

Nov. 12, 1929.

A. M. TROGNER ET AL

1,735,816

WATER COOLED TUBE SOCKET

Filed Dec. 21, 1928

2 Sheets-Sheet 1

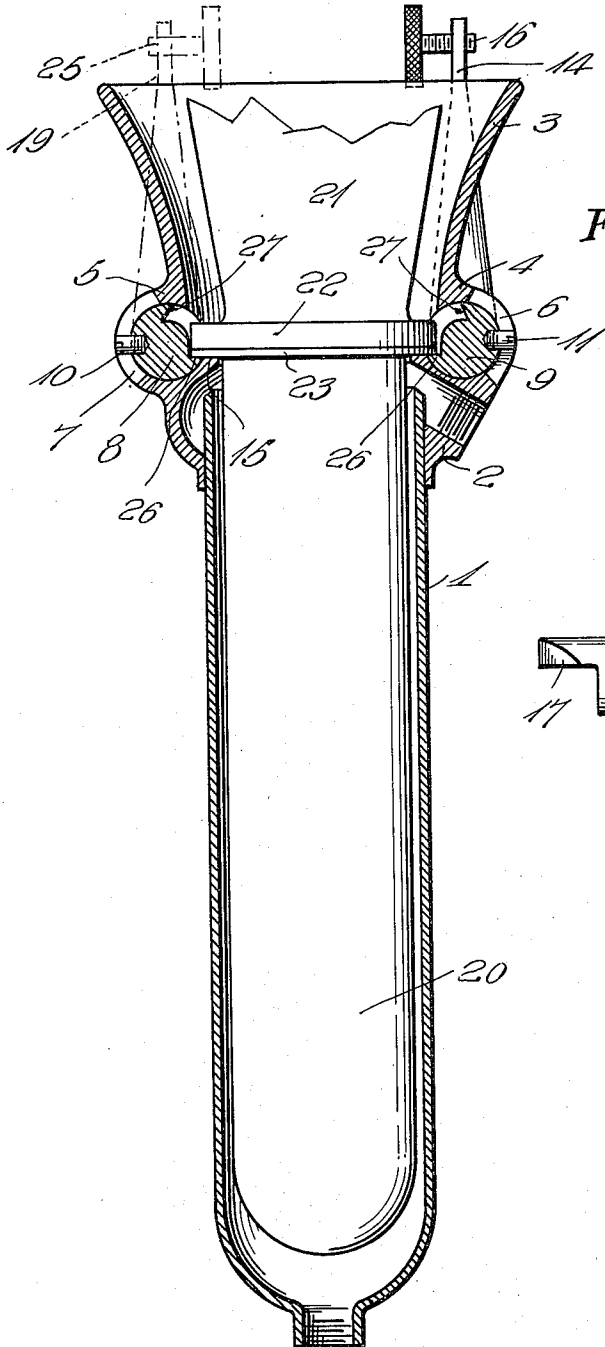


Fig. 1

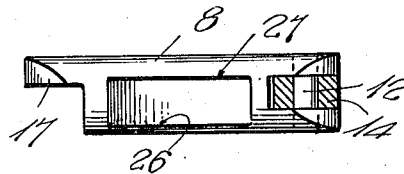


Fig. 5

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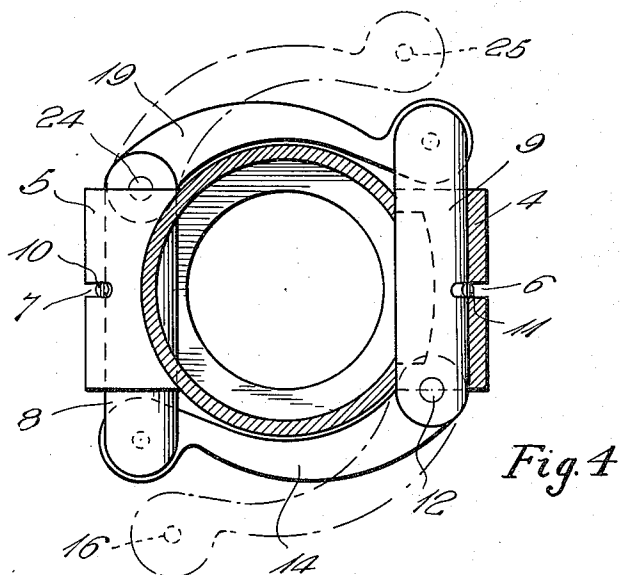


