Aug. 5, 1969 J. F. ARNAO ET AL 3,460,088

BLADE TERMINAL LAMP SOCKET

Filed Feb. 21, 1967 2 Sheets-Sheet 1

Fig. 1.

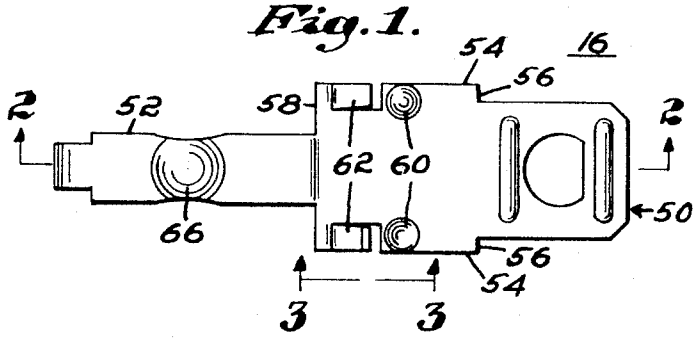


Fig. 3.

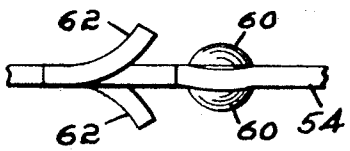


Fig. 2

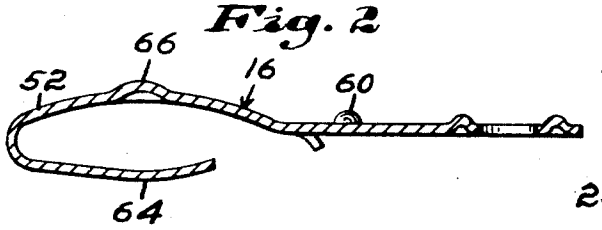


Fig. 4.

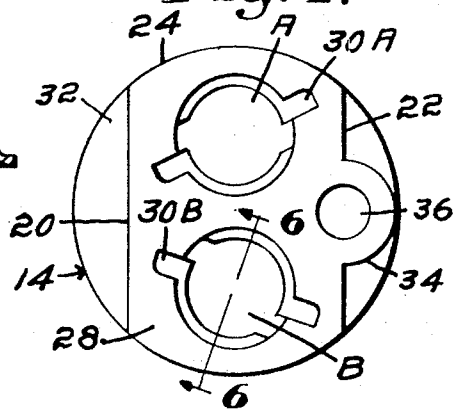


Fig. 5.

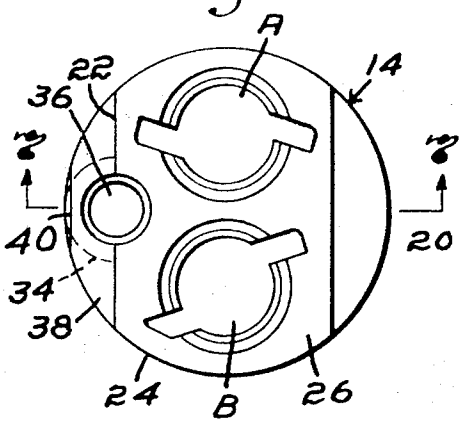


Fig. 8.

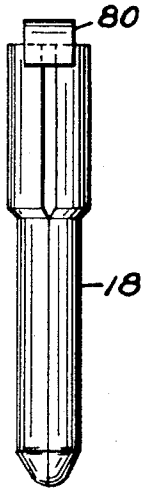


Fig. 6.

