No. 730,852. PATENTED JUNE 9, 1903.

E. L. ELLIOTT.

BULB FOR INCANDESCENT ELECTRIC LAMPS.

APPLICATION FILED OCT. 15, 1902.

NO MODEL

FIG. 1.

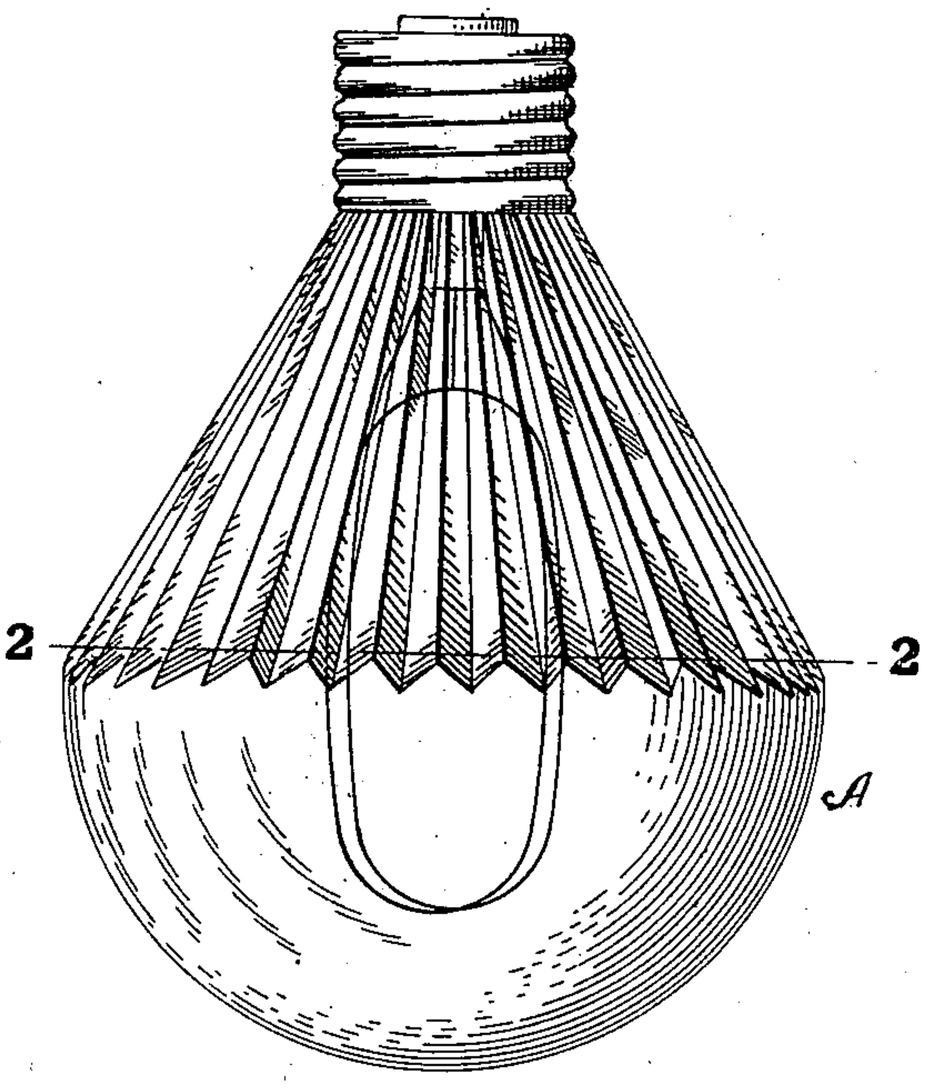


FIG. 3.

