April 22, 1941. M. ALDEN 2,239,638

TUBE SOCKET

Filed Aug. 14, 1940

Fig. 1.

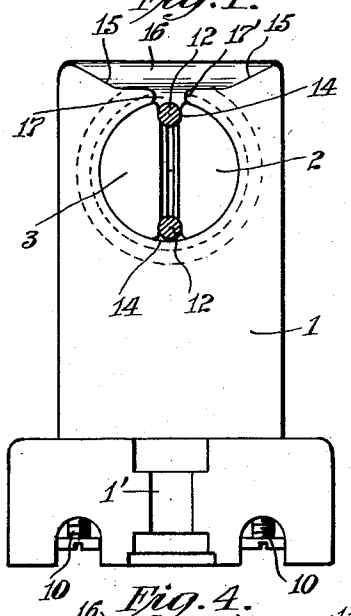


Fig. 2.

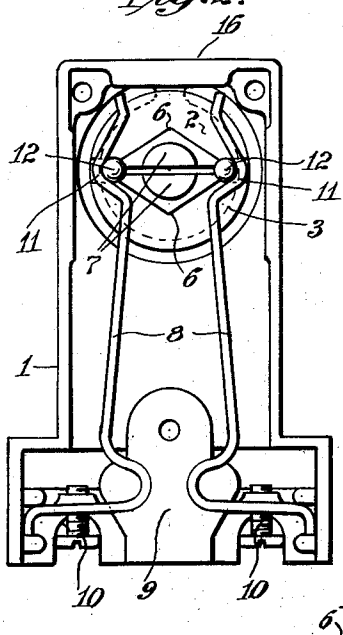


Fig. 3.

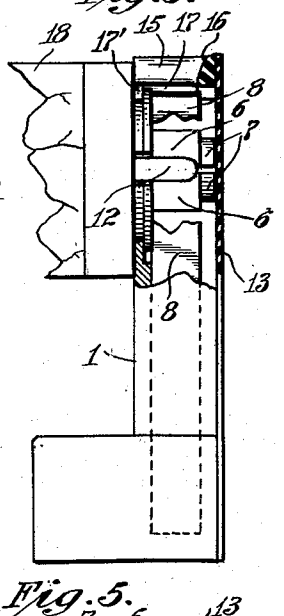


Fig. 4.

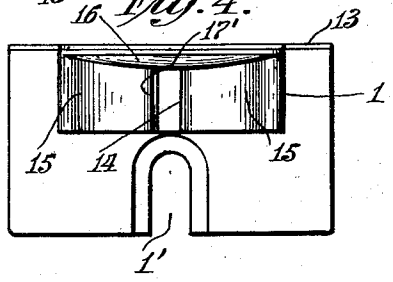


Fig. 5.

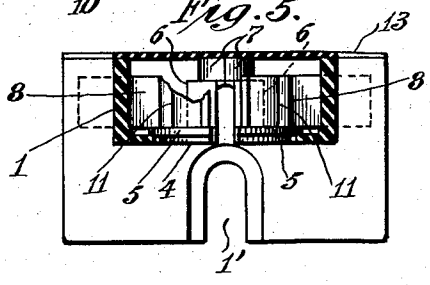


Fig. 6.

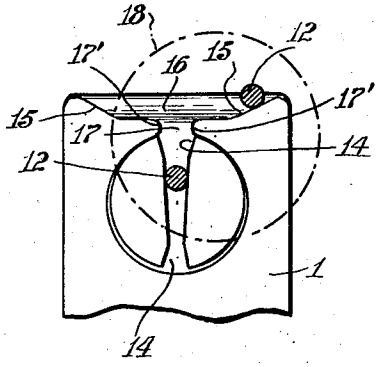


Fig. 7.

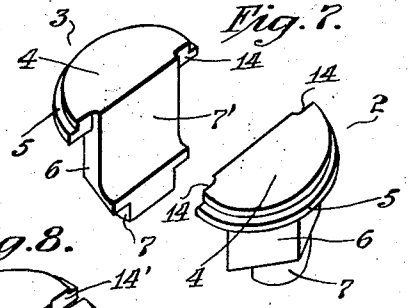
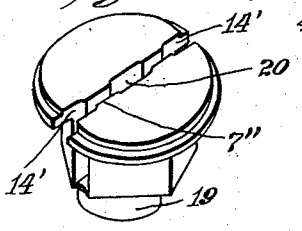


Fig. 8.



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UNITED STATES PATENT OFFICE

2,239,638

TUBE SOCKET

Milton Alden, Brockton, Mass.

Application August 14, 1940, Serial No. 352,493

8 Claims. (Cl. 173—328)

My invention relates to lamp sockets and more particularly to those used in pairs for receiving the ends of a tubular lamp, provided with double prongs, spaced apart from one another, upon each end.

