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H. E. MILLS

2,240,144

STOVE

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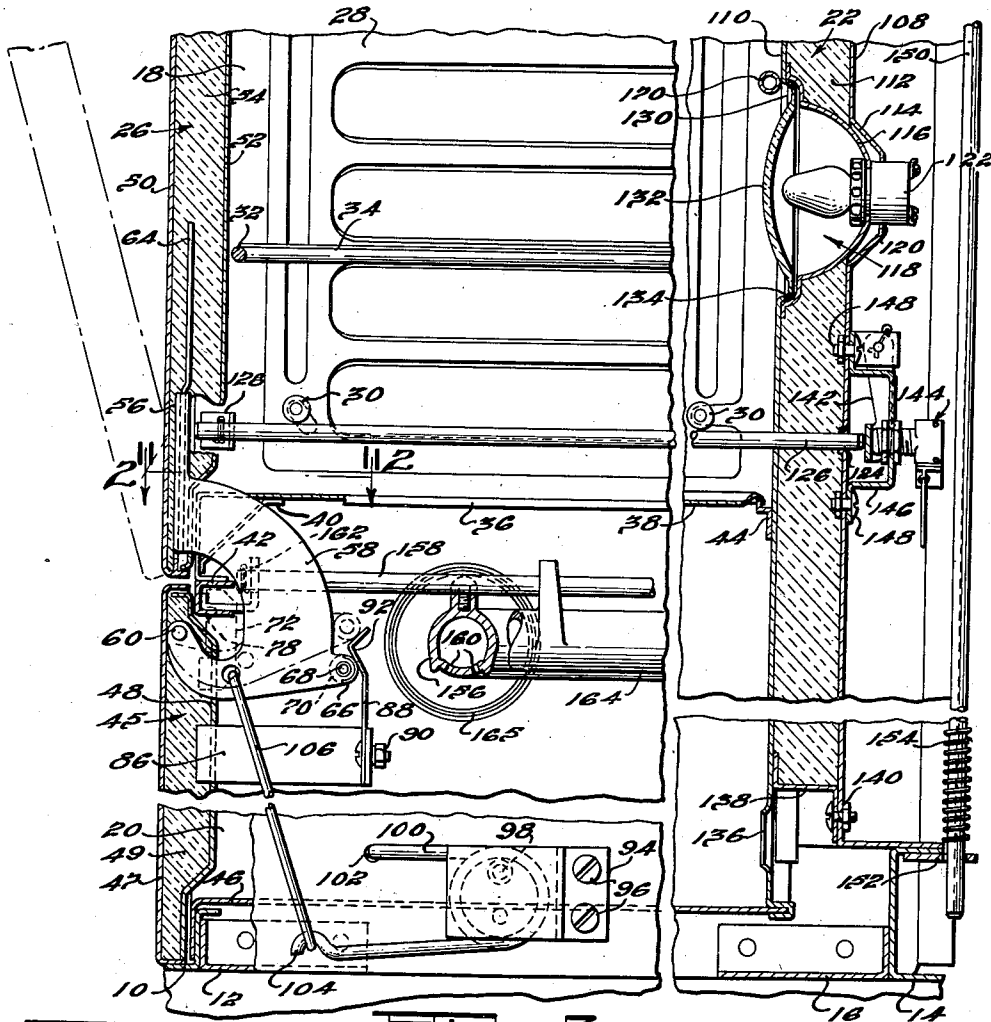


FIG. 1.

FIG. 3.

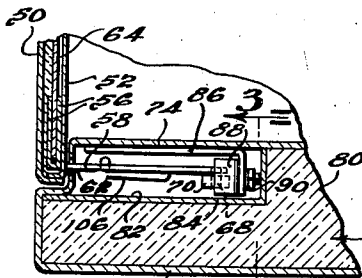


FIG. 2.

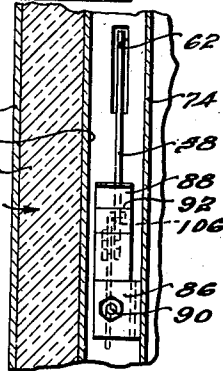


FIG. 4.

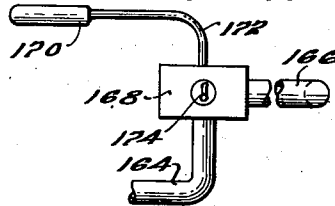


FIG. 4.

