April 28, 1925. 1,535,451

S. COHEN

ELECTRICAL CONNECTER

Filed July 1, 1921

Fig. 1.

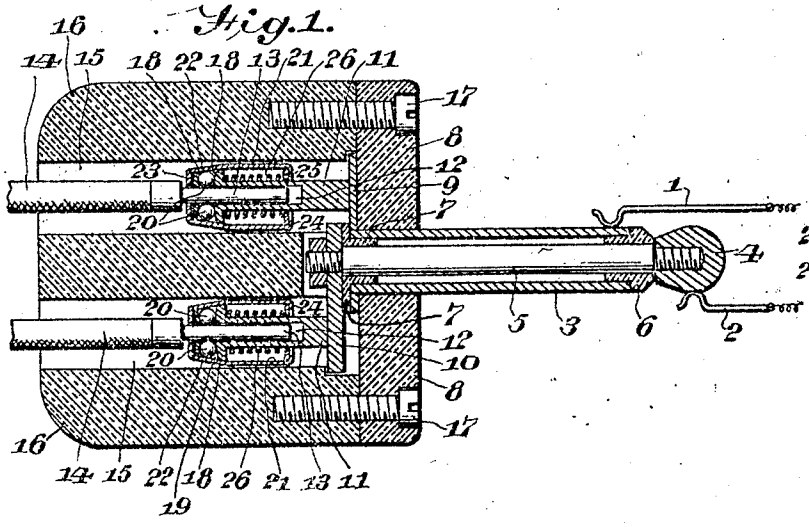


Fig. 2.

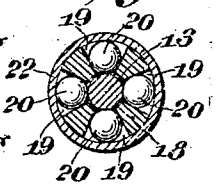


Fig. 3.

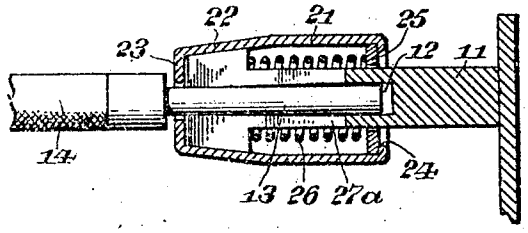


Fig. 4.

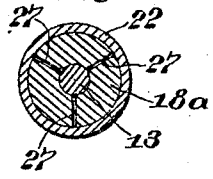


Fig. 6.

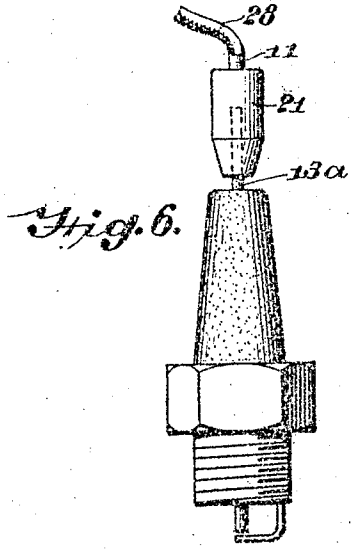
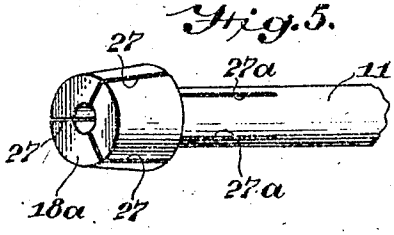


Fig. 5.



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UNITED STATES PATENT OFFICE.

SAMUEL COHEN, OF BROOKLYN, NEW YORK.

ELECTRICAL CONNECTER.

Application filed July 1, 1921. Serial No. 481,867.

To all whom it may concern:

Be it known that I, SAMUEL COHEN, a citizen of the United States, residing in Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Electrical Connecters, of which the following is a specification.

My invention relates to structure for effecting electrical connection between conductors which are readily attachable to and detachable from each other.

In accordance with my invention, one of the conductors is provided with a movable sleeve, preferably spring-actuated, which forces members within the sleeve by a longitudinal movement thereof, to engage and grip the co-acting conductor.

In accordance with my invention, a telephone or other plug, adapted to co-act with a contact structure, is provided with connecter structure of the character referred to for attaching to the plug one or more conductors, particularly flexible conductors, such as employed as telephone cords and the like.

My invention resides in structure of the character hereinafter described and claimed.

For an illustration of some of the various forms my invention may take, reference is to be had to the accompanying drawing, in which:

Fig. 1 is a sectional view, partly in elevation, of a plug structure embodying my invention.

Fig. 2 is a cross section of the connecter structure.

Fig. 3 is a sectional view, partly in elevation, of a modified connecter structure.

Fig. 4 is a sectional view through structure shown in Fig. 3.

Fig. 5 is a perspective view of part of the structure shown in Figs. 3 and 4.

Fig. 6 is an elevational view of a spark plug to which connection is made by a connecter embodying my invention.

Referring to the drawing, 1 and 2 are contacts, generally fixed, and may be the contacts of a telephone jack with which co-acts the plug structure about to be described and comprising the conducting tube 3 co-acting with the contact 1 and the conducting head or end contact 4 co-acting with the contact 2. The contact 4 is mounted upon the conducting rod 5 extending through the tube 3 and insulated therefrom at 6 and 7. The sleeve 3 may be secured to or carried by the block 8 of insulating or conducting material. Secured to the sleeve 3 is the conducting member or plate 9, and to the rod 5 is secured the conducting plate or member 10. Secured to or integral with each of the members 9 and 10 is the conducting stem or member 11, having a bore 12 into which extends the conducting wire, pin or other member 13 which, in the example illustrated, is a terminal of the flexible conducting cord 14, as a telephone cord extending through a channel or opening 15 in the block 16, of insulating material, which may be detachably secured to the block 8, as by screws 17. Upon the stem 11 is a head 18 having a plurality of inwardly extending pockets, passages or channels 19, preferably tapering or conical and communicating with the bore 12. In each of the passages 19 is disposed a movable member 20, such as a metallic sphere or ball, or equivalent.

