No. 711,556. Patented Oct. 21, 1902.

H. P. CLAUSEN.

TELEPHONE SWITCHBOARD PLUG.

(Application filed Apr. 13, 1901.)

(No Model.)

Fig. 1.

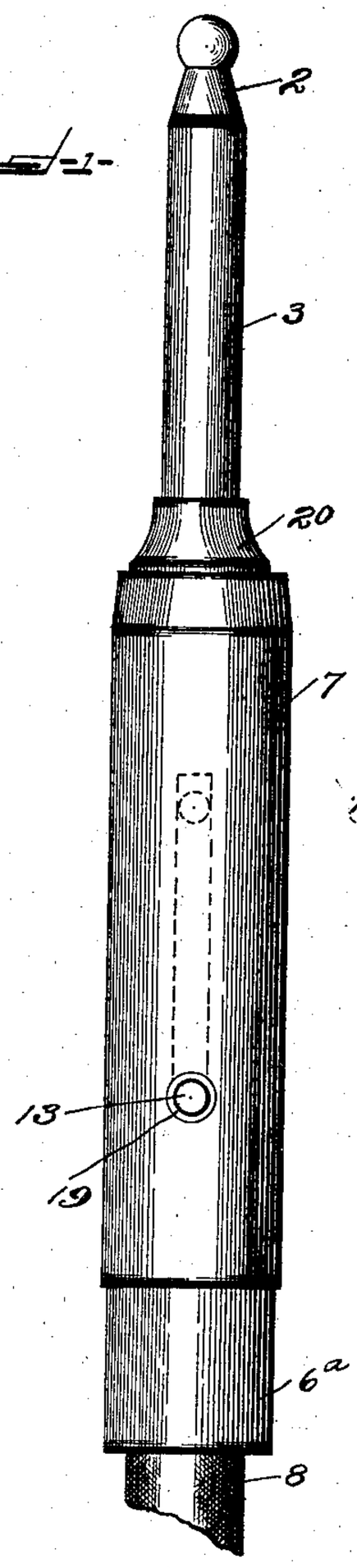


Fig. 2.

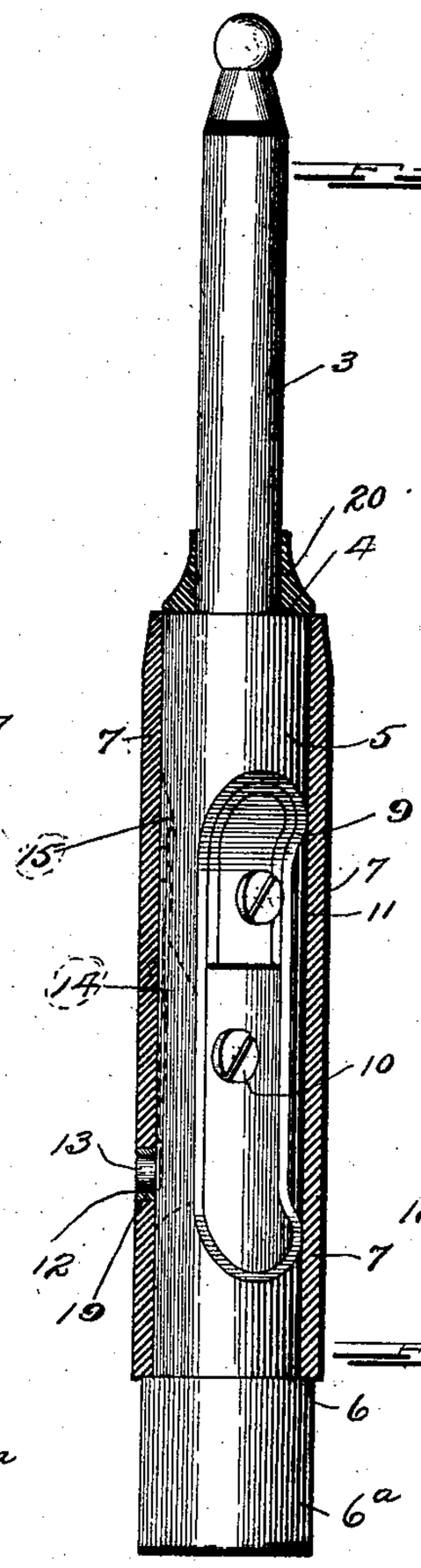


Fig. 3.

