Jan. 6, 1953 G. C. PRICE 2,624,776

REVERSIBLE ELECTRICAL CONNECTOR

Filed Nov. 19, 1951 2 SHEETS—SHEET 1

Fig. 1

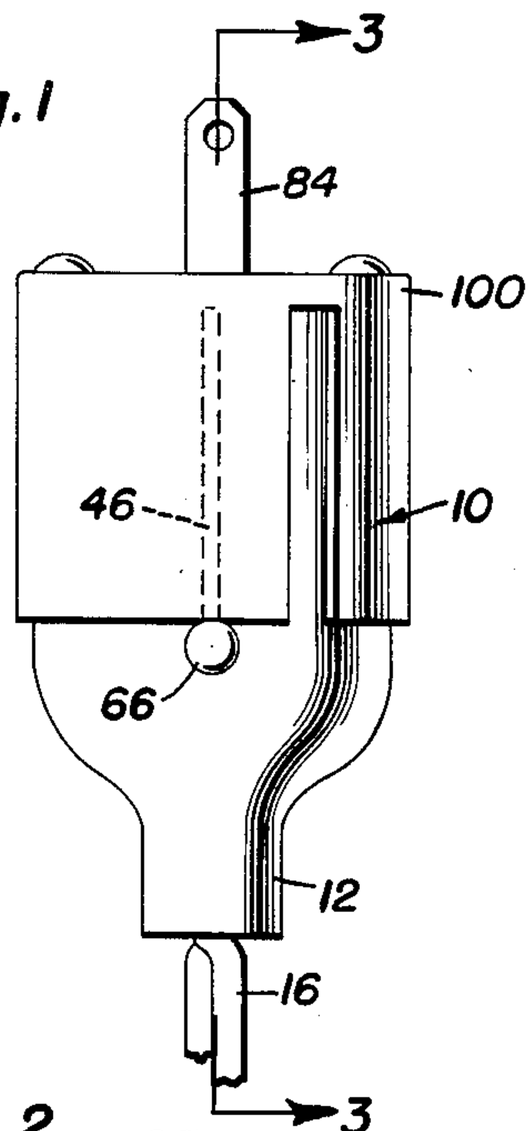


Fig. 2

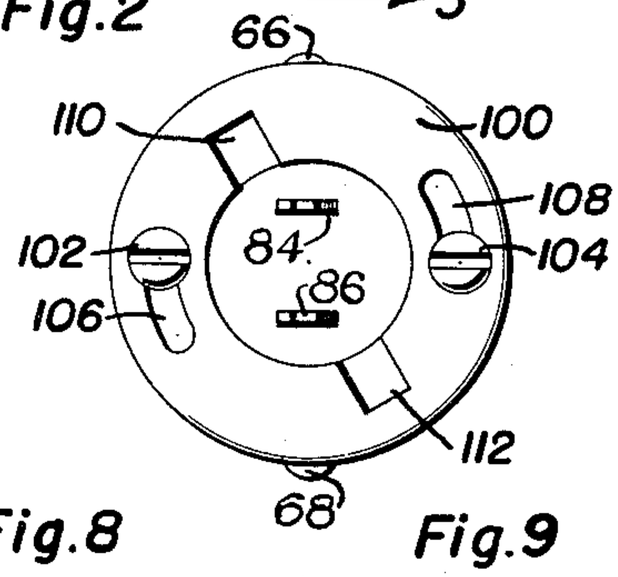


Fig. 3

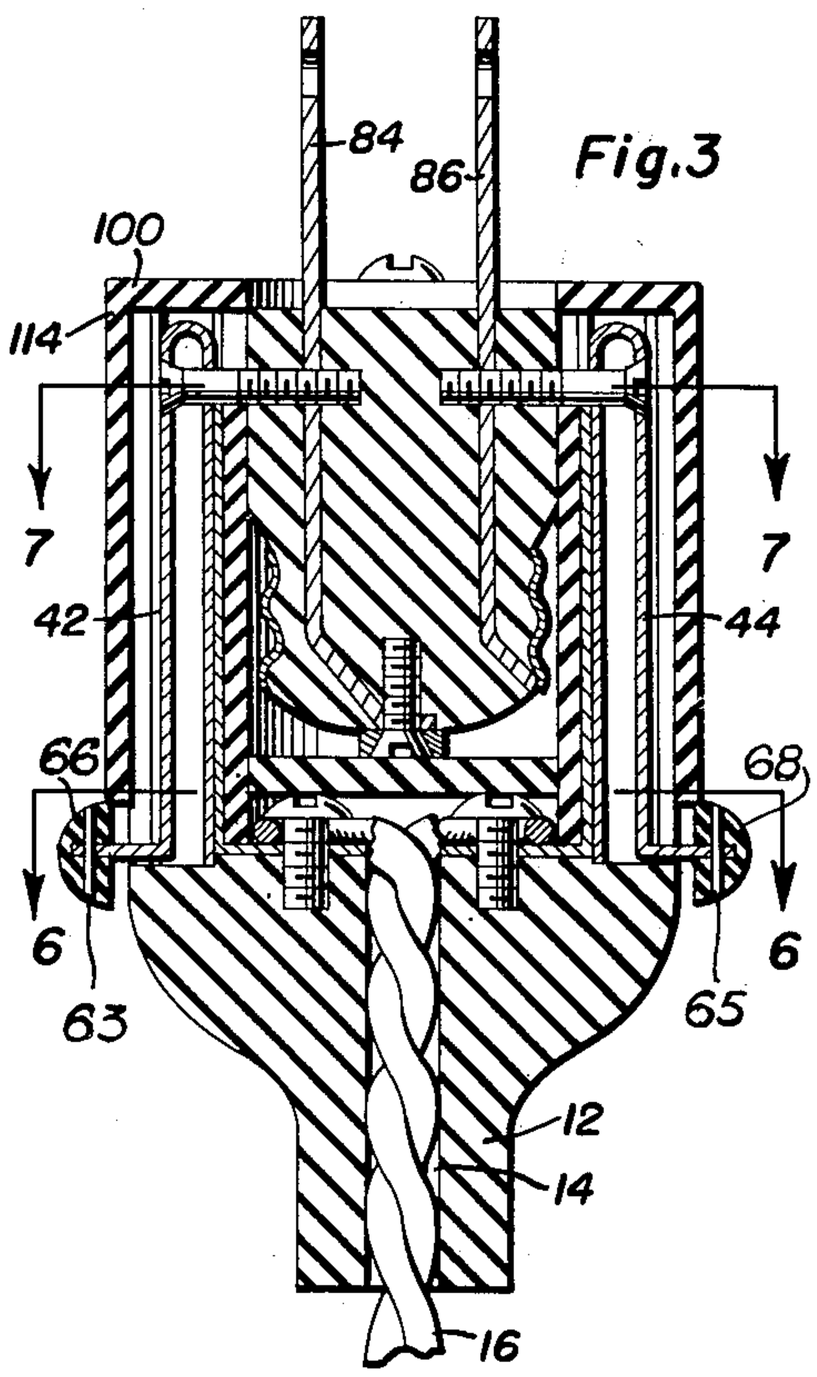


