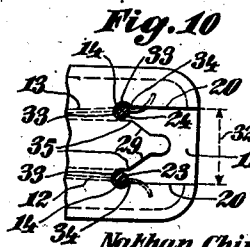
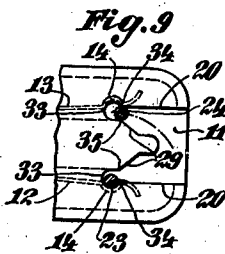
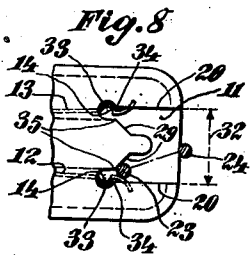
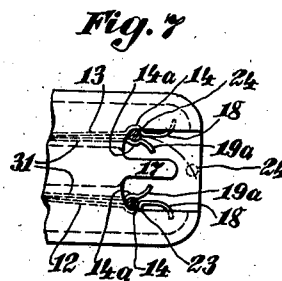
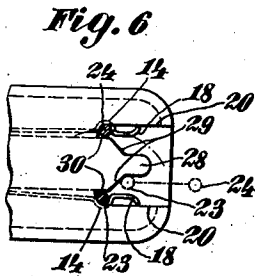
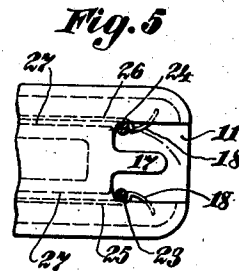
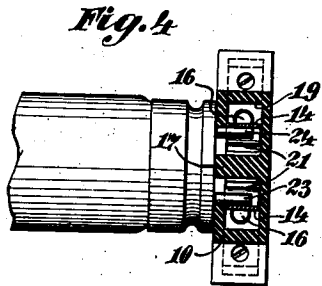
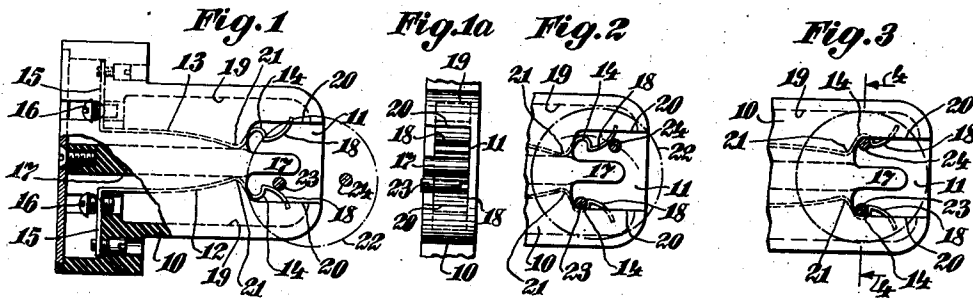


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SOCKET FOR PIN BASE LAMPS AND TUBES

2,257,786

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SOCKET FOR PIN BASE LAMPS AND TUBES

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1 Claim. (Cl. 173—328)

The invention herein disclosed relates to sockets for holding electric lamps or tubes having pin terminals, such as the "fluorescent" lamps now in use.

Special objects of the invention are to provide a socket which will require the engagement of the terminal pins therein in a certain manner or order and in a way which will place no unusual strain on the pins and will, when the pins are fully engaged, lock them firmly in such relation to overcome and prevent any possibility of the supported lamp or tube from loosening or dropping out of the socket, as has resulted in prior socket constructions.

Other desirable objects and the novel features of the invention by which the objects are attained are set forth and will appear in the following specification.

The drawing accompanying and forming part of the specification illustrates several of the possible forms the invention may take, but it will be understood that structure may be further modified and changed, all within the true scope of the invention as hereinafter defined and claimed.

Fig. 1 is a side elevation of one of the sockets, partly broken away and indicating in section how the tube is entered first to engage only one of the terminal pins.

Fig. 1a is a front end view of the socket.

Fig. 2 is a broken detail showing how after engagement of one pin with one socket terminal, the tube is rotated about that pin as a center to bring the second pin into engagement with the second socket contact.

Fig. 3 is a like view showing the tube fully rotated to bring the second pin into fully engaged relation and in which interlocked position the pins are so firmly held that the tube can not be pulled straight out but must be released one pin at a time, in the reverse order of the engaging operation.

Fig. 4 is a broken cross-sectional detail as on line 4—4 of Fig. 3.

Figs. 5, 6 and 7 are broken and part sectional details of different modified forms of the invention.

Figs. 8, 9 and 10 are broken part sectional views illustrating structure and operation of another modification.

Fig. 1 illustrates one of the two companion sockets for holding the ends of a fluorescent lamp tube and in this view, it will be seen that the socket consists of a suitable insulating base 10, formed at the front with a groove 11, open to

the inside face of the base to receive the pins of the tube and springs contacts 12, 13, at the back of said open sided groove, having hook portions 14, to engage about and secure the pins.

