May 17, 1960 B. BLITZER 2,937,265

CELLULAR LIGHTING ELEMENT AND MEANS FOR SUPPORTING THE SAME

Filed Feb. 10, 1958 2 Sheets-Sheet 1

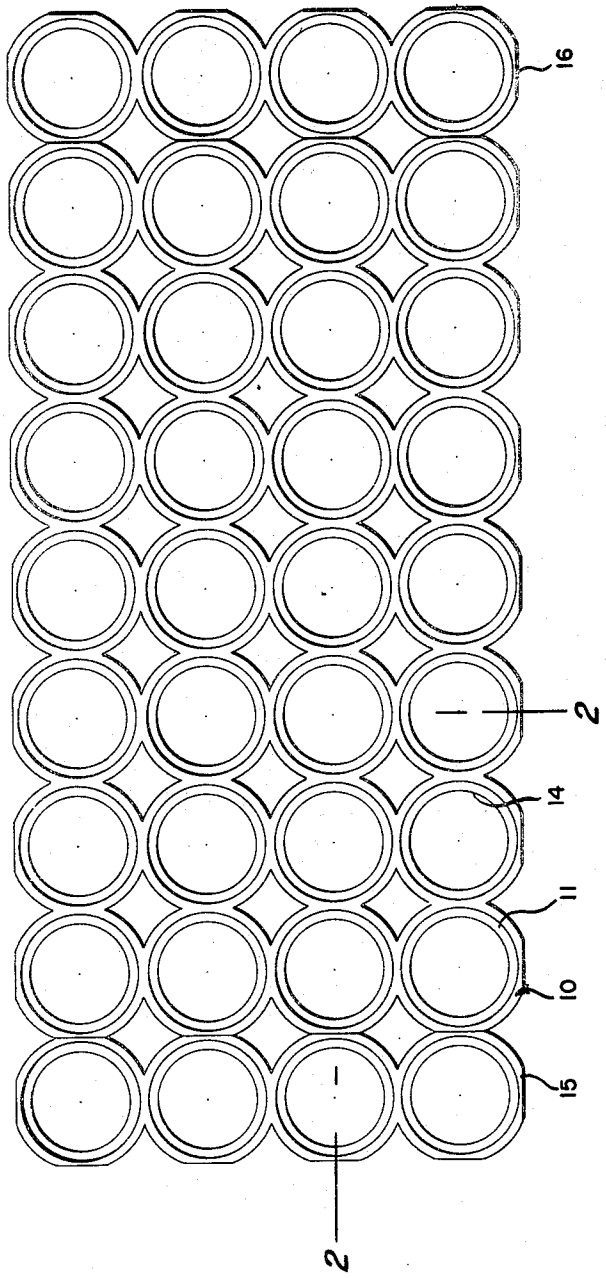


Fig. 1

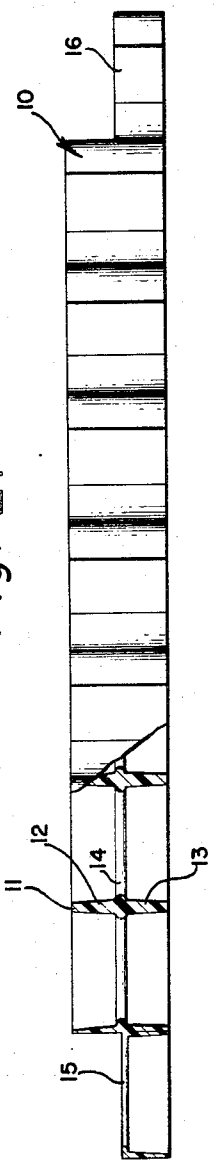


Fig. 2.

Bud Blitzer,
INVENTOR.
BY.
J. Louis Cook
ATTORNEY.

