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D. H. TUCK ET AL

2,307,247

LIGHTING SYSTEM

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Fig. 1.

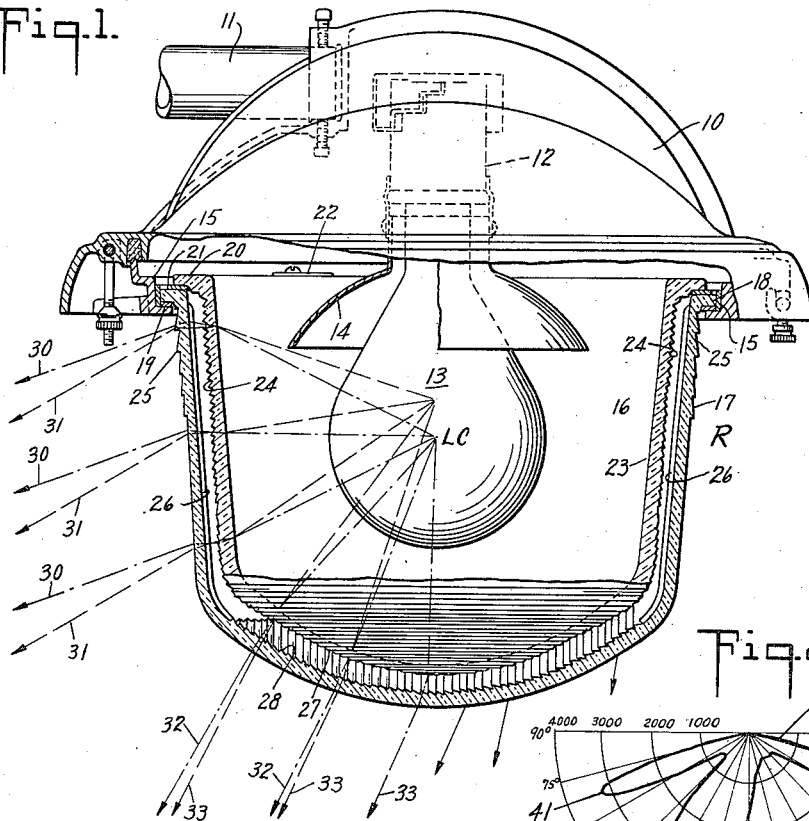


Fig. 2.

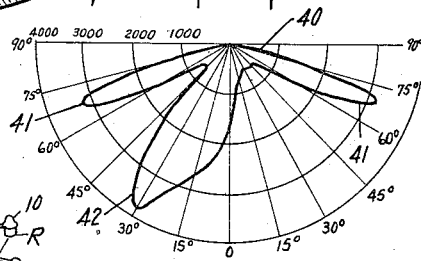


Fig. 3.

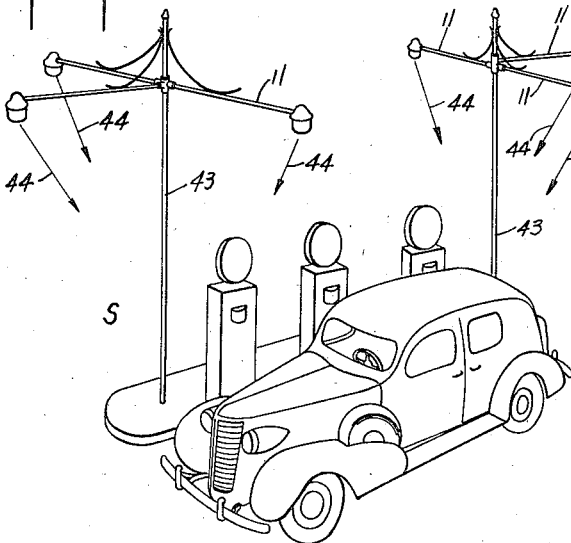
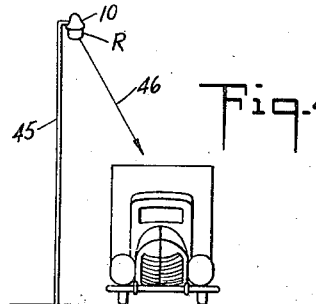


Fig. 4.



