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2,129,000

CONDENSER

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FIG. 1

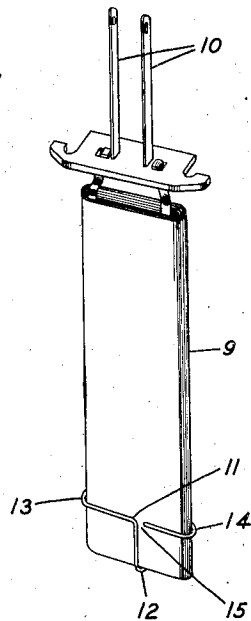


FIG. 5



FIG. 2

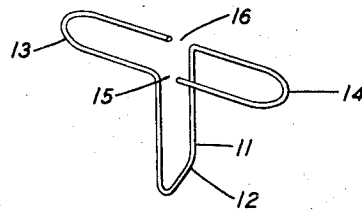


FIG. 3

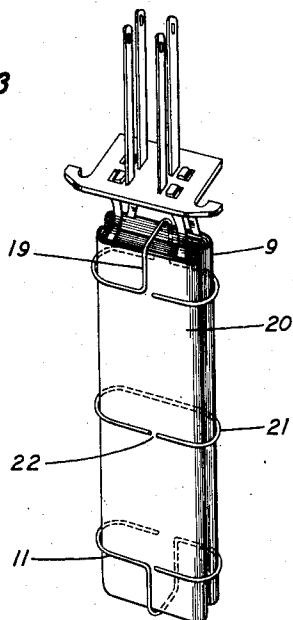
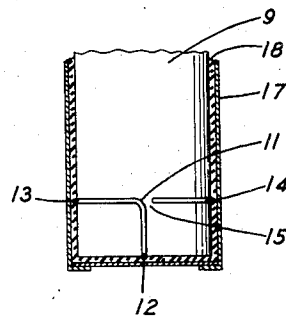


FIG. 4



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## UNITED STATES PATENT OFFICE

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## CONDENSER

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5 Claims. (Cl. 175-41)

This invention relates to condensers and more particularly to a device for maintaining a condenser unit substantially equidistant from the walls of the container in which it is mounted.

5 In accordance with one method of making a condenser, sheets of paper and foil are wound into a compact roll, impregnated with a suitable dielectric compound and pressed into a rectangular or other convenient shape. The condenser  
10 unit thus formed is then inserted into a metal container from which it is insulated and spaced by an insulating compound. The insulating compound also serves to seal the container and thus protect the unit from the entrance of moisture. While this method has been successful in  
15 connection with bulky condensers, it is not sufficiently reliable for small compact condensers of the above type where clearance between the unit and container is small and where the design is  
20 such that the length of the condenser is large as compared to its cross-sectional dimensions. The latter conditions are often encountered in condensers for use in small, lightweight apparatus.

25 An object of the present invention is, therefore, a condenser which is well sealed against the entrance of moisture although there is small clearance between the unit and container.

Another object of the invention is a condenser  
30 in which there is small clearance between the unit and the container and which is so arranged as to insure a substantially perfect envelope of sealing compound around the unit.

A further object of this invention is an encased  
35 condenser structure having means for automatically locating the condenser unit centrally in the casing for the purpose of securing uniform capacitance between the unit and the casing.

In accordance with the present invention these  
40 and other objects are attained by placing a spacing member around the unit in such a manner that the thickness of said member substantially regulates the thickness of the layer of potting compounding encasing said unit.

45 In the preferred form of the invention an insulated wire, the diameter of which approaches the desired thickness of the ensheathing layer of insulating compound, is placed around the unit and the unit is then inserted into the casing.

50 The exact shape which this wire spacer takes may vary depending upon the particular design of condenser with which it is to be used. However, in one type of condenser in which the unit tends to rest upon the bottom of the casing, the  
55 wire may assume the shape of an open U which

supports the bottom of the unit from the bottom of the casing with extensions of said U continuing around the sides of said unit in opposite directions and approximately parallel to the bottom of the casing. This device will maintain  
5 the unit equidistantly from the bottom and sides of the casing. In some instances it may be expedient to use one of these devices on each end of the unit and these may be supplemented with one or more single wires bent around the sides  
10 of the unit intermediate its ends.

In accordance with another feature of the invention, the spacing members are so arranged as to permit the potting compound to flow freely  
15 throughout the length of the casing thereby insuring an equal distribution of compound around the condenser unit.

By using an insulated wire, the natural tension of the wire is utilized in holding the spacing device onto the unit while it is being inserted  
20 into the casing. It will be apparent however, that other insulating material may be employed in place of wire.

This invention will be more clearly understood from the accompanying detailed description and  
25 drawing in which:

Fig. 1 is a view of a single condenser unit having a spacing member attached thereto in accordance with the invention;

Fig. 2 is an enlarged view of the condenser  
30 unit spacing member;

Fig. 3 is a view of a pair of rolled condenser units having a spacing device attached at each end and an intermediate spacing member between the ends;

Fig. 4 is a view of the condenser unit with the spacing device attached and inserted into a condenser casing; and

Fig. 5 is a cross-sectional view of the insulated wire preferably used in making the spacing device shown in Fig. 2.