May 17, 1960 B. BLITZER 2,937,265

CELLULAR LIGHTING ELEMENT AND MEANS FOR SUPPORTING THE SAME

Filed Feb. 10, 1958 2 Sheets-Sheet 2

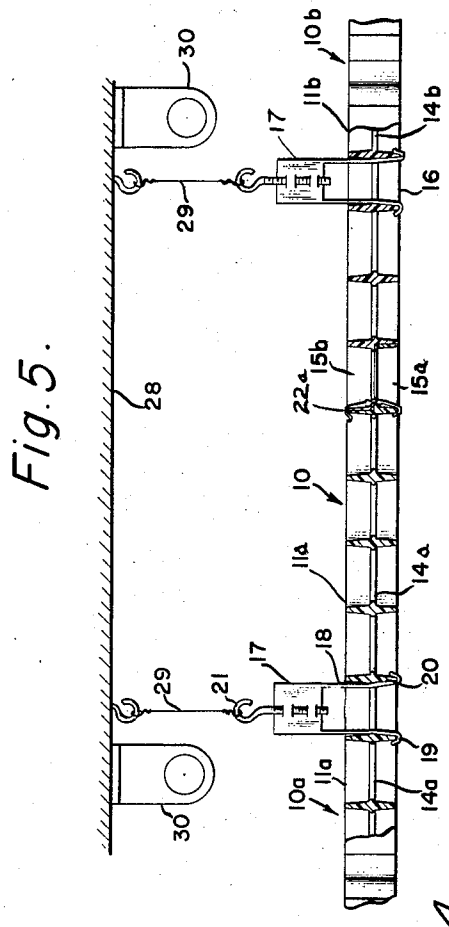


Fig. 5.

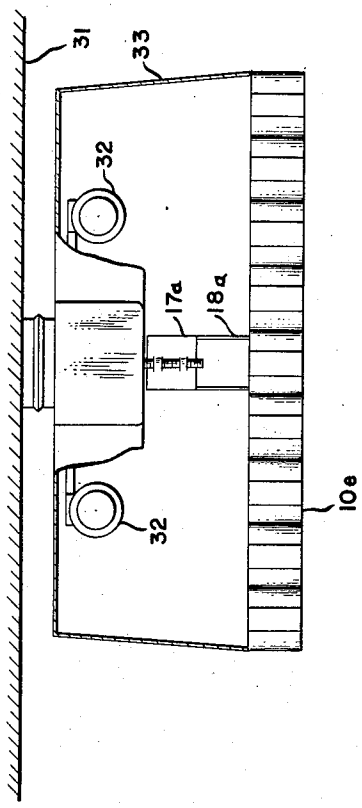


Fig. 6.

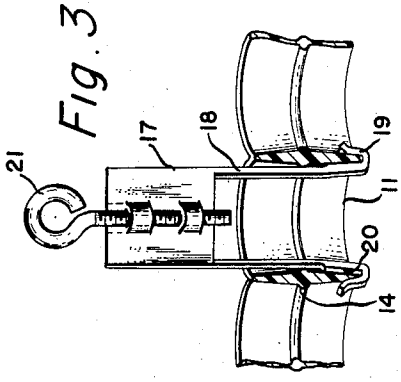


Fig. 3.

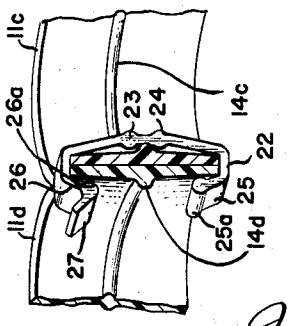


Fig. 4.

Bud Blitzer,
INVENTOR.
BY.

J. Louis Cook

ATTORNEY.

United States Patent Office 2,937,265 Patented May 17, 1960

2,937,265

CELLULAR LIGHTING ELEMENT AND MEANS FOR SUPPORTING THE SAME

Bud Blitzer, Los Angeles, Calif.

Application February 10, 1958, Serial No. 714,223

8 Claims. (Cl. 240—9)

The present invention relates to louvered grids utilized as elements of illuminated ceilings and lighting fixtures, as well as to ceiling constructions and lighting fixtures incorporating such elements. More particularly, the present invention relates to means for suspending such cellular elements beneath sources of light, such as fluorescent lamps, for the purpose of diffusing or regulating the intensity and/or direction of light emanating from such sources. The invention further relates to means for uniting adjacent segments of such louvered grid elements for the purpose of enabling such elements to be positioned over a substantial predetermined area and is particularly applicable to ceiling structures which extend wholly or partially beneath the ceiling of a room, as well as to lighting fixtures, or the like, wherein such elements are interposed over substantial areas between the user or observer and the sources of light.

