March 4, 1941. M. ALDEN 2,233,931

ELECTRICAL SOCKET

Filed Sept. 9, 1940

Fig. 2.

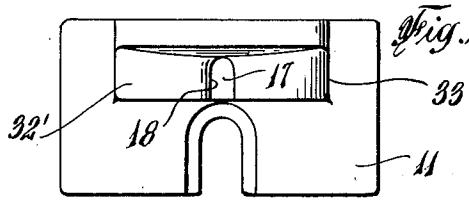
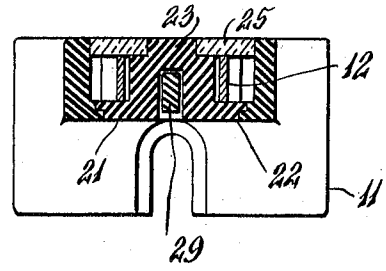



Fig. 5.



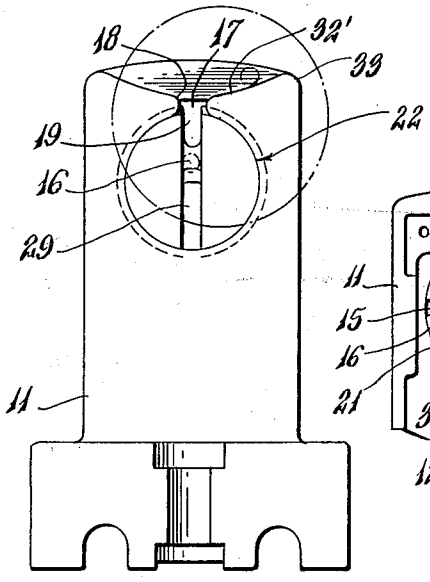




Fig. 4.

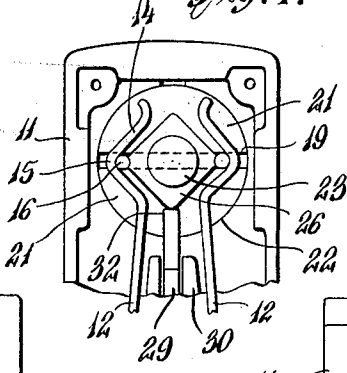



Fig. 6.

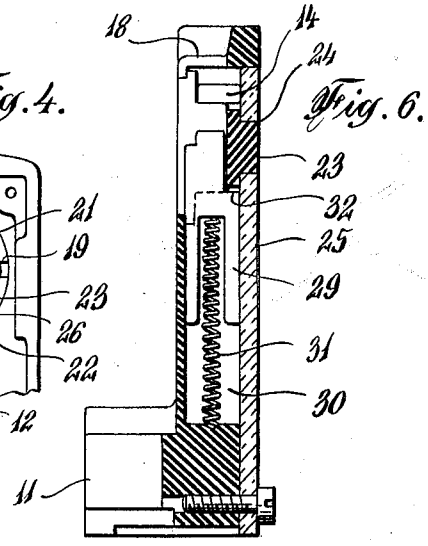



Fig. 1.

Fig. 7.

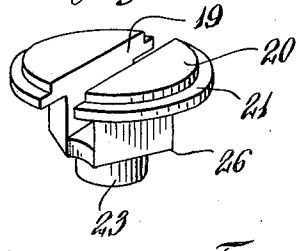



Fig. 8.

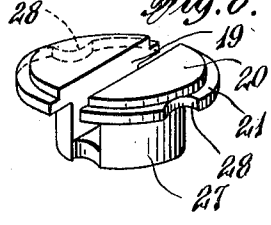



Fig. 3.

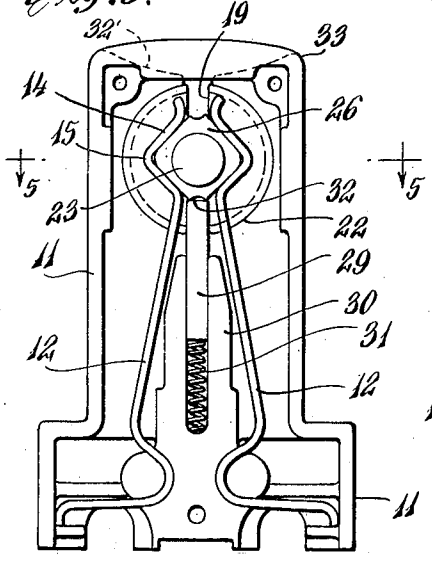



Fig. 9.

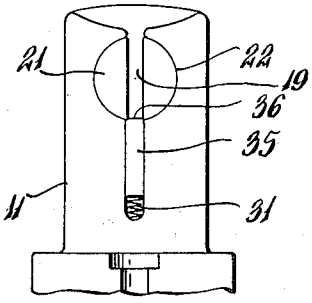
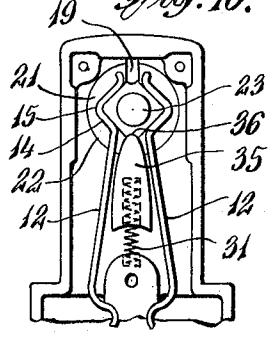



Fig. 10.




