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G. A. TINNEMAN

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LAMP SOCKET MOUNTING AND FASTENER THEREFOR

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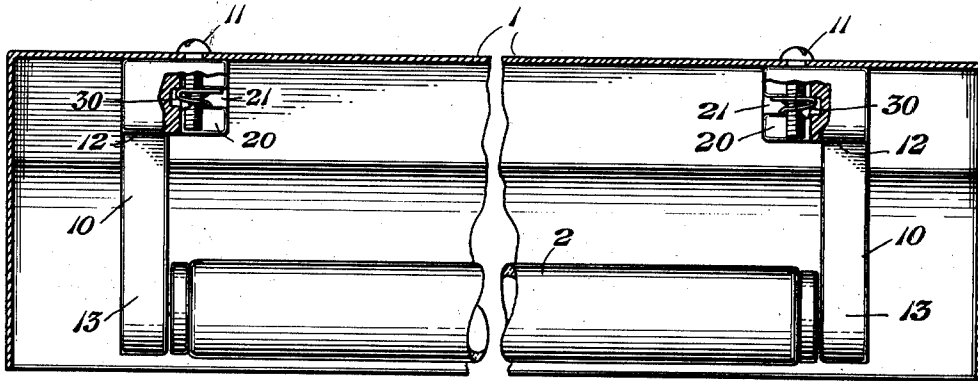


Fig. 1.

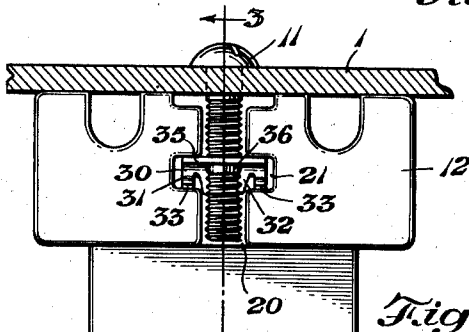


Fig. 2.

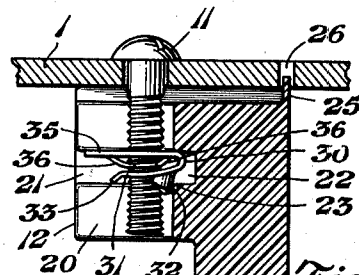


Fig. 3.

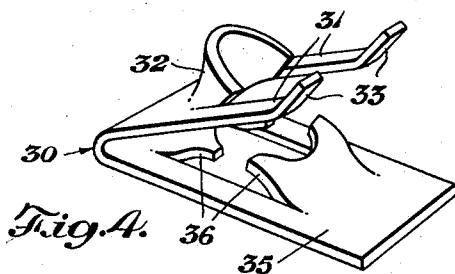
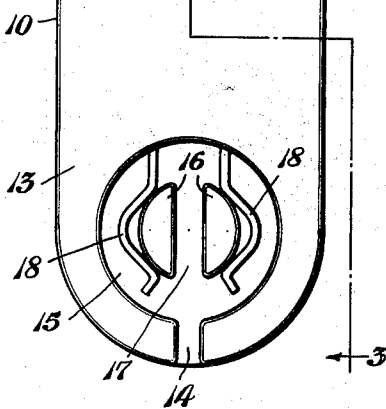


Fig. 4.

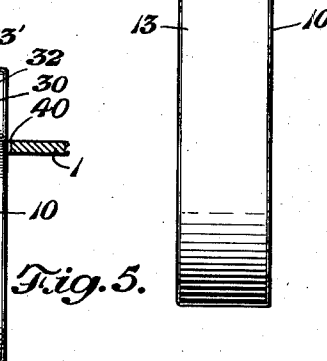


Fig. 5.

INVENTOR.  
George A. Tinneman  
BY  
H. J. Lombard

## UNITED STATES PATENT OFFICE

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LAMP SOCKET MOUNTING AND FASTENER  
THEREFORGeorge A. Tinnerman, Cleveland, Ohio, assignor  
to Tinnerman Products, Inc., Cleveland, Ohio,  
a corporation of Ohio

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2 Claims. (Cl. 189—36)

1

This invention relates in general to improvements in fluorescent lamp sockets and the like, and deals, more particularly, with an improved attaching or fastening means for securing fluorescent lamp sockets to the reflectors of lamps and related types of lighting fixtures.

The invention contemplates the provision of various well known designs of fluorescent lamp sockets with an improved attaching or fastening means which provides for speed and facility in the assembly and securing of such lamp sockets to their associated reflectors in a lamp or other form of lighting fixture. The fastening means of the present invention are such that they are adapted for generally universal application to well known types of fluorescent lamp sockets in extensive use throughout the industry without in any way modifying the sockets or the installations in which they are used.

