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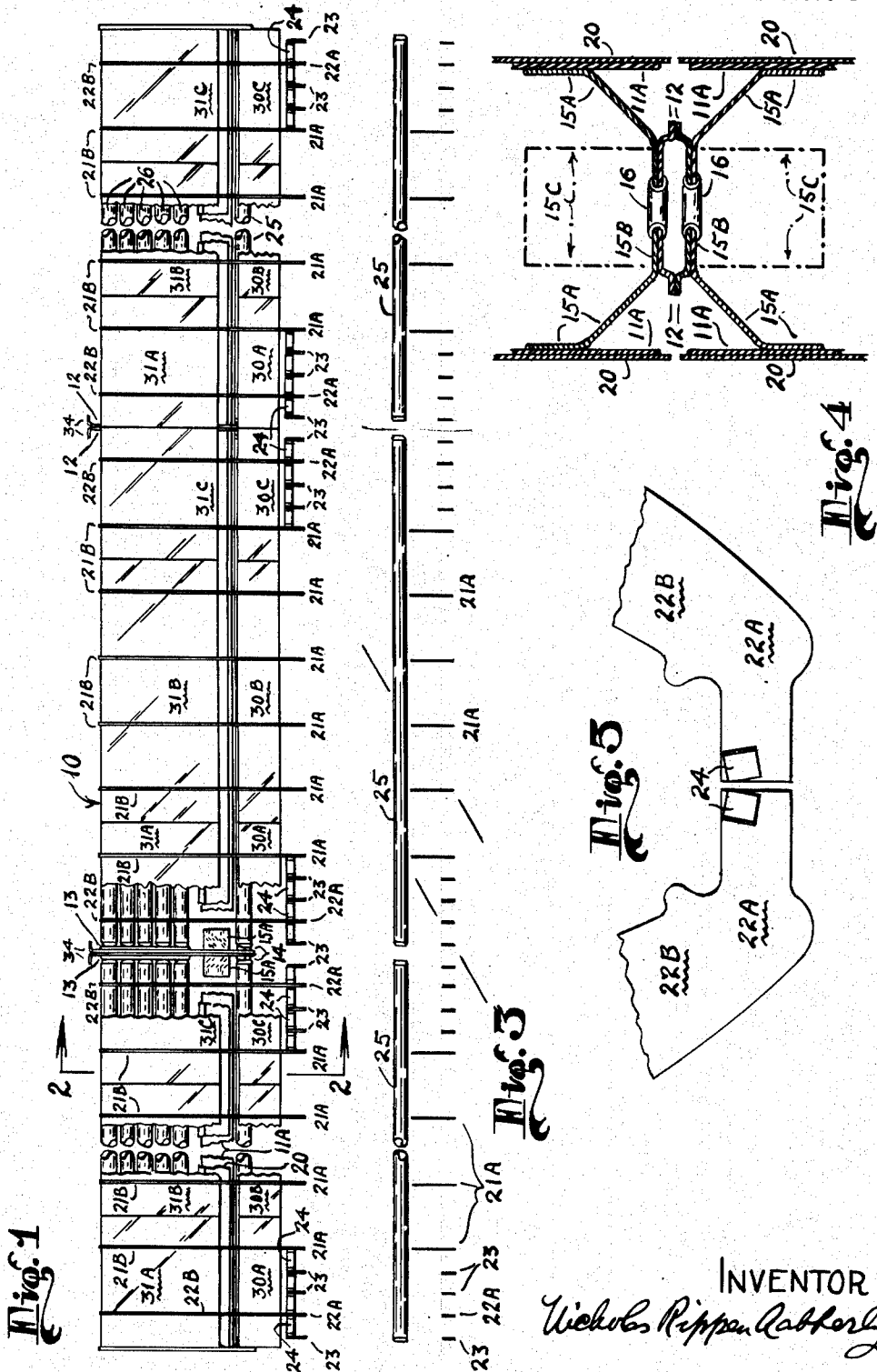
N. R. AABBERLY

