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ELECTRIC LAMP AND SOCKET

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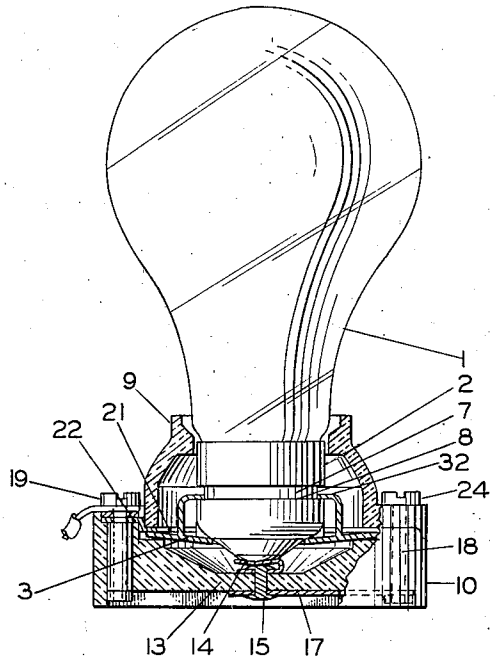


FIG. 1

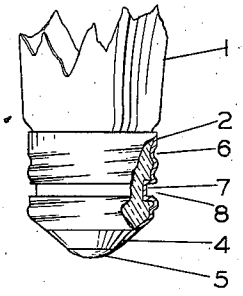


FIG. 2

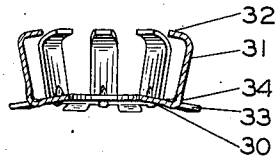


FIG. 3

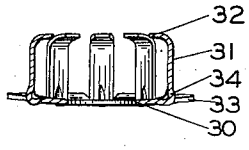


FIG. 4

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ELECTRIC LAMP AND SOCKET

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6 Claims. (Cl. 176—32)

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This application is a continuation-in-part of applications Serial No. 760,761 and Serial No. 755,034.

My invention relates to electric lamps and sockets or plugs and sockets. At the present time lamp bulbs are commonly retained in sockets by means of a screw thread. This construction has a number of inconveniences and disadvantages.

For instance, it is frequently necessary to replace a burnt out bulb while still hot in which case the procedure is complicated by the necessity of turning the bulb through several revolutions. If an implement is used as in high ceiling replacement, the bulb must be gripped so securely that it may be turned and this leads to complications in the construction of the removal implement.

Another difficulty incident to the type of lamp and socket now in use is the objectionable nicety with which the bulb must be alined with the socket in order that the threads will engage properly. This objection is particularly important where the socket is located overhead or in some such location such that the person making the replacement has his faculties disturbed.

Another disadvantage to the present type of bulb and socket resides in the expenditure in time required to remove and replace a bulb. This aspect is particularly serious in large buildings wherein a very large number of bulbs require replacement at frequent intervals.

Another difficulty inherent in the screw-type lamp and socket results from poor contact between the elements of the lamp and socket due either to improper tightening of the lamp when installed or subsequent loosening due to vibration. In either case a poor contact results in severe heating of the contacting elements and the adjacent structure upon which the socket is mounted, thus creating objectionable fusing of the lamp and socket elements and a fire hazard with respect to the adjacent structure.

Another disadvantage inherent in the screw type lamp plug and socket resides in the fact that if the lamp is tightened too energetically either the plug is twisted with respect to the lamp bulb thereby creating a short circuit or certain of the socket parts are twisted with a resultant short circuit. In either case a serious inconvenience is occasioned as well as a fire hazard.

Another disadvantage arising from the lamp and socket of the previous art is that frequently

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the lamp and socket contacting members do not make good contact with the result that arcing occurs thereby creating considerable interference in radio receivers.

The objects of my invention are to eliminate the troubles and disadvantages above discussed. However, I have found that the usefulness of an improved type of lamp base and socket is hindered unless the type of lamp base required is so designed that it may be used in the usual manner with the socket of the prior art.

It is therefore an object to provide electric lamps and sockets which can be engaged and disengaged by simply urging the lamp toward and away from the socket.

It is another object of my invention to provide a lamp base and socket which are self aligning for engagement.

It is still another object of my invention to provide a simple lamp plug and socket which will insure good contact between lamp and socket elements.

Another object of this invention is to provide a lamp and socket which may be interengaged without any twisting or danger of dislocation in either the base of the lamp or parts of the socket.

It is still another object of this invention to provide a lamp bulb having a base which will engage with my improved socket or the sockets of the prior art.

It is another object to provide a lamp base and socket which are simple and rugged in design and economical to manufacture.

