

No. 649,068.

Patented May 8, 1900.

F. R. McBERTY.

SPRING JACK FOR TELEPHONE SWITCHBOARDS.

(Application filed Jan. 26, 1898.)

(No Model.)

Fig. 1



Fig. 2

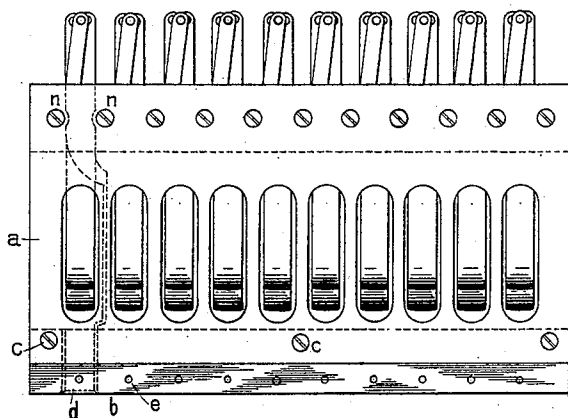


Fig. 5

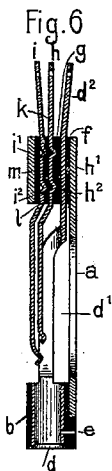


Fig. 3



Fig. 4

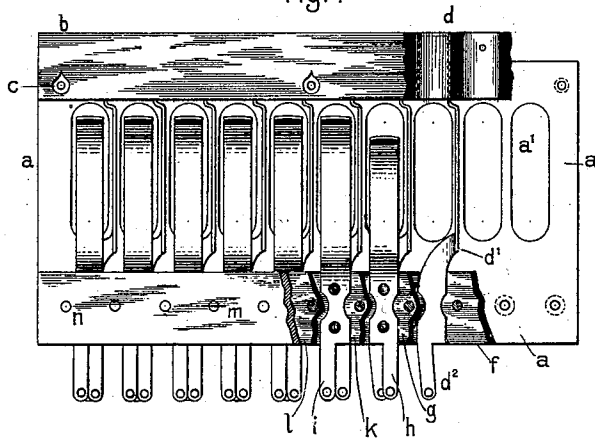
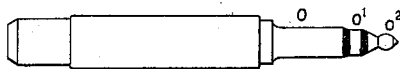


Fig. 7.



Witnesses:

A. H. Canner
A. R. Lawrence

Inventor:

Frank R. M. Bert.

by

Barton Brown
his Att'y

UNITED STATES PATENT OFFICE.

FRANK R. McBERTY, OF DOWNER'S GROVE, ILLINOIS, ASSIGNOR TO THE
WESTERN ELECTRIC COMPANY, OF CHICAGO, ILLINOIS.

SPRING-JACK FOR TELEPHONE-SWITCHBOARDS.

SPECIFICATION forming part of Letters Patent No. 649,068, dated May 8, 1900.

Application filed January 26, 1898. Serial No. 668,029. (No model.)

To all whom it may concern:

Be it known that I, FRANK R. McBERTY, a citizen of the United States, residing at Downer's Grove, in the county of Du Page and State of Illinois, have invented a certain new and useful Improvement in Spring-Jacks for Telephone-Switchboards, (Case No. 63,) of which the following is a full, clear, concise, and exact description.

My invention concerns the construction of spring-jacks or terminal sockets of telephone-lines in switchboards of telephone-exchanges. Its main object is to produce a strong and simple jack wherein all parts are readily accessible for inspection. A secondary object is to provide a jack of cheap construction by eliminating, as far as possible, the processes of milling and drilling in the jack, the parts being largely formed by punching.

To this end my new spring-jack consists in a base-plate of sheet metal, a thick strip of suitable material secured on one edge thereof carrying the thimbles or test-rings of the jacks, the springs constituting the spring-contacts of the jack mounted transversely on the other edge thereof by means of continuous strips of insulating material extending the length of the strip of spring-jacks, and bolts clamping the springs between these strips.

