

March 14, 1933.

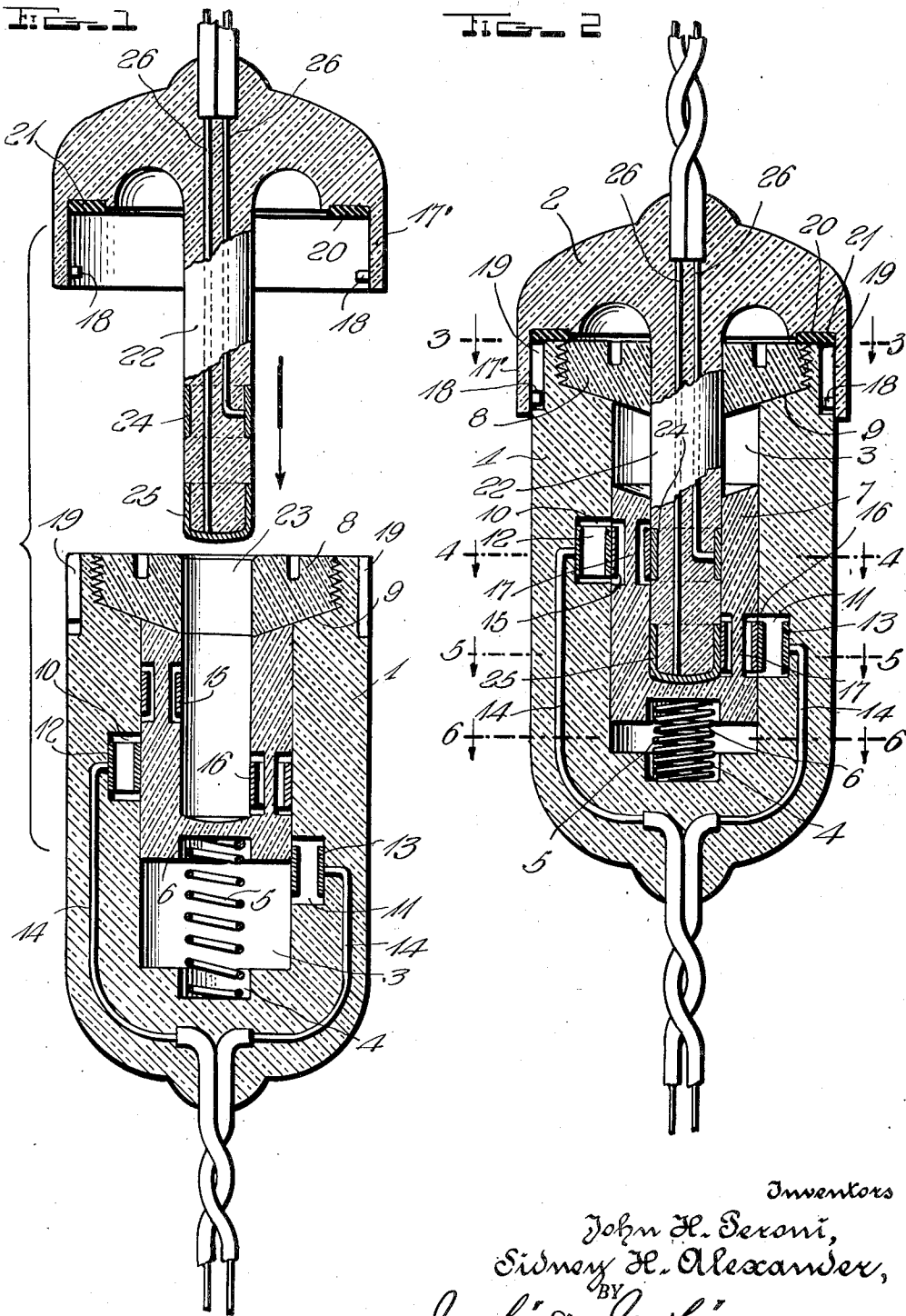
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1,901,040

