June 8, 1954

C. K. KURTZON

2,680,502

LIGHT DIFFUSING UNIT

Filed April 29, 1948

2 Sheets-Sheet 1

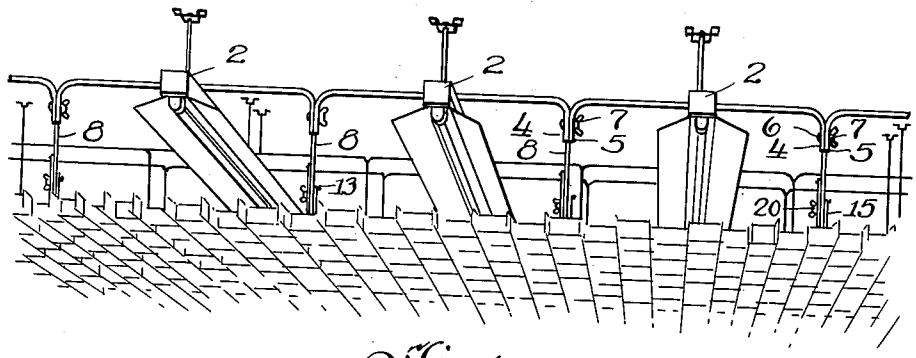
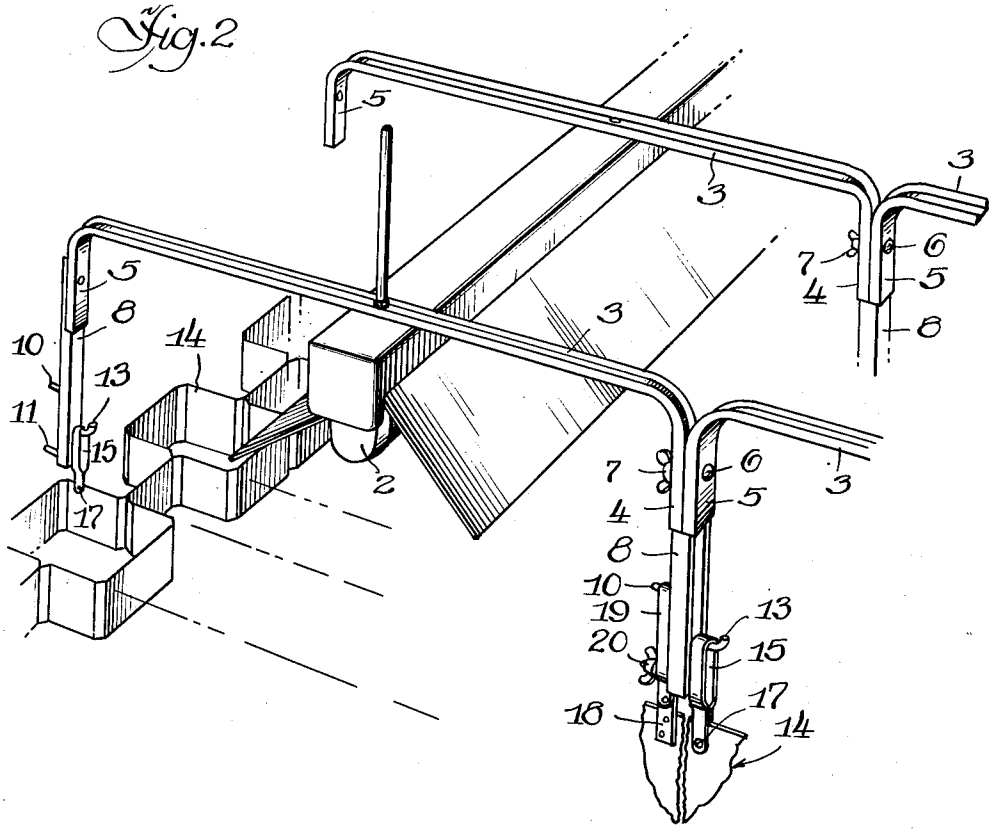


