March 9, 1937. H. HOTCHNER 2,072,986

LUMINOUS TUBE SIGN

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Fig. 1.

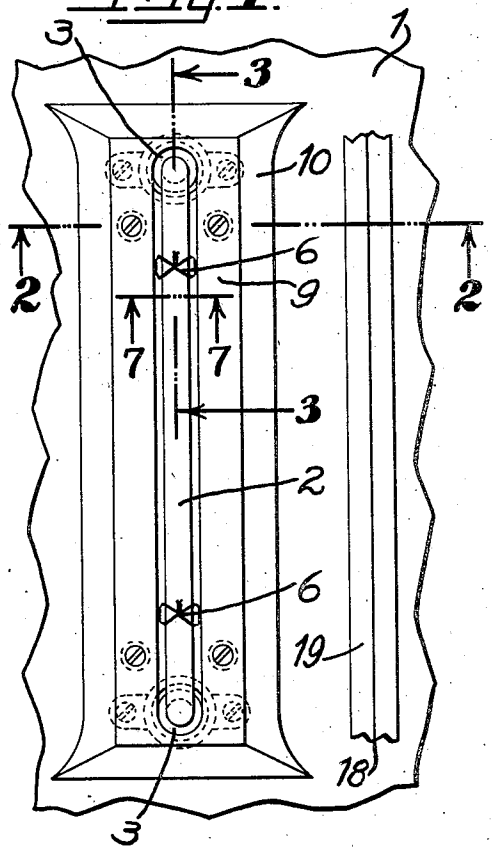


Fig. 2.

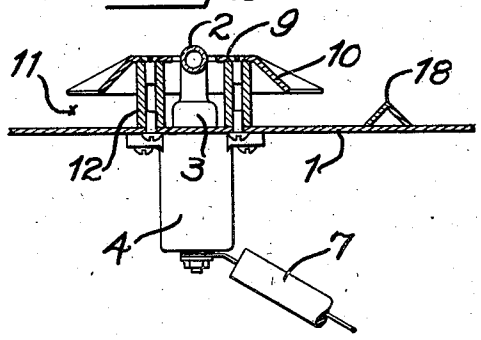


Fig. 3.

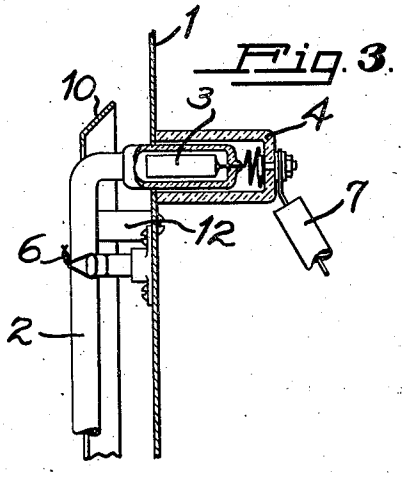


Fig. 4.

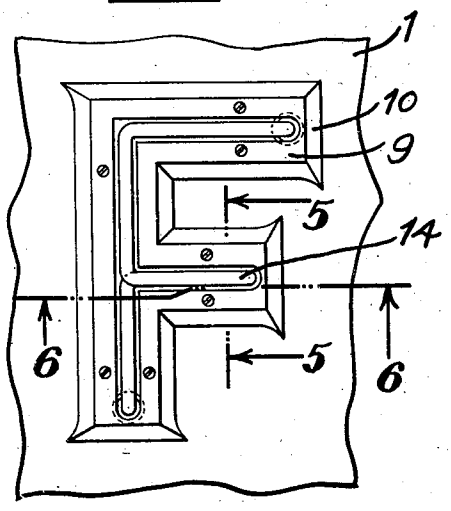
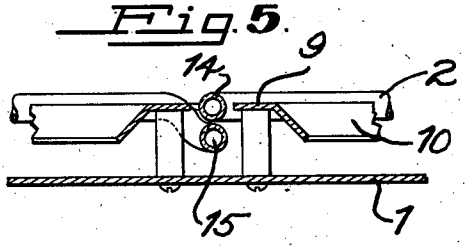


Fig. 5.



INVENTOR,
HAROLD HOTCHNER

BY
Lippincott & Metcalf
ATTORNEYS.

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Fig. 6.

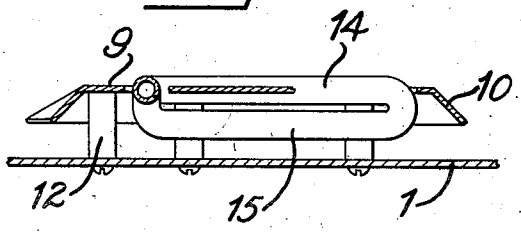


Fig. 7.

