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MOUNTING FOR NEON TUBES AND THE LIKE

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9 Claims. (Cl. 173—328)

This invention relates generally to luminous gaseous discharge tubes, and more particularly it relates to a mounting for such tubes. More specifically it relates to such tubes having cup-shaped electrodes of the type described in my Patents Nos. 2,271,687 and 2,271,688 of February 3, 1942, and to means for receiving electrodes of this type and thereby to mount the tube such as on a display panel or the like and to establish electrical connection of the electrode thereof, such as to a source of current or to the electrode of another tube.

This application is a division of my application Serial No. 311,978, filed December 27, 1939, now Patent No. 2,355,792.

For the purpose of simplifying the terminology the expression “neon tube” has been used throughout the specification as equivalent to “luminous gaseous discharge tube,” and it is therefore to be understood that when I use the term “neon tube” I do not intend to restrict myself to luminous gaseous discharge tubes in which the gaseous conducting medium is neon, but that this term is intended to include tubes containing gases other than neon and also gaseous conducting media in combination with other substances, such as mercury and its vapor.

Among the objects of my invention is the provision of means for mounting neon tubes that is effective, simple and economical, and that simplifies the operation of mounting and installing neon tubes.

It is further among the objects of my invention to provide a simple, effective and inexpensive housing adapted to receive the electrodes of neon tubes, where these are of the cup-shaped type described in my aforementioned pending applications and effectively to establish electrical connection thereof such as to a source of current or the electrodes of other neon tubes.

Among the objects of my invention are further the provision in a housing for neon tubes of an improved contact arrangement for introducing electric current into the tube, and the provision of an improved arrangement whereby a neon tube will be securely held in the housing.

To attain these objects and such further objects as may appear herein or be hereinafter pointed out, I make reference to the accompanying drawings, forming a part hereof, in which:

Figure 1 is a fragmentary plan view of a neon tube installation using a housing in accordance with my invention;

Figure 2 is a perspective view of one form of housing used in the installation of Figure 2; and showing a neon tube in place in the housing;

Figure 3 is a longitudinal sectional view through the housing of Figure 2 showing two neon tubes in place therein;

Figure 4 is a transverse sectional view through a pair of housings such as shown in Figure 2, mounted on a central support positioned in a trough-like reflecting shield, as in the installation of Figure 1, and showing neon tubes in place therein;

Figure 5 is a perspective view of a housing adapted for use alternatively to that of Figure 2;

Figure 6 is a fragmentary end view on a larger scale of the housing of Figure 5;

Figure 7 is a fragmentary longitudinal sectional view on a larger scale of the housing of Figure 5;

Figure 8 is a fragmentary perspective view on a larger scale of the body of the housing of Figure 5;

Figure 9 is a perspective view of another housing adapted for use alternatively to the housing of Fig. 2, the body of the housing only being shown;

Figure 10 is a fragmentary end view of the housing of Figure 9, showing a tube in place therein;

Figure 11 is a view of the means for fastening the tubes to the housing proper, and illustrating its adaptability to various sizes of tubes.

In Figure 1 I have shown what may be referred to as an indirect lighting neon tube installation, that is, one in which the neon tubes are not visible, but their direct light is intercepted by a shield and is directed toward the walls and the ceiling by which it is diffused and reflected before it reaches an observer. Suitable housings are shown for receiving the terminals of the neon tubes and effecting their proper connection, and these are of a type resembling those shown in Figures 9 to 12 inclusive of my prior application Serial No. 311,978, in that they are adapted for use with neon tubes having their terminals bent angularly in relation to their main body portion, but they differ therefrom in being arranged for mounting on laterally positioned panels or brackets instead of on panels or backings below their bases. They further differ from the forms herefore described in the manner of fastening the neon tubes in place in the housings, as will be fully explained hereinafter. It may further be observed that they are adapted for use in other installations than that of Figure 1. For example they might be used with tubes having bent ter-
minals, where it is desired to mount them closely adjacent to a panel, as in my parent application aforementioned.

