Nov. 27, 1928. 1,692,956

T. C. RUSSELL

FRANKFURT MACHINE

Filed June 13, 1927 4 Sheets-Sheet 1

Fig. 1.

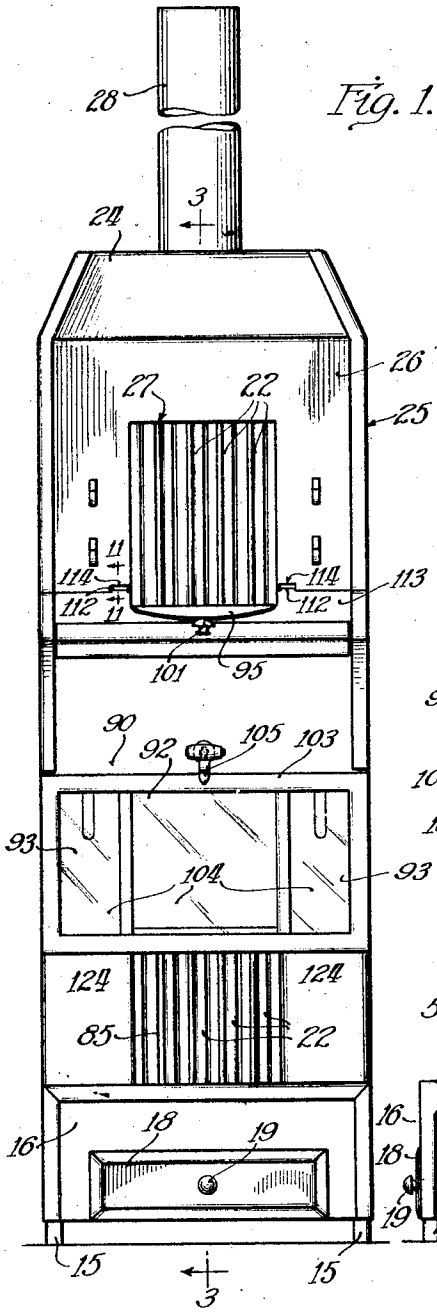
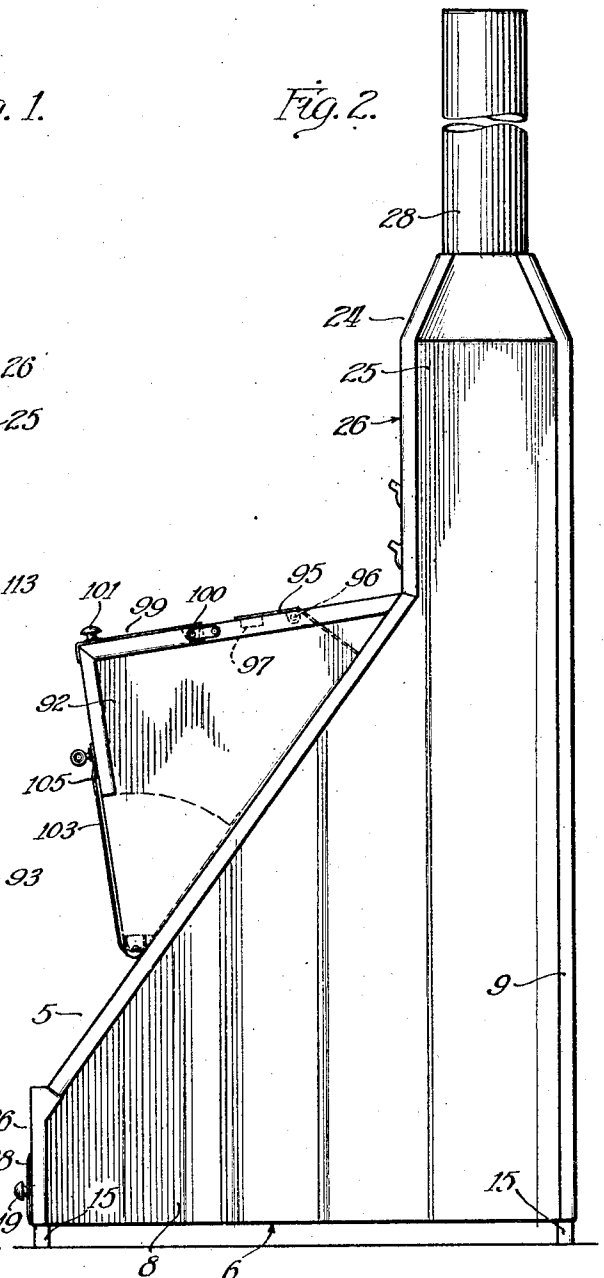


Fig. 2.



