

July 21, 1942.

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2,290,301

LUMINAIRE FOR TUBULAR LAMPS

Filed Sept. 16, 1939

2 Sheets-Sheet 1

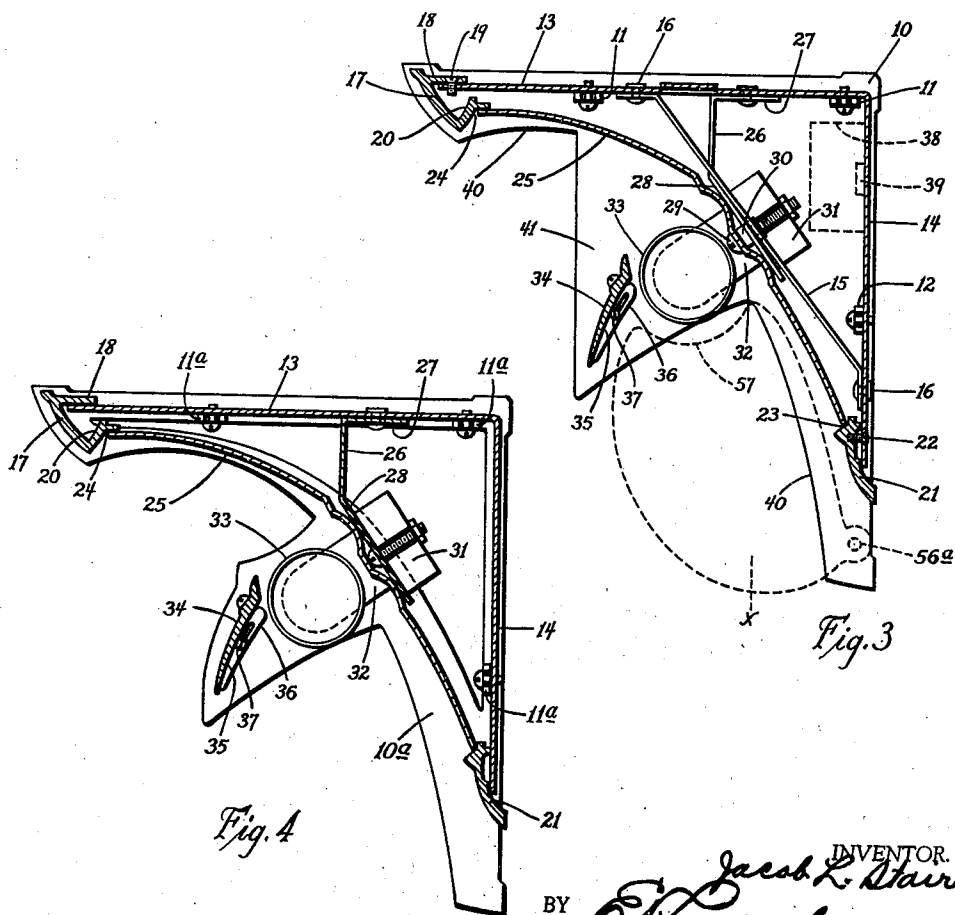
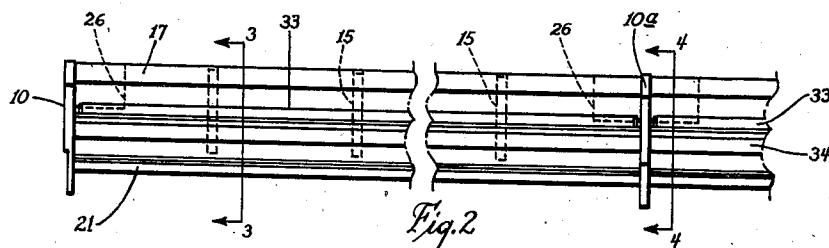
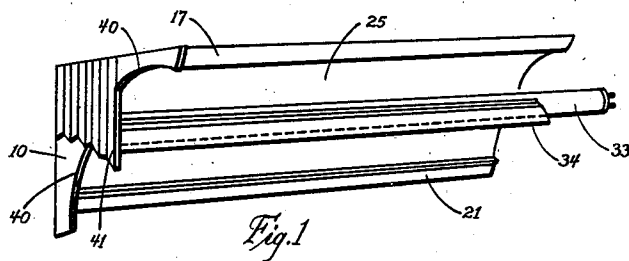