The fragmentary neon tube installation of Figure 1 comprises tubes 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, arranged in parallel rows, and the corner tubes 202, 203, 204, 205 bevel angled. The tubes are connected to each other and to the transformer 216, which serves to energize the tubes, by housing 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229 and 230. These housings are mounted on both sides of vertical plates or brackets 231, 232, 233, 234 and 235 which are carried in a reflecting trough having bottom walls 236 and substantially vertical walls 237 (see Figs. 1 and 4) and which is mounted on the walls 238 of a room or other structure, and serve to shield the installation from the view of an observer and to reflect the light against the upper parts of the walls 238 and the ceiling, where the installation is mounted below the ceiling.

The principles of construction of the housings of the installation of Figure 1 will be understood from the description of the housings 220 and 221 which are illustrated in greater detail in Figures 2, 3 and 4, the first two figures showing the housing 220, while Figure 4 is illustrative of the mounting of two housings 220 and 221 on a single bracket.

Referring now to Figures 2 and 3, the housing 220 will be seen to comprise a hollow body 239 open at the top and having a number of concave seats 240 formed in its upper rim, each adapted for the seating thereon of a glass neon tube 241, the angularly bent terminal portion 242 of which extends into the body 239. The body has sufficient capacity to receive the terminal portions of a pair of neon tubes, and it will be observed that due to the number and arrangement of the seats 240 the neon tubes are adapted to assume various positional relations to each other and to the housing. For example, in Fig. 1, the tubes are shown mounted in end to end relation and in parallel spaced relation. However, all the relative positions shown in Figure 1 of my parent application, such as rectangular bends, are also attainable with the single form of body hereinbefore described, whereas in Figure 2, whereas in Figure 1 of my parent application several forms are required.

The body 239 is further shown as of sufficient capacity to accommodate neon tube electrodes of the type shown in my aforementioned Patents Nos. 2,271,657 and 2,271,658. In the wall of the body beneath each seat 240 is an opening 243 through which may be passed a flexible member, such as a wire 244 by means of which a neon tube may be held fast within the seat. For this purpose the wire 244 is shown looped about the tube 241 in any suitable or preferred manner. In Figure 2 the wire 244 is doubled over the tube, and its free ends are then brought through an opening 243, brought up on opposite sides of the tube and then twisted together, as at 245, to form a second loop.

Lugs 246 are provided at one side of the body 239 by means of which it may be fastened to a bracket 233, as for example by bolts 247 passing through openings 248 in the lugs and through complementary openings in the brackets 233.

In Figure 4 a single lugs 246 of a pair of housings, namely 220 and 221.

A double spiral spring 249, similar to the spring 171 of Figures 11 and 12 of my parent application serves to effect electrical connection between a pair of neon tubes. For this purpose its base coils may have a friction fit with the bottom of the body 239, as already described in connection with the spring 171 of that application.

The housing 221 shown in Figure 4 is identical with the housing 220 also shown in said figure. For that reason its parts, as shown in Figure 4, have been similarly numbered, with the numerals primed.

It may again be observed that the seats 240 of this type of housing are so arranged as to adapt it for use in connecting tubes in end-to-end, parallel or angular relationship, which of course is of great advantage in reducing the number of items that a dealer or manufacturer must stock.

The housings 220 and 221 of Figure 1 serve respectively to connect the electric wires 250 and 251 to the neon tubes 207 and 208. They are similar to the housings 220 just described, but with modifications. Without going into the details of the modification in the construction of the housing 220, necessary to effect such connection, it may be stated that the twin spiral spring 249 may be made with only one spiral spring, and instead of the second spiral spring a connector like the connector 131 of Figure 14 of my parent application may be used for attaching the electric wire to the spring.

The housing shown in Figures 5, 6, 7 and 8 may be used in the installation of Figure 1 alternatively with the housings there shown, such as the housings 220 and 221 just described. It differs from the latter mainly in having preformed recesses for securing the neon tube seat 241 in the housing which is carried by the latter, instead of being separate therefrom and uniformed prior to the mounting of the tube, as in the forms hereinbefore described.

