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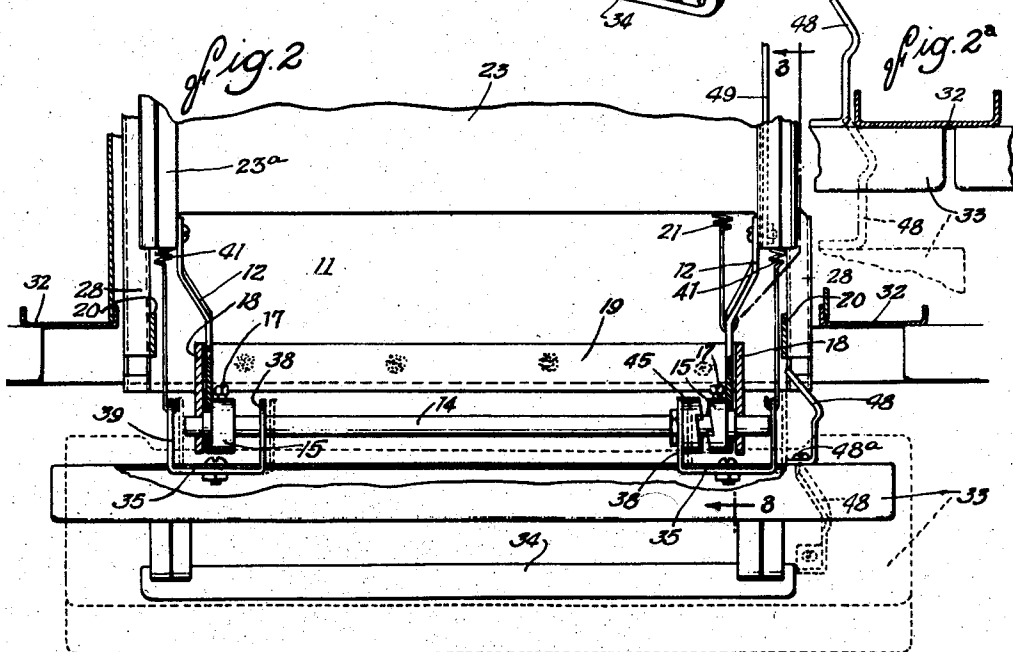
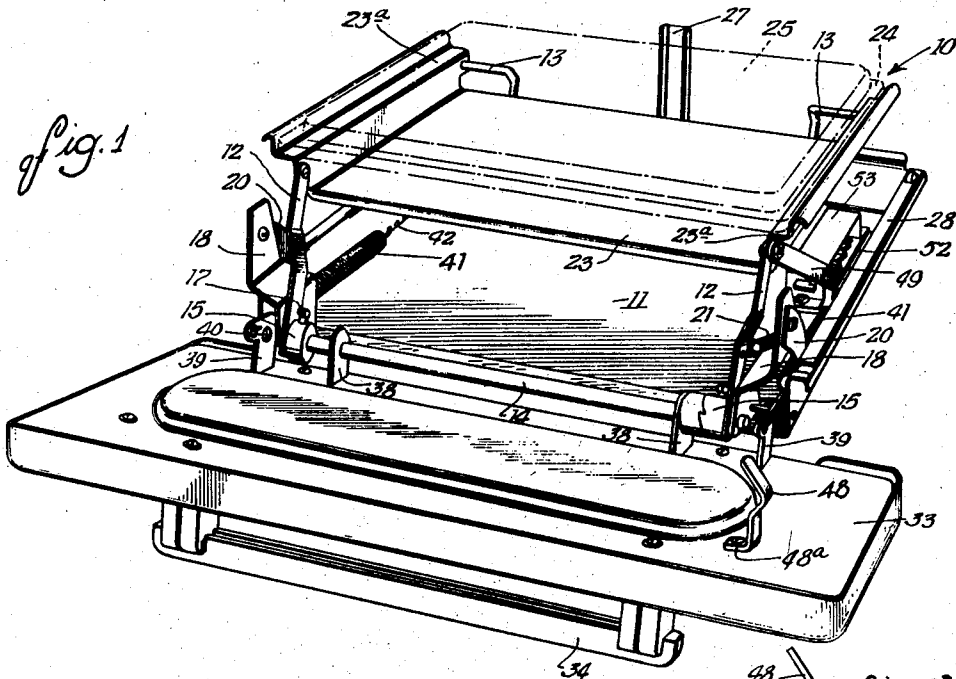
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2,204,381