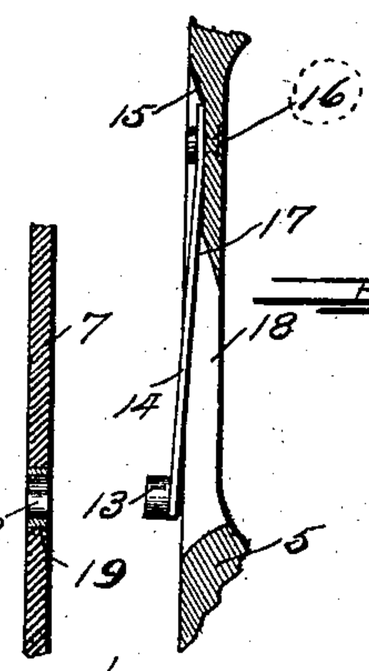


Fig. 4.

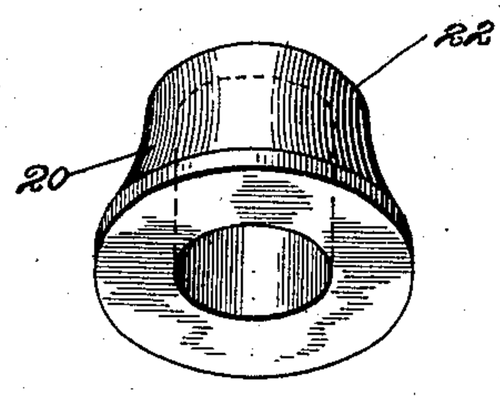


Fig. 5.

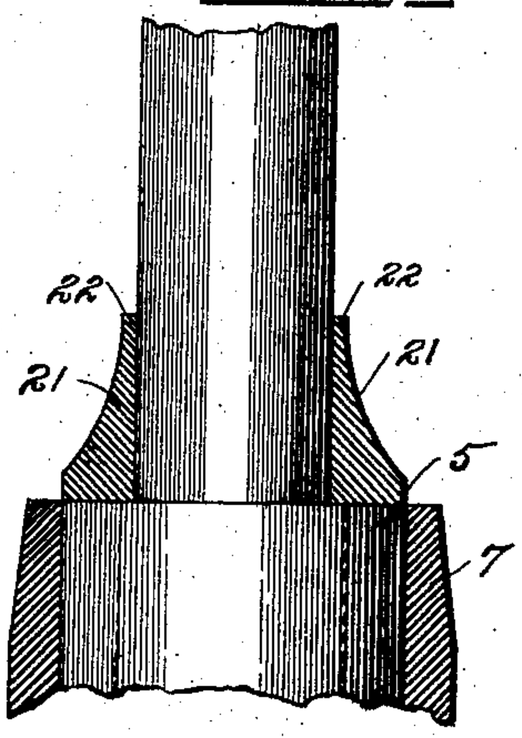


Fig. 6.

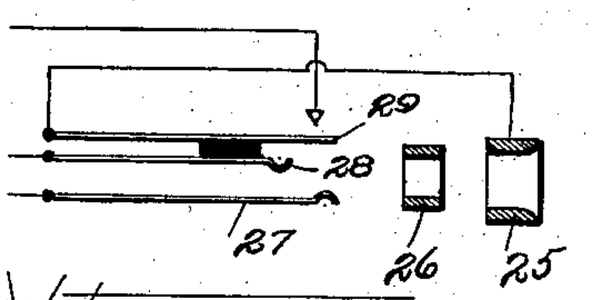
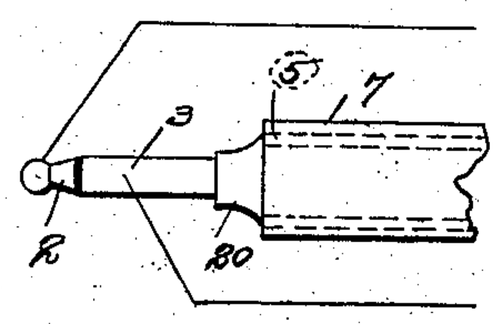


Fig. 7.



Witnesses

J. B. Weir

Robert Lewis Ames,

Inventor

Henry P. Clausen

By Chas. C. Burleigh.

Atty

UNITED STATES PATENT OFFICE.

HENRY P. CLAUSEN, OF CHICAGO, ILLINOIS, ASSIGNOR TO AMERICAN ELECTRIC TELEPHONE COMPANY, A CORPORATION OF NEW JERSEY.

TELEPHONE SWITCHBOARD-PLUG.

SPECIFICATION forming part of Letters Patent No. 711,556, dated October 21, 1902.

