

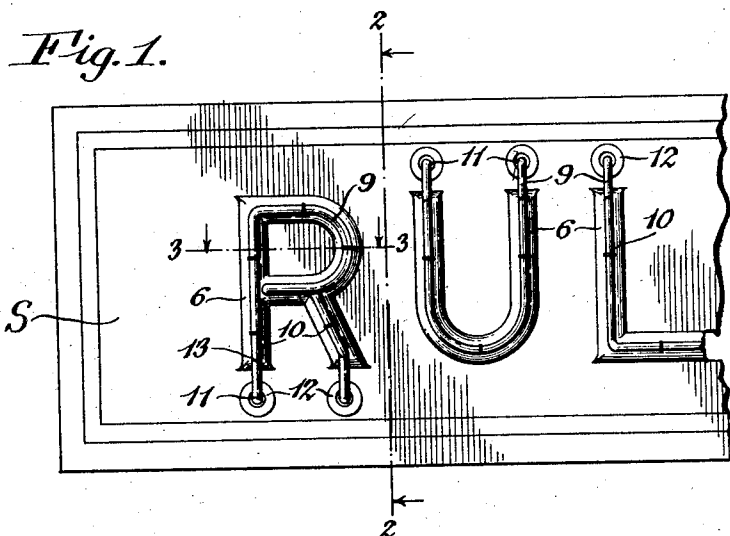
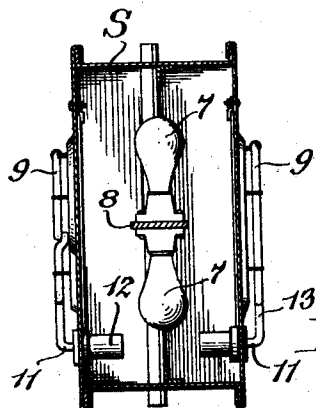
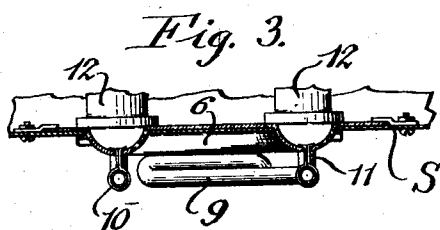
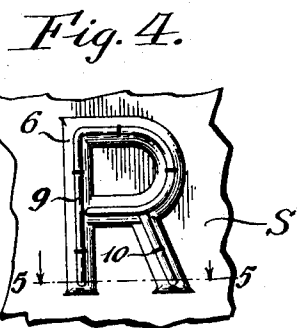
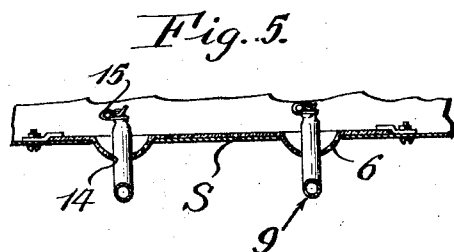
March 7, 1933.

W. K. WILEY ET AL

1,900,747

ILLUMINATED SIGN

Filed Nov. 29, 1929



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## ILLUMINATED SIGN

Application filed November 29, 1929. Serial No. 410,316.

This invention relates to illuminated signs and is directed in particular to a sign of this kind comprising companion raised glass and electroluminescent display characters of similar outline which may be illuminated to provide independent contrasting or combined display lighting effects.

The principal object of the invention is to provide a sign of the type described having characteristics which render it available; as a non-illuminated daylight sign, in which case the display characters utilized are preferably translucent and of the raised type, as an illuminated daylight sign having electroluminescent display characters in which case the translucent characters may or may not be illuminated, as an illuminated sign for night use having the translucent characters illuminated as disclosed in the Wiley et al. Patent No. 1,224,253 of May 1, 1917, as an illuminated sign for night display having the display characters thereof formed from neon or other electroluminescent tubes during the illumination of which the translucent characters may or may not be illuminated, and as an illuminated sign for night or day use having both the translucent characters and their companion like electroluminescent characters illuminated at the same time.