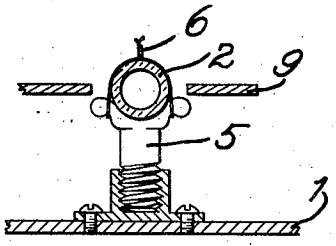


Fig. 8.

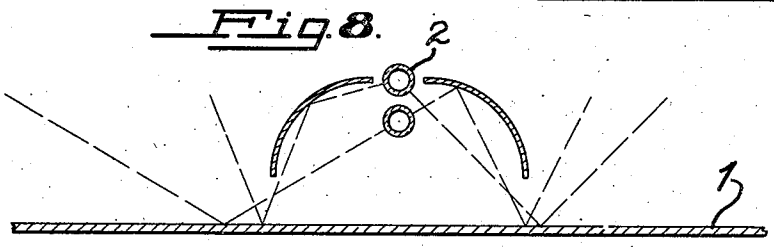


Fig. 9.

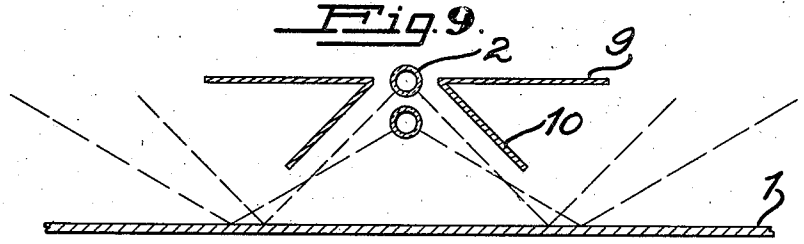
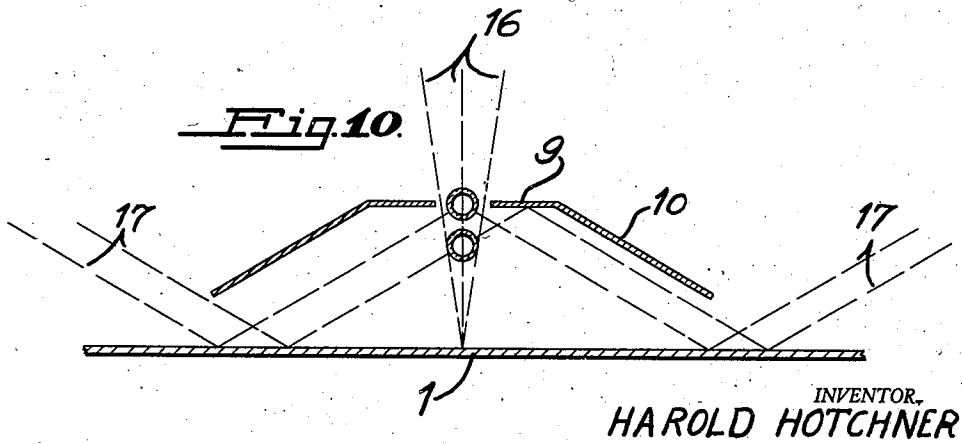


Fig. 10.



INVENTOR.
HAROLD HOTCHNER

BY
Lippincott & Metcalf

ATTORNEYS.

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UNITED STATES PATENT OFFICE

2,072,986

LUMINOUS TUBE SIGN

Harold Hotchner, San Francisco, Calif.

Application February 11, 1936, Serial No. 63,389

11 Claims. (Cl. 40—130)

My invention relates to a luminous tube sign, and more particularly to such a sign wherein the effect of a silhouette letter may be obtained.

The main object of my invention is to more fully utilize the light from a luminous tube to obtain a sign of unique characteristics.

Among the other objects of my invention are: To provide a sign wherein a raised character is shown dark against an illuminated background; to provide a luminescent tube sign wherein the tube acts in a dual capacity, i. e., supplies light directly, and by reflection, to provide novel effects; to provide a luminescent tube sign which is effective in daytime as well as at night; to provide a luminescent tube sign capable of utilizing, to the best extent, the more legible color combinations; and to provide a luminescent tube sign utilizing the light emitted from a luminous tube to a maximum extent and for novel effects.

Other objects of my invention will be apparent or will be specifically pointed out in the description forming a part of this specification, but I do not limit myself to the embodiment of the invention herein described, as various forms may be adopted within the scope of the claims.

Referring to the drawings:

Figure 1 is a plan view of a single letter of one preferred embodiment of the sign of my invention.

Figure 2 is a sectional view, partly in elevation, taken as indicated by the line 2—2 in Figure 1.

Figure 3 is a similar view, taken as indicated by the line 3—3 in Figure 1.