Louvered or cellular members of the type described herein have become popular for decorative lighting effects and for the purpose of controlling or diffusing the light emanating from sources thereof, such members usually consisting of multi-cellular members in which the cells have a rectangular or circular cross section. These grid elements may be utilized to cover or conceal an entire ceiling or any portion thereof and are usually spaced from the ceiling, since suitable sources of light are usually mounted between the element and the ceiling, such sources usually being tubular fluorescent lighting members. The grid elements themselves may be formed of suitable transparent, translucent or opaque plastic material, or may be of metal or other material which may be formed into the desired shapes.

In view of the extensive areas which such elements are designed to cover, it has generally been the practice to form them in predetermined sizes and shapes which are designed to be joined or fastened together, like clamping or otherwise. Previously these elements have been made in a rectangular shape in which the adjoining edges of the segments were supported upon rails or similar supporting members. One of the problems inherent in assemblies of the type utilized by the prior art is the fact that the supporting means for supporting or uniting the segments has been of such a nature that they will disrupt the pattern of illumination, thus destroying the ornamental and utilitarian effects desired through the use of such members. Furthermore, such supporting means are complex in nature and not readily installed, frequently requiring a great deal of additional labor and materials in order to provide suitable tracks or subseating members as supporting means.

As described in copending application Serial No. 710,596, filed January 6, 1958, of which applicant is a co-inventor, a cellular light diffusing element of the type described has been provided with cells which are so formed that an internal lip or ring is formed within all or most of the cells, such lips serving as supporting means for such elements by providing surfaces for engagement with suitable supporting members which are attached to a ceiling, as well as providing means for effecting diffusion

and control of light passing through the cell. In applicant's co-pending application Serial No. 708,673, filed January 13, 1958, a louvered grid element of the type described herein has been provided which is formed with an internally tapered cell construction and lap joints formed at the edges thereof so that a plurality of segments may be joined and united to form a unitary ceiling structure.

In accordance with the present invention, applicant has discovered novel means especially adapted for supporting and uniting louvered grid elements of the type described. Such means include particularly a multiple pronged suspension means designed to engage and support the cellular members described, as well as clip means especially designed to join and unite adjacent segments of such louvered members.

It is, therefore, an object of the present invention to provide a cellular light transmitting and diffusing element for use in ceiling and lighting fixtures, together with means for supporting and uniting adjacent segments of such element.

It is a further object of the present invention to provide a supporting means designed to suspend cellular lighting elements of the type described in a simple and yet effective manner.

It is a further object of the present invention to provide a clip member for uniting and joining adjacent segments of cellular lighting elements of the type described.

Further objects of the present invention will be apparent from a consideration of the specification and claims provided below as well as from the appended drawings, wherein:

Figure 1 is a top plan view of a cellular element of the type described herein.

Fig. 2 is a side elevational view partly in vertical transverse cross section of the element of Fig. 1 taken along lines 2—2 of Fig. 1.

Fig. 3 is a vertical sectional view partly in elevation illustrating the novel suspending device of the invention positioned within one of the cells of the cellular element in suspending position.

Fig. 4 is a vertical sectional view partly in elevation illustrating the novel clip means of the present invention in position to unite two adjacent segments of the invention where such segments are in end abutting relationship.

Fig. 5 is a vertical sectional view partly in elevation illustrating cellular elements of the type illustrated in Figs. 1 and 2 united and suspended from a ceiling.

Fig. 6 is a vertical sectional view partly in elevation illustrating an element of the invention utilized in suspending a cellular element in a lighting fixture attached to a ceiling.

