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2,432,425

P. JANIS
RECTIFIER TUBE
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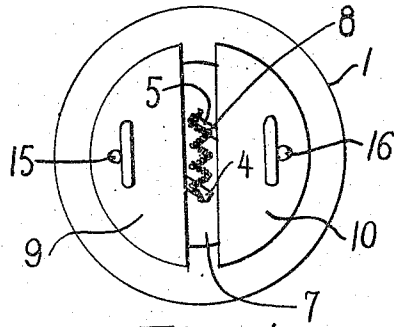


Fig. 1

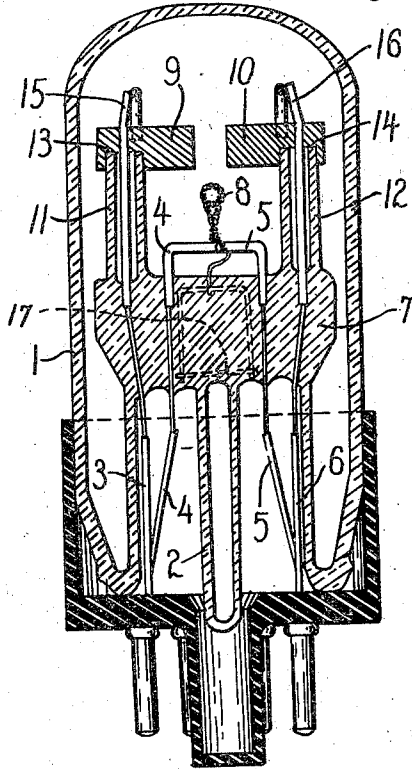


Fig. 2

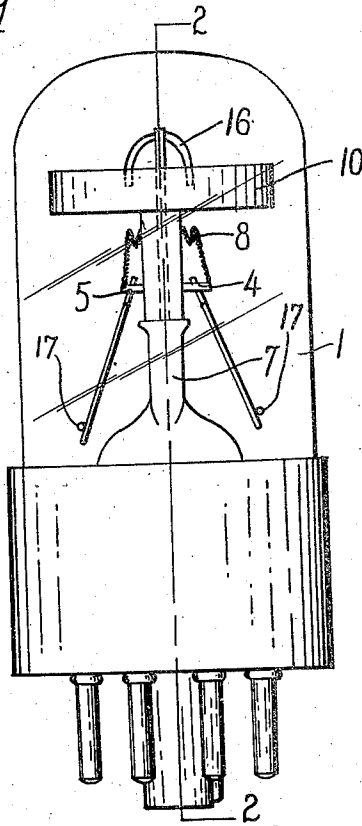


Fig. 3

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2 Claims. (Cl. 250—27.5)

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This invention relates to electric discharge devices, and particularly, to gas-filled rectifiers, especially those of the full-wave type.

An object of the invention is a compact and effective full wave rectifier with low voltage drop, high current-carrying capacity and freedom from arc-over. This is achieved by use of a filamentary cathode of high electron emissivity, an anode of carbon of low electron-emissivity and high radiation emissivity, a filling of mercury vapor and argon gas, and proper electrode spacing. Arc over is prevented without the use of shielding between the anodes.

Other features of the invention are a three-point anode support using a U or similar-shaped metal wire set into appropriate holes in the carbon anode and welded under tension to the anode lead-glass boot.

Other features, objects and advantages of the invention will be apparent from the following specification, taken in connection with the accompanying drawings, in which:

Figure 1 is a top view of a device according to the invention;

Figure 2 is a section on line 2—2; and

Figure 3 is a side view of the device.

An inert gas, such as argon at a pressure, for example, of about 4 millimeters of mercury, and a small amount of mercury vapor, is sealed into glass envelope 1, closed by the sealed exhaust tube 2. Lead-in wires 3, 4, 5, 6, extend through stem press 7, terminating in electrodes 8, 9, 10. The cathode comprises a coiled-coil filament coated with electron-emitting oxides (not shown) by being coated with carbonates of one or more of the alkaline-earth oxides and heated during exhaust to reduce the carbonate to oxides, in the usual manner. The lead-in wires 4, 5 are bent at right angles above the stem to support the filamentary coil with its main longitudinal axis perpendicular to general plane of the stem press 7.

Lead-in wires 3, 6 extend upward in the envelope through the glass tubes 11, 12 often called boots. The open ends 13, 14 of these boots fit into corresponding holes in the bottom of carbon anodes 9, 10, the anodes being shaped in general like semi-circular discs as shown. The wires 3, 6

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extend through the anodes 9, 10 and somewhat above it, being bent slightly toward each other at their ends 15, 16. A U-shaped support wire is welded to the type of the lead-in wires at the curve of the U, the open end of the U extending into the top of the anode to hold it firmly in position.

For a peak back voltage of about 100 volts, a spacing of about $\frac{1}{8}$ inch between anodes is satisfactory. The anodes may be about $\frac{1}{8}$ inch thick.

The mercury for creating the correct atmosphere within the tube is contained in the fine nickel tubes 17.

What I claim is:

1. The combination of a carbon anode, an insulating tube extending partway thereinto, a lead-in wire extending through and projecting from said anode, a wire clip extending from the projecting portion of said lead-in wire and fixing said anode firmly in position against said insulating tube.

2. A rectifier tube comprising a sealed envelope, an inert gas filling therein, mercury vapor therein, an oxide-coated wire cathode therein, two unshielded carbon anodes therein, said anodes being semi-circular cylinders spaced apart a distance sufficient to prevent arc-over, a reentrant press at one end of said envelope, lead-in wires extending upwardly into said envelope from said press, glass tubes around said lead in wires but spaced therefrom and extending part way into said carbon anodes, the lead-in wires extending through said anode and projecting therefrom, and a U-shaped wire clip supported from the top of said lead-in wire and extending into the surface of the anode to hold the latter firmly in place.

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REFERENCES CITED

The following references are of record in the file of this patent:

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