

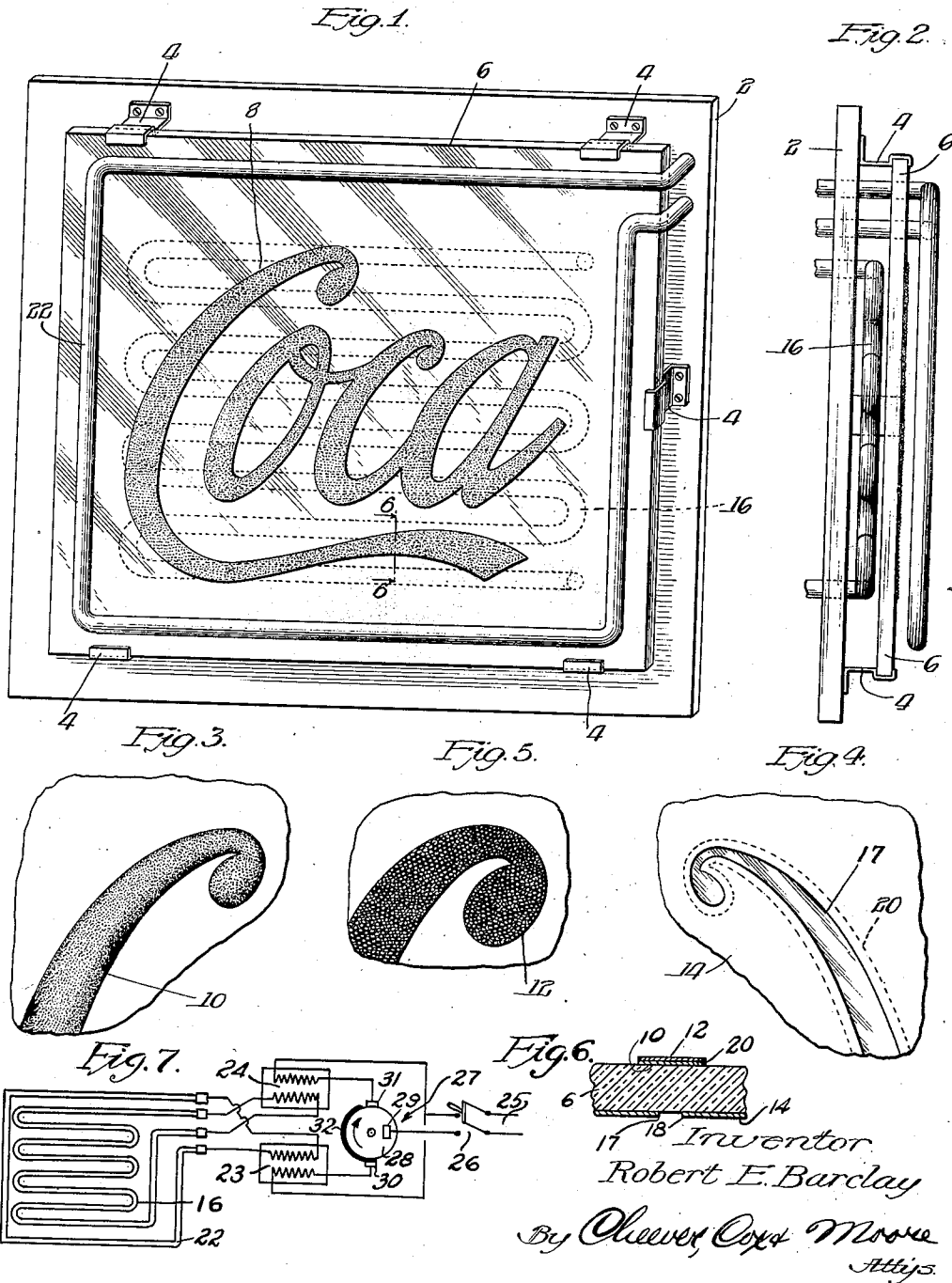
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SIGN

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## UNITED STATES PATENT OFFICE

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## SIGN

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My invention relates to luminous devices. One of the objects of my invention resides in providing means adapted to be associated with a source of light and to be illuminated thereby so as to produce not only a uniformly diffused glow, but to also boost-up and increase the lighting effect.

