Jan. 16, 1934. W. O. PROUTY 1,943,772

LUMINOUS TUBE SIGN

Filed April 12, 1930 2 Sheets-Sheet 1

Fig. 1

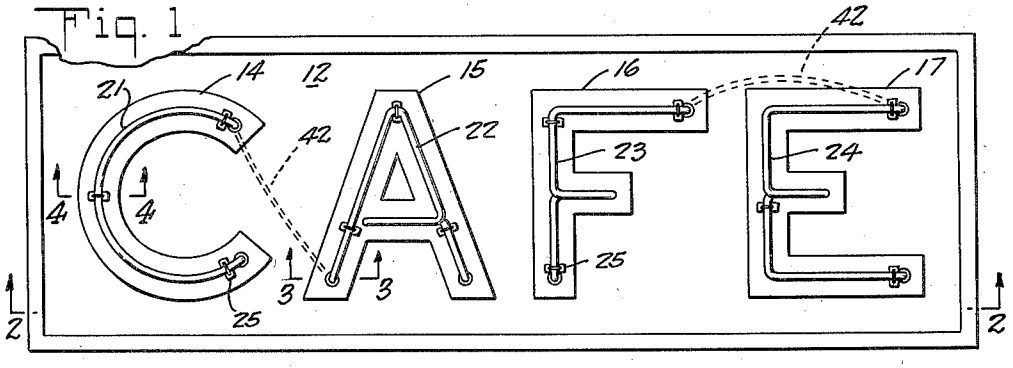


Fig. 2

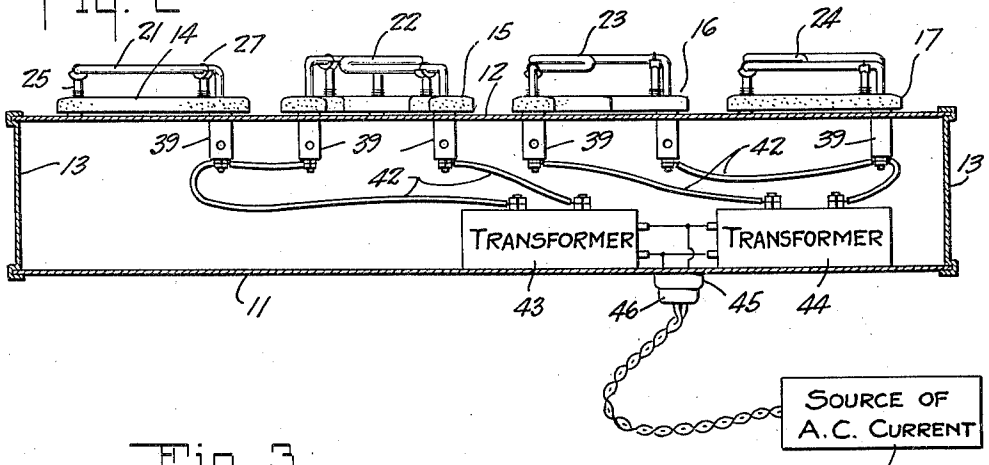
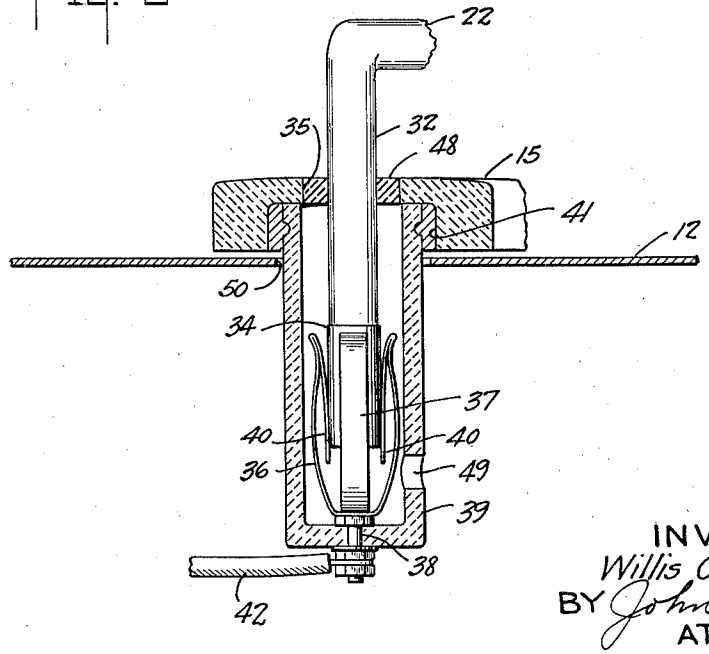


