Oct. 5, 1943. S. C. MILLER 2,330,835

NEON SIGN POST SUPPORT

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Fig. 1.

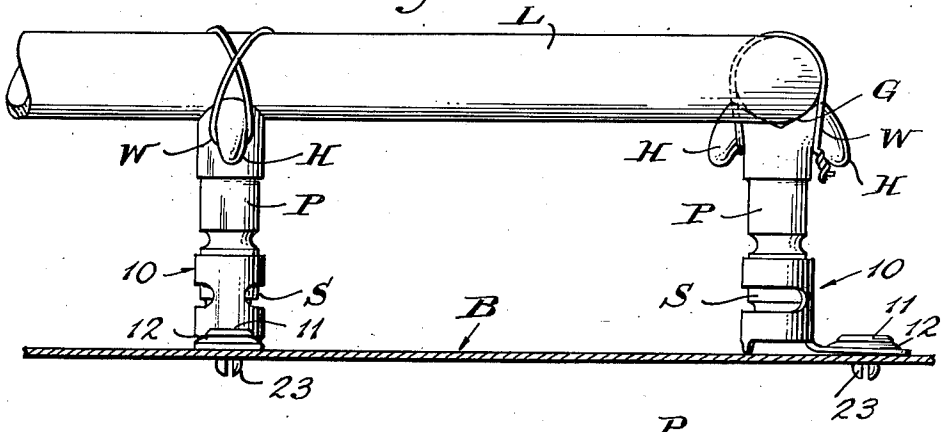


Fig. 2.

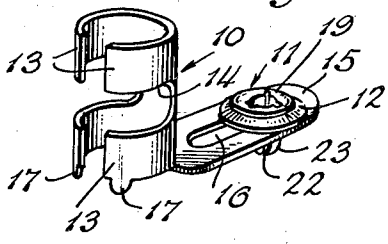


Fig. 4.

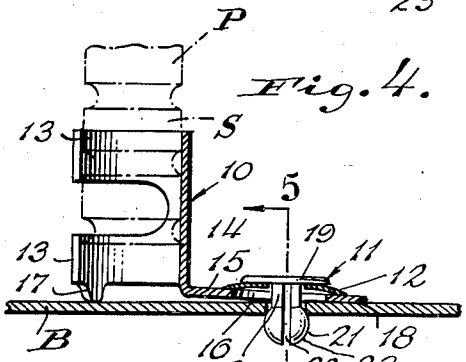


Fig. 6.

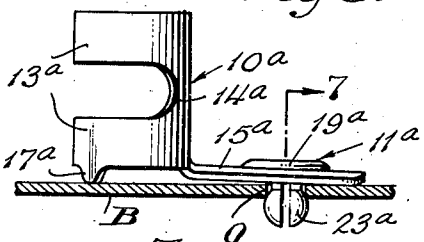


Fig. 3.

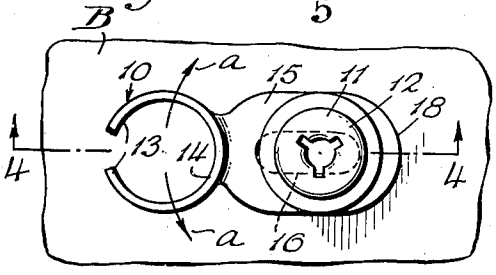


Fig. 7.

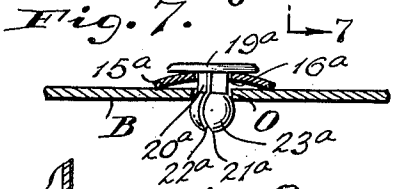


Fig. 5.

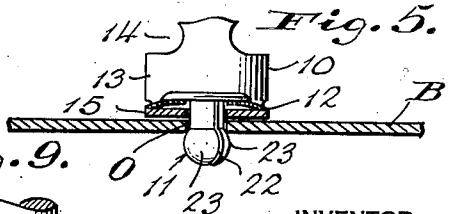


Fig. 8.