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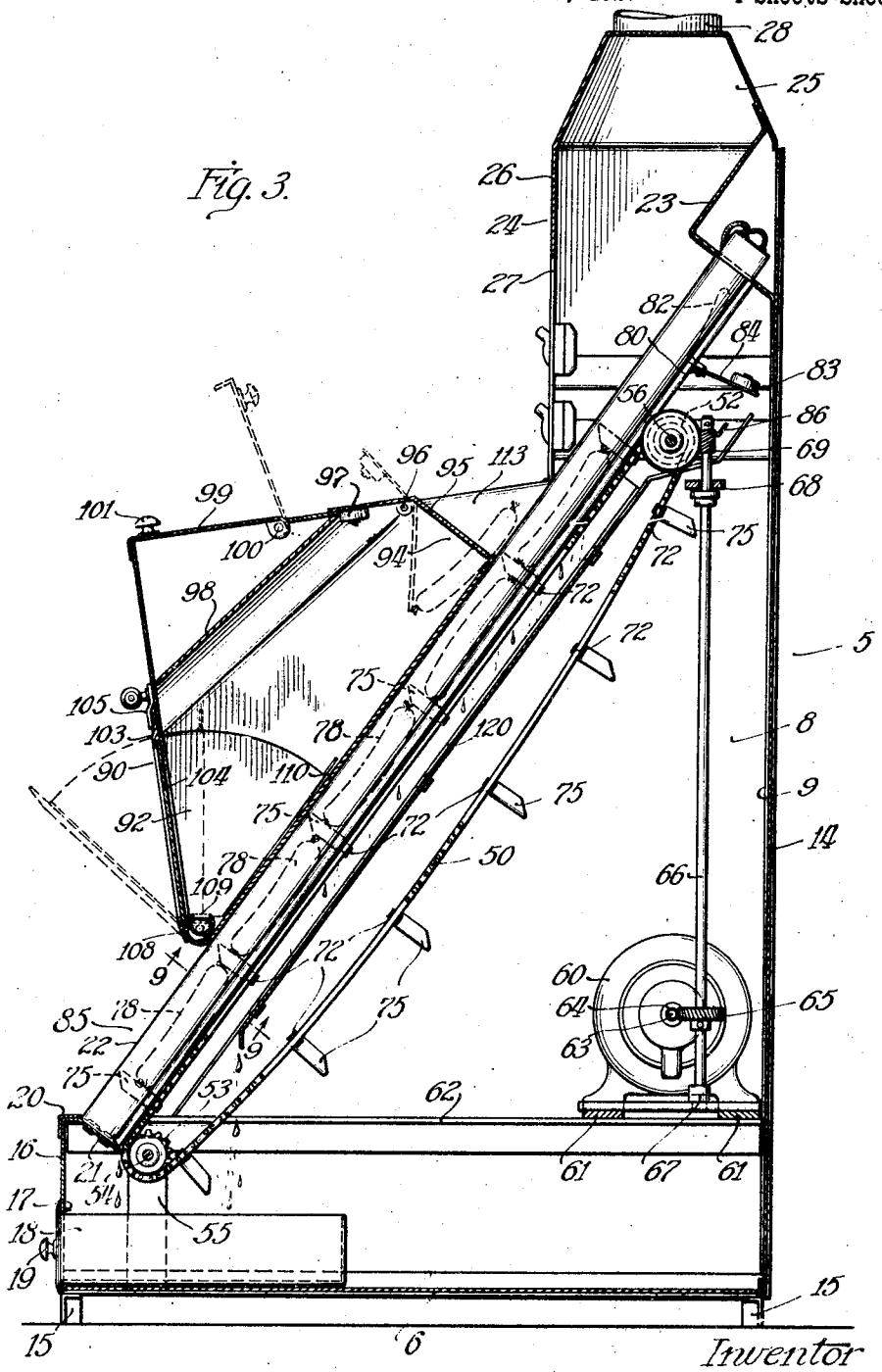
Nov. 27, 1928. 1,692,956

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FRANKFURT MACHINE

Filed June 13, 1927 4 Sheets-Sheet 2

Fig. 3.



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FRANKFURT MACHINE

Filed June 13, 1927 4 Sheets-Sheet 3

Fig. 4.

