

Jan. 18, 1949.

C. H. HODGKINS

2,459,647

LAMP HOLDER FOR FLUORESCENT LAMPS

Filed Aug. 31, 1944

2 Sheets-Sheet 1

Fig. 1.

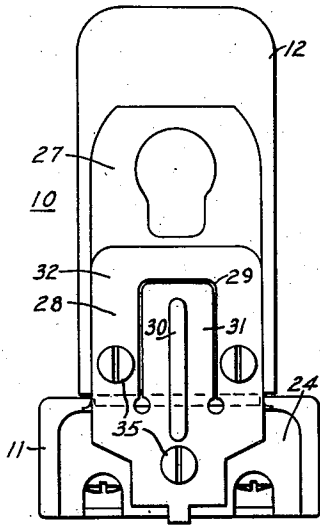


Fig. 2.

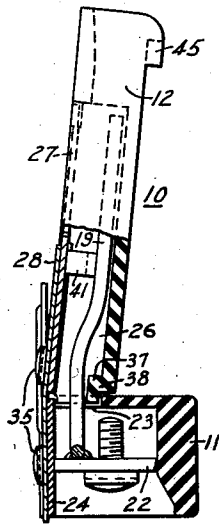


Fig. 3.

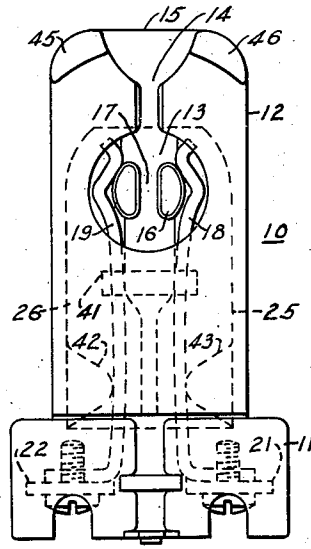


Fig. 4.

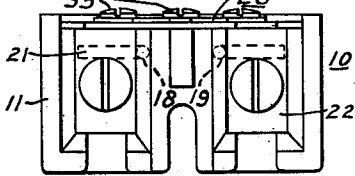


Fig. 7.



Fig. 8.

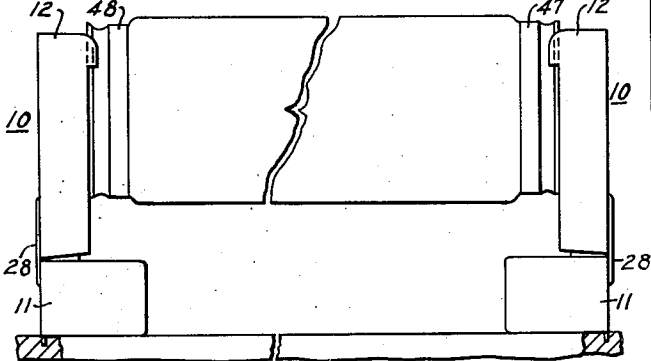


Fig. 5.

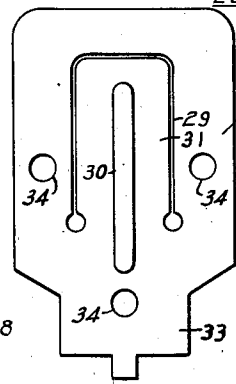
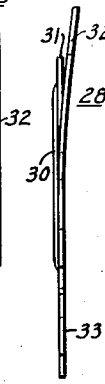


Fig. 6.



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2 Sheets-Sheet 2

Fig. 9.

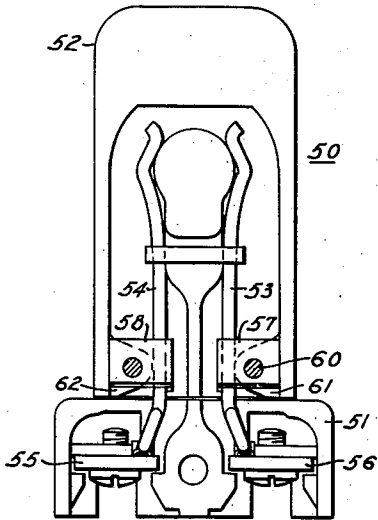


Fig. 10.

