Jan. 15, 1929. 1,699,100

W. A. DOREY

READING LAMP

Filed Feb. 19, 1926 3 Sheets-Sheet 1

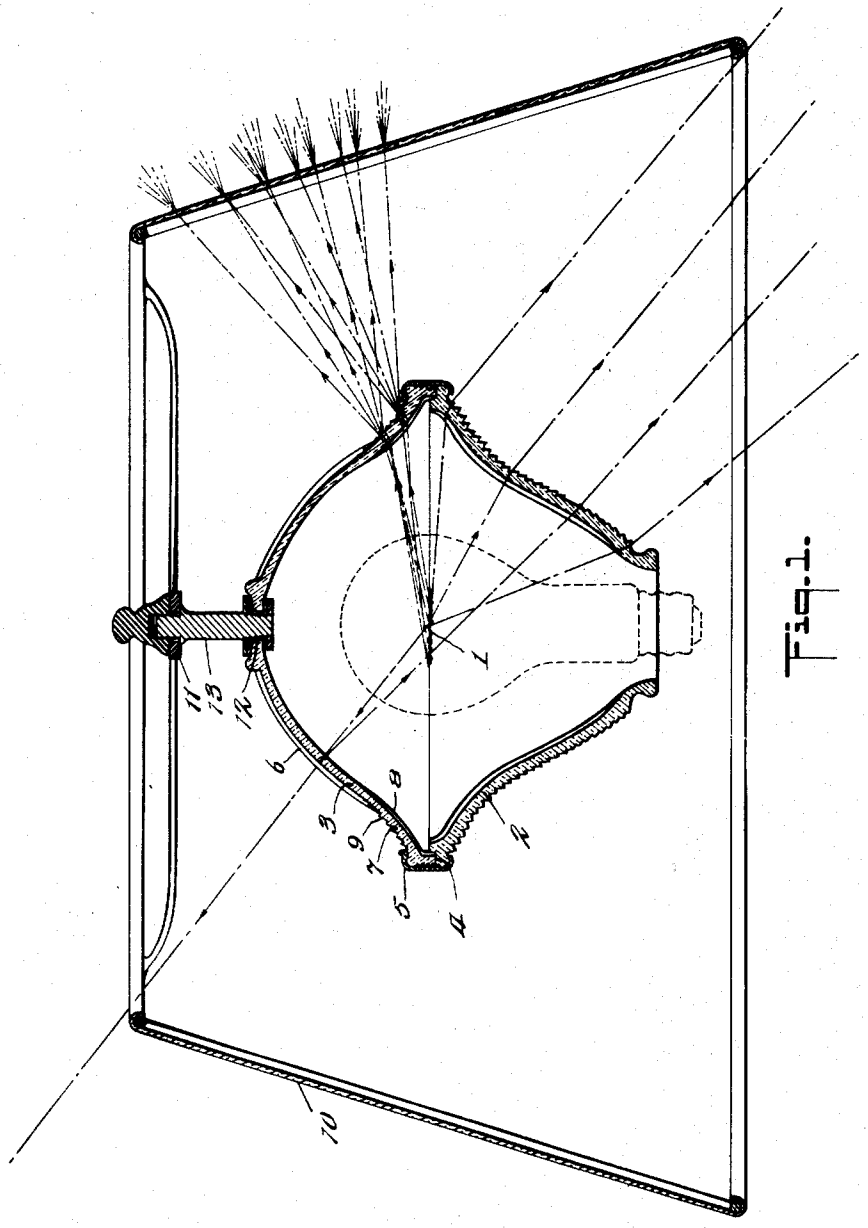

Fig. 1.

