O. BAHLS & T. SIEBERT, Jr.

PLUG AND PLUG RECEPTACLE FOR ELECTRIC CONDUCTORS.

APPLICATION FILED OCT. 28, 1916.

1,265,163.

Patented May 7, 1918.

2 SHEETS—SHEET 1.

Fig: 1.

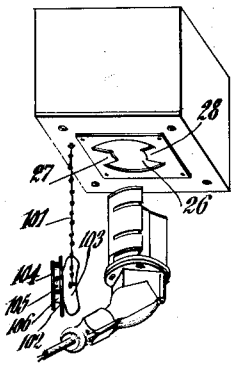


Fig: 2.

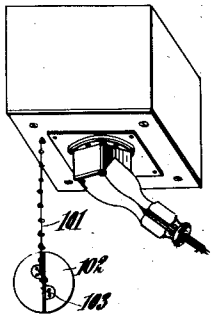


Fig: 3.

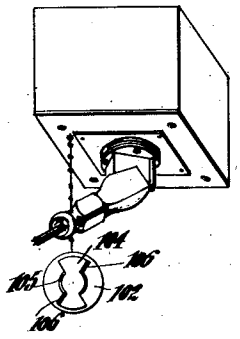


Fig: 4.

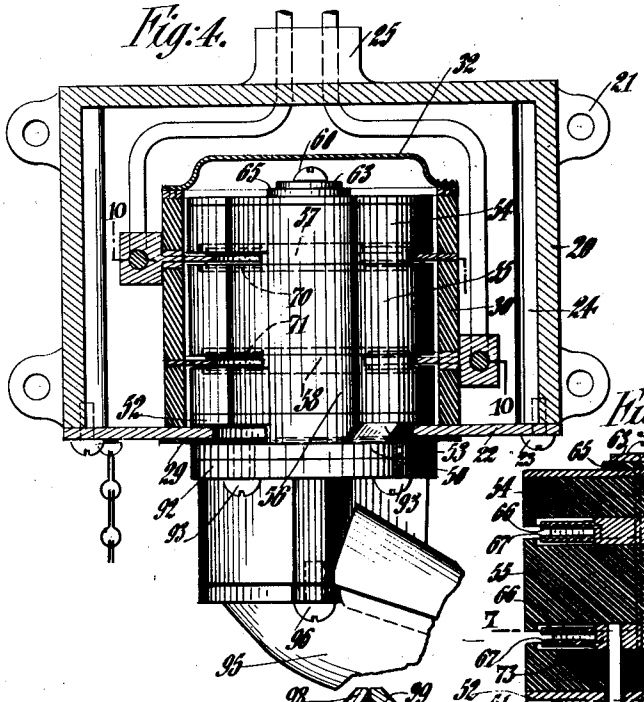


Fig: 5.

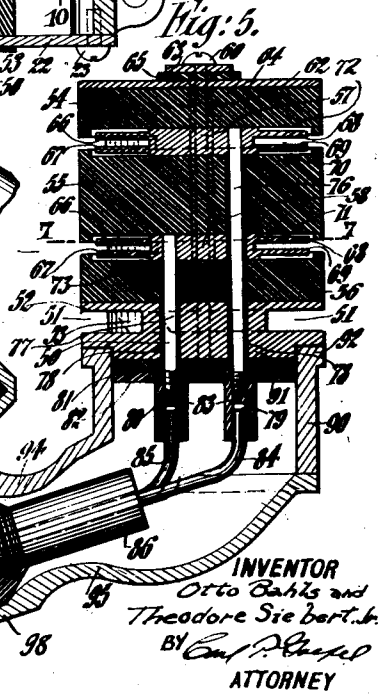


Fig: 6.

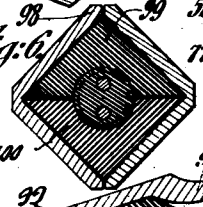


Fig: 7.

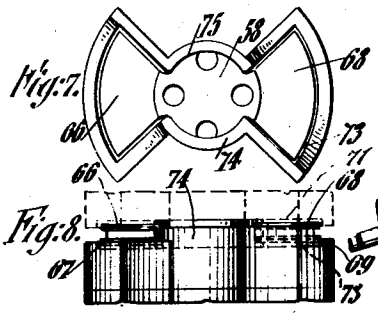


Fig: 8.

