Oct. 16, 1934. H. J. CUDNEY 1,976,836

ILLUMINATED SIGN

Filed Feb. 10, 1930

Fig. 1.

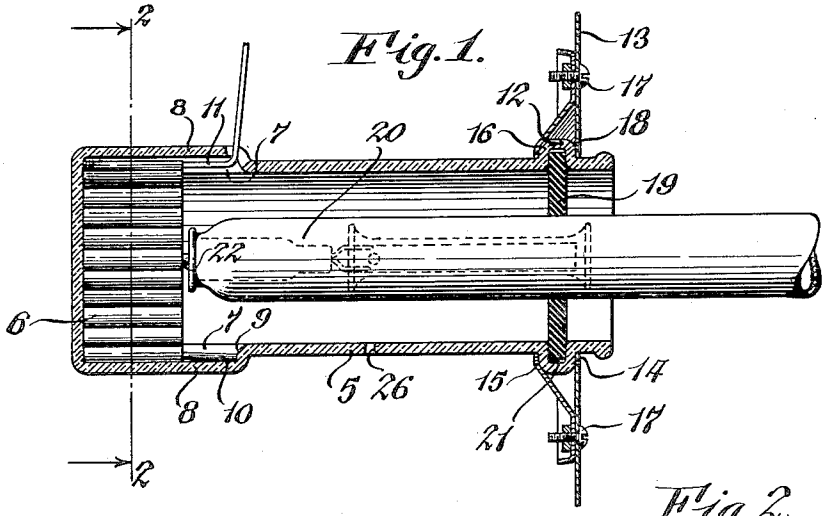


Fig. 2.

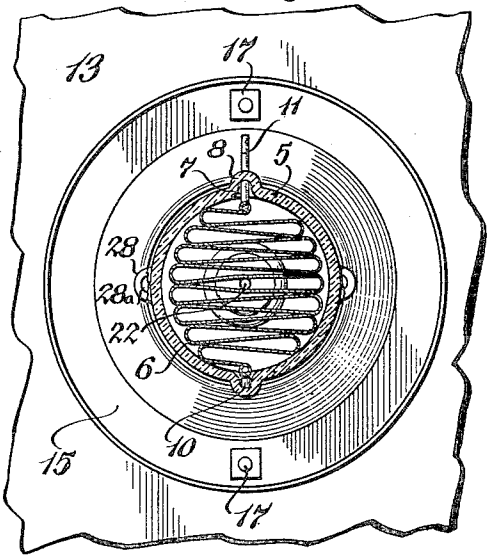
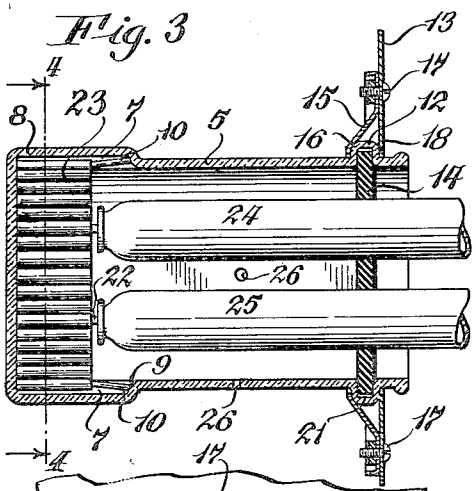


Fig. 3



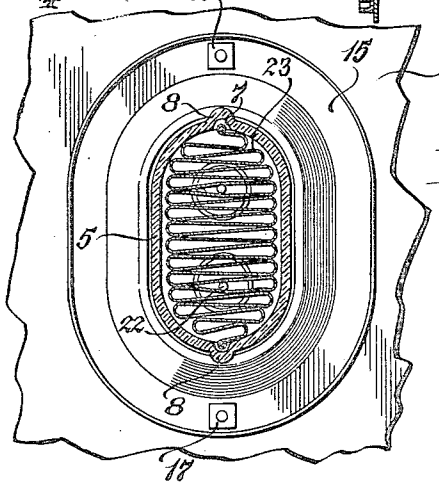


Fig. 4.