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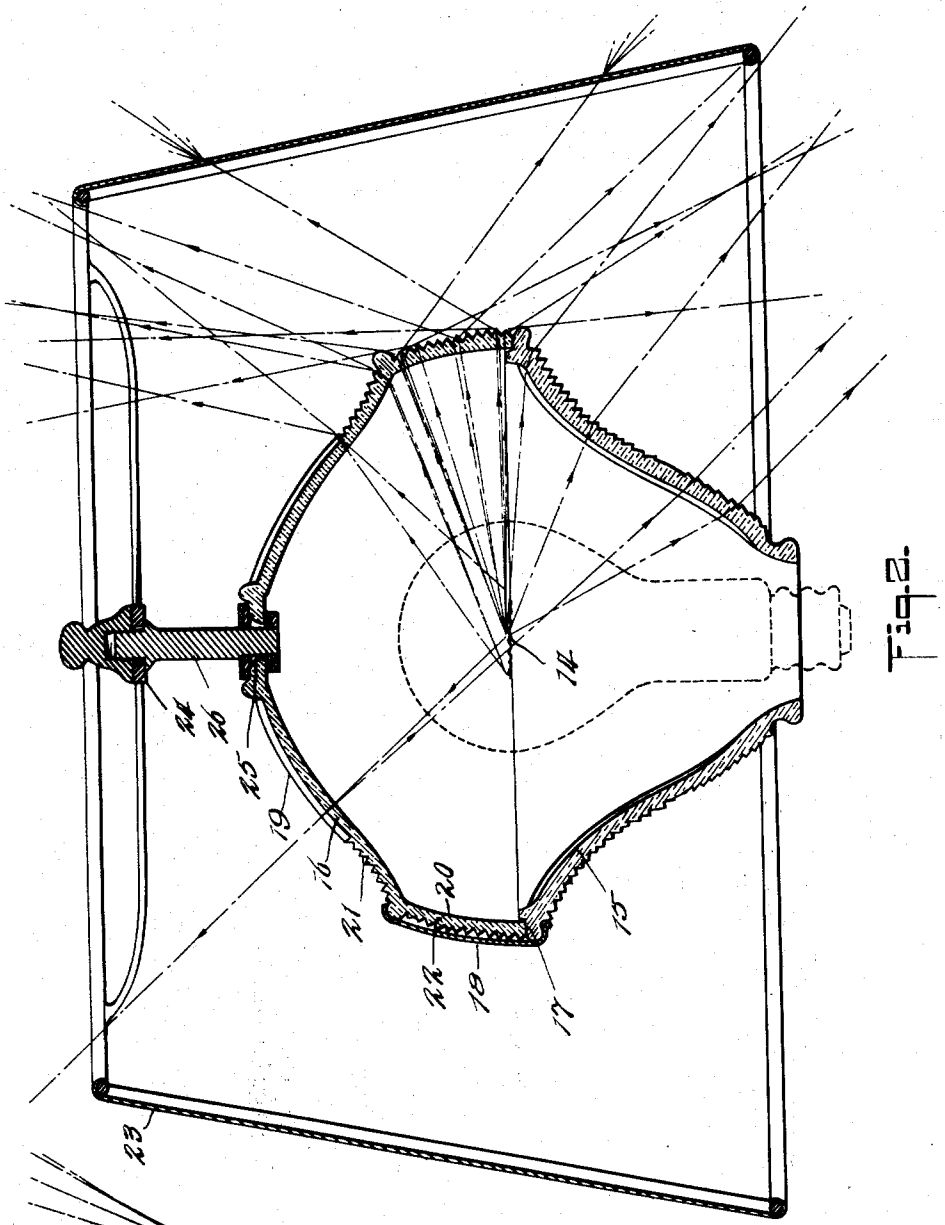

Fig. 2.

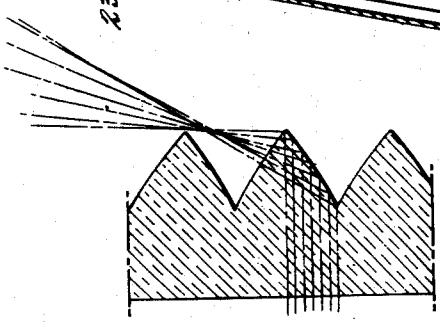

Fig. 1.

