May 26, 1942. J. P. JORGENSEN 2,283,934

LAMP SOCKET

Filed April 28, 1939

Fig. 1

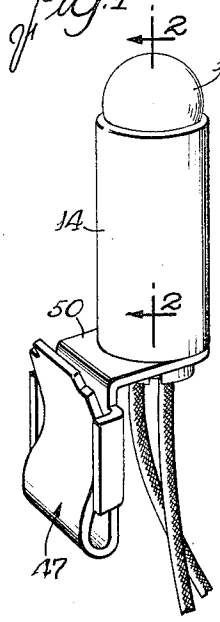


Fig. 2

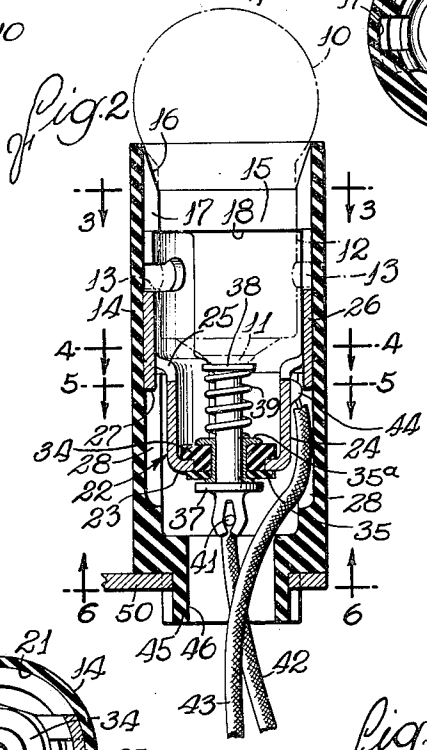


Fig. 3

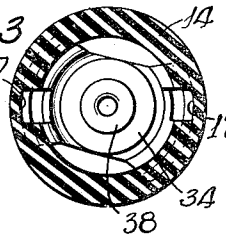


Fig. 9

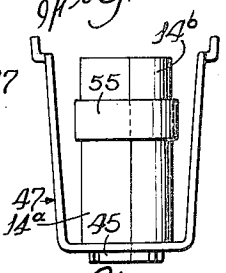


Fig. 10

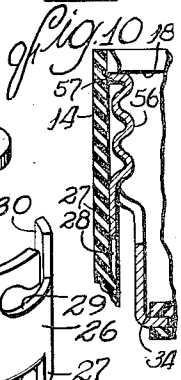


Fig. 4

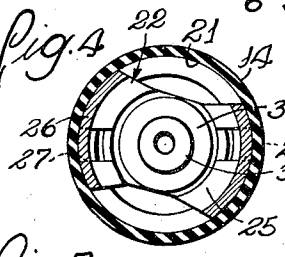


Fig. 5

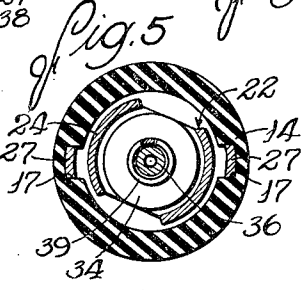


Fig. 6

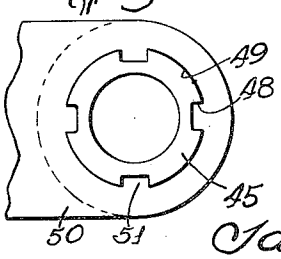


Fig. 7

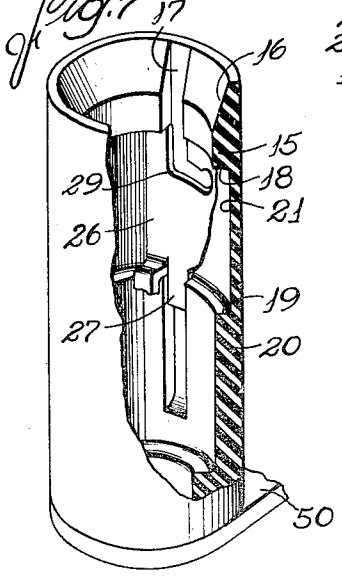


Fig. 8

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LAMP SOCKET

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14 Claims. (Cl. 173—328)

This invention relates to sockets for small electric light bulbs such as are commonly used on instrument panels and the like.

