Feb. 24, 1953 R. BROWN 2,629,814

LUMINESCENT TUBE SUPPORT FOR SIGN STRUCTURES AND THE LIKE

Filed May 24, 1948

Fig. 1.

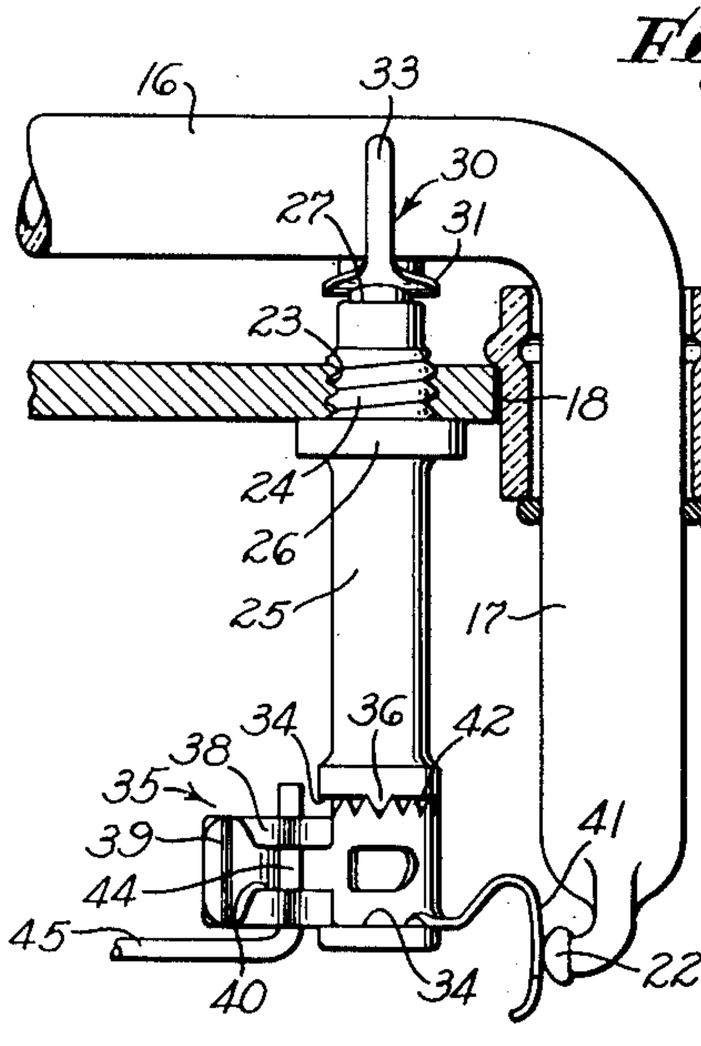

Fig. 2.

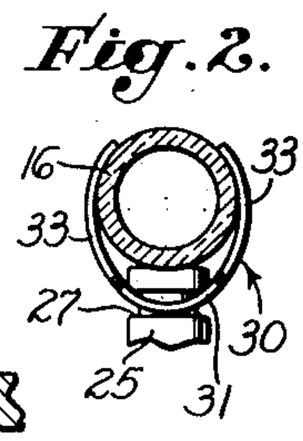

Fig. 4.

