July 22, 1958 F. L. LEFEBVRE 2,844,694

RADIANT HEATER AND REPLACEABLE ELEMENT THEREFOR

Filed Jan. 25, 1954

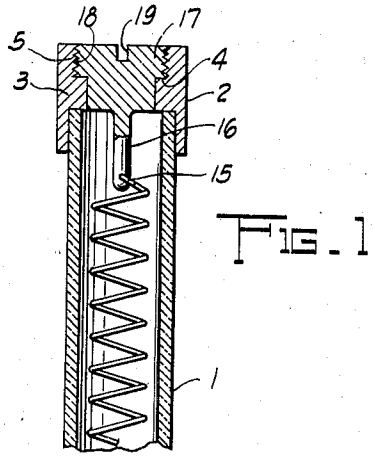
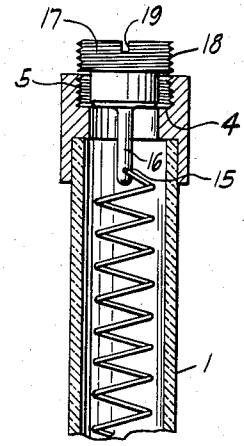


Fig. 1



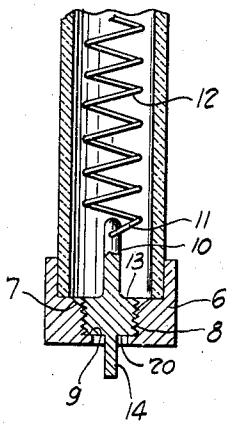
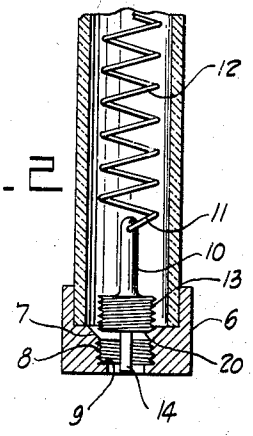


Fig. 2



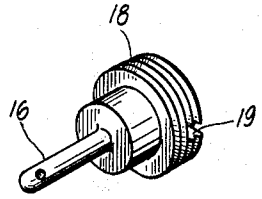


Fig. 3

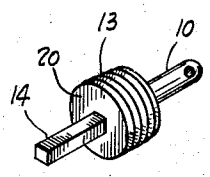


Fig. 4

INVENTOR.
FREDRICK L. LEFEBVRE
BY Robb & Robb
attorneys

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RADIANT HEATER AND REPLACEABLE ELEMENT THEREFOR

Fredrick L. Lefebvre, Twinsburg, Ohio

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3 Claims. (Cl. 201—67)

This invention relates to electric radiant heaters, and more particularly to tubular heaters of this class including those of the far-infra-red type.

More specifically this invention contemplates an improvement in tubular heaters which may be provided by construction of heaters having the heating element thereof as a replaceable part, obviating the necessity of replacing other parts which are not susceptible of wear or deterioration.

Heretofore heaters of the type of the present invention have been furnished as sealed and thus one piece units so to speak, and whether or not either the sheath or elements therein cease to function, it has been necessary to replace the entire unit. The present invention eliminates the foregoing and makes possible replacement of either as conditions may require.

It is therefore a principal object of this invention to provide a radiant heater comprised of replaceable parts which may be assembled as a substantially sealed unit.

A further object of the invention is to provide a radiant heater which may be comprised of a fused quartz sheath for example, within which may be enclosed a nickel-alloy element, said element and sheath being readily assembled and disassembled.

A still further object of the invention is to provide novel means for mounting an element within a sheath, which may be of any preferred material, so as to effect sealing of the sheath and proper electrical contact for operation of the unit.

Other and further objects of the invention will be understood from a consideration of the specification appended hereto and shown in the drawing wherein:

Figure 1 is a cross-sectional view taken through a heater of the class to which this invention is directed, showing the arrangement of the sheath, the contacts, and the replaceable or removable element therein.

Figure 2 is a cross-sectional view similar to Figure 1, showing the heating element in position just after the same has been introduced into the sheath and before complete assembly thereof.

Figure 3 is a perspective view showing one of the contacts with which the heating element itself is connected.

Figure 4 is a similar perspective view showing the other of the contacts availed of in the heater of this invention.

Referring now to Figures 1, 3, and 4 in the drawings, the heating unit of this invention is shown as comprising a sheath **1**, which is preferably of a tubular nature and may be provided in the form of a fused quartz tube of any preferred length, the diameter likewise being of any suitable size for the purpose.

At the upper end of the sheath **1** as shown in Figure 1, the same is provided with a substantially cylindrical contact part **2**, which is mounted at the open end of the tubular member **1** and sealed in place thereon. The contact member **2** is provided with an intermediate portion **3** which is formed with a shoulder **4** thereon, somewhat

more clearly shown in Figure 2, and above the shoulder **4** a threaded section **5** is formed.

