

June 24, 1969

H. G. HUFF
COMBINATION WINDOW AND SHUTTER ARRANGEMENT
FOR RANGE OVEN DOORS

3,451,389

Filed Feb. 19, 1968

Sheet 1 of 3

Fig. 2

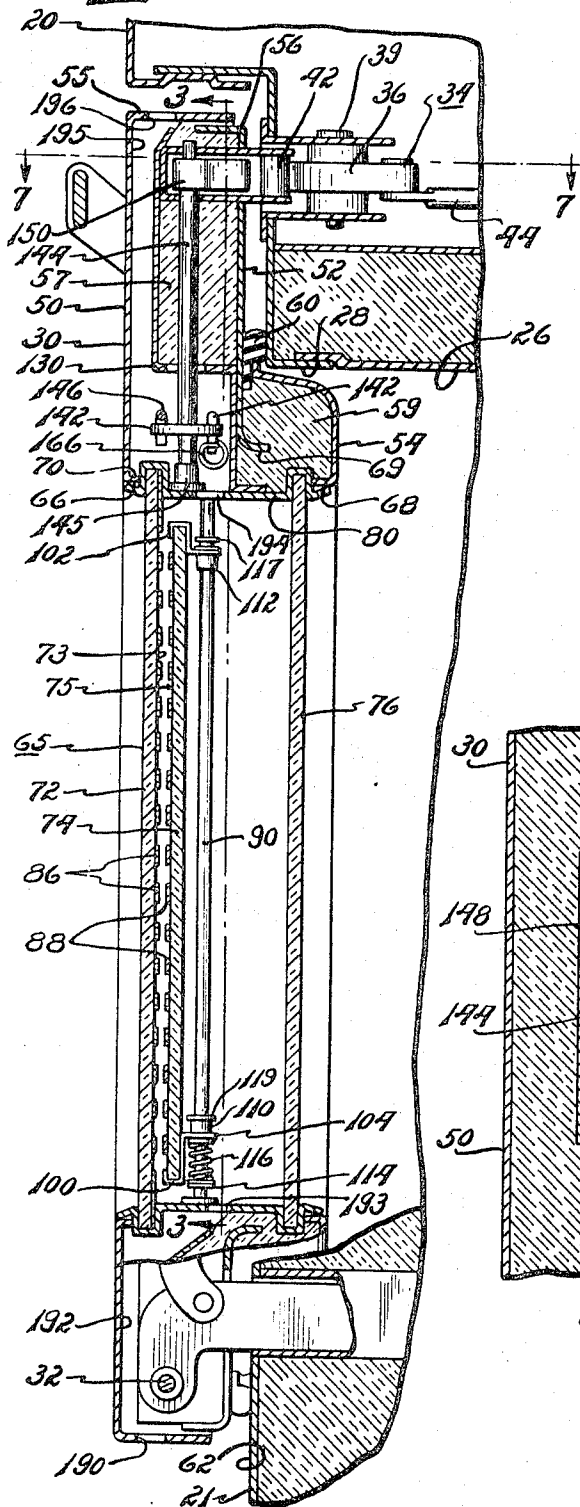


Fig. 1

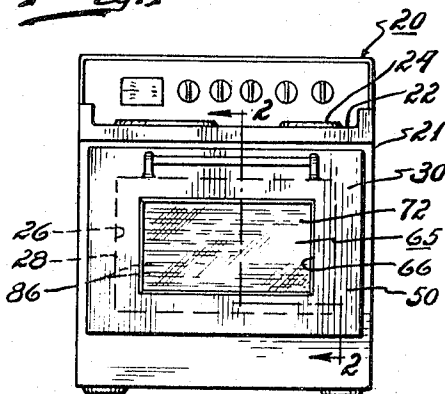
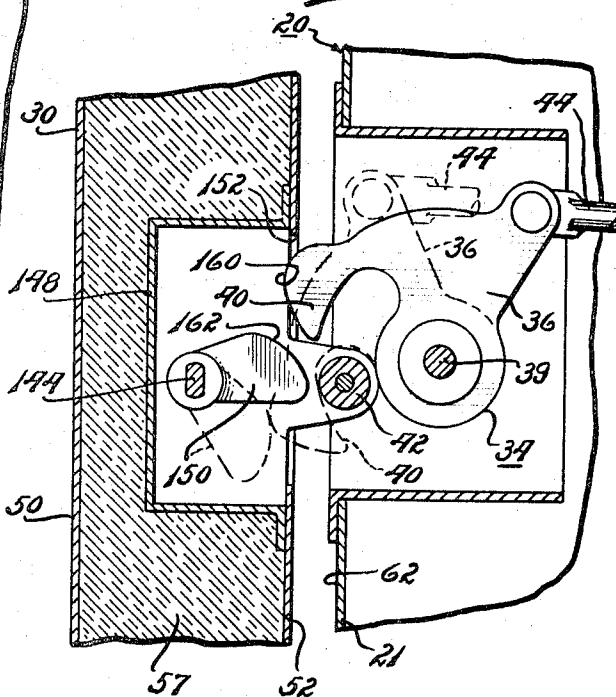