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UNITED STATES PATENT OFFICE

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STOVE

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4 Claims. (Cl. 126—39)

This invention relates to stoves and has particular reference to an oven door spring catch which is useful in connection with thermostatically controlled ovens.

In thermostatically controlled ovens there has always been the problem of how to reduce oven heat when broiling in the broiler compartment is desired. Broiling for the most part requires a higher temperature than oven cooking and, when the latter is done in a thermostatically controlled oven, broiling has presented a problem because it is the heat in the oven, rather than the heat in the broiler compartment, which governs the thermostatic control of the oven. Therefore, a means for reducing oven heat, when, at the same time, broiling is desired, is thought to be a simple panacea for this difficulty.

A principal object of this invention, therefore, is to provide in a space between the broiler outer wall and inner lining a firmly secured spring catch which is cooperative with one of the oven door hinges and operable for keeping the oven door slightly ajar when broiling is desired, thus allowing the oven heat to escape and permitting the process of broiling to be carried out without the fear of the thermostatic control system in the oven compartment shutting off the source of heat to the broiler.

Another object of this invention is to provide a catch spring for the oven door of a stove which is operable therewith for keeping said door ajar when broiling is desired, said spring being concealed within a pocket provided therefor between the broiler compartment outer side wall and inner lining.

Another object of this invention is to provide concealed means for enabling the process of broiling to be carried out in the broiler compartment of a stove without interruption or fear of interference caused by thermal conditions prevailing in the oven compartment.

Another object of this invention is to provide an oven door catch spring which cooperates with a portion of the oven door and serves to keep the latter ajar when broiling in the broiler compartment is desired, whereby the heat formed within the thermostatically controlled oven compartment is allowed to escape therefrom, thus preventing the inadvertent shutting off of the fuel supply to the burner as would otherwise occur if the heat were allowed to stay within the oven compartment.

Another object of this invention is to provide an inexpensive combination of means for allowing the operator of a domestic range to use her

broiler compartment at the same time as she uses her oven compartment without fear of the heat generated in the latter causing the control system to turn off the fuel supply to the former.

For a better understanding of the invention, reference may be had to the following specification taken in conjunction with the accompanying drawing of which there is one sheet and in which:

Fig. 1 is a side view, partly in section and partly in elevation, of a portion of a stove, namely, a part of the oven and broiler compartments, and showing the elements thereof more or less diagrammatically with some of said portions being broken away, and illustrating to some extent in detail the application of the invention thereto;

Fig. 2 is a sectional plan view of the invention disclosed in Fig. 1 and taken along the lines 2—2 of the latter figure;

Fig. 3 is a sectional elevational view taken along the lines 3—3 of Fig. 2 and showing more or less principally the disposition of the elements of the invention with respect to the means for concealing same between the lining and panel of one of the stove walls; and

Fig. 4 is purely a diagrammatic sketch of the thermostatic control system and showing its association with the gas source.

The figures are confined to a portion only of a domestic gas range, namely, to that portion of the stove which is devoted to the oven and broiler compartments. The stove itself is shown as being supported at the front by means of a frame member 10 (reinforced by and suitably connected to another member 12) and at the back by means of a frame member 14 (reinforced by and suitably connected to another member 16). The side supporting members are not shown, but are nevertheless provided. An oven compartment is shown diagrammatically at 18, and a broiler compartment at 20. Common to compartments 18 and 20 is a stove rear wall, generally indicated at 22, and a stove side wall, generally indicated at 24, said walls being secured in any conventional manner to the aforementioned frames for being supported thereby.

Oven compartment 18 is provided adjacent walls 22 and 24 and is insulated and spaced from the top burner compartment (not shown) and the various utility compartments (not shown) which are usually provided in the modern type domestic range. An oven door, generally indicated at 26, is provided for closing the oven compartment 18 and is preferably of the bottom-hinge type. The two inner walls of compartment 18 are

each provided with a rack support 28, each being removably secured to its respective wall by means of studs 30 which are fixedly mounted thereon. The removability of rack supports 28 enhances the facility in the cleaning thereof. For supporting foods within compartment 18 there is provided an oven rack 32 (or a plurality thereof) which is sized so as to have opposite sides thereof engage with opposite portions of rack supports 28 and lie in a horizontal plane covering substantially the entire area of compartment 18. Rack 32 is made up of open work material and has, preferably, a plate or pan 34 disposed thereupon for supporting foods which would otherwise drop through the spaced portions of rack 32. It is readily seen that rack supports 28 are provided each with a series of guide means for permitting removable rack 32 to occupy a plurality of selective elevations within compartment 18.

