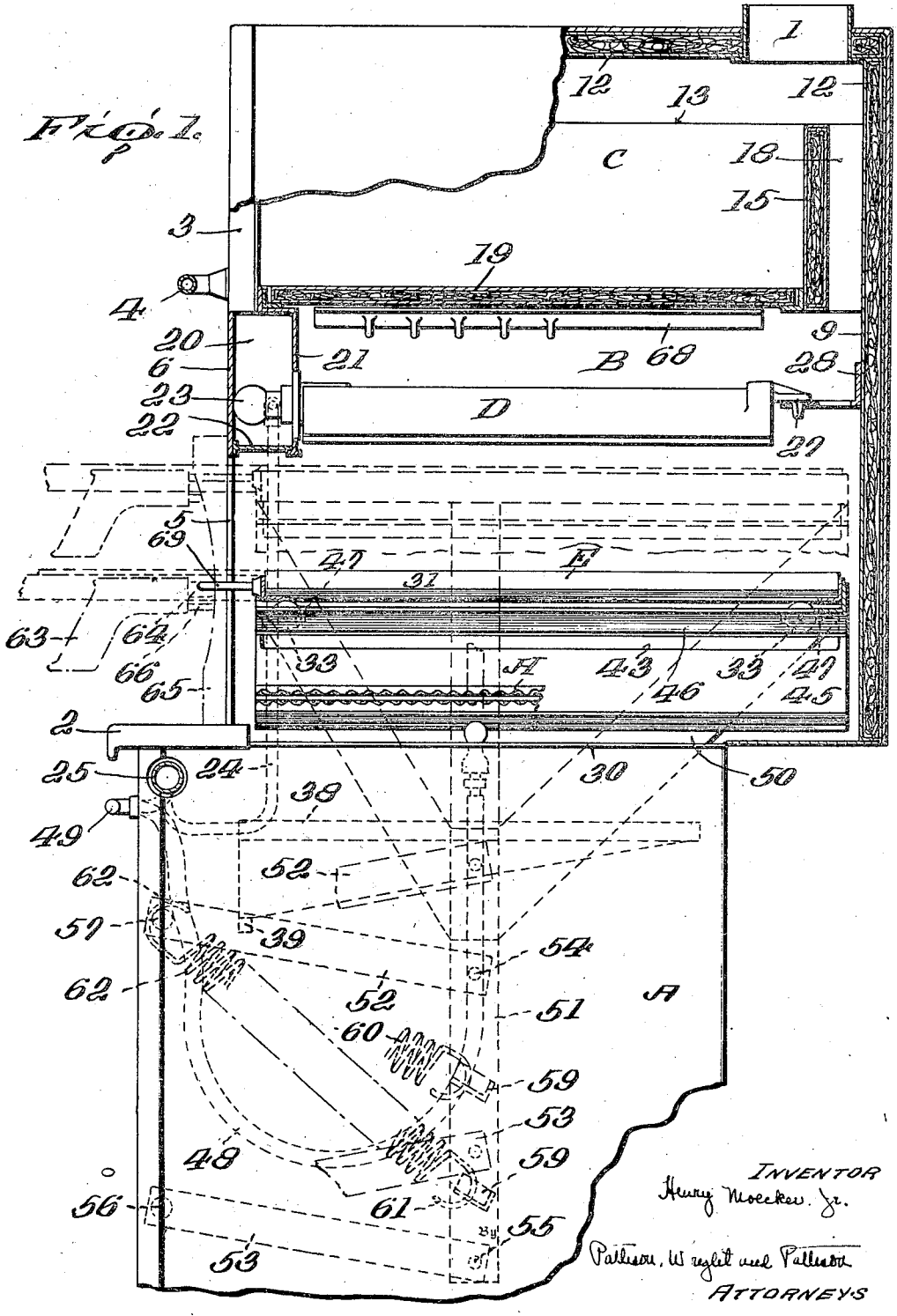
March 24, 1942. H. MOECKER, JR 2,277,446

BROILER

Filed March 18, 1940 3 Sheets-Sheet 1



INVENTOR
Henry Moecker, Jr.