The invention further consists in forming the terminal of the test-ring in such a way that it lies throughout the greater part of its length in a plane at right angles to the plane of the contact-springs and between the springs of adjacent jacks and throughout the remainder of its length in a plane parallel to that of the springs and beneath them, whereby it may be clamped in the same manner as the springs.

The invention involves also other details of construction, which will be described at length in the specification following.

The figures of the attached drawings illustrate the invention.

Figure 1 is a front elevation of a strip of ten spring-jacks. Fig. 2 is a plan of the same strip from below. Fig. 3 is a rear elevation of the strip. Fig. 4 is a view of the same from above on Fig. 3. Fig. 5 is an end ele-

vation of the strip. Fig. 6 is a section taken vertically on the center line of a spring-jack. Fig. 7 is a view of the plug designed for use with the spring-jack.

The frame of the jack consists in a flat broad strip *a*, preferably of metal, aluminium being a suitable material. To one edge of this strip a thick and narrow strip *b* of insulating material is secured by means of bolts *c*, which bolts pass through the strip at suitable intervals, their heads being countersunk in the strip *b*. The strip *b* carries the thimbles or test-rings *d* of the spring-jacks. These thimbles are short tubes, formed by punching from sheet metal and subsequently folding into cylindrical form, which fit tightly in openings drilled in the strip *b* of insulating material. The exposed ends of the thimbles *d* are flared and reamed out slightly to present broad and rounded surfaces for the application of the testing-plug. The thimbles are secured in place by means of pins *e*, extending through the stock of strip *b* and riveted into the thimbles.

The blank or punching constituting in part the thimble *d* is formed with a rearward extension *d'*, designed to form the terminal of the thimble at the rear of the spring-jack. This terminal strip lies throughout the greater part of its length in a vertical plane midway between the center lines of adjacent jacks. Near its rear extremity, however, it is bent into a horizontal plane, its horizontal portion being made equally broad with the contact-springs of the jacks and lying near the plate *a* parallel with it. Finally the extreme rear portion of the extension *d'* is formed into a soldering-terminal *d''*. The horizontal portion of this strip is insulated from the plate *a* by means of a thin ribbon or strip *f* of insulating material, as hard rubber, which extends throughout the length of the strip of spring-jacks. Above the same horizontal extensions a second similar strip *g* of insulating material is laid. On this strip *g* are placed the several contact-springs *h* of the bank or strip of jacks. Next comes the strip *k* of insulating material, and on this strip *k* are placed the springs *i* of the several jacks. Finally above the springs *h* a fourth strip *l*

of insulating material is laid and over this a strip *m* of metal, preferably brass. The various strips of material are clamped together and to the base *a* by means of screws *n*, which pass through the base-plate, their heads being countersunk therein, and are screwed into the strip *m*. The strips *f*, *g*, *h*, *l*, and *m* are of similar shape and size and may be sawed from sheet stock of suitable thickness. The apertures for the passage of the screws *n*, together with other openings which will presently be described, may be punched in the strips.

The springs *h* and *i* of each jack lie substantially parallel with the center line of the jack and have their extremities presented before the opening of the corresponding thimble *d* at different distances therefrom. Two depressions *h'* *h*² and *i'* *i*² are formed in the springs *h* and *i* by means of a prick-punch or in any other suitable way. These enter holes or depressions formed in the strips *g* and *k*, respectively, of insulating material, whereby the springs are held securely in place when clamped by the screws *n*. I prefer to slightly indent the strips *g* and *k* by means of a suitable tool while the strips are warm and to heat the strips of insulating material when the jack is assembled, clamping the parts together so strongly by means of screws *n* that the metal parts of the jack sink into the rubber, whereby they are more securely retained in place.

Beneath the springs of each jack an oblong opening *a'* is punched in the plate *a* to provide clearance for the springs *i* of the jacks to be mounted immediately beneath any strip and incidentally for the purpose of reducing the weight of the strip.

