March 28, 1939. D. WOODHEAD 2,151,882

ELECTRIC CONNECTOR

Filed Oct. 20, 1934

FIG. 1.

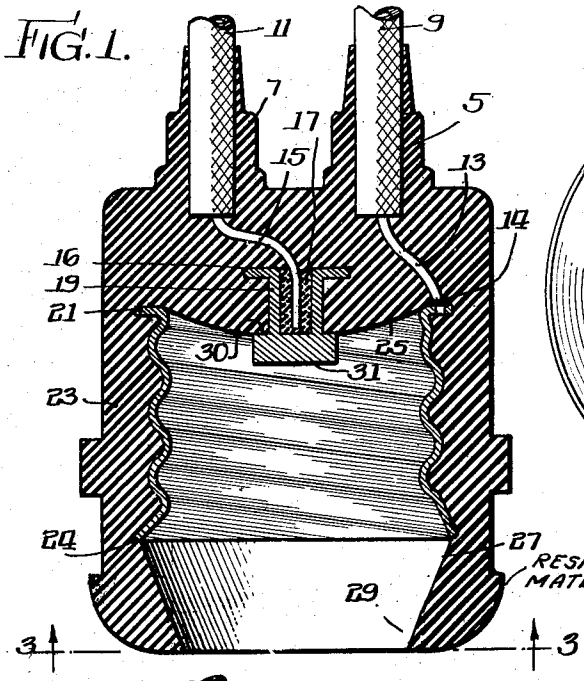


FIG. 3.

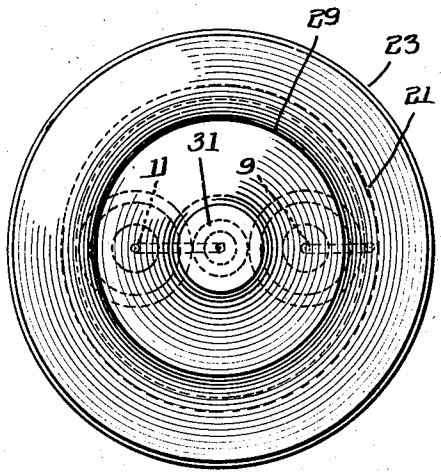


FIG. 2.

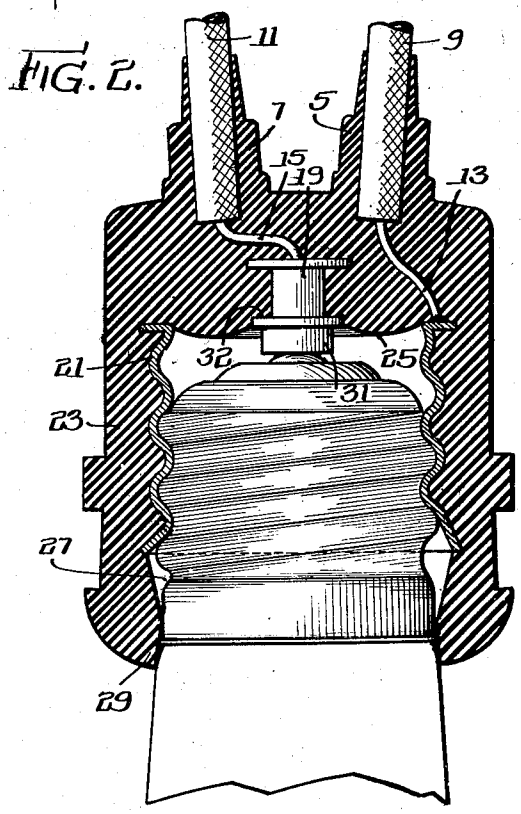
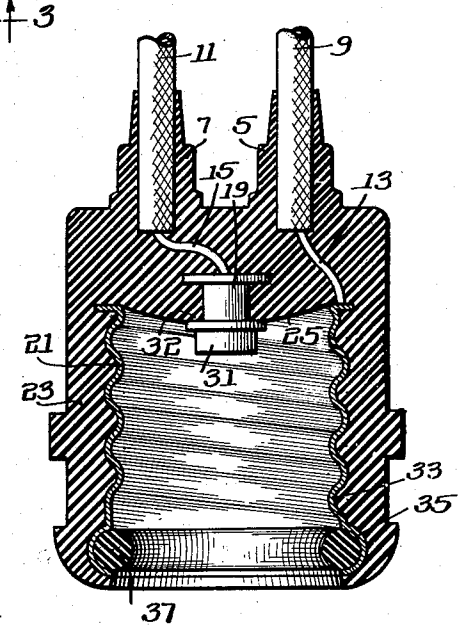


FIG. 4.



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ELECTRIC CONNECTOR

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6 Claims. (Cl. 173—358)

This invention relates in general to electric connectors, and more particularly to electric sockets.

