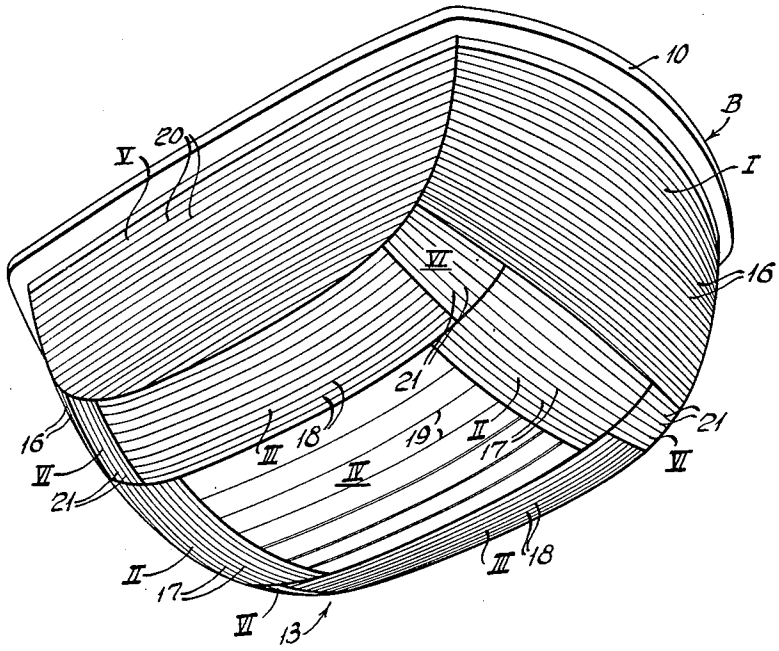
Nov. 26, 1957 K. FRANCK ET AL 2,814,723

LUMINAIRES

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Fig. 1.



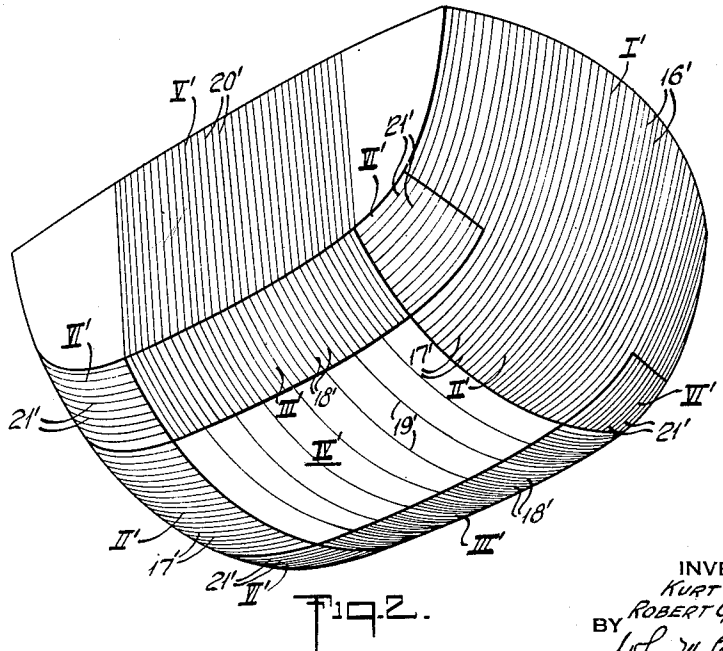


Fig. 2.

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Fig. 3.