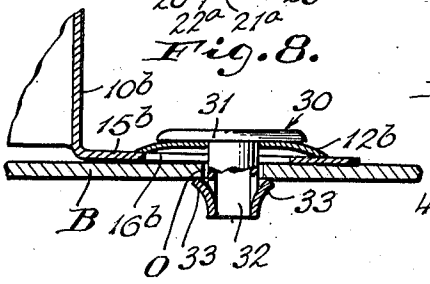
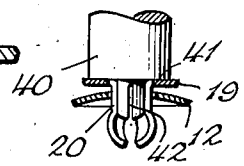


Fig. 9.



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Fig. 10.

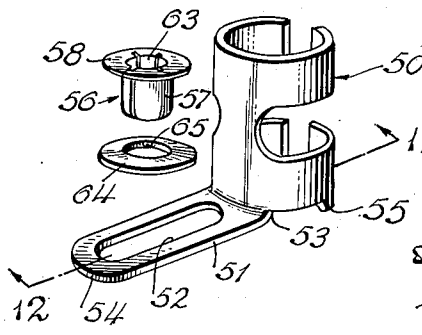


Fig. 12.

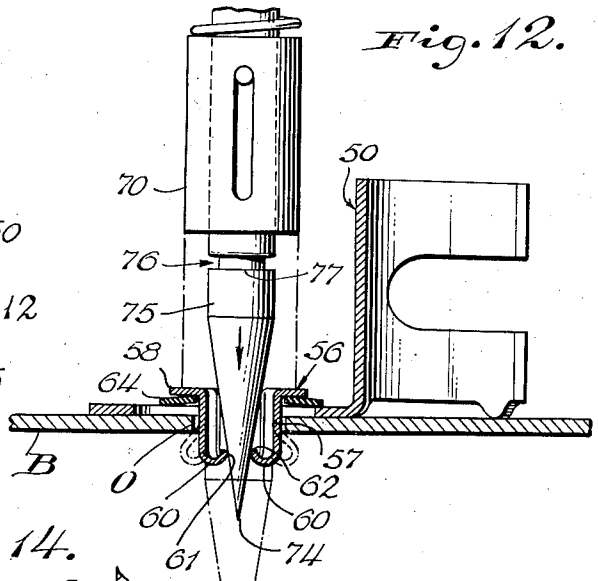


Fig. 14.

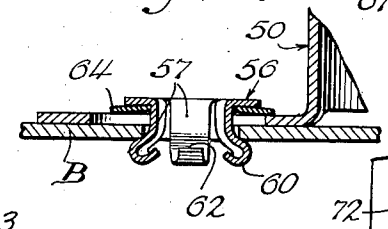


Fig. 13.

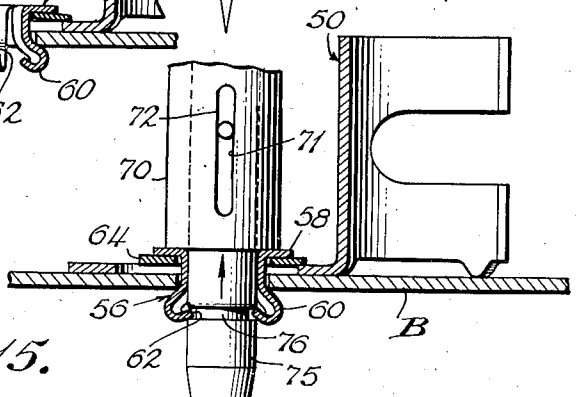


Fig. 11.

