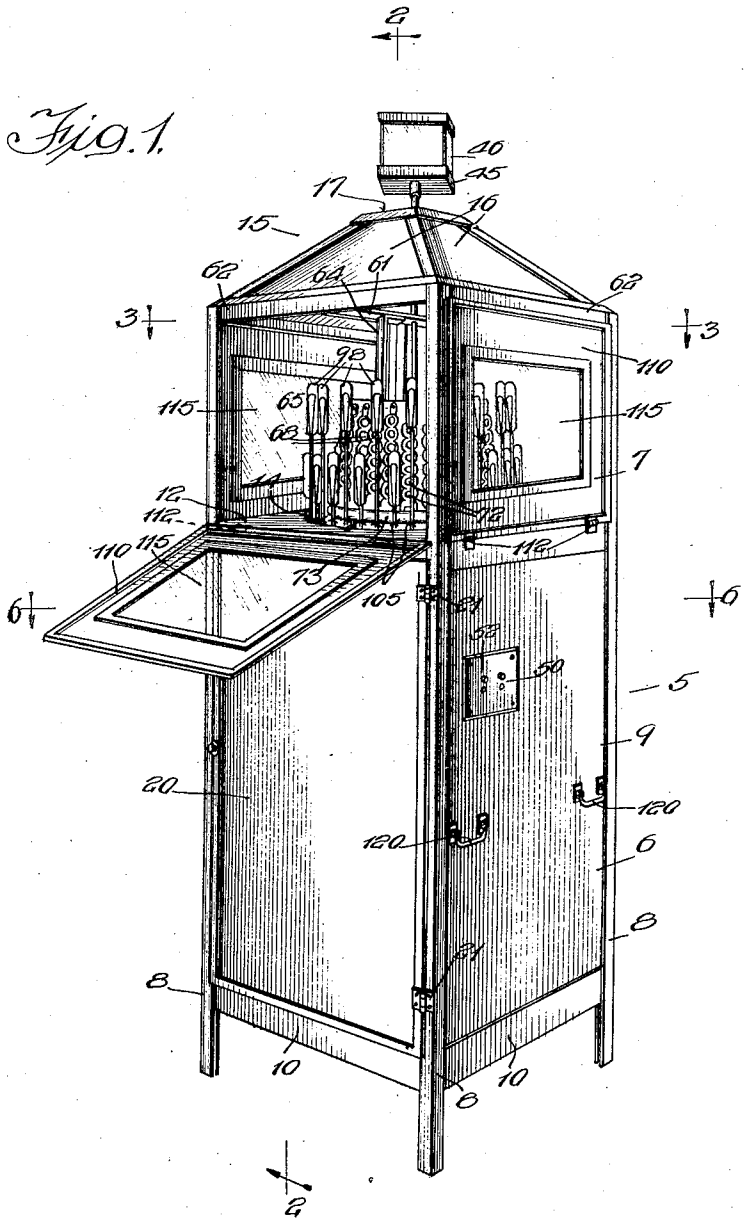
June 11, 1929. F. L. MORROW 1,716,653

FRANKFURT ROASTING MACHINE

Filed July 19, 1924 6 Sheets-Sheet 1

Fig. 1.



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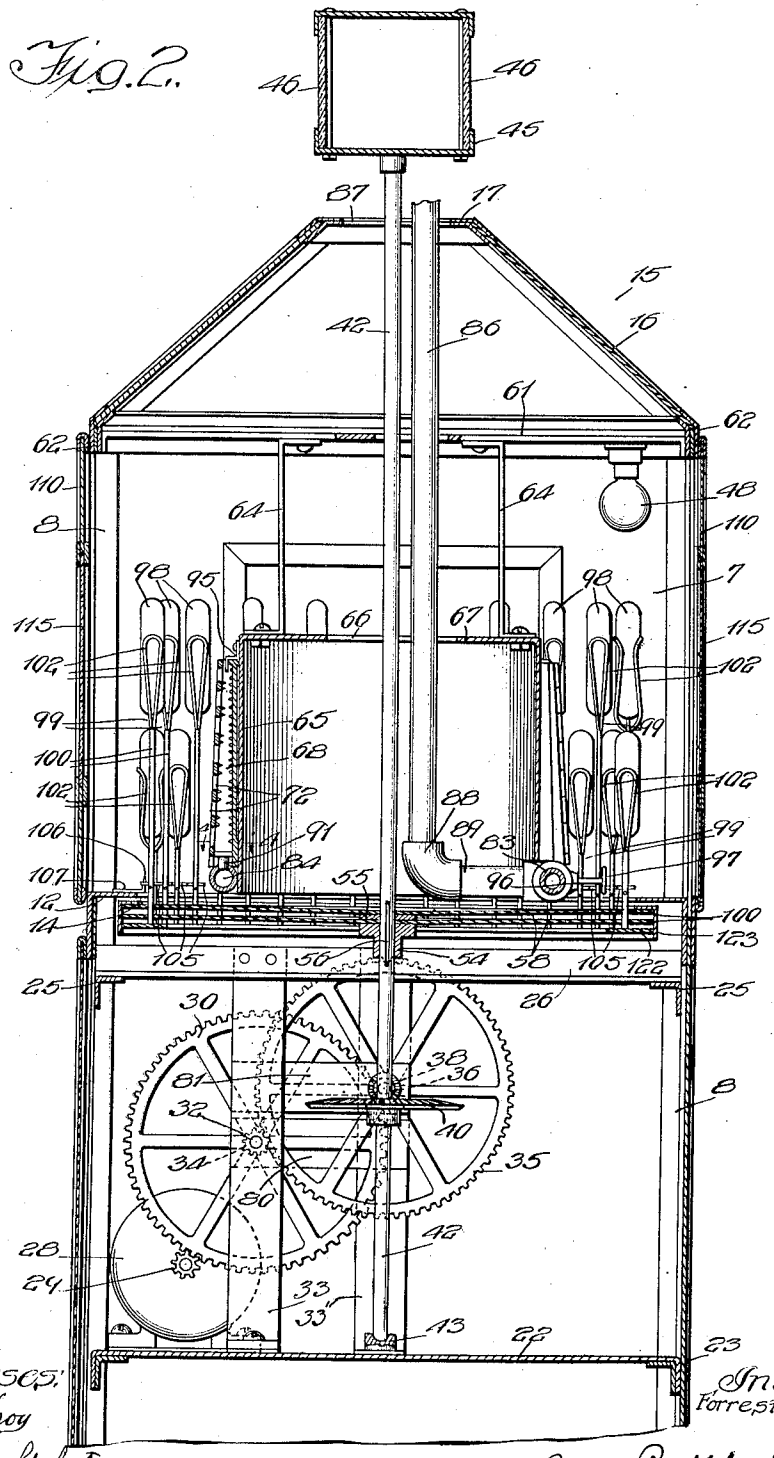
By Brown, Boettcher & Dienner
Attys

