Dec. 29, 1953 K. FISCHER 2,664,492

HEATING PLATE STRUCTURE

Filed Aug. 24, 1949

Fig.1

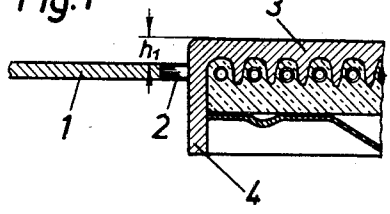


Fig.2

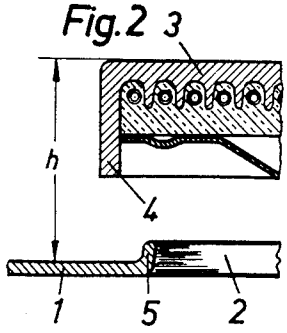


Fig.3

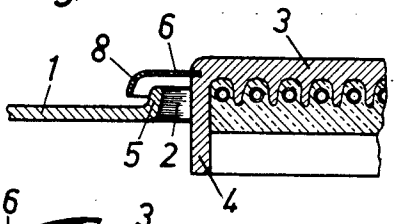
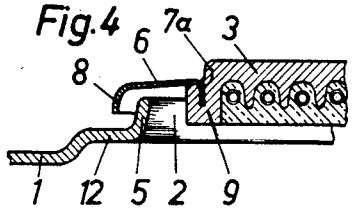


Fig.4



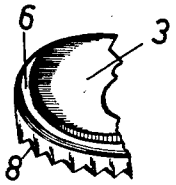


Fig.10

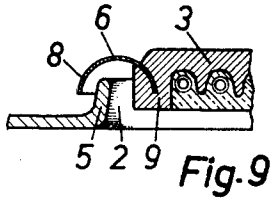
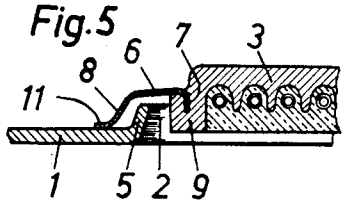


Fig.9

Fig.5



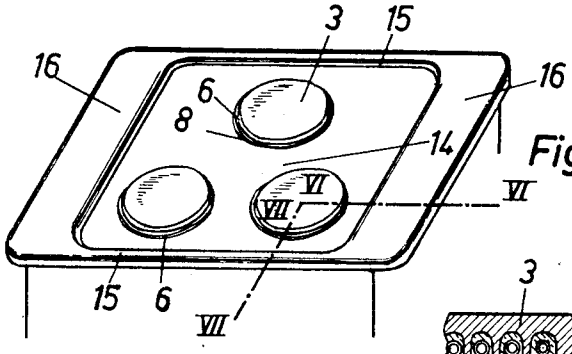
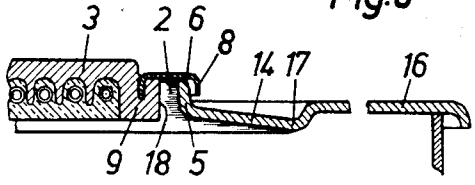


Fig.8

Fig.6



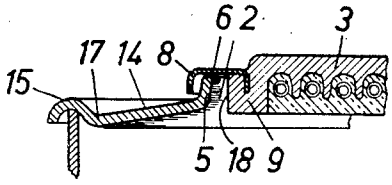


Fig.7

INVENTOR
KARL FISCHER
By Young, Emery & Thompson
Atty's.

Patented Dec. 29, 1953

2,664,492

UNITED STATES PATENT OFFICE

2,664,492

HEATING PLATE STRUCTURE

Karl Fischer, Oberderdingen, Germany

Application August 24, 1949, Serial No. 112,093

Claims priority, application Germany
February 9, 1949

5 Claims. (Cl. 219—37)

1

This invention relates to certain improvements in electric heating plate structures and stove frames therefor, of the type in which the heating plate includes an outer eaves rim adapted to prevent overflowing cooking substances from getting to the underside of the heating plate in which the heating elements are embedded.

As is well known, electric heating plates in operation are exposed to very intensive corrosion stresses which especially act upon the eaves rim which in most instances is extended downwards to a low level.

It is the object of the present invention substantially to reduce the danger of corrosion and to provide a heating plate which in addition to a good appearance offers advantages when it is installed in electric stove frames.

With this object in view, according to the present invention the eaves rim is provided as a sheet metal ring of a corrosion-proof material embedded in the outer rim of the cast iron plate, in the casting process.

According to a further feature of the invention, my novel heating plate can be fitted in a particularly appropriate manner in a suitably shaped stove frame with upwardly directed rim of the circular aperture provided in the stove plate for reception of the heating plate by extending the said eaves rim in such a way in a radial direction, that it reaches beyond the upwardly directed rim of the stove plate, thus overlapping the air gap between the outer edge of the heating plate and the inner edge of the said circular aperture which hereinafter is termed "heating hole" for the sake of brevity.