Yet another object of my invention resides in providing a cheaply constructed, efficient and attractive display device such as, for instance, a sign wherein the indicia or characters thereof are made in simulation of the characters of a gas-filled or so-called "neon tube" sign, and secure all of the lighting effects of such a sign, but being much more economical to manufacture and to operate.

Yet another object of my invention resides in the provision of a display device such as a sign, wherein the indicia or characters thereof are formed substantially flat, but which when illuminated are given a rounded effect in simulation of tube letter indicia or characters.

Yet another object of my invention resides in the provision of a sign or display device in which the illumination of the characters is done in a manner so as to create an optical illusion in that the characters, when illuminated, alternately appear as flat characters and then as rounded characters.

These and other objects of my invention will be apparent from a perusal of the following specification, when taken in connection with the accompanying drawing, wherein

Figure 1 is a perspective view of one embodiment of my invention, shown by way of illustration and not by way of limitation, as a display sign;

Figure 2 is a side view thereof;

Figure 3 is an enlarged detail view of one form of coating for the lettering or indicia of my display sign;

Figure 4 is a reverse view of Figure 3;

Figure 5 is a modified form of the coating shown in Figure 3;

Figure 6 is a section on line 6 of Figure 5 and

Figure 7 is a diagram of electrical connections.

Referring now to the drawing in detail, the sign which I have selected as an embodiment of my invention comprises a support 2 of any desired type, and herein shown as a board or panel. This board is provided with a plurality of fastening members 4 in the form of sheet metal friction clamps which are arranged to detachably support a panel 6, preferably formed of glass. This panel 6 carries the indicia of the display which is to be illuminated.

In my improved sign the display 8 is herein shown as the letters "COCA" which are formed directly on the front face of the panel and are applied thereto in the manner shown in Figure 1, wherein the letters of the word are formed of a flat, relatively thin coating 10 of luminescent material, either fluorescent material or phosphorescent material, and may be of any selected color. Such materials are well known, and some of them are referred to in the companion case filed by me. This coating 10 is translucent so light may pass therethrough so as to cause the illumination of the material.

In the adaptation of my invention to a display device of this character, I have found that the coating of luminescent material possesses two striking functions in that the material is not only luminescent, whereby a source of light disposed at the rear thereof, as hereinafter described, in passing through the coating will cause the illumination of the coating with increased brilliance, that is, the luminescent quality of the coating will augment and boost-up the lighting effect from the rays of light passing through the coating. In addition, due to certain inherent refractive and dispersive qualities of the coating, this light passing therethrough will be dispersed so as to cause the coating to uniformly glow, and thus eliminate any streaks or eliminate the visibility of the "neon tube" grid at the rear of the sign, as hereinafter explained.

In connection with a display device of the foregoing construction, I have found that by coating the glass panel 6 on its rear face with opaque material and omitting this opaque material at points opposite and registering

with the letters or indicia 8 coated on the front of the plate 6, I provide a suitable pathway for light rays to pass through the plate and to illuminate these indicia 8. This illumination from the rear of the glass panel 6 is economically accomplished by means of a grid type of gas-filled luminous tube 16. Because of the refractive and luminescent qualities of the translucent coating forming the characters 8, the grid tube will provide sufficient distribution of light at the rear of the plate 6, while at the same time causing the effective and uniform illumination of the indicia 8 throughout its entire extent without giving the so-called objectionable "streaky" illuminating effect present in other signs, due to an unequal distribution of light.

