Aug. 13, 1935. P. M. KOMM ET AL 2,011,178

ELECTRICAL CONNECTER

Filed Feb. 19, 1931 2 Sheets-Sheet 1

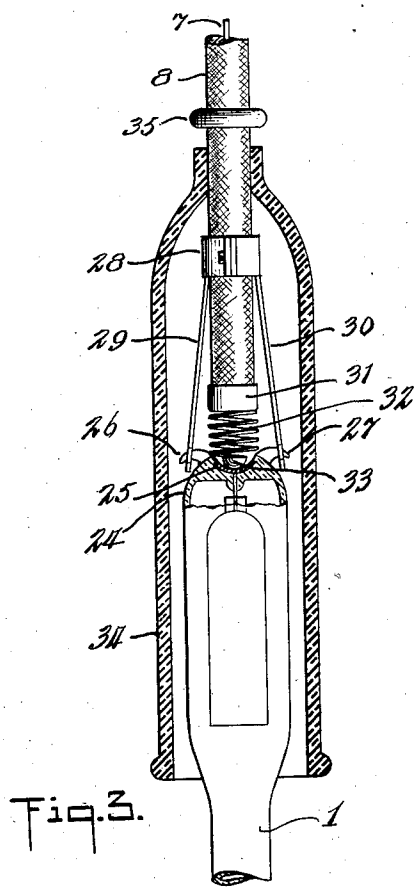


Fig. 3.

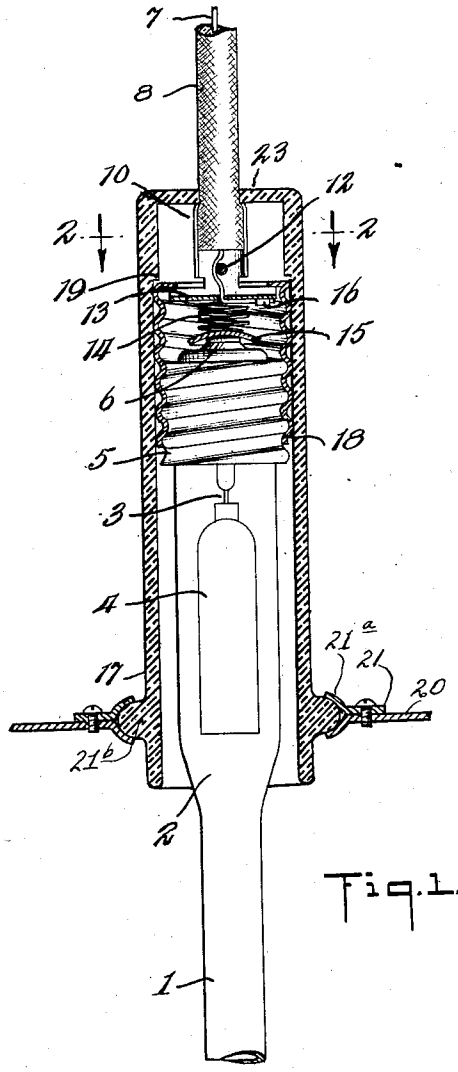


Fig. 1.

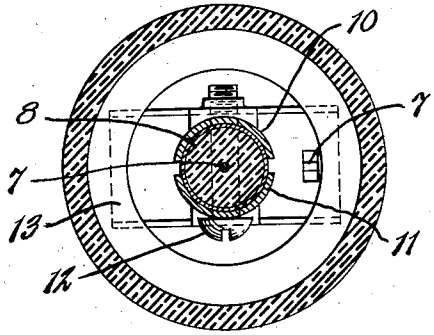


Fig. 2.

