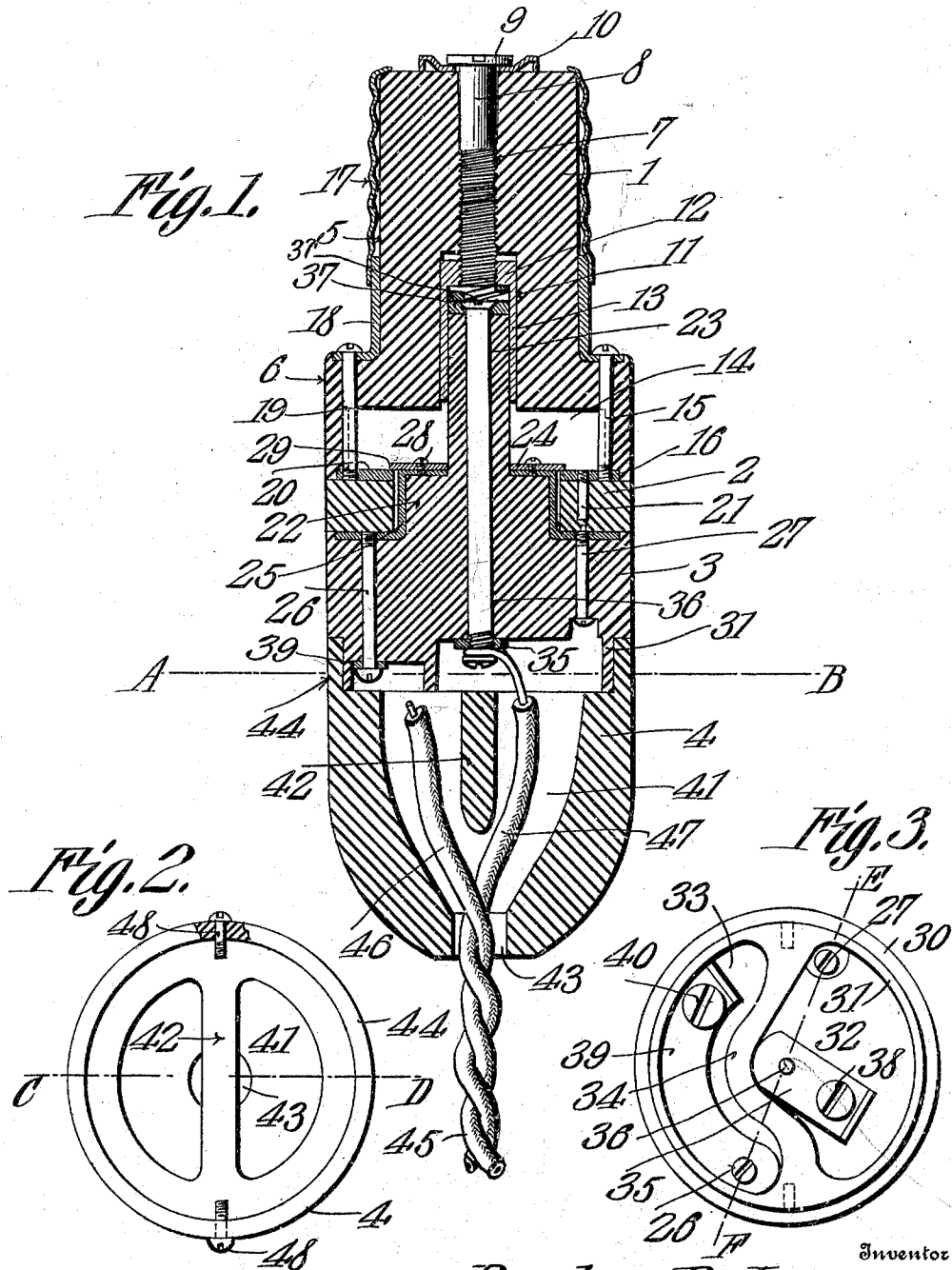


957,891.

Patented May 17, 1910.



Witnesses

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# UNITED STATES PATENT OFFICE.

REUBEN R. LANG, OF IOLA, KANSAS.

## ELECTRIC PLUG.

957,891.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed January 25, 1909. Serial No. 474,133.

*To all whom it may concern:*

Be it known that I, REUBEN R. LANG, a citizen of the United States, residing at Iola, in the county of Allen and State of Kansas, have invented a new and useful Electric Plug, of which the following is a specification.

This invention has reference to improvements in electric plugs and is designed to provide a plug for coupling a flexible conductor to a terminal socket or the connection of a socket to a flexible conductor, or in fact the invention is designed to provide an electric connection for the joining of electric conductors to extend the circuit to any desired point.

The present invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawings forming a part of this specification in which drawings,

Figure 1 is a longitudinal section on an enlarged scale of the improved plug, the lower portion below the line A—B of Fig. 1 being taken on the line C—D of Fig. 2, and the upper portion above the line A—B of Fig. 1 being taken on the line E—F of Fig. 3. Fig. 2 is a plan view of a portion of the structure of Fig. 1 below the line A—B. Fig. 3 is a plan view observed from below of that portion of the structure of Fig. 1 above the line A—B.

