Oct. 6, 1942. C. H. WYSS, JR 2,297,851

ILLUMINATED DISPLAY DEVICE

Filed Aug. 3, 1939 2 Sheets-Sheet 1

FIG. 1

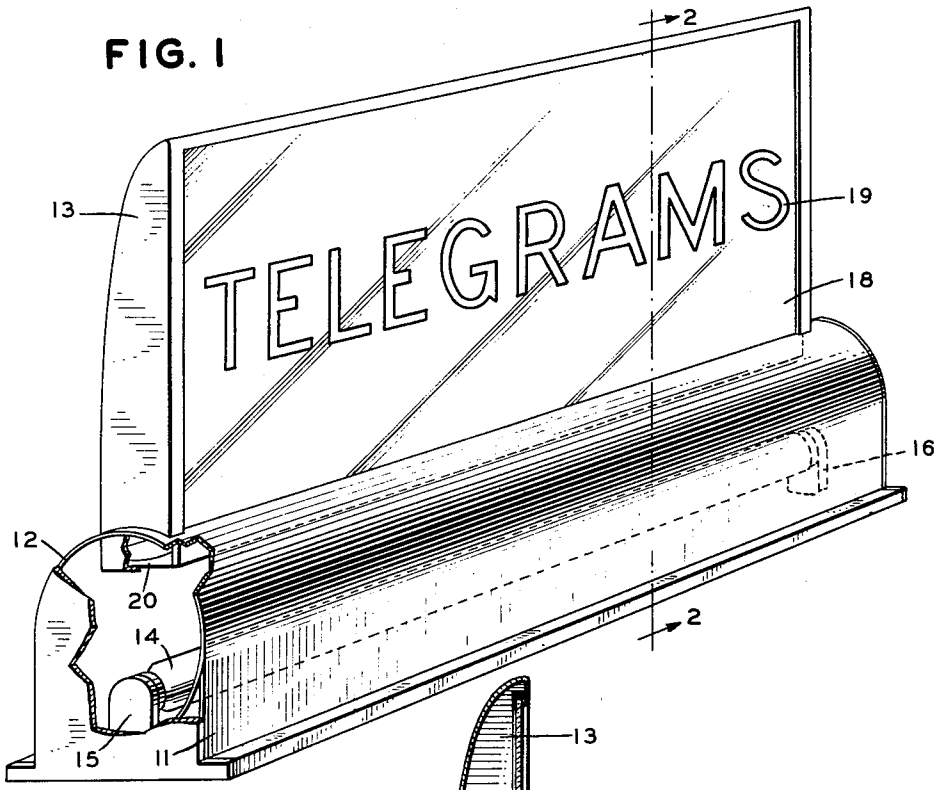
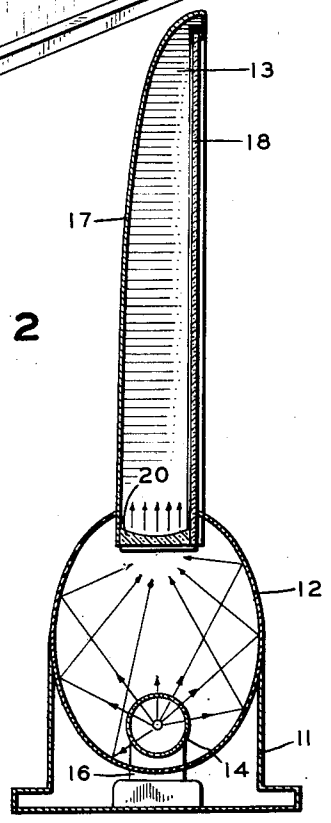


FIG. 2



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Filed Aug. 3, 1939 2 Sheets-Sheet 2

