Sept. 11, 1951 J. M. PISTEY 2,567,726

LAMP HOLDER FOR SINGLE PIN TYPE FLUORESCENT LAMPS

Filed Sept. 8, 1949

Fig. 1.

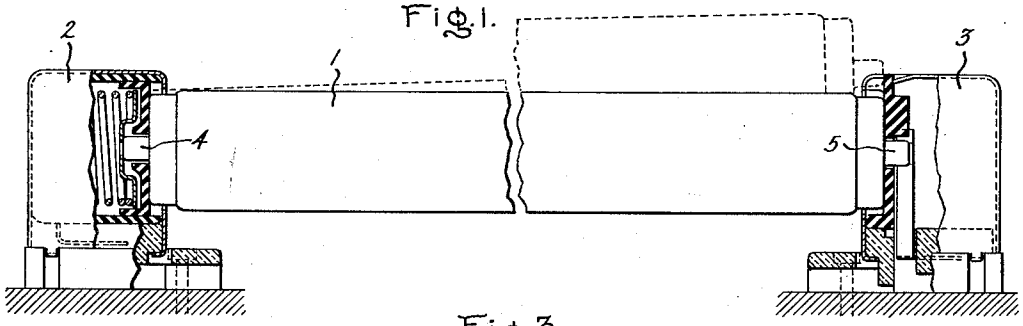


Fig. 2.

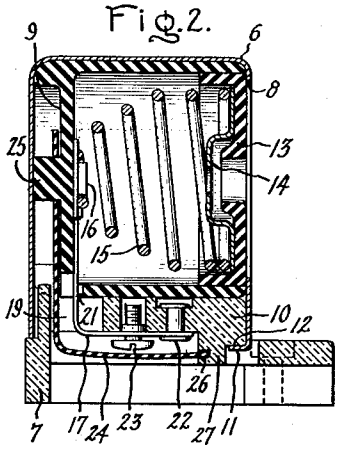


Fig. 3.

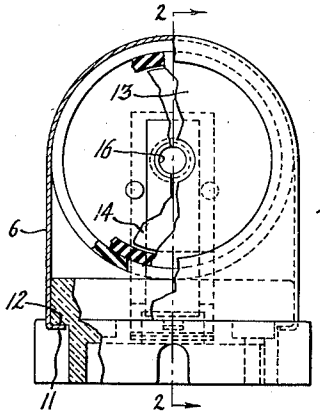


Fig. 4.

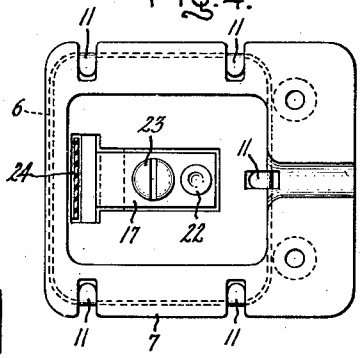


Fig. 5.

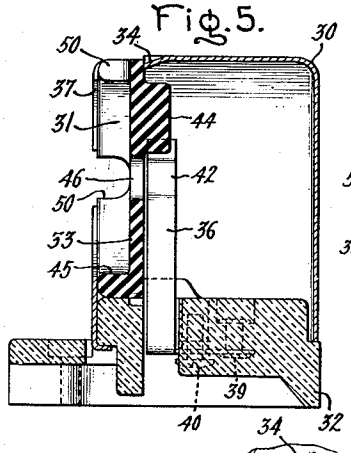


Fig. 6.

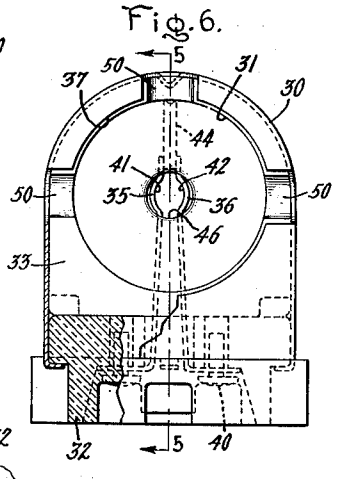


Fig. 7.

