

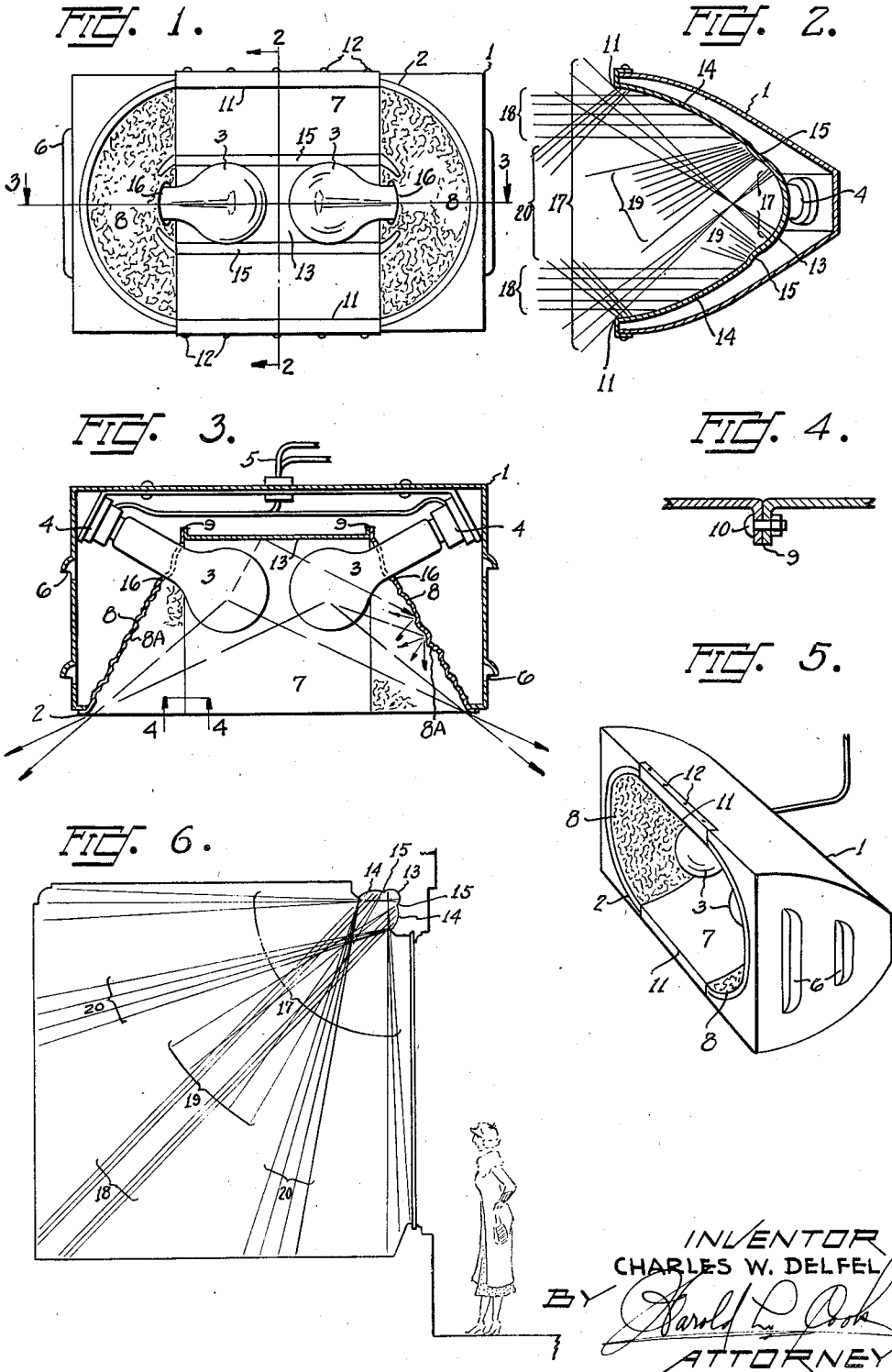
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LIGHTING FIXTURE

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LIGHTING FIXTURE

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This invention relates to lighting fixtures which employ a plurality of light sources, and more particularly to reflectors adapted to cooperate therewith to produce a uniformly lighted area.