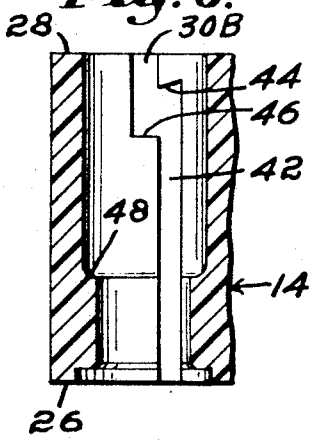
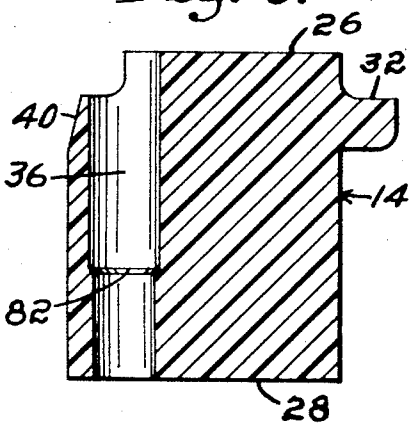


Fig. 7.



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Fig. 9.

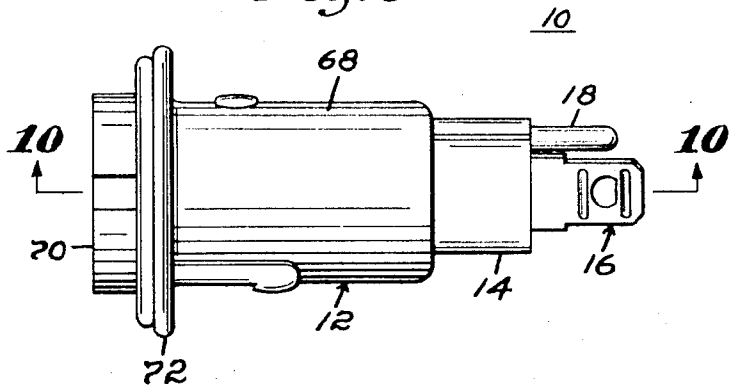


Fig. 10.

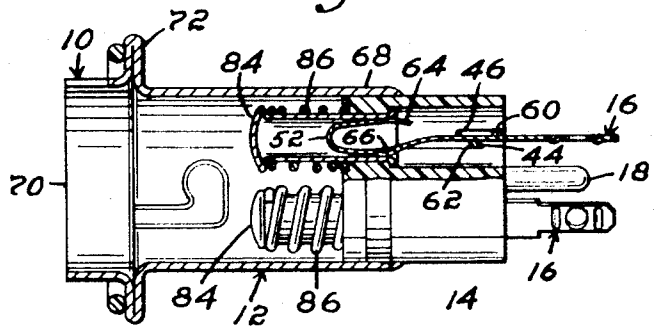


Fig. 12.

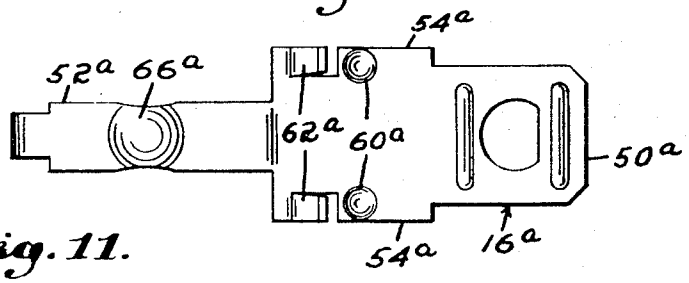
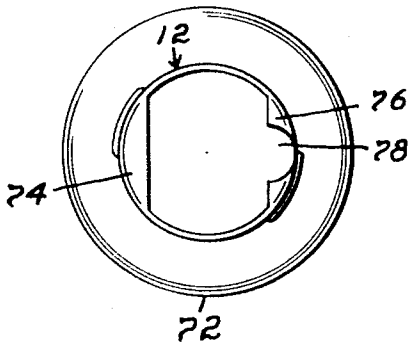


Fig. 11.



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BLADE TERMINAL LAMP SOCKET

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Int. Cl. H01r 13/64, 33/46, 11/22
U.S. Cl. 339—184 3 Claims

ABSTRACT OF THE DISCLOSURE

This is a lamp socket having a mechanical means of engaging blade terminals to the insulator thereof which rotates the blade terminals a predetermined amount to preserve an angle formed by the planes of the two blade terminals. There is also disclosed a spring portion of the blade terminals having means of providing a wiping electrical engagement with the inner wall of an eyelet which in turn is spring loaded.

