July 20, 1954 T. M. FOX 2,684,420

ELECTRIC HEATING ELEMENT ASSEMBLY

Filed Dec. 30, 1950

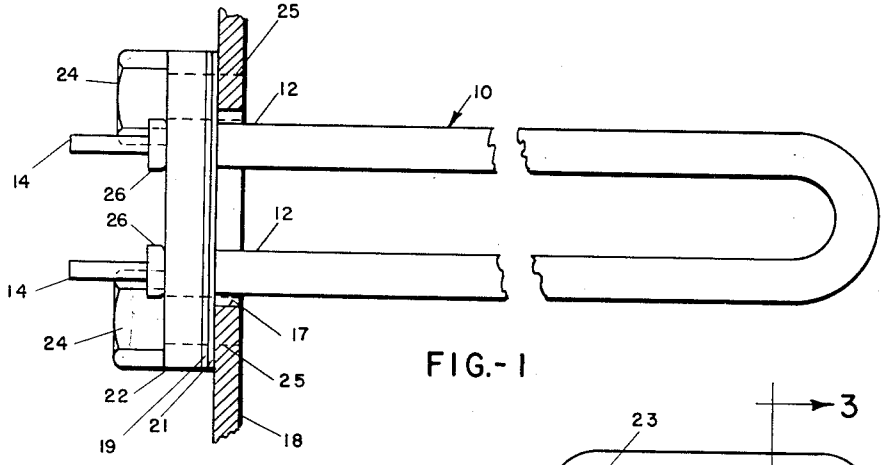


FIG.-1

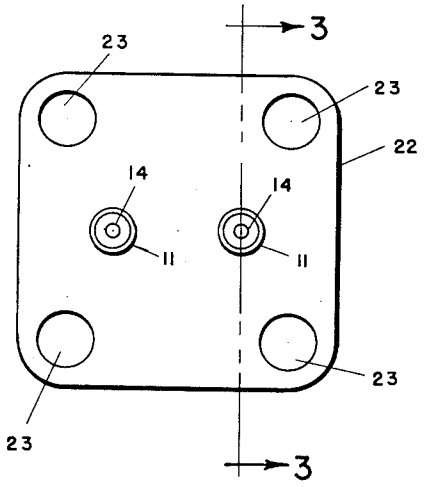


FIG.-2

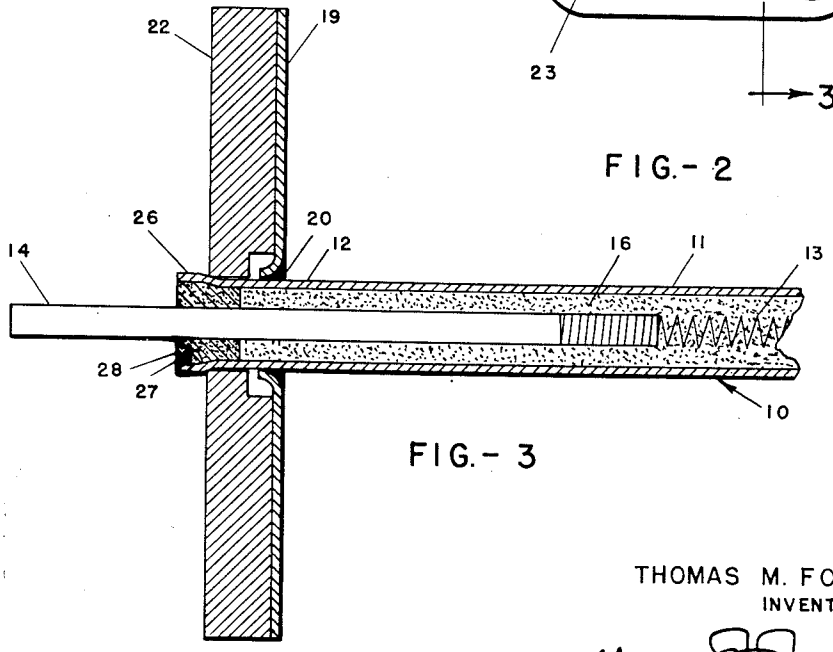


FIG.-3

THOMAS M. FOX
INVENTOR

BY

ATTORNEY

Patented July 20, 1954

2,684,420

UNITED STATES PATENT OFFICE

2,684,420

ELECTRIC HEATING ELEMENT ASSEMBLY

Thomas M. Fox, Pittsburgh, Pa., assignor to Edwin L. Wiegand Company, Pittsburgh, Pa., a corporation of Pennsylvania

Application December 30, 1950, Serial No. 203,678

2 Claims. (Cl. 201—63)

1

My invention relates to electric heating, and particularly to electric heaters for use in heating a fluid within a container or the like, and the principal object of my invention is to provide an improved heater of this type.

In the drawings accompanying this specification and forming a part of this application I have shown for purposes of illustration what I now consider to be the preferred embodiment of my invention, and in these drawings:

Figure 1 is a side elevation of the selected embodiment, indicating the application to a wall of a container or the like;

Figure 2 is an end view of the heater of Figure 1; and

Figure 3 is an enlarged partial section on the line 3—3 of Figure 2.

