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LUMINAIRE

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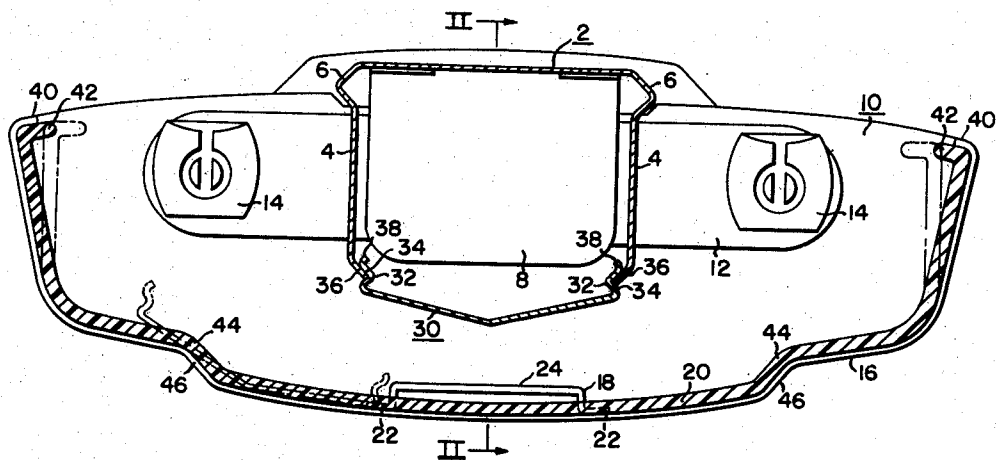


Fig.1.

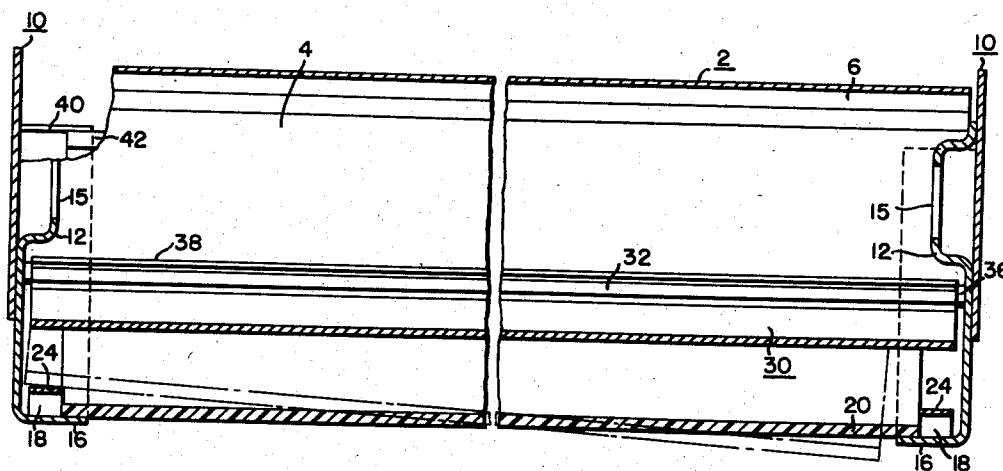


Fig.2.

WITNESSES

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LUMINAIRE

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Our invention relates to a luminaire and more particularly to a luminaire which has a light diffusing member spaced from the lamp or lamps in the luminaire in order to obtain a semi-indirect lighting distribution.

In the past it has been common practice to provide a luminaire with light diffusing panels supported in spaced relationship below and along the sides of the source of light in order to obtain semi-indirect lighting distribution. In elongated luminaires such as those employing elongated fluorescent lamps, the prior practice has not been satisfactory from a lighting standpoint due to objectionable light leakage between the sides and bottom light diffusing panels. In some instances it has also been necessary to employ several panels to cover the entire bottom of the fixture which has resulted in either objectionable light leakage between the bottom panels or the use of a center support to cover the joint between the bottom panels, which has added to the expense and created an optically denser medium running through the center of the luminaire as viewed from the bottom. It has also been necessary that each of the various panels be secured to the framework of the luminaire in order to prevent vibration and buckling of the panels which may otherwise occur. In general, it has also been necessary that some tools be employed to assemble or remove the panels from their securing means. Although such required tools have been of a very simple nature, it will be realized that due to the elevated heights at which such luminaires are normally mounted, their use has been the basis of considerable annoyance and additional labor charge. Further, the handling of a number of loose panels at such heights increases the time required to install or remove the panels for maintenance purposes.

