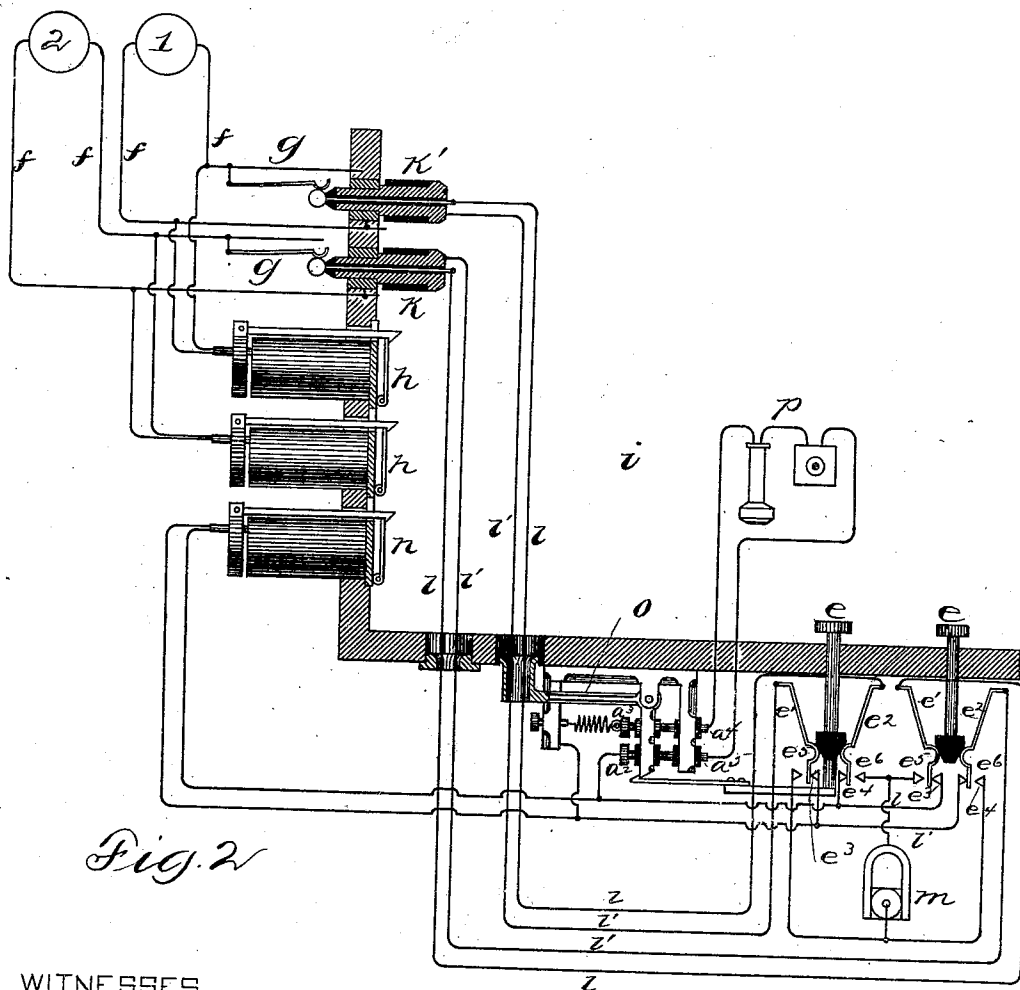
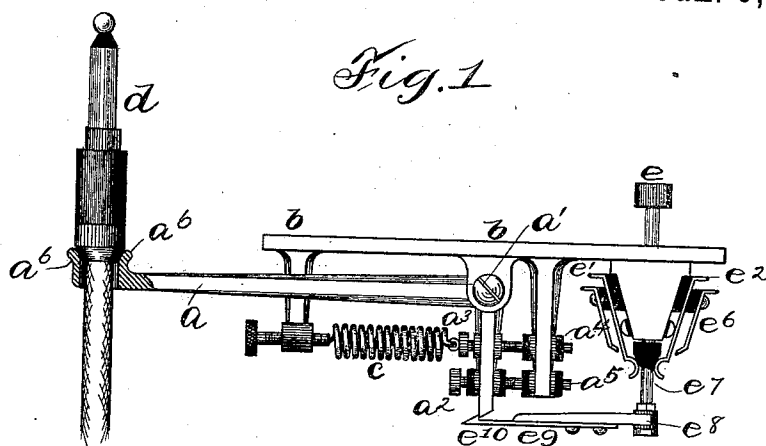


(No Model.)

