March 10, 1931. H. F. GILL 1,796,199

RESISTANCE UNIT

Filed Feb. 26, 1929

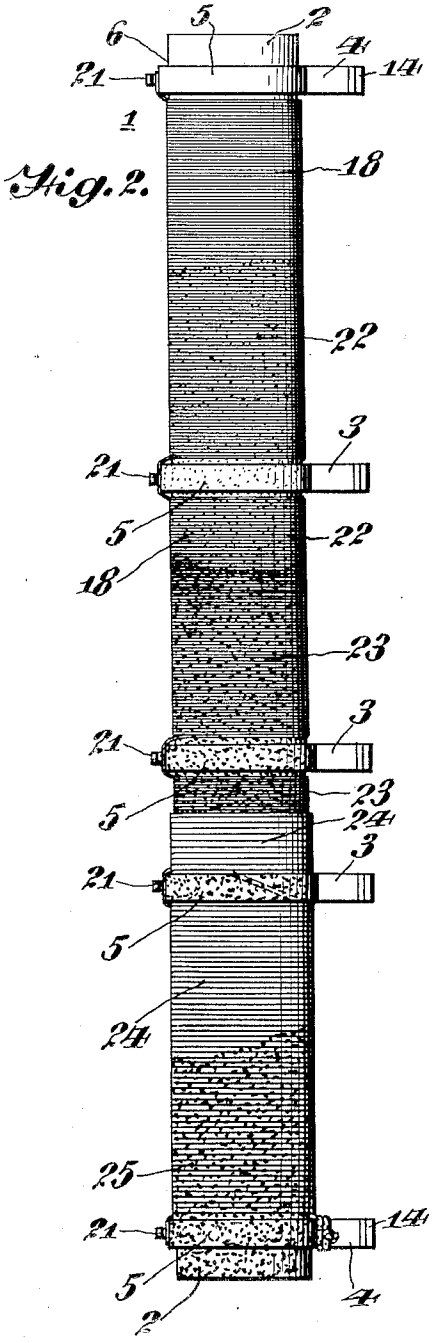

Fig. 2.

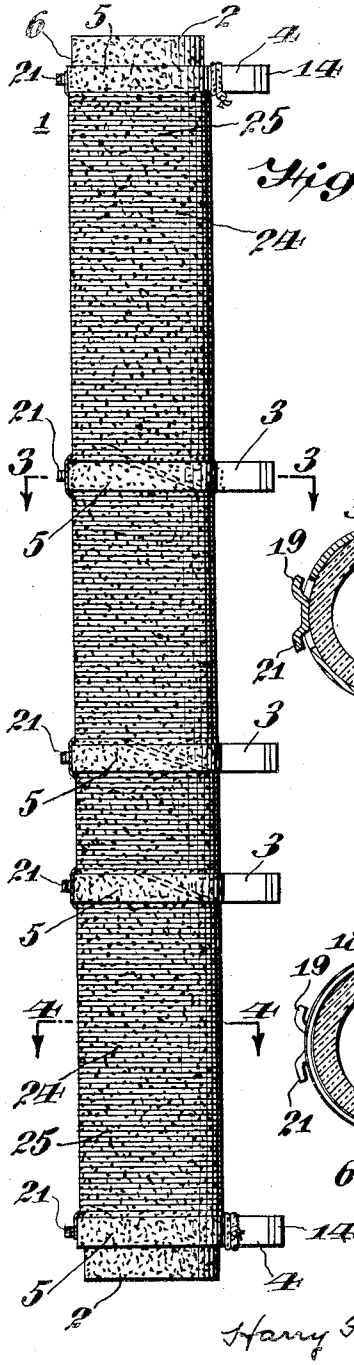

Fig. 1.

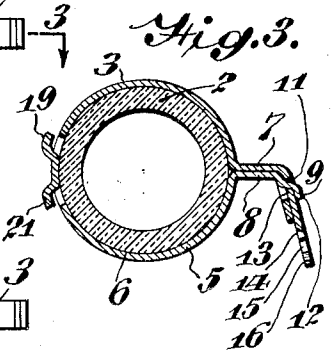

Fig. 3.

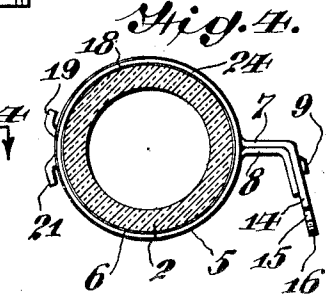

Fig. 4.

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Patented Mar. 10, 1931

1,796,199

UNITED STATES PATENT OFFICE

HARRY F. GILL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO WIRT COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF MAINE

RESISTANCE UNIT

Application filed February 26, 1929. Serial No. 342,881.

My invention relates to electrical devices and methods of manufacturing the same, and it has for one object the provision of a resistor particularly adapted for use in radio receivers that shall be characterized by its simplicity of design, ease of construction, and desirable operating characteristics.

Another object of my invention is to provide an electrical resistance device comprising an insulating member, a coil of wire mounted thereon, and a plurality of terminal connections connected at spaced intervals to the coil, said terminal connections being characterized by their low manufacturing cost, and by the ease with which they may be assembled in resistor units of the character described.