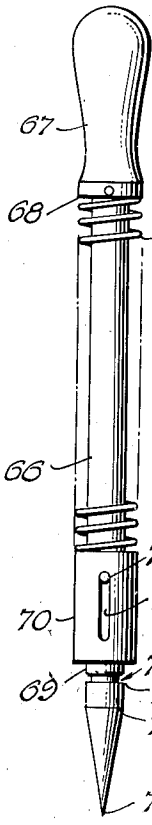
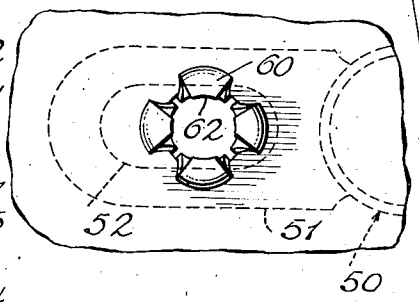


Fig. 15.



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UNITED STATES PATENT OFFICE

2,330,835

NEON SIGNPOST SUPPORT

Samuel C. Miller, New York, N. Y.

Application February 23, 1939, Serial No. 258,113

10 Claims. (Cl. 248—50)

This invention relates in general to the mounting of luminous gaseous electrical discharge tubes, such as the well-known neon lights or the like. More particularly, it relates to connector means by which posts or brackets secured to the luminous tubes may be mounted on a backing or base plate such as is customarily used in luminous sign work, in which tubes of various sizes, configurations and colors are assembled on such backings.

Coordinately therewith it relates to a tool for facilitating the ready mounting of such luminous tubes and more particularly for attaching the aforementioned connector means to a backing plate.

It is among the general objects of my invention to provide in a luminous, gaseous, electrical discharge tube installation a simple, effective, low cost arrangement adapted for being secured to a backing or base plate without the use of screws or bolts and without access to the back of such base plate being necessary and adapted to receive therein members attached to the luminous tubes.

It is further among the general objects of my invention to provide a tool adapted to facilitate the installation of an arrangement such as just described.

While arrangements for this purpose are not new, the types thereof with which I am familiar fall short of approaching the optimum results in one or more of the following respects, among others: Many of them do not afford a firm or secure support, or while firm and secure when initially installed, loosen or even become detached in a comparatively short time. Others of the devices lack sufficient capacity for adjustment and alignment so as to permit of the tubes being assembled without distortion and strain, while others again while they may be aligned and adjusted with the expenditure of much time and labor, possess no capacity for self-alignment such as will assure their automatically assuming a position in which the parts they support are subjected to the minimum strain. Others again are difficult or tedious to install.

It is therefore among the more particular objects of my invention to provide an arrangement for firmly supporting luminous tubes of the character mentioned which is effective and reliable in operation and will not become accidentally loosened and displaced, and which is self-adjusting and self-aligning and can be readily installed.

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 an elevational view showing the application of my invention to the mounting of luminous gaseous electric discharge tubes;

Figure 2 is a perspective view of one embodiment of my invention;

Figure 3 is a plan view of the device of Figure 2 in place on a base plate;

Figure 4 is a sectional view on the line 4—4 of Figure 3, looking in the direction of the arrows;

Figure 5 is a sectional view on the line 5—5 of Figure 4, looking in the direction of the arrows;

Figure 6 is a side elevational view of a second embodiment of my invention;

Figure 7 is a sectional view on the line 7—7 of Figure 6, looking in the direction of the arrows;

Figure 8 is an elevational view, partly in section, of a further embodiment of my invention;

Figure 9 is an elevational view of a tool adapted for use in the operation of installing luminous tubes, using my improved mounting means in such installation;

Figure 10 is a perspective exploded view of another embodiment of the invention;

Figure 11 is a side elevational view of an instrumentality for applying the same;

Figure 12 is a longitudinal sectional view, taken along the lines 12—12 of Fig. 10, showing the manner in which the device is attached, with the instrumentality in the forward stroke;

Figure 13 is a similar view, showing the instrumentality on the return stroke;

Figure 14 is a fragmentary sectional view showing the completed installation of the attaching means;

Figure 15 is a fragmentary rear face view of the same.

