Feb. 9, 1932. G. E. PICKUP 1,844,678

ELECTRIC HEATING UNIT

Filed Dec. 17, 1928

Fig 1.

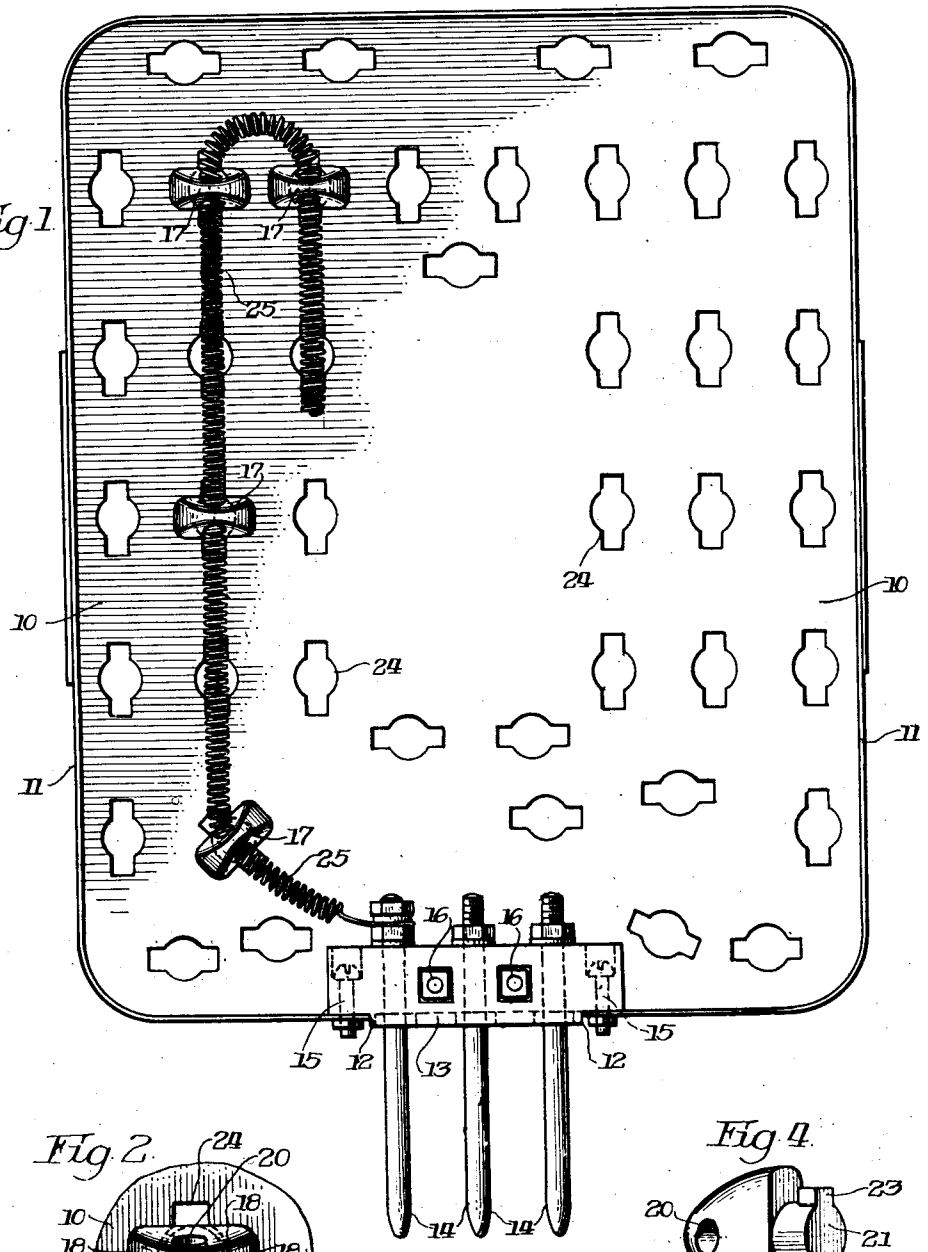


Fig 2.