Figure 4 is a plan view of a letter having a double-back therein.

Figure 5 is a view, partly in elevation and partly in section, taken as indicated by the line 5—5 in Figure 4.

Figure 6 is a view, partly in elevation and partly in section, taken as indicated by the line 6—6 in Figure 4.

Figure 7 is a cross-sectional view, partly in elevation, taken as indicated by the line 7—7 in Figure 1.

Figures 8, 9 and 10 are diagrammatic sections illustrating variations in the structure of my raised characters.

Referring directly to the drawings, Figure 1 illustrates the letter I constructed in accordance with my present invention.

As is usual with luminous tube signs, the sign body proper is provided with a sign face 1 on which is mounted a luminous tube 2 having electrodes 3 at each end thereof, these electrodes dropping into receptacles 4 attached to the sign face 1. The luminous tube is held in position, spaced from the sign face, by glass uprights 5 to which the tube is tied by wires 6. Connection to a suitable transformer is made through wire 7, as is well known in the art.

The letter I is formed, preferably from sheet metal, and has a character face 9 surrounded by a beveled edge 10, bent toward the sign face but spaced therefrom so that an opening 11 is formed all around the edge of the letter, between the edges and the sign face. The letter is maintained in this position by spacers 12, and the central portion of the character face 9 is cut out in the form of a slot to allow the tube 2 to fit therein, leaving a small margin of clearance around the tube at all points.

I prefer to position the tube in the slot in such a manner that it is substantially in the plane of the character surface, although the spirit of my invention is not affected by moving the tube slightly above or below that plane.

In Figure 4, I have shown substantially the same arrangement except that in this case I have illustrated the letter F which, as is well known in the art, contains a double-back 14 in the smaller bar of the letter. This double-back is necessary in order to form such a letter from continuous tubing, and in this case I prefer to drop the return tubing 15 in the double-back below the level of the character face, as is shown in Figure 5, where the return 15 is seen to be well below the level of the character face 9.

All of the letters of the alphabet, fancy borders or other characters may be constructed in accordance with the teachings for the letters above described, and when the tube is illuminated a unique effect is obtained, which may be more fully explained by direct reference to Figure 10, which is a diagram showing the various light paths involved.

In the first place, the tube will give direct light radiating away from the face of the sign, and as the tube and slot follow the contour of the characters, it is obvious that the tube itself will trace the character. Light will, however, be radiated from the tube toward the sign face and will be reflected therefrom back through the slot to reenforce the direct light of the tube, as indicated by the lines 16 in Figure 10. At the same time, light will be reflected from underneath the raised letter through opening 11, and will appear as a glow on the sign surface 1. The letter itself, however, comprising the front surface 9 and the beveled edges 10, will prevent this glow from

being seen from the front, on those portions of the sign surface 1 obscured by raised letter material. Thus, the raised letter itself will appear in silhouette and will effectively have a central high intensity illumination and a sharp edge illumination, due to reflection beyond the letter from the sign face, as indicated by the lines 17 in Figure 10. The effect given to the eye is peculiar, namely, that of a black letter having a brilliant central portion, the black letter being outlined by a diffused glow.

Heretofore, raised letter signs have had a luminous tube mounted on top of the raised letters, and in order to obtain proper reflection from the background, the raised letter has customarily been painted with light colors, and the sign surface itself with dark colors. However, this is not the best color combination for daylight legibility, the most legible being a black letter on a light yellow background. Due to the fact that reflection usually is desired, however, from a luminescent tube, such a combination is not commonly used. My type of letter, however, is ideal for the purpose. Inasmuch as I utilize my main sign surface for reflection, I am able to paint it a light color; and inasmuch as I do not illuminate the raised letter surface in any event by the tube, it being in silhouette, I may paint the entire letter black, thus obtaining the highest daylight legibility with a maximum reflective ability from the sign surface 1, which not only acts to outline the letter but also aids in reflecting light directly through the slot in line with the tube itself to reenforce direct light.

I am also able to obtain various color combinations by varying the color of the reflective background. In this manner I am able to obtain variations in color, the central tube itself, of course, giving its own proper light whereas the reflected glow at the edge of the letter will be that of the tube, modified by the color of the background.

Furthermore, by placing my double-backs below the level of the character surface 9, all the light generated by the double-backs is utilized for reflection, and the material of the raised letter itself effectively hides the double-backs from the observer in front of the sign. Therefore, my sign may be viewed from an angle and not be distorted by double-backs, as is ordinarily the case with naked tubes on a sign face.