Referring now to the drawings for a detailed disclosure of my invention, and first of all to Figure 1, I have therein shown a portion of a luminous gaseous electrical discharge tube supported on posts P. The drawings show the tube L as having two legs, one in the plane of the paper and the other perpendicular thereto, and one post P is shown fastened to each of these legs.

The posts P are shown as of conventional type, customarily made of glass, with head portions provided with channels or grooves G within which the tube L may seat, and hook-like protuberances H over which wires W, serving to secure the tubes L to the posts P, may be led.

Each post P terminates below in a stem portion S having annular grooves at intervals so as

to provide constricted portions permitting relatively ready fracture thereat, for the purpose of varying the height of the post P.

The problem solved by my invention is the effective connection at low cost of posts P, of conventional type, to a backing, base or face plate B, of a type such as is conventionally used for luminous tube sign work. One embodiment of my invention adapted for effecting such a connection will be found illustrated in Figures 2 to 6 in detail, and this embodiment has also been shown in Figure 1 in place in a tube installation. In these figures the connectors shown for uniting the posts P to the base plate or backing B will be found shown to consist of two main parts, a socket or pedestal member, designated as a whole by the numeral 10 and adapted to receive the stem portion S of a post P, and a fastener member, designated as a whole by the numeral 11 and serving to effect the connection between the socket or pedestal member 10 and the base plate B. An additional element will be found in the resilient washer 12 interposed intermediate the fastener 11 and the socket 10 and performing a function all as will be more fully described hereinafter.

The socket member 10 of this first embodiment of my improved connector as shown in Figures 2 to 5 comprises a body portion having paired fingers 13 extending outwardly from a central portion 14 from the bottom of which extends laterally a foot portion 15 having a slot 16 therein for a purpose that will become apparent as the description proceeds.

The fingers 13 are contoured and disposed as to encompass the stem portion S of a post P; by making them resilient they will accommodate themselves within limits, to posts or to portions of posts of different diameters. It will further be observed that each pair of fingers 13 can accommodate itself to the stem contours independently of the others and that consequently by using a plurality of such pairs spaced from each other a greater number of independent points of engagement between the inner walls of the fingers 13 and a stem S may result. The fingers are preferably of such width that they will overlie the annular grooves of the stems S (see Figure 4) and can never enter the same, whereby a firm support is assured. While I have shown two pairs of fingers 13 and I have found this number to be very satisfactory for ordinary purposes, it is to be understood that I may use more than that number. On the other hand mor certain purposes also, only one pair of fingers may be found desirable.

Each of the fingers 13 of the lowermost pair is shown as provided with a downwardly extending lug 17 projecting to such an extent below the contours of the socket member that the two lugs 17 and the toe portion 18 of the foot portion 15 constitute in effect a three point support assuring a firm foundation for the socket or pedestal member when it is resting on the base plate (see Figure 4). The lugs 17 further serve to raise the lower surface of the foot portion 15 away from the surface of the base plate, so that the foot portion may be deformed within limits, touching the base plate other than at the points of the three point support just described. This feature will be found to be of importance when the operation of the fastener member, to be next described, is understood.

The fastener 11 is shown as comprising a flattened perforated head portion 19, a relatively restricted hollow neck portion 20, and an enlarged hollow nose portion 21. A plurality of slits 22 which it will be observed extend into the head portion 19, divide the nose portion and the neck portion into segments 23 which may be described as "jaws." The material of the fastener is preferably of such character that the jaws 23 are resilient.

The nose portion 21 and the neck portion are so proportioned in relation to openings O in the backing plate and to the slot 16 in the socket member, that they may be inserted through the slot 16 and through the opening O (see Figs. 2, 4 and 5), and so that the nose portion 21 will protrude beyond the reverse side of the plate B and will expand into a position in which its rear portions form shoulders engaging the walls of the opening O and resist withdrawal of the fastener.

