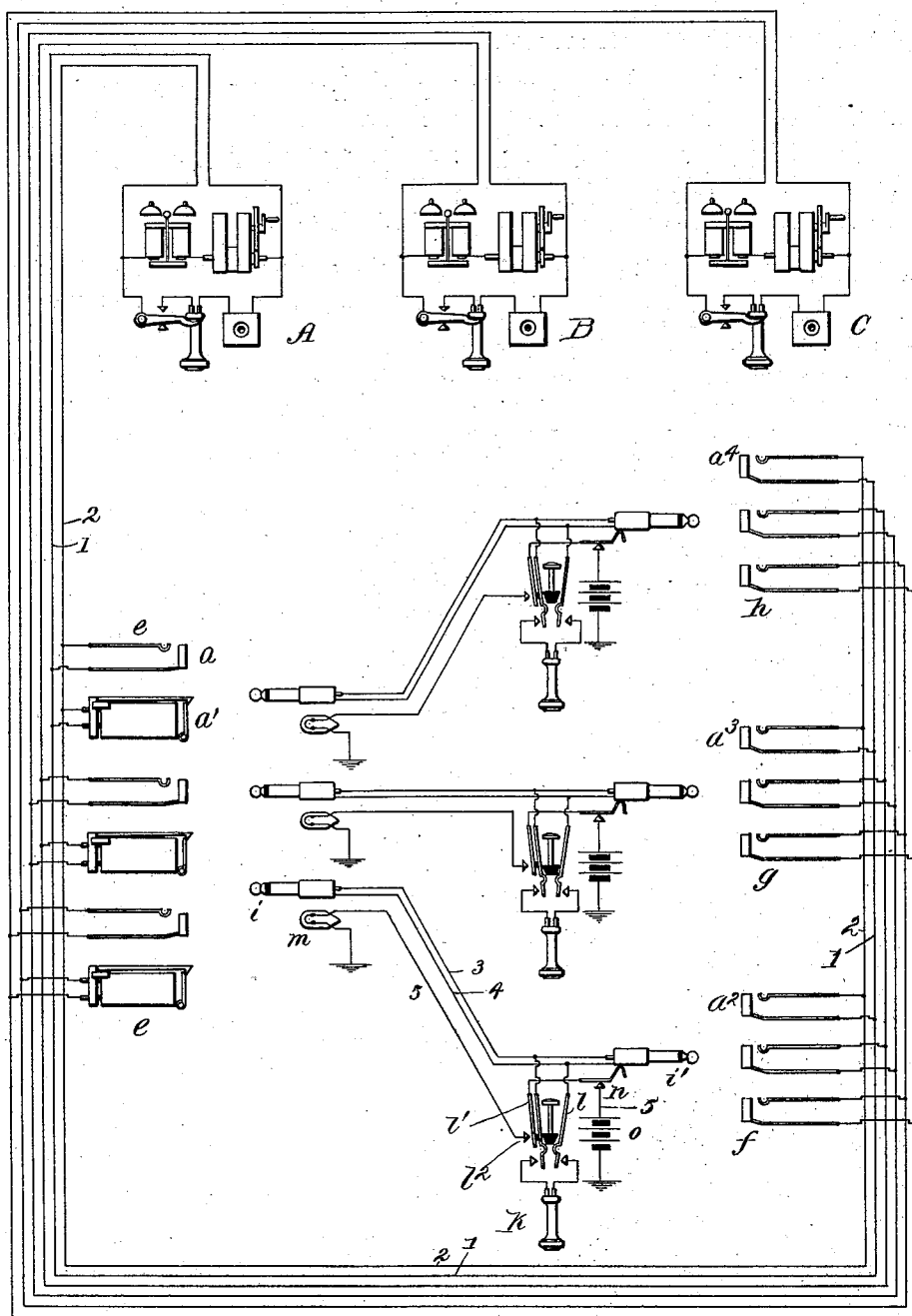


(No Model.)

F. R. McBERTY.
APPARATUS FOR TELEPHONE SWITCHBOARDS.

No. 567,404.

Patented Sept. 8, 1896.



Witnesses:
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UNITED STATES PATENT OFFICE.

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APPARATUS FOR TELEPHONE-SWITCHBOARDS.

SPECIFICATION forming part of Letters Patent No. 567,404, dated September 8, 1896.