The floor assembly of compartment 18 consists of a plate 36 adapted for supporting an oven floor tray 38, said plate and tray being supported and held in position by means of a front reinforcing means 40 (which itself is supported by means of a front and central stove frame or brace member 42), and by a rear supporting means 44, means 44 being firmly secured to a portion of the stove rear wall 22 in any suitable manner, such as by spot welding.

Broiler compartment 20 is disposed directly below oven compartment 18 and is separated therefrom by the floor assembly of compartment 18. Compartment 20 is preferably provided with a sliding drawer arrangement (same not being specifically shown), but has at least, as is shown, a door, generally indicated at 45. At 46 is shown the bottom of compartment 20 and same may be either a floor or the supporting means for the broiler drawer, if the latter is used. Member 46 is secured at either end thereof in any suitable manner to the front and rear walls of the broiler compartment. The door 45 of compartment 20 is of compound structure and has a front panel 47, a rear lining 48, and an inter-lining of insulating material 49.

Oven door 26 is a heavy compound structure comprising a door panel 50, a door lining 52, and a filling of insulating material 54 therebetween. To each lower corner of door 26 is secured a cup-shaped angle portion 56 of a cam-shaped hinge 58 which is fulcrated about a point by means of a pin 60, the portion of hinge 58 opposite the angle portion 56 being adapted for movement into and out of a slot 62 which is provided therefor in a recessed portion of the jamb of the door seat. The security between door 26 and the angle portion 56 of hinge 58 is had by disposing portion 56 within door 26 between panel 50 and lining 52 and securing same in place by means of a brace 64 which is secured to the cup-shaped portion of angle 56 of hinge 58 and itself secured in any conventional manner to a face of the oven door lining brace (not shown). The portion of one of the hinges 58 which lies between the fulcrum point 60 and the angle portion 56 is formed to provide an outwardly extending cam or roller portion 66 which is predetermined in shape and has a hole therethrough in which is disposed a pin 68 which is adapted to have rotatably secured thereto a roller 70. The hinge just spoken of is preferably that one which is adjacent the wall 24, but not necessarily so.

As has been said, each of the hinges 58 is fulcrated by means of a pin 60. Pin 60, in general,

comprises a rivet which is loosely associated with a hole provided therefor in a jaw portion of hinge 58 and is fixedly secured to a support 72 provided therefor in each of the spaces between the lining 74 and panel 76 of wall 24 and between the inner and outer portions of the wall dividing compartments 18 and 20 from the burner and utility compartments. Support 72 is spot welded or otherwise secured to inner portions of each of the two walls and has the portion thereof which supports pin 60 somewhat bent away from the portion of said wall so that pin 60 can be easily installed therein. This bend occurs at 78.

Side wall 24, which has been said to be common to both the oven and broiler compartments, is a compound structure comprising, in addition to the panel member 76 and lining member 74, a slab of insulating material 80 disposed between members 74 and 76. Material 80 is continuous throughout the space provided therefor except for the portion which is broken away in order to provide a pocket 82, the walls of which are formed by means of a box-like structure 84 one wall of which is defined by lining 74. Within pocket 82 and firmly secured to the inner face of lining 74 is a bracket 86. One end of bracket 86 breaks away from lining 74 in order to form a supporting portion for a bar spring 88 which is secured to said supporting portion by means of a nut and bolt arrangement 90. Spring 88 projects vertically upward from bracket 86 for a substantial distance and then is bent in a V-shape as at 92. Both bracket 86 and spring 88 are adapted to be concealed from view within pocket 82. The underside of the lower portion of V-shaped portion 92 of spring 88 is adapted to be contacted by the cam portion 66 of hinge 58 when door 26 is in its closed position (as is shown by the full lines of Fig. 1); when door 26 is in a partially opened position (as is shown by the dotted lines in Fig. 1), the cam portion 66 of hinge 58 is adapted to contact the upper side of the upper portion of the V-shaped portion 92 of spring 88. It will be seen, therefore, that the strength of spring 88, together with its V-shaped portion 92, are adapted to lend opposition to the opening of door 26 as well as to the closing thereof (the latter being effective after the door has been closed to the extent shown by the dotted lines in Fig. 1).

