Feb. 8, 1949. L. SCHEPMOES 2,461,446

LIGHTING FIXTURE FOR PASSENGER VEHICLES

Filed Sept. 23, 1944 2 Sheets-Sheet 1

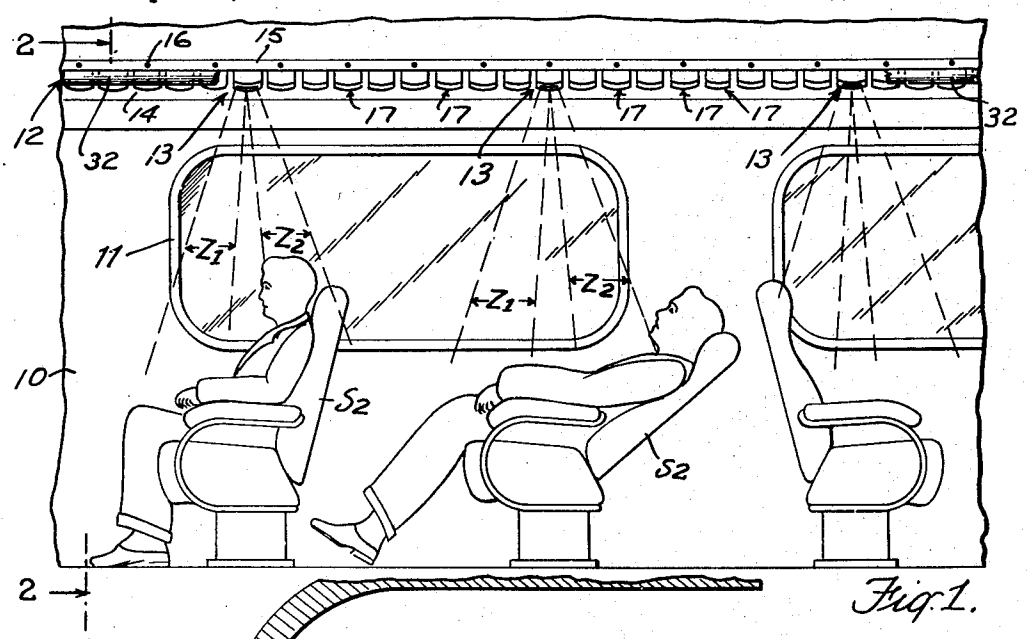


Fig. 1.

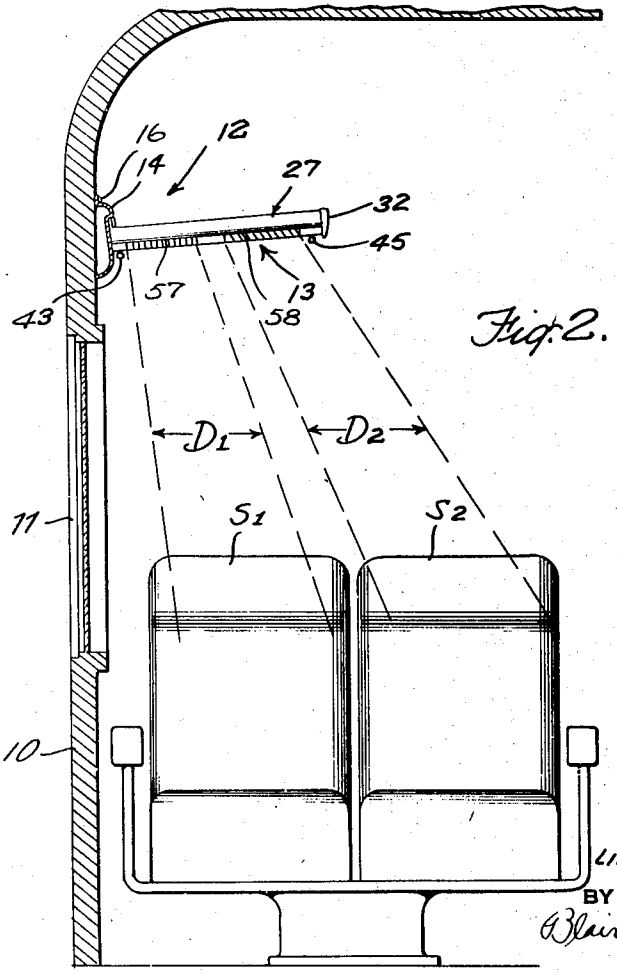


Fig. 2.

