United States Patent

[11] 3,544,782

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[54] **LUMINATED GUARD RAIL ASSEMBLY**
5 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **240/2,** 240/84
[51] **Int. Cl.** **F21v 33/00,** F21s 1/10
[50] **Field of Search** ..... 240/2, 2(W), 73, 2(B), 147, 84

[56] **References Cited**

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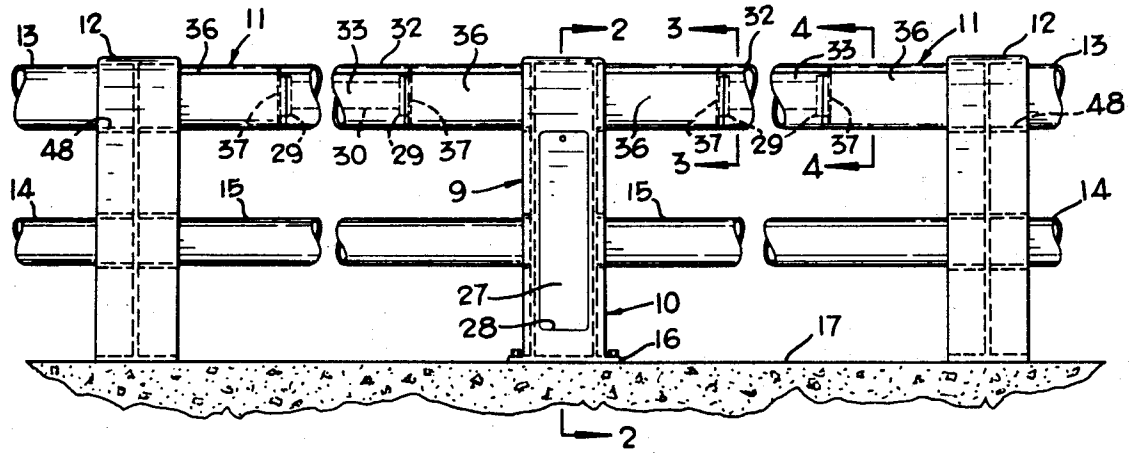
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ABSTRACT: A hollow post and a pair of laterally extending, illuminated, tubular rails form a T-shaped section which is interspaced as required within a typical post and guardrail system. External power cables enter the hollow post and are connected to a ballast member housed within the post. Supply wires from the ballast member are connected to terminals at each end of a fluorescent tube mounted within each rail. Each rail includes an interlocking translucent panel and a pair of alined access panels, all of which are curved to provide the tubular rail with an unbroken circular cross section. The hollow post has substantially the same appearance and function as the other, typical guardposts in the system.



