April 26, 1938. C. BARDWELL 2,115,324

ELECTRICAL CONNECTER

Filed Dec. 2, 1936

Fig. 1.

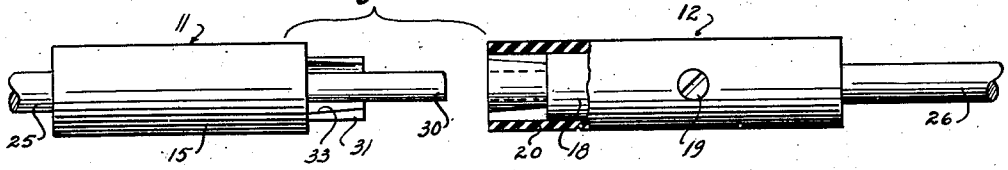


Fig. 2.

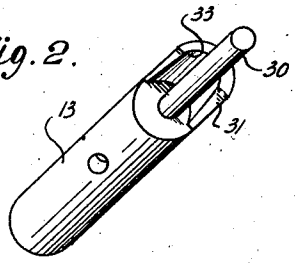


Fig. 3.

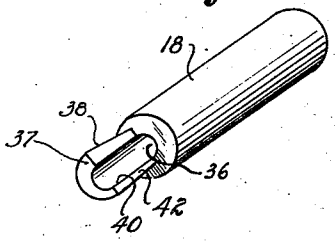


Fig. 4.

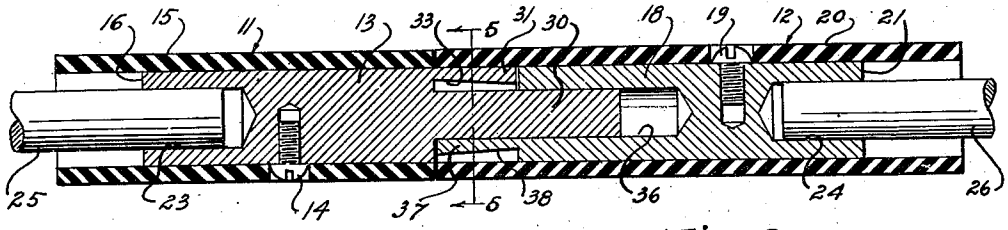


Fig. 5.

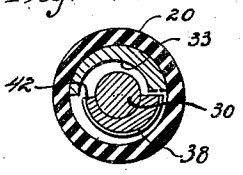


Fig. 6.

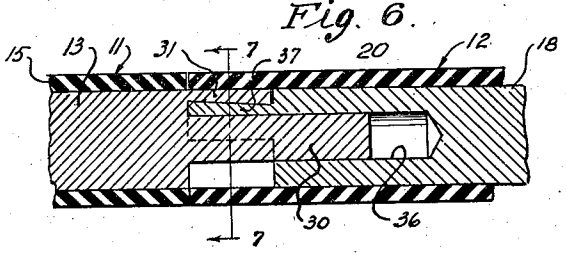


Fig. 7.

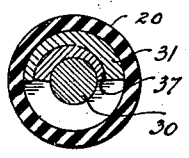
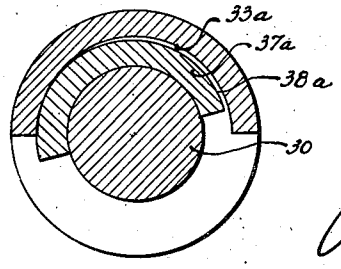


Fig. 8.



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2,115,324

ELECTRICAL CONNECTER

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Application December 2, 1936, Serial No. 113,809

10 Claims. (Cl. 173—328)

This invention relates to connecters for electrical conductors, and particularly to connecters for electrical conductors carrying relatively heavy currents, as for example as used in connection with motion picture studio lamps.

It has been common to provide electrical connecters comprising a pair of interfitting parts, one of which is slidable within the other, and which when fitted together form an electrical connection. Connecters of this type as heretofore known, however, are frequently either liable to be accidentally pulled apart, or are difficult to manipulate.

It is the purpose of the present invention to provide an electrical connecter adapted to be connected and locked together by a very simple and convenient manipulation, and which likewise may be disconnected by a simple reverse manipulation.

A further object of the invention is to provide a connecter which is of a nature to insure a substantial area of contact between the conductor portions of the joint elements.

A still further object of the invention is to provide a conductor which is durable, simple and relatively inexpensive to manufacture.

