June 24, 1947. E. HENCKLER ET AL 2,423,021

RESISTOR BALLAST

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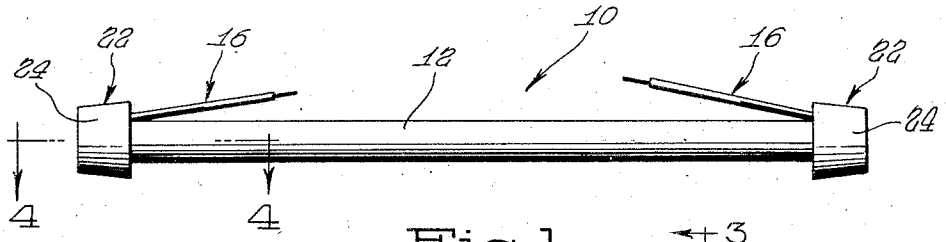

Fig. 1

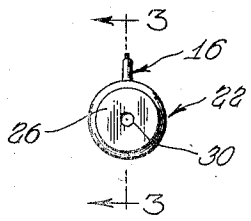

Fig. 2

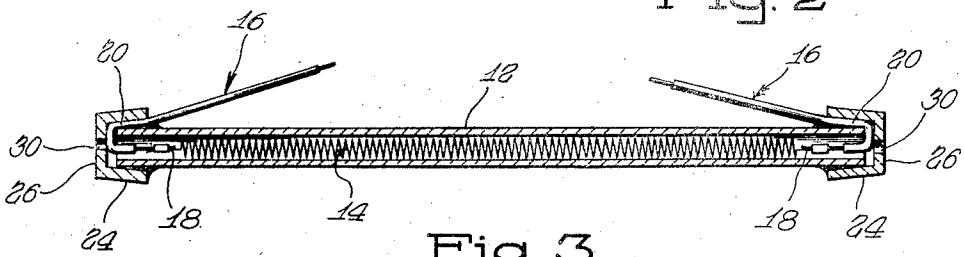

Fig. 3

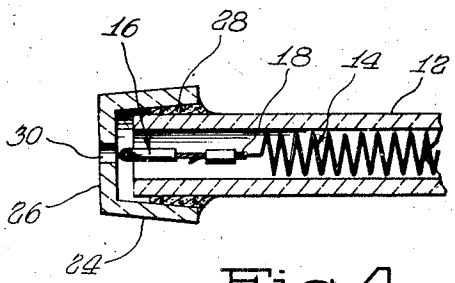

Fig. 4

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RESISTOR BALLAST

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5 Claims. (Cl. 201—64)

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This invention relates to a resistor ballast intended primarily for use with fluorescent lamps.

It is an object of the present invention to provide a resistor ballast comprising a resistance wire enclosed within a porcelain or other suitable ceramic tube and of such construction that it is well adapted to operate either with direct current or with alternating current without over heating.

Another object of the present invention is the provision of a resistor ballast which is of simple construction and which is composed of parts which can be easily manufactured and easily assembled.

A further object of the invention is generally to improve the construction of resistor ballast devices.

The above and other objects, features and advantages of the present invention will be fully understood from the following description, reference being had to the accompanying illustrative drawings.

In the drawings:

Fig. 1 is a side view of a resistor ballast embodying the present invention;

Fig. 2 is an end view thereof;

Fig. 3 is a longitudinal sectional view of the resistor ballast on the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary sectional view, on a larger scale, on the line 4—4 of Fig. 1.

Referring now to the drawings in detail the resistor ballast 10 of the present invention comprises an insulation tube 12, preferably a molded porcelain tube, although said tube can be formed of other ceramic material. A resistance element 14 is disposed within said tube and extends longitudinally thereof, said resistance member being, as here shown, a longitudinally extended helix of resistance wire, such as for example, nichrome. It will be understood that the adjacent convolutions of the resistance wire helix are spaced from each other. Terminal insulated wires 16 are connected to the adjacent opposite ends 18, respectively, of the resistance wire 14, said terminal wires being of larger diameter than that of resistance wire 14. An insulated portion of each terminal wire 16 is bent over the adjacent edge of the tube 12, as indicated at 20, in Fig. 2 and is held in place by a cap 22 formed of insulation material, preferably molded porcelain.

Cap 22 provides a closure for the adjacent end of tube 14. Each cap 22 has a peripheral portion 24, which is preferably tapered, and an end 26. The peripheral portions 24 of caps 22 surround and are secured to the adjacent peripheral

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end portions of tube 12 in any suitable way, preferably by plastic cement, as indicated at 28, in Fig. 4. The securement of caps 22 to the opposite ends of tube 12 results in the securement of terminal wire 16 to said tube. Preferably, as here shown, each cap 22 is provided with an opening 30 to allow the passage of air to and from tube 12, whereby air can circulate through said tube, around the helix and internally thereof through the passage outlined by the helix turns, for cooling purposes.