At the opposite end of the tubular sheath **1**, a further contact member designated **6** is mounted, being of substantially similar form to the member **3** previously mentioned and being seated in sealing engagement with the end of the tubular member **1**. This particular contact member **6** however is furnished at its inner portion with a tapered section or part **7**, which in turn leads to a threaded part **8**. Below the threaded part **8** is a shoulder **9**, of suitable form and somewhat reduced in size as respects the threaded portion **8**. It should be noted that the threaded portion **8** is intended to receive therein a contact element **10** which supports the end **11** of a nickel-alloy or similar heating element **12**. The heating element **12** may be formed of a coil as shown and suitably affixed to the contact member **10**. The contact member **10** is formed with a threaded portion **13** adapted to be received in the threaded section **8**, and further preferably provided with a tang **14**, the tang **14** being adapted to enter in the opening below the shoulder **9** as shown in Figure 2.

The other end of the heating element **12** is suitably fastened as at **15**, to another contact member **16**, which contact member **16** is in turn provided with a threaded part **17** thereon, the threads **18** of the threaded part being adapted to enter and operate in the threads **5** as will be understood.

It should be noted that the diameter of the coiled heating element **12**, is calculated so that it will permit entrance of the coiled part **12** into the cylindrical section **3** of the contact member **2**. Correspondingly the diameter of the threads on the contact member **10** are likewise of similar diameter and susceptible of being entered through the part **3** for assembly of the unit.

In considering Figure 2 the manner of assembly of the unit will be understood when it is noticed that the contacts **16** and **10** are suitably fastened to the corresponding ends of the coiled heating element **12**, and thereafter the member **10** is dropped through the section **3** in the contact member **2** and permitted to pass downwardly through the interior of the tubular sheath **1**, to a position where the tang **14** extends outwardly from the threaded section **8**, the taper **7** assisting in the centering and locating of the member **10**. Thereafter the threaded part **17** will be entered into the threaded section **5** of the contact member **2**, subsequent manipulation by a screw driver or the like in the slot **19** of the member **17** causing the same to assume a position as shown in Figure 1 with the shoulder **4** being engaged by the co-mating or corresponding shoulder formed on the contact member **17**. Similarly by a suitable tool, the tang **14** may be manipulated so as to cause the threaded portion **13** to move into the threads **8** and a shoulder **20** on the portion **13**, be brought into engagement with the shoulder **9** of the contact member **6**.

Thus the unit is assembled with the heating element in place therein, the provision of the member **12** in the form of a coil or spring obviously assisting in the assembly as noted.

Correspondingly dis-assembly of the respective parts may be resorted to by suitable manipulation of the respective parts **13** and **17**, in order to effect replacement of the element **12** or in the event of breakage of the tube **1**, removal of the element **12** and insertion of the same in a new tube or sheath.

In view of the foregoing it will be understood that there has thus been provided a novel composite heating unit of the radiant type which is assembled of replaceable parts.

I claim:

1. In a heating unit of the class described, in com-

bination, a hollow sheath, a first contact member at one end of the sheath, a second contact member at the other end thereof, a heating element in said sheath having a first contact part removably engaged with said second contact member, and a second contact part of said element removably seated in said first contact member, said element comprising a coil member connecting said first and second parts, said first contact part and said coil being formed to enter said sheath through said first contact member.

2. In a heating unit of the class described, in combination, a hollow sheath, a first contact member at one end of the sheath, a second contact member at the other end thereof, a heating element in said sheath having a first contact part removably engaged with said second contact member, and a second contact part removably seated in said first contact member, said element comprising a coil member connecting said first and second parts, said first contact part and said coil being formed to enter said sheath through said first contact member, said first contact part being threadedly engaged with said second contact member, said second contact part being formed with substantially larger threads for engagement with mating threads of said first contact member, and shoulder means for limiting the movement of said parts

and members for maintaining said coil member in place.

3. In a heating unit of the class described, in combination, a hollow sheath, a first contact member at one end of the sheath, a second contact member at the other end thereof, a heating element in said sheath having a first contact part removably engaged with said second contact member, and a second threaded contact part of said element removably seated in said first contact member, said element comprising a coil member connecting said first and second parts, said first contact part and said coil being formed to enter said sheath through said first contact member, the first contact member being provided with a threaded opening leading into the interior of the sheath to engage the thread of the second contact part, the threads of the first contact part and the coil member being of small diameter and thus capable of being entered through said opening without engaging the threads therein, and said coil member extends between said parts.

References Cited in the file of this patent

UNITED STATES PATENTS

1,963,328	Holinger	June 19, 1934
2,177,508	Abbott	Oct. 24, 1939