Fig. 3



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Fig. 4

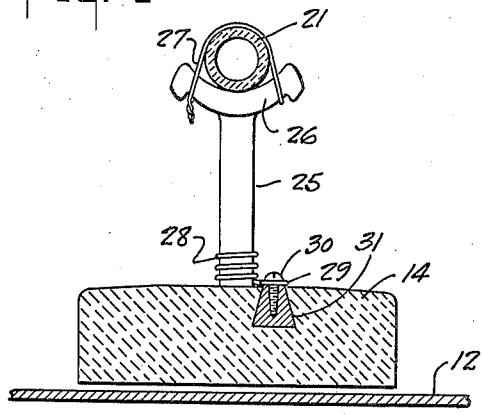


Fig. 5

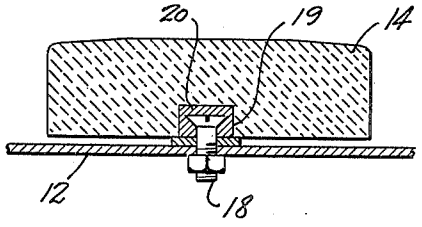


Fig. 6

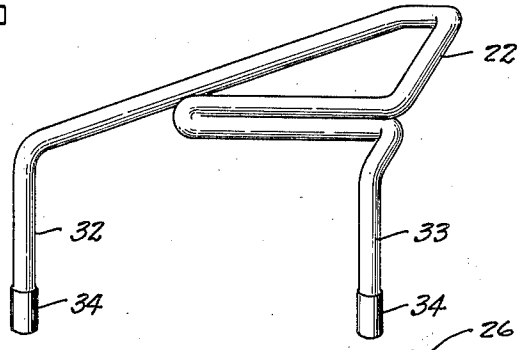
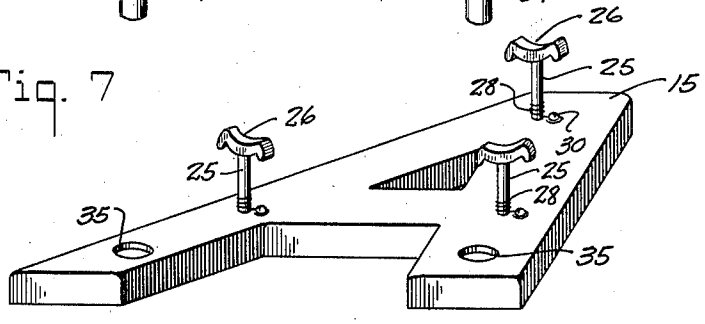


Fig. 7



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LUMINOUS TUBE SIGN

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Application April 12, 1930. Serial No. 443,737

6 Claims. (Cl. 40—130)

This application is a continuation in part of my prior application, Serial No. 319,145, filed November 13, 1928, and entitled Luminous tube mounting.

This invention relates to a sign structure, and especially to one that utilizes luminous tubes for forming the letters or symbols of the sign.

Such luminous tube signs are now in quite common use. The tubes are usually filled with one or more of the gases of the noble monatomic group, such as neon, helium and argon, and sometimes include some other material, such as mercury, to secure definite color effects. Usually the gaseous filling has a pressure of from five to twelve millimeters of mercury.

The luminous tubes are provided at their ends with electrode structures, whereby a high alternating current potential difference can be impressed across the column of gas in the tube. This potential difference is usually of the order of thousands of volts. In order to produce this electromotive force from a commercial source, use is made of a transformer for each circuit of tubing. Ordinarily, the connections from the transformers to the tube electrodes have been made by the aid of binding posts and wires permanently joined to the electrodes. Since it is sometimes necessary to remove or replace the tubes, such wiring schemes are disadvantageous, requiring as it does, a cumbersome process of loosening or tightening binding posts in the small space formed inside of a supporting box.

It is one of the objects of my invention to facilitate the removal or replacement of the tubing, and especially by the aid of readily separable connectors, the wiring being otherwise permanent.

In order to provide effective insulation for the high potentials needed, I prefer to utilize ceramic letters upon which the tubes are mounted. It has been customary to utilize sheet metal for forming these letters; but experience shows that considerable leakage currents are permitted thereby, and these cause quick deterioration of the paint used on the sign. By the use of ceramic letters, this leakage current effect is so far minimized as to be negligible.