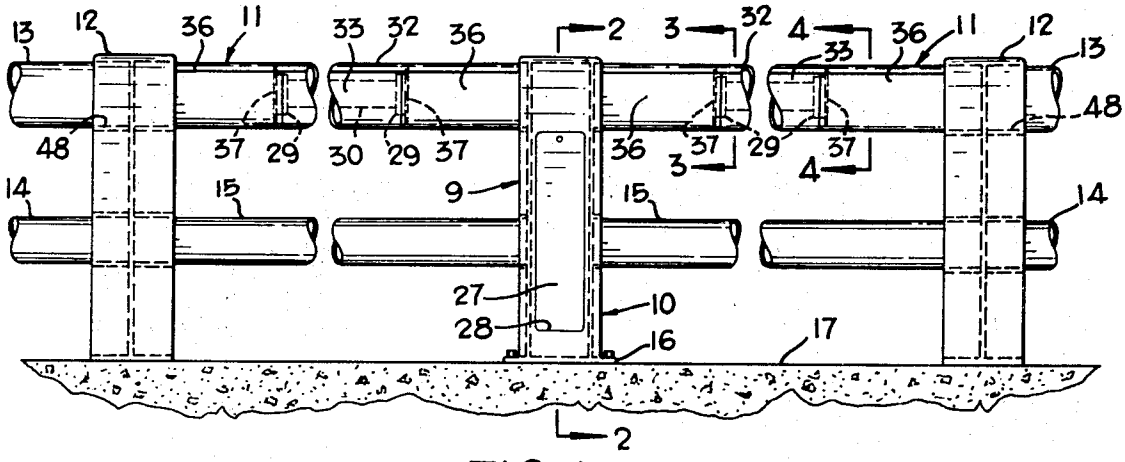


FIG. 1

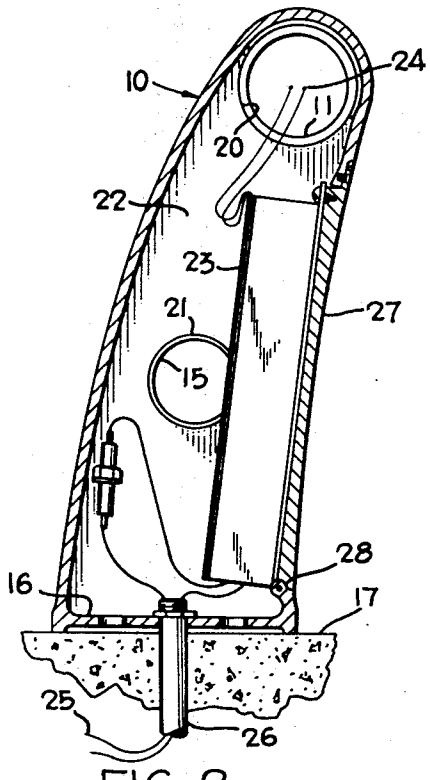


FIG. 2

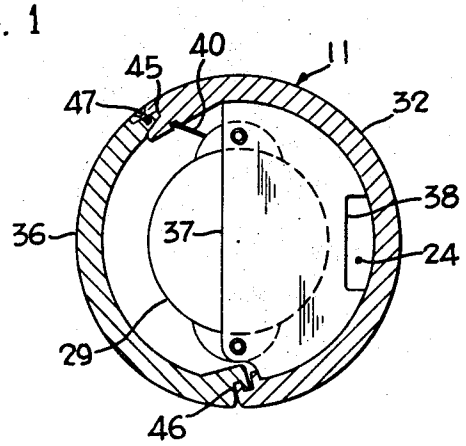


FIG. 4

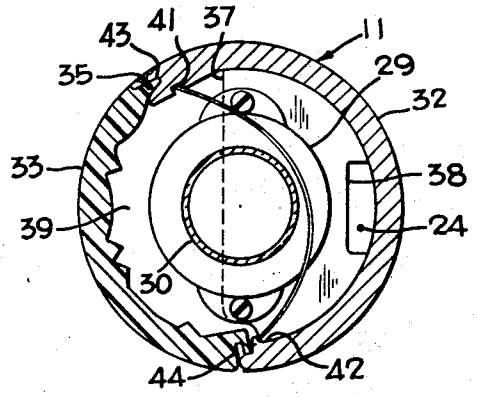


FIG. 3

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LUMINATED GUARD RAIL ASSEMBLY

BACKGROUND OF THE INVENTION

This invention relates to illuminated guardrail systems, and more particularly to a guardrail post and rail section which can be conveniently inserted at any location within a guardrail system.

Continuous efforts are being made to make road driving conditions safer, and a great deal of attention has been directed to improving ground and overhead lighting. Because good lighting is particularly essential in hazardous area and because such areas, as for example the sidewalk portions of bridges, are provided with guardrail systems, it is logical that the highway authorities pay particular attention to lighting conditions at such locations. Often this attention results in the provision of reflector surfaces on the guardrails or posts. In many instances, however, reflectors are inadequate and electrical illumination is required. It is for these locations that the present invention is admirably suited because it provides a section of illuminated rail which can easily be placed in a regular run of guardrailing.

Illuminated rails exist in the prior art, but none reveals the features and arrangement inherent in applicant's invention.

U.S. Pat. No. 3,131,871 discloses a combination rail and luminaire. In this device, the posts merely serve as a support for a continuous rail, and the power supply to the lighting element is supplied to that continuous rail. Ballast and terminal means are stated as being located within one of two compartments formed within the tubular rail by means of a central partition.

Unlike applicant's invention, in which the ballast is provided within a hollow post, thereby rendering it easily accessible by the mere opening an access door, it is necessary to remove the complete upper part of the rail before access to the electrical ballast connections can be made. Rather than a simple circular tube provided by applicant, the device of U.S. Pat. No. 3,131,871 is a relatively elaborately-shaped compartmentalized tubular member. Finally, there is no disclosure that the device can be inserted, as an independent section, within a standard guardrail system.

U.S. Pat. No 3,057,991 discloses a handrail system and means for illuminating the same. Essentially, this patent teaches an illuminated rail system mounted between posts within the arms of a unitary T-member which is supported at the top of each post. Although the post is hollow, it is merely a structural feature. There is no disclosure of power cables entering the post for distribution to the ends of a lighting element. On the contrary, the wiring is entirely within the rail section. It is clear that removing one lighting section from a series of sections, as by collision with an automobile, would black out the entire system since the electrical power line is continuous along the upper rail. The servicing of this system is accomplished by removing a relatively long length of the rather elaborate tubular rail structural section.

