

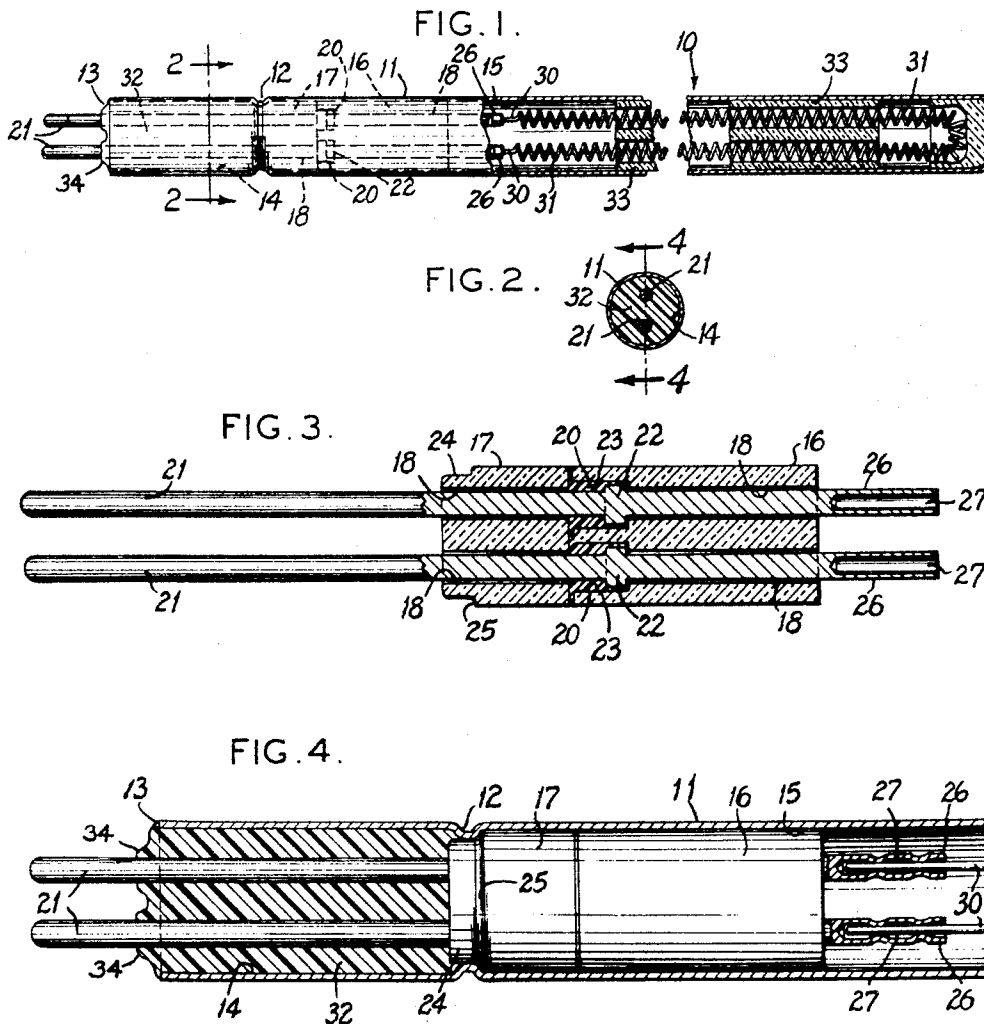
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E. G. HACHMEISTER ET AL

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TERMINAL STRUCTURE FOR ELECTRICAL HEATING UNIT

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INVENTORS,
ERNEST G. HACHMEISTER
MILTON EPSTEIN
BY *Terry and Cohn*
ATTORNEYS

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TERMINAL STRUCTURE FOR ELECTRICAL HEATING UNIT

Ernest G. Hachmeister, St. Louis, and Milton Epstein, University City, Mo., assignors to Industrial Engineering and Equipment Co., St. Louis, Mo., a corporation of Missouri

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2 Claims. (Cl. 339—136)

This invention relates to improvements in a terminal structure for a heating unit particularly adapted for defrosting refrigerators, cooling cabinets, refrigerated show cases and the like.

