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H. L. LOGAN

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LUMINAIRE

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Fig. 1.

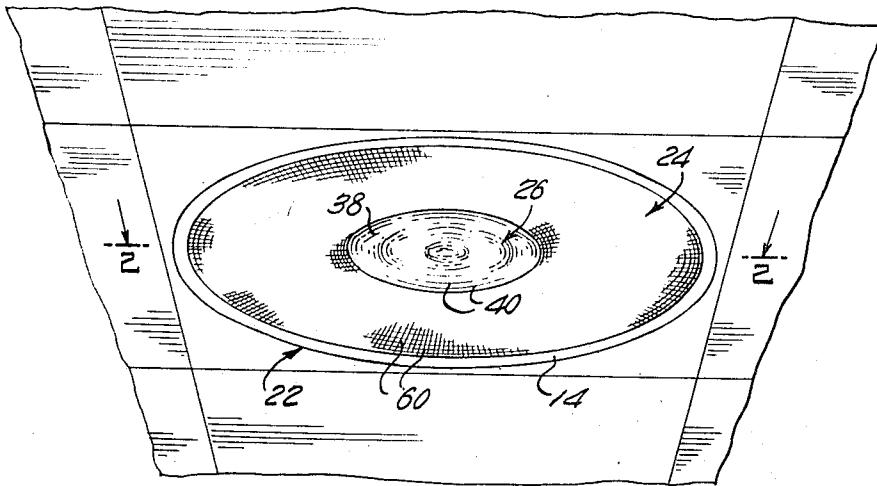
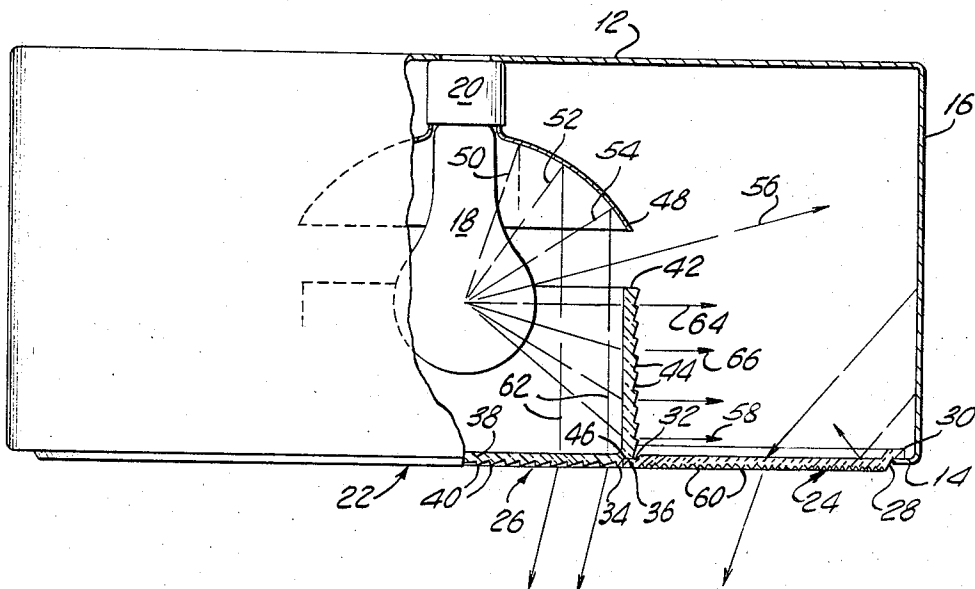


Fig. 2.



INVENTOR
HENRY L. LOGAN
BY
Molte & Molte
ATTORNEYS

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3,291,979

LUMINAIRE

Henry Leon Logan, Bronxville, N.Y., assignor to Holophane Company, Inc., New York, N.Y., a corporation of Delaware

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3 Claims. (Cl. 240—78)

This application is a continuation of my copending application Serial No. 290,071, filed June 24, 1963.

The present invention relates to incandescent lighting units for general interior lighting.

It is an object of the present invention to provide a luminaire for incandescent lamps or point light sources wherein there is provided a bottom lens made of a central lens portion and a separate annular portion extending about the periphery thereof, and with a vertical internal refractor to prevent sharp lighting changes between the central lens portion and the outer annular portion.

It is another object of this invention to provide such a luminaire wherein the central lens provides a narrow light distribution to cut down high angle brightness and wherein light not received directly by the central lens is refracted upwardly as much as possible by the internal refractor. Thus, a minimal amount of direct light from the lamp is permitted to reach the annular lens portion.

It is another object of the present invention to provide the annular portion of the lens in a pale blue color and with light directing cones on its light emergent surface. As there is no direct lamp image upon the annular portion, these cones may be as small as feasible.

Another object of this invention is to provide a luminaire effecting a simulacrum of sunlight from a blue sky, and simulating the effect of sunlight and skylight (or natural lighting) on a clear day.

This invention finds particular application in recessed luminaires, such as in ceiling luminaires.

For other objects and a better understanding of this invention reference may be had to the following detailed description taken in connection with the accompanying drawing in which:

FIG. 1 is a perspective view of a recessed luminaire embodying the invention;

FIG. 2 is a sectional view taken along the line 2—2 in FIG. 1 but showing details of the right side only.