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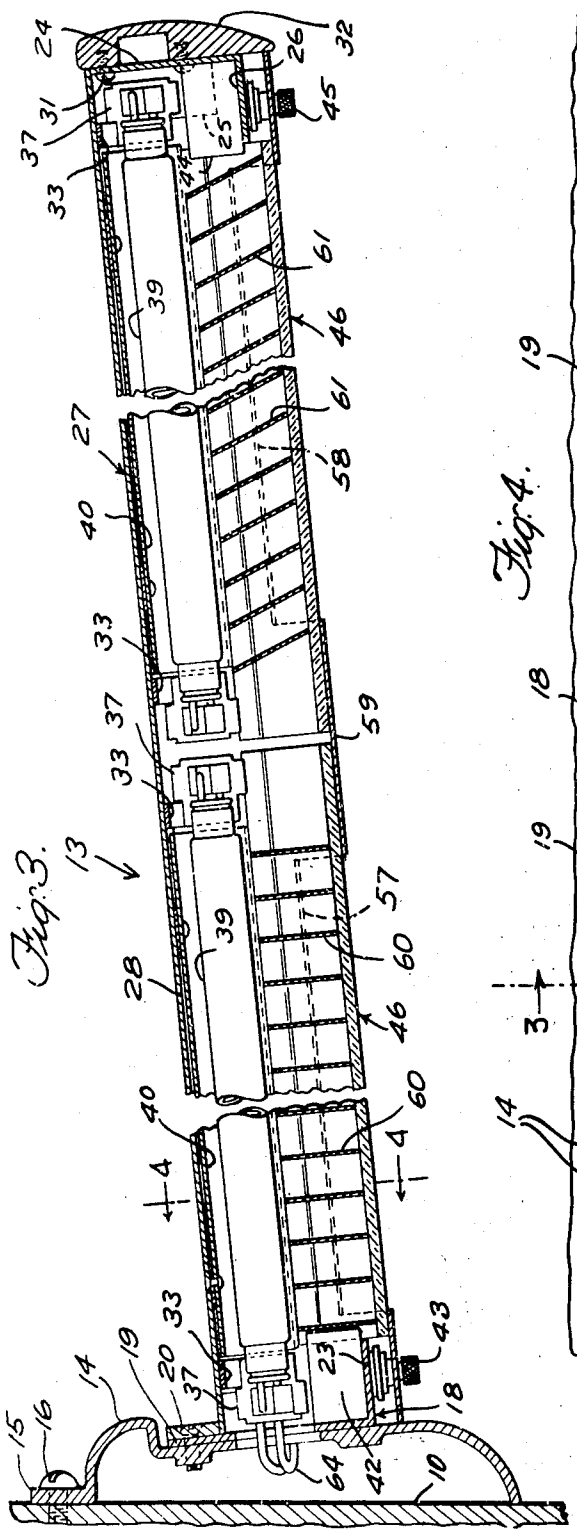


Fig. 3.

