Jan. 7, 1930. E. A. HAGEL 1,742,312

ELECTRIC CIRCUIT CONNECTER PLUG

Filed Jan. 20, 1927 2 Sheets-Sheet 1

Fig. 1

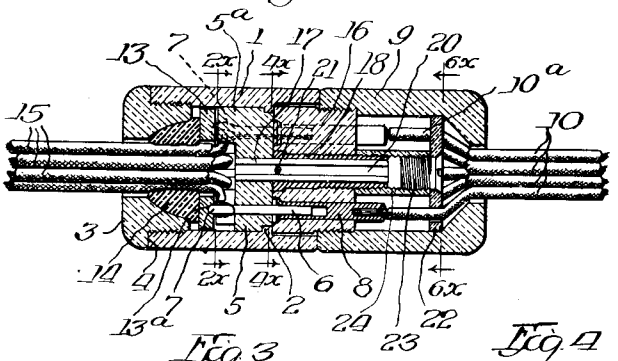


Fig. 2

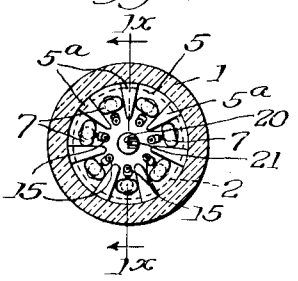


Fig. 3

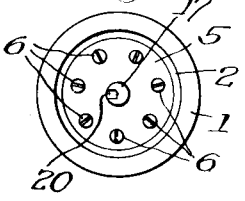


Fig. 4

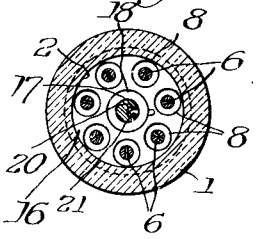


Fig. 5.



Fig. 10

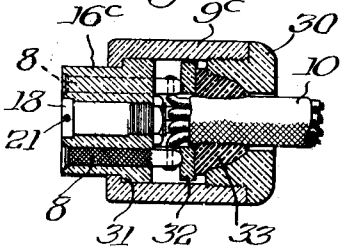


Fig. 6.

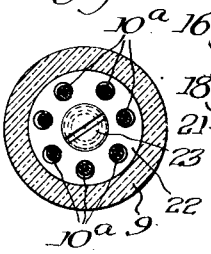


Fig. 7.

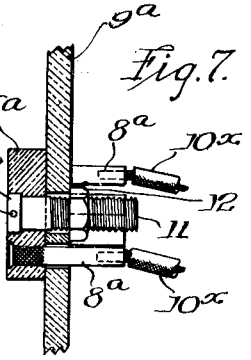


Fig 8.

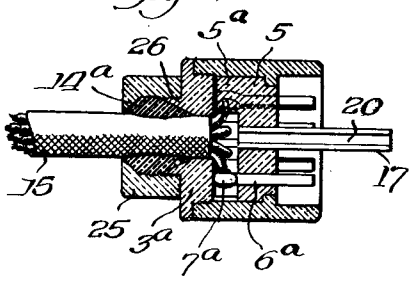
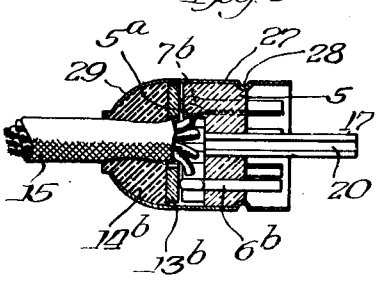


Fig 9



Witness:

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Attys

Jan. 7, 1930. E. A. HAGEL 1,742,312

ELECTRIC CIRCUIT CONNECTER PLUG

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Fig. 11

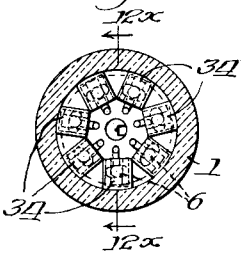


Fig. 12

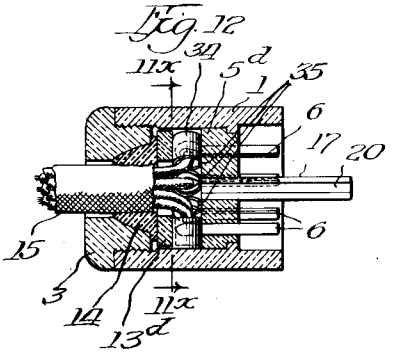


Fig. 13

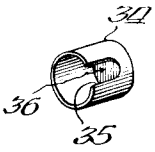


Fig. 14

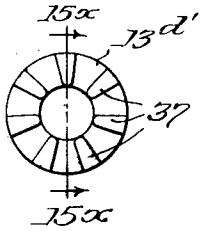


Fig. 15

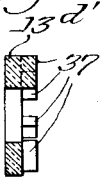


Fig. 16

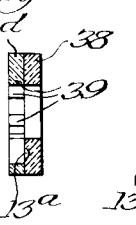


Fig. 17

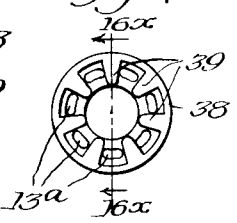


Fig. 20

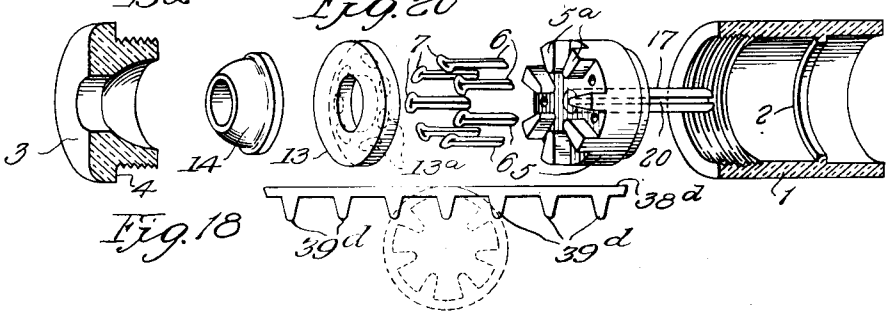
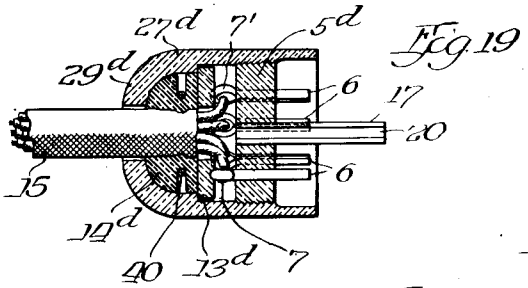


Fig. 18

Fig. 19



Witness:

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Attys

Patented Jan. 7, 1930

1,742,312

UNITED STATES PATENT OFFICE

EUGENE A. HAGEL, OF CHICAGO, ILLINOIS

ELECTRIC-CIRCUIT-CONNECTER PLUG

Application filed January 20, 1927. Serial No. 162,251.

This invention relates to plugs for connecting and disconnecting portions of electric circuits at will, and is adapted to plugs of the class in which a plurality of circuits are simultaneously connected or disconnected by placement or removal of the plug.

This invention has for its object to provide a construction of plug of the class described, which will be simpler to construct and assemble, and more durable in service, as well as one in which terminal portions of circuit wires are made more secure against disengagement from the parts with which they are individually associated, and less liable to meet electrically conductive parts and develop short circuits in case any one or more of them should become disarranged.

