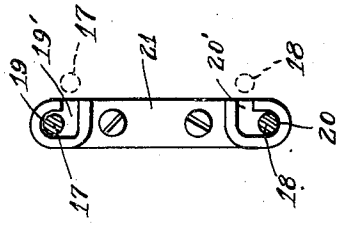
Dec. 29, 1931. P. I. HOLLMAN 1,838,832

BROILER OVEN

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Fig. 3.



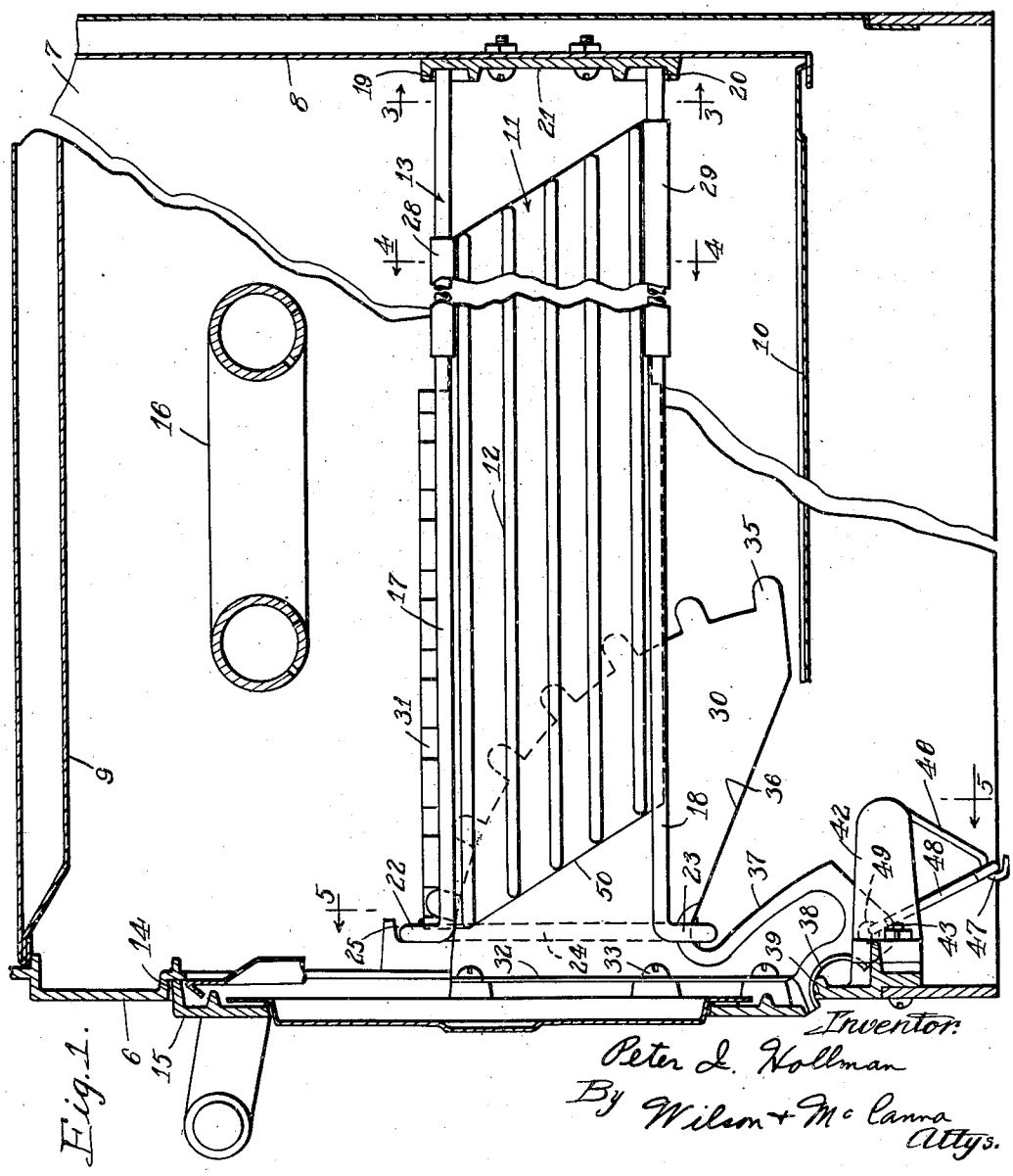


Fig. 1.

