

April 21, 1925.

1,534,430

G. F. WELLS

WAFFLE IRON

Filed July 17, 1923

2 Sheets-Sheet 1

FIG. 1.

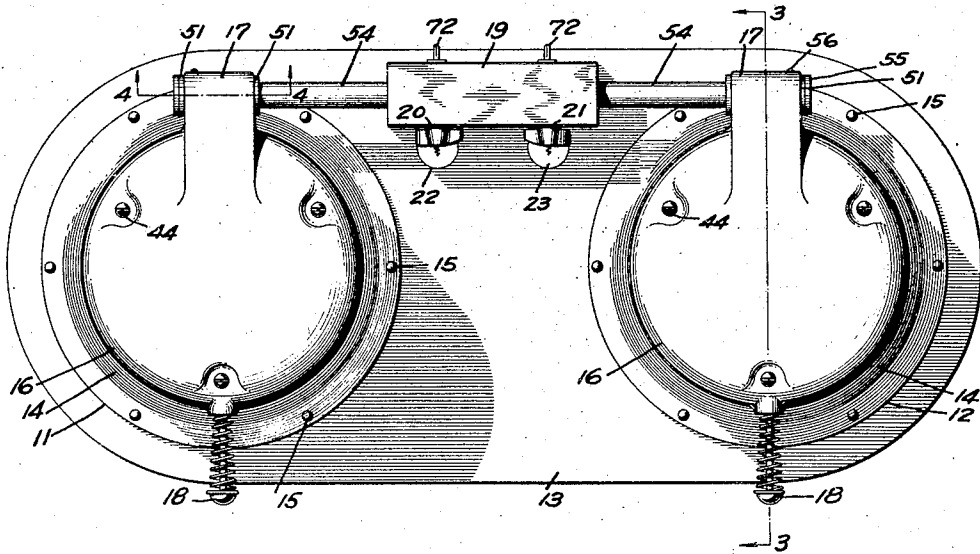


FIG. 2.

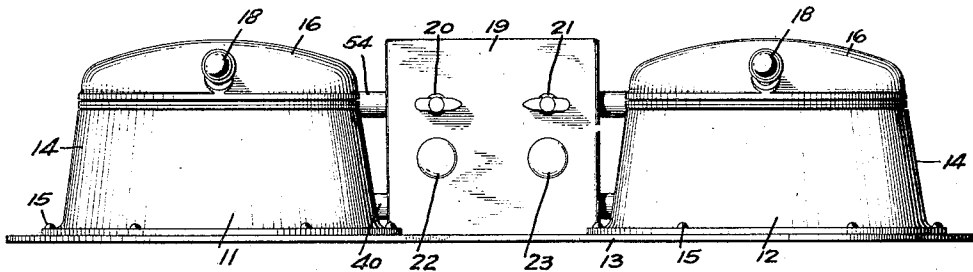
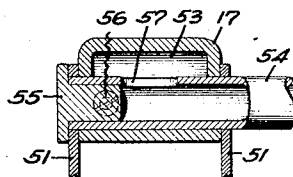


FIG. 4.



WITNESS:

H. Sherburne.

INVENTOR
George F. Wells

BY
White Post & Evans
his ATTORNEYS.

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2 Sheets-Sheet 2

FIG. 3.