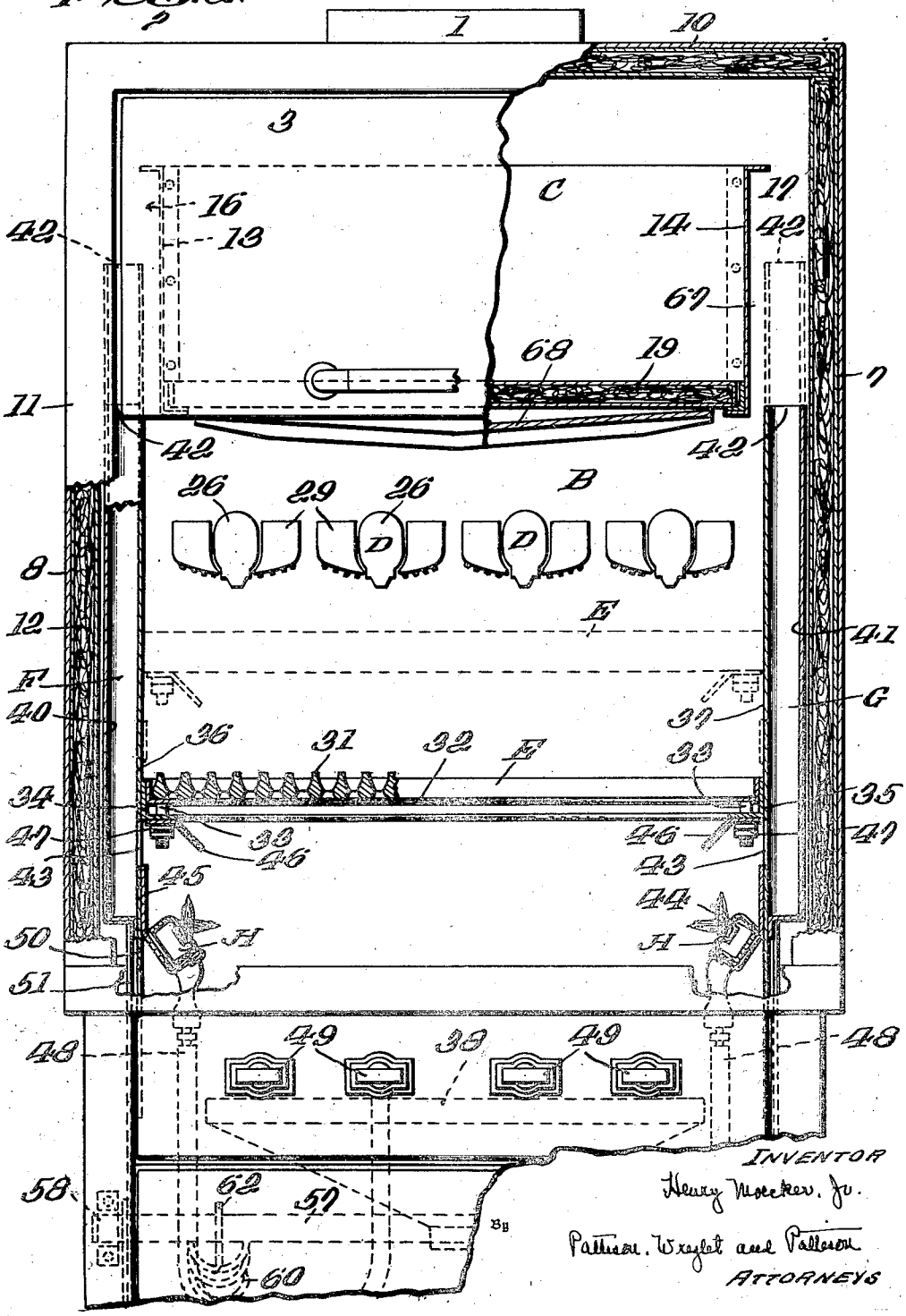
Pattison, Wright and Pattison
ATTORNEYS

March 24, 1942. H. MOECKER, JR 2,277,446

BROILER

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FIG. 2.

