Oct. 17, 1933. F. FREYMAN 1,930,932

RESISTANCE UNIT

Filed Aug. 29, 1930

Fig. 1.

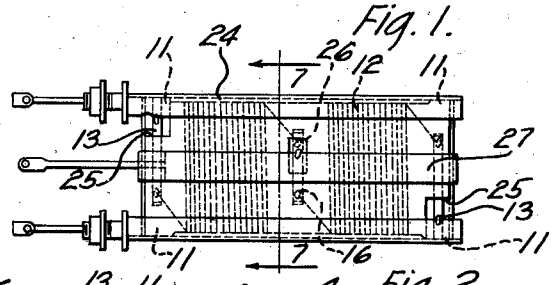


Fig. 3.

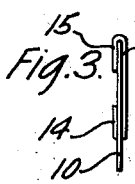


Fig. 2.

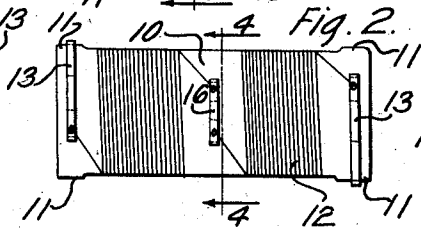


Fig. 4.

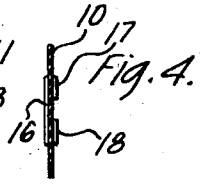


Fig. 5.

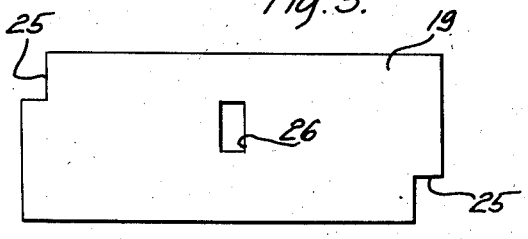


Fig. 6.

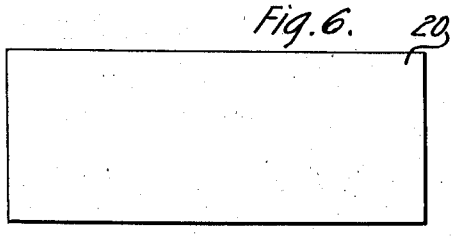
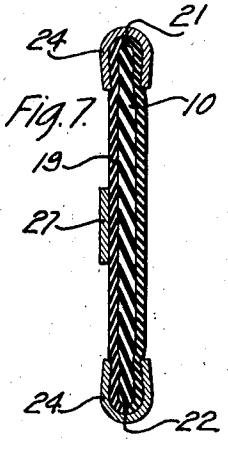


Fig. 7.



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UNITED STATES PATENT OFFICE

1,930,932

RESISTANCE UNIT

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Application August 29, 1930. Serial No. 478,649

3 Claims. (Cl. 201—64)

This invention relates to resistance units, and more particularly to resistance units which are provided with flat rectangular cores.

Heretofore in the manufacture of a certain flat type of resistance unit used in telephone systems, the resistance wire wound on a core has been connected to the binding posts secured to the lateral edges of the core by means of intermediate stranded terminal wires which have been threaded into apertures of the core and connected to the ends of the resistance wire by twisting, splicing, and finally trimming the connection.

The primary object of this invention is to provide a resistance unit of simple, durable, and inexpensive construction.

In accordance with this object, one embodiment of the invention comprises a resistance unit consisting of a flat core of partially cured phenolized insulating material, preferably phenolized asbestos, which is notched at its lateral edges to provide four corner stop lugs between which the resistance wire is wound. The ends of this resistance wire are soldered to spaced, flat terminal clips which are clamped in apertured portions of the core. Both sides of the wound core are covered with sheets of phenolized asbestos slightly wider than the core which do not require preheating for their application, and binding posts are clamped over both lateral edges of the core and covers at the same time that the opposite flat sides of the unit are subjected to pressure and the unit is heated to bake and cure the phenolic condensation product. The notches on the lateral edges of the core between the stop lugs afford space into which the phenolized material flows for properly insulating the turns of resistance wire from each other and from the lateral binding posts. The flat terminal clips are attached to the binding posts by soldering.

These and other objects of the invention will appear from the following description of one specific embodiment thereof as illustrated in the accompanying drawing, wherein

Fig. 1 is a side view of the completed resistance unit;

Fig. 2 is a side view of the core thereof;

Fig. 3 is an end view of the core showing the left end terminal clip clamped thereto;

Fig. 4 is a central cross-section view of the core taken on the line 4—4 of Fig. 3, and showing a central terminal clip clamped around this portion;

Fig. 5 is a side view of the phenolized asbestos sheet used to cover the front side of the resistance unit as viewed in Fig. 1;

Fig. 6 is a side view of a sheet of similar material used to cover the rear side of the unit, and

Fig. 7 is a central cross sectional view of the finished unit taken on the line 7—7 of Fig. 1 to show the abutting of the lateral edges of these cover sheets against each other underneath the binding posts clamped thereover.

Referring now to the drawing in which like reference numerals designate similar parts throughout the several views, the contemplated resistance unit includes a flat rectangular core 10 consisting of partially cured phenolized insulating material, preferably phenolized asbestos, and this core is notched at its lateral edges to provide four corner stop lugs 11—11. The resistance wire 12 is wound around the core 10 between the stop lugs 11—11 in a single layer of separated, helical turns in order that the turns may not contact and short circuit each other, and in the case of the particular resistance unit disclosed, the resistance wire 12 is not wound over the central portion of the core 10, but the wire terminates at that point for making an external connection. Of course it will be understood that so far as the invention is concerned connections may be made at various points along the core 10; that is, the wire may be wound into various numbers of sections.