The invention proceeds upon the principle of providing a sleeve or shell within which circuit closing terminals are enclosed through the medium of a mounting of disk-like or other suitable form, having the terminals definitely located therein at positions which cause them to receive cooperating conducting members when the plug is applied to a complementary circuit closing member; the said mounting being removably inserted in the shell, in a manner to coact with an end member on the shell in the development of pressure between the end member and the mounting, such pressure being imposed upon the terminals in the mounting, in the direction to press them firmly in the mounting. Pressure between the said members may be developed by threading one of them into the shell while the other is stationarily sustained therein, but the pressure receiving ends of the terminals are so protected by the insulating material held against movement upon them, that relative rotation of one of the members cannot develop a metallic leak-streak from one terminal to the other, said protecting means comprising either a disk interlocked against relative rotation on the terminals and through which pressure is imposed, or individual hoods upon the ends of the terminals, or both such means. The circuit closing terminals are preferably in form simulating cotter pins, with the dual advantage of presenting on one side of the mounting, resiliently split ends for coaction with socket-like circuit closing terminals on a complementary member of the connecter, and on the other side of said mounting, looped ends for conveniently soldering the ends of wires and at the same time serving to receive the pressure imposed through the medium of the follower or hoods (or both), and which presses the terminals firmly into the mounting. Preferably there will be located between the end-closing member and the heads of the terminals, a resilient body such as soft rubber compressed by the pressure referred to and acting like a packing gland, with the advantage of not only keeping the terminals tightly seated, but compressing the resilient body around the cable or bunch of introduced wires and developing a grip upon the latter that will relieve the soldered ends of the wires of tension when the cable is grasped for pulling the plug from circuit closing position. This latter function may be attained even if the end-closing member be introduced into direct bearing against the heads of the terminals or the follower or hoods resting thereon, and the combined packing and cable-gripping body of resilient material be associated with the end-closing member through means of an external gland construction. Other structural details preferably employed in applying the invention will be apparent from the following description, and it will also appear that some features of the construction and assembly of parts are applicable to the complementary circuit closing member employing terminals in the form of pin-receiving sockets, as well as to the coupling plug which carries such terminal pins.

In the accompanying drawing, in which the preferred as well as some modified constructions of the device are shown by way of illustration—

Figure 1 is an axial section through a multiple circuit connecting plug embodying the preferred construction of the invention, together with a complementary circuit closing member with which said plug is adapted to be assembled.

Figure 2 is a section on the line 2×—2× of Figure 1.

Figure 3 is an end elevation of the inner end of the device shown in Figure 1 separated from the complementary circuit closing member, which constitutes the right half of said figure.

Figure 4 is a section on the line 4ˣ—4ˣ of Figure 1.

Figure 5 is a perspective view of the follower through which pressure is applied to the terminal pins of Figure 1, and the face of which is recessed to prevent it slipping upon the heads of the pins when the closing cap is being screwed to its seat.

Figure 6 is a section on the line 6ˣ—6ˣ of Figure 1.

Figure 7 is a sectional detail view of a modified form of complementary coupling member, namely, one involving a stationary panel or wall instead of a coacting plug member, the plane of section corresponding to that of Figure 1.

Figure 8 is a sectional view showing a modified construction of the plug member of a coupling, namely, one in which the closing cap of the shell bears directly upon the heads of the terminal pins, and the packing and cable-gripping gland is formed on the exterior thereof; and

Figure 9 is a sectional view showing another modification in which the closing cap, instead of being threaded to the shell, is associated with the internal mounting through the medium of a spun shell of metal, and, instead of bearing directly upon the terminal pins, as in Figure 8, or forcing the follower disk into such bearing through means of the resilient packing body of Figure 1, bears indirectly upon the follower disk through the medium of the resilient material, and holds the latter into seating pressure against the pins and, through the pins, seats the terminal pin mounting against a spun shoulder in the shell.

Figure 10 shows a modified construction of complementary coupling member in which the mounting and its contained socket elements are held in the shell, and kept under resilient pressure, and the cable leading to said socket elements is gripped to the device as a whole by substantially the same means as shown in Figure 1 for gripping the cable and holding the circuit terminals.

Figure 11 is a section on the line 11ˣ—11ˣ of Figure 12; Figure 12 is a section on the line 12ˣ—12ˣ of Figure 11; and Figure 13 is a perspective view of a hood for the enlarged head of a terminal member employed in the device shown in Figures 11 and 12.

Figure 14 is a face view, and Figure 15 an axial section of a form of follower constructed with partitioning elements which enter in between the heads of terminal members for the dual purpose of resisting relative rotation between the follower and the terminals, and also avoiding short circuiting between the terminals.

Figure 16 is an axial section on the line 16ˣ—16ˣ of Figure 17; and Figure 17 is a face view of a composite follower in which the partitioning portion is formed separately from the pressure-transmitting portion, the latter being provided with recesses to receive the heads of the terminals.

Figure 18 is a top plan view of a section of toothed material, non-conductive, and having sufficient inherent flexibility to adapt it to be formed into an annulus to produce the effect of the partitioning washer shown in Figures 16 and 17; and

Figure 19 is an axial section of a modified construction of device in which the closing member for one end of the shell is formed integrally with the shell, the separately formed parts being all introduced from the opposite open end of the shell.