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FRANKFURT ROASTING MACHINE

Filed July 19, 1924 6 Sheets-Sheet 2

Fig. 2.



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FRANKFURT ROASTING MACHINE

Filed July 19, 1924 6 Sheets-Sheet 3

Fig. 3.

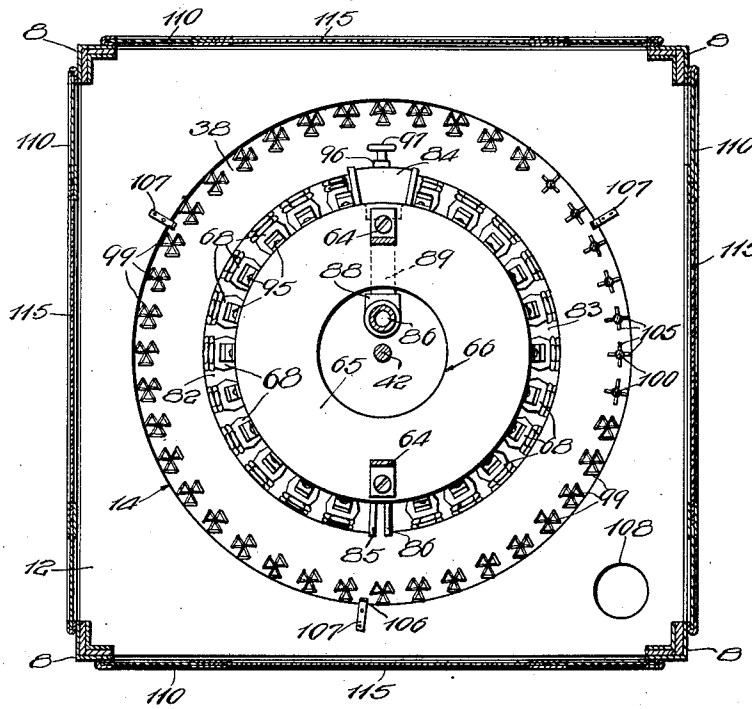


Fig. 4.

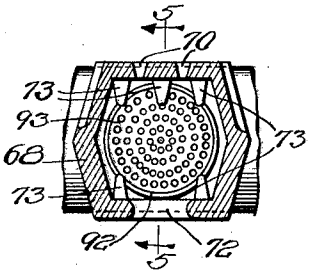
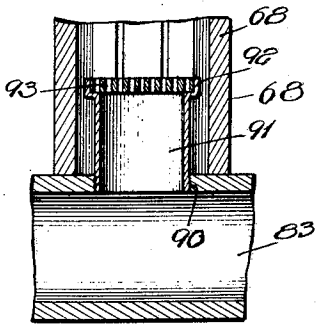


Fig. 5.



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FRANKFURT ROASTING MACHINE

Filed July 19, 1924 6 Sheets-Sheet 4

Fig. 6.

