

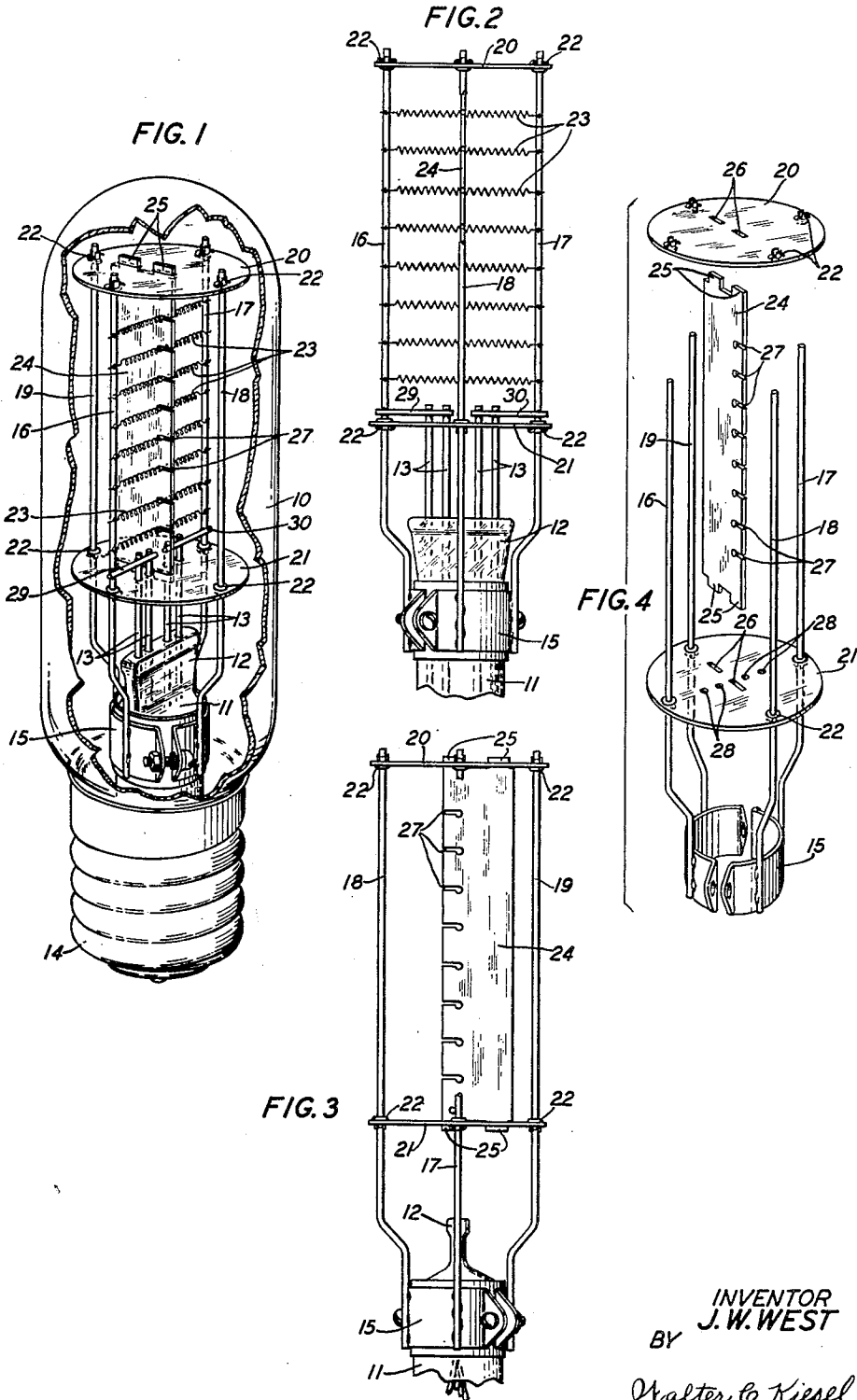
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RESISTANCE DEVICE

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RESISTANCE DEVICE

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This invention relates to resistance devices and more particularly to high current controlling devices.

In many electrical speech transmission systems involving apparatus supplied with electrical energy either from a battery source or a direct current or alternating current power line, it is essential to regulate the current supply in order that fluctuations in the source will not materially affect the operating characteristics of the apparatus. It is common practice to introduce a resistance device or ballast resistance in the operating circuit to maintain the current constant regardless of the voltage variations within a certain range. It is desirable in certain installations that the current capacity of the apparatus be maintained at a uniformly high level to satisfy exacting operating conditions.

