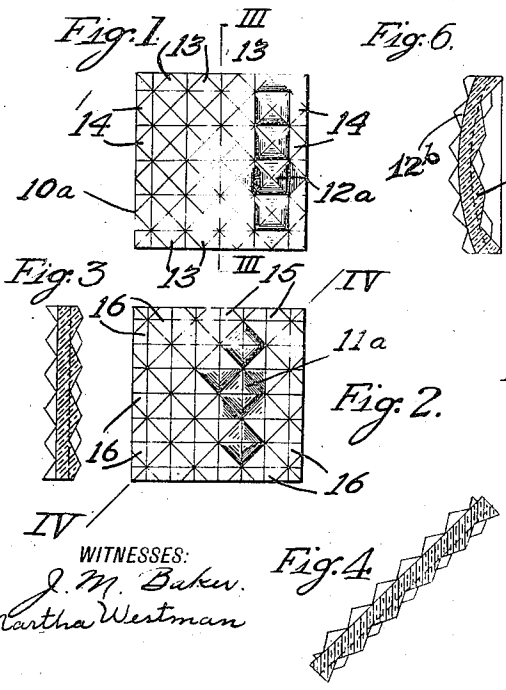
E. G. JOHANSON.

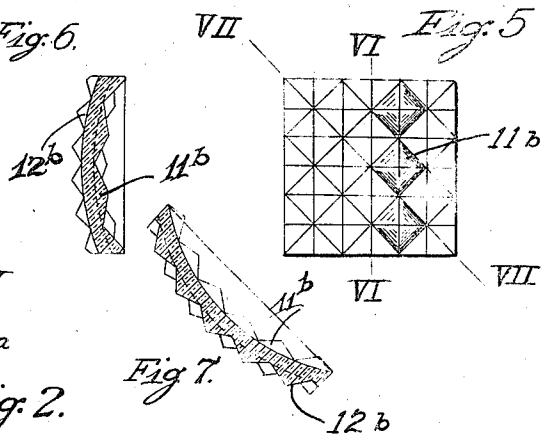
COMPOUND PRISMATIC REFRACTOR.

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1,194,294.

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COMPOUND PRISMATIC REFRACTOR.

1,194,294. Specification of Letters Patent. Patented Aug. 8, 1916.

Application filed November 21, 1912. Serial No. 732,730.

To all whom it may concern:

Be it known that I, EMIL GOTTFRIED JOHANSON, a citizen of the United States, and a resident of Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Compound Prismatic Refractors, of which the following is a specification.

My present invention relates to light refractors or diffusers in general and more particularly to articles formed of glass or other translucent material which are used for modifying light during the course of its transmission from its source, and has special reference to the provision of an improved article of the class referred to which will not only tend to modify the quality of light passing therethrough but also tend to give an appearance of a larger volume of such light.

The principal objects of my present invention are the provision of an improved form of compound prismatic refractor which when used with an electric light filament, or carbons, a gas or other burner, or other artificial light giving media, or as a light inclosure or window glazing material, will not only serve to remove the blinding effect of the glare therefrom, render the light giving point practically invisible from the exterior of the lamp or other source of such light, control the projection of such light, increase the apparent quantity of such light, and tend to compensate for inequalities in the quantity thereof arising through flickering due to variation in the potential of the current and inequalities or impurities in the filament, rods, wicks, or fuel, but also, in cases where my improved refractor is used as glazing material, render the translucent material non-transparent, thereby avoiding ordinary requirements for frosting or the application of special surfacing for the purpose of avoiding transparency; the provision of a structure adapted for refraction or diffusion of the light which during the projection of the light therethrough will disperse or absorb a minimum quantity of such light, and generally to provide an improved form of light refractor or diffuser including a composite arrangement of prismatic bodies so disposed that not only is any tendency to fracture upon expansion or contraction largely overcome and the passage of undiffused rays practially prevented, but also one which, and one the molds for which, may be readily and inexpensively manufactured by the methods and apparatus commonly employed in the present state of the art for the manufacture of pressed or cast glass ware, together with such further objects as may hereinafter appear.

I am aware that it has heretofore been proposed to manufacture lamp glasses bearing asymmetrical prisms and likewise glazing material bearing on one surface prisms which are either asymmetrical in form or asymmetrically arranged, but all of these structures are directed either toward projecting the light in a predetermined direction or to mere ornamental effects, and while certain of them to a certain extent, avoid the transparency of the material desired by me, none of them attain the kind or degree of diffusion, the simplicity in manufacture, the strength in resultant product, nor certain other desired results sought by me and more fully appearing hereinbelow.

In attaining the objects desired and certain additional benefits and advantages hereinafter more specifically pointed out, I have provided the constructions illustrated in the accompanying drawing wherein—

Figures 1 and 2 are respectively a top plan and an under plan view of a form of refractor embodying my present improvements as applied to a substantially flat sheet; Figs. 3 and 4 are sectional views of the structure of Figs 1 and 2 taken on the lines III—III of Fig. 1 and IV—IV of Fig. 2, respectively; and Figs. 5, 6 and 7 are respectively developed plan and sectional views of an application of the improvements of Figs. 1 to 4 to a curved sheet, Figs. 6 and 7 being taken on the lines VI—VI and VII—VII, respectively.

