R. R. & W. K. WILEY & W. S. HOUGH, Jr.

ILLUMINATED SIGN.

APPLICATION FILED JAN. 22, 1916.

1,224,253.

Patented May 1, 1917.

3 SHEETS—SHEET 1.

Fig. 2.

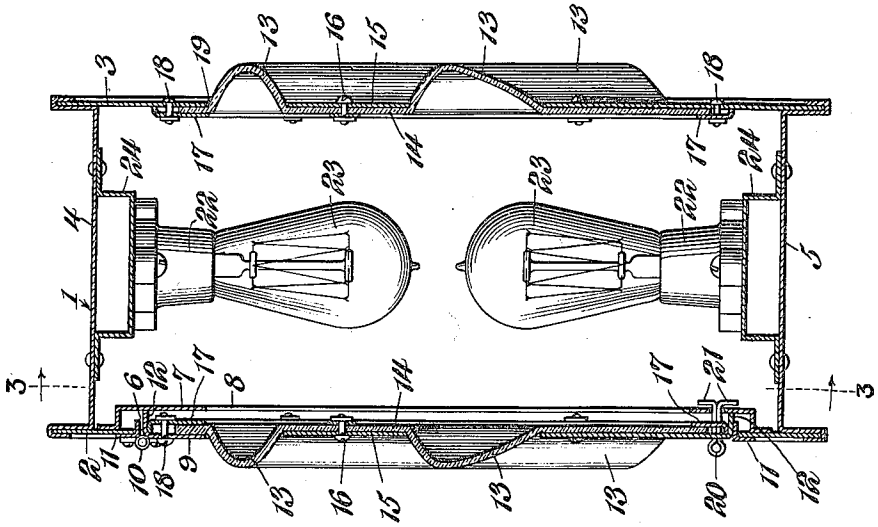
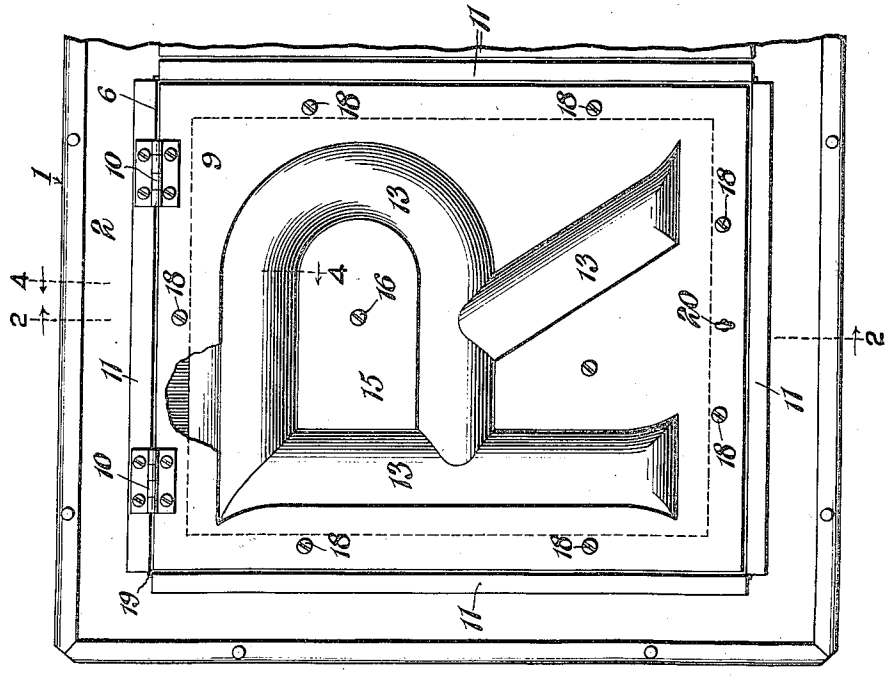


Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 4.

