July 18, 1933. F. HOTCHNER 1,918,616

DOUBLE FACED SIGN

Filed Feb. 24, 1931 3 Sheets-Sheet 1

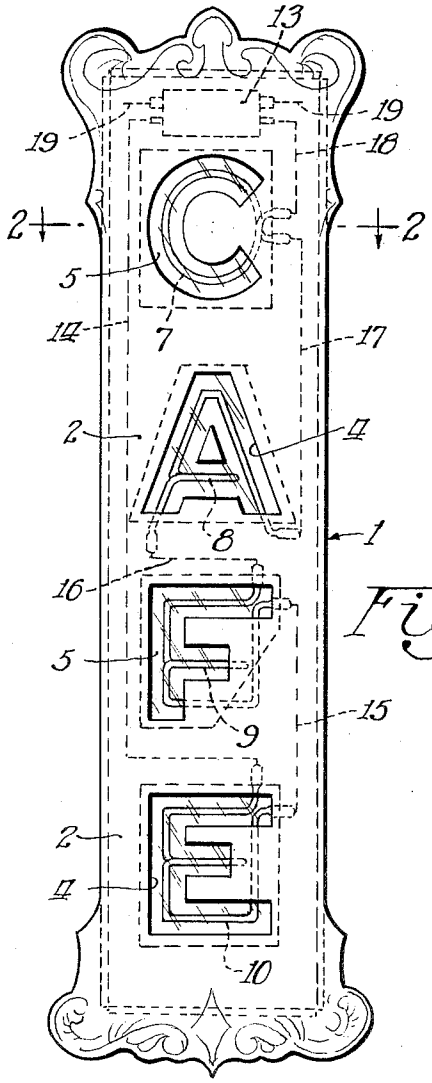


Fig. 1

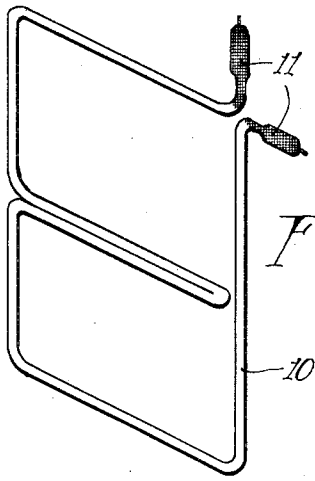


Fig. 3

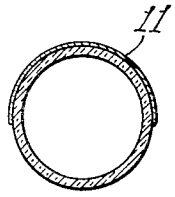
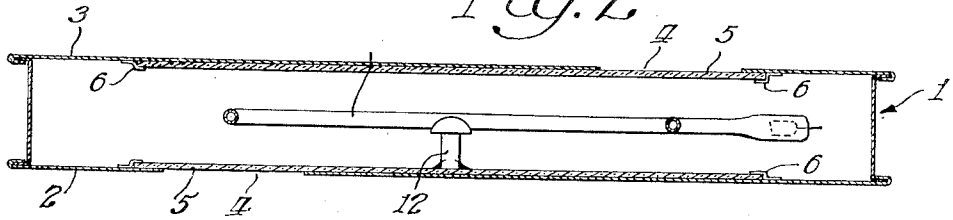