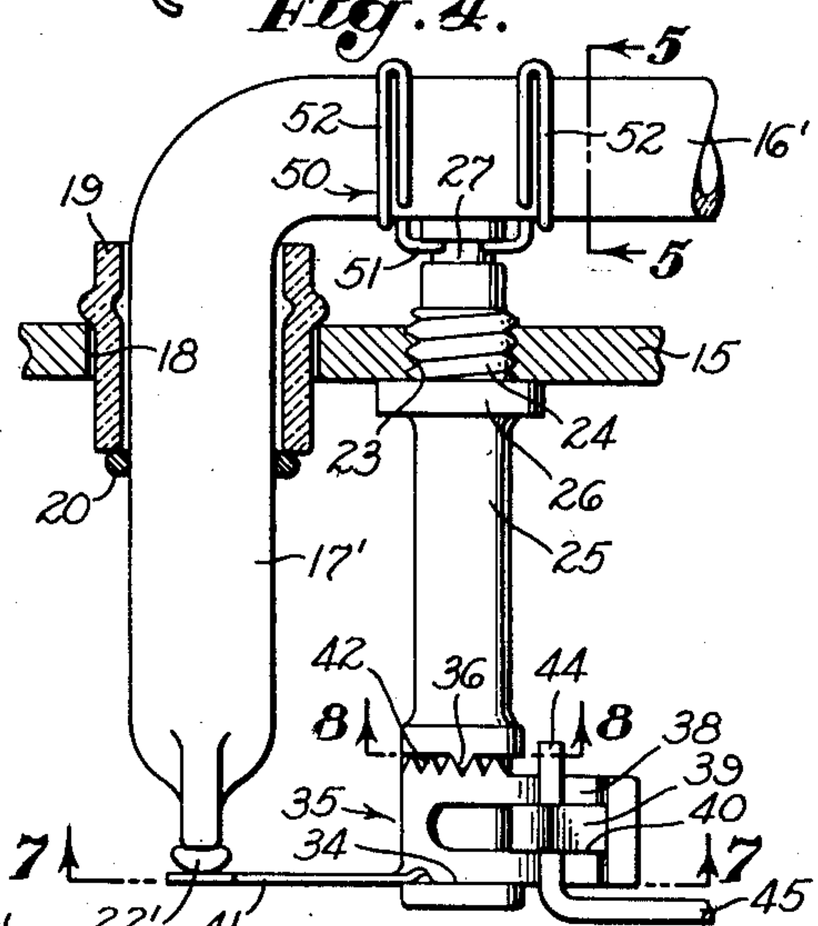

Fig. 3.

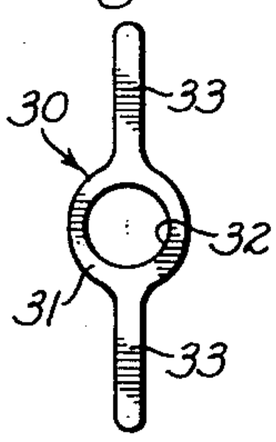

Fig. 9.

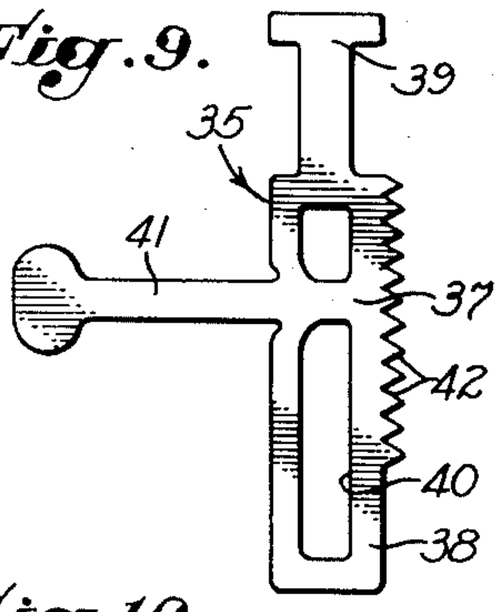

Fig. 10.

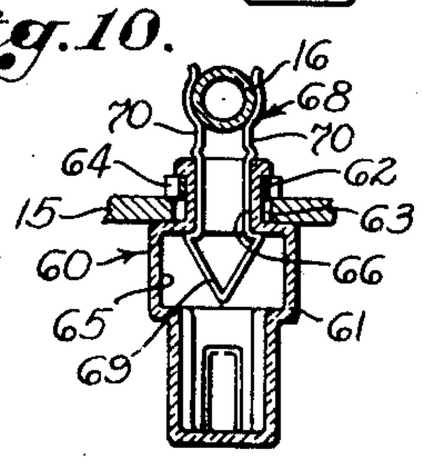

Fig. 5.

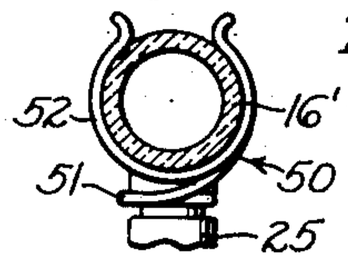

Fig. 7.

