

Nov. 20, 1923

1,474,384

T. C. RUSSELL
ELECTRIC HEATING UNIT
Filed June 17, 1922

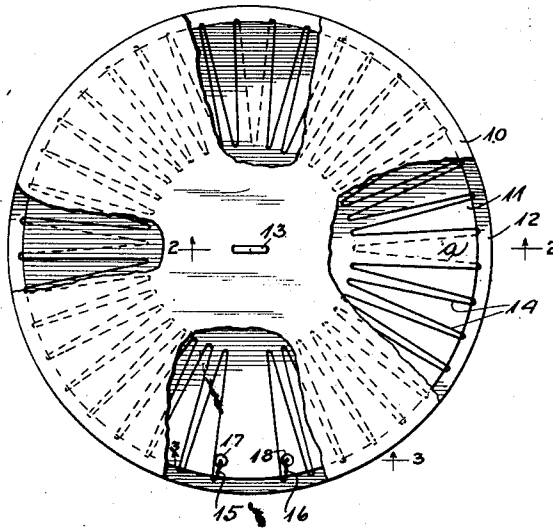


Fig. 1.

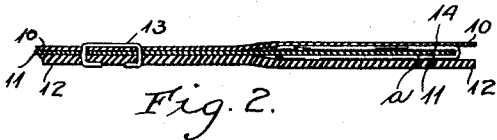


Fig. 2.

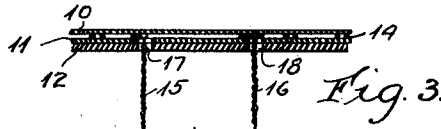


Fig. 3.

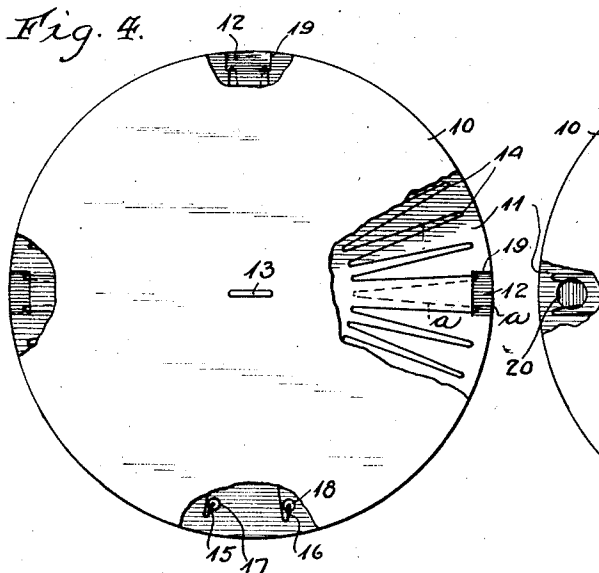


Fig. 4.

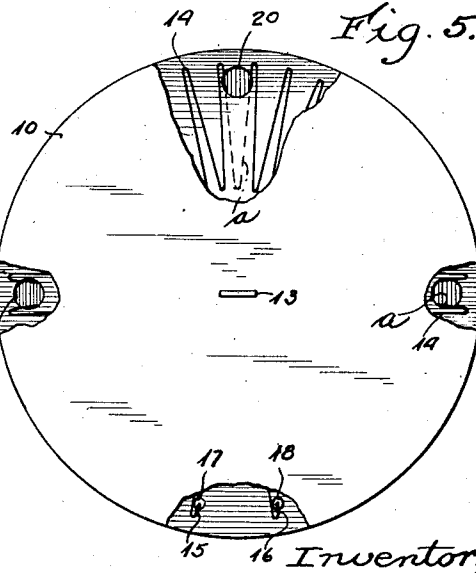


Fig. 5.

Inventor,
Thomas C. Russell,
By Charles J. Schmidt
Atty.

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UNITED STATES PATENT OFFICE.

THOMAS C. RUSSELL, OF CHICAGO, ILLINOIS.

ELECTRIC HEATING UNIT.

Application filed June 17, 1922. Serial No. 569,091.

To all whom it may concern:

Be it known that I, THOMAS C. RUSSELL, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electric Heating Units, of which the following is a specification.

My invention relates to electric heating units especially adapted for use in connection with devices such as percolators, flat irons, waffle irons, etc., and the main object is to provide for simple and quick and inexpensive assembly of the parts which constitute the unit. In my improved units I use resistance members formed by bending resistance wire back and forth in zigzag fashion to form adjacent loops or convolutions, and the important object of the invention is to provide simplified means for holding such resistance member flatly against its supporting base which is usually in the form of a sheet of mica.

Many ways have been devised for holding resistance members flatly against their supporting bases but such means are time consuming and laborious and require more or less skilled labor. My invention eliminates this and enables assembly by unskilled workmen. In accordance with my invention I secure the resistance member at intervals by hooking one of the loops or convolutions around an edge of the supporting base which is preferably of a thin sheet of mica. The invention involves several modifications of such application of the resistance element all of which are described in the following specification and shown on the accompanying drawing. On the drawing—

Fig. 1 is a plan view of a unit with parts broken away to more clearly show the arrangement.

