N. MARSHALL.

LAMP SOCKET.

APPLICATION FILED OCT. 19, 1908.

989,623.

Patented Apr. 18, 1911.

2 SHEETS—SHEET 1.

FIG. 1.

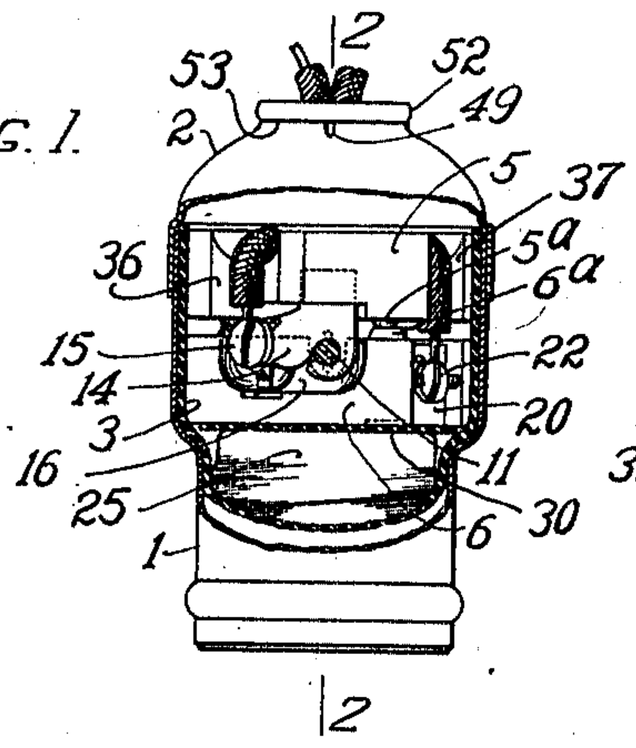


FIG. 12.

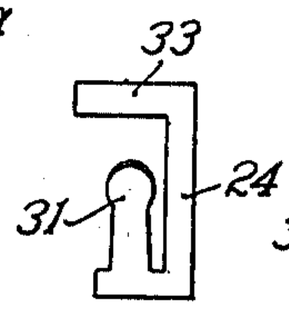


FIG. 2.

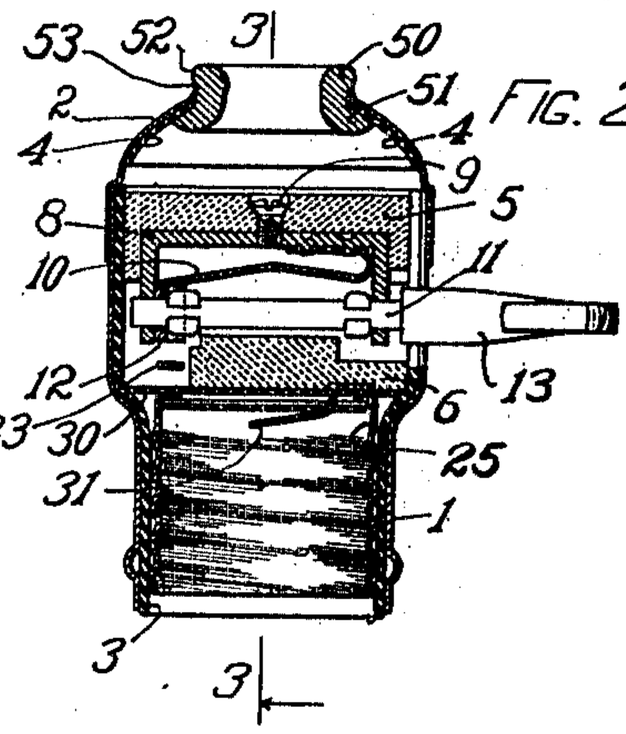


FIG. 3.

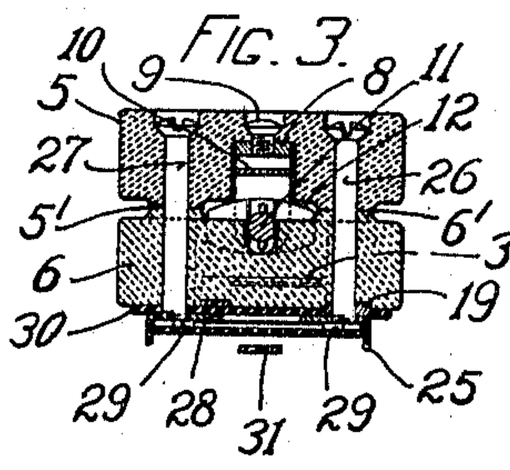


FIG. 7.

