

No. 636,277.

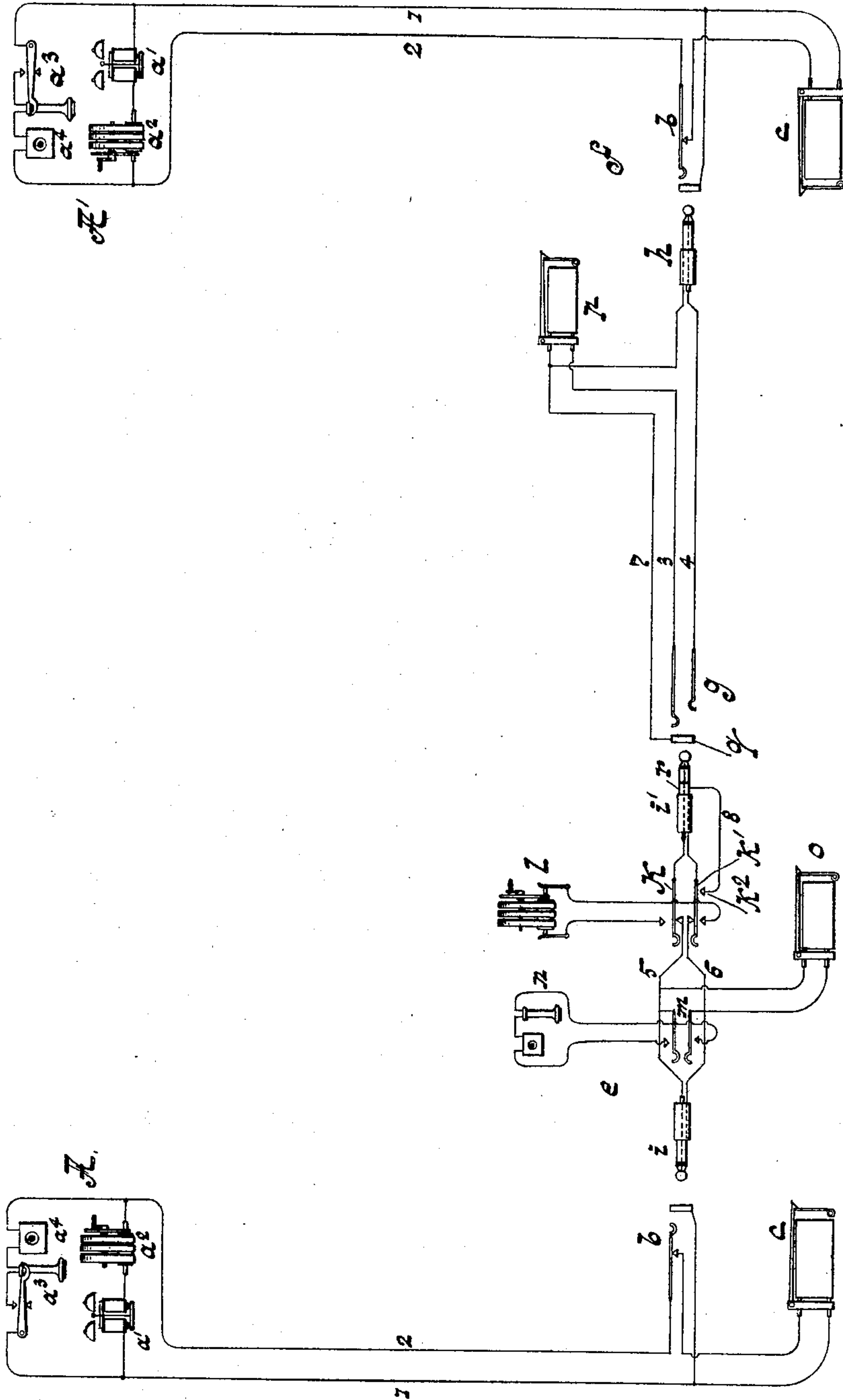
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F. R. McBERTY.

APPARATUS FOR INTEROFFICE TRUNK LINES.

(Application filed Sept. 25, 1898.)

(No Model.)



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR INTEROFFICE TRUNK-LINES.

SPECIFICATION forming part of Letters Patent No. 636,277, dated November 7, 1899.

Application filed September 25, 1896. Serial No. 606,947. (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 Interoffice Trunk-Lines, (Case No. 47,) 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.

