Sept. 30, 1924. 1,510,247

W. J. SMITH

ELECTRIC SOCKET PLUG

Filed May 15, 1922

Fig. 1

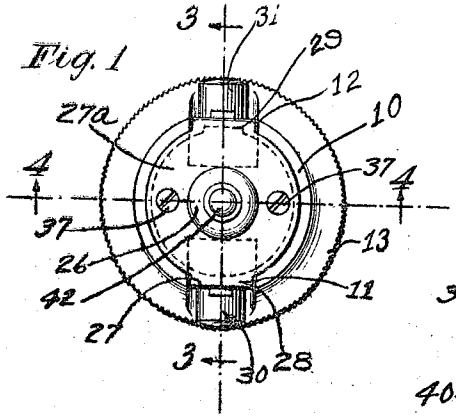


Fig. 3

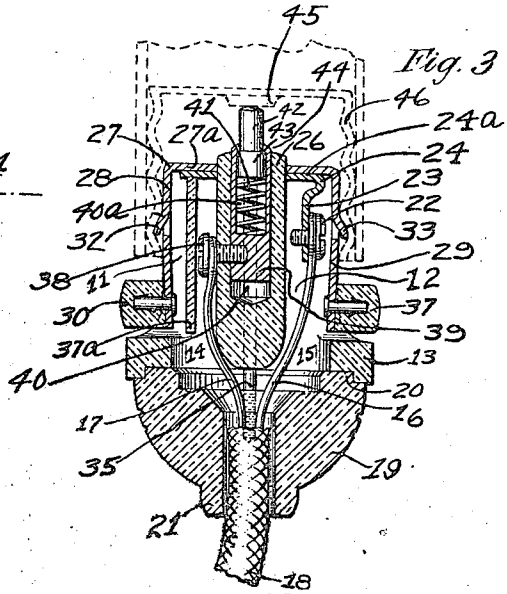


Fig. 2

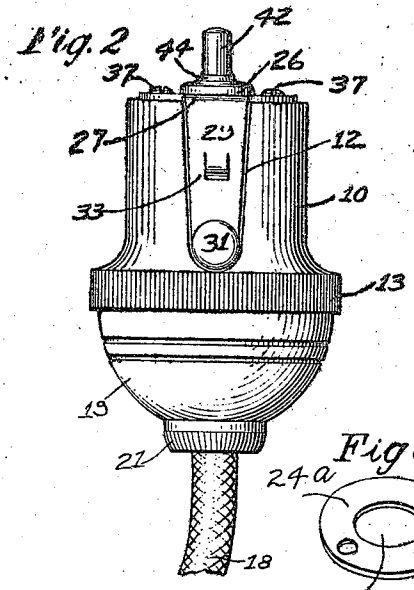


Fig. 4

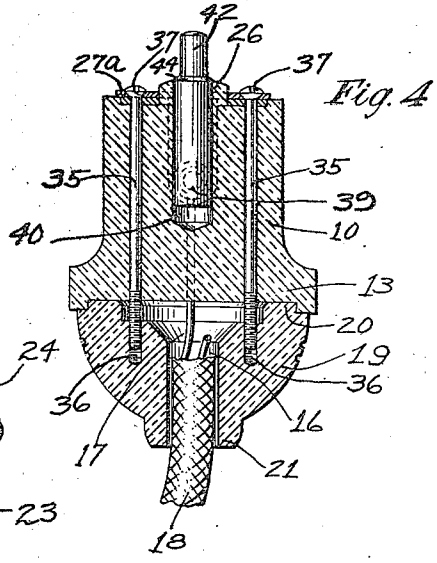
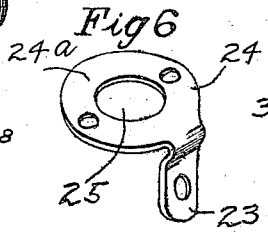


Fig 6



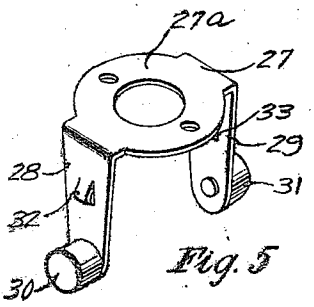


Fig. 5

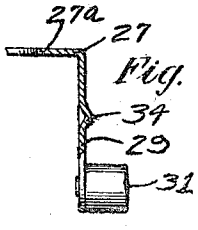


Fig. 7

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UNITED STATES PATENT OFFICE.

WILLIAM J. SMITH, OF WATERBURY, CONNECTICUT.

ELECTRIC-SOCKET PLUG.

Application filed May 15, 1922. Serial No. 561,010.

To all whom it may concern:

Be it known that I, WILLIAM J. SMITH, a citizen of the United States, and a resident of Waterbury, county of New Haven, and State of Connecticut, have invented certain new and useful Improvements in Electric-Socket Plugs, of which the following is a specification.

