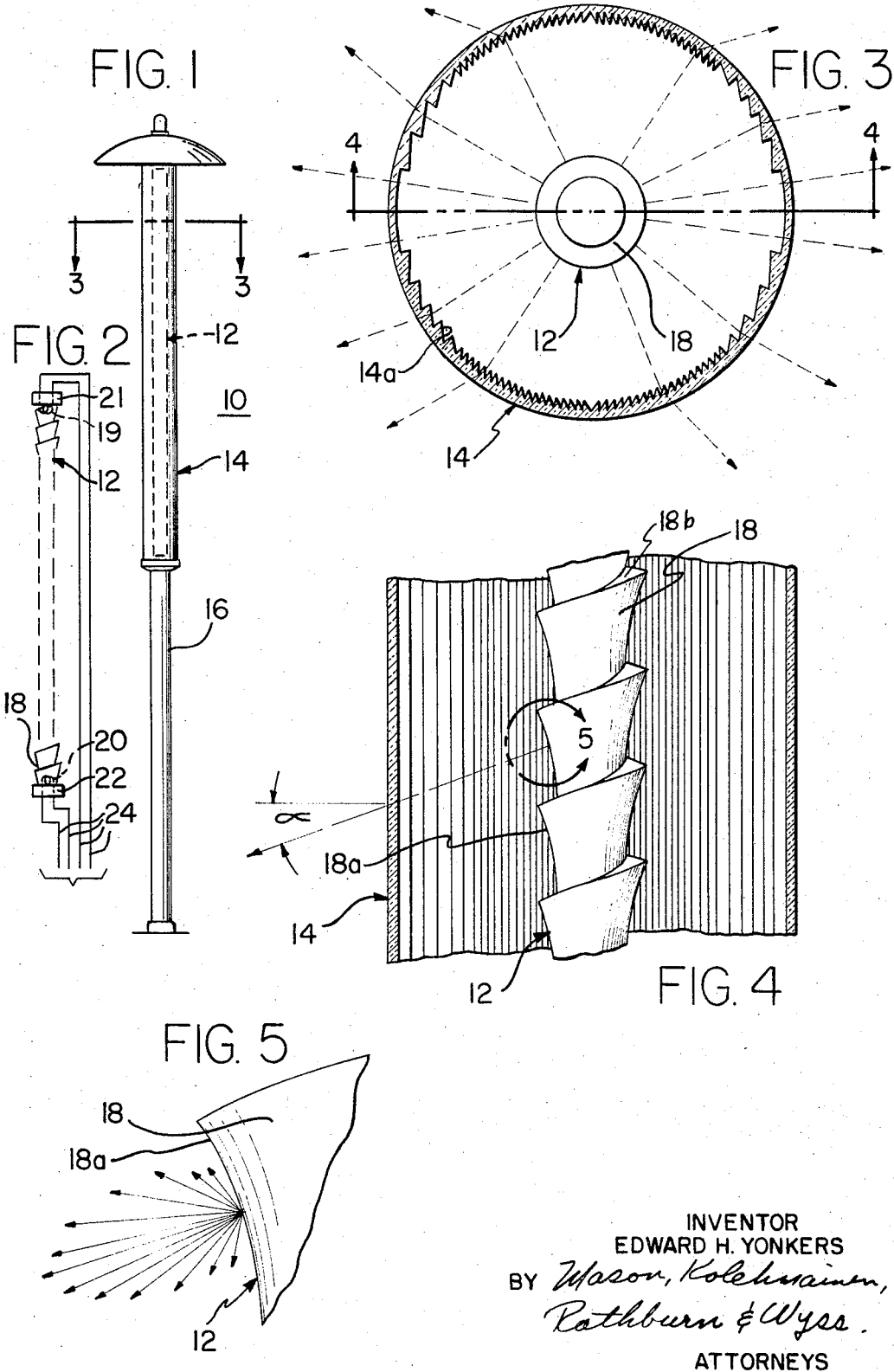


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ELONGATED LUMINAIRE WITH DIRECTIONAL CONTROL
OF LIGHT DISTRIBUTION
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ELONGATED LUMINAIRE WITH DIRECTIONAL CONTROL OF LIGHT DISTRIBUTION

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3 Claims. (Cl. 240-3)

ABSTRACT OF THE DISCLOSURE

An electric lamp includes an envelope having an outer wall shaped with spiraling concave wall surfaces generally inclined inwardly and downwardly to provide for vertical light control by the shaped surface of the lamp envelope. Such an envelope is particularly advantageous when used with a low pressure discharge lamp such as a fluorescent lamp having its light producing medium on the inner surface of the envelope.

The present application is a continuation of application Ser. No. 418,741 filed Dec. 16, 1964 by Edward H. Yonkers and assigned to the same assignee as the present invention.

The present invention relates to luminaires, and more particularly, to luminaires of the type adapted for street and other outdoor lighting.

Commercially available luminaires employing elongated tubular lamps are available. Such luminaires are generally constructed with the elongated lamp suspended generally horizontally, or inclined to the vertical, and employ reflectors to provide desired light distribution.

One object of the present invention is to provide a new and improved luminaire which utilizes the envelope of the lamp to provide directional control of the light distribution of the lamp.

A further object of the present invention is to provide a new and improved elongated lamp having an envelope of geometrical shape to provide for directional control of the light distribution.

Yet another object of the present invention is to provide a new and improved luminaire.

Yet another object of the present invention is to provide a new and improved elongated lamp.