This invention concerns the transmission of signals in the operation of connecting and disconnecting two subscribers' lines through the medium of an interoffice trunk-line.

In effecting connection between different subscribers' lines by means of a trunk-line, it is common for the operator who receives the initial call to perform all necessary acts of bringing the subscribers into communication, excepting that of connecting the distant terminal of the trunk-line with the subscriber's line at the correspondent station, this step being of course performed by another operator. It is usual in such trunk-lines to provide a clearing-out annunciator before the operator who completes the connection, who is commonly designated the "receiving-operator," can signify a call for the disconnection of the trunk-line from the subscriber's line.

The object of the present invention is to prevent the operation of this clearing-out annunciator in the trunk-line by the call-signal sent by the call-initiating operator to the called subscriber. That is accomplished by providing a device in connection with the clearing-out annunciator of the trunk-line for preventing its operation, the device being controlled or set into operation by the calling-key of the call-originating operator.

The following form of the invention is suitable for use under most conditions: The clearing-out annunciator at the receiving-station of the trunk-line may be connected in the trunk-line circuit in the usual way. About this clearing-out annunciator a shunt or short-circuiting wire is provided, extending to the other terminal of the trunk-line and com-

pleted there through the agency of special contacts on the operator's calling-key, operative only during the act of calling. This shunt-circuit may, if desired, be formed in part of a special conductor terminating in the plug of the originating or supervising operator, which is designed for insertion into the spring-jack usually forming the terminal of the trunk-line.

The attached drawing illustrates this form of the invention. It shows two substations terminating in spring-jacks and connected with annunciators in two different switchboards, a trunk-line extending between the two boards, and a pair of plugs and their plug-circuit at one of the boards for making connection between a line and the trunk-line.

The subscriber's apparatus may be of the usual type, consisting of a call-bell  $a'$ , a generator  $a^2$  of alternating calling-current, a receiving-telephone  $a^3$ , a transmitting-telephone  $a^4$ , and a switch for closing the circuit through the telephones during the use of the line. These appliances are connected by the line-conductors 1 and 2 with a spring-jack  $b$ , and with an annunciator  $c$  at the switchboard. The line from station A terminates in switchboard  $e$ ; that from station A' is served at another switchboard  $f$ . Between these switchboards extends a trunk-line 3 4, which ends in a spring-jack  $g$  in the switchboard  $e$ , and which is furnished with a terminal plug  $h$  in the switchboard  $f$ . At the switchboard  $e$  pairs of plugs  $i$  and  $i'$  are provided, with their plug-circuit 5 6. Associated with this circuit are a calling-key  $k$  for connecting a generator  $l$  of calling-current with the plug  $i'$ , a listening-key  $m$  for connecting the operator's telephone  $n$  with the plug-circuit, and a clearing-out annunciator  $o$ , permanently connected in the bridge of the plug-circuit.

The trunk-line includes at the switchboard  $f$  an annunciator  $p$ , which may be shunted by a non-inductive resistance-coil to eliminate its impedance to telephonic currents from the circuit.

In the present invention a wire 7 is led from one conductor 3 of the trunk-line intermediate of the annunciator and the terminal plug



of the line to a contact-piece  $q$  in the trunk-line jack  $g$ . The plug  $i'$ , which is designed for insertion into this jack, is furnished with a contact-sleeve  $r$  in position to register with the ring  $q$  when the plug is inserted in the spring-jack. This contact-piece  $r$  forms the terminal of a conductor 8, adapted to be brought into connection with the strand 5 of the plug-circuit. Its continuity is controlled by the switch-spring  $k'$  and its anvil  $k^2$  of the calling-key  $k$ , which are brought into contact when the key is depressed to send a call-signal. Thus when the plug  $i'$  is in the trunk-line jack  $g$  the depression of plunger-key  $k$  connects the generator  $l$  of signaling-current with the trunk-line and at the same time closes the short-circuit about the clearing-out annunciator in the trunk-line.