I have discovered that by omitting the opaque coating 14, immediately behind the character coatings 10 and 12, to form transparent openings of less width than the coatings 10 and 12, when the light shines from the grid 16 through this narrower transparent portion and thence through the coatings 10 and 12, the indicia on the front of the sign will be given a sort of rounded effect. In Figures 4 and 6 of the drawing, this arrangement is clearly shown; in Figure 4, for instance, the edges 17 and 18 of the opaque portion 14 are shown as being somewhat narrower than the marginal edges 20 of the characters or indicia formed by the coatings 10 and 12. By rounded effect I mean when the light from the grid shines through and illuminates the characters on the front of the panel, the longitudinal edges of the characters will be slightly darkened, which will tend to make them look round, somewhat after the manner of a rounded gas-filled tube.

In order to provide a more striking sign, one which will attract the maximum of attention, I have found that by arranging a source of light at the front of the sign, such for instance as the gas-filled tube 22, and by suitably connecting it in a circuit with the grid gas-filled tube lighting source 16 and further by providing an automatic switch alternately to flash one lighting tube 22 and the other 16 in continuous repetition, a very desirable effect is produced. For instance, when the front tube 22 illuminates the letters, they stand out quite plainly as flat letters, the light being refracted by the luminescent coating and being also augmented and increased in intensity. When this lighting is cut off and immediately the rear light 16 is flashed, the same overlapping arrangement of the marginal portions 17 and 18 makes them stand out as rounded, or as if they were formed as a luminous gas-filled tube.

Figure 7 shows a diagram of electrical connections for accomplishing this alternate flashing. The diagram shows the lamps 16 and 22 connected respectively to the secondaries of suitable transformers 24 and 23, the

primaries of which are connected to a suitable power source 25 through the disconnecting switch 26 and through the alternate flasher 27, which preferably comprises a wheel of conducting material 28 connected to the power source through the brush contact 29 and to the transformers 23 and 24 through the brushes 30 and 31, one half of the circular path of contact made by the brushes 30 and 31 on the wheel, being insulated by the strip 32 and the brushes being disposed on opposite sides of the path of contact so as to create a power circuit alternately to the transformer primaries. Obviously other circuit changing means may be employed in place of the alternate flasher illustrated.

In some aspects of my invention the front light 22 may be used, or in other aspects the rear light may be used, and in still other aspects both lights may be used in repeated alternation as described.

In Figures 5 and 6 of the drawing I have shown a slight modification of my sign, wherein I have formed the characters or indicia of the sign so as to include relatively small light-refracting elements, which serve to refract and disperse the light rays which pass through the glass panel 6 from the light source 16, or which strike directly from the front source of light 22 or from any other source of light. These small light-refracting elements have the same effect as the refractive characteristic of the luminescent coating in that they disperse the light from one small element to another, thus keeping a suffused glow of the letter or indicia throughout its entire extent. This effect is even more pronounced when the light in front strikes the sign from the side, as for instance by the source 22.

Many ways may be utilized for forming these small light-refracting elements, for instance, they may be formed directly in the body of the glass panel 6 or they may be formed separately and adhered to the front of the glass panel 6 as a coating 12 by means of any suitable adherent such as the luminescent coating 10, or by a suitable translucent varnish, or these light refracting elements may consist of fine globules of transparent varnish adhered thereto by the varnish or otherwise.

In the present embodiment of my invention they are formed as relatively small glass beads adhered to the glass panel 6 by means of the luminescent coating 10, which is of any desired color. In this manner the transparent glass beads enhance the color effect by their light-refractive characteristics. It must be apparent that instead of using glass beads to form the light-refracting layer 12 I may use glass prisms or any other shape.

It will be apparent that a sign of the foregoing construction is quite advantageous because it enables the manufacture and sale and

operation of a very economical sign, which possesses all of the advantages and more of the so-called "neon sign" which is formed of glass tubing, generally entailing complicated bends in the tubing and entailing the use of "paint-outs" which are opaque painted portions of the tube to eliminate the presence of light at particular portions on a sign.

