Jan. 13, 1959 J. M. PISTEY 2,869,105

FLUORESCENT LAMPHOLDER WITH SCREWLESS TERMINALS

Filed Nov. 21, 1955

Fig. 1.

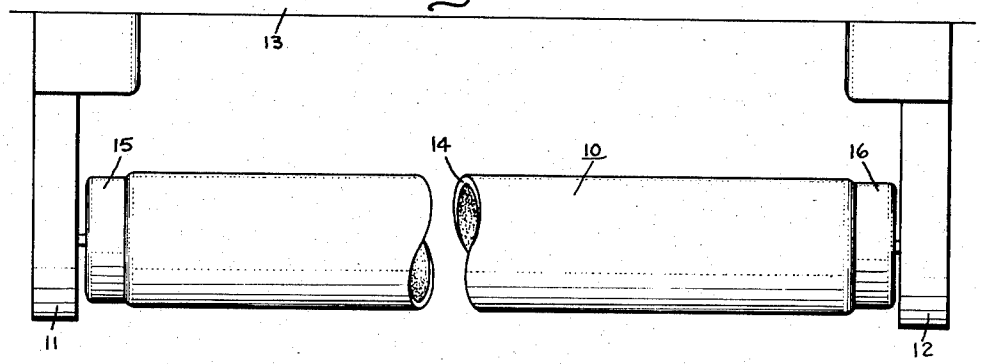


Fig. 2.

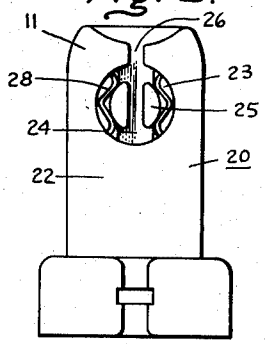


Fig. 3.

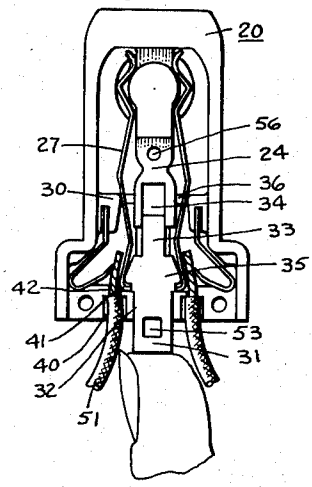


Fig. 4.

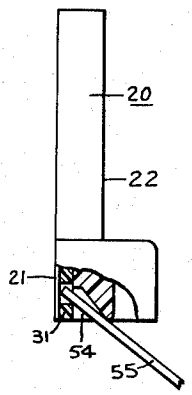


Fig. 5.

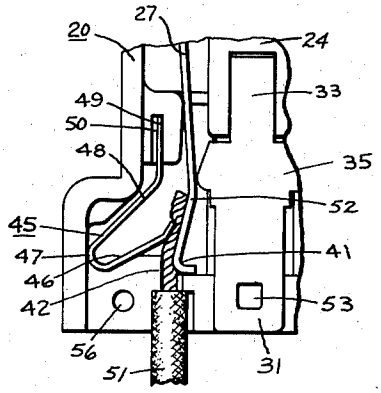
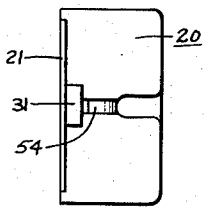


Fig. 6.



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FLUORESCENT LAMPHOLDER WITH SCREWLESS TERMINALS

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Application November 21, 1955, Serial No. 548,161

4 Claims. (Cl. 339—174)

The present invention relates to lampholders and particularly lampholders for double-ended electric discharge lamps, commonly known as fluorescent lamps.

In the past it has been common practice to provide screw terminals for making electrical connections between the contacts of the lampholders and the lead wires of a fluorescent fixture. This invention involves an elimination of screw terminals and the substitution of quick-connect terminals that are designed to reduce the manufacturer's time in wiring a fluorescent fixture.

This invention is related to that of my copending application Serial No. 465,499 which issued as Patent No. 2,729,799 on January 3, 1956 and is assigned to be the same assignee as is the present invention.

My invention is illustrated as being embodied in a bi-pin fluorescent lampholder having a pair of symmetrical contacts which are mounted in the base of the holder in edgewise relation while being separated by an insulating partition. The lower end of each contact is slightly rounded inwardly toward the other and a manually operated plunger is associated with the partition to force the two contacts apart as the plunger is pressed into the housing. A pair of lead-wire-receiving openings are formed in the bottom wall of the base, each opening having an edge substantially in alignment with the outer surface of the lower end of the related contact. An opposite edge of each opening has an extension forming an abutment so that when the contacts are spread apart the lead wires will be clamped simultaneously against the related abutments. In order to increase the holding force on the lead wires, a spring locking tongue of strip material is mounted in the base with a wire-engaging portion, an intermediate offset arm and an anchoring portion fixedly mounted in the housing. Thus, when the contacts are spread apart, the wire is likewise clamped against the free edge of the locking tongue. As a pulling force is exerted on one of the wires, the wire-engaging portion of the locking tongue will tend to pivot toward the wire and increase the resistance to the removal of the wire from the lampholder.

