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WIRE WOUND RESISTOR

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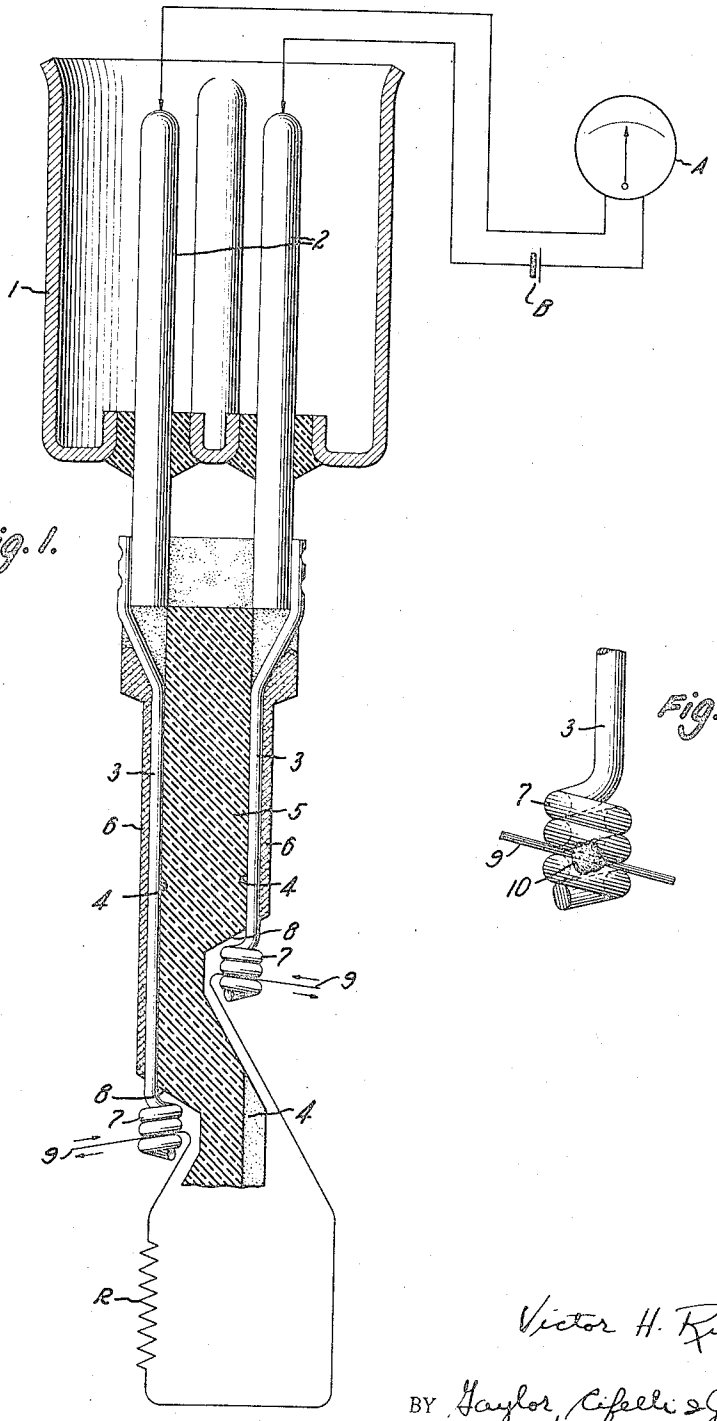


Fig. 1.

Fig. 2.

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WIRE WOUND RESISTOR

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3 Claims. (Cl. 201—63)

This invention relates to lead wires for and to processes of manufacturing wire-wound resistors.

It is frequently difficult to connect the lead wires to wire-wound resistors in such manner that the resistance included between the leads is accurately adjusted to a pre-selected value. High accuracy is essential, however, in the resistor elements of resistance boxes employed in measuring circuits and in the resistor bulbs employed for the electrical measurement of temperature.

An object of this invention is the provision of lead wires which facilitate the adjustment of wire-wound resistors to pre-selected values, and which afford a simple and novel process for the manufacture of precision-calibrated wire-wound resistors.