The plug represented in Fig. 7 is of usual construction, being provided with three contact-pieces *o* *o'* *o*², which are connected with suitable terminals within the body of the plug. The sleeve *o* is designed to register with the thimble *d* of a jack, into which the plug is inserted. At the same time the contact-ring *o'* will make connection with the spring *i*, while the contact-tip *o*² will enter beneath the extremity of spring *h* and will make electrical connection therewith.

The prior art is exemplified in Letters Patent No. 400,969, of April 9, 1889, to Harry B. Thayer, and No. 596,625, of January 4, 1898, to Charles E. Scribner. In these prior structures it will be seen that the rubber blank constituting the framework upon which the springs are mounted must be of considerable bulk and in its formation is necessarily subjected to the expensive operations of drilling and milling, the material cut away by these operations being of no value. With either of these former constructions it has not been practical to make the individual jacks of less size than a half-inch square, so that only four jacks could be placed within the space of an inch square on the switchboard. By the use of my invention, which comprises,

among other things, the light metal plate, the front thick strip of rubber for the test-pieces, the extensions of the test-pieces by springs twisted or bent, as described, and the continuous flat strips of insulating material interposed between the springs at the rear, where the springs are in parallel, there is very great economy in the matter of cost of material and labor. Moreover, there is the further advantage that I am enabled to make the jacks smaller than has been practical heretofore. I have made strong and durable jacks upon only three-eighths-inch centers, this being made possible on account of the particular form of the spring or connecting-piece which is extended from the test-piece of each jack. The different parts of the bank of jacks—as the plate *a*, forming the frame, the springs, and the test-pieces, with their extensions—may be formed as shown and sold separately to be assembled at the convenience of the user.

I claim—

1. A test-piece *d* for a switch provided with the extension, consisting of the flat portions *d'* and *d*², the said flat extension *d*² being adapted to be secured or clamped in position, said extension being twisted about ninety degrees between said portions, whereby said flat portions are brought into planes substantially at right angles to one another, as and for the purpose specified.

2. The bank of switches consisting in the combination with the metal frame *a*, of the strip *b* secured thereto and provided with openings, the test-pieces *d* fitting in said openings, the extensions for said test-pieces and the line-springs, said extensions lying at right angles to the free or movable parts of their respective line-springs, but bent or twisted at the rear to bring the flat portions *d*² of said extensions into a plane substantially parallel with the said line-springs, and means for securing said extensions *d*² and said line-springs in place upon the said metal frame but insulated therefrom, substantially as and for the purpose specified.

3. The bank of switches consisting in the combination with the metal frame *a*, of the strip *b* secured thereto and provided with openings, the test-pieces *d* fitting in said openings, the extensions for said test-pieces, the line-springs and the metal clamping-pieces *m*, the said extensions lying at right angles to the free or movable parts of their respective line-springs, but bent or twisted at the rear to bring the portions *d*² of said extensions into a plane substantially parallel with the said line-springs, and the continuous strips separating and insulating the said springs and extensions.

4. A bank of switches consisting of a metallic frame *a*, the thick strip *b* of insulating material secured to the outer edge or portion of said frame and carrying the test-pieces *d* of the jacks, said test-pieces fitting tightly in openings formed in said strip, line-springs *h* and *i* and the extensions of said test-pieces,

the extensions having portions d' thereof respectively in a plane substantially at right angles to the portions d^2 thereof, the said portions d^2 and the springs h and i of the different jacks being superimposed in parallel
5 planes but separated from one another by strips of insulating material extending between corresponding parts of all the jacks, and the metal plate m , secured to the plate

a to clamp the said strips and springs together, as described.

In witness whereof I hereunto subscribe my name this 21st day of January, A. D., 1898.

FRANK R. MCBERTY.

Witnesses:

ELLA EDLER,
DUNCAN E. WILLETT.