BROILER CONSTRUCTION

Filed April 19, 1937

2 Sheets-Sheet 1



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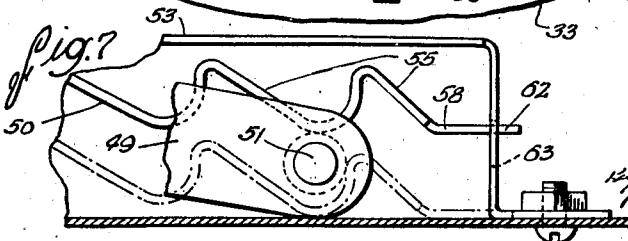
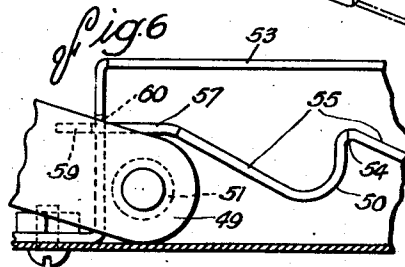
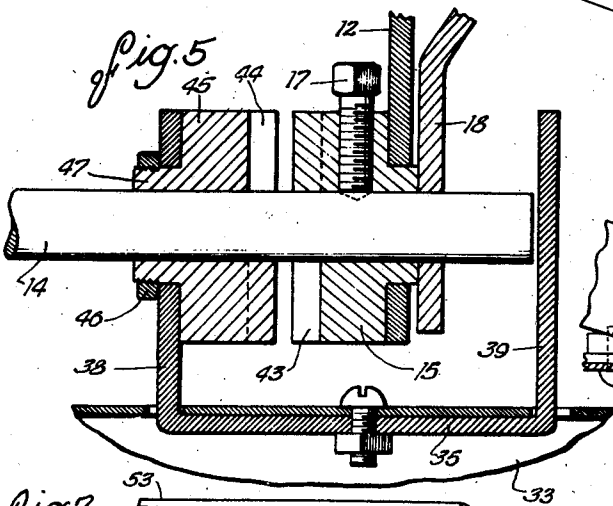
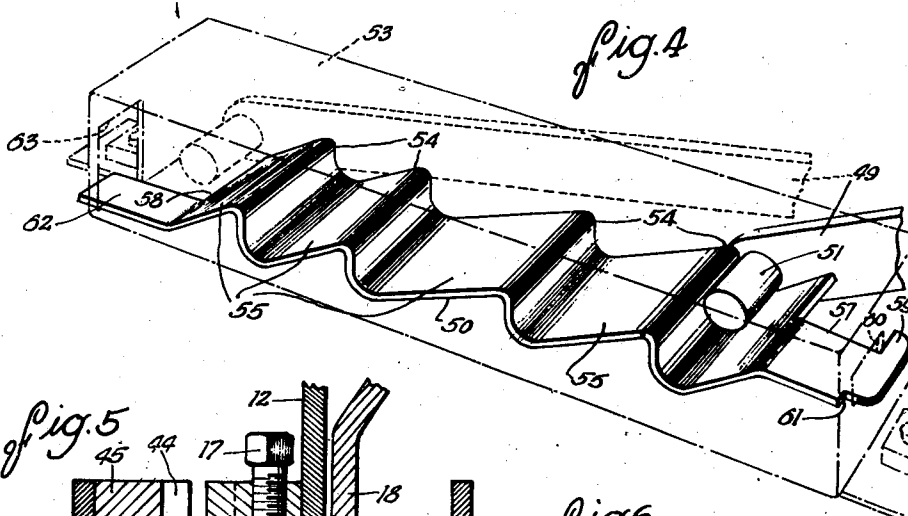
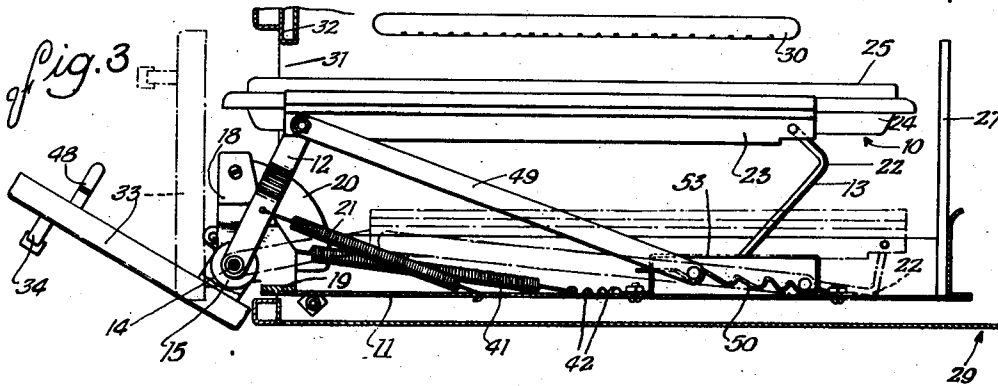
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BROILER CONSTRUCTION