Other rail systems include an illuminated fence (U.S. Pat. No. 3,222,509), which is provided with a cap construction forming a lantern; an illuminated ground-lighting system (U.S. Pat. No. 3,183,345), which is essentially a tube containing light bulbs and so shaped as to be conveniently encased within a concrete parapet, and an illuminated stairway handrail mounted on solid posts (U.S. Pat. No. 2,310,593), which is substantially cylindrical in shape and which provides a plurality of small lighting panels cut from the tube to provide top lighting, to illuminate the handrail itself, and side lighting, to illuminate the stairway.

SUMMARY OF THE INVENTION

The guardrail lighting assembly includes a hollow post provided with a pair of luminary rails extending laterally of the post and communicating with its interior. The post provides a housing for electrical ballast and a receptacle for an external power means distribution. Each rail provides a housing for a lighting element which is supplied with electrical power directly from the post. The rail includes translucent side panels removably connected to the metal housing.

Access panels are provided at each end of the luminary rail to facilitate maintenance of the lighting element.

The exterior component parts of the rail, namely the metal housing, the illuminary panels and the access panels, have compatible arcuate cross sections having a common external radius, whereby to provide a substantially flush outer cylindrical surface along the length of the rail.

Spaced diaphragms, within the metal housing, provide support means for each end of the lighting element and stiffening means for the rail.

A reflector, arcuate in shape, is snap-connected to the longitudinal edges of the housing to form a lighting chamber of substantially lenticular configuration with the translucent panel to provide maximum light utilization.

The hollow post includes a downwardly opening access door which provides a mounting panel for the ballast member and an external work platform for ballast maintenance. The outer ends of each rail are supported by other guard posts.

The hollow post a and illuminated rails are similar in overall configuration to the typical rail and posts of the guardrail system of which they are part and may, therefore, be inserted at predetermined locations within such system as independent lighting units.

The features referred to in this summary together with numerous other advantages of the invention, will more clearly appear from the following detailed description of a preferred embodiment, particularly when considered in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational view showing the illuminated section consisting of a hollow post and an upper luminary rail inserted in a guardrail system;

FIG. 2 is an enlarged sectional view through the hollow post taken on line 2–2 of FIG. 1;

FIG. 3 is an enlarged section through the luminary rail taken on line 3–3 of FIG. 1, which illustrates the translucent panel and the reflector, and

FIG. 4 is an enlarged section through the luminary rail taken on line 4–4 of FIG. 1, illustrating the access panel.

DESCRIPTION OF THE PREFERRED EMBODIMENT:

Referring now by characters of reference to the drawing and first to FIG. 1, it will be understood that this T-shaped guardrail section 9 includes a hollow post 10 and a pair of laterally extending luminary rails 11, the rails 11 communicating at one end with the hollow post 10. The rails 11 are supported at their other end by vertical posts 12. In the elevation represented by FIG. 1, guardrail section 9 is shown inserted in a regular run of a guardrail system which includes posts 12, and upper and lower guardrails 13 and 14 respectively. Of course, the guardrail section 9 could be provided in series, in which case, the hollow post 10 would be provided at alternate intervals with the typical post 12. The outward appearance of the hollow post 10 is similar to that of the typical post 12 in order to present a uniform appearance throughout the length of the guardrail structure. A lower guardrail 15 is provided to preserve the structural integrity of the guardrail system.

FIG. 2 illustrates the interior of the hollow post 10, and this post 10, apart from its hollow aspect, has essentially the same curved outline as the typical posts 12. The base 16 of the hollow post 10 is wider than the base of the typical post 12 in order to provide sufficient room for insertion of hold down bolts which connect the post 10 to the concrete support 17.

Upper and lower apertures 20 and 21 are provided in each sidewall 22. The upper aperture 20 receives the luminary rail 11, and the lower aperture 21 receives the guardrail 15. The upper aperture 20 provides a communication passage into the open end of the luminary rail 11 for passage therethrough of electrical service wires 24 which are connected to the ballast member 23. External electrical power cables 25 are fed into the hollow post 10 by means of an electrical conduit 26. Inside the hollow post 10, the electrical cables 25 are connected to the ballast member 23.

The ballast member 23 is mounted on the rear face of an access door 27 located in the front face of the hollow post 10. The access door 27 is connected at its lower end by a hinge 28, and may be swung outward to allow free and external access to the ballast member 23.

The wiring 24 passes from the hollow post 10 into the luminary rails 11 and is there connected to terminals at sockets 29 at each end of an elongate fluorescent tube 30 constituting the lighting element.

