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Dec. 2, 1941. A. BARNSTEINER 2,264,270

RANGE SURFACE UNIT INSULATOR

Filed March 28, 1939 3 Sheets-Sheet 1

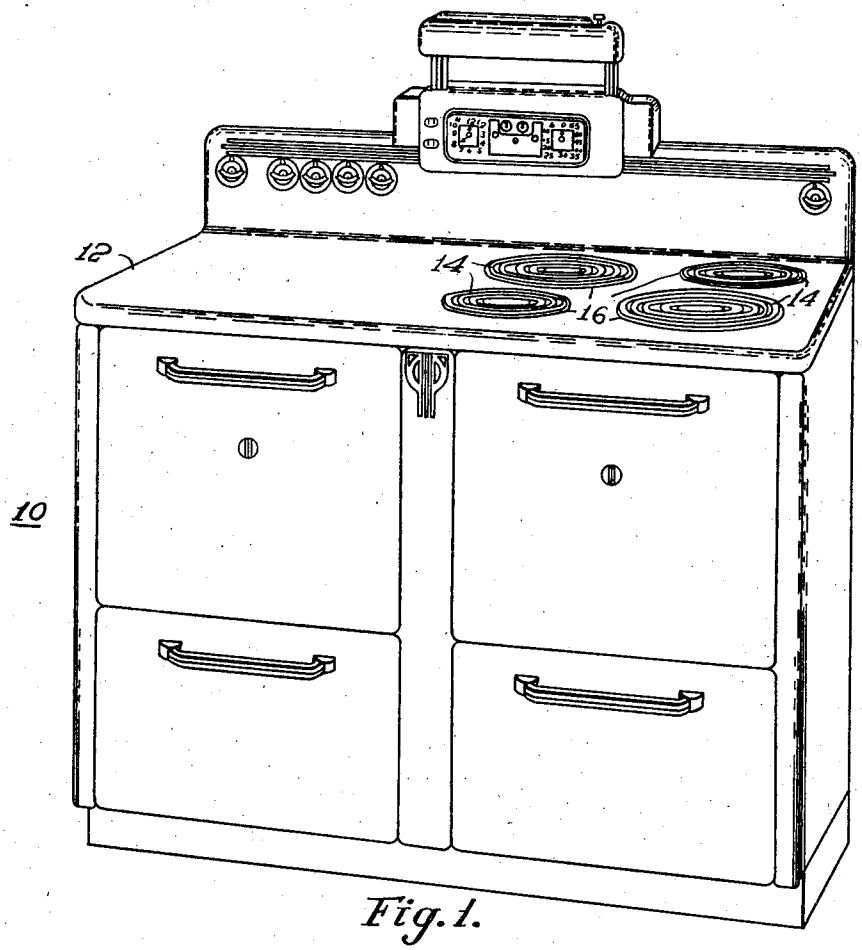


Fig. 1.

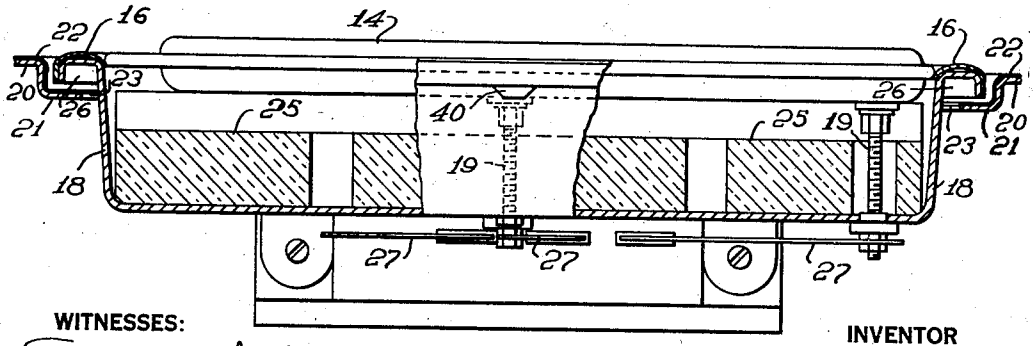


Fig. 2.