Various additional objects and advantages of my invention will appear from the following detained description of present preferred embodiments thereof, reference for this purpose being had to the accompanying drawing, in which:

Fig. 1 shows the two joint elements in accordance with the present invention in position before being moved into connection, one of the joint elements being shown in partial section;

Fig. 2 is a perspective view of one of the joint elements;

Fig. 3 is a perspective view of the other or complemental joint element;

Fig. 4 is a longitudinal section of the joint elements moved together but before being twisted into locking position;

Fig. 5 is a transverse section on line 5—5 of Fig. 4;

Fig. 6 is a view similar to a portion of Fig. 4 but showing the parts after having been twisted into locking position;

Fig. 7 is a transverse section taken on line 7—7 of Fig. 6; and

Fig. 8 is a sectional view similar to Fig. 7 but showing a modified form of the invention.

The two joint elements of the connecter are indicated in the drawing at 11 and 12. Joint element 11 comprises a cylindrical metallic plug 13, preferably of brass or other durable electrically conductive material, and attached to this plug, as by screw 14, is an insulating sleeve 15, which extends somewhat beyond the rearward end 16 of plug 13, as shown. Joint element 12 comprises a cylindrical metallic socket member 18, also preferably of brass, to which is attached, as by screw 19, an insulation sleeve 20 which extends rearwardly somewhat beyond the rearward end 21 of the socket member as shown.

The outer or rearward ends of plug member 13 and socket member 18 are provided with sockets 23 and 24, respectively, to receive the terminals of electrical conductors 25 and 26, which are soldered in place.

Plug 13 is provided at its forward end with a central cylindrical pin or tongue 30, which socket member 18 has a central bore 36 adapted slidably and rotatably to receive said pin or tongue.

Either the plug or socket member, as here illustratively shown, plug member 13, is provided at its forward end with a semi-circular flange 31 which is annularly spaced from the tongue. The outer surface of this flange 31 is concentric with the axis of the plug, being preferably a continuation of the outer cylindrical surface of the plug. The inner surface 33 of flange 31, however, is eccentric with reference to the plug axis, as clearly appears from Fig. 5. This inner surface 33 of flange 31 is also conical shaped, as illustrated, flange 31 thus tapering in thickness from its outer end toward its juncture with the body part of the plug to provide a forwardly converging inner engaging surface.

The other joint member, as here illustrated, socket member 18, has a semi-circular flange 37. The outer peripheral surface 38 of flange 37 is eccentric with reference to the axis of the joint element, as clearly shown in Fig. 5, and is conical shaped, inclining outwardly or diverging towards its outer end. The inner surface 40 of flange 37 is a continuation of the central bore 36 of the socket. Flange 37 thus tapers in thickness from its outer end toward its juncture with the body portion of socket 18. As will be apparent from the drawing, the eccentricity and taper of flange 37 are complementary to those of plug flange 31.

In connecting the joint-parts, they are slipped together into the position shown in Figs. 4 and 5, the socket flange 37 lying at the side of tongue or pin 30 opposite that occupied by flange 31. The thinner edge 42 of flange 37 is then disposed opposite the wider opening between pin 30 and plug flange 31. The plug and socket are then relatively twisted. For instance, assume that the plug is held stationary and the socket

is rotated in a right-handed direction. Flange 37 is thus brought beneath flange 31, the complemental eccentric flange faces 33 and 38 of the flanges coming into tight facial contact and becoming frictionally interlocked to resist accidental reverse rotation, and the flange parts then being in the overlapped position shown in Figs. 6 and 7. Such engagement of the faces of course prevents the socket from being rotated too far in a right-handed direction. At the same time, the complementary tapers of the two flanges prevent subsequent accidental longitudinal separation of the joint-parts.

To disconnect the connecter, it is merely necessary to rotate the joint parts in the opposite direction and then pull them apart.

In Fig. 8 is shown a modification, in which only one of the flanges, which may be either of the two, though as here shown inner flange 37*a*, has an eccentric engaging face, indicated at 38*a*, the cooperating inner surface 33*a* of the outer flange being formed concentric with the axis of the joint. Otherwise the parts are the same as in the previously described form. In this instance the same locking effect is accomplished in the same manner, except that the peripheral surfaces of the flanges do not contact throughout. There is thus lost some of the benefit of the large area of contact had when the connecter is made in the manner first described, though the connecter in this form still has sufficient area of contact for many purposes. This form has the advantage of greater ease of manufacture.

I have now described in detail certain specific forms of my invention; it is to be understood, however, that various changes in design, structure and arrangement may be made without departing from the spirit and scope of my invention or of the appended claims.