This invention relates to electrical connectors, and more particularly to a quick detachable plug for connecting the ends of a two-wire extension cord with the terminals of an electric socket.

One object of the invention is to provide an electric socket plug which may be readily pushed into the usual threaded lamp or wall socket by a direct motion of translation, and without requiring any rotative movement whatever.

A further object is to provide a plug which may be instantly snapped into and removed from an electric socket.

A further object is to provide a plug which may be securely locked in position without the use of screw threads on said plug.

A further object is to provide an electric socket plug of the above nature which will be simple, easy to assemble and manipulate, cheap to manufacture, and very efficient and durable in use.

With these and other objects in view, there have been illustrated on the accompanying drawings two forms in which the invention may be conveniently embodied in practice.

Fig. 1 represents a top plan view of the electric socket plug.

Fig. 2 is a side view of the same.

Fig. 3 is a side sectional view of the plug taken along the line 3—3 of Fig. 1, looking in the direction of the arrows.

Fig. 4 is a side sectional view of the plug taken along the line 4—4 of Fig. 1, looking in the direction of the arrows.

Fig. 5 is a perspective view of the shell-contacting member, shown in detached position.

Fig. 6 is a perspective view of the connecting ring, shown in detached position.

Fig. 7 is a side view partly in section of one of the arms of the shell-contacting member having a modified form of catch-lug.

In the usual form of socket plug, it has been customary to provide screw threads upon the circumference of the plug adapted to engage in the corresponding threads of the electric socket. This form of plug was subject to the disadvantage that the cord became twisted when screwing the plug into the socket. This twisting motion not only had a tendency to produce snarls or kinks in the cord, but oftentimes, the twist in the cord would cause the plug to become loosened after a short period of use.

By means of the present invention, the above and other disadvantages have been largely avoided.

Referring now to the drawings in which like reference numerals denote corresponding parts throughout the several views, the numeral 10 represents a cylindrical supporting base having a pair of longitudinal recesses 11 and 12 cut into opposite sides thereof. The supporting base 10, which may be constructed of hard rubber or any other suitable insulating material, preferably has its lower part provided with a knurled flange 13. Within the flange 13, the supporting base 10 is provided with a pair of tubular holes 14 and 15 for lead wires 16 and 17 of an extension cord 18.

A base cap 19 for the supporting base 10 is also provided for leading the cord 18 into the plug. This base cap 19 has an inner upstanding annular rib 20 fitting into an annular groove on the bottom flange 13 of the supporting base 10. The base cap 19 is preferably made substantially semispherical in shape, but if desired any other suitable configuration of the base cap may be employed. A reduced knurled section 21 is also provided upon the bottom of the base cap 19, which together with the knurled flange 13 assists in the manipulation of the device by the user.

The lead wire 16 after passing up through the tubular hole 15 of the supporting base 10, is led into the longitudinal recess 12 and secured in any suitable manner, as by a binding screw 22, to a depending arm 23 of a connecting ring 24. This connecting ring 24 has a top disk section 24^a, the center of which is apertured at 25. The connecting ring 24 is adapted to rest upon the top of the insulating base 10 surrounding a shoulder 26 thereof.

A shell-contacting member 27 is seated upon the top of the connecting ring 24. This member 27 is provided with a top ring section 27^a, similar to the disk portion 24^a of the connecting ring 24. The member 27 also has a pair of resilient arms 28, 29, arranged at right angles to the ring section

27ª, and depending therefrom. The depending arms 28 and 29 are slightly tapered from top to bottom, as clearly shown in Fig. 2, and are located within the longitudinal recesses 11 and 12 which are similarly tapered. The bottom ends of the arms 28, 29 are provided with outwardly projecting cylindrical finger buttons 30 and 31 preferably formed of insulating material and secured to said arms in any suitable manner as by riveting.

In order to lock the plug within the shell after it has been inserted therein, the arms 28 and 29 are provided intermediate their ends with outwardly projecting catch lugs 32 and 33 respectively. The catch lugs 32 and 33 are preferably provided with free ends, and are formed by stamping from the metal of the arms themselves, being shaped so as to fit snugly within the grooves of the screw-threaded shell.

An alternative form of catch lug for the resilient arms of the shell-contacting member is disclosed in Fig. 7. In this form, there is no free end, but the lug 34 is merely pressed out from the metal in the form of a V.

A pair of relatively long screw members 35, 35 preferably made of brass or steel are provided for detachably holding the base 10, the shell-contacting member 27, and the connecting ring 24 together. These screw members 35, 35, are adapted to pass through suitable holes in the base, the shell-contacting member, and the connecting ring, and have their lower ends threaded to engage in screw sockets 36, 36 in the cap 19. The upper ends of the screws 35, 35 are provided with slotted heads 37, 37 whereby said screw members may be manipulated with a screw driver or other tool whenever it is desired to take the plug apart.

