outer end, bracket portion 26 is provided with an outwardly and upwardly opening slot or recess 29 receiving a hinge pin 30 carried by a U-shaped bracket 31 secured to inner door panel 18 adjacent slot 28. The outboard end 32 of pin 30 is received in a complementary recess 33 in an inner wall 34 of a downwardly opening box-like combined guide and limit stop member 35 secured to the inner surface of inner wall 18 in juxtaposition to inner panel side wall 23 and inner panel end wall 21.

Within guide member 35 is disposed a spring 36 having one end 37 pivotally connected to one end 38 of a quadrant arm 39 extending through an elongated opening 40 in the top wall 41 of guide member 35 and a corresponding opening 42 in the inner panel 18. The opposite end 43 of spring 36 is secured to end wall 44 of guide member 35 adjacent inner panel end wall 21 by an exteriorly threaded plug 45 threaded into the end of the spring and secured to cover end wall 44 and inner panel end wall 21 by a screw 46.

Quadrant arm 39 is pivotally mounted on a pin 48 carried by a bifurcated support 47 secured to the inner surface of guide member wall 41 and extending through openings 40 and 42. Extending from pin 48 oppositely to arm end 38 is an elongated arm end 49 extending arcuately approximately 90°. The inner surface 50 of arm end 49 rides against a reaction means comprising a roller 51 mounted within the side wall of oven 13 immediately behind the front oven wall 14. The arm 49 is provided with an intumed end 52 for limiting the maximum opening of door 11, and shoulders 53 and 54 for controlling the movement of the door at the fully closed position (as seen in dotted lines in FIGURE 2).

Spring 36 normally urges surface 50 of the quadrant arm 39 against roller 51 and the reaction force of the spring on the lower end of door 11 urges hinge pin 30 into a fully seated disposition within recess 29 of bracket 24. Thus, pivotal movement of door 11 about the axis of pins

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30 may be readily effected to open and close the oven 13 with the pivotal mounting of the door on brackets 24 being forcibly maintained.

To permit removal of door 11 when desired, control means 16 is actuated to disable spring 36 and prevent the forcible urging of hinge pin 30 into the bracket recess 29. Referring now more specifically to FIGURES 2 through 5, control means 16 includes a longitudinally movable catch member or check 55 having a first end 56 pivotally connected to end 37 of spring 36. The opposite end 57 of the catch member 55 is offset at 58 from the flat plane of end 56 and is provided with an opening 59 merging with a pair of slots 60 and 61 each extending longitudinally of the catch member 55 and generally in alignment with the direction of action of spring 36. As seen in FIGURE 2, the end 62 of slot 60 that is remote from end 56 is disposed substantially closer to end 56 than is the corresponding end 63 of slot 61.

The longitudinal movement of catch member 55 is controlled by a manually operable stop generally designated 64 and including a leaf spring portion 65 secured at one end 66 to inner door panel 18 by suitable means such as screw 67. The opposite end 68 of the spring 65 is turned and is provided with a detent pin 69 projecting laterally into opening 59 of catch member 55. Adjacent end 68, spring 65 is provided with an upstanding boss 70 defining a push button which projects through an opening 71 in door panel 18 for ready accessibility by an operator's thumb during the grasping of the side of the door to effect a movement of detent pin 69 against the action of spring 65 from a normal disposition within slot 61 (as seen in FIGURE 2) to within slot 60 (as seen in FIGURE 4). The catch member 55 is retained against lateral movement in the direction of movement of pin 69 by the opposite edges of a slot 72 in end wall 73 of guide member 35 through which slot end portion 57 of the catch member freely extends.

The operation of control means 16 to permit the removal of door 11 from oven 13 is as follows. With door 11 arranged in the fully opened position, as seen in FIGURE 2, each boss 70 is manually depressed to move detent pins 69 into slots 60. Door 11 is then pivoted on brackets 24 to the position of FIGURE 4. In this position, quadrant arms 39 are pivoted by the action of spring 36 away from the inner door panel 18 sufficiently to draw catch members 55 through slots 72 until slot ends 62 engage detent pins 69. At this point, the operator may release bosses 70 as the pins 69 are confined within the shorter slots 62 and thereby restrained against movement toward inner door panel 18. It will be appreciated that the tolerances and flexure of leaf spring ends 68 are such as to permit detent pins 69 to be urged firmly against end walls 73 of guide members 35 to prevent further relaxation of springs 36 and thereby relieve the spring bias from quadrant arms 39.

Further pivotal movement of door 11 toward the closed position (the dotted line position in FIGURE 2) now causes quadrant arms 39 to move away from rollers 51, as further pivotal movement of the quadrant arms about the axis of pins 48 is prevented due to the disabling of springs 36 by the holding action of catch members 55. When the door has been pivoted to approximately the position of FIGURE 5, it may be lifted to remove hinge pins 30 from recesses 29 of the brackets 24. As it is no longer necessary to maintain the manual depression of bosses 70, the door handle (not shown) normally positioned at the upper end of the door may be grasped during this step, thereby facilitating removal of the door.

