Jan. 20, 1942. G. D. RECHER 2,270,474

HIGHWAY LIGHTING SYSTEM

Filed Sept. 5, 1939

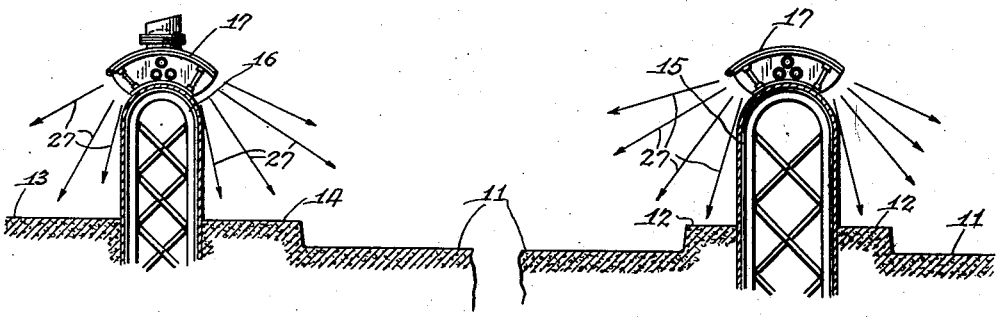

Fig. 1.

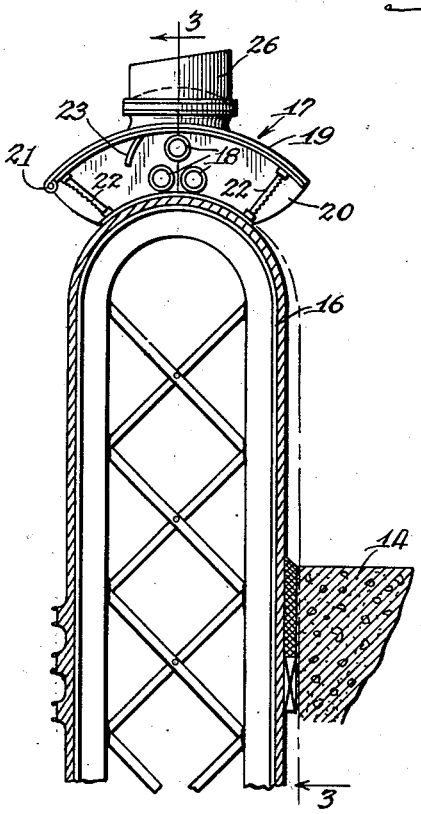

Fig. 2.

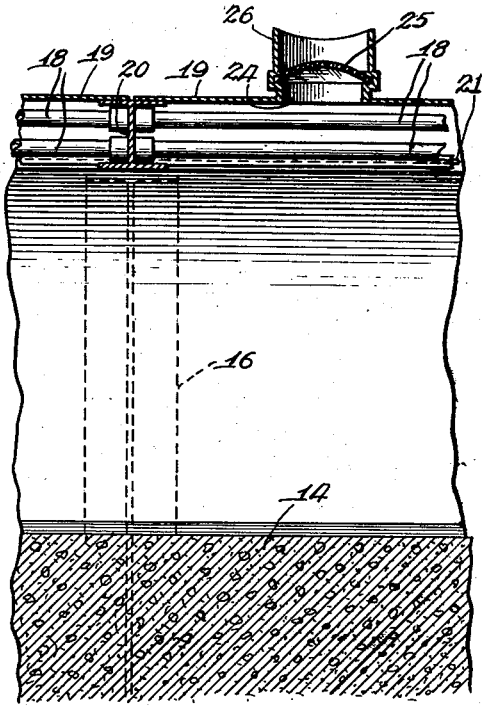

Fig. 3.

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Patented Jan. 20, 1942 2,270,474

UNITED STATES PATENT OFFICE

2,270,474

HIGHWAY LIGHTING SYSTEM

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Application September 5, 1939, Serial No. 293,310

3 Claims. (Cl. 240—25)

This invention relates to lighting systems for highways and the like.

The primary object of the invention is to provide a lighting system which will furnish illumination of substantially uniform intensity for highway surfaces and the like, without producing objectionable glare from the viewpoint of motorists using the highway.

A further object of the invention is to provide a lighting system of the above-indicated character in which the lighting means are utilized to a high degree of efficiency.

