

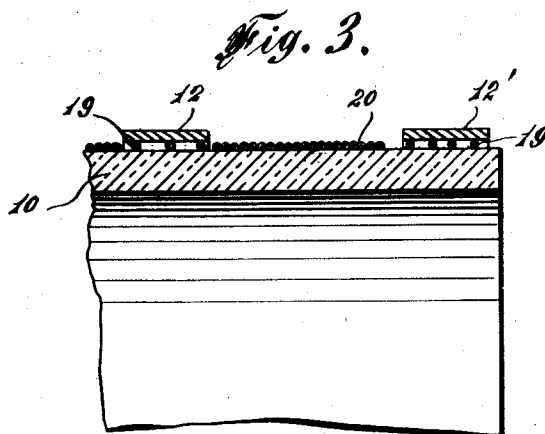
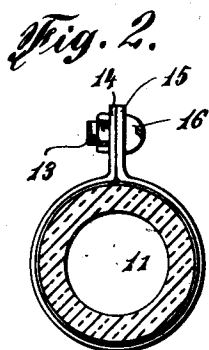
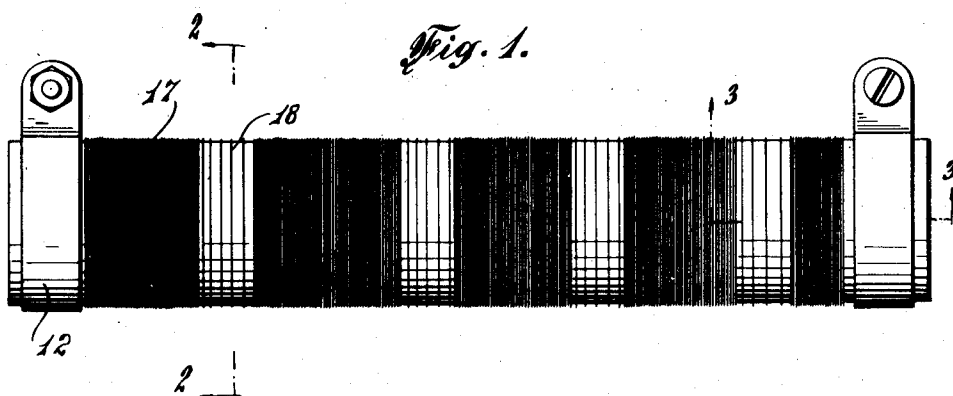
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RESISTANCE

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RESISTANCE

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This invention relates to improvements in resistance elements, particularly those applied in power units including A, B and C battery eliminators.

At the present time the resistances used in power units and comprising usually of an insulated core generally formed of porcelain are composed of a continuous length of resistance wire positioned so that the turns are closely adjacent one another and have co-operating therewith movable conductors, which conductors in the form of rings are of such width that a considerable number of turns of wire are contacted thereby at all times.

In changing the resistance of the element in conjunction with the remaining part of the power unit, considerable difficulty is encountered in obtaining accurate settings and duplicate settings, in view of the fact that a slight movement in either direction of the conducting band will cause a considerable variation in the resistivity of the element, due to the extremely large number of turns of wire traversed upon even the slightest displacement or deviation of the conducting band or ring along the length of the resistance element.

To offset this difficulty the applicant has provided a novel form of resistance element comprising of a length of wire having alternate closely or densely wound and sparsely wound sections, the closely wound sections being of considerably greater density per unit of length and of larger extent, while the sparsely wound portions are approximately one-tenth as dense, or less, per unit length. In this type of resistance the dense sections of the wire, naturally, are the areas of high resistivity, while the sparsely wound sections are of comparatively negligible resistivity, yet, at the same time providing for the necessary conductivity from the densely wound wire sections through the contact band and into the remaining part of the power unit circuit.

The densely wound sections on this resistance element are so constructed as to provide for a definite resistance value controllable and calibrated as to their amount merely by

the amount of winding thereon, but each separable by a sparsely wound section of wire, which sparsely wound section of wire is adapted to have contacted therewith the conducting band so that the resistance of a densely wound portion between two of the sparsely wound sections can be accurately called that only of the densely wound section.

Broadly, then, this invention contemplates the introduction of a variable resistance element for power units in which alternate sections of continuous resistance wire are composed of densely wound sections, while the interconnecting portions are sparsely wound, upon which sparsely wound sections there are adapted to be positioned into conductive relation therewith contact wires whereby the active resistance is that of the dense section of wire between the conducting bands positioned in contact with the sparsely wound sections of the wire.

Specifically it is aimed to provide a resistance element capable of introducing varying amounts of resistance in a power or any other radio circuit, which resistance element is characterized by the novel feature therein of low resistance sections adjacent high resistance sections, so that movable conductors resting on the low resistance section adjacent high resistance section, will allow for the introduction of a resistance in the circuit of exactly the amount calibrated as the value for the high resistance.

These and other advantages, capabilities, and features of the invention will appear from the subjoined detail description of one specific embodiment therefor illustrated in the accompanying drawings, in which,

Fig. 1 is a side elevation of the resistance element.

Fig. 2 is a view partly in section taken along lines 2—2 of Fig. 1.

Fig. 3 is a front view in section taken along lines 3—3 of Fig. 1.

Referring to the reference characters in the drawing, numeral 10 represents the core of the resistance element comprising of a non-insulating material such as porcelain or ceramic material, having a central aperture 11

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therein as shown in Fig. 2, but for the purpose of this invention, the core may be solid, if so desired.

