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H. J. DAILEY

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ANODE

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Fig. 1.

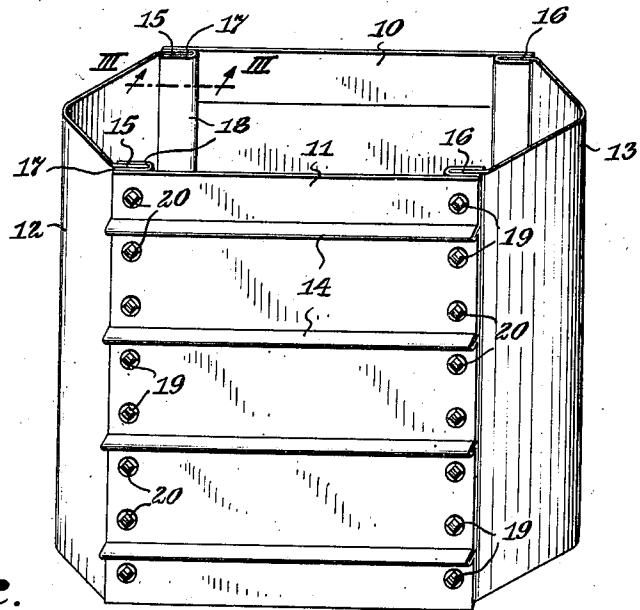


Fig. 2.

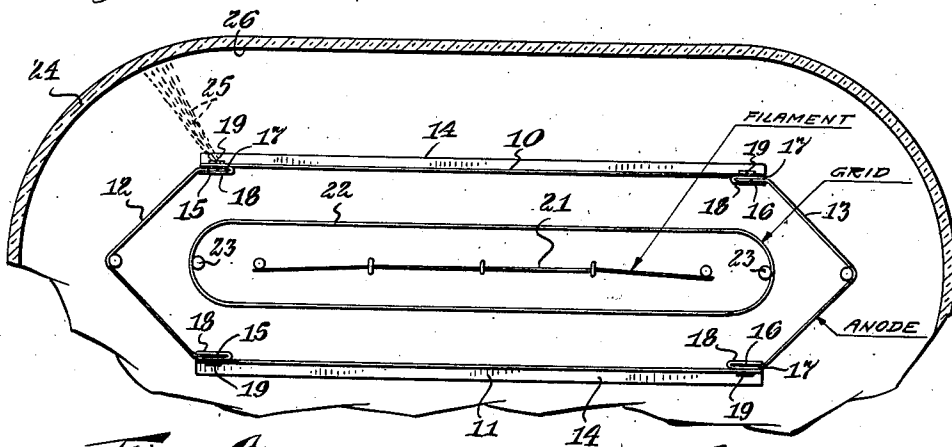


Fig. 4.

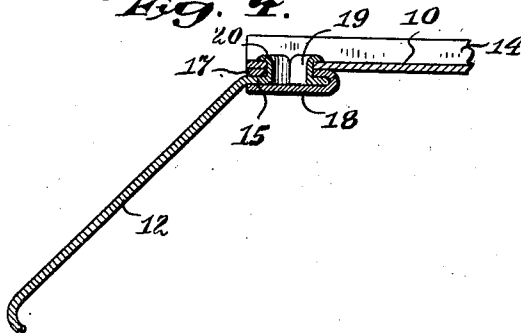
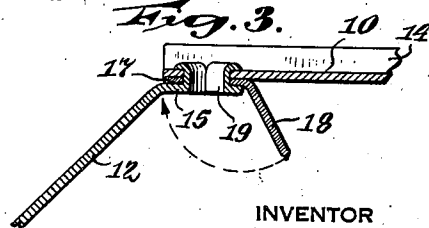


Fig. 3.



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5 Claims. (Cl. 250—27.5)

My invention relates to electron discharge de-
vices and especially to the anode structure in
such a device.

An object of my invention is to provide a sim-
plified anode structure for electron discharge de-
vices that is very cheaply assembled.

Another object of the invention is to prevent
the electron stream from damaging the walls of
the container.

Other objects and advantages of the invention
will be apparent from the following description
and drawing in which:

Fig. 1 is a view in perspective of a preferred
embodiment of my invention.

Fig. 2 is a view in cross-section through the
electrode structure of an electron discharge de-
vice.

Figs. 3 and 4 are enlarged detailed views of the
eyelet construction in its intermediate and final
form.

I desire to quickly and cheaply assemble the
anode structure of an electron discharge device.
In accordance with my invention, I also contem-
plate utilizing expensive tantalum in certain por-
tions of the device where its gas-absorbing prop-
erties with high temperature can be exercised
most efficiently and then combine this expensive
tantalum with cheaper, sturdier material for the
sake of economy. This sturdier material is mo-
lybdenum, nickel, or other easily degasified
metals usually utilized in tubes. My invention
contemplates fastening the tantalum to the
sturdier material by means of eyelets punched out
of the sturdier material and clamping the thin
tantalum sheets thereby.

