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LOCKING LAMP BULBS IN SOCKETS
Filed June 9, 1923

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This invention relates to locks for electric light bulbs and has particular reference to a construction which will prevent loosening of the standard type electric light bulb from its threaded socket due to vibration and which in addition will prevent theft of the bulb by making it impossible to remove the bulb without breaking the glass.

One of the objects of the present invention is the provision of bulb lock construction which can be readily applied to standard commercial electric light sockets and which may either be applied to such sockets in the original process of manufacture or may be quickly and easily secured to the completed socket as special attachment.

A further object of the invention is the provision of an automatic locking device which will in no wise interfere with insertion of a bulb into the socket, which will positively prevent loosening or removal of the bulb without breaking the glass and which will guard the socket against short circuiting.

In one aspect the invention comprises the combination with a standard threaded electric light bulb socket, of an attachment having a portion interlocking with the socket and an additional portion gripping the base portion of the bulb to retain the bulb in place. In this aspect the invention further contemplates a guard or shield member of non-conducting material which is retained in position by the bulb and which overlies the locking means, insulating the parts to prevent short circuiting or shock and obstructing access to the locking means.

In another aspect the invention comprises a spring member having an angularly deflected end for interlocking engagement with the lamp socket and a portion to project beyond the socket and engage the base of the lamp, the said projecting portion having an inclined or rounded end to ride over the usual head of solder where the terminal of the filament is connected to the metal base of the lamp. The invention in this form further contemplates a non-conducting shield adapted to overlie the base of the bulb and a portion at least of the spring locking member, this shield being in the form of either a ring having a spring receiving groove or a sleeve surrounding the socket and having a flared or enlarged terminal portion adapted to enclose the outer end of the spring and substantially abut the glass of the bulb.

In the accompanying drawings which show illustrative embodiments of the invention:

Fig. 1 is a side elevation of a standard lamp socket and bulb with parts broken away, the bulb being screwed almost to its seat in the socket;

Fig. 2 is a section on line 2—2 of Fig. 1;

Fig. 3 is a section on line 3—3 of Fig. 1;

Fig. 4 is a view similar to Fig. 1 showing the bulb removed from the socket;

Fig. 5 is a view similar to Fig. 1 showing a modification;

Fig. 6 is a side elevation of a standard socket showing a modified locking device applied thereto;

Fig. 7 is an end view of the locking device shown in Fig. 6; and Fig. 8 is a side view of a bulb with my guard ring in cross section.

In Figs. 1, 2 and 3 the invention is shown as applied to a standard socket comprising a typical sheet metal casing 1, an insulation sleeve 2, and a sheet metal socket member 3 corrugated to form threads adapted to receive the threaded base 4 of the standard lamp bulb 5.

The particular embodiment of my invention shown in Figs. 1 to 3 comprises a coil spring 6 shaped to thread over the corrugated socket 3 and having on its rearward end an inturned hook 7 adapted to snap into opening 8 in the socket member 3 after the spring has been threaded on the socket a predetermined distance, the opening 8 being accurately spaced from the mouth of the socket so that after the hook end 7 has snapped into the opening the coil spring will get beyond the mouth of the socket a predetermined distance.

In view of my discovery that a cause of serious difficulty with prior devices of this character consists in that the outer end of the coil spring catches on the bead of solder 9 on the base 4 of the lamp bulb 1 I incline the outer end of the coil spring so that it rides over or past this bead. The inclination may be produced by bending the end of the wire or by beveling the end. In Figs. 1 and 2, I have shown the end beveled at 10 and bent outwardly at 11 and in Fig. 1 the bead 9 is shown in engagement with the bevel 10 as the bulb 5 is being rotated.
to the right and is almost seated. In Fig. 2 the bead is shown in the position it occupies after the bulb has been screwed all the way into the socket.

The diameter of the coil spring is made somewhat less than the diameter of the base so that when the bulb is screwed into the socket the turns of the coil which project beyond the mouth of the socket hug closely to the base 4 of the socket in frictional engagement therewith. In screwing the bulb into the socket this frictional engagement tends to expand the coil thus permitting the bulb to be screwed into place without substantial resistance. However, in unscrewing the bulb the frictional engagement between the base 4 and the spring 6 tends to contract the spring and thereby increase the frictional engagement to such an extent that the base is tightly clamped by the spring to lock the bulb against removal.

Inasmuch as the lamp bulb may readily be removed by springing the end of the spring 6 away from the base 4 to break the frictional engagement between the parts, I provide a guard around the projecting end of the spring so that after the bulb has been screwed to its seat the spring is entirely enclosed. In Figs. 1 and 2 this guard is in the form of a ring 12 of insulation shaped to fit between the mouth of the shell 1 and the base end of the glass bulb. The inside of the ring 12 is provided with an annular groove 13 to receive the end of the spring when it rides over the bead as shown in Fig. 2.

