April 4, 1939. G. J. MUCHER 2,153,152

RESISTANCE

Filed May 29, 1937

Fig. 1

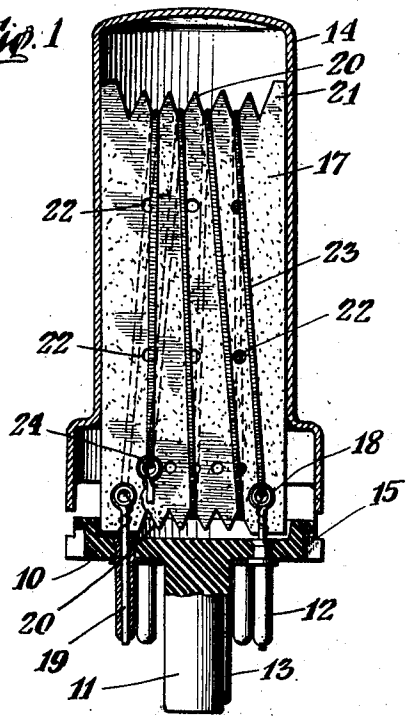


Fig. 2

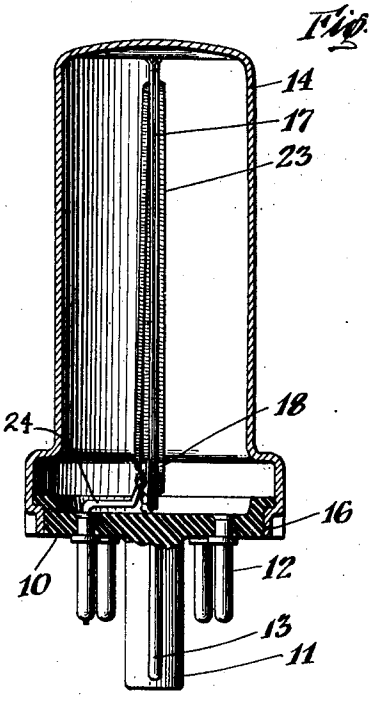


Fig. 3

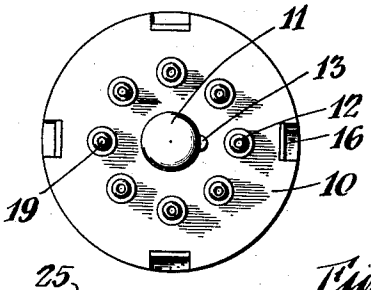


Fig. 4

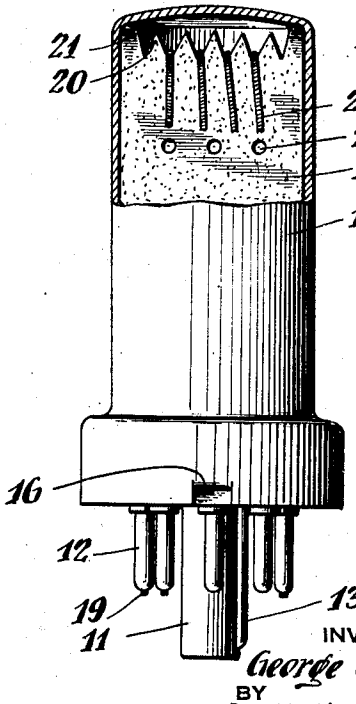


Fig. 6

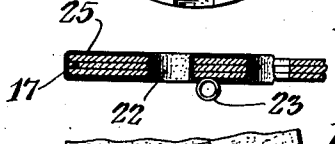
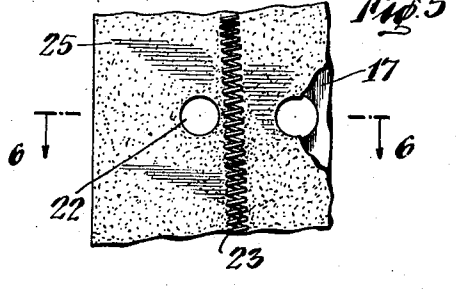


Fig. 5



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UNITED STATES PATENT OFFICE

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RESISTANCE

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Application May 29, 1937, Serial No. 145,410

4 Claims. (Cl. 201—67)

This invention relates to a structurally and functionally improved resistance capable of use in numerous different associations, but primarily intended to be employed in radio receiving and transmitting apparatus.

It is an object of the invention to furnish a resistance which will be of extremely compact and rugged character, such resistance being so supported that it is capable of being connected into or disconnected from a circuit.

A further object of the invention is that of providing a resistance which will not become overheated and in which, under no circumstances, will the terminals be detrimentally affected by heat.

Another object is that of providing a unitary resistance including any number of desired values.

An additional object is that of providing units of this character which may readily be manufactured largely by ordinary machines and methods and also by unskilled labor so that an extremely satisfactory device having a long period of effective use may be produced at nominal cost.

With these and other objects in mind, reference is had to the attached sheet of drawing illustrating one practical embodiment of the invention, and in which:

Fig. 1 is a sectional side view of the resistance showing the same in partly assembled condition;

Fig. 2 is a transverse sectional view taken through Fig. 1, but showing the parts in completely assembled condition;

Fig. 3 is a bottom plan view of the base of the unit;

Fig. 4 is a side elevation of the unit, showing certain of the parts broken away to disclose underlying construction;

Fig. 5 is an enlarged view of a fragment of the resistance mounting element, and

Fig. 6 is a transverse sectional view taken along the line 6—6 and in the direction of the arrows of Fig. 5.

In these views the numeral 10 indicates a base which is preferably in the form of a standard lamp base from which extends a centering plug 11 and an annular series of hollow terminal members 12. The plug 11 may have extending from its face a positioning rib or fin 13 which, in accordance with well known practice cooperates with the slot or notch in the socket receiving the base in order to properly position the parts.

