W. S. BACON.

DETACHABLE PLUG.

APPLICATION FILED APR. 10, 1915.

1,174,378.

Patented Mar. 7, 1916.

Fig. 1.

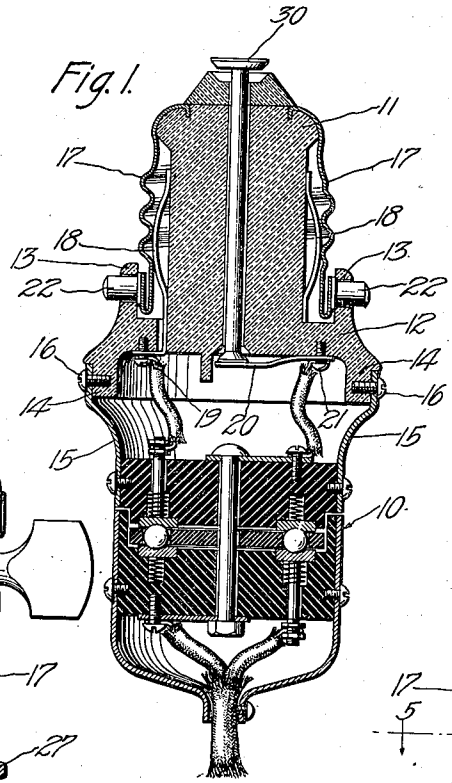



Fig. 2.

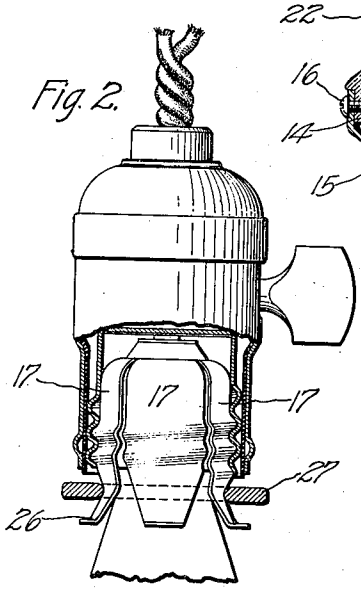
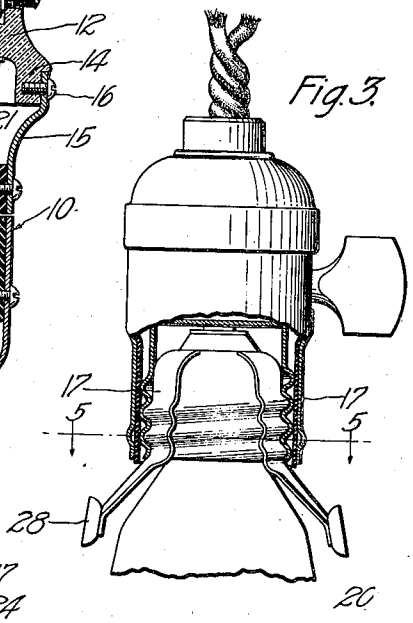



Fig. 3.



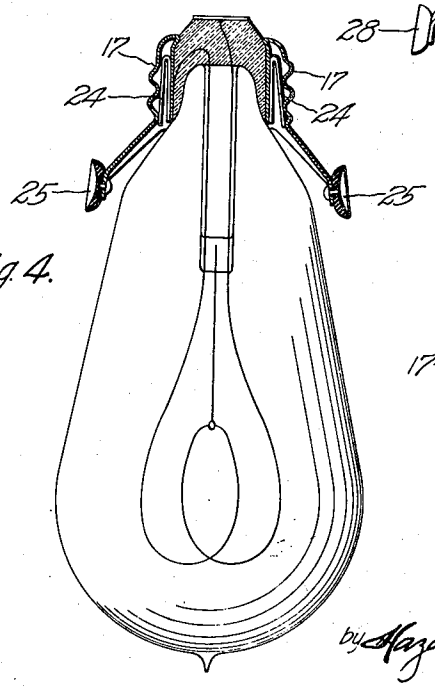
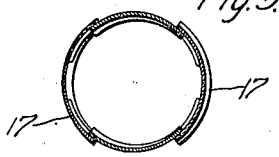




Fig. 4.

Fig. 5.




Witness:

Inventor:
William S. Bacon.
by Hazard Perry & Miller
his Attorneys.

# UNITED STATES PATENT OFFICE.

WILLIAM S. BACON, OF SAN DIEGO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO OTTO KESSLER, OF SAN DIEGO, CALIFORNIA.

## DETACHABLE PLUG.

1,174,378. Specification of Letters Patent. Patented Mar. 7, 1916.