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2 Sheets-Sheet 1



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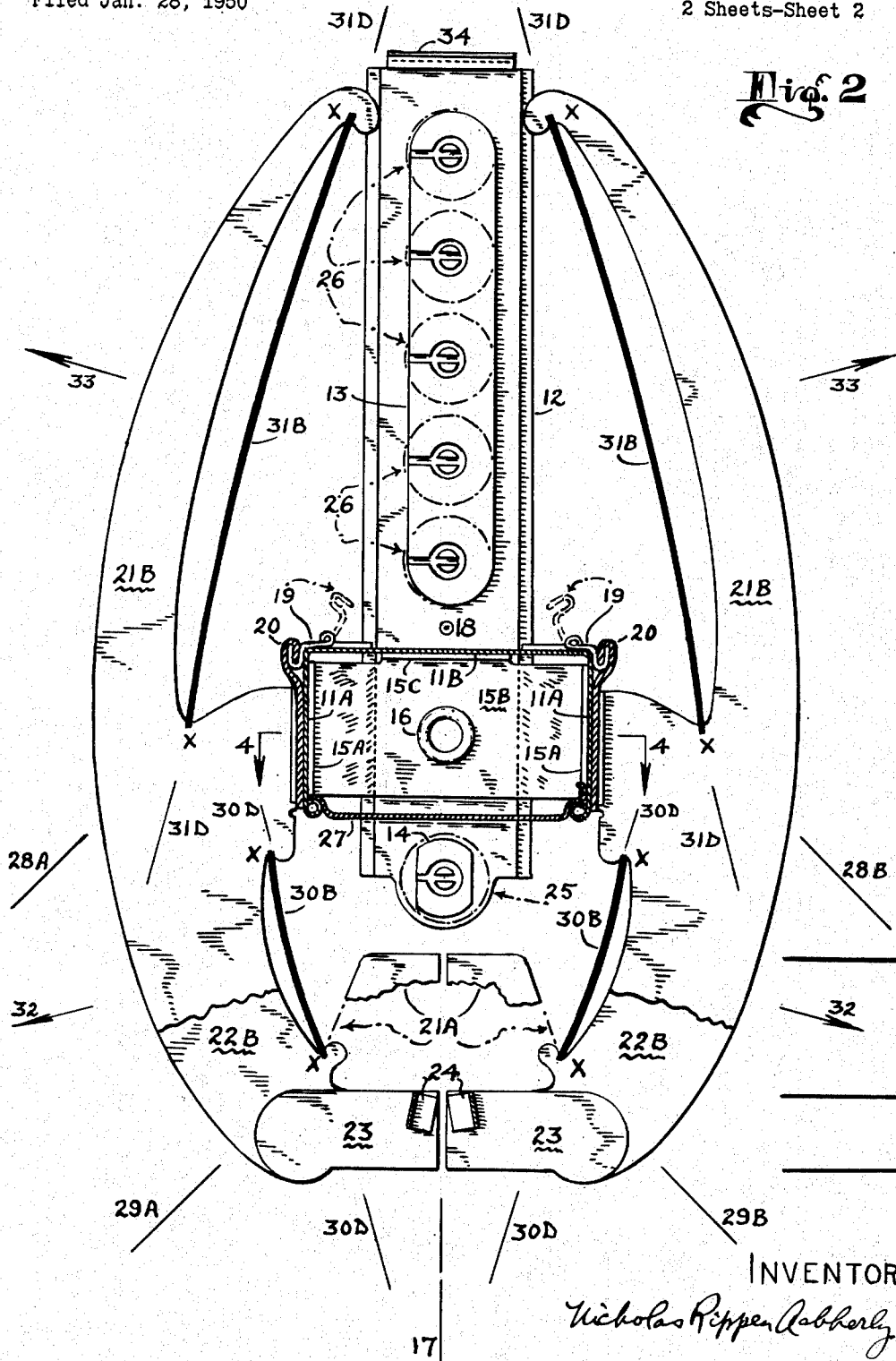
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UNITED STATES PATENT OFFICE

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LIGHT SOURCE SHIELDING MEANS FOR
FLUORESCENT LUMINAIRE

Nicholas Rippen Aabberly, New York, N. Y.

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11 Claims. (Cl. 240—51.11)

1

This invention is in the class of elongated fixtures adapted to hold one or more elongated, straight electric discharge lamps extending in the general direction of the long fixture axis. The fixture has, in transverse sectional aspects thereof thruout the greater part of the fixture length, substantially constant peripheral dimensions and a substantially constant form bilaterally symmetrical about the luminaire plane of symmetry, which is vertical when the fixture is affixed to a ceiling, beam or other structural element having a substantially horizontal surface. The invention is equally useful when incorporated in luminaires designed for attachment to vertical surfaces.

The invention is particularly useful in luminaires arranged in end to end relation constituting "ribbons" or lines of light. The invention is useful in fixtures that adjoin the ceiling and in those that are suspended below it, as mentioned.