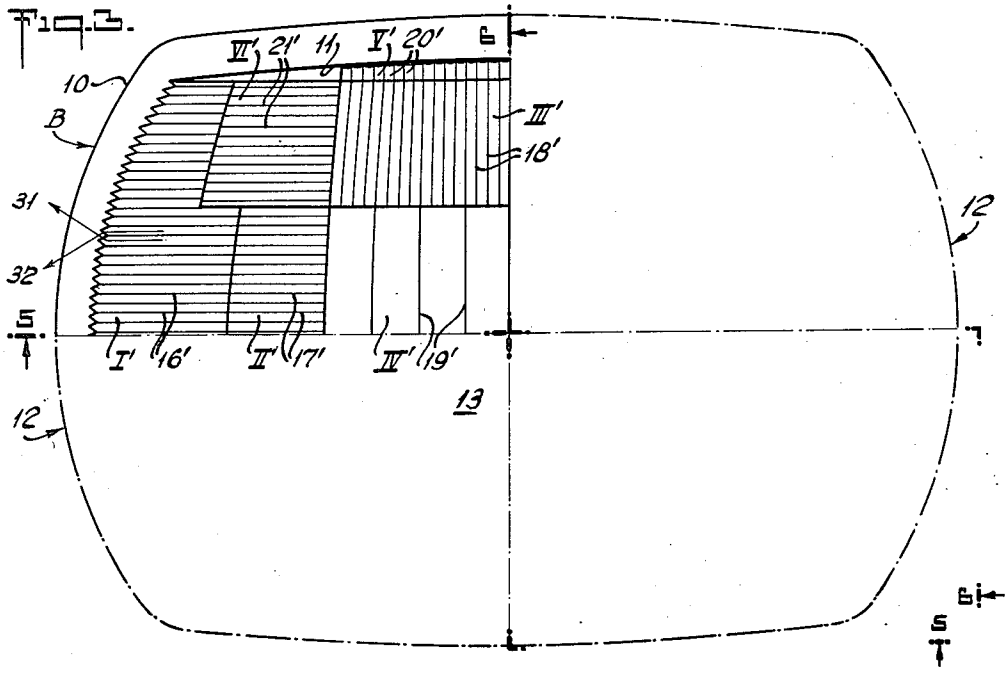
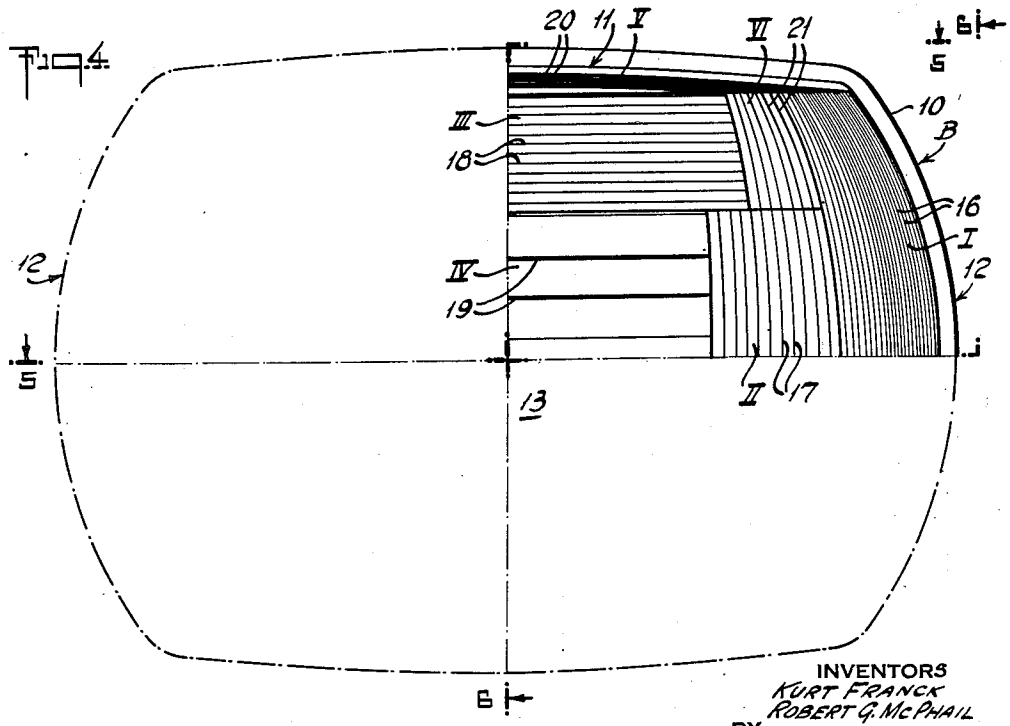


Fig. 4.



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Fig. 5.

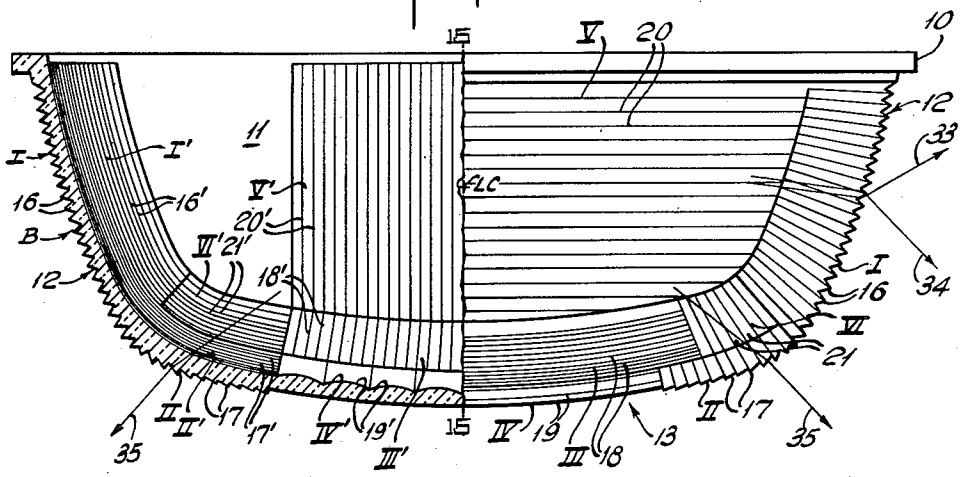


Fig. 6.