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UNITED STATES PATENT OFFICE

1,976,836

ILLUMINATED SIGN

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Application February 10, 1930, Serial No. 427,163

10 Claims. (Cl. 173—328)

This invention relates to improvements in illuminated signs of the kind in which electroluminescent tubes are utilized for display purposes. More particularly the invention includes an improved form of insulator receptacle or housing of the general character of the receptacle or housing shown in the insulator assembly which forms the subject matter of the co-pending application of R. R. Wiley, W. K. Wiley and myself, Serial No. 293,565, filed July 18, 1928. The assembly illustrated in the said application is designed to support resiliently the electrode carrying terminal portion of a tube and to seal the chamber in which it is connected to power.

The principal object of the present invention is an insulator receptacle or housing which may be sealed by a single element co-operating directly with the tube independently of the sign face to seal the chamber in which the tube terminal is connected to power.

A further object is an insulator assembly designed for the support of electroluminescent tubes and for their connection to power which includes as an element thereof a receptacle or housing of the kind generally described and which, when secured will not impair the appearance of the sign.

The invention is illustrated in the accompanying drawing, in which:—

Figure 1 is a longitudinal section of the receptacle illustrated in connection with associated parts of the assembly for which it is designed.

Figure 2 is a section taken along line 2—2 of Fig. 1.

Figure 3 is a longitudinal section of a modified form of receptacle.

Figure 4 is a section taken along line 4—4 of Fig. 3.

For purposes of illustration the receptacle or housing 5 (Figs. 1 and 2) is shown in conjunction with associated parts of the assembly for which it is designed. It may be formed from any suitable insulating material but is preferably of glass. The closed end of the receptacle is intended to accommodate a power terminal which is normally connected to power.

The power terminal, indicated at 6, is preferably fashioned from a strip of resilient metal which is folded back and forth upon itself to provide a series of folds or convolutions whereby it may be compressed and inserted through the mouth of the receptacle into the closed end thereof. Other forms of power terminals may be employed, the form shown and its co-operating relation to the electrode carrying portion forming the subject of the co-pending application of Harry J. Cudney, Serial No. 293,681, filed July 18, 1928. By virtue of its resiliency the power terminal when positioned in the closed end of the receptacle expands to a size determined by the size of the receptacle. In order to secure the power terminal in the closed end of the receptacle so that the electrodes by which the tubes are connected to power may be inserted and withdrawn from between the folds of the terminal without possibility of displacing it from its intended position means is provided for removably securing the terminal against such displacement. For this purpose opposed longitudinal grooves 7 are formed at the closed end of the receptacle, the formation of the grooves resulting in external ribs 8. The grooves preferably start from the closed end of the receptacle. They terminate at their opposite ends to provide shoulders 9. Relatively stiff wires 10 and 11 are secured to the opposite ends of the resilient strip from which the power terminal is formed. The wire 10 is of such a length that upon the expansion of the power terminal it will be forced into one of the grooves 7 and its end abut a shoulder 9. The opposite wire 11 is utilized to connect the power terminal 6 to power. It is, therefore, of greater length than the wire 10 and is bent at right angles to pass through an opening formed for this purpose, the laterally projecting portion of the wire co-operating with the walls of the opening to prevent displacement of its end of the power terminal.

A bead 12 is formed in the receptacle adjacent its open end to facilitate its securement to a supporting wall 13 of a sign casing. The receptacle is secured to the rear side of said wall and is in axial alignment with an opening 14, which is formed in the wall to provide for the assembling of the tube, the electrode carrying portion of the tube being inserted through said opening. The securement of the receptacle is effected by a ring 15 which extends over the outer shoulder 16 provided by the bead, the ring being secured to the wall 12 in any suitable manner as by nut and bolt fastenings 17. The inner shoulder 18 at the outset projects slightly beyond the front face of the ring 15 and hence when the ring is securely bolted in position said shoulder is drawn tightly against the wall 12 (as shown) thereby holding the receptacle in position. Ribs 28 (Fig. 2) similar to ribs 8 on the opposite end of the receptacle, may be formed to co-operate with

suitable recesses in the clamping ring 15 to lock the receptacle against rotary movement. The ribs may be provided with openings 28a at their outer ends to provide drainage means for the receptacle.

The construction thus far described is intended for more or less permanent securement within the sign casing except that its removal may be required for repairs or substitution, in which case such removal can be readily effected by removing the clamping ring 15. The assembly is completed by a sealing member 19 which is associated with the electrode carrying portion 20 of a tube, the purpose of the sealing member 19 being to co-operate with the power terminal 6 in the resilient support of the tube and also to co-operate with the tube in sealing the mouth of the receptacle to protect the enclosed elements against outside influences.