Fig. 4

Fig. 2



INVENTOR

Fred Hotchner

July 18, 1933. F. HOTCHNER 1,918,616

DOUBLE FACED SIGN

Filed Feb. 24, 1931 3 Sheets-Sheet 2

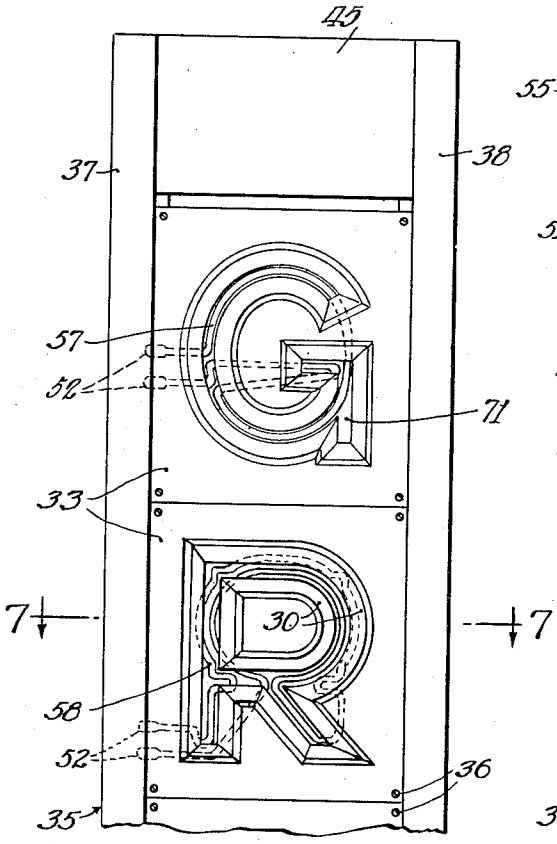


Fig. 5

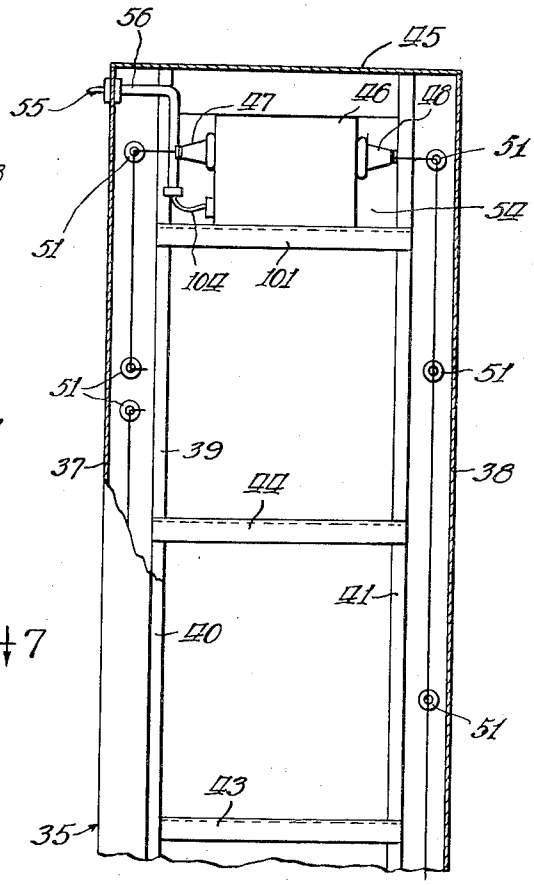


Fig. 6

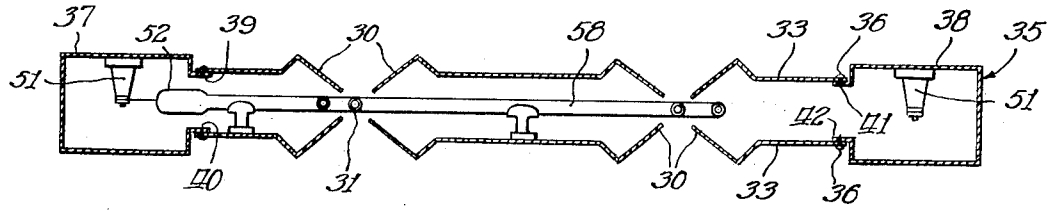


Fig. 7

INVENTOR

Fred Hotchner

July 18, 1933. F. HOTCHNER 1,918,616

DOUBLE FACED SIGN

Filed Feb. 24, 1931 3 Sheets-Sheet 3

Fig. 8

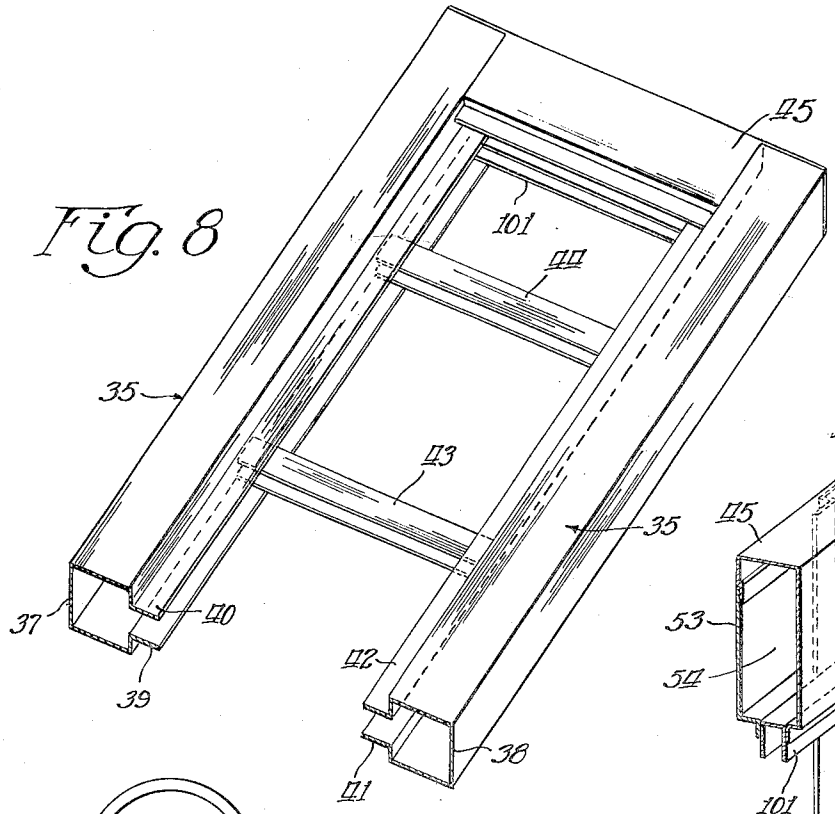
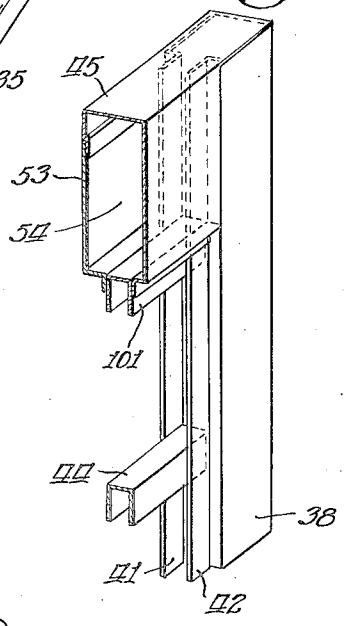


Fig. 9



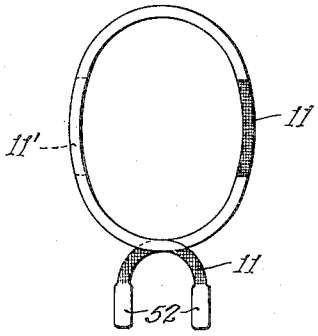


