March 7, 1950 B. T. JORDAN 2,499,507

FLUORESCENT TUBE SOCKET

Filed July 6, 1945

Fig. 1.

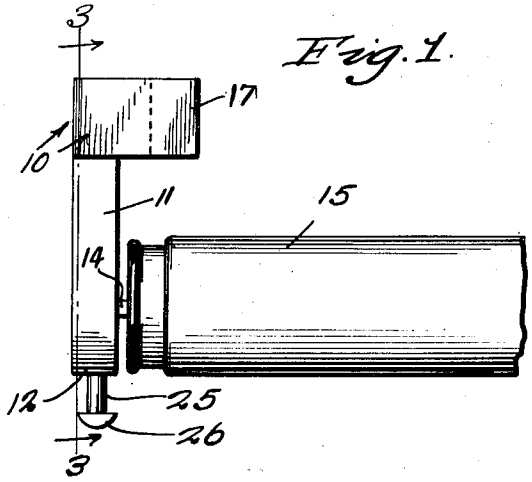


Fig. 5.

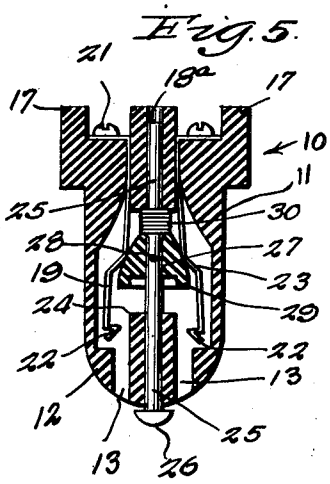


Fig. 2.

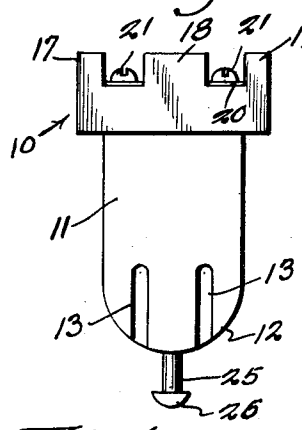


Fig. 3.

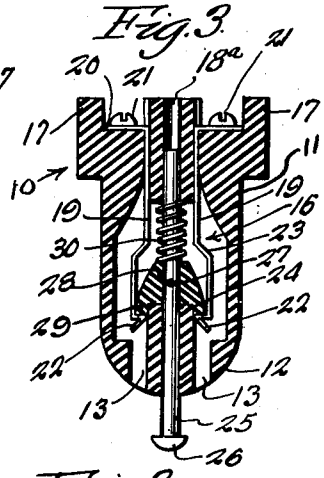


Fig. 4.

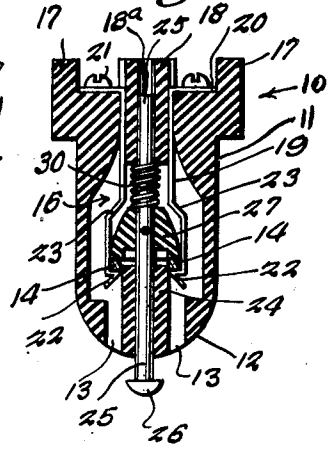


Fig. 6.

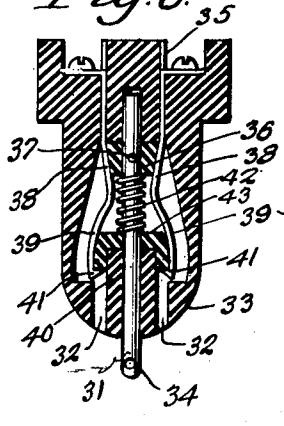
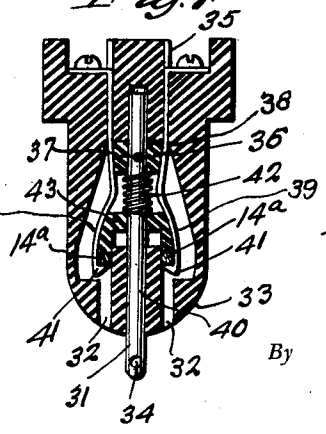


Fig. 7.



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FLUORESCENT TUBE SOCKET

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3 Claims. (Cl. 173—328)

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The present invention relates to sockets such as are especially, but not necessarily, adapted for supporting and supplying current to opposite pronged ends of present day fluorescent tubes, and the primary purpose of the invention is to structurally, functionally and otherwise improve on sockets such as would be considered as pertaining to this same category of invention.

Briefly, the preferred type of socket herein under consideration is characterized by an elongated body of general rectangular form, this having a curved outer end forming a portion of the perimeter and the latter being provided with spaced parallel slots to permit easy insertion and removal of the tube prongs. The body is formed with an internal cavity and in this cavity is provided mechanism including resilient contact fingers, the latter being constructed to constitute detents, the prongs of the tube coacting with the detents, and spring-pressed means being provided to force the prongs into satisfactory electrical contact with said detents.