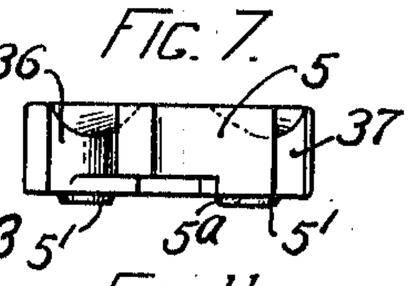


FIG. 6.

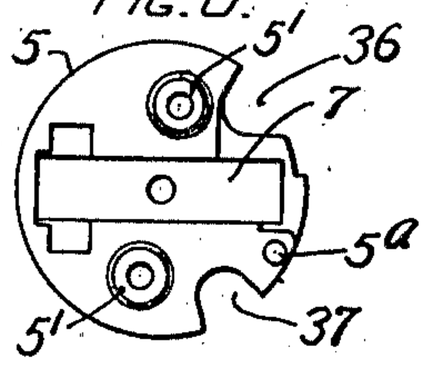


FIG. 11.

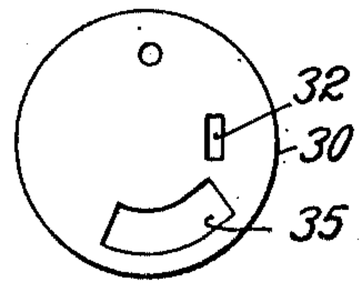


FIG. 5.

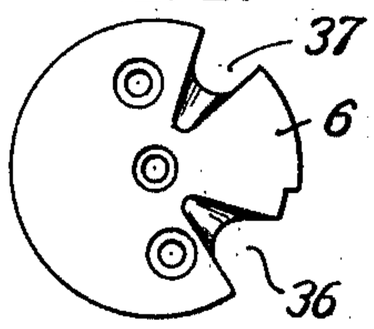


FIG. 4.

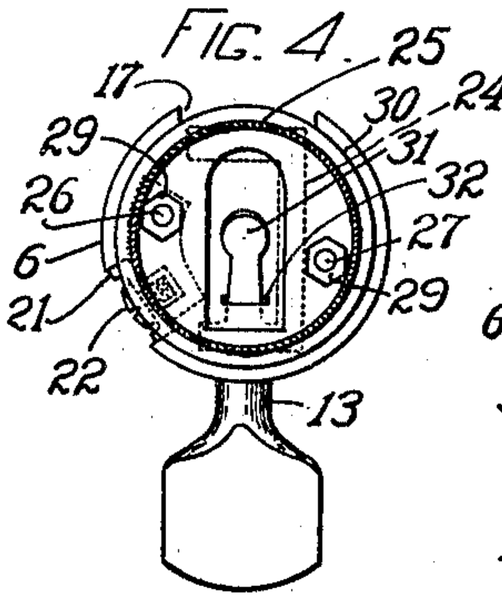
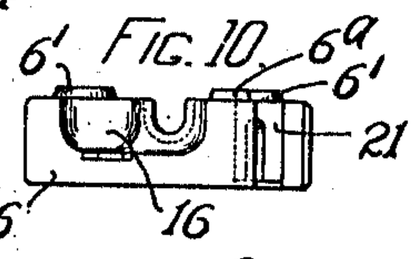
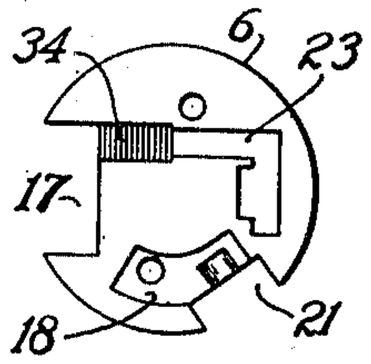


FIG. 10.





