No. 726,105. PATENTED APR. 21, 1903.

C. E. SCRIBNER.

SPRING JACK FOR TELEPHONE SWITCHBOARDS.

APPLICATION FILED JUNE 21, 1897.

NO MODEL.

Fig. 1

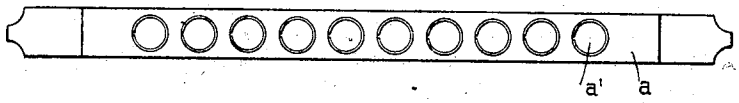


Fig. 2

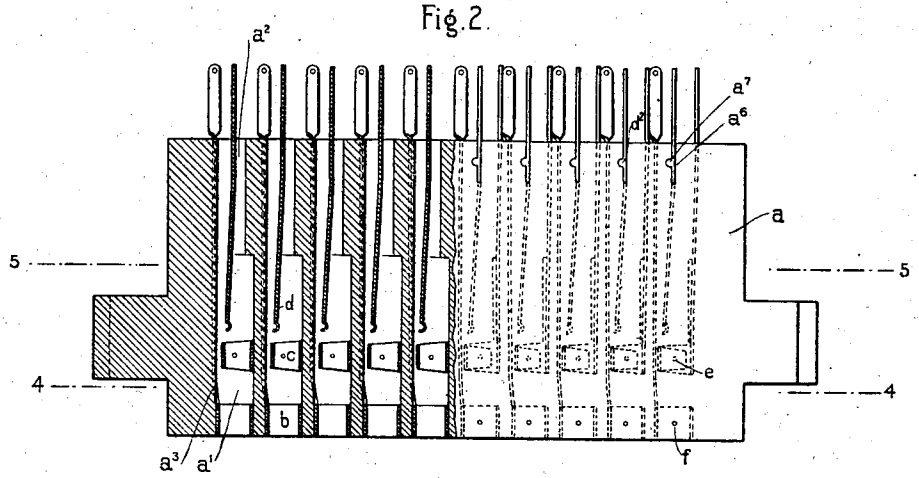


Fig. 3

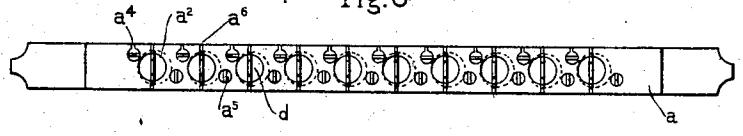


Fig. 4

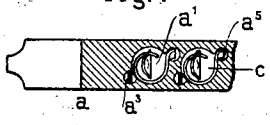


Fig. 5

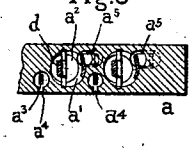


Fig. 6

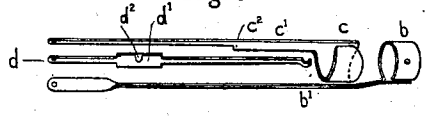


Fig. 7



Witnesses:

D. P. C. Sanger

John W. Sinclair

Inventor:

Charles E. Scribner.

by Bartlett Brown

his Attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SPRING-JACK FOR TELEPHONE-SWITCHBOARDS.

SPECIFICATION forming part of Letters Patent No. 726,105, dated April 21, 1903.

Application filed June 21, 1897. Serial No. 641,669. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Spring-Jacks for Telephone-Switchboards, (Case No. 451,) 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.

This invention concerns terminal spring-jacks or sockets for telephone-lines in telephone-switchboards, the invention consisting in certain details of construction and disposition of parts for attaining compactness of arrangement and cheapness of construction and for affording secure contact between the terminal pieces in the spring-jack and corresponding portions of the plug.

