Feb. 16, 1926. 1,572,910

A. L. WILSON

THERMIONIC DEVICE

Filed April 21, 1921

Fig. 2.

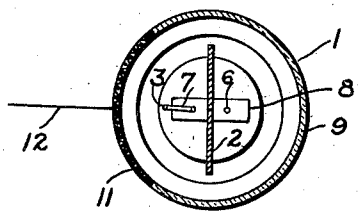
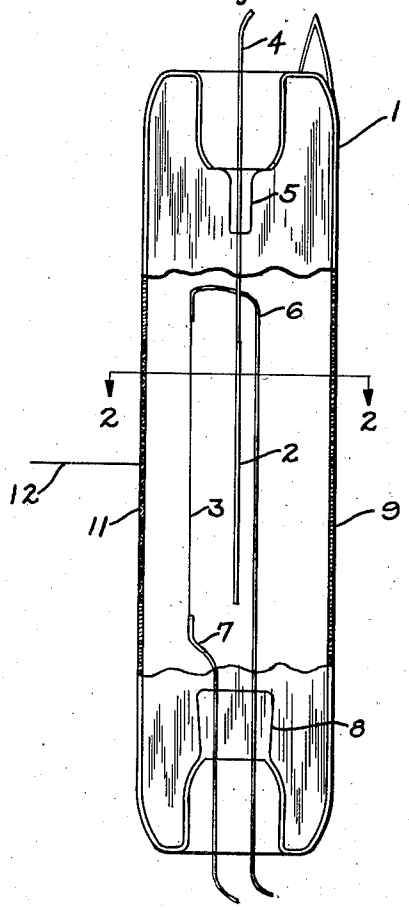


Fig. 1.



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UNITED STATES PATENT OFFICE.

ARTHUR LESLIE WILSON, OF EDGEWOOD, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

THERMIONIC DEVICE.

Application filed April 21, 1921. Serial No. 463,231.

To all whom it may concern:

Be it known that I, ARTHUR LESLIE WILSON, a subject of the King of Great Britain, and a resident of Edgewood, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Thermionic Devices, of which the following is a specification.

My invention relates to evacuated-electric devices and more especially to a novel arrangement of the electrodes associated with such devices.

One object of my invention is to provide a vacuum-tube device of unusual simplicity, ruggedness of construction and ease of manufacture.

Another object of my invention is to provide a vacuum-tube device in which the walls thereof are reinforced by a metallic substance.

Still another object of my invention is to provide a thermionic device wherein the control electrode is embedded in the containing walls thereof. Other objects of my invention will appear more fully hereinafter in the accompanying drawings, specification and claims.

In the art of vacuum-tube devices, it has been customary, in three-electrode vacuum-tubes comprising an anode, a cathode and a control electrode, to dispose the control electrode either within the evacuated device or immediately adjacent to the external surface thereof.

I have found, however, that, by impressing a wire mesh into the containing walls of a vacuum-tube device and then employing the wire mesh as one electrode, preferably a grid, of a three-electrode tube, a vacuum tube may be obtained that is of unusual mechanical and electrical strength of construction, simplicity of design and corresponding ease of manufacture.

As a matter of illustration, I have shown my invention applied to an arrangement of electrodes in which the customary hot cathode is interposed between the controlling electrode and the plate, though I do not desire my invention to be limited to such an arrangement.

A better understanding of my invention may be had by reference to the accompanying drawing, in which:

Figure 1 is a front elevational view, shown partially in perspective, of a vacuum-tube device embodying my invention.

Fig. 2 is a cross-sectional view of the vacuum tube shown in Fig. 1 on the line 2—2.

Referring to Figs. 1 and 2, I have shown an evacuated container 1 having suitably disposed therein a plate 2 and a filament 3. The plate 2 is supported by the conducting member 4 which extends through the press 5 located at one end of the tube. The filament 3 is supported by conducting members 6 and 7 which extend through the press 8 located at the opposite end of the tube 1. The walls 9 of the closed envelope are composed of a non-conducting material having high dielectric strength, such, for example, as glass, and may be reinforced by a metallic screen or gauze 11.

When employing the reinforcing element 11 as a control electrode or grid, it is necessary to embed only a relatively small amount of gauze in the walls of the tube comparable to the size of the plate element 2. The grid 11 is electrically connected to the usual circuits associated with such tubes by means of a conductor 12 which extends through a portion of the containing walls of the tube.

Briefly speaking, my invention, therefore, comprises a vacuum-tube device 1, one electrode of which is suitably disposed in the containing walls of the vessel.

One advantage of my invention is the provision of a vacuum-tube device having only two elements therein, with resulting simplicity of construction and cheapness of manufacture.

Another advantage of my invention is the provision of a vacuum-tube device in which the containing walls may be reinforced to obtain a tube of more rugged construction.

A further advantage of my invention resides in the provision of a vacuum tube in which the control is insulated from foreign objects by the containing walls of the tube.

While I have shown only one embodiment of my invention, it is capable of various changes and modifications, I desire, therefore, that only such limitations shall be imposed as are indicated in the appended claims.

I claim as my invention:

1. A vapor-electric device having an electrode embedded in the containing wall thereof.

2. An evacuated electric device having an electrode interposed between the interior and the exterior surfaces of the containing wall thereof.

3. A vacuum-tube device comprising a plurality of electrodes and a receptacle, one of said electrodes being disposed between the inner and the outer surfaces of the containing walls of said receptacle.

4. An evacuated electric device comprising an enclosed envelope having containing walls of non-conducting material and an electrode interposed between the inner and the outer surfaces of the containing walls of said enclosed envelope.

5. In a thermionic device, an enclosed envelope comprising walls of non-conducting material and a reinforcing metallic material integral with the containing walls thereof, said metallic material constituting one electrode of said thermionic device.

6. A vacuum-tube device comprising an enclosed envelope having containing walls of non-conducting material and a reinforcing metallic gauze integral therewith.

7. A vacuum-tube device having its input electrode interposed between the inner and the outer surfaces of the walls of said device and its output electrode suitably disposed within said device.

8. A vacuum-tube device comprising an enclosed envelope, a control electrode embedded in the walls thereof, a space-current path within said envelope and electrodes individual to said space-current path.

9. A vacuum-tube device comprising an enclosed envelope having a space-current path therein and means comprising a control electrode embedded in the walls of said envelope whereby the conductivity of said space-current path may be selectively controlled.

In testimony whereof, I have hereunto subscribed my name this 12th day of April, 1921.

ARTHUR LESLIE WILSON.