My invention is especially advantageous since the majority of fluorescent fixtures are at the present time supplied with stranded wire, for it allows the insertion of the stranded wire into the housing without having to deflect the locking tongue to the side which might tend to disrupt the bare strands of the wire. Likewise, it will be appreciated that there is a double clamping force exerted on each wire, and that both lead wires are clamped simultaneously by the single action of forcing the plunger into the housing.

The principal object of this invention is to provide a lampholder and particularly a fluorescent lampholder with quick-connect terminals, thereby eliminating the usual screw terminals.

A further object of this invention is to provide a fluorescent lampholder with a manually operated plunger that will simultaneously spread the contacts of the lampholder apart and into clamping engagement with the lead wires.

A further object of this invention is to provide a fluorescent lampholder with a spring locking tongue for each contact so that a wedging force is exerted on the lead wire which increases in proportion to the pulling force exerted on the wires.

My invention will be better understood from the following description taken in connection with the accompanying drawing and its scope will be pointed out in the appended claims.

Figure 1 is a side elevational view showing the general arrangement of a fluorescent lamp supported between a pair of identical lampholders embodying my invention.

Figure 2 is a front elevational view of one of the lampholders of Figure 1.

Figure 3 is a rear view of the lampholder of Figure 2 with the back cover removed and the plunger shown in its outermost position.

Figure 4 is a side elevational view partly in cross-section showing the method of prying the plunger outwardly of the housing to release the wires.

Figure 5 is a partial view on an enlarged scale of the lower left-hand corner of Figure 3 showing the plunger in the fully locked position.

Figure 6 is a bottom plan view of the lampholder of Figure 4 showing the access opening for the lower end of the plunger.

Referring in detail to the drawing, Figure 1 shows a conventional bi-pin fluorescent lamp **10** supported at opposite ends in the similar lampholders **11** and **12** which are constructed in accordance with my invention. The lampholders are in turn supported from a reflecting surface **13** forming part of a lighting fixture. The lamp **10** has a tubular glass envelope **14** provided with bases **15** and **16**, each of which has a pair of outwardly extending contact pins (not shown) to be supported in the lampholders **11** and **12**. Although I have chosen to illustrate my invention as being incorporated in a bi-pin fluorescent lampholder, it should be recognized that the quick-connect terminals of this invention are of general utility whenever it is necessary to connect one or more lead wires to the contacts of a wiring device.

Turning now to a consideration of the lampholder **11**, attention is directed toward Figures 2, 3 and 4 which best illustrate the details of construction. The present lampholder comprises a recessed base member **20** and a cover member **21** for closing the back of the holder to form a hollow housing of suitable insulating material. The front face **22** of the base has at its upper end a circular opening **23** that communicates with the interior of the holder. A vertical partition **24** formed centrally within the base **20** has a split cylindrical embossment **25** centrally located within the circular opening. A vertical slot **26** at the top of the base **20** provides an opening through which a pair of vertically aligned contact pins on the lamp base may be inserted until the lower pin rests on the bottom edge of the circular opening **23**.

The present holder is provided with a pair of symmetrical contacts **27** in flatwise relation to each other for making electrical connection with the contact pins extending from the ends of the lamp. These contacts **27** are separated by the partition **24** and are provided at their upper ends with inwardly facing V-shaped notches **28** which are located at either side of the split embossment **25**. Accordingly, after inserting the contact pins of the

lamp through the slot 26 until the lower pin rests on the edge of opening 23, a twisting force applied to the lamp will move the contact pins against the contacts 27 and spread them apart until the contact pins slip into the V-shaped notches 28, which is the normal lamp-supporting position.

I have described above more or less conventional lampholder construction, it being understood that no provision has been made as yet for attaching the lead wires to the contacts. Looking at Figure 3 into the back of the base 20, it will be seen that the mid-portions of the contacts 27 are bearing against the protrusions 30 which extend inwardly of the base from the side walls and hold the contacts under compression. This means that the contacts have to be deformed slightly in order to fit them into the positions as shown in Figure 3. The insulating partition 24 is undercut at its lower end to receive the plunger 31 which extends through the opening 32 in the bottom wall of the bases and is further guided by a projection 33 at its inner end seated in an open-ended slot 34 in the partition. The central portion of the plunger has a pair of tapered wings or side extensions 35 which converge inwardly of the housing and serve to spread the lower ends of the contacts apart when the plunger is pressed inwardly.

A small rib 36 is likewise formed in the base between the protrusions 30 and the partition 24 to engage in a notch (not shown) in the edge of the contact 27 to assist in holding the contact in place so that it is restricted to move only toward and away from the partition 24 rather than vertically in the housing. A pair of lead-wire-receiving openings 40 are present in the bottom wall of the base and equally spaced from the plunger 31. The lower end 41 of the contact 27 is rounded and opposed to an abutment 42 which is in effect an extension of one side edge of the opening 40.