SEPARABLE WEATHERPROOF PLUG

Filed May 4, 1931

2 Sheets-Sheet 1



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Fig. 3

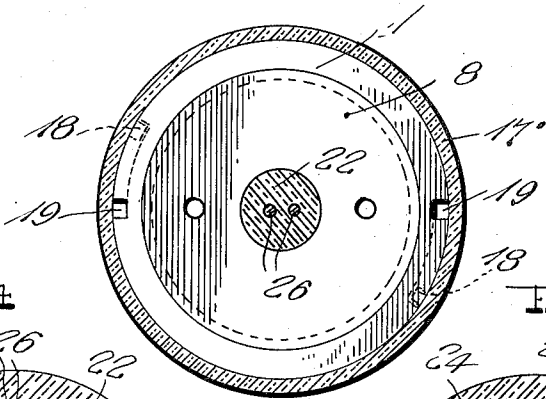


Fig. 4

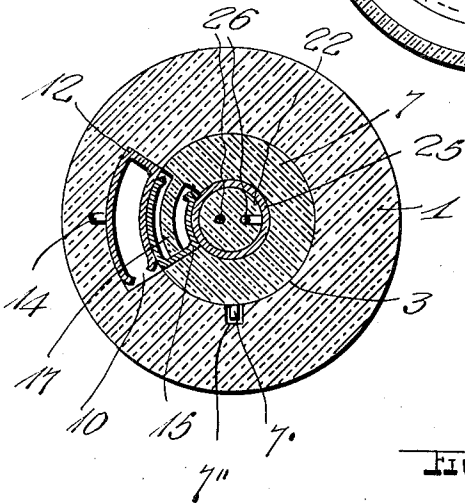


Fig. 5

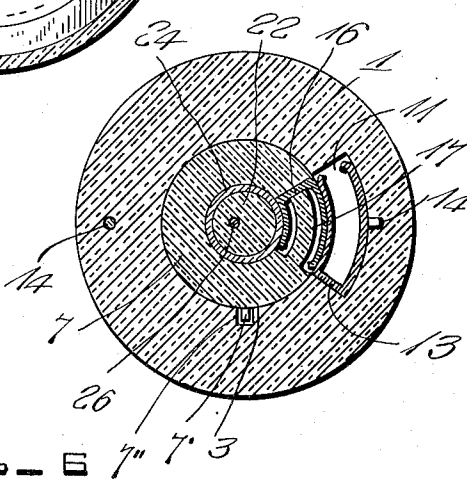
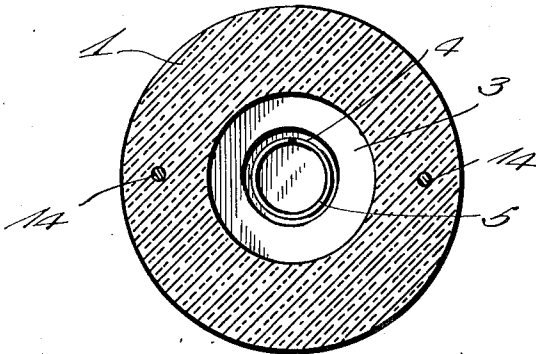


Fig. 6



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SEPARABLE WEATHERPROOF PLUG

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This invention relates to electrical appliances and more particularly to a separable plug used for releasably connecting conductor wires to each other.

5 In order to releasably connect conductor wires, plugs are used consisting of companion sections each having contacts to which wires are attached and the contacts of the two sections engage each other when the sections are connected but plugs now in use have been found unsatisfactory as the contacts to which charged wires are attached are exposed and a short circuit will be formed if a piece of metal drops into a socket or the socket becomes partially or entirely filled with water when the sections of the plug are separated.

15 Therefore, one object of the invention is to provide a plug so constructed that contacts in a socket to which power wires are attached will be covered and danger of a short circuit eliminated when the cap or companion plug section is detached.

25 Another object of the invention is to provide the socket with a shield for its contacts so mounted that while it will be yieldably held in position to prevent a short circuit it may be easily moved into position to permit completion of a circuit when the cap or companion plug section is in place.

30 Another object of the invention is to provide the socket with a shield which is moved to a circuit establishing position by merely thrusting the cap into place and will return to a shielding position immediately upon removal of the cap thereby positively insuring proper operation and making manual adjustment unnecessary.

40 Another object of the invention is to provide a plug of this character which is simple in construction and easy to operate.

The invention is illustrated in the accompanying drawings wherein:

45 Figure 1 is a longitudinal sectional view through the plug with the cap separated from the socket.

Figure 2 is a similar view showing the cap applied to the socket.

