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CONDENSER

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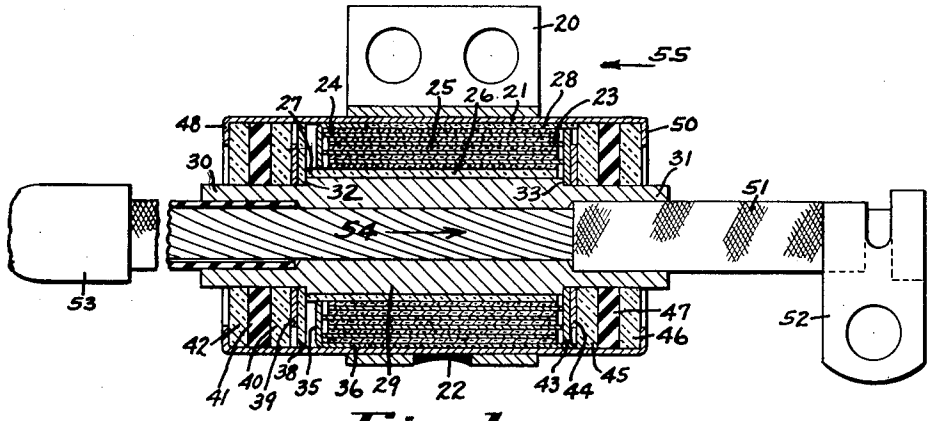


Fig. 1

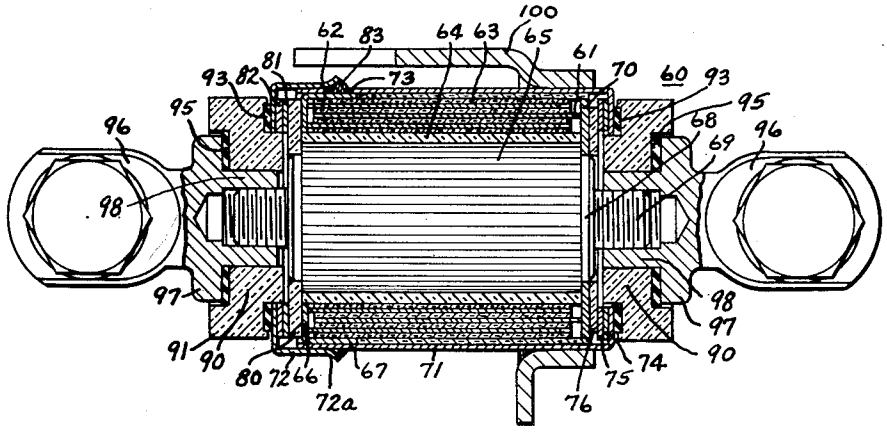


Fig. 2

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CONDENSER

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This invention relates to electrical condensers, and more particularly to condensers for dampening out high frequency disturbances, in order to eliminate interference with the operation of radio apparatus located in the vicinity of the device which is the cause of the high frequency disturbance.

An object of the present invention is to provide a condenser, one terminal of which is capable of use as a conductor in a line carrying a substantial amount of current, such as in a battery charging circuit.

Another object of the invention is to provide a structure that will assure condenser terminals and that will exclude all moisture from the condenser body.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing, wherein a preferred embodiment of the invention is clearly shown.

In the drawing:

Fig. 1 is a longitudinal sectional view of one form of an electrical condenser embodying the present invention.

Fig. 2 is a longitudinal sectional view of a modified form of the condenser construction.

The embodiment illustrated in Fig. 1 comprises a bracket 20 secured to a tubular casing 21 by soldering indicated at 22. The casing encloses a condenser section subassembly which includes a condenser winding having a foil strip 23 and a foil strip 24 insulated from each other by paper strips 25. The right margin of foil 23 extends beyond the right margin of paper strip 25 while the left margin of foil 24 extends beyond the left margin of the paper strip. These strips of foils and paper are wound upon a nonconducting tube 26 so that the left end 27 of the tube will extend beyond the condenser section. After the condenser material has been wound to the desired diameter upon the tube a paper strip 28 is wound upon the condenser section so that the right side thereof extends beyond the right end marginal edges of the coil 23. The condenser section is then impregnated in the usual manner with a desired dielectric, such as wax or an oil which tends to close up the pores in the paper strip. The condenser is now ready to be assembled upon a tubular conducting core 29. The core 29 is provided with reduced end portions 30 and 31 to form shoulders 32 and 33.