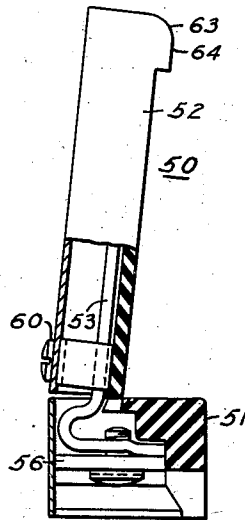


Fig. 11.

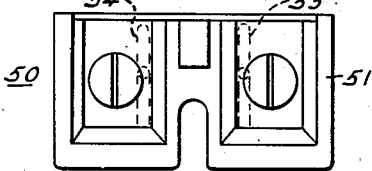


Fig. 12.

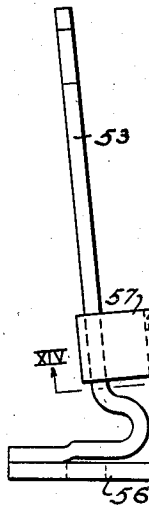


Fig. 13.

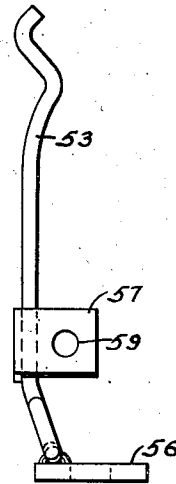
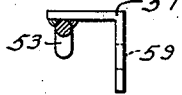


Fig. 14.



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LAMP HOLDER FOR FLUORESCENT LAMPS

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My invention relates, generally, to lamp holders and, more particularly, to lamp holders suitable for use with double-ended tubular lamps having spaced contact pins at the ends thereof, such, for example, as fluorescent lamps.

Heretofore, it has been the practice to utilize lamp holders of one-piece construction insofar as the main housing containing the flexible or resilient contact fingers is concerned. Such housings are usually made of an insulating material, such as a plastic, molded into the desired shape to provide a shell-type member open at the back and provided with a suitable slot arrangement in the face thereof to receive the lamp pins, the slots and upper ends of the contact fingers being so related as to releasably hold the lamp pins in their proper operating position.

Certain types of tubular lamps, such as 20 and 40 watt fluorescent lamps, have relatively short contact pins, and the depth of the lamp holders for use therewith is correspondingly shallow so that when the lamps are placed in end-to-end relation, there is a minimum spacing between the ends of the lamps, and, consequently, the interruption of the light-emitting surface is at a minimum. This short lamp pin and shallow holder makes it necessary for the fixture manufacturers to work to very close limits in the spacing of the holders in the fixtures so as to permit ready insertion of the lamps and still provide adequate mechanical support therefor.

While subsequent experience has shown that the close spacing of adjacent ends of the lamps is not as necessary or important as originally thought, there is such a large number of existing installations in use that it is undesirable from an economic point of view to make suitable changes in either the lamp pins or the present type of rigid lamp holders to overcome this disadvantage. Such changes would cause trouble from a replacement standpoint insofar as the fixtures in use are concerned.

Accordingly, my invention is directed to the solution of the problem of overcoming the necessity of the fixture manufacturers of having to work to close limits and still insure proper electrical contact between the lamp pins and the contact members of the holders and also provide adequate mechanical support to the lamps from fall-

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ing out of the holders due to improper lamping, etc.

The object of my invention, generally stated, is to provide a lamp holder of the character described which shall be of simple and economical construction, and which may be used to replace holders of different types now in use in lighting fixtures.

A more specific object of my invention is to provide a lamp holder which shall function to accommodate itself to the spacing between the ends of the contact pins of a tubular lamp so that the mounting space between holders need not be held within relatively close limits to insure proper electrical contact and proper mechanical support for the lamp.

A further object of my invention is to provide for positively supporting an elongated tubular lamp and holding the lamp in its proper operating position regardless of whether or not it has been properly seated or inserted into the holders.

Another object of my invention is to provide a lamp holder wherein the upright or lamp-supporting portion of the housing may move or tilt relative to the base portion and is normally resiliently biased in a predetermined direction to a predetermined position.