This invention embodies certain features of the form of construction shown in my co-pending application Serial No. 333,086.

More particularly, this invention relates to sockets of the type wherein the insertion of the lamp is accomplished by pushing the prongs into a slotted rotary member, which member is then rotated in such fashion as to bring the prongs into contact with stationary connection members located in the socket body and attached to external conductors for supplying energy to the lamp.

One object of this invention is to provide a socket construction for holding one end of a double ended lamp, such as a tubular lamp of the fluorescent type, having a plurality of prongs upon each end thereof.

Another object is to provide a structure of this character which shall be simple, cheap to manufacture and safe and easy to operate.

A special object of this invention is to provide a socket of this type wherein the lamp prongs may be easily inserted and guided into position before rotation of the lamp.

A yet further object is to provide means whereby the insertion of the prongs may be determined, even though the socket be not visible to the person inserting the lamp thereinto.

Yet another purpose of this invention is to afford in a structure of the type described, means whereby an attempt at the rotation of the socket rotor before the prongs of the lamp have been firmly seated therewithin will not give rise to undue strain upon the prongs of the lamp, or upon the parts of the socket, such as might cause breakage of the socket, or of the lamp end or body.

Another purpose is to provide a socket wherein a change of resistance to insertion of tube prongs thereinto will afford an indication of the final seating of the tube into place.

Other purposes and advantages of my invention will be apparent from the description hereinafter given.

Fig. 1 is a view in front elevation of a socket embodying one form of my invention, the tube prongs being shown in position therewithin, but out of contact.

Fig. 2 is a view in elevation from the rear, of the structure shown in Fig. 1, with tube rotated to contact position and the back plate removed.

Fig. 3 is a side elevation, partly in section.

Fig. 4 is an end view of the socket.

Fig. 5 is an end view with the insulation broken away so as to show a tube prong in position therewithin.

Fig. 6 is a view in elevation of the upper portion of a variant form of socket according to this invention, illustrating the guidance of tube prongs into position.

Fig. 7 is a view of one mode of construction of the rotor of a socket, the parts being separated for purposes of clarity of illustration.

Fig. 8 is a view of another mode of construction of the rotor in a one piece element.

Referring now more particularly to Figs. 1, 2 and 3, a body 1, of suitable insulating material is provided with a screw slot 1' for mounting purposes and also with a rotor, also formed of insulating material, and comprising two discrete sections, 2 and 3. These may be formed as shown in Fig. 7, with flat upper surfaces 4, rims 5 which are mounted in the circular opening of the body, wedge shaped portions 6 to engage the socket springs, and smooth portions 7, which last serve in conjunction with one another to form a cylindrical bearing. A portion 7' is cut away, so that when placed together, a slot is formed between the two portions.

Stationary spring contacts 8 are secured to a suitable insulating part 9, of the body of the socket, and are each provided with a connecting screw 10, of any suitable type for the reception of an external wire. The upper portion 11 of each spring is bent so as to form a prong-receiving recess. Tube prongs 12 are shown in position therein. These particular portions of my socket may be formed in accordance with the teachings of my copending application, above referred to.

The two halves of the rotor may be held together as shown in Figs. 2 and 3, by being positioned between the spring contacts and within an aperture in the rear plate 13. This plate may also perform the function of closing the rear of the socket, to prevent the ingress of dirt and to avoid the exposure of "live" parts to possible human contact therewith. The edges of the rotor sections may be cut away as shown at 14, so that the tube prongs may be inserted and lie therewithin, as shown in Fig. 1, or may be shaped somewhat differently, as shown in Fig. 6.

Referring now additionally to Figs. 4 and 5, it will be seen that the upper part of the body is provided with inclined guides 15, which are

joined by a back portion 16. These guides cause the tube prongs to be directed into a slot 17, and therethrough into the center of the rotor. The back 16 may slope inwardly toward the base so as further to guide the tube prongs longitudinally.

Preferably this slot 17 is reduced in its vertical dimension as shown in Fig. 6 until it becomes virtually impossible for the prongs of a tube when rotated to exert lateral pressure upon the walls of the slot. This action may be promoted by rounding off the edges 17' of the slot. Preferably the radius of curvature of the edges 17' is less than the radius of the tube prongs. Under these conditions the prongs will be guided into the rotor, and any torque exerted upon the tube cannot cause the prongs to jam in the slot, or cause the prongs to be bent or loosened by any lateral pressure thereupon, since the sloping walls and shaped edges of the slot of the form of Fig. 6 will cause the tube to be either drawn down into position within the rotor, or else if it has not been inserted far enough, will cause it to be ejected in an upward direction from the socket. The dotted circle 18 of Fig. 6 shows the end of the tube as it is being inserted into the socket. Fig. 6 likewise shows how the two halves of the rotor will separate slightly as the prong enters one end of the slotted portion thereof. After both prongs have passed into the cut-away portions 14 of the rotor, the two halves will again assume substantially the position shown in Fig. 1.