Paul M. Komm,
Franz J. Lomas,
George J. Madiel
and
Oscar A. Pearson
INVENTORS

BY Darby & Darby

ATTORNEYS

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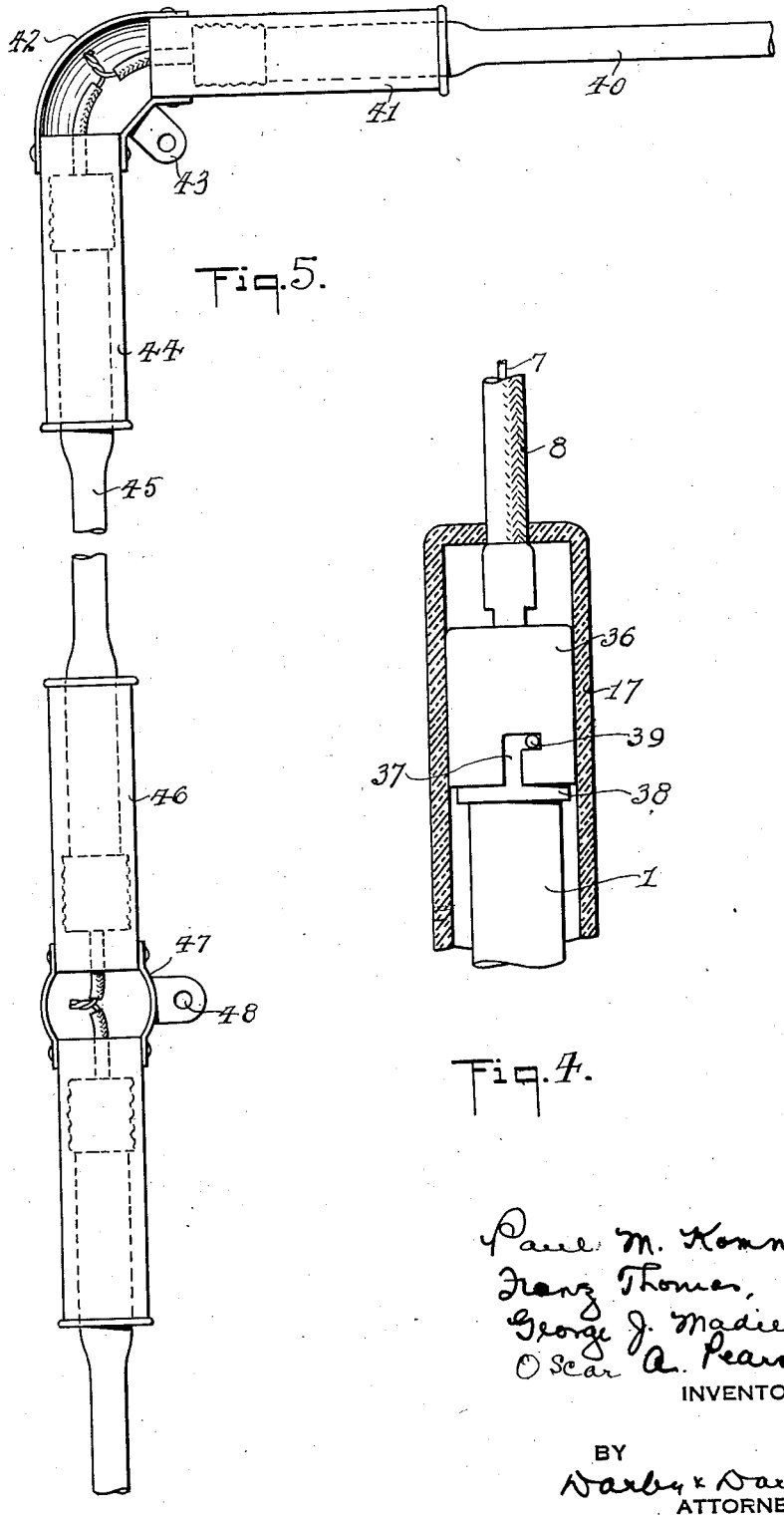


Fig. 5.

Fig. 4.

Paul M. Komm,
Franz Thomas,
George J. Madill, and
Oscar A. Pearson
INVENTORS

BY
Darby & Darby
ATTORNEYS

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ELECTRICAL CONNECTER

Paul M. Komm, Berwyn, Franz Thomas and George J. Madill, Chicago, and Oscar A. Pearson, Oak Park, Ill., assignors to Thordarson Electric Manufacturing Company, Chicago, Ill., a corporation of Illinois

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14 Claims. (Cl. 173—328)

This invention relates to electrical connection devices, and with particularity to connection sockets for lamps or similar articles.

