

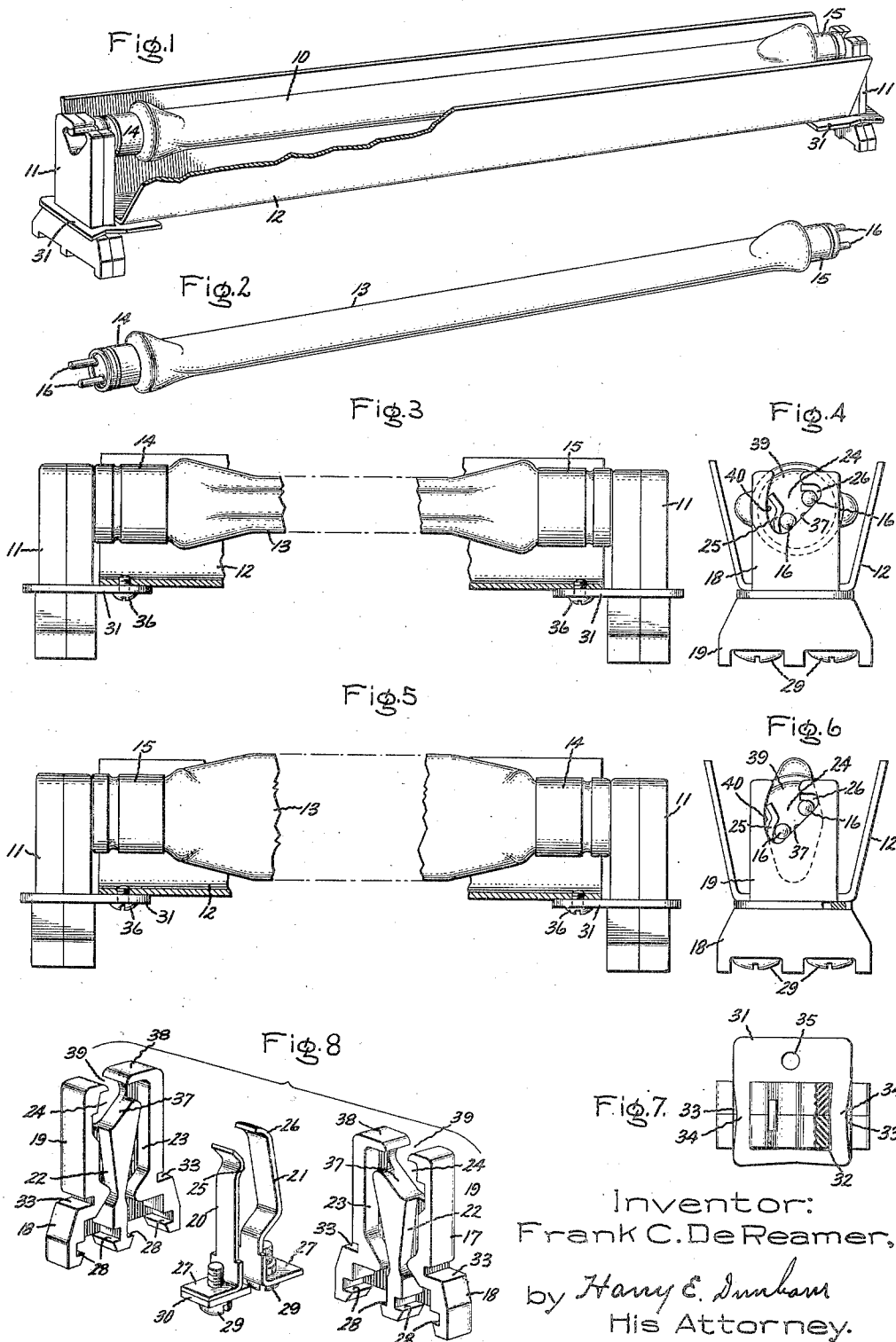
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LAMP BASE AND SOCKET

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LAMP BASE AND SOCKET

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17 Claims. (Cl. 176—29)

My invention relates to electric lamps, and more particularly to a supporting base and socket for a double-ended discharge lamp of a type now in commercial use, for example, a fluorescent lamp. My invention further relates to a tubular lamp having an envelope so formed as to be capable of emitting light rays of various widths or other characteristics, for example, an envelope of elliptical form.