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BROILER OVEN

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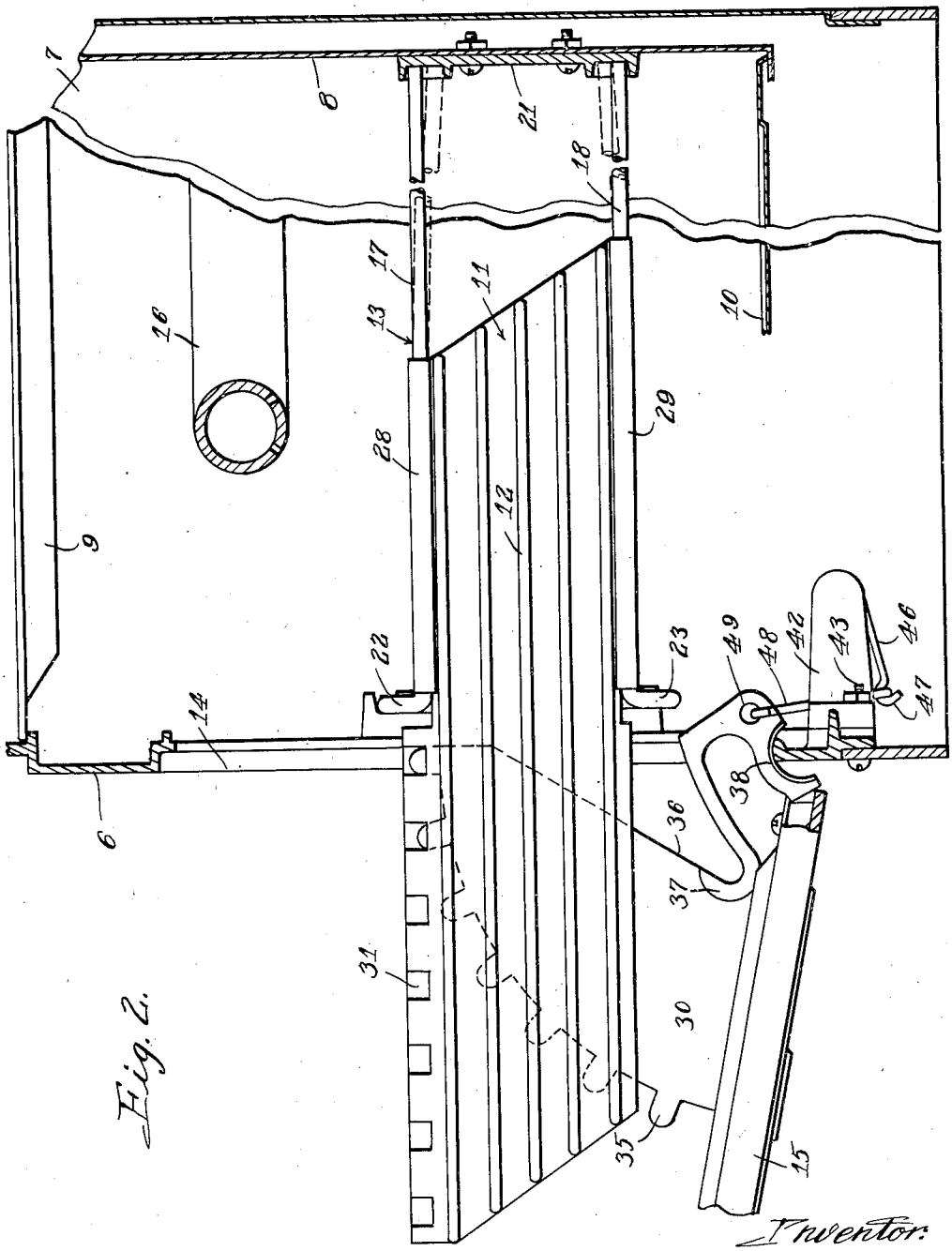


Fig. 2.

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Fig. 4.