C. E. SCRIBNER.
APPARATUS FOR TELEPHONE SWITCHBOARDS.
No. 512,398.

Patented Jan. 9, 1894.



WITNESSES
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ELECTRIC COMPANY, OF SAME PLACE.

APPARATUS FOR TELEPHONE-SWITCHBOARDS.

SPECIFICATION forming part of Letters Patent No. 512,398, dated January 9, 1894.

Application filed April 26, 1893. Serial No. 471,978. (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 Apparatus for Switchboards of Telephone-Exchanges, (Case No. 329,) 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 appliances for operators of telephone switchboards.

Its object is to provide means for automatically switching the operator's telephone into and out of circuit with the plug circuit or connecting appliances by means of which she establishes connection between telephone lines.

In the operation of making connection between telephone lines by means of the switching apparatus in ordinary use, the operator, having inserted one loop plug of a pair into a springjack of a line in response to a call signal, must connect her telephone into circuit with the loop plug to receive the order of the calling subscriber for the connection desired, and having made the connection, must disconnect her telephone from the plug circuit in order to attend to other calls, such connection and disconnection being effected by means of a manually operated key. Obviously, a considerable portion of the operator's time is consumed in the manipulation of these keys.

My invention aims to dispense with the manually operated keys and to provide automatic switching apparatus for the telephone adapted to be actuated incidentally in the performance of other necessary acts, thus eliminating from the series of necessary operations the two manipulations of the telephone switching key.

In my invention I provide for each pair of plugs a switch adapted to close the circuit of the operator's telephone with the circuit of its particular pair of plugs. The switch is brought into position to connect the telephone with the plug circuit by the weight or pressure of one of the plugs in a socket adapted to receive it, and is retained in that position by a catch until the calling key is depressed to send the call signal to the station called for after the completion of the con-

nection, the catch being disengaged from the switch by the action of the calling key and permitting the switch to disconnect the telephone from the plug circuit. Thus the operator's telephone is normally in connection with the plug circuit so that the order may be received at once upon the insertion of a plug into a springjack of the calling line, and is retained in connection with the plug circuit until, after the completion of the desired connection, the ringing key is operated; and when the connecting plugs are removed from the springjacks and returned to their sockets, to disconnect the lines, the telephone is automatically connected with the plug circuit.

My invention is illustrated in the accompanying drawings.

In Figure 1 of the drawings I have represented one form of my automatic switching or listening key. In Fig. 2 the same key is shown in connection with a plug circuit upon a telephone switchboard with which two telephone lines are connected, the lines being looped together by means of the connecting plugs.

Referring to Fig. 1 a bell crank lever *a* is provided, pivoted at *a'* to a suitable frame or standard *b*; the lever *a* carries upon its shorter arm two contact points *a²* and *a³*, the contact points being insulated from the lever. Insulated contact anvils *a⁴* and *a⁵* are provided fixed to the frame *b* in position to engage with the contact points *a²* *a³* when the longer arm of the lever is in its lowest position. A light retractile spring *c* attached to the shorter arm of the lever tends to separate the contact points. The longer arm of the lever is provided with a socket *a⁶* adapted to receive the connecting plug *d* and sustain its weight. The spring *c* is adjusted so that the lever is depressed by the weight of plug *d* until the contact points are brought into engagement. A calling key *e* is fixed to the base plate of the frame *b*. The calling key comprises two contact springs *e¹* *e²* which normally rest upon contact anvils *e³* *e⁴*, but which may be forced away from the contact anvils and into connection with other contact points *e⁵* and *e⁶* by the depression of the wedge-shaped plunger *e⁷* which enters between the springs to force them outward. The plunger *e⁷* carries also a horizontal projecting extension *e⁸*

to which is fixed a light spring e^9 terminating in a hook or catch e^{10} which engages with the extremity of the short arm of lever a . When the plug is permitted to rest in its socket e^6 , the calling key e being in its normal position, the short arm of lever a is brought into engagement with the catch e^{10} and is retained by it when the plug is removed; the depression of the plunger of the calling key e frees the lever from the catch e^{10} and permits it to withdraw the contact points a^2 a^3 from the anvils a^4 a^5 under the influence of the retractile spring c .