10 An object of my invention is the provision of a base and socket construction for a tubular lamp, such that either portion of the envelope emitting light rays of different characteristics or widths may be presented to a reflecting or sup-
15 porting surface of a lamp fixture to obtain various types of light beams.

Another object of my invention is the provision of a base and socket construction for a tubular lamp having an elliptical envelope such that the
20 major or minor axis of the envelope may cooperate with a reflecting surface.

A further object of my invention is the provision of a base and socket construction for electric lamps of the type described wherein the
25 lamp may be easily inserted in its socket and positively held therein.

In the accompanying drawing, Fig. 1 is a perspective view of a lamp mounted in a fixture showing the cooperation of the base and socket
30 elements; Fig. 2 is a perspective view of the lamp; Figs. 3 and 4 illustrate a side and end view, respectively, of a lamp, for example, an elliptical lamp, mounted in a fixture with the major axis of the envelope presented to the reflecting sur-
35 face to obtain a comparatively wide beam of light; Figs. 5 and 6 illustrate a side and end view, respectively, of the same lamp mounted with its minor axis presented to the reflecting surface to obtain a relatively narrow beam of light; Fig. 7
40 is a view of the lamp-supporting socket, partly in section; and Fig. 8 is an exploded view of the lamp socket elements.

In certain installations of double-ended discharge lamps, such as fluorescent lamps, it is desired to obtain light beams of various characteristics to adapt the illumination to a particular
45 use. For example, in lighting vertical panels equipped with indicating instruments and dials a relatively narrow beam of light is required to illuminate the panel and, at the same time,
50 shield the eyes of the reader from glare. In other instances, a wider beam of light is required to illuminate a larger area, for example, a horizontal panel of indicating instruments. I have devised
55 a single lamp and mounting socket therefor which

is capable of emitting light beams having these various characteristics depending upon the manner in which the lamp is mounted in its associated socket.

To this end, I shape the tubular envelope of a
5 fluorescent lamp in a manner such that the light-emitting surface varies in width or area to give beams of light of various intensities. The drawing illustrates a lamp of which the envelope has
10 been given an elliptical form so that either the broad or narrow face of the lamp may be used to illuminate an object. The arrangement of the lamp socket and contact pins on the lamp bases
15 is such that the lamp may be turned end for end to present either the broad or narrow face of the envelope to the associated reflector. It will be apparent that the lamp envelope may be shaped
20 other than as an ellipse; it may be made of any configuration, for example, a rectangle, to present a variety of light-emitting faces to the associated support or reflector. In some cases, it
25 may be desirable to color portions of the envelope such as the various faces of the ellipse, so that a single lamp may be used to obtain a selection of different colored light. The manner in which the
30 lamp bases are mounted in the sockets to make possible two positions of the lamp will now be described.

Figs. 1 and 2 of the drawing illustrate a tubular
35 fluorescent lamp and mounting socket constructed in accordance with my invention, the lamp 10 being mounted at each end in sockets 11 which, in turn, are supported by an associated lighting fixture or reflector 12. The fluorescent lamp includes a glass envelope 13 supported at each end
40 by bases 14 and 15 having spaced contact pins 16 electrically connected to the filaments (not shown) encased within the envelope at each end of the lamp. The envelope of the lamp is given
45 an elliptical configuration so that the broad or narrow face of the envelope, corresponding to the major and minor axes of the ellipse, may be presented to the reflector. This particular configuration is illustrated by way of an example only; it should be manifest that other forms may be
50 employed such as the rectangle previously mentioned. The spaced contact pins 16 at each end of the lamp lie in a common plane which is midway between the major and minor axes of the ellipse defining the relatively wide and narrow
55 faces of the lamp. Since in the form illustrated these faces are at right angles to each other, the plane of the contact pins extends at an angle of 45 degrees to the plane of either face. This means that the contact pins are positioned

within the supporting socket at a corresponding angle when the lamp is mounted in position to present either the wide or narrow face to the reflector. To this end, the contacts of the socket are disposed at the same angle, in this case, an angle of 45 degrees to the reflector, or other reference plane.

