July 12, 1960 R. B. RONEY ET AL 2,945,202

ELECTRICAL SOCKET

Filed Aug. 22, 1957

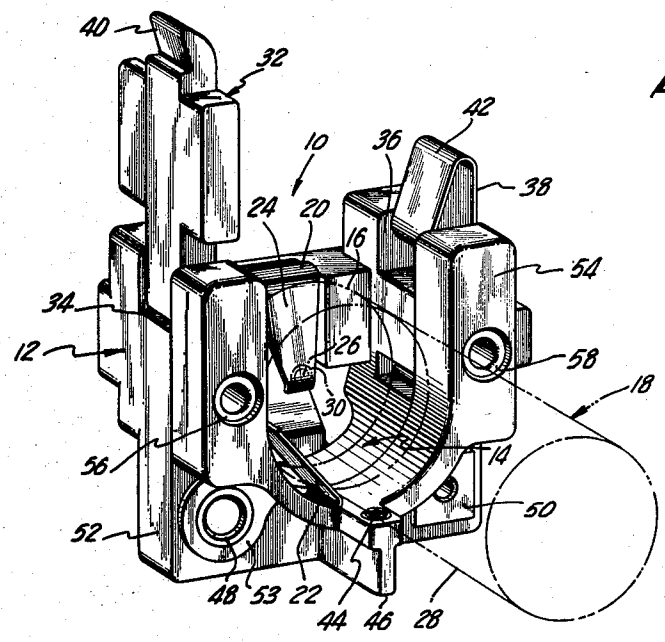
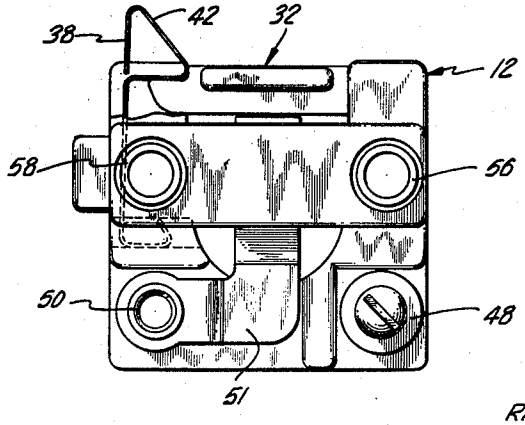


Fig. 1.

Fig. 2.



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United States Patent Office 2,945,202
Patented July 12, 1960

2,945,202

ELECTRICAL SOCKET

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Filed Aug. 22, 1957, Ser. No. 679,616

3 Claims. (Cl. 339—50)

This invention relates to an electrical socket for supporting and connecting electrical equipment.

In mounting electrical equipment, electrical sockets readily perform the functions of supporting and connecting to electrical circuits. One of the more common electrical sockets is that used for fluorescent lighting fixtures in which a light tube in the form of an elongated glass envelope is supported by electrical sockets on both ends. These sockets include slots for receiving terminal prongs projecting from the ends of the fluorescent tube. By inserting the prongs in J slots in the sockets and rotating the tube, the tube is fastened and connected electrically in the fixture.

In many instances a lighting fixture is mounted on a support subject to vibration causing the light tube to move relative to the fixture. In airplanes, for example, such tubes tend to vibrate free of the confining J slots. Also, space limitations for the fixture may prevent easy access to the lighting tube or sockets for insertion or replacement of the tube. These conditions and other electrical requirements exclude the use of the socket arrangements such as the common socket arrangement described above.

These difficulties are overcome in the present invention by an electrical socket including a socket body of insulating material defining an open chamber or compartment for receiving the terminal portion of the electrical apparatus or lighting tube. A movable arm forms a portion of the side wall and the periphery of said opening to permit lateral or transverse insertion of the terminal portion of the electrical apparatus through the space normally occupied by the movable arm. Suitable means are provided to secure the movable arm for retaining the terminal portion of the apparatus in position in the socket chamber.

In accordance with a preferred embodiment of the invention, an electrical socket supports and connects a light tube having a pair of adjacent terminals on each end of the tube. The movable arm forms a portion of the body side wall and the periphery of the socket chamber opening and is separable from the remainder of the socket body. The side walls adjacent the movable arm are bifurcated to form opposed recesses in the body side wall for receiving the tapered ends of the movable arm. Resilient detent means are mounted in the socket body projecting into one recess and outside the socket body and hinging means are mounted in the body on lateral sides of the other recess whereby the arm may be pivoted to open the side wall of the chamber for lateral insertion of the terminal end portion of the light tube. Positioning the arm and securing the end of the arm by the detent means supports and positions the terminal end portion of the light tube in the socket.

The invention is explained with reference to the drawings in which:

Fig. 1 is a perspective view of a preferred embodiment of the invention;

Fig. 2 is a rear view of the electrical socket shown in Fig. 1.

Referring to the drawings for a detailed description of the preferred embodiment of the invention, an electrical socket **10** is shown including a body portion **12** defining an open chamber **14** for receiving the terminal end portion **16** of an elongated electrical light tube **18**. A pair of wiping contacts **20** and **22** of resilient conductive material are disposed in the end and side walls of the chamber **14** for engaging the terminals **24** and **26** in the end of the light tube **18**.

The light tube **18** includes a glass enclosure **28** terminating at both ends in a terminal end portion **16**. The terminal end portion **16** comprises a conductive cap terminal **24** engaging the wiping contact **22** and contact terminal **26** in the transverse end portion of the cap **24** for engaging the wiping contact **20**. The light tube terminals **24** and **26** are separated by an insulating ring **30** surrounding the terminal **26**.