The lamps may be of the fluorescent type, or of the cold cathode type. Herein, the expression, light source, refers to a single lamp or to a group of adjacent and parallel lamps.

The salient object and advantage of the invention consists in the provision of luminaire ends that, in the case of newly installed lamps, have an average all-angular coefficient of light transmission higher than that of the intervening main part of the luminaire, or in the provision of the described relationship but confined to a single side of the luminaire, the difference in the coefficients being such that, when the lamp ends have darkened with age, said coefficient will be fairly uniform thruout the luminaire or side.

As a simple and typical embodiment of the invention, one having a louver floor assembly and two lateral sides, each lateral side consisting of a combination of translucent, longitudinally extending platelike material and upwardly extending integral extensions of the transverse louver elements in the floor side, has been selected for description herein and illustration in the accompanying drawings, in which—

Figure 1 is a side elevational view of one complete embodiment positioned between two fragmentarily represented similar embodiments, all depicted schematically and on a greatly reduced scale,

Figure 2 is an end view of the same, the aspect being indicated by arrow 2 in Figure 1, the scale being one-half of actual size,

Figure 3 is a schematic presentation of certain louver arrangements to show their relation to

2

each other and the relation of each to the light source, the aspect corresponding to that of Figure 1,

Figure 4 is a cross-sectional view on line 4—4 of Fig. 2 without perspective, and

Figure 5 is a fragmentary view of one of the compound louvers in Figure 2.

In Figure 1, the complete central embodiment and each of the two adjoining fragmentary embodiments are indicated by 10. In each, the supporting body or main frame consists of the longitudinal frame 11A, 11B, and the end frames 12 rigidly affixed thereto. Frame 11A, 11B comprises the wiring channel, and also a housing for the ballasts and starters, the web of the channel being indicated by 11B and each channel leg by 11A. Each end frame 12 mounts the upper 5-lamp lampholder 13, and the lower lampholder 14. Each frame 12 consists of a shallow channel with narrow secondary flanges. The rigid connection between frame 11A, 11B and each frame 12 is provided by bracket 15A, 15B, 15C, the two legs 15A, of the bracket being spotwelded to the two legs of the channel, 11A. The bracket web 15B, a central integral flap 15C, and an extension of web 15B, are respectively spotwelded to the web of frame 12 and to the end portion of the channel web 11B. In the webs of the bracket and the end frame are two aligned holes bushed by the grommet 16 to accommodate electrical conductors. A snap-in closure, closing the otherwise open bottom of channel 11A, 11B, is indicated by 27. The lampholders, schematically depicted, may be of one-pin or two-pin type.

The numeral 17 (bottom of Fig. 2) indicates the long median plane of the luminaire, containing the long axis 18, and constituting the plane of symmetry.

A plurality of hinges 19 is affixed to each of the two long top margins of channel 11A, 11B, which is laterally flanked by two long louver frames 20, to which are affixed six transverse compound louvers 21A, 21B, each including an inwardly extending major louver element 21A having a relatively large plane-of-symmetry-parallel dimension, and two upwardly extending integral louver elements 21B, mutually transversely opposed, on opposite sides of the plane of symmetry. Affixed to the frame 20 are two modified compound louvers 22A, 22B, each including a minor louver element 22A and two integral upwardly extending louver elements 22B. Louver elements 22B have dimensions and a form like those of louver elements 21B. The dimension of each minor louver element 22A

in the plane of symmetry is exceeded by that of each major louver element 21A. Also constituting a part of the louver assembly containing louver elements 21A and 22A are six pairs of simple louvers or minor louver elements 23, the dimension thereof being exceeded by that of said major louver elements and, in this case, being equal to that of minor louver elements 22A. The lower edge of all the transverse louvers, as seen in the drawings and particularly in Fig. 3, are in substantial alignment but the dimensions of the major louvers are so much greater than the dimensions of the minor louvers are so much greater than the dimensions of the minor louvers that the upwardly disposed edges of the major louvers extend well beyond the upwardly disposed edges of the minor louvers. At each end of said louver assembly there are four spotwelded U-brackets 24 related to one another and to the various louver elements in a manner whereby a major louver element and a respective minor louver element 22A jointly support three of the six pairs of minor louvers 23.

The lower lamp 25 is held by lower lamp-holder 14 and the five upper lamps 26 constituting the upper light source are held by lamp-holders 13.