Application filed April 10, 1915. Serial No. 20,419.

*To all whom it may concern:*

Be it known that I, WILLIAM S. BACON, a citizen of the United States, residing at San Diego, in the county of San Diego and State of California, have invented new and useful Improvements in Detachable Plugs, of which the following is a specification.

My invention relates to a detachable plug adapted to be connected with a socket and more particularly to make electric connections for electric lighting, telephone connections, etc.

It is an object of this invention to provide novel and improved means whereby electric connections can be quickly and securely established between electric conductors by means of a detachable plug which is inserted into a suitable socket.

Another object of my invention is to provide means whereby it is unnecessary to screw the plug into the socket as is the case with the ordinary plugs in use. The present plug needs merely to be pushed into the corresponding socket, thereby making a secure and intimate connection between the electric conductors.

My device comprises a base member for separable attachment plugs provided with resilient contact shell sections which are compressed while the plug is inserted into the socket but which after insertion expand, forming a perfect electric contact and securely holding the plug in place within the socket.

My invention consists in the construction and arrangement of parts hereinafter described and pointed out in the appended claims.

In the drawings which form a part of this specification: Figure 1 is a vertical cross section of my improved detachable plug shown attached to a swivel connection which is not a part of the present invention but is claimed in my application for Letters Patent Serial Number 20,420 filed April 10, 1915. Fig. 2 shows a side elevation with parts broken away of a modified form of my detachable plug in position within a socket. Fig. 3 shows a similar view of another modification of my plug. Fig. 4 shows a vertical section of still another modified form. Fig. 5 is a horizontal section taken on line 5—5 of Fig. 3.

In the form illustrated in Fig. 1, I have shown the plug mounted on a swiveled connection 10. This connection permits the rotation of the plug and prevents the electric conductor to which the plug is connected from becoming twisted or kinked from constant use, thereby lengthening the life of the wire. However, since this swiveled connection forms no part of the present invention a detailed description thereof is unnecessary.

The improved plug consists of an insulating core 11 of cylindrical shape, the lower part thereof being provided with an annular projection 12 extending at right angles therefrom. An upstanding flange 13 extending from the projection 12 forms an annular channel between the core and said flange. Extending downwardly from the projection 12 is an annular flange 14 to which the casing 15 inclosing the mechanism of the swiveled connection is secured by means of screws 16. A contact shell 17 consisting of two sections is secured to the upper part of the insulation core by means of an inturned flange. The central part of said contact shell is provided with the usual standard corrugation corresponding to any of the electric female sockets. The lower end of each section of the contact shell is turned upwardly forming a flange. Between one section of the shell and the body portion of the core is disposed a spring 18. This spring is bow shaped and bent outwardly at its central portion forcing the shell section away from the core body. Said spring also serves as an electric conductor and passes through the insulating core to the lower side thereof where it is secured by a screw 19, this screw 19 serving also as a binding post for one of the fixture wires. The other spring 18′ merely serves for forcing the other shell section away from the core body. A connection for the other conductor is established by means of a central post which passes through the longitudinal center of the core body and is provided with a contact head on either end, said heads being adapted to seat in corresponding recesses in said core body. The lower end of said central post abuts against a leaf spring 20 which is secured by a screw 21 to the lower side of the core body. Screw 21 serves also as a binding post for the other electric conductor. On diametrically opposite points on flange 13 are provided push buttons 22 made of fiber or porcelain which

abut at their inner ends against the upturned flanges of the shell sections. If it is desired to connect this plug with a socket it is only necessary to compress the push buttons 22 which will force the shell sections inwardly against the tension of springs 18 and 18′ and to insert the plug into the socket. On releasing the push buttons springs 18 and 18′ will force the shell sections against the corrugations of the socket thereby insuring a perfect contact between the lateral and central terminals. The plug can be given a fraction of a turn after it is inserted and will tighten as the corrugations of my plug are made to fit the standard electric female sockets.

In Figs. 2, 3 and 4 I have shown a slightly modified form of my device showing the plug to be permanently secured to the end of an incandescent light.

In the modification shown in Fig. 4 the contact shell consists of a plurality of sections permanently secured to the plug at the upper end. A spring 24 interposed between the core body and the shell section tends to force the latter outwardly. The lower ends of the shell section are provided with buttons 25. When inserting the incandescent light provided with my improved plug it is only necessary to press buttons 25 inwardly against the tension of spring 24, thereby decreasing the diameter of the contact shell and to push the plug into the socket. On releasing buttons 25, spring 24 will force the contact sections outwardly insuring a perfect contact between the electric conductors and at the same time holding the plug securely in place.