The lower portion of lining 74 of wall 24 is adapted to have secured thereto an angle iron 94 by means of cap screws 96. In a hole provided therefor in a portion of angle 94 a pin 98 is loosely mounted and is adapted for supporting and holding in place a coil spring 100 one end of which is hooked into and through an opening 102 provided therefor in lining 74 of wall 24. Spring 100 is coiled around pin 98 and backs up on itself to provide and terminate in a hook portion 104. Engageable with and linked to hook portion 104 of spring 100 is a hook arm 106 the end thereof opposite thereto being hooked into and through an opening provided therefor in a portion of hinge 58 which is disposed between its fulcrum point 60 and cam portion 66. It will be seen that the combination of spring 100 and hook 106 operates to lend opposition to the opening of the oven door 26 and also to facilitate the closing thereof after same has been opened, and that only one of such spring mechanisms is necessary, but that it is possible to provide one for each of the hinges 58.

The rear stove wall 22, which is common to both the oven and broiler compartments, is a compound structure comprising a back wall 108,

an inner lining 110, and insulating material 112 disposed therebetween. Wall 108 is cup-shaped as at 114 in order to provide for the reflector 116 of the oven light, generally indicated at 118, and is provided with an opening 120 for the reception therein of the oven light receptacle 122. Wall 108 also has an opening provided therein as at 124 for the slidable movement therethrough of a switch rod 126, said rod extending from the rear of the stove to the jamb of the oven compartment opening by passing through that wall of compartment 18 opposite the wall 24 and projects outwardly from said jamb after having passed through a guide 128 provided therefor in said wall, whereby rod 126 is reciprocable responsive to the opening and closing of oven door 26. The lower portion of the wall 108 terminates in an angle formation which is spot welded or otherwise secured to the rear frame member 14.

Lining 110 of wall 22 has a flanged opening provided therein as at 130 which is adapted not only for exposing the lens 132 of the oven light assembly 118 but also for supporting and centering same. A snap ring 134 is provided for securing lens 132 in place against a forward flanged portion of reflector 116. Lining 110 is also provided, near the base thereof, with a vent or opening 136 which is adapted principally to allow a passage of secondary air therethrough. For keeping the insulation 112 in its place, and also for supporting same, there is provided a member 138 which supports the insulation from underneath and is spot welded to the inner face of lining 110 at a point above the opening 136 therein, and is secured to the inner face of wall 108 by means of a nut and bolt arrangement 140.

The end of rod 126 opposite the end which is contacted by the oven door 26 is adapted to operate a lever 142 which is associated with the oven light switch, generally indicated at 144, switch 144 being secured in place behind the stove by means of a switch bracket 146 which is secured to the stove back wall 108 by means of a series of nut and bolt arrangements 148. When the oven door is closed, the switch lever 142 is in the position shown in Fig. 1 and is adapted in that position to break the oven light circuit; when the oven door is opened, the pressure on rod 126 is thereby relieved and the switch lever 142 is adapted to spring forwardly and thus close the circuit whereby the oven light is turned on. The only part of this mechanism which is exposed to the operator is that part of rod 126 which projects for a short distance outwardly through a hole in the jamb of the oven compartment opening.

The wiring of switch 144 to the oven light receptacle assembly 122, and the wiring from the electric source to and from switch 144, are not shown but are hooked up in a conventional manner so as to permit the light circuit to be open when the oven door is closed and, on the other hand, to permit the light circuit to be closed when the oven door is open.

A cover (not shown) for the top burner compartment (not shown) is provided and is pivotally connected to a slide rod 150 which is suitably adapted for permitting the cover to drop out of sight, as a result of a downward and backward motion given to the cover, when the top burners (not shown) are put in use. The top end of rod 150 is provided with said pivotal connection (not shown), the other end of said rod being insertable through an opening provided therefor in a

bracket or stop guide 152, said stop being suitably secured, as by spot welding, to the underside of the top portion of the stove rear frame member 14. A coil spring 154 is provided in telescopic relation to the portion of rod 150 disposed directly above stop 152 and has one of its ends suitably secured to that portion of rod 150 to which it is adjacent. The spring 154 is of predetermined length and strength so that the burner box cover can be lowered out of sight only to a certain depth and so that the replacement thereof to normal position will be aided by said spring.