50 Figure 3 is a sectional view taken along the line 3—3 of Figure 2 and showing the cap in section and the socket in elevation, and

Figures 4, 5 and 6 are sectional views taken respectively along the lines 4—4, 5—5 and 6—6 of Figure 2.

This improved plug consists of companion sections and the section 1 may be referred to as a socket and the section 2 as a cap for the socket. The socket or shell 1 is formed of molded insulating material and has a chamber 3 extending axially through the same. At its inner end the chamber is extended to form a seat 4 for a coiled spring 5. The other end of this spring engages in a seat 6 formed at the inner end of a core or plunger 7 formed of insulating material and the spring serves to yieldably hold the core in the extended position shown in Figure 1 with its outer end bearing against an abutment ring or collar 8 which is threaded into the pocket 9 formed by enlarging the outer end of the chamber 3. By this arrangement, the core will be retained in the chamber for sliding movement therein but be withdrawn when the ring 8 is removed.

75 In recesses 10 and 11 formed in the walls of the socket 1 are disposed resilient contacts 12 and 13 each of which is substantially U-shaped and extends circumferentially of the socket as shown in Figures 4 and 5. These contacts are set in place during molding of the socket and have attached to their outer arms power wires 14 which extend longitudinally through the socket and out at its lower or rear end, and obviously, the power connections may also be of a detachable type. To insure positive alignment of the plunger 22 with its coacting socket within the plug, pins 7' are provided on the face of the plunger 7 adapted to operate within channels 7". This feature is clearly shown in Figures 4 and 5.

80 The core 7 carries contacts 15 and 16 which are also U-shaped and are set in place during molding of the core with a portion of the core extending between their arms as shown at 17. These contacts are exposed at diametrically opposite sides of the core but one is closer to the inner end of the core than the other and by comparing Figures 1 and 2 it will be seen that the contacts 15 and 16 have such relation to the contacts 12 and 13 that when

the core is in the extended position shown in Figure 1 it will serve as a shield to prevent water or a piece of metal which may enter the core from forming a short circuit between the contacts 12 and 13 whereas when the core is forced inwardly against the action of the spring 5 the contacts 15 and 16 may have engagement with the contacts 12 and 13 respectively.

The plug section or cap 2 which is also formed of insulating material has an annular flange or wall 17' to fit snugly about the socket 1 and has pins 18 to engage in bayonet slots 19 formed in the socket and securely and releasably hold the cap in place. A gasket 20 seated in a recess 21 formed in the cap serves to form a tight joint and exclude water when the cap is in place. From the center of the cap extends an arm 22 which passes through the opening 23 of the collar 8 into the core and forces the core to the position shown in Figure 2 when the cap is in place. Therefore, the contacts 15 and 16 will be moved into engagement with the contacts 12 and 13 and since the contacts 24 and 25 carried by the arm 22 bear against the contacts 15 and 16 communication will be established between the power wires 14 and the wires 26 which extend through the cap and its arm and have their inner ends anchored to the contacts 24 and 25.

By having the plug constructed as shown in the drawings and described above all danger of a short circuit taking place when the cap is detached is eliminated as the core immediately moves to a shielding position but as soon as the cap is applied a connection will be established between the wires 14 and 26 and current may flow through the wires 26 to energize an appropriate electric appliance or motor to which the wires 26 lead.

It should also be noted that when the cap is applied to the casing and the shield moved to a circuit closing position, all of the contacts carried by the cap, shield and casing will be enclosed and if sparks are formed by arcing during application of or removal of the cap, these sparks will be confined within the plug and fire hazards due to danger of gases being ignited will be eliminated. Therefore, the plug can be safely used in a projecting room or booth of a moving picture theatre or other places where inflammable gases are liable to be present without danger of fire or explosions taking place.

From the foregoing description of the construction of our improved invention, the operation thereof and the method of applying the same to use will be readily understood. It will be seen that we have provided a simple, inexpensive and efficient means for carrying out the objects of the invention. While we have particularly described the elements best adapted to perform the functions set forth, it is obvious that various changes in

form, proportion and in the minor details of construction may be resorted to, without departing from the spirit or sacrificing any of the principles of the invention.

