

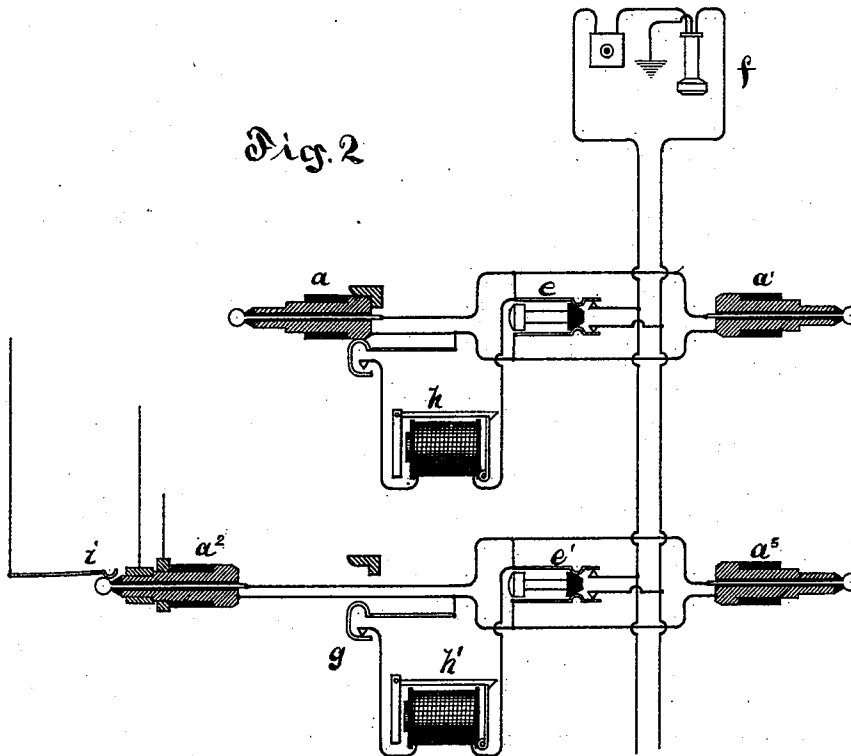
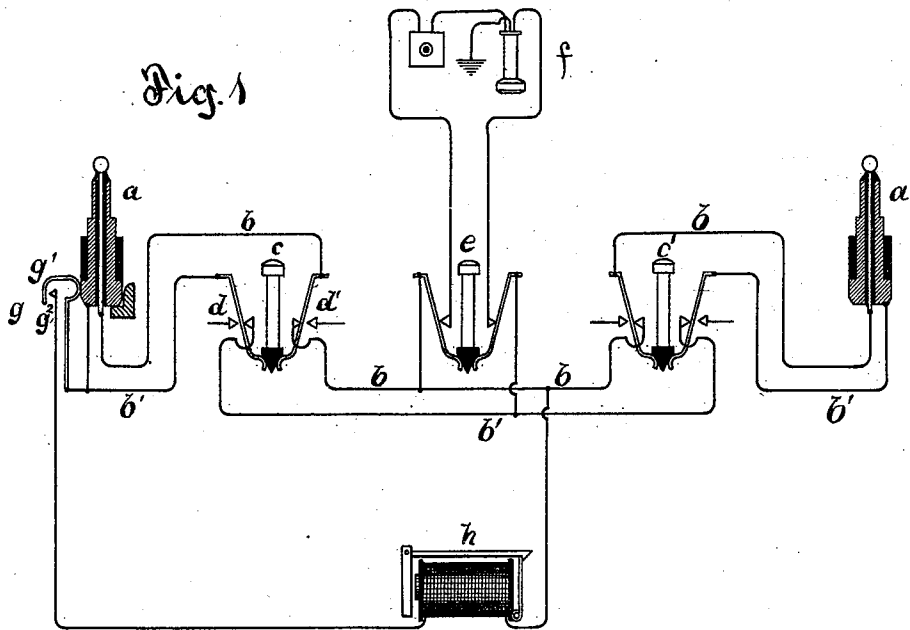
(No Model.)

