

Dec. 25, 1951

O. J. ALVAREZ
ELECTRICAL CONNECTOR
Filed March 19, 1949

2,580,269

FIG. 1.

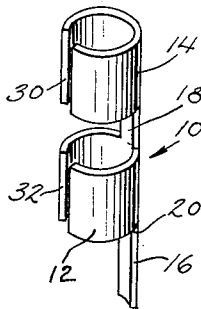


FIG. 2.

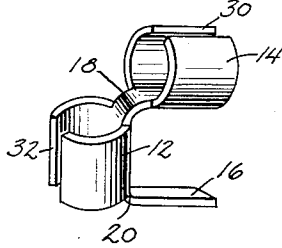


FIG. 3.

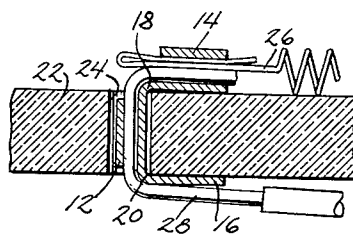


FIG. 4.

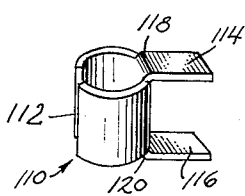


FIG. 5.

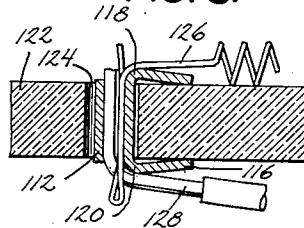


FIG. 8.

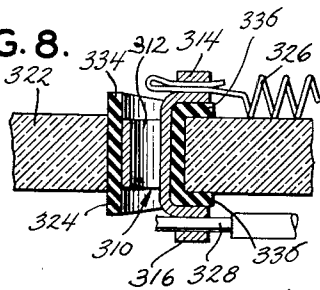


FIG. 6.

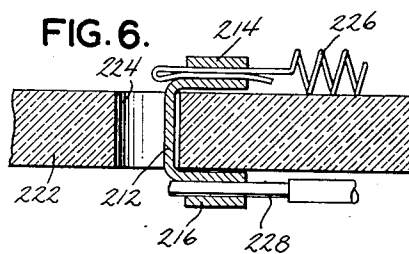
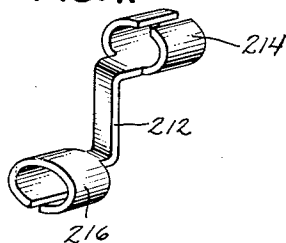


FIG. 7.



INVENTOR.
OCTAVIO JOSE ALVAREZ
BY

Michael J. [Signature]

UNITED STATES PATENT OFFICE

2,580,269

ELECTRICAL CONNECTOR

Octavio Jose Alvarez, New York, N. Y., assignor,
by mesne assignments, of one-fourth to Maria
De Reitzes-Marienwert, New York, N. Y.

Application March 19, 1949, Serial No. 82,365

5 Claims. (Cl. 201-63)

1

My present invention relates to clamps for use in connecting the heating wire and the lead in electric heaters, and to hot plates using the same.

It is a requirement for safety reasons that in electric heaters, such as hot plates or the like, the joint of the heating wire and the electric lead be relieved from mechanical stress. Heretofore, this was accomplished by providing a screw bolt extending through a hole in the supporting body and compressing the heating wire on one side, for instance, between the head of the bolt and a washer, and the electrical lead on the other side of the supporting body where it was held in position between washers by the nut tightening the bolt to secure the electrical contact. But an additional mechanical strain relief is required which may be provided by a knob or clamp so that a mechanical strain on a flexible cord will not be transmitted to terminals, splices, or interior wiring.

It is an object of my present invention to provide a clamp which is less expensive and comprises fewer parts than the known screw bolt system by incorporating the splicing, positioning and stress relieving clamp in one single unit.

It is another object of my present invention to prevent the cracking of the supporting body, such as ceramic heating plates.

Still another object of my present invention is to prevent faulty contacts between the heating wire and the electrical lead.

Also, it is an object of my invention to create a high compression desirable for the contact members, which is independent from the low compression desirable for the contact unit relative to the supporting body of ceramic.

Finally, still another object of my invention is the design of a clamp which allows clamping of the heating wire and the lead independently of each other, and one of them previous to the insertion of the clamp into the supporting body of the heater.

With the above objects in view, my present invention mainly comprises a member consisting of current conductive material, and including two end portions and a middle portion, at least one of said portions being substantially tubular and clamping at least one of the heating wire and the electric lead, the middle portion being adapted to be placed in the hole of the supporting body and the end portions being adapted to be bent in parallel directions substantially at right angles to the middle portion, so

2

as to hold the middle portion in position in the hole.