The invention, more specifically, is directed to an improved fastening device for fluorescent lamp sockets and the like, comprising a combined bolt or screw receiving element for securing purposes and a clip element adapted to seat the device automatically in fastening position and otherwise retain the same in such position during the assembly of the lamp socket with the reflector and the associated parts of a lamp or other fixture in a manner whereby the assembly may be completed at minimum cost of manufacture by reason of important savings in time, labor, handling and other expenses involved in the fabrication of any such fixture or appliance.

A primary object of the invention, therefore, is to provide an improved fastening arrangement for fluorescent lamp sockets comprising a self-retaining type of fastener which is easily and quickly applied to fastening position in an installation and is adapted to retain itself in such position during handling, shipping or in the setting up the parts of an assembly preparatory to the final securing of these parts.

A further object of the invention is to provide such a fastening arrangement in which the fastener is also self-locating by reason of means designed to locate the fastener automatically in fastening position so that no further handling or adjustment thereof is necessary in the final securing of the parts of the assembly.

Another object of the invention is to provide a fastener of the kind described which includes means for threadedly engaging a bolt or screw under continuously effective spring tension in a manner which provides a strong and durable fastening installation that is not subject to

2

loosening under the most severe conditions of vibration, shock, or the like.

A further object of the invention is for the provision of such fasteners in the manner of simple, one-piece, sheet metal devices which are cheap and inexpensive to manufacture and lend themselves to economical quantity production in that they may be produced at relatively low cost from ordinary sheet metal strip stock with little loss or waste of material.

With the foregoing objects and advantages in view, as well as other objects and advantages which will be apparent to those skilled in the art as the following description proceeds with reference to the accompanying drawings, the invention comprises the parts and combinations thereof hereinafter set forth and claimed with the understanding that the several necessary elements constituting the same may be varied in proportion and arrangement without departing from the nature and scope of the invention as defined in the appended claims.

In the accompanying drawings, there are shown means for carrying the invention into practical effect without limiting the improvements in their useful application to the particular construction and arrangement disclosed, which, for purposes of explanation, have been made the subject of illustration. Like reference characters designate like parts throughout the drawings in which:

Figure 1 a front elevational view, partly in section, showing one type of installation in which the fluorescent lamp sockets are attached to a reflector or similar panel by the improved fastening means of the invention;

Figure 2 is an enlarged side view of a fluorescent lamp socket showing the application of the improved fastener of the invention for mounting the lamp socket to the associated reflector;

Figure 3 is a sectional view of Figure 2 taken along line 3—3, looking in the direction of the arrows;

Figure 4 is a perspective view of the fastener per se; and,

Figure 5 is an elevational view, partly in section, showing an alternate arrangement for mounting a fluorescent lamp socket to a reflector using the improved fastening means of the invention.

Referring, more particularly, to the drawings, Figure 1 shows a conventional type of fluorescent lamp assembly comprising a reflector 1 housing a tubular lamp 2 which is supported at its ends by sockets 10 in a manner well known in the art.

3

The sockets 10 are attached to the forward side of the reflector by bolts or screws 11 extending through openings in the reflector and threadedly engaged with a nut form of securing means associated with the socket.

The lamp socket 10 may be of a standard general design constructed of insulating material such as porcelain or other molded plastic. The socket comprises a base 12 from which extends a body portion 13 provided on the inner face thereof with a slot 14, Figure 2, merging with an annular recess 15. A guiding stud 16 having a diametric slot 17 in line with slot 14 is disposed within said recess 15 along with contact springs 18 engaging opposite sides of said guiding stud. In mounting a fluorescent lamp, the spaced contact pins of the lamp are moved through the slots 14 and 17 until the guiding stud 16 is disposed between the contact pins, whereupon the lamp is rotated to move the contact pins within the annular recess 15 into engagement with the contact springs 18.

The base 12 of the lamp socket is provided on its inner face with a vertical stud passage 20 through which the bolt or screw 11 extends in fastening the socket to the reflector 1. A transverse slot or fastener receiving recess 21 merges with the stud passage 20 substantially at right angles thereto and includes an undercut cavity 22 adjacent the wall 23 of said stud passage 20, Figure 3. Preferably the base of the lamp socket includes a lug 25, Figure 3, receivable in a perforation 26 in the reflector to hold the lamp socket in proper position as the bolt or screw is applied and also, to maintain the socket in such position against accidental shifting after the assembly is completed.

The recess 21 including the undercut portion 22 is otherwise especially adapted to receive the preferred form of fastener, designated generally 30, which is provided with means for threadedly engaging the bolt or screw 11, under a spring tension lock which insures an attachment that will remain tight under the most severe conditions of vibration, handling and usage.