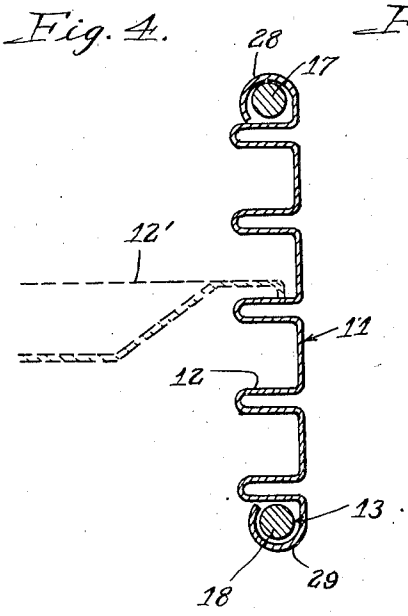
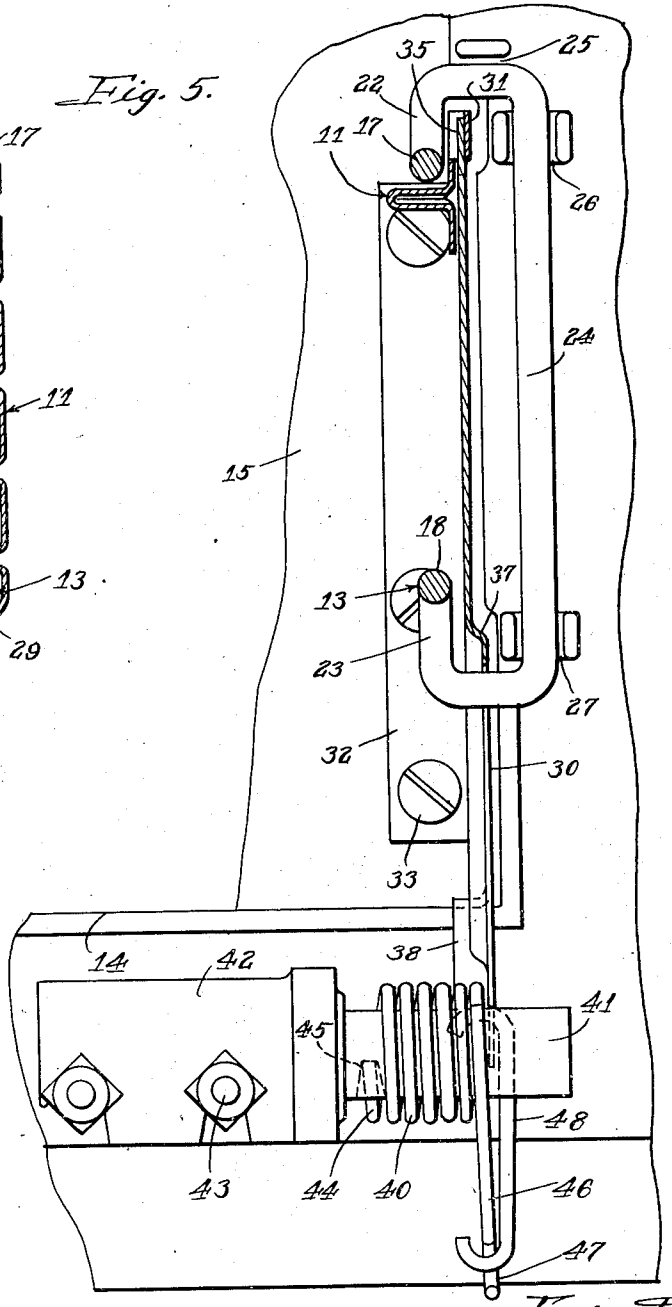


Fig. 5.



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UNITED STATES PATENT OFFICE

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BROILER OVEN

Application filed March 24, 1928. Serial No. 264,314.

This invention relates to broiler ovens for gas and electric stoves and ranges and is more particularly concerned with what I prefer to call an in-a-door broiler inasmuch as the slides supporting the broiler pan are arranged to be automatically extended out of the oven in the opening of the door and similarly returned in the closing of the door.

The principal object of the invention is to provide a broiler consisting of guides mounted within the oven on the side walls thereof having broiler pan supporting slides mounted thereon and adapted to be extended out of the oven in the opening of the door, the operating connections between the door and slides being preferably provided by gear segments mounted on the door on the inside thereof arranged to mesh with rack teeth formed on the slides. For simplicity and economy in construction as well as ease in assembling, the guides are preferably formed of wire of sufficient stiffness to provide rigid support but having sufficient flexibility to permit flexing the same in a certain way for assembling in the oven in an especially handy manner, and the slides are preferably formed of sheet metal which permits making each of the slides in one piece with ribs formed thereon to serve as supporting ledges for the broiler pan, sleeve portions at top and bottom to serve as bearings to be slidably received on the top and bottom ways afforded by the guide arranged to cooperate with the slide, and rack teeth formed by punched out ears arranged to cooperate with the gear segment mounted on the oven door. The construction of the guides is such that the slides are arranged to be limited in their movement by the engagement of the sleeve portions of the slides with stop portions formed on the guides.