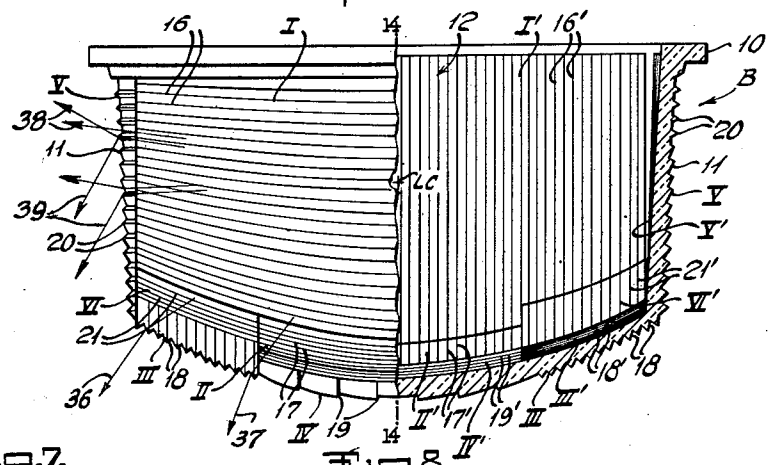


Fig. 7.

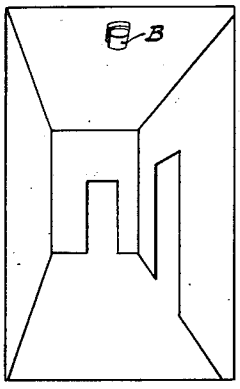
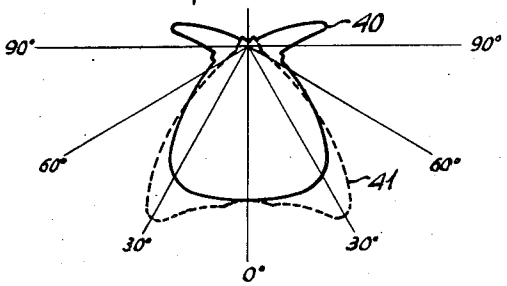


Fig. 8.



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2,814,723

LUMINAIRES

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Application April 4, 1955, Serial No. 498,951

7 Claims. (Cl. 240—106)

The present invention relates to luminaires and is more particularly directed to luminaires for corridor lighting.

The observer of a corridor light as normally mounted views the luminaire from a very restricted zone along the corridor. As the observer cannot readily avoid having the luminaire in the direct line of view, it is desirable to obtain a very low brightness throughout the projected area in the restricted field of view available.

In all other zones light may be sent in any direction whatever, that is, toward the walls, the floor and the ceiling, and full advantage can be taken of reflectances from these surfaces to achieve a harmonious brightness balance.

The present invention contemplates corridor lighting units having prismatic light controlling elements which redirect the light in such a manner as to secure very low end brightness with transmission of light toward the ceiling and side walls lengthwise of the corridor. It also contemplates controlling laterally emitted light to effect ceiling and lower side wall illumination and the control of the lower angled light to concentrate it on to the floor and spread it lengthwise of the floor.

The accompanying drawings show, for purposes of illustrating the present invention, one embodiment in which the invention may take form, it being understood that the drawings are illustrative of the invention rather than limiting the same.

In the drawings:

Figure 1 is a perspective view from below of the lighting fixture bowl showing the pattern of the external prismatic elements;

Figure 2 is a similar view of the portion of the plunger forming the internal prismatic elements and indicating in reverse, the pattern of the same;

Figure 3 is a top plan view of the bowl showing in the upper left quarter thereof, the inner prism pattern;

Figure 4 is an inverted plan view of the bowl showing in the upper right quarter thereof, the outer prism pattern;

Figure 5 is a side elevational view with parts in section on the line 5—5 of Figs. 3 and 4;

Figure 6 is an end elevational view with parts in section on the line 6—6 of Figs. 3 and 4;

Figure 7 is a perspective view of a corridor with the lighting fixture bowl mounted at the ceiling line; and

Figure 8 is a photometric chart illustrating the light distribution from the bowl.