The preferred form of fastening device of the invention comprises a return bent double-armed type of combined spring clip and nut device which may be inexpensively fabricated in one piece from a relatively small body of any suitable sheet metal, preferably spring metal such as spring steel or cold rolled steel having spring like characteristics. Broadly described, the sheet metal body is formed to provide a fastener having a base carrying means for threadedly engaging a bolt or screw and a spring clip portion in spaced relation to said base designed to seat the fastener automatically in fastening position and otherwise to retain the same in such position during the assembly of the lamp socket 10 with the reflector 1 in a manner whereby these parts may be assembled with maximum speed and facility. While the fastener may be provided from blanks of various outlines, it is manufactured in most economical quantity production from a simple, generally rectangular sheet metal section of uniform width which may be obtained at very low cost from ordinary sheet metal strip stock with little loss or waste of material.

As best seen in Figures 2-4 inclusive, one end of the spring metal blank or other sheet metal body is slit longitudinally to provide a spring arm or clip portion comprising a pair of spaced resilient spring fingers 31, and an intermediate

4

collar or indexing lug 32 between said spring fingers bent outwardly out of the plane thereof. The collar is rounded, preferably, or otherwise fashioned as necessary to define a stud passage which will clear the bolt or screw applied to the nut portion of the fastener.

The free ends of the spring fingers 31 are bent outwardly so that the extremities thereof define sharp tongues 33 that are adapted to bite into the plastic material of the wall adjacent the fastener receiving recess 21 in the lamp socket and thereby lock the fastener in applied fastening position in said recess. The spring arm or clip portion of the fastener otherwise is formed to extend in generally V-shaped or substantially U-shaped relation to the base 35 of the fastener which is provided with bolt or screw securing means preferably in the form of integral cooperating tongues 36 which are struck from the material of the base and so formed that the extremities thereof lie on a helix corresponding substantially to that of the thread of the bolt or screw for uniform threaded engagement therewith.

The thread engaging elements 36 are best provided from the sheet metal material of the base 35 by an aperture intermediate spaced parallel slits which form cooperating tongues, or the like, having spaced extremities defining the desired thread or thread opening corresponding substantially to the root diameter of the bolt or screw for threadedly engaging the thread thereof. Said tongues 36 otherwise are preferably formed to project out of the plane of the base 35 and are bent lengthwise in substantial ogee formation to provide for the maximum strength obtainable to withstand the tightening action of the bolt or screw as it is advanced to final applied fastening position.

Such thread engaging means may be pressed, stamped, extruded, or otherwise provided on the fastener in any suitable form or construction so long as the same threadedly engage with the thread of the bolt or screw 11 and, in this relation, the present invention fully contemplates the provision of such thread engaging means in various other similar and related forms, as in the manner of a keyhole type of thread opening, or a perforated protuberance which is pressed from the sheet metal and shaped to provide a helical thread or thread opening, or otherwise has the walls thereof tapped to provide a plurality of threads for threadedly engaging the bolt or screw. However, it has been found that such thread engaging means prepared in the form of cooperating, yieldable tongues 36, as shown, are the most efficient and the most practical in that they are possessed of unusual inherent strength and will not collapse or pull through when the bolt 11 is tightened, nor loosen under continuous strain and vibration in the installation. This takes place by reason of the fact that the sheet metal material from which such tongues are formed is of less thickness than the pitch or spacing between adjacent thread convolutions of the bolt or screw, wherefore the extremities of said tongues tend, more effectively, to move toward each other and dig into the grooves intermediate adjacent thread convolutions when tightened therewith and otherwise become embedded in the root of the bolt in locked, frictional fastening engagement therewith in applied fastening position. Thus, in the present example, the tongues 36 are shown as extending out of the plane of base 35 in substantial ogee formation

5

and provided preferably with notched extremities, forming substantial biting jaws designed to cut into the root of the bolt and the adjacent thread surfaces thereon in positive locking relation therewith in the most effective manner. There is thereby eliminated the necessity for a separate, auxiliary locking means such as a lock nut or lock washer and this, in mass production, makes possible a considerable saving not only in the cost of such locking devices, but also, in the expense and labor involved in the tedious, time consuming assembling operations and other added steps in manufacture which such auxiliary locking means require. It is to be understood, however, that the present invention is not limited in any manner or form to the illustrated construction of the thread engaging means but rather, comprehends also, various other similar and related forms of such tongues or equivalent thread engaging elements.

On completing a lamp assembly with the respective parts provided substantially in the manner aforesaid, a fastening device 30 is first assembled with each socket 10 either at the time of the assembly thereof in the reflector or when the sockets are prepared in numbers ready for use in mass production methods of assembly. In any event, the fastening device is easily and quickly assembled with the socket, as best seen in Figures 2 and 3, simply by inserting the fastener into the transverse recess 21 with the bight of the V-shaped portion thereof foremost and with base 35 carrying the thread engaging means 36, arranged in proper position for receiving the bolt, screw or other stud 11.