In the formation of the bead 18 which is utilized in the support of the receptacle to the sign casing as described, a channel 21 is provided which is adapted to accommodate the sealing member 19.

The sealing member 19 is preferably composed of resilient insulating material, soft rubber being desirable for most purposes. It may be distorted and inserted through the mouth of the receptacle into the enlarged chamber provided by the channel 21. The member thereupon can expand to its natural shape in which it is supported across the entrance of the receptacle by its margins which are forced into the channel 21. The member is provided with a central opening of a size which insures its tight fit upon the electrode carrying portion 20 of the tube when said portion is inserted into the receptacle to connect its terminal 22 to the power terminal.

The size of the sealing member 19 is preferably such that while it takes up substantially the entire depth of the chamber provided by the channel 21 it is of a less diameter than the said chamber. This enables its transverse movement with respect to the longitudinal axis of the receptacle to insure the co-operation of the sealing member with different tubes which may vary slightly in length or in the angles at which their terminal portions extend from their main body portions. Thus the sealing member is capable of accommodating tubes having different physical characteristics while at the same time insuring effective sealing of the tube and power terminals against the elements.

The facility with which a tube may be applied to or removed from the sign casing will be apparent. In applying the tube all that is required is to insert the electrode carrying portion through the opening in the sealing member into the receptacle until the terminals 22 are fully engaged with the power terminals, during which operation the sealing members automatically accommodate themselves to their respective tubes. The tubes are, of course, secured against outward movement with respect to the sign casing at points along their extent and the resilient power terminals and sealing members will prevent substantial lateral movement of the tubes.

In Figures 3 and 4 a modified form of receptacle is illustrated. This form is intended for use where it is desired to connect the adjacent terminals of two tubes in the same current path. Heretofore, this has necessitated the use of two receptacles 5 of the kind illustrated in Figure 1, the terminals of the receptacles being connected by a suitable lead wire. In addition to the extra labor and material costs involved in such installations it is also necessary in those cases where incandescent lamps are mounted in the sign casing for additional means of illumination, to partition off that part of the casing in which the two terminals are connected by the lead wire so that workmen in removing and replacing the incandescent lamps will not come into contact with this lead which is, of course, of such a high voltage as to be dangerous. The installation of such partitions represents a substantial item in the construction of a sign employing both electroluminescent tubes and incandescent lamps.

The receptacle construction shown in Figures 3 and 4 eliminates the necessity of such partition as the terminals of the tubes are connected in series within the receptacle by a connecting element 23 similar in shape to the power terminal 6 shown in Figure 1, the said element being secured in a similar manner in the closed end of the receptacle.

Instead of being cylindrical, it is preferably formed in the shape of a flattened tube in order that it may accommodate the adjacent electrode carrying portions 24 and 25 of the two tubes. In this arrangement the current may pass from the tube 24 through the connecting element 23 to the tube 25 or vice versa. The receptacle may be attached to and removed from its supporting wall as described with reference to Fig. 1. No high tension wires are exposed and shielding partitions are unnecessary.

Holes 26 may be formed in the bodies of the receptacles at desired points to provide for their drainage in the event that a tube be broken or water otherwise be permitted to pass into them.

The arrangement of the sealing members 19 within the receptacles as described eliminates the necessity of bushings upon the display face of the sign and as the receptacles are relatively small in size their use does not detract from the appearance of the sign.

Having described my invention, I claim:—

1. A receptacle for housing a power line terminal which is adapted to cooperate with a terminal projecting from the electrode carrying terminal portion of an electroluminescent tube in various positions comprising a hollow body of insulating material having a mouth of substantially greater size than said terminal portion, a bead formed in said body providing a shoulder upon the exterior of the receptacle for use in the support of the receptacle, a channel formed in said bead and communicating with the interior of said receptacle and a sealing member having its marginal edges located in said channel and adapted to cooperate with the electrode carrying portion of the tube to seal said mouth.

2. In an electric sign, the combination with a wall having an opening and an electroluminescent tube having an angularly extending electrode carrying terminal portion for insertion through said opening, the latter being of substantially greater size than said terminal portion, of a receptacle for housing a power line terminal which is adapted to co-operate with the terminal projecting from the said terminal portion in various positions, a bead formed in said receptacle, means engaging said bead for securing said receptacle to said sign, said bead providing a channel and a means held in posi-

tion by said channel and co-operating with said electrode carrying terminal portion of the tube for sealing said receptacle.