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Fig. 3.

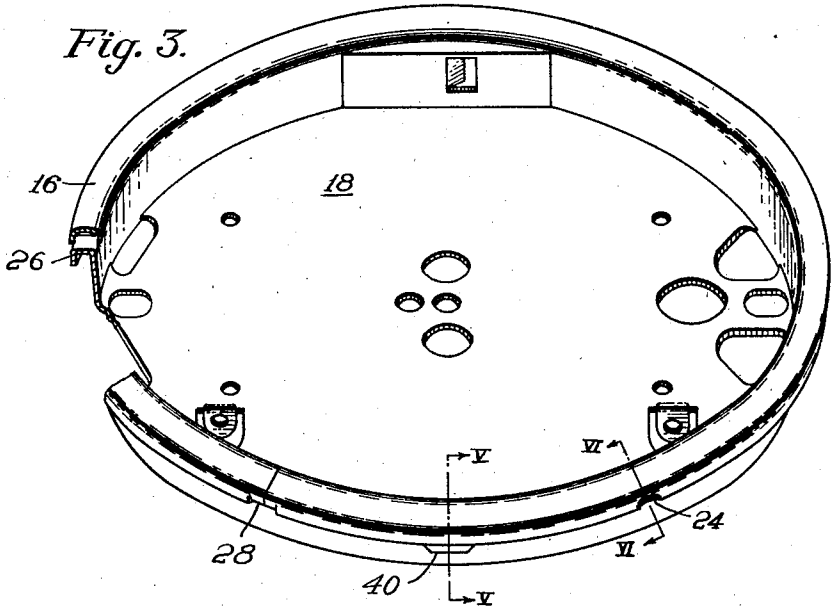
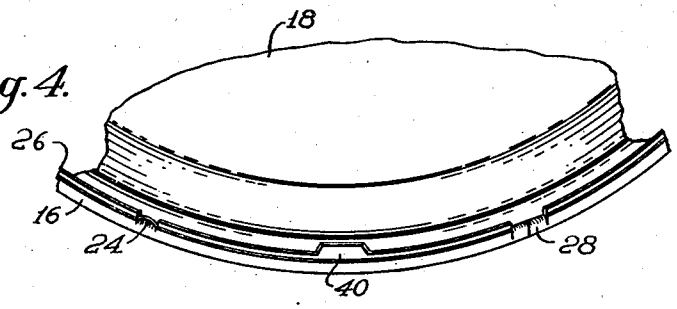


Fig. 4.



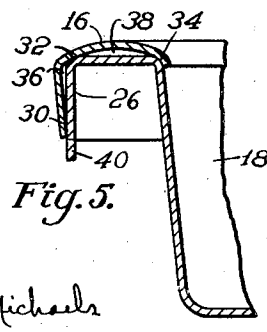


Fig. 5.

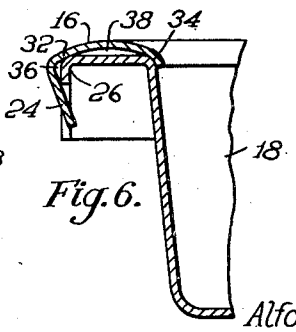


Fig. 6.

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RANGE SURFACE UNIT INSULATOR