In Fig. 2 the spring forcing the shell section outwardly is dispensed with, the shell sections themselves, which in this instance are four, but may be any preferred number, constituting the spring. The lower ends of said sections are provided with an outwardly extending flange 26 which has for its object to prevent ring 27 from slipping off said sections. This ring 27, consisting of fiber or similar insulating material, encircles the shell sections at their lower portions as shown. The sections are constricted near their lower ends and when ring 27 encircles the sections at this point it allows the maximum expansion outwardly of the sections. When inserting this plug into the socket, ring 27 is pushed downwardly toward flange 26 and in doing so will force the sections against the core body thereby enabling the plug to be inserted in the socket.

In Fig. 4 a similar construction is shown except that push buttons 28 are substituted for the ring 27. Compressing buttons 28, the sections will be forced inwardly toward the core body, whereby the plug may be inserted into the socket and on the releasing of said buttons the sections will expand outwardly holding the plug securely in place and insuring a perfect electric contact.

As shown in Fig. 5, the button carrying sections slightly overlap the intermediate sections.

It is thus seen that I have provided a new and improved plug which dispenses with the necessity of screwing the same into the socket but which quickly and easily may be inserted and removed from the corresponding socket.

I claim:

1. A detachable plug for electric conductors comprising a one piece insulating core, said core being provided at its lower end with an upstanding flange forming an annular channel, a pair of corrugated contact shell sections secured at their upper ends to the upper end of said core and extending with their free ends into said channel, a pair of springs disposed between said core and said shell sections and tending to force said shell sections away from said core, said shell sections and one of said springs forming an electric conductor, a rod slidably mounted in the longitudinal axis of said core, means to limit the movement of said rod, a rod engaging spring secured to said core for holding said rod upwardly with yielding pressure, said rod and rod engaging spring forming the second electric conductor, a pair of push buttons movably mounted in said upstanding flange for compressing said shell sections against said pair of springs, substantially as described.

2. In a detachable plug for electric conductors comprising an insulating core, a pair of corrugated contact shell sections secured thereto at their upper ends, a spring member interposed between said core body and one of said sections and tending to force said section away from the core body, a screw securing the lower end of said spring member to the core body and forming a binding post for one of the electric conductors, another spring interposed between said core body and the other contact shell section and tending to force said section away from said core body, an electric conductor passing through the central axis of said core body, a leaf spring holding the lower end of said conductor, a screw securing the spring to said core body and serving as a binding post for the other electric conductor, a pair of push buttons at opposite sides of said core body adapted to press said shell sections against the action of said springs, substantially as described.

3. A detachable plug for electric conductors comprising a one piece insulating core, a pair of corrugated contact shell sections secured at one end to the upper end of said core, a pair of springs disposed

between said core and said shell sections and tending to force said shell sections away from said core, said shell sections and one of said springs forming an electric conductor, a rod slidably mounted in the longitudinal axis of said core, means to limit the movement of said rod, a rod engaging spring secured to said core for holding said rod upwardly with yielding pressure, said rod and rod engaging spring forming the second electric conductor, and a pair of push buttons movably mounted on said core for compressing said shell sections against the pressure of said pair of springs, substantially as described.

4. A detachable plug for electric conductors comprising a one-piece insulating core, a pair of corrugated contact shell sections secured at one end to the upper end of said core, a pair of springs disposed between said core and said shell sections and tending to force said shell sections away from said core, said shell sections and one of said springs forming an electric conductor, a rod constituting the second electric conductor mounted in the longitudinal axis of said core, and a pair of push buttons movably mounted on said core for compressing said shell section against the pressure of said pair of springs, substantially as described.

5. A detachable plug for electric conductors comprising a one-piece insulating core, a pair of corrugated contact shell sections secured at one end to the upper end of said core, a pair of springs disposed between said core and said shell sections and tending to force said shell sections away from said core, said shell sections and one of said springs forming an electric conductor, a second electric conductor mounted in the longitudinal axis of said core, and means for compressing the periphery of said shell sections to reduce their external diameter, substantially as described.

6. A detachable plug for electric conductors comprising a one-piece insulating core, a plurality of corrugated contact shell sections secured at one end to the upper end of said core, a plurality of springs disposed between said core and said shell sections and tending to force said shell sections away from said core, said shell sections forming an electric conductor, a second conductor mounted in the longitudinal axis of said core, and means for compressing the periphery of said shell sections reducing their external diameter, substantially as described.

In witness that I claim the foregoing I have hereunto subscribed my name this 3d day of April, 1915.

WILLIAM S. BACON.