Figure 20 is a segregated view of the parts composing the male half of Figure 1.

Referring to the form shown in Figures 1 to 6 and Figure 20, inclusive, 1 represents a cylindrical shell formed with an internal annular seat 2, and 3 represents a closing cap screwed into the end of said shell and constructed with a flange or shoulder 4 through means of which it seats against the end of the shell. Within the shell 1, and arrested by the seat 2, is fitted a disk-like mounting 5 constructed with an annular series of bores in which are snugly fitted terminal pins 6 corresponding in number to the wires of the cable that are to be connected. These terminal pins 6 are preferably in the form of cotter pins passed completely through the mounting 5 until their heads 7 bring up against the rear face of the mounting and in a manner to present their split ends in position to enter terminal sockets 8 in a complementary coupling member, for instance, that shown at 9, on the end 10 of the cable to be connected (Figure 1) or similar terminal sockets 8ᵃ (Figure 7) mounted in a block 16ᵃ and adapted to be secured to a panel 9ᵃ by socket screw 11 and nut 12.

In order to firmly hold the terminal pins 6 in their mounting 5, and at the same time presses the mounting 5 to its seat 2, the cap 3 is caused to develop pressure against the head 7 of the terminal pins in the axial direction, which is toward the seat. This pressure against the pin heads, in Figure 1, is developed through the medium of a follower 13, shown detached in Figure 5, which is preferably formed with head-receiving recesses 13ᵃ so that it will not rotate relatively to the pins when the cap 3 is being screwed to its seat, thereby avoiding the development, from abrasion of the pins, of a metallic film that would constitute a leak between the different wires that would prove objectionable in some uses of the coupling, for instance, for radio work. Also interposed between the

pins and the end cap 3 in Figure 1, is a resilient packing body 14, suitably made of soft rubber, which develops resiliency between the pressure-inducing cap 3 and the follower 13 sufficient to keep the parts tight and avoid vibration even under such deformation or wear as the pressure might induce and notwithstanding the fact that the cap 3 reaches its ultimate seating in the original assembly of the parts. The packing 14 is preferably introduced under conditions which will cause it, by the pressure imposed upon it, to enter into gripping relation to the cable end 15, and thus resist any pull upon the said cable end and protect the delicate soldered connections between the wire ends and the pin heads 7 in case the cable is gripped for the purpose of pulling the coupling apart. To cause the packing 14 to thus function as a gripping member, the cap 3 has its inner surface developed in accordance with the well known principle of a packing gland. This particular arrangement of packing insures the still further advantage of rendering the coupling waterproof.

In addition to the physical interengagement developed by the pins 6 entering the sockets 8, the coacting coupling member 9 or 9^a is designed to enter the shell 1, for instance, by providing the member 9 with a mounting 16, or by fashioning the member 9^a so that it will similarly enter the shell 1; moreover, in each instance, the plug member 1 is provided with a central guiding pin 17 while the mounting 16 (Figure 1) or block 9^a (Figure 7) is provided with a receiving socket 18 which mate together in the assembly of the two members of the coupling. Finally, the members 17 and 8 are provided, the one with a longitudinal groove 20 and the other with a stud 21 entering said groove, so that the members of the coupling can be assembled only at one specific position of revolution, and definitely connected wires of the cable end 15 will always enter the sockets of corresponding wires in the cable end 10.

The wires of cable end 10, indicated generally by the reference character 10^a, will preferably be threaded through a spacing disk 22 secured by a screw 23 upon the inner end of a coupling sleeve 24 which, in turn, is threaded upon the inner end of a guiding socket 18 of the complementary coupling member 9. Through this means not only is the guiding socket 18 held firmly in the mounting 16 (in which it is arrested by its head at the outer face of said mounting), but rotation or twisting of the wires 10^a of the cable end 10 relatively to the socket members 8, in which they are soldered, is prevented from taking place when the shell 9 is screwed on or off the mounting 16. It will, of course, be understood that in the form of complementary coupling member shown in Figure 7, the sockets 8^a are intended to be connected by wires 10^x leading individually to instrumentalities which are to be electrically connected.

