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[54] **LAMP-POSITIONING MOGUL SOCKET**
 12 Claims, 13 Drawing Figs.

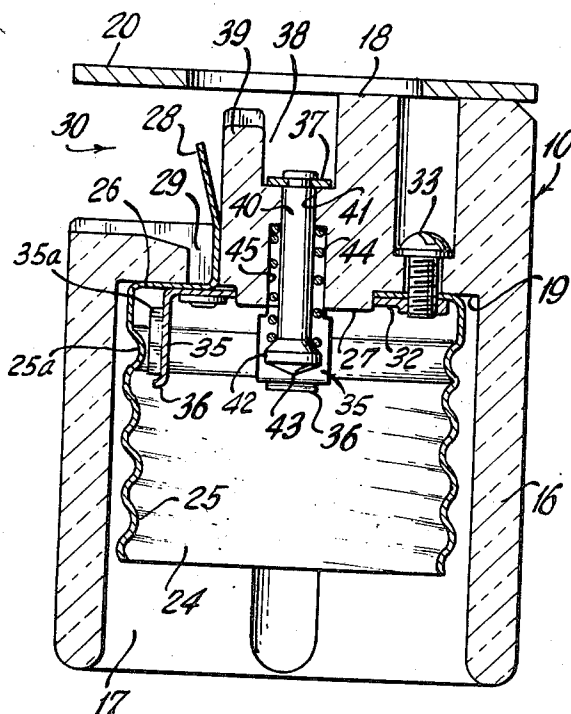
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 [50] Field of Search 339/64, 95,
 180; 240/44.2, 153