Fig. 7



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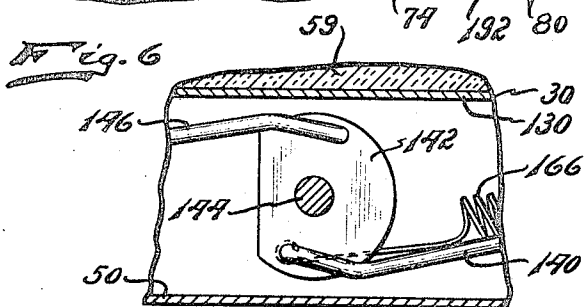
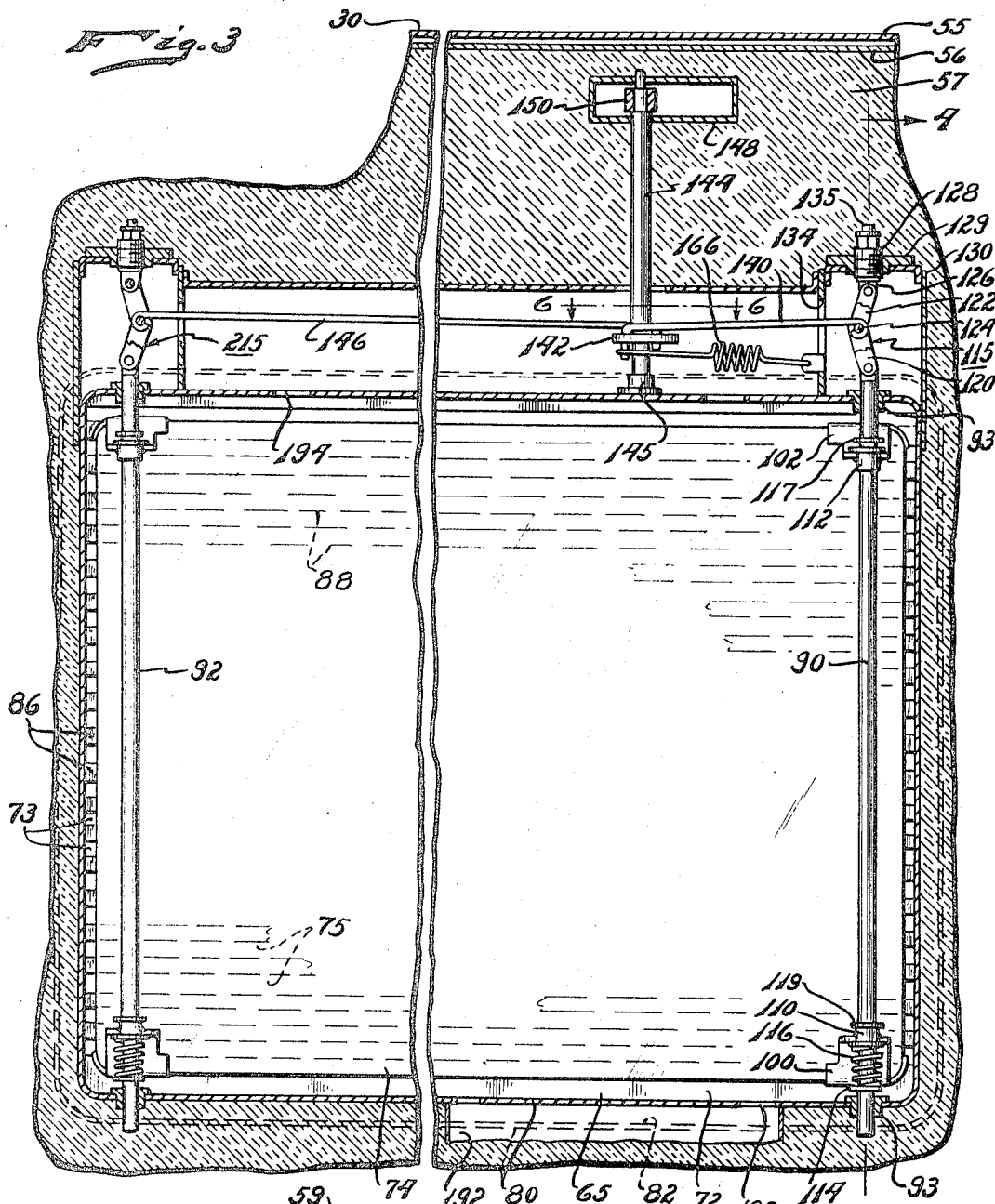