My improvement applies to spring-jacks mounted in groups on common bases or supporting-plates, such as are usually known as "strips" of spring-jacks. In constructing the spring-jack I provide a strip or plate of insulating material, through which I drill transverse openings to receive the metal contact-pieces of the spring-jacks. One of these contact-pieces consists in a short tubular thimble closely fitting the transverse opening and placed therein near one edge of the strip, its orifice being preferably accessible near the front of the strip for testing purposes. From this contact-piece an extension is led to the rear of the strip of spring-jacks through a suitably-inclined duct between adjacent perforations. Another of the contact-pieces of the jack consists in a nearly annular spring located in the perforation at the rear of the thimble before described, adapted to encircle and grasp the inserted plug, a metallic extension from this contact-piece also being led to the rear of the strip of spring-jacks. The third contact portion is a flat spring lying axially in the transverse perforation and tightly fitted therein at its rear extremity, the free extremity of the spring being in position in the transverse opening to register with the tip of a plug inserted in the jack. The three contact portions of each spring-jack are thus located in a single drilled perforation in the strip, with their axes nearly concentric, and two ducts are provided for leading the terminals of two of the contact-pieces to the rear of the strip, so that the operations essential in forming the strip of insulating material to receive the metallic parts of each jack, which operations ordinarily constitute the most costly processes in the construction of the spring-jack, consist merely in drilling the transverse opening and in forming two ducts extending therefrom for each spring-jack, together with a narrow slit opening into the perforation. One of the ducts may be a narrow channel cut by means of a saw; but with these exceptions the operations of forming the insulating base-plate consist in drilling openings, the expensive processes of milling and drifting openings being wholly avoided.

Referring now to the accompanying drawings, which illustrate my new form of spring-jack, Figure 1 is a front elevation of a strip of ten spring-jacks. Fig. 2 is a plan of the strip, a portion containing five spring-jacks being shown in horizontal section on the center lines of the spring-jacks. Fig. 3 is a rear elevation of the strip. Fig. 4 is a transverse section of two spring-jacks on the line 4 of Fig. 2. Fig. 5 is a similar section on the line 5 of Fig. 2. Fig. 6 is a perspective view of the metallic contact-pieces of the spring-jack arranged in proper position relative to each other. Fig. 7 is an elevation of the plug designed for use with the spring-jack.

The strip or base-plate a may be of hard rubber or other similar insulating material. For each spring-jack an opening a' is drilled deeply into the strip from the front edge. This opening meets a second perforation a^2 of similar diameter drilled from the rear of the strip, the axes of this tubular opening being so disposed with relation to each other that their walls lie in the same straight line at one point. From the forward extremity of the opening a' a duct a^3 of small diameter is drilled obliquely downward and outward toward the rear and under surface of the strip, (with reference to Fig. 2,) meeting a transverse narrow channel a^4, leading to the

rear of the strip formed in its under surface. Sections of this duct are seen in Figs. 4 and 5, while a rear view of the same appears in Fig. 3. Parallel with the axis of the transverse perforation a^2, but somewhat above the plane passing through the center lines of the spring-jacks, is a duct a^5, drilled obliquely and rearwardly outward from the bottom of the opening a'. Further, a slot a^6 is formed in the rear of the strip on the center line of each opening a^2, with a small lateral extension or recess a^7 on each surface of the strip. The metal parts comprised in a single spring-jack for assembly in these openings are shown in Fig. 6—a thimble b, having a rearwardly-projecting narrow extension b' formed integral with it, the length being somewhat greater than the breadth of the strip; a nearly tubular thimble c, preferably of stiff and resilient metal, having also a lateral terminal piece c', formed from the same piece, and a flat spring d, having a broadened bushing d', formed with two lugs d^2. The thimble c is not quite tubular in form, the narrow lip of the thimble being bent inward to give the tube a somewhat spiral section. The stem c' thereof is narrowed throughout a portion of its length, so that a shoulder c^2 is formed upon it. The flat spring d has the usual crimped or curved extremity, designed to conform to the spherical tip of the plug and to engage it in such manner as to retain the plug in place in the spring-jack.

In assembling the spring-jack the flat spring d is inserted in the opening a^2, the broad portion d' entering the slot a^6. The lugs d^2 are in the plane of the spring when this is put in place, but are subsequently bent over to enter the recesses a^7, extending laterally from the slots a^6. Hence when the spring is in place its transverse movement is prevented by the engagement of the broad portion with the walls of the slot a^6, while it is secured against longitudinal movement by the lugs engaging the recesses a^7.