In general the invention proposes a combination sign involving the use of milk white or other translucent characters in conjunction with like characters formed from neon or other electroluminescent tubes. In carrying out the invention it is preferred to utilize for one set of display elements, characters of the kind described in the patent to R. R. and W. K. Wiley and W. S. Hough, No. 1,224,253 of May 1, 1917. In the said patent the display characters disclosed are formed from translucent glass and have character strokes of the raised type. This particular kind of character is preferred because of the diffusive qualities of the same whereby the light rays are uniformly diffused throughout the character and this despite the fact that the lamp may be positioned directly behind the same. Such display characters have the further advantage that they are clearly

visible from various angles due to their raised character strokes.

The like characters referred to and which are utilized in conjunction with the translucent characters are, as stated heretofore, preferably formed from electroluminescent tubes. The said tubes are shaped to provide display characters similar in outline to their companion characters, it being understood, of course, that the electroluminescent characters may, if preferred, follow in outline only a portion of the companion translucent characters.

The attainment of the objects recited heretofore is permitted because of the individual characteristics of the two types of display characters employed. Whereas, the electroluminescent tubes are transparent when not illuminated, the glass characters behind them are translucent and can, therefore, be clearly seen through the former.

This enables the use of the translucent characters independently of the electroluminescent characters and their efficiency is not materially impaired by the non-illuminated electroluminescent characters. The above, of course, is in connection with a daylight sign. The same result, however, follows when it is desired to have a night sign in which the display character preferred are of raised milk white or other color glass. On the other hand, when it is desired that the sign consist solely of electroluminescent characters the translucent characters in no way detract from the display qualities of the electroluminescent characters. The fact is, that the translucent characters add to the appearance of the electroluminescent characters in a manner which will be described more fully hereinafter.

Heretofore it has been the practice in the manufacture of signs having their display characters formed from electroluminescent tubes, especially in larger signs, to paint upon the background of the sign characters similar to those which are to be provided by the electroluminescent tubes, the color of the painted characters depending upon the color of the tubes when illuminated. The electroluminescent characters are secured to the sign

casing in such a manner that they are superposed upon corresponding painted characters, the width of the painted characters being such that they stand out behind the characters formed by the electroluminescent tubes. The use of painted characters in this connection is almost indispensable for should the painted characters be omitted and the electroluminescent characters become inoperative, the sign would be rendered entirely ineffective, this being due to the fact, of course, that the electroluminescent characters when not illuminated are transparent. While painted characters will avoid this should the electroluminescent tube become inoperative during day use they are without utility should the electroluminescent characters become inoperative at night.

While the painted characters referred to serve to some extent the purpose for which they are used in connection with day signs their use involves a number of disadvantages. First, the painted characters which are usually red or blue absorb a large part of the light from the electroluminescent characters, which light is, therefore, a loss insofar as display purposes are concerned. Secondly, the painted characters are, of course, substantially flush with the surface of the background upon which they appear and are hard to read when viewed at any substantial angle. Third, should the electroluminescent tube fail at night the painted letters are not readable and the sign is rendered ineffective.

In providing a construction of sign in accordance with this invention which will carry out the objects recited heretofore, the disadvantages arising from the use of painted characters are avoided. The translucent characters are proportionately of the same width as the painted characters heretofore used and when neither the electroluminescent characters nor the translucent characters are illuminated, this presupposing the use of the sign as a day sign, the translucent characters serve the same purpose as the painted characters heretofore used.

Further advantages arising from the use of characters of this description are; that any light which is not reflected by them is diffused uniformly throughout their extent to illuminate the same, that the raised glass characters are legible at various angles with respect to the sign face, that the milk white letters may be independently illuminated by lamps behind the same to render the display characters clearly visible should the electroluminescent characters fail at night when the milk white letters are not independently illuminated.

The invention is illustrated in the accompanying drawing in which:

Figure 1 is a front plan view of the display face of a sign having raised translucent characters and like electroluminescent characters

superposed in accordance with one embodiment of the invention.

Figure 2 is a section taken along line 2—2 of Fig. 1.

Figure 3 is a fragmentary section taken along line 3—3 of Fig. 1.

Figure 4 is a fragmentary view showing a modified form of the invention.