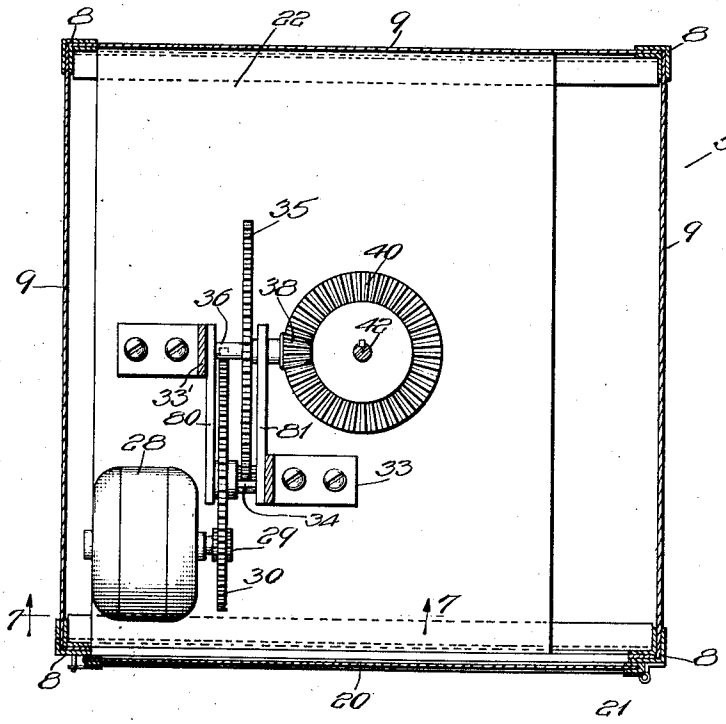
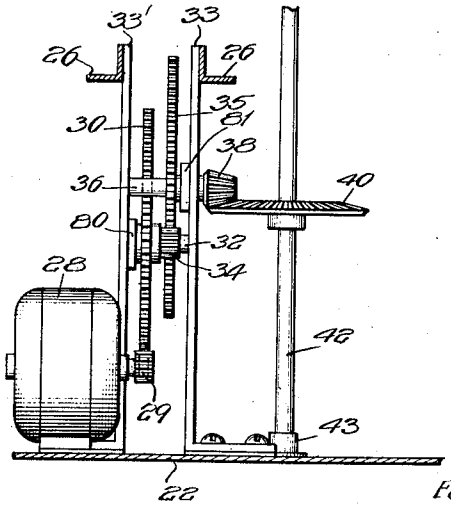


Fig. 7.



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June 11, 1929. F. L. MORROW 1,716,653

FRANKFURT ROASTING MACHINE

Filed July 19, 1924 6 Sheets-Sheet 5

Fig. 8.

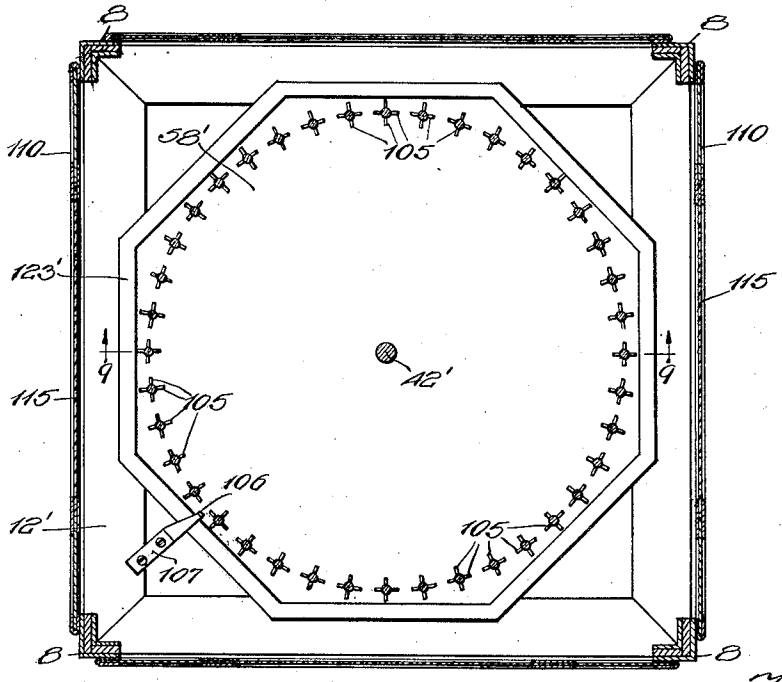


Fig. 10.

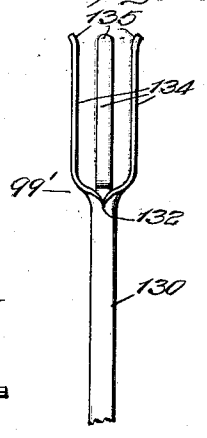
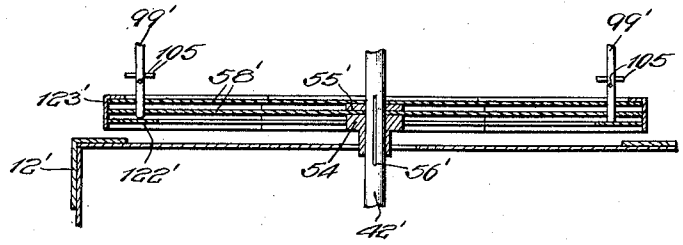


Fig. 9.