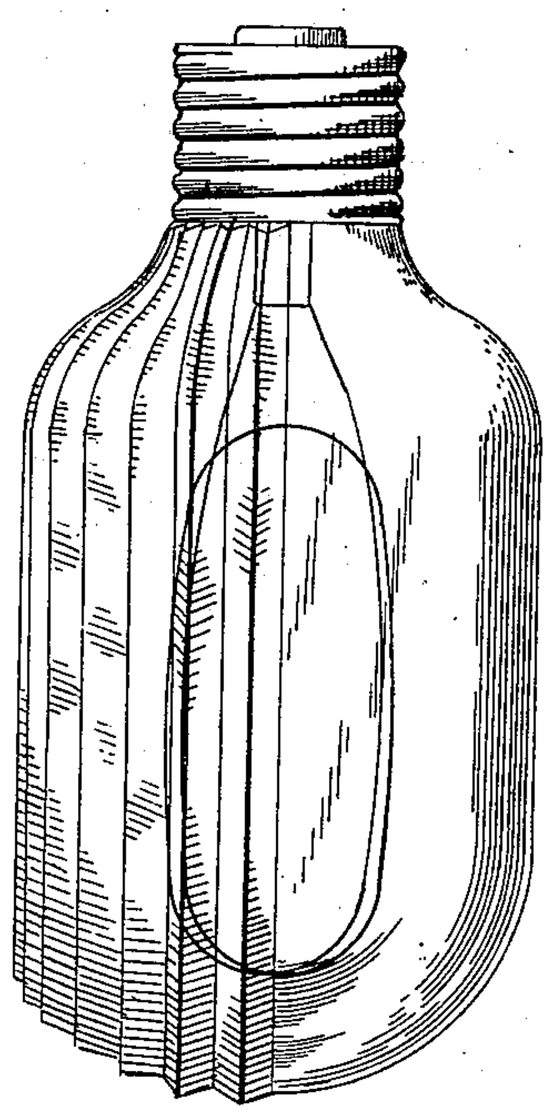


FIG. 2.

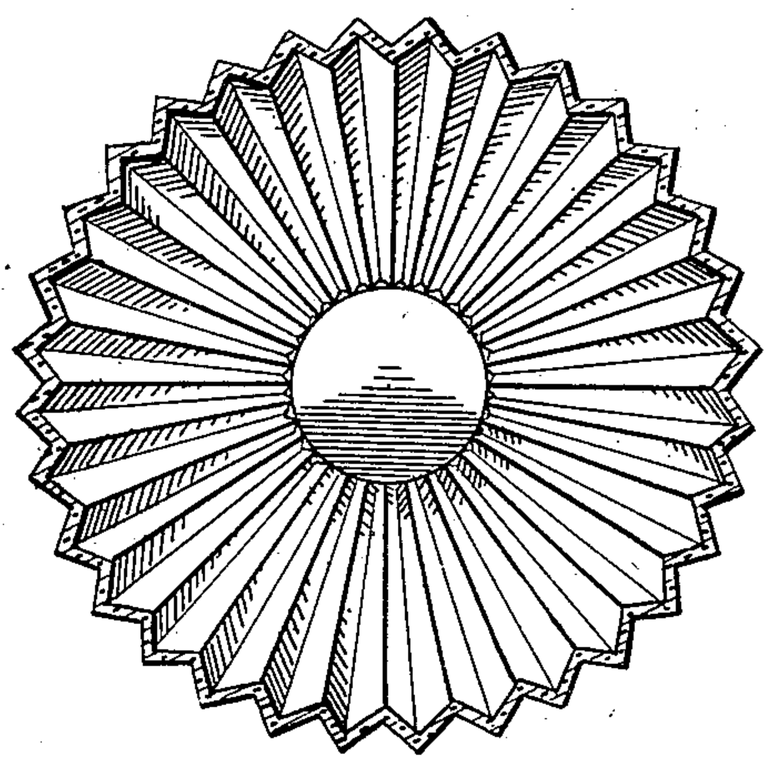
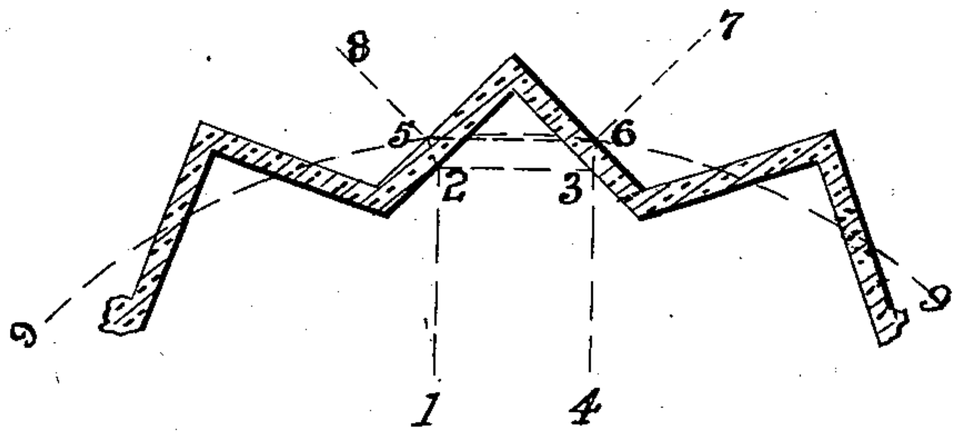


FIG. 4.



Witnesses
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No. 730,852. Patented June 9, 1903.

UNITED STATES PATENT OFFICE.