The invention is more fully described in the following specification in which reference is made to the accompanying drawings wherein:

Fig. 1 is a central vertical section through the broiler oven of a gas range embodying my invention,

Fig. 2 is a similar view showing the oven door open,

Fig. 3 is a sectional detail on the line 3—3 of Fig. 1, and

Figs. 4 and 5 are enlarged vertical sections taken on the lines 4—4 and 5—5 of Fig. 1 looking in the direction indicated by the arrows.

The same reference numerals are applied to corresponding parts throughout the views.

The gas range in connection with which I have illustrated my invention is generally of conventional construction comprising a cast front frame 6 and sheet metal hollow side and back walls 7 and 8, respectively. As stated before, only the broiler oven of the range is illustrated. Thus the baking oven bottom appears at 9 and the broiler oven bottom at 10. The usual side linings employed in the broiler oven are dispensed with in accordance with my invention and reciprocable racks 11 are substituted providing a plurality of vertically spaced ledges 12 to support a broiler pan such as that represented at 12′ in Fig. 4. The racks 11 are hereinafter referred to as slides inasmuch as they are slidably mounted on guides 13. As will presently appear the slides 11 with the boiler pan thereon are arranged to be automatically extended through the oven door opening 14 in the opening of the door 15 and likewise to be returned in the closing of the door, for which reason I prefer to call the present device an in-a-door broiler. Before proceeding with the detailed description of the broiler it will be observed in passing that the broiler oven is equipped with the usual burner 16 suitably supported from the sides of the oven in the usual manner, the said burner being in proper spaced relation both with respect to the baking oven bottom 9 and the slides 11 on which the broiler pan is arranged to be mounted.

The boiler guides 13 mounted within the oven on the side walls thereof are suitably formed of heavy wire or rod having sufficient stiffness to provide good support for the slides and still having enough flexibility to enable assembling the same in the oven in a particularly handy manner and likewise disassembling the same in the event that it ever becomes necessary or desirable. The wire of

each guide is bent generally into U-form so as to provide parallel arms 17 and 18 serving as top and bottom ways for the slide to operate upon. The free ends of said arms are received in recesses 19 and 20, respectively, provided in a cast plate 21 bolted or otherwise suitably secured to the back wall of the broiler oven. The recesses 19 and 20 are both L-shaped as best appears in Fig. 3 so that entrance-ways are provided at 19′ and 20′ to admit the free ends of the arms when they are flexed inwardly toward each other as indicated in dotted lines in Figs. 2 and 3. After the insertion of the free ends into the recesses they are arranged to spring outwardly of their own resilience to the full line positions shown in Fig. 3, thereby positively locking the guide in place, assuming of course that the forward end of the guide has been lodged in place beforehand as will now be described. The arms 17 and 18 have their front ends offset to provide stop portions at 22 and 23 for a purpose presently to appear. The front end of the guide, namely the bight portion 24, is also bent laterally with respect to the arms 17 and 18 and forms with the stops 22 and 23 a C-shaped loop arranged to be inserted in recesses 25, 26 and 27 suitably provided by lugs cast integral with the front frame 6 on the inside of the latter. When the front end of the guide is received in these recesses it is positively held against lateral or vertical movement, especially after the free ends of the arms 17 and 18 have been interlocked with the plate 21 as previously described. Each guide is obviously arranged to be quickly assembled or disassembled with its slide in place thereon. This, of course, is a great advantage in the production of the stove in the first instance but is also of advantage when the stove is in service in that it enables getting at and thoroughly cleaning the parts apt to become greasy and dirty after the stove has been in service for awhile. The provision of wire guides also greatly cheapens the construction and makes for smoother and practically noiseless operation as will presently appear.