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FRANKFURT ROASTING MACHINE

Filed July 19, 1924 6 Sheets-Sheet 6

Fig. 11

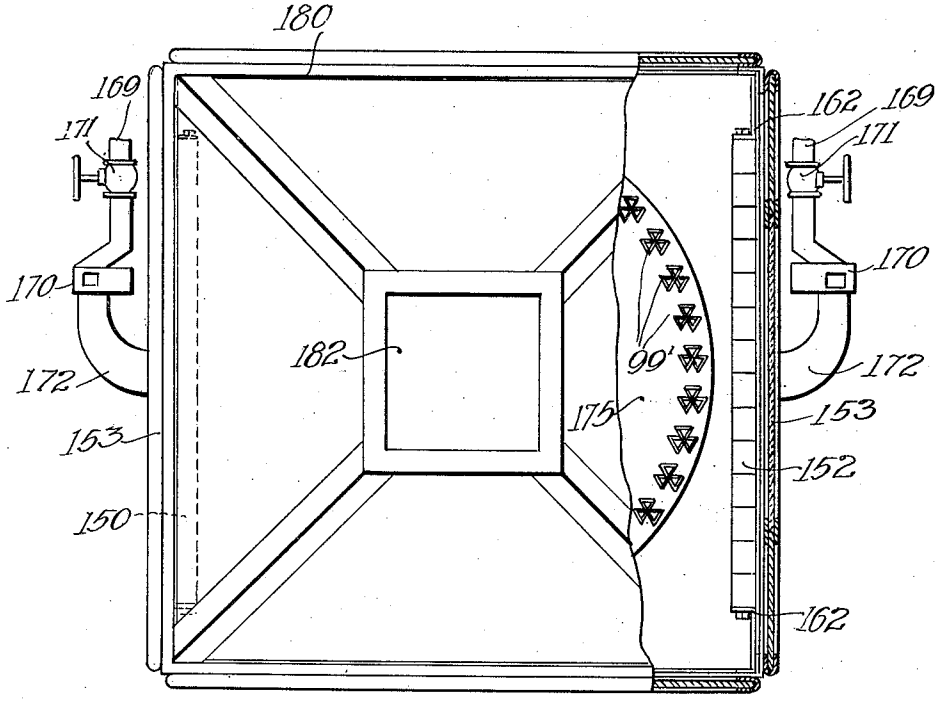


Fig. 12

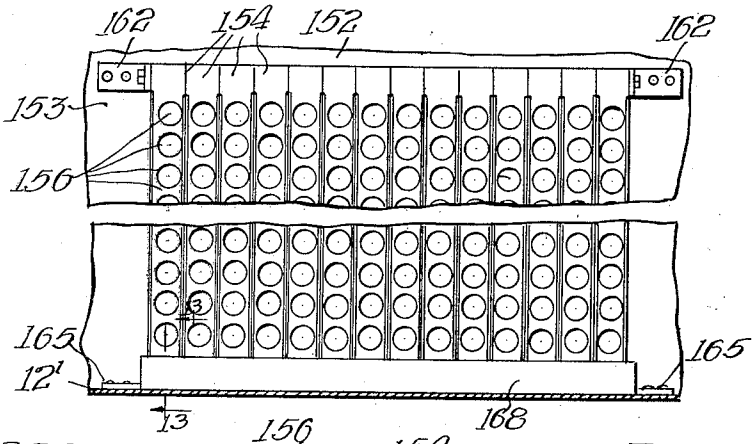
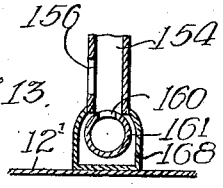


Fig. 13.



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Patented June 11, 1929. 1,716,653

UNITED STATES PATENT OFFICE.

FORREST L. MORROW, OF CHICAGO, ILLINOIS, ASSIGNOR TO FOOD DISPLAY MACHINE CORPORATION, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

FRANKFURT-ROASTING MACHINE.

Application filed July 19, 1924. Serial No. 726,968.

This invention relates to improvements in roasting machines, more particularly to an improved frankfurt roasting machine and its objects are the provision of a generally improved and simplified construction producing improved results and suitable for public display.

The invention is illustrated in the accompanying drawings in which;

Figure 1 is an isometric view of an embodiment of the invention;

Fig. 2 is a vertical section on line 2—2 of Fig. 1;

Fig. 3 is a horizontal section on line 3—3 of Fig. 1;

Fig. 4 is a horizontal detail section through one of the radiator elements on line 4—4 of Fig. 2;

Fig. 5 is a vertical section on line 5—5 of Fig. 4;

Fig. 6 is a horizontal section on line 6—6 of Fig. 1;

Fig. 7 is a fragmentary vertical section on line 7—7 of Fig. 6;

Fig. 8 is a horizontal section through the upper roasting or broiling compartment just below the heater unit carrying drum, showing an alternative form of turntable;

Fig. 9 is a vertical section through the carrier revolving and supporting turntable shown in Fig. 8, taken on line 9—9 of Fig. 8;

Fig. 10 is a perspective view of an alternative form of carrier element;

Fig. 11 is a top plan view partially in section of an alternative embodiment of the invention;

Fig. 12 is a front elevational view of one of the heaters of the embodiment shown in Fig. 11; and

Fig. 13 is a detail section on line 13—13 of Fig. 12.