I claim:

1. An electrical connecter comprising plug and socket connecter members, each comprising an elongated metallic body portion adapted to have an electrical conductor connected thereto, the forward end of said plug member having a central projecting pin and the forward end of the socket member having a central cylindrical socket adapted to receive said pin, one of said connecter members having extending from its forward end a substantially semi-circular flange spaced outside the pin and pin socket and provided with an inner conical engaging face converging toward the forward end of the flange, the other of said connecter members having extending from its forward end a substantially semi-circular flange of smaller diameter disposed outside said pin and pin socket and having an outer conical engaging face diverging toward the outer end of the flange complementarily to the conical engaging surface of the first mentioned flange, and adapted to be brought into engagement therewith, by relative rotation of the connecter members after the pin has been inserted in the pin socket, with the flanges on opposite sides of the connecter, at least one of said engaging surfaces being eccentric to the axis of the pin and pin socket.

2. An electrical connecter comprising plug and socket connecter members, each comprising an elongated metallic body portion adapted to have an electrical conductor connected thereto, the forward end of said plug member having a central projecting pin and the forward end of the socket member having a central cylindrical socket adapted to receive said pin, one of said connecter members having extending from its forward end a substantially semi-circular flange spaced outside the pin and pin socket and provided with an inner conical engaging face converging toward the forward end of the flange, the other of said connecter members having extending from its forward end a substantially semi-circular flange of smaller diameter disposed outside said pin and pin socket and having an outer conical engaging face diverging toward the outer end of the flange complementarily to the conical engaging surface of the first mentioned flange, and adapted to be brought into engagement therewith by relative rotation of the connecter members after the pin has been inserted in the pin socket, with the flanges on opposite sides of the connecter, one of said engaging surfaces being eccentric to the axis of the pin and pin socket, and the other of said engaging faces being concentric with said axis.

3. An electrical connecter comprising plug and socket connecter members, each comprising an elongated metallic body portion adapted to have an electrical conductor connected thereto, the forward end of said plug member having a central projecting pin and the forward end of the socket member having a central cylindrical socket adapted to receive said pin, one of said connecter members having extending from its forward end a substantially semi-circular flange spaced outside the pin and pin socket and provided with an inner conical engaging face converging toward the forward end of the flange, the other of said connecter members having extending from its forward end a substantially semi-circular flange of smaller diameter disposed outside said pin and pin socket and having an outer conical engaging face diverging toward the outer end of the flange complementarily to the conical engaging surface of the first mentioned flange, and adapted to be brought into engagement therewith by relative rotation of the connecter members after the pin has been inserted in the pin socket, with the flanges on opposite sides of the connecter, the engaging surface on the inside flange being slightly eccentric to the axis of the pin and pin socket.

4. An electrical connecter comprising plug and socket connecter members, each comprising an elongated metallic body portion adapted to have an electrical conductor connected thereto, the forward end of said plug member having a central projecting pin and the forward end of the socket member having a central cylindrical socket adapted to receive said pin, one of said connecter members having extending from its forward end a substantially semi-circular flange spaced outside the pin and pin socket and provided with an inner conical engaging face converging toward the forward end of the flange, the other of said connecter members having extending from its forward end a substantially semi-circular flange of smaller diameter disposed outside said pin and pin socket and having an outer conical engaging face diverging toward the outer end of the flange complementarily to the conical engaging surface of the first mentioned flange, and adapted to be brought into engagement therewith by relative rotation of the connecter members after the pin has been inserted in the pin socket, with the flanges on opposite sides of the connecter, the engaging surface on the inside flange being slightly eccentric to the axis of the pin and pin socket, and the engaging surface on the outside flange being concentric with said axis.

5. An electrical connecter comprising plug and

socket connecter members, each comprising an elongated metallic body portion adapted to have an electrical conductor connected thereto, the forward end of said plug member having a central projecting pin and the forward end of the socket member having a central cylindrical socket adapted to receive said pin, one of said connecter members having extending from its forward end a substantially semi-circular flange spaced outside the pin and pin socket and provided with an inner conical engaging face converging toward the forward end of the flange, the other of said connecter members having extending from its forward end a substantially semi-circular flange of smaller diameter disposed outside said pin and pin socket and having an outer conical engaging face diverging toward the outer end of the flange complementarily to the conical engaging surface of the first mentioned flange, and adapted to be brought into engagement therewith by relative rotation of the connecter members after the pin has been inserted in the pin socket, with the flanges on opposite sides of the connecter, said engaging surfaces both being eccentric to the axis of the pin and pin socket, in such manner as to become overlapped and frictionally interlocked in facial engagement with one another when the connecter members are rotated about the axis of the pin and socket.