Fig. 4

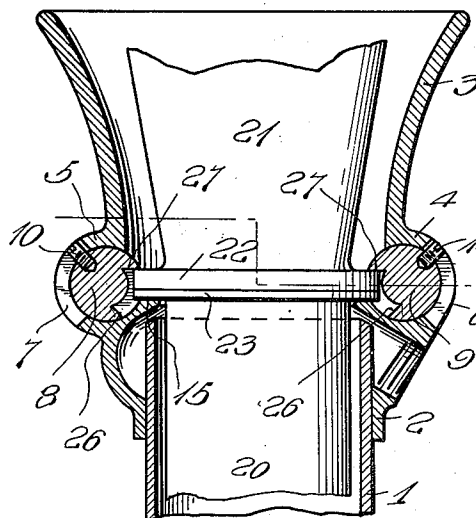


Fig. 2

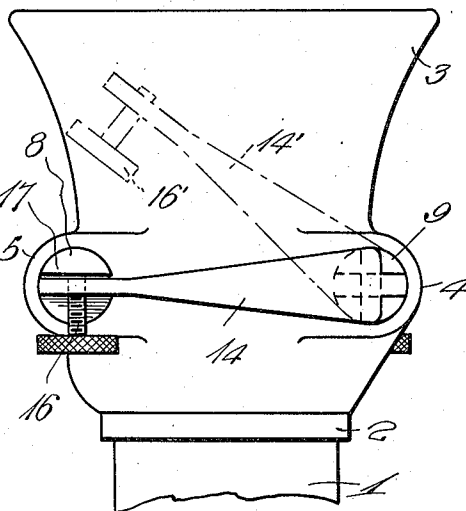


Fig. 3

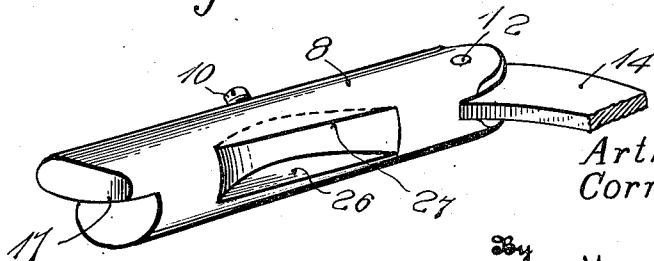


Fig. 6

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UNITED STATES PATENT OFFICE

ARTHUR M. TROGNER, OF EAST ORANGE, NEW JERSEY, AND CORRIE F. RUDOLPH, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNORS TO WIRED RADIO, INC., OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

WATER-COOLED TUBE SOCKET

Application filed December 21, 1928. Serial No. 327,709.

Our invention relates broadly to mountings for electron tubes and more particularly to a construction of holder for high power tubes.

5 One of the objects of our invention is to provide a mounting for a high power tube in which the tube may be securely clamped in a water cooling jacket and readily removed from the jacket when it is desired to
10 make replacements or repairs.

Another object of our invention is to provide a form of quickly demountable support for a high power tube of the cylindrical anode type wherein means are provided for pressing the tube in position against an annular
15 seat for effecting a water tight closure about the anode of the tube, or where means are provided for raising the tube from its seat when it is desired to remove the tube from
20 the support.

A further object of our invention is to provide a construction of high power tube support wherein a tube of the cylindrical anode type may be telescoped to a position
25 within a water cooling jacket and secured therein by means of a pair of rotatable clamps engaging an annular flange on the tube for pressing the tube into a position within the tube mounting on the one hand
30 or raising the tube out of the tube mounting when it is desired to remove the tube from the support.

Other and further objects of our invention reside in the construction of high power tube support as set forth more clearly in the specification hereinafter following and by reference to the accompanying drawings wherein,
35 Figure 1 is a longitudinal cross-sectional view through the electron tube mounting of our invention; Fig. 2 is a cross-sectional view taken through that part of the tube mounting where the flange of the tube is engaged or raised; Fig. 3 is a side elevation showing the means for clamping the high power tube
40 in the holder; Fig. 4 is a lateral view through the tube mounting showing the means for clamping the tube in place; Fig. 5 is a side elevation of one of the clamping devices employed in the structure of the tube mounting
45 of our invention and Fig. 6 is a perspective

view of one of the clamping devices employed in the tube socket construction of our invention.

In high power tube structures it is necessary to clamp the tube in a holder around
55 which the cooling fluid circulates to maintain the anode at a uniform temperature. Our invention is directed to a construction of holder by which the tube may be readily clamped in position and a hermetic closure
60 provided at one end of the anode with respect to the tube holder. The clamping means of our invention has been found to be extremely practical inasmuch as a high power tube may be rapidly inserted in the holder
65 or quickly removed therefrom by means of rotary devices which, when moved in one direction serve to pry the tube from the holder and when rotated in an opposite direction tend to urge the tube to a position within
70 the holder.