More especially, the invention relates to lighting fixtures for illuminating show windows wherein merchandise is displayed to the public, and has for its principal object the provision of a reflector in operative combination with a plurality of light sources whereby the greater number of light rays emanating from the light sources are concentrated in the zone wherein the merchandise is displayed. The light is designed to illuminate an angular space, as from the ceiling to the floor along the back prop of a show window and forward to the window glass, with apparent uniform intensity throughout the window space. The lighting fixtures are not intended to be used singly, two or more being used to illuminate each window. Each unit has a wide angle of reflection, and light is cast for a considerable distance over the ends of the fixture. This tends to distribute the rays both in front of and behind the merchandise, and to eliminate shadows.

It is, therefore, a further object of the invention to provide reflectors for lighting fixtures primarily intended for lighting show windows, which so distribute the light throughout the window that no shadows are cast by the merchandise being displayed.

A further object of the invention is to provide a lighting fixture employing a reflector-projector which will concentrate the light rays in proportion to the distance which they are intended to be projected.

A further object of the invention is to provide a lighting fixture which is highly efficient and economical in operation, which will effectively light an area such as a show window without the presence of light streaks or the waste of light through double reflections, and which will prevent the escape of light rays to areas not intended to be lighted.

A further object of the invention is to provide lighting fixtures for show windows which will effectively and efficiently illuminate the window space with a smaller number of fixtures than heretofore believed necessary, with consequent intervals of rest to the eye and the elimination of a greater proportion of the glare usual in window lighting.

With these and other objects in view, the invention resides in the novel construction and

combination of parts hereinafter described, illustrated in the accompanying drawing, and set forth in the appended claims; it being understood that various changes in form, proportion, size and details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawing:

Figure 1 is a front elevation of a lighting fixture embodying the present invention.

Figure 2 is a transverse sectional elevation taken along the line 2-2 of Figure 1, certain parts of the fixture being omitted for the sake of clarity.

Figure 3 is a longitudinal sectional elevation taken along the line 3-3 of Figure 1.

Figure 4 illustrates the method of uniting the middle or body section of the reflector with the end sections thereof. The view is taken on the line 4-4 of Figure 3.

Figure 5 is a perspective elevational view of the lighting fixture.

Figure 6 is a diagrammatical view of a show window illustrating a preferred installation of the lighting fixture herein described and showing the distribution of light rays from the fixture.

The drawing illustrates a lighting fixture comprising a casing 1, within which is mounted a reflector generally indicated at 2. Electric bulbs 3-3 are mounted in sockets 4-4 to which electrical energy is supplied by means of conductors 5. The walls of the reflector 2 are maintained in spaced relation to the walls of the casing 1, and air is admitted to the intervening space by means of vents 6-6 in the end walls of the casing 1.

The reflector 2 comprises a middle or body section 7 and end sections 8-8, the meeting edges of the respective sections being flanged as at 9. A plurality of bolts 10 secure the meeting flanges 9 to maintain the unitary relation of the component sections of the reflector. The body section 7 of the reflector is disposed between spaced, parallel edges 11-11, flanged portions of which engage the rim of the casing 1 and are secured thereto by screws 12. By removing the screws 12 the reflector 2 may be removed from the casing 1 as a unit, the bolted flanges 9 of the respective sections thereof serving to maintain the reflector in its desired shape.

The reflecting surface of the body section 7 may be described as incorporating three distinct portions. The bottom or central portion 13 of the body section 7 conforms to a segment cut

from a circular cylinder, the axis of which is coincident with the axis of the respective light sources. This cylindrical portion describes an arc of 90°, the chord of the arc being determined by lines drawn from the edges 11—11 of the body section and intersecting the axis of the electric bulbs 3—3. Intersecting the circular cylindrical portion 13 is a segment cut from a parabola which forms the forward walls 14 of the body section 7. As the walls 14 of the body section 7 approach the vertex thereof, they are blended with the segment of the circular cylinder 13 by means of a wall portion 15 which is curved inversely to the curvature of the portions 14 and 13 of the walls. Thus the body section 7 of the reflector is defined by a plurality of straight lines disposed parallel to its longitudinal axis, which lines define the surfaces of a plurality of curves disposed in a vertical plane transversely of said longitudinal axis.

