Dec. 5, 1950 A. H. HABERSTUMP 2,532,445

BROILER

Filed Nov. 13, 1944 3 Sheets-Sheet 1

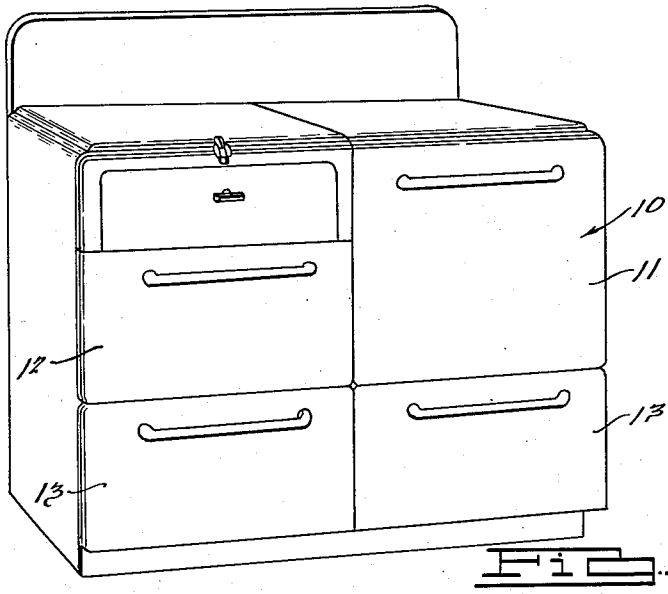


Fig. 1.

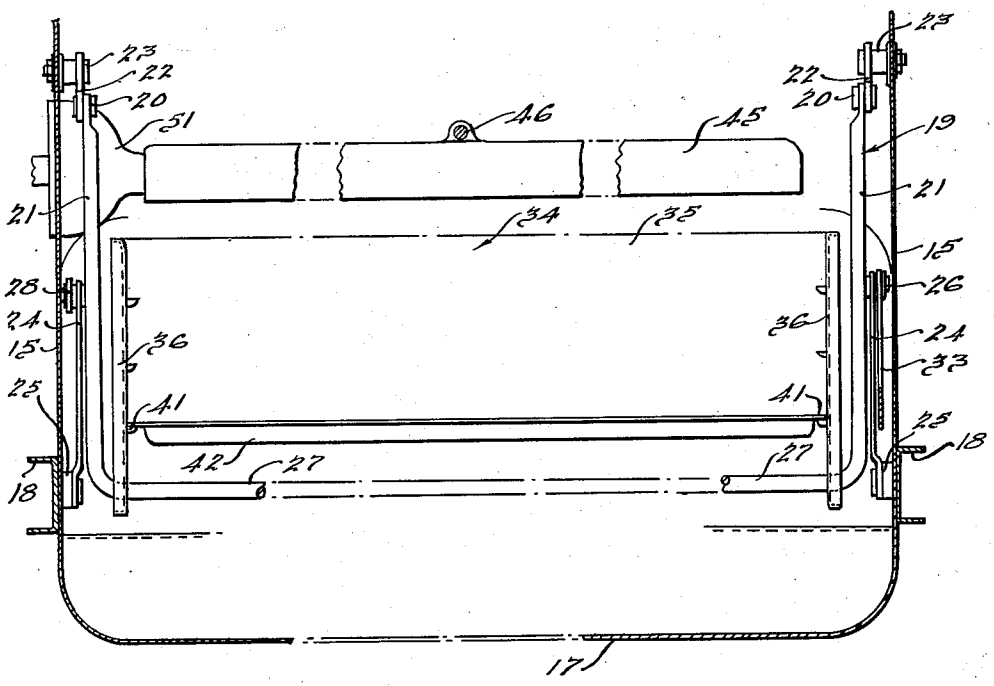


Fig. 2.