Referring to the drawings in more detail, reference character 1 represents the enclosing jacket for the circulating fluid in which the cylindrical anode 20 of the electron tube
75 21 extends. The electron tube 21 has an annular flange or shoulder at 22 to which the anode 20 connects. A compressible gasket 23 is disposed between the shoulder or flange 22 and the annular seat 15 formed on the
80 header 2 at the top of the jacket 1. The header 2 is provided with an equipotential static shield 3 coextensive therewith and intermediate laterally extending portions 4 and 5 arranged to receive the spindles 8 and 9.
85 The projections 4 and 5 are cylindrical in form and have internal bores in which the spindles 8 and 9 are rotatable. The movement of spindles 8 and 9 is limited by pins 10 and 11 respectively which project through slots 6 and 7. On the end of spindle 9 we provide the pivotal connection 12 to a lever 14. The lever 14 carries an adjusting thumb screw 16 adjacent the extremity thereof which may
90 engage the under-cut face 17 of spindle 8 when the tube is secured within the holder. The spindle 8 carries at its end a lever 19 pivotally mounted in the spindle 8 as indicated at 24. The end of the lever 19 carries
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a set screw represented at 25 for engaging the under-cut face of the end of spindle 9 when the tube is secured within the tube holder. The spindles 8 and 9 are each provided with angularly disposed faces at 26 and 27. In Fig. 2 these faces have been shown extending in planes at acute angles with respect to each other. In Fig. 1 these faces are shown extending substantially at right angles to each other, although the angle between the faces may be changed to meet the required conditions. In Fig. 6 the spindle has been illustrated in perspective view in order to show the arrangement of parts more clearly. The sets of faces 26 on spindles 8 and 9 may be shifted upwardly by rotation of the levers 14 and 19 to engage the under surface of the annular rim flange or shoulder 22 and gasket 23 for prying the tube from the holder. The sets of faces 27 may be moved downwardly to engage the upper surface of the flange or rim 22 which forces the tube structure to a position within the holder. In order to subject the tube flange to the required pressure the thumb screws 16 and 25 may be rotated to engage the under surfaces of the end of the opposite spindle. However, when it is desired to remove the tube from the holder thumb screws 16 and 25 may be quickly retracted and the levers 14 and 19 swung outwardly on their pivots and employed as cranks for rotatably shifting the shoulders and prying the tube from the holder.

The anode seal of a high power tube is relatively fragile and yet the clamping means of our invention has been found to be extremely practical for effecting or breaking a hermetic seal without injury to the tube. While we have described our invention in a certain preferred embodiment, we desire that it be understood that modifications may be made and that no limits are intended other than are imposed by the scope of the appended claims.

What we claim as new and desire to secure by Letters Patent is:

1. A mounting for a high power tube of the cylindrical anode type comprising a cooling jacket surrounding the tube, an annular seat formed in said jacket for supporting an annular flange on said tube, and a plurality of means disposed on opposite sides of said jacket for engaging the said annular flange for moving the tube from said annular seat or securing the tube into engagement with the seat at the will of the operator.

2. In a mounting for a high power tube of the cylindrical anode type having an annular flange formed thereon, a seat supporting the annular flange of said tube, a plurality of rotatable members disposed within the walls of said jacket, each of said members having faces formed thereon for engaging the said flange for urging said flange against said seat, or moving said flange from said seat by

rotary movement imparted to the ends of the rotatable members as desired.

3. In a mounting for a high power tube of the cylindrical anode type having an annular flange formed thereon, a cooling jacket, a header formed on said jacket, an annular seat disposed in said header, a pair of substantially cylindrical members journaled in opposite sides of said header, means for imparting rotary motion to the said cylindrical members, each of said cylindrical members being cut away for providing faces arranged respectively to engage the upper and lower surfaces of the annular flange on said tube for maintaining said tube in a predetermined position with respect to said annular seat or raising the tube from the seat.

4. A mounting for a high power tube of the cylindrical anode type having an annular flange formed thereon, a cooling jacket, a header on said jacket, an annular seat formed in said header, a pair of cylindrical members journaled in said header on opposite sides of said annular flange, each of said cylindrical members being cut away adjacent one side thereof and having faces thereon arranged respectively to grip the under surface of the annular flange and the upper surface thereof for raising said tube from the annular seat or urging said tube into engagement with the annular seat.

5. A mounting for a high power tube of the cylindrical anode type having an annular flange formed thereon comprising a cooling jacket, a header on said cooling jacket, a pair of cylindrical members journaled in said header on opposite sides of said annular flange, faces formed on said cylindrical members for engaging the upper and lower surfaces of said annular flange respectively, and a lever connected to the end of each of said cylindrical members and engageable with the end of the opposite cylindrical member, said levers imparting motion to said cylindrical members and urging the faces thereof into engagement with the upper or lower surfaces of said annular flange for maintaining the tube in the mounting or raising the tube from the mounting.

6. A mounting for a high power tube having a cylindrical anode with an annular flange formed thereon comprising a cooling jacket, a header formed on said jacket, an annular seat disposed in said header, a pair of cylindrical members rotatably journaled in said header on opposite sides of said annular flange, faces formed in each of said cylindrical members and disposed substantially at an angle for providing an abutment with the annular flange on the tube, a lever extending from one end of each of said cylindrical members for imparting rotary motion to said cylindrical members for raising the annular flange from said seat when the levers are moved in

one direction or urging the annular flange against said seat when the levers are moved in the opposite direction.

In testimony whereof we affix our signatures.

ARTHUR M. TROGNER.
CORRIE F. RUDOLPH.

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