In Figure 3, the vertical dotted lines indicate the average dimensions of the louver elements, both major and minor, and particularly the relative height thereof. They are so spaced as to condition longitudinal cut-off angles of thirty-two degrees from the horizontal, thruout the luminaire length, this cut-off angle being indicated by the two pairs of oblique dash lines in the view. Approximately eighteen inches of joint luminaire length traverse each juncture. In this length the light rays fall on the minor louver elements much more than would be the case should each two minor louver elements 22A, adjacent each juncture, be the same average height as that of the major louver elements. The enhanced lighting effect is prominent particularly in the case of those two pairs of simple louvers 23 between each two mutually adjacent louver elements 22A and of the two juncture-confronting surfaces of the louver elements 22A. This effect can be augmented still more by making the endmost simple louver at each end of translucent plastic instead of metal, while retaining the latter for the remainder of the transverse louvers.

Refer to Figure 2. The transverse cut-off angle is fixed at forty-five degrees. It is indicated, respectively for the upper and the lower light source, by the planes 28A, 28B and 29A, 29B. For the underneath observer, each pair of such planes condition an angle of visibility of ninety degrees of each light source. Depending on the transverse dimensions desired and on the purpose of the particular type of luminaire, especially with respect to the amount of brightness required, said angle of visibility may be as much as one-hundred-forty degrees.

Laterally shielding the lower light source 25 is the lower platelike, longitudinally extending lower shielding means 30A, 30B, 30C, consisting of one or more translucent plastic sheets. Laterally shielding the upper light source 26 is the upper platelike, longitudinally extending upper shielding means 31A, 31B, 31C, consisting of one or more translucent plastic sheets. The two respective mean planes of the two lower shielding means, indicated by 30D, form an angle of one-hundred-fifty degrees with an upwardly ex-

tending apex. The two respective mean planes of the two upper shielding means, indicated by 31D, form an angle of one-hundred-fifty degrees with a downwardly extending apex. The longitudinal margins of each shielding means is provided with a plurality of shallow notches, which are engaged by a corresponding plurality of correspondingly small portions of the inner margins of said upwardly extending louver elements at the positions indicated by X. By this relationship, the shielding means, which are flat in the non-installed state and resiliently sprung into slightly arcuated form in the installed state, are firmly but detachably retained by the upwardly extending louver elements.

There is less light at the junction of a pair of fixtures arranged in end to end relation than there is along the inwardly spaced portion of the light source. This becomes particularly marked as the lamps grow old and emit less illumination from the end zones thereof. For the purpose of compensating for this difference, the end panels 31A and 31C of each luminaire unit may be somewhat more translucent than the intermediate panels 31B.

A platelike translucent element when not provided with prismatic surfaces or the like transmits a maximum of light rays at right angles to the surfaces. Because of this, the arrows 32, 32 and 33, 33, indicate respectively angles of incidence of one-hundred-fifty degrees (derived from the angular positions of the planes 30D and 31D) along which the brightest rays pass from said light sources thru the shielding means. Such rays, because they fall on the most distant areas below and on the ceiling, are more effective than the distance of the light sources therefrom would otherwise permit; by this expedient, an appreciable amount of compensation is attained for loss of luminosity due to greater distance from the light sources, thereby attaining a greater measure of somewhat uniform light respecting area served by the luminaire. Respecting the planes 31D and 30D, it would seem that angles with upwardly and downwardly extending apices measuring less than seventy-five degrees would be more or less acceptable. However, conditions permitting, it would seem best to approach as closely as possible the small angle fixed in the views for the foregoing, namely, thirty degrees, and especially in the case of luminaires mounted adjacent the ceiling; this has of course reference particularly to the upper light source and upper shielding means.

Numeral 34 indicates mounting plates, also referred to as contributory mounting means, which either engage with other mounting plates bolted to a ceiling, in the case of fixtures mounted against or close to the ceiling, or with more or less long stems, in the case of pendant fixtures.

There may of course be a total number of lamps different from that shown, as well as a different distribution, respecting positions over and under the longitudinal strength frame.

I claim:

1. In an elongated luminaire, a longitudinal frame member, two lampholders respectively at the two ends of the frame member and adapted to jointly hold an elongated straight electric discharge lamp, and a set of plate-like, longitudinally extending, translucent, shielding panels disposed in end-to-end relation in said frame and in laterally spaced relation to said lamp, the set including two end panels and at least one intervening panel longer than the com-

5

bined lengths of the end panels and having a lower light-transmission coefficient than that of the end panels.