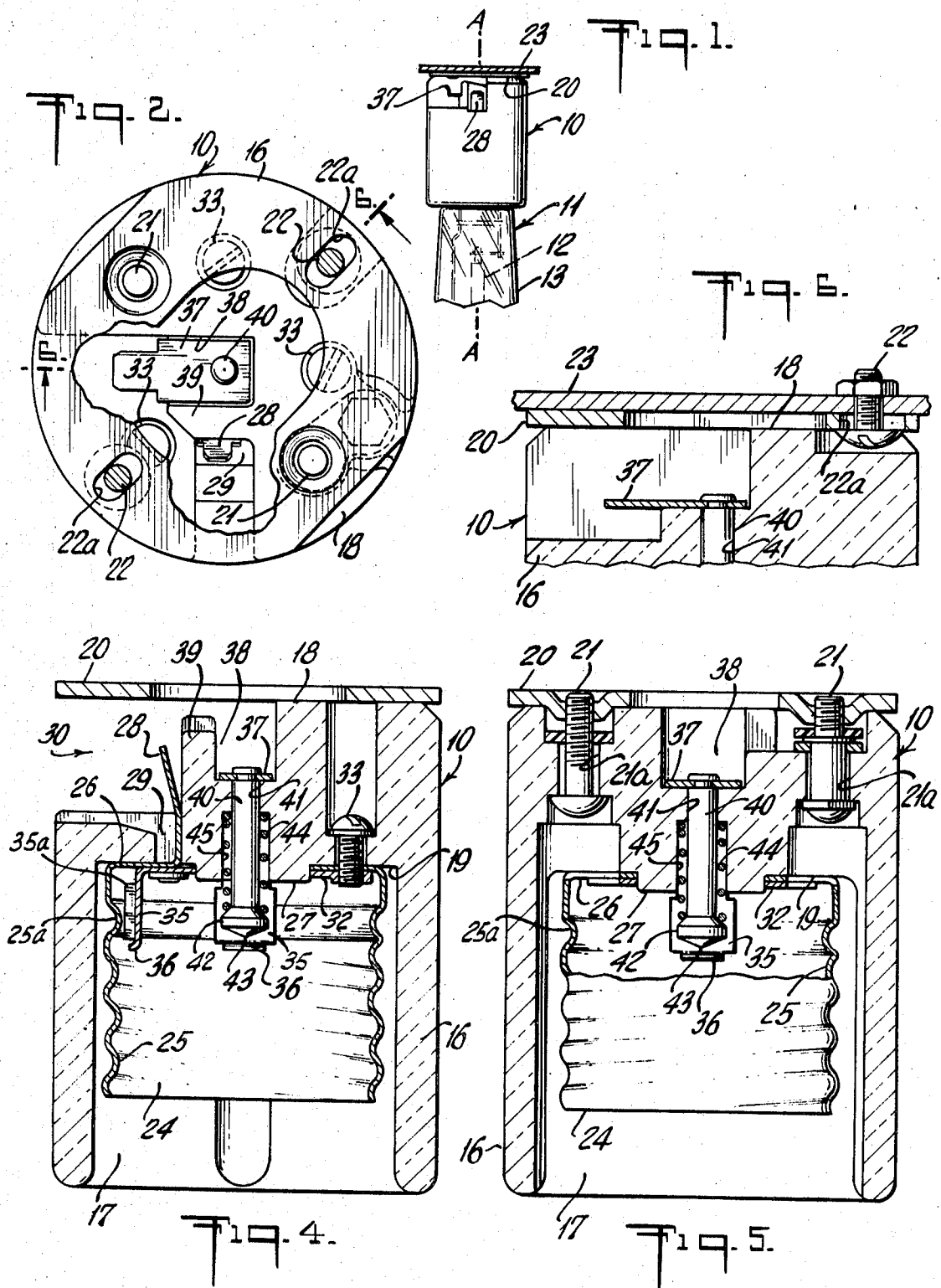
[56] **References Cited**

UNITED STATES PATENTS			
1,216,884	2/1917	Thomas	339/180
2,477,895	8/1948	Pollock	339/95
FOREIGN PATENTS			
280,279	6/1962	Netherlands	339/95

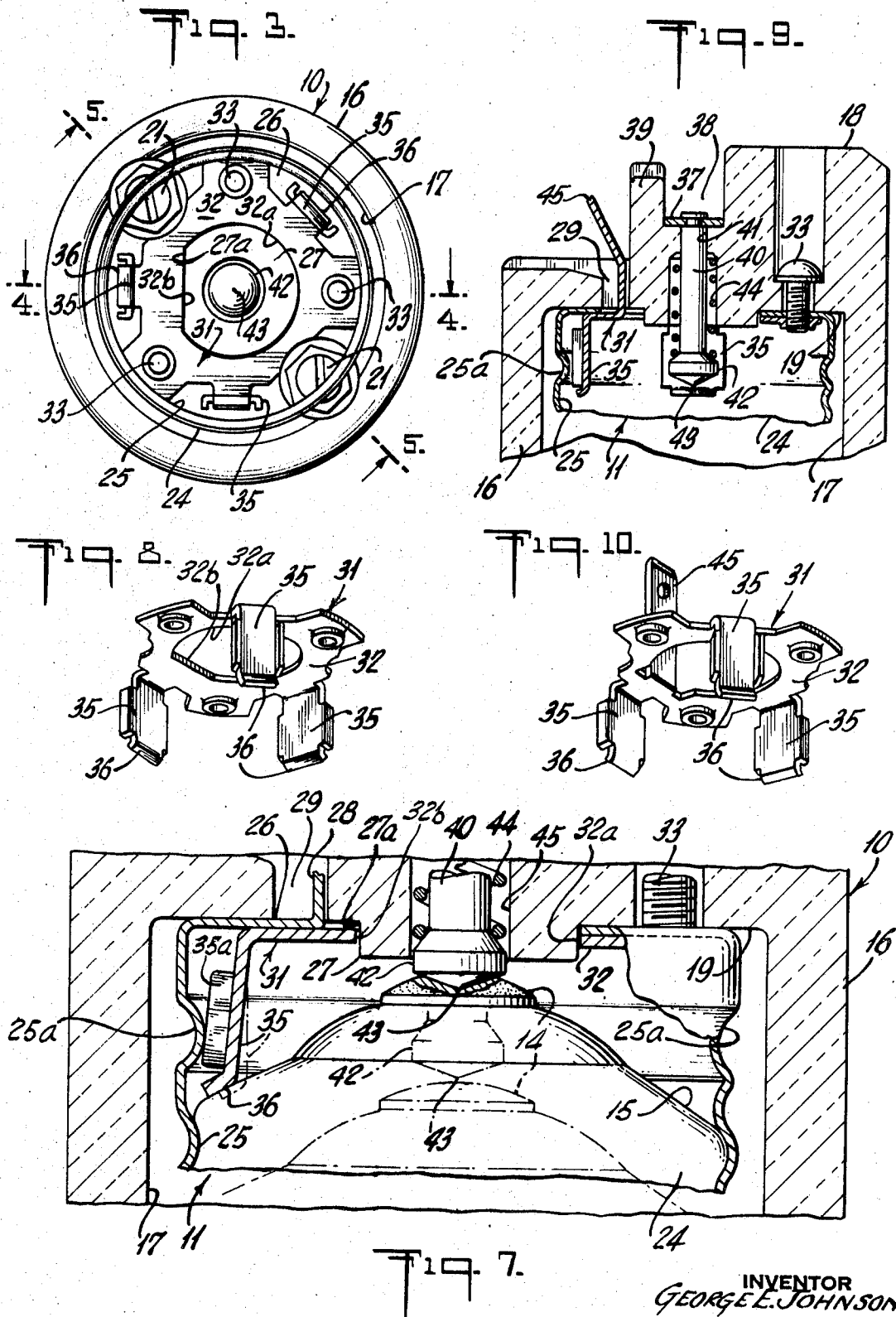
ABSTRACT: An electric lamp socket for an electric lamp having a screw type mogul base. Said socket having internal threads engaging with threads on the lamp base and having a spring-biased center contact with a pointed end of a hard material positioned to engage and make electrical contact with the center contact carried by the lamp base. Said socket including a plurality of lamp positioning members projecting upwardly from the bottom of the interior of the socket at points spaced outwardly relative to the center contact thereof. Said lamp positioning members being spaced angularly relative to each other and engaging with the base of the lamp at spaced points adjacent the outer circumference thereof when the center contact of the lamp is brought into engagement with the center contact of the socket.