6. An electrical connecter comprising plug and socket connecter members, each comprising an elongated metallic body portion adapted to have an electrical conductor connected thereto, the forward end of said plug member having a central projecting pin and the forward end of the socket member having a central cylindrical socket adapted to receive said pin, said plug member having extending from its forward end a semi-circular flange spaced outside the pin and provided with an inner conical engaging face converging toward the forward end of the flange, said socket member having extending from its forward end a substantially semi-circular flange, the inside surface of which is formed in continuation of the pin socket, and the outside surface of which is conical and diverges toward the outer end of the flange complementarily to the conical inside engaging surface on the plug member flange and is adapted to engage with said conical inside engaging surface when the plug and socket members are relatively rotated after the pin on the plug member has been inserted in the socket in the socket member with the flanges on opposite sides of the connecter, at least one of said engaging surfaces being eccentric to the axis of the pin and pin socket.

7. An electrical connecter comprising plug and socket connecter members, each comprising an elongated metallic body portion adapted to have an electrical conductor connected thereto, the forward end of said plug member having a central projecting pin and the forward end of the socket member having a central cylindrical socket adapted to receive said pin, said plug member having extending from its forward end a semi-circular flange spaced outside the pin and provided with an inner conical engaging face converging toward the forward end of the flange, said socket member having extending from its forward end a substantially semi-circular flange, the inside surface of which is formed in continuation of the pin socket, and the outside surface of which is conical and diverges toward the outer end of the flange complementarily to the conical inside engaging surface on the plug member flange and is adapted to engage with said conical inside engaging surface when the plug and socket members are relatively rotated after the pin on the plug member has been inserted in the socket in the socket member with the flanges on opposite sides of the connecter, one of said engaging surfaces being eccentric to the axis of the pin and socket, and the other of said surfaces being concentric with said axis.

8. An electrical connecter comprising plug and socket connecter members, each comprising an elongated metallic body portion adapted to have an electrical conductor connected thereto, the forward end of said plug member having a central projecting pin and the forward end of the socket member having a central cylindrical socket adapted to receive said pin, said plug member having extending from its forward end a semi-circular flange spaced outside the pin and provided with an inner conical engaging face converging toward the forward end of the flange, said socket member having extending from its forward end a substantially semi-circular flange, the inside surface of which is formed in continuation of the pin socket, and the outside surface of which is conical and diverges toward the outer end of the flange complementarily to the conical inside engaging surface on the plug member flange and is adapted to engage with said conical inside engaging surface when the plug and socket members are relatively rotated after the pin on the plug member has been inserted in the socket in the socket member with the flanges on opposite sides of the connecter, the engaging surface on the inside flange being slightly eccentric to the axis of the pin and pin socket.

9. An electrical connecter comprising plug and socket connecter members, each comprising an elongated metallic body portion adapted to have an electrical conductor connected thereto, the forward end of said plug member having a central projecting pin and the forward end of the socket member having a central cylindrical socket adapted to receive said pin, said plug member having extending from its forward end a semi-circular flange spaced outside the pin and provided with an inner conical engaging face converging toward the forward end of the flange, said socket member having extending from its forward end a substantially semi-circular flange, the inside surface of which is formed in continuation of the pin socket, and the outside surface of which is conical and diverges toward the outer end of the flange complementarily to the conical inside engaging surface on the plug member flange and is adapted to engage with said conical inside engaging surface when the plug and socket members are relatively rotated after the pin on the plug member has been inserted in the socket in the socket member with the flanges on opposite sides of the connecter, the engaging surface on the inside flange being slightly eccentric to the axis of the pin and pin socket, and the engaging surface on the outside flange being concentric with said axis.

10. An electrical connecter comprising plug and socket connecter members, each comprising an elongated metallic body portion adapted to have an electrical conductor connected thereto, the forward end of said plug member having a central projecting pin and the forward end of the socket member having a central cylindrical socket adapted to receive said pin, said plug member having extending from its forward end a semi-circular flange spaced outside the pin and pro-

vided with an inner conical engaging face converging toward the forward end of the flange, said socket member having extending from its forward end a substantially semi-circular flange, the inside surface of which is formed in continuation of the pin socket, and the outside surface of which is conical and diverges toward the outer end of the flange complementarily to the conical inside engaging surface on the plug member flange and is adapted to engage with said conical inside engaging surface when the plug and socket members are relatively rotated after the pin on the plug member has been inserted in the socket in the socket member with the flanges on opposite sides of the connecter, said engaging surfaces both being eccentric to the axis of the pin and pin socket, in such manner as to become overlapped and frictionally interlocked in facial engagement with one another when the connecter members are rotated about the axis of the pin and socket.

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