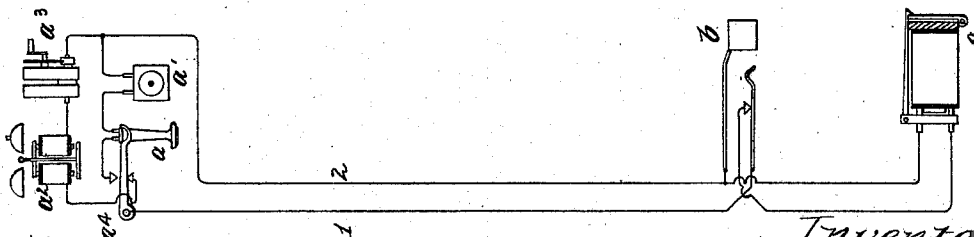
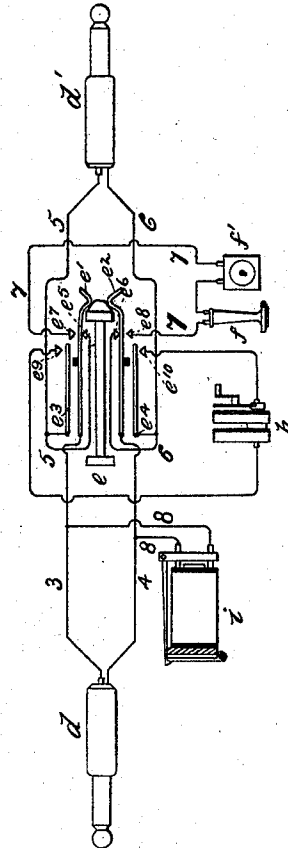
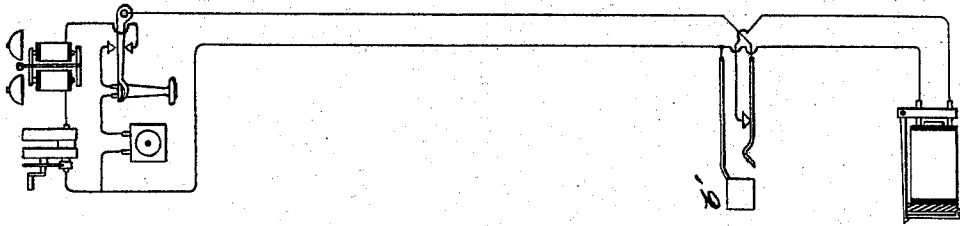


(No Model.)

F. R. McBERTY.
KEYBOARD APPARATUS.

No. 573,992.

Patented Dec. 29, 1896.



Witnesses:
Dr. H. C. Sargent.
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UNITED STATES PATENT OFFICE.

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

KEYBOARD APPARATUS.

SPECIFICATION forming part of Letters Patent No. 573,992, dated December 29, 1896.

Application filed October 29, 1895. Serial No. 567,239. (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 Keyboard Apparatus, (Case No. 30,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention concerns the operators' appliances of telephone-switchboards, being a new form of key and arrangement of circuits for transmitting signaling-currents to substations.

The object of the invention is to permit the sending of such currents automatically, the operations of connecting the source of signaling-current with the telephone-line and disconnecting it therefrom being performed incidentally to other necessary acts in the process of uniting lines in the switchboard.

The invention consists in the combination, with the plug-circuit uniting the members of a pair of connecting-plugs and the key for connecting a telephone with the plug-circuit, of a pair of switch-springs controlled incidentally in the operation of the key adapted to disconnect one of the plugs from the other and to connect it with a source of signaling-current during the use of the telephone, the latter instrument being connected with the other plug. The plug with which the telephone is connected may be employed to make connection with a calling-line. Then the insertion of the other plug into a spring-jack of the required line at once connects the source of signaling-current with that line, the signaling-current being interrupted by the manipulation of the key to disconnect the telephone.

A form of the invention is shown in the drawing herewith, in which a plug-circuit equipped with the invention is represented at a switchboard wherein two telephone-lines terminate.