As is illustrated in FIGS. 3 and 4, the principal member of the luminary rail 11 is an elongate member housing 32. An elongate translucent side panel 33 is provided in the midportion of each luminary rail 11. The translucent side panel 33 is arcuate in configuration and has an outside radius substantially equal to that of the metal housing 32 to which it is connected.

Tongue-and-groove connections 43 and 44 (FIG. 3) are provided between the translucent side panel 33 and the metal housing 32 along the pair of spaced longitudinal edges of the housing 32 to provide an interlocking fit. A plurality of screws 35 is provided at spaced intervals along the length of the translucent panel 33 to enable the translucent panel 33 to be disconnected from the metal housing 32.

Referring now to FIG. 4, the elongate metal housing 32, which has the same arcuate configuration along its entire length, is interconnected with an access panel 36 which has substantially the same arcuate configuration of the translucent panel 33, except for reflecting ripples. The access panels 36 interlockedly connect to the metal housing 32 along the edges thereof in the same way as the translucent panel 33 is connected to the metal housing 32, namely, by a tongue-and-groove connections 45 and 46 (FIG. 4). Each access panel 36 is likewise held in place by screws 47 disposed at intervals along the length of the luminary rail 11.

The electrical sockets 29 which are provided at each end of the fluorescent tube 30 are mounted on spaced transverse diaphragms 37 which are welded or otherwise attached to the inside face of the main housing 32. The diaphragms 37 also serve the purpose of stiffening the main housing 32. Each diaphragm 37 has a substantially semicircular configuration and is provided with apertures 38 to allow the passage of electrical service wires 24 from the hollow post 10 to the terminals at each end of the fluorescent tube 30.

In order to provide for a maximum efficiency in lighting, an elongate parabolic reflector 40 is provided behind the fluorescent tube 30. A lighting chamber 39, which is lenticular in cross section, has one margin formed from the reflector 40 and the other margin formed from the translucent arcuate panel 33. An elongate notch 41 and an elongate shoulder portion 42 are provided, at the upper and lower edges of the main housing 32 respectively, in order to provide a snap fit for the reflector 40.

It is thought that the functional advantages of this illuminated guardrail assembly have become fully apparent from the foregoing description of parts but for completeness of disclosure the operation of the assembly will be briefly described.

The hollow post 10 forms a receptacle for the input of power cables 25 and a housing for the ballast member 23. In addition, the post 10 provides a distribution for the wiring 24 to each end of each individual fluorescent lighting tube 30 mounted within the oppositely extending, lateral luminary rails 11 which communicate with the hollow post 10. The removal of access panels 36, which are located at each end of each luminary rail 11, enables maintenance to be performed on the light fixtures including the terminals with maximum convenience.

The overall circular configuration of the tubular luminary rail 11 enables the outer ends of the rails 11 to be supported by sockets 48 provided in the typical posts 12 of a guardrail assembly. The configuration of the hollow post 10 presents a similar outward appearance as the typical support post 12, and therefore provides a uniform appearance in the guardrail system as a whole.

Because of the particular independent arrangement of the wiring 24 to the ends of the fluorescent lighting tubes 30 in a T-shape section 9, it will be clear that destruction of one illuminated section 9, it will be comprising a hollow post 10 and a pair of tubular lighting rails 11, by collision with an automobile, will not black out the lighting system as a whole. Moreover, several illuminated sections 9 used in series, as on a bridge structure, because of the independent nature of the wiring arrangement, can be used without fear that the whole lighting system could be put out of commission.

Although the invention has been described by making detailed reference to a single preferred embodiment, such detail is to be understood in an instructive rather than in a restrictive sense, many variations being possible within the scope of the claims hereunto appended.

I claim:

1. An illuminated guardrail assembly, comprising:
   a. a hollow post;
   b. a ballast member housed within the hollow post;
   c. an electrical power means fed into the post and connected to the ballast member;
   d. a first tubular luminary rail extending laterally of the post and having one end communicating with the interior of the post, the rail including:
      1. an elongate metal housing;
      2. an elongate lighting element, mounted within the housing and having terminals at each end;
      3. electrical means extending through the rail housing and into the post to connect the terminals with the power means; and
      4. an elongate translucent side panel emitting light from the lighting element, the panel being removably attached to the metal housing;
   e. means supporting the other end of the luminary rail;
   f. the metal housing and associated translucent panel have a compatible arcuate cross section to provide a substantially circular rail of uniform outside radius presenting a flush outer face; and
   g. the hollow post including an outwardly opening access door hingedly attached at its lower end to open laterally of the rails, the ballast member being mounted on the door, the door providing an external support platform for the ballast member in its open position.