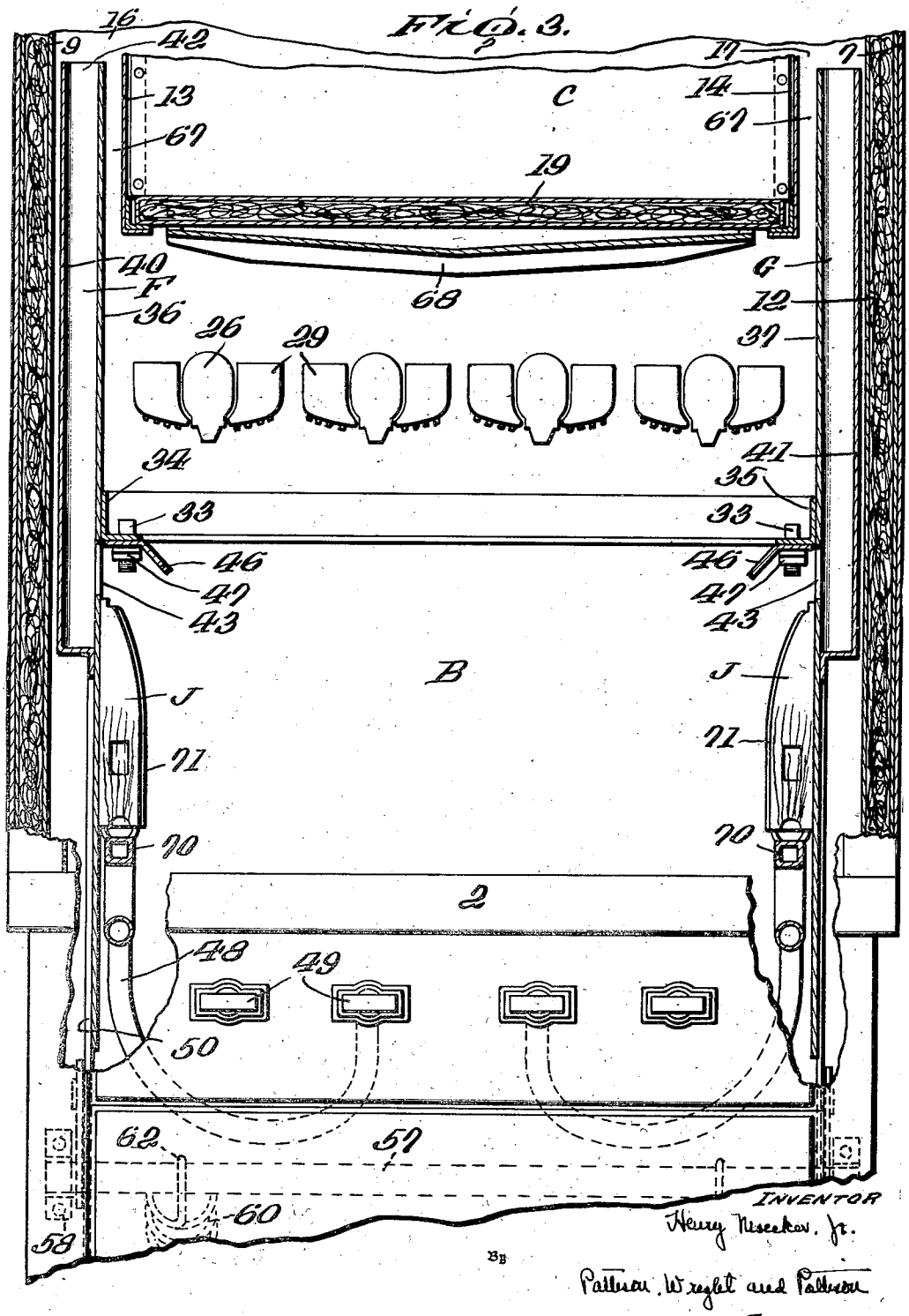


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FIG. 3.



Patented Mar. 24, 1942

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UNITED STATES PATENT OFFICE

2,277,446

BROILER

Henry Moecker, Jr., Cleveland, Ohio, assignor to American Stove Company, St. Louis, Mo., a corporation of New Jersey

Application March 18, 1940, Serial No. 324,706

8 Claims. (Cl. 126—41)

This invention pertains to broilers and in referring to the invention by this designation I have reference to the entire broiling oven or compartment of a cooking range and more particularly to that type of cooking range the broiling oven of which is provided with gaseous fuel type burners.

