United States Patent

Wood

[15] **3,662,164**

[45] **May 9, 1972**

[54] LUMINAIRE BALLAST BRACKET

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[73] Assignee: **General Electric Company**

[22] Filed: **Nov. 18, 1970**

[21] Appl. No.: **90,724**

[52] **U.S. Cl.**.....**240/25,** 174/DIG. 2, 240/DIG. 3, 240/51.11

[51] **Int. Cl.**.....**F21s 1/10,** H05b 33/02

[58] **Field of Search**.....240/25, 51.11, 73, DIG. 3; 174/DIG. 2

[56] **References Cited**

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[57] **ABSTRACT**

A bracket for holding electrical ballast devices of different sizes within the housing of a street lighting luminaire. The bracket is hung within the luminaire housing and has portions of different levels for accommodating ballasts of different widths, and it positions the ballast in selective engagement with stepped bearing bosses formed in the housing top wall.

14 Claims, 10 Drawing Figures

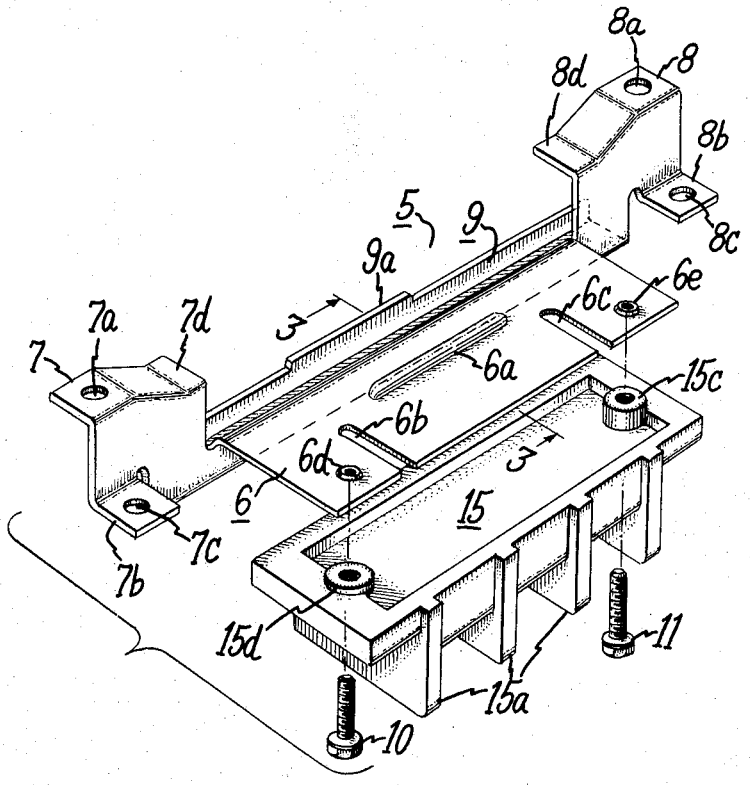

Fig. 1.