Figure 5 is a section taken along line 5—5 of Fig. 4.

The invention is illustrated in connection with a double face sign as this is usually the preferred type. It is to be understood, of course, that the invention is equally applicable to single face signs.

In carrying out the invention a hollow sign casing S is preferably employed and is provided on its opposite display faces with stenciled openings through which the raised character strokes of the translucent characters 6 project. These display characters may be illuminated by the lamps 7 positioned behind the same and which are supported in any suitable manner as at 8. This much of the construction of the sign is substantially in conformance with the type of signs disclosed in the Wiley et al. Patent No. 1,224,253 of May 1, 1917. These characters are adapted to provide a sign of attractive appearance either in the day or at night, in the latter case the lamps 7 being illuminated.

In accordance with the invention, electroluminescent characters 9 are supported in close proximity to the companion raised glass characters 6 of similar outline. The said electroluminescent characters are secured in the desired position in any suitable manner. As illustrated, this securement is obtained by small wire clips 10 which are bent around the tubular electroluminescent characters and their ends inserted through small holes in the raised glass characters and bent against the inner surface of the same.

The electroluminescent characters are adapted to be connected within the sign casing to a source of electrical energy (not shown). The terminal or electrode portions of the tube may, therefore, be bent for insertion through holes formed in the raised glass characters or they may be extended beyond the raised glass characters and bent to enable their insertion in glass receptacles secured to the sign faces.

This latter construction in which the terminal portions of the electroluminescent characters are extended beyond the display portions of the translucent characters may be desired as in this construction it is unnecessary to form any holes of substantial diameters in the translucent characters. In the first mentioned method while it is necessary to form holes in the translucent characters in order to connect the electrodes of the electroluminescent characters to a source of electrical energy the complete character presents

a very pleasing finished appearance and may be preferable in some instances. It is to be understood, however, that the electroluminescent characters may be connected to a source of electrical energy in any desired manner, the two constructions shown being intended merely to illustrate two such methods.

In Figs. 1, 2 and 3 a sign construction is illustrated in which the terminal portions 11 of the electroluminescent characters are extended beyond their corresponding translucent characters and bent inwardly to enable their insertion in the receptacles 12 which may be secured to the sign face in any suitable manner, the said receptacles being connected to a source of electrical energy (not shown). The receptacles 12 are preferably of the kind disclosed in the application of Wiley, Cudney and Cudney, Serial No. 293,565, filed July 18, 1928. Those portions of the electroluminescent tubes which preferably form no part of the display character but which are in front of a translucent character may be colored in order to provide the desired effect, said colored portions being preferably extended to the points indicated at 13.

In the modified construction illustrated in Figs. 4 and 5 the terminal or electrode portions of the electroluminescent tube which form the display character extend through openings 14 formed in the translucent character at the desired points. With this construction it is preferred to connect the lead-in wires directly to the end of the electrodes by means of spring clips 15.

The transformers (not shown) necessary to supply the requisite high voltage current to the electroluminescent characters to illuminate the same are preferably positioned within the sign casing at points where they will not interfere with the lighting of the translucent characters.

In the construction of the sign illustrated the width of the electroluminescent tube employed in forming the desired character is substantially less than the width of the character strokes of the translucent characters. The said electroluminescent characters 9 are secured against their corresponding translucent characters. In this connection it is to be noted that in the formation of certain letters in returning the tube from the end of one stroke to start the beginning of another stroke it is necessary to form a fold in the tube which fold is placed in a transverse plane in order that the character may not appear to be wider at the portion where the fold occurs. For this reason it is necessary to position the electroluminescent characters at such a distance from their corresponding translucent characters that any folds occurring in the electroluminescent characters will be provided for. It thus may be desirable in order to position

all of the display portions of the electroluminescent characters in the same plane to secure such portions to the translucent characters at a distance therefrom equal to substantially twice the diameter of the tube employed.