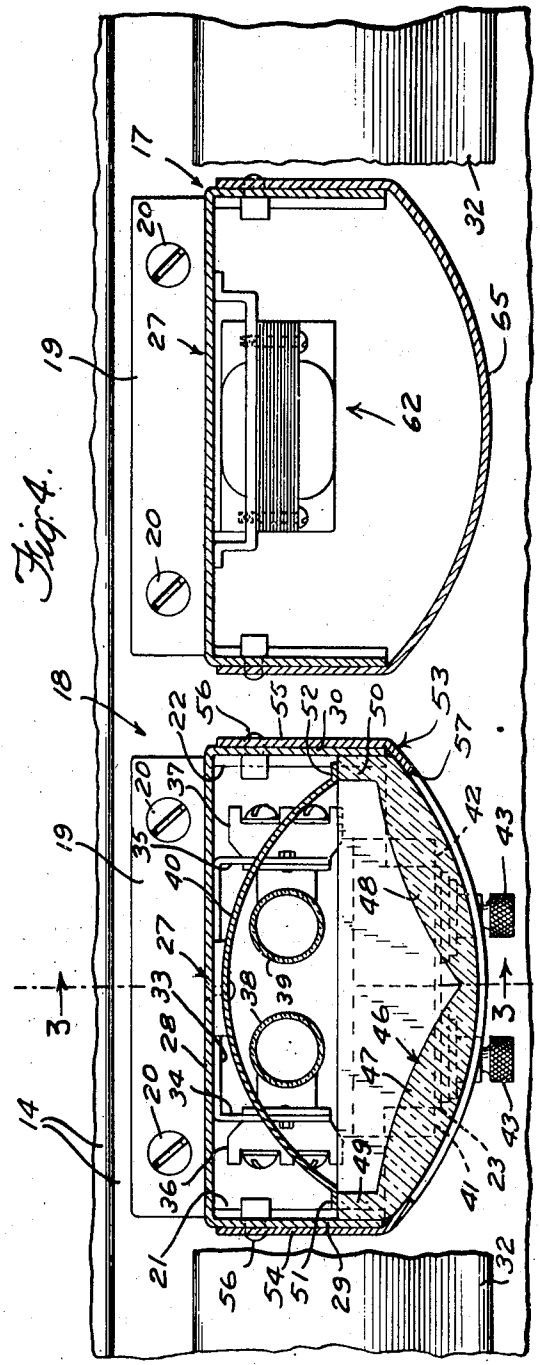


Fig. 4.

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LIGHTING FIXTURE FOR PASSENGER VEHICLES

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9 Claims. (Cl. 240—7.1)

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This invention relates to a lighting fixture for a passenger vehicle.

One of the objects of this invention is to provide a lighting fixture for a passenger vehicle, such as a railway car, for example, which is simple, inexpensive and sturdy in construction, while at the same time having aesthetic characteristics consistent with the requisites of the car interior decoration. Another object is to provide a fluorescent lighting fixture of the above nature adapted to be incorporated as part of a baggage rack mounted on a wall of the vehicle. Another object is to provide a fixture of the above nature which is sufficiently sturdy to withstand vibration resulting from operation of the vehicle as well as normal usage over extended periods of time, without the necessity of replacement or repair. Another object is to provide a fixture of the above nature by which light emission can be distributed and controlled in such a manner as to obtain sufficient and efficient illumination where desired without, however, causing undesirable glare in the region of passenger seats underlying the fixture. Another object is to provide a combined lighting fixture and bag rack in which the fixture is similar in appearance to other portions of the bag rack, and in which the amount of light emission from the fixture in the region of each underlying passenger seat may be determined by the person seated therein. Other objects will be in part apparent and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts as will be exemplified in the structure to be hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the drawing, in which is shown one form of my invention,

Figure 1 is a fragmentary elevation of a portion of one interior side of a railway car in which my combined lighting fixture and bag rack is installed;

Figure 2 is an enlarged fragmentary sectional elevation taken along the line 2—2 of Figure 1;

Figure 3 is a substantially enlarged vertical section taken along the line 3—3 of Figure 4; and,

Figure 4 is a section on a still larger scale taken along the line 4—4 of Figure 3.

Similar reference characters refer to similar parts throughout the various views of the drawing.

The ever-widening use of flourescent tubes in vehicle lighting gives rise to problems not encountered in the use of conventional light bulbs. By reason of the substantial length of the flourescent tubes, ordinary fixtures for the housing thereof are unsatisfactory as they are often unsightly and in other cases incapable of utilizing the full efficiency of the tubes. Unless properly housed and shielded, bothersome glare is apt to result, and at the same time the light emission from the tubes is not distributed in the areas where it is most desirable as, for example, in the reading plane of the passenger seat.

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It is accordingly often desirable to combine the fluorescent lighting fixture with the bag rack over the passenger seats in such a manner as to provide proper illumination throughout desired areas, render the fixture readily accessible to the passengers for control thereof, and at the same time harmonize the fixture with the decoration motif of the car. It is another object of this invention to provide a fluorescent lighting fixture which attains these ends, and at the same time obviate the above-noted difficulties.

In Figures 1 and 2 is shown a conventional day coach having a side wall 10 provided with a window 11, pairs of seats S_1 and S_2 and a bag rack generally indicated at 12, in which is incorporated at regularly spaced intervals my lighting fixture, generally indicated at 13. As will be described in detail hereinafter, fixture 13 is so arranged as to provide transverse light distributions or zones D_1 and D_2 (Figure 2), and longitudinal light distributions or zones Z_1 and Z_2 (Figure 1), the zones D thus providing lateral or transverse illuminations for seats S_1 and S_2, respectively, while the zones Z_1 and Z_2 provide longitudinal areas of illumination in the reading planes of the seats.