One of the primary objects of the invention is to provide a cooking range of a broiler having top and bottom broiler burners.

Another object of the invention is to provide a broiler grid or pan which can be raised and lowered in respect to the upper broiler burner but remains in the same position with respect to the lower broiler burners by reason of the fact that the lower burners are elevated and lowered as a unit with the broiler grid or pan.

Another and still further object of the invention is to provide a novel flue arrangement for disposing of the hot products of combustion and gases of the lower broiler burners.

Other specific objects and novel features of construction which are incidental to a broiler having the foregoing enumerated attributes will appear from the following description when read in the light of the accompanying drawings.

In the drawings:

Fig. 1 is a vertical sectional view, from front to back, through a broiler which embodies the present improved invention.

Fig. 2 is a vertical sectional view taken at right angles to Fig. 1 of the drawings.

Fig. 3 is a vertical sectional view transverse a broiler embodying a modified form of the invention.

Throughout the following description the word "broiler" is utilized to designate the entire broiling oven or chamber and the parts making up a complete broiling apparatus. In the description that member or element which is used as a support or carrier for the food or the utensil containing the food to be broiled or otherwise cooked is referred to as either a "grid" or "pan."

It is to be understood that the present broiler can be incorporated into and used in conjunction with cooking stoves or ranges of widely varying design and construction and that although the broiler burners are described as gas burners the burners could be equally well operated by or upon some other specific type of fuel.

With the foregoing in mind and having reference to Figures 1 and 2 of the drawings I have here illustrated a gas range which in its bottom or base is provided with an enclosed housing A and upon which is superimposed a broiling chamber or oven B which in turn supports a cooking or so-called baking oven C provided at its top and rear end with a conventional outlet flue 1.

The broiling and baking ovens are preferably inset from the front of the lower compartment or housing A to provide a horizontally disposed table top-like working surface 2 which extends across the entire width of the front of the range in a horizontal plane at a convenient height above the floor of the room in which the range is positioned.

The baking oven, at its front end, is provided with a conventional door 3 having an operating handle 4.

The broiling chamber throughout a large portion of its height is open at its front end as appears at 5. This opening extends from the table top-like working surface 2 upwardly to the lower end of a transversely extending closure panel 6 the upper end of which terminates at or adjacent the lower edge of the baking oven door 3.

By reference to Figure 2 of the drawings it will clearly appear that the broiling and baking ovens are in a common chamber or housing the outer side walls of which are 7 and 8, a rear outer wall 9 and a top wall 10. The front of this housing is defined by the range front frame 11, oven door 3 and the hereinbefore referred to panel 6. This common chamber has no bottom for reasons which will hereinafter more clearly appear. A bottom closure, if used, would however have to be provided with an opening permitting the passage of fuel pipes and the members which interconnect the broiler grid or pan with that portion of the elevating mechanism which is within the lower housing A, as will hereinafter more fully appear.

Most ranges today are of the so-called fully insulated type and such a range is illustrated in the drawings with the result that the side, rear and top walls of the common chamber containing the broiling and baking ovens is of the double or spaced wall type with the space between the walls filled with suitable insulating material 12.

The baking oven proper has its side walls 13 and 14 arranged in spaced parallel relationship to the inner side walls of the range while its rear insulated wall 15 is arranged in spaced parallel relationship with the inner rear wall of the range to provide flues or passageways 16 and 17 at each side of the oven and a similar flue or passageway 18 at the rear of the oven. The upper edges of the side and rear walls of the oven stop considerably short of the under side of the range top. The oven is provided with a fully insulated

bottom 19 which is disposed immediately above the upper broiler burners which are designated as an entirety in Figure 1 of the drawings by D.

A fuel manifold chamber 20 is provided behind the range front panel 6 and is defined by a rear wall 21 and a bottom wall 22. A fuel manifold pipe 23 extends longitudinally of this chamber and is connected by a suitable conduit 24 to a main fuel supply pipe 25 positioned in the upper front end of the lower range housing A.

