

May 14, 1940.

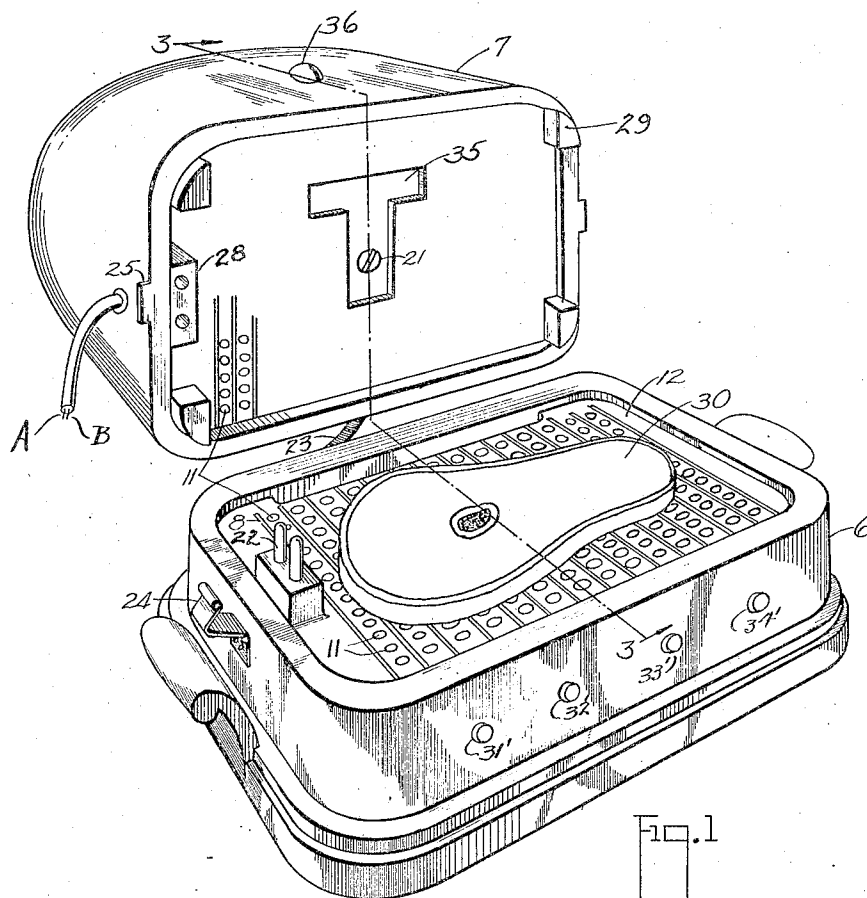
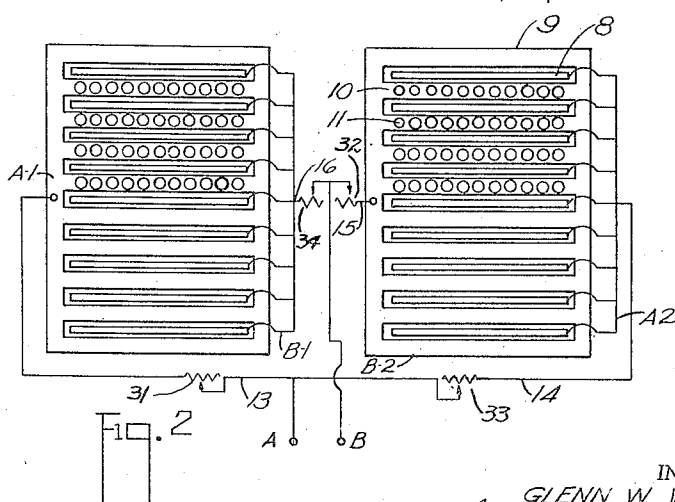
G. W. WATSON

2,200,406

HEAT TREATMENT OF FOOD

Filed July 7, 1938

2 Sheets-Sheet 1



INVENTOR.
GLENN W. WATSON
BY *Samuel Weisman*
ATTORNEY.