Application filed April 13, 1901. Serial No. 55,761. (No model.)

To all whom it may concern:

Be it known that I, HENRY P. CLAUSEN, a citizen of the United States of America, and a resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Telephone Switchboard-Plugs, of which the following is a specification.

My invention relates to switchboard-plugs, and has special reference to those used in connection with operators' cord-circuits in telephone-exchanges.

In the construction of the ordinary plug the handle portion is covered with a sleeve or handle, of rubber, fiber, or other substance, preferably an insulating substance, and this sleeve is secured to the plug by means of a small screw or screws. Beneath this sleeve a slot is usually provided or a portion cut away in the tubular handle portion of the plug, through which it is possible to get at the connections of the cord-strands with the tip and sleeve or other contacts of the plug for any purpose and to also take the plug apart. When it is desired, therefore, in the ordinary plug to remove the sleeve, it is necessary first to remove the screws which secure it in place. This is considerable trouble. Besides, there is the disadvantage that such screws, especially in small plugs, must of necessity be very small, which fact requires an expensive screw and expensive apparatus to make and tap the holes for the screws and is a delicate and expensive operation throughout and requires careful handling. Again, the screws are liable to be lost in and about the electrical equipment of the switchboard and are liable to do great damage in the way of short-circuiting or clogging other parts. Moreover, they are a disadvantage in the plug itself, for they are liable to injure some part of the insulation of the plug parts or the cord-strands and are at best a weak connection.

It is one object of my invention to do away with this screw connection of the handle-sleeve to the plug and in place thereof to provide a sleeve that can be readily and instantly removed from the plug without special tools, that has no separate parts, as the screws, to become lost, and one in which the connection is reliable and inexpensive. To be more specific, the sleeve is provided with a small opening or notch, into which a spring-catch carried by the plug part is adapted to enter when the sleeve therefor is in place on the plug. To remove the sleeve, it is only necessary to release the catch, when it can be readily slipped off to expose the parts beneath.

Another feature of my invention resides in providing the shank of the plug next the handle portion with an insulating ferrule or gasket-ring, which when the plug is inserted in a jack engages with the test-ring thereof and prevents contact between the metallic handle portion of the plug and the jack-ring to thus prevent making undesired electrical connections in the switchboard.

The invention further consists in the novel construction and combinations of parts hereinafter described, and fully pointed out in the claims, reference being had to the accompanying drawings, which form a part hereof, and in which the same reference characters designate like parts throughout the several views, and in which—

Figure 1 is a side elevation of the plug, with the ferrule and the handle-sleeve in normal position and showing also the catch and its supporting-spring in dotted lines. Fig. 2 is a similar view of the plug, with the handle-sleeve and insulating-ferrule in section. Fig. 3 is a detail sectional view through the opening in the plug handle-sleeve. Fig. 4 is a sectional detail view showing the spring-catch attached to the plug. Fig. 5 is an enlarged detail view of a portion of the plug, showing in section the insulating-ferrule about the shank. Fig. 6 is a detail perspective view of the said insulating ferrule or ring, and Fig. 7 is a diagram showing the circuits involved.

The construction of the plug generally is the same as in the ordinary case, it being provided with a tip-contact 2 and a metallic sleeve 3, forming the shank of the plug. The handle of the plug comprises a metallic tubular part 5, within which the tip and sleeve contacts end and into which the cord-strands are brought and there connected to those parts. This metallic part 5 ends, of course, at 4 and constitutes a shoulder at that point. The end 6^a of the plug is secured to the tube 5 in any desired manner, as by screwing thereinto, and forms a shoulder 6 with the part 5 and

against which the sleeve 7, which may be of insulation, is adapted to abut, though the latter feature is not essential to my invention. The cord 8 extends from the plug in the usual way and includes as many conductors or strands as are needed in the particular system in which the plug is adapted to be used, the usual number being two conductors or strands. The hollow handle portion 5 is provided, as usual, with a longitudinal slot 9 to provide access to the interior of the plug for purposes of inspection and repairing, where screws 10 and 11 are placed to make the several connections of the cords with the contacts of the plug or for other purposes and to secure the several parts of the plug together.