An object of this invention is to facilitate the assembly of a resistance device for maintaining constant current regulation of high capacity within a definite voltage range.

Another object of the invention is to prevent distortion of the multiple elements in a resistance device of high current capacity.

A further object of the invention is to insure accurate alignment of the multiple elements by an efficient mounting assembly of low cost.

In accordance with one aspect of the invention, the resistance device comprises an enclosing vessel and a mounting assembly for supporting a plurality of parallel filament sections or strands therein. The mounting assembly includes a plurality of frame supports secured to the vessel which carry a pair of spaced insulating discs between which the multiple strands of expansible filaments are arranged and secured to the frame supports.

Since the device may be mounted in various positions, it is desirable that the expansible filaments are not subjected to undue distortion caused by expansion and contraction under operating conditions. This is avoided in accordance with this invention by supplementing the main supports of the filaments with an intermediate spacer which maintains the filaments in uniform relation and insures accurate alignment of the filaments by limiting the lateral movement of the strands.

In accordance with a specific aspect of the invention the intermediate spacer of the mount comprises a vertical mica strip having a serrated edge to space the strands in parallel relation and the strip is locked in position between the end discs of the mounting frame by end projections seated in cooperating slots in the discs, to insure a low cost assembly. This arrangement forms a rigid mount for the filament sections and facilitates the manufacture of an efficient low cost unit for mass production.

These and other features of the invention will be more clearly understood by referring to the following detailed description and the accompanying drawing:

Fig. 1 is a perspective view of a complete device made in accordance with this invention with a portion of the enclosing vessel broken away to show the internal structure;

Fig. 2 is a view in elevation of the mount of this invention supported on a stem;

Fig. 3 is a side view of the mount of Fig. 2; and

Fig. 4 is an exploded view in perspective of the mount showing the details of construction.

Referring to the drawing and Fig. 1 particularly, the resistance device of this invention is embodied in an evacuated glass enclosing vessel of elongated form having an inwardly projecting stem 11 terminating in a press 12. A plurality of leading-in wires 13 are sealed in the press and are connected externally to an Edison type base 14 secured to the stem and of the vessel. A metallic collar 15, formed of two sections, is clamped securely to the stem 11 and carries a plurality of upright frame members or wires 16, 17, 18, and 19 which are arranged in spaced relation with the wires 16 and 17 in one plane and the wires 18 and 19 in a plane at right angles thereto. These support wires are braced and held in their specified relation by transverse spacer discs 20 and 21, preferably of mica, although other suitable insulating materials may be employed for this purpose. The discs are secured to the supports by metallic eyelets 22 which are crimped to the discs and welded to the wires. The disc 20 is attached to the wires at their uppermost ends, while the disc 21 is attached to the wires adjacent the press 12. This arrangement forms a rigid frame structure which is capable of withstanding vibrations or shocks which might cause breakage of the assembly or the enclosing vessel.

A plurality of parallel expansible filament sections or strands 23 are strung between the support wires 16 and 17. These sections, preferably formed of spiral tungsten for a lamp of high current capacity, are arranged between the end spacer discs 20 and 21 and extend diametrically across the axis of the device in a plane coincident with the support wires 16 and 17. As shown in the drawing a number of the filaments 23 are provided to obtain the required capacity rating for the desired device. Of course, the specific number of filament sections shown are not essential to the general aspects of this invention. Since the expansible filament sections 23 are quite brittle when cold and are easily distorted when heated to their operating temperature, it is desirable to offset these defects in order to secure a long life for the lamp and freedom from me-

chanical difficulties due to breakage of the filaments and electrical defects, such as short circuits caused by distortion of the strands.

In accordance with this invention, the parallel filament sections are supported at the center by a vertical spacer 24, formed of metal or insulating material, such as mica, which is locked in offset position between the end mica discs 20 and 21 by projections 25 on the ends of the strips, which are seated in slots 26 in the discs 20 and 21. The mica strip 24 is also provided with a serrated edge in the form of slots 27 which receive the center portions of the filament sections 23, the spiral filament being seated in the enlarged ridge at the end of the slots. This arrangement rigidly supports the center portion of the filament sections and holds the sections in lateral relation so that distortion or sagging is prevented.