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2 SHEETS—SHEET 2.

Fig:9.

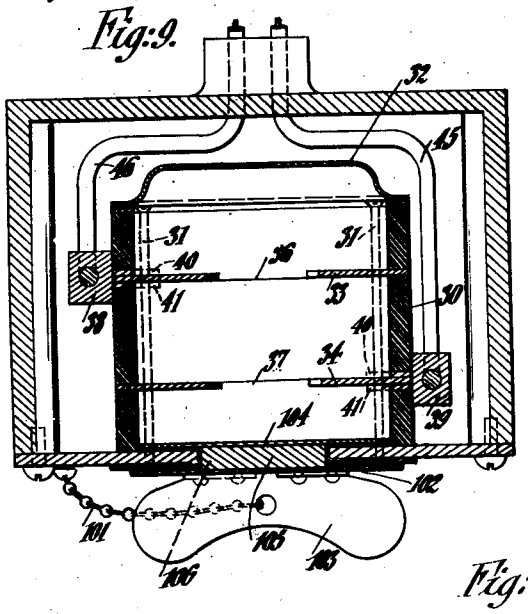


Fig:10.

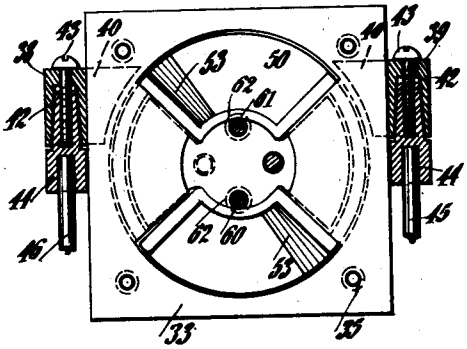


Fig:10a.

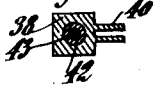


Fig:10b.



Fig:11.

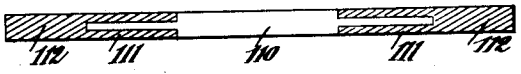


Fig:12.

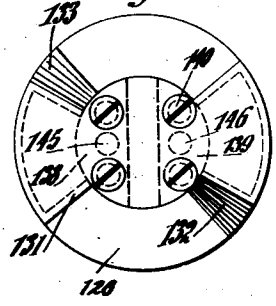


Fig:13.

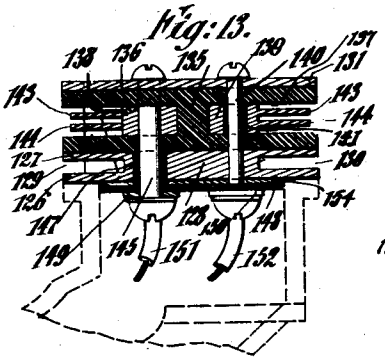


Fig:14.

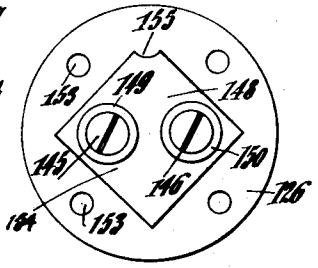


Fig:15.

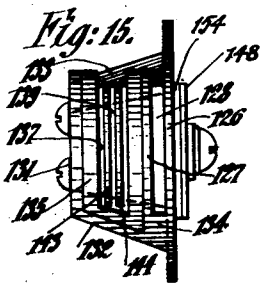


Fig:16.

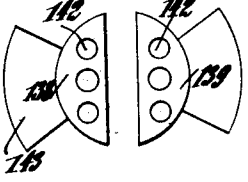


Fig:17.

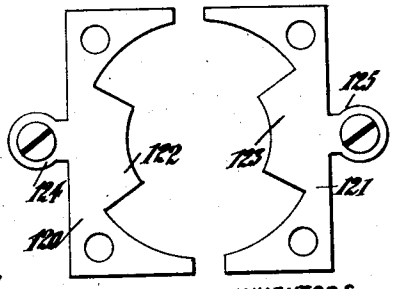
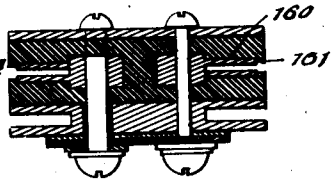


Fig:13a.



