(No Model.)

2 Sheets—Sheet 1.

C. E. SCRIBNER.

TELEPHONE SWITCH.

No. 501,168. Patented July 11, 1893.

Fig. 3.

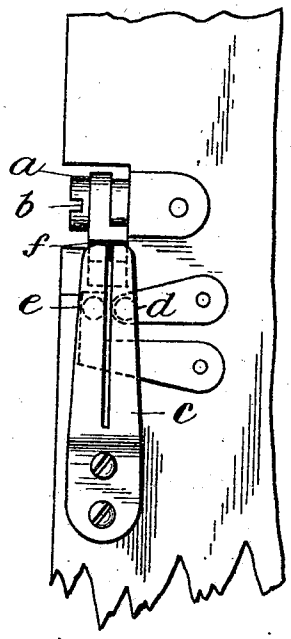


Fig. 2.

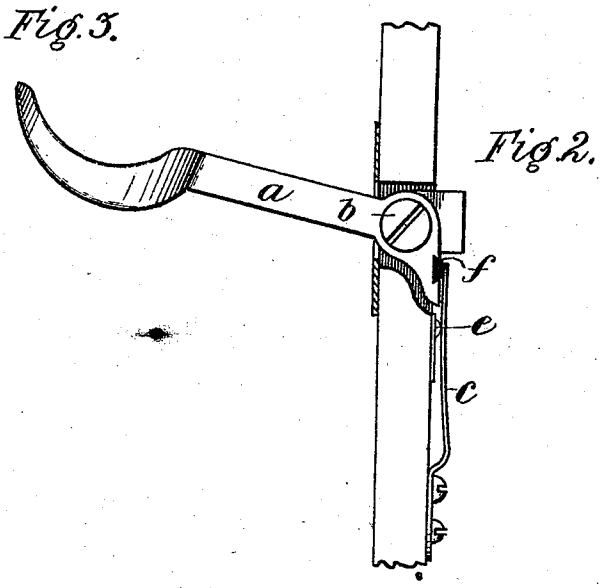


Fig. 4.

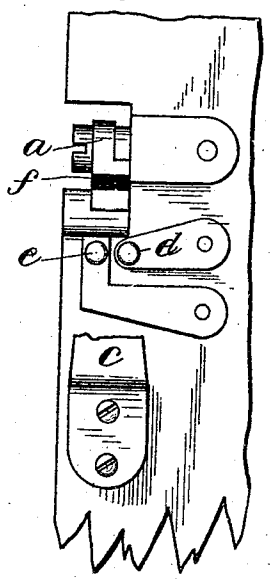
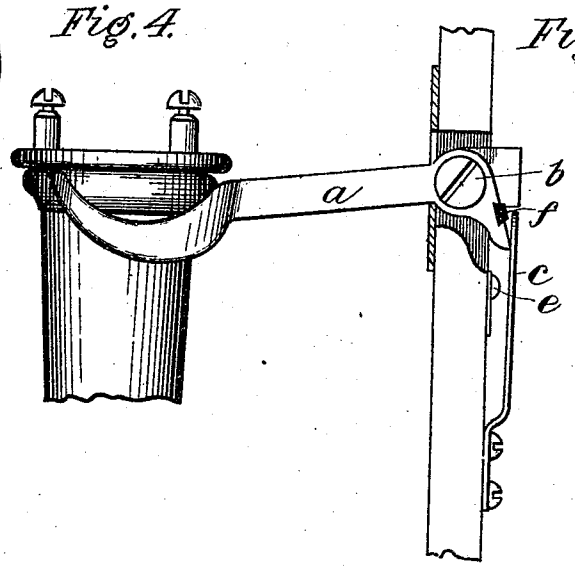


Fig. 1.



Witnesses
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Wm. M. Giller.

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By George P. Barton
Atty

(No Model.) 2 Sheets—Sheet 2.

C. E. SCRIBNER.

TELEPHONE SWITCH.

No. 501,168. Patented July 11, 1893.