Referring now in more detail to the drawings wherein similar reference numerals identify corresponding parts throughout the several views; numeral 10 represents a luminaire of this invention, substantially as shown.

The housing 12 attached to suitable support means (not shown) preferably within a ceiling, includes a rim portion 14 depending inwardly from the bottom of the side 16 thereof. Rim 14 extends about the entire circumference of the housing. A suitable light source 18, supported from socket 20 is positioned centrally within the luminaire 10.

The bottom lens 22 consists of two elements, an annular refractor 24, a cup-shaped refractor 26. The annular refractor 24 includes an end portion 28 which forms a ledge 30 for supporting the refractor 24 upon rim 14. An inner end 32 of the annular refractor forms an opening 34 which is centrally located directly beneath light source 18, within the luminaire. Inner end 32 includes a support ledge 36 which circumscribes the opening 34.

The cup-shaped refractor 26 opens upwardly within the luminaire and includes a central bottom lens 38 having a plurality of annular light depressing prisms 40 located on the outer surface thereof. The combination of the lens 38 and the prisms 40 redirect the light incident on lens 38 so that this light is inwardly directed, thereby

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creating a narrow light distribution below the luminaire 10 as shown by the light rays 62 in FIG. 1. The vertical internal wall of refractor 26 includes a plurality of light-lifting and diffusing elements 44 positioned around the outer surface. As shown by light rays 64 and 66 in FIG. 1, the light incident upon wall 42 passes through prisms 44 which are so arranged that the light rays are directed in an upward direction. Prisms 44 redirect the light beam in an upward direction and diffuse the light which is incident to wall 42. A rim portion 46 circumscribes the central lens 38 and extends outwardly therefrom to form a ledge which rests upon the inner support ledge 36 of annular refractor 24.

As can be seen from FIG. 2, a portion of the light emanating from source 18 is reflected from reflector 48, as indicated by the rays 50, 52 and 54 and is directed downwardly and through central lens 38. Other rays represented by 56 travel to the inner surface of side 16 of housing 12 as shown. Further rays, represented by 58, are refracted and/or diffused through the wall 42 and elements 44 of the refractor 26 in directions to avert their direct incidence upon the annular refractor 24. Rays 56 and 58 are diffused by the inner surfaces of housing 12 and as diffused are received by annular refractor 24.

Thus it can be understood that the light which is not directly received by the central lens 38 is treated and prevented from directly striking the annular refractor 24.

Preferably, the annular refractor 24 is composed of glass having a very pale blue color and includes a plurality of cut-off cones 60 on the bottom surface thereof to receive the diffused light from the housing inner surfaces for eliminating the high angled light components thereof. The diffused light which strikes the cones 60 at an angle greater than a predetermined value will be refracted upwards and therefore will not be transmitted to the surface below thus permitting only low angle incident beams to be transmitted to the surface below. The high angle rays will be merely refracted through the conical surfaces and not transmitted below. Cones 60 may be as small as is feasible with the glass utilized in the refractor, as no direct light is being handled.

It will be noted that the presence of the internal refractor 26 serves to prevent a sharp change between the yellow of the light which is refracted through the central lens which is not pale blue and the blue light which shines through the annular refractor. The blue light of the annular refractor and the yellow of the central light will thereby smoothly merge from one into the other.

While various embodiments of the invention have been shown and described in detail, to illustrate the application of the inventive principle, it should be understood that the invention may be embodied otherwise without departing from such principles.

I have described what I believe to be the best embodiments of my invention. I do not wish, however, to be confined to the embodiment shown, but what I desire to cover by Letters Patent is set forth in the following claims:

What is claimed is:

1. A luminaire comprising a housing, a light source positioned centrally within said housing, an annular reflector positioned above and extending outwardly from said light source, a bottom lens encompassed by said housing and positioned below said light source, said bottom lens including an outer annular portion secured by said housing, said outer annular portion including a plurality of cut-off cones positioned thereon, and an inner central portion which rests upon the inner periphery of said outer annular portion, said inner central portion including a vertical central refractor having a plurality

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of light-lifting and diffusing elements positioned around the outer surface of said central refractor, said inner central portion also including a central bottom refractor having a plurality of annular light depressing prisms positioned on the outer surface thereof.

2. In combination in a luminaire, including a housing, a reflector, a light source positioned below said reflector, and means for transmitting light positioned below said light source, said reflector directing substantially all of the reflected light vertically downwardly, said means for transmitting light comprising a central portion receiving substantially all of said reflected light and including means for concentrating the same into a comparatively narrow beam, said means for transmitting light further comprising an outer portion, a vertical portion intermediate said central and outer portion and including means for vertically redirecting incident light from said source to above said outer portion to the walls of said housing, and means formed on said outer portion for downwardly redirecting diffused light from said housing walls.

3. In combination in a luminaire, including a housing, a light source positioned within said housing and means

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for transmitting light positioned below said light source, said means for transmitting light comprising a central portion including means for receiving light incident thereon and for concentrating the same into a comparatively narrow beam, said means for transmitting light further comprising an outer portion, a vertical portion intermediate said central and outer portion and including means for vertically redirecting incident light from said source to above said outer portion to the walls of said housing, and means formed on said outer portion for downwardly redirecting diffused light from said housing walls.

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NORTON ANSHER, *Primary Examiner.*