2. In an elongated luminaire, a longitudinal frame member, two lampholders respectively at the two ends of the frame member and adapted to jointly hold an elongated straight electric discharge lamp, at least two transverse minor louver elements respectively adjacent the two luminaire ends, and a plurality of spaced, transverse, major louver elements between said minor louver elements and in a plurality exceeding that of the minor elements, each of said major and minor louver elements being underneath the lamp, the vertical dimension of each major louver element exceeding that of each minor louver element.

3. In an elongated luminaire, a longitudinal frame member, two lampholders respectively at the two ends of the frame member and adapted to jointly hold an elongated, straight, electric discharge lamp, two relatively small pluralities of transverse minor louver elements respectively adjacent the two luminaire ends, and a relatively large plurality of transverse major louver elements between said two pluralities, each of said major and minor louver elements being underneath the lamp, the vertical dimension of each major louver element exceeding that of each minor louver element, and the spacing between each two successive major louver elements exceeding the spacing between each two successive minor louver elements.

4. In an elongated luminaire, a longitudinal frame member, two lampholders respectively at the two ends of the frame member and adapted to jointly hold an elongated, straight electric discharge lamp, at least two longitudinally spaced, transverse minor louver elements respectively adjacent the two luminaire ends, a plurality of spaced, transverse, major louver elements between said minor louver elements and in a plurality exceeding that of the minor elements, each of said major and minor louver elements being underneath the lamp, the vertical dimension of each major louver element exceeding that of each minor louver element, and a set of plate-like, longitudinally extending, translucent shielding panels disposed in end-to-end relation in said frame member and in laterally spaced relation to said lamp, the set including two end panels and at least one intervening panel longer than said end panels and having a lower light-transmission coefficient than that of the end panels.

5. The invention defined in claim 2 in which the spacing between each two successive major louver elements exceeds the spacing between each two successive minor louver elements.

6. In an elongated luminaire, a longitudinal frame member, two lampholders respectively at the two ends of the frame member and adapted to hold an elongated, straight electric discharge lamp extending longitudinally of the luminaire, at least one plate-like longitudinally extending, translucent shielding panel disposed in said frame member in laterally spaced relation to the lamp, a plurality of transverse louver elements, each of at least most thereof comprising a transverse portion under said lamp and an integral

6

upwardly extending portion which is outside of and supports the shielding panel along two mutually spaced relatively small edge portions of the louver element, there being between said small edge portions a relatively large edge portion of the louver element that is spaced from the shielding panel.

7. The combination defined in claim 6 wherein the shielding panel comprises end sections and an intermediate section, and wherein the intermediate section has a lower light-transmitting coefficient than that of the end sections.

8. The combination defined in claim 6 wherein the transverse louver elements comprise: at least two longitudinally spaced, transverse, minor louver elements respectively adjacent the two luminaire ends, and a plurality of spaced, transverse, major louver elements between said minor louver elements and in a plurality exceeding that of the minor louver elements, each of said major and minor louver elements being underneath the lamp, and the vertical dimension of each major louver element being greater than that of each minor louver element.

9. The combination defined in claim 6 wherein the transverse louver elements comprise interspaced major and minor louvers, the vertical dimension of each major louver element exceeding that of each minor louver element, and the spacing between each two successive major louver elements exceeding the spacing between each two successive minor louver elements.

10. The combination defined in claim 6 wherein the shielding panel includes two end sections and at least one intervening section which has a light-transmission coefficient greater than that of the end sections, and wherein said transverse louvers include at least two longitudinally spaced, transverse, minor louver elements respectively adjacent the two luminaire ends, and a plurality of spaced, transverse, major louver elements between said minor louver elements and in a plurality exceeding that of the minor elements, each of said major and minor louver elements being underneath the lamp, and the vertical dimension of each major louver element exceeding that of each minor louver element.

11. In an elongated luminaire, a longitudinal frame member, two lampholders respectively at the two ends of the frame member and adapted to jointly hold an elongated, straight, electric discharge lamp, two relatively small pluralities of transverse minor louver elements respectively adjacent the two luminaire ends, and a relatively large plurality of transverse major louver elements between said two pluralities, each of said major and minor louver elements being underneath the lamp, and the vertical dimension of each major louver element exceeding that of each minor louver element.

NICHOLAS RIPPEN AABBERLY.

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