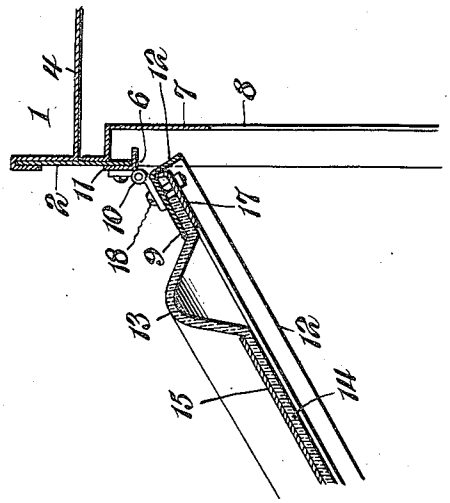
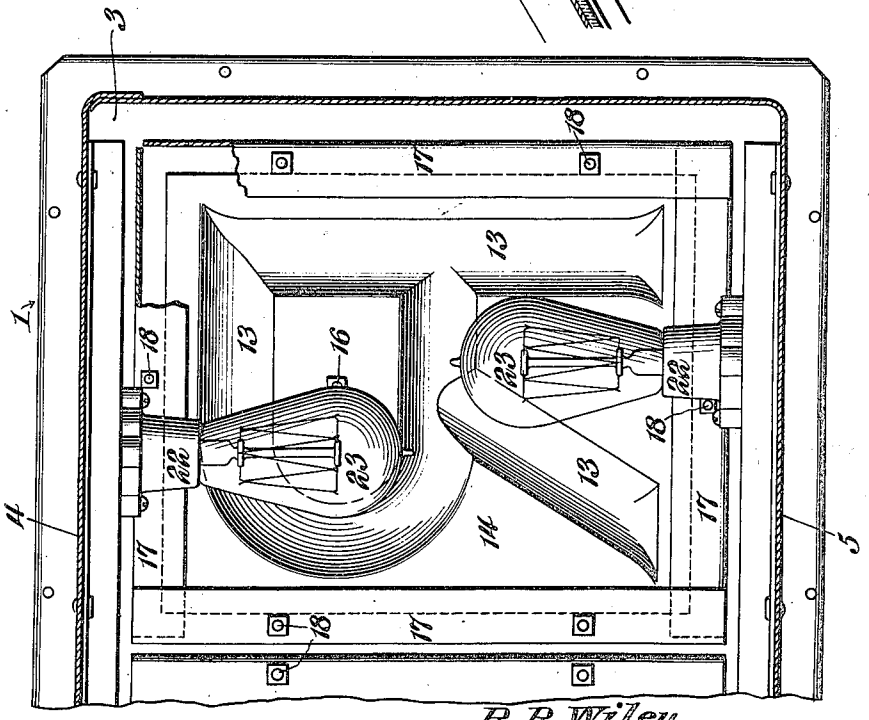


Fig. 3.



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3 SHEETS—SHEET 3.

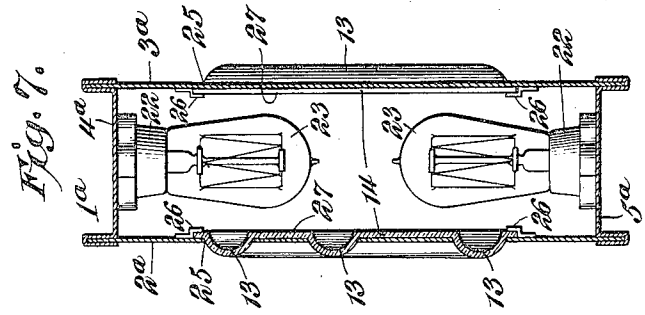


Fig. 7.