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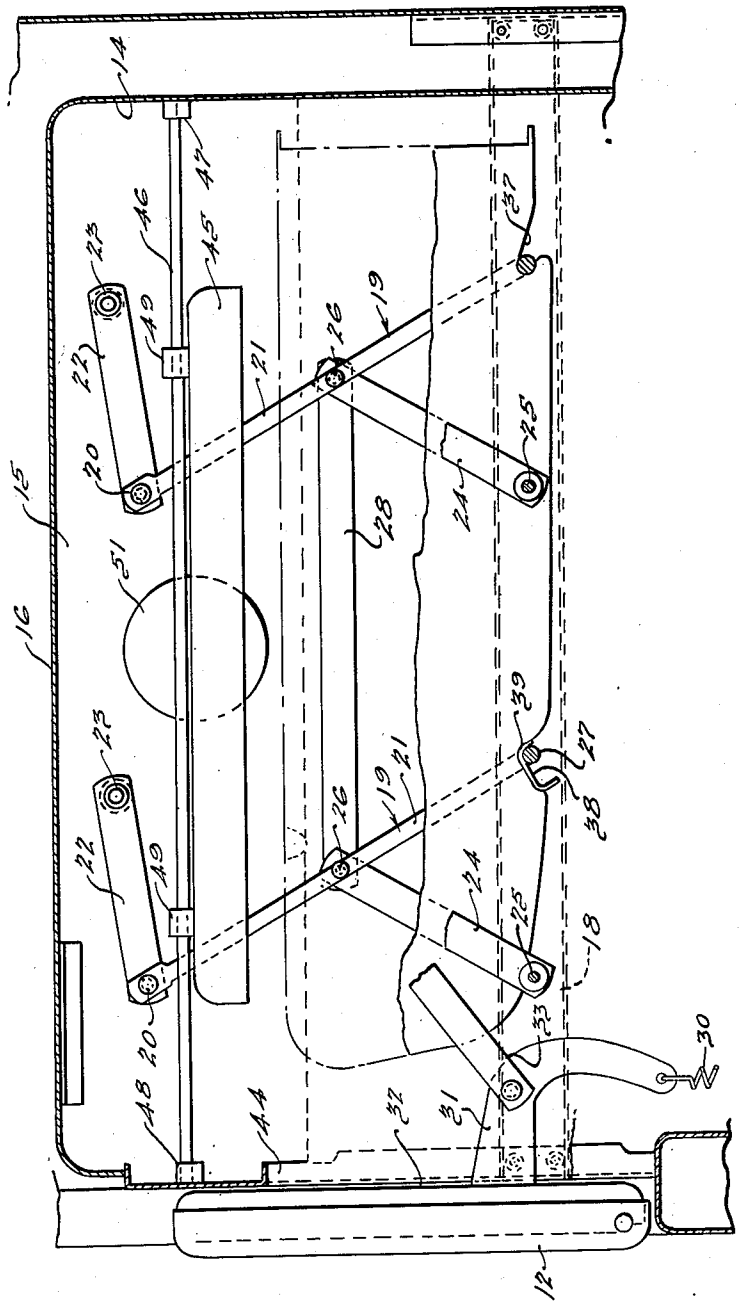


FIG. 2.

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Filed Nov. 13, 1944 3 Sheets-Sheet 3