Fig. 4

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2 Sheets-Sheet 2

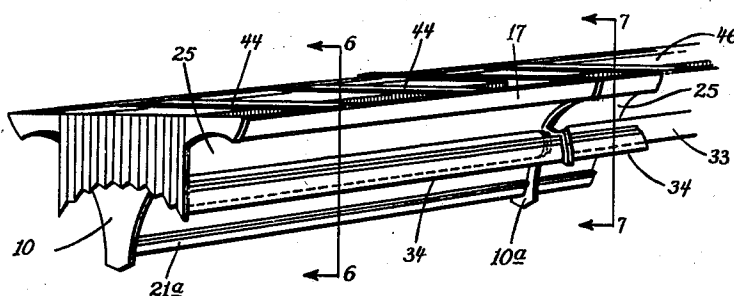


Fig. 5

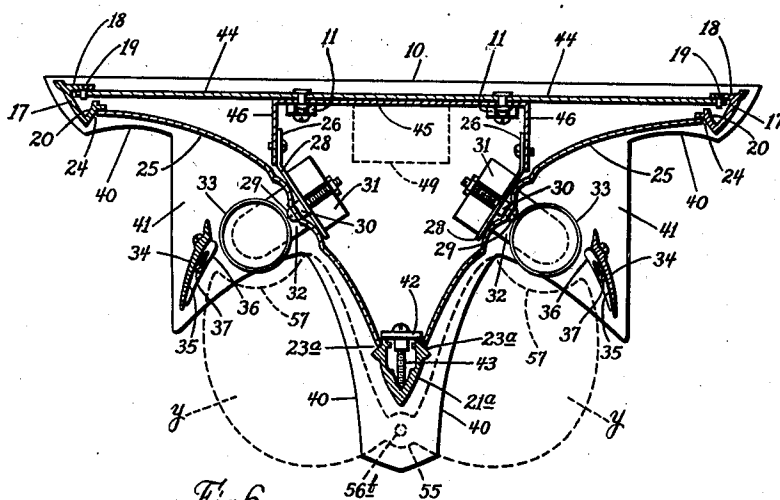


Fig. 6

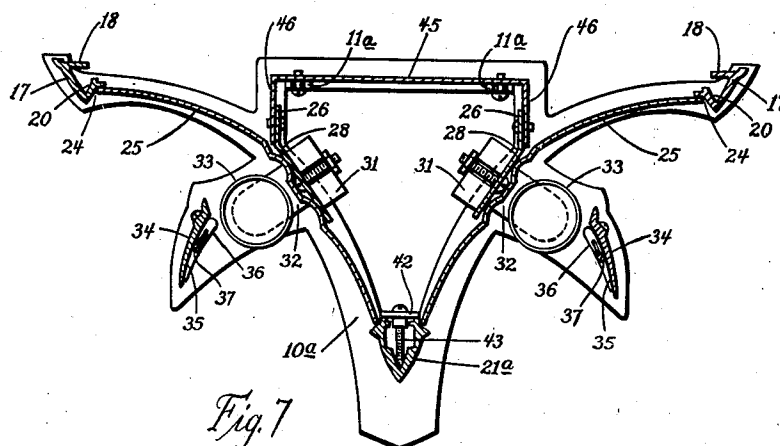


Fig. 7

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2,290,301

LUMINAIRE FOR TUBULAR LAMPS

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9 Claims. (Cl. 240—78)

My present invention relates to illuminating apparatus, and more especially to a luminaire that is adapted for use in connection with lamps of the elongated tubular type. A type of lamp which is particularly well adapted for use in my present illuminator is the recently developed fluorescent lamp which is an elongate glass tube having longitudinally extending terminal pins or studs at its ends that are removably seated in suitable holders or sockets whereby electrical current is supplied to the lamp. It will be understood that my luminaire, in all its forms, is well-adapted for use with other types of tubular lamps.

The luminaire which I have invented is of a unitary character so that a plurality of units may be placed end to end to provide an illuminating device of any desired length. A unit may comprise two inwardly and downwardly curved reflectors disposed in a back-to-back manner to provide illumination upon both sides of the center-line or central vertical plane of the structure, and by adding several sections of these back-to-back reflector units, in an end to end manner, an elongated structure is provided which may be mounted either upon a ceiling between the vertical walls of a room, suspended by pendent hanger from the ceiling. The luminaire may be further modified by separating or spacing back-to-back reflector units a distance sufficient to mount intermediate reflector units between them of a slightly different construction, whereby a light source of any length and width desired may be readily provided. This latter structure, like the first form above-described, may be mounted directly upon the ceiling, or it may be suspended therefrom on suitable hangers.