As shown in Figure 8, a compressible packing member may be omitted from between the cap 3^a and the terminal pins 6^a, and said cap may be made to bear directly upon said pins, particularly in uses in which a film liable to cause leakage of a very low order would not be objectionable, for instance, in circuit couplings for railway cars and other situations of high tension current consumption; and in such an adaption of the invention the packing, serving as a waterproofing and cable-gripping instrumentality will be preferably located as shown at 14^a between the gland 25 on the outside of cap 3^a and a threaded nipple 26 on the said cap.

In Figure 9 the shell is a thin metal body 27 instead of being made of di-electric material as in Figures 1 to 6, and has a spun or otherwise formed seat 28 to receive the mounting 16^b for the terminal pins 8^b; instead of having an end-closure in the form of a threaded cap, a resilient cable-gripping and waterproofing packing 14^b is embraced by the end portion 29 of the metallic shell, spun or otherwise contracted into pressure developing relation to the said body, thereby forcing the follower 13^b upon the heads of the pins 8^b and developing an organization which, except for disassembly of its component parts, is similar in function to the device shown in Figures 1 to 6.

In some forms of connecting plug, the member 5 is preferably formed with radial partitioning sectors 5^a intervening between the respective cotter pin heads, although of slightly less height than the latter, and thereby avoiding interference with the follower disk in its seating upon the heads of the pins, the advantage of these partitioning elements residing in the separation of the wire ends and avoidance of short circuiting if any end should become detached from its appropriate pin.

As shown in Figure 10, the complementary coupling member which carries the mounting for the sockets which receive the terminal pins of the plug member, may be constructed substantially like the plug member, namely, by substituting for the shell 9 of Figure 1, in which the mounting is threaded, a shell 9^c in which the mounting 16^c is confined in one direction by a seat 31 on the shell, and in the other direction by a cap 30 threaded into the open end of the shell 9^c in compressing relation to a packing body 33, which it causes to bind upon the cable 10, thereby gripping the cable, packing the shell against admission of water, and imposing pressure through the disk 32 upon the ends of the sockets 8, and forcing the mounting 16^c to its said seat. As further shown in Figure 10, as well as in Figure 7, the socket members 8 or 8^a may

be knurled upon those surfaces through which they contact with the mounting which carries the sockets, thereby effectually interlocking the sockets against displacement from their mountings, under longitudinal pressure on the sockets.

As shown in Figure 12, instead of having partitioning elements entering between the heads of the terminals, and countersinking the heads in the follower, the latter is in the form of a plane annulus 13^d receiving pressure from the threaded cap or end closure 3 through the medium of the resilient mass 14, and each head of a terminal 6 is provided with a hood 34 slotted at 35 to embrace the neck of the terminal, and preferably closed at one end 36 to form a housing around the head which will prevent loose strands of wire, or a loose wire itself, from coming in contact with adjacent terminals; and these hoods so applied individually to the respective terminal heads become the means which receive pressure from the follower 13^d, in Figure 12, or directly from shell-closing end or cap 3^a (Fig. 8). In the latter case the portions 5^a will not be necessary; and both the last-named cases, the hoods being immovable on the terminal heads, will prevent the formation of a leak-streak upon the face of the rotating member.

As shown in Figures 14 and 15, partitions 37 functioning substantially in accordance with the partitions 5^a (Figures 1 and 2) can be provided on the under face of the follower $13^{d'}$. Or, as shown in Figures 16 and 17, partitioning elements 39 may be formed on a washer 38 formed separately from the follower 13^d. Still another method of providing partitions between the heads of the terminals is that represented in Figure 18, according to which a strip 38^d having partitioning teeth 39^d, produced from material capable of being flexed, is shaped into an annulus, as shown in dotted lines, and thereby adapted to take the place of the partitioning washer 38 of Figures 16 and 17. If made of soft rubber, from which it may well be produced, the envelopment of the shell 1 of the device, or such equivalent form of shell as may be selected, may be depended upon to retain the annular form so long as the parts are in assembly.

According to Figure 19, the shell is in the form of a deep cup 27^d with an integral end closure 29^d, thus functioning substantially like the shell of Figure 9, although made of di-electric material capable of being molded or machined; and the resilient mass 14^d is conformed to the inner surface of such end closure in gripping relation to the cable 15, while the follower 13^d compresses said mass until arrested by a shoulder of the shell; the pressure being developed by screwing in the mounting 5^d of the terminal 6 and transmitting pressure through the terminals to the follower.