In my present invention the rounded simulation of the so-called "neon tube" is secured by the overlapping marginal portions 17 and 18, so that in operation the sign will stand out in rounded effect. My improved sign is very easily and quickly made, since it is only necessary to provide the opaque rear portion of the sign with the transparent portions conforming to the indicia to be used on the front portion of the plate 6 and it is only necessary thereafter to coat the front portion of the plate 6 with my translucent coating, registering with the rear transparent portion, and to provide a source of light at the rear, and when the alternate lighting is preferred, to place the source of light at the front to secure the alternate flat and then rounded appearance of the sign characters.

In my present invention it will be apparent that I take advantage of one of the characteristic features of my luminescent coating, and that is, I place the luminescent coating between a source of light and the eye of the observer, so that the source of light at the rear will not be apparent as a separate source of light, but will be apparent only in so far as it illuminates the translucent, luminescent coating as a whole, causing the latter to glow uniformly with added brilliance.

This factor is of importance where the light employed in the sign is stroboscopic, that is to say, consists of rapidly alternating periods of illumination and darkness. Such alternations may occur so rapidly that the eye cannot detect the periods of darkness because of the phenomenon known as persistence of vision. Nevertheless, signs employing stroboscopic light, such, for instance, as the ordinary tubular discharge arc sign, are difficult to decipher if the observer is moving past the sign or if the sign is shifting with respect to the observer. Moreover, stroboscopic light has a fatigue-producing effect upon eyes exposed to the light for extended periods. In my present invention, however, the visible portions of the sign, being formed of fluorescent material, which is excited to glow continuously, is substantially non-stroboscopic even though it may be and preferably is illuminated by a source of stroboscopic light and hence signs embodying my present invention, in addition to imparting brilliant light effects through the light refractive film, are also easy to read under all conditions because the stroboscopic effects have been overcome.

Various constructions of this aspect of my invention may be utilized.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A display device comprising a support, translucent indicia mounted on said support, and a source of light disposed behind said characters so as to project light therethrough to illuminate the same, said characters being formed of relatively small light-refractive elements adhered to the support by luminescent material.

2. A display device comprising an opaque panel having transparent portions corresponding with predetermined indicia adapted to be illuminated, said portions being covered by a coating of relatively small light-dispersive elements and luminescent material.

3. A display device comprising an opaque panel having portions cut away to correspond with predetermined indicia adapted to be illuminated, said cut-away portions being covered by a coating of relatively small light-dispersive elements adhered thereto by translucent, luminescent material.

4. A display device comprising a transparent panel having an opaque coating on its back, said opaque coating being cut-away at predetermined points, said panel at the front carrying a relatively flat luminescent coating of light-refracting material, said latter coating having its edges projected laterally substantially beyond the edges of the cut-away portions of the opaque coating, and a light disposed at the rear of said panel to shine through said cut-away portions and said luminescent coating to illuminate the same.

5. A display device comprising an opaque panel having transparent portions forming indicia, said panel at the front carrying a relatively flat coating of translucent, light-refractive material, said latter coating having its longitudinal edges projected laterally beyond the longitudinal edges of the transparent portions of the opaque panel, and a light disposed at the rear of said panel to shine through said transparent portions and said translucent coating to illuminate the same, said coating being luminescent.

6. A display device comprising an opaque panel having transparent portions forming indicia, said panel at the front carrying a relatively flat coating of translucent material, said coating having its longitudinal edges projected laterally beyond the longitudinal edges of the transparent portions of the opaque panel, and a light disposed at the rear of said panel to shine through said transparent portions and said coating to illuminate the same, said coating including relatively small transparent light-refracting elements.

7. A display sign comprising a support-

ing panel, a source of light placed at the rear thereof, indicia mounted on the front of said panel, and comprising a luminescent coating of light-refracting material, and means for confining the light so that in passing through said support it will pass solely through the luminescent coating, said means being constructed and arranged so as to illuminate the central portions of said coating more brilliantly than the marginal portions thereof.