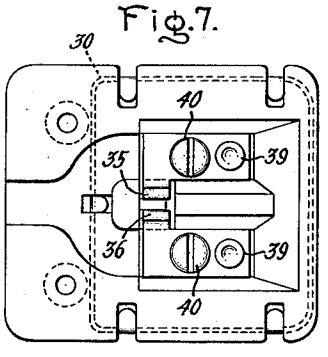
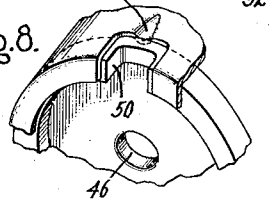


Fig. 8.



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LAMP HOLDER FOR SINGLE PIN TYPE FLUORESCENT LAMPS

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Application September 8, 1949, Serial No. 114,493

8 Claims. (Cl. 173—328)

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The present invention relates to lamp holders for tubular discharge lamps having a contact pin at each end thereof and operating at relatively high voltages. More specifically, this invention relates to an improved lamp holder of the type described in co-pending application Serial No. 626,346, De Reamer, assigned to the same assignee as that of the present application.

A primary object of the invention is to provide lamp holders or sockets of simple, economical and rugged construction.

Additional objects and features of the invention will become apparent from the following description and the accompanying drawing illustrating one embodiment thereof.

In the drawing, Fig. 1 illustrates a tubular discharge lamp supported at each end in lamp holders constructed in accordance with my invention; Fig. 2 is a sectional view through the lamp holder mounting the left-hand end of the lamp, the view being taken along line 2—2 of Fig. 3; Fig. 3 is an end or front view, partly in section, of the holder of Fig. 2; Fig. 4 is a view looking at the base of the holder; Fig. 5 is a sectional view through the holder supporting the right-hand end of the lamp, the view being taken along the line 5—5 of Fig. 6; Fig. 6 is an end or front view of the socket of Fig. 5 with part of the housing cut away, Fig. 7 is a view of the base of the holder, and Fig. 8 is a perspective view of part of the holder of Fig. 5.

Referring to the drawing, Fig. 1 shows a tubular discharge lamp 1, such as a hot or cold cathode fluorescent lamp, supported at opposite ends in lamp holders or sockets 2 and 3 constructed in accordance with the present invention. Discharge lamps of the type used with the sockets are provided with single contact pins 4 and 5 at each end thereof connected to an electrode. The lamps are adapted to start at voltages ranging from 600 to 1000 volts without preheating of the lamp electrodes.

The construction of the left-hand holder is illustrated in Figs. 2, 3 and 4. The holder 2 comprises a hollow metal housing 6 open at the bottom and an insulating base portion 7 of plastic or porcelain to which the open end of the housing is secured and which is employed to secure the holder to a support. As shown in Fig. 2, the housing has an opening 8 in the front wall thereof for receiving the end of the lamp when the lamp is mounted in the holder. Within the outer metal housing 6, there is a cup-shaped inner housing 9 of a suitable insulating material such as a molded phenolic resin. This inner housing of cylindrical cross section is adapted to fit closely within the rounded top portion of the housing 6 and is held against the top of the metal housing by the portion 10 of the base 7 which extends into the open bottom of the housing 6. The base and outer housing are secured together by a plurality of tabs 11 on the lower edge of the housing which are adapted to fold over and engage cooperating

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shoulder portions 12 on the base member 7.

The contact pin 4 on the end of the lamp is adapted to rest in an opening in an insulating disk 13 slidably mounted within the inner housing and which carries a contact disk 14 for making an electrical connection with the lamp contact pin. A spring 15 biases the contact disk into engagement with the lamp contact pin. One end of the spring rests against the flared edge of an opening 16 in a conductor bar 17, the flared edge serving to engage one of the convolutions of the spring to hold the spring in position. As the other end of the spring bears against the contact disk 14, an electrical connection is obtained between the contact disk and the conductor bar.

