May 2, 1933. J. BOYCE ET AL 1,906,309

LUMINESCENT TUBE SIGN

Filed Jan. 2, 1932

Fig. 1.

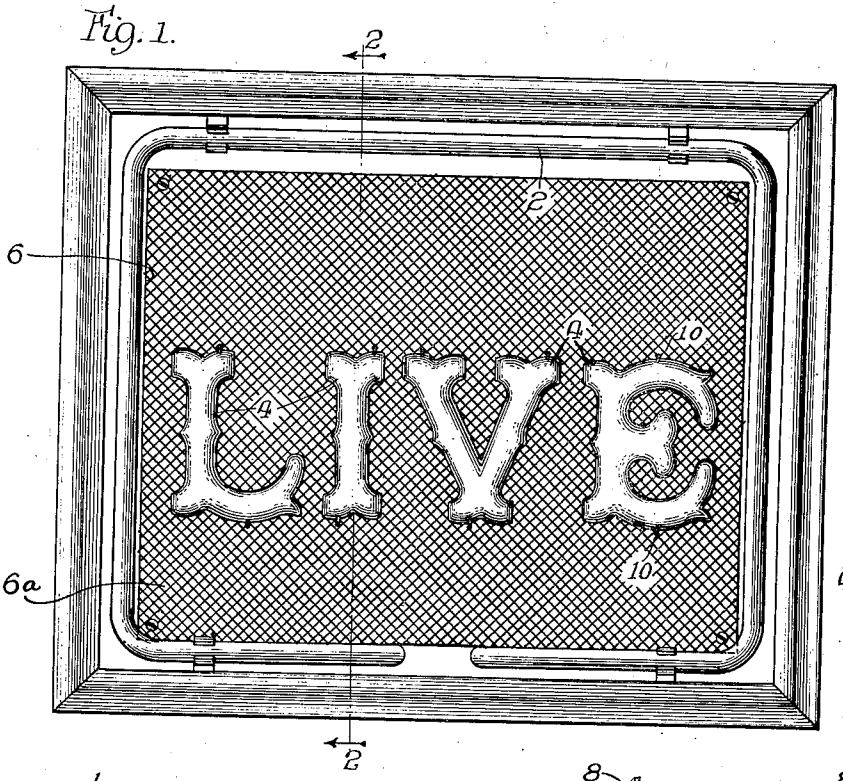


Fig. 7

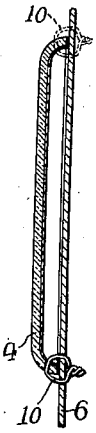


Fig. 2.