8. A display device comprising a glass support carrying an opaque coating on its rear, said opaque coating being omitted at predetermined points, indicia mounted on the front of said plate, said indicia comprising a relatively flat, translucent coating of light-refracting material overlying said omitted portions on the rear of the panel, the marginal edges of said front coating overlapping the marginal edges of said omitted portions on the rear of the panel, whereby rays of a source of light disposed at the rear of the panel will pass through said omitted portions of the opaque coating, so as to illuminate the translucent coating on the front of said light in a manner to cause said front coating to appear in simulation of rounded characters.

9. A display device comprising a glass support carrying an opaque coating on its rear, said opaque coating being omitted at predetermined points, indicia mounted on the front of said plate, said indicia comprising a relatively flat, translucent, luminescent coating of material overlying said omitted portions on the rear of the panel, the marginal edges of said front coating overlapping the marginal edges of said omitted portions on the rear of the panel, whereby rays of a source of light disposed at the rear of the panel will pass through said omitted portions of the opaque coating, and will illuminate the luminescent coating on the front of said light, so as to cause said front coating to appear in simulation of rounded characters, there being a source of light disposed at the front of the panel directly to illuminate the front indicia.

10. A display device comprising a glass panel having an opaque coating at its rear, portions thereof being cut away to form an outline of desired indicia, means mounted on the rear of said panel to provide a source of light, and display indicia mounted on the front of said panel, comprising a relatively flat coating of luminescent material and minute light refractive elements, said flat coating registering with the transparent portions on the rear of said panel and overlying marginal edges of said omitted portions of the opaque coating on the rear of the panel, and means mounted on the front of the panel to illuminate directly the front indicia, said front and rear sources of light

being constructed and arranged to be flashed repeatedly in alternation, whereby first to directly illuminate the front indicia, whereby to cause the direct illumination of the front indicia and alternately to cause the rear source of light to illuminate the front indicia.

11. A display device comprising a support, luminescent indicia mounted on said support, means for passing rays of light from a point behind said support and through the luminescent indicia, and means comprising a gaseous conductor discharge arc lamp for projecting rays of light from a point in front of said indicia toward and on to said indicia, and means for alternately and periodically stopping and starting said respective light projections.

12. A display device comprising a glass panel having an opaque coating, portions of said coating being removed to provide a transparent portion, means mounted on the rear of said panel to provide a source of light and display indicia formed on the front of said panel and comprising a relatively flat coating of luminescent material and minute light-refracting elements, said flat coating registering with and overlying the edges of said transparent portion.

13. A display device comprising a plate, a translucent layer formed on said plate and an electrical discharge arc illuminating device disposed behind the translucent layer in position to illuminate the same with stroboscopic light, said layer comprising luminescent light refracting particles.

14. A display device comprising luminescent light refracting means forming display characters and means to illuminate the luminescent light refracting means with stroboscopic light.

15. A display device comprising a transparent panel having luminescent light refracting layer on its forward surface and means disposed behind the panel to illuminate with stroboscopic light said luminescent light refracting layer through the transparent panel.

16. A display device comprising a transparent panel having a luminescent light refracting layer on its forward surface and means disposed behind the panel to illuminate with stroboscopic light said luminescent light refracting layer through the transparent panel, said panel having an opaque coating on its rearward surface, said opaque coating being cut away behind the luminescent light refracting layer.

17. In combination, a transparent panel, an opaque layer on the back of the panel, said layer being cut away at predetermined points, a luminescent light refracting layer on the front of the panel opposite said cut away portions and a discharge arc illuminating device mounted behind the panel to

excite the luminescent light refracting layer through the cut away portions of the opaque layer and the transparent portions of the panel uncovered at the cut away portions.

18. A display device comprising a plate of transparent material, translucent means comprising luminescent light refractive coatings forming characters on said plate, and a source of stroboscopic light disposed behind said plate in position to project light there-through to illuminate the characters.

19. A display device comprising a panel, luminescent light refracting means for displaying characters on said panel and means to illuminate the luminescent light refracting means with stroboscopic light.