A cup-shaped conducting member 35 having an annular flange 36 is fitted upon one end of the body, the bottom wall of which has an opening

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through which the left end 27 of the tube 26 extends so as to insulate the member 35 from the core 29. The edge of the flange 36 abuts the left end of the paper strip 28 and the bottom wall of the member 35 causes the spirally disposed ends of the foil 24 to be crushed together so as to provide a good electrical connection between the foil 24 and cup-shaped member 35. After the assembly of the cup-shaped member 35 an insulating washer 38, metallic washer 39, a hard insulating washer 40, a soft rubber washer 41 and a hard insulating washer 42 are fitted upon the reduced left end portion 30 of the core 29.

The reduced end portion 31 of the core 30 supports metallic washers 43 and 44, hard insulating washers 45 and 46, and a soft rubber washer 47 disposed between washers 45 and 46. By spinning over the casing 21 to form a flange 48, the members 38, 39, 40, 41 and 42 are clamped between the shoulder 32 and the flange 48 compressing the soft rubber washer 41 so that same will move in directions to bear snugly against the interior of the casing 21 and the surface of the reduced portion 30 of the core. The compression of the washer 41 forms fluid seals between members 41, 20 and 30. In a like manner when the other end of the casing is spun over to form a flange 50, the members 43, 44, 45, 46 and 47 are clamped between the shoulder 33 and the flange 50, causing the soft rubber washer 47 to form fluid seals between members 47, 21 and 31.

The condenser unit is for use with an electrical structure and is provided with a lead 51 which passes through the core 29 terminating with clips 52 and 53 for connection into a desired circuit. The central portion of the lead is bare and is joined electrically with the core 29 in any suitable manner. In this instance the lead operates as one terminal while the casing 21 and bracket 20 serve to ground the condenser foil 24.

In Fig. 2 is shown a modified form of the invention in which a condenser unit 60 is wound into cylindrical form and comprising foil strips 61 and 62 which are insulated from each other by paper strips 63. The right margin of foil 61 extends beyond the right margin of paper 63, while the left margin of foil 62 extends beyond the left margin of paper 63. These strips are wound upon a nonconducting tube 64. The condenser body 60 is compressed to the desired size longitudinally and in a manner that the end margins of the foils will be crushed together to form a mass of foil metal at each end of the condenser body. The condenser body is assembled upon a knurled or fluted conducting core 65. A cup-shaped member

66 has an annular flange 67 surrounding the left end of the condenser body and tube 64, the tube insulating the member 66 from the core 65. The bottom wall of the cup-shaped member 66 contacts the foil ends 62 so as to provide a good electrical connection between the foil strip and the member 66. The core 65 is provided at each end with a reduced collar portion 68 and a smaller threaded portion 69. The right end collar as viewed in Fig. 2 receives a metallic washer 70 which electrically connects the ends of the foil 61 with the core 65. The washer is preferably soldered to the ends of the foil 61.

The condenser unit is now ready to be assembled into a metal capsule-like container comprising two parts 71 and 72 which are adapted to be telescopically engaged, the part 72 being flared at 72a to receive part 71. The member 71 is provided with a lateral opening 73 near its open end. The condenser is assembled first by assembling together about the right end of the core 65 metallic spring washers 74 and 75, and a nonconducting washer 76. The reduced threaded portion 69 extends through the washers and through an opening in the bottom wall of the part 71. After the parts 70, 76, 75 and 74 are adjacent the bottom wall of part 71 with the reduced portion 69 extending through the aperture in the bottom wall thereof it is important that this opening be sealed against moisture. This is accomplished in the following manner: The aperture in part 71 receives a bushing 90 of hard insulating material having a flange 91, the inner face of which is provided with an annular groove to receive a soft rubber annulus 93 while the outer face of the bushing is provided with a recess to receive a soft rubber annulus 95. A terminal member 96 for connecting the condenser in a circuit is provided with a flange 97 having a tapped shank 98 extending therefrom. The shank 98 extends into the bushing 90 and has threaded engagement with the extension 69. When the terminal member 96 is threaded home the rubber annulus 93 is clamped between the flange 91 and the bottom wall of the part 72 and the rubber annulus 95 is clamped between the flanges 91 and 97. This clamping action forms fluid tight seals, one between the part 71 and the bushing 90 and one between the bushing 90 and the terminal 96. Entrance of moisture past the opening in the part 71 is effectively blocked by the soft rubber annulus 93 which is compressed between part 71 and the bushing 90 to provide a moisture seal. The soft rubber washer 95 is also compressed between the terminal 96 and the bushing 90 to provide a second moisture seal.

