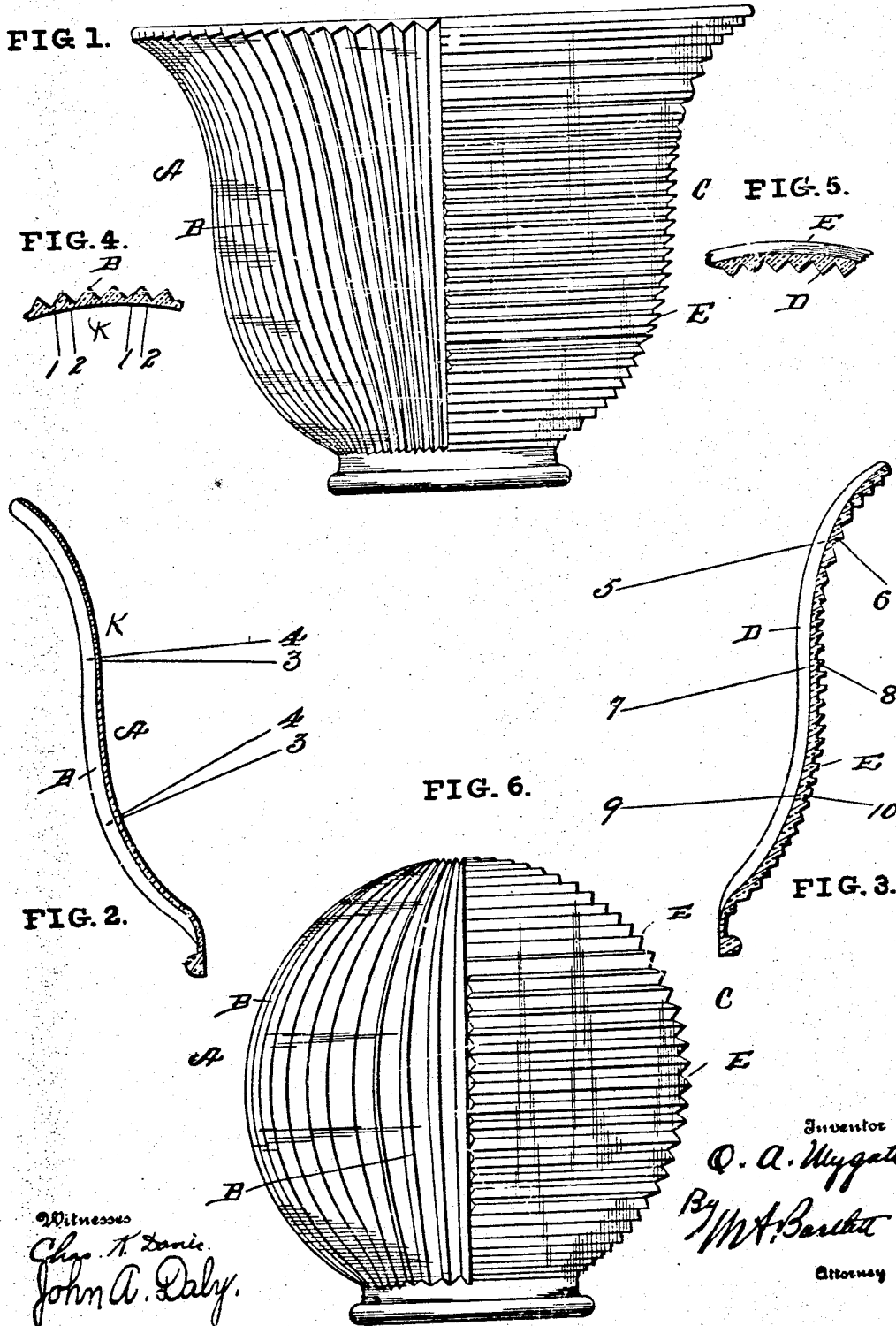


No. 804,254

PATENTED NOV. 14, 1905.

O. A. MYGATT.
PRISMATIC GLASS REFLECTOR SHADE.
APPLICATION FILED JUNE 3, 1904.

2 SHEETS—SHEET 1.



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FIG. 7.