Further features and advantages of my invention will appear from the following description of species thereof and from the drawings.

In the drawings:

Fig. 1 is a vertical view of my improved lamp and socket showing parts in section;

Fig. 2 is a vertical view of a lamp bulb provided with an improved base for engagement with either the socket of this invention or the screw-in socket common to the prior art;

Fig. 3 is a cross sectional view of a snap element component of the socket in open condition; and

Fig. 4 is a cross sectional view of the snap element of Fig. 3 but in closed condition.

Referring to Fig. 1, the lamp 1 comprises a glass bulb containing the usual filament which has its ends secured to the ferrule 2 and the tip 5 of the base. The ferrule of the base is provided with a slot 7 having a lower shoulder 8 for purposes which will presently become apparent.

The lamp is engaged with the socket referred to generally by the numeral 10 so that the ferrule and tip portion are telescoped within the hollow space provided within the socket.

To the end that the bulb will be firmly retained in the socket and that proper electrical connection will be insured, I provide a resilient snap element 3 for this purpose. This snap action element is generally of the type defined in copending application Serial No. 760,761. It comprises a dished base 30 having an inner annular ring portion and an outer portion comprising a series of spokes 33 which are integral with and substantially co-extensive with the respective annular ring portion.

The base portion, accordingly has an inner periphery defined by the inner edge of the annular ring portion, and an outer periphery defined by the ends of the spokes.

Intermediate the inner and outer periphery and between the spokes I provide struck up fingers 31. These fingers extend at a considerable angle, preferably in the neighborhood of ninety degrees to the respective portion of the base from which struck. On the free end of each finger, is provided an inturned prong which is substantially parallel to the plane of the portion of the base to which the respective finger is attached.

In order to impart rigidity between each finger and the respective portion of the base from which struck, I provide a continuous upset or rib 34 in the adjacent portions of the finger and base.

The snap action element has two conditions of stability which are alternate conditions of convexity. It follows that in the upward convex condition the fingers 31 diverge, thereby increasing the space defined by the prongs 32. In the downward convex condition, the fingers 31 converge, thereby decreasing the space defined by prongs 32.

Further, if the snap element is supported by the outer periphery of the base, it becomes apparent that in changing from the upper convex condition to the lower convex condition that the inner peripheral portion and therefore the finger portions move axially downward. This characteristic is particularly advantageous in the instant application.

The socket shell comprises a base portion 13 and a bulb guide section referred to generally by the number 9. At a section between the base portion and guide portion I provide an internal annular groove. In this groove I loosely seat the outer periphery of the snap element with the finger portions directed toward the opening defined by the socket guide portion 9.

In the base portion of the socket I provide the springy contact member 14 which is connected to terminal 24 via rivet 15 and strap 17.

In the same groove and above the snap element I provide an annular conducting ring 21 for the purpose of connecting the snap element to terminal 19. At this point it is apparent that I have provided a socket in which a snap element gripping means forms one terminal means, and a springy contact member forms the other terminal means for connecting a source of electrical energy to a lamp base or plug.

It is also apparent at this point, that with the snap element in upward convex condition that an annular space is defined by the open prong portions, and if an object is inserted into the socket and urged against the snap element base portion, the snap element base will snap downward and the prongs snap inward as shown in Fig. 4. To return the snap element to open condition, an upward or outword force applied to the inturned prongs causes the prongs to snap outward and the snap element takes on the condition of Figure 3.

I provide a lamp base or plug for use with my improved socket.

A simple embodiment is illustrated in Figure 1. The lamp has a reduced end portion and a pair of filament leads in the usual manner.

To the reduced end of the bulb I mount a conducting ferrule member 2. The ferrule has a conical end portion in which is affixed an insulating wafer 4 and in the center of which is provided a conducting tip portion. The lamp base so far described is old in the art and is supplied as a unit, the outward configuration of which is a cylindrical portion having an opening at one end, and a substantially conical portion at the other end.

Intermediate the axial length of the cylindrical portion, I provide a groove 7. The axial distance between that part of the conical end which has the same diameter as the open center of the snap element base, and the bottom of the groove is equal to or preferably slightly less than the length of the snap element finger elements.

It follows that the engagement of the lamp base in the socket, necessitates only a direct force. The conical end of the lamp base automatically centers the lamp base, and under the influence of pressure, the snap element is caused to snap downward, thereby causing prongs 32 to snap inwardly to grasp or grip in the groove of the lamp base. This last action is accompanied with a downward axial motion which causes the lamp base tip 4 to establish positive electrical contact with socket contact member 14. The same force causes the outer periphery of the snap element to exert pressure against conductor ring 21 to establish positive electrical contact therewith.