Fig. 1

Fig. 2



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2 Sheets-Sheet 2

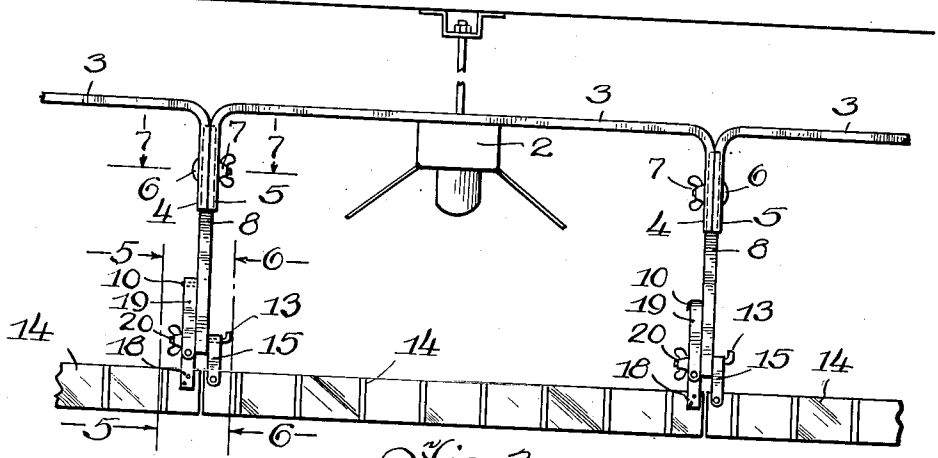


Fig. 3

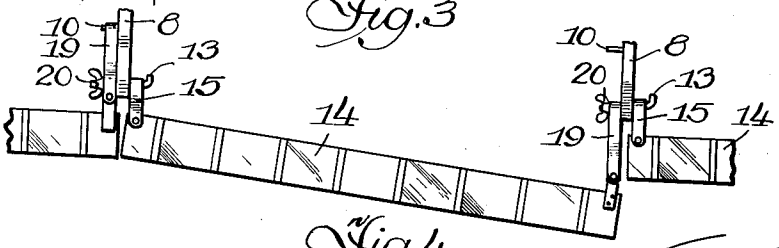


Fig. 4

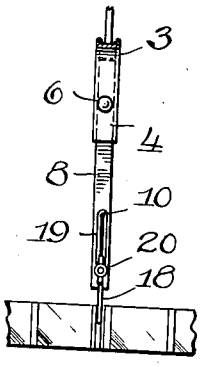


Fig. 5

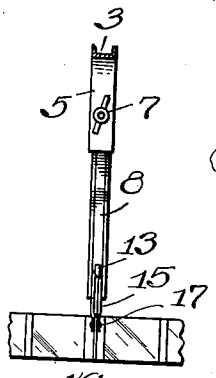


Fig. 6

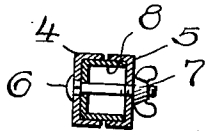


Fig. 7

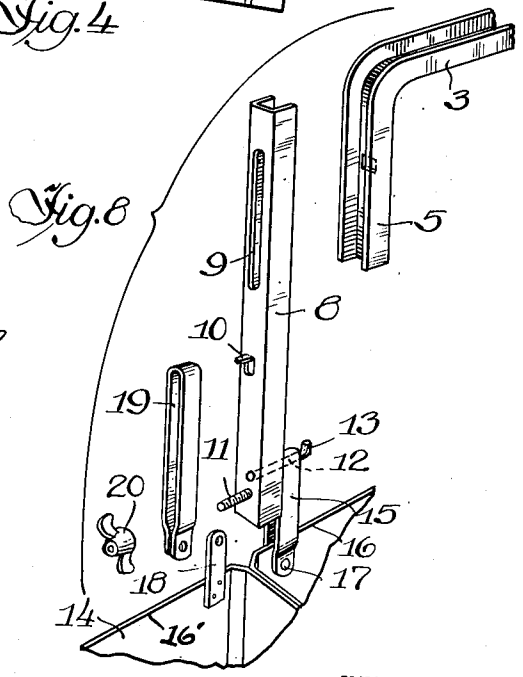


Fig. 8

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LIGHT DIFFUSING UNIT

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Application April 29, 1948, Serial No. 23,903

3 Claims. (Cl. 189—85)

1

This invention relates to a light diffuser unit, and particularly to means for supporting the unit underneath a series of fluorescent lights depending from a ceiling.

The use of fluorescent lights in stores, offices and factories is continuously growing, and this widespread acceptance of fluorescent lighting has brought with it the problem of proper diffusion necessary to provide adequate illumination without eye strain or fatigue. The diffusion of light from a series of fluorescent light tubes has been accomplished by providing supplemental ceilings of metal louvers below the lights. However, the means for securing the supplemental ceilings in place have been complicated and expensive. Cleaning the metal louvers has also been relatively expensive because of the labor involved, whether the ceilings were washed in place or were taken down for washing and then replaced.

In accordance with the present invention a supplemental ceiling is formed of units of metal louvers secured together and supported in a simple manner so that any unit may be easily removed for cleaning or for replacing any of the fluorescent light tubes above the particular unit. The louvers comprising the supplemental ceiling diffuse the light uniformly over the whole room. The louvers may be made of metal, preferably a light weight metal such as aluminum, and may be finished in the natural aluminum color, but are preferably painted white to give maximum light reflection. They may, of course, be made of other suitable materials such as coated, resin-stiffened fabrics.