The upper broiler burners are specifically illustrated as being in the form of a plurality of elongated burner arms 26 arranged in separated parallel relationship. The front ends of these burners extend into the chamber 20 for suitable connection with the fuel manifold pipe 23 while their rear ends are removably and quickly detachably supported as at 27 upon a suitable bracket 28. The spaces between the burner arms themselves and the spaces between the outermost burner arms and the inner side walls of the broiler chamber are closed to a substantial degree by placing at each side of each burner arm an elongated radiant element 29.

By reference to Fig. 1 of the drawings it will be seen that the common housing within which the broiling and baking ovens are located has a large opening 30 into a lower housing or chamber A. The structure for supporting and guiding the broiler grid or pan is positioned within this lower housing and will now be described in combination with the broiler grid and the flue arrangement for the bottom broiler burners. The broiler grid or pan is designated as an entirety at E and is illustrated as comprising a grid 31 mounted on a carrier 32. The carrier supporting the grid is supported at its front and rear upon suitable rollers 33 which are positioned adjacent the front and rear ends of a pair of guides or trackways 34 and 35 positioned in horizontal alignment at opposite sides of the broiling chamber and suitably secured, as by welding, to the inner walls 36 and 37 respectively of the flues F and G. It will be obvious that in accord with the wishes of the operator the grid and a pan could be used in combination or that either of them could be used independently. When the grid alone is used it is necessary to make provision for collection of meat juices and grease which would fall through the grid, and accordingly a grease collection pan 38 is disposed within the lower housing A beneath the open bottom 30 of the broiling chamber. This grease collection pan has an inclined bottom to provide for the total discharge of its contents through a suitable discharge pipe or valve 39. The grease collection pan would have to be emptied periodically into a suitable receptacle or a conduit from its outlet opening 39 be provided to carry the grease to some suitable place of discharge or collection.

The flues F and G have outer walls 40 and 41 respectively which are in separated parallel relationship to the inner side walls of the range. Each of the flues extend upwardly within the broiling chamber and have open upper ends 42 which when the broiling grid or pan is in its lowermost position, as illustrated in Figure 2, extends slightly into the flueways 16 and 17 at the opposite sides of the baking oven C. The positions of the upper open ends of the flues F and G when the broiler grid or pan is elevated to its uppermost position are illustrated in dotted lines in Figure 2 of the drawings and in this figure of the drawings the elevated position of the broiler grid is likewise illustrated in dotted lines.

Immediately beneath the broiling grid supporting runways 34 and 35 the flues F and G have their inner walls provided with elongated slot-like openings 43 which provide communication between the flues and the broiling chamber at a point beneath the broiling grid or pan and above the lower broiler burners which are designated as an entirety at H. The broiler burners H need not be of any specific form but in the present embodiment of the invention each of these burners is illustrated as being in the form of an elongated burner housing which is of a length substantially equal to the depth of the broiling chamber and is of the so-called "cross fire" type. That is to say, each of the burners is provided with two rows of burner orifices or ports with the ports of each row disposed at an inclination to the ports of the other row so as to cause a cross fire or cross flame as is clearly illustrated at 44 in Figure 2 of the drawings. Each of these burners is suitably secured as by a bracket or brackets 45 to the inner wall of one of the flues F and G and is disposed slightly below the opening 43 in the inner wall of the flue. To assist in directing the hot products of combustion generated by the lower broiler burners into the flues F and G baffle plates 46 are provided and are suitably secured as at 47 to the under side of the trackways 34 and 35 and extend inwardly and downwardly at an inclination to overhang the burners H and deflect the hot products of combustion into the openings 43 at the lower end of the flues F and G and protect the burner from dripping grease.

