

(No Model.)

2 Sheets—Sheet 1.

C. A. SHEA.
PLUG SPRING JACK.

No. 481,204.

Patented Aug. 23, 1892.

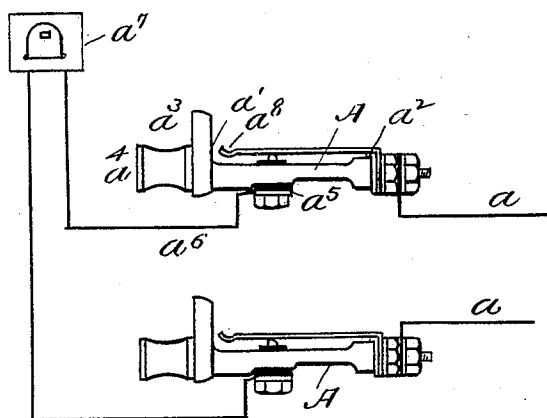


Fig. 1.

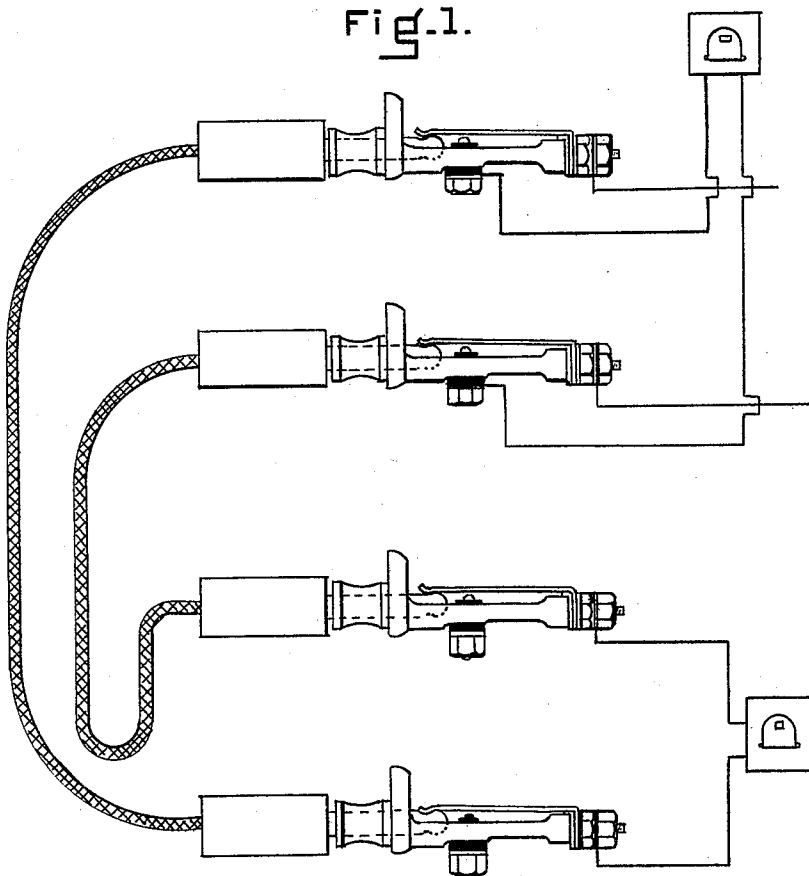


Fig. 2.

WITNESSES

J. M. Dolan

INVENTOR

Christopher A. Shea

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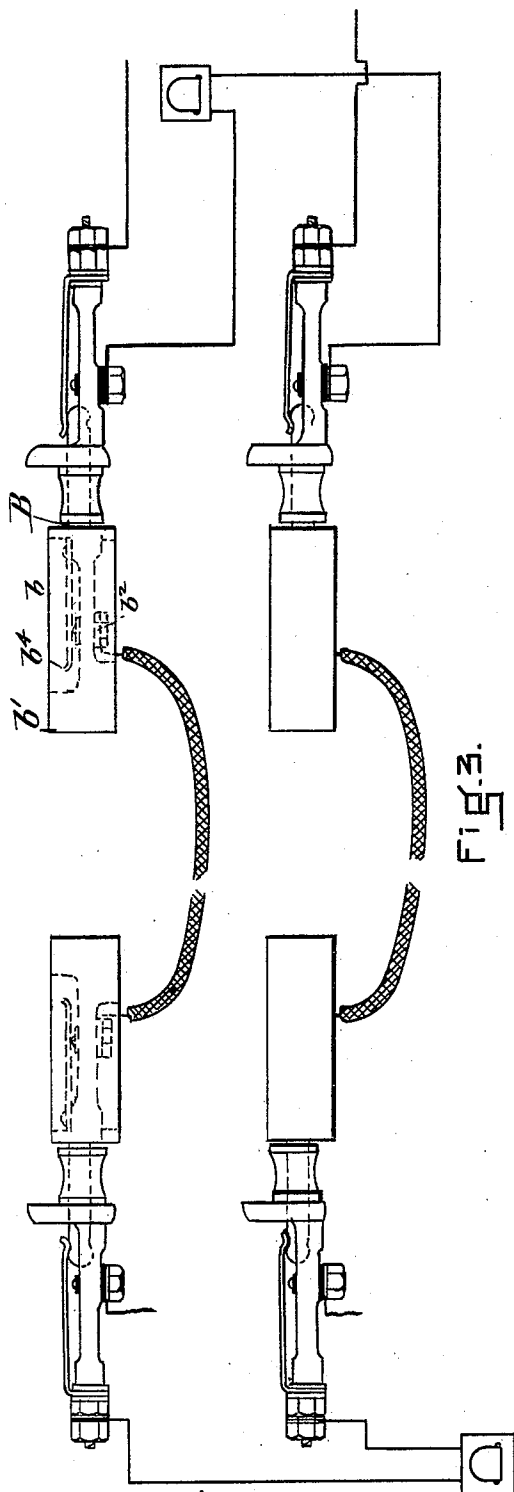