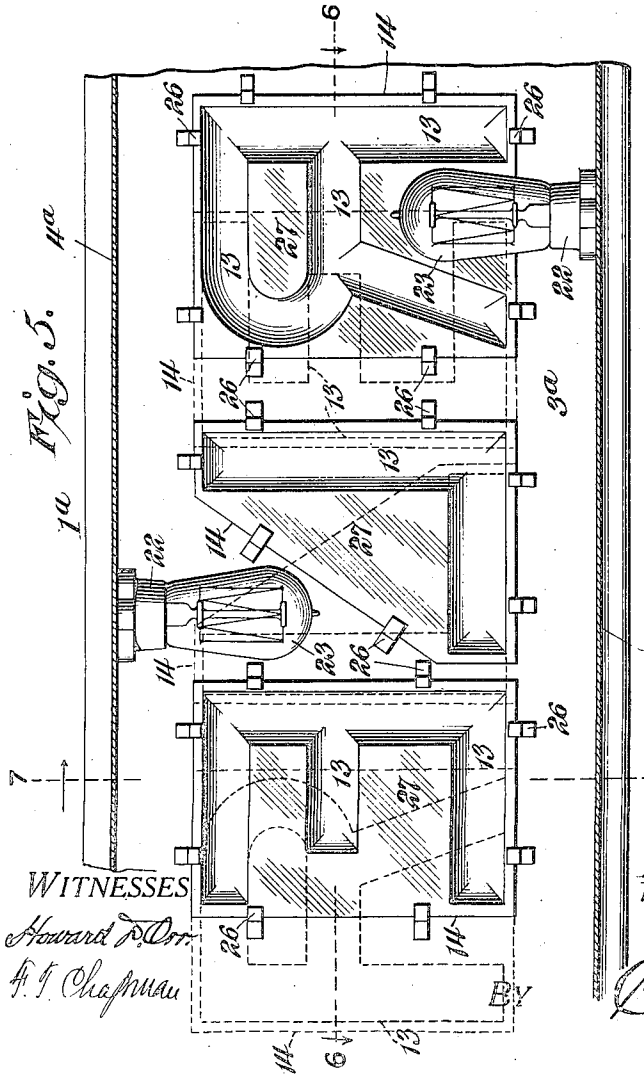


Fig. 5.

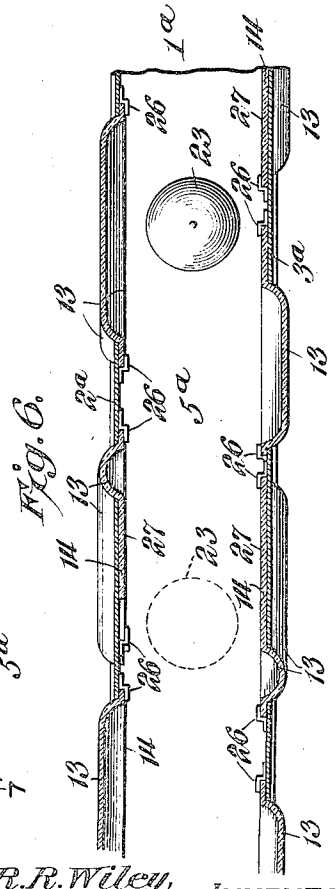


Fig. 6.

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UNITED STATES PATENT OFFICE

ROY R. WILEY AND WALLACE K. WILEY, OF BUFFALO, NEW YORK, AND WILLIAM S. HOUGH, JR., OF ST. CATHARINES, ONTARIO, CANADA.

ILLUMINATED SIGN.

1,224,253. Specification of Letters Patent. Patented May 1, 1917.

Continuation of application Serial No. 861,082, filed September 10, 1914. This application filed January 22, 1916. Serial No. 73,697.

To all whom it may concern:

Be it known that we, ROY R. RILEY and WALLACE K. WILEY, citizens of the United States, residing at Buffalo, county of Erie, and State of New York, and WILLIAM S. HOUGH, Jr., a citizen of the United States, residing at St. Catharines, Province of Ontario, Dominion of Canada, have invented a new and useful Illuminated Sign, of which the following is a specification.

This invention has reference to illuminated signs and its object is to provide a sign structure with light transmitting characters wherein the characters, which may be of peculiar construction, are efficiently mounted and are so related to the light-giving elements of the sign that the efficiency of illumination is materially increased.