Assume for the purpose of tracing the operation of the mechanism that the subscriber at station A requires a connection with station A'. The subscriber causes the display of his line-annunciator  $c$  by the usual process of operating his calling-generator  $a^2$ . Responding to the call, the operator at the switch-board  $e$  inserts plug  $i$  into the spring-jack  $b$  of the calling-line, and having learned the subscriber's order inserts plug  $i'$  into the trunk-line jack  $g$ , at the same time communicating an order to the operator at switch-board  $f$  in any suitable way to connect that trunk-line with the line to station A'. The latter operator performs this work in accordance with the instruction. The supervising operator at board  $e$  then manipulates calling-key  $k$  and sends a call-signal to the substation A' to operate the bell  $a'$  there. Since the act of depressing the key  $k$  completes a short-circuit about the clearing-out annunciator  $p$  of the trunk-line, that instrument is not operated by the signaling-current flowing in the trunk-line. At the termination of conversation either subscriber may transmit a call for disconnection by operating his generator. The current thus created will find circuit to both clearing-out annunciators  $o$  and  $p$ , causing them both to display their indicators. Thereupon the operators at both switchboards  $e$  and  $f$  will proceed to remove the connections uniting the lines, the first operator withdrawing plugs  $i$  and  $i'$  from spring-jacks  $b$  and  $g$  and the second withdrawing the terminal plug  $h$  from the spring-jack  $b$  of the line to station A'. It will be understood that unless the clearing-out annunciator  $p$  were rendered inoperative in some manner during the transmission of a call-signal from the switchboard  $e$  through the trunk-line the annunciator would become displayed during such signaling and would give a false signal to the receiving-operator. The use of this invention therefore obviates confusion in making connection in the switchboard and permits the receiving-operator to place complete dependence upon the annunciator  $p$  as a signal for

disconnecting the trunk-line from the subscriber's line.

I claim as new—

1. The combination with two telephone-lines and a trunk-line uniting them, of a clearing-out annunciator at one terminal of the trunk-line in connection therewith, an operator's calling-key at the other terminal of the trunk-line for connecting a source of calling-current with the line, and a device adapted to prevent the operation of the clearing-out annunciator, said device being controlled by mechanism at the terminal of the trunk-line at which the calling-key is located, whereby the operator in calling may prevent the display of the clearing-out annunciator; as described.

2. The combination with two telephone-lines united through a trunk-line, a clearing-out annunciator at one terminal of the trunk-line in connection therewith, and an operator's calling-key at the other terminal of the trunk-line, of a device adapted to prevent the operation of the clearing-out annunciator and mechanism connected with the calling-key to be operated therewith, adapted to bring the said device into action; as described.

3. The combination with two telephone-lines, and a trunk-line uniting them, of a clearing-out annunciator at one terminal of the trunk-line and an operator's calling-key at the other terminal thereof, electrical circuit connections adapted to render the clearing-out annunciator inoperative, and a switch connected with the said calling-key controlling the circuit connections, whereby the operation of the calling-key renders the clearing-out annunciator irresponsive; as described.

4. The combination with two telephone-lines terminating in different switchboards, a trunk-line between the switchboards, and a plug-circuit at one of the switchboards for making connection between a line there and one terminal of the trunk-line, of a clearing-out annunciator connected with the other terminal of the trunk-line, an operator's calling-key in the plug-circuit for sending signaling-current over the trunk-line, circuit connections adapted to render the clearing-out annunciator inoperative, a conductor associated with the plug-circuit adapted to form an extension of the said circuit connections when the plug-circuit is connected with the trunk-line, and switch-contacts on the calling-key controlling the connections of the said conductors; whereby the clearing-out annunciator may be made irresponsive to calling-currents sent in the trunk-line, as described.

5. The combination with a telephone-line, a trunk-line and a plug-circuit united serially to form an extended telephone-circuit, of a ringing-key in the plug-circuit, a clearing-out annunciator in the trunk-line at the other terminal thereof, and circuit connections controlled by the ringing-key adapted

to render the clearing-out annunciator inoperative during the transmission of a calling-current, as described.

5 6. The combination with a telephone-line, a trunk-line and a plug-circuit serially connected to form an extended telephone-circuit, of a calling-key in the plug-circuit, a clearing-out annunciator at the other terminal of the trunk-line connected therewith, and a

short circuit of the clearing-out annunciator to closed by the said calling-key in the act of sending a signal in the line, as described.

In witness whereof I hereunto subscribe my name this 13th day of August, A. D. 1896.

FRANK R. McBERTY.

Witnesses:

ELLA EDLER,

LOLA J. BRINKERHOFF.