The device comprises a frame 5 closed below at 6 and having above the closed lower portion 6 a roasting compartment 7. The frame 5 has four angle bar corner posts 8, the lower ends of which form supporting feet for supporting the device preferably with the closed bottom thereof spaced above the floor or other supporting surface as shown. The sides 9 of the closed bottom compartment 6 may be of sheet metal or other suitable material attached along their edges to the posts 8 and bottom rails 10.

Overlying the upper edges of the sides 9 and forming in effect the bottom of the upper compartment 7 is a shelf 12 suitably secured to the frame of the device and provided with a relatively large central opening 14. The top of the upper roasting compartment 7 is closed by a roof 15 having sloping sides 16 and a flat top 17.

The bottom compartment 6 has an access door 20 covering one side and hinged at 21 and within the compartment 6 and spaced above the bottom thereof is a shelf 22 attached through brackets 23 to the corner posts or other parts of the frame of the device. Supported above the shelf 22 on brackets 25 carried by the frame of the device are cross members 26, the purpose of which will hereafter appear.

The driving mechanism for the frankfurt carrier is mounted within the lower closed compartment upon shelf 22 and includes a driving motor 28. On the motor shaft is a driving pinion 29 which meshes with and drives a relatively large spur gear 30 freely journaled at 32 between an upright bearing member 33 and a horizontal arm 80. Gear 30 carries a relatively small pinion 34 for rotation therewith and this pinion 34 meshes with a relatively large spur gear 35. Gear 35 is freely journaled through a shaft or spindle 36 between an upright 33′ and an arm 81 and on its inner end carries a relatively small bevel pinion 38 for rotation therewith.

Bevel pinion 38 meshes with and drives a relatively large bevel driving gear 40 fixed upon the main upright turntable driving shaft 42 of the machine. The disposition of driving motor 28 off to one corner of shelf 12 and the driving connections described provides a relatively great gear reduction between the motor shaft and the main upright shaft 42. The lower ends of the uprights 33 may be turned out at right angles and attached to shelf 22 while the upper ends are attached to the cross members 26, with arms 80 and 81 carried by uprights 33 and 33′ and providing a strong and firm supporting frame for the turntable driving mechanism.

The lower end of shaft 42 bears in a socket member 43 which holds it in place and takes up the end thrust. From the gear 40 the shaft 42 extends up vertically through the center of the machine and out through the top 17. Its upper projecting end may

carry a frame 45 fixed thereon for rotation with the shaft. The frame 45 has windows 46 through which suitable advertising or other matter may be displayed, or the windows may be simply colored or otherwise decorated so that by arranging an electric lamp within the frame 45 an additional attraction will be produced.

While I have not shown an electric lamp within the frame 45 it is to be understood that such a lamp may be and is preferably employed. While it may of course be controlled separately, it is preferably connected into the circuit in which the electric lamp 48 is connected and this circuit is controlled by a suitable snap switch 50 on one of the sides 9 of the closed bottom. The circuit through motor 28 may be conveniently controlled by an adjacent switch 52.

Fixed upon the shaft 42 through an underlying hub 54, spacer 55 and spline or key 56 (Fig. 2) for rotation with the shaft 42 are a pair of vertically spaced discs 58 which discs constitute the revolvable turntable of the device. The lamp 48 is carried by a cross rail 61 which extends across and is secured at its opposite ends to the upper rails 62 at the base of the roof 15. Supported also by this cross member 61 and depending therefrom are a pair of depending brackets 64 the lower ends of which carry a depending radiator or heater unit carrying drum 65 which may be in the form of an open bottomed cylinder having its lower end terminating adjacent and spaced vertically from the turntable and having a central opening 66 in its top wall 67. Mounted on the external surface of the frame or cylinder 65 are the radiator units, heaters or glowers 68 which direct radiant heat upon the frankfurts or other articles being cooked.

Each radiator or glower 68 comprises a hollow body of suitable heat refractory material having suitable openings or inlets 70 in its rear wall for the admission of air for supporting combustion of the gas which is fed or supplied to the heater units as will be pointed out. The front walls of the heaters 68 have opening 72 through which the radiant heat is directed upon the frankfurts or other articles on the carriers. Integral protuberances or lugs 73 break up the gas supplied to the heaters, cause thorough admixture with the air and upon being heated serve to heat the combustible mixture and to maintain the ignited condition thereof.

Encircling the free lower end of drum 65 are a pair of semi-circular gas supply pipes or conduits 82 and 83 joined by a T coupling 84 and each closed at its opposite free end at 85 and 86 respectively. The gas or other fuel is supplied to the conduits 82 and 83 by means of an upright pipe or conduit 86 which extends vertically through an opening 87 in top 17 down axially through the upper compartment 17 and through the drum 65 along shaft 42 and is connected at its lower end through an elbow 88 with a horizontal tube or conduit 89 which extends radially through the lower edge of the side of drum 65 and is connected to T 84 in communication with the interior thereof.