In carrying out the principles of the invention, I adopt and use a contact-equipped body of the aforementioned type and provide therein a reciprocatory pin or plunger which constitutes an available operating member, and this is forced out by a spring and held in a normal position and is provided with a novel retainer which presses the prongs of the tube against the terminals forming the detents on the contact fingers.

Other objects, features and advantages of the invention will become more readily apparent from the following description and the accompanying illustrative drawings.

In the drawings, wherein like numerals are employed to designate like parts throughout the views:

Figure 1 is an elevational view showing a fragmentary end portion of a conventional prong-equipped fluorescent tube and illustrating how it is mounted in the improved safety-type socket.

Figure 2 is an inside elevational view of the socket, that is, a view of the same seen in Figure 1 observing it in a direction from right to left.

Figure 3 is a section through the socket, this being on the plane of the line 3—3 of Figure 1.

Figure 4 is a view like Figure 3 showing the prongs held in place and locked against accidental displacement.

Figure 5 is also a view like Figure 3 (the latter showing the structure when it is closed and empty) showing the structure open, empty and ready for the tube change.

Figure 6 is a central longitudinal sectional

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view showing a modified form of the invention with the parts closed and the socket empty.

Figure 7 is a view like Figure 6, but showing the prongs of the tube fastened in place.

Referring now to the drawings by distinguishing reference numerals, the socket comprises a unitary body of appropriate material and dimensions, the same being suitably enlarged at one end, as indicated at 10, and of elongated form, this being the body, as at 11. The marginal portion of this is such that the outer end is rounded or of arcuate form, as at 12. This forms the aforementioned crown. In the inner side I provide spaced parallel slots 13 for insertible and removable accommodation of the conventional prongs 14 on the regular or standard fluorescent tube 15. On the interior is a cavity 16 to accommodate the contact and retaining elements. At the enlarged end 10 of the structure are outer lugs 17 between which is a central lug 18, the latter being fashioned into a guide, this by way of the bore 18a or slot, which extends therethrough. On opposite sides of this guide I provide inlets for the limbs 19 of the duplicate current-conducting and contact fingers. The outer ends of these are bent laterally, as at 20, and fastened down by screws or the like 21. The free ends are of V-shaped form, as indicated at 22, and constitute prong binding detents. The intermediate portions are flared laterally outward, as at 23. That portion of the body between the slots 13 is fashioned into a guide 24 which coacts with the guide 18a in accommodating the plunger 25. This plunger is in the form of a pin whose inner end slides in the guide 18a and whose outer end projects beyond the crown 12 and is provided with a suitable actuating knob or head 26. A substantially conical follower 27 is fastened by a pin 28, or otherwise mounted, on the shank of the plunger, and this follower is fashioned into a cup, as at 29 (see Fig. 5), said cup fitting down snugly over the adjacent end portion of the guide 24. There is a spring 30 on the shank of the plunger surrounding same and interposed between the follower 27 and the guide 18a. Thus, it will be seen that in Figure 3 we see the socket closed and empty. In Figure 5, we see the same socket open and empty, this ready for tube change. In Figure 4, we see the socket loaded or charged, that is, with the prongs 14 in place and the tube ready for use. By pressing in on the plunger head 26, the follower, which is substantially conical, then becomes an expander and presses against the lateral bends 23 and spreads the contact fingers apart, as shown in Figure 5.

This renders the socket ready for release of the prongs. The prongs are slipped into proper anchoring places, this by way of said slots 13, thus moving the detents in outward directions and the follower in an upward direction until said prongs are properly locked in and by the detents and the spring returns the follower 27 to the position shown in Figure 4. Here it directly engages the prongs 14 and forces them into form contact with the V-shaped detents 22.

In the form of the invention just described, the plunger is of the push type, that is, the type in which the head 26 is pushed in in order to release the fingers by way of the expander 27. In Figures 6 and 7, a slight modification, based on the same principle of construction, is shown, and this is of the so-called "pull" type. It is sufficient, therefore, to say that the plunger 31 has a protruding end projecting beyond the slots 32 and adjacent crown portion 33. The numeral 34 designates finger grips to conveniently permit the user to catch hold of same and to pull the pin out from the guide socket 35 in the main body. It will be noticed in this connection that the expander is in the form of a tapered collar 36 secured by a pin 37, said expander collar operating between the converging cam portions 38 of the contact fingers 39. The contact fingers here terminate on opposite sides of the guide 40 in V-shaped detent heads 41 to engage the prongs as shown in Figure 7. In this case, a coiled spring surrounds the plunger pin, as at 42, and presses at one end against the expander collar 36 and at its opposite end against the flanged cup or retainer 43. The rim or flange of the cup fits over the guide 40 the same as shown in the push type in Figure 3. However, the cup 43 is freely slidable on the stem or shank of the plunger and is held in place solely by the spring. By catching hold of the grips 34 and pulling the plunger 31 out against the tension of the spring, the collar 36 engages the cam portion 38 and expands the fingers to permit easy insertion and removal of the lamp prongs. Once the prongs are in place, as shown in Figure 7, the spring acts on the retainer 43 to force it against the prongs 14a and to hold the prongs securely against the detents 41.