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2 Sheets-Sheet 2

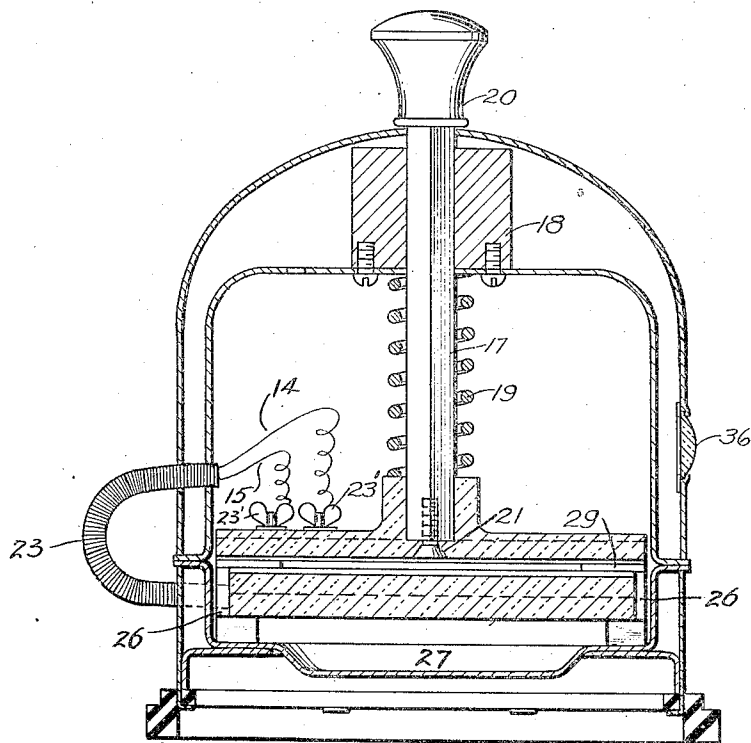


Fig. 3

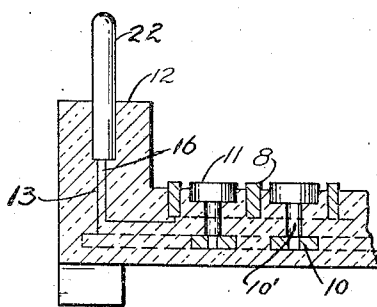


Fig. 4

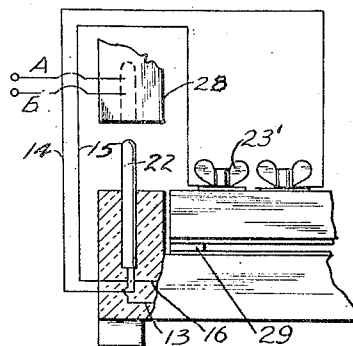


Fig. 5

INVENTOR.
GLENN W. WATSON
BY *Samuel Weisman*
ATTORNEY.

UNITED STATES PATENT OFFICE

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HEAT TREATMENT OF FOOD

Glenn W. Watson, Detroit, Mich., assignor to
Penweld Corporation, Detroit, Mich., a cor-
poration of Michigan

Application July 7, 1938, Serial No. 217,941

7 Claims. (Cl. 219—19)

The present invention pertains to a novel apparatus for and method of applying heat to foods to render them edible and is an improvement on the invention disclosed in the co-pending application of Glenn W. Watson and Earl C. Brannas, Serial No. 213,197 filed June 11, 1938.

In the earlier application, food is prepared by passing current therethrough. In the present invention, the current, in addition to being passed through the food, is further utilized to radiate heat on one or more surfaces of the food, thereby creating a browning effect. This effect is accomplished by the use of resistance metal on the surface energized by current conducted by the food, while the other parts of the apparatus are of such conductivity as to pass current freely without becoming materially heated.

The use of the high resistance elements also creates surface currents in the food, while the use of similar apparatus on both sides of the food establishes currents in opposite directions through the food. These various currents obviously subject the food to a more thorough treatment, in addition to the browning effect on the surface.

The apparatus comprises, generally, two members of good conductivity placed on opposite sides of the food, as in the previous application. These members, however, are in the form of forks rather than plates. The forked member is used in conjunction with another frame member engaging the same surface of the food and carrying numerous high resistance elements with means for conducting current therethrough. The fork and the frame member on the same side of the food are connected respectively to opposite sides of the circuit. At least one conductor is provided at the opposite surface, so that current flows through the resistance elements to the adjacent fork on the surface and to the opposite member through the food. The current in the resistance elements brings the latter to a temperature permitting radiation of heat to the food and a resulting browning effect.

The several currents in the food are separately regulated by variable resistances to govern the effect of each current.

The invention is fully disclosed by way of example in the following description and in the accompanying drawings, in which:

Figure 1 is a prospective view of the device;

Figure 2 is a wiring diagram;

Figure 3 is a vertical section on the line 3—3, and

Figures 4 and 5 are detail sections, partly diagrammatic, to illustrate the wiring.