Referring now to the drawings and more particularly to Figs. 1 and 2, a cellular or louvered member of the type referred to is illustrated at **10**. This element may preferably possess the structure described and claimed in copending application Serial No. 710,596 of which applicant is a co-inventor, and is formed of a plurality of cells **11** which, as illustrated, are of circular cross section and substantialy cylindrical. Each cell is provided with an inwardly tapering configuration in which wall portions **12** and **13** taper inwardly from the opposite surfaces of the assembly, giving a cell construction which has a greater diameter at the surface than at the interior thereof. These two tapering portions meet at an intermediate point of the cell which is formed with an inwardly extending lip or projection **14** extending circumferentially within the interior of the cell. As illustrated, this lip portion is substantialy equidistant from the surfaces or at the midpoint of the cell, although this lip may be formed at any desired intermediate distance from either

surface. As described in the aforementioned application, the inwardly projecting lip is designed to provide means for supporting the cell and also means for controlling or regulating the diffusion of the light passing through the cellular member. The cellular element is provided with means for joining adjacent segments in the form of interlocking flanges, as shown at **15** and **16**, formed at any or all of the opposite edges of the members. These flanges are preferably cutout offset portions in which the cut is taken transversely through the cell wall at a desired point terminating at the point of juncture of the tapered area or the inwardly formed lip portion. This is for the purpose of matching the segments in such a manner that the point of junction will not be readily apparent, and the matching of adjacent segments will form a lap joint in which each member serves to support an adjacent one. In this manner a plurality of segments may be assembled to present a uniform unbroken surface, with each segment or section serving to support the one which is adjacent to it. In a typical ceiling member of this type, the cell will be approximately one inch in diameter and from one-half to one inch in height, although other dimensions may be used. The cell may be oval, rectangular or hexagonal in cross section, or any desired shape, in addition to the circular cross section which is illustrated. The cellular elements may be formed of cast or molded plastic, such as polystyrene, polyethylene, polyvinyl chloride, or the like, or may be of cast, expanded or extruded metal, such as aluminum.

As shown in Fig. 3, a hanger of the invention is shown in supporting position within a cell of the cellular element in an enlarged manner in order to illustrate the manner in which the hanger functions to support and simultaneously maintain the element in proper alignment. As shown, hanger **17** is formed with a plurality of downwardly depending legs **18**. As illustrated, the hanger is formed with two legs, although it may be formed with more than two if desired. Each leg is formed with an upwardly extending prong **19**, said prongs being designed to engage the lower edge of the cell. At the same time each of said legs is provided with a tapered side portion **20** designed to engage the inwardly tapering edge of the cell and conforming thereto, the spacing of the legs corresponding to the inner diameter of the cell, thus serving to support the cell laterally in the proper horizontal position while the prongs support the element vertically. Where the support is desired to be in the position where two adjacent segments are joined in the form of a lap joint or a butt joint, the prongs will serve to support these segments in proper alignment since the prongs will engage the adjacent edge portions of such segments, as illustrated, for example, in Fig. 5. This element may be formed of the same material as the cellular member and may have the same color so that it will be rendered unobtrusive, or they may be transparent.

As illustrated in Fig. 4, adjacent segments are effectively joined together by the use of the novel clip of the invention, shown at **22**, which is formed with respective upper and lower pronged portions **25** and **26** each of which prongs is formed with an enlarged portion, as illustrated at **25***a* and **26***a*. The material of which the clip is formed will preferably have a certain degree of spring to permit positioning and removal while exerting sufficient force to maintain the edges of the segments together. These prongs are designed to embrace the edges of two adjacent cell sections **11***c* and **11***d* and extend over and around the sides thereof, the enlarged portions at the ends of the prongs being designed to engage and bear against the inner side wall of the cell, as illustrated. One of the prongs is provided with an extension **27** which forms an arm or lever for the purpose of facilitating application and removal of the clip around adjacent segments by pressure upon the arm. The clip is formed with a continuous wall extending between the pronged portions, this wall being provided with spaced enlargements **23** and **24** designed to engage the inner wall of the cell just above and below the edge of the lip or inward projection **14***c*. This serves to provide firm engagement and at the same time permits alignment of the adjacent cells in the proper position, since the lip or projection, in cooperation with the enlargements **23** and **24**, serve to align this cell with the adjacent one which is engaged by the overhanging prongs and their enlarged portions **25***a* and **26***a*. These clips may be of the same material as the cellular members and may be of the same color or transparent so that they may be unobtrusive.

As shown in Fig. 5, a plurality of adjacent segments are supported from a ceiling by means of hangers or supporting elements of the type described herein, while in Fig. 6 a cellular element of the type described is shown supported within a lighting fixture by a hanger of the type described.