The plug shown in Fig. 1 is composed of four parts, 1, 2, 3 and 4 joined together both mechanically and electrically to constitute a plug unit. The part 1 of the plug has a neck 5 and expanded head 6 at one end of the neck made of one piece of insulated material of any suitable type but preferably an insulating material possessing strength, non-frangibility, immunity to the effects of heat and moisture, and ease of working. The parts 2, 3 and 4 of the plug may also be made of the same material for the same reason. Through the neck 5 there is a central longitudinal passage 7 for the reception of a screw 8 the head 9 of which latter is of sufficient size to engage the corresponding end of the neck 5 and between the head 9 and the end of the neck 5 the screw confines a suitable washer 10 which together with the end of the screw 8 constitutes one of the electrical terminals of the plug. The portion of the passage or bore 7 through

the neck 5 remote from the terminal 8 of the neck 5 is enlarged or counter-bored as indicated at 11 for the reception of a block 12 in which is formed a threaded passage for the threaded end of a screw 8, this block serving to hold the screw 8 in the neck 5 and also serving to continue the electric circuit from the screw 8, the said block 12 being made of metal.

Seated in the counter-bored portion 11 of the passage 7 beyond the block 12 is a sleeve 13 formed integral with said block. The passage or enlargement 11 is continued into the head 6 where it finally merges into a counter-bored portion 14 concentric with the passage 7 and of considerably greater diameter than the counter-bored portion 11, the said enlarged passage 14 being inclosed by an annular flange 15 forming a continuation of the head 6. At the outer end of the flange 15 there is formed an annular rabbet 16 for a purpose which will presently appear.

Surrounding the neck 5 is a sleeve 17 having external screw threads of such pitch and size as to fit an ordinary electrical terminal socket. Secured to the sleeve 17 are strips 18 suitably bent at their ends to rest against the corresponding face of the head 6 and through these bent portions pass screws 19, the threaded ends of which screws engage and secure to the head 6 an annular plate 20 in the form of a flat ring or washer, the said plate 20 being of metal with its outer periphery resting in the rabbet 16 at the outer end of the annular flange 15, being there held by the screws 19. The corresponding outer faces of the plate 20 and the end of the flange 15 are about flush one with the other.

The member 2 of the plug is a ring of the insulating material before mentioned having its outer periphery flush with the outer face of the head 6 and its inner periphery coincident with the inner periphery of the plate or ring 20. The member 2 and the metal ring 20 are secured together by suitable screws 21. It will be understood that a sufficient number of screws 21 is used although only one is visible in the section taken in Fig. 1.

The member 3 of the plug is in the form of a cylindrical block of the same external diameter as the member 2 and head 6 of the

member 1. Formed on one end of the member 3 is a cylindrical neck 22 from which there projects an axial stem 23. The neck 22 is of such external diameter as to fit easily in the ring-shaped member 2 and this neck is of substantially the same length as the thickness of the said member 2. The end of the neck 2 remote from the body portion 3 carries a plate 24 on which at diametrically opposite points are formed wings 25 which may be countersunk into the neck 2 and the free ends of these wings are bent at right angles to the portion along the neck 22 and are sunk into the corresponding face of the body portion 3, these angle extensions being secured to the body portion 3 by means of screws 26 and 27 respectively, to which screws reference will presently be made. Fast to the plate 24 by screws 28 is a washer 29 the outer edge of which overrides the inner edge of the plate 20 thus securing the member 3 to the member 1 but at the same time permitting axial rotation of the member 3 with relation to the members 1 and 2. The washer 29 is of metal as well as the plate 24 and electrical connection is made between the plates 24 and 20 by the rubbing contact of the washer 29 on the plate 20. That end of the member 3 remote from the neck 22 is formed with an annular external rabbet 30 the inner wall of which is formed by an annular flange 31 inclosing two recesses 32 and 33 respectively divided by an intermediate web 34 formed integral with the body 3 and the flange 31. The web 34 is displaced laterally so that the recess 32 extends sufficiently to include the center of the member 3 while the ends of the web 34 join the flange 31 at diametrically opposite points.

Housed in the recess 32 is a conducting plate 35 held in place by a screw 36 extending centrally through the member 3 and the neck 22 and the stem 23 thereof, the head of the screw being at the free end of the stem 23 where it confines a disk or plate 37 to the said free end of the stem 23, the screw 36 serving to establish electrical connection between the plate 35 and disk 37. Between the disk 37 and the block 12 there is interposed a spring washer 37'. The plate 35 carries a screw 38 for the attachment thereto of the terminal of an electric conductor.