Further objects and features of the invention will be seen from the following detailed description in connection with the accompanying drawing, showing by way of example and purely schematically some embodiments of the invention and in which:

Figs. 1 to 7 show each a vertical fragmentary section through the part of a stove plate adjacent to the edge of a heating hole, and the outer rim of a heating plate, i. e.,

Figs. 1 and 2 relating to conventional designs of heating plates,

Figs. 3 to 5 and 9 relating to various embodiments of heating plates according to the invention, with cast-in corrosion-resistant sheet metal ring,

Fig. 6 is a section on the line VI—VI in Fig. 8,

Fig. 7 is a section on the line VII—VII in Fig. 8,

Fig. 8 is a perspective view of the upper part of a stove, and

2

Fig. 10 is a perspective view of another embodiment.

Similar reference numerals denote similar parts in the different views.

Referring now to the drawings in greater detail, it will be seen that 1 is the stove plate, 2 is a heating hole provided in the stove plate, 3 is the heating plate, 4 is a downwardly projecting rim which is made in one piece with the heating plate 3 and serves as an eaves rim in the conventional heating plates. It will be seen from Fig. 1, that between the inner edge of the heating hole 2 and the outer edge of the heating plate 3 there is left an air gap into which overflowing cooking liquid may easily get. Owing to the considerable heat expansions of the hot heating plate in relation to the cold stove plate this air gap cannot be dispensed with. Moreover, the rim 4 would be subject to corrosion if it would only partly lie against the rim of the heating hole.

It has been proposed already to arrange the heating plate 3 above the stove plate 1, in the manner shown in Fig. 2, in such a way that its eaves rim 4 projects radially beyond the upwardly turned rim 5 of the heating hole which in this case has a smaller diameter than the cast plate 3. Owing to the large difference in height between the upper edge of the heating plate 3 and the surface of the stove plate 1 this arrangement implies the danger that a cooking pot of a larger diameter moved out of the center of the heating plate will overturn, while with the usual small level difference (compare e. g. h_1 in Fig. 1) it would only tilt a bit, without turning over.

Referring now to my novel design as shown in Fig. 3, it will be seen that in this case a sheet metal ring 6 consisting of a corrosion-resistant and preferably non-rusting steel (e. g. V_2A steel) is cast in the outer rim of the heating plate 3 again consisting of cast iron, for bridging the air gap between the outer rim of the heating plate and the edge 5 of the heating hole 2. The outer rim 8 of the sheet metal ring 6 is downwardly bent, thus forming a vertical eaves rim with a very sharp eaves edge which prevents the cooking liquid from adhering and flowing off inwardly, i. e. towards the center of the heating plate.

Fig. 4 shows another modification of a cast-in sheet metal ring 6, having a substantially U-shaped cross section. The outer eaves rim 8 corresponds in shape to that as per Fig. 3, while the middle shank of the U is slightly downwardly inclined in an outward direction, i. e. away from the center of the heating plate. The sheet metal ring 6 according to Fig. 4 differs substantially

from that according to Fig. 3 by the fact that its inner rim is turned downwards to form a completely closed annular collar, with a rounded transition at 7a, this downwardly bent collar being embedded in the casting process in the outer rim of the cast-iron heating plate 3. The collar has about the same diameter as the outer rim of the useful surface of the heating plate 3 and is embedded at its lower edge at 9 and at its two sides, in cast iron walls embracing it from below U-fashion and all having about the same wall thickness which again corresponds to the wall thickness of the heating plate. By this embedding method every danger of corrosion is eliminated and the sheet metal ring is also more safely protected against cracks by heat expansion than in the embodiment as per Fig. 3. It should be noted that the heat expansion of the plate and of the sheet metal ring are in a proportion of about 2:3; hence also with a view to the continuously changing tensile and compressive stresses when heating and cooling the plate and the ring the collar-shaped inner rim 7a will stand substantially higher stresses than the flat form according to Fig. 3. Also the slight downward inclination of the middle or bridge portion of the sheet metal ring in an outward direction is advantageous in order to lead off the overflowing cooking liquids from the heating plate and the heating hole towards the outside. Instead of the U-shaped profile (Fig. 9) it would also be possible to choose a semicircular profile of the sheet metal ring which offers advantages in regard to the manufacture. In my novel form of the eaves ring 6, 8, 7a as per Fig. 4 the conventional eaves rim 4 of the cast iron heating plate extending downwardly to a very low point can be dispensed with or at least made substantially shorter.

Although my novel design of the eaves rim with cast-in sheet metal ring of non-rusting steel offers special advantages inasmuch as it eliminates the danger of corrosion for the rim of the cast iron plate, additional advantages will be secured in connection with stove plates whose heating holes have upwardly turned rims 5. Owing to the fact that the sheet metal rings 6, which are made with a suitable width, completely cover the annular gap 2 between the inner edge of the heating hole and the outer rim of the heating plate and even extend over the upwardly bent annular rim 5 of the stove hole, my novel sheet metal ring 6 safeguards the heating plate and the interior of the stove against the entering of overflowing food. This safety factor can be further increased by providing between the upwardly turned edge 5 of the cooking hole and the plane of the stove plate 1 a step 12 (Fig. 4) leading upwards to the edge of the heating hole and adapted to lead the flowing down cooking liquid away from the heating hole immediately in case of a brisk overflowing, so that no accumulation of liquid will take place in the vicinity of said edge.