Filed March 28, 1939 3 Sheets-Sheet 3

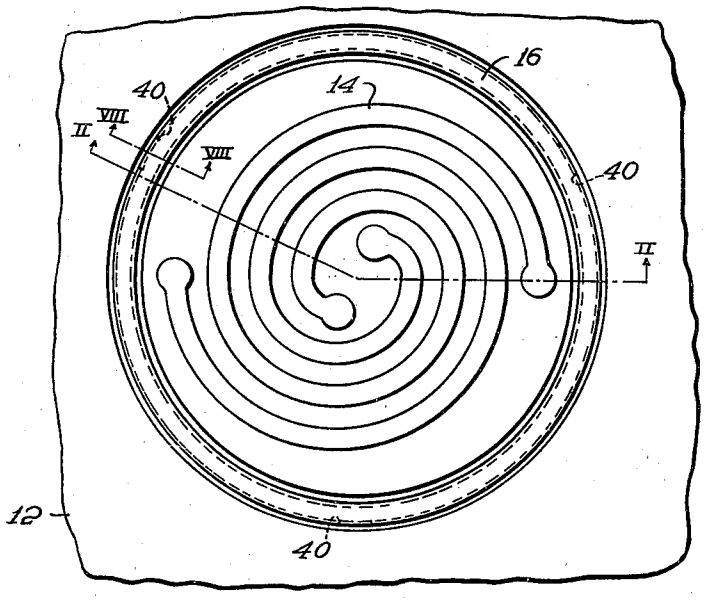


Fig. 7.

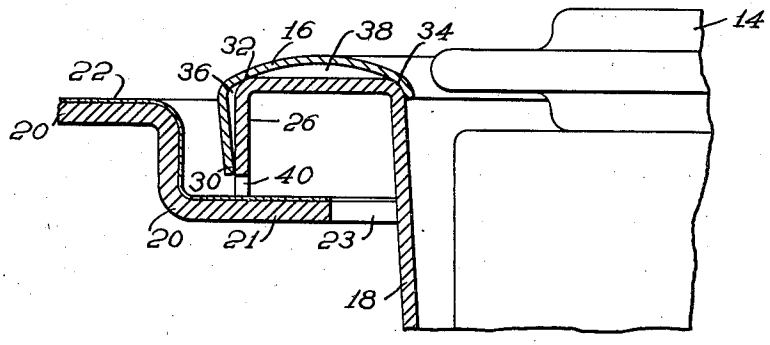


Fig. 8.

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UNITED STATES PATENT OFFICE

2,264,270

RANGE SURFACE UNIT INSULATOR

Alfons Barnsteiner, Mansfield, Ohio, assignor to Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania

Application March 28, 1939, Serial No. 264,572

3 Claims. (Cl. 219—37)

My invention relates to ranges and the like, and more particularly to a structure for heat-insulating surface units thereof from the top surface of a range and at the same time, mechanically protecting such surface. This application is a continuation-in-part of my copending application, Serial No. 177,315, filed November 30, 1937, and assigned to the Westinghouse Electric & Manufacturing Company.

With those ranges now known to the art having top surfaces which are enameled for protective and decorative purposes, and which have surface units located therein for cooking purposes, the amount of heat developed by the surface units is necessarily limited by the inherent characteristics of the decorative coating located upon the top surface of the range. In other words, in those ranges having the top surface enameled with a white coating, such coating will in time, if subjected to high temperatures, turn gray or brown, resulting in the range having a dirty, unattractive appearance, while rapid cooling from an elevated temperature causes the enameled coating to check or crack.

It is, therefore, an object of my invention to provide means whereby the temperature of a range surface unit may be increased over that now known to the art without causing injury to the enameled coating located on the range top surface.

A further object of my invention is to provide means for preventing the enameled decorative coating located upon the range top surface from being cracked or chipped about the edge of the surface unit due to an operator carelessly placing cooking vessels thereon.

A further object of my invention is to provide a removable ring about the range surface unit which will restrict the horizontal or radial flow of heat energy from the surface unit.

A still further object of my invention is to provide an insulating ring about a range surface unit support pan which, while being rigidly attached to the pan, provides an air space therebetween for insulating the ring from such pan and from the enameled surface of the range platform.

Another object of my invention is to provide means for supporting the range surface unit by the range platform in such manner as to restrict and limit the conduction of heat from such unit to the platform.

Other objects of my invention will either be pointed out specifically in the course of the following description of a device embodying my invention, or will be apparent from such description.

Referring to the accompanying drawings:

Figure 1 is a perspective view of a range embodying my invention;

Fig. 2 is an enlarged view, partly in elevation and partly in section, taken along the line II—II of Fig. 7;

Fig. 3 is a perspective view of a range surface-unit-supporting pan embodying my invention, with a portion thereof broken away;

Fig. 4 is a partial perspective view of the underside of the supporting pan shown in Fig. 3;

Figs. 5 and 6 are enlarged sectional views taken along the lines V—V and VI—VI respectively, of Fig. 3;

Fig. 7 is an enlarged plan view of a portion of the range shown in Fig. 1; and

Fig. 8 is an enlarged partial sectional view taken along the line VIII—VIII of Fig. 7.