Fig. 12

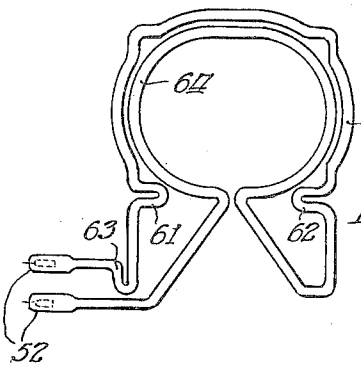


Fig. 10

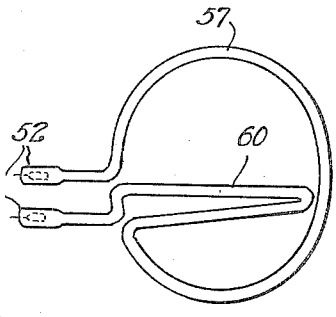


Fig. 11

INVENTOR

Fred Hotchner

Patented July 18, 1933 1,918,616

UNITED STATES PATENT OFFICE

FRED HOTCHNER, OF LOS ANGELES, CALIFORNIA

DOUBLE FACED SIGN

Application filed February 24, 1931. Serial No. 517,728.

This invention relates to a double faced tubular light electric sign, an object thereof being to provide a double faced sign having a single set of tubing, which tubing delineates characters on both sides of the sign.