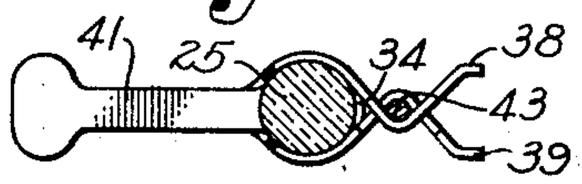

Fig. 8.

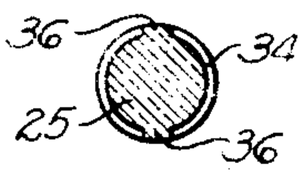

Fig. 6.

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LUMINESCENT TUBE SUPPORT FOR SIGN STRUCTURES AND THE LIKE

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Application May 24, 1948, Serial No. 28,762

11 Claims. (Cl. 240—11.4)

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This invention relates generally to the display or advertising sign art and more particularly to illuminated signs employing luminescent tubes for illumination purposes. The present application is a continuation-in-part of my prior application for patent for Illuminated Sign, Serial No. 28,763, filed May 24, 1948.

The application referred to above discloses and claims an improved luminescent tube for use in illuminating letters, numerals and other sign characters or for forming such characters. The present application pertains more particularly to clip means for supporting such a tube on the sign and contact terminal means for supplying electricity to the electrodes of the tube.

One object of this invention is to provide means for supporting a luminescent tube in spaced relation to the face of the sign, such supporting means including spring clip members carried by support members mounted on the sign.

Another object is to provide a tube supporting clip member which is retained on the supporting member due to its inherent resiliency so that the use of separate fastening elements, such as screws, rivets or the like, for this purpose is unnecessary and the device is greatly simplified and its cost of manufacture and application to the sign is materially reduced. Moreover, since the luminescent tube is merely snapped into the spring clips, the installation of the tubes on, or their removal from, the sign is simplified and greatly expedited.

Another object is to provide a spring clip for retaining the tube on the sign, this clip being particularly adapted for supporting intermediate portions of the tube and being rotatable on its supporting member so that it can be readily adjusted to the contour of the luminescent tube forming the sign character.

Another object of the invention is to provide an electrical contact element for conducting electricity which is adapted to resiliently engage the electrode tip of a luminescent tube so as to provide a positive electrical connection which will not shake loose due to vibration or from other causes.

Another object is to provide an electrical contact element which is capable of being readily applied to the tube supporting member or post without the use of extraneous fastening devices so that the structure is greatly simplified and the over-all cost of producing the sign is maintained at the minimum.

Another object is to provide a contact element which is made from resilient metal to adapt

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it to be flexed and looped around the supporting member, within a peripheral groove thereof, to hold the element in place, one side of the element having a contact arm adapted to engage the electrode tip of the tube, and the ends of the element being adapted to receive between them the end of a wire conductor which supplies electrical current to the tube by way of the contact element, the conductor serving to retain the element in place surrounding the supporting member.

Another object is to provide a contact element, of the character referred to, which has a series of notches, any of which are adapted to receive one or more lugs on the supporting member to hold the element in different selected positions of adjustment thereon.

Further objects of the invention will be apparent from the following detailed description and from the drawing, which is intended for the purpose of illustration only, and in which:

Fig. 1 is a longitudinal sectional view through a portion of the wall of an illuminated sign, showing a preferred embodiment of the clip means for mounting an illuminating tube on the sign and the electrode contact elements;

Fig. 2 is a cross-sectional view, taken on line 2—2 of Fig. 1;

Fig. 3 is a view of the blank from which the tube clip, shown in Fig. 1, is formed;

Fig. 4 is a view similar to Fig. 1, showing alternative forms of tube clip and electrode contact element;

Fig. 5 is a cross-sectional view, taken on line 5—5 of Fig. 4;

Fig. 6 is a perspective view of the tube clip shown in Figs. 4 and 5;

Fig. 7 is a sectional view, taken on line 7—7 of Fig. 4;

Fig. 8 is a sectional view, taken on line 8—8 of Fig. 4;

Fig. 9 is a view of the blank from which the electrode contact element is formed; and

Fig. 10 is a cross-sectional view, similar to Fig. 2, showing a further modified form of the tube clip.