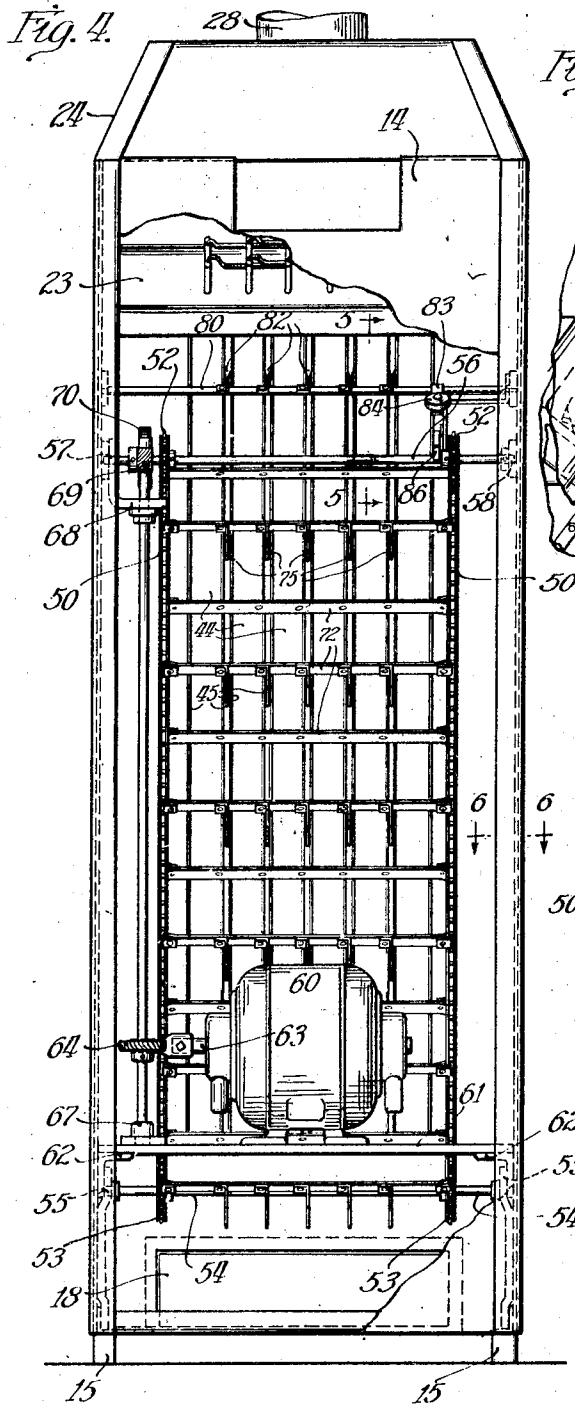


Fig. 5.

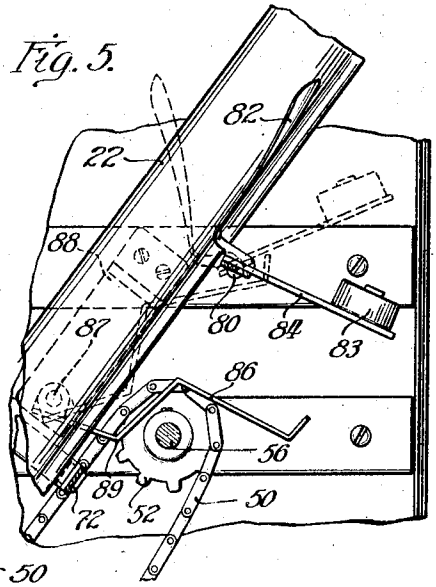


Fig. 6.

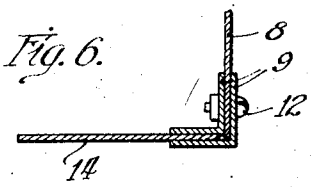


Fig. 7.

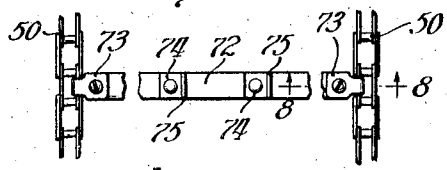
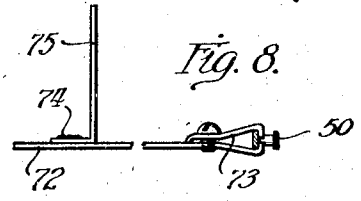


Fig. 8.



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FRANKFURT MACHINE

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Fig. 9.

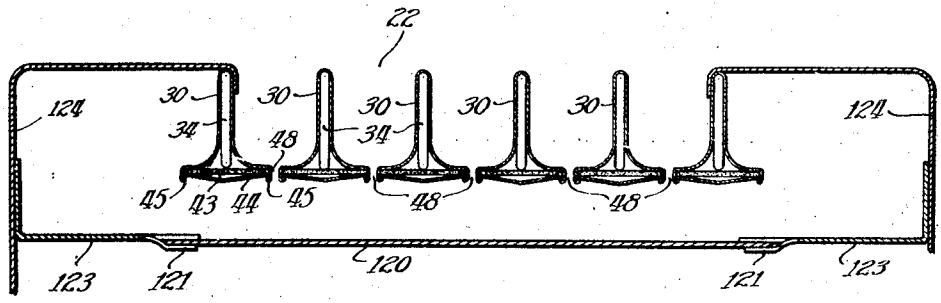


Fig. 10.