Filed April 19, 1937

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,204,381

BROILER CONSTRUCTION

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Application April 1st 1937, Serial No. 137,601

13 Claims. (Cl. 126—41)

This invention relates to broiler structures in which the distance between the food support and the source of heat may be selectively varied by simple manipulation performed externally of the broiler compartment while the food support remains within the effective zone of the heat source.

An object of the invention is to provide a broiler construction of this character which will eliminate the need for special operating levers, handles, cranks and the like used in prior constructions, by utilizing in a novel manner a conventional manipulable part of the structure as the instrumentality for varying the spacing between the heat source and the food support.

Another object of the invention resides in the provision of suitable means operable to effect the selective variations in spacing responsive to actuation of the door which closes the broiler compartment.

More specifically stated, the invention aims to provide a retractible broiler structure in which the door for the broiler compartment is mounted upon a common carriage with the elevating broiling support and may be moved to open position independently of said support or may be connected with the broiling support by a relative shifting movement whereby to provide an instrumentality for effecting elevation of said support responsive to said opening movement.

Another object is to provide a novel form of releasable connection between the broiling support and the elevating instrumentality.

Another object is to provide an elevating broiler construction of this character in which the operative connection with the elevating means is automatically released as an incident to return thereof to an initial position.

A further object is to provide improved releasable means for holding the broiling support in selected elevated positions.

Other objects reside in the improvements in construction and the novel arrangements and relationships of structure by which the foregoing objects, and the other objects and advantages of the invention which will be apparent from the accompanying drawings and the following description, may be effectually practiced.

In the drawings:

Figure 1 is a perspective view of a broiler construction embodying the principles of the invention.

Fig. 2 is a fragmentary plan view of the front portion of the broiler.

Fig. 2^a is a fragmentary sectional plan view

of the automatic door shifting and releasing means of the broiler.

Fig. 3 is a side elevational view of the broiler mechanism taken substantially along the line 3—3 of Fig. 2 and showing associated parts of a stove more or less diagrammatically.

Fig. 4 is an enlarged phantom view showing in particular the arrangement of the floating rack of the mechanism for holding the broiling support in selected positions of elevation.

Fig. 5 is an enlarged sectional plan view of the clutch between the elevating mechanism and the broiler door.

Figs. 6 and 7 are fragmentary elevational views of the holding mechanism showing different relative positions of the rack member and the holding arm.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawings and will herein describe in detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

The present invention is particularly adaptable to cook stoves in which the panel closure or door of the broiler compartment serves also as the manipulable means for withdrawing the broiler from the compartment. In such a construction the door is generally pivotally mounted to be swung open and such action thereof may be utilized to effect selective variations in the distance between the food support of the broiler and the heat source within the broiling compartment. By the provision of disengageable mechanism between the door and the food support, and also automatically releasable means for holding the food support in a plurality of selective elevated positions, it is possible to operate the door either independently of the broiler or for changing the position between the broiling support and the heat source.

As shown in Figs. 1, 2 and 3, a broiler embodying the present invention may include an elevating food support assembly, indicated generally by the numeral 10, which is supported upon a carriage 11 by suitable elevating mechanism such as parallel motion means comprising pairs of spaced, pivoted front and rear connecting arms 12 and 13, respectively. The front arms 12 extend forwardly from the food support 10 and are rigidly connected at their front ends

to an operating shaft 14 as by means of axially bored collar blocks 15 which are detachably connected to the shaft 14 by individual set screws 17 (Fig. 5).