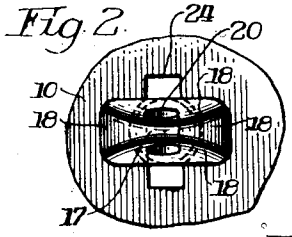


Fig 3.

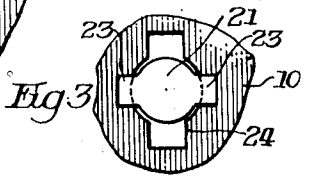
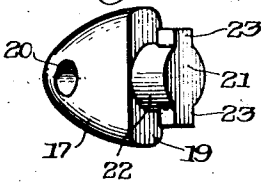


Fig 4.



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UNITED STATES PATENT OFFICE

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ELECTRIC HEATING UNIT

Application filed December 17, 1928. Serial No. 326,562.

The invention relates generally to electric heating units, and more particularly to heating units of the character employed in cook stoves and the like. It is a general object of this invention to provide a heating unit which shall be economical of manufacture, quickly and easily assembled and such that its several parts may be readily accessible for replacement or repair, without disturbing the heating unit assembly as a whole.

Another object is to provide a supporting means for the heating element of a character such that it will securely retain the element in place without the necessity of placing it under tension.

Another object of the invention is to provide a supporting means which will positively secure a heating element against bodily displacement without restraining its movement axially.

Another object is to provide a retainer for a heating element, adapted for quick and easy engagement or disengagement with a supporting base, and retained in engagement with its base through the normal tendency of the heating element to resist bending.

Another object of the invention is to provide a retainer capable of effectively supporting a heating element without the introduction of sharp bends or turning points thereby eliminating stressed sections and consequently contributing to the life of the element.

Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawings in which:

Fig. 1 is an elevational view of an electric heating unit embodying the preferred form of the invention.

Fig. 2 is an enlarged fragmentary view of a section of the base having an insulating support in engagement therewith.

Fig. 3 illustrates a preferred manner of effecting an interlocking engagement between an insulating support and the base.

Fig. 4 is a perspective view of a preferred form of insulating support.

While the invention is susceptible of various modifications and alternative constructions I have shown in the drawings and will herein describe in detail a preferred embodiment but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention.

As herein shown the invention is embodied in a heating unit comprising a base 10 preferably of sheet metal and having an upturned peripheral flange 11 to afford the necessary degree of rigidity to the base and likewise to provide a support for the circuit connections. The flange 11 is cut away at one side as at 12 to provide a seat for a terminal block of insulating material 13 in which are mounted the terminal connections 14. The terminal insulating block may be secured to the flange by means of bolts 15 and to the base plate proper by bolts 16. The heating unit may be supported within the stove in any desirable manner (not shown) so as to effect a rigid relation between oven and heater.

The invention contemplates the use of a heating element of usual form such as a coiled wire of suitable character. For the purpose of supporting the heating element upon the base 10 a novel retainer is provided. In the present instance it is in the form of a block of insulating material such as porcelain and comprises a relatively thin pyramidal head 17 having converging side edges 18 and a flat base 19. The head is provided with a transverse bore 20 whose diameter is such as to permit free movement of the heating element therethrough.

The retainer is adapted for quick and easy engagement and disengagement with the base 10 through the medium of a projection 21 integral with and depending from the base of the supporting head 17. Said projection comprises a cylindrical portion or stem 22 having its axis coincident with the vertical axis of the head, and formed on the stem 22 are diametrically disposed radial lugs 23 spaced from the bottom of the base and formed on a diameter angularly disposed to the axis of the bore 20.

The anchoring projection 21 with its diametrically disposed lugs 23 is adapted to be projected into an aperture 24 in the base 10 of the heating unit, which aperture is of a contour similar to that of the projection. It will be obvious that rotation of the support or retainer about its vertical axis, after engagement with an aperture in the base, will cause the lugs 23 to project beyond the edge of the aperture, thus locking the support against bodily displacement with respect to the base. The base 10 is provided with a series of apertures disposed so as to define a path along which a heating element may be supported.

