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1,628,858

G. E. SHAWK

RESISTOR SUPPORTING MEANS

Filed April 21, 1924

Fig. 1.

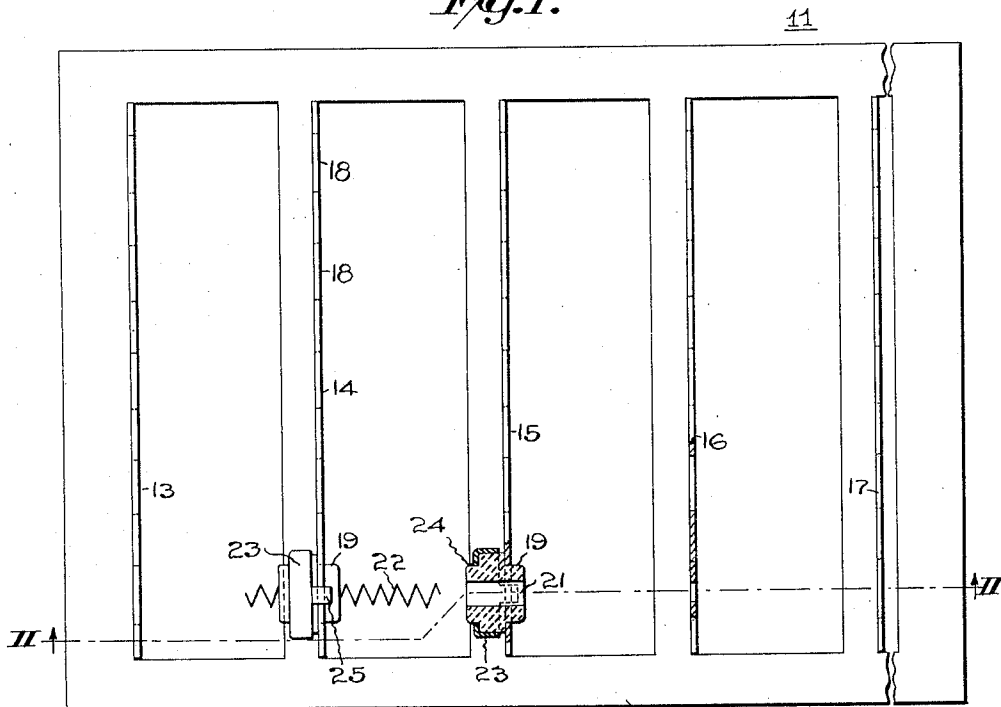


Fig. 2.

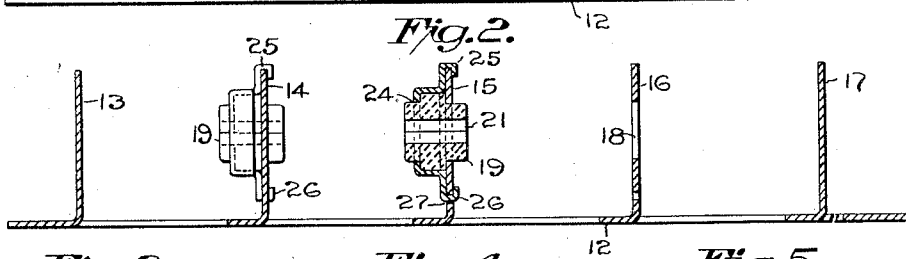


Fig. 3.

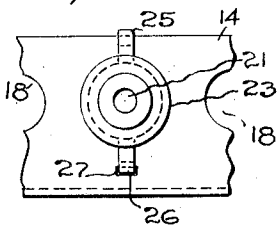


Fig. 4.

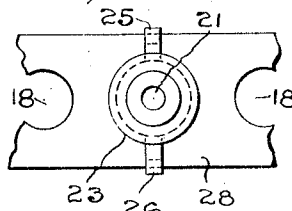
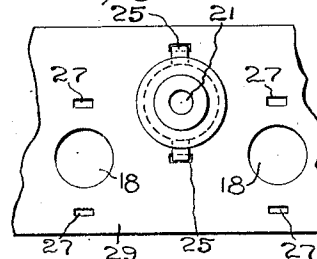


Fig. 5.



WITNESSES:

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RESISTOR-SUPPORTING MEANS.

Application filed April 21, 1924. Serial No. 707,861.

My invention relates to electric heating units and particularly to resistor-supporting means for such units.

The object of my invention is to provide a relatively simple, inexpensive, efficient and easily installed resistor-supporting means for an electric heating unit.

In practicing my invention, I provide a plurality of perforated thimbles of refractory electric-insulating material each having two end portions of reduced outer diameter. One of the end portions of each thimble fits into an opening in a metal support, and a member, of substantially cup-shape, holds the thimble in its proper operative position against the metal support and is itself held by suitable integral turned-over end lugs.

In the drawings,

Figure 1 is a top plan view of an electric heating unit embodying my invention, certain parts thereof being shown in section,

Fig. 2 is a view, in section therethrough, taken on the line II—II of Fig. 1,

Fig. 3 is a fragmentary view, in side elevation, of a part of the device shown in Fig. 1, and

Figs. 4 and 5 are fragmentary views, in side elevation, of modified forms of devices embodying my invention.

An electric heating unit 11 is illustrated in Figs. 1 and 2 of the drawings as comprising a sheet metal plate 12 that may be of any suitable or desired contour and dimensions and is shown as being substantially rectangular in shape. The plate 12 has a plurality of spaced punched-out flange portions numbered respectively 13, 14, 15, 16 and 17, that may extend either laterally or longitudinally of the plate 12 and may be of any height laterally of one surface of the plate 12. The flange portions hereinbefore enumerated may be very easily and quickly formed in or from the plate 12 by suitable punch-press work.