5 Rotatably supporting each end of the operating shaft 14 is a bearing member 18 herein comprising one leg of an inverted U-shaped bracket 19 which may be secured in a forwardly projecting position along the front end of the carriage 11. 10 Any tendency of the bracket 19 to tip forwardly is avoided by bracing plates 20 which are secured at the sides of the carriage 11 and are connected to the upper portions of the bearing legs 18. Means such as a tension spring 21 is connected 15 between one of the front arms 12 and the carriage 11 for normally acting to urge the food support 10 toward its lowermost position. In such lowermost position, elbows 22 on the rear arms 13 rest upon the carriage 11 (Fig. 3).

20 The broiling support 10 may be of any preferred construction, but in the present instance comprises a suitably dimensioned tray 23 which is supported directly by the front and rear arms 12 and 13 and has inwardly and upwardly facing 25 offset shoulders 23^a at opposite sides for slidably receiving a drip pan 24. Upon the latter is mounted a suitable food receiving plate 25 of any preferred construction. Rearward movement of 30 the drip pan 24 relative to the carriage 11 is limited by stop means, which in the present instance comprises an upright channel-shaped bar 27 rigidly secured at its lower end to the rear central portion of the carriage 11.

To permit front to rear movement of carriage 35 11, it may be provided with any preferred type of traction means. As shown, the carriage has suitable roller guides 28 at opposite sides thereof which are engageable with appropriate tracks or roller supports (not shown) in the broiler compartment of a stove, indicated generally by the 40 numeral 29. Supported within the broiler compartment is a heat source 30 such as a gas burner, although any other suitable type of heat source may be used.

45 One wall of the broiler compartment 29, which may be the front wall of the stove, has an access opening 31 which is defined by a rigid framework 32 and which is closed by a door 33 mounted on the carriage 11 and having a suitable handle 34. 50 Outward movement of the carriage 11 from the broiler compartment 13 may be limited by the stop bar 27 which is for this purpose of sufficient length to be engageable with the cross head of the front frame 32.

55 The door 33 may be of any desired construction and is pivotally supported upon the carriage 11 through the medium of the shaft 14. To this end the lower portion of the inner wall of the door carries a pair of spaced, U-shaped hanger 60 brackets 35 each of which has an inner leg 38 and an outer leg 39. The inner bracket legs 38 are suitably apertured for rotatably receiving therethrough the shaft 14, while the outer legs 39 extend into position opposite to the respective 65 adjacent ends of the shaft. The outer bracket leg 39, which is at the left side of the structure, as seen in Fig. 1, may have an aperture 40 through which the shaft 14 passes in the assembly operation.

70 To counterbalance the outward swing or opening movement of the door, suitably tensioned springs 41 may be connected at their forward ends to the outer bracket legs 39 and adjustably secured at their inner ends to the carriage 11 75 which is provided for this purpose with suitable

series of apertures 42. The tension of the springs 41 and the arrangement of the hanger legs 39 may be such as to hold the door 33 in a closed or vertical position thereof even when the carriage 11 is withdrawn, pivotal movement of the door being effected only when a downward pull is exerted upon the handle 34. In the fully open position of the door the tension force of the springs 41 will be overbalanced and the door will remain open until pushed upwardly. 10

In carrying out the principal aim of the invention, suitable means is provided for effecting a connection between the door and the elevating mechanism to raise the broiler support 10 responsive to opening movement of the door. 15 Herein, this desirable result is accomplished by utilizing one of the connecting blocks 15 as one part of a two-piece separable clutch, the coacting part of which is connected rigidly with the door 33. To this end the right hand block 15, as seen 20 in Figs. 1, 2 and 5, has on its inner face clutch teeth 43 which are adapted to engage with complementary clutch teeth 44 formed on the opposing face of a coacting clutch block 45. The latter clutch block coacts slidably with the shaft 14 and is secured rigidly to the adjacent inner door 25 hanger leg 38 as by means of a nut 46 threaded upon a hub 47 which passes through said leg.

