Jan. 9, 1940. T. W. ROLPH 2,186,079

LUMINAIRE

Filed Oct. 23, 1937 2 Sheets-Sheet 1

Fig. 1.

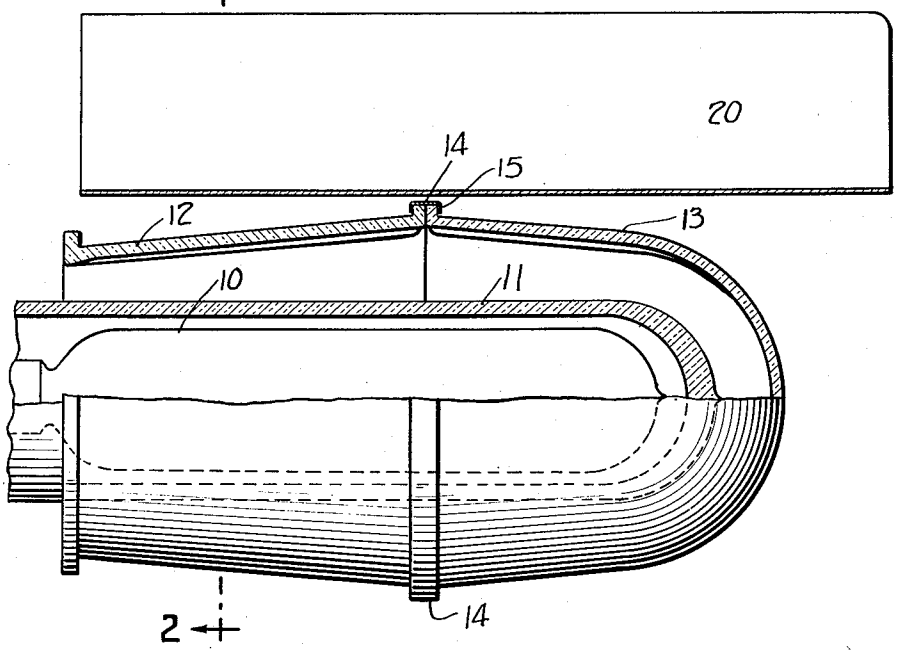


Fig. 2.

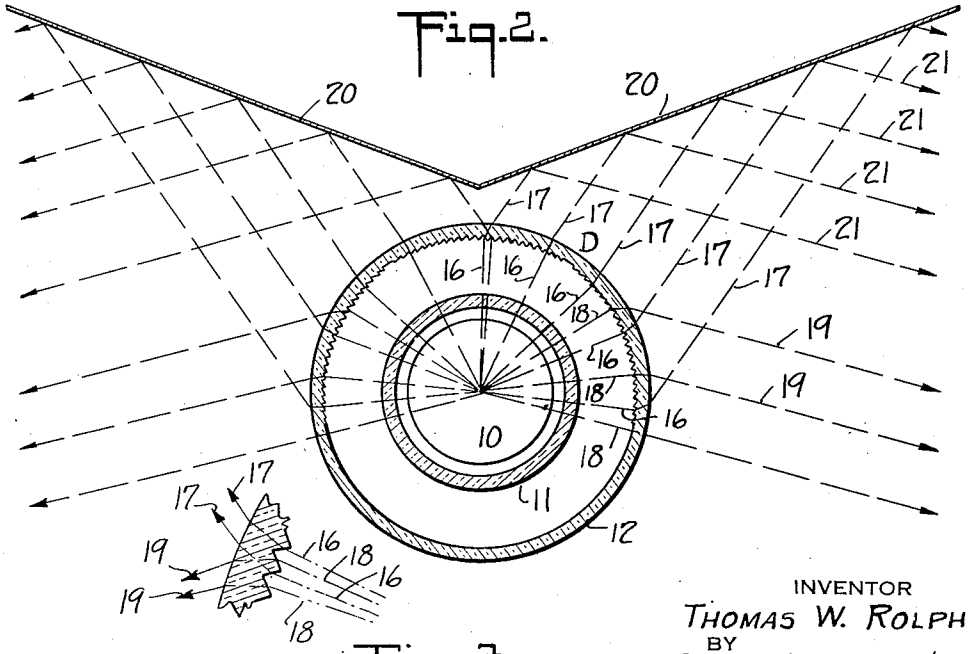


Fig. 3.