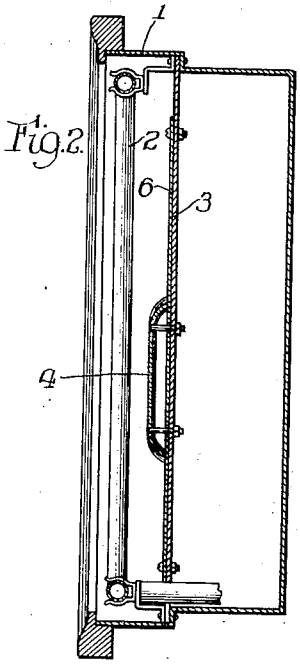


Fig. 8

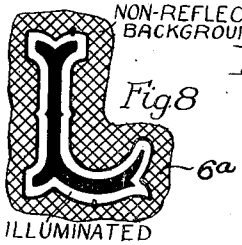


Fig. 5

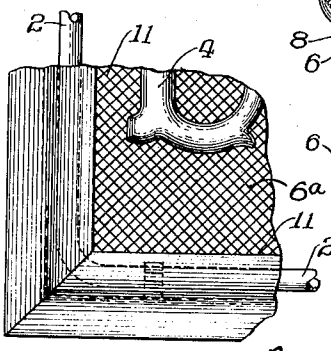


Fig. 3

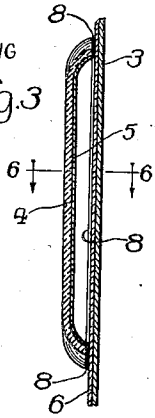


Fig. 4

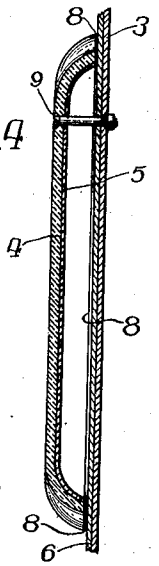


Fig. 6



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UNITED STATES PATENT OFFICE

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LUMINESCENT-TUBE SIGN

Application filed January 2, 1932. Serial No. 584,366.

This invention relates to signs of the class in which neon tubes or similar luminescent tubes are employed.

It is very difficult to produce artistic letters and other sign characters of neon tubes because of the limitations inherent in the use of glass tubing. This difficulty approaches impracticability in the case of small letters, it being quite impossible to make double-tube neon letters of the one-inch size, for example.

Another disadvantage attending the use of neon tube letters is the relatively high cost thereof, the initial cost of such a sign being relatively great and the replacement of broken letters involving much expense.

Still another objection to signs made of neon tube letters is due to the fact that while visibility is great, legibility, even at moderate distances, is poor. Such poor legibility is probably due to the dazzling brilliance of the letters and the intermingling of the rays of light emitted from the character strokes.

The present invention aims to obviate the objections above noted. Briefly stated, our object is to make possible the production of luminescent-tube signs comprising elaborate or artistic letters, as distinguished from the relatively plain forms to which glass tubing is necessarily restricted, to reduce the cost of such signs, to improve legibility, to provide for changeability, and to attain attractiveness whether the luminescent tube be operating or not.

In the accompanying drawing,

Figure 1 is a front view of a sign embodying the features of my invention.

Fig. 2 is a section on line 2—2 of Fig. 1.

Figs. 3 and 4 are sections on line 2—2 illustrating different methods of attaching the character to the background.

Fig. 5 is a fragmental view of a modified form.

Fig. 6 is a section on line 6—6 of Fig. 3.

Fig. 7 illustrates still another means of attaching the character to the supporting panel.

Fig. 8 is an attempt to represent the visual effect produced by a sign character when illuminated.

Referring to Figs. 1 and 2: The embodiment herein shown of the invention comprises a shadow box 1 which contains a luminescent tube 2 that surrounds the characters constituting the word, words, symbols, or other elements of the sign. The shadow box and the tube 2 may be of any desired outline. They may be of generally rectangular form or of some shape conforming to the theme of the sign; or they may be an outline reproduction of a trade-mark or trade symbol. On the back 3 of the shadow box 1 are mounted the sign characters 4. These are preferably formed of molded or blown glass, the character strokes being concavo-convex, as shown in Fig. 6 hereof, and more fully in the Lutwyche Patent No. 682,212, dated Sept. 10, 1901. The letters are usually formed of crystal, that is to say, transparent colorless glass, and are gilded on their concave sides. In Figs. 3, 4 and 6, the gold coating is indicated at 5. While a gold reflecting surface is preferable, silver gives acceptable results.

It is desirable that the letters or other sign characters 4 be mounted upon a mat or non-reflecting surface. This surface may be provided in any preferred manner. Herein I have shown a sheet 6 of metal, wood, glass or the like, said sheet being removably mounted upon the back 3 of the shadow box as by screws or the like. The sheet is painted or otherwise treated to produce a substantially nonreflecting surface 6^a indicated by diamond cross hatching in Figs. 1, 5 and 8. It will be understood that the letters may be mounted directly upon the back 3 or upon any preferred form of supporting panel, the surface of the backing or panel being made substantially nonreflecting.