Any one, or all, of the forms of luminaires above mentioned may be provided with transversely disposed vertical louvers which will cooperate with the respective structures in order to reduce glare by shielding the eyes of the persons adjacent or approaching the luminaires.

My present invention has been designed with the broad object in mind to provide means whereby effective distribution of illumination is secured throughout a room as well as at the desired level or work-plane. The lamp is readily accessible for removal or replacement, and the structure is given more or less artistic treatment so that it will, as a whole, appeal to the aesthetic sense. I have made provision within the structure for mounting the lamp holders and any auxiliary devices which are required in connection with fluorescent and other lamps, and I have also

provided a wireway to receive and obscure the electric conductors.

The luminaire which I have invented, as above stated, is a unitary character, and it is novel in the construction and the arrangement of its parts. The device is effective and dependable in operation; it is easy to install; it is made of simple and sturdy parts; and it is economical to manufacture so that it may be sold for a reasonable retail price to the users. The above mentioned as well as other objects and advantages will be apparent to persons skilled in the art after the construction and operation of my invention is understood from the within description which is to be taken in connection with the accompanying drawings that form a part hereof.

In the drawings:

Figure 1 is a perspective of a luminaire made in accordance with my invention, in two reflector units disposed back-to-back to provide a dual structure that is adapted to be mounted upon or pendent from the ceiling between the walls of the room.

Figure 2 is a vertical transverse section taken on the line 6—6 of Figure 1 drawn to a larger scale and looking in the direction of the arrows.

Figure 3 is another vertical transverse section taken on line 7—7 of Figure 1.

Figure 4 is a view in perspective of a built-up luminaire comprising a plurality of reflector units similar to that shown in Figure 1 with their backs towards each other but separated a distance to accommodate intermediate illuminating reflector units.

Figure 5 is a vertical transverse section on line 2—2 of Figure 4 and looking in the direction of the arrows.

Figure 6 is an enlarged view of a louver mounting clip.

Figure 7 is a detail of a suspending device for the louver unit shown in Figure 5.

The drawings, it will be understood, are more or less schematic, and are for the purpose of disclosing typical or preferred forms in which my invention may be made. In these drawings similar reference characters refer to like parts wherever these parts appear in the different views.

The structure shown in the Figures 1, 2 and 3 inclusive is preferably provided with ornamental end plates 10 that may be cast metal with a suitable design formed upon their exterior faces. The inner faces of the end plates have lugs 11 adjacent their horizontal upper edges, and these plates 10 provide the end-walls of a suitable hous-

ing that also includes a horizontal elongated metal sheet 44 that rests upon the lugs 11 and is secured thereto by screws or otherwise to provide a top wall.

Moulding strips 17 of ornamental design are positioned in the upper outer portions of the luminaire and extend from end-wall to end-wall thereof. Each moulding strip has a horizontal inwardly extending flange 18 at its upper portion that rests upon the adjacent forward portion of the top wall 13 and it is anchored thereto by screws 19. The lower portion of this moulding has an irregularly shaped upwardly and inwardly extending flange 20 the purpose of which will later be explained. Another moulding strip 21a, of ornamental design is disposed between the end walls near their lower portions and it is anchored to the lower portions of the end walls by screws 43 that pass through flanged lugs 42 on the end walls and screw into the moulding. The shape of this moulding strip is such that seats or shoulders 23a are formed on its upper portion and the irregular shaped flange 20 of the upper moulding strip 17 provides another shoulder or seat 24. Concave reflector elements 25, preferably, of sheet metal, have their upper and lower margins seated upon the shoulders 23a and 24 just described and said deflector elements are bowed inwardly, substantially in the manner shown in Figures 2 and 3, and, as seen in Figure 1, they are of an elongated character so that they extend to the end walls 10 of the housing. The reflectors 25 extend inwardly and downwardly towards each other to the center of width of the luminaire unit. The reflectors provide closures for the tapered sides of the housing and, together with other structure form an enclosure of substantially triangular outline in cross-section in which the conductors, auxiliaries, and portions of the lamp sockets or holders are disposed and obscured from view. The moulding strips 17 and 21a are disposed in spaced vertical planes one above the other, and they are also in spaced horizontal planes with the upper moulding in front of the lower moulding so that they are in offset relation the one with respect to the other.