Another problem which has been encountered in the supporting of such panels is that they normally have been removable only from the top of the luminaire, which although in itself is not objectionable, is objectionable when used with a generally U-shaped channel member, as is common in the industry, in which the electrical components are mounted. With such an assembly, additional time is required to make repairs, as the panels must be removed in order to obtain access to the electrical components.

Accordingly, one object of our invention is to provide a new and improved luminaire having a one-piece panel which may easily be inserted or removed from the lower side of the luminaire.

Another object of our invention is to provide a new and improved luminaire having a trough-shaped supporting channel with downwardly extending side walls which are covered by means of a cover member extending between the free ends of the channel and which cover may readily be removed or attached to the arms of the channel.

A more specific object of our invention is to provide a new and improved elongated luminaire having spaced end plates with inwardly extending flanges and a resilient panel extending therebetween, which panel is of a length

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less than the distance between the end plates and greater than the distance between the flanges.

Still another specific object of our invention is to provide a new and improved elongated luminaire having a supporting channel with spaced, downwardly extending arms, longitudinally spaced end plates with inwardly extending flanges and a snap on cover for the channel of a length less than the distance between the end plates and greater than the distance between the flanges.

These and other objects of our invention will become more apparent upon consideration of the following detailed description of a preferred embodiment thereof taken in conjunction with the attached drawings, in which:

Figure 1 is a lateral cross-sectional view of a luminaire constructed in accordance with the principles of our invention;

Fig. 2 is a longitudinal cross-sectional view of the luminaire as shown in Fig. 1 taken along the lines II—II thereof.

Referring to the drawings it will be noted that a luminaire constructed in accordance with the principles of our invention may comprise an elongated U-shaped channel 2 which is mounted so that the spaced arms 4 thereof extend downwardly. Channel 2 may be formed from any suitable material having sufficient structural strength such as sheet steel and may be supported in any suitable manner such as by a slide hanger, not shown, slidably engaging outwardly extending projections 6 at each side of the bight portion of channel 2. Such a slide hanger is more fully illustrated, described and claimed in our copending application Serial No. 475,362, entitled Luminaire Hanger, filed December 15, 1954, which has been assigned to the same assignee as the assignee of this invention. As is customary with such fixtures, channel 2 provides a wireway in which various electrical conductors (not shown) and control elements, such as a ballast 8, are mounted in any suitable manner.

Each end of the channel 2 is provided with an end plate 10 which extends transversely across the open end of channel 2 and outwardly beyond each of the arms 4. The particular method of securing end plates 10 to channel 2 does not constitute a part of our invention and any suitable cooperable structure for such purposes may be employed, such as that illustrated and claimed in our copending application entitled "Luminaire," Serial No. 453,184, filed October 31, 1954, and which has been assigned to the same assignee as the assignee of this invention.

As shown, each end plate 10 is provided with an integral flange 16 which extends laterally outwardly from one side of each end plate 10 toward the other end plate 10 secured to the other end of the channel 2. The flanges 16 are generally U-shaped and, as illustrated, preferably follow the outer edge contour of the end plates 10. Each plate 10 is provided with an inwardly extending boss 12 which extends transversely across the open ends of channel 2 and laterally outwardly beyond each arm 4. As shown (Fig. 1), a lamp holder 14 is secured at each end of each boss 12 in any suitable manner, not shown, for the purpose of supporting and electrically connecting one end of an elongated fluorescent lamp to the electrical conductors and control means. The particular construction of the lamp holder 14 does not constitute a part of our invention and may be any one of a number of commercially available standard lamp holders. It will be realized that the type of lamp holder utilized will depend upon the type of lamp which is to be used within the lighting fixture. Similarly, the longitudinal spacing of the lamp holders 14 will be determined by the length of the particular lamp employed. In order to facilitate wiring of the lamp holders 14, an opening 15 is provided

in each of the bosses 12 between the arms 4 of the channel 2.