More specifically, an object of this invention is to provide lead wires which have, at the end thereof for connection to a wire-wound resistor, a resilient clamping loop through which the resistance wire may be drawn back and forth to adjust the measured resistance of the resistor to the pre-selected value, and then soldered or welded.

These and other objects and advantages of the invention will be apparent from the following specification when taken with the accompanying drawing in which:

Figure 1 is a fragmentary longitudinal sectional view of a resistor bulb having leads embodying the invention, and showing schematically the method of adjusting the resistance thereof to a selected standard value; and

Figure 2 is a fragmentary view, on an enlarged scale, of the clamp end of a lead wire with an end of the resistance wire soldered or welded thereto.

The invention will be described as incorporated in a resistor bulb of the type described and claimed in the co-pending application of Henry Voorman, Jr., Serial No. 388,098, filed October 26, 1953, now Patent No. 2,750,483, issued June 12, 1956, but the novel lead wires may be employed in the manufacture of other types of resistors.

In Figure 1 of the drawing, the reference numeral 1 identifies the pre-formed socket cup of a resistor bulb subassembly as described in the aforesaid pending application. A pair of terminals 2, 2 extend through and are insulated from the base of the cup 1, and the upper ends of lead wires 3 are soldered or welded to the lower ends of the terminals 2, as shown. The lead wires are secured in grooves 4 of a ceramic bushing 5 by cement 6, and they provide the mechanical support for the insulating bushing and for an anodized aluminum tube, not shown, which is secured thereto to support the bare resistance wire R.

The lower end of each lead wire 3 is formed as a close or tight helix 7, that is one in which there normally is engagement between adjacent turns, which is located in one of the transverse notches 8 of the ceramic bushing 5, and the end portions 9 of the resistance wire are forced between adjacent turns of the respective helical coils 7 of the lead wires.

The helical turns 7 yieldingly grip the wire ends 9 to establish a good electrical contact but do not prevent a sliding of the wire ends back and forth, as indicated by the arrows, with respect to the helical clamps.

Upon completion of the resistor bulb sub-assembly to the point indicated in Figure 1; namely, with the bare ends 9 of the resistance wire yieldingly clamped in the helical turns 7 of the lead wires 3, a measuring circuit, which is shown schematically as a battery B of known voltage and a sensitive ammeter A, is connected between the bulb terminals 2 and more or less of the resistance wire is pulled through one or both of the clamping loops until the correct resistance value is obtained. The ends of the resistance wire are then secured to the lead wires by solder or weld metal 10, see Figure 2, and any further insulation which is desired for the sub-assembly is applied before it is inserted into and secured in a mounting head.

When the resistor bulb or other resistor is wound from insulated wire, it is of course necessary to remove the insulation from such portions of the ends of the resistance wire as may be drawn through the coiled ends of the leads to adjust the measured resistance to the desired value.

Having now dscribed my invention in accordance with the patent statutes, what I desire to protect by Letters Patent of the United States is set forth in the following claims.

1 claim:

1. In the manufacture of a wire-wound resistor, the process which comprises coiling one end of each of a pair of lead wires for the resistor into a close helix of a plurality of turns, forcing uncoiled end portions of the resistance wire from one side to the other between a pair of adjacent turns of the helices of the respective lead wires so as to effect a resilient gripping engagement, measuring the resistance of the resistor included between said lead wires, adjusting by moving at least one of said end portions of the resistance wire with respect to the gripping turns to bring the measured resistance to a selected value, and securing the so-adjusted ends of the resistance wire to the lead wire helices both electrically and mechanically.

2. In the manufacture of a wire-wound resistor, the process which comprises coiling one end of each of a pair of lead wires for the resistor into a close helix of a plurality of turns, forcing uncoiled end portions of the resistance wire from one side to the other between a pair of adjacent turns of the helices of the respective lead wires so as to effect a resilient gripping engagement, measuring the resistance of the resistor included between said lead wires, and adjusting by moving at least one of said end portions of the resistance wire with respect to the gripping turns to bring the measured resistance to a selected value.

3. In a resistor bulb, a ceramic bushing formed with grooves leading to notches, a lead wire secured in each groove and terminating in a close helix of a plurality of turns received in the corresponding notch, and a winding of resistance wire with end portions respectively clamped between a pair of adjacent turns of said helices.

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