The dished spring washer 12 is preferably interposed underneath the head 19 of the fastener and between it and the foot portion 15 of the socket. It adds a further element of resiliency to the arrangement, in addition to the resiliency of the fastener jaws 23, and some degree of resiliency of the foot portion 15. As a result there is never, in any of the ordinary positions of the fastener, any such position in which the parts are not under tension and free play therebetween is eliminated. At the same time the parts are free to adjust themselves for purposes of self-alignment. It will be observed that the pedestal member 10 may swivel about the fastener member 11, and at the same time the fastener member 11 can swivel in the opening O. This swivelling is indicated by the arrows A in Figure 5.

Movement radially of the opening is permitted by sliding of the neck portion 20 of the fastener in the slot 16. Tilting of the socket or pedestal member from the vertical is also possible to a limited degree due to the resiliency of its various parts.

In order to permit of the use of my improved fastener member 11 with socket members of other types, the dimensions thereof, and particularly of its neck and nose portions 20 and 21, are made such that it may be inserted through those portions of the standard types of socket members that correspond to the slot 16 of my socket member.

In the installation of luminous tubes L when my improved mounting arrangement is used, the posts P may first be loosely assembled to the tubes L and the socket members 10 added. Assuming that the plate B is in position, and provided with holes O, the operator with one hand will hold slot 16 in position over a hole O and with the other hand will force a fastener 11 (with a spring washer 12 underneath its head) through slot and hole, and the fastener will snap into place because of the resiliency of its jaws. If desired it may be withdrawn by exerting a sufficient force on it.

Where preformed holes are provided in the plate B it is of course necessary in assembling the posts P to the tubes L to mount them in approximately their final positions. However, great accuracy in this respect is not required, because of the great capacity of the mounting for adjustment and self-alignment, and because the posts P may be slid along the tube L.

It will be understood, for convenience of handling, that the socket 10 (or the corresponding parts in the embodiment hereinafter to be described) and the fastener 11 (or the correspond-

ing parts with or without the spring washer 12, where used) may be initially assembled and be ready as a unit, the proportioning of the slot 16 to the head or jaws 23 (or the corresponding parts in the other embodiments) being such that these parts may be handled as a unit, by reason of the frictional engagement which the head or jaws 23 makes as it passes through the slot 16.

While I have described that in installing luminous tubes L, the posts P may first be loosely assembled to the tubes L, this is one mode of operation, but the preferred mode is to locate the sockets 10 (or the corresponding parts) in the perforations O by their corresponding fastener elements and have these in readiness for attaching the posts P, followed by wiring the tubes L to these posts.

Where preformed holes are not provided in the plate B, it is a simple matter to drill these in the field; again there is no need for great accuracy. It will be observed that my improved mounting does not employ screw threads so that defective workmanship therein due to poorly interfitting male and female threaded members is not a source of trouble, as it is in such threaded constructions. Access to the back of the plate is never necessary, whether for applying the fastener or for removing it. All manipulations may be performed with one pair of hands—that is, by one operator; another operator is required only to hold large tubes in the proper position while the first operator secures their portions in place.

In Figures 6 and 7 I have shown a second embodiment of my invention in which the complete assembly comprises only a socket and a fastener member, and the spring washer shown intermediate these parts in the embodiment of Figure 2, has been eliminated. Parts of this embodiment corresponding to parts of the embodiment of Figure 2 have been similarly numbered, with the addition to each number of the suffix *a*, and description thereof, where the function is the same, will be omitted as superfluous.

It will be observed that the foot portion 15*a* of the socket member 10*a* is bowed or arched in transverse section, as clearly appears from Figure 7, whereby obviously, its rigidity in a longitudinal direction will be increased. By making the socket member or at least the foot portion 15*a* thereof of resilient material, the foot portion will assume the function of the spring washer 12 of the embodiment of Figure 2.

A further embodiment of my invention which I may characterize as the preferred embodiment of my invention, is shown in Figure 8. This embodiment resembles that of Fig. 2 in all respects except the construction of the fastener member. For that reason all parts shown in said figure except the fastener member have been numbered to correspond to the similar parts of Figure 2, with the suffix *b* added to the numerals.