Since the electrical sockets are normally provided in pairs, one for each end of the light tube **18**, the sockets are disposed in predetermined spaced relationship to locate the sockets at the ends of the light tube **18**.

A movable arm **32** forms a portion of the side wall of the socket body to permit lateral entry of the light tube terminal portion **16** into the socket chamber **14**. The bifurcated portions of the socket body **12** adjacent the movable arm **32** include recesses **34** and **36** for receiving the tapered end portions of the arm **32**. In order to facilitate the displacement of the arm **32** for entry of the light tube, an end of the arm is hinged to the bifurcated socket body portion laterally adjacent the recess **34**. Below the recess **36** and in the socket body **12**, a lower end of a resilient detent spring **38** is secured in a body cavity to project the upper portion into the recess **36**. In positioning the corresponding end of the movable arm **32** the upper portion of the detent spring **38** projecting into the recess **36** is displaced. The resilient bias of the detent spring returns an undercut section of its upper portion into a seat **40** formed in the end of the arm **32**. Thus the movable arm is in a closed position.

An upper portion **42** of the detent spring **38** which projects outside the body recess **36** permits manipulation of the spring against its resilient bias to pass the end of the movable arm **32** to open the side of the socket chamber **14**.

An ejection spring **44** is mounted on a support provided by a lateral socket body extension **46**. The ejection spring **44** is biased by the light tube upon closure of the movable arm **32** seating the end **16** of the light tube in the socket chamber **14**. Upon release of the movable arm **32** through manipulation and displacement of the detent spring **38**, the spring **44** provides positive ejectment of the light tube **18** from the socket chamber **14**.

A pair of terminals **48** and **50** project through the socket body **12** and are secured therein for connecting supply leads to either the front or back of the socket body. Wiping contacts **20** and **22** include extensions **51** and **53** passing through slots in the body **12** and connected to the respective terminals **48** and **50**.

To facilitate assembly of the body and molding of the socket, the preferred socket body **12** includes two body sections **52** and **54** which are secured to one another by eyelets **56** and **58** passing through aligned openings in the sections.

In operation, the movable arm **32** may be released to open the side of the socket chamber by pressing against the inclined surface **42** of the detent spring **38**. Force exerted against surface **42** displaces the detent spring against its resilient bias to displace it from the seat **40** in the movable arm **32**. The movable arm **32** is then free to pivot about its hinge axis in the recess **34** for opening the lateral side of the socket chamber **14**.

The terminal end of the light tube **18** may be laterally

inserted in the socket chamber **14** through the opening provided by displacement of movable arm **32**. Return of the movable arm to its position in the side of the socket body positions the light tube to align its terminals **24** and **26** with wiping contacts **22** and **24**. During positioning, the terminal end of the light tube compresses the ejection spring as the movable arm **32** seats under the detent spring **38** to secure and support the light bulb in position.

In the event the light bulb is to be replaced or removed for any other reason the movable arm is released by pressing against surface **42** of the detent spring **38** to displace the spring and remove it from the seat **40** of the movable arm **32**. Upon release of the movable arm **32**, spring **44** ejects the light bulb from the socket chamber **14**. This feature is particularly advantageous where the light tube and socket are mounted in a light fixture having little or no access for gripping the light bulb when positioned in the electrical socket.

Various modifications of the socket are contemplated, for example, the movable arm may be removably secured in the opposing recesses by resilient detent springs in both recesses whereby the movable arm may be completely withdrawn from the remainder of the socket body. The brush contacts may include any suitable contacts for engaging the tube terminals for accommodating the specific type of terminal on the tube, for example, slots in the end of the body accommodating the aforementioned prong type light tube terminals.

We claim:

1. An electrical socket for supporting and connecting a light tube having an end terminal located in each end of the tube and a side terminal located in the lateral side of the tube adjacent each end thereof, said socket comprising a first body member of insulating material including a pair of parallel side wall portions and a bottom portion defining an open U-shaped chamber for receiving the terminal end of the tube, and also including an end portion extending across the back of the U-shaped chamber, a second body member of insulating material disposed adjacent the front of the first body member and including a pair of parallel side wall portions and a bottom portion defining an open U-shaped chamber that is substantially coextensive with the chamber formed by

said first body member, the adjacent side portions of said first and second body members having aligned holes therein, means extending through each of said holes in the adjacent side portions to secure said first and second body members together, an arm pivotally mounted between one of the adjacent side wall portions of said first and second body members and being arranged to close the top of the chamber formed by said body members, a first wiping contact disposed adjacent the said end portion that extends across the back of said U-shaped chamber of said first-body member for engaging the end terminal of the tube, a second wiping contact disposed adjacent said second body member for engaging the side terminal of the tube, a pair of electrical terminals, each of said electrical terminals being, supported on one of said first and second body members, each of said wiping contacts including extensions connected to a respective terminal, said extension of said second wiping contact extending between said first and second body members.

2. A socket as defined in claim 1 wherein said means for securing said first and second body members together comprises an eyelet extending through each of said holes in the adjacent side wall portion.

3. A socket as defined in claim 1 wherein the end portion of said first body member has a slot formed therein extending generally parallel to the side wall portions thereof to cooperate with said first wiping contact to substantially prevent lateral movement thereof and wherein said electrical terminals are supported on said first body member and further including resilient detent means mounted between the other adjacent side wall portions of said first and second body members for releasably securing one end of said pivotally mounted arm.

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