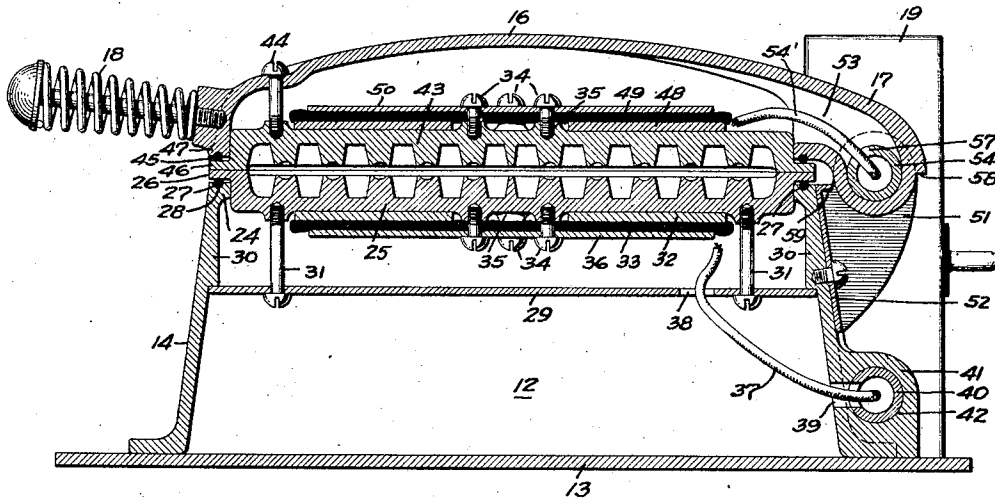
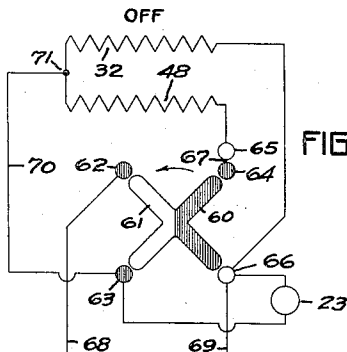


FIG. 5.

FIG. 6.

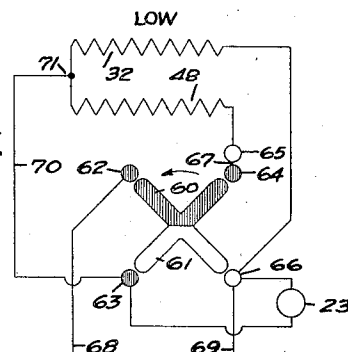
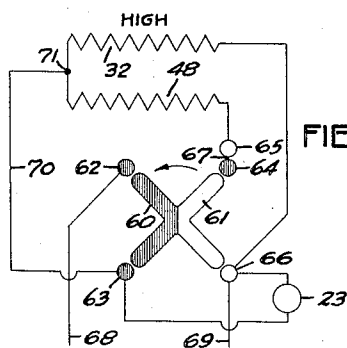
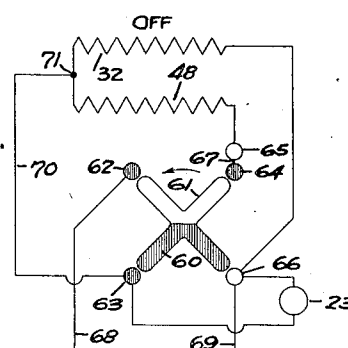


FIG. 7.

FIG. 8.



WITNESS
H. Sherburne

INVENTOR
George F. Wells
BY *White, Port & Lane*
his ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORGE F. WELLS, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO WELLS MANUFACTURING CO., OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

WAFFLE IRON.

Application filed July 17, 1923. Serial No. 852,084.

To all whom it may concern:

Be it known that I, GEORGE F. WELLS, a citizen of the United States, and a resident of the city and county of San Francisco, in the State of California, have invented a new and useful Waffle Iron, of which the following is a specification.

This invention relates to waffle irons, and particularly to such irons that are especially adapted for use in restaurants or hotels, where intermittent, irregular service is demanded, but where it is essential to maintain the iron ready for use at any instant.

It is one of the objects of my invention to provide an iron that is simple to operate, and of inexpensive construction.

It is another object of my invention to provide a waffle iron that is economical in the use of electrical energy.

Still another object of my invention is so to construct the iron that it may readily be maintained clean and free from foreign matter.

It is still another object of my invention to provide a construction whereby the electrical connections may be substantially entirely concealed, so that not only does the iron present a neat appearance, but there is an assurance that the proper operation of the iron cannot be interfered with.

It is still another object of my invention to provide a plurality of irons that are mechanically arranged on a common support so that the manipulation is rendered extremely convenient and simple.

It is still another object of my invention to construct the heating elements and their supports in such a way that they may be readily assembled, and that they may serve to heat the irons substantially uniformly, whereby improper cooking of the waffle is prevented.

My invention possesses other advantageous features, some of which, with the foregoing, will be set forth at length in the following description, where I shall outline in full that form of the invention which I have selected for illustration in the drawings accompanying and forming part of the present specification. Although I have shown in the drawings but one embodiment of my invention, I do not desire to be limited thereto, since the invention as ex-

pressed in the claims may be embodied in other forms also.

