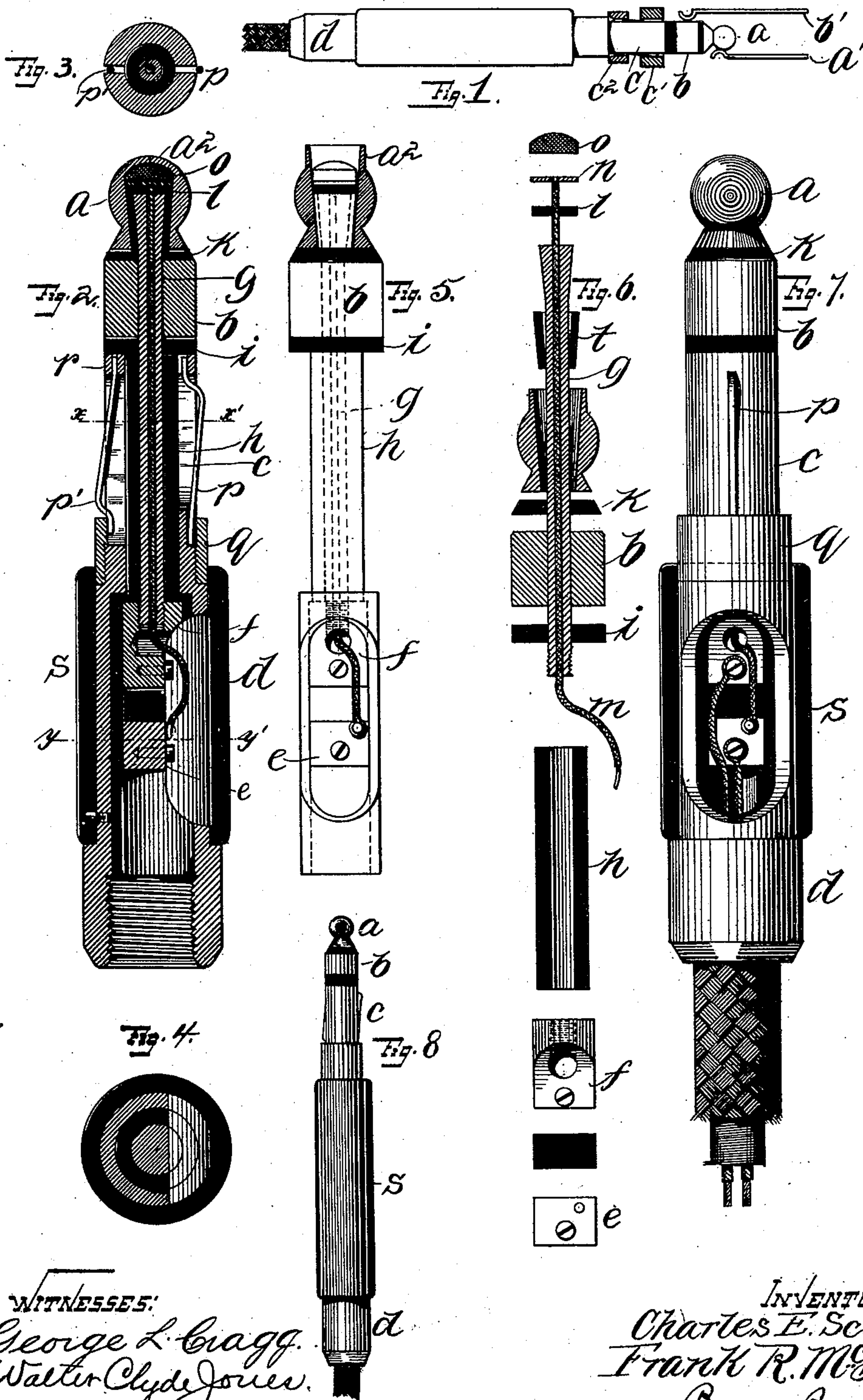


(No Model.)

C. E. SCRIBNER & F. R. McBERTY.
PLUG FOR TELEPHONE SWITCHBOARDS.

No. 574,281.

Patented Dec. 29, 1896.



WITNESSES:
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UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, AND FRANK R. MCBERTY, OF DOWNER'S GROVE, ILLINOIS, ASSIGNORS TO THE WESTERN ELECTRIC COMPANY, OF CHICAGO, ILLINOIS.

PLUG FOR TELEPHONE-SWITCHBOARDS.