Bag rack 12 has for its main support a longitudinal strip or bracket 14 (see Figure 3), the upper edge of which has a flange 15 which may be fastened to the side wall 10 of the car as by screws 16. As shown in Figures 1 and 4, bag rack 12 comprises parallel spaced rails 17, as well as fixtures 13, the rails and fixtures being substantially identical in general appearance and being secured to bracket 14 in a manner that will be described, so as to extend angularly upwardly therefrom (see Figure 3) thus to provide a support for the reception of bags, packages and the like. The rails are separated from one another and from fixtures 13 a suitable amount, thus to provide spaces between the several parts sufficient to permit the passenger to determine whether or not there is any baggage in the rack.

In so far as the essential supporting structure of rails 17 and fixtures 13 is concerned, these parts are all identical and accordingly the description following will be directed to the fixtures only. Thus, as shown in Figures 3 and 4, the housing or supporting structure of fixture 13 includes an inner end plate generally indicated at 18 having a back flange 19 which is fastened to bracket 14 by screws 20. End plate 18 also includes outwardly extending side walls 21 and 22, as well as an outwardly extending bottom flange 23. The fixture housing includes at its other end another end plate 24 (Figure 3) having side walls 25 and a bottom supporting plate or flange 26. End walls 18 and 24 are fastened to the ends of an inverted substantially U-shaped channel 27 (Figure 4), the top wall 28 of which forms a portion of the bag rack's supporting surface, the downwardly extending sides 29 and 30 of channel 27 being secured in any suitable manner as, for example, by spot welding, to the side walls 21 and 22, respectively, of end plate 18 and side walls 25, respectively, of end plate 24. To the end plates 24 of each of fixtures 13 and rails 17 (Figure 3) is fastened, as by screws 31, a finishing strip 32 which renders the entire structure rigid and maintains the spacing between the rails and fixtures.

It may now be seen that the inverted channel 27 provides a fixture housing. Fastened to the under side of channel top wall 28 (Figure 3) are a number of socket supporting straps 33 having downwardly depending legs 34 and 35 (Figure 4). To these legs are respectively fastened fluorescent tube sockets 36 and 37 which carry parallel fluorescent tubes 38 and 39. Also fastened to the under side of channel top wall 28 is an arcuate reflector 40 which curves over the tubes 38 and 39 from one side of the fixture to the other. As shown in Figure 3, reflector 40 is slightly longer than the light emitting portion of tube 39. It will now appear that fixture 13 is provided with two groups or pairs of fluorescent tubes, the tubes of each pair being parallel and corresponding tubes of different groups being coaxially aligned.

Each of the fluorescent tubes is under the control of an individual switch. Thus as is shown in Figure 4, tube 38 is controlled by a switch 41, while tube 39 is controlled by a switch 42, these switches being supported by flange or plate 23 of end wall 18. Each of the switches also has a knurled operating knob 43 which extends through the bottom of the fixture so as to be readily accessible to the undersitting passenger. Similarly, the fluorescent tubes at the outer end of the fixture (see Figure 3) are also individually provided with switches 44 carried by bottom flange 26 of end plate 24 and having accessible operating knobs 45. As is shown in Figure 2, the fluorescent tubes in fixture 13, or rather the operating knobs 43 and 45 of their switches, are readily accessible to passengers seated in seats S_1 or S_2 or both for individual control of the tubes as desired. Thus it is possible for a passenger sitting in seat S_2, for example, to control the intensity of illumination in transverse zone D_2 and longitudinal zones Z_1 and Z_2 (Figure 1), i. e. he may turn off the tubes under control of switch knobs 45 (Figure 2) so as to effect relative darkness in the area of his seat, or may select either zone Z_1 or Z_2 (Figure 1) for illumination without, however, affecting in any way the illumination of seat S_1. As noted hereinabove, it is also desirable properly to distribute the light, i. e. to provide the zoned illumination hereinbefore referred to. To this end, and with reference to Figures 3 and 4, each pair of fluorescent tubes, for example, tubes 38 and 39 (Figure 4) is provided with an underlying lens, generally indicated at 46, preferably comprising a pair of angularly related double convex portions 47 and 48. Thus the fixture includes two of these lenses 46 which underlie respectively the pairs of fluorescent tubes, and the double convex portions 47 and 48 (Figure 4) of lens 46 effect the longitudinal distribution of light in zones Z_1 and Z_2 (Figure 1). Lens 46 (Figure 4) may be supported in the fixture in any suitable manner, but preferably it is provided with opposed edges 49 and 50 which are held against feet 51 and 52, respectively, formed along the opposite edges of reflector 40. The lens is held in this position by a generally U-shaped canopy indicated at 53, the sides 54 and 55 of which are respectively secured to sides 29 and 30 of channel 27 as by detents 56 which extend through suitable holes in the canopy sides. The bottom of canopy 53 is preferably arcuate, and is provided with cutouts 57 and 58 (Figure 3) which underlie, respectively, the pairs of fluorescent tubes 38 and 39. The opposite ends of the bottom of canopy 53 are provided with holes (not shown) through which the switch operating knobs 43 and 45 extend. The center portion 59 of the bottom of the canopy is of sufficient length to effect separation of the zones of illumination Z_1 and Z_2 in Figure 1.