Background of the invention

An object of the present invention is to provide a lamp socket whose terminals are snap engaged into the insulator.

Another object of the present invention is to provide a terminal which will engage with the insulator in such a manner as to move the blade terminal a predetermined distance.

Another object of the present invention is to provide a polarizing pin which may be used as an indexing means and as an electrical termination.

Still another object of the present invention is to provide a simple swedging operation which co-operates with shoulder means, formed in the shell, to engage the shell to the insulator and also, if required, to form an electrical connection with a blade terminal.

In cases where the planes of the blade terminals of a socket are required to be at a predetermined angular relation with each other, it has been discovered that frictionally engaging the terminals to the insulator provided unacceptable variance in the mentioned angular relationship. This was due mainly to the fact that there was some slip in the dimensional relationship between the terminal and the insulator on a friction fit.

Description of the drawings

FIG. 1 is a top plan view of the blade terminal;

FIG. 2 is a section taken on line 2—2 of FIG. 1;

FIG. 3 is a side elevation, broken off, of the blade terminal looking on it at lines 3—3 of FIG. 1;

FIG. 4 is a bottom plan view of an insulator;

FIG. 5 is a top plan view of the insulator shown in FIG. 4;

FIG. 6 is a section taken on line 6—6 of FIG. 4;

FIG. 7 is a section taken on line 7—7 of FIG. 5;

FIG. 8 is a front elevation of the polarizing pin;

FIG. 9 is a side elevation of the socket assembled;

FIG. 10 is a section taken on line 10—10 of FIG. 9;

FIG. 11 is a bottom plan view of the shell; and

FIG. 12 is a top plan view of a variation of the blade terminal.

Description of the preferred embodiments

In the drawing there is shown a lamp socket **10**, comprising a metallic shell **12**, an insulating element **14** fixed within the metallic shell **12**, and having a pair of blade terminations **16**, and a polarizing pin **18**, engaged therewith.

The insulating element **14**, is formed of an organic polymeric material such as a general purpose phenolic, a modified polyphenyleneoxide, a polyacetal resin or a nylon. It has a pair of side walls **20**, **22** in spaced parallel relation to each other connected by a pair of arced end walls **24**. The insulating element **14** includes two apertures, A and B, formed through its upper surface **26**, which are spaced from each other a predetermined distance, having center lines in spaced parallel relation with a center line of the upper surface **26**. The apertures A and B extend from the upper surface **26**, of the insulating element **14**, through the lower surface **28** thereof. A retaining slot **30A** extends on each side of the aperture A and a similar slot **30B** extends on each side of the aperture B with the center line of the retaining slot **30A** forming an angle of 26½ degrees with the center line of the aperture A and the center line of the retaining slot **30B** forming an angle of 18½ degrees with the center line of aperture B. The slot formed in the upper surface is offset from that formed on the lower surface as shown in FIG. 6. Thus, the angle defined by the center lines of the retaining slots **30A** and **30B** is the requisite (in this case) 45 degrees. An arcuate flanged portion **32** extends from the side wall **20** in close proximity to the upper surface **26**. A longitudinal arcuate guide portion **34**, extends from the side wall **22**, having its cross sectional center line coincident with the center line of the upper surface **26** of the insulating element **14**, and having an axial guide bore **36** formed therethrough. An arced flange **38** also extends from the side wall **22** proximate the upper surface **26** having a portion thereof butted against the guide portion **34**, and being in right angle relationship to the axis of the guide bore **36**. The guide bore **36** is continued through the flange **38** and beyond the flange **38** as an arcuate slot. The surface of the flange **38** closest to the upper surface **26** is biased back toward the upper surface **26**, to provide a lead-in face **40**.