The lamp positioning members being in the form of upwardly extending spring fingers formed from a resilient material, such as spring steel and being capable of being cammed outwardly by engagement with the lamp base.





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Fig. 11.

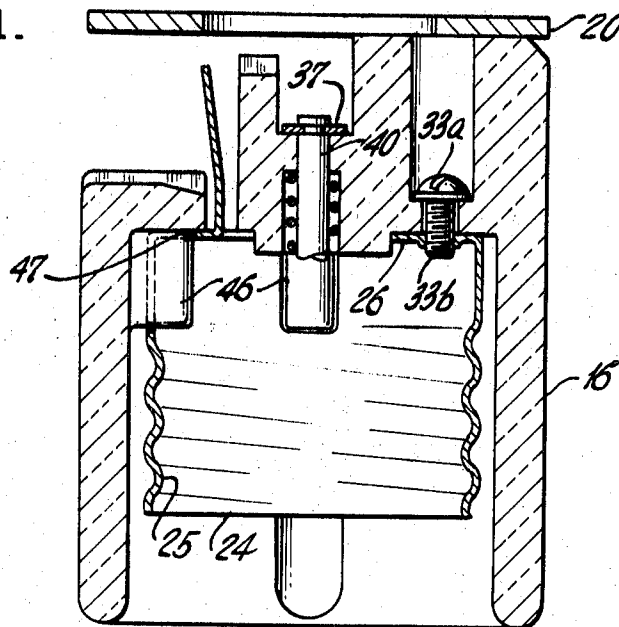


Fig. 12.