3. In an electric sign, the combination with a wall having an opening and an electroluminescent tube having an angularly extending electrode carrying terminal portion for insertion through said opening, the latter being of substantially greater size than said terminal portion, of an insulating receptacle for housing a power line terminal which is adapted to co-operate with the terminal projecting from said terminal portion in various positions, a bead formed in said receptacle, means engaging said bead for securing said receptacle to said sign, said bead providing a channel and means removably held in position by said channel and co-operating with said electrode carrying terminal portion of the tube for sealing said receptacle.

4. In an electric sign, the combination with a wall having an opening and an electroluminescent tube having an angularly extending electrode carrying terminal portion for insertion through said opening, the latter being of substantially greater size than said terminal portion, of an insulating receptacle for housing a power line terminal which is adapted to co-operate with the terminal projecting from said terminal portion in various positions, a bead formed in said receptacle, means for engaging said bead for securing said receptacle to said sign, said bead providing a channel and flexible means held in position by said channel and co-operating with said electrode carrying terminal portion for sealing said receptacle.

5. A receptacle for housing a power line terminal which is adapted to co-operate with a terminal projecting from the electrode carrying terminal portion of an electroluminescent tube in various positions comprising a hollow body having a mouth of substantially greater size than said terminal portion and a bead formed in said body providing a shoulder upon the exterior of said body for use in the support of the receptacle, a channel formed in said bead and communicating with the interior of said body and a member having its marginal portions located in said channel, said member being adapted to co-operate with the electrode carrying portion of the tube to seal said mouth and being bodily adjustable in said channel.

6. A receptacle for housing a power line terminal which is adapted to co-operate with a terminal projecting from the electrode carrying terminal portion of an electroluminescent tube in various positions comprising a hollow body having a mouth of substantially greater size than said terminal portion and a bead formed in said body providing a shoulder upon the exterior of said body for use in the support of the receptacle, a channel formed in said bead and communicating with the inerior of said body and a flexible member having its margins located in said channel, said member being adapted to co-operate with the electrode carrying portion of the tube to seal said mouth and being bodily adjustable in said channel.

7. A receptacle for housing a power line terminal which is adapted to cooperate with a terminal projecting from the electrode carrying terminal portion of an electroluminescent tube in various positions comprising a hollow body having a mouth of substantially greater size than said terminal portion and a bead formed in said body providing a shoulder upon the exterior of said body for use in the support of the receptacle, a channel formed in said bead and communicating with the interior of said body and a member having its margins located in said channel, said member being adapted to co-operate with the electrode carrying portion of the tube to seal said mouth and being formed with a central opening through which the electrode carrying terminal portion of the tube extends.

8. In an electric sign, the combination with the wall having an opening and an electroluminescent tube having angularly extending electrode carrying terminal portion for insertion through said opening, the latter being of substantially greater size than said terminal portion, of a receptacle for housing the power line terminal which is adapted to co-operate with the terminal projecting from the said terminal portion in various positions, a bead formed in said receptacle, means engaging said bead for securing said receptacle to said sign, said bead providing a channel and means held in position by said channel and co-operating with said electrode carrying terminal portion of the tube for sealing said receptacle, said means being bodily adjustable in said channel.

9. In an electric sign, the combination with a wall having an opening and an electroluminescent tube having an angularly extending electrode carrying terminal portion for insertion through said opening, the latter being of substantially greater size than said terminal portion, of a receptacle for housing a power line terminal which is adapted to co-operate with the terminal projecting from the said terminal portion in various positions, means for securing said receptacle to said sign, said receptacle being formed adjacent its mouth with an integral annular enlargement which provides a recess channel-shaped in cross-section and means fitting in said recess and co-operating with said electrode carrying terminal portion of the tube for sealing the mouth of the latter.

10. In an electric sign, the combination with a wall having an opening and an electroluminescent tube having an angularly extending electrode carrying terminal portion for insertion through said opening, the latter being of substantially greater size than said terminal portion, of a receptacle for housing a power line terminal which is adapted to co-operate with the terminal projecting from the said terminal portion in various positions, means for securing said receptacle to said sign, said receptacle being formed adjacent its mouth with an integral annular enlargement which provides a recess channel-shaped in cross-section and a rubber disc fitting in said recess and adapted to co-operate with said electrode carrying terminal portion of the tube for sealing the mouth of the latter.

HARRY J. CUDNEY.