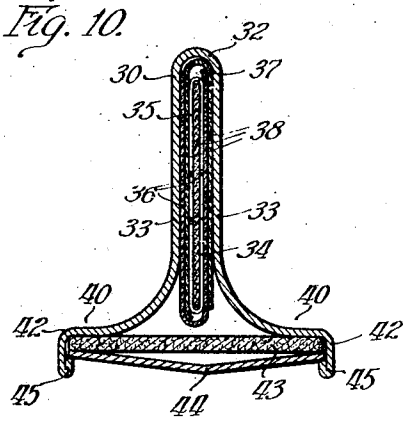


Fig. 11.

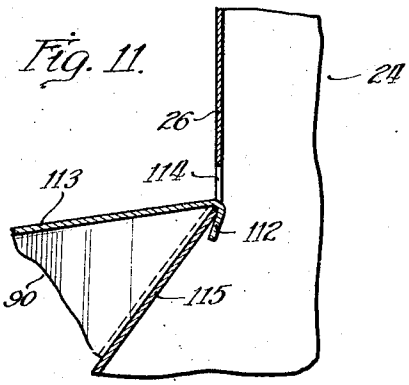
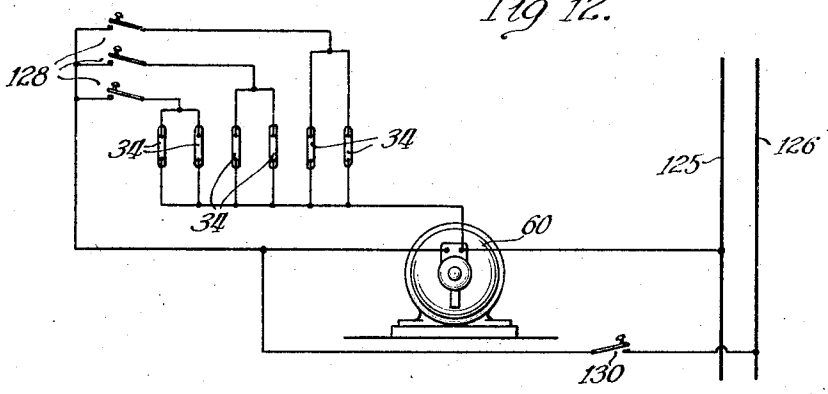


Fig 12.



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Patented Nov. 27, 1928. 1,692,956

UNITED STATES PATENT OFFICE.

THOMAS C. RUSSELL, OF EVANSTON, ILLINOIS, ASSIGNOR TO ADAM H. KULIKOWSKI, OF EVANSTON, ILLINOIS.

FRANKFURT MACHINE.

Application filed June 13, 1927. Serial No. 198,620.

This invention relates to Frankfurt roasting machines and its object is the provision of a generally improved, simplified and inexpensive machine producing improved results and suitable for public display.

The present invention provides for automatically discharging the Frankfurts at the end of the cooking period and for automatically delivering them to a heated storage bin where they may be kept in proper heated condition.

The invention also provides suitable bun or roll storage compartments and for heating these and the Frankfurt bin from the cooking heater, the Frankfurt bin to a higher temperature than the bun or roll compartments to maintain both the Frankfurts and the rolls in proper heated condition notwithstanding their different character and their different heat requirements.

The invention further provides a sectionalized heating arrangement in which the heat output may be conveniently controlled to meet different cooking requirements. During dull hours when the machine is operating at only a fraction of its full capacity the heater sections, not required, may be turned off and when the machine is operating at full capacity the heater sections may all be turned on to provide the corresponding maximum heat output. It is unnecessary in the present machine to use the full heat output when the machine is operating at only a fraction of its full capacity.

Still further the invention provides for minimizing heat losses by radiation and otherwise. The invention also provides for draining the grease away, as it is formed and with a minimum of smoking and pre-heating as well as in such a manner that the succeeding Frankfurts are not subjected thereto. The invention further provides a sanitary machine in which dirt and grease accumulations are avoided and in which all vapors and odors are effectively shut-off from the room and discharged through a suitable flue arrangement.

The machine requires little attention in operation, makes a pleasing display and the entire Frankfurt and roll or bun storage box is adapted for convenient removal to permit complete access to the machine for cleaning or attention.

While the advantages of such provisions as these in a cooking machine of this sort will be at once apparent to those skilled in the art, it is to be understood that the invention is not to be strictly limited to a particular use or purpose.

The invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a front elevational view of a machine embodying the present invention;

Fig. 2 is a side elevational view of the same;

Fig. 3 is a vertical section taken on the line 3—3 of Fig. 1;

Fig. 4 is a rear view with the back wall of the machine partially broken away;

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

Fig. 6 is a fragmentary detail section taken on the line 6—6 of Fig. 4;

Fig. 7 is a fragmentary detail elevation of the conveyor;

Fig. 8 is a detail section taken on the line 8—8 of Fig. 7;

Fig. 9 is a transverse section taken on the line 9—9 of Fig. 3;

Fig. 10 is a detail cross section through one of the trough forming channels showing the disposition of the heater therein, and showing the manner of closing the same against heat losses and grease ingress;

Fig. 11 is a fragmentary detail section taken on the line 11—11 of Fig. 1; and

Fig. 12 is a circuit diagram showing the heater and motor circuit connections.

Referring to the drawings the machine shown comprises an upright sheet metal housing 5 having a base 6 and side walls 8, 8. The rear vertical marginal edge of each of the side walls 8, 8 has angle guides 9 suitably secured thereto at 12 with their transversely extending flanges spaced to receive the adjacent vertical margins of a removable back wall 14 (Fig. 6) which is slidably mounted in the guides 9 to be conveniently withdrawn and replaced. By lifting or completely withdrawing the back 14 the rear of the housing 5 is opened and convenient access to the inside of the machine is permitted.

The bottom of the housing 5 is closed by the base or bottom wall 6 and the housing may be suitably supported on feet 15. The vertical front wall 16 is relatively short, as shown in Fig. 3 and has an opening 17 for a removable drawer or grease pan 18 which may be provided with a handle or finger piece 19. The upper edge of the front wall 16 has an angle member 20 and a suitably mounted

downwardly and inwardly inclined flange or bracket 21 which supports the lower end of the diagonal or inclined cooking troughs designated generally at 22 with their side enclosures. The back of the machine is provided internally and near the top with an angle bracket 23 which is fixedly secured and preferably independently of the slidable back 14 and which serves to suitably support the upper ends of the cooking troughs 22.

At the back of the machine and extending vertically is a stack 24 having side walls 25 and a front wall 26, which front wall is provided with an opening 27 through which the roasted or cooked Frankfurts are discharged from the machine. The opening 27 may be provided with a suitable swingable door or this opening may be otherwise suitably enclosed or semi-enclosed to exclude the discharge of vapors or odors therefrom. The stack discharges into a flue 28 which may be suitably led out to discharge the smoke, vapors, odors and the like, to the outside or at least out of the room in which the cooking machine is arranged.

The cooking troughs 22 are formed by a plurality of channels 30 which are preferably formed of German silver or other suitable metal or material having a minimum undesirable action on the Frankfurts or other articles or food which is cooked. The closed bases 32 of the channels 30 are rounded as shown in Fig. 10 and these closed rounded bases are presented outwardly and upwardly. The parallel sides 33 of each channel 30 are spaced relatively close together and housed in each channel 30 and between the relatively closely spaced parallel sides 33 is a suitable heater designated generally at 34 in Fig. 10.

Each heater 34 comprises a suitable resistance conductor 35 which may be bent back and forth at 36 (Fig. 10) and doubled over at 37 with mica or other suitable insulating material interposed between the doubled over sides of the resistance element and also wrapped over and covering the same, as shown at 38. The heater may be of any suitable or preferred construction, that shown providing a heating element which is flat, accommodates itself admirably between the sides 33 of the channels 30 and at the same time provides for giving off the desired amount of heat. These heaters 34 extend through the channels 30 from the lower support 21 but preferably terminate a distance from the upper support 23. They extend a distance to provide the desired cooking or roasting period in the movement of the Frankfurts through the troughs 22 from where they are introduced at the lower ends of the troughs to a point in their upward inclined travel. The Frankfurts are discharged from the upper ends of the troughs 22 through the opening 27 and the heaters may terminate short of the position of the Frankfurts in the troughs 22 from which they are discharged therefrom so that there will be no unnecessary heating of the troughs after the Frankfurts have been discharged, that is, there will be no unnecessary heating of the upper portions of the troughs from which the Frankfurts are discharged.

The resistance elements 35 are as already explained preferably doubled back to provide for securing the necessary heat therefrom and this, at the same time enables disposition of the two terminals of each heater at the same end.

At the bottom the free margins 40 of each channel 30 are spread at 42 to receive an asbestos sheet 43 which closes the bottom of each channel 30 and minimizes heat losses by radiation or otherwise. Underlying the asbestos sheet 43 is a steel backing plate 44 and the marginal edges of the channel elements 30 are rolled over and beaded at 45, securing the asbestos sheet 43 and underlying plate 44 firmly in place in each channel 30.