Referring first to Figs. 1, 2 and 3 of the drawing, the present improved tube clips and electrode contact elements are illustrated as applied to use in connection with an illuminated sign having a wall 15, the outer or obverse face of which constitutes the field upon which the letters, numerals or other sign characters may be inscribed, embossed or otherwise provided and illuminated by gas-filled electric luminescent tubes 16. The glass illuminating tubes 16 may

be more or less conventional in structure and their end portions 17 are bent at right angles to their main portions to adapt them to project rearwardly through apertures 18 in the sign wall or panel 15. The apertures 18 are preferably lined by bushings 19 and the inner or rearward ends of the tubes are protected from the atmosphere by sealing rings 20, these parts being fully disclosed in my prior application, referred to above. At their inner extremities, the ends 17 of the tubes 16 are provided with electrodes having exposed tips 22, which may be offset from the axes of the ends 17 as shown in Fig. 1 and disclosed more fully in my prior application.

Disposed near the apertures 18 are screw-threaded holes 23 into which the screw-threaded portions 24 of supporting members or posts 25 are screwed from the inner or reverse side of the sign wall 15, an annular flange 26 on the post abutting the inner surface of the wall to limit such movement of the post. The outer end of the supporting member 25 projects forwardly from the wall 15 and is provided with a peripheral groove 27 adjacent this end.

Adapted to be held in the groove 27 of the supporting member 25 is a tube clip element 30 which has a central portion 31 provided with an aperture 32 and a pair of fingers 33. The clip element 30 is stamped from spring metal, as shown in Fig. 3, and is bent to the bowed form illustrated in Fig. 2. Due to the inherent resiliency of the element 30, its fingers tend to flex inwardly toward each other. To apply the clip element to the post 25, the element is unflexed so that its aperture 32 assumes a circular outline adapted to pass over the outer end of the post, the portions of the element surrounding the aperture thus entering the groove 27. When the clip element 30 is permitted to flex to its normal shape, the aperture 32 becomes substantially oval, as viewed in plan, so that the element is retained in the groove 27 with its curved fingers 33 extending upwardly therefrom. It is thus seen that the portions of the luminescent tubes 16 adjacent their end portions 17 may be snapped into position between the yieldable fingers 33 to be held against the outer ends of the supporting members 25 as shown in Fig. 2. Since the tubes are held firmly against the outer ends of the members 25, they are disposed at a predetermined distance from the outer face of the sign wall 15.

Each supporting member 25, which is made from glass or other suitable non-corrosive and dielectric material, is provided with an annular groove 34 adjacent its inner end for receiving an electrode contact element 35, a pair of locking projections or lugs 36 being provided in one face of the groove (Fig. 8). Each contact element 35 is stamped from spring metal to the T shape illustrated in Fig. 9 and has a central portion 37 from which arms 38 and 39 project in opposite directions. The arm 38 has a longitudinal opening 40 while the arm 39 is narrowed throughout the greater portion of its length. Projecting from the central portion 37, at right angles to the arms 38 and 39 is a finger 41 which, when the contact element is to be used for supplying electrical current to offset electrode tips such as illustrated in Fig. 1, is curved downwardly to form, in effect, a leaf spring. One edge of the contact element 35 is serrated to provide a series of V-shaped notches 42. The arms 38 and 39 are bent into V shape as shown in Fig. 7.

Each electrode contact element 35 is mounted on its respective supporting member 25 by flexing the central portion 37 around the element within the peripheral groove 34 while forcing the arms 38 and 39 toward each other. The reduced angular portion of the arm 39 enters the opening 40 of the arm 38 and a substantially circular opening 43 is thus provided between the crossing portions of the arms. The bent end 44 of an electrical conductor 45 is then inserted through the opening 43, whereafter pressure against the arms is relieved to permit them to spring outwardly, due to their inherent resiliency, so that the end 44 of the conductor is firmly gripped between the arms. It is thus seen that the end of the conductor serves to hold the contact element 35 in flexed condition in the groove 34. Referring to Fig. 1, it will be seen that the lugs 36 are received in a pair of the notches 42 so as to prevent rotation of the contact element on its supporting member 25. Since the lugs 36 can enter any of the several notches 42, the contact element 35 can be adjusted to any position to insure positive engagement of its contact finger 41 with the electrode tip 22 of the illuminating tube 16. It will be apparent that electric current supplied through the conductor 45 flows through the contact element 35 to the electrode tip 22 of the luminescent tube 16 to energize the latter and thus to illuminate the sign.