The broiler slides 11 operating on the guides 13 are each preferably formed from a single piece of sheet metal so as to minimize cost, as well as make for a lighter and easier operating mechanism. It will be seen that each slide has the ledges 12 formed by ribs crimped in the metal and extending longitudinally of the slide (see Fig. 4). The ledges are vertically and substantially uniformly spaced to enable setting the broiler pan at any desired elevation with respect to the burner to suit requirements. The top and bottom edges of each slide are bent to provide elongated sleeve portions 28 and 29 a portion of the length of the slide at the rear end thereof as best appears in Fig. 2. These sleeve portions serve as bearings and are arranged to be slidably received on the ways afforded by the arms 17 and 18, respectively. The slides, by virtue of the construction described, are capable of being extended from the oven with the broiler pan carried thereby and the outward movement thereof is arranged to be limited by the sleeve portions 28 and 29 coming into engagement with the stop portions 22 and 23, respectively, (see Fig. 2). By limiting the outward movement of the slides in this way it is unnecessary to provide some other form of stop for the oven door 15 and, furthermore, the gear segments 30 secured to the door at opposite sides thereof and meshing with rack teeth 31 provided on the slides 11 are kept from running off their racks. Each gear segment 30 is suitably stamped from sheet metal and has a flange 32 arranged to be fastened as by means of screws 33 to the back of the frame of the door 15. The teeth 35 thereof are suitably rounded to operate smoothly in the rack teeth 31, which it will be observed are in the form of struck out ears provided on the upper edge of the slide 11 (see Fig. 5). Each gear segment is notched out on the inside thereof as appears at 36 to avoid interference with the end of the guide 13 through which the same is arranged to operate. The marginal flange 37 struck outwardly from the edges of the notch in each segment serves to add stiffness where the segment might otherwise be weak enough to tend to bend one way or another. A circular flange 38 is struck inwardly at the center of the segment to ride on the rounded bearing surface 39. Thus the gear segments not only provide operative connections between the door 15 and the two slides 11 but also provide the door mountings. A counterbalancing torsion spring 40 is provided in connection with each of the two gear segments 30. Each of said springs is carried by a stud 41 on a bracket 42 bolted to the front frame 6 as appears at 43. One end 44 of the spring 40 is held suitably by engagement in a hole 45 provided therefor in the stud 41. The other end 46 of the spring is extended on a tangent and has the outer end thereof hooked as appears at 47 for connection with one end of a link 48, the other end of which is hooked into a hole 49 provided on the gear segment 30 at a predetermined radius with respect to the center of the latter. In the opening of the door it will be evident by comparison of Fig. 2 with Fig. 1 that the spring 40 is wound an appreciable amount, sufficient at least to keep the oven door 15 from dropping with a jar.

In the operation of the in-a-door broiler the slides are found to operate noiselessly and with comparative ease on their guides and the broiler pan is extended sufficiently in the opening of the oven door to afford easy access to the contents thereof. Furthermore, it is not at all inconvenient to remove and replace

the broiler pan, this being done from the front of the stove when the door is opened. There is absolutely no danger of being burned as was the case with the old unimproved type of broiler oven. The fact that the front ends of the slides 11 are cut off diagonally as shown at 50, which is primarily for the purpose of avoiding interference with the oven door 15 in the opening and closing thereof, has also been found to be of advantage in facilitating the entering of the broiler pan at any desired elevation with respect to the burner, for the reason that the front ends of the ledges are offset with respect to one another. The two points of support provided for each of the slides by the bearings 28 and 29 make the slides perfectly rigid even when fully extended from the oven and it will be observed that the bearings are sufficiently elongated to prevent side-play of the slides. It will also be evident that the arrangement is such that access can be had to all parts of the oven without the least difficulty to permit thoroughly cleaning the same, even without disassembling any part of the construction, although that is possible as was previously described.

It is believed the foregoing description conveys a clear understanding of my invention and of its various objects and advantages. While reference has been made in the foregoing description to certain specific details of construction it should be understood that the invention is not limited in these respects but that all legitimate modifications and adaptations are intended to be covered in the appended claims.

I claim:—

1. The combination in a broiler compartment of a range, having a burner mounted in the upper portion thereof, of guides mounted in said compartment on the opposite sides thereof at a predetermined elevation with respect to the burner, independent complementary slides mounted on the guides for movement into and out of the oven, said slides providing a plurality of supports for a broiler pan at different elevations with respect to the burner in said compartment, a broiler pan removably mounted in said supports, an oven door hingedly mounted at the front of the oven, and identical means providing an operating connection between said door and each of said slides for extending the latter in the opening of the door and returning the same in the closing thereof.

2. In a broiler over the combination with a burner mounted in the upper portion of said oven, of guides in said oven at opposite sides thereof at a predetermined elevation with respect to the burner, a pair of independent complementary racks at opposite sides of said oven providing a plurality of vertically spaced ledges for supporting a broiler pan at different elevations with respect to the burner, said racks having bearing portions slidably received on said guides, said bearing portions being at the inner ends of said racks whereby to permit extension of the racks from the oven as the bearing portions slide forwardly on the guides, a broiler pan removably mounted in said racks, and an oven door hingedly mounted at the front of the oven and operatively connected in identical manner with each of said racks for extending the same in the opening of the door and returning the same in the closing thereof.