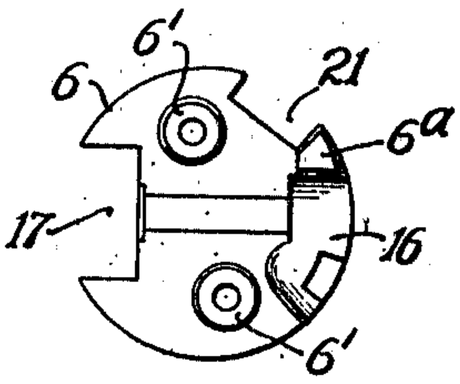


FIG. 9.

FIG. 8.

WITNESSES

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Atty

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2 SHEETS—SHEET 2.

FIG. 13.

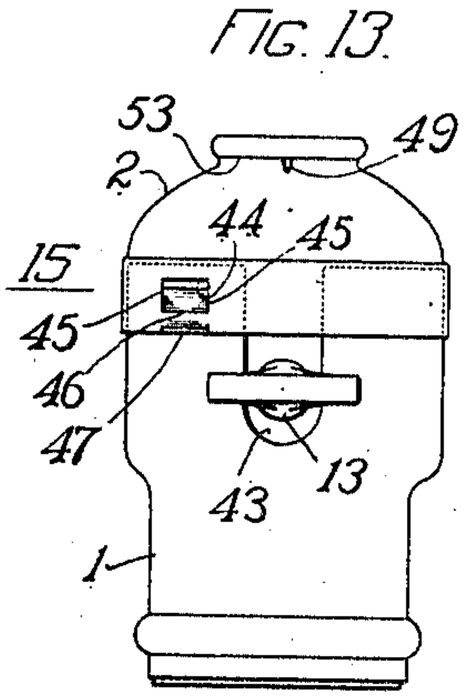


FIG. 19.

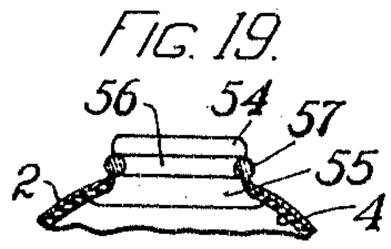


FIG. 14.

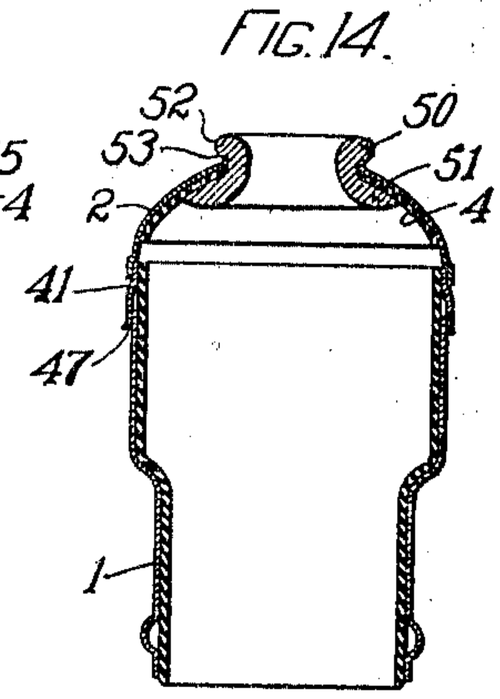


FIG. 15.

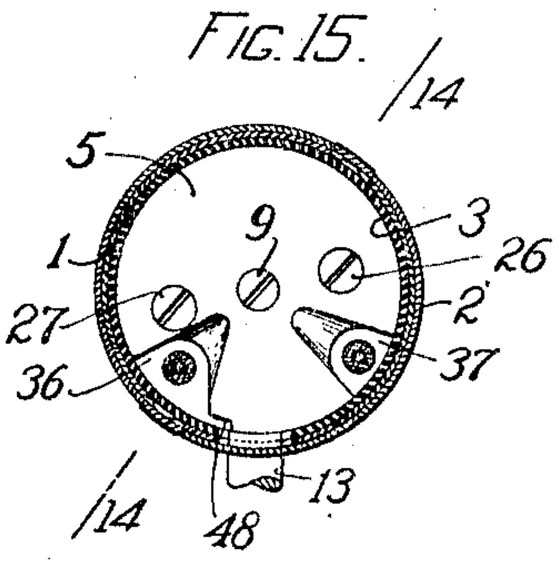


FIG. 16.