The end sections 8—8 of the reflector are more regular in form, being identical surfaces conforming to the surface of a segment cut from an approximation of a right circular cone. In the present construction, however, the apex of the cone is rounded to conform to the cylindrical portion or vertex of the body section 7, and the meeting edges of the end sections 8—8 approximate a cross section of a parabola to conform to the contour of the body section 7. The inverse curve 15 in the wall of the body section is permitted to disappear in the end sections, as shown in Figure 1, from which point the end sections 8—8 of the reflector are more truly conical. Preferably, the end sections 8—8 are disposed at an angle of 30° from a vertical line intercepting the point of union with the body section 7. The end sections of the reflector are of hammered metal, as indicated at 8a, the purpose of which will be hereinafter more specifically described.

The sockets 4—4 are placed in the end portions of the casing intermediate the end walls and the end sections 8—8 of the reflector. In each of the end sections 8—8 is an opening 16 which is designed to admit the cylindrical or stem portion of an electric bulb 3, to permit the same to be screwed into one of the sockets 4—4. Each electric bulb 3 is disposed at an angle of approximately 90° to the respective end section 8 of the reflector, and at an angle of 30° to the longitudinal axis of the body section 7 of the reflector.

The light rays emanating from the electric bulbs are projected from the reflector as best shown in Figures 2 and 6. The direct rays flow from the light source to illuminate an arc of approximately 90°. The shorter rays from the light source are, of course, of greater intensity than the longer ones, and it is the purpose of the reflector to reinforce the longer rays in proportion to the distance they are intended to be projected to illuminate a particular area.

It will be remembered that light rays leave a reflecting surface at an angle corresponding to that at which they approach it from a source of light. Therefore, the light rays reflected by the circular cylindrical portion 13 of the body section 7 of the reflector are projected thereby at an angle of 90° to the light source and serve to reinforce the direct rays from the light source through a corresponding arc of 90°. These intensified rays are indicated by the brackets marked 17 in Figures 2 and 6. The action of the light rays from the walls 14 of the reflector is similar to the action of rays from any parabolic

reflector, the rays being projected straight ahead, as indicated at 18, to illuminate the middle distance. The light rays reflected by the inversely curved portions 15 of the reflector walls are projected therefrom in a broad fan of light as indicated at 19. These rays are distributed throughout the middle distance and to areas adjacent thereto, and blend with and reinforce the straight ahead rays 18 projected from the walls 14 of the reflector.

The walls 14 of the reflector are flattened at their extreme forward edges tangentially to the curved portion, and from this portion of the reflector the light rays 20 are projected at the angle of incidence to blend with and assist the previously described reinforced direct rays 17 in illuminating the immediate foreground of the window and the upper portion of the back prop.

An important feature of the invention is the arrangement of the hammered end sections of the reflector. It will be noted that the angle at which the electric bulbs 3—3 are placed is such that they are "pointed" at the end sections of the reflector. The shadow of the filament of each bulb is cast upon the opposite end section of the reflector and is effectively scattered by the innumerable reflections presented by the hammered or broken surfaces of the metal. It will be appreciated that the end sections 8—8 may be hammered or ribbed or otherwise roughened to break up and scatter the light rays.

In Figure 6 is shown a cross section of a window illumed by the fixture herein described. It is to be noted that there is a concentration of the light rays over that portion of the window wherein the merchandise is displayed, and that to those areas where no light is required, no light rays are projected. Thus, no light is thrown upon the ceiling, and no light rays escape to the sidewalk. However, the concentration of light rays in the display areas is so gradual that to an observer all portions of the window appear to be uniformly lighted.

Applicant's lighting fixtures are designed to be installed in a window in side by side spaced relation, the fixtures being spaced apart approximately 30 inches. The lesser light rays which are projected from the end sections 8—8 of adjacent reflectors approximate the same intensity as the rays projected from the respective body sections 7, and thus effect an even lighting of the entire window. The spacing of the fixtures creates intervals of rest therebetween, and eliminates the greater proportion of the glare incident to window lighting. This is particularly true in corner windows, wherein a number of the fixtures are exposed to view across the angle of the window.

It may be stated that although the particular embodiment of the invention herein described is primarily designed for the illumination of show windows, its application is not necessarily confined thereto, but may be used either in its entirety or in part, and either with or without modifications, for the illumination of other areas as well, and I deem myself entitled to all such uses, modifications and/or variations thereof as may fall within the spirit and scope of the claims hereto appended.