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PLUG AND PLUG-RECEPTACLE FOR ELECTRIC CONDUCTORS.

1,265,163. Specification of Letters Patent. Patented May 7, 1918.

Application filed October 28, 1916. Serial No. 128,213.

To all whom it may concern:

Be it known that we, OTTO BAHLS and THEODORE SIEBERT, Jr., citizens of the United States, and residents of New York, in the borough of Manhattan, county and State of New York, have invented certain new and useful Improvements in Plugs and Plug-Receptacles for Electric Conductors, of which the following is a specification.

The present invention relates to plugs, and plug receptacles for electric conductors, and has for its object to provide such a device which will be reliable in action, and thoroughly protected against accidental short circuits during insertion or removal of the plug, and also protected against accidental mutilation of the contact plates, the plates being entirely closed and insulated. Further objects are to provide such a device which will be easy of manipulation, self ejecting, and which will conform to fire and other regulations covering such devices.

With these and other objects in view, our invention is shown in the accompanying drawings, and will be hereinafter more fully described with reference thereto, and finally pointed out in the claims.

In the accompanying drawings,

Figures 1, 2 and 3 show respectively, the manner of inserting the plug into the receptacle, the plug inserted and turned into contacting position, and the plug out of contacting position and partly ejected prior to removal,

Fig. 4 is a vertical sectional view of the receptacle, with the plug in contacting position; and shown in elevation,

Fig. 5 is a vertical sectional view of the plug,

Fig. 6 is a sectional view of the handle portion of the plug,

Fig. 7 is a top view of the plug contact plates with the upper sections of the insulating cover removed along the line 7—7 of Fig. 5,

Fig. 8 is a side elevation of the part shown in Fig. 7,

Fig. 9 is a vertical sectional view of the receptacle with cover fitted thereon,

Fig. 10 is a transverse sectional view along the line 10—10 of Fig. 4,

Figs. 10^a and 10^b are cross sectional views, showing two forms of wire connections,

Fig. 11 is a diagrammatic view showing another form of plug contact plates and receptacle plates,

Fig. 12 is a bottom plan view of a modified form of plug having the contact plates on a single plane,

Fig. 13 is a vertical sectional view thereof, showing the handle portion in dotted lines, and partly broken away,

Fig. 13^a is a vertical sectional view of a further modified form of plug,

Fig. 14 is a top plan view with the handle removed,

Fig. 15 is a side elevation, and

Figs. 16 and 17 are detail views of the plug contact plates, and the receptacle plates respectively.

Similar reference characters indicate corresponding parts throughout the several figures of the drawings.

Referring to the drawings, and more particularly to Figs. 4 and 5 thereof, the receptacle 20 is provided with lugs 21 by means of which the same may be attached to the wall or other suitable means of support may be provided if desired. The receptacle is open at one of its sides, and a cover plate 22 is secured thereto by screws 23 engaging enlarged portions 24 at the corners of the receptacle. Outlet passages 25 are provided in the receptacle at any suitable position.

The cover plate 22 is provided with an opening 26 which is circular, but for two inwardly projecting oppositely disposed segments 27 and 28, the inner edges of which are in a concentric line with respect to the opening. A smaller plate 29 having a similar opening is secured to the outer side of the plate 22, the inwardly extending segments being slightly spaced from the plate, as shown in Figs. 4 and 9, to make the said segments, slightly resilient. This plate 29 is in effect a compensating spring, which insures a firm hold for the locking feature of the plug with the receptacle.

At the inner side of the plate 22 there is provided a receptacle 30 of insulating material, secured thereto by elongated screws 31, shown in Fig. 9, and provided at its inner end with a cap 32. This receptacle 30 is formed in a plurality of sections and contact plates 33 and 34 (shown in Fig. 10 in plan) are interposed between the sections, the screws 31 being suitably insulated by tubes

35 in passing through the plates. A single contact plate and section may be used if desired. The plates 33 and 34 are provided with openings 36 and 37 respectively, similar to the openings of the cover plate, each being provided with oppositely disposed inwardly extending segments. The plates 33 and 34 are connected to terminals 38 and 39, having parallel laterally projecting wings 40 and 41 between which the plates are engaged, the said wings being partially embedded in the insulated receptacle. The terminals are each provided with a socket 42 in which is received and secured by a screw 43, the tapered end of a connector 44 to which the wires 45 and 46 are secured, the said wires extending through the outlet passage 25. The tapered end may either be circular in cross section, as shown in Fig. 10^a, or square, as shown in Fig. 10^b. The connections are preferably square in cross section to prevent the wires from turning, and thereby becoming disengaged or loose from the plates. This construction also facilitates the insertion of the connector, a screw driver only being necessary.