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3 Sheets-Sheet 3

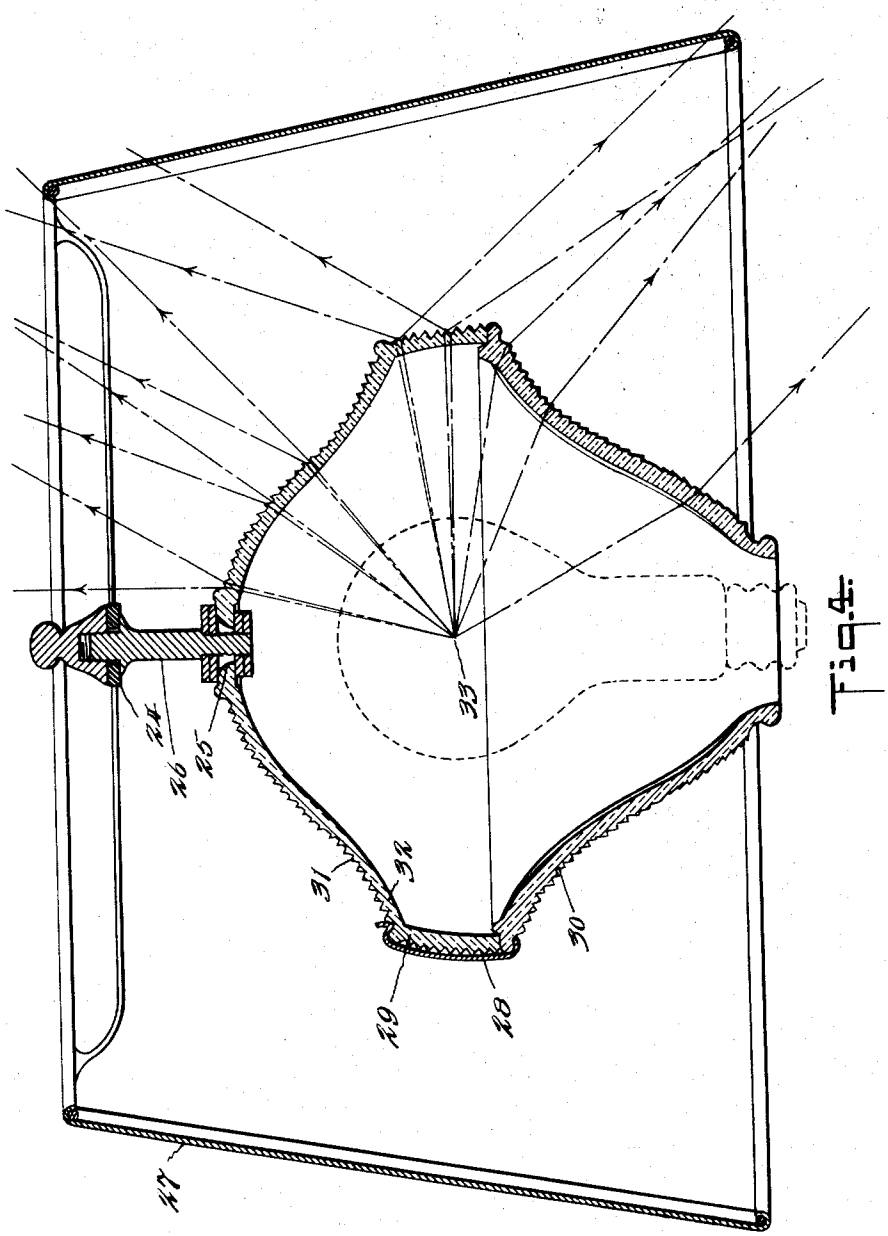

Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM A. DOREY, OF NEWARK, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO HOLOPHANE COMPANY, INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

READING LAMP.

Application filed February 19, 1926. Serial No. 89,264.

The object of this invention is the manufacture of a prismatic envelope intended primarily for use with the ornamental diffusing shades in table lamps which aims to correct the faults of present ornamental lamp constructions. In a device of this character there are three ends toward which the construction must aim.

The general requirements for a table lamp are, first, that it should be equipped with a shade of such dimensions and location that it will permit an adequate reading light to escape through the lower opening; second, that a moderate proportion of light should be permitted to escape through the upper openings to give a certain amount of general illumination; and third, that the shade itself should be somewhat luminous and at the same time should be particularly low in brightness through the angle which includes the eyes of the user.