20. A display device comprising an opaque panel having transparent portions forming characters for display, luminescent light refracting means mounted on said panel opposite the transparent portions thereof and means to illuminate the luminescent light refracting means with stroboscopic light.

21. A display device comprising a panel comprising a transparent plate having an opaque film, said film being cut away to form characters for display, luminescent light refracting means on said plate opposite said cut away portions and means to illuminate the luminescent light refracting means with stroboscopic light.

22. A display device comprising an opaque panel having transparent portions corresponding with characters to be displayed, luminescent light refracting means on said panel opposite the transparent portions and means disposed behind the panel to illuminate, with stroboscopic light, the light refracting means through the transparent portions of the panel.

23. A display device comprising a panel, luminescent light refracting means forming display characters and means to illuminate the luminescent light refracting means with stroboscopic light from in front of the panel.

24. A display device comprising an opaque panel having transparent portions forming characters for display, luminescent light refracting means on the panel opposite said transparent portions and means to illuminate the luminescent light refracting means with stroboscopic light from in front of the panel.

25. A display device comprising a transparent panel having an opaque coating, said coating being cut away to form characters for display, luminescent light refracting means on the panel opposite said cut away portions of the opaque film and means to illuminate the luminescent light refracting means with stroboscopic light from in front of the panel.

26. A display device comprising a transparent panel having an opaque coating, said coating being cut away to form characters for

display, luminescent light refracting means on the panel opposite said cut away portions of the opaque film and means to illuminate the luminescent light refracting means alternatively from in front and in rear of the panel with stroboscopic light.

27. A display device comprising an opaque panel having transparent portions forming characters for display, luminescent light refracting means on the panel opposite said transparent portions, illuminating means in front of the panel to illuminate the light refracting means, additional illuminating means behind the panel for illuminating the light refracting means, at least one of said illuminating means comprising a source of stroboscopic light.

28. A display device comprising an opaque panel having transparent portions corresponding with indicia for display, luminescent light refractive means on said panel opposite the transparent portions thereof, means mounted in front of the panel to illuminate the light refractive means directly, means mounted at the rear of the panel to illuminate the light refractive means through the transparent portions of the panel and means to flash the illuminating means alternatively whereby the luminescent light refractive means is alternatively directly illuminated from in front of the panel and indirectly illuminated from the rear of the panel.

29. A display device comprising a panel having transparent portions, luminescent light refracting means forming display characters opposite the transparent portions in the panel and means to alternatively illuminate the luminescent light refracting means directly from in front of the panel and indirectly through the transparent portions of the panel from the rear thereof.

30. A display device comprising an opaque panel having transparent portions forming indicia, said panel, at the front, carrying a relatively flat coating of translucent material, said coating having its longitudinal edges projected laterally beyond the longitudinal edges of the transparent portions of the opaque panel, and a source of stroboscopic light disposed at the rear of said panel to shine through said transparent portions to illuminate the coating of translucent material, said coating including relatively small transparent light refracting elements.

31. A display device comprising a transparent panel having an opaque coating on its back, said opaque coating being omitted at predetermined points to form transparent indicia, said panel at the front carrying a relatively flat coating of translucent material, said latter coating having its longitudinal edges projected laterally beyond the longitudinal edges of the cut-away portions of the opaque coating, and means providing

a source of stroboscopic light disposed at the rear of said panel to shine through said cut-away portions and said transparent coating to illuminate the same, said transparent coating including relatively small transparent light-refracting elements.

32. A display device including a panel comprising a transparent plate having an opaque film cut away to provide openings corresponding with indicia for display, a coating of relatively small light refractive elements and luminescent material on the panel opposite said openings in position to be illuminated through said openings.

33. A display device comprising luminescent light refracting means forming display characters and means to illuminate the luminescent light refracting means.

In witness whereof I have hereunto subscribed my name.

ROBERT E. BARCLAY.

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