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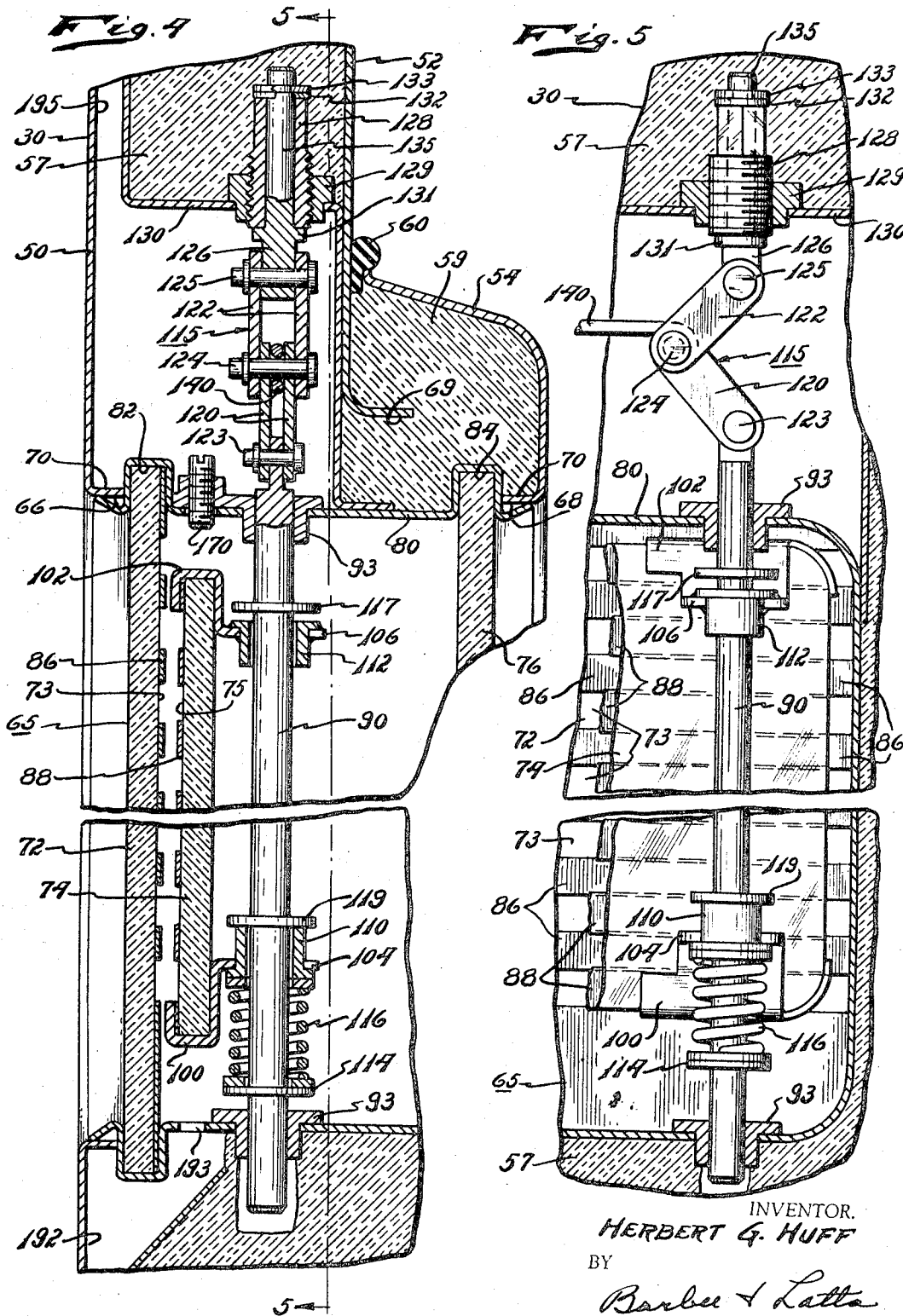
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1