The general object is to provide such a new and improved lamp socket of the above character which is simple in construction and extremely inexpensive to manufacture, and which effectually encloses all of its metal parts as well as those of the light bulb.

A more detailed object is to provide a novel electric light socket in which a split metallic member providing side and end contacts is expanded automatically within an insulating casing and, as an incident to insertion and such expansion, becomes locked against both axial and angular movement.

The invention also resides in the novel construction which adapts the socket to bulbs with bayonet type bases and which permits of assembly of the parts by automatic expansion of the contact member.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a perspective view of a lamp socket embodying the novel features of the present invention.

Fig. 2 is a longitudinal section, approximately three times actual size, taken along the line 2—2 of Fig. 1.

Figs. 3, 4, 5, and 6 are cross-sectional views taken respectively along the lines 3—3, 4—4, 5—5, and 6—6 of Fig. 2.

Fig. 7 is a broken perspective view of the lamp socket casing.

Fig. 8 is an exploded perspective view of the different parts.

Fig. 9 is an elevational view of a modified socket.

Fig. 10 is a fragmentary longitudinal sectional view of another modification.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawing and will herein describe in detail the preferred embodiment. It is to be understood, however, that I do not intend to limit the invention by such disclosure but aim to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

In Figs. 1 to 8, the invention is illustrated as a socket for a small electric light bulb 10 of the type having an end terminal 11 insulated from a metal shell or base 12 constituting the other terminal and having bayonet joint projections 13. The invention is, of course, applicable to lamps having screw bases, such adaptation being shown in Fig. 10.

The improved socket includes a tube or casing 14 of insulating material and preferably of generally cylindrical shape. At one end, the tube has an internal flange 15 of a diameter only slightly larger than the lamp base 12 and tapering as indicated at 16 toward the tube end to facilitate entry of the lamp base. Slots 17 on diametrically opposite sides of the flange extend throughout the length of the latter and are adapted to receive the projections 13 when used in connection with a bulb of the bayonet type.

The inner end 18 of the flange 15 and the upper end surface 19 of a similarly sized flange 20 coact to define an annular groove 21 in which is seated a contact carrying member 22 which is split longitudinally so as to be radially expansible and contractible. Herein, this member comprises a sheet of resilient sheet metal such as steel bent into generally U-shape and having a substantially flat closed end 23 and two contact arms upstanding therefrom and preferably curved to conform to the external shape of the bulb base with which the socket is to be used. These arms coact to form the socket proper and are of stepped construction, each having portions 24 smaller than the internal diameters of the flanges 15 and 20 so as to pass freely therethrough. Intermediate their ends, the arms are bent outwardly to provide offsets 25 which space the free ends 26 of the arms apart a distance somewhat greater than the internal diameter of the flange 15. The ends 26 are shorter than the axial length of the groove 21 so that when the member 22, while radially contracted at its open end, is inserted closed end first through the flange 15 and moved past the latter, the ends 26 will spring apart into the groove 21 and become confined therein against substantial endwise movement by abutment of the offsets 25 with the shoulders 19 and the free ends with the shoulder 18.

To prevent turning of the socket member when thus seated, lugs 27 struck out of the offsets 25 on diametrically opposite sides of the socket constitute extensions of the ends 26 and project downwardly into notches 28. The latter are formed in the flange 20 in longitudinal alinement with the slots 17 so that the lugs 27 will enter properly as an incident to insertion

of the socket member into the tube with the lugs in proper alinement with the slots 17.

Slots 30 are formed in the upper free ends of the contact ends 26 parallel to the axis of the member 22 and in longitudinal alinement with the lugs 27. At their lower ends, the slots communicate with slots 29 which extend circumferentially in opposite directions. The slots 29 and 30 cooperate with the projections 13 on the bulb to provide a bayonet joint.