When the channels 30 are arranged together in parallel spaced relation they form the cooking troughs 22 between them. These troughs 22 open outwardly and their bottoms are formed by the lower flared margins 40 of the channels 30, these flared margins being separated slightly to provide the slots 48, one of which extends continuously through the bottom of each cooking trough.

The Frankfurt carrier is in the form of an endless conveyor comprising a pair of endless chains 50, one beyond each side of the group of cooking troughs, as shown in Fig. 4. Each chain 50 is trained over and driven at the top by suitable sprockets 52 and at the lower ends of the cooking troughs 22 these chains 50 are trained over suitable idling sprockets 53. The idling sprockets 53 are mounted upon a cross shaft 54 journaled at its opposite ends in suitable supports 55 which may be mounted internally upon the side walls 8, or otherwise as desired. The driving sprockets 52 are fixed upon a cross shaft 56 for rotation therewith and this cross shaft 56 is suitably journaled at 57 and 58 upon opposite sides of the machine.

The Frankfurt carrier or conveyor may be driven by a suitable electric motor 60 supported upon a shelf 61 which extends across and is in turn supported at its opposite ends on angle members 62 suitably secured to the side walls 8. The motor shaft 63 drives a worm 64 which meshes with and in turn drives a worm wheel 65 suitably fixed upon a vertical drive shaft 66 to turn the same therewith. The shaft 66 is journaled at its lower end at 67 and near its upper end at 68 and above the bearing 68 the shaft 66 has a worm 69 which meshes with and drives a worm wheel 70 fixed upon the cross shaft 56 to turn the same therewith.

The conveyor or carrier chains 50 have

slats 72 extending transversely therebetween and suitably secured at 73 at their opposite ends thereto. These slats 72 and the chains 50 constitute a unitary conveyor which when the motor 60 is turned on travels over the sprockets 52 and 53, the outer run of this conveyor traveling beneath the channels 30. Secured at 74 through suitable angle bases to the slats 72 are the prongs 75 which feed the Frankfurts through the troughs 22 with the movement of the conveyor or carrier. The number of prongs 75 on each slat 72 is equal to the number of slots 48, that is, the number of prongs on each slat is equal to the number of troughs 22 so that each slat 72 will have a prong 75 for each trough 22. The prongs 75 in the outer run of the conveyor project through the slots 48 and operate centrally and longitudinally through the troughs 22. They are spaced in the direction of travel of the conveyor sufficiently to receive the Frankfurts therebetween, as shown in dotted lines at 78 in Fig. 3. This spacing may, of course, be varied or even adjustable if desired.

Extending transversely beneath the troughs 22 near the upper ends thereof is a cross shaft 80 having a plurality of fingers 82 fixed on this shaft 80 to turn therewith. The fingers 82 extend into and are swingable one in each of the troughs 22 and the shaft 80 is normally held in position with the fingers 82 positioned as shown in full lines in Fig. 5 by suitable counterweight means 83 on an arm 84 (Fig. 5) fixed to the shaft 80. In operation the Frankfurts or other articles are laid in the troughs 22 between the prongs 75 as they start their upward movement through the troughs. That is, the Frankfurts are introduced at the lower ends of the troughs which lower ends open outwardly and are exposed at 85 (Figs. 1 and 3). They are introduced just ahead of the prongs 75 as they start their upward inclined movement and as the conveyor travels over the sprockets 52 and 53 the prongs 75 move the Frankfurts diagonally upwardly through the troughs 22 into position near the upper ends of the troughs and for discharge through the opening 27. As the Frankfurts reach this position the fingers 82 are swung from their full line positions, as shown in Fig. 5 to their dotted line positions, turning the Frankfurts over and discharging them from the troughs through the opening 27.

The fingers 82 are swung into their dotted line positions by an arm 86 pivoted at 87 on a bracket 88. The arm 86 has an angular portion 89 which lies in the path of the slats 72 near the upper limit of their upward movement and as the slats 72 engage the angular portion 89 of the arm 86 this arm is swung into its dotted line position thereby, as shown in Fig. 5, its free angular end engaging the arm 84 and turning the shaft 80 to swing the fingers 82 into their dotted line positions discharging the Frankfurts at the upper ends of the troughs 22 with the cooperation of each slat 72 with the arm 86.