The reflectors 25 are held in position by means of relatively wide pendent hangers 26 that are secured to the top-plates 44 of the housing by attaching them to the pendent flanges 46 of a wide elongated U-shaped plate 45 that is secured to the top-plates. These hangers have lower flanges 28 extending obliquely back of each reflector element 25 to which they are connected by means of screws 29 that are threaded into bosses 30 on the hangers and pass through apertures in the reflector element.

The relatively wide hangers just mentioned extend towards each other from the ends of the fixture for several inches, approximately five inches, and they are positioned so that they provide means for mounting the lateral bases 31 of the sockets or holders 32 that are especially designed to receive the terminal pins of the fluorescent or other lamps of the tubular type identified as 33. The body portions of these sockets or holders extend through openings in the oblique portions 28 of the hangers and through aligned openings in adjacent portions of the concave reflector, and carry the tubular lamp 33 between them in a horizontal plane that is intermediate the upper and lower edges of said reflector. This arrangement permits a proportion of light waves from the lamp to reach the reflector and be directed by it away from the fixture.

Means are provided in the above-described luminaire for controlling a certain proportion of the light waves, which means also acts as a shield to reduce glare in the eyes of persons adjacent or approaching the luminaire. This means embodies an adjustable elongated moulding strip 34 having a concave back face 35 that is nearest the lamp and which has an outer face of ornamental design to harmonize with the artistically treated portions of the luminaire. The ends of this strip are secured to lugs 36 that project from portions of the respective end-walls, and these lugs are either integral with the end-walls or they are secured thereto by means of set screws 37 that may be loosened in order to adjust the strip as desired with respect to the lamp. The rear face of the strip or shield may have reflective properties and the tilting of the strip or shield will adjustably control the direction of the light waves therefrom. As shown in Figures 2 and 3 there is a shield for each lamp.

The electric conductors are led into the housing through "knock-out" openings and have suitable connection with a transformer 49 (or other auxiliary) that may be employed in connection with fluorescent and similar tubular lamps. The transformer usually embodies an elongated rectangular box having means at its ends whereby it may be attached by screws to a wall of the housing. The forward edges 40 of the end plates 10 are formed arcuate or inwardly curved in the manner shown in Figures 2 and 3 to impart graceful and artistic lines to the fixture conforming somewhat to the cross-sectional form of the reflector 25. Intermediate the ends of these curved edges there are triangular shaped enlargements 41 that extend outwardly away from said edges and provide means that are integral with the end walls upon which the moulding 34 is mounted through the medium of the lugs 36. The enlargement 41 also forms a portion of the ornamental designs which appear upon the outer surfaces of the end plates.

This structure is adapted for use as a luminaire that is mounted in a variety of positions such as directly upon the ceiling between the side walls of the room, or suspended from the ceiling by means of suitable hangers. In order to provide a structure of the character just mentioned, I dispose what appear to be two units of triangular section in back-to-back relation to each other, as illustrated in Figures 1, 2 and 3. In this type of luminaire the reflectors 25 curve upwardly and outwardly in opposite directions away from each other so that their adjacent lower margins form a downwardly extending elongated apex along the central longitudinal portion of the luminaire. This double moulding 21a has shoulders or seats 23a formed upon its upper portions on each side of its vertical center to receive the adjacent margins of the oppositely disposed reflectors 25. The intermediate portions of the reflectors are connected to the oblique portions 28 of the hangers 26.

The principles of the luminaire above described in connection with Figures 1, 2 and 3 provide a portion of the structure now to be described in connection with Figures 4, 5, 6 and 7. In these latter figures it will be observed that the two units which have their reflectors flared away from each other are spaced apart in a horizontal plane a distance sufficient to mount intermediate arched reflector elements between the backs of the flared reflector units. The left-hand and right-hand longitudinal sides of the structure

now being described contain all the essential parts of the luminaire disclosed in Figures 1, 2 and 3 to which the intermediate structures have been added. The cross bars 44a are longer than those of the structure shown in Figure 1 in order to take care of the increased width of the luminaire. The flared reflectors 25, the tubular lamps 33 and their holders 32, and the strips or shields 35 are constructed and arranged all in the same manner as before described in connection with Figures 1, 2 and 3.