The segments, it will be noted, are less in length than the open spaces between them. The plug comprises a base plate 50, having an annular recess 51 therein of sufficient depth to snugly engage the cover plate 22, the portion 52 at the inner side of the recess being of a shape corresponding to the opening of the cover plate, the wing portions, however, being substantially smaller than the opening to permit the ready insertion of the plug. The lower portion remains circular in shape. One extremity of each recess beneath the wings of the upper portion is closed by a wall 53, the outer face of which is beveled or inclined from the perpendicular edge of the inner portion 52 to the surface of the circular portion of the base plate, as clearly shown in Figs. 4 and 10. This inclined portion serves to automatically eject the plug upon turning, as hereinafter more fully pointed out.

Three blocks 54, 55 and 56 of insulating material of a shape corresponding to the inner portion of the base plate, and between which are arranged contact plates 57 and 58, are secured to the base plate by means of two elongated bolts 60 and 61 inclosed in insulating tubes 62, and engaging the base plate. The upper ends of the bolts are connected by a cap plate 63, suitably insulated from the metallic protection head 64 of the upper block 54 by an insulating washer 65. The head, insulating blocks, and inner portion of the base plate are all of the general shape of the openings of the cover plate 22, and contact plates 33 and 34, the wings being substantially smaller than the openings, however, to permit of considerable turning free movement of the plug without engagement with the wings or projecting portions of the contact plates.

The contact plates 57 and 58 are of a shape similar to that of the insulating blocks, but smaller in all of its dimensions, as clearly shown in Figs. 5, 7 and 8, and comprises an enlarged central portion, and extending outwardly from each end of said enlarged portion there are provided spaced resilient wings 66, 67 at one side, and 68, 69 at the other side, slightly depressed from the upper and lower surfaces of the enlarged portion. The space between the said resilient wings is of such width as to snugly engage the contact plates 33 and 34. The upper and lower surfaces of the central block 55 are recessed as at 70 and 71, the contact plates engaging in these recesses so that the wings are slightly spaced from the surfaces, and also from the edges thereof, the upper surface of rims surrounding the said recess being in a plane substantially intersecting the adjacent wing so that the wing is partially within the recess and partially without. The blocks 54 and 56 are recessed in a similar manner as at 72 and 73, but in addition to the ridge surrounding the recess are provided with projecting spacing ridges 74 and 75, shown in Figs. 7 and 8, which engage the ridges of the central block, inclosing the enlarged portion of the contact plates at each side, and also close one extremity of each recess inclosing the contact plate wings, and corresponding to the closing walls 53 of the base plate. This construction permits engagement of the plug contact plates with the receptacle plates by turning in one direction only. The contact plates, it will be seen, are entirely inclosed and protected against accidental engagement, the resilient contacting surfaces thereof being exposed only sufficiently to permit engagement with the receptacle contact plates.

The contact plates 57 and 58 are provided with terminal rods 76 and 77, extending through insulating tubes 78 to the lower end of the plug, where they are provided with connecting members 79 and 80, secured thereto. Insulating plates 81 and 82 are disposed between the said connecting members and the base plate. The connecting members are in the form of a tube having a central barrier 83 therein. The wires 84 and 85 of a cable 86, are secured respectively into the sockets of the connecting members by soldering or the like, the barrier 83 preventing any solder from coming in contact with the threads of the terminal rods.

A hollow handle is provided on the plug through which the cable extends, and comprises a squared portion 90 which engages a square projecting portion 91 on the base plate 50, and provided with a circular flange 92, through which the handle is secured to

the plug by means of screws 93, or any other suitable means may be employed. The remaining portion of the handle extends in an inclined direction from the plug and comprises two halves 94 and 95, the former being integral with the portion 90, the portion 95 being removable and secured to the portions 94 and 90 by screws 96, 97. The handle is provided near its outer end with an enlarged square portion 98, in which there is provided a fiber gripping member for the cable, comprising upper and lower portions 99 and 100, having a threaded or ridged bore which engages the cable, preventing turning or longitudinal movement thereof, which might cause a loosening or breaking of the connection. If desired, the internal wall of the handle may be suitably roughened to constitute a cable gripping member, in place of the fiber gripping member. In order to insure the proper positioning of the handle upon the plug, a lug may be provided upon the interior of the squared portion 90 thereof, which will engage a corresponding recess in the base plate, or other positive positioning means may be employed.