Referring to Figs. 7 and 8, the socket comprises a two-part housing 17 of insulating material, for example, a phenolic condensation product and filler, the housing having a base portion 18 and a relatively narrower extending portion 19 enclosing spaced contact members 20 and 21. Each part of the housing is formed with spaced longitudinal grooves 22 and 23 which receive the contact members 20 and 21, respectively, and which merge with a recess 24 at one end of the extension 19. At one end, the contact members 20 and 21 extend into the recess 24 and are formed with pin-engaging surfaces 25 and 26, respectively, for cooperation with the contact pins of the lamp. At their other ends, the contact members are bent at an angle to form terminal plates 27 resting in spaced channels 28 located in the base portion of the housing. Terminal screws 29 cooperate with the terminal plates. In order to facilitate engagement of the lamp contact pins with the contact surfaces 25 and 26, one of the contact blades is made movable relatively to the other. In this case, the contact blade 20 is made of flexible spring material so that it may be moved upon engagement with one of the lamp pins to insure proper seating of the pins. It should be manifest, however, that the other contact member 21 may be made movable, if desired. To provide for proper support of the terminal screw 29, the terminal plate 27 of the relatively thin flexible blade 20 is reinforced by a supporting plate 30 secured thereto in any suitable manner. The two parts of the housing are secured together by means of a locking plate 31.

As shown in Figs. 1, 7 and 8, the locking plate comprises a sheet metal member provided with an opening 32 for receiving the extending portion 19 of the housing. At a point adjacent the base portion 18 the extending portion is provided with grooves 33 in opposite edges so that as the extension is slipped through the opening in the locking plate the latter rests on the base portion in line with the grooves 33. Thereafter the walls of the locking plate formed by the opening 32 are forced inwardly into the grooves 33, as shown at 34, to secure the parts of the housing together and to mount the locking plate on the socket. A portion of the locking plate extends outwardly from the housing and is formed with an opening 35 for receiving a mounting screw. In this manner the locking plate forms a supporting medium for the socket and may be mounted on the reflector 12 by a screw 36, as shown in Figs. 3 and 5. A socket is mounted at each end of the reflector to accommodate the pins at each end of the lamp, the pins resting in the recesses 24 in engagement with the contact members.

The pin-receiving recess 24 is formed with an edge 37 extending approximately at an angle of 45 degrees to the base of the socket and the lamp contact pins are clamped by the socket contact members and rest on this guiding edge. This means that the contact pins are always seated in the recesses at the angle aforementioned. The recess 24 extends to an edge 38 of the socket and merges therewith forming a slot

39 through which the contact pins may be inserted in the recess.

Since the contact pins at both ends of the lamp are located in a common plane which, when the lamp is mounted, is always at an angle of approximately 45 degrees to the base of the reflector, the contact members and recesses of the sockets are likewise located in this position at each end of the lamp. This means that only a single socket construction is needed to support both ends of the lamp since the lamp contact pins may project into the socket housing from either side. This effects a considerable saving in the costs of manufacture and distribution inasmuch as only a single form of housing need be manufactured and a single item carried in dealer's stocks. In manufacture, the only change made in the right and left hand sockets is to place the locking plate having the mounting opening 35 on the opposite side of the socket housing, as shown in Figs. 1, 3 and 5, to facilitate mounting.

In mounting the lamp the contact pins are moved in a straight line movement through the slots 39 into the recess 24 of the sockets 11. Thereafter the pins may be rotated in either direction to bring them into engagement with the socket contact members. Since one of the contact pins engages and moves the movable contact member the pins are easily locked in position. Rotation of the contact pins is facilitated by a curved edge 40 forming a wall of the recess. In seated position the lamp pins are held securely by the socket contact members making it impossible for the lamp to become unseated except upon rotation. For this reason, the sockets are adapted to hold the lamp in inverted position, such as in a depending lighting fixture.