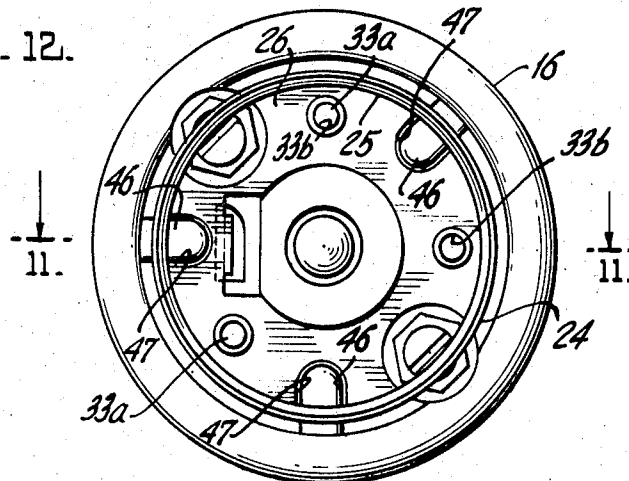
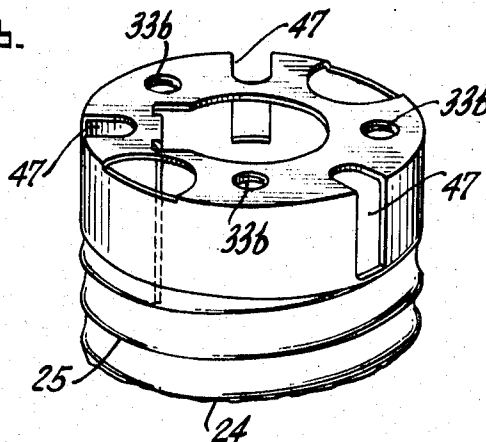


Fig. 13.



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LAMP-POSITIONING MOGUL SOCKET

The present invention relates to a lamp-positioning mogul socket. It relates more particularly to a socket for an electric lamp having a mogul size screw type base which positions and holds the lamp.

Mogul sockets of the type to which the present invention relates are frequently installed in lighting fixtures which have reflectors associated therewith to direct the light from the fixture in a desired pattern to an area which is to be illuminated. Such lighting fixtures may be employed for outdoor lighting, such as street lighting, and in such installations the lamps used are usually of a high intensity type such as sodium vapor lamps or mercury vapor lamps. In such lamps, the source of illumination is in the form of an elongated arc discharge tube which is enclosed within an outer glass envelope and it is important that such a concentrated source of illumination be located properly relative to the reflector in order to obtain the desired pattern and concentration of the light from the fixture. The positioning of the lamp in this manner is achieved initially by adjusting the lamp socket in the fixture so that the source of illumination is properly positioned relative to the reflector.

However, replacement of the lamp may result in the new lamp and its filament being positioned differently in relation to the reflector and hence, readjustment of the socket in the fixture may become necessary. Such readjustment entails additional expense and can be difficult to make, particularly when the lighting fixture forms part of an outdoor lighting installation.

Thus, an object of the present invention is to provide a socket for mogul based lamps which will uniformly position each lamp installed therein with its source of illumination in a predetermined position relative to a fixture reflector without requiring readjustment of the socket in the fixture.

Another object of the present invention is to provide a socket for a screw-in type of mogul base lamp which will securely hold the lamp in place and prevent the lamp from becoming loosened in the socket due to vibration or the like.

A further object of the present invention is to provide a socket for a screw-in type of mogul base lamp which insures that good electrical contact will be reliably established and maintained between the center contact of the lamp and the center contact of the socket with corrosion or other deterioration of the contacts being minimized.

These and other objects and advantages of the present invention will become apparent and will be better understood from the following description and the accompanying drawings in which:

FIG. 1 is a side elevation of a mogul socket embodying the present invention with an electric lamp installed therein and an adapter plate attached to a fixture support;

FIG. 2 is a rear end view of the socket and adapter plate shown in FIG. 1, but on an enlarged scale;

FIG. 3 is a front end view of the socket shown in FIG. 1;

FIG. 4 is a section view of the socket and adapter plate shown in FIG. 3 taken along line 4-4 of FIG. 3;

FIG. 5 is a section view of the socket and adapter plate shown in FIG. 3 taken along line 5-5 of FIG. 3;

FIG. 6 is a fragmentary view in section of the socket and adapter plate shown in FIG. 2 taken along the line 6-6 of FIG. 2;

FIG. 7 is a fragmentary view in section of the socket shown in FIG. 1 and a portion of the lamp installed therein illustrating certain details on an enlarged scale;

FIG. 8 is a perspective view of a lamp-positioning insert forming part of the socket shown in FIGS. 1-7;

FIG. 9 is a fragmentary view in section corresponding to FIG. 7 of a modified form of socket embodying the invention;

FIG. 10 is a perspective view of a combined lamp-positioning insert and terminal for the socket shown in FIG. 9;

FIG. 11 is a section view taken along line 11-11 of FIG. 12 of another form of socket embodying the invention;

FIG. 12 is a front end view of the socket shown in FIG. 11; and

FIG. 13 is a perspective view of a screw shell for the socket shown in FIGS. 11 and 12.