The lower disc 21 is provided with a plurality of apertures 28 through which the leading-in wires 16 extend so that their ends are above the disc 21. The pairs of wires on opposite sides of the vertical spacer 24 are then connected to the frame supports 16 and 17 by bridging wires 29 and 30, respectively. This arrangement connects all the filament sections in parallel to obtain a high capacity current rating for the device. The separate pairs of leading-in wires are connected to the respective terminals on the base 14 as previously described.

The construction forms a compact mount in which the upright frame wires are rigidly assembled and held in spaced relation by the end mica discs and the vertical spacer 24 is rigidly locked in position between the end discs to provide a mount which may be easily assembled as a unit apart from the vessel in which it is to be installed. Furthermore, the vertical spacer also forms a barrier between the separate pairs of leading-in wires in the lower mica disc 21 so that a conductive path is not easily formed by evaporated metal deposited on the disc 21 between the leading-in wires. This arrangement materially increases the insulation resistance of the device and insures a longer operating life.

While the invention is described in connection with its use in a ballast resistance for controlling current, it is, of course, understood that its use is not limited in this respect, since it may be used in other fields in which multiple filaments are mounted in a unitary assembly, such as a light source in commercial photography, resistance elements, heater type elements for therapeutics and floodlighting devices.

Furthermore, the specific details of assembly heretofore described are not to be construed as constituting the only manner of obtaining the results of this invention, since various modifications may be made to achieve the concepts of the invention and such modifications are deemed to come within the scope of the appended claims.

What is claimed is:

1. A resistance device comprising an enclosing vessel, a frame structure supported therein including insulating members spaced in parallel relation, multiple resistance elements extending across said frame and parallel to said insulating members, and a vertical insulating spacer held in position by and between said members, said spacer having slots in one edge, said elements being supported intermediate their ends in said slots.

2. A resistance device comprising a vessel, a

frame structure supported therein including insulating discs spaced apart in parallel relation, a plurality of parallel metallic filaments extending diametrically across said frame structure, and an insulating member engaging said filaments intermediate their ends and being supported by said parallel discs.

3. A resistance device comprising a vessel, a frame structure supported therein including parallel insulating discs, a plurality of parallel metallic filaments extending across said frame structure, each filament being electrically connected to said frame at opposite ends, and an insulating member supported by said parallel discs at right angles thereto and supporting said filaments at the center thereof.

4. A resistance device comprising a vessel, a frame structure supported therein including parallel insulating discs having slots therein, a plurality of parallel metallic filaments extending across said frame structure, and a vertical spacer supporting said filaments intermediate their ends and having extending portions fitted in the slots of said discs.

5. A resistance device comprising a vessel, a frame structure supported therein including parallel insulating discs, a mica strip supported by and in offset relation between said discs with respect to the axis thereof, said strip having locking slots on one edge, and a plurality of linear extensible metallic filaments supported horizontally on said frame, said filaments being seated in said slots.

6. A resistance device comprising a vessel, a mount supported therein including insulating discs spaced apart in parallel relation and frame members connecting said discs, a mica strip mounted in engaging relation with said discs and parallel to said frame members, said strip having a serrated edge substantially in a plane with said frame members, and a plurality of extensible heatable filament sections supported by said frame members and the serrated edge of said strip.

7. A resistance device comprising a vessel having a stem, leading-in wires sealed in said stem, and a unitary mount supported on said stem including parallel conducting members and spaced transverse insulating spacer members, a plurality of metallic filaments arranged between said spacer members and attached to said conducting members, said leading-in wires projecting through one of said spacer members, and bridging connections between said conducting members and said leading-in wires adjacent the ends of said wires.

8. A resistance device comprising a vessel having a stem, leading-in wires sealed in said stem, and a unitary mount supported on said stem including parallel conducting members and transverse insulating spacer members, a plurality of metallic filaments arranged between said spacer members and attached to said conducting members, said leading-in wires projecting through one of said spacer members, bridging connections between said conducting members and said leading-in wires adjacent the ends of said wires, and a vertical spacer having a serrated edge engaging said filaments and supported by said transverse spacers, said vertical spacer forming an insulating barrier between said leading-in wires.

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