Having now described my invention and in what manner the same may be used, what I claim as new and desire to protect by Letters Patent is:

1. In a lighting fixture having a plurality of light sources, a reflector comprising a body por-

tion and two end portions, the body portion defined by a plurality of straight lines parallel to its longitudinal axis and to each other which define the surfaces of a central portion conforming to a segment cut from a circular cylinder and wall portions conforming to a segment cut from a parabola, the central and wall portions being separated by a portion curved inversely to the central and wall portions, the axis of the cylindrical segment lying in a common plane with the axes of the light sources and parallel with the axis of the parabolic segment, the end portions being identical segments of the surface of an approximation of a right circular cone arranged in spaced opposition on opposite ends of and in intersecting relation with said body portion.

2. In a lighting fixture having a plurality of light sources, a reflector comprising a body portion and two end portions, the body portion defined by a plurality of straight lines parallel to its longitudinal axis and to each other which define the surfaces of a segment cut from a parabola and a segment cut from a circular cylinder, the axis of the cylindrical segment lying in a common plane with the axes of the light sources and parallel with the axis of the parabolic segment, the end portions being identical segments of the surface of an approximation of a right circular cone arranged in spaced opposition on opposite ends of and in intersecting relation with said body portion.

3. In a lighting fixture having a plurality of light sources, a reflector-projector having a body portion defined by a plurality of straight lines parallel to its longitudinal axis and to each other which define the intersecting surfaces of a segment cut from a parabola and a segment cut from a circular cylinder in a perpendicular plane transversely of said longitudinal axis, the axis of the cylindrical segment lying in a common plane with the axes of the light sources and parallel with the axis of the parabolic segment.

4. In a lighting fixture having a plurality of light sources, a reflector-projector having a body portion conforming to a segment of a parabola intersecting a segment cut from a circular cylinder, the last defined segment forming the apex or central portion of said body portion, the axis of the cylindrical segment lying in a common plane with the axes of the light sources and parallel with the axis of the parabolic segment.

5. In a lighting fixture having a plurality of light sources, a reflector-projector having a body portion conforming to a segment cut from a parabola which intersects a segment cut from a circular cylinder, the last defined segment forming the apex or central portion of said body portion, the axis of which segment lies in a plane with the axes of the light sources and parallel with

the axis of the parabolic segment, the walls of said body portion being curved inversely to and intermediate said cylindrical segments.

6. In a lighting fixture having a plurality of light sources, a reflector having a body section and opposed end sections, the several sections being secured in unitary relation, the body section having wall portions conforming to a segment of a parabola, and having a central portion forming the apex of said body section and conforming to a segment cut from a circular cylinder, the axis of the central portion lying in a plane with the axes of the light sources and parallel with the axis of the parabolic segment, the body section being defined by a plurality of straight lines parallel to its longitudinal axis and to each other, each of the respective end sections conforming to the surface of an approximation of a right circular cone, the apex of each end section being rounded to conform to the meeting edges of the central portion of the body section, and electric sockets in each end of the fixture so positioned as to receive electric light bulbs which extend through openings in the end sections of the reflector, each said bulb being pointed at the opposite end section of the reflector.

7. In a lighting fixture having a plurality of light sources, a reflector having a body section and a pair of opposed end sections, said body section comprising a central apex portion conforming to a portion of a circular cylinder, said body portion also comprising lateral wall portions conforming to portions of a parabolic cylinder, said central and wall portions being joined by inversely curved portions, the axis of the central portion lying in a common plane with the axes of the light sources and parallel with the axis of the parabolic portions, each of the respective end sections conforming approximately to the surface of a right circular cone but being irregularly deformed to prevent the reflecting of shadows and light streaks from said light sources.

8. In a lighting fixture having a plurality of light sources, a reflector having a body section and a pair of opposed end sections, said body section comprising a central apex portion conforming to a portion of a circular cylinder, said body portion also comprising lateral wall portions conforming to portions of a parabolic cylinder, said central and wall portions being joined by inversely curved portions, the axis of the central portion lying in a common plane with the axes of the light sources and parallel with the axis of the parabolic portions, said lateral wall portions terminating at their outer edges in flattened portions, and each of said respective end sections conforming approximately to the shape of a right circular cone.

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