Further objects and advantages of the present invention will become apparent as the following description proceeds and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

In accordance with these and many other objects of the present invention, there is provided a new and improved elongated electric lamp having an envelope with the light producing medium on the inner surface thereof. The envelope is of a preselected geometric configuration to provide for directional control of the light. In a preferred embodiment of the invention wherein the elongated lamp is adapted to be mounted vertically, the lamp envelope consists of spiraling concave wall surfaces generally inclined inwardly toward one end to provide for longitudinal light control by the shaped surface of the lamp envelope. Since the maximum light output is generally perpendicular to the emitting surface, the light will be directed toward the one end of the lamp.

The invention also relates to a street lighting luminaire of the type having a vertically positioned elongated cylindrical refractor, with a lamp according to the present invention mounted within the refractor. The refractor may contain refractive elements on one of its surfaces to provide for light distribution control. In a preferred embodi-

ment of the invention, the refractive elements are on the inner surface and provide lateral control. In this manner the combination of the formed lamp envelope, providing for vertical light control, and the refractive elements of the refractor, providing for lateral light control, will direct the light distribution of the luminaire in the desired direction.

For a better understanding of the present invention, reference may be had to the accompanying drawings, wherein:

FIGURE 1 is an elevational view of an outdoor lighting luminaire according to the present invention;

FIGURE 2 is an elevational view, somewhat schematic, of a lamp adapted to be used in the luminaire of FIGURE 1 according to the present invention;

FIGURE 3 is a cross-sectional view of the luminaire of FIGURE 1, taken along line 3-3 of FIGURE 1, and drawn to a larger scale;

FIGURE 4 is a partial sectional view of the luminaire of FIGURE 3, taken along line 4-4 of FIGURE 3; and

FIGURE 5 is an elevational, detailed view of the refracting surface of a lamp envelope, illustrating the detail 5 of FIGURE 4.

Referring now to the drawings, there is illustrated a luminaire 10 adapted for outdoor installation such as a street lighting luminaire and including a vertically extending, elongated, somewhat tubular fluorescent lamp 12 concentrically positioned within a vertically positioned, elongated, cylindrical refractor 14. The lamp 12 and refractor 14 are mounted at the upper end of a light pole 16.

Referring now to the lamp 12, according to the present invention the lamp 12 may include any suitable light source wherein the light producing medium is on the inner surface of the lamp envelope, and may for example, be of the low pressure discharge type described in U.S. Patent 2,774,918 granted Dec. 18, 1956, to Eugene Lemmers and commonly known as a fluorescent lamp. As illustrated in FIGURE 2, the lamp 12 consists of an elongated envelope 18 having electrodes 19, 20 sealed in opposite end thereof, containing an ionizable medium, and provided with a fluorescent phosphor coating on the inner surface of the envelope. The lamp 12 is vertically supported within the refractor 14 between spaced terminal blocks 21, 22 to provide for electrical connection through suitable electrical leads 24 connected to suitable ballast or other control means which may, if desired, be mounted within the light pole 16.

In accordance with the present invention the envelope 18 has an outer wall shaped with spiraling concave wall surfaces 18a forming emitting surfaces, FIGURES 4 and 5, generally inclined inwardly toward one end of the lamp to provide for light control due to the phosphor coating on the emitting surfaces forming the inner surface of the spiral tube. As the maximum light output is generally perpendicular to the emitting surfaces 18a, the light distribution is controlled by the shape of the lamp envelope. Additionally an upper surface 18b is defined on the envelope 18 inwardly from the top of the spiraling wall surfaces 18a. As this upper surface 18b is coated with phosphor, this surface will emit light generally upwardly; however the area of the upper surface 18b is small and the upward light loss will not be great. Advantageously the upper surface 18b can be blacked out by a suitable opaque exterior coating. The illustrated concave envelope will provide a light distribution normal to its surface as indicated by the arrows in FIGURE 5, which will have a resulting maximum candlepower at a predetermined angle α , FIGURE 4, below the horizontal. In this manner the vertical light control has been accomplished through the shaped surface of the light source.

To provide for lateral light control, the refractor 14 may be provided with suitable refractive elements. In the

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illustrated embodiment, lateral light control is achieved by vertical refractive elements 14a on the inner surface of the refractor 14. However, it will be understood that refractive elements may be on either or both the inner or outer surfaces of the refractor 14, and additionally, the refractive elements may provide for any combination of vertical and horizontal light control.

If desired, a reflector may be vertically positioned within the refractor 14 to further aid in the control of the light distribution. The lamp according to the present invention may advantageously be used in a luminaire of the type disclosed in my copending application (Case J-109) filed on even date herewith, and assigned to the same assignee as the present invention.

Although the present invention has been described by reference to only a single embodiment thereof, it will be apparent that numerous other modifications and embodiments will be devised by those skilled in the art which will fall within the true spirit and scope of this invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. An outdoor lighting luminaire comprising a vertically positioned, elongated, cylindrical refractor; and a generally tubular fluorescent lamp positioned vertically within said refractor, said lamp having light producing

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medium on the inner surface of said envelope, said lamp comprising a configured, elongated envelope having electrodes sealed in opposite ends and containing an ionizable medium, said envelope having an outer wall shaped with spiraling wall surfaces generally inclined inwardly and downwardly to provide for vertical light control by the shaped surface of said lamp envelope.

2. An outdoor lighting luminaire as set forth in claim 1 wherein said envelope includes upper surfaces extending inwardly from the top of said wall surfaces, and opaque coating on said upper surfaces.

3. An outdoor lighting luminaire as set forth in claim 1 wherein said spiraling wall surfaces are concave.

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