A further object of my invention is to provide a lamp holder wherein the base and lamp-supporting portions of the housing are attached together by means of a spring member which also functions to limit the backward movement of the lamp-supporting portion away from the end of the lamp.

These and other objects of my invention will become more apparent from the following detailed description of two embodiments thereof when read in conjunction with the drawings, wherein:

Figure 1 is a back view in elevation of a lamp holder embodying the principal features of my invention;

Fig. 2 is a side view in elevation of the lamp holder of Fig. 1 partially broken away to show the interior of the housing;

Fig. 3 is a front view in elevation of the lamp holder of Fig. 1;

Fig. 4 is a bottom view of the holder of Fig. 1;

Fig. 5 is a front view in elevation of the spring member of the holder of Fig. 1;

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Fig. 6 is a side view in elevation of the spring member;

Fig. 7 is an end view thereof;

Fig. 8 is a side view in elevation of a lamp and a pair of lamp holders constructed in accordance with one embodiment of my invention showing how the holders may be utilized in supporting a lamp in either an upright position, as shown or in any other desired position;

Fig. 9 is a back view in elevation showing a modification of my invention;

Fig. 10 is a side view in elevation of the lamp holder of Fig. 9;

Fig. 11 is a bottom view of the lamp holder of Fig. 9;

Figs. 12 and 13 are elevational views of the contact fingers or springs of the lamp holder of Fig. 9; and

Fig. 14 is a sectional view taken along line XIV—XIV of Fig. 12.

Referring now to the drawings, the lamp holder shown in Figs. 1 through 8 comprises, generally, a shell-type housing 10 of suitable insulating material formed in two separate main parts, one of which is mounted upon the other. The lower part 11 serves as a base portion to support the upright or lamp-supporting portion 12 and also as a mounting for the contact fingers of the holder.

In this embodiment of the invention, the lamp-supporting portion 12 of the housing is constructed in somewhat the same general manner as that portion of the housing of a rigid lamp holder commonly in use. In other words, an annular opening 13 is provided in the face of the portion 12, and a slot 14 extends from the opening to the outer or upper edge 15 of the housing, as shown. There is disposed within the central opening a guiding stud 16 which is slotted at 17 in alignment with the slot 14. As will be readily understood, this slot arrangement is for the purpose of receiving the spaced contact pins of the lamp, not shown, in a downward direction until one pin reaches the lower edge of the opening 13, and to permit rotation of the pins within the opening 13 into engagement with the upper ends of the flexible contact members or springs 18 and 19 disposed adjacent the opening 13.

The base portion 11 of the housing is recessed, as shown in Fig. 2, to receive the terminal portions 21 and 22 of the contact members 18 and 19 which may be anchored within the base portion in any suitable manner. The base portion 11 is also provided with an upper or top opening 23 through which the shank portions of contact fingers 18 and 19 extend in an upward direction. The base portion 11 is also open at the bottom, as shown, and also at the back, and is provided with a back cover plate 24.

The lamp-supporting portion 12 of the housing is also open at the back and is provided with suitable recesses 25 and 26 to receive the upper ends of the contact fingers 18 and 19. The back opening of this portion of the housing is closed by means of a cover plate 27. It will also be observed that the bottom of the housing portion 12 is open and in communication with the upper opening 23 in the base portion 11.

In order to provide for a limited amount of relative movement between the two separate portions 11 and 12 of the housing, provision is made for connecting or attaching them together by means of a suitable flexible joint. In this particular embodiment of the invention, the connection is made by the use of a spring member

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28 connecting the two portions of the housing together, as best shown in Figs. 1 and 2. It is to be understood, however, that any other suitable connecting means may be utilized for this purpose.

It will be observed that the spring member 28 is formed of flat material and is cut by means of a U-shaped piercing 29 so as to provide two interconnecting operating portions 31 and 32. As shown best in Fig. 6, the lower end 33 of the spring member is relatively straight and is in alignment with the operating portion 31. The upper end or operating portion 32 is slightly bent or set with respect to the lower end. The spring member is provided with suitable openings 34 for receiving the screws 35 for attaching it to the two separate portions 11 and 12 of the housing, as shown in Fig. 1.

It will be noted that the upper screws 35 extend through spaced legs of the portion 32 which causes it to become the flexible connecting portion, and the portion 31 of the spring member is ineffective in the joining of the two housing portions together.