When the plug is out of the receptacle, the circuits of the conductors are broken. Fig. 1 illustrates the position of the plug prior to insertion. When the connection is to be made, the plug is inserted into the receptacle until stopped by engagement of the base plate with the cover, whereupon the same is turned so that the recesses 51 of the base plate are engaged by the projecting segments 27 and 28 of the cover, and the contact plates 33 and 34 are engaged between the resilient wings of the corresponding contact plates of the plug, thereby completing the circuit. The resilient plate 29 of the cover plate insures a tight connection, unaffected by constant use between the receptacle and the plug. Accidental engagement of the plates and short circuits are impossible during insertion of the plug, and the circuit can only be closed by turning the plug. Fig. 2 shows the inserted position of the plug. When the plug is to be removed, the handle is thrown around to the position shown in Fig. 3. This movement causes the inclined surfaces of the walls 53 to engage edges of the segments 27 and 28, thereby causing the plug to be partially ejected. The segments 27 and 28, may be beveled off, to engage the inclined surfaces of the walls 53. The perpendicular wall of the portion 52 of the base plate receives and absorbs the shock of the blow due to rapid turning of the plug, and protects the insulated blocks from injury during this movement. The plug may thereupon be readily disengaged from the receptacle.

When the plug is disconnected, a closure is provided for the receptacle, being attached thereto by a chain 101. This closure comprises a circular outer plate 102, provided with a handle 103 and an inner plate 104, corresponding in shape to the plug, connected and spaced from the plate 102 by a disk 105. The recesses beneath the wings of the said plate 104 engage the portions 27 and 28 of the cover plate upon turning of the closure, and at one extremity of each recess there is provided a wall 106 inclined at its outer side. This inclined wall serves to eject the cover upon turning, to remove the same in a similar manner to the ejecting of the plug.

In Fig. 11 we have illustrated the manner in which the plug contact plate 110 may have a single wing at each side which engages between a bifurcated portion 111 of the receptacle plate 112.

In Figs. 12 to 17 we have shown a modified form of construction, in which our invention is embodied in a more simple form of plug, in which the contact plates of different polarity are in the same plane. The receptacle is practically the same as that shown in the first form of construction, with the exception that the two contact plates 120, 121 shown in Fig. 17 are in the same plane. The segmental projecting portions 122 and 123, and the terminals 124 and 125 are oppositely disposed to each other.

The metallic body portion of the plug is preferably constructed of one piece, and consists of a base plate, the cover portion 126 of which is circular, and the upper portion 127 is of the general shape of the opening of the receptacle, the wing portions, however, being substantially smaller as in the case of the first construction, and spaced from the portion 126 by a mechanical contact circular portion 128, thereby forming recesses 129 and 130 between the portions 126 and 127, adapted to be engaged by the cover. An upper plate 131 is provided spaced from the base plate by means of inclined walls 132 and 133, which serve to close one extremity of each of the recesses 129 and 130. A square abutment 134 is also provided at the extremity of the said recesses. Within the space between the base plate and the plate 131, there is placed a member 135 of insulating material, provided at each side with recesses 136 and 137, in which are disposed the plug contact plates 138 and 139, which are held in place by screws 140 or any suitable means, extending through the upper plate and screwed into the base plate. Suitable insulating tubes 141 are provided in the openings 142 of the contact plates, through which the screws pass. These contact plates comprise an enlarged central portion through which the screws pass, and which forms a portion of a circle, and spaced wings 143 and 144 projecting therefrom and slightly depressed from the upper and lower surfaces thereof so as to be spaced from the

walls of the recess. The contact plates may if desired be solidly backed up, and provided with an overhang. The portions 122 and 123 of the receptacle contact plates are adapted to engage between these wings upon turning the plug to close the circuit.