INVENTORS  
DAVIS H. TUCK  
and ROBERT W. STANLEY

BY  
*Joseph Shiberman*  
ATTORNEY

# UNITED STATES PATENT OFFICE

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## LIGHTING SYSTEM

Davis H. Tuck, Redding Ridge, Conn., and Robert W. Stanley, Jersey City, N. J., assignors to Holophane Company, Inc., New York, N. Y., a corporation of Delaware

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6 Claims. (Cl. 240—3)

The present invention relates to lighting systems, and is more particularly directed toward lighting systems for use in lighting the area adjacent the gasoline pumps of filling stations and the motor vehicles being serviced at these pumps.

The invention also relates to luminaires for use in obtaining general yard lighting as well as special lighting.

The pumps of gasoline filling stations are generally placed in islands past which the cars may be driven, and while the vehicles are alongside the island other servicing and inspection is necessary and to do this effectively intense lighting of the entire vehicle is highly desirable.

The present invention contemplates the mounting of a number of lighting units above the island beside which the vehicles stop, and providing these lighting units with light control means such that a symmetric beam of intense light is sent out all around the luminaire for lighting yard areas at distances remote from the luminaire, and the luminaires are arranged so as to provide a strong asymmetric beam directed at a comparatively low angle above nadir and toward the base of the support for the luminaires. By spacing the luminaires far enough from the center of the island and providing a strong beam of light downwardly and inwardly projected it is possible to light the entire exterior of the vehicles on either side of the island so that all ordinary inspections and tests may be made without the use of any auxiliary lighting, flashlights and the like.

In carrying out the present invention the luminaires are designed to use a single light source, and this light source is received in an annular refractor adapted to produce the symmetric beam for lighting the yard areas and placed above a light concentrating refractor provided with lateral light deflecting prisms to produce an asymmetric beam at a low angle above the nadir.

The luminaires particularly suitable for lighting the gasoline filling stations are also suitable for use in other locations where a wide distribution of light is desired for general lighting and lighting of high intensity desired over a small area to one side of the support for the fixture, for example, in lighting entrances, truck loading areas, truck inspection areas, and the like.

The accompanying drawing shows, for purposes of illustrating the present invention, one of the many embodiments in which the invention may take form, it being understood that the

drawing is illustrative of the invention rather than limiting the same.

In the drawing:

Figure 1 is a vertical elevational view through a luminaire;

Figure 2 is a photometric curve showing the light distribution of the luminaire of Figure 1;

Figure 3 is a perspective view illustrating the lighting of a gasoline filling station by a number of these luminaires; and

Figure 4 is a diagrammatic view showing the use of one of the luminaires in lighting the contents of a truck.

The luminaire is provided with a metal hood or cover 10 which may be supported on the end of a bracket or arm 11. The hood or cover 10 adjustably supports a lamp socket indicated at 12, a lamp bulb 13 and a spherical reflector 14. It also supports a ring 15 which carries a two-part refractor R having an inner piece 16 and an outer piece 17 nested together as indicated. The flange 18 on the outer piece rests on a gasket 19 in the ring 15. The flange 20 of the inner part rests on a gasket 21 and the refractor is clamped in place in any suitable manner by clamp plates indicated at 22. The ring and refractor may have cooperative notches and grooves to insure proper orientation of the glass.

The substantially vertical wall 23 of the inner refractor is provided with annular light concentrating prisms 24. The upper portion of the outer wall of the outer refractor is provided with comparatively large annular prisms 25 and the inner wall is provided with vertical diffusing flutes indicated at 26. The bottom of the inner refractor part 16 is provided with annular light concentrating prisms 27 accepting a cone of direct light and bending the rays toward the nadir, while the inner wall of the bottom part of the outer refractor is provided with parallel prisms 28 of the same sign.

When the light source L. C. is in the lower position, as indicated at the center of the lamp bulb 13, the light rays shown in dot-and-dash lines are acted on by the annular refractor parts and emitted as indicated at 30 at angles of approximately 70° above the nadir. Shifting the light center will change the vertical angle of the emitted beam. For example, when the light center is lifted to the upper position shown in the drawing the light rays 31 shown in dash lines are emitted at approximately 60° to the vertical. The change of position of the light center does not, however, substantially affect the direction of the rays emitted from the bottom of the lumi-

naire. The rays for the lower position are indicated in dot-and-dash lines 32, while the rays from the upper position are indicated by the dash lines 33. By carrying the flutes 26 down to the upper ends of the prisms 28 the entire luminaire presents a pleasing well lighted appearance.

