

Oct. 19, 1943.

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2,332,040

LIGHTING FIXTURE

Filed Aug. 27, 1941

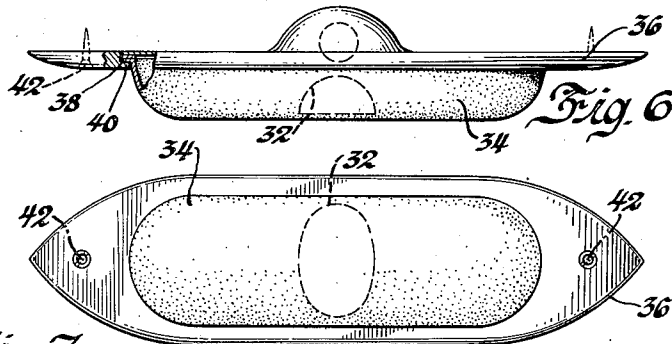
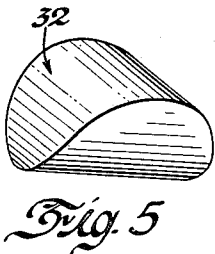
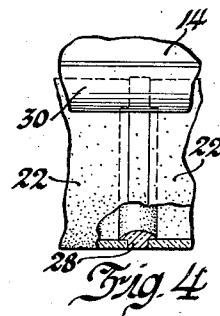
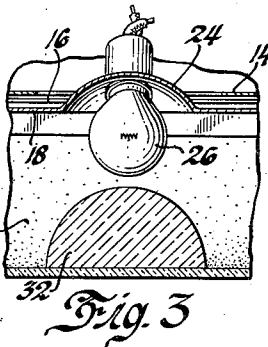
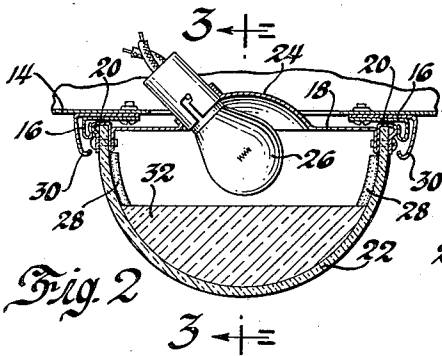
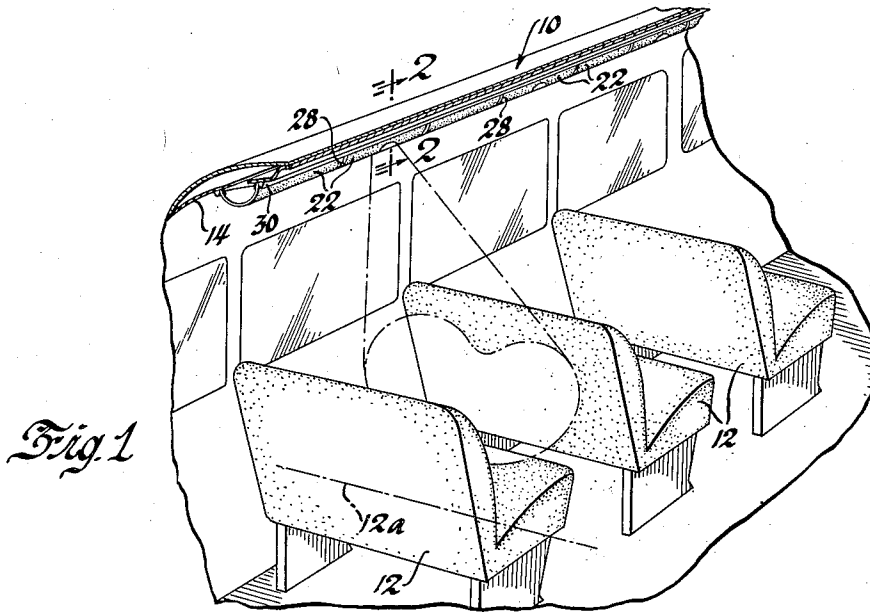


Fig. 7

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UNITED STATES PATENT OFFICE

2,332,040

LIGHTING FIXTURE

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Application August 27, 1941, Serial No. 408,422

2 Claims. (Cl. 240—7.35)

My invention relates to a lighting fixture such as is used on passenger motor coaches.

In the design of commercial passenger vehicles considerable attention must be given to the interior lighting. The lighting must be so designed as to give adequate illumination in the reading zone without being so bright as to cause glare. It is likewise desirable for the sake of economy to furnish the desired lighting at a minimum of expense. If possible, therefore, the lighting for the coach interior should be such that one light source will supply each two-passenger seat. Having all these requirements in mind, it is further desirable to provide a lighting fixture which has a pleasing appearance.

It is the object of my invention to provide a lighting fixture which may be used for the interior of commercial passenger vehicles to satisfy the foregoing requirements.

More specifically, it is the object of my invention to provide a lighting fixture for motor coaches in which a properly designed lens directs the rays of a single source of light in such a manner as to furnish illumination in the reading zone for a two-passenger seat. The lens of this invention has opposed cylindrical surfaces in which the axes of the cylinders forming the surfaces are disposed at substantially right angles to each other. The lens is so located with respect to the passenger seat that the axis of the cylinder having the greater curvature is substantially parallel to the long axis of the seat. The light pattern thus formed is generally elliptical in shape, having bright spots near the foci of the ellipse.

Figure 1 of the drawing shows a passenger vehicle provided with lighting fixtures made according to my invention.

Figure 2 is a view with parts broken away and in section substantially on line 2—2 of Figure 1.

Figure 3 is a longitudinal section substantially on line 3—3 of Figure 2.