Inasmuch as the lower broiler burners H move upwardly and downwardly with the broiling grid or pan and flues F and G, as will appear from the following description, these burners are provided with flexible fuel conduits 48 which have connection with the aforementioned main fuel supply manifold 25. A series of gas cocks 49 are positioned exteriorly of the front of the upper end of the lower housing A for controlling the supply of fuel to the several burners whereby any one or more of them can be operated as desired. In the present arrangement four gas cocks are illustrated and provision is made for controlling the supply of fuel individually to the two lower broiler burners and individually to the two upper broiler burners. This arrangement will require that the two upper broiler burners at the left have a common manifold or be in the form of a joint burner and the two upper broiler burners at the right be similarly constructed. It will be obvious that should it be found desirable each of the upper broiler burners could be an individual burner and that additional gas cocks would provide individual control of the supply of fuel to each of them.

A pair of triangular shaped plates 50 have their upper ends secured to the flues F and G respectively while their lower ends extend downwardly into the lower housing A. A vertically disposed arm 51 is secured to each of these plates and extends downwardly below the lower end thereof. By reference to Figure 2 of the drawings it will be seen that these plates and arms closely parallel the side walls of the housing A. A pair of cross arms 52 and 53 arranged in separated and parallel relationship are pivotally connected as at 54 and 55 respectively to each of the vertical arms 51. The lower cross arms 53 have their outer ends pivotally connected as at 56 to the lower housing at a point adjacent its front while the upper arms 52 have their outer ends pivotally supported on a horizontally disposed

and transversely extending shaft 57 which is supported in suitable bearings 58 positioned at each side of the lower housing A adjacent the front end thereof. A cross brace 59 interconnects the vertical arms 51 at a point closely adjacent their lower ends. A pair of coil springs 60 have their inner and lower ends 61 connected to this cross arm while their upper and outer ends 62 are connected to the transversely extending shaft 57. These springs tend normally to exert an elevating force upon the broiling grid or pan and the flues F and G with the result that these members can be raised and lowered with the minimum of effort. The springs overcome to a large degree the inclination of these members to drop with the result that the parts can be lowered without the operator expending any great amount of effort to prevent their lowering too rapidly.

To provide a convenient means for raising and lowering the broiling grid and its associated flues I have provided exteriorly of the broiling chamber and at the front thereof a handle 63 which is reciprocably mounted upon an arm 64 which has attachment to the broiler grid or pan supporting runway 34. The arm 64 passes through a housing 65 and the handle 63 has an extension 66 into this housing. The handle extension 66 has locking engagement with the housing. This locking engagement is broken by pushing the handle 63 inwardly and when the handle is in an inward position the broiling grid and pan together with its runway and all the associated parts can be raised and lowered. When the broiling grid or pan is positioned as desired the operator permits the handle to move outwardly so that its extension has locking engagement with the housing 65 to maintain the parts in their set positions.

The operating handle 63 and its locking association wtih the housing 65 forms no specific part of the present invention and this construction is illustrated and described specifically in a copending application in the name of William H. Frick, Serial Number 324,707, filed March 18, 1940. In the present construction an operating handle and a means for locking or securing the broiling grid or tray in a set position is a necessary requirement but the specific construction for effecting this result can be widely varied without in any way departing from the spirit of the invention which is the subject matter of the hereinafter appended claims.

The present broiler provides an arrangement whereby food placed upon or in the broiling grid or pan can be optionally simultaneously cooked from above and below or from above only or from below only. The arrangement is further such that the broiling grid or pan can be conveniently elevated or lowered in respect to the upper broiling burners which will facilitate cooking operations, as will be readily apparent to those skilled in and familiar with cooking. The arrangement also assures that the bottom broiling burners are at all times correctly positioned for underneath or bottom cooking irrespective of the particular position in which the broiling grid or pan may be set.

In a broiler having top and bottom burners provision must be made to prevent the bottom burners from interfering with the operation of the top burners which is a result which would occur were the products of combustion of the bottom burners permitted to reach the upper burners. In the present arrangement independent flues for the bottom burners are provided. These bottom burners vent through the vertical flues F and G into the flueways 16 and 17 at the sides of the baking oven and from there pass upwardly and over the baking oven to discharge through the main flue outlet 1. The upper burners vent through the spaces or flueways 67 between the flues F and G and the adjacent side walls of the baking oven. The upper broiler burners are used also for the purpose of heating the baking chamber and to prevent localized overheating of the bottom of the baking chamber an insulator or heat deflector 68 is provided at the under side of the oven.