The present invention is particularly adapted to that kind of illuminated sign known as a double-face sign and the light-giving units are arranged in most part so as to be hidden from direct view through the sign character strokes, while advantage is taken of the reflecting qualities of the inner faces of the character or characters on one face of the sign to increase the illumination of the strokes of the character or characters on the other face of the sign, whereby there is obtained increased illumination, even distribution of illumination and uniformity of illumination, glare spots being to a commensurate extent avoided.

The signs of the present invention have the sign characters produced on plates of opal or milk glass with the character strokes in relief, the glass employed having a particularly brilliant reflecting surface. It will be understood, however, that any light transmitting material other than glass, but having characteristics whereby the effects produced by the present invention are obtained, may be employed.

So far as the character strokes are concerned, opal or milk glass is effectively diffusive of light, wherefore, even though a light unit be directly behind a character stroke, glare spots are not prominent, and in double face signs where a light unit is placed with relation to the sign characters on opposite sides of the sign so as to be directly opposite opaque portions of the sign, the reflection from the inner surface of the material forming the characters noticeably increases the illumination and evenness of distribution of illumination. The reflecting surface is practically all of the opaque part of the sign character, since it is customary to apply the opaque material to the exterior face of the character.

The finished sign character, usually a letter or the like, is in the form of a plate of glass or other suitable material with the character strokes in relief on the observed face of the character, and such character is mounted in a carrying frame either hinged to or otherwise connected to the body of the sign for ready access to the interior of the sign and the inner face of the character, or the character is otherwise suitably mounted as may be deemed advisable.

While for some purposes certain structures shown in the drawings and to be hereinafter described constitute advantageous supporting means for the sign characters, the invention in some of its aspects is not limited to such particular supporting means.

The light transmitting part of the characters whether the latter be made of glass or other material, is of such density that even if the light unit be placed directly behind a character stroke, it will not produce a noticeable glare spot.

While in a double face sign the light units are so related to the character strokes as to be so far as possible behind the opaque or hidden parts of the characters, such light units are so related to the inner reflecting surfaces of the sign characters as to cause the light reflected by such inner surfaces to be directed through the letter strokes on the other side of the sign, thus materially increasing the brilliancy of the letters or other sign characters.

The invention will be best understood from a consideration of the following detailed description, taken in connection with the accompanying drawings forming part of this specification, with the further understanding that while the drawings show a practical form of the invention, the latter is not confined to any strict conformity with the showing of the drawings, but may be

changed and modified so long as such changes and modifications come within the scope of the appended claims.

In the drawings:—

Figure 1 is a face view of a portion of a sign showing a single character, some parts of the face of the sign being broken away to disclose more distant parts.

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

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a section on the line 4—4 of Fig. 1 with the panel carrying the sign character swung toward the open position.

Fig. 5 is a longitudinal vertical section of a portion of a double face sign of simpler construction than that of Fig. 1 and associated figures, and illustrating a mode of arranging the sign characters and light units.

Fig. 6 is a section on the line 6—6 of Fig. 5.

Fig. 7 is a section on the line 7—7 of Fig. 5.

Referring to the drawings, and more especially to Figs. 1 to 4, there is shown a casing 1 customarily of metal, and constituting the body of the sign which is assumed to be of double face type; that is, the sign characters are disposed on opposite faces of the casing 1 and the latter is so arranged as to be viewed from opposite sides. Sometimes the sign is placed upright; that is, the characters read from the top downwardly, and in other instances the sign is placed horizontally so that the characters read from left to right.

The casing has opposite face portions 2, 3, respectively, joined by longitudinal members 4, 5, and suitable end walls which, however, are not particularly indicated in the drawing. It is unnecessary to describe these parts in detail since the present invention does not relate to the particular construction of the body of the sign.