Surrounding the head 18 and stem 11 is a longitudinally movable sleeve 21 having the conical or tapered portion 22 which may have at its end the inturned flange 23. At its opposite end the sleeve 21 has the inwardly turned lip or flange 24 forming an abutment for the plate or washer 25 loosely surrounding the stem 11. Coiled about the stem 11 and disposed in the space between it and the sleeve 21 is the helical spring 26 abutting against the head 18 and thrusting against the washer 25 and thereby thrusting the sleeve 21 toward the right.

The tapered or conical end 22 of the sleeve 21 is adapted to engage the balls or other members 20 to force them inwardly toward the terminal or conductor 13.

With the parts in the position indicated in Figs. 1 and 2, the spring 26 is thrusting against the sleeve 21, forcing it toward the right, causing the tapered or inclined surface on the inside of its end 22 to thrust inwardly upon the balls 20, causing them to grip the terminal or pin 13, holding it securely to the member 11 and therefore effecting good electrical connection therewith.

By moving the sleeve 21 toward the left, Fig. 1, in opposition to spring 26, the pressure upon the balls 20 will be released and the terminal 13 may be readily withdrawn.

To insert or attach the terminal 13, the sleeve 21 is similarly moved toward the left in opposition to spring 26, thereby affording space for outward movement of the balls 20,

whereupon the terminal 13 is inserted and moved past the balls 20, which move freely outwardly. The sleeve 21 is then released and spring 26 moves it toward the right, forcing the balls inwardly to grip the terminal 13.

In Figs 3, 4 and 5, there is illustrated a modification wherein the head 18^a upon the stem 11 is divided by a plurality of slots 27, which slots preferably also extend to suitable extent longitudinally of the stem 11, as indicated at 27^a. The periphery of the head 18^a is preferably tapered or conical, as indicated, for co-action with the tapered end 22 of the sleeve 21. It will be understood, however, that both elements need not be tapered, since if one is tapered the hereinafter described clamping action will nevertheless be effected.

With the parts in position indicates in Figs. 3 and 4, the spring 26 thrusts the sleeve 21 toward the right, Fig. 3, causing engagement of the end 22 with the periphery of the head 18^a, forcing the head segment inwardly to grip and contact with the terminal or conductor 13. By moving the sleeve 21 toward the left in opposition to spring 26, the segments of the head 18^a will spread or move outwardly, due to the resiliency of their support upon stem 11, thereby releasing the terminal 13, which may then easily be withdrawn. Similarly, in inserting the terminal 13, the sleeve 21 is moved to the left, allowing insertion of the terminal 13 which, upon release of the sleeve 21, will be gripped by the segments of the head 18^a.

As indicated in Fig. 6, a spark plug, such as utilized for producing electrical ignition within the cylinder of an internal combustion engine, has its one terminal at 13^a in the form of a wire or conducting pin, while to the stem 11 of the connecter device of any of the characters above described is connected the flexible high tension conductor 28. By this structure the conductor 28 is brought into electrical communication with the spark plug terminal 13^a, the sleeve 21 being pushed downwardly and then the device passed over the terminal 13^a and the sleeve 21 released, whereupon the terminal 13^a is gripped by the structure within the sleeve 21.

Obviously, the stem 11 of the connecter device may be integral with or attached to the spark plug conductor or terminal, while the flexible conductor 28 may have a rod or pin-like terminal to be inserted in the connecter device, as the terminal 13 is inserted in the connecter device in Figs. 1 or 3.

When the member 8, Fig. 1, is of conducting matrial, as hereinbefore stated, the conducting member 3 may be secured or attached to the member 8 or may be integral therewith, the member 8 in such case again being secured to the member 16. Furthermore, when the member 8 is of conducting material, either integral with or secured to the member 3, the stem 11 may be directly secured to the member 8, in which case the member 9 may be dispensed with.

In general, the connecter device of the character herein described may be used in any relation where detachable electrical connection is to be made, as in the case of binding posts, spark plugs, attachment plugs, etc.

What I claim is:

1. A plug structure having a base portion and an open end, a hollow conducting member immovably connected to said base portion and having an elongated passage opening towards said open end, movable gripping means carried by said conducting member and free to move laterally with respect to said passage, means adapted to restrain said gripping means from any substantial longitudinal movement in a direction towards said base portion, an outer sleeve slidably mounted on said conducting member and adapted to actuate said gripping means, the movement of said sleeve towards said open end being adapted to permit said gripping means to move freely in a direction away from said passage, and the movement of said sleeve towards said base portion being adapted to force said gripping means in a direction towards the axis of said passage, and a spring adapted to urge said sleeve in a direction towards said base portion.

2. A plug structure having a base portion and an open end, a hollow conducting member immovable connected to said base portion and having an elongated passage opening towards said open end, said hollow conducting member having a conical enlargement at its open end, a movable outer sleeve fitting over said enlargement and having a conical head adjacent said enlargement, a spring located intermediate said sleeve and said hollow conducting member and adapted to urge said sleeve towards the closed end of said hollow conducting member, and gripping means located intermediate said enlargement and the adjacent end of said sleeve, said gripping means being adapted to project into said recess of said hollow conducting member to grip an object located in said recess.

In testimony whereof I have hereunto affixed my signature this 22 day of June, 1921.

SAMUEL COHEN.