Spaced circumferentially about each supply section 82 and 83 are openings 90 through the upper walls thereof and screw threaded at their lower ends into these openings 90 are upright tubes 91 having enlarged upper ends 92 in which are mounted grates 93 of refractory or other suitable material as shown in Fig. 5. The lower ends of heater units or glowers 68 are open and fit down over tubes 91 in open communication with the upper ends thereof and the lower ends of the heater unit rest upon and are supported by supply sections 82 and 83. The upper ends of units 68 are held firmly against the circular depending wall of drum 65 by brackets 95 secured thereto as shown in Fig. 2. The T 84 has a valve 96 which may be manipulated by a handle 97 to establish a flow of fuel into either section 82 or 83 separately or into both simultaneously. In use the gas or other fuel enters upright conduit 86 and flows downwardly therethrough, through elbow 88, conduit 89 and into the T and valve chamber 84. When the valve is set to permit a simultaneous flow into sections 82 and 83 the fuel flows into said sections and up through the tubes 91 and grates 93 into the heater units 68 where it combines with the air entering through openings 70 so that upon igniting the mixture which issues from openings 72 a radiant heat discharges outwardly from each radiator. It is, of course, to be understood that the controlling valve for the two sections 82 and 83 need not be combined with the T 84 but may be otherwise arranged, the combination described illustrating one manner of carrying out the invention.

The heater elements are adapted to be rendered incandescent by the gas flames entering their bases or lower ends, and direct radiant heat directly upon the frankfurts with the effect of broiling or toasting.

The frankfurts 98 or other articles are supported in upright position circularly about the circularly arranged heater units 68 by carriers 99. Each carrier 99 has a post 100 which projects through the opening 14 in shelf 12 and into vertically registering apertures in the discs 58 of the turntable. The upper ends of posts 100 have prongs 102 which may be of wire looped to form two prongs as shown in Fig. 2 for receiving the frankfurts in upright endwise position between them and of sufficient resiliency to hold the frankfurt in place and at the same time permit ready removal thereof. The portions of the frankfurts to which access of

the heat is prevented by this holding arrangement is minimized and obviously piercing of the frankfurt is avoided.

To further permit uniform and free access of the heat to the entire surfaces of the frankfurt I preferably arrange the carriers 99 alternately at different levels vertically distanced substantially the length of a frankfurt by forming the carriers of alternately greater and lesser lengths as shown in Fig. 2. This permits close grouping of the frankfurts about the heater without in any way interfering with the free access of the heat to all sides thereof. To subject all sides of the frankfurts to the heat uniformly in their rotation with the turntable about the heater I provide for turning or revolving each carrier about its own axis with the rotation of the turntable. To this end the post 100 of each carrier 99 has just above the shelf 12 a plurality of radially projecting pins or fingers 105 as shown in Fig. 2 and in connection with the alternative form of turntable in Fig. 8. Arranged in the path of radial fingers 105 is the upstanding end 106 of a stationary bracket 107 suitably secured to the shelf 12. In the rotation of the carriers about the heaters or glowers the bracket finger 106 engages the pins or fingers 105 and turns the carriers about their own axes with their rotation with the turntable about the glowers. A uniform roasting or cooking of the frankfurts is thereby produced. By the term roasting used herein I mean the broiling or toasting of the frankfurts which is produced by their direct exposure to the heat in their movement about the glowers as distinguished from strictly roasting schemes in which walls or partitions are interposed between the heater and the articles to be cooked. By avoiding piercing of the frankfurts the moisture content is retained in the jackets and the cooking is improved, the jackets being left to be broken open by the cooking action when they are done, or they may of course be removed at any time before then when it is not desired that they be that well done.

To provide additional moisture in the cooking of the frankfurts I provide a cup or receptacle 108 which may be suitably mounted upon shelf 12 and filled with water for evaporation into the cooking compartment 7 by the heater. An effective moistening of the air in compartment 7 is thereby produced.

The sides of compartment 7 are closed by doors 110 each hinged at its lower edge at 112 to the frame of the device to be opened downwardly. Each door 110 has a pane 115 of isinglass, glass which will not be injured by the heat inside of compartment 7 or other suitable material through which the frankfurts and heater are displayed. The cooking action may thus be observed and an attractive display device is provided. The doors 110 of course have suitable catches (not shown) for retaining them closed. While I have referred to a hinged door at each side of compartment 7, it is, of course, to be understood that only one or any number of said sides may be adapted for opening. By providing a hinged door at each side convenient access to any desired frankfurt is permitted. While the roof 15 is preferably closed as by making its sides of sheet metal, it is to be understood that the sides of said roof may have suitable transparent or attractive panes if desired. Opposite sides of the device have handles 120 by means of which it may be transported or moved from place to place, and it is to be understood that the lower ends of corner post 8 may be provided with suitable casters. The lower ends of posts 100 of carriers 99 engage a ring 122 suitably secured in the frame 123 of the turntable and this ring thereby forms a support for the carriers, the posts of which would otherwise slip through the registering apertures in discs 58.