In this construction, the deformable or resilient mass is preferably contracted upon the cable by means of a binder 40, thus further insuring the gripping of the cable. In all the forms where the cable is gripped by a compressible or deformable mass or body, the grip is upon the braid or other sheathing rather than upon the bundle of individual wires.

From the description and illustrative embodiment of the invention herein disclosed, it will be seen that the invention provides a multiple circuit closing plug in which there is a terminal mounting member constructed with longitudinal bores adapted to receive and provide seating for a group of circuit terminals which may be introduced endwise into the mounting member and arrested thereby in the direction in which they are inserted, with the rear ends of the terminals exposed in a group to receive an abutment through which they are held to their seats; also means for holding the terminal mounting member and abutment member in assembly and forcing one toward the other so that the terminals will be held to their seats, such means including a resilient part through which the seating force is transmitted, so arranged that the resilient force is distributed over the abutment so that one portion of the latter may yield independently of another portion thereof, and any pins that may be more prominent in their presentation than others will not prevent seating pressure being imposed upon all the pins; and that the means for holding the abutment and mounting member in assembly preferably comprises a shell in which the mounting member is sustained in one direction, and an end-closure for the shell, which either provides the abutment member or sustains a separately formed abutment member in the opposite direction, one or more of the parts being screw threaded in the shell in order to develop the terminal seating pressure.

I claim:

1. In a coupling member for electrical conductors, a terminal-pin mounting-member carried by said coupling member, a terminal-pin inserted into and arrested in one endwise direction by said mounting, and an end-member also carried by said coupling member, sustaining said terminal pin against withdrawal from the mounting member in the opposite endwise direction; said mounting member and end member being confined in relative position to develop upon said terminal pin endwise pressure toward the mounting member.

2. In a coupling member for electrical conductors, a terminal pin mounting-member carried by said coupling member, a terminal pin inserted into and arrested in one endwise direction by said mounting, and an end-member also carried by said coupling member,

sustaining said terminal pin against withdrawal from the mounting member in the opposite endwise direction; said mounting member and end member being confined in relative position to develop upon said terminal pin endwise pressure toward the mounting member, and having screw-threaded adjustment in the coupling member, one toward the other, in the direction of said endwise pressure.

3. In a coupling member for electrical conductors, a terminal pin mounting-member carried by said coupling member, a terminal pin inserted into and arrested in one endwise direction of said mounting, and an end-member also carried by said coupling member, sustaining said terminal pin against withdrawal from the mounting member in the opposite endwise direction; said mounting member and end member being confined in relative position to develop upon said terminal pin endwise pressure toward the mounting member, there being between said end member and said pin, a follower through which said pressure is imposed upon said pin.

4. In a coupling for electrical conductors, a shell, a mounting member in said shell, a shell closing member, one of said members having means for adjusting it toward the other member, and thereby developing pressure between said members, circuit terminals carried by said mounting member, and a follower located between but independent of both of said members, sustained by said closing member, and resting upon and transmitting the developed pressure to the ends of the terminal members; means being provided for preventing said follower from rotating relatively to the terminals.

5. In a coupling member for electrical conductors, a terminal pin mounting-member carried by said coupling member, a terminal pin inserted into and arrested in one endwise direction by said mounting, and an end-member also carried by said coupling member, sustaining said terminal pin against withdrawal from the mounting member in the opposite endwise direction; said mounting member and end member being confined in relative position to develop upon said terminal pin endwise pressure toward the mounting member, there being between said end-member and said terminal pin a follower through which said endwise pressure is imposed upon said pin, and between said follower and said end-member, a body of resilient material through which pressure is imparted to the follower.

6. In a coupling for electrical conductors, a shell, a mounting member in said shell, a shell closing member, one of said members being provided with screw adjustment in the shell and thereby adapted to develop pressure between the members, circuit terminals in said mounting member presented in position to receive the pressure so developed, and a follower sustained by the shell closing member, seating upon the terminal members, and transmitting the developed pressure thereto; there being between said follower and the closing member a body of resilient material.