One of the principal objects of the invention is to provide a novel type of connecting socket for electrical devices such as lamps or the like.

Another object of the invention is to provide a novel method of supporting and making electrical connection with a tubular lamp such as a luminous tube or the like.

A feature of the invention relates to a novel terminal arrangement for electric lamps, in conjunction with a novel type of socket for rigidly retaining the lamp in position within the socket.

A further feature of the invention relates to a novel socket connection for luminous tube lamps, or the like, wherein a lamp may be inserted and rigidly maintained in position without turning the lamp or the associated wiring.

A still further feature of the invention relates to a bi-part socket and support for electrode lamps such as luminous tube lights or the like. In the case of neon lamps, particularly those of considerable length, great difficulty has been encountered heretofore in providing the proper electrical connections and support to the terminals or ends of the lamp housing. The various types of sockets in use heretofore have been in the main unsightly in appearance, and usually require special clips or spring fingers for supporting the body of the lamp. In accordance with the present invention the lamp is supported in an insulating housing which by its rotation insures an efficient electrical connection to the terminals of the lamp and at the same time rigidly and securely holds the lamp in position. At the same time the weight of the sign is suspended from the covering of the conductor and not from the conductor itself.

A still further feature relates to a novel type of socket for luminous tube lamps which is capable of both indoor and outdoor use.

A still further feature relates to the novel organization and arrangement of parts which go to make up a cheap, efficient, screw threaded socket having a spring connecter in the base thereof.

A still further feature relates to a novel type of bayonet joint socket for luminous tubes or the like. Other features and advantages not specifically enumerated will be apparent after a consideration of the following detail descriptions and the appended claims.

Referring to the drawings;

Fig. 1 represents a partial sectional view of a portion of a lamp and socket according to the invention;

Fig. 2 is a sectional view of Fig. 1 taken along the line 2—2 thereof;

Fig. 3 is a sectional view of a modified form of socket;

Fig. 4 shows how separate lengths of luminous tubing may be connected in any suitable or desired formation.

Fig. 5 shows a modified manner of anchoring the luminous tube in the socket housing employing a bayonet joint.

Referring more particularly to Fig. 1, the numeral 1 represents a tubular lamp such as a neon lamp or the like which is provided with an enlarged end portion 2 having sealed therein in any conventional manner, a lead-in wire 3 on which is supported a cup-shaped or plate electrode 4. Cemented to the end of the lamp 1 is a screw threaded member 5 of brass or other suitable metal such as is ordinarily employed in electric light bulbs. The lead-in wire 3 is electrically connected to the metal disc 6 on the bottom of the lamp in the usual manner. The numeral 7 represents a conductor leading to one terminal of a source of supply potential for the lamp. If the lamp is designed to operate on high potential, then a suitable high potential insulation 8 is provided for the conductor 7. The end 9 of the insulated wire is clamped between two semi-cylindrical metal members 10 and 11 by means of screw 12 which is threaded through the members as shown more clearly in Fig. 2 of the drawings. The clamp members 10 and 11 support a flat metal member 13 to which is in turn soldered or otherwise attached a coil spring 14. A contact disc or cup 15 is soldered or otherwise fastened to the outer end of the spring 14 and serves to contact with the terminal disc 6 on the base of the lamp 1. The supply wire 7 passes through a central opening in the member 13 and the free end of this wire passes under a struck-up lug 16 on the member 13, thus enabling the clamp assembly comprising the members 10, 11 and 13 to be expeditiously placed on and/or removed from the free end of the insulated wire and avoiding soldering or the like. It will be obvious of course that instead of using the particular arrangement for connecting the wire 7 to the clamp assembly as shown in the drawings, that the wire 7 may, if desired, be soldered thereto or otherwise electrically connected in any convenient manner.