3. In a broiler oven having a burner mounted in the upper portion thereof and an oven door hingedly mounted at the front end thereof to swing down in opening, guides in said oven on the opposite sides thereof at a predetermined elevation with respect to the burner, a pair of independent complementary supports for a broiler pan having bearing portions slidably received on said guides, each of said supports having a plurality of vertically spaced longitudinally extending ledges provided thereon, the said ledges extending inwardly toward each other from opposite sides of the oven so as to provide supports at different elevations relative to the burner for a broiler pan inserted therebetween, a broiler pan removably and slidably received on any selected pair of ledges according to the elevation desired with respect to the burner, a pair of gear segments mounted on the inside of the oven door at the lateral edges thereof and extending inwardly between said supports and the sides of the oven so as to avoid interference with the broiler pan received on the supports, and a rack on the back of each support meshing with a gear segment.

4. In a broiler oven having a burner mounted in the upper portion thereof and an oven door hingedly mounted at the front thereof to swing down in opening, guides provided in said oven at opposite sides thereof at a predetermined elevation with respect to the burner, supports for a broiler pan slidably mounted on said guides and arranged to extend from the oven, said supports providing a plurality of vertically spaced longitudinally extending ledges, the ledges extending inwardly toward each other from opposite sides of the oven so as to receive the edges of a broiler pan introduced between the supports, a broiler pan removably and slidably received on any selected pair of ledges according to the elevation desired with respect to the burner, a pair of gear segments on the inside of the oven door at opposite sides thereof extending inwardly in the oven behind the supports so as to avoid interference with the broiler pan carried by said supports, and racks on the back of said supports meshing with said gear segments, each of said supports being formed from a single piece of sheet metal crimped to provide spaced longitudinally extending ribs to

serve as supporting ledges, said support being formed with struck out ears at points spaced longitudinally thereof to provide the rack teeth on the back of said support.

5. In a broiler oven having a burner mounted in the upper portion thereof and an oven door hingedly mounted at the front thereof to swing down in opening, guides provided in said oven at opposite sides thereof at a predetermined elevation with respect to the burner, supports for a broiler pan slidably mounted on said guides and arranged to extend from the oven, said supports providing a plurality of vertically spaced longitudinally extending ledges, the ledges extending inwardly toward each other from opposite sides of the oven so as to receive the edges of a broiler pan introduced between the supports, a broiler pan removably and slidably received on any selected pair of ledges according to the elevation desired with respect to the burner, a pair of gear segments on the inside of the oven door at opposite sides thereof extending inwardly in the oven behind the supports so as to avoid interference with the broiler pan carried by said supports, and racks on the back of said supports meshing with said gear segments, the guides being in the form of rods and each of said supports being formed from a single piece of sheet metal crimped to provide longitudinally extending ribs in spaced relation to one another to serve as supporting ledges, the said supports also having the edges thereof formed to provide sleeve-shaped bearing portions arranged to be slidably received on the guide rods.

6. In a broiler oven having a burner mounted in the upper portion thereof and an oven door hingedly mounted at the front thereof to swing down in opening, guides provided in said oven at opposite sides thereof at a predetermined elevation with respect to the burner, supports for a broiler pan slidably mounted on said guides and arranged to extend from the oven, said supports providing a plurality of vertically spaced longitudinally extending ledges, the ledges extending inwardly toward each other from opposite sides of the oven so as to receive the edges of a broiler pan introduced between the supports, a broiler pan removably and slidably received on any selected pair of ledges according to the elevation desired with respect to the burner, a pair of gear segments on the inside of the oven door at opposite sides thereof extending inwardly in the oven behind the supports so as to avoid interference with the broiler pan carried by said supports, and racks on the back of said supports meshing with said gear segments, the guides being in the form of rods and each of said supports being formed from a single piece of sheet metal crimped to provide longitudinally extending ribs in spaced relation to one another to serve as supporting ledges, the said supports also having the edges thereof formed to provide sleeve-shaped bearing portions arranged to be slidably received on the guide rods, and said supports being further formed to provide struck out ears in longitudinally spaced relation on the backs thereof to serve as rack teeth for meshing engagement with the gear segments.