A hole 33 punched in the closed end 23 of the socket member receives an insulating shouldered washer 34 which is fastened to a washer 35 on the other side of the end 23 by an eyelet 35a the ends of which are expanded after insertion. Projecting slidably through the eyelet and insulated from the member 22 by the washers is a contact pin 36 of relatively soft metal having a flange 37 which abuts against the under side of the washer. After entry of the pin, its hollowed upper end is forged or splayed to form a flange 38 which is adapted to abut against the end terminal 11 of the bulb. A spring 39 coiled about the pin 36 between the washer 34 and the flange 38 acts in compression to urge the pin upwardly and hold it yieldingly against the bulb contact. The lower end 40 of the pin is bifurcated to receive the bared end 41 of a covered conductor 42 which is soldered to the pin. The other conductor 43 is attached as by solder 44 to the outer side of one socket portion 24. If desired, the point of attachment may be immediately beneath one of the lugs 27 so that the solder and the conductor will be disposed in one of the notches 28 in the assembled socket. Being attached to the smaller diameter of the socket member, the conductor 43 and the shoulder 44 will pass through the flange 15 in the assembling operation.

The lower end 45 of the tube extends substantially beyond the contact pin 36 so that all of the metal parts are fully concealed. This end has an opening 46 through which the conductors extend and which is of smaller internal diameter than the tube proper.

To provide a simple means of attaching the tube 14 to a mounting bracket 47, the tube end 45 is made of reduced diameter and molded with longitudinal spline grooves 48. The end is received snugly in a hole 49 in a flange 50 on the bracket 47. Spaced around the hole are inwardly projecting lugs 51 which are slightly wider than the spline grooves 48. By pressing the tube into the hole 49, the teeth 51 are forced through the grooves 48 and become locked therein with a tight friction fit as the flange 50 comes into abutment with the enlarged part of the tube.

The tube 14, while constructed to perform numerous functions in conjunction with the socket member and the mounting bracket, is relatively simple to manufacture. Except for the groove 21, it can be molded easily from resinous insulating material and formed as a unitary piece. The groove is cut in the tube by a simple internal turning operation. Or, by splitting the tube 14 longitudinally, the groove 21 may be formed in a molding operation. In such a case, two parts 14a and 14b would be formed as shown in Fig. 9 and held together as by a contractible metal ring 55, the end 45 of the split tube being splined into the mounting bracket 47 as previously described.

In the assembly, the pin 36 is first mounted on the socket member 22 and the conductors 42 and 43 are attached. Then, after threading the conductors through the tube, the member 22 is inserted through the larger end of the tube with the lugs 27 properly alined with the slots 17 and the arms 26 contracted together so as to pass through the flange 15. As the upper ends of the arms 26 pass the shoulder 18, the arms expand automatically into the groove and the member 22 becomes locked effectually between the shoulders 18 and 19. At the same time, the lugs 27 enter the notches 28, thereby fastening the member 22 against turning within the tube.

To fit a light bulb into the socket, the base 12 is inserted in the tube and turned until the projections 23 register with and drop into the slots 17, such entry being facilitated by the taper 16. The bulb is next pushed inwardly past the flange 15 and past the position at which the end terminal 11 engages the end 38 of the contact pin 36. In this movement, the projections 13 enter and follow down along the slots 30 which are held by the lugs 27 in accurate alinement with the slots 17. After the projections encounter the lower defining edge of the slots 29, the bulb is turned in the proper direction to move the projections along their slots to the closed ends thereof. In this final position, the spring 39 serves to maintain proper contact between the projections 13 and the member 22 as well as between the pin 36 and the end terminal 11. To remove the bulb, it is only necessary to turn it in the reverse direction until the outer defining side of the slots 30 are encountered by the projections 13 which will then be alined accurately with the slots 17 to permit withdrawal of the bulb.

To adapt the socket member 22 for use with electric bulbs of the screw base type, threads 56 (Fig. 10) are rolled in the ends 26 of the contact arms. In such a case, flanges 57 are formed at the upper ends of the arms to engage the bottom of the groove 21 and space the threads for proper engagement with the threads on a bulb base inserted through the tube flange 15. Also, the lugs 27 would be disposed to similarly space the lower part of the contacts 26 away from the bottom of the groove 21.