The spring contacts 12, 13, are shown as secured at the back of the socket base at 15, as having wiring terminals 16, and as disposed at opposite sides of an intermediate insulating partition 17, and free to yield outwardly or away from each other in the chambers 19, at opposite sides of said partition.

At the front, beyond the pin holding hooks 14, the spring contacts are shown as having wedge or cam extensions 18, the free ends of which extend behind the side edges 20, of the pin receiving groove into the front ends of the chambers 19.

The inward bends 21, of the contact springs at the bases of the hook portions may engage opposite sides of the partition 17, to serve as stops for positioning the springs about as shown in Fig. 1, with the cam portions 18, slightly spaced from the parallel opposite sides of the extended front end portion of the partition.

To illustrate the novel method of engaging and interlocking the tube in the socket, the base of a tube is represented by the circle 22, and the terminal pins or prongs at 23, 24.

Fig. 1 shows how the tube is engaged in the socket by first entering one pin 23, through the open channel 11, into engagement with the cam extension 18, of one contact, whereupon said pin, backed by the adjoining face of the partition 17, will operate as a wedge to spring said contact outwardly until the pin slips over the inner end of the cam into its seat in the hook. Then the tube is rotated about the pin 23 as a center as in Fig. 2, to cause the other pin 24, by engagement with the cam 18, of the other contact, to wedge that contact open until the hook 14 receives the pin as in Fig. 3. During this rotational effort, the first engaged pin 23 has a bearing support on the insulating wall 20, and in the final position, Fig. 3, the edges or insulating walls 20 may both brace and support the pins and thus firmly position the lamp tube in place.

It will be apparent that either one of the tube pins may be engaged with either one of the socket contacts and that when one pin is engaged and hooked with its contact, the tube is easily rotated to force back the other contact until it hooks over the second pin. With both contacts hooked over the pins, it is not practical to remove the tube with a straight pull—in fact, in this position, the tube is firmly interlocked and held against acci-

dental shaking loose or intentional removal. By rotating the tube however on one of its pins or set of pins, the other pin or set of pins is easily freed from the other contact or contacts, after which the tube held only by the one pin or set of pins can be withdrawn straight out of the socket or sockets with straight line movement, the reverse of that indicated in Fig. 1.

In all stages, any undue strain on the pins is avoided, the side of the partition 17, Fig. 1, providing support for one pin while wedging back one contact, one edge 20, providing support for the pivot pin Fig. 2, during rotational movement of the tube and the two edges 20, Fig. 3, providing support to prevent any spreading of the pins.

Fig. 5 illustrates a variation in the construction involving straight shank spring contacts 25, 26, limited in their inward movements by engagement against insulating walls 27.

Fig. 6 illustrates another modification, particularly in the form of the central partition or separating wall which has a reduced front portion 28, similar to the first forms with inclined or rounded shoulders 29, to guide the entering pin outwardly and then straight substantially parallel shoulders 30, to guide and positively locate the pins in their finally and fully seated positions.

A further modification is illustrated in Fig. 7, generally similar to the first form but illustrating the contact springs as backed up on the inner sides by companion springs 31, having entry wedge portions 19a, and hook portions 14a, more or less the reverse counterparts of wedges 19 and hooks 14, to more nearly completely surround the tube pins.

In the several forms of the invention shown with application of force, one but not both of the contact hooks will release and this therefore makes it necessary to give the tube a twist or partial rotation about its axis to make one contact let go, after which it is easy to pull the remaining pin clear of the other contact. Similarly in mounting the tube, it is difficult or impossible to force back both contacts at once, but easy to force back first one contact and then, using that as a fulcrum to rock the tube and make the other pin force back the other contact. Because of this rotational engagement and disengagement, the contact springs can be made as heavy and stiff as required to provide the best possible mechanical and electrical connections.

In the Figure 6 form of construction, the spacing shoulders 30, which are opposite the inwardly facing hook portions of the yielding contacts and the shoulders provided by the edges 20, opposed to the spacing shoulders and substantially corresponding to the outside spacing of the pins, all cooperate to firmly hold the pins and prevent any accidental loosening or removal of the supported tube.

Figs. 8, 9 and 10 illustrate a form of the invention requiring that the prongs be entered at an angle, one at a time and positively preventing withdrawal of both pins at once.

This last differs from the structures previously disclosed, particularly Fig. 6, in that the space at 32, across the entry channel 11, between the side shoulders 20 is less than the space across the pins 23, 24, so that the pins can only be inserted at an angle that is, one pin ahead of the other and in the provision of more widely spaced seats 33, at the inner ends of the guide edges 20, freely receiving the pins and to provide shoulders 34 at the junction of these seats with

the side shoulders which will prevent straight withdrawal of the pins.