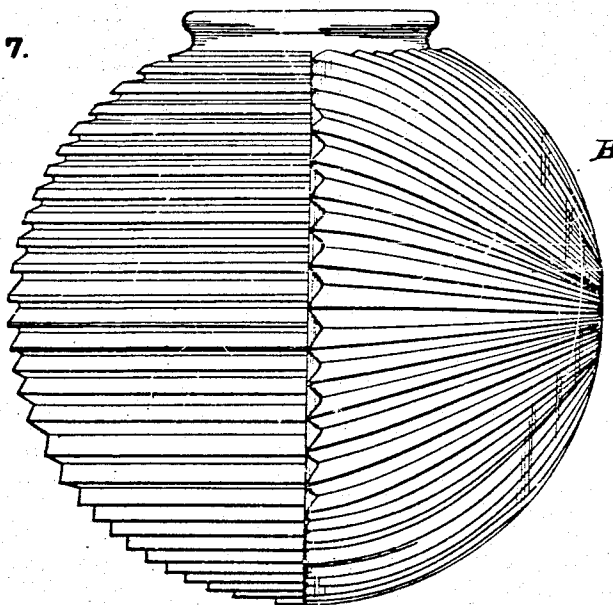
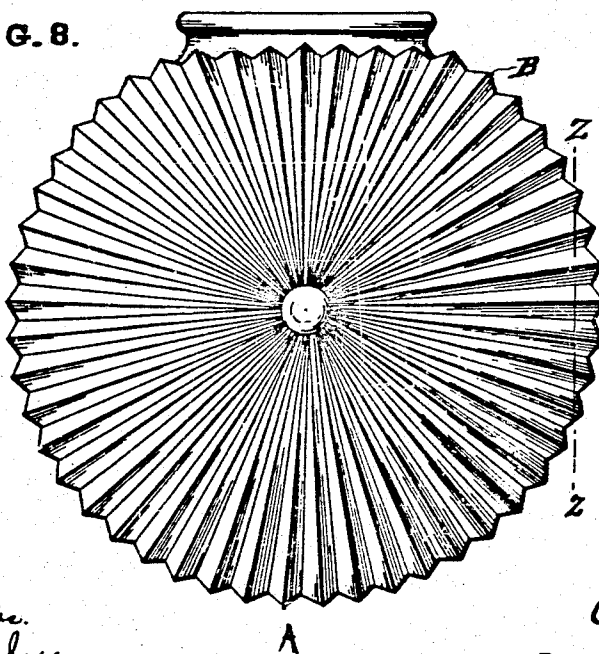


FIG. 9.



FIG. 8.



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PRISMATIC-GLASS REFLECTOR-SHADE.

No. 804,254.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed June 3, 1904. Serial No. 210,978.

REISSUED

To all whom it may concern:

Be it known that I, OTIS A. MYGATT, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Prismatic-Glass Reflector-Shades, of which the following is a specification.

This invention relates to improvements in glass reflector-shades for artificial lights.

The object of the invention is to produce in one unitary structure a reflector and shade composed entirely of glass and having a part acting entirely as a reflector and an opposite part acting as a light directing or distributing and softening shade.

The invention consists in a structure having a part, usually about one-half its surface, covered entirely with reflecting-prisms, constructed to direct back into the shade a large portion of the light-rays which emanate within the reflector. The other side of the reflector-shade is substantially a shade. It has on its outer surface a series of light directing or distributing prisms or ribs, which prisms direct the light in any desirable direction and at the same time soften the light-rays. On this directing side the interior surface of the shade may be covered with diffusing-ribs, which soften the light-rays before they reach the final directing-prisms.

Figure 1 is a side elevation of a shade-reflector embodying the principles of the present invention. Fig. 2 is a vertical section of the rear side of said device. Fig. 3 is a vertical section of the front side thereof. Fig. 4 is a broken horizontal section at the rear side of the shade-reflector, and Fig. 5 is a broken horizontal section at the front side of the shade-reflector in any plane in which the prisms appear. Fig. 6 is a side elevation of a modified form of shade-reflector intended specially for incandescent electric lights. Fig. 7 is a side elevation of a further modification. Fig. 8 is a rear elevation of Fig. 7; Fig. 9, a broken section on line *z z*.

My shade-reflectors are made of pressed glass and in all common sizes are in a single piece. That side A of the body of the structure which is to act entirely as a reflector is substantially covered by external prisms B. These prisms are of the character termed by me "double-reflecting" prisms—that is, the light from within the reflector encounters a smooth interior surface K and is deflected very little or not at all thereby. Passing to

the outer inclined face of a prism B a light-ray encounters this face at an angle of forty-five degrees, (for best results.) The ray is reflected at a right angle directly across the prism and strikes the second inclined face also at an angle of forty-five degrees thereto, (see Fig. 4,) wherein 1 2 indicates a light-ray thus reflected twice. The light-ray is thus returned on a line substantially parallel with its line of radiation. This direction of a light-ray may be somewhat modified by the form of the body, as at 3 4, Fig. 2. For ordinary consideration it may be calculated that from seventy to eighty per cent. of the light will be thrown back toward and through a lamp inclosed in the reflector and toward the shade or light distributing or radiating side of the device.

