

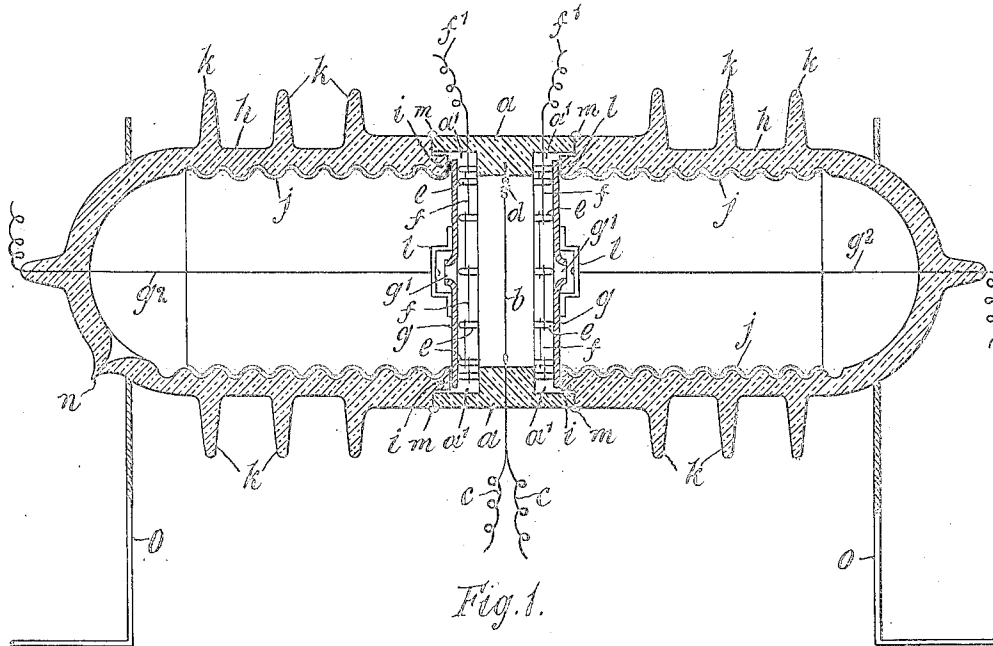
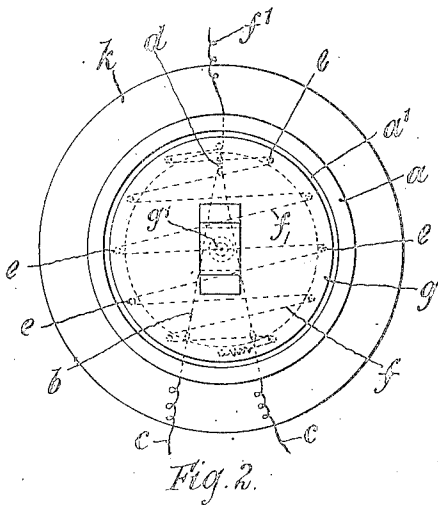
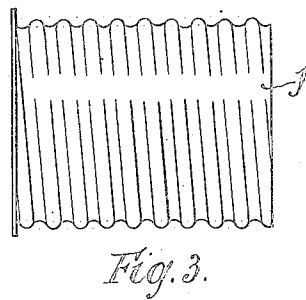
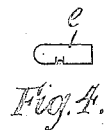
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THERMIONIC VALVE

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THERMIONIC VALVE.

Application filed April 7, 1925. Serial No. 21,451.

This invention relates to thermionic valves and its object is to provide a thermionic valve which can be readily disassembled for renewal of a ruptured filament and in which provision is made for cooling the anode.

The thermionic valve also may have two grids and two anode plates exposed to the electronic emission from a single filament in common and which can either be used in parallel in the same circuits or can be used independently for controlling different circuits.

The thermionic valve, according to the invention, consists of a stout annular glass member having a filament mounted across the central aperture of the member and within the thickness thereof, a metal grid mounted in the member on one or each side of the filament, an anode plate outside the grid or each grid, and a glass cap interfitted each side of and sealed to the member.

Preferably a grid and plate are arranged on both sides of the central annular glass member.

Heat is conveyed from the anode plates by means of metal foil liners in contact respectively with the plates and with an ample area of the glass caps.

A thermionic valve according to the invention is illustrated on the accompanying drawing, in which:—

Fig. 1 is a longitudinal section of the valve.

Fig. 2 is an end elevation of the valve with one of the caps and liners removed.

Fig. 3 is a side elevation of a liner.

Fig. 4 shows a detail on a larger scale.

a is a stout annular glass member.

b is an incandescible filament mounted across the central aperture of the glass member a at the middle of the thickness thereof and extending from and stretched between leads c , sealed through the wall of the glass member a , and a light spring d anchored to the diametrically opposite side of the disc a .

Each face of the annular glass member a is recessed at a^1 , and glass pegs e protrude axially from the base of each recess a^1 .

A grid is formed on each side of the filament b by a wire f led in a zig-zag manner to and fro across the central aperture of the annular glass member a from one peg e to another, and wound around each peg to retain the wire f against slipping. As indi-

cated in Fig. 4 each peg e may be nicked or notched at an accessible portion better to retain the grid wire f against displacement along the pegs e and so changing its position relatively to the filament b and the respective anode plate g , next to be described.