Further to effect the separation of the light into zones D_1 and D_2 (Figure 2), groups of louvers 60 and 61 (Figure 3) are provided, adjacent cutouts 57 and 58, respectively. Louvers 60 are parallel and lie in planes which are preferably substantially normal to the axes of the overlying fluorescent tubes and, as shown in Figure 4, rest on the upper surface of lens 46, in which position they are secured in any suitable manner. Louvers 61 (Figure 3), however, while parallel lie in planes which are angularly related to the planes of louvers 60, the angle being such as to direct the light into the area of zone D_2 (Figure 2). Louvers 60 (Figure 3), of course, direct the light into the area of zone D_1.

It may now be seen that the light emission from each pair of fluorescent tubes is controllable as to intensity, and also, to a certain extent, as to distribution. For example, either or both of tubes 38 and 39 (Figure 4) may be turned on or off through the manipulation of switch knobs 43 by the passenger seated in seat S_1 (Figure 2). Thus he can control the light intensity in zone D_1 and can select for illumination either of zones Z_1 or Z_2 (Figure 1), or both, as desired, thereby controlling to a certain extent the distribution of the light.

The fluorescent tubes hereinbefore mentioned are, of course, provided with the usual starting auxiliaries and ballast, and I have generally indicated this equipment at 62 (Figure 4), the equipment being supported in one of the rails 17 adjacent fixture 13, the necessary wiring extending from the fixture to the equipment 62 in the manner shown in Figure 3. Thus the wiring 64 may extend through suitable cutouts in end plate 19 and bracket 14 into the bracket, and therefrom into the adjacent rail 17 (Figure 4). Rail 17 (Figure 4) also includes a canopy 65 which is identical in configuration to canopy 53 of fixture 13, except that canopy 65 is not provided with the cutouts which underlie the fluorescent tubes

in the fixture. Thus similarity of appearance is attained between the rails and fixture.

Thus I have provided a lighting fixture which attains the several objects set forth hereinabove in a thoroughly practical and efficient manner.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limting sense.

I claim:

1. In lighting fixture construction, in combination, an elongated inverted channel, a plurality of groups of fluorescent tubes in end to end relation mounted in said channel, a canopy fastened to the bottom of said channel and having cutout portions underlying each group of tubes, an elongated lens for each group of tubes disposed between its tube group and the adjacent canopy opening, said lens having a plurality of light direction controlling portions equal in number to the tubes in said group, said portions being angularly disposed relative to one another so as to form separate elongated beams of light radiating transversely of the axes of said tubes.

2. A lighting fixture for use in railway cars or the like comprising, a bracket member adapted to be attached to a car wall, an elongated inverted channel member attached to said bracket member and having a substantially flat top wall with a pair of downwardly disposed side walls along its sides, a pair of downwardly-concave elongated reflectors mounted within said channel member and spaced longitudinally thereof to provide two reflector zones spaced along the channel member, bracket means positioned at the respective ends of said reflectors and mounted on said channel member to provide support for and the electrical connections to fluorescent tubes positioned adjacent said reflectors, a pair of lens members positioned respectively beneath said reflectors substantially coextensive therewith each of the lens members being trough-like and having two angularly disposed portions which direct light generally downwardly in two distinct rays, and a cover member snugly embracing the side-wall portions of said channel member and said lens members with there being cutout portions through said cover member for the emanation of light from said lens members.

