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ELECTRICAL TERMINAL

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FIG. 1

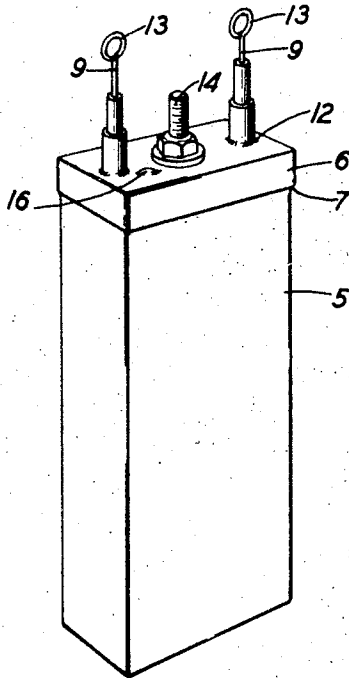


FIG. 2

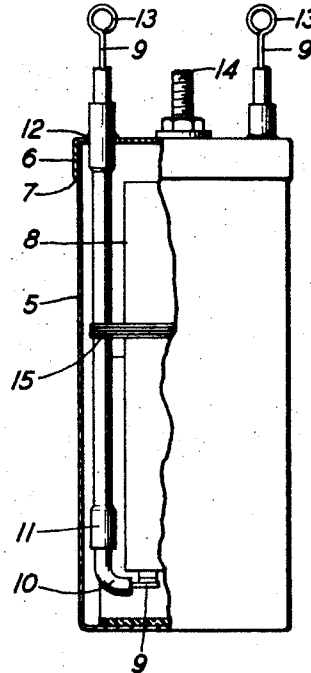
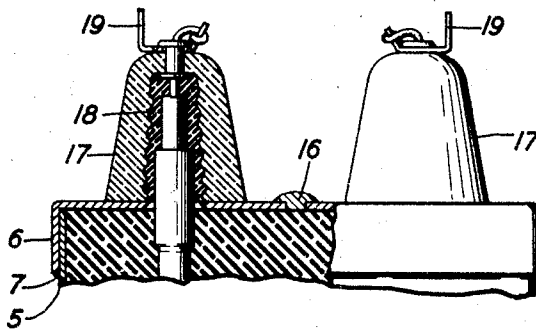


FIG. 3



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ELECTRICAL TERMINAL

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3 Claims. (Cl. 173—311)

This invention relates to electrical terminals and more particularly to the sealing of condensers in suitable containers.

In the manufacture of condensers, particularly those in which the condenser units are of the so-called paper-wound type, it is the customary practice to place the impregnated unit in a container wherein it is surrounded with a potting compound to prevent the entrance of moisture. A layer of sealing compound having a relatively high melting point is also usually placed over the potting compound to prevent escape or damage to the latter and the terminal leads of the condenser are brought up through and sealed by these compounds. While such a method of sealing is a satisfactory operation under normal conditions, it is not satisfactory for use with condensers which are subjected to high temperatures, as for example, condensers used in certain radio and sound picture fields. When the temperatures in service are of the order of the melting point of the impregnating compound, the latter tends to mix with the potting compound, resulting in a mixture, the resistivity of which is lower than that of either the impregnating compound or the potting compound, and thus lowering the insulating resistance of the condenser. This commingling of the impregnating and potting compounds also takes place to a certain extent during the pouring of the potting compound unless special precautions are taken. Also at lower temperatures there is a tendency for the potting compound to crack, thus permitting the entrance of moisture into the condenser and causing lowered resistivity.

It is, therefore, an object of the present invention to overcome the difficulties experienced in the potting of condenser units and to bring out the terminal leads from the container without permitting the entrance of moisture therein.

Another object of this invention is a condenser which will operate satisfactorily even when subjected to temperatures in excess of the melting point of the impregnating compound and irrespective of the position in which it is mounted.

These and other objects of the invention are attained by encasing the condenser units in an air-tight container and bringing out the terminal leads through metallic tubes which are soldered or otherwise sealed to the casing in such a manner as to insure a moisture and gas-tight joint. The terminal leads which are insulated with a high grade of vulcanized rubber or a similar insulating material possessing high elasticity and long life are positioned within the tubes and the

latter are reduced to a smaller diameter over a greater part of their length, thus causing compression of the elastic insulating material and as a result a joint which is moisture and gas-tight. Under certain conditions, as for example condensers not subjected to high temperature, the potting operation may be eliminated altogether, while in the case of condensers which are subjected to temperatures comparable to the melting point of the impregnating compound, the container after the unit is positioned is completely filled with the impregnating compound and then hermetically sealed. In the latter case there is no appreciable change in the electrical characteristics of the condenser even though the impregnating material is liquefied and furthermore the condenser may be mounted in any position without difficulty.