The refracting bowl B shown herein is adapted to be mounted as indicated in Figure 7 at the ceiling line of a corridor so that its ends are in the normal field of view for persons facing lengthwise of the corridor and at a suitable distance from the luminaire. The bowl has a relatively large projected area in this field of view. The bowl is of pseudo-rectangular shape when viewed by itself and is mounted with its longitudinal axis of symmetry lengthwise of the corridor. Its length to width ratio is approximately 3:2 and its length to depth ratio, approximately 3:1.

In the drawings the horizontal mounting flange of the bowl is indicated at **10**, the substantially vertical, substantially flat sides at **11**, **11**, convex ends **12**, **12**, and the relatively shallow bottom, convex longitudinally and transversely at **13**. The bowl is symmetrical on opposite sides of the longitudinal vertical median plane **14**, **14** (Fig. 6) and on opposite sides of the transverse vertical median plane **15**, **15** (Fig. 5). The ends **12** are toroidal, generated about a center near the intersection of planes **14—14** and **15—15** and a second center above the flange at the other end. The bottom **13** is also toroidal with a very long radius of curvature longitudinally. The corners are filled in at suitable radii. The bowl is designed to receive a lamp having a light source LC in these planes, at the elevation indicated by the cross (+) in Figures 5 and 6.

Viewed externally the refractor has several panels occupied by prismatic elements and indicated by Roman numerals as follows: panels I—I at the ends **12**, **12** provided with light splitting prisms **16** extending across the same; panels II centrally disposed on the bottom **13** near the longitudinal median plane **14**, **14**, and provided with transverse prisms **17**; panels III on the bottom **13** adjacent the sides **11**, **11** and provided with longitudinal prisms **18**; panel IV of rectangular shape, central of the bottom **13** and provided with wide longitudinal prisms **19**; panels V—V along the sides **11**, **11** and provided with horizontal prisms **20**; and panels VI at the corners and provided with transverse prisms **21**.

Viewed internally, the bowl has panels similarly located and indicated by corresponding Roman numerals I′, II′, III′, IV′, V′ and VI′, respectively. Inside panels I′ and II′ are provided with light splitting prisms **16′** and **17′**, respectively. Inside panels III′ are provided with narrow transverse flutes **18′**. Inside panel IV is provided with wide transverse flutes **19′**. Inside panels V′ are provided with vertical flutes **20′**. Inside panels VI′ are provided with longitudinal flutes **21′**.

The action of crossed prisms **16**, **16′** in the panels I and I′ is such as to spread the light laterally as indicated by the rays **31**, **32** of Figure 3 and up and down, as indicated by the rays **33**, **34**, Figure 5. The resultant of the double spreading is to place light on the ceiling, the floor and on distant corridor walls, with little light escaping toward the person in the corridor to produce low brightness. This prismatic construction forms the subject matter of a separate application for Letters Patent Ser. No. 498,952, filed April 4, 1955.

The inner prisms **17′** of panels II′ are light splitting prisms and the outer prisms **17** of panel II depress the light as indicated at **35**. They continue the light lowering action of the prisms **16** so as to place a continuous pattern of light lengthwise of the corridor floor. The outer prisms **18** and **19** on panels III and IV and opposed flutes **18′** and **19′** act to lower the light toward the floor as indicated at **36** and **37** (Fig. 6) and diffuse it lengthwise of the corridor. The horizontal prisms **20** on the sides of the refractor split the light, sending some of it up, as indicated at **38** for ceiling illumination, and lowering it, as indicated at **39**, for illuminating the lower side walls of the corridor.

The full line photometric curve **40**, Fig. 8, taken along the aisle shows that a substantial portion of the light is raised toward the ceiling and very little light is emitted in the direction in which an observer views a corridor lighting unit. With a 150 watt lamp the brightness toward such an observer is less than one candle per square inch. The dash line curve **41** shows that very little light escapes sidewise at and above the horizontal. The dominant light output is concentrated to be less than 45° from the nadir, both longitudinally and laterally.

Since it is obvious that the invention may be embodied

in other forms and constructions within the scope of the claims, we wish it to be understood that the particular form shown is but one of these forms, and various modifications and changes being possible, we do not otherwise limit ourselves in any way with respect thereto.