In Figures 8 and 9, I have shown variations in the structure of the light barriers positioned on each side of the tube. In Figure 8 the beveled edges 10 and character surface 9 have been merged into curved surface, whereas in Figure 9 the bevels have been placed next to the tube. The net result in each case is the same, namely, at night, a dark letter with a brilliant central illumination and a soft, sharp edge illumination, due to reflection from the sign surface.

This reflection, of course, will extend for some distance on each side of the letter, and if it is desirable to limit the distance to which the side illumination extends, I may prefer to place around the letter a raised border 18 having an angular surface 19 facing the reflection from beneath the letter. The surface 19 will give a sharp outer outline to the reflected light and prevent it from merging, if desired, with the reflected light from an adjoining letter.

Furthermore, I may also prefer to increase the reflective ability of the underside of the raised letter by either painting it a light color or coating it with a highly reflective material, such as aluminum, or burnishing it. In all cases, I prefer to mount the tube in a slot in a letter which is raised from the main body of the sign.

It is of course to be understood that the word "character", used herein, refers to running borders and scroll work as well as to letters and numerals, as the effect in all cases will be the same.

I claim:

1. A luminous tube sign comprising a sign face, a raised character mounted thereon having a character face spaced from said sign face, and having character edges following the contour of said character spaced from said sign face by a lesser distance than the spacing of said character face, said character face having a slot therein, and a luminous tube so positioned and arranged in said slot as to be visible per se, and additionally to direct light past said character edges within said character to illuminate said sign face beyond the extent of said character, said tube being mounted directly on said sign face and supported independently of said character.

2. A luminous tube sign comprising a sign face, a raised character mounted thereon having a character face spaced from said sign face, and having character edges following the contour of said character spaced from said sign face by a lesser distance than the spacing of said character face, said character face having a slot therein, said slot corresponding in extent to the sense of said character, and a luminous tube so positioned and arranged in said slot as to be visible per se, and additionally to direct light past said character edges within said character to illuminate said sign face beyond the extent of said character, said tube being mounted directly on said sign face and supported independently of said character.

3. A luminous tube sign comprising a sign face, a raised character mounted thereon having a character face spaced from said sign face, and having character edges following the contour of said character spaced from said sign face by a lesser distance than the spacing of said character face, said character face having a slot therein, a luminous tube so positioned and arranged in said slot as to be visible per se, and additionally to direct light past said character edges within said character to illuminate said sign face beyond the extent of said character, and means attached to and raised from said sign face and following the contour of said character for confining said latter illumination to a definite distance beyond said character.

4. A luminous tube sign comprising a sign face, a raised character mounted thereon having a character face spaced from said sign face, and having character edges following the contour of said character spaced from said sign face by a lesser distance than the spacing of said character face, said character face having a slot therein, a luminous tube so positioned and arranged in said slot as to be visible per se, and additionally to direct light past said character edges within said character to illuminate said sign face beyond the extent of said character, and a raised barrier on said sign face surrounding said character for confining said latter illumination to a definite distance beyond said character.

5. A luminous tube sign comprising a sign face, a luminous tube mounted on and spaced from said face and causing said face to be illuminated by reflected light, and a light-proof barrier

mounted on each side of said tube and in the plane thereof and following the extent of said tube whereby said reflected light cannot be seen from the front of said sign for the extent of the barrier, said barrier being supported on said sign face independently of said tube.

6. In combination, a sign face, a slotted character, means for supporting said character from said face, a luminous tube positioned in and following the extent of the slot in said character without touching the edges thereof, and separate means for supporting said tube from said face.

7. In combination, a sign face, a slotted character, means for supporting said character from said face, a luminous tube positioned in and following the slot in said character without touching the edges thereof, said tube emerging through apertures in said sign face, and means for supporting said tube from said face independently of the support for said character.

8. In combination, a colored sign face, a colored slotted character, means for supporting said character from said sign face, a luminous tube positioned in and following the extent of the slot in said character without touching the edges thereof, and separate means for supporting said tube from said face, the color of said sign face being of a substantially lighter hue than the color of said character.

9. In combination, a sign face, a slotted character, means for supporting said character from said face, a luminous tube positioned in and following the extent of the slot in said character without touching the edges thereof, and separate insulating means for supporting said tube from said face.

10. In combination, a sign face, a group of supports extending outwardly from said sign face, a slotted character positioned on said supports and removably attached thereto, a second group of supports, and a luminous tube positioned in and following the extent of said character without touching the edges thereof and maintained in said position by attachment to said second group of supports.

11. In combination, a sign face, a slotted character, a luminous tube, means for directly supporting said tube from said sign face in spaced relation with said sign face, means for removably supporting said slotted character with said tube positioned in and following the slot in said character without touching the edges thereof, said character being removable without disturbing the position of said tube in relation to said sign face.

HAROLD HOTCHNER.