Referring more particularly to Fig. 5, cellular segments **10***a* and **10***b* are shown joined together by means of a lap joint formed by cutout portions **15***a* and **15***b* joined together as shown, with adjoining portions held together by means of a plurality of clips **22***a*. These serve to clamp adjacent edge cells of the respective segments in the manner shown, the clip functioning to engage the upper and lower adjacent edge portions of contiguous cells, and also engage the inwardly projecting lip **14***a* in the manner shown in Fig. 4 for a butt joint. These adjacent segments, thus joined together, are suspended from ceiling **28** by means of wires **29** attached thereto by hooks or the like, as shown. The wires are attached to hook members **21** which are affixed to hangers **17**, by being threaded, or otherwise. The hangers are formed with depending legs **18** and upwardly extending prongs **19** which engage the bottom edges of the cells, as illustrated in Fig. 3. The legs are formed with tapered edge surfaces **20** which conform to the taper of the cell and bear against its inner surface. The cellular assembly is interposed between the room and fluorescent lamps **30**, thus serving to diffuse the light therefrom and present the appearance of a luminous ceiling from beneath.

In the form of the invention illustrated in Fig. 6, a cellular element **10***e* is positioned upon a lighting fixture **33** and held in position thereon by hangers **17***a* in which leg members **18***a* engage selected cells in the manner illustrated in Fig. 3. The fixture is attached to ceiling **31** in a conventional manner and contains fluorescent lamps **32**, the cellular element thus serving as a lens or screen to diffuse light to the room below.

I claim:

1. A cellular light transmitting and diffusing structure comprising a plurality of adjoining identical translucent cells having openings through the top and bottom edges thereof, the walls of each of said cells being provided with inwardly tapering surfaces extending interiorly of the bottom edge of each cell, and a hanger member for supporting said structure in suspended position comprising depending translucent legs extending through one of said cells and engaging the bottom edge of said cell, said legs having tapered side edge areas conforming to the taper of said one cell and being in engagement therewith, translucent prongs attached to said legs and extending upwardly from the lower portions of said legs and disposed within adjoining cells next to and on opposite sides of said one cell, said prongs having tapered areas conforming to the taper of said adjoining cells and in engagement therewith.

2. A cellular light transmitting and diffusing structure comprising a plurality of adjoining translucent cells having openings through the top and bottom edges thereof, the walls of each of said cells being provided with inwardly tapering surfaces extending interiorly of the bottom edge of each cell, and a hanger member for supporting said structure in suspended position comprising depending translucent legs extending through one of said cells and engaging the bottom edge of said cell, said

legs having tapered side edge areas conforming to the taper of said one cell and being in engagement therewith, translucent prongs attached to said legs and extending upwardly from the lower portions of said legs and disposed within adjoining cells next to and on opposite sides of said one cell, said prongs engaging the walls of said adjoining cells.

3. A cellular light transmitting and diffusing structure comprising a plurality of adjacent translucent segments, each segment comprising a plurality of tubular cells including end tubular cells, the end tubular cells of said adjacent segments being juxtaposed in engagement with each other and extending from the lower face to the upper face of the structure, one of said juxtaposed cells having an intermediate circumferential projection extending inwardly from its wall, a translucent clip member joining said adjacent segments together, including a central portion extending completely through said one cell, upper and lower flanges integral with said central portion and extending across upper and lower edge portions, respectively, of said juxtaposed end cells and holding said segments in alignment, clamp portions integral with said flanges and extending toward each other within the other of said juxtaposed end cells and engaging the wall of said other of said juxtaposed cells to hold said adjacent segments against each other, and enlargements on said central portion on opposite sides of and adjacent said circumferential projection.

4. A cellular light transmitting and diffusing structure comprising a plurality of adjacent translucent segments, each segment comprising a plurality of tubular cells including end tubular cells, the end tubular cells of said adjacent segments being juxtaposed in engagement with each other and extending from the lower face to the upper face of the structure, a translucent clip member joining said adjacent segments together including a central portion extending completely through one of said juxtaposed end cells, upper and lower flanges integral with said central portion and extending across upper and lower edge portions, respectively, of said juxtaposed end cells and holding said segments in alignment, clamp integral with said flanges and extending toward each other within the other of said juxtaposed end cells and engaging the wall of said other of said juxtaposed cells to hold said adjacent segments against each other.