The front of the machine is provided with a heated storage bin 90 having a central heated Frankfurt storage compartment 92 and a compartment 93 on each of the opposite sides of the same for storing rolls or buns for making up sandwiches, for example. The Frankfurt inlet 94 at the top of the compartment 92 may be closed by a trap door 95 pivoted at 96 and normally closed by a counterweight 97. As the Frankfurts are discharged from the upper ends of the troughs 22 they strike the door 95 swinging it into the position shown in dotted lines in Fig. 3 and pass on into the heated storage compartment 92. The top of this compartment may be closed by a wall 98 and the tops of the side compartments 93 are preferably open and provided with a door 99 pivoted at 100 and provided with a finger piece 101 by means of which the door 99 may be swung into its open dotted line position for the introduction of rolls or buns into the side compartments 93.

The lower ends of the compartments 92 and 93 may be closed by a door 103 having transparent panes 104 through which the interiors of the compartments 92 and 93 may be viewed. The door 103 may be held closed by a latch 105 and is preferably pivoted at its lower end to be swung into the open dotted line position, as shown in Fig. 3, to permit convenient withdrawal of the Frankfurts and buns from the lower ends of the compartments 92 and 93, as desired.

From the foregoing it will be apparent that the Frankfurt storage bin 92 which is separate from the bun or roll bins 93 overlies the heaters 34 and is heated directly thereby, whereas the compartments 93 by their side disposal are heated by radiation from the directly heated compartment 92 and from the heaters 34. This heats the compartment 92 to a higher temperature than the compartments 93 keeping the Frankfurts good and warm and in proper condition for sale as called for, and at the same time keeping the buns or rolls warm without heating them to as great an extent as the Frankfurts.

For maintaining the condition of the stored Frankfurts the bin 92 may be provided at the bottom with a pan or trough 108 (Fig. 3) open at the top and holding a body of water, as shown. The open top of the pan or trough 108 may be covered with a screen 109, which will prevent the Frankfurts from falling into the water and which will at the same time permit the vapor to pass off freely into the bin 92 to keep the Frankfurts from drying out and in proper condition.

The entire storage bin 90 comprising the compartments 92 and 93 is closed at the back by a back wall 110 and the entire bin is removably secured to the machine by lugs 112

formed integral with the sides of the top wall 113 of the bin and engageable through openings 114 in the front wall 26 of the stack portion, as shown in Fig. 11 and over the upper edge of the adjacent diagonal front wall 115 of the machine. This mounting permits easy and convenient removal of the entire storage bin simply by lifting the lugs 112 out of engagement with the upper edge of the wall 115 and lifting the bin from the machine and the bin may be replaced by replacing it upon the machine and engaging the lugs 112 through the openings 114 and with the upper edge of the wall 115.

Suitably mounted inwardly and extending diagonally beneath the cooking troughs 22 is a drip plate or grease shield 120 which receives the grease as it drips from the Frankfurts in their upward inclined travel and directs the same downwardly to the pan or drawer 18, as shown in Fig. 3. Obviously, the slots 48 in addition to permitting the prongs 75 to pass therethrough and into the cooking troughs provide continuous drain slots through which the grease may drip vertically as formed, and without running down on the Frankfurts below. This avoids any undesirable action on the following Frankfurts and prevents preheating of the grease, minimizing smoking and making for a sanitary machine in which there are no dirt or grease accumulations. Furthermore, the rolling of the beads 45 along the marginal edges of the spread ends of the channels 30 drains the grease down and away from the heaters 34. The grease shield 120 may, of course, be slidably mounted for convenient removal, as desired. Such a mounting is shown at 121 in Fig. 9 with the fixed or stationary sides 123 suitably secured to the sides 124 which enclose the diagonal front of the machine along the sides of the cooking troughs 22.

As shown in Fig. 12 the heaters 34 and the motor 60 are supplied with current from suitable line conductors 125 and 126. For this purpose the heater and motor circuit of the machine may be provided with a suitable detachable connector for connection with any suitable or preferred current outlet, such as, for example, an "Edison" outlet, as well known in the art. The motor may be a Universal motor or it may be adapted for A. C. or D. C. current as desired.

The heaters 34 may be connected in pairs, as shown, each pair being controlled by a suitable switch 128. The heater circuit is preferably so connected that the circuit through any pair of heaters cannot be closed without closing the motor circuit which is controlled by a suitable switch 130. Obviously, by closing the switch 130 the circuit through the motor 60 is closed and the Frankfurt carrier or conveyor is driven thereby to move the prongs 75 upwardly through the cooking troughs 22. Then by closing the switch controlling the two heaters 34 to the left, as viewed in Fig. 12 the opposite sides of the cooking troughs to the left are heated. When the switch for the two heaters 34 to the right, as viewed in Fig. 12, is closed the opposite sides of the right hand cooking trough are heated and by closing the circuit through the intermediate or central two heaters 34 the three intermediate troughs 22 are heated on each side.