In a double-face sign it is customary to mount the sign characters fixedly on one face of the sign and to mount those on the other face on doors or removable panels, usually, but not necessarily, hinged to the body of the sign. In other cases the sign characters may be made fast to the respective faces of the sign, and access to the interior of the sign may be provided for otherwise than by removable doors or panels. In the form shown in Figs. 1 to 4 the casing 1 is provided with openings 6, usually of rectangular contour, but of any other shape when necessary, and these openings are backed up by frames 7 having openings or cut-outs 8 therethrough of a size not less than the area of the visible portion of the sign character. The backing frames 7 are spaced a short distance inside of the inner face of the corresponding wall of the casing of the sign, this being the wall 2 in the particular showing of the drawings. By such an arrangement room is left for the reception of a door 9 connected at one edge, preferably the upper edge, to the body portion 2 of the sign by hinges 10, so that the door when closed is pendent. While any suitable material may be employed, it is preferred to make the body of the sign, and also the door 9 of sheet metal, the door fitting the opening 6, and the door having a cut-out or stencil corresponding to the exterior contour of the strokes of the sign character. For the purpose of stiffening the face plate 2 of the sign where pierced by the openings 6, reinforcement strips 11 are provided thereabout. Moreover, the door 9 has its marginal edges inturned, as indicated at 12.

A sign character may consist of a letter, a numeral, a punctuation mark, or some arbitrary or fanciful device, but for convenience of description it will be considered that the sign character is in the form of some letter of the alphabet. Such character is produced in the form of strokes 13 in relief upon a plate 14 of an outline corresponding generally to the outline of the letter, wherefore the plate 14 is in most instances of rectangular outline somewhat smaller than the door 9.

The plate 14 is customarily of sheet glass with the strokes 13 pressed from one face of the glass plate in hollow relief, so that the glass plate 14 and the strokes 13 are of approximately even thickness.

While the sign character may be made of other materials than glass, the term glass will be employed for convenience of description, with the understanding, however, that by the term glass it is meant to include other materials suitable for the purpose even though such materials are not vitreous in character.

Considering the sign character as made of glass, that type of glass known as opal or milk glass is the kind of glass employed, and the glass plate is of such thickness and density so far as its light transmitting qualities are concerned that when a light unit is placed directly behind a character stroke the light is well diffused on the opposite side of the character stroke from the light, wherefore the light is not localized, and consequently those effects known as glare spots are avoided.

The door 9 is cut out in conformity with the outline of the particular letter employed, so that the letter is outlined or surrounded by opaque material consisting of metal in the particular structure shown in the drawing, which metal is usually galvanized iron. In some letters of the alphabet there are closed loops which cannot be filled by any integral part of the door 9, and in such instances extra plates 15 are provided. These plates are fitted to the loop or loops in the

general plane of the door, and each is held thereto by a bolt 16 extending through the loop and through a suitable perforation in the glass plate 14 where corresponding to the interior of the loop of the letter.

In order to hold the plate or sheet 14 to its support without undue strain, angle strips 17 are applied to the marginal portions of the plate. These angle strips each have a relatively wide web engaging the inner face of a glass plate 14 and a relatively narrow web engaging the flange portions 12 of the door. Bolts 18 extending through the metal of the door and also through the wide web of each angle strip 17 near the narrow web, serve to secure the angle strips and glass plates to the door with the angle strips clamping the marginal portions of the glass plates. In no case do the angle strips or members 17 encroach upon the strokes of the sign character to hide any portion thereof. On that face of the sign remote from the face carrying the doors 9 the latter are omitted, and the plate 3 has cut-outs 19 corresponding to the outlines of the letters, while the mode of carrying the plates 14 and securing them to the face 3 of the sign is the same as the mode of securing the letters to the doors 9.

At the end of each door remote from the hinges 10 there is provided a latch 20, preferably in the form of a cotter pin having oppositely bent ends 21 adapted to extend through a suitable opening in the frame 7.

Within the casing 1 are appropriate lamp sockets 22 adapted to carry incandescent electric lamps 23. The sockets 22 are preferably, though not necessarily, mounted upon channel strips 24 extending lengthwise of the members 4 and 5, whereby the members 4 and 5 are correspondingly stiffened.

