

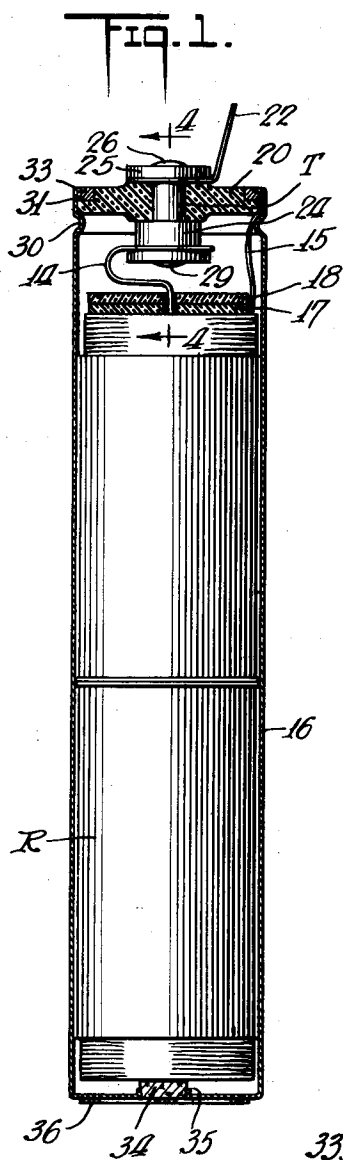
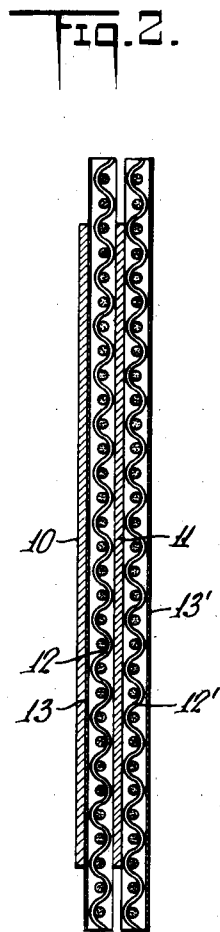
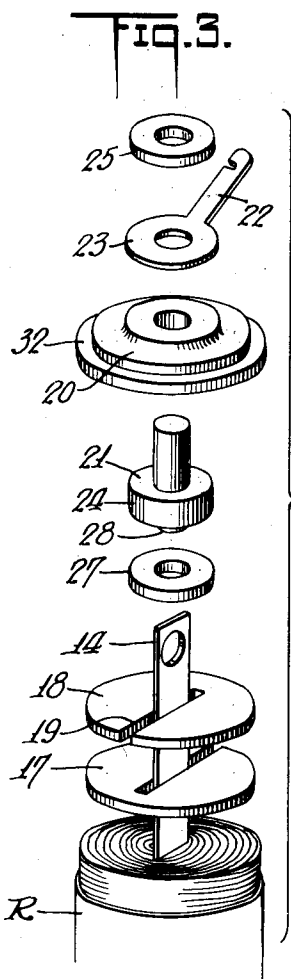
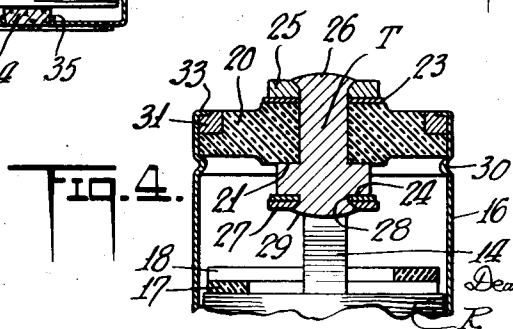
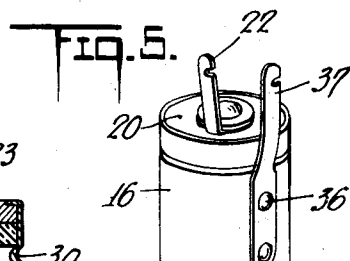
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ELECTROLYTIC CONDENSER

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ELECTROLYTIC CONDENSER

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5 Claims. (Cl. 175—315)

An object of the present invention is to provide an electrolytic condenser, such, for instance, as a by-pass condenser, suitable for use in radio receiving sets, which shall have the requisite compactness, which shall be substantially as inexpensive as, but without the objections of paper or cardboard enclosed condensers of this type commonly employed where cheapness is a desideratum.