Fig. 7

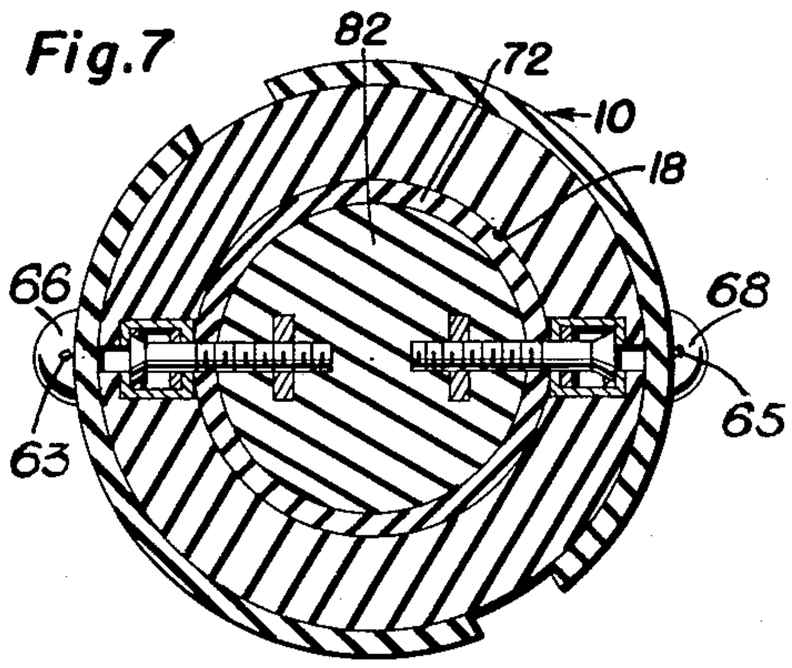


Fig. 8

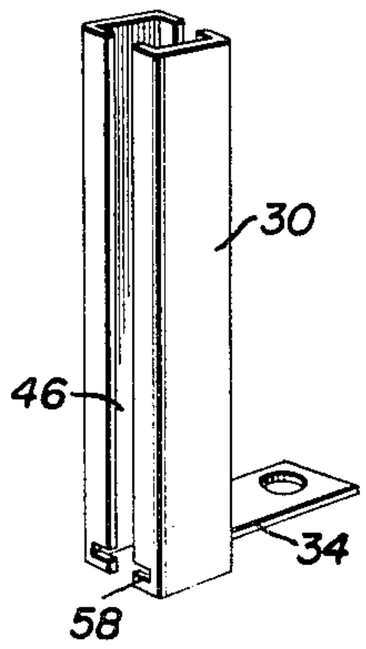
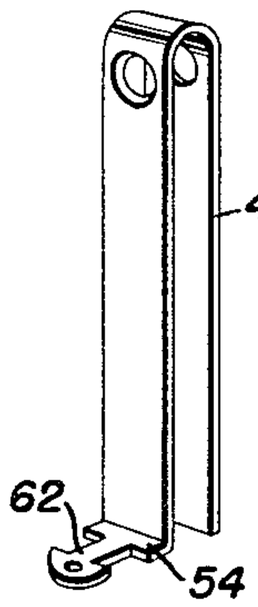


Fig. 9



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REVERSIBLE ELECTRICAL CONNECTOR