I have discovered, however, that the eyelet
construction leaves an opening in the anode wall
and that this opening will permit a beam of elec-
trons to pass therethrough and impinge against
the usual glass wall of the container. I have dis-
covered that these beams of electrons etch or
heat the interior of the glass container and a
continuation of this etching or heating would
puncture the glass walls and ruin the tube. In
accordance with my invention, I have utilized the
eyelet construction and have provided means for
covering the openings made necessary by the eye-
let construction.

In Fig. 1 I have illustrated, in perspective, an
anode in a preferred construction comprising two
lateral sides 10 and 11 of tantalum joined by two
V-shaped ends 12 and 13 of a sturdier and cheap-
er material, such as molybdenum or nickel. The
two lateral sides 10 and 11 are preferably ar-
ranged parallel to one another and a series of

longitudinal ribs 14 extend across these tan-
talam sides for strengthening purposes. With
these parallel folds the tantalum may be 4 mils
thick. The two end members 12 and 13 have ex-
tended edges 15 and 16 for attachment to the
tantalum sides. An enlarged view of this ex-
tended edge 15 is disclosed in Figs. 3 and 4.

A plate 17, preferably of similar material to
the sturdy end pieces 12 and 13, is placed between
the edge 15 and the edge of the tantalum to be se-
cured thereto. This plate 17 is of the same
height as the edge 15 but is approximately dou-
ble the width of the edge 15, having the extra
width 18 as disclosed in Fig. 3. The molybde-
num or nickel ends 12 and 13 are secured to the in-
termediate strip 17 and the tantalum side 10 or 11
by stamping an eyelet 19 through the molybde-
num or nickel material of the edge 15 and bind-
ing it over at 20 to secure the tantalum plate 10
or 11 to the V-shaped member 12 with the inter-
mediate strip 17 therebetween. These eyelets
19 extend along the lateral edges of the tantalum
plates 10 and 11 as illustrated in Fig. 1. The
extra width 18 of the intermediate strip 17 is then
bent or lapped over as disclosed in Fig. 4 to close
the openings of these eyelets.

In Fig. 2 I have illustrated a typical electron
discharge device with the filament 21, which may
be M-shaped, located in a central plane. Around
this filament is located a preferably elliptical
grid 22 formed of helical wires on the standards
23. There may, of course, be additional grids if
desired. My preferred anode structure, as illus-
trated in Fig. 1, surrounds the cathode and grid
structure. A glass container wall 24 encloses
the electrode structure. If there were openings
in the anode structure, such as the eyelet 19 in
Fig. 3, then there would be a flow of electrons 25
therethrough that would impinge upon the glass
container wall at 26 and etch this wall.

With continued operation of the tube, the wall
would be punctured at 26 and the tube destroyed
by the inrush of the atmosphere into the evacu-
ated space within the container wall 24. By the
use of my invention the openings in the eyelet
construction are closed and damage to the con-
tainer wall is prevented thereby. I have accord-
ingly disclosed a very cheaply and quickly assem-
bled anode structure that prevents damage to the
container walls by preventing the escape of elec-
trons therethrough.

It is apparent that many modifications may be
made in the particular shape and number of
elements and their assembly in the preferred em-
bodiment disclosed in the drawing, and accord-

ingly I desire only such limitations to be imposed upon my invention as are necessitated by the spirit and scope of the following claims.

I claim:

1. An anode comprising side and end pieces enclosing an electron discharge space, eyelets riveting said pieces together at the boundary of said discharge space, and material substantially covering said eyelets whereby electrons from said discharge space will not pass through said eyelets.

2. An anode comprising side and end pieces, enclosing an electron discharge space, said end pieces having eyelets securing said side pieces thereto at the boundary of said discharge space, and material substantially covering said eyelets whereby electrons from said discharge space will not pass through said eyelets.

3. An anode comprising side pieces of tantalum and end pieces of sturdier material enclosing an electron discharge space, the end pieces of sturdier material having eyelets securing said

tantalum side pieces thereto at the boundary of said discharge space, and material substantially covering said eyelets whereby electrons from said discharge space will not pass through said eyelets.

4. An anode comprising side pieces of tantalum and end pieces of sturdier material enclosing an electron discharge space, the end pieces of sturdier material having eyelets securing said tantalum side pieces thereto at the boundary of said discharge space and means covering said eyelets, comprising a strip secured in said eyelets intermediate said end piece and side piece and having a portion bent over said eyelet.

5. An anode comprising side and end pieces, a discharge space, eyelets riveting said pieces together in said discharge space, and means covering said eyelets, comprising a strip secured in said eyelets intermediate said end piece and side piece and having a portion bent over said eyelets.

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