June 17, 1958 R. E. DU BOIS 2,839,648

RESISTOR MOUNTING STRUCTURE

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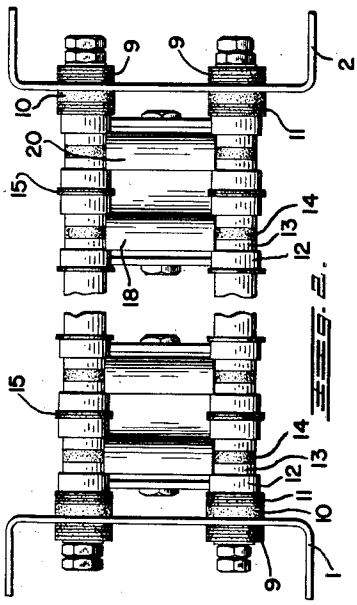


FIG. 2.

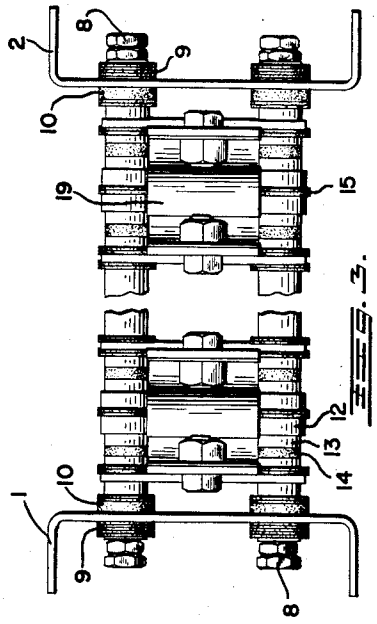


FIG. 3.

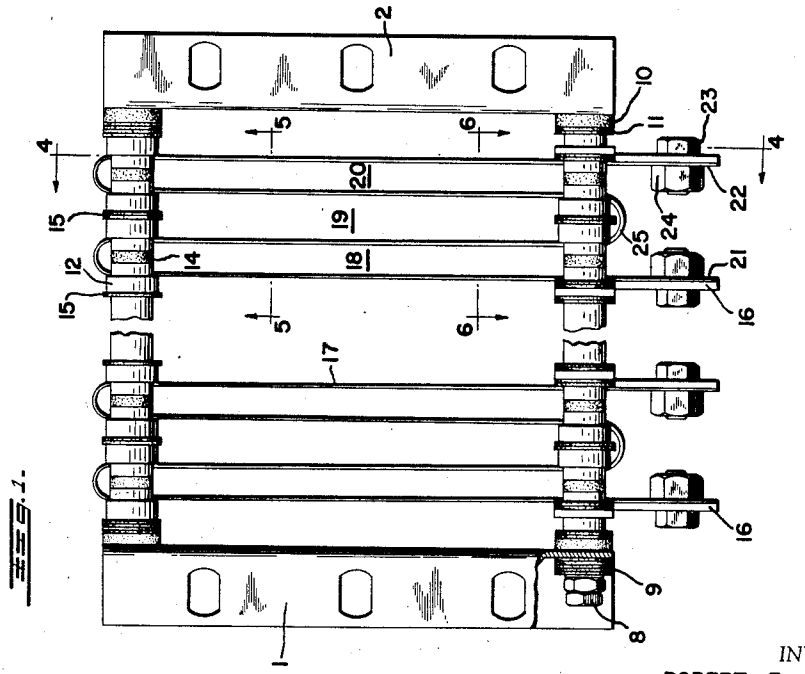


FIG. 4.

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FIG. 3.