Referring now to the drawings in detail and in particular, to FIG. 1, there is a socket 10 having a mogul based lamp 11 installed therein.

The lamp 11 which is of a conventional construction, has an externally threaded base which is screwed into the socket to support the lamp and to make electrical connections therewith. As indicated in FIG. 1, the lamp 11 may be of the sodium vapor type having a concentrated source of illumination in the form of an elongated sodium discharge tube 12 which is supported endwise within an outer envelope 13 of glass. However, it will be understood that a socket made in accordance with the present invention may be employed with other types of screw based lamps, for example lamps employing filaments.

As shown in FIG. 7, the base of the lamp 11 has a center contact 14 which is generally formed of a relatively soft material such as solder and a threaded collar 15 of an electrically conductive metal which extends around the exterior of the base of the lamp. At its lower end, the collar slopes inwardly and has an opening therein which spaces the collar from the center contact 14 of the lamp. The center contact and the collar are connected, respectively, to opposite ends of the sodium discharge tube 12 or other source of illumination such as a filament.

In the embodiment of the invention illustrated in FIGS. 1-8, the socket 10 comprises a cylindrical body 16 of a suitable insulating material such as porcelain having a cavity 17 formed therein which is open at the front end of the body. Raised portions of the socket body 16 at the rear end thereof terminate in flat surfaces 18 which are generally parallel to a surface 19 forming the bottom of the cavity 17 in the socket body.

As shown in FIG. 5, an adapter plate 20 which rests on the exterior surfaces 18 may be employed for mounting the socket in a fixture. The adapter plate is secured to the socket body 16 by screws 21 which extend through openings 21a in the bottom of the socket body and threadably engage with openings in the adapter plate. The adapter plate 20 is in turn secured by bolts 22 or other suitable attaching means to a supporting member 23 forming part of a lighting fixture. When the lamp is screwed into the socket, the source of illumination, such as the sodium tube 12, should ordinarily extend at a right angle relative to the support 23 as indicated by the line A-A in FIG. 1.

The adapter plate may be provided with slotted openings 22a for the attaching bolts 22 to permit lateral adjustment of the socket in the fixture and the fixture support 23 may also be adjustable for positioning the socket and the lamp in relation to a reflector (not shown) forming part of the lighting fixture.

The socket also includes an internally threaded screw shell 24 located within the cavity 17 in the socket body 16 for reception of the threaded end or base of the lamp 11 therein. As illustrated, the screw shell 24 is formed from an electrically conductive metal such as brass and has threads 25 rolled into its upstanding sidewalls which threadably engage and make electrical contact with the threaded collar 15 surrounding the base of the lamp. As will be noted, the threads 24 of the screw shell which are helical terminate at their lower end in an inwardly extending bead 24a which extends around the lower end of the shell in the same plane.

The screw shell also has an inwardly extending annular flange 26 formed at its lower end which is seated on the bottom surface 19 of the cavity 17 in the socket body 16. The annular flange 26 defines an opening through which a raised boss 27 located at the center of the bottom surface 19 extends. A wiring terminal 28 in the form of a tab which may be pierced from the bottom of the screw shell, extends upwardly from the inner end of the flange and through an opening 29 in the bottom of the cavity in the lamp body. The end of the terminal 28 is exposed through a side opening 30 at the rear end of the socket body to permit an electrical wiring connection to be made therein.

As illustrated in FIGS. 3 and 4, the screw shell 24 is held in place by a lamp positioning insert 31 which may be made of stainless steel or other suitable resilient material. The lamp positioning insert 31 comprises an apertured plate 32 which fits inside of the screw shell with its outer edges extending over the inwardly extending flange 26 of the screw shell. Headed screws 33 which extend through openings in the bottom or rear end of the socket body and the flange of the screw shell, threadably engage with openings in the insert plate and hold the insert and screw shell in place in the socket cavity.

