E. G. JOHANSON.

LAMP CHIMNEY OR GLOBE.

APPLICATION FILED DEC. 16, 1910.

1,030,818.

Patented June 25, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

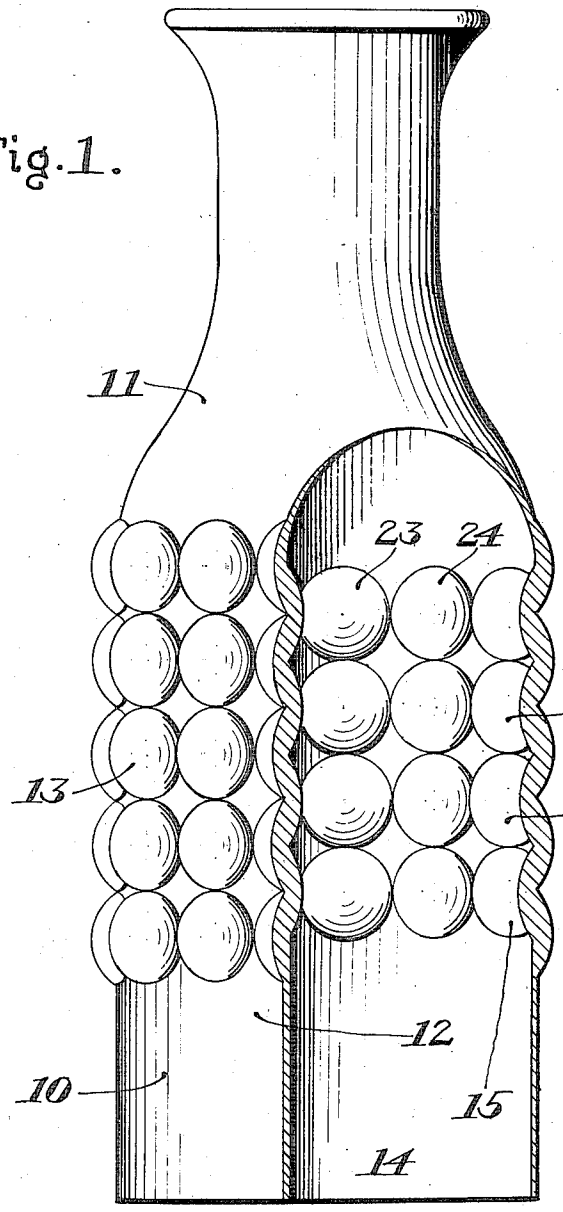

Fig. 2.

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Fig. 3.

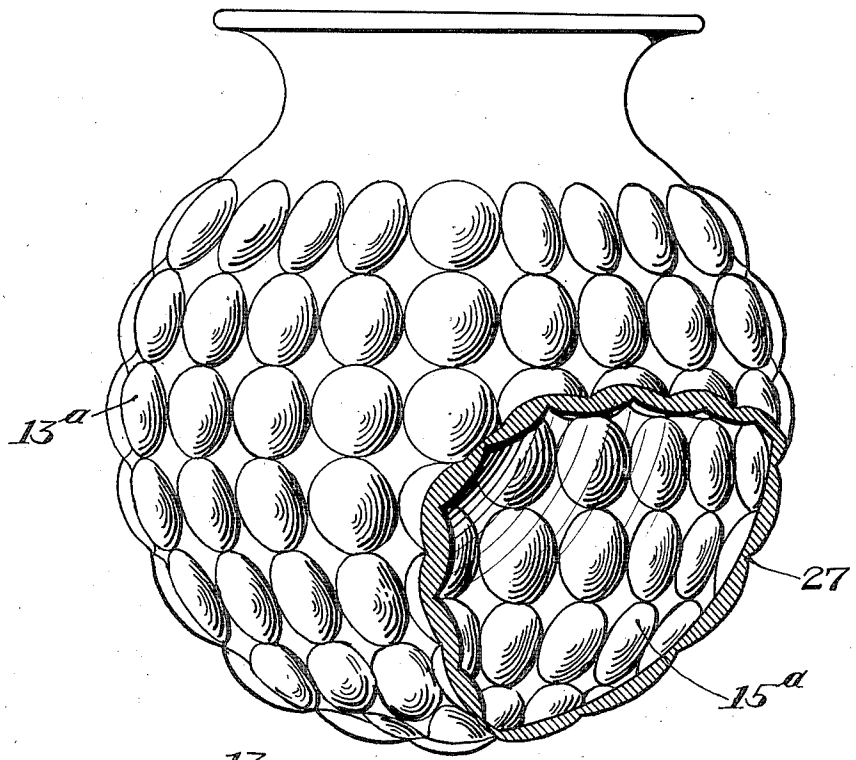
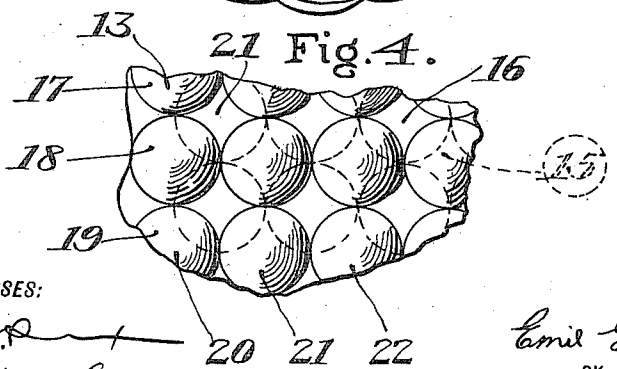