Fig. 4 shows the parts in position preparatory to threading the lamp bulb into the socket. The construction shown in Fig. 4 is similar to that shown in Fig. 1, except that the ring 12 is provided with a round groove 13 instead of a square groove as shown in Fig. 1.

In the embodiment shown in Fig. 5 the guard 12' corresponding to 12 and 12' in Figs. 1 and 4 is formed integrally with the sleeve of insulation 3 which insulates the socket 3 from the shell 1. When the guard is thus formed the insulation between the socket and shell is perfectly formed in two parts 2 and 9' to facilitate the insertion of the insulation into the shell.

The embodiments shown in Figs. 6 and 7 are similar to those already described except that the rearward end 7' of the coil spring 6' is shaped to interlock with the opening 8' with which sheet metal lamp sockets are customarily provided. The end 7' folds back along the spring through 180° and then folds inwardly through 180° so that the extreme end of the spring automatically snaps into the opening 8' after the spring has been threaded on the socket to a position where the inturnd end of the spring registers with the opening 8' and when threaded somewhat farther on the socket the hooked end of the spring interlocks with one side of the opening 8' as shown in Fig. 6. Inasmuch as the opening 8' is located at the inner end of the corrugated socket 3, instead of intermediate the ends of the socket as is preferably the location of the opening 8 in the preceding embodiments, the spring 6' is preferably made somewhat longer than the spring 6 of the other embodiments.

From the foregoing it will be evident that my improved locking spring may be readily applied to standard sockets by merely threading the spring over the socket and placing the guard (12, 12' or 12'') around the base of the lamp bulb 4 before it is secured into the socket. In the embodiments shown in Figs. 1 to 5 the opening 8 is punched in the socket 3 before the spring is threaded on the socket, a suitable device for punching the opening 8 comprising a pair of punch pliers, one jaw of which has an abutment to engage the mouth of the socket so that the opening is formed at a predetermined distance from the mouth of the socket. In the embodiments shown in Figs. 6 and 7 neither the socket nor the lamp bulb need be altered in any way.

A cardinal feature of the invention consists in that the locking device automatically interlocks with the socket after it has been threaded over the socket a predetermined distance. Another important feature consists in that the outer end of the spring is so shaped as not to catch on the head of solder on the lamp base, this apparently slight improvement eliminating much trouble heretofore arising in screwing the lamp bulb into a socket provided with a locking device of this type. Another important feature consists in the guard of insulation which not only prevents the end of the spring from contacting with the outer shell of the fixture which might result in a short circuit but also prevents access to the end of the spring.

The construction of the guard washer or sleeve is such that rotation of this part does not unlock the spring and in the preferred embodiments of the invention the guard is freely rotatable.

For convenience and conciseness of explanation I have herein described my invention as applied to a particular electric fixture, viz., a lamp bulb and socket, but it is to be understood that the invention is applicable to other fixtures, as for example a plug and socket, and the claims are to be so construed.

From the foregoing it will be evident that the essential function of the fixed stop on the lamp socket is to limit the extent to which the spring may be threaded on the socket and that the stop may take any form which affords an abutment against which the
end of the spring may abut to interlock the spring and socket against further threading movement.

I claim:

1. A locking attachment for a lamp bulb socket comprising a coiled member having an angular terminal portion for interlocking engagement with the socket, said member having an inclined portion at its opposite end adapted to ride over the solder projection of a standard bulb base, and a ring for enclosing said latter end, said ring having an annular recess to accommodate said inclined portion.

2. An attachment for standard lamp socket including a spring member having a portion for interlocking engagement with the socket and a projection adapted to extend beyond the socket, and an annular shield member for cooperation with the spring having a recess receiving the terminal portion of the spring, said shield member being formed of non-conducting material to prevent flow of current from the spring, and the rearward end of said shield abutting the mouth of the socket.

3. A locking attachment for electric light bulb sockets having a casing, including a locking spring having socket engaging and bulb engaging portions, and an annular protecting ring of greater interior diameter than the exterior diameter of the spring, said ring being exposed between the bulb and casing and having an interior annular recess to receive the end of the spring.

4. A locking attachment for electric light bulb sockets including a locking spring having socket engaging and bulb engaging portions, and a recessed annular protecting ring surrounding the bulb-engaging portion of the spring, said ring being free to rotate without binding on said spring.

Signed by me at Boston, Massachusetts, this 29th day of May, 1923.

ROBERT E. NAUMBURG.