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U.S. Cl. 126—200

17 Claims

ABSTRACT OF THE DISCLOSURE

A combination window and shutter arrangement for a range oven door adapted for use with a high temperature self-cleaning oven. The combination comprising a plurality of spaced apart window panes arranged to form a thermal barrier wherein at least two of the panes are constructed having areas of transparencies and nontransparencies and at least one of these panels is movable relative to the other so that in one position the like transparent areas of the panes are in alignment to permit viewing therethrough the oven chamber and in another position the unlike areas are aligned in opposition to obscure viewing through the window. A mechanical arrangement positions the movable panel automatically through operation of the door latching mechanism.

The present invention relates to a shutter arrangement for a windowed door of a domestic cooking range and more particularly to such windowed doors for use with bake ovens wherein the temperature may be selectively elevated above normal cooking use to a range to effect a self-cleaning of the oven walls thereof by the principle of pyrolysis.

In the preparation of foods in a range oven chamber the oven walls often become spattered in various degrees with the fats and juices from the foods being cooked. There are various methods to clean the oven walls and one method is to elevate the temperature of the oven chamber until the walls of the chamber are heated in a range approximately from 750° F. to 950° F. to reduce the food soils by utilizing the principle of pyrolysis. Often the food soils become accumulated to such a degree in one or more areas that in the reduction of the food soils there may occur a small flash fire, or fires, which, though they are momentary or of short duration, as a lazy flame, and safely contained within the sealed chamber, can cause anxiety to the housewife seeing it through the windowed door and this has led to the general practice of not providing windowed doors for such oven chambers equipped to reduce the soils by high heat. However, this is highly undesirable as it is the cooking operations for which the oven is designed and for which the window serves a practical purpose. A window is highly desired to permit visual observation of the cooking progress without periodic opening of the door that results in cooling down the oven chamber and the loss of heat retarding the cooking operation.

It is an object of the present invention to provide a windowed door for a cooking oven with a shutter arrangement adapted to shutter the window during the period the oven walls are being self cleaned of food soils by application of heat energy.

Another object of the present invention is to provide a windowed door for an oven chamber with a shutter arrangement being selectably operable to open and close the viewing through the window into the oven chamber.

A further object of the present invention is to unitize a shutter arrangement with a window assembly adapted for use in an oven door.

2

A still further object of the present invention is to provide a window in a door for a cooking oven with a shutter arrangement that is automatically operable to shutter the window by the latching of the door.

A still further object of the present invention is to provide a plurality of transparent panels arranged to form a thermal barrier and a window in an oven door wherein at least two of the panels have masked or nontransparent areas arranged with transparent areas and at least one panel being selectively movable relative to the other through a sequence of positions so as to align the areas to permit viewing or nonviewing into the oven chamber through the window.

A further object of the present invention is to utilize the masked areas of the window panes particularly when arranged to obscure viewing into the oven chamber to serve as heat reflectors forming a heat barrier for the retention of heat in the oven chamber.

These and other objects and advantages to be gained in the practice of the invention will be more apparent upon a reading of the following specifications directed to a preferred embodiment and having reference to the accompanying drawings wherein;

FIG. 1 is a front view of a cooking range having a windowed door embodying the present invention;

FIG. 2 is an enlarged vertical sectional view of the windowed door with a fragmentary section of the range body taken substantially along line 2—2 of FIG. 1;

FIG. 3 is a fragmentary sectional view taken along line 3—3 of FIG. 2;

FIG. 4 is a fragmentary sectional view, on an enlarged scale, taken along line 4—4 of FIG. 3;

FIG. 5 is a fragmentary sectional view, with parts broken away, taken along line 5—5 of FIG. 4 illustrating the window in shuttered arrangement;

FIG. 6 is a fragmentary sectional view taken along line 6—6 of FIG. 3; and

FIG. 7 is a fragmentary sectional view, on an enlarged scale, taken along line 7—7 of FIG. 2 illustrating a door latching arrangement used with the present invention.

Referring to the drawing, there is shown a free standing range 20 having a range body 21. The range body includes a top cooking surface 22 having a plurality of surface heating elements 24 and a baking oven chamber 26 whose frontal or access opening 28 is closed by a drop door 30. The door 30 is mounted by hinges 32 to the range body 21.

The oven chamber 26 may be heated in any well known manner by gas or electric for normal cooking operations at preselected temperatures in the range of 150° F. to 550° F. through the setting of suitable controls (not shown). At preselected periods heat energy may be supplied to raise the temperature of the walls of the oven chamber 26 to a range approximately from 750° F. to 950° F. to effect a self-cleaning of the oven walls of adhering food soils, cooking residue and the like, by utilizing the principle of pyrolysis. Further description of the oven heating and control arrangements for cooking and self-cleaning are not believed necessary as they form no particular part of the present invention except as to a door latching arrangement, indicated in general by the numeral 34, that is essential to and associated with the self cleaning operation and only that portion of the latching arrangement that is associated with and essential to the present invention is here illustrated and described.

The latching arrangement 34 comprises a latch member 36 pivotally mounted by a pin 39 to the range body 21. The latch member 36 is formed with a finger 40 adapted to engage and disengage a keeper 42 secured to for carry by the door 30. The latch member 36 is pivotally operated through a link 44 that connects to a control mechanism

(not shown) which may be either a manually operated lever or a motorized operated mechanism such as is shown and described in U.S. patent application of William R. Guy, Ser. No. 659,348, filed Aug. 9, 1967, and assigned to American Motors Corporation.

The oven door is constructed with an outer panel 50 and inner panels 52, 54 arranged in spaced apart relation. The panels 50, 52 are formed panshaped having their marginal edges 55, 56, respectively, turned to extend and overlie each other to form with the panels an enclosed space within which is packed suitable heat insulation material 57. The second inner panel 54 is also panshaped having its marginal edges turned and extended for engagement against the panel 52 to form an extended enclosed space within which is packed heat insulation material 59. The panel 54 forms an extension adapted, when the door is in closed position, to enter into the entrance of the access opening 28 and substantially fill or plug the opening.