In view of the fact that portions 31 and 32 of the spring member 28 have a permanent set, as shown in Fig. 6, the normal position of the upright portion 12 of the housing will be as shown in Fig. 2. In other words, this portion of the housing is tilted with respect to the base portion 11 but is flexibly joined thereto so that it may be moved backwardly or to the left, as viewed in the drawings, when the lamp is inserted.

The upright or straight portion 31 of the spring member 28 serves as a limiter or stop to limit the backward movement of the housing portion 12, the forward movement thereof being determined by the set of the spring member 28 and also by the manner in which the lower end of the housing 12 is formed and positioned within the opening 23 of the base portion 11. In this respect, it will be noted that the lower end of the housing portion 12 is provided with an offset portion 37 extending inwardly to engage the edge of the opening 23 and to form a notch or shelf 38 adjacent the inner edge of the opening 23.

If necessary, the operating portion 31 of the spring member 28 may be strengthened or stiffened by a rib 30 formed lengthwise therein, as shown in Fig. 5. This permits the use of a more flexible material for joining the two housing portions 11 and 12 together and still provides the necessary strength in the operating portion 31 of the spring member to effectively limit the backward movement of the housing portion 12.

In view of the fact that there is relative movement between the two portions 11 and 12 of the housing, the contact fingers 18 and 19 in this instance are made from round resilient current-conducting material, as shown, and are so located within the housing that they will follow the movement of the lamp-supporting portion 12 thereof without taking a permanent deformation or in any way interfering with the resilience or flexibility of the holder.

As shown in Fig. 2, the contact fingers are positioned between the front face of the housing portion 12 and a lug portion 41 which provides for always maintaining the upper ends of the contact fingers closely adjacent the face of the housing portion and the opening 13. The contact fingers are also positioned between the opposed lug portions 42 and 43 so as to give them

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the proper amount of tension to insure good electrical contact between them and the contact pins of the lamp.

Since the contact fingers have their lower ends rigidly attached to their terminal portions which are securely anchored in the base portion 11, they also have a spring effect urging the housing portion 12 forwardly and resisting its backward movement to some extent depending upon the stiffness of the fingers.

It will be apparent from Fig. 8 that when two of the lamp holders of my invention are mounted, as shown, to support a double-ended tubular lamp, the housing portions 12 will be urged inwardly toward the ends of the lamps so as to normally support the lamp in a positive manner.

The lamp holder of my invention also provides for positively locking the lamp within the holders regardless of whether or not the lamp has been properly inserted. This result is accomplished by the use of a pair of projecting lugs 45 and 46 formed on the face of the housing portion 12, as shown in Figs. 2 and 3. These lugs are positioned on opposite sides of the entrance portion of the slot 14 and extend outwardly or forwardly a sufficient distance, as shown in Figs. 2 and 3 to mechanically engage the end bases 47 and 48 of the lamp. In other words, as shown in Fig. 8, these two lugs on each of the lamp holders project over the ends of the lamp, and since the upright portions of the holders are normally biased toward each other against the opposite ends of the lamp, the lamp is securely locked in position.

As will be observed from Fig. 8, the two lamp holders used with each lamp are mounted in predetermined spaced relation in the same manner that conventional holders are mounted. It will be apparent, however, that since the holders are flexible that the mounting space therebetween need not be nearly so accurate as before as the movement of the lamp-supporting portions 12 of the holders toward and away from each other is sufficient to compensate for considerable inaccuracy in mounting.

In view of the fact that the housing portions 12 of the holders are normally urged toward each other, positive contact between the contact pins of the lamp and the contact fingers of the holders is insured at all times. This, together with the functioning of the locking lugs 45 and 46 on the face of the housing, not only insures positive electrical contact, but also insures that the lamp will not accidentally drop from the holders.

In the embodiment of my invention shown in Figs. 9 through 14, the housing 50 is formed in two parts, one part 51 constituting the base portion of the housing, and the other part 52 constituting the upright or lamp-supporting portion thereof. This housing is constructed in generally the same manner as that of the embodiment shown in Figs. 1 through 8 and is provided on its face with suitable slots, not shown, for receiving the contact pins of the lamp.