In the position shown by Figs. 3 and 4 the lamp has been mounted so that the relatively wide face of the envelope is presented to the reflector to obtain a relatively wide beam of light, the base 14 being on the left hand and the base 15 on the right hand. If it is desired to change the width of the beam to a narrower one the lamp is removed from the sockets and simply turned end for end and reinserted in them so that the base 15 is on the left hand and the base 14 on the right hand. Irrespective of direction of rotation of the pins within the socket, they will always engage the socket so that the broad or narrow face of the envelope is presented to the reflector depending upon which end of the lamp is inserted in any one socket. This result is obtained by virtue of the fact that the lamp contact pins are located in a plane midway between the wide and narrow faces of the lamp envelope; inasmuch as the socket contacts likewise are fixed in a similar angular relationship, only one face of the envelope can be presented to the reflector unless the lamp is turned end to end.

By my construction a single lamp, a single reflector and a single set of sockets may be used to obtain light beams of varying characteristics simply by reversing the lamp within the socket. This results in a considerable simplification of the lamp fixture assembly and makes possible a wider use of the lamp. While the socket is designed particularly for use with a lamp capable of producing light beams of various characteristics, it should be manifest that the socket is adapted to support a fluorescent lamp of the conventional type equally as well.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In combination, a double-ended electric device having an elliptical glass envelope and a base at each end, each of said bases having spaced contact pins extending outwardly therefrom and all of said pins lying in a common plane located substantially at an angle of 45 degrees to the major and minor axes of said elliptical envelope, and a pair of spaced sockets constructed and arranged to receive and mount said electric device therebetween, said sockets being provided with recesses having longitudinal slots extending to the edges thereof and spaced contact members in said recesses for receiving the lamp contact pins, said contact members lying in planes located approximately at angles of 45 degrees to the axes of said sockets whereby said electric device may be mounted in said socket by insertion of the pins at each end of the device in the said longitudinal slots of the adjacent socket by straight movement of the device until the pins are within said recesses whence the device may be rotated in either direction to bring the said contact pins into engagement with said contact members.

2. In combination, a double-ended electric device having a base at each end and an intermediate elongated envelope for emitting rays of different characteristics in planes approximately at right angles to each other, each of said bases having spaced contact pins extending outwardly therefrom, all of said pins lying in a common plane located approximately midway between the planes of the rays of different characteristics, and a pair of spaced sockets constructed and arranged to mount said electric device therebetween, said sockets being provided with recesses extending to the edges thereof and spaced contact members in said recesses for receiving the lamp contact pins, said contact members lying in planes located approximately at angles of 45 degrees to the bases of said sockets.

3. In combination, a double-ended electric device having an elliptical glass envelope and a base at each end, each of said bases having spaced contact pins extending outwardly therefrom and all of said pins lying in a common plane approximately midway between the planes of the major and minor axes of said elliptical envelope, and a pair of spaced sockets constructed and arranged to mount said electric device therebetween, said sockets being provided with recesses having slots extending to the edges thereof and spaced contact members in said recesses for receiving the lamp contact pins, one of said contact members in each socket being movable relatively to the other, said contact members lying in planes approximately at angles of 45 degrees to the bases of said sockets.

4. In combination, a double-ended electric device having an elliptical glass envelope and a base at each end, each of said bases having spaced contact pins extending outwardly therefrom and all of said pins lying in a common plane located substantially at an angle of 45 degrees to the major and minor axes of said elliptical envelope, and a pair of spaced sockets constructed and arranged to receive and mount said electric device therebetween, said sockets being provided with recesses having slots extending to the edges thereof and spaced contact members in said recesses for receiving the lamp contact pins, said contact members lying in planes located approxi-

mately at angles of 45 degrees to the bases of said sockets.

5. In combination, a double-ended electric device having a base at each end and an envelope formed with wide and narrow faces at substantially right angles to each other to obtain relatively wide and narrow beams of light, each of said bases having spaced contact pins extending outwardly therefrom and all of said pins lying in a common plane approximately midway between the planes of the wide and narrow faces of said envelope, and a pair of spaced sockets constructed and arranged to mount said electric device therebetween, said sockets being provided with recesses having slots extending to the edges thereof, and spaced contact members in said recesses for receiving the lamp contact pins.

6. In combination, a double-ended electric device having a base at each end and an intermediate envelope for emitting rays of different characteristics in planes spaced angularly to each other, each of said bases having spaced contact pins extending outwardly therefrom and all of said pins lying in a common plane approximately midway between the planes of the rays of different characteristics and a pair of spaced sockets constructed and arranged to mount said electric device therebetween, said sockets being provided with recesses having slots extending to the edges thereof and spaced contact members in said recesses for receiving the lamp contact pins.