The fastener member 30, of this embodiment may comprise a flattened head portion 31 and a hollow stem portion 32 of resilient material from which are struck, so as to point rearwardly and outwardly, a plurality of prongs 33. These prongs are so disposed and proportioned that when the fastener member is inserted into place the prongs 33 will first move inward so as to permit the insertion, and when the fastener member reaches its final position they will spring outward as shown in Figure 8, and reverse movement, that is, movement tending to withdraw the fastener member will be prevented by the engagement of the prongs 33 against the reverse side of the plate B. In this manner the fastener provides a connection that is more secure than that provided by the fastener 11 of Figure 2. While a tool might be readily devised for pushing the prongs 33 inward to enable withdrawal of the fastener 30 from the opening O, ordinarily this type of fastener would be used with the contemplation of its destruction when the parts are to be disassembled.

In Figure 9 I have shown a tool that may be conveniently used in conjunction with the operation of attaching my improved fastening members to plates B. As illustrated in Figure 9, such a tool may comprise a handle portion 40 provided with a blunt end portion 41 adapted to form a shoulder against which may rest the head 19 of a fastener 11, and from which projects a resilient longitudinally split portion 42 adapted for insertion into the hollow of the neck portion 20 of the fastener member 11 and to resiliently engage the inner walls thereof. Once inserted into a fastener member it will hold it while the fastener is being pushed into place, using the tool as a handle and once the fastener is in place, the tool is readily withdrawn therefrom, as will be obvious.

In performing the operation just described, the spring washer 12 may be placed over the neck of the fastener, as shown in Figure 9, before the fastener is positioned.

Making reference to Figures 10 to 15, there is illustrated another embodiment of my invention.

In this embodiment, any standard socket member 50, having the usual laterally extending base 51, may be employed. This base 51 may be formed with the longitudinal slot 52, as will be recognized by those in the art as existing at the present time. It will be understood, however, as in the embodiments previously illustrated, some degree of resiliency or springiness may be given to the base 51 by slightly angularly disposing the base 51 from a point adjacent the inner end 53 and the outer end 54 thereof. This slight angular displacement will temporarily provide a two point contact between the lugs 55 and the end 54.

Additionally, resilient or spring action may be obtained by arcuately forming the base 51 in its transverse section, as will be apparent from a consideration of Figures 6 and 7. The angular displacement of the base 51 or its arcuate formation, as shown in Figures 6 and 7, merely adds additional resiliency, though it will be understood that flat stock may be employed where sufficient resiliency is imparted to the dished washer hereinafter to be described, and already referred to in connection with the member 12.

For the purposes of illustrating this embodiment, I provide a fastening element 56 in the form of a deformable eyelet comprising a shank 57 made of sectional elements connected to the flange 58 and defined by slit lines 59. Sectional construction is obtained by slitting the shank 57 along the slit lines 59 and extending into the flange 58, to give requisite flexibility, as will be readily understood. The forward portions of the sectional elements of the shank 57 are formed with inwardly directed tongues 60, providing a rather close contacting cluster of these elements, with a small orifice 61. The tongues 60, as will be apparent, are bent sharply upwardly so that their ends 62 provide latching elements,

the function of which will be apparent as this description proceeds.

It will be observed that the fastener element 56 has an internal boring or orifice 63 of relatively large diameter, and an orifice 61 of relatively small diameter.

With this form of fastening element provided, I then provide a spring washer 64, having an orifice 65 corresponding substantially to the diameter of the shank 57 of the fastener element 56. It will be understood that the springiness of the spring washer 64 may be obtained by dishing this element and making the washer 64 of suitable spring material.