Terminals 145 and 146 are provided for each of the contact plates 138 and 139, which extend through the base plate, and are screwed into the enlarged portion of the said plates. These screws are insulated from the base plate by insulating tubes 147, and also by a plate 148, disposed between the base plate and the washers 149 and 150 of the terminals. The wires 151 and 152 of the cable are secured beneath the heads of the terminals, and a handle similar to that shown in our first construction, and shown partially in dotted lines, is secured to the base plate, screw holes 153 being provided therefor, and the insulating plate 148 and a raised portion 154 of the base plate being square, to accommodate the same. One cover 155 is recessed to insure the proper positioning of the handle by engagement therewith of a corresponding lug on the handle.

This form of plug operates in a similar manner to our first form of construction, the inclined walls 132 and 133 serving to eject the plug upon turning the same to break the circuit.

In Fig. 13ª, we have shown a slightly modified form of plug, in which the contact plates, are solidly backed up by the insulating portion, as at 160, an overhanging portion 161 being provided partially inclosing the edges of the plates. This form may, if desired, be employed in the other form of my invention, and details of the other form substituted in this last described form. Illustration of these various applications of modification to the different forms are omitted for the sake of clearness and brevity.

It will be understood that if desired, only a single contact plate may be provided in the plug, and receptacle, making the connection of one polarity only, or one polarity may be used with a number of contact plates, and other changes may be made within the spirit and scope thereof, as defined in the appended claims.

We claim:

1. An electric connection, comprising a receptacle, a transverse insulated contact plate therein, a conductor connected to said plate, and a plug of insulating material provided with a transversely disposed recess therein, a contact plate disposed within said insulated recess, and providing a space within said recess adjacent said contact plate, a conductor connected to said plug contact plate, said plug contact plate being arranged in a plane relatively to the plate of the receptacle so as to frictionally engage the same when the plug is turned, means on said plug adapted to engage said receptacle, when said plug is turned to lock said plug in said receptacle, and means adapted to eject said plug from said receptacle when said plug is turned to disengage said locking means.

2. An electric connection, comprising a receptacle, a transverse insulated contact plate therein, a conductor connected to said plate, and a plug of insulating material provided with a transversely disposed recess therein, a contact plate disposed within said insulated recess, and providing a space within said recess adjacent said contact plate, a conductor connected to said plug contact plate, said plug contact plate being arranged in a plane relatively to the plate of the receptacle so as to frictionally engage the same when the plug is turned, a cover plate on said receptacle having an opening therein for insertion of said plug, and provided with projecting portions, recessed portions on said plug adapted to engage said projecting portions of said cover plate when said plug is turned to lock said plug in said receptacle, and inclined walls adapted to engage said projecting portion when said plug is turned to disengage said recesses from said projecting portions, adapted to eject said plug from said receptacle.

3. An electric connection, comprising a receptacle, a transverse insulated contact plate therein, a conductor connected to said plate, and a plug of insulating material provided with a transversely disposed recess therein, a contact plate disposed within said insulated recess, and providing a space within said recess adjacent said contact plate, a conductor connected to said plug contact plate, said plug contact plate being arranged in a plane relatively to the plate of the receptacle so as to frictionally engage the same when the plug is turned, a cover plate on said receptacle having an opening therein, for insertion of said plug and provided with projecting portions, recessed portions on said plug adapted to engage said projecting portion of said cover plate, when said plug is turned to lock said plug in said receptacle, inclined walls adapted to engage said projecting portions, when said plug is turned to disengage said recesses from said projecting portion, adapted to eject said plug from said receptacle, and abutment walls, the upper extremity of said inclined walls adapted to absorb the shock of turning said plug.

4. An electric connection, comprising a receptacle, a transverse insulated contact plate therein, a conductor connected to said plate, and a plug of insulating material provided with a transversely disposed recess therein, a contact plate disposed within said insulated recess, and providing a space within said recess adjacent said contact plate, a conductor connected to said plug contact plate, said plug contact plate being arranged

in a plane relatively to the plate of the receptacle so as to frictionally engage the same when the plug is turned, a cover plate on said receptacle having an opening therein for insertion of said plug and provided with projecting portions, an auxiliary spring-plate on said cover plate having an opening corresponding to the opening of said cover plate, and recessed portion in said plug adapted to engage said projecting portion of said cover plate when said plug is turned to lock said plug in said receptacle, said auxiliary spring-plate constituting compensating means to maintain a firm connection between said plug and said receptacle.