The invention may be more clearly understood by reference to the accompanying drawing in which,

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

Fig. 2 is a front elevation of the condenser of Fig. 1 with a portion of the container cut away to show the method of bringing out the terminal leads; and

Fig. 3 is a partial view showing a modified structure.

Referring more particularly to Figs. 1 and 2 there is disclosed an electrical condenser provided with a container consisting of a lower portion or can 5 and a cover 6, the two portions being joined together at 7 by soldering or similar means to insure an air-tight container. The condenser unit 8 is positioned within the container so that its terminals are adjacent the lower portion of the can, and terminal leads 9, 9 are connected to the terminals of the condenser unit. Each of the terminal leads is insulated with a covering 10 of soft rubber or similar elastic material, such for example as "Duprene" or rubber "Thiokol" and is then threaded through a tube 11, the inner diameter of which is substantially that of the outer diameter of the insulated wire. The middle portion of this tube is then decreased in diameter as by a drawing or a rolling operation so that in this portion the insulating medium is under compression between the terminal lead and the inner wall of the tube, thus insuring an air-tight seal. Each of the tubes 11 passes through a suitable perforation in the cover and is soldered thereto as at 12 to insure an air-tight seal at this point. The outer end of the terminal leads 9 is formed into an eyelet 13 to facilitate soldering

connecting leads thereto. A standard form of mounting lug 14 is provided to permit mounting the condenser unit on racks in the standard manner.

5 In assembling this condenser, terminal leads are threaded into metallic tubes of suitable dimensions, these tubes being preferably cut from copper tubing which has previously been coated with tin or solder in order to avoid any deteriorating effect of copper on the rubber. The tubes are then rolled down tightly over the rubber for the greater portion of their length to provide the necessary compression to insure an air-tight seal but leaving at each end a portion approximately one half inch long which is maintained at its original diameter in order to prevent excessive bulging of the rubber. The leads are next soldered to the condenser terminals and the tubes are held in position by a wrapping 15 of thread which binds the tube to the condenser unit. The tubes are then threaded through perforations in the cover and are soldered thereto to insure an air-tight seal. The unit is then placed in position within the container and the cover is soldered or brazed to the can 5. Instead of using a separate tube for each terminal lead it may be desirable under certain conditions to place two or more insulated leads in the same tube which is then drawn down to provide the necessary compression to insure a tight seal.

30 In case that the condensers are not to be used under service conditions where the temperature exceeds the melting point of the compound used to impregnate the condenser units, no potting operation will be necessary. However, at temperatures exceeding the melting point of the impregnating compound the container is filled with a potting compound which is the same as the compound used for impregnation. This compound is poured into the container through perforation 16 in the cover which is sealed by solder after the compound has been poured.

40 In the modification shown in Fig. 3 the tube 12 is soldered to the cover 6 as previously described and the hollow bushing 17 of glass or ceramic material is then placed over the terminal

and secured thereto by means of an adhesive 18, such as asphaltic cement. The terminal wire extends to the top of the bushing and is connected to a suitable soldering terminal 19. This construction is used for condensers which are to be subjected to high potentials in order to minimize the danger of surface leakage.

What is claimed is:

1. A terminal member comprising a metallic tube and a terminal lead insulated with an elastic medium extending therethrough, said tube extending over substantially the entire length of said insulated lead, the inner diameter of said tube at its ends being substantially the outer diameter of the insulated terminal lead and the inner diameter of the middle portion of said tube being less than the outer diameter of the insulated terminal lead whereby the elastic insulation is compressed over the greater portion of its length to provide an air-tight seal.

2. A terminal member for use with electrical apparatus mounted in an air-tight container comprising a metallic tube adapted to be hermetically sealed in the container, a terminal lead insulated with an elastic medium positioned within said tube, the length of said tube being only slightly less than the length of said insulated terminal lead, the middle portion of said tube for a greater portion of its length being reduced in diameter to such an extent as to cause compression of the elastic medium against the walls of the tube and means for hermetically sealing said tube to said container at one of the unreduced portions of said tube thereby insuring a moisture and gas-tight seal.

3. A terminal member for use with electrical apparatus mounted in an airtight container comprising a rubber covered terminal lead and a closely fitting copper casing extending over substantially the entire length of said insulated lead, said casing being reduced in diameter over a greater portion of its length to cause compression of the rubber insulation against the walls of the casing thereby insuring a moisture and gas-tight seal.

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