When the electrode tip 22' of an illuminating tube 16' is disposed in axial alignment with the end portion 17', as shown in Fig. 4, the contact finger 41 is made to project in a plane normal to the axis of the supporting member 25 so as to engage the tip.

It is within the concept of this invention to provide a tube clip element 50 of the alternative type disclosed in Figs. 4, 5 and 6, this element being formed from spring wire stock. As shown best in Fig. 6, the clip element 50 includes a central arcuate portion or base 51, the sides of which are adapted to straddle and grip the periphery of the grooved portion 27 of the supporting member 25 when the element is snapped into place thereon. From the central base portion 51, the ends of the wire are bent upwardly, then downwardly in loops 52 of a diameter adapted to receive the tube 16 as shown in Fig. 5. The clip element 50, being rotatable on the supporting member 25, may be turned to accommodate tubes 16 having various outlines.

The clip elements 30 and 50, described above, are herein shown as carried by the supporting elements 25 which are employed adjacent the terminal portions of the tubes 16 or 16'. However, supporting members of this type are not required for supporting tube clips which are used for holding intermediate portions of the tubes since no electrical contact elements are necessary at these points. Fig. 10 illustrates a supporting member and clip combination which is particularly adapted for use in holding intermediate portions of the tube. The alternative supporting member 60 includes a body portion 61 having a reduced stem portion 62 projecting therefrom and adapted to extend through an aperture 63 of the sign wall 15, the end of the body portion being held against the side of the sign wall by a spring locking element 64. The body portion 61 has a transverse opening 65 and the stem portion has an axial bore 66 communicating with the opening. A wire clip element 68 has a pointed end or head 69 adapted to be disposed in the opening 65, the ends of the wire extending from the pointed end in fingers 70 which pass outwardly through the

bore 66. The outer ends of the fingers 70 are curved so as to adapt them to receive and grip the tube 16 therebetween when the tube is snapped into place. To mount the clip element 68 on the supporting member 60, the sides of the element are drawn together so as to contract the width of the pointed head 69 to allow the latter to be inserted through the bore 66 and into the opening 65, after which the sides are released to permit the head to expand within the opening so as to retain the clip element on the supporting member. The clip element 68 is thus rotatably mounted on the supporting member 60 so that it can swivel thereon to accommodate tubes of different contours.

As will be apparent, the supporting member 25 might be secured to the sign wall 10 in substantially the same manner in which the supporting member 60 is mounted. For example, instead of being provided with the threaded portion 26, the member 25 can have a plain cylindrical portion extending through a hole in the sign wall, the cylindrical portion having a peripheral groove into which a spring clip is insertable to retain the supporting member in place on the sign wall, this construction being similar to that disclosed in Fig. 10 and therefore not illustrated in detail.

While the embodiments of my invention herein illustrated and described are capable of providing the advantages primarily stated, it is to be understood that the invention is not restricted to these specific forms but may include all modifications and variations coming within the scope of the appended claims.

I claim as my invention:

1. In an illuminated sign having a wall provided with an aperture and a luminescent tube mounted at one side of the wall and having an end projecting through the aperture, said end being provided with an electrode tip: a supporting member having a portion to be secured to the wall and a portion projecting from the side of said wall opposite from said tube and providing an extending end thereof, said supporting member having a peripheral groove adjacent said extending end, said groove providing shoulders at its opposite sides; and a contact element engageable in said groove and against said shoulders for maintaining the position of said element, said element having a portion adapted to engage said electrode tip.

2. The combination defined in claim 1 in which said contact element is resilient and is flexed around said supporting member within said groove in position to be engaged by retaining means for holding said contact element in said flexed condition.

3. The combination defined in claim 1 in which said contact element is resilient and is flexed around said supporting member within said groove, and including an electrical conductor engageable with said contact element to retain the same in said flexed condition.