The thimble c is placed within the strip from the front thereof, the stem or extension c' threading duct a^5 until the shoulder c^2 comes against the floor of the tubular opening a'. The thimble is secured in this position by a pin e, passing through the wall of the socket and riveted in the thimble c. The thimble b is inserted in the opening a', with its outer edge flush with the strip of spring-jacks, so as to be accessible for the usual operation of testing, the extension b' from the thimble being threaded through the duct a^3 and thence through the saw-cut a^4 to the rear of the spring-jack and being secured in the duct by twisting the broadened terminal through a right angle, so that it cannot be withdrawn from the duct. This thimble also should preferably be secured in place by means of a pin f through the hard rubber.

The plug, Fig. 7, designed for use with this spring-jack comprises the usual spherical tip g and two concentric metallic sleeves g' and g^2. The length of the sleeve g^2 should be such that when the plug is fully inserted in the spring-jack the sleeve will extend through or slightly beyond the inner end of the thimble b. The sleeve g' is of proper length and in suitable position to enter the spring-thimble c and is of such diameter as to be grasped with force thereby. The tip g is obviously designed to be thrust under the curved extremity of spring d and to be engaged thereby.

From the foregoing description it will be apparent to one familiar with spring-jacks for telephone-switchboards as usually constructed that the present spring-jack is much more simple and compact than any heretofore produced, while the operations involved in forming and assembling the parts are of the simplest nature. It will be further apparent that the electrical connection formed between the spring d and the tip g, the thimble c and the sleeve g', and the thimble b and the sleeve g^2, respectively, will be firm and reliable, inasmuch as the first two contacts are formed between rigid bodies and springs, while the last is formed between a thimble and the sleeve forced against it by the pressure of the springs.

The invention is defined in the following claims:

1. In a spring-jack, the combination with a supporting-plate having a tubular opening therein adapted to receive a connecting-plug, of a spring contact-piece of substantially spiral section in the tubular opening, the outer portion of said spiral being rigidly secured to the wall of said opening and the inner end thereof being free to encircle and grasp the plug, substantially as described.

2. The combination with a supporting-plate having a tubular opening formed therein adapted to receive a connecting-plug, of a contact-piece of substantially tubular form contained within said opening, said tubular contact-piece being slit lengthwise from end to end and having one of its lips bent toward the axis of the opening, the portion not bent in being secured to the wall of the opening lying concentrically therein, whereby a contact-piece of substantially spiral cross-section is produced for making contact with an inserted plug, substantially as set forth.

3. In a spring-jack the combination with a supporting-base having a transverse tubular opening therein, of a contact-ring of substantially spiral section in the forward extremity of said opening, and a flat spring mounted in a nearly axial position in said tubular opening having its extremity presented before the opening in the said ring to engage the tip of a plug therein, as described.

4. In a spring-jack, the combination with a base of insulating material having a tubular opening therein, of a tubular contact-thimble secured in the forward extremity of said opening, a second contact of substantially spiral section at the rear of said thimble, the inner end of the spiral projecting toward the

axis of the spring-jack and the other end thereof being secured to the wall of the tubular opening, and a flat spring secured in a substantially axial position in the said opening, having its extremity presented before the opening of the spiral contact, and a plug adapted for insertion in the spring-jack having three cylindrical contact-pieces registering with the thimble, spiral contact and the flat spring, respectively, as described.

5. In a spring-jack, the combination with a plate of insulating material having a transverse tubular opening therein, the forward portion of said opening being of greater diameter than the rear, of a thimble in the larger opening and a flat spring lying in the axis of the perforation secured in the constricted portion of said perforation, and a terminal extension of the said thimble passing through a duct parallel with said constricted portion and opening into the larger portion, substantially as described.

In witness whereof I hereunto subscribe my name this 5th day of May, A. D. 1897.

CHARLES E. SCRIBNER.

Witnesses:

ELLA EDLER,

FRANK R. MCBERTY.