March 13, 1962 E. LEONI 3,025,337

BALLAST-RETAINING FASTENER FOR LIGHTING FIXTURES

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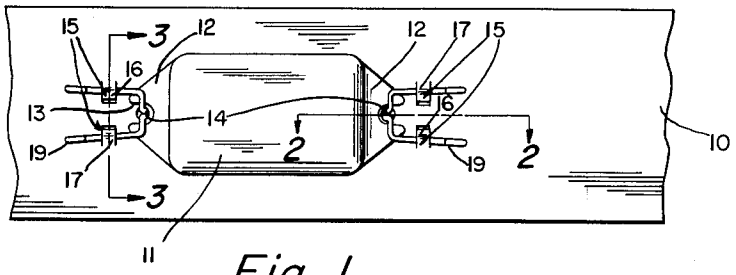


Fig. 1

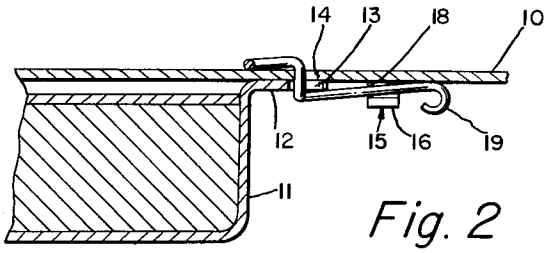


Fig. 2

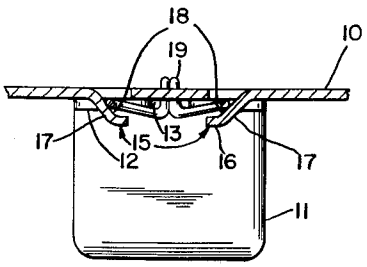


Fig. 3

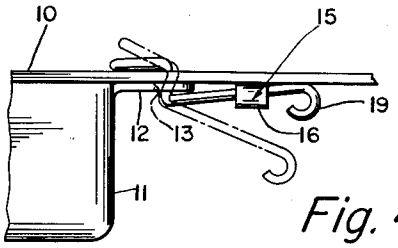


Fig. 4

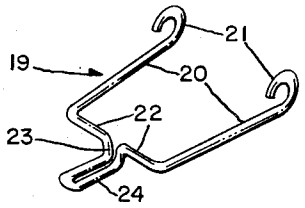


Fig. 5

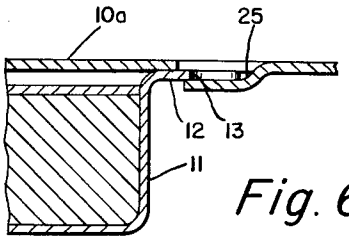


Fig. 6

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BALLAST-RETAINING FASTENER FOR LIGHTING FIXTURES

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The present invention relates generally to fluorescent lighting fixtures and more particularly to improved means for assembling the ballast component into said fixtures.

Heretofore, in the assembly of such lighting fixtures, the ballast unit has been secured to the base plate by screws or bolts and nuts. In inexpensive units, rivets have been utilized, but this type of fastening does not permit of ready replacement of defective ballast units. Furthermore, the use of any of such conventional fastening means have involved a certain modest labor cost in addition to the cost of the fasteners themselves.

It is the primary object of my invention to provide novel fastener means for securing ballast units in such fixtures.

Another object of my invention is to provide fasteners which are less expensive than conventional fasteners and which involve a significant reduction in the time required for assembly.

Other objects and advantages of my invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

FIG. 1 is a plan view of a ballast unit mounted on a fixture plate by means of elements embodying my invention.

FIG. 2 is an enlarged cross-sectional view taken on line 2—2 of FIG. 1.

FIG. 3 is another cross-sectional view taken on line 3—3 of FIG. 1.

FIG. 4 is a fragmentary view in side elevation of the arrangement shown in FIG. 1.

FIG. 5 is a perspective view of the fastener element itself.

FIG. 6 is a view similar to FIG. 2 but showing a modified form of the invention.

Referring more particularly to FIGS. 1–5 of the drawings, I have shown a portion of the base plate **10** of a fluorescent lighting fixture on which is mounted a conventional ballast unit **11**. The ballast unit is provided with mounting ears **12** projecting laterally therefrom in the plane of the bottom or base of the unit. Each ear **12** is provided with a peripheral notch or recess **13** for the purpose of receiving a conventional fastening element, such as a bolt (not shown).

The base plate **10** is provided with spaced openings **14** which are adapted to be in registry with the recesses **13** in the ears **12**. It will be understood that the ballast unit **11** ordinarily is secured to the underside of the plate **10** so as to extend downwardly therefrom. Therefore, the illustration of FIG. 1 can be taken to represent a bottom plan view of the mounting arrangement. However, the principles of my invention are applicable irrespective of whether the ballast unit be resting upon or depending from the mounting surface.

The base plate **10** is provided with a pair of oppositely-disposed abutments or tongues **15** which are elevated out of the plane of the base plate **10** and are outward of the aperture **14** and aligned laterally on opposite sides of the longitudinal axis defined by the openings **14** or the recesses **13**. The tongues **15** are conveniently formed by slitting the base plate and pressing out the tongues during the same stamping operation in which the base plate is formed. It will be noted (FIG. 3) that each tongue or abutment **15** has an overlying portion **16**,

spaced from the mounting surface of the plate **10**, and an angularly inclined cam portion **17** which intersects the mounting surface and which provides a recess **18** for a purpose which will become apparent as the description proceeds. A pair of such tongues **15** is provided outwardly of each of the openings **14** in the base plate and are preferably from ¼" to ¾" remote from the respective openings **14** associated therewith.