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# UNITED STATES PATENT OFFICE

2,233,931

## ELECTRICAL SOCKET

Milton Alden, Brockton, Mass.

Application September 9, 1940, Serial No. 355,947

6 Claims. (Cl. 173—328)

This invention relates to sockets of the type used to receive tube or lamp bases having a plurality of pins, such as those found in fluorescent lamps.

More particularly my invention relates to a type of socket provided with a rotating support or carrier element, into which the lamp pins are seated and which element is then rotated so as to bring these pins into engagement with the contacts of the socket.

One object of my invention is to provide, in a socket of the character described, means which will tend to lock the rotating carrier element at certain angular positions of rotation, corresponding in the one case to the correct angle for the insertion or withdrawal of the lamp pins, or corresponding in the other case to the angular position in which these pins make full contact with the contact elements of the socket.

Yet another purpose of the invention is to provide a socket in which the entrance slot is more or less closed when no pins lie therewithin, so that when inserting the pins, the tendency of one pin to enter while the other pin engages the body of the socket will be lessened.

Another purpose of this invention is to provide a socket in which there will be a force tending to eject the pins from the socket when the tube is in the correct angular position for the pins to be withdrawn therefrom.

Another object is to make it practically impossible to break the socket when trying to rotate the lamp tube in the socket.

Still another purpose is to provide means which will, in such a socket, afford indication of the completion of the turning of the rotor through a desired angular extent, as by change of resistance to movement encountered or by an audible click.

Another object of my invention is to provide, in a socket of this type, means for locking the rotor in the angular position in which the pins are in engagement with the contacts of the socket, independently of the frictional engagement of the pins themselves, and additionally thereto.

A still further purpose is to provide means whereby when no tube is inserted, the rotor will be held in a position so that it will be ready to receive the pins of a tube.

An additional purpose is to provide a socket of this type in which any attempt to rotate a partially inserted tube will cause the ejection of the pin of the tube which may have been inserted.

Reference is now made to the drawing where

Fig. 1 is a view in elevation of a socket according to one form of my invention, the rotating support being shown in the "off" position and showing a tube with one pin inserted in the support.

Fig. 2 is an end view of the socket.

Fig. 3 is a back elevation with the cover plate removed.

Fig. 4 is a rear view of part of the socket with the pins of a tube in place in the "on" position.

Fig. 5 is a sectional view on the line 5—5 of Fig. 3.

Fig. 6 is a longitudinal section on the plane of line 6—6 of Fig. 3.

Figs. 7 and 8 are perspective views of two types of rotors which may be used.

Fig. 9 is a front elevation of a modified form of socket, and

Fig. 10 is a back elevation, with the cover removed, of the form of structure of Fig. 9.

A body 11 is formed of suitable insulating material. Contact springs 12, 12 of suitable material, such as phosphor bronze, are spaced apart within the body, the lower ends being suitably fixed and the upper ends 14 movable and provided with recesses 15, which serve to retain and make contact with the pins 16 of an inserted tube, when the latter is fully seated in the socket.

In the upper edge of the socket body is provided a slit 17, leading from the exterior of the socket and allowing both pins of a tube to pass therethrough into slot 19 of the rotor 20. The edges 18 of this slit 17 are quite narrow so as to afford a minimum abutment area for the tube pins. This rotor may be formed as in Fig. 7 with a bearing rim 21 for engaging the periphery of circular aperture 22 in the face of the body. It may also have a bearing 23 at the rear, which seats within aperture 24 in the rear cover plate 25, as shown in Fig. 6. Between the front and rear bearing surfaces, the rotor may be formed with an angular section, as shown at 26 in Fig. 7, or may be substantially cylindrical, as shown at 27 in Fig. 8, in that part which stands between the contacts. The rotor may also have notches 28 midway between the ends of the slot 19.

To mount the end of a tube in the socket, it is merely necessary to insert the pins 16 sidewise through the slit or entrance 17 into slot 19 until the lower pin strikes against the lower wall of the opening 22 so that both pins will stand between the contacts 12, 12 and then to rotate the tube and support in either direction until the pins snap into the recesses 15, 15 of the contacts.

In case the rotor shown in Fig. 7 be employed, the angular shaped portion 26 will co-operate with the springs so as to determine a tendency

of the rotor to seat itself at two angular positions, about 90 degrees apart.

In the instant invention, I have additionally provided a plunger or pin **29** of any suitable material, preferably insulating material, which is capable of longitudinal movement within a bearing member **30**, and is under pressure tending to expel it therefrom, by the action of spring **31**. The upper end of the pin enters slot **19** of the rotor, when no other body lies within the slot in the "off" position, and may conveniently enter the slot as far as the hub portion of the rotor or completely close the slot.