The conductor bar 17 comprises a strip of sheet metal such as brass. It is bent to form an angle. One arm of the angle containing the opening 16 passes through an opening 19 in the base 7 and a cooperating slot 21 at the bottom of the inner back wall of the housing 9 and upwardly along the back wall thereof. The other arm is secured in any suitable manner, as by a rivet 22, to the base 7. A terminal screw 23 is mounted in the conductor bar 17 for making an electrical connection with the holder.

To provide additional insulation for the conductor bar, there is provided a strip of flexible insulating material 24 such as sheet fiber of about the same width as the opening 19. This strip has a hole in one end thereof for engaging a knob 25 on the outer surface of the back wall of the housing 9 while the other end of the strip extends forwardly along the bottom of the base 7 parallel to and in shielding relationship with the conductor bar 17 with the tip thereof inserted into a groove 26 in a front depending portion 27 of the base member.

In assembling holder 2, the conductor bar 17 is secured to the base 7 by means of rivet 22 and the inner housing 9 is placed on the base plate with the upright end of the conductor bar inserted through slot 21. The insulating strip is then inserted into opening 19 with the upper end thereof mounted on knob 25 and the lower end inserted in slot 26. The spring 15, contact disk 14 and insulating disk 13 are then inserted into the open face of the inner housing and while holding them in this position, the outer housing is slipped downwardly over the inner housing and fastened by means of tabs 11 to the base 7. In the assembled position, the insulating disk is held within the inner housing by the edge defining opening 8 in the outer housing, the diameter of this opening being slightly less than the interior diameter of the inner housing and disk 13.

Referring now to Figs. 5, 6 and 7, the holder 3 will be seen to comprise a metal housing 30 of the same general shape as housing 6 and including a lamp receiving opening 31 in the front wall thereof. It is also positioned on and secured to an insulating plastic or porcelain base 32 in the

same manner as housing 6 is secured to its cooperating base 7.

The opening 37 in the front wall of the housing 30 is closed by means of an insulating member 33 resting on the base 32 and having a rounded upper edge in contact with the rounded top of the housing. Lateral displacement of member 33 away from the front face of the housing is prevented by a projection 34 pressed from the top wall of the housing and adapted to engage the rear top edge of member 33 and also by conducting bars 35 and 36 extending upwardly from the base 32. Upwardly projecting ribs of base 32 are also provided to support member 33.

One end of each of the conducting bars 35 and 36 is fastened at the base 32 as by rivets 39 and these same ends are provided with terminal screws 40. The other ends are in the form of spring members which extend upwardly immediately behind member 33 and are provided with curved sections 41 and 42 for engaging lamp contact pin 5 and the ends of the bars are maintained in spaced relationship by means of a vertical rib 44 on the back surface of the member 33.

In order to guide the lamp contact pin into bridging engagement with the contact members, the front of the member 33 is provided with a recess 45 to accommodate the end of the lamp. The wall at the bottom of the recess is provided with an opening 46 through which the contact pin of the lamp extends into engagement with the curved sections 41 and 42 of the conducting bars. Thus, the recess serves as a guide when inserting the lamp in this holder. It also serves to support one end of the lamp to prevent the lamp from falling out of the holder.

The holders are employed in a service assembly with the holders spaced as indicated in Fig. 1 a distance such that the lamp ends can be supported by the cooperating holders with the contact pins engaging the conductor members within the holder housings.