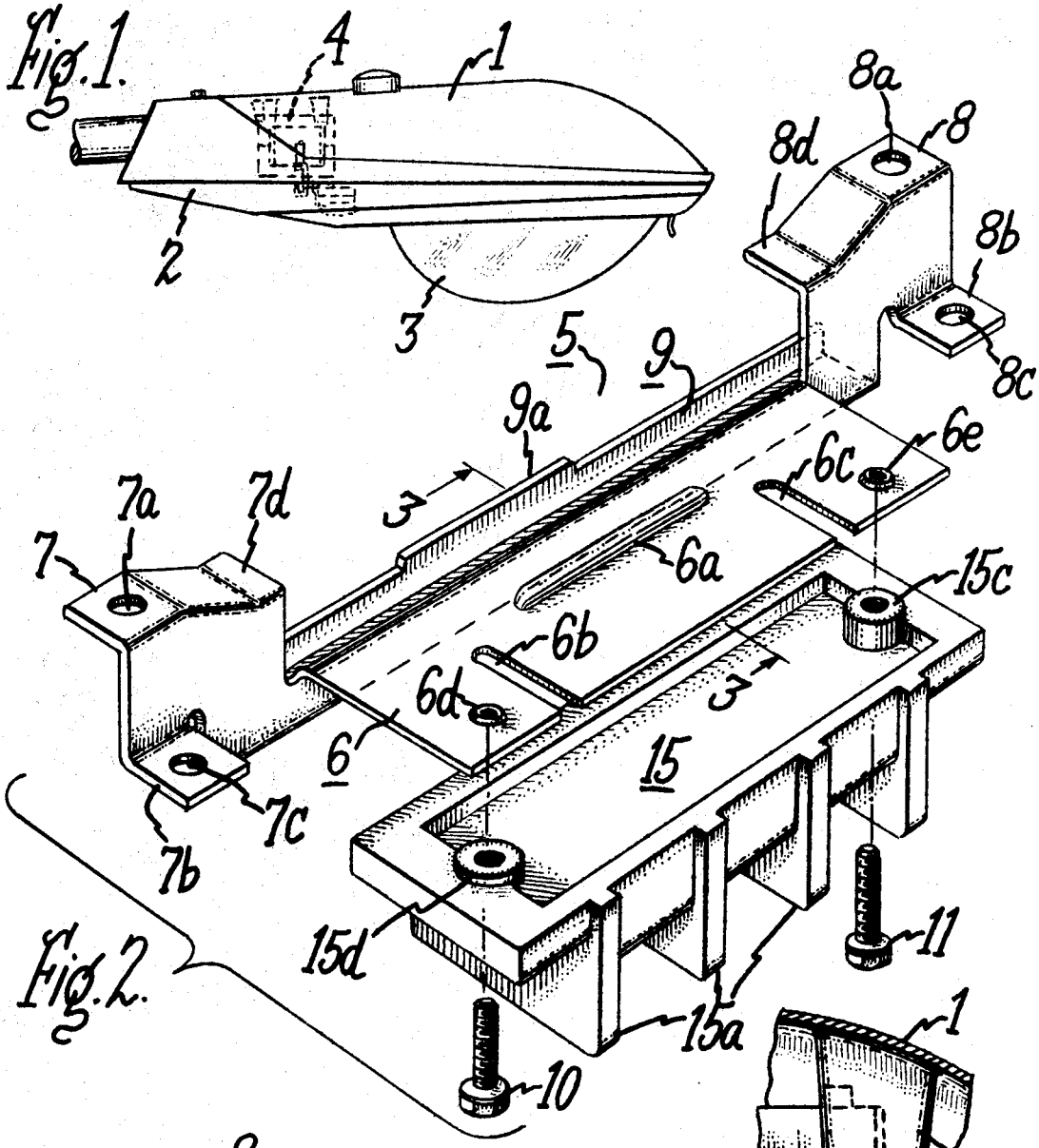

Fig. 2.

Fig. 3.

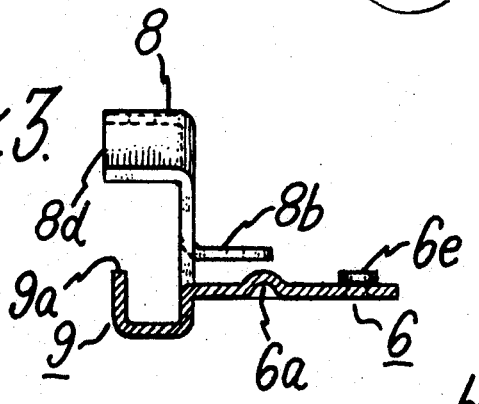

Fig. 4.

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Fig. 5.