FIG. 3.

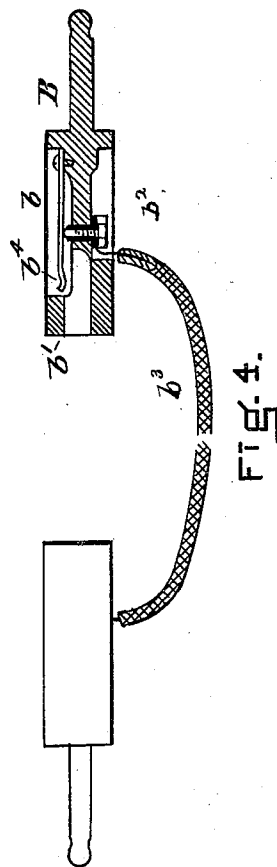


FIG. 4.

WITNESSES

J. W. Dolan

INVENTOR

Christopher A. Shea

UNITED STATES PATENT OFFICE.

CHRISTOPHER A. SHEA, OF BOSTON, MASSACHUSETTS.

PLUG SPRING-JACK.

SPECIFICATION forming part of Letters Patent No. 481,204, dated August 23, 1892.

Application filed April 23, 1892. Serial No. 430,316. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPHER A. SHEA, a citizen of the United States, residing at Boston, in the county of Suffolk, State of Massachusetts, have invented a new and useful Improvement in Plug Spring-Jacks for Telephone-Exchanges and for other Purposes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The switchboards of telephone-exchanges as now ordinarily constructed contain a large number of switches known as "spring-jack" or "Liverpool" switches, each of which embraces a frame or support rigidly secured to the framework of the switchboard, connected at its end with the main-line wire, formed at its front end with a plug-hole of considerable depth and having about midway its length and in line with the opening a contact-making spring end and an insulated contact-point, which is connected with a line running to a drop or other place. Normally the spring and contact-point are in contact, so that the current runs from the main line through the jack-frame spring and contact-point to the drop or other line. The spring and contact-point are arranged in line with the plug-hole, and by inserting a plug into the hole sufficiently far the spring is lifted by the end of the plug from the contact-point, and the circuit between the two lines is broken, while another over the main line, spring-jack frame, and plug is established. The plug has a groove back of its end and the spring is shaped not only to make a contact, but to catch and hold the plug by shutting into the groove.

In the ordinary use of the spring-jack switches in telephone-exchanges connection between two jack-switches or main lines is established by means of a portable conductor-cord bearing at each end a plug of the character described, and by inserting the plug into the plug-hole of one spring-jack, breaking the contact with its drop-line, and inserting the other plug into the plug-hole of another spring-jack and breaking its contact with its drop-line, a circuit between the two main lines connected with the respective spring-jacks is obtained and maintained so long as

the plugs are in position in the spring-jacks, the circuit then being by one main line, its spring-jack frame, a plug and its connecting and conducting cord, the plug at the other end of the cord, another spring-jack frame, and another main line. The multiplicity of the main line and drop-wires and spring-jacks, their proximity, and the liability of crossing the wires, and many other reasons render it necessary to maintain a constant supervision and examination of the various lines, which must take place when they are in use, as well as at other times.

Heretofore, so far as I am aware, there has been no way by which this examination can readily be had while the lines are in use, and in the examination or testing of lines in use the line-tester can obtain a connection only by holding the end of his testing line or plug in contact with some part of the jack; and if the drop or drop-line should be defective or require testing, or if a main line should be put to a drop on another table there would be no way of getting in on the line without taking down the plugs and when through putting them back again. With my invention access is obtained to both line and drop without disturbing the connection between two jacks or unplugging.