C. E. SCRIBNER.

KEYBOARD APPARATUS FOR TELEPHONE SWITCHBOARDS.

No. 548,229.

Patented Oct. 22, 1895.



WITNESSES

A. Benoit
Ella Edler

INVENTOR

Charles E. Scribner
By *Barton Brown*
Attys.

UNITED STATES PATENT OFFICE.

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

KEYBOARD APPARATUS FOR TELEPHONE-SWITCHBOARDS.

SPECIFICATION forming part of Letters Patent No. 548,229, dated October 22, 1895.

Application filed February 7, 1893. Serial No. 461,388. (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 Keyboard Apparatus for Telephone-Switchboards, (Case No. 319,) 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 switching apparatus for central offices of telephone-exchange systems, more particularly to the circuits and mechanism of the "keyboard," or the connecting-plugs and their associate appliances.

The object of my invention is to simplify the operation of the keyboard apparatus in establishing connection between two lines.

Heretofore each operator at each switchboard in a telephone-exchange office has been provided with pairs of connecting-plugs electrically connected together, keys by which she was enabled to connect a telephone set to any particular pair of plugs, or to disconnect it therefrom, and an annunciator, known as the "clearing-out" annunciator, connected with the plug-circuit to receive the signal for disconnection from the connected sub-stations. These clearing-out annunciators have commonly been constructed of high resistance and retardation, and one has been connected in a bridge-wire between the different sides of each plug-circuit joining the different contact-pieces of the plugs, if these were adapted for metallic circuits, or between the plug-circuit and earth in the case of grounded circuits. Each operator is usually provided with twelve or fifteen pairs of connecting-cords. It has thus been necessary that the listening-keys for connecting an operator's telephone with any cord-circuit should be normally in position to disconnect the telephone, since if they were all placed in the position of connecting the telephone with the different cord-circuits the telephone set would be shunted by the twelve or fifteen clearing-out drops, and would thus be greatly reduced in efficiency. Hence the operator, having received a call from a subscriber's line, after inserting one connecting-plug into the spring-

jack of that line to answer the call, must throw the key corresponding to the pair of connecting-plugs which she has employed into position to connect her telephone therewith, and having received the order she must again operate the key to disconnect the telephone from the plug-circuit.

In my invention I arrange the clearing-out drops in normally-open branch circuits between the different sides of the plug-circuits and provide cord-switches, one for each pair of connecting-plugs, adapted to be actuated by the lifting of the plug from its socket to close the normally-open branch containing the clearing-out annunciator. Thus in the normal condition of the apparatus the plugs are all in their sockets and the clearing-out annunciators of all the pairs of plugs are disconnected from their respective plug-circuits, while the operator's telephone is connected with all the plug-circuits. Upon receiving a call-signal the operator lifts one of the connecting-plugs of a pair and inserts it into the answering spring-jack of the calling-line. She thus places her apparatus in position to receive the order from the subscriber without manipulating any keys, while by the same act the clearing-out drop is connected with the cord-circuit. The clearing-out drop of the cord-circuit used only is connected with its cord-circuit. The operation of establishing connection between subscribers is thus facilitated and the time required in performing the operation is correspondingly reduced.

I have illustrated my invention in the accompanying drawings, and will describe it more fully in connection therewith.

Figure 1 of the drawings shows a pair of loop-connecting plugs connected together in the usual manner by conductors, the operator's calling-keys and listening-key, the clearing-out drops, and the cord-switch being also shown. In Fig. 2 I have shown two pairs of loop-connecting plugs with their plug-circuits simplified by the omission of the calling-keys, one of the connecting-plugs being inserted into a spring-jack of a line to connect therewith, and the corresponding cord-switch being in position of connecting the annunciator with the plug-circuit.