When no tube is in the socket, the pin **29** will prevent accidental rotary movement of the support or rotor **20**, acting as a lock or latch therefor. However, when both pins of the tube have been inserted into slot **19**, the first entering pin will cause lock pin **29** to be pushed in a retrograde direction so that the latter will lie completely without the rotor, or at least will be so close to the edge thereof that the lock pin extremity **32** will easily be pushed out of the rotor slot when the rotor is turned. After the lock pin is once out of the way, the rotor may be easily turned until the tube pins are seated in the body contacts as above described.

The upper end of the body is preferably concave with its walls **32'** inclined toward the entrance slit **17** and the corners **33** are located far enough from the entrance slit so that if one pin is in the slot **19** the other can not be twisted over the corner **33**. This makes it impossible to break off the end of the body as is frequently done when the end of the body is convex and so narrow as to permit one pin to pass around the end when the other is in the slot.

An alternative type of rotor, shown in Fig. 8, is provided with notches **28** having rounded edges, and located approximately 90 degrees from the points where the ends of slot **19** emerge upon the periphery of the rotor. When the rotor has been turned into the position where the tube pins engage the socket contacts, one of these depressions **28** will be located directly above lock pin **29**, the end **32** of which will then be impelled by spring **31** so that it will enter notch **28**, and may be arranged to give an audible click when so doing. This will furnish an additional locking effect for the rotor in its other position, but will readily eject the end of the lock pin, due to the contour of the surfaces of both members which are in engagement, so that when the tube is to be removed from the socket, the rotor may easily be turned back again to the position where the pins may be removed through slit **18**.

In the variant form of socket shown in Figs. 9 and 10, the pin **35** is formed to slide within the space between the contact springs **12**, **12** under the impulsion of tension spring **31**. The pin is in this case made somewhat wider, and instead of entering the slit of the rotor to any great extent, the upper rounded end **36** of the pin seats itself for a short distance only in the rotor slot, as indicated in Fig. 9.

The first form, however, is preferred, as the spring pressed latch or locking pin acts to immediately eject the tube pins as soon as the tube is turned to the "off" or removing position. This type also aids in preventing pins being straddled from the slot to the side of the socket. It also serves as an indication to the operator that pressure must be applied to insert the pins—hence he is more likely to continue such inward pressure until he meets a stop, from which position the tube may be safely rotated to the "on" position.

It should be understood, however, that the latch may engage in the slot **19** when the tube is out of the socket and that the rotor may also have notch **28** engaged by the latch when the tube and rotor have been turned to the "on" position.

While I have described my spring pressed member as serving to lock a rotating member, as well as tending to eject the tube pins, yet it will be apparent that this latch may alternatively perform only one of these functions. For example the tube pins may be guided into position by means other than the rotating carrier element, and yet the spring pressed plunger will tend to eject the tube pin when the latter is in such position that it can be pushed upwardly and outwardly from the socket body.

I claim:

1. A tube socket comprising a body member containing two spaced contacts, at least one of which is resilient, a rotatable support mounted in the body member between said contacts and at least partly embraced thereby and having a slot leading to said contacts and a spring pressed latch interlocking radially with the support to hold it in one position, said latch being retractable by pressure from a pin of a tube when it is being inserted into said slot, said pin acting laterally upon said latch.

2. A tube socket comprising a body member containing two spaced contacts with a rotatable support mounted between them so as to be at least partly embraced thereby, said support having a slot for the pins of a tube and a spring pressed latch interlocking radially with the support to prevent its rotation, said latch projecting into said slot when no pin is in place and being adapted to be compressed to release the support by the direct lateral contact therewith of a tube pin inserted in the slot between said contacts.

3. A tube socket comprising a body member containing two spaced contacts, a rotatable support mounted in said member so as to be at least partly embraced by said contacts, said support having a slot and the body member having an entrance slot leading to the slot in said support, the end of the body member being concave and having inclined walls leading to the entrance slot in the bottom of the concave end and a spring pressed latch interlocking radially with the support to prevent its rotation.

4. A tube socket comprising a body member containing two spaced contacts with a rotatable support mounted between and at least partly embraced by them, said support having a slot and a spring pressed latch interlocking radially with the support to prevent its rotation, said latch projecting into said slot in one position and being adapted to be compressed to release the support when a tube prong is inserted in the slot between said contacts and said support having a notch arranged 90 degrees away from said slot and adapted to receive said latch when the support is in another position.

5. A tube socket comprising a body member containing two spaced contacts with a rotatable support mounted between and at least partly embraced by them, said support having a slot and the body member having an entrance leading to said slot, the edges of said entrance being narrow compared with the width of said slot, and a spring pressed latch projecting radially into said slot and being adapted to be compressed

to release the support when a tube pin is inserted in the slot between said contacts.

6. A socket for tubes having projecting prongs comprising a body having a chamber containing oppositely disposed spring contacts and having a slot in one end leading to the space between the contacts, a spring pressed member arranged in line with said slot in said chamber and adapted to be laterally engaged by a prong of a tube when it is inserted sidewise into said chamber, said member serving to at least partly eject the tube prong in a lateral direction when pressure is released.

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