In the present disclosure I have illustrated my invention in connection with a tubular sheathed-resistor electric heating element 10 comprising an open end tubular sheath 11 formed to have its end portions 12 disposed adjacent each other and opening in approximately the same direction, a resistor 13 extending longitudinally of the sheath 11 between terminal pins 14 extending through the open ends of the sheath 11, and refractory material 16, such as granular magnesium oxide, embedding the resistor 13 and the inner portions of the terminal pins 14, electrically insulating the same, and serving to conduct the heat from the resistor 13 to the sheath 11.

As indicated in Figure 1, the element 10 is constructed and arranged to extend through an aperture 17 in a wall 18 of a tank or duct or other container or the like, so that its heated portion in general is disposed on one or the inner side of the tank wall 18 and the terminal pins 14 are accessible for electrical connection on the other or outer side of the tank wall 18.

According to the present disclosure the heater comprises a flange or gasket plate 19 preferably of a material suitable to resist attack by the fluid within the container or the like, traversed by the end portions 12 of the heating element 10, fuse-connected to the sheath 11 fluid tight, as by silver soldering as indicated at 20, of a size to overlie the aperture 17 in the wall 18 and the annular portion of the wall 18 margining the aperture 17, and adapted to be closed to the wall 18 preferably with the interposition of a suitable gasket 21.

The illustrated heater further comprises means to hold the heater to the wall 18, comprising a backing or mounting member 22 positioned over the gasket plate flange 19, and in the present instance, provided with four holes 23 for the passage of bolts 24 received in suitably threaded apertures 25 in the wall 18.

2

With the foregoing it is important to provide means to hold the backing member 22 assembled with the remainder of the heating element 10 prior to such time as the latter is applied to the container or the like, and previously it has been proposed to accomplish this result by welding the backing member 22 to the sheath 11.

However, according to my invention this result is accomplished by expanding the sections of the sheath 11 adjacently beyond the member 22, as indicated at 26, so that these sections of the sheath 11 are extended over the member 22, preferably in tight engagement with the member 22, and thereby not only hold the member 22 assembled with the remainder of the heating element 10 prior to application of the assembly to a tank or container wall, but after the device has so been applied, effectively support the remainder of the heating element from the member 22.

Conveniently this expansion may be accomplished either by spinning the sections 26 into expanded condition or by means of a die applied to effect the result, in either event stopping or routing out the refractory material 16 short of the ends of the sheath 11, leaving recesses 27 for the entrance of the spinning tool or die, preferably subsequently filled by a material of a sealing nature, as indicated at 28.

Although I have described one particular embodiment, it will be apparent that various changes may be made, and other embodiments constructed, suitable to accomplish part or all of the advantages, and therefore it is to be understood that the present disclosure is illustrative only, and that my invention is not to be regarded as limited thereto, but as of the scope defined by the appended claims.

Wherefore I claim:

1. An electric heating element assembly for application to a container for heating the contents thereof, comprising a heating element having a metallic sheath including an outer terminal portion for extending through an opening in a wall of said container, a metallic gasket plate having an aperture for receiving therethrough said terminal sheath portion, means for securing said sheath portion to said gasket plate in fluid tight relation with respect to said plate aperture, a rigid backing plate in juxtaposed relation to said gasket plate and having an aperture aligned with said gasket plate aper-

ture for receiving therethrough said terminal sheath portion of said heating element, and means for frictionally securing said terminal sheath portion to said backing plate in tightly wedged relationship peripherally of said backing plate aperture to constitute therewith and with said gasket plate a rigid unitary assembly, whereby said heating element sheath may be projected inwardly through said container wall opening and secured therein in fluid tight relation to said wall by means of securing elements extending through the exteriorly disposed backing and gasket plates and into said container wall in spaced relation to said wall opening.

2. An electric heating element assembly for application to a container for heating the contents thereof, comprising a heating element having a metallic sheath including an outer terminal portion for extending through an opening in a wall of said container, an electric current resistor within said sheath and a refractory material for electrically insulating said resistor from said sheath and for conducting heat from said resistor to said sheath, a metallic gasket plate having an aperture for receiving therethrough said terminal sheath portion, means for securing said sheath portion to said gasket plate in fluid tight relation with respect to said plate

aperture, and a rigid backing plate in juxtaposed relation to said gasket plate and having an aperture aligned with said gasket plate aperture for receiving therethrough said terminal sheath portion of said heating element, the outer end of said terminal sheath portion being expanded over and wedged against the outer surface of said backing plate to constitute therewith and with said gasket plate a rigid unitary assembly, whereby said heating element sheath may be projected inwardly through said container wall opening and secured therein in fluid tight relation to said wall by means of securing elements extending through the exteriorly disposed backing and gasket plates and into said container wall in spaced relation to said wall opening.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
2,274,445	Greer	Feb. 24, 1942
2,423,184	Greer	July 1, 1947
2,473,669	White	June 21, 1949

FOREIGN PATENTS

Number	Country	Date
546,150	Great Britain	June 30, 1942