A combination sign of the type described is capable of producing a variety of lighting effects and may be produced at a relatively low cost. Independently of the electroluminescent characters the sign is available by virtue of the translucent characters either as a day or night sign. During the utilization of the sign in this manner the electroluminescent characters which are not illuminated and are, therefore, transparent, do not interfere to any appreciable extent with the display characteristics of the translucent characters. On the other hand the electroluminescent characters may be illuminated to provide either a day or night sign without the illumination of the translucent characters. In the use of the sign while the translucent characters are not illuminated by independent lamps they function in a manner similar to the painted characters which have been employed heretofore, that is to say, to impart to the electroluminescent character the appearance of having broad character strokes, or should the electroluminescent characters fail, to provide display characters for the sign.

In addition to the above effects attainable by this kind of sign a pleasing and attractive effect is produced by simultaneous illumination of both the electroluminescent characters and the companion translucent characters.

As heretofore described, upon illumination by the lamps 7, the light produced is uniformly diffused throughout the raised glass characters to impart to the character strokes of the translucent characters the appearance of cold bars of white light.

The illuminated electroluminescent characters provide the translucent characters with center strokes of a color depending on the particular gas employed as the electroluminescent medium, for example, bright red in the case of neon. Thus when the translucent characters are milk white in color the letter produced by the companion characters consists of a center stroke of bright red and marginal strokes of brilliant white. If it is desired, a different arrangement of the color strokes of the characters may be obtained by providing electroluminescent characters which cooperate with their companion translucent characters to outline the same instead of the construction illustrated in which the electroluminescent characters are superposed upon the translucent characters to provide center strokes of bright red.

An arrangement of translucent display characters outlined by electroluminescent characters has the advantage that the electroluminescent characters may be secured to the

sign faces in cooperative positions with their companion translucent characters without the necessity of forming holes in the translucent characters.

5 In outlining the translucent characters by electroluminescent characters, a display character is provided having a center stroke of white and outlining strokes in color, as distinguished from the construction illus-  
10 trated in which the center strokes are in color and the outlined ones white. Raised white glass characters when outlined in the manner described provided an attractive and striking effect when both the raised white glass char-  
15 acters and the outlining characters are illuminated at the same time, the raised glass characters standing out with intense whiteness in contrast to the color border provided by the electroluminescent characters.

20 In connection with illuminating the display characters of the sign it is to be noted, assuming the use of milk white translucent characters in conjunction with neon tubes, that, regardless of the arrangement of such  
25 characters, when the electroluminescent characters are illuminated without illuminating the translucent characters by their independent lighting means 7 a translucent display character is provided having charac-  
30 ter strokes which have a pinkish tinge with the neon characters appearing in bright red, the pinkish tinge being due to the fact that a part of the red light from the electroluminescent tube is diffused throughout the translu-  
35 cent character. Notwithstanding this fact, when the lamps 7 inside the sign are illuminated the pinkish tinge of the translucent characters disappears and they take on a brilliant white appearance.

40 By virtue of these contrasting lighting effects a striking and attractive illuminated sign may be provided by illuminating the companion display characters singularly and then simultaneously, i. e. illuminating the  
45 translucent characters by the lamps 7, then illuminating the electroluminescent characters without illuminating the said lamps, and then illuminating both at the same time. When the sign is illuminated in this manner and the  
50 lamps 7 are first illuminated the translucent letters appear as cold bars of white light. Upon the illumination of the electroluminescent characters simultaneously with disconnecting the lamp 7 from a source of electric en-  
55 ergy, the resultant characters have character strokes of a definite color in accordance with the gas employed and the translucent characters have a tinge of such color, for example a pinkish tinge if the gas be neon. When  
60 the lamps 7 are then illuminated simultaneously with the electroluminescent characters, the resultant display characters have character strokes of the definite color and bright white strokes, the relative arrangement of  
65 such colors depending in any case upon the

particular arrangement of the electroluminescent characters.

