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E. J. LEONARD

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TUBE SUPPORTS

Filed Nov. 26, 1962

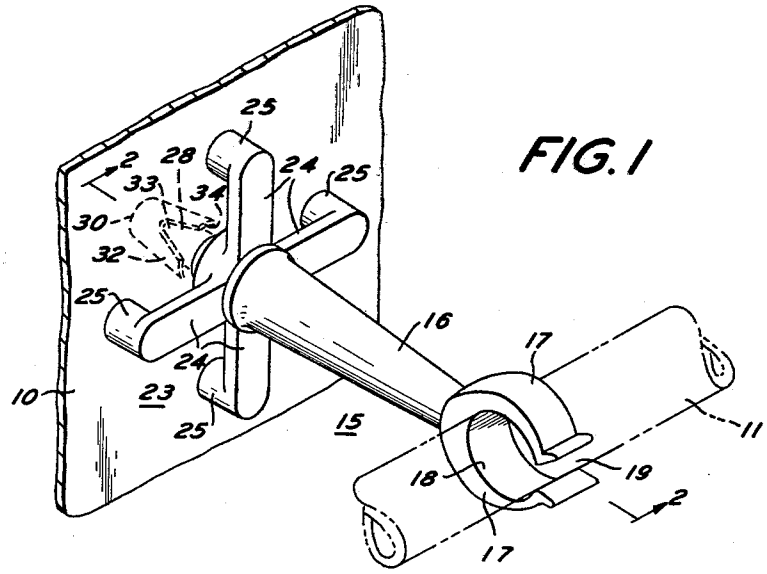


FIG. 1

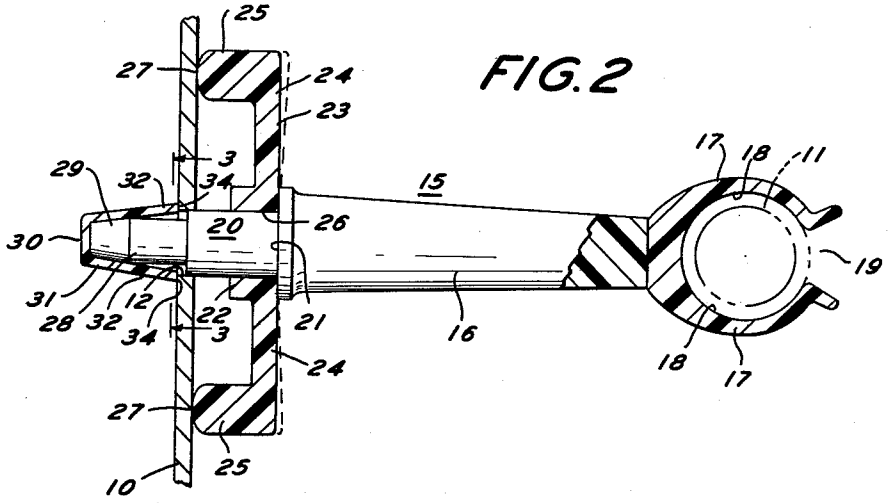


FIG. 2

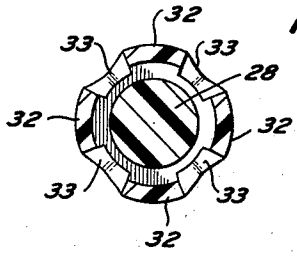


FIG. 3

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TUBE SUPPORTS

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6 Claims. (Cl. 248—50)

This invention relates to tube supports.

Difficulties have been encountered with the devices and procedures now available for mounting neon tubes and the like for light display purposes. It has been necessary to drill holes at the desired locations on a mounting plate, then mount a bolt or the like with access required to both sides of the mounting plate. The elevated and relatively inaccessible locations at which neon tubes and the like are used has made the problem of mounting the tubes difficult because of the necessity of working on a ladder.

The prior available devices in many instances have involved possible shock hazards, particularly for replacements.

It is the principal object of the present invention to provide a tube support, for neon tubes and the like, which can be quickly and easily mounted for use with a saving of time and material.

It is a further object of the present invention to provide a tube support which is free from corrosion in the presence of salt air and acid fumes, which is free from static electricity and which is resistant to heat and cold.

It is a further object of the present invention to provide a tube support which can be made of transparent material and will not adversely affect the visibility of the tube in use.

It is a further object of the present invention to provide a tube holder which can be easily installed by the operator, only one hand being needed.

It is a further object of the present invention to provide a tube holder which can be removed, if desired, and reused.

Other objects and advantageous features of the invention will be apparent from the description and claims.

The nature and characteristic features of the invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part thereof, in which:

FIGURE 1 is a view in perspective of a tube holder in accordance with the invention in position on a mounting plate;

FIG. 2 is a vertical sectional view, enlarged, taken approximately on the line 2—2 of FIG. 1;

FIG. 3 is a vertical sectional view, still further enlarged, taken approximately on line 3—3 of FIG. 2.