Adapted to be positioned over the enlarged portion 2 of the lamp is a cylindrical housing 17

of suitable insulating material such as porcelain, hard rubber, "Bakelite", wood or the like. The member 17 has fastened to its interior wall a metallic threaded receptacle 18 having a thread complementary to that of the member 5. The screw threaded member 18 may be held in place by cement, rivets, or in any other convenient manner. Preferably the lower inner wall of the housing 17 is shouldered as indicated by the numeral 19, to provide a seat for the member 18.

In the drawings, numeral 20 represents a flat surface wherein the socket is to be mounted, for example, this surface may represent the outer wall of a sign housing or it may represent an outlet in a wall or other surface where the lamp is to be used. The housing 17, together with the remaining parts may be held in proper position in the member 20 by means of a ring 21, which may be screwed or otherwise fastened to the member 20, thus clamping the flanged edge 22 of the member 17 against the member 20. It will be noted that in the particular embodiment shown in Fig. 1, the ring 21 has a concave flange 21^a, and also the member 20 has a similar flange. These flanges are of the same general shape as the rounded bead portion 21^b or the member 17, thus providing in effect a "universal" mounting and enabling the socket and tube to be positioned at any desired angle with respect to member 20.

In using the combined socket and connecter shown in Figs. 1 and 2, the wire 7 is threaded through the opening in the lower wall 23 of the housing 17 and the connecter including the members 10 and 11 is then tightened around the end of the insulation 8 by means of the screw 12. The connecter having been thus attached to the end of the insulation, the wire 7 is passed underneath the struck-up lug 16 on the member 13, and this lug may be pressed to clamp the wire in good electrical connection with the member 13. With the connecter thus attached and electrically connected to the wire 7 the said wire is pulled until the portion 13 rests against the bottom of the screw threaded receptacle 18, as shown in Fig. 1. The housing 17 is then positioned over the end of the lamp 1 and said housing is rotated causing the member 5 to engage the threaded receptacle 18 and thus tightening the lamp in position.

While the lamp is being thus tightened in position the contact disc 15 engages the lamp terminal and the spring 14 is compressed thus providing an efficient electrical contact to the lamp terminal. By this arrangement therefore the lamp may be very securely and rigidly fastened within the housing 17, thus avoiding the use of additional clips for supporting the lamp in position. Furthermore when the lamp is thus properly positioned, the only part of the socket visible, is the housing 17 which may be made artistic in appearance and thus avoid the unsightly connecters that have usually been employed heretofore. After the lamp has been positioned in the housing the ring 21 may be secured in position to hold firmly the said housing with relation to the surface 20.

From the foregoing description it will be seen that in making electrical connection between the lamp 1 and the supply wire 7 it is not necessary to turn either the wire or the lamp, the electrical connection being effected merely by turning the housing 17 to thread the screw base of the lamp into the correspondingly threaded receptacle 18 on the interior of the housing.

While in the embodiment of Fig. 1 the entire weight of the tube 1 and the receptacle is borne by the member 20, it will be understood that this is not at all necessary. The member 20 may be entirely omitted, in which case the entire weight of the tube 1 is borne by the wire covering 8. This latter feature is of advantage in connection with indoor hanging lights, and since the covering 8 may be of relatively heavy material it is not necessary to employ additional supports, and furthermore there is very little strain, if any, on the wire 7 itself. This is clearly shown in Fig. 3, wherein the luminescent tube 1 is entirely supported by the members 28, 29 and 30 from the insulating covering 8.

There is thus provided in effect, what may be termed a bi-part socket wherein the housing 17 forms one member of the socket and the member 13 with its resilient contact button forms the other member or base of the socket. While the member 13 is shown of a particular shape, it will be understood that broadly the invention contemplates the use of any type of member being of sufficient size to prevent the wire 7 being completely pulled through the housing 17. Furthermore, while the housing 17 is shown with a separate metal internally threaded member, it will be understood that this is not absolutely necessary, and that the member 17 may itself be internally threaded. Accordingly the expression "internally threaded" as used in the claims is intended to cover both of these features.