For ready attachment of the socket member 50 to a frame plate B, which is formed with an orifice O, it is preferred that I accomplish the same by an instrumentality shown in Figure 11. This is preferably a percussion tool comprising a shaft 66, one end whereof is provided with a handle 67, having a flange 68. Adjacent the opposite end 69 I provide a sleeved collar 70, formed with a slot 71, permitting limited slidable movement for the length of the slot 71 by a cross pin 72. Between the collar 70 and the flange 68, I interpose a coiled spring 73 which normally forces the collar 70 away from the flange 68. It will be understood that the collar 70 may move upwardly in the form shown in Figure 11, as determined by the length of the slot 71 against the resilient expansion of the spring 73. The free end of the shaft 66, extending beyond the collar 70, is tapered or conically formed to its free end 74, providing a sharp point, and terminates at its base into a cylindrical section 75, the diameter of which corresponds substantially to the boring 63 of the fastener element 56.

Spaced from the section 75 is an annular slot 76, having a rather sharp shoulder 77.

With an instrumentality of this character provided, I will now refer to Figures 12 and 13 for the manner in which the socket member may be affixed to a sign plate B, employing the fastener element 56 and spring washer 64.

I first nest the washer 64 upon the shank 57 of the fastener element 56 and these elements, in turn, are then projected through the slot 52, formed in the base member 51. The assembly is then positioned so that the shank 57 enters the orifice O. In this position, the point of the instrumentality shown in Figure 11 is forced to enter the orifice 61. Pressure upon the handle 67 serves first to project the point 74 through the orifice 61. As the pressure is continued and the shaft 69 moves through the collar 70, contact will be made by the collar 70 and the flange 58, to drive the shaft 57 through the orifice O against the spring action of the washer 64. As the shaft 69 progresses downwardly, the tapered sides of the instrumentality spread the sections 57, as will appear in dotted lines in Figure 12. This action serves to upset the sections 57 by reason of the camming effect obtained by the tapered portion 74 against the tongues 60.

The limiting movement downwardly of the shaft 69 against the collar 70 finally projects the shaft 69 so that the annular slot 76 is brought beyond the line of the tongues 60, so that on the return stroke, the ends 62 of the tongues 60 may enter the slot 76. The retraction movement causes engagement of the shoulder 77 with the ends 62 of the fastener element. Further retraction of the shaft 69 thereby serves further to crimp the sections 57 on the interior face of the plate B, to form a locking element, as will appear more clearly from an inspection of Figures 14 and 15.

It will thus be apparent that by the embodiment herein illustrated, the socket member 50 may be applied to a plate B and the orifice O thereof, in a simple manner, from the front face of the frame plate B. A simple tool, in the nature of a percussion tool, not only may be utilized to locate the fastener element 56 but, in the same stroke of action in pressing the same in position, upset the sections 57 into locking engagement. It is understood that the spring washer 64 and such springiness as may be offered by the base 51 compensate for any variation in thickness of the frame plate B.

It will also be apparent that the fastener elements 56 may be made of readily deformable metal so that if it should be found necessary to remove the socket member 50, any simple tool, such as a screw driver, may be pried underneath the flange 58 to remove the same. While this action may permanently disfigure the fastener element 56, these parts are relatively so inexpensive that they may be discarded after once having been used.

In general, it will be observed that I have provided a construction for quickly and facilely attaching socket members of the character described, without the use of screws or bolts and without absolute need for making the rear face of the frame plate accessible.

It will further be observed that while it is known to me that screws have heretofore been used to threadedly engage the frame plate, my construction permits a fastening engagement by the mere thrusting of the fastening element through the orifice of the frame plate, by a single stroke.

It will further be observed that by reason of the resiliency of the resilient elements comprising the foot or base, the transverse and longitudinal contour thereof or the spring washer, an automatic compensation is obtained for any difference in thickness of the frame plate B which may be encountered. The resiliency or springiness of these parts further permits a longitudinal adjustment of the socket member through the sliding action along the slot formed in the foot portion or base so that the socket member may be adjusted to be aligned with the neon sign tube L.