The plate 32 has a center aperture 32a through which the central boss 27 at the bottom of the cavity in the socket body extends. The aperture has a flat portion 32b which mates with a flat portion 34 on the boss. This aligns the threaded openings in the plate with corresponding openings in the flange of the screw shell and the openings in the socket body.

As shown best in FIGS. 3 and 8, the plate 32 of the insert has a plurality of angularly spaced outstanding fingers 35 which are formed from the resilient material of the plate and thus, are capable of springing outwardly. The fingers 35 extend upwardly adjacent the inner wall of the screw shell to a point slightly beyond the head 25a where reinforcing bosses 35a extending along the side edges of the fingers will strike the bead when the spring fingers are cammed outwardly by insertion of a lamp. As illustrated, three upstanding spring fingers 35 are provided with two of the fingers being spaced about 90° apart and about 135° from the third finger.

The upper ends of the upstanding spring fingers 35 are relieved and slope outwardly, as indicated at 36, and engage with a rounded or curved portion of the metal collar 15 surrounding the base of the lamp as the lamp is screwed into the screw shell 24.

As the lamp is screwed into the socket, the curved portion of the lamp is brought into engagement with the upstanding fingers 35 at three spaced points about its periphery and the spring fingers will be cammed outwardly until they are brought into contact with the bead on the socket shell which limits further movement of the spring fingers and causes them to be positioned uniformly. Thus, if the lamp should be tilted or at an angle of other than 90° relative to the socket or fixture support 23 at its base enters the screw shell, engagement of the lamp base with the three upstanding fingers at three spaced points corrects this condition and insures that each lamp installed in the socket will assume the desired position relative to the socket or fixture support 23 despite possible variations in the cooperating threads. It will be understood that if desired, more than three lamp positioning members or fingers may be employed.

When the lamp base has cammed the spring fingers outwardly as shown in FIG. 7, the resilience of the spring fingers exerts pressure on the base of the lamp and increases the frictional engagement between the threads on the collar of the lamp base and the threads of the screw shell which tends to prevent the lamp from becoming loose in the screw shell of the socket due to vibration or other causes.

Referring now to FIGS. 2 and 4, a second terminal 37 in the form of a metal tab to which a wiring connection may be made is located in a recess 38 formed in the rear end of the socket body 16 and is separated from the first terminal 28 by a partition 39. Access to the second terminal is also provided through the side openings 30 in the socket body. However, other forms of terminals may be employed if desired.

The second terminal 37 is connected to one end of a metal post or pin 40 which extends through a centrally located opening 41 leading from the recess 38 in the rear end of the socket body and through the central boss 27 to the cavity in the socket body. The other end of the pin 40 has an enlarged head 42 terminating in an outwardly facing point 43 which is centrally located at the bottom of the cavity for engagement with the center contact 14 of the lamp base. The pointed end of the pin is of harder material than the center contact of the lamp and as the lamp is screwed into the socket shell, the pointed end of the pin engages with and seats itself in the soft metal of the center contact 41 on the base of the lamp. This also ena-

bles the lamp to pivot or tilt relative to the pointed end 43 of the center contact without disturbing the connection as the lamp base is screwed into the socket shell and aids in obtaining the desired angular position of the lamp relative to the socket.

The pointed end of the pin 40 is urged outwardly relative to the bottom of the cavity by means of a compression spring 44 which is interposed between the headed end of the pin and the bottom of a recess 45 which is formed in the bottom of the cavity and surrounds the pin.

The spring 44 urges the pointed end 43 of the center contact pin 41 into engagement with the center contact of the lamp with a sealing effect which tends to prevent electrical deterioration of the contacting surfaces of the pin and the center contact of the lamp by oxidation or the like.

In addition, the spring pressure exerted on the center contact pin on the lamp base also increases the frictional engagement between the threads on the lamp base collar 15 and the threads 25 of the screw shell 24 and also aids in preventing the base of the lamp from becoming loosened in the screw shell due to vibration or the like.