Each of the flange portions 13 to 17, inclusive, is provided with a plurality of spaced openings 18 therethrough. Any suitable or desired number, spacing and size of openings may be provided in the respective flange portions.

The openings 18 are preferably made substantially circular in shape and have located therein one end of a thimble 19 of refractory electric-insulating material. The

thimbles 19 severally comprise two reduced end portions and an intermediate portion of relatively larger external diameter, and have an opening 21 extending therethrough.

The length of the respective reduced end portions may be made any suitable or desired amount and is preferably made in accordance with the thickness of the metal flange portion with which it is to be operatively associated. This is to insure that the creeping distance from the perforation or opening 21 to the metal of the flange portion may be sufficiently large to prevent grounding of a resistor member 22, that extends through the opening 21.

The respective thimbles 19 are held in their proper operative positions relatively to the respective openings 18 by punched-out metal members 23, of substantially cup-shape. The internal diameter of the portion of cup-shape of the retaining members 23 is of such dimensions as to fit closely around the intermediate portion of the respective thimbles 19. An opening 24 is provided in the central part of the portion of cup-shape in order that the other end of the thimble, of reduced diameter, may extend therethrough and project therefrom, substantially as shown in Figs. 1 and 2 of the drawings. The members 23 are each provided with a pair of integral and relatively narrow lugs 25 and 26 that are adapted to extend through a suitable opening 27 (see Fig. 3) in the flange portion 14 or that are adapted to be bent around the edge of the flange portion, as is shown in Figs. 2 and 3 of the drawings.

As noted above, any suitable or desired number of openings 18 may be provided in the respective metal flange portions, and a corresponding number of thimbles and retaining members, of substantially cup-shape, may be operatively associated therewith in order that the resistor member 22, that is preferably of helically wound wire, may extend through the openings 21 in the thimbles and therebetween in any suitable or desired extension relatively to the entire surface of the plate 12 or of the heating unit itself. Any desired construction of terminal members (not shown) may be provided, as usually employed in the art.

In order to permit of easy and quick removal of a damaged thimble, I preferably

split the thimbles 19 as is shown more particularly in Fig. 2 of the drawings. When the thimbles are thus made up in two co-operating halves, a damaged thimble may be easily and quickly removed and be replaced by a new one in a very short time without the necessity of tearing down the entire heating unit.

In Figs. 4 and 5, I have illustrated the use of the retaining members, of substantially cup-shape, on relatively narrow and relatively wide flange portions. Fig. 4 illustrates a metal flange member 28 that is relatively narrow and is provided with a plurality of openings 18 therethrough. The member 28, of cup-shape, is provided with lugs 25 and 26, each of which may be bent around and over the respective edges of the strip 28. In Fig. 5, there is illustrated a metal plate 29, of greater width, provided with a plurality of openings 18 therethrough, each of which has located adjacent thereto, two alined openings 27, through which the respective lugs 25 and 26 may extend and have their outer ends bent over against the other surface of the plate or member 29.

The use of a perforated clamping member for holding a refractory thimble against a perforated metal supporting plate permits of the easy and quick installation of a resistor member in an electric heating unit. By making the perforated clamping member of substantially cup-shape at its central or intermediate portion, it is possible to surround a thimble having two reduced end portions and an intermediate portion of larger external diameter in such manner that it will be held in its proper operative position even though it is cracked or broken, thereby prolonging the life of the heating unit. While I have shown and described a sheet metal plate, it is obvious that a relatively thin cast plate may be employed, and that relatively short perforated members may be provided each having a single opening therethrough for receiving a refractory thimble.

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

I claim as my invention:

1. In an electrical heating unit, the combination with a member having an opening

therethrough, of a perforated refractory thimble having a reduced end portion located in said opening, and a clamping strap of substantially cup-shape having an opening therethrough for receiving a second reduced end portion of said thimble and having turned over lugs thereon.

2. In an electrical heating unit, the combination with a member having an opening therethrough, of a perforated thimble of refractory electric-insulating material having a reduced end portion located in said opening, and a clamping member, of substantially cup-shape, surrounding a portion of said thimble and having turned-over lugs for securing said clamping member against said first member.

3. In an electrical heating unit, the combination with a member having an opening therethrough, of a perforated refractory thimble having a reduced end portion located in said opening, and a clamping strap having an opening therethrough for receiving a second reduced end portion of said thimble and having turned-over lugs for securing said clamping strap against said first member.

4. In an electrical heating unit, the combination with a metal strip having an opening therethrough, of a perforated refractory thimble having a reduced end portion fitting into said opening, and a clamping member, of substantially cup-shape, secured to said metal strip for holding said thimble in proper operative position relatively thereto.

5. In an electrical heating unit, the combination with a metal plate having a plurality of punched-out, laterally-extending integral flange portions, each having a plurality of spaced openings therethrough, of a plurality of perforated thimbles, of refractory electric-insulating material, each having a reduced end portion extending through an opening in said flange portions, members, of substantially cup-shape, surrounding a portion of said thimbles and having turned-over lugs for clamping said thimbles against the respective flange portions, and a resistor member extending through and between said perforated thimbles.

In testimony whereof, I have hereunto subscribed my name this 10th day of Apr., 1924.

GUY E. SHAWK.