It is also contemplated within the purview of this invention to have the lower edge of the outer rim 8 and so the whole heating plate 3 seat on the stove plate 1. In this case the outer rim may be provided with a packing rim 11 elastically seated on the stove plate, as per Fig. 5. This, however, in general is undesirable since the overflowing liquid owing to capillary effects tends to extend quickly under the whole rim underneath the broad seating surface 11. This effect frequently felt to be a disadvantage, however, can be avoided by providing the rim 8, of Fig. 4, whether seated on the stove plate or spaced therefrom, with sharp jags (Fig. 10) or teeth suitable for leading away the drops, or by bending the lower rim inwardly and outwardly in a wave or zig zag form, in the manner which is well known, e. g., from round cake forms, so that no illustration will be necessary in this respect.

Advantageously the sheet metal ring 6 is arranged in such a way in relation to the useful upper surface of the heating plate 3 that the level of the surface of the sheet metal ring lies deeper than the surface of the heating plate approximately by the thickness of the heating plate.

Figs. 6, 7, and 8 will exemplify the mounting of a heating plate as per Fig. 4 in a specially shaped stove plate, whose shape will best be seen from the two sectional views in Figs. 6 and 7. The surface 14 of the stove plate 1 is slightly inclined towards all sides from the upwardly bent edge 5 of the stove hole to an elevated border which in Fig. 7 is relatively narrow, as indicated at 15, but in Fig. 6 is somewhat broader, as shown at 16. At the lowest points 17 of the surface 14 in the immediate vicinity of the border 15, or 16, any overflowing cooking liquid will be collected and can be easily wiped away by the housewife or operator, while any overflow into the annular gap 2 between the rim 13 of the heating plate and the upwardly bent stove hole rim 5 is prevented. This is an important advantage of my novel combination of a specially designed heating plate with a specially designed stove plate.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In an electric heating plate structure for an opening in a stove plate having an upwardly turned rim therein, a cast iron heating plate and a sheet metal ring of a corrosion-resistant material whose inner border is bent downwards from its radially projecting portion so as to form a completely closed annular collar which has substantially the same diameter as the outer edge of the upper surface of the heating plate and is cast in the outer rim of said heating plate, said ring comprising a peripheral eaves edge projecting over the upwardly turned rim of the stove plate, the bending point between said collar and said radial portion being rounded off.

2. In an electric heating plate structure, a cast iron heating plate and a sheet metal ring of a corrosion-resistant material whose inner border is bent downwards from its radially projecting portion so as to form a completely closed annular collar which is cast in the outer rim of said heating plate so as to be completely embedded at its lower edge and at its lateral faces by cast walls of said cast iron heating plate having substantially the same wall thickness on the lower, inner, and outer sides of said collar, said ring comprising a peripheral eaves edge.

3. In an electric heating plate structure, a cast iron heating plate and a sheet metal ring of a corrosion-resistant material whose inner border is bent downwards from its radially projecting portion so as to form a completely closed annular collar which is cast in the outer rim of said heating plate so as to be completely embedded at its lower edge and at its lateral faces by cast walls

of said cast iron heating plate having substantially the same wall thickness on the lower, inner, and outer sides of said collar, said ring comprising a peripheral eaves edge, the upper edge of said eaves ring being seated lower than the upper edge of the heating plate by an amount corresponding to the thinnest wall thickness of the recessed heating plate.

4. In an electric heating plate structure for an opening in a stove plate having an upwardly turned rim therein, a cast iron heating plate and a sheet metal ring of a corrosion-resistant material cast in the outer rim of said heating plate, said ring having an inner portion which is bent downwards from its radially projecting portion to form a completely closed annular collar, and having a slight downward slope towards its periphery which is formed with a downwardly turned collar including an eaves edge projecting over the upwardly turned rim of the stove plate.

5. In an electric heating plate structure, a cast iron heating plate and a sheet metal ring of a corrosion-resistant material whose inner border is bent downwards from its radially projecting portion so as to form a completely closed annular collar which is cast in the outer rim of said heating plate so as to be completely embedded at its lower edge and at its lateral faces by cast walls of said cast iron heating plate, said ring comprising a peripheral eaves edge.

KARL FISCHER.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,257,106	Parkhurst	Feb. 19, 1918
1,699,737	Hicks	Jan. 22, 1929
1,700,543	Pierson	Jan. 29, 1929
1,715,692	Backer	June 4, 1929
2,029,573	Knapp et al.	Feb. 4, 1936
2,176,382	Smith	Oct. 17, 1939

FOREIGN PATENTS

Number	Country	Date
62,663	Norway	July 8, 1940
241,189	Switzerland	June 17, 1946
252,708	Switzerland	Oct. 16, 1948
363,362	Italy	Oct. 3, 1938
446,410	Great Britain	Apr. 29, 1936
463,007	Great Britain	Mar. 19, 1937