A gasket 60 is carried by the door, being secured with the attachment of the panel 54 to the panel 52 and is adapted to seal the door about the opening 28. The gasket 60 extends over to engage the front face 62 of the range body and is extended to engage peripherally about and adjacent the opening 28.

A window opening is extended through the door 30 in which is secured my window and shutter assembly, indicated in general by the numeral 65. The assembly 65 is set and secured in aligned cutout openings 66, 68 formed in the panels 50, 54, respectively, and extends through the enlarged opening 69 formed in the panel 52. The marginal edges of the panels about openings 66, 68 are flanged as at 70 to form a rest and securement for the assembly 65.

The assembly 65 comprises transparent heat resistant panels or glass panes 72, 74, 76 of which panes 72, 76 are secured in fixed spaced parallel relation in a frame member 80. The marginal edges of each pane 72, 76 are received in respective channels 82, 84 formed in the frame member 80 holding the panes 72, 76 in a fixed stationary position in the door. Other stationary panes may be added paralleling panes 72, 76 to increase the efficiency of the thermal barrier of the window without affecting the present invention.

The transparent panel or glass pane 74 is positioned between the window panes 72, 76 and is preferably in a plane parallel with and in close proximity to the window pane 72, being supported in a floating relation therewith.

The adjacent or opposing faces of the windowpanes 72, 74 are provided with masked areas 86, 88, respectively. The masked areas are formed by applying tape, metalized coating, screening or the like and are arranged in a pattern on a surface of each pane 72, 74, to opaque or obscure areas and limit see through to the transparent or unmasked areas 73, 75, respectively. The masked areas being in a pattern with the transparent areas so that upon adjusting the pane 74 into one position relative to the pane 72 the transparent, or like areas 73, 75 will be in opposed aligned relation to permit viewing the oven chamber therethrough. Adjusting the pane 74 into a second position, the dissimilar or unlike areas will be aligned in opposition so that no viewing of the oven is had through the window as the unmasked areas 73 of one panel overlies respective transparent areas 88 of the other panel, and vice versa.

The pane 74 is vertically supported on vertical posts or rods 90, 92. The rods are each journaled for axial movement in respective vertically aligned bearings 93 provided in the lower and upper rails of the frame member 80 and each rod is positioned to parallel a respective vertical side edge of the window pane 74. Each rod is similarly attached to support and move the window pane 74 as well as being similarly and simultaneously operated through identically arranged linkage connections from the latch 34 so that a description of one is believed adequate.

Attached to the lower corner of the window pane 74

is a clip 100 with a similar clip 102 being attached at the opposite top corner of the pane for slidable attachment to the post 90. Each clip 100, 102 is formed with an arm extension 104, 106, respectively, for securement by weld or the like to respective sleeves 110, 112 that are mounted for free sliding movement on the rod 90. The sleeve 110 is movable between collars 114, 119 secured in fixed spaced apart relation on the rod 90. The sleeve 110 is resiliently held in abutment against the collar 119 by pressure of a coiled spring 116 whose opposite end rests upon the collar 114. The sleeve 112 is engageable by a collar 117 affixed on the rod for moving the windowpane downwardly.

The upper end of the rod 90 projects through the upper bearing 93 and frame member 80 for operative connection to a link assembly 115 comprising a first and second pair of parallel links 120, 122. One end of the links 120 is pivotally connected by a pin 123 to the rod 90 while its opposite end is pivotally connected by pin 124 to one end of the links 122. The opposite end of the links 122 is pivotally connected by a pin 125 to a stud 126 that is adjustably mounted by being axially movable with and rotatable within a sleeve member 128. The sleeve member 128 is threadably secured in a plate 129 fixedly attached to a housing 130 which is secured to the frame member 80. The stud 126 and sleeve member 128 are assembled to adjustably position the pivot pin 125 preferably in the axial direction of the axial movement of the rod 90 to align and position the windowpane 74 relative to the windowpane 72. The stud 126 is formed with a shank 135 that is rotatably journaled in and extends through the sleeve member 128. To affix the stud for carry by the sleeve member 128 the shank 135 is formed with a collar 131 adapted to abut one end of the sleeve member 128 while in abutment against the opposite end of the sleeve member is a thrust washer 132 affixed with a locking ring 133 to the shank 135.

The housing 130 encloses and shields the link assembly 115 from the insulation 57 in the door. An opening 134 is formed in the housing 130 through which extends a connecting rod 140 having one end secured to the pivot pin 124 and its opposite end to a cam disk 142 at a radial distance from the disk's axis. A similar rod 146 is attached to the disk diametrically opposite the connection of the rod 140 to operatively interconnect an identical linkage arrangement, designated as 215, as described above to effect the same movement for the rod 92 simultaneously with the movement of the rod 90.