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Fig. 4

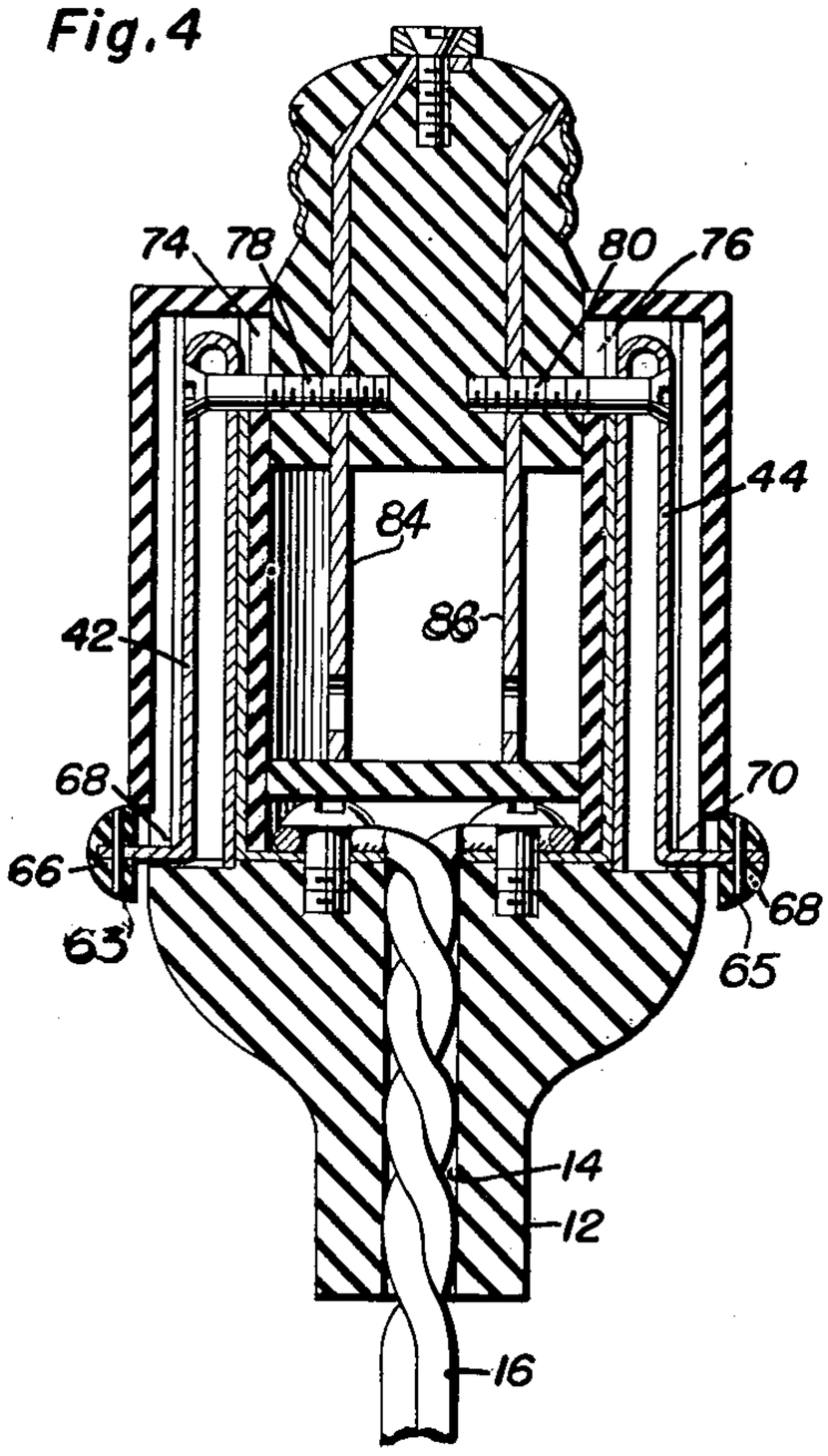