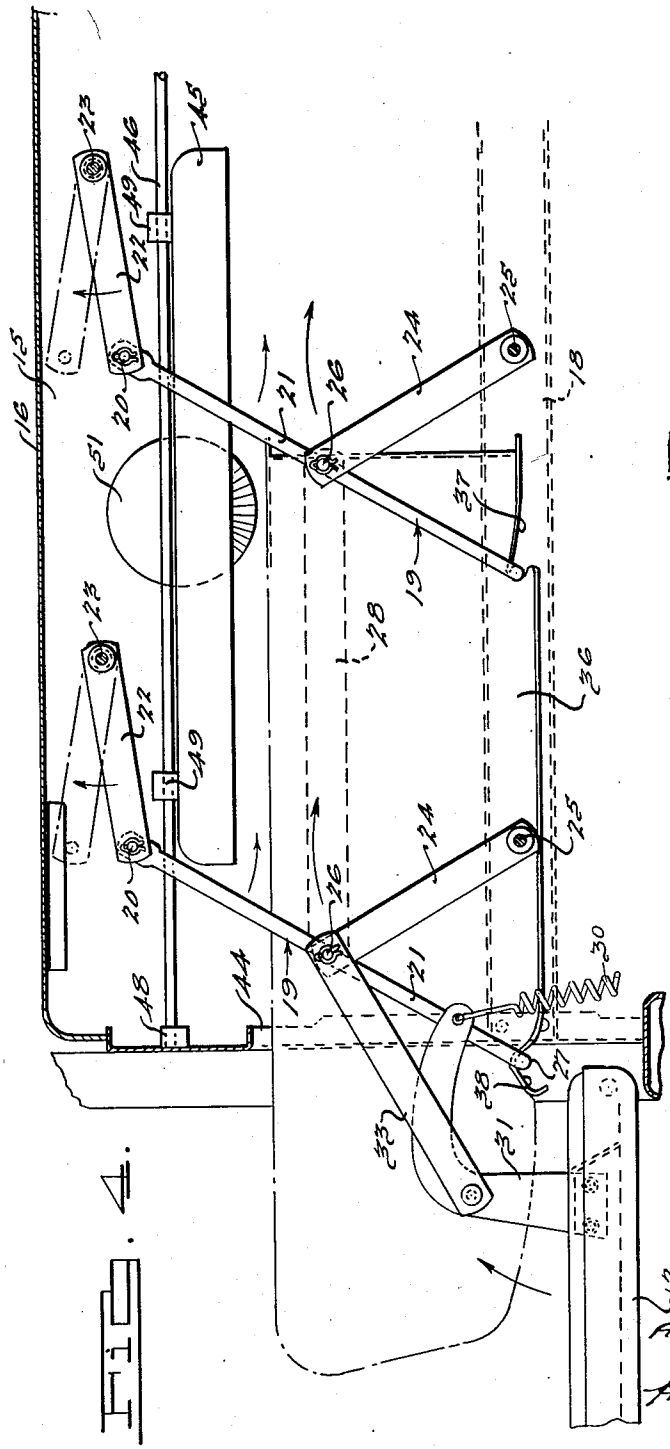


Fig. 4.

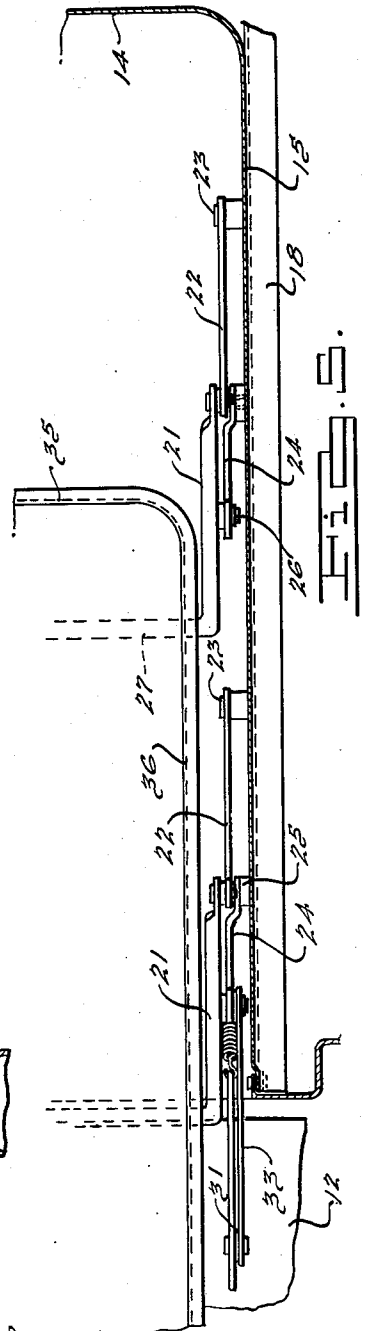


Fig. 5.