A further object is to provide a lighting system or construction of the above-indicated character which may be advantageously embodied in the construction of the highway itself, and which may be maintained and serviced with a minimum of difficulty and expense.

Still another object of the invention is to provide a highway lighting system embodying aviation markers which will not interfere with the efficiency of the system in so far as highway illumination is concerned.

Other objects and advantages of the invention will appear from a consideration of the detailed description appearing hereinafter, in conjunction with the accompanying drawing forming a part hereof, in which

Figure 1 is a transverse sectional view of a highway construction including a lighting system embodying the present invention;

Fig. 2 is a fragmentary transverse sectional view similar to the left-hand portion of Fig. 1 but on an enlarged scale, and

Fig. 3 is a fragmentary longitudinal sectional view taken on the line 3—3 of Fig. 2, on the same scale as the latter.

Referring to the drawing, Fig. 1 shows a highway construction including pavement sections or strips 11, 11 longitudinally separated by a division strip or curb section 12. A sidewalk 13 is illustrated at the left-hand side of the construction, and an inner walk or curb strip 14 is also shown.

A guard rail construction 15 extends along the division strip 12, and a similar construction 16 extends along the side of the highway, separating the sidewalk 13 therefrom. It will be understood, of course, that another similar construction (not shown) may be provided at the opposite side of the highway. These guard rail structures or the like are surmounted by lighting means and housings, etc., therefor, indicated generally by the reference character 17. The guard rail structures are preferably formed of trussed elements anchored in the highway construction itself and covered with sheet metal or the like, as shown.

The lighting system construction, as illustrated more in detail in Figs. 2 and 3, comprises essentially one or more series of light sources 18 mounted at the top of the rails 16 and covered by shade means 19. In the form shown, the light source means 18 are elongated lamps extending longitudinally of the guard rail construction and may suitably consist of tubular electric lamps such as gaseous discharge lamps. The shade means 19 are preferably provided with reflective inner surfaces to direct the light rays from the lamps 18 in the desired manner.

The lamps 18 may be suitably mounted on the webs of supporting members 20, which are substantially I-shaped in cross section. These supporting members 20 extend transversely of the rail 16, being spaced along the same at suitable intervals, and are preferably formed to fit the contour of the top of said rail, to which they are suitably secured. The shade means 19 are preferably pivotally mounted on the members 20, as indicated at 21, and are arranged in substantially abutting sections of such length that the ends thereof, as well as intermediate portions thereof if desired, are supported by the upper flanges of the members 20.

Lenses 22, 22 are preferably used to enclose the lamp-housing sections, these lenses and their supports being suitably mounted between adjacent supporting members 20 and cooperating therewith to enclose the space between the top of the rail structure 16 and the shade sections 19. Auxiliary reflectors such as that indicated at 23 may also be provided if desired.

The shade sections 19 are preferably provided at desired intervals with openings 24 within which lenses or transparent closures 25 are mounted, to serve as night aviation markers. Anti-glare sleeves 26, having their upper extremities terminating in a plane or other surface tilted away from the highway, are preferably mounted above the openings 24 as shown.

It will be seen that the lighting system described above is adapted to furnish illumination for highway surfaces and the like at a high degree of uniformity and efficiency, without producing objectionable glare from the viewpoint of motorists. The light sources are preferably disposed at a sufficient elevation above the pavement level to be well above the normal splash line but without reaching a height at which they are directly visible underneath the shades 19, from the level of the eyes of motorists driving along the highway. A guard rail of suitable height, as illustrated, say not over three or four feet, positions the lighting means properly when the same are mounted thereon as shown.

The web portions of the supporting members 20 are preferably extended somewhat beyond the lenses 22 in the manner illustrated, so that they form relatively closely spaced baffles or transverse shades shutting off direct vision of the light

sources when viewed at an acute angle in the normal direction of vision of persons passing along the highway. The shade means 19 are also suitably curved as shown so that the outer extremities thereof come down to such a level with respect to the level of the light sources as to confine the light rays below the normal level of the eyes of persons driving vehicles along the highway.

While the light sources 18 are preferably of a substantially continuous nature extending longitudinally of the highway, they may be arranged in somewhat separated units and in that event the lenses 22 may be arranged to diffuse the light rays longitudinally of the highway as well as transversely in order to obtain the desired high degree of uniformity of illumination. In any event, however, it is contemplated that suitable light sources shall be arranged in relatively closely spaced relation with respect to the longitudinal extent of the highway.