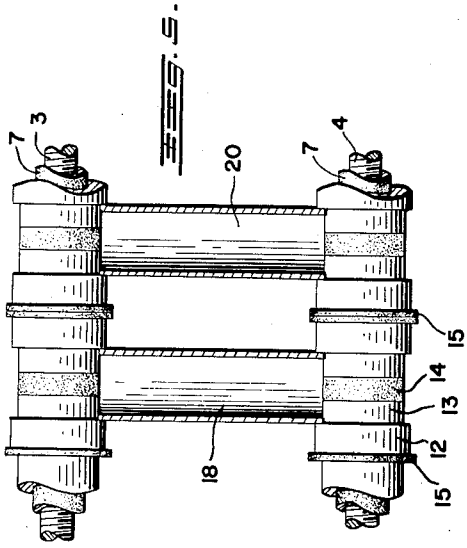


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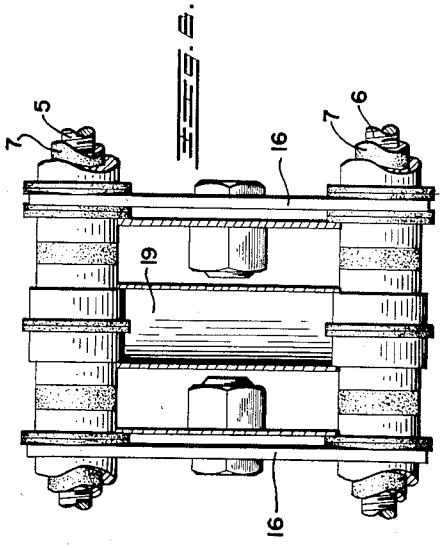
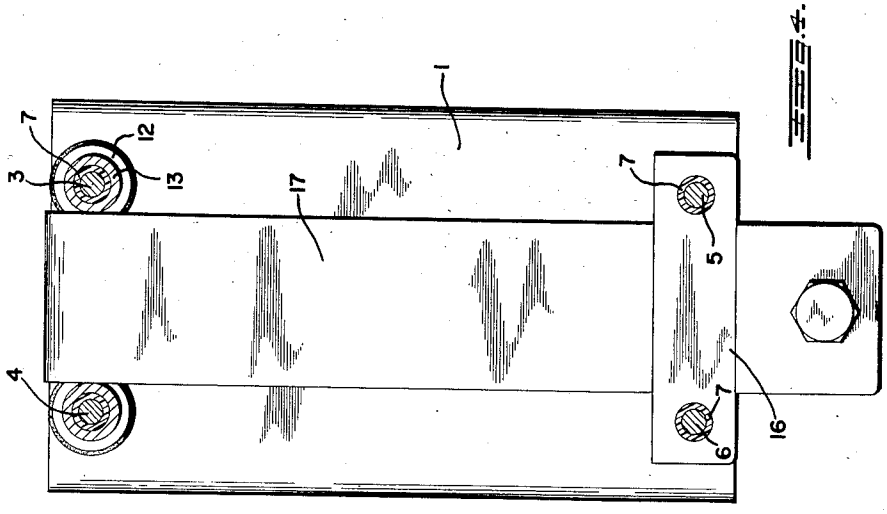


FIG. 4.



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RESISTOR MOUNTING STRUCTURE

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Application July 5, 1956, Serial No. 596,058

4 Claims. (Cl. 201—69)

This invention relates generally to electrical resistance units and more particularly to mounting structures, such structures for zig-zag strap resistances.

The primary object of this invention is to provide a mounting structure for zig-zag resistances which will permit ready insertion and removal of individual units of the resistance into and from the mount.

Another object of this invention is to provide a zig-zag resistance mounting structure which will permit expansion and contraction of the resistance without warping under varying temperature conditions.

A further object of this invention is to provide a zig-zag resistor mounting structure which will readily support resistance units of the same width but of varying other dimensions so that the entire structure may be readily set up to provide varying preselected electrical resistance values.

With the foregoing and other objects in view, the invention resides in the following specification and appended claims certain embodiments and details of construction of which are illustrated in the accompanying drawings of which:

Figure 1 is a view in front elevation of the resistor structure;

Figure 2 is a top plan view of the resistor structure;

Figure 3 is a bottom plan view of the resistor structure;

Figure 4 is a side elevational view taken along the lines 4—4 of Figure 1;

Figure 5 is a partial view in section taken along the lines 5—5 of Figure 1, and

Figure 6 is a partial view in section taken along the lines 6—6 of Figure 1.

Referring now more particularly to the drawings, the resistor mounting structure is illustrated as having frame members 1 and 2 connected together at the top and bottom in spaced relationship by bolts 3, 4, 5 and 6. Surrounding each bolt is a sleeve 7 of insulating material. The bolts extend through the frame members 1 and 2 and the protruding portions thereof are provided with nuts 8 to secure the structure together. Between the nuts 8 and frame members are insulating washers 9. Positioned on the bolts 3, 4, 5 and 6, immediately inwardly of the frame members 1 and 2 are spacing washers 10 and insulating washers 11.

Positioned along each bolt between the washers 11 is a series of identical resistance carrying sections. Each such section includes a pair of metallic mounting bushings 12 having reduced diameter sections 13 facing each other. Each such pair of bushings 12 is separated one from the other by an insulating washer 14. Between the bushings of each such section an insulating washer 15 is provided.