The ordinary forms of commercial light sources equipped with fairly large substantially cylindrical shades of a fabric or parchment and open at top and bottom may be arranged to give fairly satisfactory results, but the natural distribution of the light source under these conditions does not deliver a sufficient proportion of the light to the work which normally will be located within a fairly narrow zone at an angle of from 30° to 60° out from the vertical. Moreover, the shade itself will directly intercept much the largest proportion of the total light and which may very much better be delivered in the working zone or upward toward the ceiling and this is not only wasteful but often objectionable because it may make the shade altogether too bright. In my construction the main element for furnishing the direct illumination through the lower opening of the shade consists of a refracting screen which includes practically all the light delivered by the source below the horizontal and delivers it within the working zone previously referred to. For most efficient service this screen is of a contour flaring out widely toward the upper edge The action of such refracting screen can be intensified by the use of a substantially spherical or elliptical reflector placed over the top of the light source and if this reflector be made of prismatic glass a portion of light will be transmitted upward. If, however, the whole upper hemisphere be covered by this reflector portion an undue proportion of light will be transmitted at or near the horizontal to the shade and if the reflector be made to join neatly with the refracting screen the prisms near the junction will be so close to the shade that the transmitted light will tend to show as bright vertical bands on the surface of the shade. I have, therefore made this reflecting portion of a smaller scale so that it will be spaced relatively farther from the shade than the refracting screen and have joined it to the top edge of the refracting screen by means of a third member which is preferably integral with the reflector and which in some forms will scatter the light in generally upward directions to and above the upper edge of the shade and in other forms will deflect part of the light through the bottom opening to the working plane and a part of the light upward through the top opening of the shade, the two components fringing off toward the horizontal 14 sufficiently so as to light up the shade. By making a complete enclosure of this type for the source I obtain a very simple rugged and satisfactory support for the shade, and the shade may be extended to a sufficient angle above the envelope so that the secondary source providing the general illumination toward the ceiling will not be visible at any ordinary angle of view either sitting or standing. By varying the construction of the central member and the proportions of light included by the central member and the reflector the amount of light delivered to the shade can be varied and the proportion delivered to the ceiling may be increased or decreased.

In the drawings, Fig. 1 is a vertical cross section of a lamp embodying my invention;

Fig. 2 is a vertical cross section of a table lamp, showing a further modification of the invention;

Fig. 3 is an enlarged cross section of the prisms used on the exterior of the inter-

mediate portion of the globe shown in Fig. 2.

Fig. 4 is a vertical cross section of a lamp showing a further modification of my invention.

Fig. 1 is a vertical cross section showing one form of my invention which is especially fitted for cases in which it is desired that the shade shall be somewhat brightly illuminated and a very moderate portion of light is desired toward the ceiling. Referring to Fig. 1, 1 is the light source, 2 is a refracting screen surrounding the lower half of the source and adapted to transmit and refract light rays as shown by dotted lines. 3 is a prismatic cover enclosing the upper part of the light source and joined to the refracting screen 2 by means of seat 4 and retaining clips 5. The upper portion of cover 3 is provided with reflecting prisms 6 which reflect a portion of the light rays from the source down to the refracting screen by which they are refracted and transmitted to the reading plane, and transmit a portion of the light rays upward toward the ceiling. The lower portion 7 of the cover 3 is provided on its inner surface with radial flutes 8 adapted to scatter light rays laterally and on its outer surface with horizontal refracting flutes 9 adapted to refract and scatter the light in general upward directions. Both the inner and outer surfaces of portion 7 are preferably etched so as to increase the scattering effect. 10 is a substantially cylindrical shade of a conventional form widely used in the art which is provided at the top with a three wire support centering at the metal ring 11. The cover 3 is provided with a hole 12 and the shade is attached to the glass enclosure by means of the nipple 13. The length of this nipple may be increased or decreased for shades of different proportions so as to bring the lower edge of the shade down to such a position that the working light will not be interfered with and yet the face of the observer will be well shaded. Owing to the prismatic construction of the glass enclosure only a very slight amount of scattered light is delivered to the shade at angles immediately below the horizontal and as a result the brightness of the outside of the shade itself at these angles is especially low and the eyes of the reader are naturally within this zone and are therefore well protected from glare due to the source. At the same time, a wide range of light is delivered through the lower mouth of the shade and onto the reading matter or other work. At angles somewhat above the horizontal a larger proportion of scattered light is delivered to the shade so that it has a moderately bright cheerful appearance.