Suitable reflector and lens arrangements are utilized to direct the light rays from the sources thereof in the desired directions and with the desired distribution. For example, in a lighting section such as that shown at the left-hand side of Fig. 1, where the lighting unit is mounted between a sidewalk and a vehicle roadway, it may be desired to direct a relatively large proportion of the total light onto the roadway, and only a minor proportion thereof onto the sidewalk. This is accomplished by the provision of suitable light-directing means which may include reflectors such as the auxiliary reflector 23 illustrated by way of example in Fig. 2. In all cases the arrangement is such that substantially all the light rays, except the small proportion directed upwardly through the aviation markers 24, 25 (if used), are directed downwardly and laterally across the surfaces to be illuminated, as indicated generally by the arrows 27, 27, so that glare is avoided.

Another important advantage of the lighting system and construction herein disclosed resides in the fact that it can be serviced and cleaned with a minimum of difficulty and expense. Being located at a conveniently accessible level, it can be attended by workmen without the aid of ladders or the like. The hinged or pivotal mounting of the shade sections 19 permits ready opening of the same to afford immediate access to the lamps, reflectors, inner lens surfaces, etc., so that repairs and replacements can be made with great ease.

In the use of a lighting system of the character herein disclosed, shadows and dark areas on the road surfaces and the like are avoided, and the necessity of having excessively bright areas due to poor light distribution is likewise eliminated, thus making for better vision and greater safety for motorists and others using the highway.

The term "highway" and similar designations are used herein to refer to all constructions of an equivalent character, such as elevated highways, viaducts, bridges, etc., and the guard rail construction herein referred to is intended to include such structures as hand rails, bridge rails, and the like.

While only certain specific embodiments of the invention have been shown and described herein, it will be readily understood by those skilled in the art that various changes and modifications may be made in the details of construction and arrangement of parts without departing from the spirit and scope of the invention, as set forth in the appended claims. For example, the invention is not limited to the exact shape and arrangement of the light sources and reflecting and shade means illustrated, and equivalent constructions embodying the spirit of the invention are likewise intended to be covered by said claims.

What is new and is desired to secure by Letters Patent, therefore, is:

1. A highway lighting system comprising an elongated guard rail structure adapted to be mounted adjacent the edge of a highway to extend longitudinally thereof, a series of light-source means mounted on the top of said guard rail structure substantially above the curb level and extending longitudinally thereof, light-directing means associated with said light-source means and directing light rays therefrom downwardly and across the highway surface at a substantially uniform intensity throughout the length of the lighting system and confining said rays below the normal level of the eyes of persons driving vehicles along the highway, and baffle means located at longitudinally spaced intervals between said light-source means and extending transversely thereof a substantial distance from the longitudinal axis thereof to shut off direct vision of said light-source means from acute angles.

2. A highway lighting system comprising an elongated guard rail structure adapted to be mounted adjacent the edge of a highway to extend longitudinally thereof, elongated lighting means mounted on the top of said guard rail structure substantially above the curb level and extending longitudinally thereof, light-reflecting means associated with said lighting means and directing light rays therefrom downwardly and across the highway surface at a substantially uniform intensity throughout the length of the lighting system, and shade means confining said rays below the normal level of the eyes of persons driving vehicles along the highway, said shade means being provided with transparent sections directed substantially upwardly and illuminated by said lighting means to provide night aviation markers and said transparent sections being surrounded by opaque anti-glare sleeves.

3. A highway lighting system comprising an elongated guard rail structure adapted to be mounted adjacent the edge of a highway to extend longitudinally thereof, elongated lighting means mounted on the top of said guard rail structure substantially above the curb level and extending longitudinally thereof, light-reflecting means associated with said lighting means and directing light rays therefrom downwardly and across the highway surface at a substantially uniform intensity throughout the length of the lighting system, and shade means confining said rays below the normal level of the eyes of persons driving vehicles along the highway, said shade means being provided with transparent sections directed substantially upwardly and illuminated by said lighting means to provide night aviation markers and said transparent sections being surrounded by substantially vertically extending opaque anti-glare sleeves having their upper extremities inclined downwardly and outwardly away from the highway whereby said transparent sections are substantially concealed from view from the highway.

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