One end of each grid wire f is secured to a lead f^1 sealed through the wall of the annular glass member a and the other end of the grid wire f is anchored to the diametrically opposite peg e .

Against the ends of each of the two sets of pegs e is located a circular metal plate g , each of which plates g constitutes an anode.

An elongated closed ended cylindrical glass cap h abuts against each end face of the annular glass member a , and by a reduced portion i entering the recess a^1 , also bears lightly but firmly against the respective anode plate g . The plates g are thus held against the ends of the pegs e , in a manner permitting expansion and contraction in the direction of the planes of the plates g .

The internal surface of the cylindrical portion of each glass cap h is corrugated helically and a helically corrugated metal foil liner j is held in such corrugations with an end flange in contact with the respective anode plate g and interposed between same and the respective cap h . These liners j serve to convey heat from the anodes g to the walls of the glass caps h , which would not be conveyed by convection owing to the vacuum which eventually reigns in the space within the caps h . The external surfaces of the cylindrical portions of the glass caps h are formed with ribs k to radiate heat from the walls thereof.

A hole g^1 is formed in each plate g . This hole g^1 is masked externally by a bracket plate l , to which a lead g^2 , sealed through the end of the respective glass cap h , is secured.

The caps h are sealed to the central annular glass member a by a glass bead m fused around the outer border of each abutting surface.

The space enclosed by the caps h and annular glass member a is exhausted of air through an eventually sealed pip n in one of the glass caps h , the vacuum being propagated through the holes g^1 in the anode plates g .

Direct electronic bombardment of the caps h through the holes g^1 in the anode

plates g is prevented by these holes g^1 being masked by the bracket plates l .

The two grids f and the two anodes g may be used in parallel by joining the grid leads f^1 together and the anode leads g^2 together, or may be used separately. In the latter case one grid f and plate g may be used for controlling one circuit and the other grid f and plate g for controlling another circuit, or one such pair may be kept inoperative in reserve.

The valve can be disassembled for replacement of one or more of its contained parts by grinding off one or both glass beads m .

o are metal bracket plates having holes in which the caps h are held. Thus the whole valve may be conveniently supported as shown by being clipped between the plates o .

Obviously the grid and plate may be omitted from one side of the annular glass member a .

The grid f may be a wire mesh.

I claim:

1. A thermionic valve consisting of a stout annular glass member, an incandescible filament mounted across the central aperture of and within the thickness of said member, a metal grid mounted in said member alongside said filament, an anode plate mounted outside said grid, and a glass cap laterally interfitting and sealed to said member.

2. A thermionic valve consisting of a stout annular glass member, an incandescible filament mounted across the central aperture of and within the thickness of said member, a metal grid mounted in said member alongside said filament, an anode plate mounted outside said grid, a glass cap laterally on and sealed to said member, and a metal liner in said glass cap in contact with said anode plate.

3. A thermionic valve consisting of a recessed stout annular glass member, an incandescible filament mounted across the central aperture of and within the thickness of said member, pegs on and protruding within said recessed portion of said member, a metal grid mounted on said pegs in said member alongside said filament, an anode plate mounted outside said grid against the ends of said pegs, and a glass cap laterally on and sealed to said member and bearing against said anode plate.

4. A thermionic valve consisting of a recessed stout annular glass member, an incandescible filament mounted across the central aperture of and within the thickness of said member, pegs on and protruding with-

in said recessed portion of said member, a metal grid mounted on said pegs in said member alongside said filament, an anode plate mounted outside said grid, a glass cap laterally on and sealed to said member and bearing against said anode plate, and a flanged metal liner in said glass cap with its flange interposed between said cap and said anode plate.

5. A thermionic valve consisting of a stout annular glass member, an incandescible filament mounted across the central aperture of and within the thickness of said member, a metal grid mounted in said member on each side of said filament, an anode plate mounted outside each said grid, and a glass cap interfitting each side of and sealed to said member.

6. A thermionic valve consisting of a stout annular glass member, an incandescible filament mounted across the central aperture of and within the thickness of said member, a metal grid mounted in said member on each side of said filament, an anode plate mounted outside each said grid, a glass cap on each side of and sealed to said member, and a metal liner in each said glass cap in contact with each said anode plate.

7. A thermionic valve consisting of a stout annular glass member recessed on both sides, an incandescible filament mounted across the central aperture of and within the thickness of said member, pegs on and protruding within said recessed sides of said member, a metal grid mounted on said pegs in said member on each side of said filament, an anode plate mounted outside each said grid against the ends of said pegs, and a glass cap on each side of and sealed to said member and bearing against each said anode plate.

8. A thermionic valve consisting of a stout annular glass member recessed on both sides, an incandescible filament mounted across the central aperture of and within the thickness of said member, pegs on and protruding within said recessed sides of said member, a metal grid mounted on said pegs in said member on each side of said filament, an anode plate mounted outside each said grid against the ends of said pegs, a glass cap on each side of and sealed to said member and bearing against each said anode plate, and a flanged metal liner in each said cap with its flange interposed between each said adjacent cap and each said adjacent anode plate.

In testimony whereof I have signed my name to this specification.

ARTHUR ELLIOT BEATTIE.