(No Model.)

C. E. SCRIBNER.

COMBINATION TELEPHONE KEY.

No. 433,424. Patented July 29, 1890.

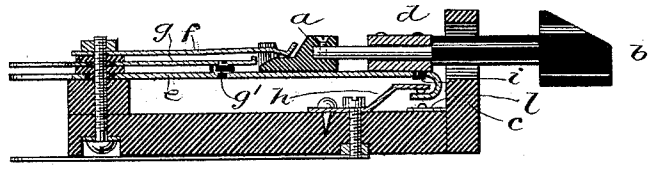

Fig. 1.

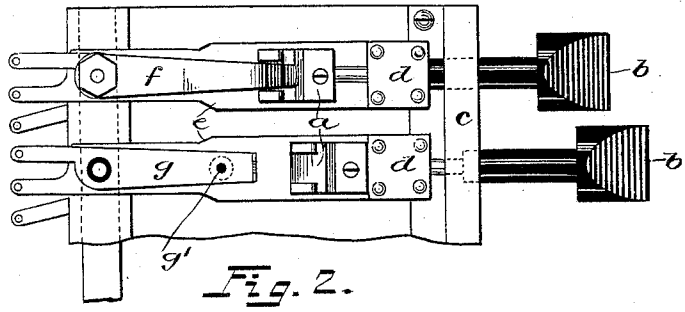

Fig. 2.

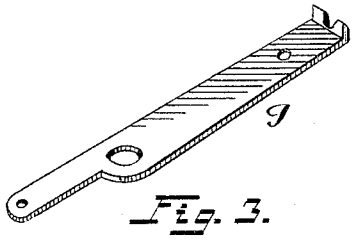

Fig. 3.

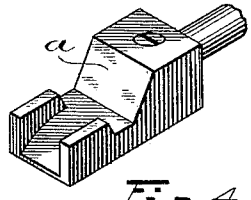

Fig. 4.

Witnesses.
C. G. Hawley.
Geo. R. Parker.

Inventor.
Charles E. Scribner.
By George P. Barton
Attorney.

UNITED STATES PATENT OFFICE.

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

COMBINATION TELEPHONE-KEY.

SPECIFICATION forming part of Letters Patent No. 433,424, dated July 29, 1890.

Application filed June 1, 1889. Renewed April 17, 1890. Serial No. 348,315. (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 Combination Telephone-Keys, (Case 200,) 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 electric keys, and more especially to that form which is designed for use in telephone-exchanges. Combination-keys adapted to connect the operator's telephone into circuit when operated in one way and to make connection with the signal battery or generator when operated in another way have been sometimes termed "listening" and "calling" keys. As to the state of the art prior to my invention, reference is made to Letters Patent No. 388,453, granted me August 28, 1888, for loop-key. Owing to the constant use to which my loop-key, as shown in said patent, is subjected in a telephone-exchange, the contact-springs have sometimes become displaced, being moved laterally, and in some cases said springs have lost their proper tension, so as to be connected together improperly. By my invention herein I avoid these defects, the springs being always maintained in proper relation one to another and of proper tension.

My invention consists in providing a grooved wedge and two studs or separating-pieces of insulating material and a knife-edge contact-point upon one of the springs arranged and combined as hereinafter described.

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

Figure 1 is a sectional view of my key. Fig. 2 is a plan view showing a portion of a section or strip of such loop-keys. Fig. 3 is a detached perspective view of the spring provided with the knife-edge contact. Fig. 4 is a detail perspective view of the wedge provided with side pieces for preventing the spring which is operated thereby from moving laterally.

I have not deemed it necessary to show the circuit and connections, since they form no part of the invention herein claimed.

Referring to Fig. 1, the wedge *a* is of insulating material, and is provided with a handle or knob *b*, the shank of which passes loosely through an opening in the face *c* of the strip. The hole in the facing *c* is somewhat larger than the shank, in order that the handle may be depressed when desired. I provide the guide *d*, which is mounted upon the free end of the contact-spring *e*. The wedge *a* in Fig. 1 is shown thrust in under spring *f*, so as to lift said spring *f* from the knife-edge contact provided upon its underlying contact-spring *g*.