In order to understand my invention and its application, I will now refer to the drawings, wherein—

Figure 1 is a diagram view of an ordinary connection between stationary spring-jacks of a telephone-exchange and their drop. Fig. 2 is a view representing spring-jacks of an exchange-board connected with a secondary or auxiliary drop by the common form of connected portable plugs. Fig. 3 is a view representing such connection as obtained by use of my improved device. Fig. 4 is a view of my device as detached.

a represents the main lines; A , the spring-jacks, which form fixed parts of the switch-board of an exchange. The frame or body a' of each jack is made of a suitable conducting metal, and its inner end a^2 is attached to the main line. Its outer end a^3 has the plug-hole a^4 .

a^5 is an insulated contact-point connected by line a^6 with the drop a^7 .

a^8 is the contact-breaker, preferably in the form of a latch-spring attached at its rear end to the rear end of the jack body or frame, and at its front end extending into the line of the plug-hole. Normally it rests upon the insulated contact-point.

My invention I have termed a "plug spring-jack." It comprises a plug B of a size and length to enter the plug-hole of the stationary or rigid spring-jack A, and upon being pressed home to lift the contact-spring a^8 from the contact-point at the same time establishes a connection between the main line and the plug. My plug spring-jack also has, preferably, integral with the plug, an extension b ending in a plug-hole b' , an insulated contact-point b^2 , connected or attached to a flexible conductor b^3 , and a spring contact-maker b^4 , arranged by its removal from the contact-point to break connection between the plug B and the flexible conductor b^3 . This conductor b^3 extends, preferably, to another plug spring-jack of similar construction, to which it is similarly attached, and connects the two together, (see Fig. 4.) but it may be connected with an ordinary plug.

The entire device is portable and takes the place of the common portable plugs and connection now used.

It will be seen that my improvement embodies the use of a portable connecting device, which not only employs the plugs ordinarily used in connection with spring-jacks, but also contact makers or breakers, whereby after connections with the spring-jacks are made, as in the ordinary use of the old connecting device, the circuit may be broken between the plugs at one or other plug ends and without destroying the connection between the plugs and the rigid spring-jacks. Not only this, but means are established whereby other connections or circuits may be readily established, while the connecting portable plug spring-jacks are in position or acting to connect with the rigid spring-jacks at the ends of two main lines, as after they have been inserted into the fixed spring-jacks or "plugged," as it is termed, they still present means for receiving other plugs in the same manner that the fixed spring-jack receives the plug of the connecting device, so that while a connection is on without removing the plugs another plug may be inserted into the plug-hole of the portable spring-jack plug and the lines and drop tested or another circuit or connection established.

By the use of my improved spring-jack plug there is access to both line and testing drop, while the main lines are connected. In going in on the drop side the line is lifted off and in going in on the line side the drop is lifted off, as with the fixed spring-jacks, and once the connection is thus made between—say, a fixed spring-jack and the spring-jack of a testing-drop—it can remain so, the testing continuing while the connection with another line is es-

tablished or being established either by use of the ordinary connected plugs or by the employment of my improved plug spring-jack. The improvement can of course be used wherever it is desired to make connection between terminals ending in spring-jacks.

It will appear from what has been said above that this portable device may be used in connecting the terminals of any electric conductor with each other or with drops or any other lines or for the purpose of forming loops or for any connecting use, and in this category I would mention its value for patching or for cross-connecting wires, and where, too, the patch being on, remains so, and the frequent annoyance and mischief of a cross connection being put back wrong when taken down for testing purposes will be thus done away with. It will be noticed, also, that not only does the use of this combined plug spring-jack permit of the lines and drops being tested while a connection is on, but it saves the time which would otherwise be used in plugging and unplugging with the ordinary form of plug, and prevents the annoyance to users of the line which arises from interruptions which not only occur during the testing, but which also occur through accident and lack of care in replugging, so that my improvement not only saves in time and trouble at the exchange or where used, but also improves the system by improving the service.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The terminal or line connector herein described, the same consisting of two engaging circuit breaking and holding devices, each comprising a plug or terminal-engaging device, a circuit-breaker, and a support or holder for a supplemental or additional testing-plug or circuit-breaker, and a flexible conductor connecting the insulated contact-points of the two devices, as and for the purposes described.

2. In a portable device for connecting or engaging electrically-charged line-terminals, a plug or terminal-engaging device, a flexible conductor, a circuit-breaker between the conductor and the engaging device, and a support or holder for a supplemental or additional testing-plug or circuit-breaker.

3. In a portable device of the character specified, a body or frame having at one end the terminal engaging or connecting piece and at the other end a support or hole for receiving and holding the end of a testing plug or instrument, a spring circuit-breaker carried by said body or frame, an insulated contact-point with which the spring is normally in contact, and a flexible conductor connected with the contact-point upon the side of the frame or body, as and for the purposes described.

4. The combination of the body or frame having the tongue or plug B, the extension b ,

the spring b^4 , contact b^3 , the extension having the plug-hole b' , as and for the purposes described.

5 The combination of the rigid spring-jack switch A, having the contact-breaker a^3 and plug-hole a^4 , with the portable connecting device comprising the plug B, the contact-

breaker b^4 , the contact-point b^3 , the conductor b^3 , and plug-hole b' , substantially as and for the purposes described.

CHRISTOPHER A. SHEA.

Witnesses:

F. F. RAYMOND, 2d,
J. M. DOLAN.