Another object is to provide a condenser of the above type devoid of pitch or other plastic filling composition, devoid of unabsorbed liquid, capable of use on relatively high voltage, and which, though of compact construction, is substantially proof against short-circuit.

Another object is to provide a condenser of the above type which shall have a minimum number of parts, easily assembled, which shall substantially maintain the moisture content of the electrolyte therein at a nearly fixed value without involving the variability in performance due, on the one hand, to leakage or seepage of any moisture from the structure, or, on the other hand, to entry of moisture from the atmosphere.

In carrying out the invention, an active condenser unit of the general type shown in the prior patent to Georgiev, No. 1,789,949, issued January 20th, 1931, is employed. This unit fits into a cylindrical aluminum can at the open end of which the terminals of the electrodes are disposed. The anode terminal, preferably a tab, is spaced from the cathode terminal, also preferably a tab, by one or more washers affording an opening for the former and retaining the latter against the rim of the can. An insulating closure button preferably rests on a bead in the can and mounts a shouldered solid rivet piece extending therethrough, to the inner end of which the anode terminal is affixed by heading over, and to the outer end of which a terminal lug is affixed by heading over.

In the accompanying drawing, in which are shown one or more of various possible embodiments of the several features of the invention, Fig. 1 is a view in longitudinal cross-section of a preferred embodiment of the condenser structure;

Fig. 2 is a sectional view showing the preferred arrangement of foil and interlay in the condenser roll and on an enlarged scale transversely;

Fig. 3 is a dropped perspective view of the parts making up the closure button assembly,

Fig. 4 is a view in cross-section on line 4—4 of Fig. 1 and showing the correlation of the button to the anode tab; and

Fig. 5 is a fragmentary perspective view of a slight modification of the invention.

Referring now to the drawing, there is shown a rolled active condenser element of the general type of that shown in the prior patent above identified, and which by itself is not my invention. In a preferred embodiment, this roll is composed of a cathode foil 10 and an anode foil 11, each of thickness in the order of .001 inches, between which there is interposed a layer of gauze 12 and a layer of paper 13, the latter of close texture and of thickness in the order of .0005 inches. A similar layer of gauze 12' and paper 13' is disposed on the opposite face of the anode, and the six layers of gauze, paper and foil are tightly rolled together to form the roll R, which is enclosed in a cylindrical aluminum can 16, as shown in Fig. 1, and terminals, preferably unitary tabs 14 and 15 protrude from the anode and cathode respectively, at the upper end of the roll.

Within the can, there are preferably two insulating washers 17 and 18, each with a radial slit 19, said washers straddling opposite edges of the anode tab 14, the cathode tab 15 being held by said washers toward the wall of the can and away from short-circuiting relation with respect to the anode tab.

The closure of the can preferably comprises a button 20 of phenol condensation product, vulcanite or the like, through which extends an aluminum rivet piece T, which is pre-assembled therewith. The said rivet piece has a shoulder 21 pressing against the lower face of the button 20 and a terminal lug 22 formed with an eye 23 rests upon the upper face of the button and encircles the upper end of the rivet piece. A metal washer 25 rests upon the eye 23 and all of said parts are clamped in secure unitary assembly by heading over the rivet, as at 26, preferably by a rolling operation.

The anode tab 14 is connected at the lower end of the rivet piece and against a shoulder 24 thereof, by means of a metal washer 27 encircling the reduced lower extremity 28 thereof, the protruding end of which is headed or rolled over as at 29, to establish a firm mechanical and electrical connection with respect to the anode tab.

The condenser roll R with the terminal button connected to the anode tab, as just described, being now inserted into the can 16, and the washers 17 and 18 being placed in straddling relation over the anode tab and positioned as shown in Fig. 1, the terminal button 20 is inserted into the open end of the can to rest at its periphery upon an intumed bead 30 near the rim of the

can. A yielding gasket 31 preferably of rubberized fabric is disposed in a corresponding peripheral rabbet 32 at the upper face of the button, and the rim of the can is then rolled over as at 33 against the rubber ring to afford a liquid and air-tight closure.

To relieve excessive gas pressure that may be engendered in the operation of the condenser, a vent structure is preferably provided in the bottom of the condenser can. While the vent structure taken by itself is not my invention, it may be briefly set forth as comprising a cork stopper 34 fitting into a small inturned opening 35 in the bottom of the can, and preferably covered by a slit sheet 36 of paper. In use, the cork is sufficiently dense to sustain limited gas pressure evolved in operation, but in the event of sudden generation of excessive pressure, as may occur under rare conditions, the cork will allow escape of gas and under extreme conditions, may be entirely blown out of the casing structure.

