

Jan. 8, 1935.

J. J. MUCHER

1,987,489

ELECTRICAL RESISTOR

Filed Feb. 8, 1934

Fig. 1.

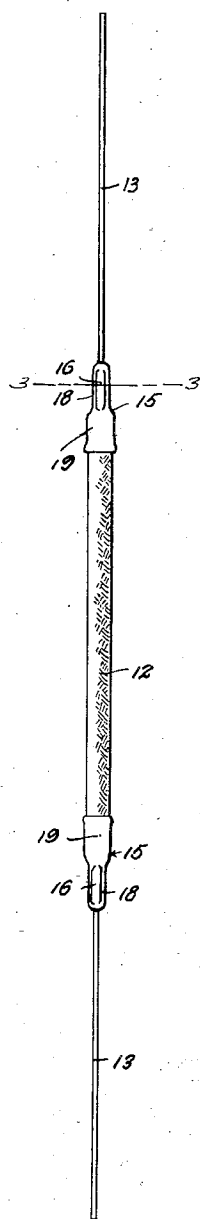


Fig. 2.

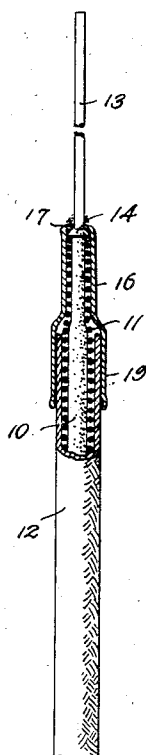


Fig. 4.

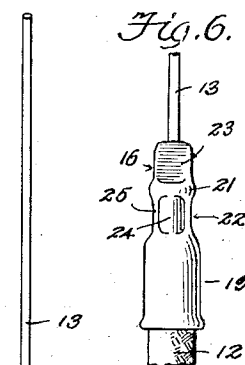


Fig. 6.

Fig. 7.

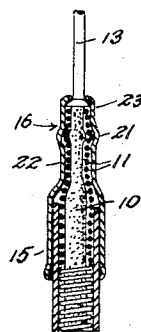


Fig. 3.

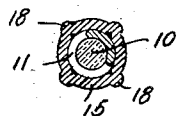
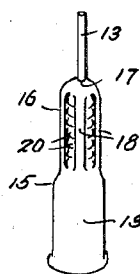


Fig. 5.



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1,987,489

ELECTRICAL RESISTOR

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Application February 8, 1934, Serial No. 710,298

2 Claims. (Cl. 201—63)

This invention has general relation to electrical resistors and while not necessarily restricted thereto, the invention is especially applicable to flexible resistors such as are used in radio receiving apparatus.

The invention broadly comprehends a resistor embodying an improved terminal and an attaching tip therefor which are constructed in such a manner as to effect a more positive and permanent connection between the terminal and resistance winding and core.

The invention further resides in a tip which is constructed so as to completely encase the end of the resistance element which precludes any possibility of loosening of the ends of the winding and protrusion of the same from the tip and avoiding short circuiting of the element.

The invention more particularly contemplates an electrical resistor including a terminal and a seamless conductor tubular tip for attaching the same to the resistance element, in which the terminal and tip are provided with interfitting means of connection which, after the securement of the tip to the resistance element, positively locks and anchors the terminal against separation of the tip and element.

The invention is further directed to an electrical resistor possessing a high resistance in relation to its length and size, which can be connected in a circuit or apparatus having a small available area between associated parts and which includes a seamless tubular tip encasing the ends of the resistance element so as to insure a firm electrical connection therewith and a constant resistance value, while protecting the ends of the resistor, and which tip is so constructed and secured to the resistor as to prevent accidental disengagement of the terminal with the resistance element.

With the above enumerated and other objects in view, reference is now made to the following specification and accompanying drawing in which there is disclosed a preferred embodiment of the invention, while the claims cover variations and modifications thereof which fall within the scope of the invention.

In the drawing:

Fig. 1 is a side view of an electrical resistor constructed in accordance with the invention.

Fig. 2 is an enlarged fragmentary longitudinal sectional view of one end of the resistor shown in Fig. 1.

Fig. 3 is an enlarged cross sectional view taken approximately on the line 3—3 of Fig. 1.

Fig. 4 is a side view of one of the terminal units.

Fig. 5 is an enlarged fragmentary perspective view of a modified form of the invention.