In Fig. 5 and associated figures there is shown a casing 1^a having opposite faces 2^a and 3^a with longitudinal members 4^a, 5^a. The faces 2^a and 3^a have cut outs or stencils 25 corresponding to the outlines of the letters, which latter each comprise a plate or sheet 14 with letter strokes 13, while closed loops of the letters are provided with opaque filling pieces, as described with reference to the structure of Fig. 1 and associated figures. In the structure shown in Figs. 5 to 7 the sign characters are held to the sides 2^a and 3^a by clips 26 of simple character. While the sockets 22 have been described with relation to the structure of Fig. 1 and associated figures as supported upon channel strips 24, such strips are omitted in the structure of Fig. 5 and the sockets 22 are mounted directly upon the longitudinal strips 4^a and 5^a and carry lamps 23, as before.

The electrical connections of the lamps have been omitted as unnecessary for an understanding of the invention. The lamps, however, are located with reference to the letters so that they may come so far as practical behind opaque portions of the letters so that the character strokes may not be backed up at any point by intense illumination. However, even if the lamps be placed directly behind the character strokes obtrusive glare spots are not produced because of the character of the glass or other material employed.

In the case of milky or opal glass, the inner faces of the sheets 14 are smooth or glazed, so as to provide reflecting surfaces 27 for the light emitted by the lamps 23.

Fig. 5 illustrates a small portion of the inner face of one side of a double face sign showing three letters as seen from the interior of the sign. For convenience it is assumed that these same letters occur on the opposite face of the sign, although displaced more or less with relation to the letters seen in full lines in Fig. 5. The displaced letters are indicated in dotted lines, and are assumed to be on the face of the sign which has been removed in the showing of Fig. 5.

The lamps 23 are shown as carried by both the upper and lower longitudinal strips 4^a and 5^a of the sign of Fig. 5, because it is assumed that this sign is of relatively large size, wherefore upper and lower rows of electric lamps are needed to equalize the illumination. The full line letters of Fig. 5 have the lamps so related to them that they receive no direct illumination, while the dotted line letters do in part receive illumination straight through the character strokes. In both instances, however, light from the lamps 23 is reflected from the surfaces 27 of the glass plates 14 through the strokes of the characters on the other face of the sign, and experience has shown that the illumination is very noticeably increased by such reflected light. If what may be termed the inner faces of the glass plates 14 be glazed, or be otherwise made highly reflecting, the illumination obtained by reflected light is more pronounced than when such surfaces are not so highly reflecting, as sometimes occurs where other materials than glass are used in the construction of the letters.

It is peculiar to the present invention that the illumination of the sign characters is brilliant and noticeably uniform, this being due to the location of the lamps or illuminating units in large part behind opaque parts of the sign characters or corresponding faces of the sign, so that the light reaching the eye of the observer is a diffused light illuminating the character strokes quite evenly. Such illumination is noticeably increased by the utilization as reflectors of material areas or portions of the inner faces of certain of the plates, such portions being other than those portions constituting character strokes. Furthermore, the reflecting portions are in

such angular relation to the light units that light therefrom striking the plates is directed through character strokes on the other side or face of the sign.

By producing the sign characters of opal or milk glass or other material of like character with the character strokes in relief, the diffusiveness of the material used causes the letters to stand out boldly at night while the reflecting qualities of such material in day light causes the sign to be prominently visible in the day time to an extent approaching that of the illumination produced at night by the light units within the sign.

This application, in so far as it shows the same subject-matter, is a continuation of our application No. 861,082, for illuminated sign, filed September 10, 1914.

What is claimed is:—

1. A double-face sign having sign characters on opposite sides each formed of a plate of light transmitting material with character strokes thereon in relief and the inner surface of each plate constituting a reflector for light, and illuminating units within the sign and located back of and in angular relation to portions of certain of the plates other than those portions of said plates constituting the character strokes, whereby light rays emitted by the illuminating units and reflected from the reflecting portions of the plates pass out through character strokes on the opposite side of the sign and thereby sensibly reinforce the direct illumination of such character strokes.