4. In an illuminated sign having a wall provided with an aperture and a luminescent tube mounted at one side of the wall and having an end projecting through the aperture, said end being provided with an electrode tip: a supporting member secured to the wall and projecting from the other side thereof, said supporting member having a peripheral groove adjacent its end; and a contact element disposed in said groove and provided with a resilient contact finger engageable with said electrode tip.

5. In an illuminated sign having a wall provided with an aperture and a luminescent tube mounted at one side of the wall and having an end projecting through the aperture, said end being provided with an electrode tip: a supporting member secured to the wall and projecting from the other side thereof, said supporting member having a peripheral groove adjacent its end, said supporting member having at least one lug disposed within said groove; and a resilient contact element disposed in said groove and having a plurality of notches for receiving said lug so as to retain said element in different positions of rotative adjustment on said supporting member, said contact element being engageable with said electrode tip.

6. In an illuminated sign having a wall provided with an aperture and a luminescent tube mounted at one side of the wall and having an end projecting through the aperture, said end being provided with an electrode tip: a supporting member secured to the wall and projecting from the other side thereof, said supporting member having a peripheral groove adjacent its end; said supporting member having at least one lug disposed within said groove; a resilient contact element adapted to be flexed around said supporting member within said groove, said element having a plurality of notches for receiving said lug so as to retain said element in different positions of rotative adjustment on said supporting member, said element having a contact finger engageable with said electrode tip; and an electrical conductor engageable with said contact element for maintaining said element in said flexed condition.

7. In an illuminated sign having a wall provided with an aperture and a luminescent tube mounted at one side of the wall and having an end projecting through the aperture, said end being provided with an electrode tip: a supporting member secured to the wall and projecting from the other side thereof, said supporting member having a peripheral groove adjacent its end; a resilient contact element engageable in said groove and adapted to engage said electrode tip, said contact element being flexed around said supporting member within said groove, the ends of said contact element being adapted to cross each other; and retaining means adapted to be disposed between said crossing ends to maintain said contact element in said flexed condition.

8. In an illuminated sign having a wall provided with an aperture and a luminescent tube mounted at one side of the wall and having an end projecting through the aperture, said end being provided with an electrode tip: a supporting member secured to the wall and projecting from the other side thereof, said supporting member having a peripheral groove adjacent its end; a resilient contact element engageable in said groove and adapted to engage said electrode tip, said contact element being flexed around said supporting member within said groove, one end of said element being V-shape and having an elongate aperture therein and the other end of said element being V-shape and receivable in said elongate aperture and cooperating with said apertured end to define an opening between said V-shaped ends; and an electrical conductor receivable in said opening and acting to retain said contact element in said flexed condition.

9. For an illuminated sign having a sign wall and a luminescent tube provided with an end having an electrode tip, means for mounting said tube on said sign wall and including: a supporting member having a portion to be mounted in

said sign wall, a portion fixed to and extending from one end of said mounting portion to extend from one side of said sign wall, and a portion fixed to and extending from the other end of said mounting portion to extend from the other side of said sign wall; an open-ended spring clip mounted on one of said fixed portions and comprising spring fingers spaced at their outer ends to receive said tube through such space and to grip said tube; and a contact element mounted on the other of said fixed portions and having a projecting finger to engage an electrode tip on a rearward portion of said tube upon proper positioning of said tube in said spring clip, the outer end portion of each of said fixed portions being provided with a groove having opposing shoulders between which said clip and element are respectively mounted.

10. Mounting means as in claim 9 wherein said fixed portions and said mounting portion of said supporting member are axially aligned.

11. For an illuminated sign having a sign wall and a luminescent tube provided with an end having an electrode tip, means for mounting said tube on said sign wall and including: a supporting member having a portion to be mounted in said sign wall, a portion fixed to and extending from one end of said mounting portion to extend from one side of said sign wall, and a portion fixed to and extending from the other end of said mounting portion to extend from the other side of said sign wall; an open-ended spring clip mounted on one of said fixed portions and comprising spring fingers spaced at their outer ends to receive said tube through such space and to grip said tube; and a contact element mounted on the other of said fixed portions and having a projecting finger to engage an electrode tip on a rearward portion of said tube upon proper positioning of said tube in said spring clip, said fixed portions and said mounting portion of said supporting member being axially aligned.

RALPH BROWN.

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