As stated, the plug is provided with an insulating or other sleeve 7, as in the ordinary case, said sleeve, however, instead of being secured to the metallic handle portion 5 of the plug by screws in the ordinary manner is provided with an aperture 12, through which projects a stud or projection 13, carried, preferably, by the leaf-spring 14, it being integral with the spring or secured thereto in any desired way and the other end of the leaf-spring 14 being secured to the metallic handle portion 5 in a depression 15, formed in the outside thereof. This connection is preferably made by the rivet 16, as seen in Fig. 4, though it is obvious that other means could be employed for attaching it thereto. The said depression 15 is extended to the point 17 and there cut entirely through the tubular portion of the handle to form the slot 18, in which the free end of the spring 14 may be depressed to release the stud 13 from the opening 12 in the sleeve. When the catch is so depressed, the insulating-sleeve may be drawn forward or slipped off over the shank of the plug and removed therefrom. In large plugs I consider it preferable to provide the opening 12 with a ferrule 19, inserted in the said aperture in any desired manner, which prevents undue wear upon the edges of the aperture and makes a better connection throughout, though in small sizes of plugs it is not deemed necessary. The size of the projection 13 may also vary in accordance with the requirements of the construction in which it is placed. While the particular catch shown is considered preferable so far as some features of the invention are concerned, other catches could be substituted in place thereof and still come within the limits of my invention.

In some systems it is desirable that the sleeve 5 of the handle portion of the plug should not come into contact with the metallic or test ring of the jack. To guard against this, I place an insulating ferrule or ring 20, as hard rubber or other desired material, upon the shank of the plug, abutting the end of said tube 5 or shoulder 4. This ferrule is formed, as shown in Figs. 5 and 6, with a tapering periperal portion 21, which allows its forward end 22 to readily enter the test-ring of the jack, and when it is so inserted the sleeve 5 of the plug cannot make electric connection therewith. This ring, besides having the function explained, is valuable as presenting a finished exterior and pleasing appearance to the plug. As shown in Fig. 7, it may be desired to insert the plug in a jack having a test-ring 25, a supporting-ring 26 for the sleeve of the plug, and jack-springs 27, 28, and 29 and still not have the metallic portion 5 of the handle contact with the sleeve 25, which is in the test-circuit of the line. The ferrule or ring 20 prevents this in a simple and convenient manner.

It is obvious that various changes, alterations, and modifications in the details of construction may be made without departing from the spirit or scope of my invention, and I therefore do not wish to be limited thereto; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A telephone switch-plug comprising a body portion, a sleeve or handle-covering removably fitted upon said body portion, and a spring-catch for locking the sleeve in place upon said body portion.

2. A telephone switch-plug comprising a metallic body portion having its side cut away so as to expose its interior, a spring secured to said body portion, and a handle-covering of insulating material inclosing said spring and removably fitted upon said body portion, said covering being provided with a lateral opening adapted to receive a projection on said spring.

3. A telephone switch-plug comprising a metallic body portion formed with a shoulder and having also a recess for the purpose of exposing its interior, a flat spring secured to said metallic body portion, and a handle-sleeve of insulating material inclosing said spring and removably fitted upon said metallic body portion, the end of the sleeve bearing against the said shoulder, and said sleeve being provided with a lateral opening adapted to receive a projection on said spring.

4. A telephone switch-plug constructed with a cylindric metallic body portion, a reduced cylindric portion projecting from the end of said metallic body portion and serving as a sleeve-contact for said plug, a tip-contact mounted at the end of the plug and insulated from said sleeve-contact, the latter being of uniform diameter from end to end, and an insulating-ferrule fitted upon said sleeve and adjusted into position to bear against the shoulder provided by said cylindric metallic body portion.

5. A telephone switch-plug comprising a cylindric body portion, a handle sleeve or covering removably fitted upon said cylindric body portion and provided with a lateral opening or recess, a spring-catch or locking device mounted upon said cylindric body portion and adapted to engage said opening or recess in said sleeve, the latter being composed of

insulating material, a shank portion for said plug consisting of a cylindric sleeve of uniform diameter from end to end, a tip-contact mounted at the end of the plug and insulated from said sleeve-contact, and an insulating-ferrule fitted upon the cylindric sleeve-contact, said insulating-ferrule being adjusted into position to bear against the shoulder provided by said cylindric body portion of the plug, and the ferrule being of less diameter than the bore of the handle-covering.

6. A telephone switch-plug having its handle provided with a removable insulating sleeve or covering, and having the handle portion thus provided with an insulating exterior constructed with a spring-catch adapted to engage said sleeve, the said sleeve being provided with a lateral opening to afford access to said spring-catch.

Signed by me at Chicago, Cook county, Illinois, this 10th day of April, 1901.

HENRY P. CLAUSEN.

Witnesses:
CHAS. C. BULKLEY,
HARRY P. BAUMGARTNER.