The dimensions of the resistance member 14 and of the tube 12 may vary within suitable elements. However without limiting our invention, it may be stated that for a 15 or 20 watt resistor ballast, the gauge of the nichrome wire resistance member 14 is 33 and the length of said resistance wire is 140 inches wound on a mandrel of a diameter of about ¼ inch to about ⅜ inch. The porcelain tube 12 is about 14 inches to about 16 inches in length and has an internal diameter of about ⅜ of one inch to about $\frac{5}{16}$ of one inch, there being a slight clearance between the expanded helix of the resistance wire and the internal surface of the tube. It will be noted that the opposite ends of the resistance wire 14 are located adjacent the opposite ends, respectively, of tube 12 so that said wire, in the expanded condition of the helix, extends substantially for the full length of tube 12.

The use of the resistor ballast of the present invention will be apparent to those skilled in the art and it will be understood that the resistance member 14 is electrically connected by means of the terminal member 16 in series with the source of current for the fluorescent lamp.

Thus it is seen that the resistor ballast embodying our invention, as described above, is well adapted to accomplish the objects and purposes hereinabove set forth. It will be understood, however, that various changes in the details of construction and in the arrangements of parts may be made without departing from the underlying idea or principles of our invention within the scope of the appended claims.

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

1. A resistor ballast comprising an insulation tube, a longitudinally expanded helix of resistance wire disposed within said tube and extending longitudinally thereof, said helix having its opposite ends adjacent the opposite ends, respectively, of said tube, and closure members secured to the opposite ends, respectively, of said tube, said helix being disposed with its turns disposed

around a longitudinal air passage internally of the helix and said closure members being provided with openings for the circulation of air through said tube longitudinally of said helix and through said passage internally of said helix.

2. A resistor ballast comprising an insulation tube, a longitudinally expanded helix of resistance wire disposed within said tube and extending longitudinally thereof, terminal wires connected to the opposite ends, respectively, of said helix adjacent the opposite ends of said tube, and closure members comprising caps formed of insulation material secured to the opposite ends, respectively, of said tube, said caps having peripheral portins surrounding and secured to the adjacent peripheral portions of the tube externally thereof in overlapping relation thereto, said terminal wires extending from the interior of the tube to the exterior thereof and having portions secured between the adjacent inner peripheral portions of the caps and the outer peripheral portions of the tube.

3. A resistor ballast comprising an insulation tube, a longitudinally expanded helix of resistance wire disposed within said tube and extending longitudinally thereof, said helix having its opposite ends adjacent the opposite ends, respectively, of said tube, the turns of the helix outlining a longitudinal air passage internally of the helix, said tube being provided with openings for the passage of air through the tube around the helix and internally of the helix through said internal passage thereof.

4. A resistor ballast comprising a porcelain, tube, a longitudinally expanded helix of resistance wire disposed within said tube and extending longitudinally thereof, terminal wires fixed to the opposite ends of said tube and connected to the opposite ends, respectively, of said helix adjacent the opposite ends of said tube, said terminal wires extending from the interior of the tube to the exterior thereof, and closure members comprising caps formed of insulation material secured to the opposite ends, respectively, of said tube, said caps having peripheral portions surrounding and secured to the adjacent peripheral portions of the tube, said terminal wires extending from the interior of the tube externally thereof in overlapping relation thereto to the exterior thereof and having portions secured between the adjacent inner peripheral portions of the caps and the outer overlapped portions of the tube.

5. A resistor ballast comprising an insulation tube, a longitudinally expanded helix of resistance wire disposed within said tube and extending longitudinally thereof, and terminal wires fixed to the opposite ends of said tube and connected to the opposite ends, respectively, of said helix adjacent the opposite ends of said tube, and closure members secured to the opposite ends, respectively, of said tube, said terminal wires extending from the interior of the tube to the exterior thereof and closure members comprising caps formed of insulation material secured to the opposite ends, respectively, of said tube, said caps having peripheral portions surrounding and secured to the adjacent peripheral portions of the tube externally thereof in overlapping relation thereto, said terminal wires extending from the interior of the tube to the exterior thereof and having portions secured between the adjacent inner peripheral portions of the caps and the outer peripheral overlapped portions of the tube, said closure members being provided with openings in the ends thereof, respectively, for the circulation of air through said tube.

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