Upon the core 10 there is adapted to be wound a length of wire, which wire terminates at opposite extremities of the core 10, being adapted to form a contact not shown with the contact rings 12 which have terminal posts 13 thereon for interconnection of the resistance element to the remaining parts of the radio circuit.

As shown in Fig. 3 this contact ring 12 is split at its upper extremity having its two portions 14 and 15 fastened by means of a bolt 16. Since the contact ring 12 is formed of flexible copper or brass plate, the contact ring may be adapted to be compressed or expanded with respect to the core element 10 or to the wire thereon by mere operation of the bolt 16 fastening the two portions 14 and 15 thereof, a loosening of the bolt being adapted to cause an expansion of the ring and to allow the said ring to be passed along the length of the core 10 to contact with the wire at any required portion thereof; the contact ring being of higher conductivity, naturally, the resistance of the wire will be that resistance only between any two of the contact rings.

As shown in Fig. 1 the resistance wire is wound alternately into densely wound sections 17 and very sparsely wound sections 18, it being the purpose of this invention to cause the contact rings to be positioned on the core only at the sparsely wound sections 18 thereof so that the small amount of resistance wire which contacts with the inner face of the contact ring 12 will be infinitely small and negligible in comparison to the resistance introduced upon passage of current through the dense winding of the sections 17.

Since the contact ring 12 is narrower than the sparsely wound resistance section 18, the ring will never contact with any of the windings of the densely wound section 17, and the resistance which will be obtained between any two contact rings positioned in the sparsely wound sections, will be that of the densely wound sections therebetween.

As seen in Fig. 1 the respective densely wound sections 17 of resistance are of variable length, each section being sufficient for the introduction of the required resistance in the circuit, so that the contact rings will be usually placed in the sparsely wound sections 18 on opposite sides of a densely wound section 17, but it is obvious from the disclosure, that even if a still higher resistance were required, and the two contact rings should be placed at opposite sides of a series of two or more of the densely wound resistances as shown in Fig. 1, the resistance resulting from the sparsely wound sections will be so small in comparison with that introduced by the densely wound sections, that the required resistance can be considered to be that of the

densely wound sections alone, the deviations caused by the introduction of the resistance of the sparsely wound portions being practically negligible in these cases.

In Fig. 3 there is clearly indicated the use of the device wherein a plurality of rings 12 and 12' are positioned in the sparsely wound sections 19 on opposite sides of a densely wound section 20, the resistance of the sparsely wound sections being negligible, in fact, approaching zero, while the fact that the extremities of the conducting rings 12 and 12' are positioned at a fraction of an inch from the extremities of the densely wound section 20, will allow for the introduction, upon passage of current therethrough, of the calibrated value of the resistance of the dense section 20.

Though the core element herein has been shown as a hollow cylinder, it is within the province of the invention to provide for shape or size of resistance element, as long as the wire is positioned in alternately densely wound and sparsely wound sections, and the conductor bands or rings are disposed within the sparsely wound sections.

It is obvious that various changes and modifications may be made to the details of construction without departing from the general spirit of the invention as set forth in the appended claims.

What I claim is:

1. A resistance element comprising a length of wire formed as a plurality of sections of sparsely wound and densely wound wire turns, contact rings slidable over said sections of wire and adapted to be positioned on the sparsely wound sections whereby the resistance formed by the passage of current from one contact ring through the resistance and through the second contact ring is that of the densely wound section.

2. A resistance element comprising a core having a continuous length of wire wound thereon, said wire being composed of a plurality of sparsely wound and densely wound sections alternately disposed along the length of the core and conductor members comprising movable bands slidable along said core over said wire and adapted to rest in the sparsely wound wire sections, whereby the resistance formed by the passage of current from one contact band through the resistance and through the second contact band is equal to the resistance of the densely wound section of wire.

3. A resistance element comprising an insulating core having wire wound thereon in alternately densely and sparsely wound sections, conductor bands surrounding said wire and movable along the core, said bands being adapted to rest and be in contact with the sparsely wound sections of the resistance wire whereby the resistance produced upon passage of current through said con-

ductor bands is equal to the resistance of the densely wound wire positioned between the conducting bands.

4. A resistance element comprising an insulating core having a length of resistance wire wound thereon in alternately densely and sparsely wound sections, the densely wound sections comprising a considerably greater amount of turns than the sparsely wound sections, conductors slidable over said wire along said core element and adapted to rest in the sparsely wound sections on opposite sides of a densely wound section, whereby the resistance introduced upon passage of current therethrough is equal to the resistance of the densely wound section.

5. A resistance element, comprising an insulated core, having a length of resistance wire wound thereon in alternate densely and sparsely wound sections, conductors slidable over said wire, along said core and adapted to rest in the sparsely wound sections, said densely wound sections of wire being of different lengths, whereby to introduce varying resistances between conductors positioned in the sparsely wound sections of wire.

6. A resistance element, comprising a length of wire, formed as a plurality of sections of alternate sparsely and densely wound series of turns of wire, conductor bands contacting with said sparsely wound turn series, the resistance of the sparsely wound turn series being negligible, said densely wound turn series being composed of different numbers of turns, whereby variation in the resistance of the element may be provided for by the displacement into different sparsely wound sections along the length of the element of the conductor bands.

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