5. An electric connection, comprising a receptacle, a transverse insulated contact plate therein, a conductor connected to said plate, and a plug of insulating material provided with a transversely disposed recess therein, a contact plate disposed within said insulated recess, and providing a space within said recess adjacent said contact plate, a conductor connected to said plug contact plate, said plug contact plate being arranged in a plane relatively to the plate of the receptacle so as to frictionally engage the same when the plug is turned, a hollow handle on said plug provided with a portion of non-circular cross section, a cable extending through said handle, means connecting said cable to said conductor of said contact plate of said plug, and a pair of gripping means of non-circular contour within said portion of said handle of non-circular cross section adapted to prevent movement of said cable, said gripping means being prevented from rotary movement.

6. An electric connection, comprising a receptacle, a transverse insulated contact plate therein, a conductor connected to said plate, and a plug of insulating material provided with a transversely disposed recess therein, a contact plate disposed within said insulated recess, and providing a space within said recess adjacent said contact plate, a conductor connected to said plug contact plate, said plug contact plate being arranged in a plane relatively to the plate of the receptacle so as to frictionally engage the same when the plug is turned, a hollow handle on said plug, comprising two half portions, a cable extending through said handle, means connecting said cable to said conductor of said contact plate of said plug, and a pair of gripping means in said handle adapted to increasingly engage said cable as said half portions of said handle are brought together to prevent movement of said cable.

7. An electric connection, comprising a receptacle, a transverse insulated contact plate therein, a conductor connected to said plate, and a plug of insulating material provided with a transversely disposed recess therein, a contact plate disposed within said insulated recess, and providing a space within said recess adjacent said contact plate, a conductor connected to said plug contact plate, said plug contact plate being arranged in a plane relatively to the plate of the receptacle so as to frictionally engage the same when the plug is turned, a hollow handle on said plug extending substantially laterally therefrom, coöperating positioning means on said plug and handle, a cable extending through said handle, and means connecting said cable to said conductor of said contact plate of said plug.

8. An electric connection, comprising a receptacle, a transverse insulated contact plate therein, a conductor connected to said plate, and a plug of insulating material provided with a transversely disposed recess therein, a contact plate disposed within said insulated recess, and providing a space within said recess adjacent said contact plate, a conductor connected to said plug contact plate, said plug contact plate being arranged in a plane relatively to the plate of the receptacle so as to frictionally engage the same when the plug is turned, a hollow handle on said plug, a cable extending through said hollow handle, and coupling means connecting said cable and said conductor of said contact plate of said plug, provided at each end with sockets respectively engaging said cable and said terminal, said socket engaging said terminal being screw threaded, and a barrier separating said cable and said conductor, to prevent solder or the like from coming into contact with said threads.

9. An electric connection, comprising a receptacle, a transverse insulated contact plate therein, a conductor connected to said plate, and a plug of insulating material provided with a transversely disposed recess therein, a contact plate disposed within said insulated recess, and providing a space within said recess adjacent said contact plate, an overhanging portion surrounding said contact plate and partially inclosing the edges of said contact plate, a conductor connected to said plug contact plate, said plug contact plate being arranged in a plane relatively to the plate of the receptacle so as to frictionally engage the same when said plug is turned.

10. An electric connection comprising a receptacle, a transverse insulated contact plate therein, a conductor connected to said plate, and a plug of insulating material provided with a transversely disposed recess therein, a contact plate disposed within said insulated recess and providing a space within said recess adjacent said contact plate, an overhanging portion surrounding said contact plate and partially inclosing the edges of said contact plate, said contact plate being spaced from the wall of said recess and from said overhanging portion, a conductor

connected to said plug contact plate, said plug contact plate being arranged in a plane relatively to the plate of the receptacle, so as to frictionally engage the same when said plug is turned.

11. An electric connection, comprising a receptacle, a transverse insulated contact plate therein, a conductor connected to said plate, and a plug of insulating material provided with a transversely disposed recess therein, a contact plate disposed within said insulated recess and comprising spaced wings, providing a space therebetween within said recess, overhanging portions surrounding said wings of said contact plate and partially inclosing the edges of said wings, said wings being spaced from the walls of said recess and from said overhanging portion, a conductor connected to said plug contact plate, said plug contact plate being arranged in a plane relatively to the plate of the receptacle to permit frictional engagement of the same between said wings, when said plug is turned.