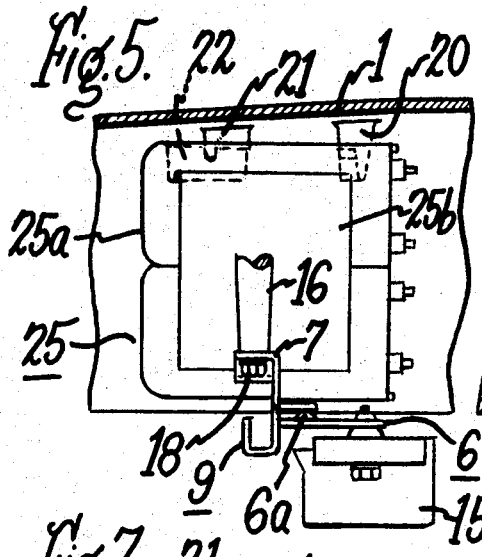


Fig. 6.

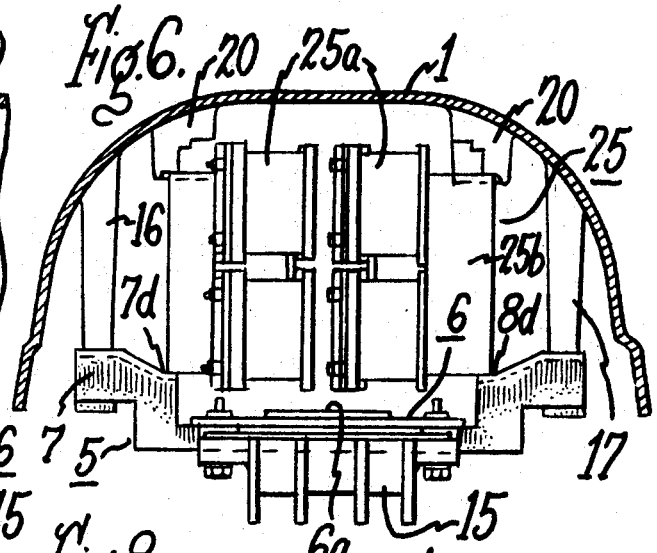


Fig. 7.

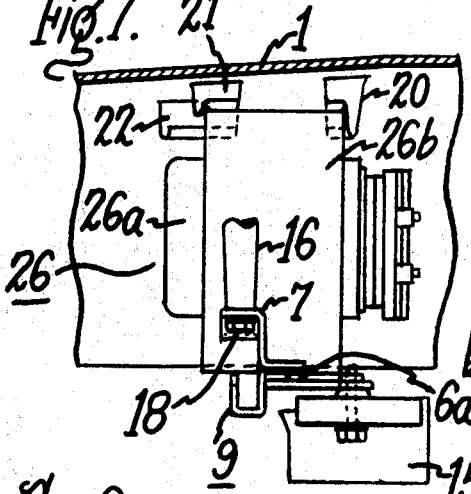


Fig. 8.

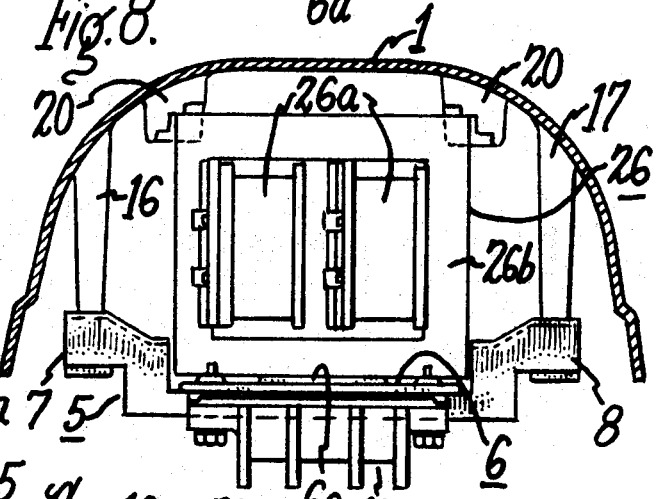


Fig. 9.

