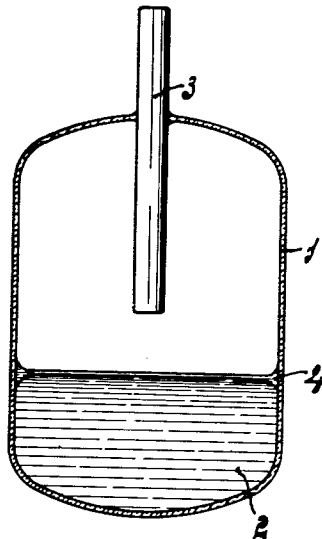


Dec. 13, 1955

H. G. BRUIJNING
VAPOR DISCHARGE TUBE

2,727,174

Filed July 2, 1952



INVENTOR

HUGO GEORGE BRUIJNING

BY

Frederick M. Vogel

AGENT

1

2,727,174

VAPOR DISCHARGE TUBE

Hugo Georg Bruijning, Eindhoven, Netherlands, assigner
to Hartford National Bank and Trust Company, Hart-
ford, Conn., as trustee

Application July 2, 1952, Serial No. 296,907

Claims priority, application Netherlands April 4, 1951

1 Claim. (Cl. 313—163)

This application is a continuation-in-part of an applica-
tion, Serial No. 271,830 filed February 15, 1952, by the
same inventor.

This invention relates to vapor discharge tubes, in
particular, to vapor discharge tubes comprising a
mercury pool cathode and a hydrogen gas filling.

Tubes of the foregoing type frequently have a draw-
back in that they have two different, comparatively con-
stant, igniting or breakdown voltages which alternately
arbitrarily occur. When such a tube is utilized in a
pulse generating apparatus, for example, pulses are pro-
duced which have unequal amplitudes because of these
two arbitrary igniting voltages.

It is an object of this invention to provide a mercury
vapor discharge tube having a hydrogen-filling with one
constant igniting voltage, particularly for use in an ap-
paratus for producing pulses.

This and further objections of the invention will ap-
pear from the description that follows.

According to the invention, a vapor discharge tube
comprising a mercury pool cathode and a hydrogen-
filling of about 1 to a few atmospheres pressure is pro-
vided with a thin layer of a liquid having a low molecular
weight covering the cathode. With such an arrangement,
the tube has one constant igniting voltage.

The invention will now be described with reference 40

2

to the accompanying drawing in which the sole figure
shows a mercury vapor discharge tube, in cross-section,
in accordance with the invention.

Referring to the drawing, the tube shown comprises
5 an envelope 1, of glass, for example, enclosing a mercury
pool cathode 2. An electrically conducting rod 3 of re-
fractory metal, e. g., molybdenum, which serves as an
anode, extends through an opening in the upper wall
10 portion of the envelope 1 and is spatially separated from
the cathode 2. The tube is filled with hydrogen to a
pressure, at room temperature, of about 1.5 atmosphere.

In order to ensure a constant igniting voltage, a thin
layer 4 of a liquid having a low molecular weight, e. g.,
water covers the surface of the pool cathode 2. Water
15 is preferred although other liquids of low molecular
weight, such as ethyl alcohol, can be used since it is
decomposed into oxygen and hydrogen by the arc dis-
charge occurring within the tube which recombines to
form water vapor in the atmosphere of the tube. The
20 water film should be exceedingly thin, i. e., of the order
of 0.1 to 0.2 mm. for best results.

While I have thus described my invention with specific
examples and embodiments thereof, other modifications
25 will be readily apparent to those skilled in the art with-
out departing from the spirit and the scope of the in-
vention as defined in the appended claim.

What I claim is:

A vapor discharge tube comprising a mercury pool
cathode, a hydrogen filling of not more than a few at-
30 mospheres, an anode, an envelope enclosing said cath-
ode and said anode, and a layer of water covering said
cathode and having a thickness of about 0.1 mm.

References Cited in the file of this patent

UNITED STATES PATENTS

1,861,621	Buttolph	June 7, 1932
2,186,215	Slepian	Jan. 9, 1940