In the embodiment of the invention illustrated in FIGS. 9 and 10, a wiring terminal 45 is formed as part of the lamp engaging and positioning insert 31. The terminal 45 which is in the form of a quick connect tab, is bent at right angles to the insert plate 32 and extends through the opening 29 in the rear end of the socket body 16. In this arrangement, the screw shell does not require a wiring terminal and one of the electrical connections to the lamp is established through engagement of the upstanding spring fingers 35 on the metal insert with the threaded metal collar 15 surrounding the base of the lamp. In this arrangement, the metal from which the lamp engaging and positioning insert is made can be of such thickness as is required to carry the current load without changing or increasing the thickness of the metal from which the screw shell is formed. In addition, the screw shell need not be made of metal and a saving can be realized by eliminating the metal for the screw shell.

In the embodiment of the invention illustrated in FIGS. 11-13, angularly spaced members in the form of bosses 46 are employed to engage with and position the lamp. In this construction, the bosses 46 which may be formed as part of the socket body, extend inwardly from the sidewalls of the cavity in the socket body and upwardly from the bottom thereof.

The spaced bosses project inwardly through slotted openings 47 in the screw shell 24 and are positioned to engage with the lower end of the lamp base as the lamp is screwed into the socket. Thus, a three-point engagement takes place between the lamp base and the bosses which brings the lamp into a vertical position as it is being installed in the socket. In this construction, the screw shell 24 is held in place by screws 33a which extend through openings in the rear end of the socket body 16 and which threadably engage with openings 33b in the inwardly extending flange 26 of the screw shell.

In the foregoing description, corresponding reference numerals have been used to identify similar parts in the various embodiments.

It will be understood that various changes may be made in the embodiments of the invention illustrated and described herein without departing from the scope of the invention.

I claim:

1. In an electrical socket for receiving and positioning an electric lamp having a threaded base with a rounded lower end and a contact at the center thereof, the combination which comprises:

- a socket body formed of an insulating material having a cavity formed therein to receive a lamp base;
- said cavity having a bottom and an open outer end;
- a contact centrally located at the bottom of said cavity;
- threaded means in said cavity for threadably receiving and engaging with an externally threaded member of conductive material surrounding a cylindrical portion of the lamp base;

- e. a plurality of angularly spaced lamp-positioning members located within the cavity and extending upwardly from the bottom thereof; and
- f. said lamp-positioning members being outwardly disposed relative to said center contact and having upper ends engaging with a rounded lower end of the lamp base at a plurality of points spaced about its outer circumference as a central contact on the lamp base is brought into engagement with the center contact at the bottom of the cavity whereby the lamp is caused to assume a predetermined angular position relative to the socket body.

2. In an electrical socket, the combination as defined in claim 1 wherein:

- a. the threaded means in the cavity comprises an internally threaded screw shell of an electrically conductive material;
- b. said screw shell having a plurality of angularly spaced slots formed therein at its inner end;
- c. the lamp-positioning members comprise a plurality of angularly spaced bosses formed in the cavity of the socket body and extending upwardly from the bottom thereof; and
- d. each of said bosses extending inwardly through one of the spaced slots in the screw shell.

3. In an electrical socket for receiving and positioning an electric lamp having a threaded base with a rounded lower end and an externally threaded apertured collar of electrically conductive material surrounding said base and a center contact spaced from said collar at said lower end of said base, the combination which comprises:

- a. a socket body of insulating material having a cavity formed therein;
- b. said cavity having a bottom and being open at an outer end thereof;
- c. a screw shell of electrically conductive material having threads formed therein located within said cavity for threadably receiving an externally threaded base of a lamp;
- d. said screw shell having an inwardly extending annular flange at an inner end thereof;
- e. said flange resting on the bottom of the cavity;
- f. an annular metal plate having an outer edge portion extending over said flange in opposing relation to the bottom of the cavity;
- g. said plate being secured to the bottom of the cavity and holding the flange in place thereon;
- h. at least three spring fingers formed on and extending upwardly from said plate at angularly spaced points about its outer perimeter and corresponding in height generally to the length of the rounded lower end of the lamp base;
- i. said angularly spaced fingers being spaced inwardly relative to the screw shell at the lower end thereof and having relieved upper ends engaging with the rounded lower end of the lamp base at spaced points adjacent its outer periphery; and
- j. the upper ends of all of said spring fingers being brought into engagement with the rounded lower end of the lamp base as the lamp base is screwed into the screw shell and thereby positioning the lamp in a predetermined angular position relative to the socket body.