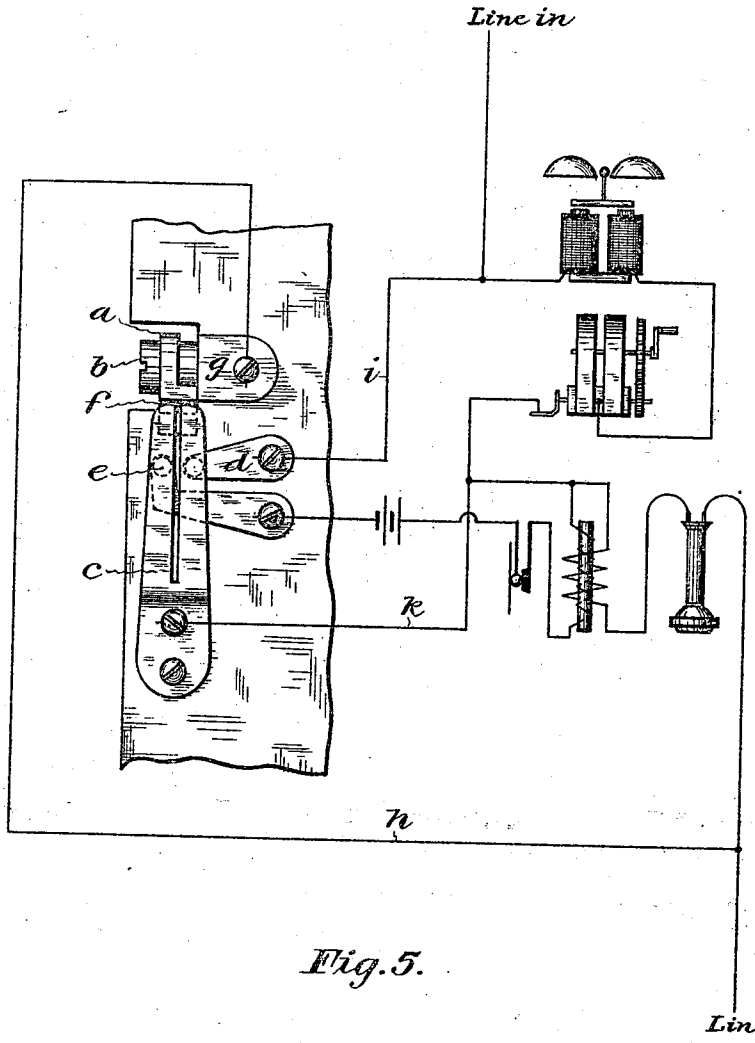

Fig. 5.

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UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

TELEPHONE-SWITCH.

SPECIFICATION forming part of Letters Patent No. 501,168, dated July 11, 1893.

Application filed December 27, 1886. Serial No. 222,694. (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 Telephone-Switches, (Case No. 111,) 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.

My invention relates to telephone switches such as are usually employed at subscribers' stations. These switches are designed to hold the bell in circuit when the telephone is not in use and to automatically bring the telephone into circuit when it is taken down for talking. The well known gravity switch is now most generally used at the subscribers' stations. My wedge switch has also been extensively used. In all of these different forms, a retractile spring has been used in connection with the switch lever so that when the telephone is taken down, the lever will be moved by the retractile spring so as to bring the telephone into circuit. Sometimes branch connections have been used, and sometimes shunt circuits, so that when the telephone is in use, the bell will be cut out or shunted, or vice versa.

My invention relates more especially to the construction of the switch and consists in a flat spring preferably bifurcated, adjusted to press against the shorter arm of the switch lever, the shorter arm of the lever being provided with insulation and a projecting lug or contact. The strength of the spring is such that the lever will be raised by the spring pressure when the telephone is removed, but not of sufficient strength to hold the lever in its elevated position when the telephone is hung thereon. In this manner electrical connection is closed between the lug or contact and the spring when the telephone is on the hook, but broken when the telephone is removed, the spring pressing against the insulation throwing the lever up so as to separate the lug, which is below the insulating piece, from the spring. Local connections for the transmitter are also provided upon which the flat spring closes to complete the circuit when the telephone is removed from the hook. When retractile springs are used, as heretofore, the working margin has been the difference between the weight of the telephone and the force of the retractile spring and no greater margin was obtainable. In my switch, however, there is no such limit, since the flat spring may be made as strong as may be desired, as the weight of the telephone in my device is only required to overcome the difference in pressure of the spring upon the insulated point of the shorter arm of the lever which is nearest the pivot and the contact point or lug placed a short distance therefrom. Thus all the pressure of the contact spring is utilized all the time in making the contact instead of half of it as is the case when an ordinary retractile spring is used. In the patent to Jacob F. Mehren, No. 349,947, dated September 28, 1886, a circuit breaker is shown in which a spring serves to raise the telephone support and make contact therewith when the telephone is removed. The pressure of this spring is, however, at its minimum when its contact is closed with the lever. Moreover, the circuit of the telephone when connected up with the Mehren switch would be through the bearings or pivots thereof. By the use of my invention, better contacts are obtained than heretofore, and in case the pivots of the switch lever should become corroded, no resistance would be thereby introduced into the local circuit or telephone circuit, since these circuits are completely independent of the connection with the switch lever, thus making my switch more reliable than any heretofore made with which I am familiar.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side view of my switch with the telephone hung upon the hook. Fig. 2 is a similar view thereof with the telephone removed. Fig. 3 is a rear view of the bifurcated flat spring with which the line is connected. Fig. 4 is a rear view of the switch with the bifurcated spring broken away. Fig. 5 is a diagram illustrative of the connections of the apparatus at a subscriber's station with my switch.

Like parts are indicated by similar letters of reference in the different figures.