Disposed in the upper portion of broiler compartment 20, and adapted for broiling or oven heating purposes, is a burner 156 which is suitably supported by a rod 158 and having burner openings 160. Rod 158 is adapted for supporting burner 156 inasmuch as it itself is rigidly supported by means of a bracket 162 which is in turn supported by the central stove frame member 42. Burner 156 includes a mixer tube 164 one end of which terminates in a bell mouth 165 which is provided with the usual air openings (not shown) and the usual valve mechanism (not shown), the other end of which is connected to the manifold or feed line 166 (after having passed through a combination manual and automatic control valve diagrammatically illustrated at 168).

In an obscure position in the oven compartment 18 (so as to be out of the way and at the same time directly reacted upon by the heat in the compartment 18) is disposed a thermostatic bulb or element 170. Element 170 can be any means whatsoever which will suitably reflect the effect of the temperature within compartment 18 upon the valve mechanism 168. The communication between the element 170 and the valve 168 is had by means of a conduit or extension 172 of element 170 connected to said valve. Valve 168, controlled either automatically by the element 170 or manually by a handle 174, is adapted to inter-associate itself with the effect of the oven heat, the gas source 166, and the burner mixer tube 164, so that after the desired temperature has been reached in the oven, the effect of said temperature will be reflected upon the mechanism in valve 168 so that the source of fuel to the burner will thereby be cut off. And, when this desired temperature does cut off the fuel supply to the burner, it simply means that not only is oven heating brought to an end, but also is broiling. To prevent this inadvertent cutting off of the fuel supply to the burner when both the oven and broiler compartments are in use, the spring 88 is provided which will necessarily keep the oven door ajar and permit the escape of a certain amount of heat from the oven compartment and thereby allow broiling to be continued without the interruption otherwise caused by the temperature regulating system associated with the oven compartment.

It is to be understood that the invention is not to be considered as limited to the embodiments and applications thereof which have been selected for the purposes of illustration, but is intended, rather, to embrace and include all other embodiments and applications of the new and useful principles thereof, which are to be considered reasonably within the scope of the appended claims.

I claim:

1. In a stove, an oven compartment having an opening for providing access thereto, a door for closing said opening, a broiling compartment ar-

ranged below said oven compartment, a heating element disposed in said broiling compartment and adapted for heating said oven compartment, thermostatic means associated with said heating element for regulating the supply of energy thereto and having an element thermally associated with said oven compartment so that said thermostatic means may be set for controlling said heating element to provide a selected temperature condition within said oven compartment, a support in said broiling compartment below said heating element for supporting a food product to be broiled by said heating element, and means associated with said door to said oven compartment for maintaining said door ajar so as to prevent the operation of said thermostatic means when it is desired to use said heating element for broiling food in said broiling compartment.

2. In a stove having an oven compartment with a door for closing same, a heating element arranged to supply heat to said oven compartment, a broiling compartment below said oven compartment and in which said heating element is arranged, thermostatic means for controlling the supply of energy to said heating element, a heat responsive element for actuating said thermostatic means thermally associated with said oven compartment, a cam member secured to said door and a spring secured to said stove and associated with said cam for holding said door ajar whereby the operation of said thermostatic means is prevented.

3. In a stove having an oven compartment with side walls, a door for closing said compartment, a heating element disposed below said oven com-

partment and arranged to supply heat thereto, a broiling compartment below said oven compartment and in which said heating element is arranged, thermostatic means for controlling the supply of energy to said heating element, a power element for said thermostatic means and arranged to respond to changes of temperature in said oven, a cam member secured to said door and a spring secured to said stove between opposite faces of one of said walls and associated with said cam for opposing the closing of said door whereby the temperature in said oven compartment is prevented from rising to a point whereby said thermostatic means will interrupt the supply of energy to said heating element.

4. In a stove having an oven compartment with side walls, a door mounted on a horizontal pivot for closing said compartment, a heating element arranged to supply heat to said oven compartment, a broiling compartment below said oven compartment and in which said heating element is arranged, thermostatic means for controlling the supply of energy to said heating element, a heat responsive element for actuating said thermostatic means and positioned to be affected by the temperature in said oven, a cam member secured to said door and a concealed spring secured to said stove between opposite faces of one of said walls and associated with said cam for opposing the closing of said door whereby the temperature within said oven compartment is prevented from rising to a point where said thermostatic means will interrupt the supply of energy to said heating element.

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