A fastener element **19** (FIG. 5) of formed wire or the like is utilized to secure the ballast unit against displacement from the base plate **10**. The element **19** has two coplanar arms **20** which, preferably are disposed in slightly divergent relationship to each other. The free end of each arm **20** may be bent or curled to provide a finger grip **21** for convenient manipulation of the fastener. The pair of arms are somewhat wider than the spacing of the pair of tongues **15**.

The forward portions **22** of each arm are bent sharply toward each other so as to almost meet or abut each other midway of the element **19**. These portions **22** are substantially coplanar with the portions **20** and are adapted to overlie the mounting ear **12** of the ballast unit **11**.

From the horizontal extending portions **22**, each arm is provided with a short vertical portion **23** which is of a length slightly greater than the combined thickness of the base plate **10** and mounting ear **12**. The portion **23** provides a horizontal offset for a horizontal extension or offset bar **24**. The plane of the bar **24** is preferably at an angle of about 5–10 degrees to the plane of the arm portions **20**.

The fastener element illustrated in FIG. 5 of the drawings can readily be made by forming a single piece of metal wire, thus avoiding any machining or assembly cost in the manufacture of the fastener element.

In using the fastener **19**, the offset bar **24** is projected through the opening **14**, as shown in phantom in FIG. 4, so as to be on the side of the base plate **10** opposite to the mounting surface thereof. This brings the portions **22** into overlying relationship to the mounting ear **12** on opposite sides of the recess **13**. The arms **20** are then manually contracted or drawn toward each other by means of the finger grips **21** so as to decrease their overall width sufficiently to permit the portions **20** to pass the tongues **15** and enter the recesses **18** provided by the tongues, as shown in FIGS. 3 and 4. Alternatively, one of the arms **20** may be inserted in a recess **18** and then the arms may be contracted to permit entry of the other arm into its adjacent recess **18**. Either procedure is quickly and easily accomplished. The material, such as steel wire, of which the element **19** is formed must have sufficient resiliency to permit the necessary manual manipulation without permanent set or deformation. It will be noted that in contracting the arms **20**, the closely adjacent vertical portions **23** will abut each other and thus serve as a fulcrum or reaction point for this manipulation of the arms **20**, and thus minimize any deformation of the portions **22**.

When the arms **20** are in registry with the recesses **18** provided by the pair of tongues **15**, the arms are released and will spring into the recesses and engage the inclined surfaces **17**. The surfaces **17** will cam the arms **20** toward the one surface of the mounting plate **10** to simultaneously cause the offset bar **24** to be pivoted into pressure engagement with the reverse surface of the plate **10**. The arm portions **22** define the nominal axis of the pivotal movement.

The pair of arms **20**, being normally more widely spaced than the pair of retaining tongues **15**, will thus yieldably maintain the offset bar **24** in such position as to firmly clamp the mounting ear **12** against the plate **10** between the bar **24** and the overlying portions **22** of the

element 19. A second element 19 is utilized in similar manner to clamp the other ear 12 of the ballast unit 11. In this manner, the ballast unit is secured against vertical displacement relatively to the plate 10; and the vertical portions 23 of the element 19, which traverse the recess 13 in the ear 12, prevent any substantial horizontal displacement of the ballast unit.

If, for any reason, the ballast unit must be removed, the securing element 19 is quickly and easily removed by contracting the pair of arms 20 to release the element from the tongues 15. Thus, the manufacturing assembly of the lighting fixture is accomplished more speedily and with less material cost in the first instance, and any subsequent replacement of the ballast unit is quickly and conveniently accomplished.

In FIG. 6 I have shown a modified form of my invention in which the element 19 is utilized for clamping only one of the mounting ears 12. In this form the mounting plate 10*a* is slit and embossed to provide a recess or pocket 25 to slidably receive and retain one mounting ear 12. The other mounting ear 12 is then secured to the plate 10*a* by means of the element 19 as above described.

It is to be understood that the forms of my invention, herewith shown and described, are to be taken as preferred examples of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of my invention, or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. In a fluorescent lighting fixture, the combination of a base plate having a mounting surface, a ballast unit provided on said base plate, a resilient fastener element removably securing said ballast unit to said mounting surface, said resilient fastener element having a pair of spaced arms, each of said arms having a forward portion extending laterally therefrom, said forward portions projecting toward each other and overlying a portion of said ballast unit, each of said forward portions having a bent portion extending substantially normal thereto, an offset portion projecting forwardly from said bent portions and traversing said mounting surface in underlying relationship to said base plate to clamp said ballast unit to said base plate between said offset portions and said forward portions of said element, and means provided on said base plate and retaining said element in said clamping relationship to said ballast unit.

2. A combination as defined in claim 1 in which said means comprise a pair of spaced tongues on said base plate and said arms engage said tongues.

3. A combination as defined in claim 2 wherein each of said tongues presents an inclined surface and each of said arms is cammed thereby toward abutment with said mounting surface.

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