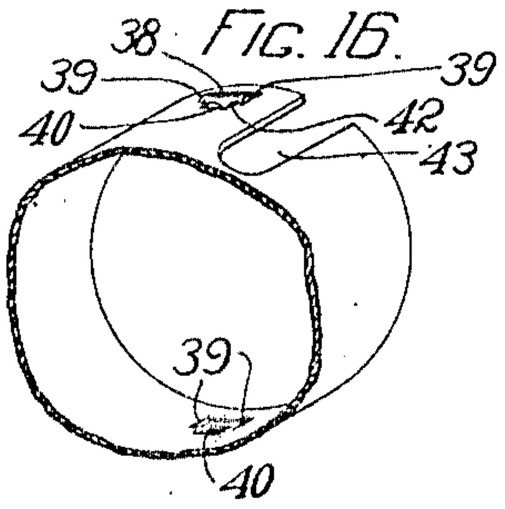


FIG. 18.

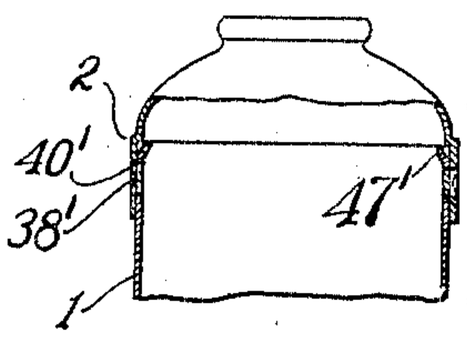


FIG. 20.

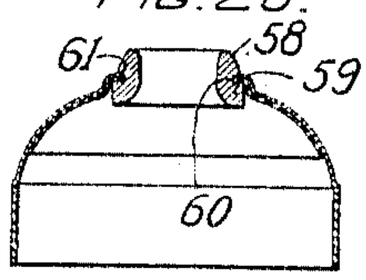
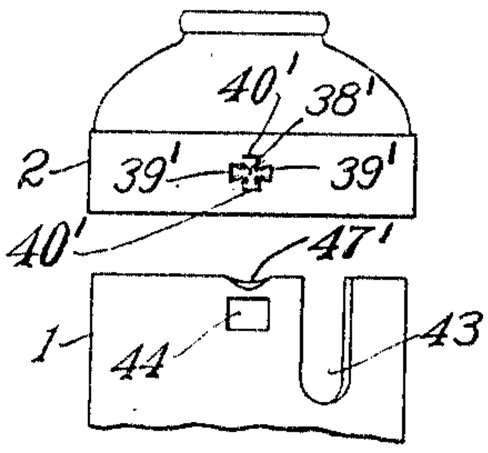


FIG. 17.



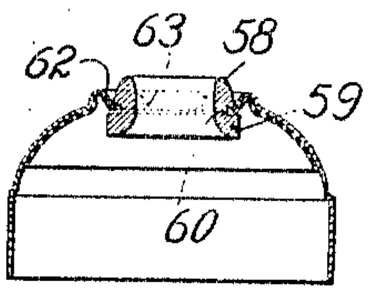


FIG. 21.

WITNESSES

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UNITED STATES PATENT OFFICE.

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LAMP-SOCKET.

989,623. Specification of Letters Patent. Patented Apr. 18, 1911.

Application filed October 19, 1908. Serial No. 458,464.

To all whom it may concern:

Be it known that I, NORMAN MARSHALL, citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Lamp-Sockets; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to incandescent lamp sockets, and more especially to that type of sockets in which the current carrying parts are mounted upon a base of porcelain or other insulating material and are inclosed within a metallic shell and cap.

The object of the invention is to provide a socket having its various parts constructed and arranged in an improved and simplified manner whereby the current carrying parts are effectively insulated, the number of the parts are reduced, and the manufacture and assembling of the parts facilitated and rendered convenient and inexpensive.

To this end the invention consists in the features of construction and combinations of parts hereinafter described and referred to in the claims, the advantages of which will be apparent to those skilled in the art.