Referring to Fig. 1, *a a'* are loop-connecting

plugs of ordinary construction. The tips of the plugs are connected together by conductors b and the sleeves by conductors b' . Included in the circuit of the conductors $b b'$ are two calling-keys c and c' , each having switch-contacts by which, when the plunger is depressed, it disconnects both contact-pieces of one of the plugs from those of the other and connects them to the terminals $d d'$ of any suitable generator of signaling current. A listening-key e is provided, having its contact-springs connected to the conductors b and b' , respectively, and its corresponding contact-points connected with the terminals of the telephone set f . The plug a rests in a socket provided with a cord-switch g , consisting of a spring g' , having a pressure toward the plug, and a contact-point g^2 , against which the spring g' closes when the plug is removed from its socket. The clearing-out annunciator h is connected at one terminal with the conductor b and at the other terminal with the contact g^2 of the cord-switch. The spring g' of the cord-switch is connected with the sleeve strand or conductor b' of the plug-circuit. Thus in the idle condition of the plugs a and a' the clearing-out annunciator h is disconnected from the plug-circuit $b b'$ at the cord-switch g , while the telephone set f is connected with the plug-circuit through the listening-key e . When the plug a is raised from its socket to answer a call from a subscriber's line, the cord-switch contacts are closed, whereby the bridge-wire between the sides $b b'$ of the plug-circuit is completed through annunciator h . When the order has been received, the telephone set f is disconnected from the cord-circuit by depressing the plunger of the key e .

In Fig. 2 pairs of plugs a, a', a^2 , and a^3 are shown connected by circuits similar to those of Fig. 1. The telephone set f is connected to the listening-keys e and e' of both plug-circuits, and normally is connected with both plug-circuits. The annunciator h of one pair of plugs $a a'$ is in an open circuit. The plug a^2 of the other pair is shown inserted into a spring-jack i , as in answering a call from a subscriber, and the cord-switch g of that pair of plugs is closed, whereby the clearing-out annunciator h' is connected with the circuit. Thus the telephone set f is shunted only by the clearing-out annunciator h' , so that its efficiency is not appreciably reduced. It will be understood that an operator may be provided with many more pairs of plugs than herein shown, and several of these may be in use at the same time in connecting lines, so that several of the individual annunciators

may be connected with their plug-circuits; but the operator will have disconnected her telephone set f from all but one of the plug-circuits in use by means of the listening-keys, so that her telephone set is still shunted by only one of the clearing-out annunciators.

Thus by the employment of my invention a saving of one operation—namely, that of throwing the listening-key into position to connect the telephone set with the plug-circuit preliminary to receiving an order—is effected, and a considerable saving in time and labor in effecting connections is attained.

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

1. The combination with a pair of plugs united by conductors, of a clearing out annunciator in a normally open circuit, a socket for one of said plugs, and means for automatically closing the normally open circuit containing the clearing out annunciator when said plug is removed from the socket; substantially as described.

2. The combination with connecting plugs of a telephone switchboard, of circuits connected with the plugs, a normal resting-socket for each plug, a cord switch in each socket, an annunciator and circuit connections to the annunciator controlled by the cord switch to connect the annunciator with the plug circuit, substantially as described.

3. The combination with a pair of connecting plugs connected by conductors, of a socket for one of the plugs wherein it rests when idle, a cord switch having contact points arranged to be separated when the plug is in its socket, an annunciator, and circuits connecting the annunciator through the cord switch contacts with the plug circuit, substantially as described.

4. The combination with several connecting plugs and their plug circuits, of a telephone normally connected with all the plugs, a socket for each plug wherein it rests when idle, a cord switch in each socket, an annunciator for each plug circuit and circuit connections with each annunciator controlled by the corresponding cord switch to connect it with the corresponding plug circuit when the plug is lifted from its socket, substantially as described.

In witness whereof I hereunto subscribe my name this 6th day of January, A. D. 1893.

CHARLES E. SCRIBNER.

Witnesses:

ELLA EDLER,
A. P. BENNOCK.