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UNITED STATES PATENT OFFICE

2,532,445

BROILER

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Application November 13, 1944, Serial No. 563,149

15 Claims. (Cl. 126—41)

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This invention relates to broilers for cooking ranges and particularly to a broiler or other device which is supported on levers in such a manner as to be movable from one position to another in a horizontal plane.

In the co-pending application of H. E. Mills, Serial No. 501,373, filed September 6, 1943, now abandoned and assigned to the assignee of the present invention, a swing-out type of broiler is illustrated, described and claimed wherein the broiler swings on an arc from an upper position adjacent to the broiler burner to a lower, then an upper position when projected from the broiler compartment. While the outer and inner positions were substantially of equal height so that the operator could ascertain the height of the substance being heated when within the oven, difficulty was experienced with this type of structure as the downward swinging movement of the broiler interfered with the opening of the door. This required a delay mechanism to be employed which retarded the movement of the broiler when the door was initially opened. The capacity of the broiler and the amount of its projection from the compartment were reduced by the use of the delay mechanism.

When employing the link system of the present invention a straight line movement is provided to the broiler, the same as when the broiler is mounted on slides. The link system has the advantage of eliminating the noise attending the scraping of the broiler on the slides when withdrawn from, and inserted into, the compartment thereon.

The present invention pertains to the use of a pair of U-shaped stirrups on which the broiler is removably mounted. The stirrups are supported on their upper ends on pivoted arms to permit the upper ends of the stirrups to move upwardly and downwardly as the broiler is moved outwardly or inwardly of the compartment. Links are mounted on pivots at the bottom of the compartment which are aligned with the bottom of the stirrups. The upper ends of the links are pivoted to the stirrup at a point above the bottom of the stirrups equal to the length of the link above its bottom pivot. The links form an isosceles triangle with the stirrups and maintain the bottom of the stirrups on a line through the pivots of the links as the bottoms of the stirrups

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move toward and beyond the pivots. While so moving, the upper ends of the stirrups are permitted to move upwardly and downwardly in view of their support on the pivoted arms at the top portion of the compartment.

Since the bottom of the stirrups moves on a horizontal plane through the fixed pivots of the links, the broiler moves outwardly and inwardly of the compartment in a horizontal plane located at a predetermined height below the broiler burner disposed in the top part of the compartment. The broiler unit preferably embodies a frame having notches in the bottom which engage the horizontal portion of the stirrups so as to be removable therefrom and retained thereon at all times against tilting. A broiler pan is selectively supported on spaced ledges provided at opposite sides of the broiler frame to be disposed at variable heights with relation to the broiler burner.

The door is spring pressed toward open and closed positions by suitable spring mechanism and an arm is provided on the inner face of the door which is interconnected to the frontmost stirrup by a link which actuates the stirrup to move the broiler unit out of the compartment when the door is open and into the compartment when the door is closed.

Accordingly, the main objects of this invention are: to suspend a broiler in a compartment on pivoted elements which produces the movement of the broiler unit into and out of the compartment in a horizontal plane; to support a pair of stirrups on pivoted arms and attached to links which are pivoted at the bottom of the compartment to pivots on the sides of the stirrups for producing a horizontal movement to the broiler unit supported thereby; to enclose a broiler compartment with a door having a spring thereon which retains the door in open and closed position and which is interconnected to a broiler suspension mechanism by a link which moves the broiler pan out of the compartment when the door is open and into the compartment when the door is moved to closed position; and in general to provide a broiler unit which is moved into and out of the broiler compartment in a horizontal plane by link mechanism actuated when the door is moved into closed and open positions,

all of which is simple in construction, positive in operation, and economical of manufacture.