It will be understood that while all of the benefits of my invention may be obtained by utilizing all of the features, my invention is not thereby to be limited but that selected portions of my embodiments have novelty per se, and that my invention is to be limited by the scope of the appended claims.

Having thus described my invention, and illustrated its use, what I desire to secure by Letters Patent:

1. In connecting means for mounting luminous gaseous electrical discharge tubes on perforated base plates, a socket member having an extension forming a support and shaped to provide a three point resilient contact when placed on the front face of said base plate, and separate means, adapted for insertion in a perforation of said plate and engaging said extension for effecting a resilient connection between said socket member and said plate.

2. In means for effecting a connection between a luminous gaseous electrical discharge tube and a perforated backing plate, a socket member adapted to receive a post connected to said tube, and a fastener member adapted to be fastened to

said plate by the resilient engagement of portions thereof with the walls of a perforation in said plate, and said socket and fastener members being resiliently interconnected so as to be relatively slidable and rotatable.

3. In means for effecting a connection between a luminous gaseous electrical discharge tube and a perforated backing plate, a socket member adapted to receive a post connected to said tube, and a fastener member adapted to be fastened to said plate by the resilient engagement of portions thereof with the walls of a perforation in said plate, and said socket and fastener members being resiliently interconnected so as to be relatively slidable and rotatable, said interconnection including a spring washer.

4. In means for effecting a connection between a luminous gaseous electrical discharge tube and a perforated backing plate, a socket member adapted to receive a post connected to said tube having a lateral extension forming a support for said socket, and a separable fastener member adapted to be resiliently snapped into a perforation of said plate and to be positively held against withdrawal therefrom and engaging said extension, and a resilient connection between the extension of said socket and fastener members.

5. In a connector for effecting a connection between a post carried by a luminous gaseous electrical discharge tube and a backing plate, a socket member comprising spaced pairs of resilient jaws adapted to grip said post, a foot portion extending laterally from the ends of an end pair of jaws, and a lug projecting outwardly from each jaw of said end pair of jaws and to be extended substantially beyond other edge portions of said jaws so as to provide, together with the toe of said foot portion a three point support for said member one of which points of support being adjacent the end of said foot portion, another of which points of contact being adjacent the lug extended from the said jaw.

6. In a socket member comprising resilient jaws adapted to grip a post, lugs extending from said jaws and adapted to contact a flat surface and to space said jaws therefrom, and a slotted foot portion extending outwardly to one side of said jaws and adapted to cooperate to space said jaws from said flat surface, said foot portion being arched in transverse cross-section.

7. In a socket member for mounting sign posts of the character described and which are to be used for attaching said sign posts to a sign frame plate by use of an anchoring orifice formed in said plate, said socket member comprising a perforated base extending laterally outwardly in a warped condition to provide a resilient contact between said base and said plate, the perforation whereof being adapted to be aligned with the anchoring orifice of said plate, the combination with the resiliently disposed base of said member of a fastening element passing through said base for connecting said socket to said sign frame plate comprising a headed element having a shank formed with sectional portions arranged to pass through said base and plate, said portions being expansible longitudinally and transversely of said shank to anchor said base to said plate upon expansion of said portions by adjustment to the thickness of said base, the warped condition thereof and plate lying between said element and said portions.

8. In a socket member in accordance with claim 7, wherein the fastening element thereof is formed from normally resiliently deformable sheet metal.

9. In a socket member in accordance with claim 7, wherein the fastening element thereof has the sectional portions thereof formed to terminate in the inwardly directed tongues normally clustered together whereby, whereby pressure against said tongues will serve to expand the same and form crimpings engaging the interior face of said plate.

10. In a socket member in accordance with claim 7, wherein said perforated base is orificed in the form of an elongated slot and wherein the headed element includes resilient means to compensate for play between said element and said plate and to augment the frictional contact between said base and plate to hold said base in frictional adjustable position on said plate.

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