Reference to these views will now be made by use of like characters that are employed to designate corresponding parts throughout.

The structure of the device, which is merely illustrative, and may be altered according to requirements, comprises a base 6 and a lid 7 removable therefrom.

In each of the sections 6 and 7 is mounted a fork 8 consisting of a metal having a high electrical conductivity and which does not generate material heat when current is passed therethrough. The fork is associated with a frame 9, preferably also of good conducting material and surrounding the fork, as shown in Figure 3. Conducting bars 10 extend from side to side of the frame and preferably alternate with the prongs of the fork. Each bar 10 carries a number of elements, such as studs 10' with flat heads 11 of resistance metal adapted to produce approximately a dark red heat when current is passed through them.

The fork 8 and frame 9 in each section 1 and 2 may be encased in a suitable insulating material 12, such as porcelain or the like leaving exposed heads 11 and one edge of each prong 8'. The heads 11 and the exposed edges of the prongs preferably lie in the same plane, for a purpose that will presently be described.

For the purpose of description, the two sides of the circuit are designated as A and B, the frame and fork in one of the sections as A¹ and B¹ respectively, and the fork and frame in the other section as A² and B² respectively. The side A of the circuit is connected by a conductor 13 to the frame A¹ and by a conductor 14 to the fork A². The other side B of the circuit is connected by a conductor 15 to the frame B² and by a conductor 16 to the fork B¹.

The unit in the lid has a stem 17 extending upwardly and slidably through a boss 18 to the exterior of the lid. A spring 19 is inserted between the boss and the plate 12 to exert a downward pressure on the unit, the movement being limited by the knob 20 on the upper end of the stem. The unit is preferably held to the stem by a screw 21, whereby the unit can easily be removed for cleaning.

The base 6 carries a pair of prongs 22 from which extend the conductors 13 and 16 respectively to the frame 9 and fork 8 of the lower unit. The sections carry complementary clamp members 24 and 25 for holding the lid down when in use.

The lower unit also seats detachably in the base section 5. It is formed at two edges with recesses 26 permitting communication to a basin 27 in the base member. This arrangement permits the juices liberated from the food to flow to the basin.

The upper unit has a plug 23 receiving the prongs 22 when the lid is brought down. The current source A, B is connected to this plug. The conductors 14, 15 are extended from the prongs 22 externally through a coiled wire sheath 23 to the frame and fork of the upper unit, to which they are connected by wing nuts 23'. This completes the circuits without requiring any fastening between the lower unit and the base 5. However, no circuit is completed until the lid is placed on the base. The units are then concealed, so that the operator cannot possibly get a shock.

After the food has been prepared, the lid is lifted, and the juices or gravy may be poured out of the base 5. For cleaning the lower unit, it needs only be lifted out of the base.

Insulating blocks 29 on the upper unit hold the units spaced apart in case the lid is brought down without placing food in the device. There is no danger of receiving a shock, since the sections 5 and 6 overlap as illustrated, and the circuit is not closed until the prongs 22 are fully inserted in the plug 23. This device constitutes the main switch, and no other switch is necessary.

In the operation of the device, the food to be prepared, which may be a steak 30, is laid upon the section 5, and the lid 6 is brought over it. The following currents are all active at the same time in varying degrees:

1. From A to frame A¹, through the bars 10, elements 11 and the food to frame B², its bars and elements, and conductor 15 to complete the circuit at B.
2. From A¹ to fork A², through the food to fork B¹ to conductors 16 and 15 to complete the circuit at B.
3. From the resistance elements 11 of frame A¹ across the surface of the food to the prongs of fork B¹.
4. From the prongs of fork A² to the resistance elements 11 of frame B².

The passage of currents through the food as well as on the surfaces depends on the moisture content of the food and varies accordingly. Also, during treatment of the food, any circuit or circuits may fluctuate according to the changes in the condition of the moisture content.

Variable resistances 31 and 32 are inserted in the conductors 13 and 15 respectively for separately controlling the surface current and the browning at either side of the food, according to requirements or taste. Thus, one side of the food may be cooked or browned more thoroughly than the other side. In this connection, for the preparation of foods requiring browning on only one side, the resistance elements may be dispensed with on one side. Likewise, variable resistances 33 and 34 are inserted in the conductors 14 and 16 respectively for separately controlling the currents through the food as desired. The several resistances are regulated by separate knobs 31', 32', 33' and 34' on the base 6 as shown in Figure 1.