The retaining slots **30A** and **30B** are extended as channels **42**, on opposed sides of the inner wall of the apertures A and B respectively. Each of the channels **42** has a lower shoulder **44** extending therein in close proximity to the lower surface **28**, of the insulating element **14**. The upper shoulder **46** extends from the opposite side of the channel **42** further from the lower surface **28** and the lower shoulder **44** by a predetermined distance. The orientation of the channels **42** in the disclosed embodiment which are on the same side in apertures A and B are identical in configuration. A circumferential shoulder **48**, extends from the inner wall of the apertures A and B further from the lower surface **28**, than the upper shoulder **46**, and is formed by thickening the inner wall, which thickening is continued until very close to the upper surface.

The blade terminal **16** comprises a substantially flat blade portion **50**, and an arcuate portion **52**. The blade portion **50**, is rectangular in configuration having a pair of spaced parallel side edges **54**. Each of the side edges **54** has an external shoulder **56** formed therein approximately intermediate the distance between the end edges **58**, of the blade portion **50**. One of the side edges **54** has an arcuate protuberance or finger **60** extending from the plane of the blade portion **50**, and has a tang **62**, extending in an opposite direction from the protuberance while the other side edge **54** has a similar protuberance or finger **60** and tang **62** which extend in opposite directions from the plane of the blade portion **50** as that of the first mentioned side edge **54**, with the free terminal ends of both tangs **62**, directed away from the spring portion **52**. The spring portion **52** extends from an end edge **58**, in close proximity to the tangs **62**, which are closer to the spring portion **52**, than the protuberance **60**.

The spring portion 52, comprises a flat, arced integral stiffening portion and a frame terminal end 64, connected to the stiffening potrion by a bight portion. A spherical dimple 66, is formed in the stiffening portion extending away from the plane of the free terminal end 64, which somewhat overlies the stiffening portion and which is narrower than the stiffening portion and forms a "U" shaped configuration therewith. The free terminal end 64, is directed toward the same plane as the terminal ends of the tangs 62. A pair of spaced transverse ribs may be formed at the terminal portion of the blade portion 50, to provide a compensating means and to provide a contact surface. The terminal portion of the blade portion 50 is narrower than the remaining part of the blade portion 50 thereby providing the external shoulders 56, mentioned heretofore.

The shell 12 formed of a copper alloy comprises a tubular body portion 68 and a tubular extension portion 70, integrally connected by a flange 72. The shell 12, is open at both ends with the circle, defined by the body portion open end, having two small segments 74 and 76, extending thereacross providing internal shoulder portions in opposed relation to each other. The segment 76 is traversed by an arcuate notch 78 for a purpose to be described hereinafter. The body portion 68 includes a pair of J slots formed in opposed relation to each other.

The polarizing pin 18 is of tubular configuration having a lower portion formed with a tapered or pointed terminal end and upper portion of greater diameter than a lower portion thereby providing a pin shoulder therebetween. The upper portion has a tail portion 80, extending therefrom which is bent transversely across the circle defined by the end of the upper portion and is then bent downwardly toward the same plane as that toward which the lower portion is directed.

To assemble the lamp socket 10, an insulator subassembly may be formed by engaging a hollow headed eyelet 84, in each aperture A and B and the shank of the eyelet 84 having a compression spring 86 circumscribing its shank and the eyelet 84, being held by flaring the open end against an inner circumferential shoulder formed in close proximity to the upper surface 26, of the insulating element 14. A blade terminal is then placed into the aperture A and another into the aperture B with the arcuate spring portion 52 passed into for example the aperture A from the lower surface 28, and with the side edges 54, riding within a portion of the retaining slot 30A. As force is applied on the blade terminal 16, the walls of the retaining slot 30A will cause the tanks 62, to flex, since the distance between the terminal end of the tanks 62 and the plane of the blade terminal 16, is greater than the width of the slot. As the pressure is continued, the retaining walls will come into contact with the arcuate proturberances or fingers 60 creating a counter pressure against that of the tangs 62, until the terminal ends 64 of the tangs 62 ride by the lower shoulder 44, formed in the channels 42. At this time, the forces exterted by the protuberances, or fingers 60, will tend to rotate the blade portion 50, four degrees. In this case, if a rotary motion is provided then it may be in a clockwise or counterclockwise direction, looking down upon the lower surface 28, four degrees. Since both of the blade terminals 16, will rotate in this manner a similar number of degrees, the 45 degree angle will be maintained by the planes of the two blade terminals 16. Due to the flexibility of the free terminal end 64, and the interference caused by the spherical dimple 66, a very tight mechanical and electrical fit is provided between the inner surface of the eyelet 84, and the spring portion 52. Of course, the width at its widest portion, between the free terminal end 64, and the remaining part of the spring portion 52, is greater than the inner diameter of the eyelet 84, thereby assuring the mentioned tight interference fit. The displacement of the eyelet 84, when depressed by insertion of the light bulb (not shown) into the light socket 10, produces a wiping action between the inner wall of the eyelet 84, and both the spherical dimple 66, and the free terminal end 64. In order to move the blade portion 50*a* in a lateral or planar direction rather than a rotary direction, the protuberances 60*a* both extend in the same direction proximate to the side edge 54*a* of the blade portion 50*a* and the tangs 62*a* both extend in the same direction on the opposite side of the blade terminal 16*a*.