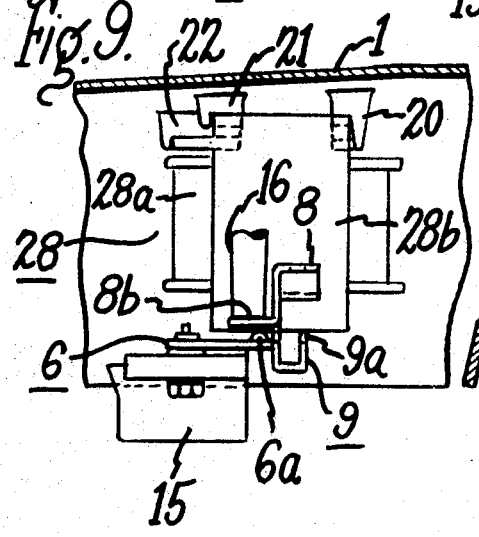
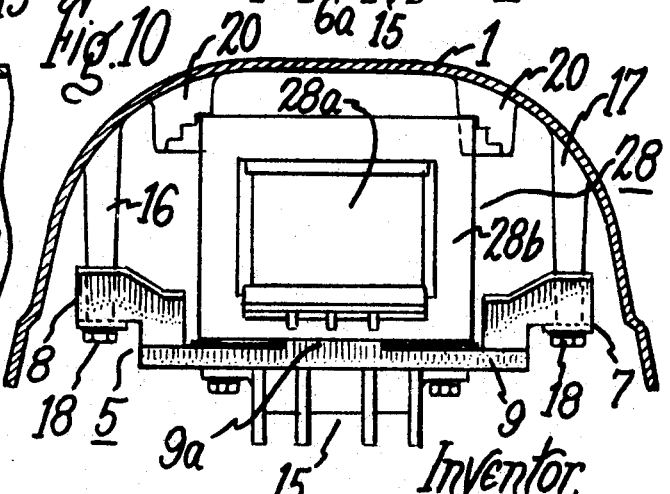


Fig. 10.



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LUMINAIRE BALLAST BRACKET

The present invention relates to luminaires, and more particularly to a support bracket for ballast components of luminaires.

It is an object of the invention to provide an improved bracket for luminaire electrical components.

It is a particular object of the invention to provide an improved bracket for mounting ballast components such as transformers and reactors of various sizes, types and ratings within the housing of street lighting luminaires.

Another object of the invention is to provide a bracket of the above type for mounting the ballast component in heat transfer relation to the luminaire housing.

A further object of the invention is to provide a bracket of the above type to which a terminal board may be readily attached.

Still another object of the invention is to provide a bracket of the above type which is simple in construction, inexpensive to manufacture, and is readily assembled in the luminaire housing with a minimum of fastening hardware.

Other objects and advantages will become apparent from the following description and the appended claims.

With the above objects in view, the present invention relates to a ballast support arrangement in a luminaire comprising a luminaire housing adapted to contain an electrical ballast component, the housing having a wall provided on its inner surface with spaced bearing portions having a plurality of steps at different levels formed therein, the wall having spaced support members, and an elongated bracket member having opposite end portions and an intermediate shelf portion, the end portions having outer connecting means securing the bracket member to the support members and having inner ledges above the plane of the shelf portion, whereby an electrical ballast component may rest with its bottom selectively on the shelf portion or the ledges of the bracket member and with its top selectively engaging the steps of the spaced bearing portions of the housing.

The invention will be better understood from the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a side elevational view of a street lighting luminaire in which the invention may be embodied;

FIG. 2 is an exploded view in perspective of the ballast mounting bracket and associated terminal board constructed and arranged in accordance with an embodiment of the invention;

FIG. 3 is a cross-sectional view of the bracket shown in FIG. 2 taken along the line 3 — 3;

FIG. 4 is a detailed view of one of the stepped bearing bosses on the luminaire housing wall;

FIGS. 5 and 6 are respectively side and front views of the ballast bracket holding a large size ballast transformer in assembly with the luminaire housing;

FIGS. 7 and 8 are similar views showing the bracket holding a smaller ballast transformer; and

FIGS. 9 and 10 are similar views showing the bracket holding a typical reactor ballast.