In Fig. 2 substations 1 and 2 are represented each connected by a line circuit f with a springjack g and a signal receiving annunciator h upon a switchboard i at the central station. One pair of loop plugs k k' is shown upon the switchboard, the plugs being shown inserted in the springjacks of the telephone lines. The like contact pieces of the two plugs are connected together by conductors l and l' which thus serve to unite the two telephone lines into a continuous electric circuit. Two calling keys e are provided included in the circuit of the conductors l l' ; the springs e' e^2 of each key are connected with the contact pieces of the corresponding plug, while the contact anvils e^3 and the anvils e^4 of the two keys are connected together respectively. The anvils e^5 e^6 constitute the terminals of a generator m of signaling current. Thus by depressing either of the keys the circuit from the corresponding plug to the other plug of the pair is interrupted and the signaling generator m is looped into circuit with it to send a call signal over the line with which the loop plug is connected. A clearing-out annunciator n is permanently connected in a bridge or branch connection between the conductors l and l' of the plug circuit. A listening key or telephone switch o , such as shown in Fig. 1, is represented upon the switchboard. The loop plug k' is adapted to rest upon the socket e^6 when not in use. The contact points a^2 a^3 are connected with the different conductors l l' , respectively; the contacts a^3 a^4 constitute the terminals of the operator's telephone set p . The subscriber at one substation desiring to be put in communication with another substation may send a signaling current as usual to operate his annunciator at the central office; the operator observing the signal inserts one plug k into the springjack of the line calling and is thus at once in position to receive the oral order from the calling subscriber for the connection desired. She then completes the connection with the line called for by inserting the remaining plug k' of the pair into the springjack of that line and depresses the plunger of the appropriate calling key, looping the generator m into circuit with the plug k' and thus transmitting a signaling current to the distant substation to notify the subscriber there that a connection awaits attention. The act of depressing the plunger of key e , to send the call signal, releases the

telephone switch o and permits it to disconnect the operator's telephone p from the plug circuit, leaving the telephone free to be connected with other plug circuits in answering other calls. Obviously, a single telephone might be connected with a number of different keys o by branch wires extending to their contact pieces a^4 a^5 . When the subscribers have finished their conversation, one of them transmit the signal for disconnection, by which the clearing-out annunciator n is operated and indicates the signal to the attendant, who thereupon removes the plugs k k' from the springjacks and returns them to their sockets. When the plug k' is replaced in its socket it depresses the lever a , again connecting the telephone with the plug circuit, and at the same time bringing the short arm of the lever into engagement with the catch e^{10} .

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

1. The combination in a switch, of a switch lever actuated by the pressure of a connecting plug in its socket, a catch engaging the switch lever to retain it in one of its positions, and means for actuating the catch to release the switch lever, substantially as described.
2. The combination with a switch lever adapted to be actuated by the pressure of a connecting plug in its socket, of a catch adapted to engage with the switch lever to retain it in one of its positions, said catch being controlled by another switch key to release the switch lever, substantially as described.
3. The combination with the plug circuit of a switch-board, of a switch lever adapted to be actuated by the pressure of one of the plugs in its socket when out of use, said contacts upon the switch lever controlling the connections of a telephone with the plug circuit, a catch adapted to engage with the switch lever to retain it in one of its position, said catch being controlled by a calling key in the plug circuit, substantially as described.
4. In combination, a pair of connecting plugs, conductors joining the plugs together, a switch adapted to be actuated by the pressure of one of the plugs in its socket when out of use, a telephone whose connections with the plug circuit are controlled by the switch, a calling key in the plug circuit and a catch connected with the calling key, normally engaging the switch lever to retain it in position to connect the telephone with the cord circuit, adapted to be disengaged from the switch lever when the calling key is operated to send a call signal, substantially as described.

In witness whereof I hereunto subscribe my name this 22d day of March, A. D. 1893.

CHARLES E. SCRIBNER.

Witnesses:

ELLA EDLER,
LUCILE RUSSELL.