7. In a broiler oven having a burner mounted in the upper portion thereof and an oven door hingedly mounted at the front thereof, guides provided in said oven at opposite sides thereof, each of said guides comprising a pair of parallel vertically spaced substantially horizontal rods, supports for a broiler pan arranged to be slidably received on said guides, each of said supports being formed from a single piece of sheet metal crimped to provide longitudinally extending ribs on the inner face thereof to serve as supporting ledges and also formed to provide sleeve portions at the top and bottom edges thereof to serve as bearings slidably received on the guide rods, and means providing connections between said supports whereby they are arranged to be simultaneously extended from the oven or returned into the same when the oven door is opened and closed.

8. A broiler oven as set forth in claim 7 wherein the last mentioned means comprises a pair of gear segments mounted on the inside of the oven door at opposite sides thereof and extending inwardly in the oven behind the supports whereby to avoid interference with the broiler pan carried by the latter, and wherein each of the sheet metal supports has the upper edge thereof struck to provide longitudinally spaced ears on the back thereof arranged to serve as rack teeth for meshing engagement with the gear segment associated therewith.

9. In a broiler oven as set forth in claim 7 wherein each of said guides is formed from a single piece of wire rod bent generally to U-form so that the arms thereof serve as parallel guide rods, means for removably supporting each of said guides in the oven, said means comprising a part in said oven providing a recess adapted to receive the bight portion of said U-shaped guide, and a plate mounted in said oven having a pair of recesses for receiving the free ends of the arms of said U-shaped guide, the free ends of said arms being insertable and removable from said recesses by flexing of one or both of said arms in a predetermined manner.

10. A broiler oven as set forth in claim 7 wherein each of said guides is formed from a single piece of wire rod bent into substantially U-shape whereby the arms of the U serve as parallel guide rods, the bight portion of the U-shaped guide being conformed so that the end of at least one of said arms is in offset relation to the rest of the bight

portion to provide a stop arranged to be engaged by one of the bearings of the broiler pan support, the said guide having means for supporting the same in the oven.

11. A broiler oven as set forth in claim 7 wherein each of said guides is formed from a single piece of wire rod bent into substantially U-shape whereby the arms of the U serve as parallel guide rods, the bight portion of the U being bent at right angles and formed into a substantially C-shape so that the ends of the arms of the U are offset in relation to the bight portion to provide stop portions arranged to be engaged by the bearings of the broiler pan support cooperating with the guide, the said guide having means for supporting the same in the oven the said means comprising a part of the oven providing recesses for the reception of the C-shaped bight portion whereby to support one end of the guide, and a plate providing a pair of recesses for receiving the free ends of the arms of the U-shaped guide whereby to support the other end of the guide, the said recesses being of such a form that the ends of said arms are arranged to be inserted or removed therefrom by flexing one or both of said arms in a predetermined manner.

12. A broiler oven as set forth in claim 7 wherein each of the gear segments is secured to the back of the oven door and has the center thereof conformed for cooperation with a bearing part of the frame in which said door is mounted whereby the door is hingedly supported in its frame on the gear segments, spring means for counterbalancing the door, and means providing operative connection between said spring means and a part of each of said gear segments whereby to counterbalance the door in the opening thereof.

13. In a broiler oven having a burner mounted in the upper portion thereof and an oven door hingedly mounted at the front thereof, a pair of supports for a broiler pan provide at opposite sides in said oven and providing a plurality of vertically spaced ledges, a broiler pan removably and slidably received on any selected pair of ledges, said supports having upper and lower bearing portions, and a pair of guides at opposite sides in said oven having the bearing portions of said supports operating thereon, each of said guides being formed from a single rod bent into substantially U-shape whereby the arms of the U serve as parallel guideways, there being means providing recesses at one end of the oven to receive the bight end of each U-shaped guide for support thereof, and means at the other end of the oven providing recesses for reception of the other end of the guide, said guides having the one end thereof removably received in the recesses therefor and the other end being removable following such disengagement whereby quick and easy removal of the guides is permitted.

14. In a broiler oven having a burner mounted in the upper portion thereof and an oven door at the front thereof arranged to swing down in opening, guides in said oven on the opposite sides thereof, slides mounted on the guides for movement into and out of the oven, said slides providing on the inner sides thereof a plurality of supports for a broiler pan at different elevations with respect to the burner, a broiler pan removably mounted on said supports, said slides having racks provided on the outer sides thereof, and a pair of gear segments fastened to the inside of the oven door and providing hinge supports therefor, said segments extending inwardly alongside the outer sides of said slides and meshing with the racks thereon.