SPECIFICATION forming part of Letters Patent No. 574,281, dated December 29, 1896.

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To all whom it may concern:

Be it known that we, CHARLES E. SCRIBNER, residing at Chicago, in the county of Cook, and FRANK R. MCBERTY, residing at Downer's Grove, in the county of Du Page, State of Illinois, citizens of the United States, have invented a certain new and useful Improvement in Plugs for Telephone-Switchboards, (Case No. 355,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

Our invention relates to connecting-plugs adapted to be used with spring-jacks of telephone-switchboards, being particularly applicable to connecting-plugs having two or more separate insulated contact portions. Its object is to provide a plug of stronger and more durable structure than heretofore used; and our invention consists in certain details of construction adapted to this end.

Our invention is illustrated in the accompanying drawings, which represent a plug having three contact portions insulated from each other adapted to make connection with three corresponding contact-pieces of a spring-jack.

In Figure 1 of the drawings a plug having four contact-pieces is represented, two of which are arranged to make connection with two insulated contact parts of the plug and the remaining two to be crossed together by means of a third insulated portion of the plug. Fig. 2 is an enlarged longitudinal sectional view of our improved plug. Fig. 3 is a section of the same on line $x x'$ of Fig. 2. Fig. 4 is a section on line $y y'$ of the same figure. Fig. 5 is an elevation of certain parts of the plug, partially in section. Fig. 6 is a sectional view of the same parts separated so as to disclose the order of assembling them. Fig. 7 is an elevation of the plug with a portion of the shell removed to show the manner of connecting the conducting-cords with the corresponding parts of the plug. Fig. 8 is a side elevation of the plug of approximately normal size.

The plug presents three separate contact portions to the corresponding parts of the

spring-jack—a nearly spherical tip a , a short cylindrical portion b , and a longer cylindrical portion c —the first two of which are adapted to make connection with the springs a' and b' , respectively, and the last to make contact with both the rings c' and c'' of the spring-jack. The contact portion c of the plug is integral with the body or handle d of the plug. The body d is bored out through its entire length, the bore being smaller within the portion c . Two connection-blocks $e f$ are arranged within the body of the plug, insulated from its walls by suitable concentric sleeves of hard rubber or other insulating material.

A tube g , preferably of steel, extends through the shank or contact portion c of the plug and is insulated therefrom by a surrounding sleeve h of hard rubber. Near its forward portion this tube g carries a short collar b , which is securely driven upon the tube and is separated from the shank c by an interposed washer i of insulating material. At its forward extremity the tube is enlarged into a conical shape and carries the remaining contact-piece of the plug, the spherical tip a . This tip has a conical hole in it axially, lined with insulating material, the taper of the perforation being the same as that of the cone-shaped extremity of the tube g . The tip a is formed with a thin circular lip a^2 , which is designed to be turned or spun down in a lathe after the parts are assembled to cover the opening in the tip, as shown in Fig. 2.

A washer k , of insulating material, is interposed between the tip a and the collar b , and a similar washer l is also placed over the extremity of the tube g . The connection with the tip a is carried to the body of the plug by means of an insulated wire m , extending through the tubular aperture in the tube g . This wire is connected within the tip a with a small brass plate n , placed over the washer l . The space above the washer n is filled with lead or solder o to insure perfect contact between the tip a and plate n .

Within the body of the plug the wire m passes out from the tube g through a perforation in the block f , in which the tube is screwed, and is secured in a suitable manner

to the binding-post or block *e*. For insuring contact with the rings *c'* and *c''* when the plug is inserted in the spring-jack two springs *p* and *p'* are provided in the shank *c* of the plug. These are constructed of wire and are arranged in longitudinal slots in the shank *c* of the plug, each being securely held by one extremity and being free to vibrate at its other extremity, the springs being reversely arranged in respect to their points of rigid support. Thus the spring *p* is held at its lower extremity by the ring *q*, which is screwed upon the shank of the plug, while the spring *p'* is not held but is only limited in its play by this ring. The latter spring is similarly secured by a ring *r*, also screwed upon the shank. The usual inclosing shell or tubular cover *s*, of insulating material, is provided, surrounding the greater part of the body of the plug.