A further object of one form of the invention is to provide a sign having the tubing all enclosed and protected from the weather and damage from other causes.

Another object in one of its forms is to provide a new and novel type of beveled edge letter internally lighted sign illuminated by luminous tubes, which are visible from a wide angle of view.

Another object in one of its forms is to provide a method of mounting an insulated discharge tube within the body of the sign permitting simple and convenient connections thereto and the ready replacement of unit tubes.

A still further object in one of its forms is to provide a luminous tube sign of reduced thickness.

Another object in one of its forms is to provide a simple method of mounting the transformer in a luminous tube sign and a simple wiring system providing for short connections.

Another object in one of its forms is to provide a new type of sign body with interchangeable letters.

A further object is to reduce the total footage of tubing necessary to illuminate the reading matter of a double faced sign.

These and other objects will become apparent from a detailed description of the drawings, it being understood that the features of the invention may be used singly or in various combinations and that the invention is not limited to the particular embodiment shown but only by the prior art and the appended claims.

In the drawings:

Fig. 1 is an elevation of a sign made according to this invention.

Fig. 2 is an enlarged section of the same taken at the line 2—2 of Fig. 1.

Fig. 3 is a perspective view of the tube behind the letter F in the sign shown in Fig. 1.

Fig. 4 is an enlarged view of a section of the tube shown in Fig. 3 to illustrate the method of rendering certain sections of the surface of the tube opaque for the purposes described below.

Fig. 5 is an elevation of a portion of a sign made according to this invention, embodying further novel features.

Fig. 6 is a view of the same, partly in section, and with certain elements removed to illustrate the construction of the sign.

Fig. 7 is an enlarged section taken on the line 7—7 of Fig. 5.

Fig. 8 is a perspective view of the frame of the sign shown in Fig. 5.

Fig. 9 is a perspective view of a portion of the same taken at another angle to more clearly illustrate the relation of the parts.

Fig. 10 is a view of the tube behind the letter R of the sign shown in Fig. 5.

Fig. 11 is a view of the tube behind the letter G of the sign shown in Fig. 5.

Fig. 12 is a view of a double face tube requiring no casing.

Numeral 1, Fig. 1, indicates a sign of the "transparent double-faced vertical" type having the word "CAFE" cut from the sheet metal face of each side of the sign. As shown in Fig. 2, the sheet metal faces 2 and 3 are cut out as indicated at 4, 4, etc., and glass sheets 5, 5, preferably of opalescent glass, are secured behind the openings by the clips 6, 6, etc., this being the typical construction for transparent signs illuminated by incandescent lamps. Instead of opalescent glass, clear glass may be used, there being an advantage in opalescent glass in that it more clearly illuminates the entire stroke of the letter. It is to be understood that this invention may be practiced either way.

The letters are illuminated by the discharge tubes 7, 8, 9 and 10, each of which is in the form of a display pattern found by the superposition upon each other of the two adjacent characters in reverse, so that in viewing the sign from either side the entire character opening of each character is fully lighted. In order that certain portions of the tube which are not properly part of the outline as regards the view from either side

of the sign may be rendered inapparent to the eye, such portions are rendered opaque as indicated by 11, Fig. 3, the preferred method of so doing being that of painting out a portion of the glass with opaque paint although there are numerous simple devices that may also be used. In Fig. 4 only one-half of the circumference has light obstructing means.

The tubes are mounted on insulators 12, 12, etc., secured to the glass plates behind which they are mounted, or in any other convenient manner if so desired, and are connected to the transformer 13 and to each other, all in series by means of the wires 14, 15, 16, 17 and 18. It is to be noticed that the wiring of this sign is relatively simple, due to the fact that only a single set of tubes need be accommodated, in contradistinction to the complicated wiring necessary in signs of the prior art having tubing mounted on the face of each side. The transformer in this sign is supported from the top of the sign as indicated and the low tension feed wires 19—19 are connected to the same in the usual manner.

In the sign shown in Figs. 5 to 11, I show a modification. The necessity for painting out portions of the tubing is eliminated and a better appearing sign is provided. In this form of the invention, the character openings are but slightly wider than the diameter of the tubes, and the metal faces of the sign have inturned edges as more clearly apparent from Fig. 7.