Figure 4 is a detail view with parts broken away and in section showing the construction of the spacer which is disposed between adjacent external units of the fixture.

Figure 5 is a view in perspective of the lens used in the lighting fixture.

Figures 6 and 7 are views in elevation and plan respectively of a modified lighting fixture using the lens of my invention.

Referring now to the drawing in detail, 10 indicates a passenger motor coach provided with forwardly facing seats 12, each of which has a long axis 12a. In the illustration, axis 12a is substantially perpendicular to the long axis of the

vehicle. To the head lining 14 above the row of seats 12 is secured a pair of opposed generally J-shaped clips 16. These clips may be made of any suitable resilient material. The downwardly extending resilient members of these clips engage and removably hold in place a support 18. Support 18 is provided at its edges with parallel beaded channels 20. The beads of channels 20 cooperate with the downwardly extending resilient members of clips 16 as best indicated at Figure 2. Secured in the channels 20 are the edges of a trough-like or generally channel-shaped cylindrical member 22. Member 22 may be made of any suitable light pervious material such as glass or any of the molded plastics now available. The light transmitting plastic commercially known as Lucite has been found very satisfactory.

Spaced along support 18 I provide recesses 24 which serve as reflectors and mounting means for light bulbs 26. The spacing of bulbs 26 should coincide with the spacing of seats 12 with the bulb disposed above the seat space so as to illuminate the reading zone of the seat space. It has been found desirable to provide member 22 in sections. These sections may be of any desired length but I prefer to provide two such sections for each light source, having one section disposed immediately beneath each light source with the intervening space occupied by another section of member 22. Adjoining sections of member 22 are spaced by substantially semi-circular strips 28. Strips 28 are generally T-shaped in cross section as seen in Figure 4. These strips may also be made of a suitable molded plastic. It may be pointed out here that rather pleasing and sometimes striking ornamental effects may be obtained by the judicious choice of colors of the molded plastics used for members 22 and 28. It will generally be found preferable to make member 22 of a white translucent material which will glow along its entire length with bright spots spaced along its length according to the location of the light sources. Spacer members 28 may likewise be white translucent members but a decorative effect may be obtained by making spacers 28 of colored translucent plastics. A generally L-shaped molding 30 may be secured to head lining 14 on each side of the trough-like member 22. Molding 30 serves to conceal the holding means for support 18 and trough-like member 22 and may also add to the ornamental effect of the fixture as a whole. For example, a pleasing effect is obtained by making moldings 30 of chrome plated sheet metal.

The lens 32 of my invention is shown in perspective in Figure 5. As is readily seen from

Figures 2, 3 and 5, this lens has opposed surfaces which are formed by substantially circular cylinders the axes of which are substantially at right angles. In the illustrations, the curvature of one of these cylinders is substantially equal to the inside curvature of member 22. The curvature of the other cylinder is considerably greater. The difference is readily seen by reference to Figures 2 and 3. This arrangement of opposed cylindrical surfaces with one surface having a greater curvature than the other gives a generally elliptical light pattern with concentrations of light near the foci of the ellipse. By a careful proportioning of the curvature of the two surfaces these two concentrations of light may be spaced to coincide with the reading zones of two passengers seated side by side on one of the seats 12. It will be found that the light thus furnished for reading will cause a minimum of glare due to reflection from window surfaces and the like, resulting in greater eye-comfort to the driver as well as the passengers. The light pattern produced by this lens is indicated in dotted lines in Figure 1. It has been found that the surface of lens 32 whose cylinder is substantially parallel to the longitudinal axis of the seat should have a curvature which is in the vicinity of once and one half to twice the curvature of the cylinder whose axis is substantially perpendicular to the long axis of the seat. This 2 or $1\frac{1}{2}$ to 1 ratio is given merely to indicate the order of magnitude of the ratios. More specifically, a ratio of 17 to 10 has been found satisfactory.

It will not always be desirable to use the elongated member 22 made up of aligned short sections as shown in Figures 1 to 4. Figures 6 and 7 illustrate a modified lighting fixture with which lens 32 may be used. In these two figures a light pervious member 34 which may be cylindrical in cross-section is held in place by a retaining frame 36. Cover member 34 is provided with a peripheral flange 38 which cooperates with a shoulder 40 on frame 36. Frame 36 may be held

in place on the headlining by screws 42 or any other suitable fastening means.

Lens 32 may be cemented in place in members 22 or 34 by any suitable light pervious cementing material such as Canada balsam. However, any other satisfactory means of securing lens 32 may be used. It may be found desirable, for example, to mold the plastic of which member 22 or 34 may be made directly about lens 32.

The lighting fixture comprising my invention is not necessarily limited to use in vehicles. It may be used in any application presenting problems and requirements similar to those found in motor coach lighting.

I claim:

1. In a lighting fixture for application to the ceiling of a bus or other vehicle, the combination of a longitudinally extending support, a light source secured to said support intermediate the ends of said support, a longitudinally extending light pervious member which is substantially semicylindrical in cross section having the opposite edges thereof secured to said support and constituting a light transmitting cover for said light source, and a light concentrating lens mounted within said cover member intermediate the ends of said member and adjacent said light source, said lens having the opposite surfaces thereof formed by two intersecting cylinders disposed with their axes substantially at right angles to each other with one of said surfaces conforming to and fitting within the inner surface of said cover member.

2. The combination set forth in claim 1 in which the curvature of the lens surface which conforms to the adjacent surface of the cover member is smaller than the curvature of the opposite lens surface to thereby produce a relatively strong concentration of light rays within a generally elliptical predetermined area having its major axis extending transversely of the vehicle.

PETER ZAMPOL.