June 25, 1929. W. R. BULLIMORE 1,718,632

THERMIONIC VALVE

Original Filed July 21, 1925

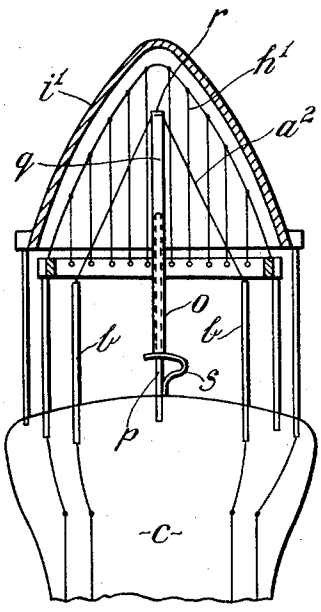


Fig.1

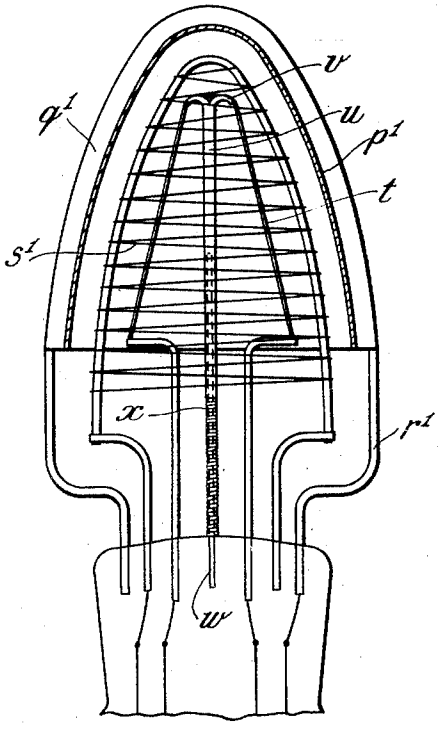


Fig.2

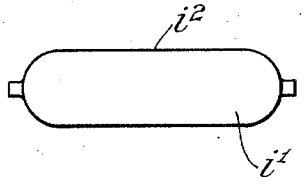


Fig.3

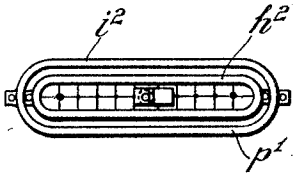


Fig.4

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UNITED STATES PATENT OFFICE.

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THERMIONIC VALVE.

Original application filed July 21, 1925, Serial No. 45,124, and in Great Britain May 1, 1925. Divided and this application filed July 16, 1927. Serial No. 206,346.

This invention relates to thermionic valves for use in wireless telegraphy and telephony and to the kind in which a grid is interposed as a controlling device between a heated filament and an anode.

The object of the present invention is to provide improvements in the construction and method of mounting the electrodes of a thermionic valve to ensure the maximum possible utilization of electron emission and to maintain the electrodes rigidly in position during use and thus preserve even interspacing of the electrodes from one another.

Reference will now be made to the accompanying drawings which illustrate by way of example constructions according to the invention and in which:—

Figure 1 is a sectional elevation showing one construction,

Figure 2 is a sectional elevation of another construction,

Figure 3 is a plan of the construction shown in Figure 1, and

Figure 4 is a bottom plan thereof.

The form illustrated in Figures 1, 3 and 4 comprises a filament a^2 in the form of a pointed straight sided arch secured at its ends to conductor supports b extending inwardly from the re-entrant tube or foot c of the vitreous container or bulb or the valve, a grid h' and anode i' which in shape are conical with flattened sides h^2 and i^2 Figures 3 and 4, the coned portions being disposed in planes parallel to the two inclined portions of the filament a^2. The flattened sides of the arched grid and anode lie in planes parallel to a line connecting the two points at which the ends of the filaments are connected to their supports b.

An additional support p is sealed into the re-entrant tube c of a valve and has slidably mounted thereon a tubular support o the upper end of which is forked as shown at r to provide a support for the apex of the filament a^2. Near the base of the wire p is fixed one end of a leaf spring s the free end of which is forked and bent inwardly towards the wire p to engage on either side of the latter beneath the end of the tubular member q which is thus arched upwardly to maintain the filament in a taut condition.

Figure 2 illustrates an alternative method of supporting the filament. In this construction the anode p^1 is formed in two parts having peripheral flanges q^1 which are caused to abut and are secured together by welding or other suitable means and mounted on supports r^1. The shape of the anode in cross section is similar to that shown in Figures 1 to 4. The grid s^1 conforms in shape to the anode and both of these electrodes are mounted concentrically with a filament t, the upper end of which is supported by a member u. The upper end of the member u is split into two outwardly flaring lips v, whose outer ends curve downwardly and which are partially circular in cross section. The filament t is seated in these lips and held thereby against lateral displacement whilst the curvature imparted to the wire by the general contour of the lips v assists it to maintain the required shape approximately to the curvature of the upper ends of the grid and anode. The member u is slidably mounted over a stem w mounted in the re-entrant tube and around which is coiled a spring x the upper end of which bears against the lower edge of the member u thus serving to maintain the filament always in a taut condition..

Instead of splitting the sleeve u to form the lips v the upper end of the sleeve may have attached thereto by welding or any other suitable means a T-piece of any desired contour in accordance with the curvature of the electrodes. It is to be understood, however, that the invention is not limited to any particular form of the member u as, for example, a filament support may be made by twisting two pieces of wire in such a manner that a central portion is formed consisting of two untwisted portions connected at their ends and presenting an approximately circular or oval shape in plan. The end portions of the twisted wires are bent downwardly and connected with the upper end of a sleeve similar to that shown at u.

By supporting the electrodes in the manner above described the transmission of vibration from the exterior of the vitreous container or bulb to the electrodes is prevented and the electrodes are preserved in positions of correct interspacing owing to the common support to which each electrode is secured at its apex.

I claim:—

1. A thermionic valve comprising a grid,

an anode, a supporting member, an arched filament, and a spring pressed slidable support extending from said supporting member to support the mid portion of said filament and having a seat for engaging the mid portion of the filament, which seat comprises a fork curved in the direction of the length of the filament.

2. A thermionic valve according to claim 1 wherein said seat for engaging the mid portion of the filament comprises two outwardly flaring lips having downwardly curved outer ends, the filament being seated in these lips.

In witness whereof I affix my signature.

W. R. BULLIMORE.