Other objects and features of novelty of this invention will be specifically pointed out or will become apparent when referring, for a better understanding of the invention, to the following description taken in conjunction with the accompanying drawings, wherein

Figure 1 is a perspective view of a cooking stove having a broiler therein embodying features of this invention;

Fig. 2 is an enlarged view, in front elevation, of the broiler compartment and movable broiler therein embodying features of this invention;

Fig. 3 is a broken sectional view of the side of the broiler compartment illustrated in Fig. 2, with the door in closed position;

Fig. 4 is a view of the structure illustrated in Fig. 3, with the compartment door in open position, and

Fig. 5 is a plan view of the right-hand side of the compartment illustrated in Fig. 4.

In Fig. 1 a stove 10 is illustrated, having an oven compartment enclosed by a door 11, a broiler compartment enclosed by a door 12, and two drawer compartments enclosed by the front drawer panels 13. The broiler compartment 14 embodies side walls 15, a top wall 16, and a bottom wall 17. Angles braces 18 are provided on the side walls 15 to provide additional strength for the support of the broiler compartment within the stove. A pair of U-shaped stirrups 19 have the ends of the upwardly projecting arms 21 pivoted at 20 to the ends of links 22 which are pivotally secured on studs 23 to the sides 15 of the broiler near the top of the compartment. Links 24 have their lower ends mounted on pivots 25 which are secured to the side walls 15 of the compartment and to the reinforcing channel elements 18. The top ends of the links 24 are pivotally secured on the studs 26 which project from the upwardly extending arms 21 of the stirrups. The length of the links 24 between the pivots 25 and the studs 26 is equal to the length of the arms 21 from the stud 26 to the horizontal portion 27 of the stirrup. This forms an isosceles triangle between the portion of the arms 21 and the links 24 at substantially all positions of the stirrups so that the portions 27 of the stirrups will be maintained in a horizontal plane in all positions in which the stirrups are moved. This is made possible by the support of the upper ends of the arms 21 on the pivoted links 22 which permit the ends to oscillate about the stud 23 as the horizontal portion 27 of the stirrup moves in the horizontal plane.

The horizontal portion 27 of the stirrup is retained in the horizontal plane by the links 24 which, as pointed out hereinabove, is in isosceles triangular relation with the bottom portion of the arms 21 in all positions of the stirrups except, of course, that when the link and arm are in the same vertical plane. One or more cross links 28 may be attached to the studs 26 of the stirrups to have both of the stirrups positively moved when the door is opened. The door is of the conventional type having a spring 30 associated therewith for retaining the door in both open and closed positions. A fixed arm 31 projects from the inner face 32 of the door, the outer end of which pivotally supports one end of a link 33 the opposite end of which is pivoted to a projecting stud 26 on the front stirrup 19.

The broiler unit embodies a frame 34 which is herein illustrated as a stamping having a back wall 35 and side walls 36 which are unsupported at the front end. The rear bottom edges of the side walls 36 contain angularly disposed slots 37 which receive the horizontal portion 27 of the rear stirrup in such manner as to prevent the frame from tilting upwardly therefrom. The front portion of the side walls 36 is provided with an elongated notch 38 which receives the horizontal portion 27 of the front stirrup 19 after the rear portion is hooked over the rear stirrup. The notch 38 is preferably provided with a flange 39 at the top for preventing wear. The inner face of the side walls 36 is provided with horizontally disposed channel portions 41 which receive the broiler pan and tray 42 which are similar in construction to the broiler pan and tray disclosed in the above-mentioned co-pending application. The broiler pan and tray may be slid forward on the channel portions 41 and are positioned at various heights within the frame 34 thereby. The construction of the operating mechanism of the broiler is such that the weight of the frame, broiler, pan and tray and the food and utensil supported thereon tends to maintain the broiler in any position of adjustment. When the door is moved to open position, the arm 31 thereof moves the link 33 to move the stirrups frontwardly to thereby move the frame 34 and the pan and tray 42 on a horizontal plane out through the compartment opening 44. When the door is moved to closed position, the link reverses the movement of the stirrups to move them from the position illustrated in Fig. 4 to that illustrated in Fig. 3 when the door is maintained in closed position by the balancing spring 30.