In assembling the parts here described the conical insulating-tube is first placed over the tube *g*, around the conical extremity of the tube. Then the tip *a* is forced down into position over the same extremity of the tube. The insulating washer *l* is then placed over the extremity of the tube *g*. The conductor *m* is inserted in the tube, bringing the plate *n* into contact with the washer *l*, after which the solder *o* is placed in the opening, heat being employed, if desired, to insure perfect contact both with the plate *n* and the tip *a*. The thin lip *a''* is now turned inward to complete the spherical shape of the tip *a*, whereby the parts within the tapered opening of tip *a* are compressed firmly together and the tip is securely wedged upon the tube *g*. The washer *k* is next placed behind the tip *a* and the collar *b* is forced into place firmly against the washer. The tube *g* is finally inserted into the insulated bore of the shank *c* and is screwed into place in block *f*, the conductor *m* being passed through the perforation in block *f* and screwed or soldered to its binding-post *e*.

The cord connections with the plug are made in the usual manner, one conductor being connected with the binding-screw of block *f* and the other with the binding-screw of block *e*.

If desired, the shank *c* may be utilized as a third cord connection, the corresponding conductor being secured in the usual way to the body of the plug.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a connecting-plug the combination with a tube forming or carrying one contact portion of the plug, of a second contact portion surrounding and secured upon a projecting portion of said tube, and a wire extending from said second contact portion through the tube to the interior of the plug, substantially as described.

2. The combination in a connecting-plug, of a tube carrying one contact-surface in an intermediate position, a second contact por-

tion supported upon and surrounding the projecting extremity of said tube but insulated therefrom, and a conductor extending from said second contact portion through the tube to a suitable connecting-post within the body of the plug, substantially as described.

3. The combination with a tube of conducting material carrying a collar or sleeve forming one contact portion of a connecting-plug, but projecting beyond said collar, of a spherical tip constituting another contact-piece of the plug supported upon and surrounding the projecting extremity of the tube but insulated therefrom, and an insulated conductor extending through the tube and connected with the spherical tip, substantially as described.

4. In combination, a conducting-tube carrying a collar constituting one contact-piece of the plug but projecting beyond the same, the projection being enlarged at its outer extremity, a spherical tip constituting another contact-piece of the plug having an axial opening corresponding in shape to the enlarged projection of the tube, insulating material filling the perforation in the tip about the tube, and an insulated conductor connected with the tip and extending through the tube, substantially as described.

5. In combination, a tubular body or shank of a connecting-plug having a portion formed into a contact-piece for a spring-jack, a conducting-tube extending longitudinally therein but insulated therefrom, a collar carried upon said tube constituting a second contact-piece of the plug, said tube projecting beyond the collar, a spherical tip secured upon said projecting extremity of the tube but insulated therefrom, a conducting-wire connected with said tip and extending through said tube, and independent means for connecting with both the tube and the conducting-wire within the body of the plug, substantially as described.

6. The combination with the tube *g*, of the spherical tip *a* having the lip *a''* formed thereon, said spherical tip being secured upon said tube but insulated therefrom, and a conducting-wire connected with said tip within its central perforation, and extending through the tube, said lip *a''* being finally turned down to close the opening in the tip, substantially as described.

7. The combination with the tube *g* carrying the collar *b* and having the enlarged projecting extremity, of the sleeve *t* of insulating material surrounding said extremity, the tip *a* having an axial perforation corresponding in form to said enlarged extremity and having the lip *a''* formed upon it, the insulating-washer *l* placed over the extremity of the tube *g*, said lip *a''* being turned in to compress the enlarged portion of said tube into the corresponding opening of the tip to secure the latter firmly in place upon the tube, substantially as described.

8. In combination with the tip *a* having the lip *a''* formed thereon, the tube *g* to which the

said tip is secured, the washer *l* of insulating material covering the extremity of said tube, the conducting-plate *n* forming the terminal of conductor *m*, and the soft conducting material *o* placed over the plate *n*, whereby when the lip *a*² is turned down the conducting material is compressed and caused to make perfect contact between the plate *n* and the tip *a*, substantially as described.

10 9. In a connecting-plug, the combination with a central conducting-stem forming a conduit, of two contact portions carried there-

by and suitably insulated the one from the other and one insulated from such stem or conduit, and a wire extending through such conduit from the contact insulated from the stem for the purpose set forth.

In witness whereof we hereunto subscribe our names this 30th day of April, A. D. 1894.

CHARLES E. SCRIBNER.

FRANK R. McBERTY.

Witnesses:

ELLA EDLER,

LUCILE RUSSELL.