The recess 33 has housed therein a plate 39 provided with a screw 40 for the attachment thereto of the terminal of an electric conductor and this plate 39 is securely fastened in the said recess and to the member 3 by the screw 26 before referred to. The screw 27 is accessible through the recess 32 and is placed in insulating relation to the plate 35 in said recess.

The member 4 of the plug is preferably though not necessarily conoidal in shape and has formed through it a similarly shaped

chamber or passage 41 divided through a portion of its length into two compartments by a diametric web 42 formed in one piece with the walls of the member 4. At the apex of the conoidal member 4 the chamber 41 communicates with a short passage 43 leading to the exterior of said member 4. The external diameter of the larger end of the member 4 is the same as that of the member 3 and on this end there is formed an annular flange 44 arranged to seat in the rabbet 30 of the member 3 and receive and house the flange 31 of said member 3. The passage 43 is of such size as to receive a flexible double conductor 45, the members 46 and 47 of which are separated after entering the chamber 41 and the bared ends of these conductors are carried to the screws 38 and 40 respectively and are thereby placed in electrical connection with the plates 35 and 39 in the usual manner.

The member 4 is made fast to the member 3 by screws 48 extending through the flange 44 and engaging the web 34 where they enter suitably threaded holes formed in the corresponding end of the web 34.

The electric circuits through the plug may be traced on the one hand by the screw 8 through the block 12, sleeve 13 and washer 37' to the plate 37 thence by the screw 36 to the plate 35 and ultimately to the conductor 47. On the other side the circuit may be traced by the screw sleeve 17 and strip 18 to the screw 19 thence to the plate 20 and by the washer 29 to the plate 24 thence by one of the wings 22 to the screw 26 and ultimately to the plate 39 to which the other conductor 46 is connected.

It will be observed that the two circuits through the plug are thoroughly insulated one from the other against any possibility of short circuiting within the body of the plug while at the same time the members 3 and 4 are rotatable with relation to the members 1 and 2 without disturbing the electrical connections.

It will be observed that when the plug end 1 of the device is in a suitable socket the remainder of the plug is entirely free from exposed metal parts so that danger of shock or the establishment of external circuits is entirely obviated. At the same time either member of the plug may be rotated so that there is no danger at any time of twisting the conductors 45 as would otherwise be liable to occur in screwing the plug into a socket or in connecting the other end of the conductor 45 to an electrical translating device or to another plug or socket where screw connections are used.

The construction of the plug is such as to adapt it specially to the carrying of heavy currents without danger of heating or short circuiting and this is especially true where rubbing contacts are employed

in the plug, the construction being such that these contacts have liberal contacting surfaces.

What is claimed is:—

5 1. An electric plug comprising two sections axially swiveled together, one section having an axially located terminal countersunk therein and the other section having an axial stem of insulating material, a conductor extending axially through the said stem and having its free end provided with a circuit terminal adapted to contact with the countersunk terminal of the first named section when the stem is inserted in said  
15 countersink.

2. An electric plug comprising two members swiveled together, one member having an axial countersink therein and the other member having a neck and an axial stem of insulating material formed thereon the said stem entering the countersink in the other member, and a ring or collar of insulating material surrounding the neck on one section and secured to the other section.

25 3. An electric plug comprising a member of insulating material provided with an axial countersink, another member of insulating material having an axial neck and a stem projecting from said neck and adapted to enter the countersink of the first member, a third member of insulating material secured to the first member and inclosing the neck on the second member, and a fourth member of insulating material secured to the second member at the end remote from the neck and stem thereon.

4. An electric plug comprising a member of insulating material provided with an axial countersink having an electric terminal housed therein, another member of insulating material having an axial neck and a stem projecting from said neck and provided with a circuit terminal, said stem being adapted to enter the countersink in the first  
40 named member, a third member of insulating material secured to the first member and

inclosing the neck on the second member, and a fourth member of insulating material secured to the second member at the end remote from the neck and stem thereon.

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5. An electric plug comprising a member of insulating material provided with an axial countersink housing an electric terminal, and also provided with a head carrying an annular conducting plate, and another  
55 member of insulating material having a neck formed on it at one end and a stem projecting in axial relation to the neck and adapted to enter the countersink of the first named member, said second named member  
60 having two conducting plates on the neck one over-riding the annular conducting plate carried by the first named member, and a circuit terminal on the stem adapted to engage the circuit terminal in the countersink  
65 in the first named member.

6. An electric plug comprising a member of insulating material provided with an axial countersink housing an electrical terminal and also provided with a head carrying an annular conducting plate, another member of insulating material having a neck formed on it at one end and a stem projecting in axial relation to the neck, and adapted to enter the countersink in the first  
70 named member, said second named member having two conducting plates on the neck one over-riding the annular conducting plate carried by the first named member, a circuit terminal on the stem adapted to engage the circuit terminal in the countersink  
80 in the first named member, and a ring of insulating material surrounding the neck on the second member and secured to the first named member.

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In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

REUBEN R. LANG.

Witnesses:

JAS. S. TAYLOR,  
E. W. MYLER.