The features of the invention will be readily understood from an inspection of the accompanying drawings, in which—

Figure 1 is an elevation of a socket embodying the invention, a part of the shell and cap and of the insulating lining being broken away; Fig. 2 is a vertical central section on line 2—2, Fig. 1; Fig. 3 is a vertical sectional view of the socket base on line 3—3, Fig. 2, a part of the screw shell being omitted; Fig. 4 is a view looking into the screw shell, the screw shell being shown in section, and the insulating disk within the shell being removed for the sake of clearness; Fig. 5 is a top view of the upper section of the socket base; Fig. 6 is a bottom view of the same; Fig. 7 is a side elevation looking toward the left in Fig. 5; Fig. 8 is a top view of the lower section of the socket base; Fig. 9 is a bottom view of the same; Fig. 10 is a side view looking toward the left in Fig. 8; Fig. 11 is a detail view of an insulating sheet to be described; Fig. 12 is a detail view of the center contact plate; Fig. 13 is an elevation of the socket showing one form of devices for connecting the shell and cap of the inclosing casing; Fig. 14 is a vertical sectional view through the shell and cap on line 14—14, Fig. 15, the socket base and parts carried thereby being removed; Fig. 15 is a sectional view on line 15—15, Fig. 13, the socket base being shown in plan; Fig. 16 is a perspective view of the upper part of the shell showing the locking projections formed thereon; Fig. 17 is an elevation of a socket cap and shell showing the locking projections formed in the cap and the locking apertures formed in the shell; Fig. 18 is a vertical sectional view through the locking device shown in Fig. 17, with the cap and shell connected together; Fig. 19 is a detail sectional view showing a modified form of cap bushing; and Figs. 20 and 21 are views showing another form of cap bushing.

As shown in Figs. 1 to 12, the base and current carrying parts of the socket are inclosed within a metallic casing consisting of the shell 1 and the cap 2, and are separated from the casing by an insulating lining 3 fitting within the shell and an insulating lining 4 fitting within the cap.

The porcelain base of the socket comprises an upper section 5 and a lower section 6 which carry and support the current carrying parts of the socket. The socket shown is a key socket, and the upper section 5 of the base is provided in its under face with a recess 7 formed to receive the key frame 8, which is of well known construction, and is secured in the recess by a screw 9. The key frame carries the usual contact spring 10 and key shaft 11, upon which is mounted the switch block 12. The end of the key frame adjacent the key 13 is provided with an offset portion 14 carrying a binding screw 15 to which one of the conductor wires is secured. The upper face of the lower section 6 of the base is recessed to accommodate the key shaft, and this section is provided on one side with a recess 16 in which the end of the key frame carrying the binding screw 15 is located. On the opposite side of the lower section 6 of the base, a recess 17 is formed, the walls of which embrace the switch block 12. The lower face of the lower section 6 is provided with a recess 18 for receiving and positioning a plate 19 which is provided with an upward offset portion 20 which lies within a recess 21

formed in the side of the section and carries a binding screw 22. The lower face of the section 6 is also provided with a recess 23 shaped to receive and hold in position a center contact plate 24.

The screw shell 25 is secured upon the lower face of the base, and the sections of the base are secured together by two screws 26 and 27 which extend through holes in the sections of the base and in the flange 28 of the shell, and engage nuts 29 located within the shell. A disk 30 of vulcanized fiber or other suitable insulating material is interposed between the flange of the shell 25 and the porcelain block 6 and separates the center contact plate 24 from the shell. The center contact plate is provided with a contact finger 31 which projects through a slit 32 in the insulating sheet 30 into position within the shell, where it forms a spring contact for engaging the center contact of the lamp base. The center contact plate is provided with a laterally offset portion 33 which lies within the recess 17 in the block 6, and is in position to be engaged by the switch block 12. This part of the plate 24 may be bent upward as indicated in Fig. 2, so as to form an effective spring contact plate for coöperating with the switch block, the recess 23 in the face of the block 6 being formed with an upwardly extending inclined portion 34 to allow the upward bending of the plate.