When the invention is applied to a double face sign of the form illustrated, a portion of the light from the electroluminescent charac- 70 ters which passes through the translucent characters, is reflected by the inner surfaces of the translucent characters to the opposite side of the sign where a portion of the same is diffused throughout the translucent charac- 75 ters upon that side of the sign. This cross reflection of the light produced by the electroluminescent tubes is in effect similar in many respects to the cross reflection of the light produced by the lamps 7 within the sign casing substantially as described in the heretofore mentioned Wiley et al. patent. The diffused and reflected light from the elec- 80 troluminescent characters, therefore, tends to heighten the illumination of the translucent characters. 85

Having fully described our invention, we claim:

1. An illuminated sign adapted to provide a number of contrasting lighting effects in the illumination of the display characters thereof comprising a sign casing having an opening therein corresponding to the outline of a display character, a translucent element secured to said sign for display through said open- 90 ing, means within the sign casing for illuminating said element, a second display element formed from an electroluminescent tube and following in outline a portion of the character formed by said translucent element and the opening in said casing, said second element being secured to said sign in close proximity to said translucent element. 95 100

2. An illuminated sign adapted to provide a number of contrasting lighting effects in the illumination of the display characters thereof comprising a sign casing having an opening therein corresponding to the outline of a display character, a translucent display element secured to said sign for display through said opening, means within the sign casing for illuminating said element, a sec- 105 ond display element formed from an electroluminescent tube and following in outline the character formed by said translucent element and the opening in said casing, said second element being secured to said sign in close proximity to said translucent element. 110 115

3. An illuminated sign adapted to provide a number of contrasting lighting effects in the illumination of the display characters thereof comprising a sign casing having an opening therein corresponding in outline to a display character, a translucent element secured to said sign for display through said opening and formed with raised character strokes which extend through said opening, means within said casing for illuminating said character strokes, a second display ele- 120 125 130 ment formed from an electroluminescent tube

and following in outline a portion of the raised character strokes of said translucent element, and means for securing said second display element in close proximity to said translucent display element.

4. An illuminated sign adapted to provide a number of contrasting lighting effects in the illumination of the display characters thereof comprising a sign casing having an opening therein corresponding in outline to a display character, a translucent element secured to said sign for display through said opening and formed with raised character strokes which extend through said opening, means within said casing for illuminating said character strokes, a second display element formed from an electroluminescent tube and following in outline the raised character strokes of said translucent element and means for securing said second display element in close proximity to said translucent display element.

5. An illuminated sign adapted to be illuminated to provide a number of contrasting lighting effects in the illumination of the display characters thereof comprising a sign casing having an opening therein corresponding to the outline of a display character, a translucent display element having raised character strokes adapted to extend through said opening, means within said casing for illuminating said element, a second display element formed from an electroluminescent tube and following in outline a portion of said translucent element and having its terminal portions bent to extend into said casing for connection to power said second element being secured in close proximity to said translucent element.

6. A double face illuminated sign having display characters on the opposite faces thereof and adapted to provide a number of contrasting lighting effects in the illumination of the display characters of the sign comprising a sign casing having openings in its opposite sides corresponding to the outlines of display characters, a translucent display element secured to said sign for display through each opening having its character strokes in relief and adapted to extend through an opening, the inner surface of said element constituting a reflector for light, means within said casing for illuminating said element, a second display element formed from an electroluminescent tube and following in outline a portion of said translucent element said second element being secured in close proximity to said translucent element.

7. A double face illuminated sign having display characters on the opposite faces thereof and adapted to provide a number of contrasting lighting effects in the illumination of the display characters of the sign comprising a sign casing having openings in

its opposite sides corresponding to the outlines or display characters, a translucent display element secured to said sign for display through each opening having its character strokes in relief and adapted to extend through an opening, the inner surface of said element constituting a reflector for light, means within said casing for illuminating said element, a second display element formed from an electroluminescent tube and following in outline the character strokes of said translucent element, said second display element being secured in close proximity to said translucent element.

8. An illuminated sign adapted to provide a number of contrasting lighting effects in the illumination of the display characters thereof, comprising a sign panel having an opening therein corresponding to the outline of a display character, a translucent display element having raised character strokes extending through said opening and following the outline thereof, illuminating means at the rear of said opening, a second display element formed from an electroluminescent tube and following in outline the character formed by said translucent element and the opening in said panel, said second element being secured in close proximity to said translucent element and having its ends extending through said panel.

In testimony whereof we hereby affix our signatures.

WALLACE K. WILEY.  
HARRY J. CUDNEY.

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