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Filed Oct. 23, 1937 2 Sheets-Sheet 2

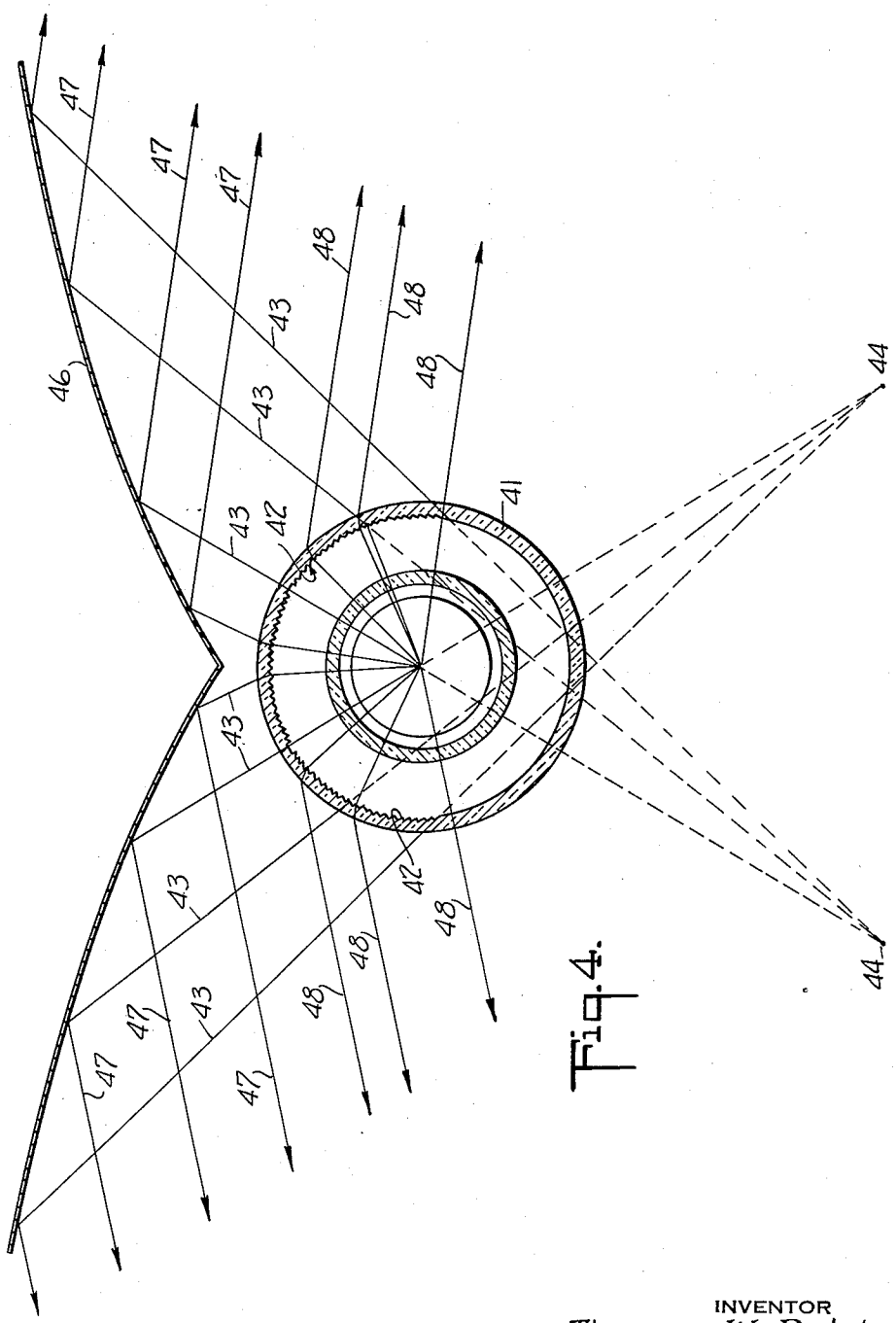


Fig. 4.

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LUMINAIRE

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7 Claims. (Cl. 240—25)

The present invention relates to luminaires, and is more particularly directed toward luminaires designed for lighting extended areas such as street surfaces.

The present invention contemplates the use of a long light source normally mounted horizontal and a combination of prisms and reflectors designed to act on the light to direct it toward the remote street areas.

A further object of the invention is to provide an arrangement of light controlling elements particularly suitable for use with sodium tube lighting.

The accompanying drawings show, for purposes of illustrating the present invention two of the many embodiments in which the invention may take form, it being understood that the drawings are illustrative of the invention rather than limiting the same.

In these drawings:

Figure 1 is a vertical sectional view through a street lighting luminaire with parts in elevation;

Figure 2 is a typical cross sectional view on the line 2—2 of Figure 1;

Figure 3 is an enlarged fragmentary view; and

Figure 4 is a view similar to Figure 1 showing a modification.

The evacuated bulb of a sodium lamp is indicated at 10. It is surrounded by the usual heat conserving enclosure 11. An ordinary long lamp bulb of the incandescent type may be used if desired.

The light source is surrounded by a prismatic envelope preferably made in two parts 12 and 13. These parts are held together by a metal band 14 spun about the flanges 15. The parts 12 and 13 may be readily made of pressed glass. The inside walls of these prismatic parts 12 and 13 are provided with longitudinally extending ribs which form prisms for light control.