The center contact and switch plate is securely positioned by the recess 23, and is firmly held in the recess by the shell 25 and interposed insulating sheet or disk 30. The plate is practically inclosed in insulating material, and is thus effectually insulated from the shell 25 and the other current carrying parts. Since the plate lies between the shell and the base, the contact finger 31 may be projected through the insulating sheet and into the center of the shell, without requiring the cutting away of a portion of the wall of the shell. A disk of mica or other suitable insulating material is introduced into the shell 25, and lies between the center contact and the flange of the shell, the disk being pierced for the passage of the center contact as indicated in Fig. 2.

The plate 19 which carries the binding screw 22 is normally positioned by the recess 18 in the under face of the block 6, and is held in the recess by the shell 25 which is forced against the under surface of the plate by the screw 26 and nut 29. The insulating disk 30 is provided with an aperture 35 corresponding in shape to the shape of the plate 19, so that said plate is in engagement and makes electrical connection with the shell 25.

The upper block 5 of the base is provided with two peripheral grooves 36 and 37 arranged to register with the recesses 16 and 21 respectively in the block 6, and to form passages for the conductor wires leading to the binding screws 15 and 22. The adjacent faces of the blocks 5 and 6 are provided with bosses 5′ and 6′ surrounding the holes through which the screws 26 and 27 pass, and with lugs 5^a and 6^a which serve to accurately maintain the blocks at the proper distance apart regardless of irregularities in the opposing faces of the blocks.

The construction and arrangement of the parts described provides a strong base which is well adapted for manufacture by shaping dies, and which effectively insulates the switch plates from the binding screws to which the wires are attached. The switch block and contact plate for making and breaking the circuit through the lamp are located in the recess 17 on one side of the base while the binding screws 15 and 22 are located in the recesses 16 and 21 respectively which are on the opposite side of the base where they are remote from the switch contacts, and are also separated from the switch contacts and from each other by intervening walls of porcelain.

The shell 1 and cap 2 forming the inclosing casing of the socket are locked together against relative movement either axially or circumferentially by duplicate sets of latching devices arranged diametrically opposite to each other and adapted to be engaged by relative axial movement between the cap and shell. These latching devices each consist of a projection on one of the members of the casing provided with side and transverse locking shoulders, and an aperture or recess in the other member provided with coöperating locking shoulders.

The form of latching device which I prefer to use is shown in Figs. 13 to 17. As shown in Figs. 13 to 16, the projections are formed in the wall of the shell and the cooperating recesses or apertures are formed in the wall of the cap. As here shown, each projection 38 is formed by slitting the wall of the shell on parallel axial lines at 39 and slitting the wall transversely at 40 between the axial slits 39. The slits 39 and 40 are so formed that they do not intersect. The wall of the shell embraced within the slits is bent or forced outward to form abrupt shoulders at the slits 39 and 40, which project at right angles to the surface of the shell. The projection is formed with a sloping surface 41 extending toward the edge of the shell so that the edge of the cap will readily slide over the projection as the cap is applied to the end of the shell. The inner corners 42 of the projection which lie between the ends of the transverse and side slits remain integrally connected with the wall of the shell so that there is no danger of the offset or bent portion of the wall becoming displaced or of bending outward sufficiently

to allow the wall of the cap to pass under the inner end of the projection. One of the projections 38 is formed adjacent to the slot 43 in the shell through which the key shaft projects, so that the latching projection may be forced radially inward in disengaging the cap and shell. The cap is provided on diametrically opposite sides with two rectangular apertures 44 adapted to receive the projections 38, and provided with side shoulders 45 and with an intermediate transverse shoulder 46 for engaging and coöperating with the side and transverse shoulders of the projections 38. A positioning notch 47 is formed in the edge of the cap in line with each of the apertures 44, by slitting the wall of the cap axially in line with the axial walls 45 of the recesses, and bending the edge of the cap between the axial slits outward slightly.

Instead of forming the projections in the shell, and the apertures in the cap, the relative arrangement may be reversed by forming the apertures in the shell and the projections in the cap. Either arrangement may be employed, as may be found more convenient or desirable in manufacturing the caps and shells. In Figs. 17 and 18, a different form and reverse arrangement of the projections and apertures is shown. As shown in these views, the projections 38′ are formed in the cap, the wall of the cap being bent inward between the axial slits 39 and two transverse slits 40′. The apertures 44′ are formed in the wall of the shell. Positioning notches or depressions 47′ are formed in the edge of the shell by bending inward the edge of the shell in line with the apertures 44′. The manner of engaging and disengaging the latching devices is the same with this relative arrangement of the projections and apertures as with the relative arrangement shown in Figs. 13 to 16. When engaged, the side and transverse shoulders of the projections and apertures positively lock the parts against relative movement in either direction, both circumferentially and axially, so that relative displacement of the parts under comparatively heavy strains is effectively prevented.