This embodiment of the invention, however, differs from the other in that the flexibility between the parts 51 and 52 is obtained by utilizing the contact springs or fingers instead of a separate spring member as in the other embodiment.

In this instance, the contact springs 53 and 54 have their lower ends attached to terminal portions 55 and 56 which are securely anchored in the base portion 51 by means of suitable slots formed therein.

In order to cause the contact springs 53 and 54 to also function as a flexible hinge between the

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two separate parts of the housing, each contact spring is provided with a clamp member rigidly secured to the shank portion thereof. Thus, the contact spring 53 is provided with a clamp member 57 and the contact spring 54 with a clamp member 58. As shown best in Fig. 14, these clamp members are L-shaped and are provided with an opening 59 to receive a suitable attaching screw 60.

As shown in Fig. 9, the upper portion 52 of the housing is provided with oppositely disposed internal lug portions 61 and 62, the outer ends of which are engaged by the contact springs and function as a pivot or fulcrum therefor. These lugs are utilized for the purpose of mounting and attaching the clamp members of the contact springs, thus rigidly securing the contact springs to the upper portion of the housing.

The position of the contact springs with respect to the front face of the upper portion of the housing is clearly shown in Fig. 10. The shape of the clamps is such as to maintain their associated contact springs in proper position with respect to the slots in the face of the housing, and at the same time permit the contact springs to function as resilient hinge members between the two parts of the housing.

As shown in Figs. 10, 12, and 13, the contact springs are so shaped as to normally hold the upper portion 52 of the housing in a forwardly tilted position with respect to the base portion 51.

This embodiment of the invention also provides for positively locking the lamp within the holders regardless of whether or not the lamp has been properly inserted. In other words, the holder is provided with projecting lug portions 63 and 64 on the face thereof which function in the same manner as the projecting lug portions 45 and 46 of the other embodiment.

In view of the foregoing detailed description of two embodiments of my invention, it will be apparent that I have provided lamp holders for use with double-ended tubular lamps of various types which differ considerably from the standard or conventional holders now in use. I have provided flexible holders which are of simple construction and which are economical to produce. The holders of my invention may be used interchangeably with any holder of the same size now in use in fixtures of all types. The use of my holders may in many instances improve the fixture and reduce maintenance expense thereon in those fixtures where the lamp holders have not been properly spaced during manufacture.

While I have shown and described two specific embodiments of my invention, it will be apparent to those skilled in the art that modifications and changes may be made therein without departing from the principles of the invention.

I claim as my invention:

1. A lamp holder for use with tubular lamps having spaced contact pins at the ends thereof comprising, a mounting base portion having contact terminals mounted therein and an opening in the top thereof, a separate lamp-supporting portion mounted upon the base portion over the top opening, a pair of flexible contact fingers mounted upon the contact terminals in the base portion and having free ends extending into the lamp-supporting portion through said opening to be engaged by the lamp pins, and a leaf spring member mechanically connecting the base and lamp-supporting portions together, said spring member serving as a flexible joint between said portions and functioning to bias the lamp-supporting por-

tion to a tilted position with respect to the base portion.

2. A lamp holder for use with double-ended tubular lamps having spaced contact pins at the ends thereof comprising, a generally hollow housing of insulating material formed in two main portions one of which serves as a base portion and the other as a lamp-supporting portion, elongated flexible contact fingers mounted within the housing with corresponding ends attached to the base portion and their free ends extending into the lamp-supporting portion disposed to engage the lamp pins when inserted into the holder, and a spring member connecting said base and lamp-supporting portions together, said spring member being in the form of a leaf spring with its upper end having a flexible portion attached to the lamp-supporting portion of the housing and bent over slightly with respect to its lower end and a straight unbent portion serving as a stop member, whereby the lamp-supporting portion of the housing is normally biased to a forwardly tilted position with respect to the base portion and its backward movement limited by the unbent portion of the spring.

3. A lamp holder for use with double-ended tubular lamps having contact pins at the ends thereof comprising, a housing of insulating material formed in two main portions one of which serves as a base portion and the other as a lamp-supporting portion, elongated contact fingers mounted within the housing disposed to engage the lamp pins, and a flat spring member attached to the back of the base portion and the lamp-supporting portion to resiliently retain the lamp-supporting portion in an upright position on the base portion, said spring member having one portion thereof bent intermediate its ends to normally tilt the lamp-supporting portion in one direction with respect to the base portion and having an integral unbent free portion disposed to limit the movement of the lamp-supporting portion in the opposite direction by engaging the back of the lamp-supporting portion.