An insulating washer 80 abuts the left end of the tube 64 to assist in insulating the member 67 from the core 65. The left end of the core extends through the washer 80, said end also extending through metallic spring washers 81 and 82 and an opening to the bottom wall of part 72. With the washers 80, 81, 82 in their proper positions the part 72 is moved into position so that the parts 71 and 72 are telescopically engaged. The open end of the part 71 has a close fit with the cup-shaped member 67 to provide a good electrical connection between the parts 71 and 67. When the parts 71 and 72 are telescopically engaged the left threaded end of the core will extend loosely through the aperture provided in the bottom wall of part 72.

This opening in the bottom wall of part 72 is sealed in a similar manner as is the opening of part 71 in that identical parts 90, 93, 95 and 96 are used. After the opening in part 72 is sealed against moisture the joint between the members 71 and 72 is soldered at 83 with the solder extending through the opening 73 to connect electrically the parts 71 and 72 with part 67. The solder encircles the joint to provide a fluid seal at that point. It is to be understood that other fusing material could be used instead of solder.

It is pointed out here that when the respective terminals 96 are threaded home to form seals around the openings in parts 71 and 72, the spring washers 74, 75 and the spring washers 81 and 82 are placed under tension, the washers 74, 75 urging the washer 70 against foil 61 while spring washers 81 and 82 operate upon the washer 80 to hold the part 67 firmly against the foil 62.

After the completion of the condenser assembly, shown in Fig. 1, the clips 52 and 53 may be connected into a battery charging circuit or any other circuit where a filter is desirable. The lead 51 serves as one terminal of the condenser since it is directly connected with the foil 23 through the core 29 and washer 43. The bracket 20 provides the other terminal for the condenser since it is joined to the casing 21 which is connected with the foil 24 through the cup-member 35 whose flange 36 contacts the inside of the casing 21. Clip 53 is connected to the cause of high frequency electrical disturbance which may be a D. C. generator the commutation of which is the cause of the disturbance. In that case the terminal clip 52 might be connected with a storage battery charged by the generator.

It is to be pointed out here that the modification shown in Fig. 2 can be equally connected in a battery charging circuit and operates in a manner set forth for the device shown in Fig. 1. In Fig. 2 the terminal 96 is connected to the foil 61 through core 65 and washer 70. A bracket 100 provides the other terminal for the condenser as it is connected to the part 71 which is connected with the foil 62 through solder 83 and member 66.

While the embodiment of the present invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. In a fluid seal arrangement for a chamber defined in part by a pair of concentric tubular terminal members, one of said members being provided with an abutment at each end thereof; an electrical device located within the chamber, said device including a pair of insulated conducting elements, each element connected with a different terminal member; and closures of insulating material at each end of the members for hermetically closing the chamber, said closures including a yieldable washer of impervious material confined between hard washers, and means provided by the other member for clamping the closures against the abutments causing the yieldable washers to be compressed and make fluid-tight contact with both tubular members.

2. In a fluid seal arrangement for a chamber defined in part by a pair of concentric tubular members, said inner member having an abutment at each end and located within the confines of the outer member, an electrical device supported by the inner member between the abutments and having a pair of conducting elements, each element being connected to a different member, closures at each end of the chamber, each closure

including a yieldable apertured disc of impervious material disposed between a plurality of hard apertured discs and supported by the inner member, and means including portions of the outer member rolled inwardly against the outer disc of each closure to clamp the closure against its respective abutment and thereby compress the yieldable disc causing said yieldable disc to make fluid-tight contact with both tubular members.

3. A sealed container for an electrical device comprising, a relatively heavy metal core having abutments at each end thereof; an electrical device supported on the core between the abutments; a relatively thin metallic tube surrounding the device and the shoulders; closure means for the tube including a plurality of insulating discs slidably supported on each core end and dimensioned so as to fit within the tube, one of said discs being made of impervious yieldable material and disposed between a pair of hard discs; and means including portions at both ends of the tube rolled inwardly against the outer face of the closure means for clamping same firmly against their respective abutments and thereby causing the yieldable discs to move in radial directions to form fluid tight seals with the inner surfaces of the tube and also the outer surfaces of the core.

4. In a fluid seal arrangement for a chamber defined in part by a metallic tubular terminal member and a core terminal member projecting through the tubular member and having its opposite ends extending beyond the opposite end of the tubular member, said core terminal member having an abutment at each end and positioned

within the confines of the tubular member; an electrical device supported on the core member and positioned between the abutments, said device including a pair of insulated conducting elements each element electrically connected with a different terminal; closure means for each end of the chamber slidably mounted on the core member and dimensioned so as to fit within the tubular member, said closure means including an apertured yieldable disc of impervious material disposed between a plurality of apertured discs of hard insulating material; and means including portions of the tubular member for clamping the closure means firmly against their respective abutments and thereby forcing the respective yieldable discs in radial directions into fluid tight contact with the inner surface of the tubular member and also into fluid tight contact with the core member.

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