7. An electric device having an elliptical glass envelope and a base at each end, each of said bases having spaced contact pins extending outwardly therefrom and all of said pins lying in a common plane located approximately at an angle of 45 degrees to the major and minor axes of said elliptical envelope.

8. An electric device having a base at each end and a tubular glass envelope having wide and narrow faces at approximately right angles to each other to obtain relatively wide and narrow beams of light, each of said bases having spaced contact pins extending outwardly therefrom and all of said pins lying in a common plane located approximately midway between the planes of the wide and narrow faces of said envelope.

9. An electric device having a base at each end and an intermediate elongated envelope for emitting rays of different characteristics in planes spaced angularly to each other, each of said bases having spaced contact pins extending outwardly therefrom, all of said pins lying in a common plane located approximately midway between the planes of the rays of different characteristics.

10. In a socket for electric lamps or the like, a member of insulating material having a base for mounting on a support, said member being provided with a recess extending to an outer edge of the member and spaced contact members in said recess adapted to receive the spaced contact pins of a lamp as the pins are moved transversely through the recess, one of said contact members being movable relatively to the other, said contact members being disposed in a common plane located at an angle of approximately 45 degrees to the base of said member.

11. A socket for electric lamps, or the like, comprising a member of insulating material, said member being provided with a recess formed with a longitudinal slot extending to an outer edge of the member and spaced contact members in said recess adapted to receive the spaced contact pins of a lamp as the pins are moved

transversely through the slot into said recess, said contact members being disposed in a common plane located at an angle of approximately 45 degrees to the longitudinal axis of said slot.

- 5 12. A socket for electric lamps, or the like, comprising a member of insulating material, said member being provided with a recess formed with a slot extending to an outer edge of the member, and relatively movable spaced contact members in said recess adapted to receive the spaced contact pins of a lamp as the pins are moved transversely through the slot into said recess, said contact members being disposed in a common plane located at an angle of substantially 45 degrees to an axis of said member.

13. In a socket for electric lamps or the like, a member of insulating material having a base for mounting on a support, said member being provided with a recess extending to an edge of the member, the said recess having a wall located in a plane at an angle of approximately 45 degrees to the base portion of said member and spaced contact members in said recess adjacent said wall adapted to receive the spaced contact pins of the lamp, one of said contact members being movable relatively to the other.

14. In a socket for electric lamps or the like, a two-part housing of insulating material, said housing having a base portion and another portion extending outwardly from said base, a recess formed in said extending portion extending to an edge thereof, spaced contact members mounted in said recess and adapted to receive the contact pins of a lamp, one of the contacts being movable relatively to the other and a mounting plate of sheet metal having an opening for receiving said extension, a wall of the mounting plate formed by said opening being bent inwardly to engage said extension and hold the parts of said housing together.

15. In a socket for electric lamps or the like,

a two-part housing of insulating material, said housing having a base portion and an extending portion, said extension being formed with a recess extending to an edge thereof, spaced contact members mounted in said recess and adapted to receive the contact pins of a lamp, one of said contacts being movable relatively to the other, said extension being formed with a slot in the exterior wall thereof at a point adjacent the base portion, and a mounting means for said socket comprising a sheet metal plate provided with an opening for receiving the extended portion of said housing, a portion of the wall of said plate formed by said opening being bent inwardly into said slot for locking said plate to said housing and for securing the parts of said housing together.

16. In a socket for electric lamps, or the like, a two-part housing of insulating material, recesses formed in the parts of said housing and extending to edges thereof, spaced contact members mounted in said recesses and adapted to receive the contact pins of a lamp, one of said contacts being movable relatively to the other, and means to hold the parts of said housing together comprising a band of metal surrounding said housing.

17. In combination, a double-ended electric device having a base at each end and an intermediate envelope for emitting rays of different characteristics in planes spaced angularly to each other, each of said bases having spaced contact pins extending outwardly therefrom, all of said pins lying in a common plane approximately midway between the planes of the rays of different characteristics, and a pair of spaced sockets constructed and arranged to mount said electric device therebetween, said sockets being provided with spaced contact members for receiving the lamp contact pins.

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