The wire 17 after passing through the tubular hole 14 is led into the longitudinal recess 11 where it is secured in any suitable manner as by means of a binding screw 38 to the insulating base 10 and is spaced from the arm 28 by a rectangular strip 37ª of insulating material. The inner end of the screw 38 engages in a spring housing 39 which fits within a cylindrical recess 40 in the top of the base 10, between the longitudinal recesses 11 and 12. The spring-housing 39 is provided with a hollow socket portion 40ª within which is a helical spring 41 which may be formed of brass, steel, or any other suitable metal, and which is adapted to engage the bottom of a central terminal pin 42. The lower end of the terminal pin 42 is provided with a shoulder 43 adapted to normally engage the inwardly directed flange 44 on the spring-housing 39 to limit the upward movement of said pin.

As clearly shown in Fig. 3, the upper portion of the terminal pin 42 is adapted to resiliently engage the center contact terminal 45 of the socket member, while the catch lugs 32 and 33 are adapted to contact with the shell terminal 46 of said socket.

In operation when it is desired to connect the plug and the socket, the operator will grasp the plug with the hand and press upon the two finger buttons 30 and 31. The catch lugs 32 and 33 will thus be bent inwardly, permitting the plug to be inserted as far as it will go without engagement with the side threads of the socket shell 46. After the terminal pin 42 comes into contact with the contact-terminal 45, it will be pushed along a slight distance further in order to compress the spring member 41. The operator will then release the buttons 30 and 31, whereupon the catch lugs 32 and 33 will spring outwardly and engage in the grooves of the shell socket so that the plug will be detachably locked in position.

The distance between the lug 32 and the ring section 27ª of the shell-contacting member should preferably be made slightly greater than the distance between the lug 33 and said ring section, in order to allow for the pitch of the threads on the socket shell, so that both of said catch lugs 32 and 33 will be permitted to seat in opposite grooves of the threaded portion of the shell 46.

The connecting ring 24 and the shell-contacting member 27 should preferably be made from bronze or brass, or if desired, any other suitable material may be employed. If desired, the spring member 41 may be eliminated, in which case the terminal pin 44 and its housing would be integrally joined together.

While the wires 16 and 17 have been illustrated as passing directly from the cord 18 to the binding screws 22 and 38, it will be understood that they may be locked in the plug by knotting them together within the base cap 19, care being taken, of course, to see that they are suitably insulated from one another.

Moreover, the supporting base 10 and the cap 19 may be formed integrally instead of being made in two parts, if desired. In this case, the screws 35, 35 would be made much shorter, and would merely seat in screw sockets terminating a short distance below the connecting ring 24. This construction may be made at less expense, and will be more suitable for some purposes than the form previously disclosed.

Likewise, in some cases it may even be advantageous to omit the connecting ring 24 and its binding screw 22. When this is done, the wire 16 must be made longer, and must be brought up through the entire length of the longitudinal recess 12, and wound about the shoulder 26 beneath the shell-contacting member 27.

It will thus be seen that this invention

provides an improved form of unthreaded unitary plug which is adapted to be directly pushed into the shell of an electric socket without any screwing motion whatever.

It will be understood that the parts of the plug may be constructed of any desired dimensions according to the size of the socket with which it is to be employed. While the electric socket plug has been herein illustrated in connection with lamp and wall sockets, it will be understood that it is also adapted to other purposes as for example, radio plugs for connecting the wires of radio outfits to their sockets.

While there have been disclosed in this specification, two forms in which the invention may be embodied, it is to be understood that these forms are shown for the purpose of illustration only, and that the invention is not to be limited to the specific disclosures, but may be modified and embodied in various other forms without departing from its spirit. In short, the invention includes all the modifications and embodiments coming within the scope of the following claims.

Having thus fully described the invention, what is claimed as new, and for which it is desired to secure Letters Patent, is:

1. In a socket plug for electrically connecting a pair of conducting wires to the terminals of an electric socket having a central terminal and a screw-threaded shell, a spring-pressed pin adapted to engage said central terminal, a shell-contacting member surrounding said pin, said shell-contacting member having a flat base and a pair of parallel disposed resilient arms at right angles to said flat base, each of said resilient arms having an outwardly projecting lug for detachably engaging the screw threads of the socket shell, a connecting ring in electrical contact with said shell-contacting member, and means for connecting said conducting wires to said pin and said ring respectively.

2. In a socket plug for electrically connecting a pair of conducting wires to the central and threaded shell terminals of an electric socket, a cylindrical supporting member of insulating material having a pair of longitudinal wire-housing slots, a binding screw in one of said slots and electrically connected to a central conducting plug, said plug being adapted to contact with the central terminal of said socket, said plug having a central recess, a spring-pressed pin located in said recess, said pin being enlarged at its lower end, the upper edges of said plug being upset inwardly around said pin to lock said pin in said recess, and means connected to the other conducting wire for resiliently engaging the shell terminal of the socket.

In testimony whereof, I have affixed my signature to this specification.

WILLIAM J. SMITH.