Referring now more particularly to the structure of Figs. 1 to 4, it will be observed that in this embodiment of my invention, I have arranged on one surface 10^a of the refractor a number of prismatic bodies 12^a which are preferably rectangular in form

and arranged in what I shall for the purpose of convenience call substantially vertical rows 13—13, and substantially horizontal rows, 14—14, (Fig 1), and on the opposite surface a plurality of prismatic bodies, 11^a, which are arrranged in rows 15—15, and 16—16, that are disposed at an angle to the rows 13—13, and 14—14.

In order to more clearly define the relation of the rows of prisms on the one side to those on the opposite side of the refractor, I shall use the term "axial plane of a prism" as denoting that plane which passes through the apex of the prism perpendicularly to the surface of the refractor and parallel to one pair of basal edges of the prism. The axis of a prism is referred to as the line passing through its apex perpendicularly to the surface of the refractor as a whole.

Assuming that Figs. 1 and 2 represent the opposite sides of a fragment of translucent material, such as glass, embodying my present improvements, it will be readily understood that the greatest amount of diffusion is obtained with the arrangement of bodies in the rows 13—13 and 14—14 on one surface of the sheet and in the rows 15—15 and 16—16 on the opposite surface of such sheet in such a manner that the longitudinal center lines of each row of prisms on each surface are parallel and lie in the same plane and that the center lines of each row of prisms on the opposite side are parallel and lie in the same plane but are arranged at an angle of 45 degrees to the center lines of said first mentioned rows, since by virtue of such an arrangement light which would otherwise pass uninterruptedly through the translucent body at points adjacent the bases of the prismatic bodies on one surface is interrupted and diffused by means of the arrangement of prismatic bodies on the opposite surface. These, as will clearly be seen on reference to Figs. 3 and 4, are so arranged and positioned that the center of each prismatic body 11^a is at substantially the center of the intersecting lines formed by extension or alinement of two of the bases of four of the bodies 12^a, and vice versa. It will thus be observed that substantially no ray of light may pass through the refractor without being subjected to the action of the prismatic bodies, and thus that a maximum of diffusion and greatest appearance of light is attained. It will likewise be observed, especially on viewing said Figs. 3 and 4, that there is a substantial corrugation of all parts of the diffuser adjacent the flame, where a flame is used, and that the shallowest points on one surface are the highest points on the opposite surface, and that owing to the fact that each surface is corrugated in two directions at right angles to each other and at an angle to the corrugations on the opposite surface, a considerable degree of expansion is possible and the consequential danger of fracture either from expansion or shock is to a great degree avoided.

The structure of Figs. 5 to 7 is in all substantial respects the same as that of Figs. 1 to 4 save in this that I have here shown my present improvements as applied to a curved sheet such as is often used in bow window sash, I, in this embodiment, employing on the concave surface of the sheet prismatic bodies 11^b which are larger, but less numerous than the bodies 12^b in order to compensate for the curvature of the sheet. It will readily be apparent that this arrangement of prismatic bodies just described is applicable to bowls, lamp chimneys and shades, and other forms of glass ware.

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

1. A light diffuser or refractor having a plurality of rows of prismatic bodies on each surface thereof, each prismatic body having a plurality of axial planes, the bases of the prismatic bodies on each surface being arranged with all their axial planes intersecting at acute angles all the axial planes of the prismatic bodies on the opposite surface.

2. A light diffuser or refractor having a plurality of rows of prismatic bodies on each surface thereof, each prismatic body having a plurality of axial planes, the bases of the prismatic bodies on each surface being arranged to completely cover the adjacent bases of the prismatic bodies on the opposite surface and with all their axial planes intersecting at acute angles all the axial planes of the prismatic bodies on the opposite surface.

3. A light diffuser or refractor having on each surface a plurality of rows of prismatic bodies each having more than two faces, the axial planes of all the prismatic bodies on one surface intersecting at acute angles all the axial planes of the prismatic bodies on the opposite surface.

4. A light diffuser or refractor having a plurality of rows of obtuse angled prismatic bodies on each surface thereof, the axial planes of all the prismatic bodies on one surface intersecting at acute angles all the axial planes of the prismatic bodies on the opposite surface.

5. A light diffuser or refractor having prismatic bodies of more than two sides arranged on both surfaces thereof, the axis of each prismatic body on one surface being offset and symmetrical with respect to the axes of the adjacent prismatic bodies on the opposite surface.

6. A light diffuser or refractor having a plurality of rows of substantially contiguous pyramidal bodies arranged on either side

thereof in a plurality of series of substantially vertical and substantially horizontal rows on both surfaces thereof, the rows on one surface having their axial planes at substantially 45 degrees with respect to the axial planes of the rows on the opposite surface.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

EMIL GOTTFRIED JOHANSON.

Witnesses:

MARTHA WESTMAN,

PAUL CARPENTER.