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J. S. WILLIAMS

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ELECTRIC CONDENSER

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Fig. 1.

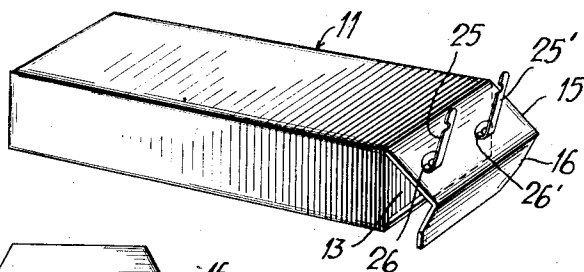


Fig. 2.

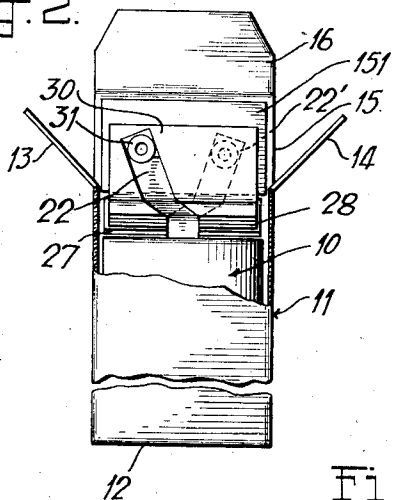


Fig. 3.

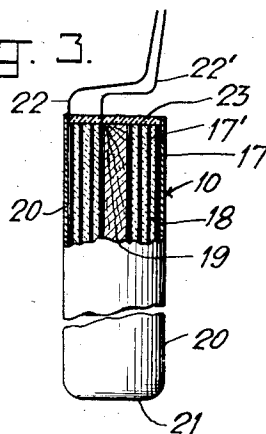
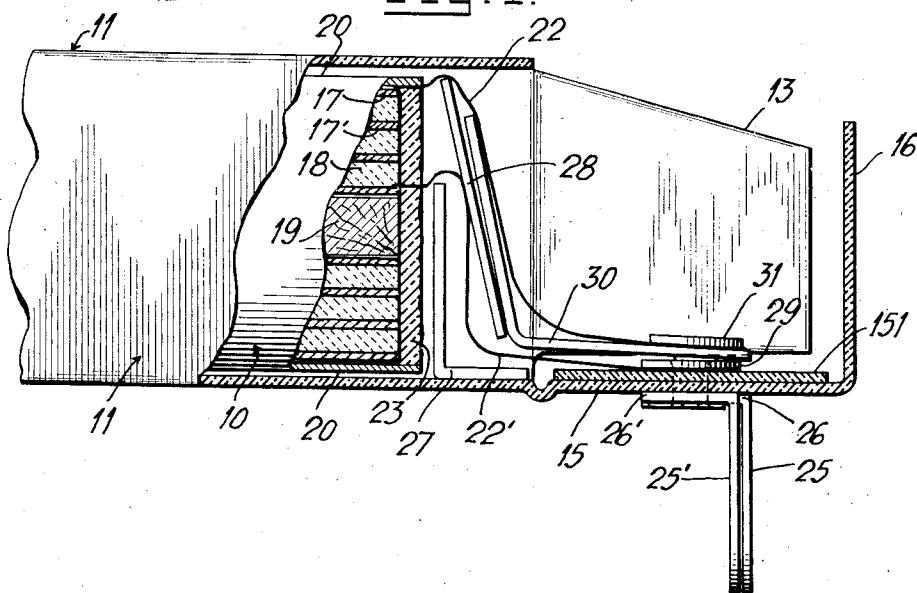


Fig. 4.



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ELECTRIC CONDENSER

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9 Claims. (Cl. 175—315)

This invention relates to electric condensers or capacitors and particularly to so-called dry electrolytic condensers or capacitors of the wound type.

- 5 The object of the invention generally is to provide an improved condenser of the character indicated which is efficient, economical, readily manufactured and is adapted to provide a relatively high capacitance in a relatively small space.
- 10 More specifically, it is an object to provide a so-called dry electrolytic condenser in the form of a cartridge or packet having an envelope or casing carrying the terminals arranged so that the device may be readily inserted and connected for
- 15 use in a large variety of electric appliances, for example, in radio receivers, power-packs, and the like.