FIG. 3

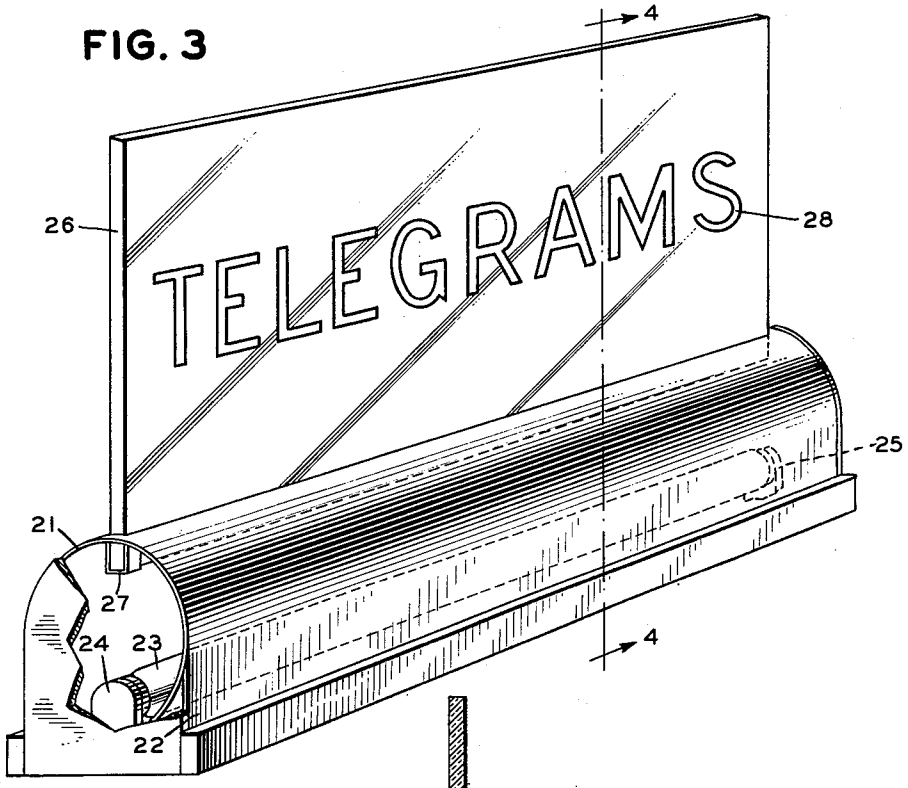
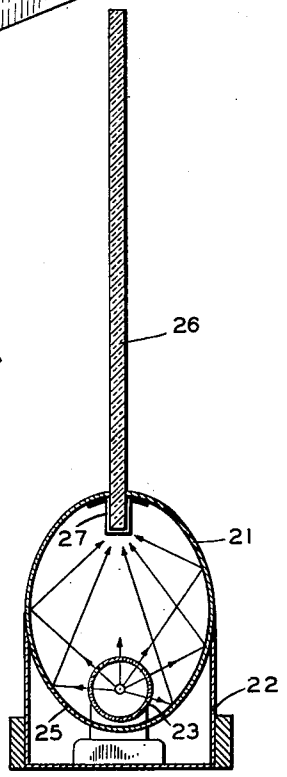


FIG. 4



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Patented Oct. 6, 1942 2,297,851

UNITED STATES PATENT OFFICE

2,297,851

ILLUMINATED DISPLAY DEVICE

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Application August 3, 1939, Serial No. 288,073

3 Claims. (Cl. 240—2)

This invention relates to display devices and has particular reference to illuminated signs.

An object of the instant invention is to provide a novel sign structure whereby a high degree of efficiency is obtained in the utilization of the light supplied.

Another object of the invention is to provide a sign structure employing an elliptical reflector to direct substantially all of the available light into the space to be illuminated.

Still another object of the invention is to provide a sign structure embodying a novel arrangement of an elliptical reflector, a source of light and a light pervious panel whereby substantially all of the available light is directed into an edge of the panel.

The invention will be described in connection with two illustrative embodiments thereof taken in conjunction with the accompanying drawings, of which,

Fig. 1 is a perspective view, partially broken away, of a sign embodying one form of the invention;

Fig. 2 is a sectional view of the sign taken on the line 2—2 of Fig. 1;

Fig. 3 is a perspective view of a sign embodying the invention in another form; and

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3.

Having reference first to Figs. 1 and 2, the invention is disclosed in a sign, the panel of which is illuminated substantially uniformly from the rear. The sign comprises a base portion 11, a reflecting chamber 12 attached to the base and a light diffusing chamber 13 extending from and in communication with the reflecting chamber. The reflecting chamber 12 is of an elongated character and has an elliptical transverse cross-sectional configuration. A tubular source of light 14 is supported between two brackets 15 and 16 and extends substantially the entire length of the reflecting chamber 12 being located at the lower focal point of the elliptical chamber.

The diffusing chamber 13 is formed of a rear wall 17 which is preferably curved as shown. However, it is contemplated that the curvature, if any, which is given to the rear wall of the diffusing chamber may be varied within wide limits without departing from the spirit of the invention. The front wall of the diffusing chamber is formed by a light pervious panel 18 upon which may be inscribed any desired design or other indicia such as advertising matter designated generally by the character of reference 19. The lower portion of the light diffusing chamber 13 is disposed within the light reflecting chamber 12 so that it lies slightly above the upper focus of the elliptical reflecting chamber. This lower portion of the diffusing chamber which is in communication with the reflecting chamber is closed by a light refracting member 20. In the disclosed embodiment the refracting member is one having a cross-sectional configuration which is plano-concave with the concave surface facing into the diffusing chamber.