Referring to the accompanying drawings, in which like reference characters indicate like parts in the several figures, I show a range 10 having a top surface 12 with surface units 14 located therein, and a protective ring 16 being disposed about each of the surface units 14 and being attached to each surface unit supporting pan 18, as hereinafter described.

The range top surface or platform 12, which may be formed in any desired manner, is preferably formed of a single sheet of metal 20 having a depressed ledge 21 adjacent the surface unit receiving apertures 23, as shown in Figs. 2 and 8. The top surface metal 20 has a decorative and protective coating 22 placed thereon, which usually is of a white color. The coating 22 is generally enamel and is usually baked or fired on the top surface metal plate 20, in accordance with a familiar practice. The top surface 12 thus is composed primarily of a metal sheet 20 with a decorative coating 22 which, due to its being baked or fired on the metal plate 20, is very brittle and susceptible to color change with high temperatures, and crazing or cracking due to mechanical injury and rapid cooling. By having the top surface 12 of the range 10 coated in such a manner, it is apparent that the range will have a clear evenly colored decorative top surface, the esthetic effect of which would be destroyed by any irregular change in color or with cracks or chips within the coating itself. However, a range embodying my invention would be protected from being defaced in such a manner, as hereinafter described.

The surface unit 14, which may be of any well-

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known type, is rigidly attached to and located within the dish-shaped supporting pan 18. The pan 18 may be enameled to protect it from oxidation and heat developed by the surface unit 14. If the supporting pan 18 be enameled, it is preferred that it be colored a dark color, such as black or the like. The surface unit 14 is rigidly attached to the pan 18 by means of bolts 19 and may be connected to a supply circuit (not shown) by means of terminal straps 27. An insulating block 25 may be located within the pan 18 and may be positioned intermediate the surface unit 14 and the pan 18. This block 25 may be composed of a ceramic material, or of any other desired heat-insulating material.

The pan 18 has an annular outwardly extending flange 26 located about the upper wall thereof upon which the protective ring 16 is placed (see Figs. 2, 3 and 8). It is preferred that the protective ring 16 be composed of a material having a lower heat conductivity than that of the surface unit 14 and of the supporting pan 18, such as chromium plated or polished stainless steel, or the like, so as to prohibit or restrict the horizontal or radial flow of heat from the surface unit 14. The protective ring 16, which is preferably solid, is held in position upon the upper periphery or the annular flange 26 of the pan 18 by being crimped over against the pan 18 at a plurality of points, as shown at point 24 in Figs. 3, 4 and 6. In addition, the ends of the protective ring 16 may be crimped in against the pan 18 to lock such ring in place upon the pan, see 28 in Figs. 3 and 4. With the ring 16 crimped against the pan 18 in such a manner, it is obvious that the ring 16 will be rigidly attached thereto and cannot be readily removed from the pan 18. If it be desired, the material of the top surface of the ring 16 may be polished to a high luster to harmonize with the prevailing decorative features of the ranges now known to the art.

The protective ring 16 is formed and positioned upon the pan 18 so that it contacts the annular flange 26 thereof at only three places; namely, the two peripheries 30 and 34 of ring 16, and an intermediate point 32, see Figs. 5, 6 and 8. Two air-gaps 36 and 38 are thus formed between the ring 16 and flange 26 of pan 18. These stagnant air-gaps 36 and 38 act as insulators and prevent the flow of heat from the ring 16 and the pan 18. Accordingly, the passage of heat from the surface unit 14 to the pan 18 will be greatly restricted due to the presence of such ring 16.

In addition, if the ring 16 be highly polished, such polished surface will reflect a large portion of the heat directed towards the flange 26 of pan 18 by the surface unit 14 or a vessel placed thereon.