The cam disk 142 is secured to for rotation with a vertical shaft 144 whose lower end is journaled in a bearing 145 attached to the frame member 80 and its upper end extends into a housing 148 for securement thereon of a member or cam follower 150.

The housing 148 is formed with an open side that is aligned with an opening 152 formed in the inner panel 52 of the door. The opening 152 is arranged to receive the finger 40 as it moves to engage and interlock with the keeper 42. The keeper 42 may be a fixed pin or a roller, as shown, which is mounted on an axis pin secured to lugs extending from the housing 148 to be held in fixed relation to the door in front of the opening 152.

The latch finger 40 is formed with a hump arrangement having a cam surface 160 adapted to tangentially engage an arcuate surface 162 formed on the member or cam follower 150 to frictionally drive the cam follower 150 to swing in a clockwise direction to the dotted line position shown in FIG. 7 and to be there held by the displacement of the latch member 36 while it remains interlocked with the keeper 42. The clockwise movement of the cam follower effects a lifting of the window pane 74 to shutter the window and obscure viewing therethrough, as will be more fully explained hereafter. This movement is effected against the tension of a spring 166 which is connected between the cam disk 142 and the housing 134.

Associated with the oven door hinge may be any well-

known resilient tensioning device or arrangement, not shown, to hold the oven door in closed position. This is a well-known practice and the use of the latch 34 is not essential or required when the oven chamber is either in use for normal cooking operation or is not in use. During these periods with the door unlatched the windowpane 74 will be supported in its lower position relative to the stationary windowpane 72 so that its masked areas 88 will overlie in respective alignment with the masked areas 86 of the stationary window pane 72 and their respective unmasked or transparent areas 73, 75 will be in a similar opposed relation to permit viewing therethrough the oven chamber, as shown in FIGS. 2 and 4.

Should the windowpane 74 fail to properly align with the windowpane 72 to permit see through the proper alignment can be readily made by a threading of the sleeve member 128. Access to the sleeve member 128 is had by removal of the outer door panel 50. By threading the sleeve 128 to travel axially up or down it will correspondingly effect a lifting or lowering of the window support carrying with it the windowpane 74. The shank 135 is nonrotatably carried axially by the sleeve member 128 being threadably adjusted to vertically carry the link assembly 115 and rod 90 in the required direction of positioning the windowpane 74. However, by uncoupling the rod 140 from the pin 124 the link assembly and rod may rotate with the sleeve member in effecting adjustment of the pane 74.

When the oven chamber is to be heated to relatively high temperatures to reduce the food soils and thereby effect a self-cleaning of the oven walls safety standards require that the closed door be latched. The general practice is for the latching to be automatically or manually accomplished simultaneously with the setting of the oven heat controls and with an interlock arrangement whereby the door will be maintained latched for the period the chamber's temperature is elevated above 550° F.

In the present structure the latching of the door operates the positioning of the movable windowpane 74 to obscure viewing through the window and in the unlatching of the door the windowpane 74 by its weight and gravity will reposition itself to permit see through into the oven chamber.

In the latching of the door the cam follower 150 is tangentially engaged by to follow the moving cam 160 as the finger 40 interlocks with the keeper 42. The cam follower 150 is swung to rotate the shaft 144 and therethrough the affixed cam disk 142 to axially pull the rods 140, 142 to lift the windowpane 74 through the action of the link assemblies 115, 215, respectively. The rod 140 carries the pin 124 in an arcuate travel fixed by the links 122 about its axis pin 125 in a direction to lift upwardly the link 120 in a pivotal scissor-like closing action with the link 122 which vertically lifts the pin 123 and the rod 90. A similar lifting action is effected simultaneously for the rod 92 to provide an even lifting or raising of the windowpane 74. As the rod moves upwardly the pane 74 is lifted thereby through the spring 116 and clip 100. The windowpane 74 is lifted until its upper horizontal edge abuts against a stop pin 170 threaded into the frame member 80.

The stop pin 170 is threadably adjustable to also serve for aligning the pane 74 so that in its lifted position its masked areas 88 will overlie to cover the transparent areas 73 of the pane 72 while the transparent areas 75 of the pane 74 will overlie to be covered by the masked areas 86 of the pane 72. In this position the masked areas of one pane are contiguous with the masked areas of the other pane to form a nontransparent wall obscuring any viewing of the oven chamber.

The above described mechanism in translating movement from the latch to the rod members 90, 92 has some overtravel designed into its movement to insure that the pane 74 will be carried into its proper lifted position

against the stop pin 170 arranged to insure alignment of the pane 74 with pane 72 to obscure viewing through the window. To avoid stressing the window pane 74 against the stop pin the overtravel is compensated by interposition of the resilient spring 116 in the lift mechanism.

While the door remains latched the finger 40 will displace the cam follower 150 to hold it in its swung position, shown in dotted lines in FIG. 7, to thereby hold the pane 74 in its lifted position.