Fig. 5

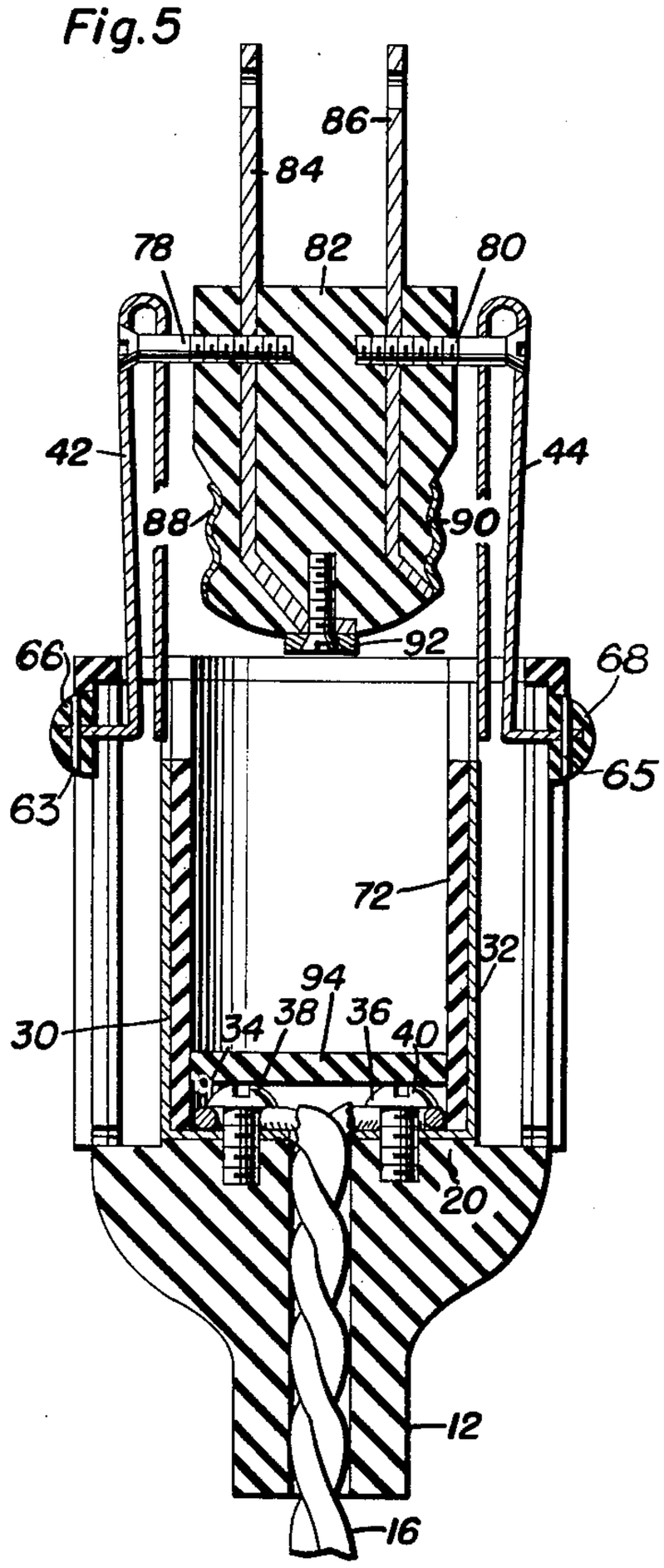
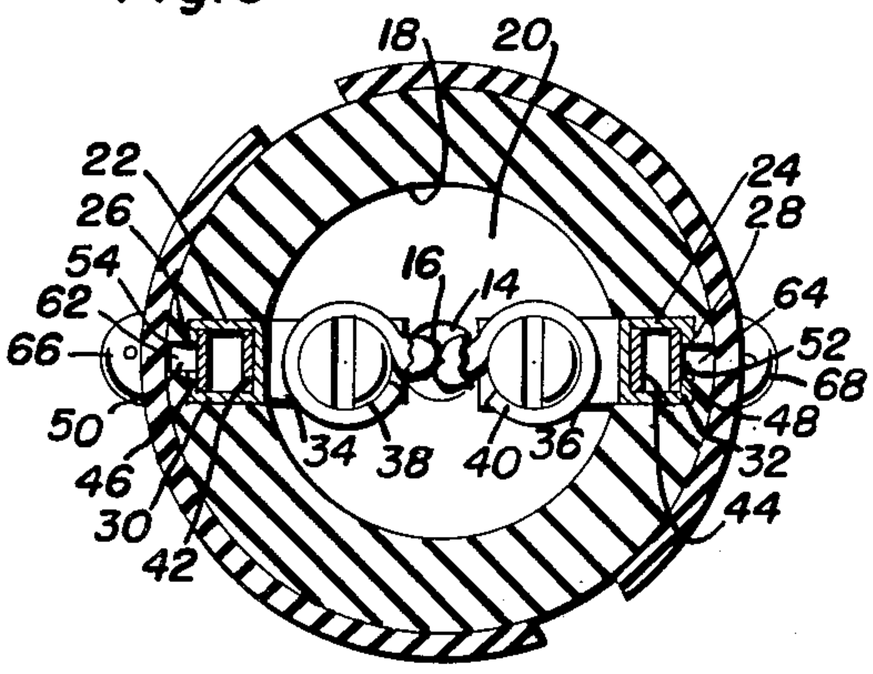