The appliances at the substations may be of the usual type—telephones a and a' , a signal-bell a^2 , a generator a^3 of signaling-current, and a switch a^4 for connecting the signaling apparatus and the telephones alter-

nately with the line-circuit. The metallic-circuit line comprises two line-wires 1 and 2, which extend to the contact-pieces of a spring-jack b in a switchboard, and thence to an annunciator c near the spring-jack.

The usual plugs d and d' are furnished for uniting lines by means of their spring-jacks, and a "listening-key" e is provided controlling the connection of the operator's telephones $f f'$ with the conductors uniting the plugs. This key has two pairs of switch-springs $e' e^2$ and $e^3 e^4$, all of which are thrust outward when the button of the key is depressed. Springs e' and e^2 have normal resting-anvils e^5 and e^6 , respectively, and alternate anvils e^7 and e^8 . Springs e^3 and e^4 have only the anvils $e^9 e^{10}$, upon which they impinge when separated.

The tip g and sleeve g' of plug d are connected, by conductors 3 and 4, respectively, with the springs e' and e^2 . The tip of plug d' is united by wire 5 with the spring e^3 and anvil e^5 of the key, and the sleeve of the plug with the spring e^4 and contact e^6 . The anvils e^7 and e^8 constitute the terminals of a conductor 7, including the operator's telephone. The anvils e^9 and e^{10} form the terminals of a generator h of current suitable for operating the signal-bells a^2 at the substations.

The usual clearing-out annunciator i is connected in a bridge 8 of the plug-circuit.

The key e may be left normally in position to sever the connection between the two plugs, leaving the plug d connected with the telephones $f f'$ and the plug d' connected with the generator h .

The subscriber may operate his line-annunciator c in the usual way—by operating his generator a^3 . The operator, responding to the call, inserts plug d (which may be denominated the "answering-plug") into spring-jack b , whereupon she finds her telephones connected with the line ready to receive the subscriber's order. Having learned the number of the line with which connection is required, she inserts plug d' (the "calling-plug") into the spring-jack b' of that line. The calling-generator h is now connected with the line to the required station and rings the bell at the station. A moment later the operator may release the plunger of key e , whereby

the telephone-circuit 7 and the generator *h* will be disconnected from the plugs and the latter will be united through conductors 3 5 and 4 6. The plug-circuit joining the lines for
5 conversation is then complete.

It will be observed that this device obviates all waste of time in transmitting call-signals after the establishment of connection with a line and all manipulation of special
10 calling-keys.

The invention admits of various modifications. Hence I do not limit myself to the form shown; but

I claim as new and desire to secure by Letters Patent—
15

1. The combination with a plug, of a telephone-circuit associated therewith, a generator of signaling-currents, a key constructed to interrupt said telephone-circuit and to connect
20 said generator with the plug, and an instrument through which the severed portion of the telephone-circuit is closed by said key; substantially as described.

2. The combination with an answering-plug, of a calling-plug, a plug-circuit for the
25 plugs, a generator of signaling-currents, a telephone, and a combined listening and calling key constructed to connect the generator with the calling-plug and the telephone

with the answering-plug; substantially as described. 30

3. The combination with the answering-plug having a telephone associated therewith, of a calling-plug having a generator of calling-currents associated therewith, a plug-circuit for the plugs, and a key constructed to sever the connection between the plugs and to connect the generator with the calling-plug and the telephone with the answering-plug; substantially as described. 35 40

4. In combination two telephone-lines, one provided with a telephone and the other with a signal-bell, a conductor uniting the lines, an operator's telephone and a generator of signaling-current, a key connecting said telephone with said first-mentioned line and said generator of signaling-current with said second-mentioned line, and switch-contacts in the key operated in disconnecting the generator in the telephone adapted to complete the
50 conductor uniting the lines, substantially as described.

In witness whereof I hereunto subscribe my name this 14th day of September, A. D. 1895.

FRANK R. McBERTY.

Witnesses:

ELLA EDLER,
LUCILE RUSSELL.