The polarizing pin 18, is formed from a single piece of sheet, conductive material, such as brass, and has a slot formed along its upper longitudinal surface, although a slot is not absolutely necessary. The pin 18, is introduced into the guide bore 36, at the upper surface 26, of the insulating element 14. The upper portion of the guide bore 36, is of greater diameter than a lower portion providing an inner circumferential shoulder 82. The diameter of the guide bore 36, allows the lower portion of the polarizing pin 18, to pass easily and as it enters the lower portion of the guide bore 36, the upper portion of the polarizing pin 18, as it enters the upper portion of the guide bore 36, experiences a closing or compressing action forcing the two parts of the upper surface of the polarizing pin to come together along the longitudinal slot. This action continues until a predetermined part of the polarizing pin extends beyond the lower surface 28, of the insulating element 14, and the shoulder formed on the polarizing pin 18, is in abutting relationship to the inner circumferential shoulder 82, of the guide bore 36. The bent terminal end of the tail portion 80 of the polarizing pin 18 overlies a portion of the lead face 40, of the flange 38. If desired, the pin 18, may be constructed so that it can be dropped into the guide bore 36 without interference until the shoulder formed on the pin 18 butts the inner circumferential shoulder 82, of the guide bore 36. Obviously the longitudinal slot is not necessary in this case.

The insulator subassembly can now be dropped into the shell 12, with the extended polarizing pin 18, and the blade terminals 16, first, and with the guide portion 34 directed to pass through the notch 78, formed in the segment 76. This will also place the flange portion 32, into superposed abutting relationship with the shoulder formed by the segment 74, and place the flange 38 into superposed abutting relationship with the segment 76. In this position the major portion of the insulating element 14, extends beyond area encompassed by the shell 12, as shown in FIGS. 9 and 10. This portion of the assembly is completed by swaging a restricted portion of the outer surface of the shell 12 inwardly so that one swaged part will extend over and into abutting relationship with the turned down portion of the tail portion 80, of the polarizing pin 18, and by swaging another portion into abutting relation over the flange 38, thereby assuring that the insulating subassembly is physically secured to the shell 12, and is also, if required, electrically engaged to the polarizing pin 18.

The polarizing pin may, if desired, be made of a non-conductive material and then used exclusively as a polarizing or indexing element and, of course, it may be, as set forth hereinbefore, formed of a conductive material and used as a combination polarizing element and electrical termination.

With reference to the foregoing description it is to be understood that what has been disclosed herein represents several embodiments of the invention and is to be construed as illustrative rather than restrictive in nature and that the invention is best described by the following claims.