Application filed January 24, 1896. Serial No. 576,681. (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 Apparatus for Telephone-Switchboards, (Case No. 34,) 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 applies to the plan of switching telephone-lines in exchanges known as the "call-distributing system." It is an arrangement of signals for facilitating the work of the attendants and securing an increased efficiency of operation.

In the call-distributing system all subscribers' initial call-signals are noted by an operator denominated the "distributing-operator," by whom they are distributed among several other operators, who receive the subscribers' orders and make the required connections, the latter class being named "answering-operators," the design being that the work of making the connections may be equally divided among the several switching-operators.

My invention consists in a system of signals under the observation of the distributing-operator and controlled by the answering-operator, by which the latter may signalize to the former her readiness to answer calls, whereby the distributing-operator may be kept informed as to the busy or idle condition of the answering-operators, and may be able to so assign calls to each operator as to keep all uniformly busy. These signals may preferably be operated by the answering-operator automatically or incidentally in the performance of some manual act in the process of receiving orders or making connections. In a satisfactory embodiment of the invention the signaling instrument is associated with the terminal plug of a trunk-line leading from the distributing-operator to an answering-operator, and is operated by the listening-key of the answering-operator in the act of connecting her telephone with the trunk-line in position to receive orders. The display of a

signal then indicates to the distributing-operator that the answering-operator attending the corresponding trunk-line has her telephone connected with that line and is free to receive orders. She will therefore connect the terminal plug with the line of the next subscriber calling, after which the answering-operator will obtain the subscriber's order for the connection required, and will perform the necessary acts to establish communication as demanded. The first movement of the answering-operator may cause the effacement of the signal before the distributing-operator, so that the disappearance of this signal will inform the latter operator that the call has received attention. This form of the invention is shown in the attached drawing. The drawing represents diagrammatically three telephone-lines extending from substations to the central station, connected at the central station, each with a connection-socket and a signaling instrument at an annunciator-board, and with several connection-sockets on different sections of a multiple switchboard. The necessary trunk-lines between the distributing-operator and the different answering-operators, together with the signaling apparatus which constitutes the subject of this application, are also shown.

Since the equipment and connections of the different lines are alike, it will be sufficient to trace and describe only one of the lines.

The line 1 2 may terminate at its substation A in any usual telephonic and calling apparatus. At the central station the line has its two conductors connected with the different line contacts of a terminal socket or spring-jack a , and with an annunciator or other signaling instrument a' , which are located in the annunciator-board e before the distributing-operator, and with other connection-sockets or spring-jacks a^2 , a^3 , and a^4 in different sections f , g , and h of a multiple switchboard of ordinary type. From the annunciator-board e a trunk-line extends to each section of the multiple switchboard, that to board f being numbered 3 4. This trunk-line terminates at each extremity in a plug, the plugs being designated i and i' , re-

spectively. The apparatus thus far described is well known in the art and constitutes no part of my invention.

The obvious design is that all call-signals shall be received by the operator at board *e*, and that each calling-line may be extended by her through the medium of one of the trunk-lines to any desired operator at the multiple switchboard, so that the work of answering calling subscribers and completing connections may be uniformly divided among the answering-operators.

Each answering-operator is furnished with the usual telephone *k*, whose connection with the trunk-lines is controlled through a listening-key *l*. By means of this key she may connect her telephone with any trunk-line which has been or is to be united with the line of a calling subscriber at the annunciator-board for the purpose of receiving the subscriber's order.

I provide in connection with the trunk-line a local signaling-circuit 5, which includes a signal instrument, as a lamp *m*, before the distributing-operator, and is controlled by a suitable switch manipulated by the answering-operator. This switch consists in a switch-spring *l'* and its anvil *l''*, placed on the listening-key *l*, so that they may be closed together when the listening-key is brought into position to connect the telephone *k* with the trunk-line. Means are provided also for extinguishing the lamp *m* at the proper time. For this purpose the circuit is continued through the switch contacts of a plug-seat switch *n* for the plug *v'*, the switch being adapted to open the circuit when the plug is removed from its socket. A source of current *o* is included in the signaling-circuit.

It will be understood that the distributing-operator is provided with a number of trunk-lines to each answering-operator, each equipped with such a scheme of signals as here described as applied to circuit 3 4.