From Fig. 7 it will be seen that the edges of bevels 30, 30, 30, etc., of the letters, approach so close to the strokes of the tube 31 as to form an effective "cut-off" for the portions of the tube which are not to be visible from either side.

The sign shown in Figs. 1 to 4 is made of necessary is usually determined by the rea thickness sufficient to provide an insulating clearance between the high tension wiring and either side of the sign. The thickness quirements of the National Board of Fire Underwriters for safety and fire protection and is usually considered to be about double the minimum flash-over distance from a high tension wire of 15,000 volts to ground, regardless of the fact that most of the wire is insulated.

In the prior art with the method of mounting tubing on the face of the sign, a double faced sign becomes exceedingly thick due to the fact that electrodes on opposite sides not only must terminate within the sign a sufficient distance to maintain the safe flash-over distance to the side of the sign on which they are mounted, but also must be a sufficient distance from the wiring on the opposite side of the sign to provide the necessary safety; hence such signs average about 8 inches in thickness which is exceedingly bulky.

In the sign shown in Figs. 1, 2, 3 and 4, the thickness may be reduced considerably due to the fact that we have only one set of tubing and need only provide a flash-over distance from the center to the two sides.

A further improvement is effected in the sign shown in Figs. 5 to 11 in that although we maintain the same thickness around the edge of the sign as required in views 1 to 4, the thickness may be very greatly reduced over all that portion of the sign which constitutes the main display surface, due to the fact that the terminals of the tubes are all in the border portions and the fact that the thickness between the tubing itself and grounded metal may be much less than that between the wiring and grounded metal. In fact, it is common for tubing to be mounted on the outside of signs with a clearance of one-half inch from edge of tubing to grounded metal. Utilizing this fact, I designed the sign shown in these views with the inner edge of the letter bevels approaching so closely to the tubing that the tubing may be seen at a very wide angle of view through the character openings, also serving to a degree to illuminate the surface of the bevels. The main body portion of the letter characters may approach the tubing, just as closely as desired, giving a very deeply embossed effect to the sign, although usually it will not approach as closely to the tubing as do the inner edges of the bevels.

It is also possible to eliminate the glass behind the letter openings in this form of sign and it will be seen that there is no necessity in this form for painting out any of the portions of the tubing due to the fact that the character openings are only slightly greater than the width of the tube.

The letter plates indicated by 33, 33 in Fig. 7 preferably are stamped from sheet metal and are removably secured in the frame 35 by means of screws 36, 36, etc. Any letter plate may be taken off for the purpose of removing the corresponding illuminating tube. The frame 35 is formed of the channels 37 and 38 (Fig. 8) which have re-entrant edges 39, 40, 41 and 42 to which the letters are secured. The frame channels are spaced by means of U-shaped spacer bars 43, 44 and 101, and the top enclosure plate 45. The transformer 46 is mounted in the space provided at the top by said enclosure plate and secured to the upper spacer bar 101. High tension wires from the transformer pass from the terminals 47 and 48 directly through the spaces in the frame channels to the tube terminals, being supported in the middle of the space in the channels by the insulators 51, 51, etc., and are connected to the terminals 52, 52, etc., of the various tubes, the tubes all being connected in series with the transformer in the conventional manner without any wiring passing between the main display portion of the sign, thereby permit-

ting the considerable reduction of the thickness of the main display portion of the sign, as explained above.

The transformer compartment 54 (Figs. 6 and 9) is closed by the cover plate 53 which may also be readily removed to permit access to the transformer. The low tension supply wires 55 connected to the primary terminal 104 enter the transformer compartment through the conduit 56.

Figs. 10 and 11 show the tubes 57 and 58 which correspond to the letters G and R in Fig. 5, it being understood that the same letters are to be seen on the opposite side of the sign and thus these two tubes are made in the form of a pattern, determined by the superposing of these letters upon each other in reverse, provision being made for maintaining all of the tubing in a single plane, for the reasons explained below. For the sake of simplicity, the down stroke of the letter G indicated by numeral 71 is not lighted by tubing. In the ordinary simple alphabet the only other place where this expedient is advisable is in the letter Q which being rarely used, may if desired when used be simplified by the elimination of the cross bar which, however, as in the case of the down stroke of the G, still is represented by the formation of the stamping even though not being followed by the tubing.