Referring now to the drawings, and particularly to FIG. 1, there is shown a street lighting luminaire of known form comprising an elongated housing 1 of inverted channel shape closed at its bottom by a bottom panel 2 hinged at its rear end to housing 1 and having a refractor 3 mounted therein. Bottom panel 2 is latched at its front end to housing 1, and when unlatched, it may be swung down in known manner to provide access to the interior of housing 1. Mounted within housing 1 by means of the support bracket device of the invention, as more fully disclosed below, is ballast device 4 which serves as an electrical ballast for the gaseous discharge lamp (not shown) employed in the luminaire, as well understood in the art.

In luminaires of the type shown, any one of several different sizes of ballast devices may be used, depending on the particular wattage of the lamp employed or the particular type of ballast induction device used, e.g., reactor type, lag type, regulator type, etc.

Heretofore, it has been the practice to provide brackets of different sizes to accommodate the different sizes of ballasts in the luminaire housing. In accordance with the present invention, a single bracket is provided which is constructed to accommodate all of the various sizes of ballasts commonly used for such purposes and to readily mount each type of ballast in secure position against the luminaire housing in heat transfer relation therewith using a minimum of fastening hardware. In addition, the invention provides for attachment to the ballast bracket of a suitable electrical terminal board on which electrical connections are made between the electrical operating components of the luminaire.

As seen in FIG. 2, ballast bracket 5 comprises an elongated member having a relatively flat shelf 6 extending horizontally from the front side thereof and opposite upwardly extending flanged end portions 7, 8. At their outermost upper regions, bracket end portions 7, 8 are formed with apertures 7*a*, 8*a* for receiving mounting screws, and are formed at their lower portions with flanges 7*b*, 8*b* extending in the same direction as shelf 6 and having apertures 7*c*, 8*c* therein spaced forwardly from corresponding apertures 7*a*, 8*a*. At their inner regions, bracket end portions 7, 8 are formed with ledges 7*d*, 8*d* positioned above the plane of flat shelf 6.

At its rear side, bracket 5 is formed with a channel portion 9 (see FIGS. 3 and 10) extending along the bracket from about the mid-point of end portion 7 to about the midpoint of end portion 8. The outer edge of channel 9 is formed with a ridge 9*a* which lies in a plane spaced above the plane of the surface of shelf 6. As seen in FIGS. 2 and 3, shelf 6 is formed with an elongated boss 6*a*, the top of which lies approximately in the same plane as that of channel ridge 9*a*. Shelf 6 is formed with spaced slots 6*b*, 6*c* opening at its front edge. Outwardly of the latter slots shelf 6 has a pair of apertured bosses 6*d*, 6*e* adapted to threadably receive screws 10, 11 (see FIG. 2) by means of which terminal board 15 is attached to the bottom of shelf 6. Terminal board 15 is formed at its underside with partitions 15*a* between which terminal binding posts or the like (not shown) are arranged for making the necessary electrical connections between the electrical operating components of the luminaire, as well understood in the art. Terminal board 15 is formed at its opposite ends with apertured bosses 15*c*, 15*d* through which screws 10, 11 pass for securing the terminal board to the bottom of shelf 6 as previously mentioned. Slots 6*b*, 6*c* formed in shelf 6 serve to provide a desirable flexibility to the shelf to avoid possible damage to terminal board 15 when the latter is screwed tightly against the shelf.

As seen in FIGS. 5 – 10, luminaire housing 1 is formed on the inner side of its top wall with two laterally spaced, downwardly extending hanger bosses 16, 17 having tapped recesses at their bottom ends for receiving screws 18 passing through opposite end apertures 7*a*, 8*a* (or, alternatively, apertures 7*c*, 8*c*) of bracket 5, by means of which the latter member may be secured to bosses 16, 17.