In accordance with a preferred embodiment of my present invention, I use a clamp, at least one of the portions of which is substantially flat, and at least another of the portions of which is substantially tubular.

In one embodiment of my invention, the middle portion is substantially tubular, and the end portions substantially flat, the middle portion being adapted to clamp together the heating wire and the electrical lead.

In another embodiment of my invention, the end portions are substantially tubular, and the middle portion flat, one of said end portions being adapted to clamp the heating wire, and the other of the end portions being adapted to clamp the lead.

According to still another embodiment of my invention, one of the end portions is substantially tubular, and the other one substantially flat while the middle portion is substantially flat, the tubular end portion being adapted to clamp together the heating wire and the lead.

A still further embodiment of my invention has one end portion and the middle portion substantially tubular, and the other end portion being substantially flat. The tubular end portion is adapted to clamp together the heating wire and the lead while the tubular middle portion serves as stress relieving part for holding the lead.

I have found it an advantage to connect the middle portion with the end portions by means of flat bridge portions which, eventually, are bent to right angle pieces which cover the edges of the supporting hole, at the same time preventing a sharp bend of the lead.

Preferably, the clamp according to my present invention is provided with a sleeve of insulating material surrounding the middle portion and placed together with the latter in the hole of the supporting body. This is particularly advantageous if the two end portions and the middle portion are shaped as tubular members, and the heating wire is clamped in one end portion and the lead in the other.

The novel features which I consider as characteristic for my invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its methods of operation, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is a perspective view of an embodiment of my invention;

Fig. 2 shows the same embodiment in perspective view after bending;

Fig. 3 shows the clamp according to Fig. 2 in position in the heater together with the heating wire and the lead, the clamp and the heater being shown in section;

Fig. 4 is a perspective view of another embodiment of my invention;

Fig. 5 is a sectional elevation of the clamp shown in Figure 4 in position together with the heating wire and the electrical lead;

Fig. 6 shows a sectional elevation of another embodiment of my invention together with the heating wire and the lead, the supporting body being shown in cross-section;

Fig. 7 is a perspective view of still another embodiment of the invention; and

Fig. 8 is a sectional view of still another embodiment of the present invention.

Referring now to the drawings, and first to Figures 1 to 3, I have shown a clamp generally denoted by 10, and consisting of current conductive material. It is provided with a middle portion 12, and two end portions 14 and 16. The middle portion in this embodiment is substantially tubular in shape.

The end portion 14 is also substantially tubular whereas the end portion 16 is substantially flat. Between the middle portion 12, and the end portions 14 and 16, two bridge portions 18 and 20 are provided.

Figure 1 shows the clamp before bending, and Figure 2 after bending.

It is to be understood that the clamp has to be brought into position before bending both end portions, although one end portion may be bent in advance.

Figure 3 shows a clamp according to Figure 2 in position in a heater of which part of the supporting body 22 is shown. The supporting body 22 is provided with a hole 24 which receives the middle portion 12 of the clamp. The end portions 14 and 16 are bent substantially at right angles to the middle portion 12 in position in the hole 24 of the supporting body 22. The bridge portions 18 and 20 cover partly the edges of the hole 24.

The heating wire 26 and the electrical lead 28 are clamped together in the tubular end portion 14 which to this end is compressed by means of a suitable tool (not shown). The tubular members 12 and 14 are provided with slots 30 and 32, which facilitate their compression. The middle portion 12 accommodates the part of the lead 28 which is near the end, and is compressed so as to hold said lead and to relieve the joint between the heating wire 26 and the lead 28 from mechanical stress. The bridge portions 18 and 20 serve as bushing-like guides for the lead which thus is protected from the abrasive edge of the ceramic.

Referring now to Figures 4 and 5, the clamp 10 is shown to have a tubular middle portion 112 and flat end portions 114 and 116. As will be seen from Figure 5, the middle portion 112 clamps together the heating wire 126 and the electrical lead 128, while the end portions 114 and 116 serve as bushing-like guiding members for the heating wire 126 and the electrical lead 128, respectively.

The bridge portions 118 and 120 partly cover the edge of the hole 124 in which the middle portion 112 of the clamp 110 is placed.

In the embodiments described so far, the heating wire and the electrical lead are clamped together either in the end portions according to Figure 3, or in the middle portion according to Figure 5.

According to the following figures, the heating wire and the electrical lead are separately clamped to the end portions of the clamp.