Intermediate the ends of the cross-bars 44a there are a plurality of U-shaped bracket members 50 that depend below said cross bars and have flanged upper ends that are suitably connected to the under-sides of said bars 44a. A plurality of upwardly curved elongate reflectors 51 have their lower margins engaged on the shoulders or seats 23a of the dual or double moulding strips 21a that have their ends secured to the transverse end plates of the luminaire. The end plates 10b are of larger dimensions than the end plates 10a of the other form and one or more additional dual moulding strip 21a are mounted at their ends on lugs 42a on said end plates. The longitudinal sides of a reflector 51 flare upward towards each other and the upper portion 51a of the reflector 51 is anchored to the U-shaped bracket members 50 by screws or otherwise. Lamp holders 32a are secured to the U-shaped brackets adjacent the end plates 10b and project through the webs of said brackets and the tops 51a of the reflectors to position the tubular lamps 33 in the upper portions of said reflectors. The transformers or auxiliaries may be mounted in the brackets 50 or upon the cross-bars 44a as may be convenient, and the electric conductors are disposed in the wire-way which is provided above and between the reflectors 25 and 51.

In the type of luminaire just described I have shown a louver structure the walls of which are adapted to shield the eyes of persons adjacent or approaching the illuminating device in a direction towards the ends of the structure. This louver device embodies a plurality of suitably shaped plates 52 disposed transverse to the axes of the lamps and reflectors in parallel relation to each other. These louver plates have their lower edges formed in a plurality of downwardly disposed convex curves 53, and the upper edges of the plates have deeply curved recesses 54 that meet in somewhat circular bosses 55 that are apertured to receive horizontal parallel rods 56 that pass transversely through the bosses 55 and anchor the plates so that they provide a unitary structure. Downward curved recesses 57 are formed in the tops of the plates to accommodate the lamps. As shown, the upper margins of the louvers conform generally in outline with the adjacent structure of the luminaire, and as a whole the louver unit constitutes means to reduce the glare reaching the eyes of persons near the ends of the luminaire or approaching the same in oblique direction.

This louver unit is attached to the luminaire by means of separable clips that comprise a pair of relatively narrow plates having oppositely disposed semi-circular portions 58 at their lower ends to encircle adjacent portions of the louver rods 56 and have irregularly shaped upper portions 59 that conform generally with the outline of the dual moulding strips 21a which they embrace. Intermediate these curved end portions there are straight parallel portions 60 through

which the screw 61 passes to draw the two parts of the clips towards each other and clamp them upon the molding strip and the louver rod in the manner illustrated. Instead of using these clips the louver unit may be connected to the illuminating structure by a plurality of hinged arms 62 that have their ends pivoted respectively on the luminaire and the louver unit. When these arms are in folded or closed positions suitable latches retain the parts against unintentional separation, and upon release of these latches the arms may be extended and support the louver unit in a pendent manner a suitable distance below the body of the lighting fixture where the lamps and other parts may be conveniently handled.

All of the forms of the luminaire may be provided with louvers that comprise vertical metal plates disposed transverse to the reflectors and also transverse to the axes of the tubular lamps. These louver devices have already been described in connection with the luminaire shown in Figures 4 to 7 wherein they embody a unitary structure.

In the form of luminaire shown in Figures 1, 2 and 3 wherein the housing sections are arranged in back-to-back relation, the louvers *y* extend upward upon each side of the central somewhat circular bosses 55a that are apertured to receive the bar or rod 56b, and this bar is secured to the bottom moulding strip 21a by the same type of separable clips that are shown in Figure 10.

Each form of my luminaire herein described is of a unitary character and is readily adapted to be lengthened merely by mounting a plurality of units end to end until the desired length is attained. In constructing devices as just suggested I prefer to omit the proximate end plates or end-walls of the housing and replace them with an intermediate plate or wall 10a detailed in Figure 3 that corresponds generally in shape with the outline of the end wall except that it is skeletonized to reduce its weight and also to provide transverse openings back of or between the reflectors to permit the electric conductors to pass through them and extend continuously throughout the housing. The intermediate walls are provided with suitable lugs 11a upon both faces to which the ends of the moulding strips and the top wall sections are connected. It will be understood that by joining several units, through the medium of these intermediate walls, the length of any of the forms of my luminaire may be readily increased to as great an extent as desired.