Unlatching the door the finger 40 is swung out of engagement with the keeper 42 to allow the cam follower 150 to return to the full line position, shown in FIG. 7, being assisted in its return by the tension spring 166. The spring 166 will reversely rotate the cam disk 142 moving the rods 140, 146 outwardly to reset the links to assume a near vertical alignment which allows the rods 90, 92 to move axially downwardly. As the rods move downwardly the spring 116 releases its compression on the clip 100 to allow the window pane 74, by its weight and gravity, to drop downwardly to its first position. The downward movement of the pane is guided by the rods 90, 92. Should the pane 74 become hung up the collar 117, on rod 90, will abut the sleeve 112 to force the pane to move downwardly with the rod.

While the nontransparent or opaqued areas of each window pane are preferably shown as having masks applied as horizontal strips to form transparent areas therebetween, it will be obvious that other means may be employed to arrange this and other patterns as desired. The opaqued areas may be, if desired, integrally formed in the panes.

Though a tangential frictional drive arrangement is shown between the moving finger 40 and the cam follower 150 it will be obvious that a gear sector arrangement may, if desired, be here employed to operate the window lifting mechanism in lowering and lifting the windowpane 74.

The masked areas provide some reflective surfaces to form a limited heat barrier for normal cooking, and a more effective barrier when the window is shuttered during the application of high heat into the oven chamber. However, the conduction of heat to the outer windowpane 72 and the door's outer panel 50, particularly during the period of applying high heat to clean the oven walls, is often more than desired and to reduce this thermal transfer air cooling passageways are provided to conduct the heat therefrom. Cool air is admitted through openings 190 formed in the lower edge of the door to flow through a passageway 192 formed with, for cooling, the lower portion of the outer panel 50. From the passageway 192 the air passes through openings 193 formed in the lower rail of the frame member 80 to circulate and cool particularly the pane 72 and pass through openings 194 formed in the upper rail of the frame member 80.

From openings 194 the air enters to flow upwardly in passageway 195 of which the upper portion of outer panel 50 forms a part so as to be cooled by the air flowing therethrough. The air exits from passageway 195 through openings 196 formed in the top edge of the door.

Although a specific embodiment of this invention is shown and disclosed, it will be appreciated that certain modifications and improvements are within the spirit and scope thereof. Accordingly, such modifications and improvements as are not specifically excluded by the language of the hereinafter claims are to be considered as inclusive thereunder.

I claim:

1. In a range oven door adapted to close an access opening to an oven chamber comprising;

a window opening in said door,

a window covering said opening and including a stationary and a movable panel in opposed spaced apart relation,

said panels each having similarly arranged transparent areas in complement with nontransparent areas, and

means for supporting said movable panel and being operable to support said movable panel in a sequence of positions of which one being the alignment of the like areas of said panels to permit viewing therethrough into said oven chamber and in another position aligning the unlike areas of said panels in opposition to obscure viewing into said oven chamber through said window.

2. In a range oven door of claim 1 including; means for latching and unlatching said door in closed position and said means being operatively associated with said supporting means to advance in sequence the position of said movable panel with each latching and unlatching action.

3. In a range oven door of claim 1 including; means for latching said door in closed position and said means being operatively associated with said supporting means to advance the position of said movable panel, and resilient means associated with said supporting means to continue the sequence of positioning said movable panel following the unlatching of the door.

4. In a range oven door adapted to close an access opening to an oven chamber and having a window opening, a window for closing said opening comprising a pair of transparent panels mounted in spaced apart parallel planes in a frame secured to said window opening, shutter means for said window comprising a movable panel positioned intermediate and in a plane parallel to said transparent panels, said movable panel having separated defined areas formed for see through into said oven chamber and at least one of said transparent panels having areas opaqued in a like arrangement as the defined see through areas of said movable panel, means for supporting said movable panel in a first position relative to said other like arranged mounted panel to permit viewing into said oven chamber through said window and in a second position to obscure viewing into said oven chamber by alignment in opposition said defined see through areas of one panel in opposition with said opaqued areas of the other, and operative means for adjusting said movable panel on said supporting means into said first or second positions.

5. A range oven door of claim 4 including; latch means for said door and being operatively connected with said operative means to adjust said movable panel into at least one of said positions.

6. A shutter arrangement for a window in a range oven door, said door being adapted to close an access opening to an oven chamber, said window comprising a plurality of panels arranged in opposed spaced apart parallel relation and each panel having a like arrangement of transparent areas arranged in complement with opaque areas, means for arranging said panels relative to each other into a first position having the transparent areas unobstructed to permit viewing therethrough into said oven chamber and arranging said panels relative to each other into a second position to obscure viewing through said window by alignment of the transparent areas of one panel in opposition to an opaqued area of another panel, and means connected with said arranging means and being operative to alternately provide the arrangement of said first and second positions.