The switches 128 are selectively and independently controllable so that the heating may be sectionalized, as desired. It is, therefore, unnecessary to run the machine fully heated under minimum cooking load or during idle periods. The heaters for one cooking trough may be turned on when the output from that trough is sufficient and when it is desired two troughs may be turned on or three or all of them. This further minimizes the heat loss during idle periods.

Merely as illustrative of a particular embodiment of the invention there are four Frankfurts cooking in each trough 22 all of the time, provided all troughs are operating and Frankfurts are being introduced at the bottom of each as they are discharged from the top or upper ends. One trough turns out or discharges say, one cooked Frankfurt per minutes, which would result in each Frankfurt cooking about four minutes from its introduction into the bottom of the trough to its discharge from the upper end of the trough. This may, of course, all be varied, as desired, and is referred to merely as illustrative of a particular embodiment of the invention.

Obviously, the Frankfurts do not require attention upon being introduced into the machine to determine whether or not they have been cooked or roasted sufficiently, but upon being once introduced are automatically discharged at the end of a predetermined period, which may be regulated to determine the desired cooking. The speed of travel of the carrier or conveyor may be changed by changing the ratio of the worms and cooperating worm wheels. The cooked Frankfurts are automatically delivered to a heated storage bin which maintains them in proper condition until sold or called for. The machine may be conveniently opened or disassembled for inspection, cleaning or repair and in use is effectively closed against heat losses and against the escape of vapors or odors into the room. The grease delivered to the pan 18 may be removed from time to time merely by withdrawing and replacing this pan.

I claim:—

1. In combination, a longitudinal cooking trough, heater means extending along said trough, an endless conveyor operable adjacent said trough, means on said conveyor and for feeding the articles through said trough with the movement of the conveyor, said trough

being inclined and having means to permit grease to drain vertically therefrom as formed, a drip pan underlying said trough for receiving the grease from said trough, a storage bin overlying said cooking trough and heated by said heater means, means for automatically discharging the articles as cooked from said conveyor and into said compartment, and means on said conveyor for actuating said last means with the movement of the conveyor.

2. In combination, a longitudinal cooking trough, heater means extending along said trough, an endless conveyor operable adjacent said trough, means on said conveyor for feeding the articles through said trough with the movement of the conveyor, said trough being inclined and having means to permit grease to drain vertically therefrom as formed, a drip pan underlying said trough for receiving the grease from said trough, a storage bin overlying said cooking trough and heated by said heater means, means for automatically discharging the articles as cooked from said conveyor and into said central compartment, means on said conveyor for actuating said last means with the movement of the conveyor, a vertical enclosing casing, and a flue stack leading off from the top of the casing adjacent the upper end of the cooking trough.

3. In combination, a longitudinally slotted cooking trough, heater means extending along said trough, an endless conveyor operable adjacent said trough, prongs on said conveyor and extending through the slot in said trough for feeding the articles through said trough with the movement of the conveyor, said trough being inclined to permit grease to drain vertically through said slot as formed, a drip pan underlying said slot for receiving the grease from said trough, a storage bin overlying said cooking trough and heated by said heater means, said storage bin comprising a detachably mounted bin having a centrally disposed Frankfurt storage compartment heated directly by said heater means, compartments on opposite sides of said central compartment heated by radiation therefrom and adapted for storing buns, means for automatically discharging the articles as cooked from said conveyor and into said central compartment, means on said conveyor for actuating said last means with the movement of the conveyor, a vertical enclosing casing, a flue stack leading off from the top of the casing adjacent the upper end of the cooking trough, a driving motor within the casing, a driving connection from said motor to said conveyor, and a slidably mounted back wall adapted to be opened or removed to permit access to the interior of the casing.

4. In a machine of the class described, the combination of an enclosing casing having vertical sides and a slidably removable back, a plurality of cooking troughs inclined from the front of the casing and supported adjacent the back and near the top of the casing, a vertical stack opening upwardly from the back of the casing, and a storage bin detachably supported over said cooking troughs, said stack having an opening for the delivery of cooked articles from said troughs to said bin.

5. In a machine of the class described, the combination of an enclosing casing having vertical sides and a slidably removable wall, a plurality of cooking troughs inclined from the front of the casing and supported adjacent the back and near the top of the casing, a vertical stack opening upwardly from the back of the casing, a storage bin supported over said cooking troughs, said stack having an opening for the delivery of cooked articles from said troughs to said bin, an endless conveyor for feeding the articles through said troughs, and means actuated by the movement of said conveyor for discharging the articles from said troughs through said stack and into said storage bin.

In witness whereof, I hereunto subscribe my name this 8th day of June, 1927.

THOMAS C. RUSSELL.