I claim as my invention:

1. A socket for an electric light bulb having a cylindrical base and bayonet projections thereon comprising, in combination, a tube of insulation having an internal flange at one end for receiving and enclosing said bulb base, longitudinal slots in said flange receiving said projections when said base is inserted into said end, a second internal flange within said tube spaced from said first flange and cooperating therewith to form a peripheral groove, notches in said second flange longitudinally alined with said slots, a U-shaped contact member of resilient metal within said tube having its closed end projecting beyond said groove and its open end of larger diameter expanded into the groove whereby the member is confined axially by said flanges, lugs on said enlarged end projecting into said notches to hold the member against turning relative to said tube, said enlarged end having bayonet slots communicating with said slots and adapted to receive said projections, an insulating washer mounted in an aperture in the closed end of said member, a contact pin extending through and slidable axially in said washer, and a compression spring coiled around said pin within said member and urging the pin against the end contact of said bulb when the latter is seated in said bayonet slots.

2. A socket for an electric light bulb having

a cylindrical base and bayonet projections thereon comprising, in combination, an open ended tube of insulation having an internal peripheral groove, longitudinal slots in said tube extending to the groove from one end of said tube, a notch in said tube at the other end of the groove and longitudinally alined with one of said slots, a U-shaped metal socket member having an enlarged open end expanded into said groove whereby the member is confined axially, said enlarged end having bayonet slots communicating with said slots and adapted to receive said projections, a lug on said enlarged end projecting into said notch to hold the member against turning relative to said tube with said bayonet slots in register with said first mentioned slots, and an insulated contact mounted at the closed end of said member for engagement with the end contact of said bulb when the latter is seated in said bayonet slots.

3. A socket for an electric light bulb having a bayonet contact projection on its base, said socket comprising, in combination, a tube of insulation having axially spaced internal shoulders, a longitudinally split metallic socket member of different diameters at opposite ends, the larger end being expanded between said shoulders so as to be confined axially thereby and being adapted to receive said base of said bulb inserted through one of said shoulders, a bayonet slot in said larger end adapted to interengage with said projection when the bulb is inserted in said socket, means on said tube and member interengageable automatically as an incident to insertion of the member in the tube to limit relative turning of the two, and a contact mounted on and insulated from the smaller end of said member and engaging the end contact of said bulb when said projection and slot are interengaged.

4. A socket for an electric light bulb having a base with bayonet projections thereon comprising, in combination, a tube of insulation open at one end and providing two internal shoulders facing each other in opposed relation, a U-shaped contact member having two relatively movable contact fingers and adapted when contracted at its open end to be insertable in one end of said tube, said member having an enlarged open end adapted to be expanded into said groove whereby the member is confined axially by said shoulders, interengaging elements on said tube and member holding the member against turning relative to said tube, said enlarged end having bayonet slots adapted to receive said projections, and a contact mounted on and insulated from the closed end of said member to engage the end contact of said bulb when the latter is seated in said bayonet slots.

5. A socket for an electric light bulb comprising, in combination, a tube of insulation having an internal flange at one end for receiving and enclosing the base of said bulb, a second internal flange within said tube spaced from said first flange and cooperating therewith to form a peripheral groove, a notch in said second flange, a resilient U-shaped contact member disposed within said tube and having an enlarged open end expanded into said groove whereby the member is confined axially by said flanges, a lug on said enlarged end projecting into said notch to hold the member against turning relative to said tube, said enlarged end when thus seated providing a socket for the base of said bulb, an insulating washer mounted in an aperture in the closed end of said member, a contact pin extending through and slidable axially in said washer, and a compression spring coiled around said pin within said member and urging the pin against the end contact of said bulb when the latter is seated in said member.

6. A socket for an electric light bulb having a base with contact terminal formations thereon, said sockets having, in combination, a rigid tube of insulation open at one end and having longitudinally spaced internal shoulders facing each other, a resiliently expansible contact member inserted through said end past said shoulders and expanded therebetween so as to be confined axially, means interengageable automatically as an incident to endwise insertion of said member in said tube and acting to hold the member against turning relative to the tube, said member providing a socket for receiving the base of said bulb and having formations thereon interengageable with said base formations to fasten the base in said socket, and an insulated contact mounted on said member and yieldably engaging the end contact of said bulb when the bulb is seated in the member.