For preparing steaks, the exposed parts of the prongs 8' and resistance elements 11 in one or both units may be relieved at 35 approximately in the shape of a steak bone.

After the food has been prepared, the lid 6 is

lifted by the knob 20 and the food removed. The juices are poured out of the basin 27 through one of the recesses 26 by merely tilting the base section 5. Thereafter, the units are easily removed for washing or cleaning, the lower unit being merely lifted out and the upper unit separated at wing nuts 23' and screw 21.

One of the sections carries a lens 36 illuminated by a pilot lamp (not shown) suitably connected in the circuit to light when the current is flowing.

The invention is also applicable to other kinds of foods, by properly shaping the surface of the units and the sections carrying the units, as for baking breads, and so forth.

The heating units are effectively cleaned with a hair or other insulated brush previously dipped in water. While current is flowing through the units, the latter are rubbed with the wet brush. A suitable means for supplying this current, although the lid is raised, may readily be provided.

In the cleaning operation, the moisture in the brush instantly turns to hot water and steam and dissolves the juices, the latter being permitted to flow into the gravy receptacle. This material is useful as gravy because it has not been adulterated but merely diluted somewhat with water. This gravy has a pleasing brown appearance and at no time is it black nor does it contain charred material.

This is a means of making gravy as well as a means for conditioning the units for further use. Where the device is used repeatedly, as in restaurants, hotels, etc., it is desirable to treat the units in this manner after every two or three uses. Where used for only one operation at a time, as at home, the unit should be cleaned after each use.

Although a specific embodiment of the invention has been illustrated and described, it will be understood that various alterations in the details of construction may be made without departing from the scope of the invention, as indicated by the appended claims.

What I claim is:

1. A device of the character described comprising, in a circuit, two groups of conductors connected to opposite sides of the circuit, resistance elements carried by one of said groups, said elements and the other group being adapted to engage the same surface of an article of food, and another conducting member connected to same side of the circuit as said other group and adapted to engage another surface of said article of food, whereby current flows from said other group through the food to said conducting member and from said resistance elements across the surface of the food to said other group.

2. A device of the character described comprising, in a circuit, two units adapted to be placed in engagement with opposite surfaces of an article of food, each unit comprising two groups of conductors, resistance elements carried by one of the groups of each unit and adapted to engage the food, the groups of each unit being connected respectively to opposite sides of the circuit, whereby current flows through the food in two paths between like groups and across the surfaces of the food between unlike groups.

3. A device of the character described comprising, in a circuit, two units adapted to be placed at opposite surfaces of an article of food, each unit comprising two groups of conductors, resistance elements carried by one of the groups of each unit and adapted to engage the food, the last named groups being connected to opposite

sides of the circuit, and the remaining groups being connected to opposite sides of the circuit and adapted to engage the food, whereby current flows through the food in two paths between like groups and across the surfaces of the food between unlike groups, and a variable resistance in each side of the circuit.

4. A device of the character described comprising a series of spaced conductors adapted for connection to one side of a circuit, another series of conductors alternating with the first series and adapted for connection to the other side of the circuit, and resistance elements mounted on one of said series, said elements and the other series being adapted to engage the same surface of an article of food, said elements being of such resistance as to generate sufficient heat to brown said surface.

5. A device of the character described comprising a series of spaced conductors adapted for connection to one side of a circuit, another series of conductors alternating with the first series and adapted for connection to the other side of the circuit, and headed members mounted on one of said series, the heads of said members being of materially higher resistance than said conductors, said heads and the other series being adapted

to engage the same surface of an article of food.

6. An apparatus of the character described comprising two relatively movable sections of substantially equal area adapted to contain food between them, conducting units mounted respectively in said sections and adapted for connection to opposite sides of a circuit, whereby to pass current through the food, a drain basin formed and confined in the lower section, the unit in said section being spaced marginally from said section to provide access to said basin.

7. A device of the character described comprising, in a circuit, two units adapted to be placed at opposite surfaces of an article of food, each unit comprising two groups of conductors, resistance elements carried by one of the groups of each unit and adapted to engage the food, the last named groups being connected to opposite sides of the circuit, and the remaining groups being connected to opposite sides of the circuit and adapted to engage the food, whereby current flows through the food in two paths between like groups and across the surfaces of the food between unlike groups, the food-engaging surfaces of said units being relieved in the shape of a steak bone.

GLENN W. WATSON.