Fig. 6



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REVERSIBLE ELECTRICAL CONNECTOR

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Application November 19, 1951, Serial No. 256,987

6 Claims. (Cl. 173—361)

1

This invention relates to an electrical connector and particularly to a dual purpose connector for connecting to either a screw base or a standard plug outlet.

In the operation of electrical appliances about the home and other places it is usually customary to plug the appliance into a customary wall outlet having a pair of spaced apart slots into which conducting prongs extend to make contact with conductors safely hidden behind an insulating surface. However, it is frequently desirable to utilize the appliance at a place where there is no customary plug-in receptacle but where there is a screw base device such as a lamp. It has heretofore been customary to provide the fixtures with the usual plug-in appliance and to carry an extra screw in device to go into the screw base into which the plug-in may be made. As is well known the auxiliary device is almost always lost when desired to make the connection. Likewise, when the apparatus is carried from house to house for demonstration or other purposes it is frequently found that one house will have a screw base receptacle while the other will have the standard plug-in device.

The present invention provides a dual purpose plug which may be shifted to operate in either type of receptacle.

An apparatus according to the invention comprises a substantially cylindrical body of insulating material having a tubular bore in which is concealed a slidable plug one end of which is provided with a screw receptacle while the other end is provided with a pair of extended prongs for connection to the standard wall plug. The plug is mounted on trunnions secured in telescoping connectors so that the plug may be extended out of the insulating body and arranged in a desired position after which it will be returned to the body and locked in place in either of the desired positions.

It is accordingly an object of this invention to provide an improved connector.

It is a further object of this invention to provide a connector which may be favorably used either as a screw-in device or as a plug-in device.

It is a further object of this invention to provide a dual purpose connector having safety lock thereon.

It is a further object of this invention to provide a dual purpose plug which is completely closed and safe against accidental damage.