A suitable operating circuit comprises a source of low or house voltage alternating current and an autotransformer for supplying a high voltage for starting and operating the lamp. In such a circuit, conducting bars 35 and 36 form part of the primary circuit to the transformer so that unless the lamp contact pin 5 is inserted into holder 3, the circuit is open and there is no possibility of high voltage being applied to the assembly, i. e., to the high voltage contact 14 in holder 2 which is part of the high voltage circuit. It will further be seen that the holders 2 and 3 are constructed and mounted so that the lamp can be inserted in one way only. The arrangement is such that the lamp must first be inserted in the high voltage or secondary holder 2 and then inserted in the low voltage holder 3. If one end of the lamp is first inserted in the holder 3, the other end cannot be inserted in holder 2 because the distance between the opposing faces of the housings 6 and 30 is less than the length of the lamp. However, when one end of the lamp is first inserted in holder 2, this end of the lamp may be inserted a considerable distance into the socket due to the large amount of movement provided by the coiled spring 15. When the lamp is inserted a sufficient distance, the other end of the lamp can be inserted into recess 45 in holder 3 into which it is snapped by the pressure of the spring 15 in the holder 2. Thus, the circuit to the primary of the transformer is completed to energize the lamp operating circuit only after the lamp is fully mounted on the lamp fixture by first inserting it in holder 2 and then mounting it in holder 3.

To decrease the distance between the holders which is necessary for this operation, there has been provided at the periphery of recess 45 a series of notches 50 extending through both the housing 30 and the insulating member 33. The notches are of a width sufficient to accommodate contact pin 5. By this arrangement, spring 15 need not be compressed as great a distance as is necessary when such a notch is not provided. Employing the notch 50, the end of pin 5 need only clear the base of the notch so that holders 2 and 3 can be mounted closer together or the amount of movement provided for by spring 15 can be less than would otherwise be required in the absence of notch 50.

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

1. A lamp holder for a tubular discharge lamp having a contact pin at one end thereof, said holder comprising a base portion of insulating material having a flat bottom surface to provide for the mounting thereof, said base portion including a raised boss on the upper surface thereof having smaller dimensions in the plane of said bottom surface than the dimensions of said base portion, an insulating member having a semi-circular upper surface, said insulating member adapted to be positioned on said raised boss with the axis of said semi-circular surface parallel to the bottom surface of said base, an electrical contact secured to said base and extending upwardly therefrom in proximity to a wall of said insulating member, means for making electrical contact between a lamp contact pin and said base contact, said means including an opening positioned in a wall of said insulating member at the axis of said upper semi-circular surface, means for securing said insulating member to said base comprising a metal shell having an end opening conforming to the size of said raised boss and engageable therewith, said shell having a semi-circular upper portion conforming to the upper surface of said insulating member and engageable therewith to maintain said member fixed relative to said base, said shell further having a substantially circular opening having its center substantially on the axis of said upper surface of said member, and means for securing said shell to said base portion.

2. A lamp holder for a tubular discharge lamp having a contact pin at one end thereof, said holder comprising a base portion of insulating material having a flat bottom surface to provide for the mounting thereof, said base portion including a raised boss on the upper surface thereof having smaller dimensions in the plane of said bottom surface than the dimensions of said base portion, an insulating member having a semi-circular upper surface, said insulating member adapted to be positioned on said raised boss with the axis of said semi-circular surface parallel to the bottom surface of said base, said base supporting an electrical contact, means within said lamp holder for making electrical contact between a lamp contact pin and said base contact, means for securing said insulating member to said base comprising a metal shell having an end opening conforming to the size of said raised boss and engageable therewith, said shell having a semi-circular upper portion conforming to the upper surface of said insulating member and engageable therewith to maintain said member fixed relative to said base, said shell further hav-

ing a substantially circular opening having its center substantially on the axis of said upper surface of said member, and means for securing said shell to said base portion.

3. A lamp holder for a tubular discharge lamp having a contact pin at one end thereof, said holder comprising a metal housing open at the bottom and having in one wall thereof an opening for receiving one end of a lamp, a plate of insulating material closing said opening and having a recess therein for receiving an end of the lamp and an aperture therein for receiving the contact pin in said end, contact means within said housing behind said aperture for engaging said contact pin, a notch in the wall of said plate defining said recess and cooperating notch in said housing to accommodate said contact pin as the lamp is moved into operating position within said holder, a base member of insulating material secured to the open bottom of the housing and having a portion extending into said housing, and terminal means on said base electrically connected to said contact means.