The structure by which the above advantages are attained will be described in detail in the following specification, taken in conjunction with the accompanying drawings, in which:

Figure 1 is a perspective view of a plurality of light diffusing units assembled together into a unitary structure, with one end broken away to facilitate illustration of the lighting fixtures and the interengagement of the channel brackets supporting the light diffusing units;

Fig. 2 is a fragmentary top perspective on an enlarged scale showing the means for supporting the light diffusing units;

Fig. 3 is a fragmentary end elevation showing a light diffusing unit held in its normal position;

Fig. 4 is a fragmentary end elevation showing a light diffusing unit at an intermediate position, illustrating the first step towards removal of the unit from its normal position;

Fig. 5 is a cross sectional view, taken along the line 5—5 of Fig. 3;

2

Fig. 6 is a cross sectional view, taken along the line 6—6 of Fig. 3;

Fig. 7 is a cross sectional view, taken along the line 7—7 of Fig. 3; and

Fig. 8 is an exploded view showing the parts for supporting meeting edges of two adjoining light diffusing units.

In the drawings, the reference numeral 2 indicates a fluorescent light fixture supported from a ceiling in any conventional manner. Although the light fixtures are shown as being supported by tie rods, the invention is equally applicable to fixtures secured against the ceiling. A plurality of inverted U-shaped channel brackets 3 are welded or otherwise secured, as by mechanical means, to the top of light fixture 2 so as to extend transversely thereto. The length of each channel bracket 3 is equal to the center-to-center spacing of adjacent light fixtures so that the downturned ends 4 and 5 of adjacent channel brackets will engage each other. The bracket may be made of a pair of telescoping parts to permit an adjustment in length. Ends 4 and 5 of adjacent brackets are secured together by a bolt 6 held by a wing nut 7.

An adjustable bar 8 has its upper end secured between ends 4 and 5 of adjacent brackets 3. Bar 8 is preferably channel shaped and has an elongated slot 9 in its bottom wall. Bolt 6 extends through slot 9 to secure the end of bar 8 in place. Slot 9 provides for vertical adjustment of the light diffusing units so that the distance between the fluorescent light fixtures and the light diffusing units may be adjusted to give the desired diffusion and, primarily, so that the diffusing units may be leveled and aligned with each other. If desired, the length of ends 4 and 5 of brackets 3 may be increased to permit the desired vertical adjustment and thereby eliminate bars 8. The lower portions of ends 4 and 5 would then be fixed, preferably adjustably fixed, to support the light diffusing units in the same manner as in the structure having bars 8.

A projection or ledge 10 extends outwardly from adjustable bar 8 below the bottom edge of slot 9. In the drawings this projection is shown as being struck out from bar 8, but the exact manner of forming it is not material to the present invention. The essential characteristic of projection 10 is that its upper surface must be such that a member, hereinafter described, engaged with the projection may be slid or otherwise readily removed therefrom.

A threaded stud 11 extends outwardly from bar 8 in the same direction as projection 10, from a region slightly above the edge of the bar. A

pin 12, also positioned near the lower end of bar 8, projects therefrom in the opposite direction to projection 10 and stud 11. Pin 12 is preferably somewhat above stud 11, as shown. The end of pin 12 is turned upwardly, as indicated at 13.

The light diffusing units 14 each comprise a plurality of louvers formed of thin metal strips arranged in honeycombed formation, with the edges of the strips forming the top and bottom surfaces of the unit. The strips are preferably aluminum or sheet metal. They may be welded together at their meeting surfaces, or may be secured together in any suitable manner. If the louvers are aluminum they may be finished in their natural color, but it is preferred to paint them white to diffuse the light without absorbing too much of it. The height of the louvers is sufficient to conceal the fluorescent light tubes from the view of persons looking at the ceiling at an angle. The louvers must be shallow enough so that they readily reflect light to the area below.

A short loop 15 is pivoted at its lower end to one louver 16, as indicated at 17. An end louver 16' (Fig. 8) of an adjacent light diffusing unit has a strap 18 projecting upwardly therefrom. A long loop 19 is pivoted at its lower end to the top of strap 18. This loop may be pivoted directly to the diffusing unit and thereby dispense with the strap. Loop 19 is long enough to simultaneously embrace projection 10 and stud 11. A wing nut 20 secures loop 19 in place against bar 8.