In order to allow the inward movement of the wall of the shell adjacent to the key slot 43, the periphery of the base block 5 is recessed at 48 to receive the shell and insulating lining as the wall of the shell is bent inward.

In order to provide an effective insulation between the conductor cords and the socket cap in sockets which are adapted to be suspended by the conductor cords, a bushing of insulating material is secured in the opening in the top of the cap through which the conductor cords pass. In order to facilitate the manufacture and introduction of this bushing into the aperture in the top of the cap, the bushing is provided with an annular shoulder adapted to engage the wall of the cap at the edge of the aperture through which the bushing is inserted, and to retain the bushing in the aperture by said engagement.

As shown in Figs. 1, 2, 13 and 14, the aperture at the wall of the cap about the cord aperture through its top is slit as at 49, so that it may spring outward somewhat. The bushing 50, which may be formed of any suitable insulating material, is provided with a flange 51 adapted to underlie the wall of the cap, and to retain the insulating lining 4 in position in the cap. The bushing is also provided with an annular projection 52, which is of somewhat larger diameter than the aperture through the cap, and the under surface of which forms a shoulder 53 for engaging with the edge of the cap wall about the cord aperture, and thus retaining the bushing in position within the aperture and with the flange 51, clamping the insulating disk 4 against the wall of the cap. The slitting of the wall of the cap about the cord aperture enables the bushing 50 to be forced up through the aperture until the annular projection 52 passes through the aperture, when the wall of the cap about the aperture will spring inward, bringing the edge against the shoulder 53, so that the bushing is firmly retained in position.

In Fig. 19 a different form of bushing and securing means is shown. In the construction shown in Fig. 19, the insulating bushing 54 is provided with a flange 55 arranged to underlie the wall of the cap, and to retain the insulating disk 4 within the cap. The bushing is also provided with an annular groove 56 arranged to lie just outside the wall of the cap when the bushing is in proper position in the aperture. The diameter of the bushing above the groove 56 is substantially the same as the diameter of the aperture, so that the bushing may be readily passed through the aperture from the inside of the cap. A ring 57 is introduced into the groove 56 after the bushing has been inserted in the aperture, and is of such a diameter that it projects beyond the edge of the aperture and the under surface of the ring forms a shoulder for engaging the wall of the cap at the edge of the aperture and retaining the bushing in position. The ring 57 may be and preferably is a split spring ring, which may be readily applied to the groove in the bushing, or may be readily removed in case it is desired to remove the bushing for the purpose of refinishing the socket, or for any other purpose.

In Figs. 20 and 21 a different form of insulating bushing and securing means is shown. As shown in these views, the bushing 58 is provided with a flange 59 adapted to underlie the wall of the cap, and to re-

tain the insulating disk 4 in position in the cap. Above the flange 59 the bushing is grooved at 60 to receive the wall of the cap about the edge of the cord aperture, and the upper side of the groove forms a shoulder 61 for engaging the wall of the cap at the edge of the aperture, and retaining the bushing in position. This form of bushing may be introduced into the aperture by bending the wall of the cap about the aperture inward as indicated at 62, Fig. 21, and shearing through or slitting the wall of the cap about the edge of the aperture, as indicated at 63. With the wall of the cap about the aperture thus bent and grooved, the bushing may be introduced into the aperture from the inside of the cap, as indicated in Fig. 21, and then the wall of the cap about the aperture bent upward, as indicated in Fig. 20, thus bringing the edge of the aperture into the groove 60 and under the shoulder 61, so that the bushing is firmly held in the aperture in the cap.

While I prefer to embody the various features of the invention in a socket having the specific construction and arrangement of the parts shown and described, it will be understood that this specific construction and arrangement is not essential to the invention in its broader aspect, and may be varied and changed without departing from the invention.