- It is also an object to provide an insulating envelope or sleeve having flaps on the end to fold over and completely encase the condenser, certain of the flaps being arranged to carry the terminals in a safe and economical manner.

- It is a further object to provide an improved construction for the body of a wound condenser in the form of a metallic shroud which encases the parts in a safe and convenient manner.

- Other objects of the invention will in part be obvious and will in part appear hereinafter.

- The invention accordingly comprises the features of construction, combination of elements, and arrangement of parts, which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the claims.

- 35 For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawing, in which:

- 40 Fig. 1 is a perspective view of a condenser constructed in accordance with the invention, the flap carrying the terminals being partially opened;

- Fig. 2 is a view partly in elevation and partly in section showing the flap which carries the terminal in open position;

- Fig. 3 is a view partly in elevation and partly in section showing the construction of the condenser proper without its casing; and

- 50 Fig. 4 is an enlarged fragmentary view mainly in section showing the flap construction which carries the terminals.

- Referring now to the drawing, 10 denotes generally the body of a condenser that is slipped into an insulating envelope or casing 11, here indi-

cated in the form of a prismatic tube or box with flaps at the end adapted to be folded over so as to enclose totally the body of the condenser within the same. The prismatic envelope here shown has four sides, so that the ends may have as many as four flaps. While the lower end indicated at 12 in Fig. 2 may have four flaps, it, as well as the upper end which is designed to carry the terminals, preferably has but three. The side flaps of the upper end, shown at 13 and 14, are designed to fold inwardly and slightly over-lap as they close the end of the casing. The back flap 15 is designed to fold over the flaps 13 and 14 when folded down in place, the back flap being further extended at 16 to provide a tongue adapted to enter the slit between the flaps 13 and 14 and the side which has no flap; this tongue when so inserted engaging frictionally with the inside wall of the front side of the casing, so that when in place the box remains permanently closed. The casing may be made from any suitable sheet material of an insulating character, for example a sheet of fiber impregnated with an insulating oil or wax. The dimensions of the casing are such that the sides are relatively close to the body of condenser 10 when disposed therein. While this condenser body is of the wound type, that is, in the form of a roll or cylindrical body comprising conducting plate electrode elements 17 and 17' separated by dielectric material 18 and wound upon a central supporting column 19, it is preferred that such cylindrical body shall undergo a certain amount of deformation to flatten the sides, whereby the interior space of the casing 11 is filled more economically by the condenser body, reducing the clearance, which has no commercial advantage, that obtains on the interior along the four corner edges of the casing.

While the condenser body 10 may be a mere roll of conducting and dielectric elements supported on a central column, it is preferred that this roll shall be enshrouded in an outer protecting sheath here indicated at 20. This outer sheath may, of course, be made from a sheet of suitable material. Metal, however, is preferred and is with advantage in a form that is drawn tightly over and about the exterior surface of the body of the condenser, and secured in place. To this end the sheath is provided in accordance with the present invention in the form of an extended metallic tube of a diameter initially sufficient to permit the condenser roll just to be slid in place. The metallic tube here shown is of the thin-walled, collapsible type and has a closed lower end 21 and may be made from any suitable material, for ex-

ample, of aluminum. When the metallic sheath 20 has been properly drawn over the condenser roll, a pair of strip-like flexible terminal electrodes 22 and 22' will project from the open end of the tube. These strip-like terminal electrodes may initially be provided as extensions of the conducting plates or sheets, out of which the condenser roll is made, or they may be conducting strips that are attached to the plate electrode elements in any suitable manner. The condenser body when suitably enshrouded is sealed in the sheath 20 by means of a filling of insulating material 23 that is originally plastic and soft, but when put in place and dried or cooled becomes hard. A suitable plastic insulating material for this purpose is that known as "Parolite".