The entire inner surface of the light reflecting chamber 12 is conditioned to reflect the light emanating from the source 14. Since the source of light is located at one focus of the elliptical reflecting chamber, substantially all of the light emitted therefrom is reflected and concentrated in the vicinity of the other focus of the chamber. The component beams of light reaching this point impinge upon the lower or plane surface of the refracting member 20 at various angles but, after passing through this member, are directed upward as substantially parallel beams. The light entering the diffusing chamber 13 as described is reflected from the rear wall 17, which is also reflectively conditioned, onto the back surface of the panel 18. The configurations of the refracting member 20 and the reflecting wall 17 are such that the light is distributed over the surface of the panel 18 in a substantially uniform manner. Obviously, the reflecting member 17 may be differently shaped and a correspondingly differently shaped refracting member may be used in combination therewith to also produce a substantially uniform illumination of the panel.

Thus, it is seen that substantially all of the light which is available from the source 14 is concentrated at a point adjacent the upper diffusing chamber 13 and is directed into this chamber by means of the refracting member 20 in such a manner that the light impinging upon the reflecting member 17 is distributed evenly over the panel 18.

Another embodiment of the invention is shown in Figs. 3 and 4 to which reference will be made for the subsequent portion of the description. In this modification of the invention an elliptically shaped reflecting member is employed in combination with a source of light disposed at one focus thereof and a transparent panel having one edge thereof disposed adjacent the other focus of the reflecting member. This type of sign is known in the art as an edge lighted sign, numerous forms of which have been used heretofore. However, in all previous embodiments a somewhat inefficient use has been made of the avail-

able light. The instant invention provides a sign of this nature which is appreciably more efficient than similar signs used in the past.

An elongated reflecting chamber 21 having an elliptical transverse cross-section is supported on a base 22. A tubular source of light 23 is supported by a pair of brackets 24 and 25 at the lower focus of the reflecting chamber 21. An opening is formed in the top of the chamber 21 through which is inserted a transparent panel 26. This panel projects within the chamber 21 a sufficient distance to bring its lower edge substantially at the upper focus of the reflecting chamber and is supported in this position by a plurality of hangers or brackets such as 27. The panel is provided with appropriate indicia 28, which may be applied thereto in any well known manner such as etching or sand-blasting.

The larger portion of the light which is supplied from the source 23 is concentrated at the upper focus of the reflecting chamber 21 adjacent which is disposed the lower edge of the panel 26. Thus substantially all of the light is directed into the lower edge of the panel and, in accordance with a well known principle, is reflected back and forth between the surfaces thereof until it becomes incident upon a roughened surface formed by the characters 28. It is then allowed to escape from the panel and thus illuminates the characters inscribed thereon.

It is believed that the foregoing description of two illustrative embodiments of the invention is sufficient to disclose the nature of the invention, the scope of which is set forth in the appended claims.

What is claimed is:

1. An illuminated display device comprising, a reflecting chamber characterized by an elliptical cross section, a source of light disposed at one focus of said reflecting chamber, a diffusing chamber having a light reflective curved rear wall and communicating with said reflecting chamber adjacent the other focus thereof, a light refractive member disposed at the juncture of said chambers to direct a substantial portion of the light flux transmitted thereby toward the opposite end of said diffusing chamber, a light pervious panel disposed to form the front wall of said diffusing chamber, and means including said reflective rear wall and said refractive member for illuminating said panel substantially uniformly.

2. An illuminated display device comprising, a reflecting chamber characterized by an elliptical cross section, a source of light disposed at one focus of said reflecting chamber, a diffusing chamber characterized by a light reflective parabolically curved rear wall and communicating with said reflecting chamber adjacent the other focus thereof, a lens disposed at the juncture of said chambers to direct a substantial portion of the light flux transmitted thereby toward the opposite end of said diffusing chamber, a translucent panel disposed to form the front wall of said diffusing chamber, and means including said reflective rear wall and said lens for illuminating said panel substantially uniformly.

3. An illuminated display device comprising, an elongated reflecting chamber characterized by an elliptical transverse cross section, a source of light extending substantially the length of said reflecting chamber at one focus thereof, a diffusing chamber extending from said reflecting chamber and having one side thereof disposed in communication with said reflecting chamber adjacent the other focus thereof, a light reflective curved member forming the rear wall of said diffusing chamber, a light pervious member forming the front wall of said diffusing chamber, a light refractive member forming the communicating side of said light chamber and characterized by a plano-concave transverse cross section and serving to direct a substantial portion of the light flux transmitted thereby toward the opposite end of said diffusing chamber, and means including said reflective member and said refractive member for illuminating said panel substantially uniformly.

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