In the enlarged view of Figure 5, a spring locking tongue 45 of strip material is shown as including a tongue portion 46 a re-entrant end 47, an offset arm 48 and an anchoring portion 49 which is seated in slot 50 of the protrusion 30 in the base. Likewise, the re-entrant end 47 is located in the corner formed by the side wall and the bottom wall of the base so that the tongue portion 46 may fulcrum therefrom. Thus, it will be readily understood by one skilled in this art that there is a spacing provided between the free end of tongue 46 and the contact 27 so that a stranded lead wire 51 may easily be inserted therebetween without meeting any obstructions. After both wires are in place, the plunger 31 is forced into the housing while its tapered wings 35 spread the contacts 27 apart until the plunger reaches its final position where the wings extend slightly beyond an inwardly directed bend or deformation 52 in each contact. Thus, the plunger will be held within the housing by the spring force exerted by the contacts 27. Also, it is quite clear that the lower end 41 of the contacts will clamp the wire against the abutment 42 as well as the free end of the locking tongue so that when a pulling force is exerted on the wire, the tongue 46 will tend to be carried along by the wire and pivot so that it wedges the wire tighter against the contact and increases the resistance to the removal of the wire.

In order to remove the wires from the housing, the plunger is provided with an aperture 53 in its outer end, as seen in Figures 3 and 4, and an access opening 54 is made in the bottom of the base 20 so that a tool such as rod 55 may be inserted into the plunger opening 53 to obtain a sufficient mechanical advantage to pry the plunger outwardly of the housing. The wings 35 of the plunger serve the secondary function of preventing the plunger from becoming displaced from the housing for the wings serve as a stop means to limit the outward movement of the plunger.

It is an easy matter to assemble this lampholder for all of the parts may be assembled in the base from one side before the cover is installed. As an example, the spring locking tongues 45 are anchored in the slots 50 and seated in the corners formed by the side and bottom walls of the base. Then the contacts 27 are dropped into position and the plunger 31 is assembled therebetween. Threaded openings 56 are formed in the partition 24 and in the bottom wall of the base so that the cover 21 may be placed over the back of the base and fastened by suitable screw means (not shown) as is well understood in this art. It should also be appreciated that the plunger 31, contacts 27 and the locking tongues 45 all have back surfaces which are flush with the partition 24, protrusions 30 and bottom wall of the base so that the cover 21 serves to support them rigidly in the base.

Modifications of this invention will occur to those skilled in this art; therefore, it is to be understood that this invention is not limited to the particular embodiment disclosed but that it is intended to cover all modifications which are within the true spirit and scope of this invention.

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

1. A wiring device comprising a hollow housing of insulating material supporting a similar pair of movable contact strips in flatwise relation to each other, an insulating partition of the housing separating the two contact strips along the length thereof and also serving as a guide for a manually-operated plunger which extends through an opening in the bottom wall of the housing, the plunger having side extensions at its inner end that hold the plunger from being removed through the bottom wall of the housing and also spread the lower ends of the two contacts apart when the plunger is forced into the housing, a lead wire-receiving opening in said bottom wall on the outer side of the lower end of each contact, and a separate spring locking tongue adjacent the lower end of each contact strip, each tongue being anchored at one end in the housing so that the free end of the tongue is in spaced relation with the adjacent contact when the plunger is in its outer position, the free end of the tongue also being directed at an acute angle toward its respective contact and away from the nearest wire-receiving opening to assist in guiding the lead wires into the device, whereby a lead wire may be inserted between each locking tongue and its related contact strip and the plunger pressed into the housing to spread the contacts apart and force the lead wires against the free ends of the locking tongues.

2. A wiring device as recited in claim 1 wherein the lower portion of each contact strip extends below the free end of the related locking tongue and presses the lead wire against an abutment formed in the housing after the contact strips are spread apart by the inward movement of the plunger.

3. A wiring device as recited in claim 2 wherein each contact strip has an inwardly directed portion which engages behind the related side extension of the plunger in its innermost position, and serves as a releasable spring force holding the plunger in place against accidental withdrawal.

4. A wiring device comprising a hollow housing of insulating material supporting a similar pair of movable contact strips in flatwise relation to each other, a manually-operated plunger extending through an opening in the bottom wall of the housing and between the lower portion of the contacts, the plunger having side extensions at its inner end that hold the plunger from being removed through the said opening in the bottom wall, each side extension having an inclined edge that converges inwardly toward the other and away from the bottom wall of the housing, each contact strip having an inwardly directed portion that engages behind the related side extension of the plunger in its innermost position, whereby each contact serves as a releasable spring force holding the plunger in place against accidental withdrawal, and

a lead wire-receiving opening in the bottom wall of the housing on the outer side of the lower end of each contact, so that when lead wires are inserted into the opening of the device and the plunger is forced into is innermost position, the lower ends of the two contacts will be spread apart and brought into clamping engagement with the lead wires.

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