The body of the housing is shown at 258, and it will be observed that it is hollow and open at the top. Its upper rim is provided with concave seats 261, these being shown at the ends and at one side; obviously, however, they might also be provided on the remaining side if desired. Positioned within suitably contoured recesses 262 adjacent each end seat 241 of the housing shown is a similar form of housing shown in Figure 2, whereas in Figure 1 of my parent application several forms are required.

These are conveniently formed with a loop 264 at their high portion, for attaching purposes, as will be explained, and with an open loop portion 265 adapted to receive a neon tube 266 and to grip the same. A pair of clips 263 are shown associated with each end seat 261 and these are secured to opposite sides of the wall of the body 260 in any suitable or preferred manner, as by rivets 267 passing through openings 268 in the walls of the body and headed over the loops 264. It will be understood that in order to insert a tube such as 266, the same is forced between the end portions 269 and 270 of the clips 263, against the resilient resistance of the latter and is held thereby.

The resulting construction permits ready insertion or removal of the tube 266 without altering the housing in any way.

Obviously the clips 263 themselves may be made removable, as for example by using bolts instead of the rivets 267.

While clips 263 have been shown only on the ends of the body 260, it will be understood that they 247 is shown being used on the sides, wherever required or desired, on the sides as well. It is further to be noted that the fastening 244 of the preceding embodiment may be used instead of the clips 263 where the latter are not available.
the construction of the body 260 being adapted therefrom. Lugos 271 are provided on the body 260 for attachment purposes.

A second alternative form for use with the installation of Figure 1 is shown in Figures 9, 10, and 11. In this form, the hollow body portion 280, similar to the body 250, is provided with dished tube-receiving seats 281 along its rim. Brackets 282, projecting outwardly from the body 280, are positioned one below each seat 281, and each bracket has two spaced holes 283 therein. A neon tube 294 is adapted to seat on a seat 281 and may be held thereon by a resilient clip 285, having two legs 286 and 287, adapted for insertion into the holes 283, and provided in the illustrated form with a looped bight portion.

In order to increase the holding power of the clips and lessen the chances of their accidental disengagement, the ends 289 and 290 of the legs 286 and 287 may be bent laterally outward so as to produce a shoulder effect that will increase the resistance to withdrawal of the legs from the holes.

In Figure 11 I have illustrated the adaptability of this construction for use with neon tubes of different diameters which are indicated by the dotted and dashed circles 284 and 284′. Obviously, the clip 285 is adaptable, with suitable manipulation, to clamp either of them in place.

The body 280 is also provided with suitable attaching lugs 291. It will be observed that common to the various embodiments described and illustrated in Figures 1 to 11, there is provided in an insulating housing for the purposes described, a seat for locating the neon tube, avoiding the need for the employment of the usual elevation posts for such illuminants, to bind and to mount the same to some frame, so that the housing not only displaces these usual contrivances, but more effectively gains compactness and eliminates light obscurations and minimizes interference with the reflective surface in association with which the neon tubes are mounted.

It will thus be observed that I have provided a housing adapted for use with neon tubes having electrodes such as described in my aforesaid Patents Nos. 2,271,657 and 2,271,658, and that is simple, effective and economical. While these improved housings are particularly suitable for use with neon tubes having electrodes of the aforementioned type, it is to be understood that they may be used with neon tubes having electrodes of other types, and that my invention contemplates such use.

My invention further contemplates the joint use of the various features of my invention in relations other than the identical relations herein disclosed, and that I do not restrict myself to such disclosed combinations.

While I have herein shown and described several illustrative embodiments of my invention and the manner of their use, it is to be understood that my invention may be embodied in many other forms, as will be obvious to those skilled in the art. All such departures from the spirit thereof, and that the disclosure herein is by way of illustration merely and is not to be interpreted in a limiting sense, and that I do not limit myself other than as called for by the language of the appended claims.