Instead of making the rotor in two wholly separate sections, a single element, as shown in Fig. 8, may be provided. In this case, the insulating material is chosen so as to have sufficient elasticity so that the prongs will slightly force apart the walls of the slot 7'' notwithstanding that the bearing portion in this case is constituted by a single solid portion 19. The notches or ends 14' of the slot are made just wide enough to receive the tube prongs and the slot at 7'' is made narrower than the diameter of the prongs so that when the tube prongs are inserted, resistance to insertion is met which instantly ceases when the prong reaches the bottom of the slot at 14'. I may provide a slight depression 20 in the central part of the slot. When a tube prong is inserted, it will first seat itself in this depression, and then pass to its ultimate resting place in notch 14'. Thus a tube will snap into place in two steps, which action will serve as a guide to the person inserting the same, even though the socket be not visible to him at the time of such insertion.

I claim:

1. A tube socket including a body of insulating material, a slotted carrier rotatably mounted within said body and having a groove affording entry to the prongs of a tube base within the groove of said carrier and also allowing said prongs when inserted to describe arcs of rotation when said carrier is rotated, spring contacts mounted within said body and making contact with said prongs, respectively, upon the rotation of said carrier, said carrier being laterally expansible upon the insertion in the groove of a tube prong and said body being also provided with an entrance slit located in one edge thereof, through which slot said prongs can enter to seat within said groove in said carrier.

2. A socket for the reception of a twin-pronged base including a body portion having in one edge thereof a slit for the passage therethrough of the tube prongs and also having a plurality of contacts for receiving said prongs, a rotor having two spaced sections arranged respectively upon opposite sides of the slit and yieldable means forcing said sections toward each other, whereby the insertion of a tube prong through the slit in said body into one end of the space between said sections will cause said sections to separate sufficiently to admit the passage therewithin of said tube prong.

3. A socket for the reception of a twin-pronged tube base including an elongated body of insulating material having at one end thereof a central entrance slit with shoulders on either side thereof, a grooved rotary member mounted in the same end of said body, the entrance slit and the groove in said rotor at a predetermined angular position of the rotor forming a continuous passageway for the entrance of the tube prongs into said rotor, and contact springs for engagement with said prongs located upon opposite sides of said rotor, said shoulders extending at least as far from said entrance slot as the distance between the tube prongs, whereby the entrance of one prong into said entrance slit prevents the other prong from passing over the outer edge of one of said shoulders.

4. In a socket for the reception of a twin-pronged tube base of the type using a rotor to receive and guide the tube prongs into contact-making position, a rotor having two parts with a slot therebetween for the passage of tube prongs, means for resiliently urging said parts towards one another so as to require the separation of the parts when said prongs enter said rotor, and contact-making means located upon opposite sides of said rotor for making contact with the respective tube prongs when said rotor is turned about its axis.

5. A socket for a two pronged lamp comprising a body of insulating material with a chamber therein, a pair of spaced spring contact arms mounted in the chamber, said body having a circular opening in one face and a slot leading to the space between said contact arms, an insulating carrier mounted to rotate in said opening and composed of two parts with a diametrical slot between them, the two parts being movable toward and from each other, said two carrier parts having angular portions embraced by said spring contact arms.

6. In a rotor type socket, a body of insulation, a slitted rotor for the reception of tube prongs and rotatable within said body, said body having spaced prong receiving contacts on opposite sides of said rotor and likewise being formed with a slit passing from one lateral surface of said body to the edge of said rotor, said slit having a longitudinal extension small compared with the diameter of a tube prong, and said body being provided with smoothly inclined guiding surfaces leading from a lateral wall thereof to the beginning of said slit, whereby a tube prong will be guided along said inclined surfaces, through said slit into the slit in the rotor.

7. In a rotor type socket, a stationary body of insulating material, a slitted member rotatable within said body and located at a point remote from the periphery thereof, spring contacts mounted in the body on opposite sides of said rotatable member, a guiding channel extending from said periphery to said slitted member, and a guiding member forming the rear side of said channel and sloping inwardly as it approaches said slitted member, whereby the prongs of a

tube being inserted into said socket will be guided longitudinally into said slitted member.

8. A socket for the reception of a twin-pronged tube base including an elongated body of insulating material substantially rectangular at one end and having therein a central entrance slot with shoulders on either side thereof, contact springs located within said body upon opposite sides of said entrance slot and engaging with the respective tube prongs when inserted through said slot and rotated within said body, the edges of said entrance slot being approximately semi-cylindrical with a radius of curvature so small as to eliminate any substantial abutment for a tube prong and said shoulders extending at least as far from said entrance slot as the distance between the contact springs when engaged by the tube prongs, whereby the entrance of one prong into said entrance slot prevents the other prong from passing over the outer edge of one of said shoulders.

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