As seen in FIGS. 5 – 10, the inner surface of the top wall of luminaire housing 1 is also formed with front, intermediate and rear pairs of downwardly projecting bosses against which ballast devices of various sizes are pressed by bracket 5. Each of the front pair of bearing bosses 20, as shown in detail in FIG. 4, is formed with three steps of varying height, each pair of intermediate bearing bosses 21 has two steps having levels corresponding to the upper two step levels of front bosses 20, and each pair of rear bearing bosses 22 has one step corresponding to the lowermost step level of front bosses 20. Although only one boss 21 and one boss 22 are shown, it will be understood that corresponding bosses are provided on the opposite side of housing 1. Also, while two bosses 21 and 22 are referred to, it will be understood that these bosses may be formed as or considered a single boss having the three levels described. As will be seen, rear and intermediate bosses 21 and 22 are formed with depending stop portions at their rear corners to prevent rearward and lateral shifting of the ballast

devices, while front bosses **20** have similar stop portions at the front corners to prevent forward and lateral shifting.

FIGS. **5** and **6** illustrate the assembly of a particular type of ballast transformer **25** in luminaire housing **1** by means of the described bracket device **5**. Transformer **25** comprises windings **25***a* mounted on a metal core **25***b*. Such a ballast transformer is relatively short and wide, so that in the assembly the transformer core **25***b* rests with its bottom side edges on the opposite ledges **7***d*, **8***d* of bracket **5**, and its top edges at the front engage the lowermost levels of spaced front bearing bosses **20** while its top edges at the rear engage the steps of spaced rear bearing bosses **22** (see FIG. **5**). Lateral and longitudinal shifting of core **25***a* is prevented by the depending stops on bosses **20** and **22** mentioned previously, as shown in FIGS. **5** and **6**. In this assembly, bracket **5** is connected to bosses **16**, **17** at its upper flanged end portions **7**, **8** (i.e., at apertures **7***a*, **8***a*) and is arranged with channel portion **9** facing rearwardly and flat shelf **6** extending forwardly with terminal board **15** hanging below it.

FIGS. **7** and **8** depict the application of the described supporting structure to a different type of ballast transformer **26** having windings **26***a* and core **26***b*. Such a ballast transformer is typically narrower and taller than the previously described ballast, and in the assembly, in which bracket **5** is in the same position as that shown in FIGS. **5** and **6**, the ballast core rests with its bottom on elongated boss **6***a* of shelf **6** and ridge **9***a* of channel portion **9** as shown. At its top, core **26***b* engages the intermediate step of front bearing bosses **20** and the lower step of intermediate bearing bosses **21** which also have depending stop portions to prevent lateral and rearward shifting of the core.

FIGS. **9** and **10** show the arrangement of a reactor type ballast **28** in housing **1**, and in this assembly bracket **5** is reversed in position so that shelf **6** extends rearwardly and channel **9** extends forwardly, and the bracket is connected to hanger bosses **16**, **17** at its apertured flanges **7***b*, **8***b*. As will be seen, reactor ballast **28** is somewhat shorter than the ballast shown in FIGS. **7** and **8**. In this assembly, the bottom of core **28***b* rests at its forward portion on ridge **9***a* and at its rearward portion on elongated boss **6***a*, and the top corner portions of core **28***b* engage the uppermost steps of front bearing bosses **20** and intermediate bearing bosses **21**.

While three particular types and sizes of ballast devices are described and shown as mounted by means of the supporting arrangement of the invention, it will be understood that other types and sizes of ballasts may also be suitably accommodated by the described bracket structure and arrangement.

As will be evident from the showing of bracket **5** in FIG. **2**, the bracket may be formed from a single piece of sheet metal, merely by suitably bending out various portions of the sheet to form the described parts of the bracket.