An electric socket ordinarily comprises a threaded brass shell which is electrically connected to one wire of an electric circuit, and a flexible spring brass contacting member therein electrically connected to the other wire of the electric circuit. The spring brass contactor is contained centrally within the upper portion of the brass shell, and held therein by being mounted in a porcelain insulating plug, set in the upper open end of the brass shell. In constructing such an electric socket, two things are of paramount importance. The spring contact must be electrically insulated from the shell which forms the other contact of an electric circuit to the lamp, and secondly, in order to provide a resilient contact for the light globe, this spring contact must permit a play of at least 3/64", so that the springiness thereof will follow the contact point on the lamp globe as the globe tends to move out of contact by reason of vibration or other causes, and also to resiliently urge the lamp globe downwardly so that it will be tightly held within the threads of a brass shell which forms the other contact of the electric circuit to the lamp.

In the manufacture of lamp sockets generally, the operation of securing the central spring contact to the porcelain plug member is attained with a very high amount of breakage, and therefore results in undue expense.

It is an object of this invention to provide an electric connector in which one of the contacts is imbedded in an insulating resilient material.

It is another object of this invention to provide a more economical electric lamp socket which is made of water-proof material.

It is another object of this invention to provide an electric lamp socket which has a unitary water-proof casing, said electric lamp socket having the contacts thereof insulatingly molded therein.

Numerous other objects and advantages will be apparent throughout the progress of the following specification.

Certain features of the ring closure means illustrated in Fig. 4 are not claimed herein as that comprises subject matter of applicant's copending application Serial No. 748,251, filed October 13, 1934, which has matured into Patent No. 2,119,452, issued May 31, 1938 in which the subject matter is claimed.

Several preferred embodiments of this invention are shown in the accompanying drawing, in which—

Fig. 1 is a cross-sectional view of one embodiment of this invention.

Fig. 2 is a cross-sectional view of another preferred embodiment.

Fig. 3 is a plan view of the embodiment shown in Fig. 1, looking in the direction of the arrows 3—3, Fig. 1.

Fig. 4 is another preferred embodiment of this invention.

In Fig. 1 is shown a selected embodiment of the invention which comprises a flexible casing 23 made of molded rubber. On the top of this casing, and unitary therewith are extensions 5 and 7 respectively, which are molded around the electric conducting wires 9 and 11 respectively, making a water-tight joint therewith. The conductor 9 is electrically connected to a threaded brass shell 21 by the bared end of the conductor 13, which is soldered or otherwise electrically connected to the shell 21 at 14. The other conductor 11 is connected to the other contactor point 19 of the socket, by a bared end of the conductor wire 15, which is inserted into a solder-filled cavity 17 in the contactor point 19. The contactor point 19 is molded in the upper central portion of the socket casing. This contactor point has a flange 16 which serves to imbed the contactor point 19 more securely within the molded rubber. The contactor point 19 is furthermore provided with a shoulder 30 and a contact surface 31. The shoulder 30 bears against the outer surface of the top part of the casing, and further aids in securing the contactor point within the rubber molded thereabout. The casing 23 is so molded that the top of its interior portion 25 has a downwardly curved cross section. Within the rubber casing is operatively secured a threaded brass shell. The brass shell extends downwardly for a substantial distance from the top of the inside of the rubber casing to a point 24. The rubber casing continues downwardly from the end of the brass shell and is flanged inwardly along an oblique surface 27 to an opening 29, said opening 29 being smaller in diameter than the diameter of the brass shell 21. This is shown with greater particularity in Fig. 3, the circle 29 being the bottom opening of the rubber casing, the circle 21 being an indication of the brass shell. When a lamp globe is screwed upwardly into the socket, the opening 29 being somewhat smaller than the shell, and naturally somewhat smaller than the screw cap portion of the lamp globe, the rubber about the

casing makes a tight connection with the lamp globe as it enters. As the lamp globe is screwed up into the brass shell, it finally comes in contact with the surface 31 of the contactor point 19. As the lamp globe is further propelled into the brass shell, the contactor point being molded within resilient rubber, tends to give upwardly and permit the lamp to enter further into the brass shell, the surface of the rubber casing at the top of the inside, assuming a double bowed cross section such as shown at 25 in Fig. 2, the rubber about the contactor point being compressed somewhat. When the lamp has finally been screwed up into the socket, the resiliency of the rubber casing about the contactor point tends to force the contactor point downwardly against the top of the lamp globe, which action serves to give a wiping contact between the contactor point and the central contact of the lamp, and furthermore to resiliently urge the lamp downward against the threads of the brass shell, serving thereby to more securely hold the lamp within the socket. Finally, as the lamp tends to move down away from the contactor point 19 by reason of vibration and other similar factors, the resiliency of the rubber in which the contactor point is mounted, will urge the contactor point 19 downwardly so as to follow the central contact point on the lamp and maintain contact therewith, thus preserving the electric circuit unbroken. Inasmuch as rubber is a very good insulating material, as well as a very good resilient medium, it serves to insulatingly separate the contactor point 19 from the brass shell 21.