Having considered the introductory aims and objects, here are additional factors worthy of attention. The following are considered advantages derived from the construction herein shown and described, to wit:

1. To mechanically lock the prongs of the lamp tube in the socket in conjunction with the socket contacts to prevent the lamps from falling out of sockets due to excessive vibration.

2. A means incorporated in the socket and made a part thereof to release contacts from the lamp tube prongs.

3. Better electrical contact is maintained due to the spring tension of the locking mechanism which bears at all times on the lamp tube prongs.

4. Tubular lamps may be inserted into the socket through straight openings which eliminates the necessity of revolving the lamp tube in order to lock as is necessary in most of the present sockets now on the market.

5. With the improved socket it can be made more substantial and gives better electrical contact and less trouble than present sockets on the market.

The idea that resulted in this improvement was conceived and brought into being from the trouble with fluorescent light tubes falling due to excessive vibration in industries, especially in multiple story buildings. The light tubes falling could result in a serious accident, or injury to products and machinery. Also where excessive vibration exists quite a bit of trouble is experienced with the present type sockets due to them becoming loose and not making the proper electrical contact and results in the lamps not burning and excessive maintenance cost.

Changes in shape, size, materials and rearrangement of details and parts may be resorted to in actual practice, so long as they do not depart from the spirit of the invention or the scope of the attending claims, this as is well understood.

I claim:

1. A fluorescent tube-accommodation socket of the class described comprising a body having an internal slotted chamber for reception of prongs on a conventional-type fluorescent tube, a pair of duplicate companion contact fingers anchored at corresponding ends in said body and projecting for use into said chamber, the opposite ends of said fingers being free and being provided with substantially V-shaped detents and said detents being adapted to releasably engage said prongs, a manually operable plunger slidably mounted in said body for operation in said chamber, one end of said plunger extending beyond the adjacent end of said casing for accessible operations, a coiled spring surrounding the plunger, a prong clamping retainer mounted for operation on said plunger, said coiled spring being engageable at one end with said retainer and at its opposite end with said body, said retainer being of cup-like form with the annular lip portion of the cup adapted to engage the prongs to hold the prongs against said detents, in the manner and for the purposes described.

2. A socket of the class described comprising an elongated body provided with an internal cavity and a pair of spaced parallel prong-accommodation and keeper notches opening into said cavity, guides formed in the body and extending into the cavity, a plunger mounted for reciprocation in said guides and spanning said cavity, one end of said plunger projecting beyond the corresponding end of said body to render same readily accessible for convenient operation, a coiled spring in said cavity surrounding a portion of said plunger and bearing at one end against said body, a substantially frusto-conical cup-like member fastened on the plunger, the remaining end of said spring bearing against said member, a pair of spaced substantially parallel contact fingers mounted for operation in the cavity and supported in said body, said fingers being disposed on opposite sides of the plunger as well as on diametrically opposite sides of said frusto-conical member, the free terminals of the fingers being of V-shaped form, said member functioning both as a detent for said prongs, and an expander for said fingers, and the intermediate portions of said contact fingers having offset portions defining cams with which said expander coacts.

3. A fluorescent tube accommodation and supporting socket comprising a body having an internal cavity defining a chamber, said chamber having spaced aligned guides to accommodate a manually operable plunger, one end of said plunger projecting beyond the corresponding end of said body for convenience of accessible operation, said body also having a pair of spaced parallel prong reception notches, said notches opening into said chamber in such a manner as to permit

the prongs to enter the chamber by way of said notches, a substantially frusto-conical member fastened on that portion of the plunger which is operable in said chamber, a coiled spring surrounding a portion of the plunger within the confines of said chamber, said coiled spring bearing at one of its ends against a coacting portion of said body and bearing at its opposite end against said frusto-conical member, and a pair of substantially parallel contact fingers mounted for operation in the chamber and anchored at corresponding ends in said body, said fingers being disposed on opposite sides of the plunger and also on diametrically opposite sides of said frusto-conical member, the remaining ends of said fingers being free and of V-shaped form, said frusto-conical member functioning both as a detent for said prongs when the latter are engaged in said V-shaped terminals and as an expander for said fingers, the intermediate portions of

said fingers having offset portions and said offset portions defining spreading cams, and said expander having spreadable contact with said cams, whereby when the plunger is operated by one's finger, the expander engages the cams, against the tension of the spring and spreads the fingers apart in the manner and for the purposes described.

BENJAMIN THOMAS JORDAN.

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