In order to accomplish the purposes of our invention, a stop 18 is secured to each end plate 10 so that each stop 18 extends upwardly from the bight portion of its cooperable flange 16 and inwardly from the end plate 10 toward the other end plate 10 secured to the other end of channel 2. As shown, stops 18 are generally an inverted U-shape, having a pair of tabs 22 extending outwardly from the free ends of the arms of the stops 18 which engage the upper surface of flanges 16. With such construction, the stops 18 may be readily secured to the flanges 16 of end plates 10 in any suitable manner, such as by spot welding. It will be noted that stops 18 are elongated and extend transversely to the channel 2 to provide an upper supporting surface 24 for purposes more fully described hereinafter. The showing of a separate stop 18 is for the purposes only of illustrating one form of the invention, and it is to be realized that if desired, other forms and types of stops may be employed. For example, the stops 18 may be formed integral with the end plates 10 in any suitable manner, such as by embossing end plates 10. The stops 18 may also be formed from various suitable materials and secured to either end plates 10 or flanges 16 in any suitable manner.

As shown, a panel 20 extends between end plates 10 below the channel 2 and is formed from any suitable light transmitting resilient material such as polystyrene which is also a light diffusing and reflecting material. The panel 20 (Fig. 1) is preferably formed by being extruded having a cross section with an outer surface which is substantially identical in contour to that of the inner surface of the flanges 16 on the end plates 10.

Referring now to Fig. 2, it will be noted that when panel 20 is properly inserted (as shown in solid lines) between the stops 18, the opposite ends of the panel 20 are supported by the inner surfaces of the flanges 16. In order, therefore, to properly support panel 20, flanges 16 extend inwardly past the opposed edges of the stops 18 for a substantial distance, so as to engage a sufficient area of the outer surface of the panel 20 so that the panel 20 is self-supporting. It will also be noted that panel 20 is of a sufficient length so that its opposite ends are located closely adjacent the opposed edges of the stops 18. Sufficient clearance is provided between the ends of the panel 20 and the stops 18 to permit ready removal of panel 20 as described hereinafter.

Removal of the panel 20 is readily accomplished by simply pushing either end of the panel 20 upwardly past the adjacent stop 18 and thereafter pushing the elevated end of panel 20 longitudinally toward the adjacent end plate 10. As shown in dotted outline in Fig. 2, such longitudinal movement of panel 20 causes the other end of panel 20 to slide off its supporting flange 16 so that such unsupported end may be dropped below the lower edge of the adjacent end plate 10. Thereafter, the panel 20 may be pushed longitudinally in the opposite direction so that the dropped end of the panel 20 slides below the adjacent end plate 10 and the elevated end of panel 20 clears the inner edge of the flange 16 of the end plate 10 at the other end of the channel 2. Due to the light weight of the panel 20, such movement of panel 20 is easily accomplished notwithstanding its length. The particular way the panel 20 is manually grasped during the above operation is not of a critical nature and any grasp that is found to be comfortable may be employed by the person removing the panel 20. Also, if desired, the elevated end of the panel 20 may be supported by the upper surface 24 of the adjacent stop 18 prior to pushing the panel 20 toward the opposite end plate 10 to permit the person removing the panel 20 to change his grasp. One grasp which can conveniently be employed is to place the hands generally opposite each other in engagement with the outer surface of the sides

of the panel 20 so that the sides of panel 20 may be flexed inwardly toward each other to overcome friction between the sides of the panel 20 and the sides of flanges 16 during the period the one end of panel 20 is elevated. Also with such a grasp the panel 20 may easily be moved in either longitudinal direction without necessitating changing the grasp. Once cover 30 is properly in place the panel 20 may easily be replaced in the reverse manner as previously described.

It will be obvious that upon removal of the panel 20 the space between the arms 4 of the channel 2 will be exposed so that electrical connections may readily be made therein. As is customary, however, such spaces are enclosed in use and, as shown, a new and novel cover 30 is provided for such purpose. The cover 30 may be formed from any suitable material having sufficient structural strength, such as sheet steel, and may have any suitable general configuration. As shown, the cover 30 is slightly bowed downwardly and is provided with a longitudinally and upwardly extending flange 32 at each of its sides.