We claim:

1. A lamp socket comprising a tubular shell having a body portion open at one end, said open end having shoulder means attached thereto and extending inwardly, an insulating element having side walls, a flange portion extends from one of said side walls proximate said upper surface and a flange extends from the opposite side wall proximate said upper surface, the planes of said flange and

flange portion being in right angle relationship to the axis of the insulating element, said insulating element including a guide portion extending from one of said side walls in abutting relation with said flange and having an axial bore formed therethrough, said axial bore adapted to engage a pin member, and said insulating element having an upper surface, a lower surface and at least two longitudinal apertures extending from said upper surface through said insulating element, a slot formed through said upper surface on opposed sides of each of said apertures and each of said slots extending as channels along the inner wall of its respective aperture, each of said channels having a lower shoulder proximate said lower surface and having an upper shoulder on the opposite side of said channel, more remote from said lower surface and said lower shoulder and said flange portion and said flange abutting said shoulder means when said insulating element is engaged with said shell and terminal means extending from said insulating means said terminal means comprises at least a pair of blade terminals, each of said blade terminals having a flat blade portion and a U-shaped spring portion extending from said blade portion, said spring portion of narrower width than said blade portion and having a resilient free terminal end, each of said blade terminals having its blade portion substantially rectangular in configuration and having a pair of side edges in parallel relationship with each other, each of said edges including a tang directed away from the plane of the blade portion and an arcuate extension directed away from the plane of the blade portion opposite from that of the said tang and each of said tangs having a terminal end adapted to engage said lower shoulder formed in said insulating element.

2. A lamp socket comprising a tubular shell having a body portion open at one end, said open end having shoulder means attached thereto and extending inwardly, an insulating element having side walls, a flange portion extends from one of said side walls proximate said upper surface and a flange extends from the opposite side wall proximate said upper surface, the planes of said flange and flange portion being in right angle relationship to the axis of the insulating element, said insulating element having an upper surface, a lower surface and at least two longitudinal apertures extending from said upper surface through said insulating element, a slot formed through said upper surface on opposed sides of each of said apertures and each of said slots extending as channels along the inner wall of its respective aperture, each of said channels having a lower shoulder proximate said lower surface and having an upper shoulder on the opposite side of said channel, more remote from said lower surface and said lower shoulder and said flange portion and said flange abutting said shoulder means when said insulating element is engaged with said shell and terminal means extending from said insulating means said terminal means comprises at least a pair of blade terminals, each of said blade terminals having a flat blade portion and a U-shaped spring portion extending from said blade portion, said spring portion of narrower width than said blade portion and having a resilient free terminal end, each of said blade terminals having its blade portion substantially rectangular in configuration and having a pair of side edges in parallel relationship with each other, each of said edges including a tang directed away fram the plane of the blade portion and an arcuate extension directed away from the plane of the blade portion opposite from that of the said tang and each of said tangs having a terminal end adapted to engage said lower shoulder formed in said insulating element.

3. A lamp socket comprising a tubular shell having a body portion open at one end, said open end having shoulder means attached thereto and extending inwardly, an insulating element having side walls, a flange portion extends from one of said side walls proximate said upper surface and a flange extends from the opposite side wall proximate said upper surface, the planes of said flange and flange portion being in right angle relationship to the axis of the insulating element, said insulating element having an upper surface, a lower surface and at least two longitudinal apertures extending from said upper surface through said insulating element, a slot formed through said upper surface on opposed sides of each of said apertures and each of said slots extending as channels along the inner wall of its respective aperture, each of said channels having an upper shoulder, said flange abutting said shoulder means when said insulating element is engaged with said shell and terminal means extending from said insulating means said terminal means comprises at least a pair of blade terminals, each of said blade terminals having a flat blade portion and a U-shaped spring portion extending from said blade portion, said spring portion of narrower width than said blade portion and having a resilient free terminal end, each of said blade terminals having its blade portion substantially rectangular in configuration and having a pair of side edges in parallel relationship with each other, each of said edges including a tang directed away from the plane of the blade portion and an arcuate extension directed away from the plane of the blade portion opposite from that of the said tang and each of said tangs having a terminal end adapted to engage a portion of said channel.

References Cited

UNITED STATES PATENTS

2,912,669	11/1969	Fitz Gerald	339—188
2,997,681	8/1961	Klassen	339—184 X
3,098,687	7/1963	Fitz Gerald	339—217 X
3,139,316	6/1964	Meyer et al.	339—217 X

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U.S. Cl. X.R.

339—188, 217, 258