This wire 12 is terminated at each end of the core 10 by soldering ends of the wire to a pair of similar flat terminal strips or clips 13—13 which are clamped to the core. As shown in Fig. 3, the clips 13—13 are clamped to the core by inserting one end 14 of each of the clips through apertures in the core and then bending these ends against the flat surface of the core. The opposite ends 15 are simply bent around the edge of the core and against the flat surface thereof. Both of the clips 13 are similarly clamped in position, except that in the illustration the right end clip 13 is shown attached to the lower edge of the core whereas the left hand clip 13 is secured to the top edge of the core. It is not important to the invention which edge of the core the clips are attached to or in what relative direction their ends are bent, the essential feature being that these clamping clips 13 are readily clinched to the core and it is a simple matter to connect the ends of the resistance wire 12 thereto, since the resistance ends are simply soldered to the clips.

A central clip 16, similar to the clips 13—13

is shown secured to the center of the core 10, the clip being shown attached to the core in this instance simply by inserting both ends 17 and 18 of the clip, as shown in Fig. 4, through spaced apertures in the core and then bending or clamping these ends down against one flat surface of the core. The inner ends of the resistance wire 12 are shown soldered to the two ends of the clip 16.

After the clips have been secured in the aforementioned manner the wound core 10 is covered on each side by partially cured phenolized covers or sheets 19 and 20 of insulating material, which may be phenolized asbestos the same as the core 10. The sheets 19 and 20 are of about the same thickness as the core 10 but, as shown in Fig. 7, their width slightly exceeds that of the core so that the lateral edges of these sheets somewhat overlap the edges of the core in order that the edges of the sheets just abut against each other, as shown at 21 and 22. By using sheets of such a width just exceeding the width of the core, the sheets do not have to be preheated before they are applied to the core as has heretofore been the practice in some instances. In the next step of the manufacture of the unit after the core is covered with the sheets, a pair of binding posts 24—24 are inserted over the lateral edges of the assembled core 10 covered with the sheets 19 and 20, and pressure plates (not shown), slightly narrower than the width of the resistance unit, are placed against and applied to both flat surfaces of the unit. The unit is heated to bake and cure it, and said pressure plates simultaneously clinch the inner edges of binding posts 24—24 to the insulating material, as shown in Fig. 7. This pressing and baking of the assembled unit converts the phenolized covers 19 and 20 and the core 10 into a homogeneous structure which encloses and embeds resistance wire 12, and the recess or notch on each lateral edge of the core 10 between the stop lugs 11—11 becomes filled with phenolized material to insulate thoroughly and completely the binding posts 24—24 from the resistance wire and the turns of resistance wire from each other.

Corner portions of the sheet 19 are cut out as shown at 25—25 to provide spaces for a contact between the terminal clips 13—13 and the binding posts 24—24 where the adjacent terminal clips and binding posts may be soldered to each other, as shown in Fig. 1. A central aperture 26 is provided in the sheet 19 when the central terminal clip 26 is used, and a central binding post 27 (Fig. 1) is, as the last step of the manufacture, clamped at its ends to the ends of the assembly and soldered to the central terminal clip 16. The binding post 27 is secured in position simply by bending clamping portions at its ends around the ends of the covers 19 and 20 and core 10. If labels are to be attached to the covers 19 and 20, the preferable method is to glue them thereto while the covers are still in strip form before the covers are assembled in the unit. This then completes the manufacture and provides an assembled unit as shown in Fig. 1.

Although phenolized asbestos is preferably used as the material for the core and covering sheets, since the asbestos gives the unit sufficient body and strength and is incombustible, and such phenolized material has a sufficiently high melting point to resist heat in service and at the same time may be cooled sufficiently rapidly to make the manufacture commercial, it will be noted that other fibrous materials may be employed which are impregnated with suitable materials, such as varnish, shellac, natural or artificial resins, and so on, without departing from the spirit and scope of the present invention.

It will also be noted that the notch or recess located in each edge of the core 10 between the end stop lugs 11 (Fig. 2) allows sufficient melted phenolized material to flow therein to adequately insulate the turns of the insulating wire 12 extending around the edges of the core from each other, and also to fully insulate these portions of the resistance wire from the lateral binding posts 24—24. It will also be remembered that the flat terminal clips 13—13 and 16 are readily clinched to the core 10 and provide a simple means for terminating the resistance wire. Furthermore it will be noted that the phenolized sheets 19 and 20 which are slightly wider than the core 10 do not have to be preheated to be applied. It is therefore believed to be apparent that the invention produces a simple and efficient resistance unit.

It will of course be understood that the invention is not limited to the specific embodiment herein illustrated and described, but is limited only by the scope of the appended claims.

What is claimed is:

1. A resistance unit comprising a flat rectangular core of phenolized insulating material, resistance wire wound on the flat core, flat terminal clips clamped about spaced apertured portions of the core and connected to the ends of the resistance wire, a pair of phenolized insulating covers for the wound core having their lateral edges just abutting each other at the lateral edges of the core, and a pair of binding posts clamped and secured over the abutting edges of the covers, and secured to the terminal clips.

2. A resistance unit comprising a core, a resistance element wound on the core, a clip on each end of said core, an insulating sheet on each face of said core, one of said sheets having windows overlying said clips, binding posts clamped over the lateral edges of said sheets, and a connection extending through said windows between each of said clips and one of said binding posts.

3. A resistance unit comprising a flat core of insulating material, resistance wire wound thereon, a pair of insulating covers for the wound core having their lateral edges abutting along the sides of the core, and a pair of binding posts clamped over the abutting edges of the covers and electrically connected to the resistance wire.

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