The positioning and manner of mounting the eye-shielding strips 34 permits them to be tilted in a manner to not only shield the eyes but also to reflect light from the faces which are nearest the lamps. The strips may also be bodily moved up and down, or transverse to their axes, to compensate for various conditions of lamp exposure in the rooms in which the structure is installed. This bodily adjustment may readily be taken care of by providing an elongate slot in the lug 36 through which the screw 37 passes into the adjacent end wall or intermediate plate to attach the lug thereto.

What I claim is:

1. A luminaire embodying a frame comprising transverse end walls; a top the ends of which are connected to said end walls; means extending along the longitudinal margins of said top; and secondary means extending longitudinally between the lower portions of said end walls below said top, in combination with two elongated in-

wardly bowed reflectors extending between said end walls and arranged to reflect light waves outwardly and downwardly in opposite directions away from each other, the upper portions of said reflectors engaged with the means at the margins of said top and the lower portions of said reflectors engaged with said secondary means; hangers pendent from the top of said frame the lower portions of which are connected to said reflectors to maintain the latter engaged with aforesaid longitudinal means; an elongate lamp in front of the transverse central portion of each reflector, each lamp disposed to provide relatively wide uninterrupted light emission spaces above and below the same; said secondary means positioned to shield the eyes of a person at a side of the luminaire from light waves emanating from the opposite side of the luminaire; and an upstanding light interrupting shield adjacent each lamp, whereby to reflect a proportion of light waves from said lamps in a downwardly direction, and each shield adapted also to obscure portions of the adjacent lamp whereby the eyes in line with said shield are protected from direct glare from the lamp.

2. A luminaire embodying a frame comprising transverse end walls; a top the ends of which are connected to said end walls; means extending along the longitudinal margins of said top; and secondary means extending longitudinally between the lower portions of said end walls below said top; in combination with two elongated inwardly bowed reflectors extending outwardly and downwardly in opposite directions away from each other; the lower portions of said reflectors disposed adjacent each other, and engaged with said secondary means, said secondary means being common to both reflectors, the upper portions of said reflectors engaged with the means at the margins of said top; hangers pendent from the top of said frame the lower portions of which are connected to said reflectors to maintain the latter engaged with the aforesaid longitudinal means; an elongate lamp in front of the transverse central portion of each reflector, each lamp disposed to provide relatively wide uninterrupted light emission spaces above and below the same; said secondary means positioned to shield the eyes of a person at a side of the luminaire from light waves emanating from the opposite side of the luminaire; and an upstanding light interrupting shield adjacent each lamp, whereby to reflect a proportion of light waves from said lamp in a downwardly direction, each shield adapted also to obscure portions of the adjacent lamp whereby the eyes in line with said shield are protected from direct glare from the lamp, and said secondary means adapted to shield the eyes of a person on one side of the luminaire from light waves emanating from the opposite side of the luminaire.

3. A luminaire embodying a frame comprising transverse end walls; a top connecting said end walls; upper longitudinal members along the margins of said top; and a lower longitudinal member between the lower portions of said end walls below said first members; in combination with two elongated oppositely facing concave reflectors extending between said end walls and inclined inwards towards each other; the upper portions of said reflectors contacting said upper members and the lower portions of said reflectors contacting said lower members, said frame and said reflectors together constituting an elongated compartment; hangers depending from said top

and disposed with portions back of said reflectors; means removably connecting said reflectors to said hangers to maintain said reflectors engaged with said upper and lower members, whereby a reflector is adapted to be readily dismounted to permit access to said compartment; a light shielding reflector strip intermediate upper and lower portions of each reflector; and an elongated tubular lamp between each said strip and the transverse central portion of the adjacent reflector, whereby to permit free flow of light waves above and below each lamp.

4. A luminaire embodying a frame comprising transverse end walls; elongated parallel members extending longitudinally between the upper outer portions of said end walls; longitudinal members extending between the lower portions of said end walls below said first members and between the vertical planes thereof; in combination with two elongated oppositely facing concave reflectors extending between said end walls and inclined inward and downward towards each other; the upper margins of said reflectors contacting said upper parallel members and the lower portions of said reflectors contacting said lower members, said frame and said reflectors together constituting an elongated compartment; brackets secured to upper portions of said frame structure and disposed with portions back of said reflectors; means removably connecting said reflectors to said brackets whereby to demountably support said reflectors in engagement with said longitudinal members; a light-shielding reflector strip at the transverse mid-portion of each reflector; lamp-holders connected to said brackets and extended in front of said reflectors; and an elongated lamp supported by the respective holders and disposed longitudinally between each said strip and the adjacent reflector, whereby to permit free flow of light waves above and below each lamp and the adjacent light-shielding reflector strip.