Referring to the drawings:

Figure 1 is a top plan view of a waffle iron assembly adapted for restaurant work, and embodying my invention;

Fig. 2 is a front elevation of the assembly shown in Fig. 1;

Fig. 3 is an enlarged sectional view along plane 3—3 of Fig. 1;

Fig. 4 is an enlarged sectional view along plane 4—4 of Fig. 1, illustrating a detail of the hinge construction; and

Figs. 5, 6, 7, and 8 are wiring diagrams of the electric control for each iron, illustrating the conditions of the heating circuits for various positions of the switch.

In the present instance I show a pair of waffle irons 11 and 12 that are supported side by side on a flat base 13. Each of these irons includes a lower section 14 that is fastened, as by rivets 15, to the base 13; and an upper section 16 that is hinged to the lower section 14 by the aid of the lugs 17. The irons are arranged to have the axes of their hinges substantially coinciding. A wire handle 18 is attached to the upper section so that it may be manually rotated about its pivot. A connection box 19 is also supported on the base 13, and is conveniently placed between the two irons 11 and 12, and substantially in line with the hinges. This box carries the connections, and also supports the manual control devices, such as the snap switches 20 and 21 whereby the circuits for the irons may be manipulated. Connection plugs may be inserted over the posts 72 that extend from the back of box 19, and in this way the irons may be connected to an external source. Pilot lights 22 and 23 are also appropriately supported on the box 19, and serve to indicate the conditions of the circuits, as will be explained hereinafter. The advantages of locating the box toward the rear and between the irons are that the control is readily accessible, without in any way interfering with the operation of the irons; furthermore, the electrical connections may be very conveniently arranged.

The details of construction of the irons 11 and 12 may be most easily understood from a consideration of the enlarged section, Fig. 3. The lower section 14 is formed of a

hollow tubular supporting shell, having a rim or flange 24 at the top, for supporting the lower waffle mold 25, which has a cooperating flange 26. Between the flanges 24 and 26, I preferably place some form of insulating packing, such as the asbestos rope 27. When the mold 25 is fastened down, this rope 27 is compressed partly into the recess 28 provided for it in one of the flanges, and in this way it not only insulates the mold against heat conduction to the shell section 14, but it also prevents the entrance of dirt, batter or grease between the flanges. This feature assists materially in keeping the current consumption down, due to the slight loss due to heat conduction, and keeps the cooking surfaces at uniform temperature irrespective of the conditions of operation of the iron. In other words, the iron is maintained at operating temperature at all times.

In order to tighten the mold 25 in place, I prefer to use a plate 29 that is maintained in spaced relation to the mold, as by the aid of several small projections 30 extending inwardly from the inner wall of the section 14. Fastening means, such as the screws 31, pass through this plate and engage threaded apertures in the lower side of the mold 25.

The electrical heating element 32 is preferably formed as a flat member, with a large aperture in its center, and may take the shape of a circle, or ellipse, or rectangle, dependent upon the particular configuration of the mold 25. The element 32 is placed immediately adjacent the lower surface of the mold, so that it may impart thereto substantially all the heat developed therein. It is also to be noted that the area of contact is a substantial portion of the whole mold area, and there is thus a substantially uniform heating of the mold. In order to fasten the element 32 to the mold 25, I place a heat insulating member 33 over it, which is preferably made of asbestos, and one or more screws 34 or other fastening means pass through this insulation 33 and the large central aperture of the heating element 32, and into threaded apertures in the lower surface of the mold. These apertures are formed in the small bosses or projections 35 which also serve to space the element 32 centrally with respect to the mold 25. I preferably use in addition, a metal clamping plate 36 that extends over the insulation 33; the fastening screws 34 pass through this plate, securely holding the element 32, and insulation 33, against the mold 25. The plate 36 acts as a clamp over a large portion of the element 32.

The electrical connections 37 for the lower mold 25 pass through an aperture 38 in plate 29, and thence through aperture 39 near the bottom of section 14, into a pipe

40 that extends into the connection box 19. This pipe 40 is appropriately accommodated in a projection 41 extending from the rear of the section 14. This projection is provided with an aperture 42 for the pipe 40, which aperture extends only partly through the boss 41, so that the end of pipe 40 is closed by the end wall of this boss.