Separation or engagement of the clutch teeth 43 and 44 is effected by bodily shifting movement 30 of the door 33 in a plane parallel to the axis of the shaft 14 between the full line and broken line positions shown in Fig. 2. This shifting movement of the door may be effected simply by manual force exerted upon the handle 34 in the 35 direction of the axis of the shaft 14. The extent of separation of the clutch teeth 43 and 44 in the declutching movement of the door is limited herein by engagement between the outer leg 39 of the right hand door hanger bracket 35 and the 40 adjacent end of the shaft 14, so that while the door may be freely and independently swung open as desired, the clutch may be very quickly re-engaged to effect the elevational adjustment.

In the preferred arrangement, the separable 45 clutch connection is automatically released whenever the door is returned to its initial or fully closed position. For this purpose a suitable L-shaped detent 48 is secured as by means of a bolt 48^a to the inner face of the door 23 near the 50 top thereof. The construction and position of the detent 48 is such that when the door is closed the detent will cam against the associated vertical edge of the stove frame 32 and shift the door into the declutching position (Fig. 2^a). As a result, 55 the door may be opened from the fully closed position for inspection purposes or to retract the carriage 11 without effecting any elevational adjustment.

In operation, when it is desired to elevate the 60 broiling support 10, and it is in its lowermost position as indicated in broken outline in Fig. 3, the door 33 is drawn away from the frame 32 to release the detent 48 and while still in its vertical or nearly vertical position may be quickly shifted 65 to engage the clutch teeth 43 and 44. Thence, upon actuating the door pivotally outwardly toward open position, the clutch connection will cause the shaft 14 to rotate correspondingly and thus rock the remote ends of the rigid front arms 70 12 upwardly to carry the broiling support 10 correspondingly. In the present instance a substantially quarter turn of the shaft 14 is effective to elevate said support 10 to its highest position. Due to the almost horizontal position of the front 75

arms 12 and the rear arms 13 at the beginning of the elevating movement, it will be apparent that during rotation of the shaft 14 at a constant speed, the rate of elevation of the broiling support 10 will be rapid at first and diminish as the arms approach the vertical and the degree of elevation increases. When the door 33 is released or returned to its vertical position, the spring 21 will tend to draw the broiling support back towards its lowermost position.

For greatest efficiency and best results, different broiling operations call for different spacings between the heat source 30 and the broiling support 10, and means is therefore provided for holding the latter in any one of several selective elevated positions. In the present instance, the holding means includes a pawl arm 49 pivotally connected to the front end of the broiler support tray 23 at one side and extending rearwardly and downwardly for cooperation with a rack plate 50. For this purpose the arm 49 carries a laterally projecting pin 51 for engagement with the rack plate. Movement of the lower end of the arm 49 during elevational movements of the broiling support 10 is guided between a vertical plate 52 (Fig. 1) and one edge of an inverted U-shaped housing member 53 which overlies the rack plate.

The rack plate 50 is suitably mounted in the housing 53 (Figs. 3 and 4) and has a series of undulations or teeth 54 which are preferably arranged with progressively diminishing spacing in a front to rear direction and substantially proportioned to the rate at which elevation occurs so that every tooth will define an equal degree of elevation. Thus, in the exemplary form shown, the rack plate 50 has four teeth 54, the spacing of which is calculated to secure four equal steps of elevation. Moreover, the form of the rack teeth is such that the pin 51 will ride up an inclined approach 55 to each tooth and drop with an audible clicking sound upon the succeeding inclined approach, thereby indicating to the user the degree of elevation attained.

Release of the holding pin 51 from the rack plate 50 when it is desired to return the broiling support to its lowermost position is effected herein by overrunning the front end of the rack plate and moving the pin under the plate to the starting position at the rear end of the plate. To this end the front end of the plate 50 is spaced above the carriage 10, and front and rear portions of the rack plate are recessed as at 57 and 58, respectively, along the edge adjacent to the holding arm 49 to afford passage for the pin 51. At its extreme forward end the rack plate 50 is provided with a laterally projecting finger 59 forming, in effect, a hook which is adapted to extend through an aperture 60 formed therefor in the front of the rack housing 53 to hold the rack plate against rearward movement. An offset shoulder 61 formed in the opposite edge of the rack plate from the finger 59 serves as an abutment to hold the plate against forward movement. The aperture 60 is at such a height as to hold the forward end of the rack plate 50 high enough to permit the pin 51 to drop through the recess 57 into a position below the plate 50 when the broiling support 10 is moved slightly beyond the uppermost broiling position (Fig. 6). Then as the broiling support is lowered, the pin 51 will move rearwardly under the rack plate which is free at its rear end to move upwardly during passage of the pin (Fig. 7). When the pin 51 has overrun the rear end of the rack plate 50 and reaches the recess