A burner 45 of conventional form is mounted in any suitable manner within the upper part of the compartment and is herein illustrated as being mounted on a rod 46. The ends of the rods are retained in the U-shaped brackets 47 and 48 on the rear and front walls, respectively, of the compartment. The medial portion of the rod extends through apertures in bosses 49 projecting upwardly from the top surface of the burner. The mixing chamber 51 of the burner extends through an aperture in one of the side walls 15 and is connected to a suitable source of gas supply and controlled in the conventional manner. While a gas burner 45 is herein illustrated, it is to be understood that an electric heating unit may be substituted therefor.

What is claimed is:

1. In a broiler compartment having a door, a plurality of links having one end pivoted near the top of the compartment, a pair of U-shaped stirrups having their upper ends pivoted to the free ends of said pivoted links, a pair of additional links pivoted at each side at the lower portion of the broiler compartment and pivotally secured to the side portions of the stirrups intermediate the top and bottom thereof to have the length of the bottom portion substantially equal the length of the additional links, and a broiler unit supported on the bottom portion of the stirrups for movement in a horizontal plane.

2. In a broiler compartment having a door, a plurality of links having one end pivoted near the top of the compartment, a pair of U-shaped stirrups having their upper ends pivoted to the free ends of said pivoted links, a pair of additional links pivoted at each side at the lower portion of the broiler compartment and pivotally secured to the side portions of the stirrups intermediate the top and bottom thereof to have the length of the bottom portion substantially equal

the length of the additional links, a broiler unit supported on the bottom portion of the stirrups for movement in a horizontal plane, and means interconnecting the door with at least one of said stirrups for moving the broiler unit when the door is moved.

3. In a device for supporting an element for horizontal movement, a pair of stirrups of U-shape having a base and two arm portions, a plurality of links having one end pivotally mounted and the other end pivoted to the ends of said arms, additional links having one end pivotally supported and the other end pivoted to the arms intermediate the ends, with the portion of the arms below the intermediate pivot substantially equal to the length of said additional links between the pivots thereof, and means for moving the links and stirrups with the element resting upon the bottom portion of the stirrups to shift said element in a plane controlled by said stirrups and links.

4. In a stove compartment, a broiler unit, a pair of stirrups for supporting said unit, links pivoted within the compartment at one end and having the other end pivoted to the ends of the upwardly projecting arms of the stirrups, additional links having their ends pivoted within the compartment and having the opposite ends pivoted to the arms in such manner as to have the portion below the pivot substantially equal the length of the additional links whereby the broiler unit moves in a horizontal path when moved into and out of the compartment.

5. In a stove compartment, a broiler unit, a pair of stirrups for supporting said unit on the bottom portion thereof, links pivoted within the compartment at one end and having the other end pivoted to the ends of the upwardly projecting arms of the stirrups, additional links having their ends pivoted within the compartment and having the opposite ends pivoted to the arms in such manner as to have the portion below the pivot substantially equal the length of the additional links whereby the broiler unit moves in a horizontal path when moved into and out of the compartment, and means attached to at least one of said stirrups for producing movement of the broiler unit when actuated.

6. In a stove compartment, a broiler unit, a pair of stirrups for supporting said unit on the bottom portion thereof, links pivoted within the compartment at one end and having the other end pivoted to the ends of the upwardly projecting arms of the stirrups, additional links having their ends pivoted within the compartment and having the opposite ends pivoted to the arms in such manner as to have the portion below the pivot substantially equal the length of the additional links whereby the broiler unit moves in a horizontal path when moved into and out of the compartment, a door for said broiler compartment and a link interconnecting the door and at least one of said stirrups for moving the broiler unit out of the compartment when the door is opened and for moving said unit into the compartment when the door is closed.