It should, of course, be understood that the description and drawings herein are illustrative merely, and that various modifications and changes can be made in the structure disclosed without departing from the spirit of the invention.

Referring now more particularly to the drawings a mounting plate **10** is shown which serves as a back reflector, sign plate, or merely as a support, as desired, for a gas tube such as a neon tube a fragmentary portion of which is illustrated at **11**.

The plate **10** may be varied in thickness in accordance with the requirements of a particular installation and merely by way of specific illustration can be in the range from 0.060 inch to 0.120 inch.

At each of the locations on the plate **10** at which a support is desired, a hole **12** is drilled through the plate **10**, say with a three sixteenths inch drill. The size of the hole **12** will be varied to accommodate the dimensions of the specific tube support but the size stated has been found to be satisfactory.

The tube holder **15** to be described is advantageously made of synthetic plastic material, which preferably is resistant to corrosion in the environment in which it is used, is free from the tendency to collect or generate static electricity, is transparent, is strong and free from likelihood of shattering, is resistant to changes in temperature and capable of functioning without change in atmospheric temperatures, and is relatively rigid but possesses adequate resiliency at both ends.

The tube holder **15** is preferably made in a plurality of parts and includes a tapered stem **16** with resilient fingers **17** extending therefrom, interiorly curved as at **18** for resilient gripping engagement with the tube **11**. The spacing at **19**, at the ends of the fingers **17** facilitates the entry of the tube **11** between the fingers **17** for mounting or the withdrawal of the tube **11** if desired.

The stem **16** has a shank **20** coaxial therewith terminating at a shoulder **21**. The shank **20** is adapted to receive the central boss **22** of a spider **23** having resilient arms **24** with terminal projections **25** extending normal to the ends thereof. The boss **22** has a central opening **26** through which the shank **20** extends. The projections **25** preferably have rounded ends **27** for engagement with the plate **10**.

The shank **20** has an extension **28** of reduced diameter from which a frusto conical end section **29** extends. An end piece **30** extends over and is permanently secured to the end section **29**. The end piece **30** has a tapered skirt portion **31** with bendable resilient spaced holding strips **32** of predetermined thickness and length extending therefrom with slots **33** therebetween and terminal ends **34**.

The diameter of the extension **28** taken with the thickness of the strip **32** is such as to permit movement thereof through the hole **12** in the plate **10**.

The mode of application and of use will now be pointed out.

When it is desired to mount a tube **11** on a mounting plate **10** a plurality of holes **12** are drilled at locations at which tube holders **15** are to be mounted.

A spider **23** is then applied to the shank **20** with its terminal projections **25** pointed away from the fingers **17**.

The shank **20**, with the end piece **30** in place, is advanced to and inserted through the hole **12**.

As the inserting action is commenced the tapered skirt portion **31** facilitates the insertion. The holding strips **32** in their passage through the hole **12** are flattened to positions engaging the shank **20** and after they have passed completely through the hole **12** spring outwardly so that their terminal ends **34** engage the plate **10** to retain the stem **16** in holding position.

The resiliency of the arms **24** of the spider **23** permits the insertion and accommodation to plates **10** of different thicknesses without the necessity for using different sizes of holders. The temporary distortion of the arms **24** upon insertion is indicated in broken lines in FIG. 2.

The tube **11** can then be snapped into position for retention.

It will thus be seen that a simple but effective structure has been provided by which the objects of the invention are attained.

I claim:

1. A support comprising a stem having a shoulder thereon with a shank of reduced diameter extending therefrom, a spider having a boss with a central opening through which said shank extends with said shoulder in engagement with the spinder, said spider having a plurality of resilient arms extending outwardly from the shank with terminal projections at the ends of said arms, said shank having an end member thereon with outwardly projecting resilient strips collapsible to positions of reduced diameter.

2. A support as defined in claim 1 in which said end

member has a skirt of smaller diameter at its terminal end for facilitating insertion through an opening.

3. A support as defined in claim 1 in which said projections have terminal portions for engagement on one side of a mounting plate and said terminal projections are engageable with the opposite side of a mounting plate.

4. A support as defined in claim 1 in which said stem at the end opposite said shank has opposed resilient gripping fingers.

5. A support as defined in claim 1 in which said spider is movably mounted on said shank.

6. A tube support for retaining a tube in position on a supporting plate and said plate has an opening therethrough comprising a stem, said stem having tube engaging and retaining portions at one end and a shoulder contiguous to the other end with a shank of reduced diameter extending from said shoulder, a spider having a central boss with a central opening through and beyond which said shank extends, said spider having a plurality of resilient arms extending outwardly from the shank with terminal projections for engagement with one side of the supporting plate, said shank having an end member thereon with a plurality of resilient strips extending toward the opposite end of the stem and outwardly, said end member and said strips being insertable through said plate opening, said strips being collapsible for such insertion and in free condition springing outwardly with their end terminals in holding engagement with the opposite side of the supporting plate.

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