As shown more clearly in Fig. 4, it will be seen that the wedge is provided with side pieces, so that the spring *f* cannot be moved laterally. The spring *g* is separated from spring *e* by a stud *g'* of insulating material. This stud *g'*, being inserted into each of springs *g* and *e*, holds said springs separate and prevents any lateral motion thereof. The knife-edge is thus always held high enough, so as to form a support for the spring *f* when the wedge is withdrawn, thus insuring a good electrical connection between springs *g* and *f*. The free end of spring *e* is bent, so as to come under the contact *h*, and the tension of said spring *e* is such as normally to press against said contact *h*, as shown. This pressure of spring *e* against contact *h* must be sufficient to insure a good electrical connection.

I have provided a rubber stud *i* above the contact *h* upon the spring *e*, in order that when handle *b* is depressed and connection made between spring *e* and the generator-contact *l*, while connection is broken between the spring *e* and contact *h* below, there will be no accidental connection made between spring *e* and contact *h* above. This stud *i* enables me to adjust the spring *e* to press upward with greater force than would be safe if the said stud *i* were not used.

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

1. The combination, with the handle *b*, mounted upon the free end of a spring, of a contact *h*, under which the free end of said spring is bent and adapted to press normally against the same, a contact *l*, against which

the free end of said spring is adapted to be closed when the handle is depressed, and a stud *i*, of insulating material, above contact *h*, substantially as and for the purpose specified.

2. The combination, with the spring *g*, provided with a knife-edge and placed in the same plane with springs *f* and *e* on opposite sides thereof, of the stud *g'* between spring *e* and spring *g*, and the grooved wedge mounted upon spring *e* and adapted to be thrust under spring *f* to lift the same, whereby lateral movement of said springs is prevented and springs *g* and *e* maintained insulated from one another, substantially as and for the purpose specified.

3. The combination, with the spring *g*, provided with a knife-edge and placed in the same plane with springs *f* and *e* on opposite sides thereof, of the stud *g'* between spring *e* and spring *g*, and the wedge mounted upon spring *e* and adapted to be thrust under spring *f* to lift the same, whereby lateral movement of said springs is prevented and springs *g* and *e* maintained insulated from one another, substantially as and for the purpose specified.

4. The combination, in a telephone-key, of lever *e*, with its opposing contact, a contact-piece *g*, carried thereon, a stud *g'*, adapted to insulate the lever *e* from contact-piece *g* and at the same time prevent lateral motion of the one with relation to the other, contact-spring *f*, adapted for contact with contact-piece *g*, plunger *a*, provided with projecting flanges adapted to lift spring *f* from contact-piece *g* and at the same time prevent lateral motion of the said spring *f*, whereby spring *e* may be moved to and from its contact or the spring *f* be moved to and from its contact and disarrangement of the parts with relation to each other prevented, substantially as set forth.

5. The combination, with the spring *f*, of its underlying spring and the spring *e* and its contacts, said spring *e* carrying the guide, said springs being in the same plane, and the grooved wedge and the handle therefor, said wedge being adapted to be inserted under the free end of spring *f* to lift the same from contact with its said underlying spring, and the handle thereof having a vertical movement, whereby on depressing the handle the spring *e* is separated from one contact and closed upon another contact, while lateral movement of the springs is prevented when the wedge is inserted, substantially as and for the purpose specified.

6. The combination, with the springs *e f* and the intermediate spring, of the stud *g'*, of insulating material, between the spring *e* and the intermediate spring, and the grooved wedge mounted upon the free end of spring *e* and adapted to be inserted under the spring *f* to lift the same from contact with the intermediate spring, while lateral movement of the several springs with relation to one another is prevented, substantially as set forth.

In witness whereof I hereunto subscribe my name this 9th day of May, A. D. 1889.

CHARLES E. SCRIBNER.

Witnesses:
ELLA EDLER,
GEORGE P. BARTON.