4. A lamp holder for a tubular discharge lamp having a contact pin at one end thereof, said holder comprising a metal housing open at the bottom and having in one wall thereof an opening for receiving one end of a lamp, a plate of insulating material closing said opening, a projection extending inwardly from the wall of said housing and adapted to engage an edge of said plate to hold it in contact with said wall, said plate having a recess therein for receiving an end of the lamp and an aperture therein for receiving the contact pin in said end, contact means within said housing behind said aperture for engaging said contact pin, a notch in the wall of said plate defining said recess and cooperating notch in said housing to accommodate said contact pin as the lamp is moved into operating position within said holder, a base member of insulating material secured to the open bottom of the housing and having a portion extending into said housing, and terminal means on said base electrically connected to said contact means.

5. A lamp holder for a tubular discharge lamp having a contact pin at an end thereof, said holder comprising a hollow metal outer housing open at the bottom and having in one wall thereof an opening for receiving an end of a discharge lamp, an inner housing of insulating material within said casing having an open end communicating with the opening in said outer housing, a plate of insulating material slidably enclosed in said inner housing for closing said opening, and having a surface supporting a contact disk, a base member of insulating material secured to the open bottom of the outer housing and terminal means on said base electrically connected with said contact disk.

6. A lamp holder for a tubular discharge lamp having a contact pin at an end thereof, said holder comprising a hollow metal outer housing open at the bottom and having in one wall thereof an opening for receiving an end of a discharge lamp, an inner housing of insulating material within said casing having an open end communicating with the opening in said outer housing, a plate of insulating material slidably enclosed in said inner housing for closing said opening, and having a surface supporting a contact disk, a base member of insulating material secured to the open bottom of the outer housing, terminal means on said base, means for electrically connecting said terminal means with said contact disk, said means comprising a conductor bar extending upwardly along the inner rear wall of said inner housing and a spring member having one end in contact with said bar and the other end in contact with said contact disk.

7. A lamp holder for a tubular discharge lamp having a contact pin at an end thereof, said holder comprising a hollow metal outer housing open at the bottom and having in one wall thereof an opening for receiving an end of a discharge lamp, an inner housing of insulating material within said casing having an open end communicating with the opening in said outer housing, a plate of insulating material slidably enclosed in said inner housing for closing said opening, and having a surface contact supporting a contact disk, a base member of insulating material secured to the open bottom of the outer housing, and having a slot therein, a cooperating slot in the bottom portion of the inner housing, conducting means in said slots and, having one end secured to a bottom surface of said base member and the other extending upwardly along the inner rear wall of said inner housing, a spring member within the inner housing electrically connecting said conducting means to said contact disk, a slot in a bottom portion of the base member, and insulating means associated with said conducting means and comprising a strip of flexible insulating material having one end secured to the outer rear wall of the inner housing and the other engaging the slot in the bottom portion of the base member.

8. A lamp holder for a tubular discharge lamp having a contact pin at one end thereof, said holder comprising a base portion of ceramic material including a raised boss on the upper surface thereof, an open-ended cylindrical plastic housing adapted to be positioned on said raised boss with the axis of said cylindrical housing parallel to the upper surface of said base, an end plate of insulating material slideable within said cylinder to close said open end, spring means within said cylinder for urging said plate towards said open end, an electrical contact in said base, an electrical contact on said end plate, means including said spring for establishing electrical contact between said base contact and said end plate contact, said end plate having an opening therein engageable with said contact pin to establish contact between said pin and said plate contact, means for securing said cylinder to said base and for limiting the outward axial movement of said end plate comprising a metal shell having an open base conforming to the size of said raised boss and engageable therewith, said shell having a semi-cylindrical upper portion conforming to the size of said cylinder and engageable therewith to maintain said cylinder fixed relative to said base, said shell further having an opening registering with said end plate, said opening having a diameter smaller than that of said end plate to limit the outward axial motion thereof, and means for securing said housing to said base portion.

JOHN M. PISTEY.

REFERENCES CITED

The following references are of record in the file of this patent:

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Number	Name	Date
1,770,667	Hersee et al.	July 15, 1930
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