In order to obtain a snap on and off action of the cover 30, each flange 32 is provided with a laterally inwardly extending groove 34, and the free end of each arm 4 of the channel 2 is bent angularly downwardly and inwardly to form a projection 36. As shown, the projections 36 are frictionally received within the grooves 34 with the free ends thereof engaging the bottoms of grooves 34. As the arms 4 of channel 2 are elongated and formed from sheet steel they have sufficient resiliency so that their free ends may be sprung laterally outwardly. Thus, in order to anchor the cover 30 in place it is only necessary to initially place the cover 30 angularly with relation to one of the projections 36 so that it is located in the adjacent groove 34. Thereafter by swinging the cover 30 around the engaged groove 34, the other flange 32 is aligned with the other projection 36. When the other flange 32 and the other projection 36 are so aligned, the unengaged side of cover 30 may be forced upwardly so that the other projection 36 engages the other groove 34. In order to facilitate such action, the free edges of flanges 32 are bent inwardly to provide a cam portion 38 which initially engages the free edge of the projection 36 with which it is forced into engagement. Thus, during the forcing operation the cam portion 38 will force the free edge of a projection 36 outwardly until the free edge of the projection clears the upper portion of the flange 32. Thereafter, due to the resiliency of the arms 4 of the channel 2, the projection 36 will snap into engagement with the bottom of its cooperable groove 34.

Removal of the cover 30 may readily be accomplished by grasping either of the sides of cover 30 below the projections 36 and pulling it downwardly. Again due to the resiliency of the arms 4 of the channel 2, the adjacent arm 4 will be forced outwardly to clear the upper cam portion 38. Once one side of the cover 30 has been so removed from between the arms 4 the other side will freely disengage the other projection 36.

As shown in Fig. 2, the cover 30 is longer than the opposed free edges of the flanges 16 and somewhat shorter than the distance between the end plates 10. The cover 30, after removal, may thus be conveniently placed to either side of the stops 18 (Fig. 1) so that its ends are supported by the flanges 16, respectively. Further, as the cover 30 is longer than the distance between the opposed edges of the stops 18, the lower side of the cover 30 will engage the stops 18 so that the cover 30 is held to one side of the open bottom of channel 2. With such an arrangement, electrical connections or repairs may easily be accomplished within the channel 2 without requiring that the cover 30 be completely removed from the luminaire.

In addition to the structure heretofore described, it will be noted that the upper ends of flanges 16 are bent transversely inwardly for a short distance to provide an

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upper stop 40. Similarly the upper ends of the arms of the panel 20 are provided with a transversely inwardly extending flange 42 of a form so that the corners of flanges 42 with the sides of panel 20 are closely received within the stops 40. Such a construction prevents the panel 20 from being moved directly upwardly after it is installed. Accordingly, in order to remove panel 20 it is necessary that its sides be flexed inwardly, as previously described, so that flanges 42 clear the stops 40 as shown by the dotted lines in Fig. 1.

When stops 40 are provided, it is necessary that the outer ends of bosses 12 be spaced inwardly from the flanges 42 so that the sides of the panel 20 may be freely flexed inwardly. Flanges 42 will also engage the outer end of the stops 40 if the panel 20 is not in its proper position, whereby the inserter can readily determine whether the panel 20 has been properly installed. If desired, the panel 20 and each of the flanges 16 may be provided with laterally spaced upwardly indented portions 44 and 46, respectively, which will additionally locate panel 20 laterally below the channel 2. Such indentations may be varied in various ways to obtain differing appearances for the underside of the luminaire.

Having described a preferred embodiment of our invention in accordance with the patent statutes, it is desired the invention not be limited to such specific construction, inasmuch as it is apparent that modifications thereof may be made without departing from the broad spirit and scope of our invention. Thus, for example, it is not necessary that the flanges 16 be located at the outer edge of end plates 10, but only that the inner surface of flanges 16 be of the same contour as the outer end surfaces of panel 20. Also if desired only the ends of panel 20 need be formed to cooperate with the flanges 16. Further, stops 18 may be of any form or shape so as to provide a front edge between the panel portion of the end plates 10 and the free ends of the flanges 16. Accordingly, it is desired that this invention be interpreted as broadly as possible and that it be limited only as required by the prior art.

We claim as our invention:

1. A luminaire comprising, an elongated support having a pair of downwardly extending laterally spaced sides extending the length thereof, end members secured to the ends of said support, respectively, to extend laterally beyond said sides and below the ends of said sides, an elongated cover having a length substantially equal to the length of said support, means for removably supporting said cover over the bottom opening between said sides, flange means on said end members extending inwardly toward each other and below said cover, said flange means extending from a point spaced below said cover generally upwardly at opposite sides of the end members and having their free edges spaced apart a distance less than the length of said cover for supporting said cover therebetween when the cover is removed from said sides, a laterally inwardly extending projection on the inner side of each of said flange means at a location spaced beneath said cover when in its normal position in engagement with the sides of said support to maintain said cover to one side of said support when it is supported on said flange means, and lampholding means secured to said end members adjacent said sides.