Referring to Fig. 3 there is shown a modified form of socket wherein the base portion 24 of the lamp 1 is provided with a metallic cap 25 which has attached thereto a pair of curved lugs 26, 27. If desired these lugs may be formed integrally as struck-up portions of the cap 25 which may be cemented or otherwise fastened to the base of the lamp. The supply wire 7 having a suitable insulation 8, has clamped thereto a bi-part ring 28 which carries a pair of metal strips or extensions 29, 30. These strips are preferably of springy material such as brass, phosphor bronze or the like. At their upper ends the members 29 and 30 are provided with slots to receive the curved lugs 26 and 27 on the base of the lamp. Clamped to the end of the insulation 8 is a cap or bi-part metal member 31 which carries a spring 32 having a contact disc or button 33 supported thereon. An insulating housing 34 similar to the housing 17 of Fig. 1 is provided and a rubber ring 36 may be provided around the insulation 8 to limit the movement of the housing 34, thus the ring 35 may be moved until the lower end of the housing 34 is held against the member 28. In positioning the lamp 1 in the receptacle the insulated wire carrying the member 28 and the arms 29 and 30 is forced inwardly until the slots engage the hooked portions 26, 27 on the base of the lamp. When it is desired to remove the lamp the members 29 and 30 are again forced inwardly causing them to spread further apart and disengage the slots from the hook portions 26, 27, whereupon members 29 and 30 may be turned out of the plane of said hook portions and the lamp withdrawn. The arrangement disclosed in Fig. 3 is particularly useful where the lamp 1 is to be suspended by means of the insulated wire itself since the weight of the lamp is borne by the hooked members 26, 27 and the slotted members 29 and 30.

Instead of employing a screw ferrule socket as shown in Fig. 1 for anchoring the tube within the housing, a bayonet type socket may be employed. Thus as shown in Fig. 4 the housing 17 has secured on the interior thereof a cylindrical mem-

ber 36 having a bayonet slot 37 in one wall thereof. The luminescent tube 1 has attached to the base thereof by cement or any other suitable manner, a cap 38 which carries a pin 39 adapted to engage with the bayonet slot 37 in the manner well known in the radio art. It will be understood, of course, that the supply wire 7 and the insulating coating 8 are provided with a clamp assembly in the same manner as disclosed in Fig. 1. In other words the covering 8 serves to support a clamp such as the clamp 10 of Fig. 1, which in turn carries a spring pressed contact member such as 15 of Fig. 1. Thus the only essential difference between the embodiment of Fig. 1, and that of Fig. 4 is that the threaded member 18 is replaced by the bayonet joint member 36 and the threaded ferrule 5 is replaced by the members 38 and 39.

If the receptacle and lamp is to be used in a horizontal or nearly horizontal position the wall of the member 17 may be perforated as indicated in the drawings, to allow moisture to strain off without reaching the lamp contacts.

Referring to Fig. 5 there is shown schematically one manner of arranging separate tubular sections in serial formation. While the drawings show the tubular sections arranged substantially in L formation, it will be understood that this is merely illustrative and that the tubular sections may be arranged in any other desired formation. The numeral 40 represents a portion of a luminescent tube which is mounted in a socket 41 of the type shown in either Figs. 1, 3 or 4. The receptacle 41 is positioned within the end of a coupling member 42 by means of screws, threads, or even by frictional engagement. The member 42 carries a lug 43 whereby the said member may be attached to any suitable support, such as a wall, alcove or the like. Positioned within the opposite end of the member 42 is a similar receptacle 44 and tube 45. The opposite end of the tube 45 is mounted in a similar receptacle 46 which in turn is fastened within a coupling member 47 having a fastening lug 48. Similarly succeeding sections of luminescent tubing may be connected in the same manner. In order to connect the tubes in circuit the free ends of the connecting wires may be twisted together and soldered as represented in the drawings, or if desired the ends of the wires may carry right and left handed threaded members whereby the wires may be connected together merely by turning the threaded members. It will be understood that the coupling members 42, 47 etc. are tubular in shape so as to completely enclose the wire connections and to provide a continuous rigid support between the successive sections. The foregoing arrangement is particularly suitable for alcove lighting, or so-called "outline" illumination.