In order to disengage the lamp and socket assembly it is merely necessary to exert a pulling force on the bulb in a direction away from the socket. Engagement of the finger member with the lower shoulder 8 of the lamp plug causes the snap element to snap into upward convex condition thereby causing the inturned fingers 32 to spring apart and release the lamp.

In order that the lamp plug which is adapted to cooperate with my improved socket shall have its usefulness increased to include its use in the sockets of the prior art, I provide the preferred embodiment of Fig. 2. In this embodiment, the lamp 1 is provided with the metal ferrule 2. This ferrule is provided with the customary screw threads as well as the annular groove 7 already described with reference to the lamp plug of Figure 1.

It follows that the fabrication of lamps in accordance with my improved design does not detract in any way from their usefulness in the sockets of the prior art.

Although the invention has been described with reference to the above described specific embodiments, other modifications are possible. Therefore the invention is restricted only by the appended claims as interpreted in view of the prior art.

What is claimed is:

1. In combination, an electric lamp and a socket, said electric lamp comprising a glass envelop having a neck portion and a base member secured to said neck portion, said base comprising a symmetrical metal ferrule, an insulator, and a conducting tip element, said conducting tip

element being axially spaced from said ferrule along the median line thereof, said ferrule having an annular groove spaced from said tip element, said socket including a plurality of gripping means affixed to a convex snap element, said snap element being in the form of an open geometrical figure to thereby admit the tip element and part of the insulator element of said lamp base and said gripping means adapted to spring inwardly when said snap element is depressed to thereby engage the base annular groove.

2. In combination, a lamp and a socket, said lamp having a base portion provided with at least a groove spaced from the free end thereof and lying in a plane substantially normal to the axis of said lamp, a snap action element having two conditions of stability and having a dished resilient base portion having an open center of dimensions less than the cross-section of the lamp base portion, means supporting the outer edge portion of the snap action element in the socket normal to the axis thereof, upturned fingers affixed to the snap action element intermediate the inner and outer edges thereof and directed toward the open end of the socket, in-turned prongs affixed to the free end of the fingers, said prongs being of a length to admit the lamp base into the socket when the snap action element is convex toward the open end of the socket, and said fingers being of a length substantially equal to the distance between said lamp base free end and the groove, whereby insertion of said lamp base into said socket engages the snap action base inner edge portion to reverse the convexity thereof to cause said fingers to spring inwardly and the prongs to engage said lamp base groove, and an electrical terminal connected to said snap element to establish electrical continuity with the lamp base portion.

3. An electric plug element comprising a cylindrical ferrule and a substantially conical end portion comprising an insulator and a conducting tip element supported at the end of said insulator, and said ferrule having formed thereon a continuous groove having at least one helical groove portion and a cylindrical groove portion, said cylindrical groove portion having a depth greater than the helical portion.

4. An electric plug comprising a substantially cylindrical metal ferrule and affixed thereto an insulating frusto-conical end portion, a metal contact element supported by the end of the frusto-conical portion, said ferrule being provided with a continuous groove having helical end portions and an intermediate cylindrical portion, said

cylindrical portion being deeper than the helical portions and being bounded at the outer edges thereof by the adjacent helical portions.

5. A plug member comprising a cylidrical ferrule member having a frusto-conical end portion, an insulator element affixed to the end of the frusto-conical end portion and a conducting tip member supported by the free end of said insulator member; the outer surface of said cylidrical member being provided with an annular groove intermediate the ends thereof, said groove being defined by side walls in which the side wall most proximate the tip member lies in a radial plane.

6. In combination, a lamp and a socket, said lamp having an envelope with a base affixed thereto, said base comprising a cylindrical conducting member, and a metal tip member spacedly affixed to said cylindrical member on the axis thereof by insulation means having a substantially conical surface, said cylindrical conducting member having an external annular groove in a plane normal to its axis; said socket having a pair of terminals and comprising a hollow body defined by bottom and side walls, a groove in said side walls lying in a plane normal to the median line of said hollow body, a flexible metallic snap action device having an outer edge portion, a central opening defined by an inner edge portion and a latching means affixed intermediate said edge portion, said outer edge portion being seated in said hollow body groove; a conducting member also seated in said groove adjacent said snap action device outer edge on the face thereof away from the socket bottom wall, said conducting member being connected to one of said terminals, a contact element supported by the bottom wall of said socket; whereby said lamp base is engaged with said socket by snugly inserting the same thereinto to automatically cause the snap action device latching means to engage the lamp base groove and urge the same downward to thereby establish positive contact between said lamp base tip member and said socket bottom wall contact element.

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