What is claimed is:

1. A corridor lighting luminaire comprising a bowl symmetrical about vertical, longitudinal and transverse median planes, and a concentrated light source at the intersection of the planes and below the upper edge of the bowl, the bowl having substantially vertical parallel sides shorter than the length of the bowl and provided with horizontal light splitting prisms which deviate light from the source upwardly and downwardly to light the corridor walls alongside the luminaire, the bowl having ends which extend from the ends of the sides to the longitudinal median plane, converge downwardly from its upper edge, and are provided with prisms which deviate light from the source away from the longitudinal median plane and above and below the horizontal for lighting the ceiling and corridor walls more remote from the luminaire and reducing brightness to an observer in the corridor at normal angles of view, the bowl having a rotund bottom provided with longitudinal light lowering prisms to reduce the transverse spread of downward light from the source and transverse diffusing flutes to increase the longitudinal spread of light.

2. The luminaire claimed in claim 1, wherein the longitudinal prisms on the central portion of the bottom are relatively large and of small refracting power and the longitudinal prisms in the bottom outside the central portions thereof are relatively small and of greater refracting power.

3. The luminaire claimed in claim 1, wherein the said ends are outwardly convex in both horizontal and vertical planes and the ends have lesser radii of curvature in vertical planes than the bottom.

4. Means for lighting the ceiling, side walls and floor of a corridor or the like, and avoiding high brightness in the normal line of sight lengthwise of the corridor, comprising a concentrated light source mounted adjacent to but below the ceiling level and a refractor intercepting all light from the source which would otherwise fall on said ceiling, side walls and floor and redirecting the same, the refractor being in the form of a bowl closed at the bottom and symmetrical on opposite sides of median longitudinal and transverse planes through the source, said bowl having generally parallel sides opposite the source and parallel with the corridor wall, the said sides being provided with longitudinally extending prisms which deviate light upwardly and downwardly for nearby ceiling and side wall lighting, ends connecting the sides and provided with light splitting prisms which raise and lower the light for the ceiling and remote floor areas and laterally deviate the light for lighting remote side wall areas, a bottom provided with longitudinal light depressing prisms which reduce transverse divergence and transverse diffusing ribs which spread light longitudinally and place such light on the floor, and between the ends and bottom corner portions with prisms which reduce the longitudinal divergence of the emitted light and increase its lateral divergence.

5. A refracting bowl symmetrical on opposite sides of longitudinal and transverse vertical planes and with a length-width ratio of substantially 3:2 and a length-to-depth ratio of substantially 3:1, the bowl having substantially flat parallel sides, downwardly converging rotund ends with horizontal radii of curvature of substantially ½ the length of the bowl, a shallow dished bottom portion and corner forming fillets of relatively small radius connecting the ends and bottom, the ends being provided with internal vertical light splitting prisms and externally generally horizontal light splitting prisms, the sides being provided with horizontal external light splitting prisms and internal vertical light spreading flutes, the bottom being provided with transverse flutes opposed to light concentrating prisms which extend part way to the ends of the bottom, the portion of the bowl between the said ends and the said prisms on the bottom and adjacent the longitudinal plane being provided with longitudinal light splitting and transverse light lowering prisms, the portions laterally of the last mentioned portion being provided with light spreading prisms.

6. A direct lighting bowl symmetrical on opposite sides of vertical longitudinal and transverse planes at right angles to one another and having substantially vertical parallel sides, toroidal ends each generated about a vertical axis in the longitudinal plane adjacent to the transverse plane and a horizontal axis above the opposite end, a toroidal bottom extending from side to side with relatively short transverse radii of curvature and relatively long longitudinal radii of curvature, and corners with shorter radii of curvature than the vertical radii of curvature of the ends, the ratio of length to width being substantially 3:2 and of length to depth being substantially 3:1, the said sides having light splitting prisms to direct light up and down, the ends having light splitting prisms which direct light up and down and laterally, the bottom having longitudinal prisms which reduce the transverse spread of light and transverse flutes which increase the longitudinal spread of light, the corners having external transverse light lowering prisms and internal, longitudinal light spreading prismatic elements.

7. An elongated refracting bowl having a horizontal upper edge with substantially vertical parallel sides, rounded ends converging downwardly, and a bottom externally convex both longitudinally and transversely, prismatic means in the sides to transmit light originating from a source in the center of the bowl upwardly and downwardly at the expense of horizontal transmission, prismatic means in the ends to transmit light from the source upwardly, downwardly and laterally at the expense of transmission longitudinally and horizontally, prismatic means in the bottom to reduce the transverse divergence of light from the source and spread it longitudinally, and prismatic means in the ends for spreading light laterally and lowering it.

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