The shade-reflectors are shown in vertical position in Figs. 1 and 6, but can be turned to any position desired. For convenience of description the prisms will be described in the positions they occupy when the reflector-shades are in the position of Figs. 1 and 6. Thus it will be seen that the prisms B extend in generally vertical direction with reference to the body of the shade-reflector. In a spherical reflector the reflecting-prisms are substantially in the form of lunes. Some light will pass through the prismatic reflector, and the external appearance of a lighted reflector will be that of a darkened surface with bright lines thereof. To maintain the proper reflective angles of their plane surfaces, the reflecting-prisms must vary in width and height with their position on the body of the reflector.

The front or light-diffusing side C of the shade-reflector is preferably covered internally with small vertical or lunar prisms or ribs D. These internal prisms will not reflect the light back toward its source, but will simply deflect the light-rays more or less in horizontal direction as they pass through the glass. The surfaces need not be planes, but may be merely rounded flutings for this purpose. The amount of light received by the front face C or shade part of the device will be something less than twice the amount which would be there received were the reflector part of the device omitted.

The outer surface of the shade C is substantially covered with horizontal directing or distributing prisms E. These prisms are of various characters, according to the illumination desired. These prisms may be single-reflecting prisms or light-directing prisms and

do not reflect light to any considerable extent back into the interior of the shade-reflector; but direct the rays in calculated directions or in all directions.

5 The upper prisms—say for one-fourth the height of the shade—may be made to direct the light-rays in a direction inclined downwardly at a considerable angle. The prism along the central part of the face C may be made to
10 direct the rays downwardly at a lesser angle, and the prisms at the lower part of the face C may be made to direct the rays about horizontally. Such directions for light-rays are indicated by lines 5 6, 7 8, 9 10, Fig. 3.
15 Such an arrangement for prisms will give a concentration of light along a horizontal band near the shade-face. Other arrangement or construction of the prisms E may be made to concentrate the rays or to diffuse them, as
20 desired. The directing-planes of these prisms are determined by the mold, which is made on carefully-calculated lines.

By continuing the reflector side of the device for something more than half the circumference a very considerable concentration of light-rays may be effected over a limited area at the front of the reflector-shade.

In the patent of Blondel *et al.*, No. 563,836, July 14, 1896, the construction of horizontal
30 light-directing prisms is explained at length. In my Patent No. 736,535, of August 18, 1903, the construction of vertical reflecting-prisms on the outer face of the reflector is explained. These latter prisms I term "double-reflect-
35 ing" prisms, while the horizontal prisms E, if reflectors at all, are single-reflecting or light-distributing prisms and may serve merely to diffuse the light-rays.

By "light-distributing" prisms I refer to
40 prisms having their plane faces at calculated angles with reference to the source of light, so that a large proportion of light passing through the prisms collectively shall be by the prisms directed in definite quantities in pre-
45 determined directions. By "light-diffusing" I mean the breaking up of the light-rays and the scattering and softening of the rays without attempt to control the quantity of light in a given direction.

50 As shown in Figs. 7 and 8, the reflector may have lunar reflecting-prisms radiating from one center instead of from two centers, as in Fig. 6.

55 Light-distribution, as understood in this art, is the direction of light-rays in definite and

determined directions. Light-diffusion is the softening or blending of light-rays, with no special relation to their ultimate direction.

In my Patent No. 736,535 a shade is described wherein the upper part of the globe
60 is a reflector and the lower part is surrounded by circumferential prisms, which may be directing-prisms. If this globe were turned at a right-angle, it would have the effect of directing the light in rings or circles instead of
65 the distribution of the light-rays in a plane or planes, as in the present invention.

What I claim is—

1. A prismatic-glass reflector-shade having its outer rear face substantially covered with
70 integral reflecting-prisms arranged to reflect light-rays back into the shade and out at the front thereof, and having its front outer face substantially covered with prisms, with their longer axes extending in a generally horizontal
75 direction, and arranged to pass the light-rays in predetermined directions according to the inclination of the plane faces of said prisms.

2. A prismatic-glass reflector having its outer rear face substantially covered with in-
80 tegral reflecting-prisms, and its inner surface opposite said reflecting-prisms smooth, and having on its front outer surface a series of horizontally-arranged light-directing prisms.

3. A prismatic-glass reflector having its
85 outer rear face substantially covered with reflecting-prisms extending in a generally vertical direction and its inner rear surface smooth, and having its front outer surface substantially covered with light-directing prisms with
90 their longer axes arranged horizontally, and the interior surface behind these directing-prisms covered with diffusing-ribs.

4. An integral reflector-shade to inclose an artificial light, composed of glass, with its rear
95 face externally covered with prisms arranged to reflect a large proportion of the light-rays from within, back into the device and out through the opposite face, the shade or distributing side of the device being provided
100 with prisms with their longer axes extending in a generally horizontal direction, and having their plane faces arranged to direct the passing light-rays in converging planes.

In testimony whereof I affix my signature in
105 presence of two witnesses.

OTIS A. MYGATT.

Witnesses:

H. E. NASON,
GEO. A. COTA.