58 (broken outline position Fig. 4) the rear end of the rack plate drops back into starting position, and the pin is again in readiness to slide up the rear inclined approach 55 for reengagement when the broiling support is again elevated. During its vertical movement, the rear end of the rack plate is guided by a finger 62 which extends through an aperture 63 at the rear of the rack housing 53.

From the foregoing, it will be apparent that the present invention provides a broiler arrangement which is of simple, efficient and durable construction and which embodies a new principle of operation wherein, through a novel structural relationship, a usual part of the cooking apparatus, such as the door to the broiler compartment, is adapted for operation to effect desired variations in spacing between the broiling support and the heat source. Although provided with this new function, the door is still adapted for its usual purposes, namely, to provide the manipulable means for withdrawing the broiler carriage, and to enable opening of the broiler compartment for inspection purposes without disturbing the desired broiling adjustments. In this connection, it is notable that the releasable operating connection between the door and the broiling support, and the improved releasable holding means are highly desirable features of the invention.

The advantage of the present simplified arrangement may be readily appreciated when it is considered that in certain prior constructions it has been necessary in elevating the food support, directly to manipulate some part thereof which, after a period of operation, may be dangerously hot. Where, on the other hand, elevating adjustment in the prior constructions has been effected by manipulation externally of the broiler compartment, there have been provided necessary contrivances operative through the medium of special handles, cranks, levers and the like, all of which were effective independently of any action of the door of the broiler compartment.

With the present novel construction, however, the broiling mechanism may be elevated easily and simply, without special skill or elaborate instruction merely by the well-known manual action incidental to opening the broiler door.

I claim as my invention:

1. In combination in a broiler construction of the character described adapted for use in a stove having an opening for access to the broiler, supporting structure having a vertically adjustable food support and elevating mechanism connected between said structure and support, a pivoted door member adapted to close the access opening of the stove, means for rendering said door member releasably connectible with said mechanism in response to a motion other than pivotal and thereafter acting in response to pivotal motion of said door member to operate said mechanism and effect movement of said food support into a selected elevated position, and means for holding said food support in such elevated position.

2. A cooking stove construction comprising, in combination, a broiler compartment having an access opening and a closure for the opening movable in its major plane and also movable to open position in a direction angular to said plane, a heat source mounted in said compartment, food supporting means mounted in spaced relation to said heat source, and means providing a releas-

able connection between said supporting means and said closure upon movement of the latter in its major plane for varying the spacing between said heat source and said food supporting means in response to movement of said closure toward open position.

3. In combination in a broiler construction for cook stoves including a broiler compartment having an access opening, a rotatably supported shaft, an elevatable broiling support within said compartment having an elevating arm extending therefrom and rigidly connected with said shaft, and a door mounted to close said opening and having an operating connection with said shaft responsive to movement of the door to rotate the shaft and actuate said arm to elevate said broiling support.

4. An elevating broiler construction of the character described comprising, in combination, an elevating food support and carrying means therefor including front and rear connecting means, a shaft mounted across the front of said carrying means and supporting the front connecting means, a panel member pivotally connected to said shaft and having limited shifting movement axially of the shaft, clutch mechanism including one part rigid with said front connecting means and a coacting part rigid with said panel member, said coacting part being adapted upon shifting movement of said panel member in one direction for interengagement with said one part to complete a rigid connection through said front connecting means effective in the pivotal movement of said panel member to impart elevating motion to said food support, and means for holding said food support in selected positions of elevation.

5. In combination in a stove including a broiler compartment having therein a heat source and a spaced food support, means shiftable manually from an initial position for actuation through a predetermined range of movement, means between said food support and said shiftable means to form an operating connection effective after movement of said shiftable means from said initial position for varying the spacing between said heat source and said support in response to actuation of the shiftable means through said range of movement, and means operable as an incident to return of said shiftable means to said initial position to release said connection and permit independent actuation of said shiftable means.