The body of the condenser 10 when in place in the insulating casing 11 preferably rests on the lower end 12. The upper end, however is preferably somewhat short of the upper end of the casing 11. In the clearance space thus afforded between the upper end of the condenser body 10 and the casing 11, connecting means are provided for making electrical connections between the strip-like terminals 22 and 22' and those carried by the flap 15. These latter are shown at 25 and 25' and comprise rigid conducting elements preferably in the form of L shaped members having perforated bases that are secured by means of rivets or eyelets to the conducting strips 22 and 22', respectively.

In order to make these electrical connections within the clearance space in the wrapper in a manner which protects the connections so that they are not liable to be short-circuited and at the same time are convenient to manufacture, additional insulating baffles or strips are slipped into this space. The first insulating baffle to be slipped into place is a strip bent into the form of an L, as shown at 27 in Fig. 4, that is inserted behind the conducting strip 22' which comes out from the condenser body nearest to the center of the same. This baffle may press the conducting strip a little way out toward the front of the box, but is of a height not in excess of that of the clearance space, so that the flap 15 may be readily folded down in place without resistance from this baffle.

Over the top of the conducting strip 22' is slipped a second baffle member 28 in the form of a rectangular insulating sheet that loosely fits in the top of the casing. The conducting strip 22' is now laid along the inner side of the flap 15, a reinforcing strip of insulating material 151 being preferably interposed for stiffening purposes. A conducting washer and eyelet 29 is then inserted and crimped into place passing through the strip 22', the strip 151, the flap 15 and the perforated base 26' on the exterior of the flap 15.

Similar connections are provided for the conducting strip 22, but first an L shaped insulating baffle 30 is inserted which is preferably larger than the insulating baffle 27, this baffle having its sides almost large enough to fill the open end of the clearance space in the casing 11 and when in place and the flap 15 closed, is no longer L shaped, but V shaped, the two sides being inclined at a relatively small angle. When the baffle 30 has been slipped into place, the conducting strip 22 is laid carefully thereover and up along the side that projects over the flap 15. This is perforated at a point to one side of that where connection between the terminal 25' and conducting strip 22' was made, and a second conducting

washer and eyelet 31 pushed therethrough. This passes through not only the conducting strip 22, but also the overlying flap of baffle 30, the strip or stiffener 151, the flap 15 and the perforated base 26 of the terminal 25. It is thus seen that the flap 15 may be bent back and forth without in any way interfering with the electrical connections between the condenser 10 and the terminals 25 and 25' that are secured to the flap 15, but are adequately separated by insulation.

In operation, it is seen that when the condenser has been assembled, as shown in Fig. 4, the flaps 13 and 14 are bent into overlapping position across the top of the casing 11, and then the flap 15 is bent downwardly and the tongue 16 inserted to make frictional contact with the front wall of the casing. Thus a box-like condenser is provided in an insulating envelope substantially protecting the condenser body, while the terminal electrodes are in a position to be conveniently attached to electrical conductors connecting the condensers in an electrical circuit. If for any reason it is desired to examine the condition of the condenser, the condenser may be detached and the flap 15 pulled open, the connections inspected and the condition of the interior of the box ascertained; this will, in general, disclose whether or not the condenser is in proper working order. It is also seen that by enshrouding the condenser body in the metallic sheath 20, the condenser body is further protected. In the preferred form of a collapsible aluminum tube, this sheath furnishes complete protection against access of moisture or gases from the surrounding air to the condenser roll. In the event, however, that gas should generate within the condenser roll, this can find relief to some extent by causing distention of the collapsible aluminum tube, and if that is not sufficient, by causing the metallic sheath to break away from the sealing material 23 in the end of the condenser, permitting the gas to escape without otherwise injuring the condenser. The use of such collapsible aluminum tubes enables these objects to be accomplished without materially increasing the cost over merely encasing the condenser roll in a cardboard container.

Since certain changes may be made in the above construction and different embodiments of the 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 described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In an electrical condenser, the combination with a body provided with flexible terminal conducting strips, of a prismatic insulating envelope having foldable flaps at the ends for totally enclosing said body, and terminal connections mounted on the exterior of one of said flaps electrically connected to said strips on the interior of said envelope.