The alternative form of turntable shown in Figures 8 and 9 is mounted above the shelf 12′ instead of below the shelf 12 as in Figures 1, 2 and 3. It comprises an octagonal frame 123′ with the discs 58′ which carry the carriers 99′ as before and a lower retaining ring 122′. As before, the turntable is secured upon shaft 42′ for rotation therewith by an underlying collar 54′ T 56′ and spacer 55′.

To prevent undue heat losses in operating the machine in cold weather with a cold bottom compartment 8, I contemplate the provision of a suitable heater (not shown) in said compartment. Such a heater would preferably be mounted in the lower part of the bottom compartment and could be supplied with fuel from the conduit 86 which supplies the heater units 68.

The alternative form of frankfurt carrier shown in Fig. 10 comprises a thin walled tube 130 the lower portion of which forms the mounting post which may be provided with suitable projecting pins or fingers such as those shown at 105 in Fig. 2 for turning the carrier about its own axis. The upper end of the tubular post is provided with three in the present instance, although more or less may be employed, longitudinal slits 132 which divide the upper end of the carrier into three relatively narrow arcuate ends 134, these ends 134 are rolled out or spread as by means of a die or other suitable tools and form prongs for receiving the frankfurt in vertical upright position between them. The upper ends of the prongs 134 may be turned out slightly at 135 to avoid injury to the frankfurt in placing it in and removing it from the carrier. The prongs 134 thus produced are relatively narrow and

offer but little interference to access of the heat to the entire surface of the frankfurts and the carrier thus produced is sturdy, relatively inexpensive and easily formed. In the other form of carrier the wire prongs may be formed separately from and suitably attached to the post or they may be formed or twisted together to form the post as an integral part thereof. While a tube of circular cross section is admirably adapted for forming the carrier shown in Fig. 10, it is to be understood, of course, that a tube of any other desired cross section may be employed.

In the embodiment of the invention shown in Figs. 11, 12 and 13, the frankfurts or other articles are revolved between a pair of heaters 150 and 152 mounted internally upon opposite sides 153 of the machine. Each heater 150 and 152 comprises a plurality of vertical mounted heater elements 154 formed of suitable heat refractory material and each having a plurality of vertically arranged inwardly discharging openings or outlets 156. The lower ends of hollow elements 154 are open and these open ends open over openings 160 in supply tubes 161, one of which is arranged below the lower open ends of each heater 150 and 152. The elements 154 may rest upon and be supported at their lower ends by tubes 161. Their upper ends are mounted as a unit between angle brackets 162 attached interiorly to side walls 153 of the machine. The tubes 161 may have projecting ears or lugs 165 for bolting or otherwise suitably mounting them upon shelf 12'; and a sheet metal cover 168 may enclose each tube and be provided with openings for receiving the lower ends of the heaters 150 and 152 and holding them in proper position over the openings 160 or the open lower ends of the respective heaters may be otherwise held properly positioned over the openings 160.

The fuel is supplied to tubes 161 from a pair of hose or other suitable supply conduits 169, one for each tube 161. In each supply line is an air valve 170 of any suitable or preferred type for admitting air to support combustion of the fuel and regulating the proportioning of air to fuel as well understood in the art. Also in each upply line is a valve 171 by means of which either fuel line and thereby either heater may be turned or shut off independently of the other, or they may be turned on or shut off together. The mixture passages or conduits 172 from the valves 168 to the tubes 161 may flare slightly as shown and each opens at its inner end into its respective tube 161.

The frankfurts are supported in upright endwise position by carriers 99' circularly spaced about the turn table 175 for rotation therewith and suitable knock over means is preferably provided, as in the other embodiments for turning the carriers 99' about their own axes as they rotate with the turntable between the heaters 150 and 152. Uniform roasing of all sides is thus assured and by turning off one heater for example, the speed of the roasting operation may be varied. As before, the top of the upper roasting compartment is again closed by a sloping roof 180 having a flat top 182.

I do not intend to limit the invention to the particular details shown and described.

I claim:—

1. In a device of the class described, a casing having a closed lower compartment, and an upper compartment having its interior open to view, a heater in the upper compartment, a driving motor in the lower compartment, a drive shaft having driving connection with said motor within said lower compartment and extending generally vertically, a turn table mounted upon said drive shaft for rotation therewith, carrers mounted upon said turn table and rotatable in said upper compartment, and means for turning said carriers upon their own axes in their movement with the turn table, said last means comprising knockover means on the carriers and means mounted in the path of movement of said knockover means and cooperable therewith to turn the carriers in their movement with the turn table.

2. In a machine of the class described, a vertical drive shaft, a turntable on said shaft, a drum suspended above the turntable, heater means on said drum, carriers mounted on said turntable for rotation about said heater means, the drive shaft extending vertically through the drum and a fuel supply conduit extending vertically through the drum and adapted for supplying said heater means.

3. In a machine of the class described, the combination of a casing having a lower closed compartment, and an upper cooking compartment having a roof, the upper compartment having transparent panes for exposing its interior to view, a heater in said upper compartment, a plurality of carriers for supporting frankfurts individually in upright position about said heater, drive means in the lower compartment for revolving the carriers in the upper compartment about said heater, said drive means including a drive shaft extending vertically through the roof and a conduit entering through the roof and extending down within the path of movement of the carriers for supplying fuel to the heater means.