Fig. 2 is a vertical cross section showing one form of my invention which is especially fitted for cases in which it is desired to keep the brightness of the shade very low, and also when it is desired to have a greater proportion of the light emitted towards the ceiling. Referring to Fig. 2 14 is the light source, 15 is a refracting screen surrounding the lower half of the source and adapted to transmit and refract light rays as shown by dotted lines. 16 is a prismatic cover enclosing the upper part of the light source and joined to the refracting screen 15 by means of seat 17 and clips 18. The upper portion of cover 16 is provided with reflecting prisms 19 which reflect a portion of the light rays down to the screen by which they are refracted and transmitted to the reading plane, and transmit a portion of the light rays upward toward the ceiling. The lower portion 20 of the cover 16 is provided in its upper part with horizontal refracting prisms 21 which refract the light striking them upward through the top opening of the shade. On the lower part it is provided with horizontal reflecting and refracting prisms 22 which are so arranged that substantially all of the light striking the prism surface is reflected to the opposite prism surface and then transmitted at angles approaching tangency with the general contour. 23 is a substantially cylindrical shade provided at the top with a three wire support centering at the metal ring 24. The cover 16 is provided with a hole 25 and the shade is attached to the glass enclosure by means of a nipple 26.

Fig 3 is an enlarged cross section of prismatic construction 22 and shows on dotted lines the course of light rays striking one face of the prism. The action of the light rays striking the opposite face will be exactly similar except that the emission will be in the opposite direction. The result of the action of prisms 22 is in the main that this portion of the light is split into two components, one passing upward and out through the upper mouth of the shade and second passing downward and out of the lower mouth of the shade. The shade 23 will be illuminated by the fringe of the two beams produced by the prisms 22 and by scattered light from the whole glass enclosure.

Fig. 4 is a cross section of a lamp showing a modification of my invention in which a larger upward component of light is desired. It is similar to the form shown in Fig. 3 except that the reflecting prisms are entirely omitted, the refracting prisms continuing to the top of the globe. In this modification, the shade 27 surrounds the globe 28 which is composed of a top 29 and a bottom 30. Prisms 31 such as are found on the intermediate portion 32 are continued to the top of the globe. Incident rays from the light source 33 intercepted by prisms 31 are directed upward and spread outward through the upper opening of the shade. The ex-

treme outward rays from the lowermost set of prisms 31 are made to converge at or near the outer edge of the shade opening so as to eliminate the edge of the shadow.

I claim:

1. In a reading lamp, an upper closed prismatic cover, a lower refracting screen, both meeting each other at or below the horizontal median plane of a light source, the cover being formed with prism areas, the upper area having radial prisms reflecting a portion of the light rays downwardly to the screen and transmitting a portion upwardly skywise, the second area auxiliary to the first named area having circumferential prisms transmitting light rays upwardly, the third area having circumferential prisms for distributing the light rays laterally, upwardly and downwardly, the screen being formed with prism areas adapted to transmit and reflect light rays angularly below the horizontal median of the light source.

2. In a reading lamp, an upper closed prismatic cover, a lower refracting screen, both meeting each other at or below the horizontal median plane of a light source, the cover being formed with prism areas, the upper area having radial prisms reflecting a portion of the light rays downwardly to the screen and transmitting a portion upwardly skywise, the second area auxiliary to the first named area having circumferential prisms transmitting light rays upwardly, the third area having circumferential prisms for distributing the light rays laterally, upwardly and downwardly, the screen being formed with prism areas adapted to transmit and reflect light rays angularly below the horizontal median of the light source, the upper of said last named areas directing the light rays downwardly and the lower area directing the light rays outwardly, whereby an annular beam of light is directed outwardly and downwardly.

Signed at Newark, in the county of Licking and State of Ohio, this 17th day of February, 1926.

WILLIAM A. DOREY.