This avoids all difficulties previously encountered in manufacturing water-proof lamp sockets, since it is possible to strip or clean off a small portion of two insulated electric wires, insert one of the cleaned off portions into the contactor point cavity 17, and secure it thereto by an electric contact maintaining medium such as solder, secure the other electric conductor or wire to a brass shell in similar fashion, place the wires with their respective contact point and shell within a mold, and pour rubber into the mold. After allowing the mold to cool and set, the finished socket may be taken therefrom and the rough edges left by the mold trimmed, if desirable. This eliminates entirely the operation of securing spring contacts for a porcelain plug for insertion in a brass shell, and results in a much more efficient and economical socket, which, at the same time, is thoroughly water resistant and moisture proof.

Other embodiments of this invention may be made such as, for instance, that shown in Fig. 2, where the contactor point instead of bearing upon the rubber of the casing by its shoulder 30 as was described in connection with Fig. 1, is fitted with an auxiliary shoulder 32 for the purpose of securing greater bearing surface on the rubber. The socket may be further modified by extending the brass shell at 33 as shown in Fig. 4, and fashioning therein as an integral part thereof an annular metal ring of substantially semicircular cross section, into which ring may be inserted a rubber gasket or washer 37. In this last embodiment of the invention, the water resistant and moisture proof characteristics of the socket are dependent, at least at the point of contact with the lamp, upon the rubber washer 37 as shown in Fig. 4 rather than the rubber lip 28 as shown in Fig. 2.

Changes may be made in the form, construction and arrangement of the foregoing, without departing from the spirit or scope of the invention as set forth in the appended claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. A moisture-proof electric connector comprising a dielectric flexible resilient casing, a screw threaded shell imbedded therein, a central contact means imbedded therein, said central contact means being flexibly and insulatingly held from the shell by the material of the casing, said casing furthermore extending longitudinally outward from the open end of the screw threaded casing to form an extension portion, said extension portion of the casing having formed on the inside thereof an annular groove, an annular metal shell disposed within said groove, said shell having a substantially semicircular cross section, and a resilient rubber ring or washer disposed within said metal ring.

2. A moisture-proof electric connector comprising a dielectric resilient casing, a screw threaded shell imbedded therein, a central contact means imbedded therein, said central contact means being flexibly and insulatingly held from the shell by the material of the casing, said shell having formed integral therewith an extension portion disposed downwardly from the end of the screw threads thereof, said extension portion having formed therein an annular groove, said groove having a substantially semicircular cross section, and a washer or ring disposed within said groove, said washer or ring extending inwardly of the diameter of the screw threaded shell so as to form a resilient ring at the opening of the shell, said ring being of smaller diameter than the shell, whereby a water-tight connection is made when a lamp globe is inserted into the connector.

3. An electric connector comprising a molded resilient soft rubber casing, a threaded open-ended metal shell molded therein, lead-in wires molded in said casing, said casing being formed at the top with a downwardly extending arcuate surplus of the resilient rubber casing material, said surplus extending downwardly into the open top of the threaded metal shell, and a flanged metal contact member partially embedded in the rubber casing at the center of the downwardly extending surplus, said lead-in wires being respectively connected to the flanged contact member and the threaded shell, the resilience of the molded rubber casing being such as to permit movement of the flanged contact member upwardly and downwardly with respect to the threaded metal shell a distance approximately equal to the pitch of the threads in said threaded metal shell.

4. An electric connector comprising a molded, resilient, soft rubber casing, a threaded open-ended metal shell molded therein, lead-in wires embedded in said casing, said casing being formed at the top with a downwardly extending surplus of the resilient rubber casing material, said surplus extending downwardly into the open top of the threaded metal shell, and a flanged metal contact member partially embedded in the rubber casing at the center of the downwardly extending surplus, said lead-in wires being respectively connected to the flanged contact member and the threaded shell, the resilience of the molded rubber casing being such as to permit movement of the flanged contact member upwardly and downwardly with respect to the threaded metal shell

a distance approximately equal to the pitch of the threads in said threaded metal shell.

5. An electric connector comprising a molded, resilient, soft rubber casing having an opening to receive a lamp globe, a contact member in said opening and secured to said casing to engage the base of the lamp globe, lead-in wires embedded in said casing, said casing being formed at its top with a boss of the resilient, soft rubber material and extending downwardly into said opening centrally thereof, a second contact member secured to said boss substantially at the center of said opening, said lead-in wires being connected to said contact members, the resilience of the boss maintaining contact between the second contact member and the central contact projection extending from the base of the lamp globe.

6. A combination of an electric light socket formed of a unitary piece of resilient, soft, rubber-like material to receive the shank of an electric light globe and having an integral boss extending inwardly centrally of the socket, said boss being resilient enough to support a contact member carried by said boss and to maintain contact between said member and the central contact of the lamp globe inserted in said socket, and a second contact member secured within said socket to contact the shank of said globe and to hold the shank of said globe in assembled relationship within said socket.

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