The photometric curve 40 of Figure 2 shows a high intensity beam at 41, 41 about 70° above the horizontal, and a second asymmetric beam 42 with its maximum about 20° above the nadir showing that the parallel prisms have a refracting power sufficient to divert substantially all the light which they receive to one side of the nadir.

A gasoline filling station S illustrated in Figure 3 is provided with two uprights or posts 43, 43 at the ends of the island. These posts carry the pipes 11 and the luminaires are mounted on the ends of the pipes as indicated. The arrow 44 indicates the direction of the asymmetric beam produced by the bottom part of the luminaire, and in each case this beam is preferably directed toward the foot of the post 43. By mounting the luminaires about 16 feet above the top of the island and spacing them out about 8 feet from the center of the island it is possible to secure a very intense illumination of the entire upper outer surface of the automobile so that work can be done around the exterior parts of the car and the engine. By having the lights not only at the sides of the station, but beyond the ends of the island light is projected into the vehicle from all directions.

In Figure 4 the luminaire is indicated as being mounted on top of a post or along a side wall 45 and here the high intensity down beam, indicated at 46, is directed into the top of a truck. Such illumination is highly effective at the entrances of factories so that a watchman can see inside a truck before admitting it to the factory. Such illumination is also useful around gates, entrances, and the like.

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

What is claimed is:

1. The combination with the usual gasoline pumps mounted on an island of an outdoor gasoline filling station to be used for serving fuel to motor vehicles standing alongside, of posts at the ends of the island and luminaires carried by the posts at a substantial elevation above ground and spaced sufficiently to be beyond the outside of the vehicles, the luminaires each having means to produce a downwardly slanting beam spreading from nadir inwardly toward the base of the corresponding post to provide illumination for work on the vehicles, and means to produce downwardly and outwardly directed symmetrical beams for general lighting of the surrounding areas.

2. The combination of claim 1, wherein each luminaire has a single light source and includes an asymmetric refracting dish under the source

and a symmetric refracting band about the source.

3. Apparatus for general lighting in the yard of a gasoline filling station and for inspecting lighting of motor vehicles standing in an area adjacent the pumps of the filling station, comprising luminaires mounted at a substantial height above the vehicles on opposite sides of the pumps, each luminaire having means to produce at a high angle above nadir a downwardly directed beam symmetrical about a vertical axis for lighting remote yard areas and means to produce at a low angle above the nadir a downwardly sloping beam with its maximum intensity directed toward the pumps and substantial intensity down to nadir for lighting the vehicles in said area.

4. Apparatus for general lighting in the yard of a gasoline filling station and for inspecting lighting of motor vehicles standing in an area adjacent the pumps of the filling station, comprising luminaires mounted at a substantial height above the vehicles on opposite sides of the pumps, each luminaire having a source, an upper annular refractor to produce symmetrical downward light distribution at high angles above the nadir for general lighting of the yard, and a lower refractor having annular light concentrating prisms for reducing the divergence of the downwardly directed light and parallel prisms for deviating concentrated light into an asymmetric beam at a steep angle to nadir, the luminaires being oriented to direct such light toward the pumps.

5. A luminaire comprising a light source, a refractor about the source, the refractor having substantially vertical walls extending above and below the horizontal plane through the source and provided with annular prisms for concentrating light into a downwardly directed beam symmetrical about a vertical axis, the refractor having a bottom with annular light concentrating prisms and opposed parallel prisms for deviating the concentrated light into an asymmetrical beam at a steep angle to nadir, the focus of the first set of annular prisms being coincident with the focus of the second set of annular prisms whereby vertical shifting of the light source is effective to change the angle of the symmetrical beam above the nadir without substantially affecting the steepness of the angle of the asymmetrical beam.

6. A luminaire comprising a light source, a two part nested refractor about the source, each part of the refractor having substantially vertical sides provided with opposed horizontal prisms for controlling the vertical distribution of the light, and convex bottoms, one bottom having annular light concentrating prisms and the other bottom having parallel prisms of the same sign opposed to the annular prisms, the parallel prisms being of a refracting power to direct substantially all the light delivered to them by the annular prisms to one side of the nadir and produce an asymmetric oblique beam.

DAVIS H. TUCK,  
ROBERT W. STANLEY.