7. In a coupling member for electrical conductors, a terminal pin mounting member carried by said coupling member, a terminal pin inserted into and arrested in one endwise direction by said mounting member, and an end-member also carried by said coupling member, sustaining said terminal pin against withdrawal from the mounting member in the opposite endwise direction; said mounting member and end member being confined in relative position to develop upon said terminal pin endwise pressure toward the mounting member; said terminal pin mounting member being formed separately from the coupling member and seated thereagainst, by the pressure of the end member upon the pin.

8. In a coupling member for electrical conductors, a terminal pin mounting member carried by said coupling member, a terminal pin inserted into and arrested in one endwise direction by said mounting, and an end-member also carried by said coupling member, sustaining said terminal pin against withdrawal from the mounting member in the opposite endwise direction; said mounting member and end member being confined in relative position to develop upon said terminal pin endwise pressure toward the mounting member; said terminal pin mounting-member being formed separatively from the coupling member and seating thereagainst under endwise pressure of the end member upon said pin; and said end member being threaded in the coupling member and adapted thereby to develop said endwise pressure upon the pin and seating pressure upon the pin mounting.

9. In a coupling for electrical conductors, a shell, a mounting seated in said shell, terminal conducting means inserted in said mounting, pressure developing means carried by said shell, imposing pressure upon said terminal means, and by said pressure forcing said mounting to its seat in the shell, and a follower interposed between said pressure developing means and the terminal means; said terminal means comprising a series of headed members; and said follower comprising a disk seated upon the heads of said members.

10. In a coupling for electrical conductors, a shell, a mounting seated in said shell, electric terminal members inserted in said mounting, and pressure developing means carried by said shell, imposing pressure upon said terminal means, and by said pressure forcing said mounting to its seat in the shell; said pressure developing means comprising a cap threaded in the shell, and adjustable thereby toward said terminal means.

11. In a coupling for electrical conductors, a shell, a mounting seated in said shell, electric terminal members inserted in said mounting, and pressure developing means carried by said shell, imposing pressure upon said terminal members, and by said pressure forcing said mounting to its seat in the shell; said pressure developing means comprising a cap threaded in the shell and adjustable thereby toward said terminal means, and a follower interposed between said cap and said terminal means.

12. In a coupling for electrical conductors, a shell, a mounting in said shell, electric terminal members inserted in said mounting, a member coacting with said mounting to develop pressure upon said terminal members, and a follower interposed between said coacting member and said terminal members; said follower being recessed to receive the last-named members and resist its rotation thereon.

13. In an electric connecter, a shell, a mounting seated in said shell, terminal means carried by said mounting, a pressure developing cap threaded in said shell and adapted to transmit pressure through said terminal means to said mounting, and a resilient body interposed between and transmitting such pressure from said cap to said terminal means.

14. In an electrical conductor, a shell, a mounting seated in said shell, terminal means carried by said mounting, a follower in bearing against said terminal means, a resilient body in bearing against said follower, and a cap in said shell adapted to impart pressure to said resilient body.

15. In an electrical connecter, a shell, a mounting seated in said shell, terminal means carried by said mounting, a follower in bearing against said terminal means, a resilient body in bearing against said follower, and a cap in said shell adapted to impart pressure to said resilient body; said cap being threaded in said shell; and said follower being interengaged with the terminal means in the direction to resist rotation of the follower by the threaded cap.

16. In an electrical connecter, a shell, a terminal pin mounting member carried by said shell, a terminal pin seating in one longitudinal direction in said mounting member, a conductor entering the shell and in electrical connection with said terminal means, a gland, and a deformable packing member compressed by said gland and caused by such compression to press the terminal member in the longitudinal direction of its seating and simultaneously bind the connecter and resist transmission of tension through the connecter to the terminal pin.

17. In an electrical connecter, a shell, a terminal pin mounting member carried by said shell, a plurality of terminal pins seating in one longitudinal direction in said mounting member, a follower transmitting pressure to said pins in the direction of their seating, conductors entering the shell and connected to the respective terminal pins, a deformable packing member adapted to press against said follower and against said conductors, and means for compressing said packing member and forcing it against said follower and into gripping relation with said conductors.