Other objects and many of the attendant advantages of this invention will be apparent from the following detailed description taken in conjunction with the accompanying drawings in which:

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Figure 1 is an elevation of the connector according to the invention;

Figure 2 is an end view of the connector according to the invention;

Figure 3 is a sectional elevation of the connector taken substantially on the plane indicated by the line 3—3 of Figure 1;

Figure 4 is a view similar to Figure 3 showing the plug reversed;

Figure 5 is a view similar to Figure 3 showing the plug extended into selecting position;

Figure 6 is a cross section through the connector taken substantially on the plane indicated by the line 6—6 of Figure 3;

Figure 7 is a cross section taken substantially on the plane indicated by the line 7—7 of Figure 3;

Figure 8 is an enlarged perspective view of the guide members; and

Figure 9 is an enlarged perspective view of the U-shaped connector which slides in the guide members.

In the exemplary embodiment of the invention according to the drawings, the plug-in device comprises a substantially cylindrical body constructed of suitable insulating material such as a thermo-setting plastic. The body 10 is preferably provided with a reduced end portion 12 and has an axial bore 14 extending therethrough, the bore 14 in the reduced portion 12 is of relatively small size and is intended for the purpose of admitting an electrical conductor such as a pair of twisted wires 16. The opposite end of the bore is enlarged as at 18, the junction between the enlarged bore 18 and the axial bore 14 providing a substantially flat shoulder 20. A pair of opposed channels 22 and 24 extend from the end of the body down to the shoulder 20. Each of the channels 22 and 24 is provided with a narrow slot 26 and 28 extending from the rectangular channels 22 and 24 to the exterior of the body 10.

Substantially rectangular metallic guide members 30 and 32 are secured in the channels 22 and 24 and have projecting terminals 34 and 36 which overlie the surface of the shoulder 20 and extend substantially into the region of the bore 14. Connectors 38 and 40 are provided on the terminals 34 and 36 so that the wires 16 may be attached to the respective terminals.

U-shaped connectors 42 and 44 are slidably

engaged in the rectangular guides 22 and 24. The guides 22 and 24 are provided with external slots 46 and 48 and projections 50 and 52 are attached to the outer legs of the U-shaped members 42 and 44 and extend through the slots 46 and 48 to be engaged for a purpose presently to be described.

The projections 50 and 52 extending through the slots 46 and 48 are provided with relatively enlarged base portions 54 and 56 which engage enlargements 58 of the base of the slots 46 and 48. The expansible nature of the U-shaped members causes the enlarged portion of the extensions 50 and 52 to spring outwardly and engage the enlarged openings 58 so that the U-shaped members are locked at the telescoped position in the guides 30 and 32. In order to slide the U-shaped members 42 and 44 in the guides 30 and 32 extensions 62 and 64 are provided on the enlarged projections of the U-shaped members and extend outwardly through the slots 46 and 48 and also through the slots 26 and 28 in the insulating material. Insulating buttons 66 and 68 are secured to the ends of the projections 62 and 64 by means of insulating pins 63 and 65. The U-shaped connectors can then be slid in the guides by depressing the buttons 66 and 68 to force the enlarged base portion out of the locking opening 58 so that the extensions 62 and 64 may slide in a relatively narrow guide opening in the guide members and in the insulating shell.

Preferably the interior of the bore 18 is provided with an insulating lining 72 which extends substantially the full length of the enlarged bore and has a pair of opposed slots 74 and 76 for engagement with trunnions 78 and 80 which are journaled in the outer ends of the U-shaped connectors 42 and 44. A substantially cylindrical plug 82 is mounted on the trunnions 78 and 80 and has a pair of parallel extending conductors 84 and 86 embedded in the insulating material. The trunions 78 and 80 extend into the plug and make metallic contact with the respective conductors 84 and 86 so that as shown the conductor 84 is connected through the trunnion 78 to the connector 42 and then through the guide 30 and terminal 34 to the connector 38 and one of the wires of the conductors 16. Likewise, conductor 86 is connected through trunnion 80 to the U-shaped connector 44 to the guide 32, the terminal 36 and the connector 40 and the other wire of the conductor 16.

The conductors 84 and 86 extend in spaced parallel relation from one end of the plug 82 to provide the well-known plug terminals for connection with the usual wall outlet. The opposite end of the plug 82 is provided with screw threads 90 the surface of which is covered by a band of conducting material 88. One of the conductors such as 86 is electrically connected to the conducting band 88 which serves as a regular screw thread connector for connecting into a screw base. A terminal 92 is provided axially of the end of the plug 82 and the opposite conductor 84 is electrically connected to the terminal which in turn connects to the middle connector of the usual screw base.