6. In combination in a cooking stove including a broiler compartment having a framed opening, a heat source and a food support mounted in spaced relation within said compartment, a door for closing said opening mounted for pivotal and limited shifting movements, disengageable means between said door and said food support operable when the door has been shifted into one position to vary the spacing between said heat source and said food support in response to pivotal movement of the door, and means carried by said door coactive with the frame defining said opening for shifting the door from said one position to disengage said means.

7. In combination in an elevating broiler construction of the character described, a broiling support adapted to be elevated from an initial position and means for holding said support in a plurality of selective elevated positions, said means being releasable by elevating said support slightly above the highest selective position for returning the same to said initial position.

8. An elevating broiler construction comprising, in combination, a food support mounted for elevation to selective positions from a lowermost position, a pawl arm pivotally connected at one of its ends to said support and having a rigid element extending laterally from its opposite end, and a floating rack member mounted to be engaged at successive points by said element to maintain said support in said selective positions, said rack member being mounted to be overrun at its front and rear ends and arranged to permit said element to move rearwardly thereunder after overrunning the front end, whereby to release said support for return to said lowermost position and to move said element to its rearward overrun position.

9. A broiler construction comprising, in combination, a broiling support, mechanism for elevating said support, means for holding said support in elevated broiling position including a rack element and a rack-engaging member, said rack element being of such length and being so mounted that said member will overrun the end of said rack element when said support is elevated a predetermined distance beyond the uppermost broiling position, and means for receiving and guiding said member from the overrun position thereof back to the opposite end of said rack element during lowering movement of said support for operative reengagement with said rack element upon return of said support to its lowest position.

10. In combination in a broiler construction of the character described, an elevating food support, manually engageable means for effecting elevation of said support, mechanism for holding said support in a plurality of selective positions of elevation including an engagement part and means engageable therewith at a starting point and a plurality of successive points therebeyond determinative of said selective positions, said engagement part and said means being disengageable by movement of said food support beyond the uppermost of said selective positions whereby to permit lowering of said support to non-elevated position, and means for receiving said part upon disengagement thereof from said engageable means to guide said part to said starting point as an incident to lowering of said support.

11. A broiler construction of the character described comprising, in combination, a compartment having a heat source therein and an access opening, a broiling support within said compartment adapted to be moved to selective spaced positions relative to said heat source, releasable means cooperative with said broiling support for holding the latter in any of said selective positions, a door for said access opening, and means including a separable clutch mechanism adapted to be engaged selectively by a movement of said door in its major plane to form an operating connection between said broiling support and said door and when thus engaged being operable by opening movement of said door to move said broiling support to any of said selective positions.

12. A broiler arrangement of the character described comprising, in combination, means defining a broiler compartment including a heat source and an access opening, a broiling support structure housed within said compartment and adapted to be withdrawn through said opening, a closure for said opening, and mechanism for adjusting the spacing of said broiling support

structure relative to said heat source including selectively interengageable members respectively associated with said broiling support structure and said closure arranged to be interengaged by
5 a movement of the closure in its major plane for effecting an operating connection between the adjusting mechanism and said closure, said members when thus interengaged being operative in response to movement of the closure in another
10 plane to actuate the adjusting mechanism for effecting said adjustments in the spacing between the broiling support structure and the heat source.

13. In combination in a broiler device of the
15 character described adapted for use in a stove having a broiler compartment, supporting structure comprising a carriage adapted to be moved into and out of the broiler compartment, a vertically adjustable food support and elevating

mechanism connected between said carriage and said food support, a door member pivotally mounted upon said carriage and adapted to act as a closure for the access opening into the broiler compartment, means for rendering said door
5 member releasably connectible with said mechanism in response to a motion of of the door member parallel to its pivotal axis and thereafter acting in response to pivotal motion of said door member to operate said mechanism and effect
10 movement of said food support into a selected elevated position, means for holding said food support in such elevated position, and a handle on said door member engageable for moving the carriage and broiler assembly as a whole or
15 for moving the door member as aforesaid relative to said carriage.

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