18. In a coupling for electric conductors, a shell, a mounting member in said shell, terminals carried by said mounting member, a follower engaging the respective terminals, and through them resisting movement of the follower, and partitions entering the spaces between the ends of the terminals.

19. In a coupling for electric conductors, a shell, a mounting member in said shell, terminals carried by said mounting member, and a follower engaging the respective terminals, and through them resisting movement of the follower; one of said members being constructed with partitions entering the spaces between the ends of the terminals.

20. A coupling member for electric circuits, comprising a mounting member, terminals arranged in annular series in said mounting member, and a follower member bearing against said terminals; one of said members being constructed with radially disposed partitioning means entering the spaces between the ends of the terminals.

21. In a coupling member for electric circuits, a shell, a mounting member in said shell, terminals in said mounting member, wires united to the respective terminals, and a follower member sustained in said shell independently of the mounting member and bearing against the ends of the terminals; one of said members being constructed with radially disposed partitions entering between the ends of the terminals to which the wires are united.

22. In a coupling for electrical conductors, a shell, a mounting member in said shell constructed with a series of bores, and with partitions located between adjacent bores, terminals in the bores of said mounting member with ends exposed between said partitions, wires united to the said ends, and a follower member sustained in said shell independently of the mounting member and bearing against said ends.

23. In a coupling member for electrical conductors, a terminal pin mounting member carried by said coupling member, terminal pins inserted into and arrested in one endwise direction by said mounting, and an end-member also carried by said coupling member, sustaining said terminal pins against withdrawal from the mounting member in the opposite endwise direction; said mounting member and end member be-

ing confined in relative position to develop upon said terminal pins endwise pressure toward the mounting member, the ends of said terminal pins being exposed on said mounting member to receive such pressure, and said mounting member being constructed with partitioning portions between adjacent ends of said terminal pins.

24. In a coupling for electrical conductors, a shell, a mounting seated in said shell, conducting terminals inserted in said mounting, and pressure developing means carried by said shell, imposing pressure upon said terminals, and by said pressure forcing said mounting to its seat in the shell; said mounting being provided with partitioning members between the several terminals; said partitioning members being of less height than the terminals to avoid resisting the seating of the pressure means upon said terminals.

25. In a coupling for electrical conductors, a shell, a mounting seated in said shell, electrical terminal members inserted in said mounting, and pressure developing means carried by said shell, imposing pressure upon said terminal means, and by said pressure forcing said mounting to its seat in the shell; said pressure developing means comprising a cap threaded in the shell and adjustable thereby toward said terminal means; there being between said cap and said terminal means a follower which is recessed to engage the ends of said terminal means and prevent the follower from partaking of the rotary movement of said cap.

26. In a coupling for electrical conductors, a shell, a mounting seated in said shell, electrical terminal means inserted in said mounting, and pressure developing means carried by said shell, imposing pressure upon said terminal means, and by said pressure forcing said mounting to its seat in the shell; said pressure developing means comprising a cap threaded in the shell and adjustable thereby toward said terminal means; there being between said cap and said terminal means a follower which is recessed to engage the ends of said terminal means and prevent the follower from partaking of the rotary movement of said cap; also a resilient body between the cap and the follower.

27. In a coupling for electric conductors, a mounting member constructed with a plurality of longitudinal terminal receiving bores, terminals introduced endwise into said bores and seating against said mounting member in the direction of their insertion, an abutment behind the rear ends of said terminals in position to resist withdrawal of said terminals from the mounting member, and means including a resilient part holding said mounting member and said abutment in assembly and resiliently forcing one toward the other, and thereby holding said terminals to their seating against the mounting member.

28. In a coupling for electric conductors, a mounting member constructed with a group of longitudinal bores, terminals inserted endwise in said bores, seating against the mounting member in the direction of their insertion, and having exposed rear ends presented by said mounting member in a group, an abutment behind said rear ends of the terminals in position to press the terminals collectively to their seats, resilient means sustaining said abutment, and means acting through said resilient means against said abutment holding said abutment and mounting member in assembly and forcing one toward the other; the resiliency in the sustention of the abutment being distributed over the abutment and permitting one portion of the abutment to yield independly of other portions thereof and seat all of the terminals.

Signed at Chicago, Illinois, this 18th day of January, 1927.

EUGENE A. HAGEL.