It is another object of my invention to provide a sturdy supporting structure for the sign, that is inexpensive and simple to manufacture.

My invention possesses many other advantages, and has other objects which may be made more easily apparent from a consideration of one embodiment of my invention. For this purpose I have shown a form in the drawings accompanying and forming part of the present specification. I shall now proceed to describe this form in detail, which illustrates the general principles of my invention; but it is to be understood that this detailed description is not to be taken in a limiting sense, since the scope of my invention is best defined by the appended claims.

Referring to the drawings:

Figure 1 is an elevation of the front of a sign structure embodying my invention;

Fig. 2 is a sectional view, taken along plane 2—2 of Fig. 1;

Fig. 3 is an enlarged detail section, taken along plane 3—3 of Fig. 1;

Fig. 4 is an enlarged detail section, taken along plane 4—4 of Fig. 1;

Fig. 5 is a view similar to Fig. 4, but showing how the letters are attached to the support;

Fig. 6 is a perspective view of a tube unit utilized in connection with the supporting letter; and

Fig. 7 is a similar perspective view of a ceramic letter, that serves as a base for the tube shown in Fig. 6.

In general, my improved sign structure can be incorporated either in a single or double faced sign. In the present instance, I show a sheet metal box structure for a single face sign. This structure includes the back 11, front 12, and sides 13, all formed of sheet metal. The front 12 serves as a background structure to support the sign letters or characters. The sides 13 in the present instance are shown as having edges folded over the edges of the front and back portions 12 and 11, and also serve to lend rigidity and strength to the structure.

On the face of the front 12 are one or more letters or characters, such as 14, 15, 16 and 17, which form the sign. Each of these letters or characters is shown in this instance as made from ceramic material, such as porcelain, and as being quite thick. It is ordinarily desirable to provide a glaze or enamel on the face of the letters. As illustrated most clearly in Fig. 5, the letters can be detachably held to front 12 as by bolts 18 extending from the reverse side of the letter. The head of each bolt can be permanently fastened in a recess such as 19, as by the aid of some conformable or moldable material 20, such as cement or Babbitt metal.

In the present instance, each letter 14, 15, 16, 17 has a unit tube supported thereon, these unit tubes being marked as parts 21, 22, 23 and 24. They outline the letters 14, 15, 16 and 17 by being appropriately bent to conform with the

letters. They can be supported detachably on the letters in any desired way; for example, glass posts 25 (Figs. 4 and 7) can be provided, on top of each of which is a saddle 26 for seating the tube. A wire 27 can be used in conjunction with each saddle to hold the tube firmly in place thereon.

One manner in which these glass posts 25 can be supported on the letters is disclosed most clearly in Fig. 4. These posts are gripped at their bases by a helical spring device 28, which is formed with an eye 29 for allowing a screw 30 to pass through it. This screw can be arranged to be tightened in a lead mass 31 embedded in a hollow formed in the face of the letter.

At the ends of each unit of tubing are electrode structures which extend back of the support 12. Preferably I make the electrode structures such that they form no large or bulbous extensions. For example, each of the ends 32, 33 of tube 22 (Figs. 3 and 6) can carry a cap or thimble 34 that can conduct the current to the tube electrode proper, or it can serve to seal the tube and thus itself act as an electrode. In either case, the cap or thimble 34 forms a projection of substantially the same size as the tube, so that it can readily pass through appropriate apertures such as 35 (Figs. 3 and 7) in the letters.

I arrange matters in such a way that the cap ends of the tubes 21, 22, 23, 24 can be slipped into connectors that are permanently wired in the box. For example, as shown most clearly in Fig. 3, each of the letters can be provided with a pair of spring contacts, for the accommodation of the current conducting members 34. In the present instance, these spring contact devices are shown as formed of a pair of spring strips 36, 37, bent up to be U-shaped, and held as by post 38 at their bottom portions, inside of a ceramic sleeve 39. These strips 36, 37 are shown as reversely bent to form resilient contact fingers 40, which thus form a yielding socket or receptacle that can accommodate the member 34 even if the member 34 happens to fall slightly out of alinement with the axis of the socket. Strips 36, 37 thus form contact members separable from the end of tube projection 32.