As will be apparent from an inspection of the drawing the U-connectors 42 and 44 are extended at which time the plug may be turned on the trunnions 78 and 80 to any desired position after which the connectors 42 and 44 are returned to their position so that the locks on the members 42 and 44 engage the slots in the guides 30 and 32 to lock the plug in a selected position. Preferably a disc of insulated material is applied in the bottom of the bore 18 to prevent accidental connection between any portion of the plug and the connectors on the shoulder 20.

The safety cover 100 is provided on the open end of the bore 18 and is secured to the body 10 by means of suitable fasteners herein indicated as screws 102 and 104. The cover 100 is provided with arcuate slots 106 and 108 so that the cover may be rotated a fraction of a turn on the body 10. The cover 100 is likewise provided with a pair of rectangular passages 110 and 112 which in one position of the cover 100 are in communication with the ends of the guides 30 and 32 so that the U-shaped members 42 and 44 may be projected through the safety cover. Also when the U-shaped members are retracted the safety cover may be turned and secured in position to provide a second lock for the U-shaped connectors. The safety cover 100 is provided with a depending skirt 114 which extends over the edge of the body 10 and preferably extends substantially the full length thereof and is provided with oppositely disposed slots which register with the openings 110 and 112 so that the buttons 66 and 68 may slide therein when it is turned in registry with the lateral slots 26 and 46 and when the cover is turned to safety position the body skirt 114 will cover the slots in the side of the connector so that it will be impossible for a person to get any portion of the body in contact with the guides or U-shaped members or to extend metal objects such as pins, coins etc., into the slots.

It will thus be seen that the present invention provides a safety feature in that the sliding U-shaped connectors are doubly locked so that there is no possibility of accidental extension of the U-shaped connectors so that they can be touched by a person. Likewise, all portions of the device that are alive are completely covered by insulating material when in use so that it is impossible for any person to accidentally touch or project any conducting material into contact with a conducting portion of the connector. The device may be readily unlocked and the connectors projected so that the plug of either type may be selected at will.

While for purposes of exemplification a particular embodiment of the invention has been shown and described according to the best present understanding thereof, it will be apparent to those skilled in the art that many changes and modifications can be made therein without departing from the true spirit of the invention.

Having described the invention, what is claimed as new is:

1. A dual purpose electrical connector comprising a substantially cylindrical body of insulating material, there being an axial passage through said body, said passage being enlarged at one end providing a shoulder intermediate the ends of said passage, oppositely disposed longitudinal channels in the sides of said enlarged bore, a slot connecting each of said channels to the outside of said body, substantially rectangular guide members in each of said channels, each guide member having a longitudinal slot communicating with the corresponding slot in said body, an inwardly extending terminal on said guide member, said terminals overlying said shoulder, a U-shaped connector slidably mounted in each of said guide members, a plug member, a pair of conductors embedded in said plug, a trunnion mounted in each of said U-

shaped connectors, said trunnions extending into said plug, the respective trunnions being connected to separate conductors, said conductors extending in spaced parallel relation from one end of said plug.

2. A dual purpose electrical connector comprising a substantially cylindrical body of insulating material, there being an axial passage through said body, said passage being enlarged at one end providing a shoulder intermediate the ends of said passage, oppositely disposed longitudinal channels in the sides of said enlarged bore, a slot connecting each of said channels to the outside of said body, substantially rectangular guide members in each of said channels, each guide member having a longitudinal slot communicating with the corresponding slot in said body, an inwardly extending terminal on said guide member, said terminals overlying said shoulder, a U-shaped connector slidably mounted in each of said guide members, a plug member, a pair of conductors embedded in said plug, a trunnion mounted in each of said U-shaped connectors, said trunnions extending into said plug, the respective trunnions being connected to separate conductors, said conductors extending in spaced parallel relation from one end of said plug, a band of conducting material on a threaded portion of said plug, one of said conductors being connected to said band, an axially disposed contact on the end of said plug, the other of said conductors being connected to said contact.