Fig. 4.



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LAMP CHIMNEY OR GLOBE.

1,030,818. Specification of Letters Patent. Patented June 25, 1912.

Application filed December 16, 1910. Serial No. 597,676.

To all whom it may concern:

Be it known that I, EMIL GOTTFRIED JOHANSON, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lamp Chimneys or Globes, of which the following is a specification.

My present invention relates to the chimneys of lamps, and the globes or shades which are used for protecting the flame of or directing light derived from lamps, and contemplates the provision of an improved article of the class referred to which will both enlarge the apparent size of the flame and also soften and diffuse the light therefrom.

The principal objects of my present invention are the provision of an improved form of chimney or globe which will more uniformly enlarge the apparent size of the flame and more evenly diffuse the light rays of such flame, than others known to me, and thereby give the appearance of a substantially continuous flame of the size of the chimney, without showing the outline of the wick, filament or carbon rods contained therein, and compensate as far as possible for any inequalities in such light due to flickering on account of unevenness in the surface of the wick, difference in the potential of the current, or impurities in the carbon points of the arc used therein; the provision of an improved arrangement of lenses on such chimney whereby the tendency thereof to fracture upon expansion is largely overcome; the provision of an improved arrangement of lenses whereby substantially no undiffused rays may pass through the chimney, together with such further objects as may hereinafter appear.

I am aware that it has been heretofore proposed to form chimneys carrying thereupon a plurality of lenses; chimneys provided with corrugated portions to allow for expansion; and chimneys provided with two series of corrugations, one arranged at an angle to the other, but none of these constructions give the magnified flame appearance of the light which is the principal object sought by me.

In obtaining the objects above stated I have provided certain constructions illustrated in the accompanying drawings wherein—

Figure 1 is an elevational view, partly in section, of a lamp chimney embodying my improvements; Fig. 2 is an enlarged sectional view of the chimney of Fig. 1; Fig. 3 is an elevational view, partly in section, of a lamp globe embodying my improvements; and, Fig. 4 is a diagrammatic view, illustrative of the relation of the several lenses on one surface of the chimney or globe to those on the other surface thereof.

Referring first to Figs. 1 and 2; I have here shown my improvements as applied to a chimney 10, which may be used with common oil or gas flame, or with slight modifications of the upper portion 11 with an electric arc-lamp. It will be observed that upon the outer surface 12 of such chimney I have arranged a number of bull's-eye lenses 13, preferably convex, and on the inner surface 14 thereof, lenses 15, of somewhat smaller diameter to the end that I may attain a relation between such lenses to be below described.

Referring now more particularly to Fig. 3, it will be observed that I have here shown my improvements as applied to a globe such as is available for use with electric light bulbs containing an incandescent filament, or with inverted gas flames acting upon incandescent candles. It should be understood that the general arrangement of the lenses 13^a and 15^a is similar to that of Fig. 1, save that the size of the lenses decreases from the largest diameter on such globe proportionately to the decrease in diameter of such globe.