In the region from zenith down approximately to, but preferably slightly below, the horizontal the prisms are arranged to concentrate light rays, such as 16, into an obliquely upwardly directed beam of parallel light rays 17. In the region from slightly below the horizontal to a considerable distance above the horizontal the prisms are such as to act on divergent light rays 18 and concentrate them into a downwardly sloping beam of parallel rays, indicated at 19. In the region below the point marked D these prismatic forms overlap, and the prisms are formed by ribbings such as indicated in Figure 3. One face of a rib acts on the rays 16 to elevate them, while the other face of the rib acts on the rays 18 to depress them. At the lower part of the prism area practically all of the light is refracted into the downward beam, and as the prism formation extends upwardly less and less of the light is refracted into the downward beam and more and more of the light is refracted into the upward beam. Toward the upper part of the prismatic area all of the light is refracted into the upward beam. This prismatic formation achieves a high efficiency in the use of the light.

The prismatic envelope and light source are mounted in any suitable manner below a V-shaped reflector 20, 20. This is preferably a metal reflector. Each side of the V-shaped reflector is placed at an oblique angle with respect to the light rays 17 and acts on these light rays to direct them downwardly and outwardly, as indicated at 21. According to the preferred design the rays 21 and 19 are parallel. Owing to the size of the light source of the sodium lamp there would be considerable spread of the light rays above and below the lines indicated in the drawings.

The enclosure 12, 13 affords an added heat conserving medium, so as to protect the enclosed light source against weather and against loss of heat.

In the arrangement shown in Figure 4, the same ultimate result is achieved by employing a refractor 41 having prisms 42 which concentrate the light into a moderately divergent beam 43 having a virtual center at 44. These rays fall on a parabolic reflector 46 and are directed into a beam of parallel rays 47. The lower prisms may be the same as those of Figure 1 so far as producing a downwardly directed beam 48 is concerned.

It is obvious that the invention may be embodied in many forms and constructions within the scope of the claims and I wish it to be understood that the particular forms shown are but two of the many forms. Various modifications and changes being possible, I do not otherwise limit myself in any way with respect thereto.

What is claimed is:

1. A luminaire comprising a horizontal rectilinear light source, a refractor concave toward the light source and having a series of prisms extending parallel with the light source, which refract rays in a predetermined zone from zenith into a beam directed obliquely above the horizontal, a rectilinear reflector parallel with and above the source and disposed obliquely to said refracted beam to intercept the same and reflect its rays into a downwardly oblique beam of sub-

stantially parallel rays, the refractor having an additional series of prisms for intercepting light from the source and refracting it into a beam substantially parallel with the beam reflected from the reflector.

2. A luminaire such as claimed in claim 1, wherein throughout a portion of the region occupied thereby the active surfaces of the prisms of one series alternate with the active surfaces of the prisms of the other series so that the bundles of rays falling on two adjacent surfaces are divided and one bundle deviated into the upper beam and the other bundle deviated into the lower beam.

3. A luminaire such as claimed in claim 1, wherein the reflector is in a plane and the first mentioned series of prisms are such that the upwardly extending beam is composed of parallel rays.

4. A luminaire such as claimed in claim 1, wherein the reflector is of parabolic cross section with its focus below and at the opposite side of the light source, and the first mentioned series of prisms are such that the upwardly extending beam is composed of rays diverging from said focus.

5. In a luminaire, a light source, a concentric prismatic member having prisms acting on light from the light source for concentrating rays into a beam directed above the horizontal, a reflector intercepting the reflected rays obliquely and reflecting them into a substantially parallel beam, the concentrating prisms opposite the more remote portion of the reflector alternating with light concentrating prisms of reversed sign which divert the rays intercepted thereby into a direct beam substantially parallel with the reflected beam.

6. In a luminaire, a light source, a concentric prismatic member having prisms acting on light from the light source for concentrating rays into a beam directed above the horizontal, a reflector intercepting the reflected rays obliquely and reflecting them into a substantially parallel beam, the concentrating prisms opposite the more remote portion of the reflector alternating with light concentrating prisms of reversed sign which divert the rays intercepted thereby into a direct beam substantially parallel with the reflected beam, the prism faces being so disposed that the proportion of the light diverted into one beam progressively increases while the proportion of light diverted into the other beam progressively decreases.

7. A luminaire comprising a rectilinear V-shaped reflector, a rectilinear light source disposed below the center of the reflector, and a refractor about the source, the refractor having two sets of longitudinally extending prisms each adapted to produce a beam of rays which falls on the adjacent side of the reflector, the angle of the V being such that the reflected beams are directed outwardly below the horizontal, the refractor also having two sets of longitudinally extending prisms each acting on direct light and concentrating it into a beam generally parallel with and below the adjacent reflected beam.

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