The letter R shown in Fig. 10 is the most complicated form of tubing which it is necessary to use when the same letter is superposed upon itself in reverse. In the entire alphabet only four letters present real difficulty in reversing, being the letters B, D, P and R. It will be found that the letter G in Fig. 11 contains no more tubing than the usual letter G in the conventional single viewing signs of the prior art, considering that there are jump-over portions between the letters and an appreciable portion of return bend tubing as signs are made today.

In checking the alphabet it will be found that the letters A, C, H, I, M, O, T, U, V, W, X and Y reverse directly of themselves, the only one of this group requiring any additional tubing at all being the letter C. The remaining letters of the alphabet may be made to reverse with no more difficulty than that involved in the letter F.

Thus, 12 of the 26 letters in the alphabet may be made in the practice of this invention with the use of no more than half the tubing, and in some cases considerably less than half the tubing, than that which would be required for the two letters of a double faced sign of the prior art. Therefore, as much as 50 per cent of the tubing of a double faced sign may be saved by the use of this invention. Practically all of the letters of the alphabet superpose themselves upon each other with very little additional footing than that required by a single letter alone illuminated for single viewing.

Considering vertical double faced signs having common copy such as Drugs, Cafe, Candies, Cigars, Garage, Hotel, etc., it will be found that in the majority of cases a very considerable saving of tubing is effected by this invention over that tubing necessary for the conventional double faced sign illuminated by tubing on the face of each side of the sign, with the consequent reduction in the cost of wiring and transformer capacity.

In order to provide for the greatest reduction of thickness practical in this form of the sign, I provide that all the tubing including the return bend portions be preferably made in a single plane; thus the distance between the approaching edges of opposite character bevels need be but little greater than that of a single piece of tubing. This will be noticed in Figs. 10 and 11 at the places indicated by the numerals 60, 61, 62, 63 and 64, these places in the conventional method of making letters in the prior art being represented by tubing lying behind each other, thus appearing to the eye as single tubing. This, however, is not necessary in this construction as the cut off of any desired portions of the tubing is effected by the letter plates. It will be seen in Fig. 5 that the character opening cuts off portions of the tubing to complete the appearance of the continuous tubing. This effect is much more continuous in practice than would appear from the drawings due to the fact that for the sake of clarity, the elements in the drawings are not in correct proportion.

In many cases the outer casings may be dispensed with and the tubing used by itself in accordance with this invention. In such cases the tubing is made to represent the character which it is desired to display, in opposite directions, and then those portions of the tubing not needed on opposite sides are provided with light obstructing material 11 as shown in Fig. 4. Such a tube illustrative of the character "C" is shown in Fig. 12. One-half of the circumference is darkened as shown at 11, and the other half of the circumference is darkened as shown at 11'. When illuminated this tube will display the character "C" in opposite directions.

In the claims the expressions "display pattern" or "character" is to be understood as including any pattern of inscriptions, characters, figures, numerals, symbols, ornaments, designs, borders or signs, whether including but one of any such devices, or a number of any one of such devices or any combination of such devices when used as an intended visible portion of the display according to this invention or as referring to the elements of said device when in any of such forms.

I claim:

1. In an electric sign, a hollow sign body, character openings on each side of said sign body, and a luminous tube within said sign body in alignment with a character opening on each side of said sign body, said tube being in the form of a pattern formed by the superposition of said opposing characters upon each other in reverse.

2. In an electric sign, a hollow sign body, character openings in opposite sides of said sign body, a luminous tube within said sign body visible through two opposing openings on opposite sides of said sign body, said tube being in the form of a display pattern formed by the superposition of said opposing characters upon each other in reverse, those portions of said tube which show through either of said character openings from the normal angle of view not corresponding to the general outline of either of said character openings being rendered relatively opaque whereby each character opening is illuminated by a line of tubing corresponding in general form to said character opening.