7. In a lamp socket, a U-shaped sheet metal piece having an apertured closed end and upstanding parallel arms with their free ends offset outwardly relative to their connected ends, said free ends having bayonet slots formed therein and extending longitudinally from the upper ends of said arms and then transversely, a lug struck out from at least one of said arms and constituting an extension of one of said free ends, an insulating washer mounted in the aperture of said closed end, a contact pin extending through and slidable in said washer, and a spring coiled about said pin and acting between said closed end and the pin to urge the pin toward the open end of said piece.

8. In a lamp socket, a U-shaped sheet metal piece having upstanding parallel arms with their free ends substantially parallel and offset outwardly and laterally from their connected ends, said free ends providing a longitudinally split yieldably expansible socket for receiving the base of an electric light bulb, formations on said free ends within said socket and interengageable with said light bulb base, and a contact pin insulated from and slidably mounted on the closed end of said piece.

9. A socket for an electric light bulb having, in combination, a rigid tube of insulation having inturned shoulders at one end defining between them a slot extending longitudinally of the tube, a U-shaped contact member insertable into said tube past said shoulders and having resilient free ends adapted to expand automatically behind said shoulders after passing the latter when the member is inserted in said tube, a bayonet slot in one of said free ends opening longitudinally thereof and elements on the tube and member interengaging automatically as an incident to insertion of said member in said tube and coacting to hold said tube and member against turning with said slots in longitudinal alinement.

10. A socket for an electric light bulb having, in combination, a rigid tube of insulation having inturned shoulders at one end, a U-shaped contact member resiliently contractible at its open end so as to pass said shoulders when the member is inserted in the tube and expand automatically behind said shoulders after passing the latter, said member being fashioned for interengaging contact with a light bulb inserted in

said tube whereby to grip said bulb and hold the same removably in said member, and an insulated contact mounted on said member for engagement with the end contact of said bulb.

11. A socket for an electric light bulb comprising, in combination, a resiliently expansible contact member of U-shape having two legs spaced apart at the open end a greater distance than at the closed end, a rigid tube of insulation enclosing said member and engaging the same to hold the member against axial and turning movement, a contact insulated from and slidably mounted on the closed end of said member for yieldable engagement with the end contact of a lamp bulb base inserted in said open end, and a conductor lying alongside one of said legs adjacent said closed end and electrically connected to the member.

12. In a lamp socket, a U-shaped metal piece having a closed end and upstanding parallel arms with their free ends offset outwardly relative to their connected ends, formations on said free ends adapted for interengagement with the base of a lamp bulb, a lug rigid with said piece and disposed alongside the connected ends of the piece, an insulated contact supported on said closed end for engagement with the end of a lamp bulb supported by said piece, and a tube of insulation surrounding said piece and having means interengageable with said lug to hold the piece and tube against turning relative to each other.

13. A socket for an electric light bulb having, in combination, a rigid tube of insulation having inturned shoulders at one end, a U-shaped contact member resiliently contractible at its open end so as to pass said shoulders when the member is inserted in the tube and expand automatically behind said shoulders after passing the latter, said member being fashioned for interengaging contact with a light bulb inserted in said tube whereby to grip said bulb and hold the same removably in said member, an insulated contact mounted on said member for engagement with the end contact of said bulb, and means rendered active in the insertion of said member in said tube to interconnect the tube and member and hold the two against relative turning.

14. A socket for an electric light bulb having, in combination, a rigid tube of insulation having an inturned shoulder near one end, a generally U-shaped resiliently expansible contact member inserted closed end first through said tube end past said shoulder and expanded behind the latter with the extreme end of at least one leg of the member abutting against the shoulder whereby the member is locked positively against withdrawal from the tube, formations on the free ends of said member interengageable with the base of said light bulb to grip said base and hold the same removably in the member, and an insulated contact mounted on said member for engagement with the end contact of said bulb.

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