In the application of the fastener, the fingers 31 are compressed from their generally V-shaped relation to the base 35 upon entering the recess 21 and being urged toward the base by the adjacent wall of the recess. The collar or lug 32 passes through the adjacent space of the vertical stud passage 20 until it engages the wall 23 of the stud passage 20 adjacent the undercut portion 22 of recess 21, and, in this relation, the bight of the V-shaped portion of the fastener is disposed in said undercut portion 22 of the recess.

In the foregoing described assembly of the fastener with the socket, the collar or indexing lug 32 has an important function in automatically locating and guiding the fastener to proper fastening position. The collar is substantially in line with the thread opening in the base of the fastener defined by the thread engaging elements 36, and since said collar slides in the adjacent space of the vertical stud passage 20, it necessarily centers said thread engaging elements 36 between the walls of said stud passage 20. At the same time, the collar 32 is designed to serve as a stop which engages the wall 23 of the stud passage 20 to limit the inward movement of the fastener in the transverse recess 21 and thereby automatically locates the fastener in correct fastening position in assembled relation with the socket.

In the final application of the fastener into the recess 21, the fingers 31 are compressed to a generally parallel and spaced relation to the base 35 of the fastener, and, in this compressed relation, the sharp tongues 33 on the extremities thereof are forced to bite into the plastic of the adjacent wall of the recess to lock the fastener in finally applied fastening position therein.

With the socket thus provided with fastening means, the attachment of the socket to the reflector in completing a lamp assembly requires

6

only the simple operation of applying the bolt or screw 11 through the aperture in the reflector and through the vertical passage 20 in the socket into threaded engagement with the thread engaging elements 36 of the fastener. Inasmuch as the fastener is already located in proper fastening position in the socket recess, no time is lost in handling the fastener or in adjusting the same to align the thread engaging means 36 thereof with the bolt or screw 11. Consequently, the operation for attaching a socket 10 to a reflector is performed with the greatest speed and facility making for important savings in mass production methods of assembly.

Figure 5 shows an alternate application of the invention wherein the socket 10 is mounted with the base 12 thereof at the rearward side of the reflector and the body 13 of the socket extending through an opening 40 in the reflector to its forward side. The fastener and socket are identical to that described with reference to Figures 1-4 inclusive and are used in more or less the same relation except that the fastener 30 is reversed in the recess 21 so that the thread engaging means 36 thereof are in position for threadedly engaging the bolt or screw 11 applied from the forward side of the reflector 1. In applying the fastener to the socket recess 21 in this arrangement, the collar 32 of the fastener serves the same function in centering the fastener and in locating the same in correct fastening position upon engagement with the adjacent upper wall portion 23' of said stud passage 20. Similarly, the tongues 33 on the extremities of the spring fingers bite into the plastic of the adjacent upper wall of the recess 21 to lock the fastener in applied fastening position.

While the invention has been described in detail with a specific example, such example is intended as an illustration only, since it will be apparent to those skilled in the art that other modifications in the construction, arrangement and general combination of parts thereof may be devised without departing from the spirit and scope of the invention. The present disclosure is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, with all changes falling within the scope, meaning and range of equivalency of the claims intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. A fastening assembly comprising a member provided with a stud passage merging with a fastener receiving recess extending transversely of the axis of said stud passage between the ends of and on both sides of said stud passage, said recess including an undercut portion at the rear of said stud passage, a fastener comprising a sheet metal body defining a base provided with stud securing means, said base lying laterally in said recess on both sides of said stud passage with one end extending into said undercut portion, said fastener including means defining an outwardly projecting lug aligned with said stud securing means and engaging the wall of said stud passage adjacent said undercut portion positioning the fastener in said recess against both lateral and lengthwise movement with said stud securing means aligned with said stud passage, said fastener including means yieldable relative to the fastener base and engaging a wall

of said recess to retain the fastener in fastening position therein.

2. A fastening assembly comprising a member provided with a stud passage merging with a fastener receiving recess extending transversely of the axis of said stud passage between the ends of and on both sides of said stud passage, said recess including an undercut portion at the rear of said stud passage, a fastener comprising a sheet metal body defining a base provided with stud securing means, said base lying laterally in said recess on both sides of said stud passage with one end extending into said undercut portion, a return bent arm on said base having an outwardly projecting lug aligned with said stud securing means and engaging the wall of said stud passage adjacent said undercut portion positioning the fastener in said recess against both lateral and lengthwise movement with said stud securing means aligned with said stud passage, and means on said return bent arm engaging a wall of said recess to retain the fastener in fastening position therein.

GEORGE A. TINNEMAN.

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