3. A dual purpose electrical connector comprising a substantially cylindrical body of insulating material, there being an axial passage through said body, said passage being enlarged at one end providing a shoulder intermediate the ends of said passage, oppositely disposed longitudinal channels in the sides of said enlarged bore, a slot connecting each of said channels to the outside of said body, substantially rectangular guide members in each of said channels, each guide member having a longitudinal slot communicating with the corresponding slot in said body, an inwardly extending terminal on said guide member, said terminals overlying said shoulder, a U-shaped connector slidably mounted in each of said guide members, a plug member, a pair of conductors embedded in said plug, a trunnion mounted in each of said U-shaped connectors, said trunnions extending into said plug, the respective trunnions being connected to separate conductors, said conductors extending in spaced parallel relation from one end of said plug, a band of conducting material on a threaded portion of said plug, one of said conductors being connected to said band, an axially disposed contact on the end of said plug, the other of said conductors being connected to said contact, a tubular insulating lining in said bore, said lining having slots to receive said trunnions.

4. A dual purpose electrical connector comprising a substantially cylindrical body of insulating material, there being an axial passage through said body, said passage being enlarged at one end providing a shoulder intermediate the ends of said passage, oppositely disposed longitudinal channels in the sides of said enlarged bore, a slot connecting each of said channels to the outside of said body, substantially rectangular guide members in each of said channels, each guide member having a longitudinal slot corresponding slot

in said body, an inwardly extending terminal on said guide member, said terminals overlying said shoulder, a U-shaped connector slidably mounted in each of said guide members, a plug member, a pair of conductors embedded in said plug, a trunnion mounted in each of said U-shaped connectors, said trunnions extending into said plug, the respective trunnions being connected to separate conductors, said conductors extending in spaced parallel relation from one end of said plug, a band of conducting material on a threaded portion of said plug, one of said conductors being connected to said band, an axially disposed contact on the end of said plug, the other of said conductors being connected to said contact, a tubular insulating lining in said bore, said lining having slots to receive said trunnions, an annular guard of insulating material mounted on the end of said body, said guard having openings through which said U-shaped connectors can be extended.

5. A dual purpose electrical connector comprising a substantially cylindrical body of insulating material, there being an axial passage through said body, said passage being enlarged at one end providing a shoulder intermediate the ends of said passage, oppositely disposed longitudinal channels in the sides of said enlarged bore, a slot connecting each of said channels to the outside of said body, substantially rectangular guide members in each of said channels, each guide member having a longitudinal slot communicating with the corresponding slot in said body, an inwardly extending terminal on said guide member, said terminals overlying said shoulder, a U-shaped connector slidably mounted in each of said guide members, a plug member, a pair of conductors embedded in said plug, a trunnion mounted in each of said U-shaped connectors, said trunnions extending into said plug, the respective trunnions being connected to separate conductors, said conductors extending in spaced parallel relation from one end of said plug, a band of conducting material on a threaded portion of said plug, one of said conductors being connected to said band, an axially disposed contact on the end of said plug, the other of said conductors being connected to said contact, a tubular insulating lining in said bore, said body having slots to receive said trunnions, an annular guard of insulating material mounted on the end of said body, said guard having openings through which said U-shaped connectors can be extended, coupling means extending through said guard into said body, said guard having arcuate slots engaging said coupling means whereby said guard may be shifted to place said openings out of register with said U-shaped connectors.

6. A dual purpose electrical connector comprising a substantially cylindrical body of insulating material, there being an axial passage through said body, said passage being enlarged at one end providing a shoulder intermediate the ends of said passage, oppositely disposed longitudinal channels in the sides of said enlarged bore, a slot connecting each of said channels to the outside of said body, substantially rectangular guide members in each of said channels, each guide member having a longitudinal slot communicating with the corresponding slot in said body, an inwardly extending terminal on said guide member, said terminals overlying said shoulder, a U-shaped connector slidably mounted in each of said guide members, a plug member, a pair of conductors embedded in said plug, a trun-

nion mounted in each of said U-shaped connectors, said trunnions extending into said plug, the respective trunnions being connected to separate conductors, said conductors extending in spaced parallel relation from one end of said plug, one of said conductors being connected to said band, an axially disposed contact on the end of said plug, the other of said conductors being connected to said contact, a tubular insulating lining in said bore, said body having slots to receive said trunnions, an annular guard of insulating material mounted on the end of said body, said guard having openings through which said U-shaped connectors can be extended, coupling means extending through said guard into said body, said guard having arcuate slots engaging said coupling means whereby said guard

may be shifted to place said openings out of register with said U-shaped connectors, a depending skirt on said guard, said skirt having slots that are in register with the slots of said body when said openings are in register with said guide members.

GARFIELD C. PRICE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
747,553	Kelsey	Dec. 22, 1903
2,284,231	Price	May 26, 1942