5. A cellular light transmitting and diffusing structure comprising a plurality of adjacent translucent segments, each segment comprising a plurality of tubular cells including end tubular cells, the end tubular cells of said adjacent segments being juxtaposed in engagement with each other and extending from the lower face to the upper face of the structure, one of said juxtaposed cells having an intermediate circumferential projection extending inwardly from its wall, a translucent clip member joining said adjacent segments together including a central portion extending completely through said one cell, upper and lower flanges integral with said central portion and extending across upper and lower edge portions, respectively of said juxtaposed end cells and holding said segments in alignment, clamp portions integral with said flanges and extending toward each other within the other of said juxtaposed end cells, said clamp portions having enlargements engaging the wall of said other of said juxtaposed end cells to hold said adjacent segments against each other, and enlargements on said central portion on opposite sides of and adjacent said circumferential projection.

6. A cellular light transmitting and diffusing structure comprising a plurality of adjacent translucent segments, each segment comprising a plurality of tubular cells including end tubular cells, the end tubular cells of said adjacent segments being juxtaposed in engagement with each other and each of said juxtaposed cells extending from the lower face to the upper face of the structure, one of said juxtaposed cells having an intermediate circumferential projection extending inwardly from its wall, a translucent clip member joining said adjacent segments together including a central portion extending completely through said one cell, upper and lower flanges integral with said central portion and extending across the upper and lower edge portions, respectively, of said juxtaposed end cells and holding said segments in alignment, clamp portions integral with said flanges and extending toward each other within the other of said juxtaposed end cells and engaging the wall of said other of said juxtaposed cells to hold said adjacent segments against each other, and enlargements on said central portion on opposite sides of and adjacent said circumferential projection.

7. A cellular light transmitting and diffusing structure comprising a plurality of adjacent translucent segments, each segment comprising a plurality of tubular cells including end tubular cells, the end tubular cells of said adjacent segments having overlapping steps through which said end cells extend with the cells of one step in alignment with the cells of the other step, said aligned cells being contiguous a second cell of one of said segments, a pair of overlapping and aligned cells jointly having an intermediate circumferential projection extending inwardly from their wall, a translucent clip member joining said adjacent segments together including a central portion extending completely through said pair of overlapping aligned cells, upper and lower flanges integral with said central portion and extending across upper and lower edge portions, respectively, of said aligned cells to hold said segments in alignment, clamp portions integral with said flanges and extending toward each other within said second cell and engaging the wall of said second cell to hold said adjacent segments against each other, and enlargements on said central portion on opposite sides of and adjacent said circumferential projection.

8. A cellular light transmitting and diffusing structure comprising a plurality of adjacent translucent segments, each segment comprising a plurality of tubular cells including end tubular cells, the end tubular cells of said adjacent segments having overlapping steps through which cells extend with the cells of one step in alignment with the cells of the other step, said aligned cells being contiguous a second cell of one of said segments, a pair of overlapping and aligned cells jointly having an intermediate circumferential projection extending inwardly from their wall, a translucent clip member joining said adjacent segments together including a central portion extending completely through said pair of aligned cells, upper and lower flanges integral with said central portion and extending across upper and lower edge portions, respectively, of said aligned cells to hold said segments in alignment, clamp portions integral with said flanges and extending toward each other within said second cell, said clamp portions having enlargements engaging the wall of said second cell to hold said adjacent segments against each other, and enlargements on said central portion on opposite sides of and adjacent said circumferential projection.

References Cited in the file of this patent

UNITED STATES PATENTS

2,453,980	Hartman	Nov. 16, 1948
2,477,911	Travis et al.	Aug. 2, 1949
2,506,951	Doane	May 9, 1950
2,535,879	Tinnerman	Dec. 26, 1950
2,602,978	Clark	July 15, 1952
2,641,433	Wright	June 9, 1953
2,647,985	Biller	Aug. 4, 1953
2,810,171	Brooks et al.	Oct. 22, 1957
2,823,004	Melloh	Feb. 11, 1958
2,839,671	Cullen	June 17, 1958

FOREIGN PATENTS

1,118,879	France	Mar. 26, 1956