The hook *a* is pivoted at *b* and may be in the form of a bell crank as shown. The flat spring *c* normally rests in connection with one of the arms of the pivoted lever as shown in Fig. 1. The tension or resiliency of flat spring *c* is not sufficient to sustain the weight of the telephone. Therefore when the telephone is upon the switch, as shown in Fig. 1, the flat spring or lever *c* is separated from contacts *d e* and closes to the lever or hook *a* as shown. On removing the telephone from the hook, the spring *c* presses against the arm of the lever and moves said lever until spring *c* comes against the insulation *f*. Spring *c* carries pivoted lever *a* still farther until it is separated from contact with the metallic portion of said pivoted lever and closes upon contact points *d e* as shown in Fig. 2. It will be seen that by this construction, the lever is greatly simplified and contacts made more certain than heretofore, since the spring *c* may be made strong enough to move the pivoted lever loaded with the entire weight of the telephone.

Spring *c* is bifurcated as shown and the free ends of the spring are opposed to two contact points. When the telephone is upon the hook, the pivoted lever forces the spring away from the points and connection is made between the spring and the pivoted lever. In the diagram, Fig. 5, the circuit of the "line in" is through the bell and generator to spring *c* and thence to the shorter arm of switch lever *a* and thence to the bracket *g* and thence by wire *h* to the "line out" when the telephone is hung upon the switch. In this position the spring *c* is lifted from the contacts *e*, *d*, as shown in Fig. 1, so that the circuit of the local battery is open. On removing the telephone, the lever is thrown up to the position indicated in Fig. 3. The spring *c* is disconnected from the lever *a* and rests upon the piece of insulation *f*. The circuit, when the lever is thus raised, may be traced by "line in" over wire *i* to contact *d* and thence to the spring *c* resting upon said contact *d*, and thence by wire *k* through the secondary of the induction coil and the telephone and thence to the "line out." The local circuit is, at the same time, formed between points *e*, *d*, and the spring *c*. When the telephone is removed from the hook, the spring moves into circuit with the two contact points, moving the lever until the extremity of the spring rests upon the rubber, and the metallic portion of the pivoted lever is disconnected from the spring. Thus it will be seen that a connection from the subscriber's line to the switch may be switched to the pivoted lever and thence through the bell and calling generator to ground when the telephone is on the hook, or through the microphone and receiver to ground when the telephone is removed from the hook; and in this latter position the local circuit will be closed through the contact points and the spring as shown without the pivoted lever forming any portion of the circuit. The object of the bifurcation is to permit the single spring *c* to make two separate contacts as shown.

One marked improvement of my device is that the contact with the insulation *f*, and the contact with the metal portion of the short arm of the lever are at different points upon the spring *c*. Heretofore in spring levers for supporting telephone receivers, the springs, as for example in Patent No. 349,947, have been so arranged as to slide from contact with the insulation to contact with the metal part of the short arm of the lever, so that the bearing of the insulation, and of the short arm of the lever will be upon the same point on the spring. The result is in practice that the insulating material soon accumulates, like a film more or less upon the contact surface of the spring, and causes imperfect contact with the metal—in fact producing a partial insulation which frequently actually prevents the proper operation of the instrument. In my device, by providing a different structure whereby the contacts with the surface of the spring shall be upon two separate parts of it, this difficulty is entirely obviated. Hence my device is an important and substantial practical improvement.

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

1. The combination with a telephone switch lever and the telephone adapted to be hung thereon, of the spring adapted to constantly bear against the shorter arm of said lever, said shorter arm being provided with two bearing surfaces, said bearing surfaces being placed at different distances from the pivotal axis of the switch, whereby when the telephone is hung upon the switch the bearing surface farthest from said pivotal axis is pressed against said spring, while the other bearing surface nearest the pivotal axis is separated from the spring, while on removing the telephone the spring by its tension acting to rotate the lever is caused to bear upon the bearing surface nearest to the pivotal axis and separate from the other bearing surface.

2. The combination with the pivoted lever serving as a telephone support, of a bifurcated circuit contact spring fixed at one end and adapted to press continuously at its other end upon the shorter arm of said lever, the tension of said contact spring being sufficient to raise the telephone supporting lever when the telephone is removed therefrom, and local contact points *d e* under the different portions of said bifurcated contact spring upon which contact points said spring is closed when the telephone is removed from the switch, thereby completing a local transmitter battery circuit independent of the pivot of the telephone supporting lever, substantially as described.

3. In a telephone switch, the combination of the bifurcated spring *c*, two contact points, one for each prong of the bifurcated switch

and a lever pivoted as described, whereby the two springs of the lever may be alternated in connection to the pivoted lever or to the two contact points.

4. The combination with a vibrating telephone switch having the shorter arm provided with two bearing surfaces, one metallic and the other of insulating material, said bearing surfaces being at different distances from the pivotal axis of the switch, of a spring contact adapted to constantly press against the said shorter arm, the pressure of said spring being exerted upon only one of said bearing surfaces at a time, the particular bearing surface against which the spring is pressed being determined by the position of the switch lever, substantially as and for the purpose specified.

In witness whereof I hereunto subscribe my name this 3d day of November, A. D. 1886.

CHARLES E. SCRIBNER.

Witnesses:
GEORGE P. BARTON,
CHAS. C. WOODWORTH.