2. A double face sign comprising a casing, sign characters on opposite sides thereof each comprising a sheet of light-transmitting material with sign character strokes in relief on one face thereof, the casing having side portions of opaque material with openings therethrough corresponding to the outlines of the sign characters and each plate of light-transmitting material having its inner face of a character to reflect light, and illuminating means within the sign located with respect to the sign characters and the inner faces of the plates to cause light from the illuminating means to traverse the character strokes and to be reflected by the inner reflecting faces of the plates to and through the character strokes on the opposite side of the casing from the reflecting faces, whereby the illumination of the sign character strokes is reinforced by such reflected light.

3. A double face sign having sign characters on opposite sides each formed of a plate with character strokes thereon in relief, said plate being of material translucent to and diffusive of light and having the inner face constituting a reflector of light, the outer face of each plate except where provided with character strokes having a covering of opaque material, and illuminating units within the sign located with respect to the character strokes and the inner reflecting surfaces of the plates to direct light through the character strokes and to the reflecting surfaces for reflection from said surfaces across the interior of the sign to and through the character strokes on the opposite side of the sign from the reflecting surfaces, whereby the reflected light reinforces the illumination of the character strokes due to direct light.

4. A double face sign comprising a casing, sign characters on opposite sides thereof, and illuminating units within the casing, each sign character comprising a plate having character strokes in relief from one face thereof and with the other face constituting a reflector of light, and said plate being of a material translucent to and diffusive of transmitted light and of a density to prevent concentration of the light from a light unit viewed directly through a character stroke, said plates each having an exterior covering of opaque material about the character strokes, and the light units being located with respect to the character strokes to direct light therethrough and to cause light from the light units to be reflected from the reflecting surfaces across the interior of the sign to and through the character strokes on the opposite side thereof, whereby the direct illumination of the character strokes is reinforced by the light so reflected.

5. A double face sign comprising a casing having light giving units therein between the sides of the casing with the casing otherwise free from obstruction to the passage of light from one side of the casing to the other, and sign characters on opposite sides of the casing each formed of a plate of light transmitting material with the sign character in relief from the outer face thereof and with the inner face constituting a reflector of light and the exterior of the plate having a covering of opaque material bordering the character strokes, and supports within the casing for each plate engaging the edge portions only thereof and leaving the remainder of the plate exposed whereby light emitted from the light giving units is transmitted through the character strokes and other portions of the light are reflected from the reflecting surfaces of the plates across the interior of the casing to and through the character strokes on the opposite sides thereof, so that the direct illumination of the character strokes is reinforced by the reflected light coming from the reflecting surfaces of said plates.

6. A double face sign having sign characters on opposite sides each formed of a plate of opal or milk glass with sign characters in relief on one face thereof and with the other face constituting a reflector of light, each sign character having its exterior except where provided with character strokes cov-

ered with opaque material, and light emitting units within the sign situated with respect to the character strokes to direct light therethrough and to direct light upon the reflecting surfaces of each plate for the reflection of such light by said plate across the sign to the opposite side thereof and through the character strokes there located, whereby the direct illumination from the light units is reinforced by the light reflected from the plates.

7. A double face sign having sign characters on opposite sides each formed of a plate of opal or milk glass with sign characters in relief on one face thereof and with the other face constituting a reflector of light, each sign character having its exterior except where provided with character strokes covered with opaque material, and light emitting units within the sign situated with respect to the character strokes to direct light therethrough and to direct light upon the reflecting surfaces of each plate for the reflection of such light by said plate across the sign to the opposite side thereof and through the character strokes there located, whereby the direct illumination from the light units is reinforced by the light reflected from the plates, said plates being of a density and light diffusive character to prevent concentration of the direct light of the light giving units when the latter are directly viewed through the character strokes.

8. In an illuminated sign, a sign character comprising a sheet of light transmitting material having the strokes of the sign character in spaced relation to the margins of the sheet, a covering of sheet metal for the exterior of the sheet of light transmitting material leaving the character strokes exposed, said covering being of greater spread than the area defined by the character strokes, and angle strips of sheet metal each of an extent to embrace the marginal portions of the sheet of light transmitting material exterior to the area defined by the character strokes with the angle edge of each angle member in spaced relation to the corresponding edge of the sheet of light transmitting material, and fastening means traversing the angle member between the edge of the sheet of light transmitting material and the angle edge of the angle member and also secured to the exterior metal covering of the sign character.