4. In a machine of the class described, the combination of a casing having a lower closed compartment, and an upper cooking compartment having a roof, the upper compartment having transparent panes for exposing its interior to view, a heater in said upper compartment, a plurality of carriers

for supporting frankfurts individually in upright position about said heater, means in the lower compartment for revolving the carriers in the upper compartment about said heater, said drive means including a motor and a drive shaft extending vertically through the roof, a conduit entering through the roof and extending down within the path of movement of the carrier for supplying fuel to the heater means, an incandescent lamp in the upper compartment, and switch means on the side of the casing for controlling the drive motor and the lamp circuit.

5. In a device of the class described, a turntable, a drum suspended thereover, heater means on said drum, means for turning the turntable from below, a plurality of carriers mounted on the turntable and rotatable about said heater means, and fuel supply means for said heater means comprising a pair of conduits about the bottom of the drum, a conduit extending downwardly through the drum and having connection with each of said conduits and valve means for establishing a supply of fuel from said last conduit to either of said first conduits separately or to both said first conduits together.

6. In a machine of the class described, a vertical drive shaft, a turntable on said shaft, a drum suspended above the turntable, heater means on said drum and carriers mounted on said turntable for rotation about said heater means.

7. In a device of the class described, a turntable, a drum suspended thereover, heater means on said drum, means for turning the turntable from below, a plurality of carriers mounted on the turntable and rotatable about said heater means, and fuel supply means for said heater means comprising a conduit about the bottom of the drum, and a supply conduit extending downwardly through the drum and communicating with said first conduit.

8. In a device of the class described, a turntable, a drum suspended thereover, heater means on said drum, means for turning the turntable from below, a plurality of carriers mounted on the turntable and rotatable about said heater means, and fuel supply means for said heater means comprising a conduit about the bottom of the drum, said conduit having circumferentially spaced upwardly opening outlets, and the heater means comprising heater elements opening over said outlets and lying on the drum.

9. In a device of the class described, a turntable, a drum suspended thereover, heater means on said drum, means for turning the turntable from below, a plurality of carriers mounted on the turntable and rotatable about said heater means, and fuel supply means for said heater means comprising a conduit about the bottom of the drum, said conduit having circumferentially spaced upwardly opening outlets, and the heater means comprising heater elements opening over said outlet and lying on the drum, said heater elements adapted to be rendered incandescent by gas flames entering their bases.

10. In a device of the class described, a casing having upper and lower compartments, a heater in the upper compartment, a turn table mounted for rotation, means in the lower compartment for imparting rotary movement to the turntable, said turntable comprising discs having registering apertures, a support underlying said apertures, and carriers having mounting posts entering said apertures and having endwise supporting engagement with said underlying support.

11. In a device of the class described, a casing having upper and lower compartments, a heater in the upper compartment, a turn table mounted for rotation, means in the lower compartment for imparting rotary movement to the turntable, said turntable comprising discs having registering apertures, a support underlying said apertures, and carriers having mounting posts entering said apertures and having endwise supporting engagement with said underlying support, said carriers having prongs at their upper ends for supporting frankfurts in upright position in substantially the plane of the heater.

12. In a device of the class described, the combination with a heater and turntable mounted for rotation of a plurality of carriers mounted alternately at different levels upon said turntable and rotatable therewith in the plane of the heater.

13. In a device of the class described, the combination with a heater and turntable mounted for rotation of a plurality of carriers mounted alternately at different levels upon said turntable and rotatable therewith in the plane of the heater, and knockover means in the path of movement of the carriers with the turntable for turning said carriers on their own axes.

14. In a device of the class described, the combination of a vertical drive shaft, a turntable mounted on said shaft for rotation therewith, said turntable comprising discs having registering apertures to receive carriers for rotation with the turntable, and means below the discs for receiving and supporting the lower ends of the carriers.

15. In a device of the class described, the combination of a heater, a turntable below said heater and projecting outwardly therefrom, a plurality of carriers individually mounted in circumferentially spaced apertures in the outwardly projecting portion of the turntable, means below said apertures

for receiving and supporting said carriers, said turntable comprising a pair of discs having registering apertures circumferentially about the projecting portion of the turntable, a plurality of carriers having mounting posts mounted in said apertures and having their upper ends formed to support frankfurts in upright position, and means below said apertures for receiving and supporting said carriers.

16. In a device of the class described, the combination of a heater, a turntable below said heater and projecting outwardly therefrom, a plurality of carriers individually mounted in circumferentially spaced apertures in the outwardly projecting portion of the turntable and means below said apertures for receiving and supporting said carriers.

17. In a device of the class described, the combination of a heater, a plurality of carriers adapted for individually supporting frankfurts on end and in upright position without piercing the same, said carriers being arranged alternately at different levels.

18. In a machine of the class described, the combination of a casing having an upper cooking compartment, a heater in said compartment, a plurality of carriers for supporting frankfurts individually in upright position rotatably mounted about said heater, and a conduit extending through said upper compartment for supplying fuel to said heater means.

In witness whereof, I hereunto subscribe my name this 10th day of July, 1924.

FORREST L. MORROW.