In Figure 6, the end portions 214 and 216 are both tubular shaped, and the middle portion 212 is substantially flat shaped. Otherwise, the arrangement of the clamp is the same as that according to Figures 3 and 5. The tubular end portions 214 accommodate the end of the heating wire 226 and the tubular end portion 216 accommodates the end of the electrical lead 228. The end portions 214 and 216 are bent in the same direction substantially at right angles to the middle portion 212 so as to hold the latter securely in position in the hole 224 of the supporting body 222.

In Figure 7 is shown an embodiment substantially equal to that shown in Figure 6, except that the end portions 214 and 216 are bent in opposite directions, but parallel to each other.

In Figure 8 I have shown an embodiment in which the middle portion 312 and the end portions 314 and 316 are all shaped as tubes.

The end portions 314 and 316 accommodate the ends of the heating wire 326 and the electrical lead 328, respectively.

The middle portion 312 is surrounded by a sleeve 334 made of insulating material and insulating the clamp 310 from the supporting body 322. The sleeve 334 is inserted together with the middle portion 312 into the hole 324 of the body 322.

As will be seen from Figure 8, the rim portions of the sleeve 324 adjacent to the end portions 314 and 316 of the clamp 310 are bent outward as at 336.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of clamps, differing from the types described above.

While I have illustrated and described the invention as embodied in clamps for connecting the heating wire of an electric heater to an electrical lead, I do not intend to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of my invention.

Without further analysis, the foregoing will so fully reveal the gist of my invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention, and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What I claim as new, and desire to secure by Letters Patent, is:

1. A clamp for use in connecting the heating wire of an electrical heater having a supporting body to an electric lead, said clamp consisting of current conductive material and including in combination two end portions and a substantially tubular middle portion, said middle portion being adapted to be placed in a hole of the supporting

5

body and said end portions being adapted to be bent in parallel directions substantially at right angles to said middle portion so as to hold said middle portion in position in the hole; and clamping means on at least one of said end portions formed integral therewith and serving for clamping a wire to said clamp.

2. A clamp for use in connecting the heating wire of an electrical heater having a supporting body to an electric lead, said clamp consisting of current conductive material and including in combination two end portions and a substantially tubular middle portion, one of said end portions being substantially tubular and the other one of said end portions being substantially flat, said tubular mid-portion being adapted to hold the lead near the end, and said tubular end portion being adapted to clamp the heating wire and the lead together, said middle portion being adapted to be placed in a hole of the supporting body and said end portions being adapted to be bent in parallel directions substantially at right angles to said middle portion so as to hold said middle portion in position in the hole.

3. A clamp for use in connecting a heating wire of an electrical heater having a supporting body to an electric lead, said clamp consisting of current conductive material and including in combination two integral end portions, a substantially tubular middle portion and substantially flat bridge portions connecting, respectively, said middle portion to said end portions, one of said end portions being substantially flat and the other of said end portions being substantially tubular, said middle portion being adapted to hold the lead near its end and said tubular end portion being adapted to clamp the heating wire and the lead together, said middle portion being adapted to be placed in a hole of the supporting body and said end portions being adapted to be bent in parallel directions substantially at right angles to said middle portion so as to hold said middle portion in position in the hole, said bridge portions being adapted to be bent into right angle pieces adapted to cover, respectively, the edges of the hole.

6

4. A clamp for use in connecting a heating wire of an electrical heater having a supporting body to an electric lead, said clamp consisting of current conductive material and including in combination two substantially tubular integral end portions, a substantially tubular middle portion and substantially flat bridge portions connecting, respectively, said middle portion to said end portions, one of said end portions being adapted to clamp the heating wire and the other one of said end portions being adapted to clamp the lead, said middle portion being adapted to be placed in a hole of the supporting body and said end portions being adapted to be bent in parallel directions substantially at right angles to said middle portion so as to hold said middle portion in position in the hole, said bridge portions being adapted to be bent into right angle pieces adapted to cover, respectively, the edges of the hole.

5. A clamp as claimed in claim 4, comprising a tubular sleeve consisting of insulating material and surrounding said middle portion, said sleeve being adapted to be placed with said middle portion in a hole of the supporting body.

OCTAVIO JOSE ALVAREZ.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,404,979	Kruesheld	Jan. 31, 1922
1,672,915	Schwarzenhauer	June 12, 1928
1,678,118	Hovlid	July 24, 1928
2,023,517	Creager et al.	Dec. 10, 1935
2,475,448	Cusato	July 5, 1949
2,486,115	Chiuchiolo	Oct. 25, 1949

FOREIGN PATENTS

Number	Country	Date
14,427	Denmark	Jan. 16, 1910
496,868	Great Britain	Dec. 7, 1938