It is an important objective of the present invention to provide improved means in the terminal structure by which terminal prongs are securely retained in insulator elements arranged in a casing assembly, such improved means relieving the heating coil from all stress and strain to which the prongs may be subjected incident to connection and disconnection of a cooperating female plug.

Another important object is realized by the provision of a pair of coating insulator elements arranged in end to end relation through which the terminal prongs extend, and by the provision of recesses in one element located adjacent the other element, the recesses being adapted to receive shoulders formed on the prongs so that the shoulders cooperate with the insulator elements to retain the prongs.

Other important advantages are achieved by utilizing an adhesive material in the recesses and between the insulator elements, such material securing the elements together and cooperating with the previously described assembly to retain the terminal prongs in positive connection with the insulator elements.

Still another important object is afforded by the provision of an internal shoulder on the tubular casing arranged to engage an abutment on one of the insulator elements to secure the elements in the casing in spaced relation to one casing end. Other advantages are realized by placing an insulating material about the terminal prongs from the casing end to the insulator elements.

Yet another object is obtained by constructing one insulator element with a reduced end portion adapted to interfit closely the annular depressed casing shoulder and to extend slightly into the casing portion forwardly of such shoulder, and by placing an insulating material in the casing around the prongs and reduced element portion whereby to insulate the prongs from the casing and to retain the elements in assembly.

Other important objects are realized in the provision of a terminal structure that is simple and durable in construction, economical to manufacture, and which is readily assembled and connected to the heating unit to afford a water proof or moisture proof device.

The foregoing and numerous other objects and advantages of the invention will more clearly appear from the following detailed description of a preferred embodiment, particularly when considered in connection with the accompanying drawing, in which:

Fig. 1 is a fragmentary side elevational view of the heating unit shown partly in cross section;

Fig. 2 is a cross sectional view of the terminal structure as seen along line 2—2 of Fig. 1;

Fig. 3 is an enlarged cross sectional view of the internal portion of the terminal structure before assembly to the tubular casing, and

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Fig. 4 is an enlarged, fragmentary view, partly in cross section as seen along line 4—4 of Fig. 2.

Referring now by characters of reference to the drawing and first to Fig. 1, it is seen that the heating unit consists generally of an elongate tubular structure 10 that is usually placed in the cold area of a refrigerator or refrigerated show case, the heating unit being utilized to defrost the cold area selectively upon attachment of a female plug and the application of electric power to energize such unit.

The terminal structure for the heating unit includes a tubular casing 11 preferably constructed of brass, which may be an integral part of the tubular structure of the heating unit as is shown in Fig. 1, but may be constructed as a separate part attached to the tubular structure carrying the heating elements. The tubular casing 11 is provided with an annular depressed portion 12 that is spaced a distance from the forward end 13 of the casing, the depressed portion 12 affording an annular internal shoulder that divides the tubular casing 11 into a forward casing chamber 14 and a rearward casing chamber 15.

A pair of insulator elements 16 and 17 are arranged in end to end relation within tubular casing 11, the elements 16—17 having a diameter that closely approximates the internal diameter of casing 11. Formed in insulator elements 16—17 are a pair of aligned bores 18 that extend from one end to the other. Formed in each bore 18 of insulator element 16 at the end adjacent insulator element 17, is an enlarged recess 20 that is slightly larger than the bore diameter.

A terminal prong 21 is received in and extends through each bore 18. Each prong 21 is provided with an enlarged shoulder 22 that is received in the recess 20.

In assembling the component parts of the terminal structure, the prongs 21 are located in bores 18 of insulator element 16 and the shoulders 22 located in recesses 20. The shoulders 22 are particularly located along the length of prongs 21 so that they abut element 16 to determine the desired extension of prongs 21 behind insulator element 16. After the prongs 21 are disposed in element 16 as described, an adhesive material 23 is placed in recesses 20 on the end surface adjacent insulator element 17. Then the insulator element 17 is fitted over terminal prongs 21 and pressed against insulator element 16, the adhesive material 23 securing the elements 16—17 together and cooperating with such elements to retain shoulders 22 in recesses 20. With this construction as is shown in Fig. 3, the terminal prongs 21 and insulator elements 16—17 are retained as a unitary structure in which the prongs 21 are prevented from moving longitudinally in bores 18 upon application of any stress or strain applied to such prongs.