Fig. 6 is an enlarged fragmentary side view of still another modified form of the invention.

Fig. 7 is an enlarged fragmentary longitudinal sectional view of one end of the modified form of the resistor shown in Fig. 6.

Referring to the drawing by characters of reference, 10 designates the preferred flexible core of the resistor which is made of any suitable non-conducting or insulating material and while the same is disclosed herein as of circular shape in cross section, it may be of any other desired cross sectional configuration. A resistance wire or element 11 is continuously wound about the core, and a flexible casing or sheath 12 of insulating material covers or encases the winding and core, and terminates in spaced relation to the ends thereof to expose the opposite end portions of the resistance wire or element.

A terminal 13 is provided for each end of the resistor, each of which, in the present disclosure, being shown as a bendable wire having an enlarged head 14. A metallic tip or cap 15 is also provided which is open at its inner end and is provided with a constricted outer end portion 16 having an aperture 17 of a size to snugly fit over the terminal 13, but which aperture is small enough to prevent the passage of the headed end of the terminal therethrough. The outer end of the terminal 13 is first passed through the open inner end of the tip or cap 15 and then reaved through the aperture 17 of the outer end portion 16 thereof until the headed inner end 14 engages with said end portion to act as a stop. The tip or cap 15 is then telescopically fitted over the end of the core 10, resistance element or wiring 11 and casing or sheath 12 and the end portion 16 of the tip or cap which corresponds in length to the portion of the resistance element which is exposed from the sheath or casing 12 is then compressed inwardly to tightly grip and secure the tip or cap to the resistance element and core. The terminal 13 is further secured to the cap or tip by soldering the same at its point of emergence from the aperture 17. The terminal 13 is thus securely connected with the resistance element 11 and completely covers and encases the end of the element and core so as to avoid any possibility of short circuiting due to protrusion of the resistance element.

The tip or cap is constructed of seamless material so as to prevent splitting thereof, and preferably the compressions of the outer end portion 16 are effected in a manner to provide longitu-

dinal extending circumferentially spaced ribs 18 which lend strength to the structure and provide a positive and permanent gripping connection for the tip or cap with the resistance element and core. The innermost uncompressed portion 19 of the tip or cap overlies the end of the casing or sheath 12 so as to cover and protect the same. A definite and constant resistance value is thereby obtained which is determined by the length of the resistance element between the connections established by the innermost ends of the compressed portions 16 of the tips or caps at the opposite ends of the resistor.

In the modified form of the invention illustrated in Fig. 5, the end portion 16 of the tip or cap 15 is compressed upon the resistance winding and core so as to provide the flutes or crimps 20 between the ribs 18 which more securely hold the tip or cap upon the resistance winding and core.

In Figs. 6 and 7 illustrating another modified form of the invention, the end portion 16 of the cap 15 is compressed upon the resistance 11 in a manner to provide a medial annular expanded area 21 which is designed to receive a portion of the resistance and allows for bulging of the core caused by the compression of the areas 22 and 23 lying on opposite sides of the expanded area 21, the area 23 having flat faces and the area 22 having depressed curved faces 24 joined by outwardly expanded circumferentially spaced longitudinally extending ribs 25. The expanded area 21 being designed to receive a portion of the resistance, and allowing for bulging of the core

between the compressed areas 22 and 23, firmly anchors the cap to the winding and core.

What is claimed is:

1. An electrical resistor including a non-conductive core, a resistance winding thereon, a flexible terminal wire having an enlarged inner end, and a tubular metallic tip compressed over the end of the winding and core so as to provide longitudinally extending circumferentially spaced outwardly disposed ribs and depressed areas compressing the winding into the core to thereby effect a mutual bonding of the metallic tip, winding and core, said tip having an aperture at its outer end of less size than the enlarged end of the terminal wire, with the enlarged end thereof compressed within the end portion of the tip and the terminal wire protruding from the aperture and in circuit with the winding through the metallic tip.

2. An electrical resistor including a core of insulation material, a resistance winding thereon, a flexible terminal wire having a solid headed inner end and a tubular conductor tip having a portion compressed upon the end of the winding and the core and embedding the winding in the core to thereby effect a mutual bonding of the conductor tip, winding and core, and said tip being formed at its outer end with an aperture of less size than the headed end of the terminal wire with the headed end thereof compressed within the end portion of the tip and the terminal wire protruding from the aperture and in circuit with the winding through the conductor tip.

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