2. In an electrical condenser, the combination with a body provided with flexible terminal conducting strips, of a prismatic insulating envelope having foldable flaps at the ends for totally enclosing said body, insulating baffles inserted at one end of said envelope insuring the electrical separation of said terminal strips, and rigid terminal connections on the exterior of one of said flaps electrically connected to said strips on the interior of said envelope.

3. In an electrical condenser, the combination with a body provided with flexible terminal conducting strips, of a prismatic insulating envelope having foldable flaps at the ends for totally enclosing said body, insulating baffles inserted at one end of said envelope insuring the electrical separation of said terminal strips, rigid conducting members having perforated bases disposed in spaced relation on the exterior of a flap at one end, and conducting securing means passing through said perforated bases and making electrical contact individually with said terminal strips on the interior side of said flap.

4. In an electrical condenser, the combination with a condenser body provided with terminals, of a metallic sheath for said body in the form of a tube closed at the bottom and dimensioned to fit snugly about the sides, hardened plastic insulating material about said terminals sealing said body in the open end of said sheath, a prismatic envelope having foldable flaps at the ends for totally enclosing said sheathed body, and rigid terminals on the exterior of one flap at one end electrically connected to said terminals on the interior of said envelope.

5. In an electrical condenser, the combination with a condenser body provided with terminals, of a metallic sheath for said body in the form of a tube closed at the bottom and dimensioned to fit snugly about the sides, hardened plastic insulating material about said terminals sealing said body in the open end of said sheath, a prismatic envelope having foldable flaps at the ends totally enclosing said sheathed body and of a length adapted to provide a narrow clearance at the terminal end of said body, insulating baffles inserted in said space arranged to insure electrical separation of said terminals, and rigid terminals on the exterior of one flap at one end electrically connected to the first said terminals on the interior of said envelope.

6. In an electrical condenser, the combination with a condenser body provided with terminals, of a metallic sheath for said body in the form of a tube closed at the bottom and dimensioned to fit snugly about the sides, hardened plastic insulating material about said terminals sealing said body in the open end of said sheath, a prismatic envelope having foldable flaps at the ends totally enclosing said sheathed body and of a length adapted to provide a narrow clearance at the terminal end of said body, insulating baffles inserted in said space arranged to insure electrical separation of said terminals, and rigid terminals on the exterior of one flap at one end electrically connected to the first said terminals on the interior of said envelope.

matic envelope having foldable flaps at the ends totally enclosing said sheathed body and of a length adapted to provide a narrow clearance at the terminal end of said body, insulating baffles inserted in said space arranged to insure electrical separation of said terminals, a stiffening strip on the outermost flap at the clearance end of said envelope, said terminals being led out to lie over said stiffening strip and having a portion of one insulating baffle extending therebetween, rigid conducting L shaped members having perforated bases disposed on the exterior of said outermost flap, and conducting securing means passing through said perforated bases and said terminal extensions overlying said stiffening strip whereby the terminals on the exterior of said flap make electrical contact with those on the interior of said envelope.

7. In an electrical condenser, the combination with a condenser body provided with flexible terminal conductors, of a prismatic insulating envelope having foldable flaps at the ends for enclosing said body, and substantially rigid terminal connections mounted on the exterior of one of said flaps electrically connected to said conductors to provide said enclosed condenser body with external terminals.

8. In an electrical condenser, the combination of an encased condenser body provided with flexible terminal conductors extending from the case, a prismatic insulating envelope having foldable flaps at the ends for enclosing said encased body, and substantially rigid terminal connections mounted on the exterior of one of said flaps electrically connected to said conductors to provide said enclosed and encased condenser body with external terminals.

9. In an electrical condenser, the combination of a condenser body sealed within a case provided with flexible terminal conductors extending from said case, a prismatic insulating envelope having foldable flaps at the ends for enclosing said encased body, and substantially rigid terminal connections mounted on the exterior of one of said flaps electrically connected to said conductors to provide said enclosed and encased condenser body with external terminals.

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