The insulator elements 16—17 are located in casing chamber 15 at the rear of depressed portion 12, as is more clearly shown in Fig. 4. Insulator element 17 is provided with a reduced forward end portion 24 that interfits the annular portion 12 and extends partially into forward casing chamber 14. In forming reduced end portion 24, a shoulder 25 is provided that engages depressed portion 12 to retain the elements 16—17 in the desired position.

The terminal prongs 21 extend forwardly of element 17, through casing chamber 14 and extend out of forward casing end 13 for selective connection with a female plug (not shown). The portions 26 of terminal prongs 21 extending rearwardly of insulator element 16 are provided with sockets 27 adapted to receive the terminal ends 30 (Fig. 4) of the heating coil generally referred to at 31 in Fig. 1.

With the insulator elements 16—17 arranged in the position shown in Fig. 4 with reduced end portion 24 interfitted into depressed casing portion 12, an insulating

material 32 such as molded plastic or rubber is disposed in the forward casing chamber 14 about terminal prongs 21 and reduced insulator element portion 24. In the preferred construction, the insulating material 32 electrically insulates prongs 21 from casing 11 and serves to retain prongs 21 and insulator elements 16—17 in position. The insulating material 32 includes raised portions 34 about prongs 21 which increases the distance from conductor to ground.

The ends 30 of heating coil 31 are placed in sockets 27 and are retained by crimping the terminal prong ends 26 as shown in Fig. 4. The heating coil 31 extends through a series of insulators 33 (Fig. 1) located in tubular structure 10, the insulators 33 operatively spacing the rows of heating coil 31 from each other and from the tubular casing 11.

It is apparent that the heating coil 31 is energized merely by attaching a female plug to the terminal prongs 21 extending outwardly of the casing end 13 and outwardly of insulating material 32, and by applying electric power.

Although the invention has been described by making detailed reference to a single preferred embodiment, such detail is to be understood in an instructive, rather than in any restrictive sense, many variants being possible within the scope of the claims hereunto appended.

We claim as our invention:

1. A terminal structure for a heating unit having a heating coil comprising a tubular casing including a forward casing end, the casing being provided with an annular depressed portion spaced from said casing end to provide a forward chamber and a rearward chamber, a pair of insulator elements arranged in end to end abutting relation in said rearward casing chamber, said insulator elements being provided with a plurality of aligned bores extending from end to end, a plurality of terminal prongs located in said bores, one of said insulator elements being provided with recesses in said bores adjacent the other element, said prongs being provided with enlarged shoulders received in said recesses, adhesive material in said recesses and between abutting surfaces of said insulator elements, said adhesive material retaining the elements together and fixing the shoulders in said recesses, one of said insulator elements having a reduced forward end portion arranged to interfit said depressed casing portion and to extend partially into said forward casing chamber, said depressed casing portion engaging the last

said insulator element to retain said element in said rearward casing portion, the prongs extending rearwardly of said elements for connection to the heating coil, the prongs having forward ends extending through said forward casing chamber and outwardly of said casing for selective connection to a female plug, and a molded insulating material disposed in and filling said forward casing chamber about said prongs and reduced forward end of the said one insulator element from the forward end of the casing to said insulator element.

2. A waterproof terminal structure for a heating unit having a heating coil comprising a tubular casing including a forward casing end, the casing being provided with an annular depressed portion spaced from said casing end to provide a forward chamber and a rearward chamber, insulating means located in said rearward casing chamber, a plurality of terminal prongs connected to and carried by said insulating means, said prongs having forward ends extending through said forward casing chamber and outwardly of said casing for selective connection to a female plug, the insulating means having a reduced portion that closely interfits the annular depressed casing portion and extends into the forward casing chamber, the said reduced portion being spaced from the casing defining the forward casing chamber, said depressed casing portion engaging the insulating means to retain said means in the said rearward casing chamber, and a molded insulating material disposed in and filling said forward casing chamber about said prongs and about that reduced portion of the insulating means located in the forward casing chamber from the forward end of the casing to said insulating means.

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