3. A lighting fixture for use in railway cars or the like comprising, a bracket member adapted to be attached to a car wall, an elongated inverted channel member attached to said bracket member and having a substantially flat top wall with a pair of downwardly disposed side walls along its edges, a pair of downwardly-concave elongated reflectors mounted within said channel member and spaced longitudinally thereof to provide two reflector zones spaced along the channel member, bracket-connector means mounted on said channel member to provide support for and the electrical connections to illuminator tubes positioned adjacent said reflectors, a pair of lens members positioned respectively beneath said reflectors substantially coextensive therewith each of the lens members being trough-like and having two angularly disposed portions which direct light generally downwardly in two distinct rays, a plurality of louvers disposed in two groups which groups are associated respectively with said lens members and with the louvers of each group being positioned in substantially parallel relationship whereby light emanation through the lens members is directed in specific zones, and a cover member snugly embracing the side-wall portions of said channel member and said lens members with there being cut-out portions through said cover member for the emanation of light from said lens members.

4. A lighting fixture as described in claim 3 wherein two illuminator tubes are positioned in spaced parallel relationship along each of said reflectors with each tube directing light through one of said portions of the associated lens member.

5. A lighting fixture as described in claim 3 wherein an individual switch is provided for each of said tubes and wherein the louvers in the group furthest from said bracket member are angularly disposed so as to direct the light in a generally downwardly direction and away from the wall to which the bracket member is attached.

6. Apparatus as described in claim 1 wherein a plurality of groups of parallel louvers are provided with the groups associated respectively with the tubes and with the louvers of each group being angularly disposed with respect to certain other of the louvers, whereby the light emanation from the tubes is zoned longitudinally thereof.

7. In railway car construction, the combination of: a plurality of parallel horizontal rail members each secured at one end to the car wall and projecting outwardly therefrom with the space between each rail member and the next being substantially less than the width of the rail members so as to form a baggage rack; each of said rail members including, an elongated inverted channel member having a top flat wall and downwardly depending side walls, and a cover member snugly embracing the side walls of the channel member and extending across the bottom thereof, and one of said rail members having an opening in its cover member; a longitudinal rail member extending parallel to the said car wall and along the ends of said parallel rail members opposite to said car wall and attached to said parallel rail members; and lighting fixture means mounted within the rail member having an opening therein and comprising, a downwardly concave elongated reflector, and a trough-like lens member positioned beneath said reflector and providing space for an elongated illuminator tube.

8. In railway car construction, the combination of: a baggage rack construction formed by a plurality of parallel horizontal rail members each of which is secured at one end to the car wall and projects outwardly therefrom with the space between each rail member and the next being substantially less than the width of the rail members, and a longitudinal rail member extending parallel to said car wall and attached to the ends of said parallel rail members which are remote from said car wall; each of said rail members including, an elongated inverted channel member having a flat top wall and downwardly depending side walls, a bottom cover member having a bottom wall covering the open bottom of said channel member and having side walls which telescope snugly with the side walls of said channel member, one of said rail members having one or more openings in the bottom wall of its cover member; and a light fixture assembly mounted within the rail member having an opening or openings in its bottom wall comprising, a plurality of end brackets which are adapted to cooperate and receive a plurality of elongated illuminators in the space therebetween,

reflector means extending along the top of said space and being adapted to reflect light rays downwardly, and lens means positioned beneath said space and covering said opening or openings in the bottom wall of the cover member.

9. In a lighting fixture of the character described, the combination of, an elongated inverted channel member having a top wall and a pair of downwardly disposed parallel side walls along its sides, reflector means mounted within said channel member and fixed to said top wall and providing a plurality of downwardly-concave reflector surfaces, said reflector means having edge portions which extend parallel to and adjacent said side walls, a plurality of brackets mounted on said top wall and positioned respectively at each end of each of the spaces directly beneath said reflector surfaces thereby to provide mounting means for elongated illuminators positioned adjacent said reflector surfaces, lens means positioned beneath each of the spaces for illuminators to direct light rays therefrom, said lens means having side edges which engage the side edge portions of said reflector means thereby to hold the lens means in spaced relationship, and

a cover member having a cover wall which frames said lens means and overlaps the edges of said lens means so as to provide support therefor, said cover member having integral side walls which telescope with the respective side walls of said channel member.

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