ELIAS L. ELLIOTT, OF YONKERS, NEW YORK, ASSIGNOR TO ILLUMINATING ENGINEERING COMPANY, A CORPORATION OF NEW YORK.

BULB FOR INCANDESCENT ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 730,852, dated June 9, 1903.

Application filed October 15, 1902. Serial No. 127,401. (No model.)

To all whom it may concern:

Be it known that I, ELIAS L. ELLIOTT, a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Bulbs for Incandescent Electric Lamps, of which the following is a specification.

The object of my said invention is to produce a bulb for incandescent electric lamps which shall throw or reflect the greater portion of the light in any desired direction. I accomplish this object by forming a portion of said bulb with angular corrugations the angles whereof are such that the rays of light falling thereon will be reflected backwardly and pass out through the opposite side of the bulb, together with the direct rays, in the direction desired.

Referring to the accompanying drawings, which are made a part hereof, and on which similar reference characters indicate similar parts, Figure 1 is a side elevation of an electric-light bulb of my improved construction; Fig. 2, a cross-section through the same, looking upwardly from the dotted line 2 2 in Fig. 1; Fig. 3, a view of a modified form; and Fig. 4, a diagrammatic view showing a section of the corrugated angular surface on an enlarged scale, the direction of the rays of light being indicated by dotted lines.

The bulb A in itself is or may be of any ordinary form or construction except for the corrugated or reflector portion which constitutes the subject-matter of my said invention. It may be blown in a mold by methods well known to those skilled in the art, and its thickness is made substantially uniform throughout, the corrugated portion being formed angular on the inside as well as the outside. The surfaces of the sides of these corrugations extend at substantially ninety-degree angles, which is the angle producing the best results. While some deviation of this angle may be made and good results follow, it will be plain from the following description that the greater the deviation from this angle the less effective will be the reflector character of the angular surface.

Referring now to Fig. 4, a ray of light 1, falling upon the surface of a corrugation, as at 2, a minor portion thereof will be reflected from said point to the opposite surface of said corrugation at 3 and from said point reflected downwardly toward the point 4 in a direction parallel with the incidental direction of the ray. A major portion will, however, be refracted slightly and pass through the thickness of the glass to the outer surface at 5, from which point it will be reflected to the opposite side of the corrugation, striking the outer surface at 6, from which point it will be refracted slightly to point 3 and from there reflected in the direction of point 4. While the larger portion of the rays will thus be reflected by the corrugated angular surfaces back in the opposite direction, from which they will strike said angles and pass out through the plain surface of the bulb, a sufficient portion will pass through in the direction indicated by dotted lines 7 and 8 to give all needed illumination in the direction above or on the back side of said corrugated surface. The total result of said reflections and refractions is to reflect a major portion of the rays which fall upon the angular corrugations normal to a line drawn through them, as 9 9, in a direction opposite to that of the incidental rays. The result is thus practically the same as in the use of a plain mirror-reflector having a surface on said line. By forming any portion of an electric-lamp bulb with such angular corrugations, therefore, that portion will act as a reflector and reflect the incidental rays falling thereon back in the opposite direction, directing the major portion of the light through the plain portion of the bulb. In Fig. 1, as will be readily seen, such reflection would be downwardly to beneath the lamp, while in the form shown in Fig. 3 the reflection would be horizontally or through the side of the bulb, which form may be found useful in many places, such as illuminating show-windows, &c. It will be understood, of course, that any portion of the bulb-surface desired may be thus corrugated and the light reflected in whatever direction desired. The greater portion of the rays of light, which in the use of the ordinary form of globe are wasted by passing in a direction where they are not needed, are thus saved and reflected to the place where of greatest advantage for use.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A bulb for incandescent electric lamps formed with a portion entirely of clear glass corrugated and a portion plain, the angles of the corrugations being such as to reflect a major portion of the rays of light backwardly through the plain portion, substantially as set forth.

2. A bulb for incandescent electric lamps formed entirely of clear glass with a portion of its surface corrugated and a portion plain, the angles of the sides of the corrugation being substantially ninety-degree angles, substantially as set forth.

3. A bulb for incandescent electric lamps formed of clear blown glass of substantially uniform thickness and formed with a part of its surface corrugated on both sides, and a part plain, the angles of the sides of the corrugations being such as to reflect the major portion of the rays of light backward through the plain portion, substantially parallel with the incidental rays, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Washington, District of Columbia, this 14th day of October, A. D. 1902.

ELIAS L. ELLIOTT. [L. S.]

Witnesses:

E. W. BRADFORD,

DOROTHY B. SHAFER.