Having explained the nature and object of the invention, and specifically described some of the forms in which it may be embodied, what I claim is:—

1. A lamp socket, having, in combination, an insulating base provided with an L-shaped positioning recess in its end, a center contact plate fitting within said recess and provided with a center contact finger 31 and a contact portion 33, a shell for receiving the lamp base secured to the end of the base and insulated from the plate, and a key-frame mounted in the base and provided with a contact block coöperating with the contact portion 33 of the plate, substantially as described.

2. A lamp socket, having in combination, an insulating base provided with a positioning recess in its end, a shell for receiving the lamp base, a plate in the recess provided with a spring portion, a center contact finger projecting from the plate into the space within the shell, and a switch block mounted in the base to coöperate with the spring portion of the plate, substantially as described.

3. A lamp socket, having, in combination, an insulating base comprising an upper block, a recess in the upper block for receiving a key frame, a key frame in the recess, a key shaft in the frame provided at one end with a switch block, a binding screw on the opposite end of the frame, a lower block covering the recess in the upper block, a peripheral recess in the lower block for the binding screw, a peripheral recess on the opposite side of the lower block for the switch block, a lamp base receiving shell secured on the end of the lower block, a peripheral recess in the lower block for a binding screw plate, a binding screw plate in said recess having a portion secured between the shell and the end of the lower block, a plate secured between the shell and lower block having a portion overlying the switch block and a center contact finger projecting within the shell, and an insulating sheet between the latter plate and the shell, substantially as described.

4. A lamp socket, having, in combination, an insulating base comprising an upper block, a recess in the upper block for receiving the key frame, a key frame in the recess, a key shaft in the frame provided at one end with a switch block, a lower block covering the recess in the upper block, a peripheral recess in the lower block for the switch block, a lamp base receiving shell secured on the lower face of the lower block, a plate secured between the shell and block and provided with a portion underlying the switch block, and an insulating sheet between the plate and shell, substantially as described.

5. A lamp socket, having, in combination, a shell and cap provided with a plurality of latching devices symmetrically arranged about the axis of the socket, and each consisting of a projection on one part having two sides and a transverse locking shoulder, and a recess in the other part having corresponding shoulders and adapted to be engaged with the projection solely by relative axial movement between the cap and shell, substantially as described.

6. A lamp socket, having, in combination, a cap and shell one of said members being provided with a recess having two sides and a transverse locking shoulder, and the other member being provided with correspondingly located side and transverse slits, and having the wall between the slits displaced to form abrupt locking shoulders whereby the cap and shell may be latched together by a relative axial movement and locked against axial or circumferential movement, substantially as described.

7. A lamp socket, having, in combination, a cap and shell one of said members being provided with a recess having two sides and a transverse locking shoulder, and the other member being provided with correspondingly located side and transverse slits, and having the wall between the slits displaced to form abrupt locking shoulders, and a positioning notch in the edge of the recessed member adapted to engage the projection on the other member, substantially as described

8. A lamp socket, having, in combination

a cap and shell, one of said members being provided with two side slits and a non-intersecting intermediate transverse slit, and having the wall between the slits displaced to form abrupt shoulders at the slits, and the other member having a recess with corresponding abrupt side and transverse shoulders, substantially as described.

9. A lamp socket, having, in combination, a shell, a cap provided with a cord aperture in its top, and an insulating bushing adapted to be projected through the aperture from within the cap and provided with a flange for underlying the wall of the cap about the aperture, and with a shoulder for engaging the edge of the aperture and retaining the bushing therein, substantially as described.

10. A lamp socket cap having a cord aperture in its top, and an insulating bushing adapted to be projected through the aperture from within the cap having a flange for underlying the wall of the cap about the aperture, and a shoulder for engaging the edge of the aperture and retaining the bushing therein, substantially as described.

11. A lamp socket, having, in combination, a cap and shell, one of said members being provided with two side slits and two non-intersecting transverse slits, and having the wall between the slits disposed to form four abrupt shoulders at the slits, and the other member having a recess forming a corresponding abrupt side and transverse shoulders, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses.

NORMAN MARSHALL.

Witnesses:

WARREN G. OGDEN,

N. D. MCPHAIL.