May 15, 1962 R. J. THOMAS ETAL 3,035,164

HOUSING FOR DISCHARGE TUBE

Filed June 21, 1957

FIG. 1

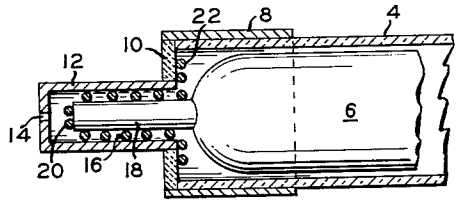
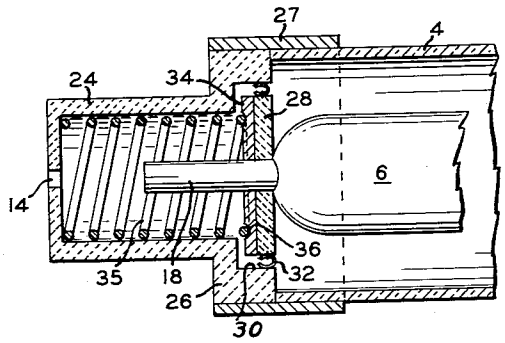


FIG. 2



INVENTORS
RAYMOND J. THOMAS
MICHAEL G. TESI

BY Karl Huber
James E. Bryan
ATTORNEYS

United States Patent Office

3,035,164
Patented May 15, 1962

3,035,164

HOUSING FOR DISCHARGE TUBE

Raymond J. Thomas, New Brunswick, and Michael G. Tesi, Nutley, N.J., assignors to Engelhard Hanovia, Inc., a corporation of New Jersey

Filed June 21, 1957, Ser. No. 667,146
2 Claims. (Cl. 240—11.4)

The present invention relates to a housing for discharge tubes and, more specifically, provides a housing wherein the tube is suspended inside of the housing.

In accordance with the invention, the housing has a substantially helical spring enclosed inside of its end portion, one end of the spring bearing against the housing and the other end bearing against the discharge tube. Thereby heat conduction from the tube to the housing is greatly reduced, the warm-up time decreases and the tube reaches its operating voltage more quickly. Further, the tube suspended between springs inside of the housing is efficiently protected against mechanical shocks and tubes of slight differences of length can be mounted into the same housing.

The invention will be further illustrated by reference to the accompanying drawings, in which

FIG. 1 is a longitudinal and fragmentary section through one embodiment of the invention and

FIG. 2 represents a longitudinal and fragmentary section through another embodiment of the invention.

The housing for discharge tubes as shown in FIG. 1 consists of a cylinder **4** of material transmissive to the radiation produced by the discharge tube **6**, e.g., glass. The end portion of the housing comprises a metal sleeve **8** which envelops the cylinder **4**, a disc **10** of heat resistant, e.g., ceramic, material affixed to the sleeve **8** and a metal ferrule **12** inserted tightly into the disc **10**. An opening **14** in the ferrule is provided for electrically connecting the discharge tube **6**, all electrical parts not being shown.

Inside of the described end portion of the housing, a substantially helical spring **16** is provided, the main portion of the spring enveloping the lead-in neck **18** of the tube **6** and being located within the ferrule **12**. At both ends, the spring **16** terminates into flat spirals, the outer spiral **20** being of decreasing diameter and enclosing the bottom portion of the lead-in neck **18**, while the inner spiral **22** is of increasing diameter and follows the shoulder formed by the ferrule **12** and the disc **10**.

The embodiment of the invention as shown in FIG. 2 is more particularly intended for discharge tubes operating with higher currents, the tube being at a comparatively greater distance from the housing.

The end portion of the housing consists of a cup-shaped end enclosure **24**, made from heat resistant, e.g., ceramic, material and provided with a flange **26**. The flange **26** is affixed to a metal sleeve **27** and holds a collar **28** of heat resistant material axially movable in a circular recess **30**. Into the space between the edge of the collar **28** and the wall of the recess **30**, tabs **32** of spring material can be inserted and attached to the collar **28**. Upon the lead-in neck **18** and adjacent to the outer surface of the collar **28**, a metal washer **34** is mounted which holds the last spiral of a spring **35** in a circular groove **36** in the face of the washer. At the other end thereof, the spring bears against the bottom of the end enclosure **24**.

The dimensions of the housing are chosen in such a way that, according to the embodiment represented in FIG. 1, the spring **16** is slightly extended while the spring of FIG. 2 is subject to compression. In both cases, tubes of slight differences in length can be mounted into the same housing wherein they are suspended and protected against mechanical shock. At the same time, heat conduction from the discharge tube to the housing is greatly reduced and the warm-up time of the tube shortened.

It will be obvious to those skilled in the art that many modifications may be made within the scope of the present invention without departing from the spirit thereof and the invention includes all such modifications.

What is claimed is:

1. In a mounting assembly for discharge tubes having an envelope which terminates in at least one lead-in neck joined to the envelope along a circular area, an annular collar mounted around the lead-in neck adjacent said circular area, a housing surrounding said lead-in neck and said collar, a helical compression spring having a resilient center portion and bearing with its outer end against said housing, the inner end of the spring bearing against said collar to lend resilient support to the discharge tube, substantially the entire length of the lead-in neck being freely enveloped by the resilient portion of said helical compression spring to permit axial displacements of the neck within the spring helix, and a plurality of springs engaging the periphery of the collar and bearing against the inner wall of the housing to maintain the collar substantially centered within the housing.

2. In a mounting arrangement for a discharge tube having a longitudinal axis, means comprising a generally cylindrical lead-in neck secured to one end of said discharge tube for providing a first spring bearing surface on the end of said tube which extends substantially perpendicularly to the axis of said tube, a housing surrounding said lead-in neck, said housing terminating in a tubular end portion of restricted diameter to form a circular shoulder constituting a second bearing surface, and a helical spring, the inner end of the spring terminating in an enlarged flat spiral which bears against said shoulder as the second bearing surface, the outer end of the spring terminating in a diminishing flat spiral which bears against the first bearing surface at the outer end of the lead-in neck, said spring extending between said bearing surfaces and freely enveloping said lead-in neck over their longitudinally coextensive lengths.

References Cited in the file of this patent

UNITED STATES PATENTS

1,044,757	Decker et al.	Nov. 19, 1912
1,938,001	Wilson	Dec. 5, 1933
2,003,342	Cavanaugh	June 4, 1935
2,118,437	Kayatt	May 24, 1938
2,130,768	Kresge	Sept. 20, 1938
2,375,807	Miller	May 15, 1945
2,654,870	Miller	Oct. 6, 1953

FOREIGN PATENTS

1,016,242	France	Aug. 20, 1952
1,092,510	France	Nov. 10, 1954