What is claimed is:

1. A separable weatherproof plug comprising a socket formed with a chamber open at one end, contacts embedded in said socket and engaged by conductors and having portions exposed through the wall of the chamber in spaced relation to the bottom thereof, a shield movably mounted in said chamber and guarding said contacts from water and foreign elements, a cap detachably applied to the open end of the socket and having a portion extending into said chamber and engaging said shield to move the shield out of its normal position, said extension carrying contacts engaged by conductors and the shield having contacts exposed through side portions thereof and engaged by the contacts of the extension and moved into engagement with the contacts of the socket when the shield is moved to its adjusted position.

2. A separable weatherproof plug comprising a socket of insulation formed with a chamber open at one end, a core of insulation slidable in said socket and yieldably held against inward movement, an abutment ring of insulation in the outer end of the chamber to limit outward movement of the core, a detachable cap of insulation fitting about the open end of said socket to entirely enclose the same when applied to the socket and having an arm extending through said ring into said socket and engaging said core to move the core inwardly, said socket having spaced contacts mounted therein and the core carrying contacts spaced from the contacts of the socket when the core is in its normal position and engaging the contacts of the socket when the core is moved inwardly, and contacts carried by said arm to engage the contacts of said core when the cap is applied to the socket.

3. A separable weatherproof plug comprising a socket formed with a chamber open at one end, a core slidable in said socket and yieldably held against inward movement, an abutment means detachably mounted in the outer end of said chamber to limit outward movement of said core, a cap detachably applied to the open end of said socket and turned into interlocking engagement therewith, said cap having an arm extending through the abutment into said socket and engaging said core to move the core inwardly, said socket having contacts mounted therein and the core carrying contacts spaced from the contacts of the socket when the core is in its normal position and engaging the contacts of the socket when the core is moved inwardly, said contacts being resilient and each U-shaped and extending circumferentially of the socket with one arm

embedded and serving to hold the contacts in place and its other arm exposed for frictional engagement with an exposed arm of a cooperating contact when the core is moved inwardly, and contacts carried by said arm and extending circumferentially about the same to insure engagement with the contacts of said core when the cap is applied to the socket and turned into interlocking engagement with the same.

4. A separable weatherproof plug, comprising a socket formed with a chamber open at one end, a core slidable in said socket and yieldably held against inward movement, a cap detachably applied to the open end of said socket and having an arm extending into said socket and engaging said core to move the core inwardly, said socket having contacts mounted therein and the core carrying contacts spaced from the contacts of the socket when the core is in its normal position and engaging the contacts of the socket when the core is moved inwardly, and contacts carried by said arm and extending circumferentially about the arm whereby engagement of the contacts of the arm and core will be assured when the cap is applied to the socket.

5. A separable weatherproof plug comprising a socket open at its front end and a removable cap for the open end thereof, said socket having a shell defining a chamber open at its outer end and an annular collar removably mounted in the open end portion of the chamber and constituting an abutment formed with a central passage, a core slidable longitudinally in said chamber and yieldably held in an extended position in engagement with said collar, the core being formed with a longitudinally extending pocket open at its outer end and aligned with the passage of said collar contacts carried by the shell and core and disposed out of engagement with each other when the core is in its extended position, the core when extended serving to shield the contacts of said shell from engagement by water or a foreign substance accidentally dropped into the pocket of the core, said cap having an arm to extend through the passage of said collar and enter the pocket of the core and move the core to a retracted position for engagement of the contacts of the core and shell with each other when the cap is applied, said arm having contacts to engage the contacts of the core and establish communication between conductor wires secured to contacts of the shell and arm.

6. A separable weatherproof plug comprising a shell having a chamber extending longitudinally therein, the outer end of said chamber being enlarged to form a pocket having threaded walls, an abutment ring screwed into said pocket, a core slidably secured in said chamber and yieldably held against inward movement, and held from rotating in said chamber by a channel and pin, contacts

in said shell having portions exposed in the chamber, conductors extending through said shell and anchored to said contacts, contacts carried by said core to engage the contacts of the shell when the core is moved inwardly, the core when in engagement with said collar serving as a shield for the contacts of the shell and having its contacts spaced therefrom, a cap for the front end of said shell detachably engaged therewith and having an arm to extend through the collar into the core and move the core inwardly to a retracted position and dispose its contacts in engagement with contacts of the shell, and contacts carried by said arm having conductor wires anchored to them and having engagement with contacts of the core when the cap is in place.

In testimony whereof we affix our signatures.

JOHN H. PERONI.
SIDNEY H. ALEXANDER.

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