While specific embodiments of the invention have been disclosed in the drawings, it will be understood that the invention is not limited thereto, and that various changes and modifications may be made therein without departing from the spirit and scope of the invention.

What is claimed is:

1. In combination a supply wire having an insulation sheath, an internally threaded member having an opening in the base thereof and adapted to receive the corresponding threaded base of a lamp, a removable connecter member fastened to said sheath having a greater width than the opening in said base for preventing said wire pulling through said base, means for supporting the lamp and said internally threaded member from said sheath, and means for connecting said lamp with said supply wire.

2. The combination according to claim 1 in which the connecter member is provided with means for clamping it to said sheath.

3. In combination a supply wire having an insulation sheath, an electrical connecter member clamped to said sheath, said member having a width greater than the diameter of said wire, and an internally threaded socket member secured to said clamp, said socket member having an opening larger than the diameter of said wire but smaller than the width of said connecter member.

4. In combination a lamp having a threaded base, a socket for said lamp comprising a revoluble housing having an internally threaded surface, a supply wire for said lamp passing centrally through an opening in the base of said housing, and means carried by said wire for making electrical contact with said lamp and for preventing said wire from completely pulling through said housing, the last mentioned means including a transverse member carried by said supply wire having a width greater than that of said opening, a coil spring carried by said transverse member, and a contact button carried by said spring.

5. In combination a lamp having a screw-threaded base, an internally threaded socket member having a perforated base, a current supply wire passing through said perforation, a member fastened to said wire for preventing said wire pulling through said perforation, said socket upon rotation serving to clamp said member between the base of the lamp and the base of the socket.

6. In combination a lamp having a threaded base, an internally threaded rotatable socket, a supply wire passing through the base of said socket, means attached to the end of said wire for clamping said wire between the base of said lamp and the base of said socket when said socket is threaded onto the base of said lamp.

7. In combination a supply wire having a contact button, a coiled spring resiliently fastening said button to the end of said wire, an internally threaded socket through which said wire passes, and a lamp having a threaded base adapted to thread into said socket, said socket being rotatable with respect to said wire.

8. In combination a current supply wire having an insulation sheath, a metallic member clamped to said sheath but out of contact with said wire, a socket carried by said member, a contact button within said socket, and a coiled spring connection between said contact button and said wire.

9. A terminal connecter for terminal supply wires having an insulation sheath comprising a portion adapted to surround the sheath, means for clamping said surrounding portion to said sheath, a socket secured to said clamping means, a transverse connecting portion to receive the end of the wire and electrically connected thereto, a coiled spring attached to said transverse connection portion, and a contact button carried by said spring.

10. In combination a lamp having a hook attached to the base thereof, a current supply wire for said lamp, a resilient contact member affixed to the end of said wire and bearing against the base of said lamp, a spring finger clamped to said wire and having a slit to engage said hook.

11. In combination a lamp having a contact surface attached to the base thereof, a pair of hook members attached to the lamp base, a current supply wire for said lamp, a pair of slotted fingers clamped to said wire, the slots of said fingers engaging said hooks to provide a support for said lamp.

12. The combination according to claim 11 in which the end of the supply wire also carries a resiliently mounted contact button engaging a corresponding contact on the base of the lamp.

13. In combination, a wire having an insulation sheath, an insulating housing having an opening in one end adapted to receive the sheathed wire, a cylindrical member on the interior of said housing, said member having a bayonet slot in one wall thereof, a lamp having a cap on the base thereof, a pin on said cap adapted to engage said bayonet slot to hold said lamp in position within said housing, and a clamp adapted to be clamped to said sheath and attached to said member for supporting said member and lamp said clamp being larger than the opening in said housing to prevent the wire pulling through said housing, a coil spring carried by said clamp, and a contact button carried by said spring, said wire being connected to said spring.

14. In combination an electric supply wire having an insulating covering, a member clamped to said covering, a coil spring attached to said member, a contact button attached to said spring, and a bayonet joint receptacle supported by said member adjacent to and in line with said contact button, said wire being connected to said spring.

PAUL M. KOMM.
FRANZ THOMAS.
GEORGE J. MADILL.
OSCAR A. PEARSON.