Whenever it is desired to conveniently visually inspect the article being cooked on the broiling grid the grid is pulled outwardly from the broiling oven and to facilitate this movement the front edge of the grid or tray is provided with a handle 69 which extends outwardly through the open front end of the broiling chamber to a point where it can be conveniently grasped. This handle is sufficiently remote from the interior of the broiling chamber to prevent it from becoming too hot to be grasped. When the broiling grid and pan are pulled outwardly from the broiling chamber venting of the lower broiler burners into the flues F and G, by reason of the baffles 46, is sufficiently complete to prevent the lower broiler burners from interfering with the operation of the upper broiler burners notwithstanding the fact that the broiling tray 32 in this instance would be no longer interposed between the upper and lower broiler burners.

When a combined broiling grid and pan are used the pan can serve as the collection medium for meat juices and grease unless it be desired to provide the pan with openings in its bottom which would drain into the grease collection pan 38 in the lower housing A. When a grid alone is used the grease collection tray 38 is an essential element as otherwise it would be impossible to keep the base chamber A clean.

When a grid type food and utensil supporting element is used alone the venting arrangement for the lower burners is such as to prevent the operation of the lower burners interfering with the operation of the upper broiler burners.

In Figure 3 of the drawings a modified form of the invention is illustrated. The construction of the modified form of the invention is identical with that of the preferred form with the exception of the type and construction of the lower broiler burners. Accordingly the same reference numerals appearing in Figures 1 and 2 of the drawings are used in respect to Figure 3 with the exception of the lower broiler burners.

The lower broiler burners in this instance are designated as an entirety at J and are commonly referred to as radiant type burners. Specifically they each comprise elongated burner housings 70 provided in their top walls with burner ports or orifices which discharge fuel within suitable radiant elements 71 which are supported upon the burner housings. These radiant elements can be of varying constructions. In the present instance they are vertically elongated and terminate immediately below the inlet passageways 43 into the lower ends of the flues F and G.

In this figure the broiling grid and pan are shown as being completely removed from their supporting guides or runways 34 and 35 but it is to be understood that a suitable food and utensil supporting element is provided and sup-

ported for sliding in a horizontal plane upon the runway rollers 33.

The modified form of the invention has all the attributes of the preferred form of the invention and its operation is similar. Figure 3 of the drawings is for the purpose of illustrating the use of the invention in broiling ovens having burners of varying construction.

The drawings and foregoing description are to be considered as merely illustrative of the inventive concept and the invention is to be limited only within the scope of the hereinafter appended and following claims.

I claim:

1. In a device of the character described, a broiling oven having a chamber with upper and lower broiler burners therein which receive their secondary air supply from said oven chamber, said oven above said upper broiler burner being provided with an outlet flue for venting the hot gases and products of combustion generated by said upper broiler burner and which rise above said burner, flue conduits having their upper ends communicating with said oven outlet at a point above said upper broiler burner and having inlets disposed closely adjacent said lower broiler burner, said flue conduits receiving and directing the hot gases and products of combustion generated by said lower burners around said upper burners to prevent the lower burners from interfering with the operation of the upper burners, and a broiling grid or pan in said oven above said lower broiler burner.

2. In a device of the character described, a broiling oven having a chamber with upper and lower broiler burners therein which receive their secondary air supply from said oven chamber, said oven above said upper broiler burner being provided with an outlet flue for venting the hot gases and products of combustion generated by said upper broiler burner and which rise above said burner, flue outlet conduits having their upper ends at all times communicating with said oven outlet at a point above said upper broiler burner and having inlets disposed closely adjacent said lower broiler burner, said flue conduits receiving and directing the hot gases and products of combustion generated by said lower burners around said upper burners to prevent the lower burners from interfering with the operation of the upper burners, said flue outlet conduits and said lower burners being connected and vertically movable as a unit a broiling grid or pan in said oven above said lower broiler burner and being vertically movable therewith, means supporting said broiling grid or pan to permit it to be slid in and out of said oven, and means to raise and lower said lower burner.