In practice a plurality of insulating retainers 17 are rove upon a heating element 25 after which its ends are secured to the terminals 14, and the element is fastened to the base by inserting the depending projections of the retainers in their respective apertures. It will be obvious that the plane of the bores 20 being perpendicular to the axis of the lugs 23 it becomes necessary, in engaging successive retainers with the base, to twist the element at approximately right angles to its normal path to effect engagement of the lugs with the apertures in the base. Upon being released the resiliency of the heating element 25 will rotate the support until the lugs are enabled to engage the underside of the base thus effectively preventing removal of a support without overcoming the normal tendency of the heating element to resist bending.

It will be seen that by the construction provided it is possible to effect quickly and easily engagement between the insulating support and the base. It is equally obvious that any particular section of the element may be removed to effect its repair without disturbance of the remaining supports upon the base, and consequently without removing the major portion of the element. Also, it will be observed that the supporting retainers are held in operative relation to the base by the heating element, but without placing the latter under tension, and the bores 20 in the retainers are of such size as to permit free axial movement of the element and therefore prevent the introduction of stresses which would normally result from its tendency to expand and contract with alternate heating and cooling.

The heating unit is of course adapted for use in various ways and in a variety of positions. If used between two spaces to be heated, the apertures in the base are of such character as to provide openings through which direct radiation may be secured from the coil to the opposite side of the base.

I claim as my invention:

1. In an electric heating unit, a base member, means on said base member defining a path along which a heating element may be supported, a plurality of insulating blocks adapted to be mounted on said base and having bores formed therein, means spaced from said blocks and in rigid non-rotative relation thereto formed to coact with said first means as the blocks are rotated to positions wherein said bores are substantially parallel to said path to interlockingly engage said blocks with said base, said blocks being freely movable between released and interlocked positions, a heating element threaded through the bores in said blocks and extending along said path, said heating element engaging the sides of said bores to hold said blocks against rotation and constituting the sole means acting to retain said first means in interlocked relation with said second means.

2. In an electric heating unit, the combination of a base, a resilient coiled resistance element extending along said base in spaced relation thereto, means supporting said element from said base at points spaced longitudinally of said element, said base having an irregular opening therein adjacent to said element and between said points, said element normally extending across said opening in one direction, an insulating block having an aperture therein near one end thereof through which said element extends in snugly fitting relation to the walls of the aperture, and a lateral projection in a fixed non-rotative position on the other end of said block adapted to register with and to be projected through said opening by endwise movement of the block when the axis of said aperture is angularly displaced from said direction, said block and said projection being adapted to be rotated to interlockingly engage said projection with said base when said axis is parallel to said direction, and said element acting yieldingly and as the sole means to maintain said projection in interlocked relation to said base.

3. An electric heating unit comprising a base having a plurality of spaced irregular apertures therein, a plurality of insulating supports, one mounted in each of said apertures, each of said supports having a lateral projection in fixed relation thereon arranged to be interlocked with said base by rotation of said support, and each of said supports also having an opening therethrough spaced from said base, and a resilient heating element extending through said openings so as to be carried by said supports in spaced relation to said base and acting against the sides of said openings to hold said supports against rotation whereby said element constitutes the sole means acting to maintain the projections on said supports in interlocked relation with said base.

4. An electric heating unit comprising, in combination, a base, a plurality of insulating supports each having a bore formed therein, means in fixed non-rotative position on said base and cooperating means in fixed non-

rotative position on each of said supports operable by rotation of said support about an axis perpendicular to said bore to interlock said support with said base, an electrical resistance element reeved through said bores, the relative diameters of the bores and said element being such as to permit axial and rotational movement of the element with respect to the axis of the bore, and said element engaging the sides of said bores to prevent rotation of said supports whereby said element constitutes the sole means acting to maintain said two means in interlocked relation.

In testimony whereof, I have hereunto affixed my signature.

GEORGE E. PICKUP.