Referring now more particularly to Fig. 4, it should be understood that I have here illustrated my preferred form of arrangement of the several series of lenses. The greatest amount of diffusion is attained with

the least number of lenses, as here shown as follows: The lenses 13 are arranged in horizontal rows 17, 18 and 19, having the axes of each row of lenses in the same horizontal plane, and the axial planes of the several rows parallel, in such a manner that the lenses of each vertical row 20, 21 and 22 also have their axes in the same vertical plane and such several planes are substantially at right angles to the planes of the rows 17, 18 and 19. Light which would otherwise pass uninterruptedly through the interstices 16 between the several lenses on the outer surface, is interrupted and diffused by means of the arrangement of lenses 15 on the inner surface of the chimney or globe, which are similarly arranged to those of the lenses 13, as indicated in dotted lines in Fig. 4, and so positioned that the center of each lens 15 is substantially the center of each interstice 16, and vice-versa. It will thus be observed that substantially no ray of light may pass through the chimney or globe without being subject to one of the lenses 13 or 15, and that thus a maximum diffusion and appearance of solid flame is attained.

On viewing Fig. 2 it will be seen that there is a substantial corrugation of all that part of the chimney adjacent to the flame, save the lines of nearest approach between the vertical rows indicated at 23 and 24 and the horizontal rows indicated at 25 and 26, on both sides of the chimney, and that even at such points as at 27 (Fig. 3) there is a corrugation on one surface of the chimney allowing for a reasonable degree of expansion, and the consequential danger of fracture, either from expansion or shock, is largely avoided.

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

1. A light refractor or diffuser having a plurality of rows of lenses on the outer and inner surfaces thereof, the lenses of one row of the outer surface being arranged on a common axial plane and the lenses of another row being arranged on a common axial plane at an angle to the first mentioned axial plane, and the lenses on the inner surface being smaller than those of the outer surface, similarly arranged, and positioned to completely cover the interstitial spaces between the lenses on the outer surface, whereby a common relative relation of the lenses on one surface to those of the other surface is maintain . and thereby all light passing through the portion of the inclosure having lenses applied thereto is equally diffused by lenses throughout all parts of such portion.

2. A light refractor or diffuser having lenses arranged on both the inner and outer surfaces thereof, the lenses on one surface being arranged over the interstices of the lenses on the other surface.

3. A light refractor or diffuser having lenses arranged on both the inner and outer surfaces thereof, the centers of the lenses of one surface of the chimney being arranged off-center relatively to the centers of the lenses on the other surface thereof, and but partly over such lenses.

4. A light refractor or diffuser having lenses arranged on both the inner and outer surfaces thereof, the axial planes of the lenses of one surface thereof being arranged substantially opposite the centers of the interstitial spaces on the other surface.

5. A light refractor or diffuser having lenses arranged on both the inner and outer surfaces thereof, the lenses of one surface being arranged approximately adjacent the centers of the interstitial spaces between the lenses of the other side thereof, whereby such interstitial spaces are completely covered.

6. A light refractor or diffuser provided with a plurality of vertical and horizontal series of rows of lenses on the outer and inner surfaces thereof, the lenses of the opposing surfaces being out of axial alinement, the lenses of one surface being of a different size from the lenses of the other surface.

7. A light refractor or diffuser having a surface provided with substantially contiguous lenses arranged in rows, each row including a plurality of lenses with the axes of each row in the same horizontal plane and the axial planes of the several rows parallel and the lenses of each vertical row having their axes in the same vertical plane with said planes substantially at right angles to the planes of the horizontal rows.

8. A light refractor or diffuser having a plurality of rows of lenses on the outer and inner surfaces thereof the lenses of one row being arranged on a common axial plane and the lenses of another row being arranged on a common axial plane at an angle to the first mentioned axial plane.

9. A light refractor or diffuser having a plurality of rows of lenses on the outer and inner surfaces thereof, the lenses of one row being arranged on a common axial plane and the lenses of another row being arranged on a common axial plane at an angle to the first mentioned axial plane on one side of the chimney, and the lenses on the other side being similarly arranged and positioned over the interstitial spaces between the lenses on the opposite side of the chimney.

10. A light refractor or diffuser having lenses arranged in a plurality of series of rows on both the inner and outer surfaces thereof, the rows of each series on one surface being arranged at an angle to those of

each series on the other surface and projecting into the interstitial spaces therebetween.

11. A light refractor or diffuser having substantially contiguous lenses of substantially like form arranged in a plurality of series of vertical and horizontal rows on both the inner and outer surfaces thereof.

12. A light refractor or diffuser provided with a plurality of series of rows of substantially contiguous lenses of substantially like form on both the outer and inner surfaces thereof, the lenses of the outer surface being larger than the lenses of the inner surface.

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

EMIL GOTTFRIED JOHANSON.

Witnesses:

PAUL CARPENTER,

E. C. NAYLOR.