4. In an electrical socket, the combination as defined in claim 3 wherein:

- a. the screw shell has an inwardly extending bead formed at the inner end of the threads formed thereon; and
- b. said bead extending around the screw shell in a single plane and being positioned in opposing relation to the upper ends of the spring fingers thereby limiting outward movement of the spring fingers.

5. In an electrical socket, the combination as defined in claim 4 which includes:

- a. a contact mounted at the center of the bottom of the cavity in the socket body;

- b. said contact having a pointed upper end positioned in opposing relation to a center contact on the lower end of the lamp base; and

- c. said pointed end of the contact in the cavity being capable of deforming the center contact on the lamp base and permitting pivotal movement of the lamp base relative thereto.

6. In an electrical socket, the combination as defined in claim 4 which includes;

- a. a contact mounted at the center of the bottom of the cavity in the socket body;
- b. said contact having a pointed upper end positioned in opposing relation to a center contact on the lower end of the lamp base;
- c. said pointed end of the contact in the cavity being capable of deforming the center contact on the lamp base and permitting pivotal movement of the lamp base relative thereto; and
- d. spring means urging said pointed end of the contact in the cavity toward engagement with the center contact on the lower end of the lamp base.

7. In an electrical socket for receiving and positioning an electrical lamp having a threaded base in a predetermined position, the improvement which comprises:

- a. a socket body of insulating material having a lamp receiving cavity formed therein;
- b. said cavity being open at an outer end thereof and having a closed bottom;
- c. means in said cavity for threadably engaging with a cylindrical portion of a threaded lamp base;
- d. said cylindrical portion of tee lamp base terminating in a rounded lower end having a central contact located at said lower end of the base;
- e. an electrical contact positioned in opposing relation to the lamp base contact at the bottom of said cavity;
- f. angularly spaced lamp positioning members extending upwardly from the bottom of said cavity for engagement with the rounded lower end of the lamp base as the center contact on the lamp base is brought into engagement with the contact in the cavity; and
- g. said lamp positioning members being spaced outwardly relative to the contact at the bottom of the cavity and having upper ends engaging the rounded lower end of the lamp base at spaced points adjacent an outer circumference thereof.

8. In an electrical socket, the improvement as defined in claim 7 which includes;

- a. an annular metal plate seated at the bottom of the lamp receiving cavity;
- b. said plate having a central opening and being spaced outwardly relative to the contact at the bottom of the cavity;
- c. said lamp positioning members comprise at least three angularly spaced spring fingers formed on and extending upwardly from said plate at an outer periphery thereof; and
- d. said spring fingers having upper ends positioned in opposing relation to the rounded lower end of the lamp base adjacent the outer circumference thereof and engaging with a metal collar surrounding the rounded lower end of the lamp base at its outer circumference as the center contact of the lamp base is brought into engagement with the contact at the bottom of the cavity.

9. In an electrical socket, the improvement as defined in claim 7 wherein:

- a. the contact at the bottom of the cavity has a pointed upper end opposing the center contact on the lamp base; and
- b. said pointed end of said contact being capable of deforming the contact of the lamp base and permitting angular movement of the lamp as the rounded lower end of the lamp base is brought into engagement with the lamp positioning members.

10. In an electrical socket, the improvement as defined in claim 9 wherein:

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a. the spring fingers carried by the annular plate have outwardly flared upper ends.

11. In an electrical socket, the improvement as defined in claim 9 which includes:

a. means for limiting outward movement of the spring fingers upon introduction of the rounded end of the lamp base therebetween.

12. In an electrical socket, the improvement as defined in claim 9 which includes:

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a. an internally threaded metal shell supported in the cavity in the socket body for threadably engaging with a threaded portion of the lamp base;

b. said shell having an outer wall spaced outwardly relative to the spring fingers carried by the annular plate; and

c. interengaging means on said spring fingers and said shell for limiting outward movement of the spring fingers.

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