As may be best seen in Figures 1, 4 and 6, the lower bolts 5 and 6 also carry terminals 16. The terminals 16 serve two functions. They provide selective connecting points for circuits in which the resistor might be utilized and they also serve to removably support zig-zag strap

resistors 17 within the frame structure defined by the members 1 and 2 and their connecting bolts. Depending upon the overall resistance required, the structure may be made up of any given number of zig-zag resistor units 17. Viewing Figure 1 it is to be noted that each resistor unit 17 includes a single continuous strap of resistance metal formed into three reversely curved loop portions 18, 19 and 20, with terminus attaching ends 21 and 22. The ends 21 and 22 are secured to terminals 16 by bolts 23 with nuts 24. Adjacent resistors 17 are coupled together (not shown) at the terminals 16 to provide electrical continuity from one end of the structure to the other.

With special reference to Figures 2, 3, 5 and 6, it will be noted that loop 18 of resistor 17 is slidably carried on the facing reduced diameter portions 13 of bushings 12. The loop 18 is thus restrained from moving in any direction except longitudinally of itself when it expands and contracts under temperature changes when in use. Loop 20, of resistor 17, is carried similarly to loop 18. Loop 19, however, is carried at the bottom of the structure on the oppositely directed reduced diameter portions of bushings 12. The extremity 25 of loop 19 actually extends around the major diameter portions of the abutting bushings 12.

Assembly and disassembly of the structure is quite simple. The basic mounting members including the members 1 and 2, and the connecting bolts therefor, together with their spacers, washers, bushings and terminals are shown to construct a resistance for a particular application. The mounting frame is completely assembled. Resistors 17 are then slid into position along the undercut sections 13 of bushings 12. The ends 21 and 22 of the resistors are then secured to terminals 16 by bolts 23. Removal is equally as simple and obvious.

Since the resistors 17 are secured only at the terminals 16 the individual loops, thereof, 18, 19 and 20, are free to expand to prevent warping or buckling under high heating conditions.

The construction has a particularly advantageous electrical feature in that the resistor strap material may be cut to precise lengths, bent into the three loop unit form, and then be inserted into the standardized frame. In this manner the exact resistance value between terminals in the structure may be preselected accurately without waste of material, while the same frame will lend itself to usage with resistors of variable physical dimensions. As illustrated, the frame is only adapted to resistors of a single width, but it is quite obvious that by providing additional holes in frame members 1 and 2, the spacing of the bolts 3, 4, 5, and 6 could be varied to suit other widths of resistance strap material.

It is readily obvious to one skilled in the art that the structural details of this invention may be materially modified; all such structural modifications being well within the purview of the inventor, and in the following appended claims.

I claim:

1. A resistor structure comprising frame members, means interconnecting said frame members and holding them in rigid spaced relationship, terminal means carried by certain of said interconnecting means, resistor means abutting said interconnecting means, said resistor means being constrained to move longitudinally of itself by said interconnecting means, and means to removably secure said resistor means to the structure only at said terminal means.

2. A resistor structure comprising frame members, means interconnecting said frame members and holding them in rigid spaced relationship, terminal means carried by certain of said interconnecting means, a zig-zag re-

sistor formed of a strap of resistance material bent into a plurality of adjacent loops, said loops abutting said interconnecting means and being in free sliding relationship therewith and being constrained to move only longitudinally of the said loops of the resistor by said interconnecting means, and means to removably secure said resistor means to the structure only at said terminal means.

3. A resistor structure comprising a pair of frame members, insulated bolt means interconnecting said frame members and holding them in rigid spaced relationship, bushings mounted on said bolt means, said bushing having portions of reduced diameter facing each other, terminal means carried by certain of said bolt means, a zig-zag resistor formed of a strap of resistance material bent into a plurality of adjacent loops, said loops abutting said reduced diameter portions of said bushings, being in free sliding relationship therewith, and being constrained to move only longitudinally of the said loops of the resistor by said bushing means, and means to removably secure said resistor means to the structure only at said terminal means.

4. A resistor structure comprising a pair of frame members, two pairs of insulated bolt means interconnecting

said frame members and holding them in rigid spaced relationship, bushings mounted on said bolt means, said bushings having portions of reduced diameter facing each other, terminal means carried by one pair of said bolt means, a zig-zag resistor formed of a strap of resistance material bent into a plurality of adjacent loops, said loops abutting said reduced diameter portions of said bushings on each pair of said bolt means, being in free sliding relationship therewith and being constrained to move only longitudinally of the said loops of the resistor by said bushing means, and means to removably secure said resistor means to the structure only at said terminal means.

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