The operation of the signals is as follows: When an answering-operator, having performed all the work at hand, is ready to make further connections, she will depress the plunger of her listening-key *l*, whereby her telephone will be brought into circuit with the trunk-line, and whereby at the same time the signaling-circuit 5 will be closed at the switch contacts *l' l''* and the lamp *m* will be lighted. The illumination of this lamp will be a signal to the distributing-operator that the operator attending to the trunk-line 3 4, with which this signal is associated, is in position to receive calls, and she will insert the terminal plug *i* of this trunk-line into the socket of the subscriber who next calls. The subscriber will thus be placed in telephonic communication with the answering-operator at section *f* of the multiple board. This operator will receive his order, and while doing this will raise the plug *v'* to make the required connection. The act of raising the plug will interrupt the signaling-circuit 5 at the switch contacts of

the plug-switch *n*, so that the lamp *m* before the distributing-operator will be extinguished. The obscuring of the lamp will signalize to the latter operator that the call has received attention.

Any usual mode of transmitting signals for disconnection may be adopted, and for notifying the distributing-operator that the completed connection may be removed.

The particular means employed by the answering-operator to cause the display of the signal *m* may be varied without departing from the essence of my invention; also other appliances may be used for causing the disappearance of the signal before the distributing-operator.

I claim as new—

1. The combination with an annunciator-board in which are located the annunciators and terminal sockets of a number of telephone-lines, answering-boards in each of which are located terminal spring-jacks of said lines, and trunk-lines from the annunciator-board to the different answering-boards, of a signal at the annunciator-board for each answering-board, and means for exciting each of said signals, controlled at the corresponding answering-board, substantially as described.

2. The combination with an annunciator-board wherein are located the annunciators and terminal sockets of a number of telephone-lines, answering-boards whereon are located terminal spring-jacks of each of said lines, and trunk-lines from the annunciator-board to the different answering-boards, of a switch at the answering-board for each trunk-line actuated by the answering-operator preliminary to making a connection, and a signaling-circuit from each answering-board including a signal at the distributing-board, said circuit being controlled by the said switch at the answering-board, whereby the readiness of an answering-operator to receive calls is signaled to the distributing-operator, as described.

3. The combination with an annunciator-board wherein are located the annunciators and terminal sockets of a number of telephone-lines, answering-boards whereon are located terminal spring-jacks of each of said lines, and trunk-lines from the annunciator-board to the different answering-boards, of an operator's telephone at each answering-board, a listening-key for each trunk-line adapted to connect the said telephone with the trunk-line, and a signaling-circuit including a signal at the annunciator-board, controlled by switch-contacts on the listening-key, substantially as described.

4. The combination with a switching system comprising an annunciator-board on which are located an annunciator and a socket for each line, a number of answering-boards on each of which are located sockets for different lines, and a trunk-line from the annunciator-board to each answering-board, of

a signaling-circuit associated with each trunk-line and including a signal at the annunciator-board, and a switch controlling the continuity of said signaling-circuit at the answering-board, substantially as described.

5 5. The combination with a switching system comprising an annunciator-board in which are located an annunciator and a terminal socket for each line, answering-boards
10 in each of which are located terminal sockets for different lines, and trunk-lines from the annunciator-board to the different answering-boards, of a signaling-circuit associated with
15 each trunk-line including a signal at the annunciator-board, an operator's telephone-switch for the trunk-line at the answering-board, and switch-contacts adapted to close
20 the signaling-circuit when the telephone is brought into circuit with the trunk-line, substantially as described.

6. The combination with a switching system comprising an annunciator-board whereon are located an annunciator and terminal

socket for each line, answering-boards on each of which are located terminal sockets for the
25 lines, and trunk-lines from the annunciator-board to the different answering-boards, of a signaling-circuit associated with each trunk-line including a signal at the annunciator-board, an operator's telephone-switch for each
30 trunk-line at the answering-board, switch-contacts adapted to close the signaling-circuit corresponding to any trunk-line when the telephone is brought into circuit with the said
35 trunk-line, and a switch for each trunk-line at the answering-board operated in making connection with the subscriber's line, adapted to efface the corresponding signal, substantially as described.

In witness whereof I hereunto subscribe my
40 name this 21st day of November, A. D. 1895.

FRANK R. MCBERTY.

Witnesses:

ELLA EDLER,
MYRTA F. GREEN.