Referring to Fig. 1 there is shown a rolled paper and foil condenser unit 9 which has been pressed into a rectangular shape and a pair of terminals 10 suitably attached thereto. At the lower end of this unit there is attached a spacing member 11. This member 11 which is more clearly shown in Fig. 2 is made of a U-shaped member, preferably of insulated wire, which fits about the end of the condenser unit at 12 and has extensions 13 and 14 of the sides of the U projecting approximately parallel to the end of the unit and around the sides thereof. The insulated wire as shown in Fig. 5 comprises a metal core 23 which is covered by an insulating cov- 55

ering 24 preferably of paper pulp. It will be noted, as shown in Figs. 1 and 2, that the projecting members 13 and 14 do not extend around the unit to entirely enclose it but that spaces 15 and 16 are left between the sides of the U-shaped member and its extensions 13 and 14 on either side of the condenser unit. These spaces serve to permit the insulating compound to flow there-through and to surround the unit completely.

These features are more clearly understood by referring to Fig. 4 which shows a condenser unit 9 having a spacing member 11 attached at the lower end and inserted into a container 17, shown in partial cross-section, which may be of metal or other material. As shown in the drawing, the spacing member 11 maintains the unit 9 out of contact with the container 17 and at the same time centrally locates the unit in the container, the distance between the unit and the container being the diameter of the wire forming the spacing member. This permits an even coating of insulating compound 18 to flow between the casing and the unit. The space between the casing and the lower portion of the unit below the parallel extensions of the U is filled with the insulating compound which flows through the spaces 15 and 16. This uniform thickness of insulating compound around the unit prevents the entrance of any moisture into the casing and at the same time maintains an even capacitance between the unit and the casing.

In assembling such a compact condenser unit, the spacing members 11 may be bent slightly so that the natural tension of the wire will cause it to cling onto the unit while the unit is being inserted into the container. It is obvious that other suitable materials may replace insulated wire as the material from which to construct the spacing member. However, small insulated wires make inexpensive and satisfactory spacing members and such wires insulated with paper pulp have been found to be particularly satisfactory.

Referring to Fig. 3, there is shown a plurality of condenser units 9 and 20 associated together in the conventional manner and having a pair of spacing members 11 and 19 attached to opposite ends of the unit thus permitting even spacing and insulation when they are inserted into a container in accordance with Fig. 4. As a means of further insuring even spacing of the unit in the casing, an additional spacing member 21 may be placed around the unit intermediate its ends. This member comprises an insulated wire placed around the unit and having an opening 22 there-through for the passage of insulating compound.

What is claimed is:

1. An electrical condenser comprising a condenser unit, a casing therefor, and means comprising a stiff member in the form of a U supporting said condenser unit from the bottom of said casing, and an integral stiff extension of said U extending substantially parallel to the bottom

of said casing around the sides of said unit, said member and said extension being capable of withstanding without deformation the temperatures above the melting point of a sealing compound employed for sealing said unit in said casing.

2. In an electrical condenser, a condenser unit sealed in a casing, and means comprising a stiff insulated wire in the form of a U supporting said unit out of contact with the bottom of said casing, and stiff extensions of said U bent in opposite directions around the sides of said unit and so arranged that a sealing compound is free to flow to the bottom of the casing, said member and said extensions being capable of withstanding without deformation pouring temperatures of the sealing compound employed for sealing said unit in said casing.

3. In an electrical condenser, a condenser unit sealed in a casing, and means comprising a stiff insulated wire in the form of a U supporting said unit out of contact with the bottom of said casing, and stiff extensions of said U bent in opposite directions around the sides of said unit, the diameter of said insulated wire being such as to determine substantially the minimum thickness of the layer of sealing compound encasing said unit.

4. In a condenser, a condenser unit and a casing therefor, a stiff spacing member bent around said unit and formed of insulated wire having a diameter substantially equal to the clearance between said unit and casing, said spacing member having an opening therein to permit passage of insulating compound therethrough, said insulated wire being retained on said unit solely by the inherent tension extended by said wire on said unit.

5. An electrical condenser comprising a condenser unit, a housing therefor, a U-shaped member comprising a stiff insulated wire on the bottom of said unit for supporting the bottom of said unit and for separating the bottom of said unit from the bottom of said housing, said U-shaped member having extensions continuing around the sides of said unit and being approximately parallel to the bottom of said housing, a second U-shaped member comprising a stiff insulated wire on the top of said unit, said second U-shaped member having extensions continuing around the sides of said unit and being approximately parallel to the top of said unit, a stiff intermediate wire surrounding said unit, said extensions and said intermediate wire having approximately the same diameter, said extensions and said intermediate wire having openings therein to permit the passage of insulating compound therethrough and said U-shaped members and said intermediate wire being retained on said units solely by the inherent tension of the respective members and wire on said unit.

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