In the thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:

1. A twin electrode receptacle for tubular illuminants comprising an elongated hollow body adapted to receive the rectangularly disposed electrode end of the illuminant through an opening defining a rim for said body, a bracket at the side of the body having a base in a plane substantially parallel to the axial line of said body, seats for the side portions of said illuminants formed in the said rim the seats lying in a plane at substantially right angles to the plane of said bracket whereby said tube is held in said seat is maintained at a fixed angle in relation to the plane of the base of said bracket.

2. A twin electrode receptacle for tubular illuminants comprising an elongated hollow body of insulating material adapted to receive pairs of the rectangularly disposed electrode ends of the tubular illuminants through an opening defining a rim, a bracket at the side of the body and seats for the side portions of said illuminants comprising recesses in the said rim in a plane substantially at right angles to the plane of said bracket whereby spaced illuminants may be maintained in predetermined angular relationship to said bracket.

3. A twin electrode receptacle for tubular illuminants comprising an elongated hollow body of insulating material adapted to receive the rectangularly disposed electrode ends of contiguous illuminants through an opening in said body defining a rim portion, a bracket at the side of said body, seats for the side portions of said illuminants formed in the said rim by recessing said rim in a plane substantially at right angles to the plane of said bracket thereby to hold said illuminants in a fixed angle in relation to said bracket and whereby pairs of said receptacles may have their bases united to arrange a plurality of said illuminants in parallelism.

4. A twin electrode receptacle for pairs of tubular illuminants comprising an elongated body adapted to receive the rectangularly disposed electrode end of the tubular illuminant through an opening defining a rim, a bracket at the side of the body and seats for the side portions of said illuminants formed in the said rim in a plane substantially at right angles to the plane of said bracket to dispose the main body of said illuminants in fixed relation to an electrode contact within said body and anchoring means for fastening elements adjacent said seat on said rim whereby to hold said illuminants in fixed relation to the base of said bracket.

5. A twin electrode receptacle for receiving the rectangularly disposed electrode terminals of pairs of neon tubes comprising a hollow body open at one side and providing a rim formed with a plurality of seats conforming to said tube contour, a bracket at the side of the body and fastening means adjacent each of said seats adapted to hold one of said tubes in said seats.

6. In an indirect lighting neon tube installation, the combination comprising twin electrode receptacles having mounting means thereon for the neon tubes arranged to receive in mounted relationship therewith the rectangularly disposed electrode ends of the tubular neon tube receptacle being formed with brackets having bases in parallelism with the axial line through said brackets, pairs of said receptacles being joined to each other and to supporting means therefor to dispose said neon tubes in parallelism and in fixed relation to said brackets.

7. A twin electrode receptacle forming the in-
sulation for neon tubes comprising a hollow body open on one side defining a rim portion, seats formed in said rim portion at right angles to the axial line through said body whereby a tube having an electrode terminal at right angles to the main body of the tube may be supported within said receptacle and engaging portions for fastening elements formed in said body adjacent said seats arranged to cooperate with fastening elements to hold said tubes in the said seats.

8. A twin electrode receptacle for neon tube illuminants arranged to receive a rectangularly disposed branch defining the electrode terminal of said tubes, said receptacle comprising a hollow body open at the top and adapted to receive the terminal portion of said tube, axially concave seats formed in the rim of said body, adapted to seat the wall of the tube in fixed relation to the axial portion of said receptacle and engaging portions for fastening elements formed in the body of said receptacle adapted to cooperate with fastening elements to hold said tube in said seat, said elements comprising substantial U-shaped resilient clips arranged to receive the neon tube in the bight portion thereof.

9. A twin electrode receptacle for neon tubes comprising a hollow body open at one end defining a rim portion adapted to receive within it the rectangularly disposed electrode terminal of the neon tube, a bracket substantially at right angles to said rim portion, recesses on the rim forming seats for the neon tubes, engaging portions for fastening elements formed in the body of said receptacle adjacent said recesses, and fastening elements engaging said portions adapted to hold said tubes within said seats and comprising resiliently directed U-shaped clips arranged to conform to tubes of various dimensions.

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