15. A structure as set forth in claim 14 wherein the gear segments are each stamped from a single piece of sheet metal having the teeth thereof projecting from the arcuate periphery, there being a laterally directed radially extending flange formed on one edge of said segment by means of which the same is arranged to be fastened to the inside of the oven door, and a laterally directed substantially semi-circular flange formed at the center of said segment concentric with the arcuate periphery arranged to ride on a bearing provided therefor in the front of the oven.

16. A structure as set forth in claim 14 wherein the gear segments are each stamped from a single piece of sheet metal having the teeth thereof projecting from the arcuate periphery, said segment being arranged to be secured to the oven door along one of its radial edges, there being a laterally directed substantialy semi-circular flange formed at the center of said segment concentric with the arcuate periphery arranged to ride on a bearing provided therefor in the front of the oven.

17. A structure as set forth in claim 14 wherein each of the gear segments is stamped from a single piece of sheet metal having the teeth projecting from the arcuate periphery there being a laterally directed radially extending flange formed on one edge of said segment by means of which the same is arranged to be fastened to the inside of the oven door, and the center portion of said segment being rounded in form substantially semi-circularly and concentric with the arcuate periphery and arranged to ride on a bearing provided therefor at the front of the oven.

18. In a broiler oven having a burner mounted in the upper portion thereof, and an oven door hingedly mounted at the front thereof to swing down in opening, guides provided in said oven at opposite sides thereof at a predetermined elevation with respect

to the burner, slides for supporting a broiler pan providing a plurality of vertically spaced supporting ledges for mounting a broiler pan at different elevations relative to the burner and having bearing portions arranged to be slidably received on the guides, a broiler pan removably mounted on the slides, and means operatively connecting the slides with the oven door for extending the same in the opening of the door and returning the same in the closing thereof, each of said slides being formed from a single piece of sheet metal crimped to provide spaced, parallel, longitudinally extending and inwardly directed ribs to constitute the supporting ledges.

19. In a broiler oven having a burner mounted in the upper portion thereof, and an oven door hingedly mounted at the front thereof to swing down in opening, guides provided in said oven at opposite sides thereof at a predetermined elevation with respect to the burner, slides for supporting a broiler pan providing a plurality of vertically spaced supporting ledges for mounting a broiler pan at different elevations relative to the burner and having bearing portions arranged to be slidably received on the guides, a broiler pan removably mounted on the slides, and means operatively connecting the slides with the oven door for extending the same in the opening of the door and returning the same in the closing thereof, each of said slides being formed from a single piece of sheet metal crimped to provide spaced, parallel, longitudinally extending and inwardly directed ribs to constitute the supporting ledges, the forward ends of said slides being cut on a diagonal whereby to offset the end of each supporting ledge relative to the end of the next adjacent ledge.

20. In a broiler oven having a burner mounted in the upper portion thereof and an oven door arranged to swing down in opening, a pair of slides at opposite sides of said oven having means on the inside thereof for supporting a broiler pan therebetween at different elevations with respect to the burner, said slides each having upper and lower bearing portions, and having racks projecting from the outside thereof for gear operation of said slides, a pair of guides each formed from a single piece of rod material providing a pair of parallel vertically spaced horizontal guide rods on which the aforesaid upper and lower bearings are slidably received, and an elongated transverse connecting loop portion at one end of said guide rods bent in a plane transverse to the plane of said rods, means at each side of the oven for supporting the opposite ends of the guides, the said guides being disposed with the elongated loops thereof at the front end of the oven, and a pair of mutilated gear segments mounted on the inside of the oven door and extending inwardly alongside the outside of the slides and meshing with the racks thereon, said gear segments being operable through the aforesaid elongated loops.

21. In an oven construction the combination with an oven casing having a door opening in one vertical face thereof and a door hingedly mounted at its lower edge for completely closing said opening, of a pair of substantially independent complementary slides, each slidably mounted for movement into and out of the oven, a plurality of superposed elongated guides extending substantially the full depth of the oven for each slide between which the same is mounted whereby vertical cocking thereof is prevented, and identical means connecting each slide to the door for simultaneous movement of said slides and simultaneous movement with the door in the movement thereof.

In witness of the foregoing I affix my signature.

PETER I. HOLLMAN.