7. In a compartment having an element movable therefrom in a horizontal plane, a pair of U-shaped stirrups for supporting the element on the bottom portion between the arms which extend upwardly therefrom, links pivoted to the side of the compartment and having their ends pivoted to the top portion of the arms, additional links pivoted to the walls of the compartment having their opposite ends pivoted to the arms at a point above the bottom portion equal to the length of said additional links, said stirrups and links producing a horizontal movement to the element when moved relative to the compartment.

8. In a compartment having an element movable therefrom in a horizontal plane, a pair of U-shaped stirrups for supporting the element on the bottom portion between the arms which extend upwardly therefrom, links pivoted to the side of the compartment and having their ends pivoted to the top portion of the arms, additional links pivoted to the walls of the compartment having their opposite ends pivoted to the arms at a point above the bottom portion equal to the length of said additional links, said stirrups and links producing a horizontal movement to the element when moved relative to the compartment, a door for said compartment, and means interconnecting the door and at least one of said stirrups for actuating said element and moving it out of the compartment when the door is opened and into the compartment when the door is moved to closed position.

9. In a broiler compartment, a pair of U-shaped elements having a horizontal portion and upwardly directed arms at each of the sides, links pivoted to the sides of the compartment at one end to the ends of the arm at the other end, additional links pivoted to the sides of the compartment at one end and to the arms at a point intermediate their lengths, a frame supported on the horizontal portion of the U-shaped elements, and a broiler pan mounted on said frame.

10. In a broiler compartment, links in said compartment, a broiler supported on said links, additional links pivoted to said compartment and to said first links interjacent the ends thereof for supporting said links and broiler, and means pivotally attached to said first links for confining the upper free ends of said first links to a predetermined path of movement as the broiler is moved in and out of said compartment.

11. In a broiler compartment, a broiler unit in said compartment, a pair of U-shaped stirrups supporting said unit, links pivoted to said compartment and to said stirrups interjacent the ends thereof for supporting said stirrups and broiler unit and for controlling the path of movement thereof, and means supported by said compartment for pivotally securing the upper ends of said stirrups while permitting a predetermined movement thereof.

12. In a broiler compartment having walls, a pair of U-shaped stirrups having upwardly extending arms, a broiler supported on the bottom section of said stirrups, links pivoted to the compartment walls and to the arms of the stirrups interjacent their ends, and means on said compartment walls for pivotally confining the free ends of the stirrup arms to a predetermined path of movement as the broiler is moved inwardly and outwardly of said compartment.

13. In a broiler compartment having walls, a pair of U-shaped stirrups having upwardly extending arms, a broiler supported on the bottom section of said stirrups, links pivoted to the compartment walls and to the arms of the stirrups interjacent their ends, and means on said compartment walls located vertically above the points where the links are pivoted to the compartment walls for pivotally confining the free ends of the stirrup arms to a predetermined path of movement.

14. In a broiler compartment, a pair of U-shaped stirrups, a pair of links pivoted to each

side of the lower part of the broiler compartment and pivotally secured to the side portion of the stirrup intermediate the top and bottom thereof to have the length of the bottom portion substantially equal to the length of the additional links, means supported near the top of the compartment for pivotally confining the upper ends of the side portion of the stirrups to a predetermined path of movement, and a broiler unit supported on the bottom portion of the stirrup for movement in a horizontal plane.

15. In a broiler compartment, a plurality of vertically disposed arms, links pivoted to each side of the lower portion of the broiler compartment and pivotally secured to the arms intermediate the top and bottom thereof to have the length of the bottom portion substantially equal to the length of the links, means on the upper wall of the compartment for pivotally confining the upper ends of the arms to a predetermined path of movement, and a broiler unit supported

on the lower portion of said arms for movement substantially in a horizontal plane.

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