9. In an illuminated sign, a sign character comprising a sheet of light transmitting material with the character strokes in spaced relation to the margin of the sheet, an exterior opaque covering for that portion of the sheet of light transmitting material other than the character stroke portions thereof and extending beyond the margins of said sheet, and holding means for the sheet of light transmitting material comprising angle strips applied to the marginal portions of the sheet with fastening members traversing the angle strips exterior to the marginal portions of the sheet and securing the angle strips to the exterior covering for the sheet of light-transmitting material.

10. An illuminated sign comprising a casing having openings therein, doors mounted in said openings, and each comprising a sheet of metal cut out in conformity with the outline of a sign character, a plate of light-transmitting material with a sign character produced thereon in relief, and holding members applied to the marginal portions of the sheet and to the door with the inner face of the sheet except where engaged by the holding members wholly exposed.

11. A double face sign comprising a casing with stencil openings on opposite sides, sign characters each comprising a sheet of light transmitting material with character strokes in hollow relief on one face of the sheet and projecting through the stencil openings with the exterior of the sheet except where in relief covered by opaque material, said sheet being of a character and density to be translucent to and diffusive of light transmitted through it and having its inner face of a character and exposed to reflect light reaching it, and illuminating units within the casing located behind portions of sign character sheets where exteriorly covered by opaque material and related to the reflecting inner surfaces of the sheets to cause light emitted from the light units and reaching such reflecting surfaces to be directed across the interior of the sign casing to and through sign characters on the opposite side of the sign, whereby the direct illumination of the character strokes by the light units is reinforced by reflected light reaching them from other sign character sheets.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

ROY R. WILEY.
WALLACE K. WILEY.
WILLIAM S. HOUGH, JR.

Witnesses:
EDWIN B. LEITH,
AUGUSTUS R. WHITE.

DISCLAIMER.

1,224,253.—*Roy R. Wiley* and *Wallace K. Wiley*, Buffalo, N. Y., and *William S. Hough, jr.*, St. Catharines, Ontario, Canada. ILLUMINATED-SIGN. Patent dated May 1, 1917. Disclaimer filed April 12, 1923, by the assignee, the *Flexlume Corporation.*

Hereby enters this disclaimer to those claims of the specification of said Letters Patent which are excessive, namely claims 8, 9 and 10 of said Letters Patent and which are as follows:

"8. In an illuminated sign, a sign character comprising a sheet of light transmitting material having the strokes of the sign character in spaced relation to the margins of the sheet, a covering of sheet metal for the exterior of the sheet of light transmitting material leaving the character strokes exposed, said covering being of greater spread than the area defined by the character strokes, and angle strips of sheet metal each of an extent to embrace the marginal portions of the sheet of light transmitting material exterior to the area defined by the character strokes with the angle edge of each angle member in spaced relation to the corresponding edge of the sheet of light transmitting material, and fastening means traversing the angle member between the edge of the sheet of light transmitting material and the angle edge of the angle member and also secured to the exterior metal covering of the sign character.

"9. In an illuminated sign, a sign character comprising a sheet of light transmitting material with the character strokes in spaced relation to the margin of the sheet, an exterior opaque covering for that portion of the sheet of light transmitting material other than the character stroke portions thereof and extending beyond the margins of said sheet, and holding means for the sheet of light transmitting material comprising angle strips applied to the marginal portions of the sheet with fastening members traversing the angle strips exterior to the marginal portions of the sheet and securing the angle strips to the exterior covering for the sheet of light-transmitting material.

"10. An illuminated sign comprising a casing having openings therein, doors mounted in said openings, and each comprising a sheet of metal cut out in conformity with the outline of a sign character, a plate of light-transmitting material with a sign character produced thereon in relief, and holding members applied to the marginal portions of the sheet and to the door with the inner face of the sheet except where engaged by the holding members wholly exposed."

[*Official Gazette May 1, 1923.*]