Fig. 2 is an enlarged sectional view on plane 2—2, Fig. 1,

Fig. 3 is an enlarged sectional view on plane 3—3, Fig. 1,

Fig. 4 is a plan view with parts broken away showing a modified arrangement, and

Fig. 5 is a plan view with parts broken away showing another modified arrangement.

The heating units shown are circular, such shape being used with percolators and other cylindrical or circular vessels and devices.

The unit comprises a top disk 10 preferably of mica, an intermediate disk 11 also pref-

erably of mica, and a bottom disk 12 which is preferably of some insulating and heat resisting material such as asbestos. The three disks are secured together by any suitable means as for example a rivet 13. The resistance member is in the form of a resistance wire bent back and forth in zigzag fashion to form narrow adjacent loops or convolutions 14. Such resistance element is readily and accurately formed by machines described in Johnson Patent No. 1,345,445 dated July 6, 1920. In Fig. 1 a simple arrangement is shown for holding the resistance member in place. The intermediate disk 11 is of less diameter than the upper and lower disks and the resistance member is arranged on top of the disk parallel with the circumference, and in order to hold it flatly against the disk some of the loops or convolutions are hooked around the edge of the disk to lie against the bottom of the disk and between it and the lower disk 12 as clearly indicated at *a*. The resistance member can be hooked into place at as many points as desired, three or four being however sufficient to hold it in place. As the loops are narrow and the bends of short radius, the bends will receive and clamp the edge of the supporting disk and securely anchor the intermediate convolutions against displacement so that the full resistance of the wire is always available and short circuiting of convolutions is prevented.

The terminals 15 and 16 of the resistance member are preferably formed by twisting the sides of one or more loops together to give strength and these terminals are projected outwardly through holes 17 and 18 in the intermediate and lower disks as shown in Fig. 3. After the resistance member has been arranged and anchored on the intermediate disk and its terminals extended through the holes 17 and 18 the rivet 13 or other means is applied to secure the disks together, the resistance member being then clamped between the disks. The unit is applied to the device to be heated by clamping it with its top against the heating surface of the device, this bringing the resistance member flatly against the heating surface with the intervention only of the thin upper mica disk 10 of the unit, and the device can be very rapidly and efficiently heated.

In the modified arrangement of Fig. 4 notches 19 are provided at intervals at the

edge of the intermediate disk 11 and at each of these notches the adjacent loop or convolution α of the resistance member is hooked around the disk, these notches assisting in preventing displacement of the heating member circumferentially.

In the modified arrangement shown in Fig. 5 holes 20 are provided at intervals in the intermediate disk to which the adjacent convolutions or loops of the resistance member are inserted to engage against the bottom of the disk. The terminals 15 and 16 in the arrangement of Figs. 4 and 5 are inserted through holes 17 and 18 in the same manner as with the arrangement shown in Fig. 1.

I thus produce a simple, inexpensive yet highly efficient heating unit which does not require especially skilled labor for its assembly. The resistance member of the unit is preformed, the resistance wire after being bent forming a ribbon which is rolled up on reels, and when a unit is to be assembled a length of the ribbon having the required resistance is cut from the reel and applied on its mica supporting disk, and then after hooking loops or convolutions at intervals around edges of the disk and projecting the terminals through the holes provided therefore the heating member is in proper arrangement. The shape of the unit will of course conform to the device with which it is to be used.

Having described my invention, I claim as follows:

1. In an electric heating unit of the class described, the combination of a supporting base of thin insulating material, a resistance

ribbon in the form of a resistance wire bent back and forth in zigzag fashion in the form of adjacent loops, said loops being similar and all of the same length, the ribbon being applied flatly against said base with the majority of the loops on one side thereof, the other loops at various points hooking around the edge of the base to lie against the opposite face thereof to thus secure the ribbon in place.

2. In an electric heating unit of the class described, the combination of a thin supporting base, and a resistance ribbon composed of wire bent back and forth regularly in zigzag fashion to form loops of similar size and lengths, said ribbon being applied against one side of said base with the loops at right angles with the edge thereof, some of said loops at intervals hooking around the edge to lie against the opposite face of the base to thereby clamp the ribbon in place.

3. In an electric heating unit of the class described, the combination of a supporting sheet of insulating material, a resistance element in the form of a resistance wire bent regularly back and forth into narrow similar adjacent loops, said elements engaging flatly against said sheet parallel with said edge and with the loops at right angles with the edge, openings through said sheet, the loops adjacent said openings being extended therethrough to the rear side of said sheet to thereby anchor the resistance element to the sheet.

In witness whereof, I hereunto subscribe my name this 14th day of June A. D., 1922.

THOMAS C. RUSSELL.