3. In a device of the character described, a broiling oven having a chamber with upper and lower broiler burners therein which receive their secondary air supply from said oven chamber, said oven chamber being provided with a discharge flue above said upper broiler burner, a flue conduit extending from a point within said oven above said upper broiler burner to a point adjacent said lower broiler burner and provided with an inlet adjacent said lower broiler burner, and said flue conduit at all times receiving and directing the hot gases and products of combustion from the lower burner to discharge around and above said upper broiler burner.

4. In a device of the character described, a broiling oven having a chamber with upper and lower broiler burners therein which receive their secondary air supply from said oven chamber, said oven chamber being provided with a discharge flue above said upper broiler burner, a flue conduit extending from a point within said oven space above said upper broiler burner to a point adjacent said lower broiler burner and provided with an inlet adjacent said lower broiler burner, a broiling grid or pan within said oven above said lower burner, said lower broiler burner, said flue conduit and said broiling grid or pan being interconnected to form a unit, means supporting said unit and operable to adjust said unit vertically in said oven chamber, and said flue conduit at all times receiving and directing the hot gases and products of combustion from the lower burner to discharge around and above said upper broiler burner.

5. In a device of the character described, a broiling oven having upper and lower broiler burners therein which receive their secondary air supply from said oven, said oven having a space therein above said upper burner provided with an outlet flue, said lower burner comprising a pair of elongated burner arms one each of which is disposed at each side of said broiling oven, a flue conduit adjacent each of said lower burner arms provided with an inlet opening adjacent thereto, and each of said conduits being provided with an outlet opening disposed in and communicating with the said oven space above said upper broiler burner.

6. In a device of the character described, a broiling oven having a chamber with upper and lower broiler burners therein which receive their secondary air supply from said oven chamber, said oven having a space therein above said upper burner provided with an outlet flue, said lower burner comprising a pair of elongated burner arms one each of which is disposed at each side of said broiling oven, a flue conduit adjacent each of said lower burner arms and having an inlet opening adjacent thereto and an outlet disposed in the oven space above said upper broiler burner, and a baffle adjacent each of the inlet openings of said conduits acting to direct the hot gases and products of combustion generated by said lower burner into said conduits.

7. In a device of the character described, a housing having a cooking or baking oven in its upper end, a flue conduit receiving passageway at each side of said oven, an outlet flue in the upper end of said housing having communication with said flue conduit receiving passageways and said cooking oven, a broiling oven in said housing beneath said cooking oven and having upper and lower broiler burners therein, said flue conduit receiving passageways having communication with the upper end of said broiling oven above said upper broiler burner to conduct hot gases and products of combustion generated by said upper burner to discharge through said outlet flue, said lower broiler burner comprising a pair of burner arms one each of which is positioned adjacent a side wall of said broiling oven, a flue conduit associated with each of said burner arms and having a discharge end positioned in one of said flue conduit receiving passageways at one side of said cooking oven, each of said conduits having an inlet opening adjacent its associated lower burner arm.

8. In a device of the character described, a housing having a cooking or baking oven in its upper end, a flue conduit receiving passageway at each side of said oven, an outlet flue communicating with the upper end of said housing hav-

ing communication with said flue conduit receiving passageways and said cooking oven, a broiling oven in said housing beneath said cooking oven and having upper and lower broiler burners therein, said flue conduit receiving passageways having communication with the upper end of said broiling oven above said upper broiler burners to conduct the hot gases and products of combustion generated by said upper burner to discharge through said outlet flue, said lower broiler burner comprising a pair of burner arms one each of which is positioned adjacent a side wall of said broiling oven, a flue conduit associated with each of said burner arms and having a discharge end positioned in one of said flue conduit receiving passageways at the sides of said cooking oven, an inlet into each of said conduits adjacent its associated lower burner arm, a broiling grid or pan positioned above said lower broiler burner, said lower broiler burner arms and said conduits and said broiling grid or pan being interconnected to make them movable as a unit, means to vertically adjust said unit within said broiling oven, the upper ends of said conduits reciprocating but at all times remaining within the flue conduit receiving passageways at the sides of said cooking oven when said unit is raised or lowered, said broiling grid or pan being horizontally movable out of and into said oven independent of the unit of which it forms a part.

HENRY MOECKER, JR.