A plurality of small depending supporting lugs 40 are located along the outer depending edge of flange 26 of pan 18, see Figs. 2, 3, 4, 5, 7 and 8. There are only three lugs 40 used, in this instance. The lugs 40 are adapted to support the pan 18 and heater 14 upon the depressed ledges 21 of range platform 12 within the apertures 23, and to restrict the conductivity of heat from the pan 18 to such platform 12. These lugs are comparatively short and shallow so as to produce a relatively negligible contact area with the platform 12 in comparison to the total periphery of the pan 18.

The lugs 40 retain the pan 18 above the level of the ledge 21 within the apertures 23. Accordingly, the heat flow from such pan to the enameled surface 22 of the platform 12 is greatly restricted.

The protective ring 16 is located slightly above the top surface 12 of the range 10 (see Figs. 2 and 8). The exact position thereof is determined by the depth of the outer edge of flange 26 and lugs 40. By having the protective ring 16 located slightly above the top surface of the range 10, it is apparent that as an operator positions a cooking vessel upon the surface unit, the protective ring 16 will prevent the corners or edge of the vessel from striking the edge of the top surface located substantially in juxtaposition with the pan 18, and will guarantee that the vessel will be elevated above the range top surface.

It is, therefore, apparent that due to the positioning of the ring 16 above the level of the top surface, such ring will protect and prevent the top surface from being chipped or cracked by the vessels being carelessly placed upon the surface unit.

It is well known that with white enamel which is generally used upon the top surface of the ranges as now known to the art, such enamel is liable to turn gray or brown with continued use of the surface units at high temperatures. This factor, which is inherent in the decoration of the top surface, fixes the upper limits or usable temperatures of the surface units by preventing the surface units from being satisfactorily used above that temperature which would readily discolor the decorative coating placed upon the range top surface.

The air-gaps 36 and 38 between the ring 16 and the pan 18 insulate such ring from the pan and limit the flow of heat from such ring to the pan. Further, the lugs 40, in effect, raise the pan 18 up from the enameled surface 22 of the platform 12 and prevent the conduction of heat thereto. The ring 16 and lugs, therefore, permit the temperature of the surface unit 14 to be increased to its limit of capacity while not exceeding a safe temperature rise at the edge of the top surface 12, by reason of the temperature differential across the protective ring 16 and between the pan 18 and platform 12.

It is, therefore, apparent that the protective ring 16 performs at least a triple function; namely, providing a decoration or trim about the surface unit, a mechanical protective means for preventing the enameled top surface of the range from being cracked or chipped, and restricting or retarding the flow of heat from the surface unit to the surrounding enameled top surface, thereby enabling the surface unit to be operated at a relatively high temperature for a given non-harmful temperature rise of the top surface. In this way a quicker-heating, more efficient surface unit is also provided.

The protective ring 16 is disposed in its entirety intermediate the heating unit 14 and the upper edge of the apertures 23 in the cooking surface 12 and out of contact with such surface, for thermally and mechanically protecting the surface around the aperture.

Various modifications may be made in the device embodying my invention without departing from the spirit and scope thereof, and I desire, therefore, that only such limitations shall be placed thereon as are imposed by the prior art and the appended claims.

I claim as my invention:

1. In combination, cooking apparatus including a surface unit comprising, in combination, a

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heating element, supporting means comprising a dish-shaped device for said heating element, and means comprising a separate ring-like member attached to and enclosing the upper periphery of said dish-shaped device with an enclosed air space therebetween.

2. Cooking apparatus comprising, in combination, a surface unit including a heating element, a dish-shaped device for supporting said heating element having an outwardly extending peripheral flange, and a ring-like member of different contour than said flange enclosing the same, the difference in contours providing at least one heat-insulating space therebetween.

3. Cooking apparatus comprising, in combination, a top surface covered with a decorative coating and having an opening therein, and a surface unit disposed in said opening and comprising a heating element, a dish-shaped device for supporting said heating element having a substantially horizontally extending upper peripheral flange, and a ring-like member of different contour than said flange enclosing the same and extending in a generally horizontal direction at a level above that of said top surface, the difference in contours providing at least one heat-insulating space therebetween and the top surface of said ring-like member being highly reflecting.

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