A further object of my invention is to provide means, whereby the exposed surface of a conductor may be protected in a simple and efficient manner,—my invention contemplating in particular the provision of a protective surface covering formed of an insulating thread.

A still further object of my invention is to provide electrical apparatus, comprising a coil of wire having an insulating surface coating, a protective covering for the surface coating formed of a thread of insulating material, and an exterior surface coating for said thread covering.

With these and other objects and applications in mind, my invention further consists in the details of construction, operation, and arrangements, hereinafter described and claimed and illustrated in the accompanying drawing, wherein

Fig. 1 is a side elevational view of a tapped resistor unit embodying my invention;

Fig. 2 is a view similar to Fig. 1, but showing certain portions of the resistor unit broken away; and

Figs. 3 and 4 are transverse sectional views taken on the lines 3—3 and 4—4, respectively, of Fig. 1.

Referring to the drawing, the tapped resistor unit 1 therein shown comprises a tubular core or support 2 of insulating material which is provided with intermediate and end terminal connections 3 and 4, respectively. Each of these terminal connections comprises a circular portion 5, which closely fits an outer side 6 of the insulating tube 2, and a pair of end portions 7 and 8.

The end portions 7 and 8 are fastened together by means of a struck-up tongue 9 which extends from the end portion 8 through a recess 11 in the end portion 7. As shown in Fig. 3, an end 12 of the tongue 9 is folded around and adjacent edge portion 13, so that the end portions 7 and 8 may be rigidly interlocked. One of the end portions 7, 8, say the former, is provided with an extension 14 having a slot 15 which extends inwardly from one edge thereof, whereby a hook 16 may be formed. Thus, a lead wire (not shown) may be readily secured to the terminal connection merely by being wound or looped around the hook 16.

A wire coil 18 is wound around the insulating tube 2, and it is connected at intervals to the terminal connections by being looped around a pair of oppositely extending hooks 19 and 21. As illustrated in Fig. 3 the hooks 19 and 21 are formed in the curved portion 5 of the terminal connections by pressing outwardly adjacent portions thereof, preferably during the stamping operation.

The outer surface of the wire coil 18, the terminal connections 3 and 4, and the exposed portion of the insulating tube 2 are covered first with a suitable insulating coating 22 and then with a coating 23 consisting largely of an asphaltic material. Since the coating 23 is very brittle, it frequently happens that the resistors are rendered useless by reason of the chipping of the coating 23 from the wires, thereby permitting the short-circuiting thereof. This difficulty is overcome in my invention by providing an insulating protective covering for the wire coil 18 and the brittle coating 23, which prevents injury to the coating 23, as well as the wire coil 18, in the event, for example, that a person handling the resistor unit 1 should strike the same with a tool or other sharp object.

The insulating protective covering, in accordance with my invention, is formed by winding a fine thread 24 of cotton or other in-

sulating material spirally over the wire coating 23, as shown in Fig. 2. Such covering may be readily applied to the resistor unit 1 with a minimum expenditure of time and of money, and affords maximum protection. Preferably, the thread covering is provided with a coating 25 of suitable insulation material, such as asphaltic material.

In practice, the method of manufacture involves first the formation of the terminal connections 3 and 4, and then the mounting of these connections on the tubular member 2. The wire coil 18 is next wound on the tube 2 and connected at intervals to the terminal connections 3 and 4. The whole is now placed in a bath of suitable insulating material such as asphaltic material so as to insulate the coils of wire from one another and effectively secure the same in position, whereupon the asphalt coating 23 is applied.

In accordance with my invention, the next step consists in winding the thread of cotton or other insulating material around the coating 23, as shown in Fig. 1, in order to form the thread covering, whereupon the unit is again dipped in a bath of asphaltic material, to form the outside protective coating 25. The final product represents a resistor unit which may be subjected to rough handling, such as frequently occurs in course of transit, with substantially no danger of injuring the inner protective coating 23 or causing the short-circuiting of the turns of the wire coil 18.

While I have shown only one form of embodiment of my invention, for the purpose of describing the same and illustrating its principles of construction and operation, it is apparent that various changes and modifications may be made therein, without departing from the spirit of my invention.

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

1. An electrical resistance device comprising a support of insulating material, a conducting wire wound helically around said support, the adjoining helixes of the said wire being insulated from each other, a coating of asphaltic material overlying the said helically wound wire, a string of fibrous material helically coiled around the said coating, and a protective coating of asphaltic material overlying the said helically coiled string.

2. An electrical resistance device comprising a tubular support of insulating material, an electric conducting wire helically coiled around the said support, the adjoining helixes of the said wire being insulated from each other, an insulating fibrous material overlying the said helically coiled conducting wire, and asphaltic material impregnating and overlying the said fibrous material.

3. An electrical resistance device comprising, in combination, a support of insulating material, a wire helically coiled around the said support, the adjoining helixes of which are out of contact with each other and are protected from each other by insulating material, a cotton string helically coiled around the said support and overlying the said wire, and a protective asphaltic material overlying the said helically coiled cotton string.

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 23d day of February A. D. 1929.

HARRY F. GILL.