The upper waffle mold 43 is substantially identical with the lower mold, and is similarly fastened to the upper shell 16, by the aid of the screws 44. An asbestos rope 45 is also interposed between flanges 46 and 47 for a purpose similar to that already described. The heating element 48, insulation 49, and metal clamp 50 are substantially similar to the corresponding parts of the lower section.

The upper section 16 is hinged relative to the remainder of the structure, and appropriate provisions are made not only for hingedly connecting the sections, but also to provide passageways through the hinge structure for the electrical connection to the upper heating element 48. For this purpose a pair of hinge lugs 51 (Figs. 3 and 4) are fastened to the lower section 14. This may readily be accomplished by forming these lugs integrally with an attaching piece 52 that fits closely to the external surface of the section 14. Between these hinge lugs, plays the upper hinge lug 17 which is hollow and formed preferably integrally with the top section 16. The interior of lug 17 connects with the interior of section 16 by the aid of the passageway 53, through which the connections 54' extend for the upper heating element 48. The hinge pin for the lugs 51 and 17 is formed by the hollow pipe 54 shown most clearly in Fig. 4. This pipe extends through these lugs, and its end is closed up in any convenient manner, as by the button 55 inserted therein. The pipe 54 is preferably fastened to the lug 17 so as to rotate therewith, as by the aid of a screw 56, which also serves to hold the button 55 in place. The pipe extends axially of the lugs into the connection box 19, as indicated most clearly in Fig. 1, and carries the connections 54'. An aperture 57 (Fig. 4) is provided near the end of the pipe under the lug 17 to permit the passage of these connections into the pipe. It is evident that by this structure, the connections are entirely concealed and protected from injury of any sort.

In order to limit the movement of the upper section 16 with respect to the lower section, a small shoulder 58 is formed on the lug 17, which is adapted to act against a stop shoulder 59 formed on the attaching piece 52, when the iron is opened to its full extent.

The control switches 20 and 21 are con-

nected in such a way that two degrees of energization of the heating elements may be obtained. For restaurant work this arrangement has particular advantages. Thus during the idle period the lower degree of energization may be used, in order to keep the irons hot and ready for instant use. In this way no delay can arise in waiting for the iron to be brought up to working temperature. The loss in current is relatively small, and for convenience it more than makes up for this factor.

The diagrams, Figs. 5, 6, 7 and 8 illustrate how this control is effected by an ordinary four position snap switch such as 20 or 21. In these switches, there are two rotatable contact segments, labelled 60 and 61 respectively, disposed in different planes. We may assume that the shaded segment 60 is above the unshaded segment 61. Four sets of contact clips cooperate with these blades or segments, the clips being in the path of movement of one or the other of the segments. To indicate this in a diagrammatic fashion, the shaded circles 62, 63 and 64 represent contact clips that are in the plane of the upper segment 60, while the unshaded clips 65 and 66 are in the plane of the lower segment 61. The clips 64 and 65 are disposed on a common conducting post, one above the other, and this is diagrammatically indicated by a connection 67 between the two circles 64 and 65. The radial extensions of segments 60 and 61 are shown shorter than necessary to bridge the clips, for the sake of clearness, but it is to be understood that these arms are long enough to enter between those clips which are in the same plane as the segments.

In the off position of Fig. 5, the lower segment 61 is not in a position to bridge any of the contact clips, and the upper segment 60 engages merely the clips 64. The heating elements 32 and 48 are not operatively connected to the supply lines 68 and 69, which are fastened respectively to clips 62 and 66. A quarter of a turn in a counter-clockwise direction brings the segments to the position of Fig. 6, where both elements 32 and 48 are in series across the lines 68, 69, and a low degree of energization results. The circuit may be traced as follows: line 68, clips 62, segment 60, clips 64, element 48, element 32, clips 66, to line 69. Another quarter of a revolution brings the segments to the position of Fig. 7, where the elements 32 and 48 are in parallel across the lines, and are therefore energized to a greater degree than before. The circuit may be traced as follows: line 68, clips 62, segment 60, clips 63, connection 70, point 71, where the current divides—one path including element 32, and clips 66 to line 69, and the other including element 48, clips 65, segment 61 and then to clips 66 and line 69. Another quarter turn

brings the switch to the position of Fig. 8, where the elements are again deenergized.