4. A lamp holder for use with double-ended tubular lamps comprising, a housing formed in two main portions one of which has a top opening and serves as a base portion and the other of which has a bottom opening and serves as a lamp-supporting portion, said lamp-supporting portion being positioned on said base portion with said openings in registering relation and having at least one protruding lug member formed on one face hereof adjacent its upper end, elongated contact fingers mounted on the base portion and extending through said opening into the lamp-supporting portion, and a spring member mechanically connecting said base and lamp-supporting portions together and normally biasing the lamp-supporting portion to a tilted position with respect to the base portion, said protruding lug portion serving to mechanically lock the lamp into the socket.

5. A lamp holder for use with double-ended tubular lamps comprising, a housing formed in two main portions one of which serves as a base portion and the other as a lamp-supporting portion, said lamp-supporting portion having a slot in one face thereof adjacent its upper end to receive the contact pins of a lamp and having a pair of lug portions formed on said one face at its upper end on either side of said slot, flexible contact fingers mounted within the housing having their upper ends disposed adjacent the slot, and a flat spring member connecting the base

and lamp supporting portions together and normally biasing the lamp-supporting portion to a tilted position with respect to the base portion.

6. A lamp holder for use with double-ended tubular lamps having spaced contact pins at the ends thereof comprising, a housing of insulating material formed in two main portions one of which serves as a base portion and the other as a lamp-supporting portion, said base portion having a top opening over which the lower end of the lamp-supporting portion is positioned in an upright manner, said lamp-supporting portion being open at the bottom and having a slot in one face thereof to receive the contact pins of the lamp, a pair of elongated resilient contact fingers mounted within the housing with their lower ends anchored to the base portion and with their upper ends disposed adjacent said slot, spring means connecting said base and lamp-supporting portions together and normally biasing the lamp-supporting portion to a tilted position with respect to the base portion, said lamp-supporting portion having lug portions formed thereon at its upper end on the face thereof containing the slot adapted to mechanically engage the end of the lamp.

7. A lamp holder for use with double-ended tubular lamps comprising, a hollow housing formed in two separate parts one of which serves as a mounting base portion and the other as a lamp-supporting portion, flexible contact members mounted in the housing having one end thereof attached to the base portion and the other free end extending into the lamp-supporting portion for engagement with the lamp pins, and spring means mechanically connecting the base and lamp-supporting portions of the housing together to provide a flexible hinge connection and permit relative lateral movement therebetween in one plane of movement only, said spring means normally functioning to resiliently hold the lamp-supporting portion in a tilted position with respect to the base portion and permit backward movement thereof in said one plane of movement.

8. A lamp holder for use with tubular lamps having spaced contact pins at the ends thereof comprising, a hollow base portion having an opening in the top thereof, a separate hollow lamp supporting portion mounted on the base portion over the top opening, a pair of elongated resilient contact members having corresponding ends attached to the base portion and extending into the lamp supporting portion through the opening in the base portion with their opposite free ends positioned to be engaged by the lamp pins, and connecting members rigidly connecting the contact members intermediate their ends to the lamp supporting portion, whereby the contact members also function as a resilient hinge connection between the base and lamp supporting portions.

9. A lamp holder for use with tubular lamps having spaced contact pins at the ends thereof comprising, a hollow base portion having an opening in the top thereof, a separate hollow lamp supporting portion mounted on the base portion over the top opening, a pair of elongated resilient contact members having corresponding end terminal portions rigidly secured within the base portion and their opposite free end portions extending into the lamp supporting portion through the top opening and positioned to be engaged by the lamp pins, and a clamp member rigidly secured to each contact member inter-

mediate its ends and detachably secured to the lamp supporting portion, said contact members being shaped to normally hold the lamp supporting in a tilted position with respect to the base portion, whereby the contact members also function to mechanically hinge the base and lamp supporting portions together and provide for a limited hinging movement therebetween in one plane of movement only.

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