When any unit 14 is to be removed, wing nut 20 is loosened so that the upper end of loop 19 can be slid off from projection 10. Stud 11 is longer than projection 10 so that nut 20 can be loosened sufficiently to permit loop 19 to be swung on its pivot and be slid from the projection and be engaged with the thread of stud 11. Unit 14 then assumes the position illustrated in Fig. 4. The left hand end of unit 14, as viewed in Fig. 4, may then be raised slightly so that loop 15 may be swung on its pivot 17. It will clear upturned end 13 and thus free one end of the unit. Wing nut 20 may then be removed from stud 11 to permit complete removal of unit 14.

From the foregoing it will be seen that I have devised novel and useful means for supporting a plurality of light diffusing units in conjunction with conventional fluorescent light fixtures, with adjacent light diffusing units secured together to form a unitary ceiling structure that can be expanded to fit any size room. Each bar 8 supports the meeting edges of two adjacent light diffusing units. It will be understood that when the area to be covered by the light diffusing units is not an exact multiple of the individual units, units at the side or end of the ceiling may be tailored to fit into the remaining space. Channel brackets 3 may be telescoped to fit into the space. It is also possible to secure a sheet metal panel to the walls adjacent the ceiling and to secure the extreme ends 4 or 5 of the channel brackets closest to the walls to angle members projecting from the sheet metal panel.

Although I have described a preferred embodiment of my invention in considerable detail, it will be understood that the description thereof is intended to be illustrative, rather than restrictive, as many details may be modified or changed without departing from the spirit or scope of my invention. Accordingly, I do not desire to be restricted to the exact structure described.

I claim:

1. A light diffusing member comprising a plurality of supporting members, a pair of projections extending in opposite directions from each of said supporting members, a plurality of light diffusing units, each of said units having appreciable thickness and having opposite edges spaced from adjacent units a distance less than said thickness, each of said units having a pair of upwardly extending supporting members, said upwardly extending supporting members being pivoted to said unit adjacent said opposite edges, each of said upwardly extending supporting members having means for detachably securing each of said supporting members on one of said projections to support opposite edges of said units at a predetermined level, each of said units being swingable outwardly on axes disposed parallel to the plane of the units but spaced inwardly from the outer plane thereof, one upstanding supporting member of each of said pairs of upstanding supporting members being also supportable on its projection at a level lower than said predetermined level to permit lowering of one edge of each of said units, said other upstanding supporting member of each of said pairs of upstanding supporting members being disengageable from its projection to permit unlimited lowering of its edge of said unit only after said opposite edge of said unit has been partially lowered.

2. A light diffusing member comprising a plurality of supporting members, a pair of projections extending in opposite directions from each of said supporting members, a plurality of diffusing units, each of said units having appreciable thickness and having opposite edges spaced from adjacent units a distance less than said thickness, each of said units having a pair of loops, said loops being pivoted to said unit adjacent said opposite edges, each of said loops having means for detachably securing it on one of said projections to support opposite edges of said units at a predetermined level, each of said units being swingable outwardly on axes disposed parallel to the plane of the unit but spaced inwardly from the outer plane thereof, one loop of each of said pairs of loops also supportable on its projection at a level lower than said predetermined level to permit limited pivotal movement of its edge to lower said edge below said predetermined level, said other loop being disengageable from its projection when said first mentioned edge is in its partially lowered position to permit lowering of its edge a distance sufficient to clear the adjacent edge of the adjacent unit, whereby any of said units may be removed from said supporting members.

3. A light diffusing member comprising a plurality of light diffusing units of appreciable thickness positioned adjacent each other, each of said units having peripheral edges spaced from peripheral edges of adjacent units a distance less than said thickness, thereby giving the appearance of a single continuous member without intervening breaks, a plurality of supporting members, each supporting member being positioned above the meeting edges of two adjacent light diffusing units, a projection extending in opposite directions from each of said supporting members, a plurality of pairs of loops, one loop of each of said pairs of loops being pivoted to one of said light diffusing units adjacent one edge thereof, said one loop being detachably connected to one of said projections to support one edge of one of said units at a predetermined level, means for supporting the other loop of said pair of loops on the opposite projection of an adjacent supporting member to support the oppo-

site edge of said unit at either said predetermined level or at a lower level, to permit partial lowering of said opposite edge of said unit, each of said units being swingable outwardly on axes disposed parallel to the plane of the unit but spaced inwardly from the outer plane thereof, said first mentioned loop of said pair being disengageable from its projection to permit unlimited lowering of its edge of said unit when said opposite edge of said unit is supported in partially lowered position to permit removal of said one unit from

said light diffusing member without interference from any adjacent unit.

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