It is to be noted that pilot light 23 is bridged across the clips 63 and 66, which connect to opposite points of element 32. Thus in the position of Fig. 6, this light is subjected to an e. m. f. which is substantially half of that across the lines 68 and 69, and it will therefore burn dimly. In the position of Fig. 7, however, it is subjected to the full voltage, and is bright. In the other two positions it is deenergized. This light therefore indicates the condition of the circuits.

Although but one form of circuit control for one of the irons has been described, it is evident that many other wiring schemes may be devised to effect the same result.

The operation of the device may now be set forth. In order to start either or both of the irons, either or both of the switches 20 and 21 are moved to the high position. After the irons are thoroughly hot, waffles may be cooked therein, and when the cooking is completed, the switches may be turned to the low positions, to maintain the irons at operating temperature. An order for waffles may then be promptly filled by simply turning the switches to the high position again, and the irons are immediately available for service. Upon completion of the order, the switches may be returned to the low positions. Dirt or grease or other foreign matter cannot interfere with the operation of the iron, due to the use of the concealed connections, and of the gaskets 27.

I claim:—

1. In an electrically heated cooking device, a metallic member to which heat is to be imparted, a support for said member, said support providing a supporting surface near the edge of the metallic member, an insulating ring-like gasket disposed between the support and the member, and means for fastening them together.

2. In an electrically heated cooking device, a flanged metallic member to which heat is to be imparted, a support for said member, said support providing a supporting flange cooperating with that of the metallic member, and an insulating gasket between the flanges, and means for fastening the flanges together.

3. In an electrically heated waffle iron, a waffle mold, a support for the mold, said support providing a supporting surface near the edge of the mold, an insulating gasket disposed between the support and the mold, and means for fastening all of these parts together.

4. In an electrically heated waffle iron, a flanged mold, a support for the mold having a flange cooperating with the flange on the mold, and an insulating gasket held between the flanges.

5. In an electrically heated waffle iron,

a mold, a hollow supporting member for the mold, said member cooperating with the mold near its outer edge, a member disposed in the hollow support and spaced from the mold, and one or more fastening devices extending from the member and engaging the mold.

6. In an electrically heated waffle iron, a pair of cooperating waffle molds, heating elements for each of the molds, and means for maintaining the iron constantly at operating temperature, comprising means for supplying a relatively low energization to the heating elements.

7. In combination, a pair of electrically heated waffle irons each having hinged sections, a common support for the irons whereby the axes of rotation of the sections are substantially in alinement, pipes connected to one of the hinged sections with their axes substantially coinciding with that of the hinges, electrical connections for the irons extending through the pipes, and a connection box into which the pipes extend.

8. In combination, a pair of electrically heated waffle irons each having an upper section hinged to be movable into open and closed position, each of said upper sections having a hollow hinge lug and an electrical heating element, said hinge lugs having a common axis of rotation, a connection box between the irons, a conduit for each iron extending between the hollow hinge lug and the box, and electrical connections in said

conduits and extending into the hollow hinge lug.

9. In combination, a pair of electrically heated waffle irons, each of said irons having a hinged upper section and a stationary lower section, the axes of rotation of the upper sections substantially coinciding, a connection box between the irons, pipes extending from the lower sections to the box, electrical connections in the pipes for the lower sections, pipes fastened to the upper sections and extending coaxially with the axis of rotation toward the box, and electrical connections for the upper sections in these latter pipes.

10. In an electrically heated waffle iron, a pair of mold sections, a pair of spaced hinge lugs supported by one of said sections, a hollow hinge lug carried by the other section and disposed between the other lugs, a pipe extending through the lugs and forming the hinge pin, said pipe having an aperture communicating with the interior of the hollow lug, connections for that section which supports this hollow lug in the pipe and passing through the aperture, a closure for one end of the pipe, and means for fastening the closure into the pipe and for fastening the pipe to the hollow hinge lug.

In testimony whereof, I have hereunto set my hand.

GEORGE F. WELLS.