There is thus provided by the invention a versatile ballast supporting bracket which is simple to manufacture and low in cost, and which serves in the described assembly to securely mount a variety of ballast components in a luminaire housing in thermal contact therewith and while supporting a terminal board in the same assembly, all with the use of a minimum of fastening hardware.

While the present invention has been described with reference to particular embodiments thereof, it will be understood that numerous modifications may be made by those skilled in the art without actually departing from the scope of the invention. Therefore, the appended claims are intended to cover all such equivalent variations as come within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a luminaire, a ballast support arrangement comprising, in combination, a luminaire housing adapted to contain an electrical ballast component, said housing having a wall provided on its inner surface with spaced bearing portions having a plurality of steps of different levels formed therein, said wall having spaced support members, and an elongated bracket member having opposite end portions and an intermediate shelf portion, said end portions having outer connecting means securing said bracket member to said support members and having inner ledges above the plane of said shelf portion, whereby an electrical ballast component may rest with its bottom selectively on the shelf portion or the ledges of said bracket member and with its top selectively engaging said steps of said spaced bearing portions of said housing.

2. A device as defined in claim **1**, and electrical terminal means secured to the underside of said shelf portion of said bracket member.

3. A device as defined in claim **1**, said outer connecting means of said end portions comprising a pair of spaced upper flange portions and a pair of spaced lower flange portions, said bracket member being selectively attachable to said support members at said upper and said lower flange portions respectively.

4. A device as defined in claim **1**, said shelf portion comprising a substantially flat shelf extending from one side of said bracket member and a substantially channel-shaped portion extending from the opposite side of said bracket member, the outer edge of said channel-shaped portion and the top of said shelf being substantially co-planar.

5. A device as defined in claim **1**, said bearing portions of said housing comprising laterally spaced pairs of rearward and forward stepped bosses.

6. A device as defined in claim **5**, wherein said pairs of said spaced bosses each comprise three stepped levels.

7. A device as defined in claim **6**, said shelf portion comprising a substantially flat shelf extending from one side of said bracket member and a substantially channel-shaped portion extending from the opposite side of said bracket member, the outer edge of said channel-shaped portion and the top of said shelf being substantially co-planar, said outer connecting means of said end portions comprising a pair of spaced upper flange portions and a pair of spaced lower flange portions, said bracket member being selectively attachable to said support members at said upper and said lower flange portions respectively, and electrical terminal means secured to the underside of said flat shelf of said bracket member.

8. A device as defined in claim **7**, said lower flange portions projecting on said one side of said bracket member and said upper flange portions projecting on said opposite side thereof.

9. A device as defined in claim **8**, said spaced support members comprising a pair of elongated bosses extending downwardly from said housing wall on opposite sides of said bearing portions.

10. A device as defined in claim **8**, wherein said bracket member is connected at said upper flange portions to said support members with said flat shelf extending forwardly in said luminaire housing.

11. A device as defined in claim **8**, wherein said bracket member is connected at said lower flange portions to said support members with said flat shelf extending rearwardly in said luminaire housing.

12. A device as defined in claim **8**, wherein said bracket member is connected at said upper flange portions to said support members with said flat shelf extending forwardly in said luminaire housing, and a ballast device is arranged with its bottom resting on said ledges of said bracket member and with its top engaging the lowermost levels of said stepped bearing bosses.

13. A device as defined in claim **8**, wherein said bracket member is connected at said upper flange portions to said support members with said flat shelf extending forwardly in said luminaire housing, and a ballast device is arranged with its bottom resting on said co-planar shelf and channel-shaped portions of said bracket member and with its top engaging the intermediate levels of said stepped bearing bosses.

14. A device as defined in claim **8**, wherein said bracket member is connected at said lower flange portions to said support members with said flat shelf extending rearwardly in said luminaire housing, and a ballast device arranged with its bot-

tom resting on said co-planar shelf and channel-shaped portions of said bracket member and with its top engaging the uppermost levels of said stepped bearing bosses.

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