5. A luminaire for tubular lamps embodying a top; transverse end-walls connected thereto; two back-to-back horizontal main reflectors of concave cross-section facing downward and outward below said top, said reflectors formed in the quadrants of circles each to one side of a vertical plane; longitudinal mouldings along the outer margins of said top; a moulding connecting lower portions of said end-walls; means connecting intermediate portions of said reflectors to said top with the upper and lower margins of said reflectors engaged with said mouldings; fluorescent tubular lamps extending horizontally in front of said reflectors intermediate upper and lower margins thereof and within said quadrants; horizontal secondary reflectors facing said lamps and said main reflectors and within said quadrants and adapted to intercept direct light waves from said lamps in the normal range of vision; and means operatively connecting said reflectors and lamps in the positions named.

6. A luminaire for tubular lamps embodying a top; transverse end-walls connected thereto; two back-to-back horizontal main reflectors of concave cross-section facing downward and outward below said top, said reflectors formed in the quadrants of circles each to one side of a vertical plane; longitudinal mouldings along the outer margins of said top; a moulding connecting lower portions of said end-walls; hangers on said top back of said reflectors; means connecting said hangers to said reflectors, whereby to engage the upper and lower margins of said re-

flectors with said mouldings; fluorescent tubular lamps extending horizontally in front of said reflectors intermediate the upper and lower margins thereof and within said quadrants, whereby said reflectors are disposed above, back of, and below said lamps; and horizontal secondary reflectors facing said lamps and said main reflectors and within said quadrants and adapted to intercept direct light waves from said lamps in the normal range of vision.

7. A luminaire for tubular lamps embodying a top; transverse end-walls connected thereto; two back-to-back horizontal main reflectors of concave cross-section facing downward and outward below said top, said reflectors formed in the quadrants of circles each to one side of a vertical plane; longitudinal mouldings along the outer margins of said top; a lower moulding connecting lower portions of said end-walls; said top mouldings engaged with the upper margins of said reflectors, and said lower moulding providing common means engaged by the lower margins of both reflectors; means connecting intermediate portions of said reflectors to said top whereby to maintain the upper and lower margins of said reflectors in engagement with said mouldings; fluorescent tubular lamps extending horizontally in front of said reflectors intermediate the upper and lower margins thereof and within said quadrants; and horizontal secondary reflectors facing said lamps and said main reflectors and within said quadrants and adapted to intercept direct light waves from said lamps in the normal range of vision.

8. A luminaire for tubular lamps embodying a top; transverse end-walls connected thereto; two back-to-back horizontal main reflectors of concave cross-section facing downward and outward below said top, said reflectors formed in the quadrants of circles each to one side of a vertical plane; longitudinal mouldings along the outer margins of said top; a lower moulding connecting lower portions of said end-walls; said

mouldings constituting engaging means for the upper and lower margins of said reflectors, the lower moulding being common to both reflectors; hangers secured to and depending from said top and at the rear of said reflectors; means connecting said reflectors to said hangers, whereby the upper and lower margins of said reflectors are maintained in engagement with said mouldings; fluorescent tubular lamps extending horizontally in front of said reflectors intermediate the upper and lower margins thereof and within said quadrants; and horizontal secondary reflectors secured to said end-walls and facing said lamps and said main reflectors, said secondary reflectors disposed within said quadrants and adapted to intercept direct light waves from said lamps in the normal range of vision.

9. A luminaire embodying a housing comprising vertical end-walls; an elongated horizontal strip extending between lower portions of said end-walls; elongated horizontal strips extending between upper portions of said walls and disposed outwardly on each side of and beyond the vertical plane of said lower strip; a top between said walls; elongated relatively wide members extending between said walls, said members inclined upwardly away from each other with their upper and lower margins engaged with said strips, whereby to provide opposite outwardly-facing reflectors; said members, said top, and said end-walls together constituting a housing of substantial dimensions in cross-section; in combination with hangers depending from said top back of said reflectors; means detachably connecting said reflectors to said hangers, whereby a reflector is adapted to be removed for access to said housing; lamp holders on said hangers and projected outside said reflectors; elongated lamps removably carried by said holders in front of said reflectors; and upstanding light-shields in front of said lamps.

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