3. In an electric sign, a hollow sign body, character openings in opposing sides of said sign body, a plurality of luminous tubes within said sign body positioned behind said character openings and in alignment with said character openings, each of said tubes being in the form of a display pattern corresponding to the superposition of the two opposite character openings with which it aligns upon each other in reverse.

4. In an electric sign, a hollow sign body, character openings in opposing sides of said sign body, a plurality of luminous tubes within said sign body positioned between said character openings, each of said tubes being visible through opposing character openings, each of said tubes being in the form of a display pattern determined by the superposing upon each other of two opposing character openings in reverse, and portions in each of said tubes showing through either of the corresponding character openings but not conforming to the general form thereof, being rendered relatively opaque whereby each character opening is illuminated by luminous tubing having the general form thereof.

5. In an electric sign, a hollow sign body, character openings in opposing sides of said sign body, a plurality of luminous tubes within said sign body positioned behind said character openings and visible through said character openings, each of said tubes being in the form of a display pattern corresponding to the superposition of the two adjacent character openings through which it is visible upon each other in reverse, a transformer within said sign, conductors connecting said tubes to each other in series, and conductors connecting said transformer to ends of the series formed by said tubes.

6. In an electric sign, a hollow sign body, character openings in opposite sides of said sign body, the surface of said body adjacent said openings being beveled inwardly towards said openings and towards the center of said sign body whereby each of said characters is represented by an opening, and a beveled surface on each side of said openings, luminous tubes within said sign body visible through two opposing character openings on opposite sides of said sign body, said luminous tubes being in the form of display patterns formed by the superposition of said opposing character openings upon each other in reverse.

7. In an electric sign, a hollow sign body, character openings in opposite sides of said sign body, the surface of said body adjacent said openings being beveled inwardly towards said openings and towards the center of said sign body whereby each of said characters is represented by an opening, and a beveled surface on each side of said openings, luminous tubes within said sign body visible through two opposing character openings on opposite sides of said sign body, said luminous tubes being in the form of display patterns formed by the superposition of said opposing character openings upon each other in reverse, said luminous tubes lying in close proximity to said character openings and visible from a wide angle of view therethrough.

8. In an electric sign, a hollow sign body, a border portion of said sign body being of thickness sufficient to permit insulating clearance between a high tension conductor within said sign body and either surface thereof, and a major display surface portion adjacent said border, the thickness of which is materially less than the thickness of said border and insufficient to provide insulating clearance from a high tension conductor within said sign and either side thereof, character openings in a side of said sign body having beveled edges, a luminous tube within said sign body having the general form of said character openings, the innermost portions of said bevel extending very closely to said luminous tube, said luminous tube being visible at a wide angle of view through said character openings.

9. In an electric sign, a double faced sign body having character openings on opposing sides thereof, a luminous tube within said sign having the form of a display pattern formed by the superposition of said character openings on opposing sides of said sign upon each other, said character openings being of width approximating the width of said tube whereby portions of said tube not corresponding to the character openings on either side of said sign are not visible on said side.

10. In an electric sign, a double faced sign body having character openings on opposing

sides thereof, a luminous tube within said sign body in the form of a display pattern formed by the superposition upon each other in reverse of opposing character openings, said character openings having a width approximating the width of said tube, the surface of said sign adjacent said openings being in the form of flaring bevels, the innermost portions of which bevels approach closely to said tube whereby portions of said tube not corresponding to the character opening on either side are cut off to view on said sign and said portions corresponding to the character opening on either side are visible at a wide angle of view by virtue of the bevels approachng said openings.

11. In an illuminated sign, a luminous tube in the form of a display pattern formed by the superposition of two characters upon each other in reverse, all of the portions of the tubing in the major portion of said display pattern being formed to lie in a single plane, and character plates having openings corresponding to said superposed characters positioned on opposite sides of said tube whereby those portions of said tube corresponding to each of said character openings are visible through each of said character openings.

12. In an illuminated sign, a luminous tube in the form of a display pattern formed by the superposition of two characters upon each other in reverse, all of the portions of the tubing in the major portion of said display pattern being formed to lie in a single plane, and character plates having openings corresponding to said superposed characters positioned on opposite sides of said tube whereby those portions of said tube corresponding to each of said character openings are visible through each of said character openings, the width of said openings corresponding to or being slightly greater than the width of said tube whereby portions of said tube not corresponding to each of said character openings are cut off from view by said plates.