Fig. 8 shows how one pin 23, must be entered ahead of the other at an angle such that it will pass in between the shoulder 34 at the outside and the shoulder 35 at the inside. After passage of this first pin behind shoulder 34 into full engagement with the hook 14 of spring contact 12, where it occupies a position in the seat 33, Fig. 9, the tube may pivot on pin 23 as a fulcrum and in which relation, the second pin 24, will swing up behind the other shoulder 34 as in Fig. 10, into fully seated position and fully engaged and held by the hook 14 of the second contact spring 13. In this last position, the shoulders 34 overstand the pins and positively prevent straight or simultaneous removal of the same and require that the tube first be rocked to free one pin before the other pin can be released.

While the present practice is to mount lamps and tubes in between a pair of the sockets and to complete the circuit through pins at opposite ends of the tube in engagement with the contacts in the sockets, it is realized that the circuit may be altered so as to complete the same through the pins at one end only or through only one of the pins at each end of the tube. Under such possible conditions, only one socket may be required for circuit purposes, or only one contact of each of a pair of the sockets be utilized to carry current. The claims covering the invention and the terms employed are therefore to be considered in this light. While in most cases it is desirable to have the pins backed up by solid insulating material in their final position, such as indicated in Figs. 3, 5, 6, 7 and 10, this is not essential, since the hooked portions of the springs hold the pins very firmly.

The entrance cams 18 may be inclined on such slight angles that in constructions such as shown in Figs. 1 and 5, both pins may be forced in at the same time, thus avoiding any special care in inserting a tube, but the hooks 14, at the inner ends of these entrance cams are so abruptly angled that once both pins are engaged, they will be positively held and can not both be disengaged at the same time and this locking of the tube in place is effective and remains so, no matter in what position the socket may be mounted.

In constructions like that shown in Fig. 5, where the intervening insulating walls 27, hold the contacts separated to such an extent that the portions of the contacts nearest to the opposing faces of the intermediate partition 17, are spaced away from that partition a distance greater than the diameter of the pins 23, each and either of said pins will then be freely insertable into either of the channels at opposite sides of the partition. This particular construction therefore enables a tube to be inserted in a socket without any opposition to entry of the first pin and the tube to be then rotated after the first pin is entered behind the hook of the first contact and thus caused in such movement to be grasped by such first contact, to wedge the second pin over the entrance cam 18, of the second contact into firmly held engagement in the grasp of the hook of the second contact. As shown in Fig. 5, the hook portions of these contacts are faced inwardly toward the intervening partition 17, so as to clasp only about the outer sides of the contact pins. Hence these contacts, either one of them, will yield to rotational movement of the tube in either direction to permit passage of one pin out of the grasp of one hook and when this is effected, the other

pin will be fully released by the other hook, because of its being held by the adjacent wall 27, spaced from the partition 17, a distance greater than the diameter of the pin. Thus when one pin of a tube is released, the other pin will be free and the tube will then practically drop out of the socket or at least be removable without the opposition of a spring contact. A tube may thus be inserted in or withdrawn from a socket of this construction, or from a pair of such sockets by freely entering one pin or set of pins and then rotating the tube to engage one pin or set of pins, or conversely simply be rotated to release one pin or set of pins, after which the tube will drop out or may be simply lifted out of the socket or pair of sockets.

What is claimed is:

A supporting socket for lamps and tubes having spaced terminal pins and comprising a socket base of insulating material having a wide entrance groove through one edge of the same for substantially simultaneous entry of both terminal pins and defined by opposed substantially parallel side walls spaced a distance apart substantially equal to the overall spacing of the terminal pins to admit the entry of both or either of said pins, an interposed insulating partition between said spaced side walls of said wide entrance groove and having substantially parallel opposite edges opposed to and substantially parallel to said substantially parallel side walls, spring contacts on said base at opposite sides of said intermediate partition and yieldable away from each other, said contacts having open pin receiving hooks and disposed with the open sides of said hooks faced inwardly toward and opposed to said substantially parallel opposite edges

of said intermediate partition, said contacts being tensioned toward each other with said hooks positioned a distance apart less than the overall spacing of said terminal pins, said hooks having extensions at the free ends of the same inclined outwardly away from said opposing edges of the intermediate partition, said free ends of said open hooks being spaced away from the opposing edges of said intermediate partition a distance greater than the diameter of the terminal pins to enable free passage of either terminal pin over the inclined extension and into engagement in the open hook of either contact and whereby after such free engagement of either terminal pin in either open hook, the lamp or tube carrying the terminal pins may be rotated inwardly toward the socket base about the pin which is engaged in the contact hook as a center to bring the other terminal pin into wedging engagement with the inclined extension of the other contact, to effect spreading of the contacts sufficiently for engagement of the second terminal pin in the open hook of the second contact and whereby the lamp or tube may be released by simply rotating the same in either direction to free one of the terminal pins from the open hook of one contact, after which the other pin will be freely disengageable from the hook of the other contact, the insulating partition between the contacts being limited in extent to enable said rotary movements of the lamp or tube to carry one terminal pin into engagement with or to free it from the hook of one contact while the other terminal pin is pivotally held in the hook of the other contact.

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