A shell 14 of metal or other heat dissipating material is secured to the base preferably by having the latter notched and undercut at a plurality of points indicated at 15 and slitting the lower edge of case 14 to provide a plurality of locking tongues 16 extendable into these notches as best shown in Figs. 2 and 3.

Extending above the central portion of base 10 is a support 17 preferably comprising a thin body of mica or similar material. The mounting of this body is conveniently effected by having the same perforated adjacent its lower and outer edges so as to receive eyelets 18 or equivalent fastening elements by means of which it is firmly clamped to pins 19 of a diameter such that they may extend into the bores of the terminal members 12. The width of sheet 17 is equivalent to the internal diameter of shell 14. Its lower edge is preferably spaced from the upper face of base 10 and this lower edge, as well as the upper edge, is formed with notches 20. It is to be observed that in its upper edge the sheet 17 presents adjacent its side edges extended portions 21 which preferably project beyond the plane normally occupied by the inner end surface of the tube or shell 15 when the latter is completely mounted upon the base. Moreover, sheet 17 may be formed with openings 22 and a resistance wire 23 extends from end to end of the sheet and is maintained against displacement by resting within the notches.

The ends of this wire are coupled to the pins 19 which provide the mounting for sheet 17 and at this time it is to be noted that the resistance may be tapped at any number of desired points. One of these has been indicated in Figs. 1 and 2, it being noted that a pin 24 is coupled to the wire at this point, preferably by employing an eyelet such as 18 which extends through one of the openings 22, through which opening also wire 23 is passed. This wire additionally may be extended through the adjacent notch 20 so that the possibility of dislodgment is reduced to an utter minimum. Pin 24, as best shown in Fig. 2, is extended outwardly and downwardly into one of the terminal elements 12 in the manner previously described in connection with pin 19.

Thus, in this resistance three resistance values are present, to wit: (*a*) from the terminal in which one pin 19 is disposed to the terminal in which the second pin 19 is arranged, (*b*) from the left hand terminal 19 to the terminal with which pin 24 is associated, and (*c*) from the terminal with which the right hand pin 19 (as viewed in Fig. 1) is associated to the terminal within which pin 24 is disposed. It is, of course, to be appreciated that the resistance might be tapped at any number of additional points, but

this has not been shown with a view to avoiding undue complication of the illustration.

It is apparent that air may circulate within the tube or shell 14, around the ends of sheet 17. It may, moreover, circulate through openings 22, and in view of the heat dissipating character of tube 14, the temperatures will be always maintained well below any point at which damage might occur. As afore brought out, sheet 17 is firmly mounted by the pins which are attached thereto and incident to the fact that the width of this sheet is preferably equivalent to the diameter of the tube, no relative sidewise movement of the parts may occur. Moreover, as afore mentioned the portions 21 divide into such a plane that the tube, when fully mounted, will engage the upper edges of the same. This has a tendency to spread these upper edges as better indicated in Figs. 2 and 4, thus locking the sheet against further movement. The pins 19, 24, will of course be immovably secured with respect to the terminals within which they are disposed by utilizing solder, compressing these terminals, or otherwise.

Thus, an extremely unitary structure is presented and one in which the terminals are well below the source of heat. Consequently an accidental detachment of these terminals due to this cause is precluded. Moreover, being normally mounted in a vertical plane, there is little if any likelihood of the resistance coils breaking, even if the parts are subjected to a violent jarring action. However, to still further preclude the possibility of breaking, it will be observed, as in Figs. 5 and 6, that the surface of sheet 17 is preferably coated with a layer of cement, varnish, or other suitable material as indicated at 25, and coils 23 are applied while this material is still in a plastic or tacky condition. Consequently, each individual convolution of the coils will be somewhat embedded in the layer, thus anchoring the same against movement. Additionally, this layer will key through the openings 22 around the edges of notches 20, etc., and will serve as an envelope for sheet 17, preventing any deterioration thereof even under extreme conditions. This is especially desirable if the sheet is formed of mica in that substantially no disintegration or bulging of the parts will occur.

Thus, among others, the several objects of the invention as afore noted are achieved. It will be appreciated that numerous changes in construction and rearrangements of the parts might be resorted to without departing from the spirit of the invention as defined by the claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A resistance including a sheet of insulated material, a resistance wire encircling said sheet, a base, means connected to said wire and to said base for mounting said sheet, and a shell also mounted by said base and having an internal diameter substantially equivalent to the width of said sheet the side edges of said sheet having slidable contact with the inner face of said shell at diametrically oposite points within the same.

2. A resistance including a sheet of insulated material, a resistance wire encircling said sheet, a base, means connected to said wire and to said base for mounting said sheet, and a shell also mounted by said base, and projecting portions formed adjacent one of the ends of said sheet and extending into a plane beyond that normally occupied by said shell whereby said shell in being applied to said base will deformably engage said projecting portions to provide parts extending to both sides of said sheet and in bracing contact against the inner face of said shell.

3. A resistance including an insulating member, resistance wire disposed thereon, a base, means connected to said resistance wire and said base for mounting said insulating member, a shell for cooperation therewith, said shell being formed with a domed top portion, the height of said shell at its side edges being slightly less than that of said insulating member whereby the inner surface of said shell dome engages at its peripheral edges with the upper edge of said insulating member when said shell is positioned on said base and engages such insulating member in bracing contact.

4. A resistor including a flat insulating member, resistance wire carried thereby, a base, means connected to said wire and to said base for mounting said flat insulating member, a shell also mounted on said base, the inner surface of said shell deformably engaging portions of said flat insulating member and maintaining said flat insulating member in a fixed position within said shell.

GEORGE J. MUCHER.