13. In an illuminated sign, a luminous tube in the form of a display pattern formed by the superposition of two characters upon each other in reverse, all of the portions of said tube in the major portion of said display pattern being made to lie in a single plane, said portions which would be superposed over each other by the said superposition of said characters being displaced sufficient to permit all of said tubing to lie within said single plane.

14. In an illuminated sign, a luminous tube in the form of a display pattern formed by the superposition of two characters upon each other in reverse, all of the portions of said tube in the major portion of said display pattern being made to lie in a single plane, said portions which would be superposed over each other by the said superposition of said characters being displaced sufficient to permit all of said tubing to lie within said single plane, and display character plates positioned on opposite sides of said tube having openings corresponding to said superposed characters.

15. In an illuminated sign, a luminous tube in the form of a display pattern formed by the superposition of two characters upon each other in reverse, all of the portions of said tube in the major portion of said display pattern being made to lie in a single plane, said portions which would be superposed over each other by the said superposition of said characters being displaced sufficient to permit all of said tubing to lie within said single plane, and display character plates positioned on opposite sides of said tube having openings corresponding to said superposed characters, whereby portions of said tube corresponding to each of said character openings are visible through each of said character openings and portions of said tube not corresponding to each of said character openings are cut off from view by said character plates.

16. In an illuminated sign, a sign body having opposing character plates and a luminous tube therebetween, said character plates having character openings therein, said luminous tube being in the form of a display pattern formed by the superposition of said characters upon each other whereby portions of said tube corresponding to each of said characters in full are visible through each of said character openings and portions not corresponding to each of said characters are cut off from view by said character plates, all of said tube lying in a single plane, the distance between said opposing sign plates being but slightly greater than the width of said tube whereby said tube is visible through a wide angle of view through each of said character openings.

17. In an illuminated sign, a sign body having opposing character plates and a luminous tube therebetween, said character plates having character openings therein, said luminous tube being in the form of a display pattern formed by the superposition of said characters upon each other whereby portions of said tube corresponding to each of said characters in full are visible through each of said character openings and portions not corresponding to each of said characters are cut off from view by said character plates, all of said tube lying in a single plane, the distance between said opposing sign plates being but slightly greater than the width of said tube whereby said tube is visible through a wide angle of view through each of said character openings, and a conductor conveying portion in said sign body of materially greater width than said display portion, the terminals of said

tube extending into said conductor conveying portion, and high tension conductors extending through said conductor conveying portion to said terminals.

18. A device for displaying an unsymmetrical character in opposite directions, comprising luminous tubing formed to represent said character from two opposing viewpoints together with means on opposite sides of said tubing to obscure those portions of said luminous tubing not needed to display said character.

19. In an electric sign, a hollow sign body, character shaped regions through which a discharge column is delineated by direct transmission of light therefrom in opposing sides of said body, a luminous gaseous discharge envelope within said sign body and having a luminous column portion positioned in alignment with said character regions, the distance between the sides of said body adjacent said regions being reduced below, safe clearance for wiring at the potential necessary to operate said envelope said luminous portion being in the form of a display pattern corresponding to the superposition of the character regions on opposite sides thereof upon each other in reverse, said body having an enlarged compartment therein, a transformer therein and conductors connecting said envelope and transformer.

20. In an electric sign, a hollow sign body, a border portion of said sign body of thickness sufficient to permit insulating clearance between a high tension conductor within said sign body and either surface thereof, and a major display surface portion adjacent said border, the thickness of which is materially less than the thickness of said border and insufficient to provide insulating clearance from a high tension conductor within said sign and either side thereof, a character opening in a side of said sign body, a luminous envelope within said body having its luminous portion of the general form of said opening the edges of said body around said openings extending very closely to said luminous portion whereby said luminous portion is visible at a wide angle of view through said character openings and whereby a sharp line of demarcation is obtained between the character openings and the edges of the body around said openings.

FRED HOTCHNER.