Sleeve 39 can be permanently joined to the reverse side of the associated letter or character as by being cemented into a counterbore 41. This sleeve can extend into the box, as through the aperture 50 provided for that purpose. The post 38 can serve as a connection to which a source of potential difference can be connected. Thus the heavily insulated cables 42 can serve to connect some of the luminous tube units in series, as well as to connect the whole series to the secondary winding of a corresponding transformer 43, 44. These transformers can be located in the box structure 11—12—13, and can be permanently wired to the posts 38 as well as to the plug receptacle 45. In this receptacle can be accommodated the usual plug 46 connected to any usual source 47 of alternating current. The arrangement is such that the plug 46 can be inserted into receptacle 45 from outside the box structure. The transformers can be wired to posts 38, after the letters 14, 15, 16 and 17 are fastened to the front member 12 of the box. Access to these terminals or posts can readily be provided through appropriate openings in the casing if such a casing be used.

Although in the present instance I show two transformers and individual tube units for each letter, it is obvious that changes can be made, dependent upon the particular design of the installation.

It is clear that the entire sign can be permanently wired. The cables 42 can be joined once and for all to the transformers and between letters. In case any of the tube units is to be removed, the fastening wires 27 are first removed, then the unit is simply pulled out of the sockets 36—37. Replacement of the tube is just as simple. No electric wiring at all need be disturbed.

In case the sign is to be hung outdoors, resilient washers such as 48 (Fig. 3) can be used to close the space between the tube and the aperture 35, so as to prevent substantial entry of moisture into the sleeve 39. Apertures 49 can also be provided in these sleeves for drainage purposes.

Due to the use of characters such as 15 that have excellent dielectric properties, the sign structure does not provide any favorable path for leakage currents. Such leakage currents, at the potentials required for operation, are highly undesirable, as they cause rapid deterioration of the paint on the sign, necessitating frequent renovation.

I claim:

1. In a device of the character described, a character adapted to be supported on a background portion, a luminous tube mounted on the character, said tube having an end with a conducting member for transmitting electrical energy into said tube, and a connection means for said tube, said connection means being separable from the conducting member, and supported on the character at the rear thereof, and in alinement with an aperture in the character for the insertion of the tube end, said connection means being adapted to extend into an aperture in the background portion.

2. In a device of the character described, a character adapted to be supported on a background portion, a luminous tube mounted on the character, said tube having an end with a conducting member for transmitting electrical energy into said tube, a sleeve supported on the character at the rear thereof, and in alinement with an aperture in the character for insertion of the tube and into the sleeve, and a separable contact member in the sleeve for conducting electrical energy to the tube when the end is inserted, said sleeve being adapted to extend into an aperture in the background portion.

3. In a device of the character described, a character adapted to be supported on a background portion, a luminous tube mounted on the character, said tube having ends, each with a conducting member for transmitting electrical energy into said tube, both of said ends being adapted to enter into apertures in the character, and a pair of connection means for the ends of said tube, each of said means being supported on the character at the rear thereof, and separable from the conducting member and in alinement with a respective aperture in the character for the insertion of the respective tube end, said connection means being adapted to extend into an aperture in the background portion.

4. In a device of the character described, a character adapted to be supported on a background portion, a luminous tube mounted on the character, said tube having ends, each with a conducting member for transmitting electrical

energy into said tube, both of said ends being adapted to enter into apertures in the character, a pair of sleeves, supported on the character at the rear thereof, and in alinement respectively with the apertures in the character, for insertion of the tube ends into the sleeves, and a separable contact member in each sleeve for conducting electrical energy to the tube when the ends are inserted, said sleeves being adapted to extend into apertures in the back ground portion.

5. In a device of the character described, a ceramic character adapted to be supported on a background portion, a luminous tube mounted on the character, said tube having an end with a conducting member for transmitting electrical energy into said tube, said end being adapted to enter into an aperture in the character, an insulation sleeve supported on the character at the rear thereof, and in alinement with an aperture in the character for the insertion of the tube end, and a separable contact member in the sleeve for conducting electrical energy to the tube when the end is inserted, said sleeve being adapted to extend into apertures in the background portion.

6. In a device of the character described, a ceramic character adapted to be supported on a background portion, a luminous tube mounted on the character, said tube having ends, each with a conducting member for transmitting electrical energy into said tube, both of said ends being adapted to enter into apertures in the character, a pair of insulation sleeves supported on the character at the rear thereof, and in alinement respectively with the apertures in the character for the insertion of the tube ends, and a separable contact member in each sleeve for conducting electrical energy to the tube when the ends are inserted, said sleeves being adapted to extend into apertures in the background portion.

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