To reinstall the door 11 on oven 13, a reversal of the above-described steps is effected. Thus, the lower end of the door is disposed adjacent brackets 24 and pins 30 moved into the bracket recesses 29 until fully seated therein. The door is then allowed to pivot downwardly until quadrant arms 39 engage rollers 51 as shown in FIGURE 4. The downward pivoting is then allowed to continue whereupon the quadrant arms are pivoted in a clockwise direction (from the position of FIGURE 4 to the position

of FIGURE 2) thereby moving catch members 55 outwardly through slots 72 until detent pins 69 are no longer held in slot ends 62 whereupon the springs 65 return detent pins 69 to their normal disposition within slots 61, as seen in FIGURE 2.

As control means 16 are disposed substantially fully within door 11, inadvertent operation thereof is effectively precluded and the elements thereof are protected against damage and deposition of dirt or food materials thereon. The manipulation of bosses 70 to disable springs 36 and thereby permit removal of the door 11 from the oven may be readily effected. The automatic locking of the control means in the spring disabling position during the final steps of the removal operation further facilitates the door removal. Further, the automatic restoration of the control means to the non-disabling position by the simple expedient of pivoting the door to the fully open position upon reinstallation makes such reinstallation extremely simple.

While only one embodiment of my invention has been illustrated and described, it is within the scope of this invention to use a compression spring acting between stop 73 and end 38 in place of the tension spring 36. Furthermore, this invention embraces the repositioning of hinge pin 48 within cavity 19, if necessary, so as to accommodate the reversal of quadrant arm 39 so that lever arm 39 will engage the top rather than the bottom of rollers 51 with such engagement being effected by connecting spring 36 to lever arm 39 on the opposite side of pivot pin 48 from that illustrated.

While I have shown and described one embodiment of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as defined in the appended claims.

The embodiment of the invention in which an exclusive property or privilege is claimed is defined as follows:

1. In a device including a wall, support means on the wall, a door, means mounting said door on said support means, said mounting means permitting pivotal movement of said door when said mounting means is urged in one direction and permitting disassociation of the door from the support means when such urging is prevented, and spring means urging said mounting means in said one direction, apparatus permitting disassociation of the door from the wall, comprising: a catch member movably carried within said door and operably associated with said door mounting means; means defining an opening in the door adjacent said catch member; and locking means within said door and including a manipulating portion generally in said opening to be accessible exteriorly of said door said locking means being selectively operable to fix the catch member and prevent urging of said door mounting means in said one direction by the spring means.
2. In a device including a wall, support means on the wall, a door, means mounting said door on said support means, said mounting means permitting pivotal movement of said door when said mounting means is urged in one direction and permitting disassociation of said door from said support means when said urging is prevented, and spring means urging said door mounting means in said one direction, means for permitting disassociation of the door from the wall, comprising: a catch member movably carried within said door and operably connected to said spring means; detent means in said door and engageable with said catch member; means defining an opening in the door adjacent said catch member; and manually operable means generally within said opening and accessible from the exterior of the door, said manually operable means being connected to said detent means to position the same in the path of movement of said catch member to preclude movement of said catch member and thereby prevent urging of said door mounting means in said one direction.

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3. In a device including a door, and a door mounting mechanism having a support and means including a spring biasing the door into engagement with the support, apparatus controlling said spring, comprising: a catch member having a first portion connected to said spring and a second portion defining a pair of slots having different extents in the direction of action of said spring; and stop means having a portion selectively co-operable with said second portion of said catch member to permit free movement of the catch member with said spring or to preclude movement of said catch member by said spring, said stop means including a detent selectively movable from one to the other of said slots.

4. In a device including a door and a door mounting mechanism having a spring, apparatus controlling said spring, comprising: a catch member having a first portion connected to said spring and a second portion having a pair of slots having different extents in the direction of action of said spring; a stop selectably cooperating with said slots to permit free movement of said catch member with said spring when disposed in the slot having the greatest extent and to hold said catch member against movement and

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thereby disable said spring when disposed in the slot having the smallest extent.

5. In a device including a door and door mounting mechanism having a spring, apparatus controlling said spring, comprising: a catch member having a first portion arranged to be connected to the spring and a second portion provided with an opening defining a pair of slots having different extents in the direction of action of the spring; stop means having a pin projecting into said opening; and manually operable means for adjustably positioning said pin in a selected one of said pair of slots alternatively to permit free movement of the catch member with the spring or to hold the catch member against movement and thereby disable the spring.

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