7. A range oven door of claim 6 including said last mentioned operative means including a latch means for said door and being operative therewith to arrange said panels in said second position upon the latching of said door.

8. A range oven door of claim 7 including resilient means for urging said arranging means to ar-

range said panels in the first position following the unlatching of said door by said latch means.

9. A range oven door for an oven chamber, said door having a window opening, a window for closing said opening comprising a plurality of immobile transparent windowpanes fixedly secured in said opening for viewing therethrough said oven chamber, means for shuttering said window comprising; a panel interposed intermediate a pair of said window panes and being dimensionally smaller than said opening for movement within and about said opening relative to said adjacent panes, said panel being formed with limited see through areas, at least one of said adjacent secured windowpanes having limited areas for see through with other areas opaqued and the opaqued areas being in a like pattern to the limited see through area of said movable panel, means for supporting said movable panel in a first position relative to said adjacent pane to cooperatively align therewith their see through areas for viewing said oven chamber, and means operative upon the closing of said door for adjusting said supporting means to shift and support said movable panel in a second position to obscure viewing through said window by alignment of its see through area opposite the opaqued area of the adjacent fixedly secured pane.

10. In a cooking range having a door for closing an access opening of an oven chamber formed in the range body, latch means for said door and being selectively operable to latch said door in closed position to said range body, a window opening in said door covered by an improved window arrangement having shutter means to obscure viewing through the window, said window arrangement comprising a plurality of parallel arranged windowpanes and at least one being movable relative to the others being fixedly held in a frame member, said movable pane having transparent areas alternating with opaqued areas and at least one of said fixedly held panes having a like arrangement, support means for said movable pane and being operative to move said pane parallel to said other panes, pivotal means movably mounted to said door and being adapted upon closure of said door to being pivoted by said latch member in latching said door, translating means interconnecting said pivotal means with said support means to translate the pivotal movement of said pivotal means to linearly shift said support means upon being imparted movement by said latch member to carry said movable pane into a position with said like arranged pane for aligning the transparent areas of one pane in opposition to the opaque areas of the other to obscure viewing through said window.

11. In a cooking range of claim 10 including; resilient means operatively connected to urge said support means to carry said movable pane into a position with said other panes to align their transparent areas to permit viewing therethrough said oven chamber, and said latch member having means interlocking with said pivotal means while said door is latched to prevent said resilient means from initiating actuation of said support means.

12. In a cooking range having a door for closing an access opening of an oven chamber formed in the range body, latching means for said door including a latch member being operable from said range body to alternately engage and disengage with a keeper carrier on said door, a window opening in said door and being covered by an improved window assembly including shuttering means to selectively obscure viewing through the window, said window assembly comprising a plurality of window

panes in parallel opposed relation and at least one of said panes being movable relative to the others being fixedly held in a frame member,
 said movable pane having portions of its areas opaqued to form a pattern of alternate transparent and opaqued areas and at least one of said fixedly held panes having a like arrangement,
 an axially movable rod member journaled in said frame member,
 means affixing said movable pane with said rod members to support and move said pane in a plane parallel with at least said like arranged fixedly held pane,
 a member journaled in said door and adapted to being engaged and being moved by the movement of said latch member,
 means interconnecting said member with said rod member to translate the movement of said latch to axially move said rod member to carry said movable panel into a first and a second position in response to the movement of said member as being effected by said latch member,
 said first position being an alignment of the transparent areas of said panes for see through and said latch member being disengaged from said keeper, said second position being effected by said latch member engaging said member and said keeper,
 and means for limiting the movement of said movable pane in said second position so that the transparent areas of one pane are in opposition to the opaqued areas of another to obscure viewing through said window.
 13. The cooking range of claim 12 including; resilient means with said translating means to urge operative movement in one direction.
 14. The cooking range of claim 12 including: said limiting means being an adjustable stop threadably secured in said frame member and adapted to being abutted by said movable pane.
 15. The cooking range of claim 14 including:

resilient means interposed between said support means and said rod members to permit further limited axial movement of said rods following the stoppage of said movable pane upon abutting said stop means.

16. The cooking range of claim 12 including:

said translating means comprising, a shaft operably connected for rotation with said member, link means operatively connected to axially move said rod member comprising a first and a second link member each having one end thereof pivotally interconnected to the other, the opposite end of said first link member being pivotally interconnected to said rod member and the opposite end of the second link member being pivotally connected to an anchoring means secured to said door, means operatively interconnecting said shaft to the pivotal interconnection of said link members, and said anchoring means being secured to said frame member.

17. The cooking range of claim 16 including;

said anchoring means comprising a sleeve member and a coaxially extended shaft rotatably secured in for carry by said sleeve member,
 said sleeve member having means for securement to said frame member to permit axial movement relative thereto, and
 said shaft extending from said sleeve member for the pivotal securement thereon of said second link member.

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