By the construction above described, I have found it possible to produce a condenser of 8 microfarad capacity to withstand a voltage of 500 or more, which condenser has an outer diameter of less than one inch and a length of less than five inches. This condenser by reason of its compactness can be disposed where but little space is available, and need not be arranged vertically but can be placed in horizontal or oblique relation, if desired.

It is preferred to employ an electrolyte in the condenser of the general character of that disclosed in the prior patent to Georgiev, No. 1,815,768 of July 21, 1931. Such electrolyte by reason of its mobile character, penetrates the gauze and paper interlay and does not involve material enlargement in the bulk of the roll prior to impregnation.

The rivet piece and button affording secure frictional engagement with respect to each other and with respect to the metal container, the condenser is hermetically sealed thereat, and no seepage or creepage of electrolyte with respect thereto is incurred, and the difficulties with paper enclosed condensers of this type, are effectively avoided.

In the condenser structure described, the terminal lug 22 is for the positive or anode, and the can itself constitutes the negative or cathode terminal, against which the periphery of the button 20 firmly presses the cathode terminal tab 15. Where it is desired to insulate the can with respect to the grounding-mount or chassis structure (not shown) on which the condenser is supported, it is preferred, as best shown in Fig. 5, to connect to the wall of the condenser as by rivets 36, a side lug 37, which latter may be connected to the chassis.

It will thus be seen that there is herein described apparatus in which the several features of this invention are embodied, and which apparatus in its action attains the various objects of the invention and is well suited to meet the requirements of practical use.

As many changes could be made in the above construction, and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I

claim as new and desire to secure by Letters Patent of the United States is:—

1. An electrolytic condenser comprising a cylindrical metallic container, a condenser roll therein having a positive and a negative terminal lead protruding from the upper end thereof, an insulating washer maintaining the negative lead adjacent the inner wall of the container and presenting an opening for the positive lead, an insulating button having a central metal rivet piece mechanically and electrically connected to the positive lead, the periphery of said button pressing the negative lead into electrical and mechanical contact with the inner wall of the container.

2. An electrolytic condenser comprising a cylindrical metal can and a condenser roll substantially filling said can and having a positive and a negative terminal tab protruding from the upper end thereof, a pair of radially slotted washers straddling the positive tab and loosely fitting into the container, the peripheries of said washers positioning the negative tab adjacent the can wall, and a closure for said can comprising an insulating button having a central solid rivet piece therethrough, mechanically and electrically connected to said positive tab, the periphery of said button pressing the negative tab into secure contact with said can.

3. An electrolytic condenser comprising an aluminum can, a condenser roll supported on the bottom of said can including aluminum foils with an absorbent interlay, flexible terminal tabs unitary with said foils protruding from the upper end thereof, an inturned bead adjacent the rim of said can, an insulating button snugly fitting within the rim of said can, resting upon said bead and having a central rivet piece therethrough permanently assembled therewith, the latter provided with a reduced tip upset over said positive tab, the periphery of said button pressing the negative terminal tab against said can, the rim of said can being turned in to press said button against said bead and means preventing contact between the tab of the positive foil and the can.

4. An electrolytic condenser comprising an aluminum can, a condenser roll supported on the bottom of said can including aluminum foils with an absorbent interlay, terminal tabs unitary with said foils protruding from the upper end thereof, an inturned bead adjacent the rim of said can, an insulating button having a central rivet piece therethrough and snugly fitting within the rim of said can and resting upon said bead, the positive tab retained by the lower end of said rivet, the periphery of said button pressing the negative terminal tab against said can, the rim of said can being turned in to press said button against said bead, and insulating washer means radially slotted and straddling said positive tab to space the latter from the negative tab, the latter engaging the periphery of said washer.

5. An electrolytic condenser comprising a container, a condenser roll substantially filling the same and having a flexible positive lead and a flexible negative lead, an insulating cover closing said container, having a solid metal rivet piece therethrough and protruding therebelow, said positive lead retained by said rivet piece under said cover, the periphery of said cover pressing the negative lead into electrical and mechanical contact with the inner wall of the container, and means intervening between said flexible leads to prevent short-circuiting contact therebetween.

SAMUEL I. COLE.