2. A luminaire comprising, an elongated support having a pair of, downwardly extending, laterally spaced sides extending the length thereof, an elongated cover, means for removably supporting said cover over the bottom opening between said sides, end members secured to the ends of said support, respectively, which extend laterally beyond the sides of said support and below the free ends of said sides, said end members including opposed flange means extending inwardly toward each other and located spaced below the free ends of said sides, rigid stop means on said end members, respectively, located closely adjacent the upper surfaces of

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said flanges, respectively, and spaced from said support and cover when the cover is in its normal position in engagement with the sides of said support, said stop means having opposed portions spaced a greater longitudinal distance apart than the opposed ends of said flanges, said cover having a length at least slightly greater than the longitudinal distance between said stop means so that said cover may be supported by said flanges and maintained to one side by said stop means when removed from said sides, an elongated light transmitting panel of a length greater than the longitudinal distance between opposed ends of said flanges and slightly less than the longitudinal distance between the opposed portions of said stop means so that one end of said panel may initially be placed above one stop means in the space between it and said support, after which the other end of said panel may be swung into alignment with the opposed portion of the other of said stop means, and the entire panel then moved toward the other stop means until its one end clears the said one stop means so that the outer surface of the panel is supported by the upper surface of said flanges and the ends of the panel are closely received between the opposed portions of said stop means, and lampholding means secured to said end members adjacent said support.

3. A luminaire comprising, an elongated support, end members secured to the ends of said support, respectively, which extend laterally beyond the sides of said support, said end members including opposed generally U-shaped flange means extending inwardly toward each other, rigid stop means on said end members, respectively, located adjacent the bight portion of said flanges between said flanges and said support and spaced from said support, said stop means having opposed portions spaced a greater longitudinal distance apart than the opposed ends of said flanges, an elongated light transmitting panel of a length greater than the longitudinal distance between opposed ends of said flanges and also greater than the distance between either of said stop means and the edge of the opposed flange means and slightly less than the longitudinal distance between the opposed portions of said stop means, said panel having a generally U-shaped cross section with its outside contour being substantially the same as the inside contour of said flanges, at least a portion of said panel being resilient so that the arms at one end of the panel may be forced slightly together so that said end of the panel may be placed in the space between one stop means and the support, after which the arms of the other end of the panel may be swung into alignment with the opposed portion of the other stop means, and the entire panel then moved longitudinally toward the other stop means to a position where its ends are closely received between the opposed portions of said stop means and the outer surface of the arms of the panel engage the inner surface of the flanges, the upper edge of each side portion of each flange having a laterally inwardly extending projection, at least the upper edge of each end of the arms of said panel also having a laterally inwardly extending projection, said projections on said flanges being located to engage the outer surface of said projections on said panel and prevent movement of said panel toward said support when said panel is so inserted, and lampholding means secured to said end member adjacent said support.

4. A luminaire comprising, spaced end plates joined by an elongated supporting member, flanges on said end plates spaced from said supporting member and projecting inwardly toward each other for supporting a panel, said flanges extending across the bottom and up the opposite sides of the end plates and inwardly at the upper ends thereof, a light transmitting panel which is shaped in section in accordance with said flanges and is of a length to be supported with its opposite ends seated on the end plate flanges, respectively, rigid stops mounted

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adjacent said flanges but inwardly of the outer ends thereof and spaced from said supporting member, said panel being longer than the distance between the opposed ends of said flanges and the distance between either of said stops and the edge of the opposed flange but slightly less in length than the distance between said stops so that the panel can seat on said flanges between the stops, and said panel being of resilient material so that the panel can be inserted from the bottom of the luminaire with one end inserted first against one end plate above the adjacent stop and flange, whereupon the other end of the panel will clear the flange on the

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other end plate and can be lifted into place above it and the panel then moved longitudinally to a position between the stops, and opposite ends of the panel can be flexed to clear the inwardly extending parts of the flanges and engage the inner side of the flanges to positively lock the panel in place.

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