2. An illuminated guardrail assembly, comprising:
   a. a hollow post;
   b. An electrical power means fed into the post;
   c. a first tubular luminary rail extending laterally of the post and having one end communicating with the interior of the post, the rail including:
      1. an elongate metal housing;
      2. an elongate lighting element, mounted within the housing and having terminals at each end;
      3. electrical means extending through the rail housing and into the post to connect the terminals with the power means; and
      4. an elongate translucent side panel emitting light from the lighting element, the panel being removably attached to the metal housing;
   d. means supporting the other end of the luminary rail;
   e. a second tubular luminary rail extending laterally of the post opposite to the first tubular luminary rail and, in conjunction with the first rail, providing a pair of rails each having one end communicating with the interior of the post, the second rail including:
      1. an elongate metal housing;
      2. an elongate lighting element, mounted within the metal housing and having terminals at each end;
      3. means extending through the second rail housing and into the post to connect the terminals of the associated lighting element with the power means; and
      4. an elongate translucent side panel emitting light from the lighting element, the panel being removably attached to the metal housing;
   f. means supporting the other end of the second rail;

g. each metal housing and associated translucent panel having a compatible arcuate cross section to provide a substantially circular rail;

h. each metal housing including a pair of spaced longitudinal edges to which the associated translucent panel is attached; and

i. an elongate arcuate reflector being connected to the longitudinal edges of each housing and forming a substantially lenticular configuration in cooperation with the translucent panel to provide maximum light utilization.

3. An illuminated guardrail assembly as defined in claim 2, in which: spaced lateral diaphragms, within each elongate metal housing, support each end of the lighting element and form a chamber behind the reflector, each diaphragm including an aperture for the passage of the electrical means from the hollow post through the rail to interconnect both terminals.

4. An illuminated guardrail assembly as defined in claim 2, in which:

a. the support means for the opposite end of each rail is provided by a vertical post of substantially the same overall size as the hollow post; and

b. a secondary guardrail extends between each support post and each hollow post.

5. An illuminated guardrail assembly, comprising:

a. a hollow post;

b. an electrical power means fed into the post;

c. a first tubular luminary rail extending laterally of the post and having one end communicating with the interior of the post the rail including:

1. an elongate metal housing;

2. an elongate lighting element, mounted within the housing, and having terminals at each end;

3. electrical means extending through the rail housing and into the post to connect the terminals with the power means; and

4. an elongate translucent side panel emitting light from the lighting element, the panel being removably attached to the metal housing;

d. means supporting the other end of the luminary rail;

e. a second tubular luminary rail extending laterally of the post opposite to the first tubular luminary rail and, in conjunction with the first rail, providing a pair of rails each having one end communicating with the interior of the post, the second rail including:

1. an elongate metal housing;

2. an elongate lighting element, mounted within the metal housing and having terminals at each end;

3. means extending through the second rail housing and into the post to connect the terminals of the associated lighting element with the power means; and

4. an elongate translucent side panel emitting light from the lighting element, the panel being removably attached to the metal housing;

f. means supporting the other end of the second rail;

g. each metal housing including a pair of spaced longitudinal edges to which the associated translucent panel is attached;

h. each metal housing and associated translucent panel having a compatible arcuate cross section to provide a substantially circular rail;

i. each luminary rail includes:

1. a removable access panel of arcuate configuration at each end of the rail, alined with, and of the same arcuate width as the translucent panel to provide access to the terminals, the outside radii of the metal housing, the translucent panel and the access panels are substantially the same. The access and translucent panels being interlockingly connected to the housing to provide a substantially flush outer cylindrical surface along the length of each rail;

2. an elongate arcuate reflector, snap-connected to the longitudinal edges of the housing and forming a substantially lenticular configuration in cooperation with the translucent panel to provide a maximum light utilization; and

3. spaced lateral diaphragms within the elongate metal housing support each end of the lighting element, the diaphragms forming a chamber behind each reflector and each diaphragm including an aperture providing for the passage of the electrical means from the hollow post through the rail to interconnect both terminals of the lighting element;

j. a ballast member housed within the hollow post;

k. the hollow post including an outwardly opening access door hingedly attached at its lower end, the inside face of the door mounting the ballast member, the door providing an external support platform for the ballast member in its open position;

l. the support means for the opposite end of each rail is provided by a vertical post of substantially the same overall size as the hollow post; and

m. a secondary guardrail extends between each support post and each hollow post.