The letters or sign characters 4 may be mounted upon the background in various ways. For example, they may be cemented upon the sheet 6, as indicated in Fig. 3, the reference numeral 8 denoting a layer of cement by which the edges of the letter are affixed to the background. If desired, the letters may be secured in place by means of small slender screws or bolts 9 (Figs. 2 and 4). Where two screws are employed for

each character, the use of cement may be dispensed with. Where one screw is used, as indicated in Fig. 4, cement is employed to assist in holding the letter in proper position. Preferably, however, the letters are attached to the sheet 6, the back 3 or other supporting panel by means of wire 10 passed through openings in the letter and the support, as shown in Fig. 7. The wire and the openings are in practice quite invisible. The wire fastenings are or may be supplemented by cement.

In the form shown in Fig. 1, the neon tube 2 is exposed so as to be in plain view, whereas in the modified form shown in Fig. 5 the shadow box comprises an inwardly extending perimetral rim or flange 11 which overhangs the tube.

It will be apparent from Fig. 2 that the neon tube 2 is in a plane parallel to and forwardly of the plane in which the sign characters 4 are located. Thus the light emitted from the tube 2 strikes upon the rounded sides of the character strokes. Since the letters are of transparent glass and have smooth exteriors and a metallic reflecting film upon the inner or concave surfaces, the light from the neon tube is reflected from the curved or sloping sides of the character strokes and causes the opposite sides of each character stroke to be strongly illuminated. The middle or highest portion of the convex character stroke does not reflect light to an observer standing in front of the sign; consequently, that portion of the character stroke appears to be black. The brightly illuminated sloping sides of the character stroke and the black or unilluminated middle portion of the stroke cause the letter to appear, to an observer standing in front of the sign, to be a double-outline letter, as indicated in Fig. 8.

It will be seen that the construction herein disclosed possesses the attractiveness inherent in neon tube signs and in addition provides the beauty of form which may be imparted to molded or blown glass letters as distinguished from letters made of bent glass tubing. The attractiveness of the sign is further enhanced by the double-outline appearance. The advantages of this type of construction are most striking in the case of small letters, it being possible to employ letters as small as one inch in height of artistic form and simulating double-outline letters, whereas such letters cannot practically be formed of glass tubing.

The invention permits of a great saving in cost, the cost being in the neighborhood of a sixth or an eighth of that of a double-tube neon letter.

Since the letters are highly reflecting, they are very effective and attractive in daylight whether the neon tube be operating or not.

The letters may be easily and cheaply replaced, if broken. The border tube, being relatively simple in form, also may be readily replaced at small expense, if necessary.

If variations are desired, the sign characters may be removed and others substituted, thus giving the advantages incident to changeability.

The screw heads, being small and being in the dark zone, are, for all practical purposes, invisible.

It will be understood that the invention is not restricted to the use of neon tubes, but that luminescent tubes containing various other gases or mixtures of gases may be employed.

While the embodiment selected for illustration comprises a shadow box, it should be understood that the neon tube and the sign characters may be mounted upon any suitable supporting panel.

We claim as our invention:

1. A sign comprising a sign character having a smooth highly-reflecting convex surface, a non-reflecting background for the sign character, and a luminescent-gas tube surrounding the character but located in a plane parallel with and forward of the plane of the character and serving to impart a double-outline appearance to the sign character.

2. A sign comprising a sign character which is concavo-convex in cross section, said character being formed of transparent colorless glass and having a smooth highly-reflecting convex surface and a reflecting coating on the concave surface, a non-reflecting background for the sign character, and a luminescent-gas tube surrounding the character but located in a plane parallel with and forward of the plane of the character and serving to impart a double-outline appearance to the sign character.

3. A sign comprising a shadow box, a luminescent-gas tube within said box, sign characters mounted upon the back of the box, said tube surrounding said characters but located in a plane parallel to and forward of the plane of the characters, and serving to impart a double-outline appearance to the sign character, and a nonreflecting background in said shadow box for said characters.

In testimony whereof we have hereunto affixed our signatures.

JAMES BOYCE.
RICHARD BOYCE.