12. An electric connection comprising a pair of coöperating members, a laterally disposed insulated contact plate on one of said members, a conductor connected to said plate, the other of said members being formed of insulated material and provided with a laterally disposed recess therein closed at one radial extremity and open at the other radial extremity, a contact plate disposed within said insulated recess, and providing a lateral space within said recess adjacent said contact plate, and a conductor connected to said last mentioned contact plate, said last mentioned contact plate being arranged in a plane relatively to the first contact plate, so as to frictionally engage the same within said lateral space adjacent said contact plate when the members are turned with respect to each other to lock the said members against separation.

13. An electric connection, comprising a receptacle, a transverse insulated contact plate therein, a conductor connected to said plate, and a plug of insulating material provided with a transversely disposed recess therein, a contact plate disposed within said insulated recess, and providing a space within said recess adjacent said contact plate, a conductor connected to said plug contact plate, said plug contact plate being arranged in a plane relatively to the plate of the receptacle so as to frictionally engage the same when the plug is turned, a cover plate on said receptacle having an opening therein for insertion of said plug, and provided with projecting portions, means on said plug adapted to engage said receptacle when said plug is turned to lock said plug in said receptacle, and means adapted to eject said plug from said receptacle when said plug is turned to disengage said locking means, and a closure for said receptacle, comprising a plate provided with recesses adapted to engage said projecting portions of said cover plate to lock the same thereon when turned in one direction and means for ejecting said closure when turned in the other direction.

14. An electric connection, comprising a receptacle, a transverse insulated contact plate therein, a conductor connected to said plate, and a plug of insulating material provided with a transversely disposed recess therein, a contact plate disposed within said insulated recess, and providing a space within said recess adjacent said contact plate, a conductor connected to said plug contact plate, said plug contact plate being arranged in a plane relatively to the plate of the receptacle so as to frictionally engage the same when the plug is turned, a cover plate on said receptacle having an opening therein for insertion of said plug, and provided with projecting portions, means on said plug adapted to engage said receptacle when said plug is turned to lock said plug in said receptacle, and means adapted to eject said plug from said receptacle when said plug is turned to disengage said locking means, and a closure for said receptacle, comprising a plate provided with recesses, adapted to engage said projecting portions of said cover plate to lock the same thereon when turned in one direction, and inclined walls adapted to engage said projecting portion, when said closure is turned in the other direction to eject the same.

15. An electric connection, comprising a receptacle, a transverse insulated contact plate therein, a conductor connected to said plate, and a plug of insulating material provided with a transversely disposed recess therein, a contact plate disposed within said insulated recess, and a conductor connected to said plug contact plate, said plug contact plate being arranged in a plane relatively to the plate of the receptacle, one of said plates being bifurcated and adapted to frictionally engage the other of said plates, when the plug is turned, a cover plate on said receptacle having an opening therein for insertion of said plug, and provided with projecting portions, means on said plug adapted to engage said receptacle when said plug is turned to lock said plug in said receptacle, and means adapted to eject said plug from said receptacle when said plug is turned to disengage said locking means, and a closure for said receptacle, comprising a plate provided with recesses, adapted to engage said projecting portions of said cover plate to lock the same thereon when turned in one direction, and inclined walls adapted to engage said projecting portion, when said closure is turned in the other direction to eject the same.

16. An electric connection comprising a

pair of coöperating members, a laterally disposed insulated contact plate on one of said members, a conductor connected to said plate, the other of said members being formed of insulated material and provided with a laterally disposed recess therein, a contact plate disposed within said insulated recess, and providing a lateral space within said recess adjacent said contact plate, and a conductor connected to said last mentioned contact plate being arranged in a plane relatively to the first contact plate, so as to frictionally engage the same within said lateral space adjacent said contact plate when the members are turned in one direction with respect to each other to lock the said members against separation, and means for ejecting one of said members with respect to the other when turned in the other direction.

In testimony that we claim the foregoing as our invention, we have signed our names in presence of two subscribing witnesses.

OTTO BAHLS.
THEODORE SIEBERT, JR.

Witnesses:
D. LEWIS MATTERN,
A. Y. COUGAN.