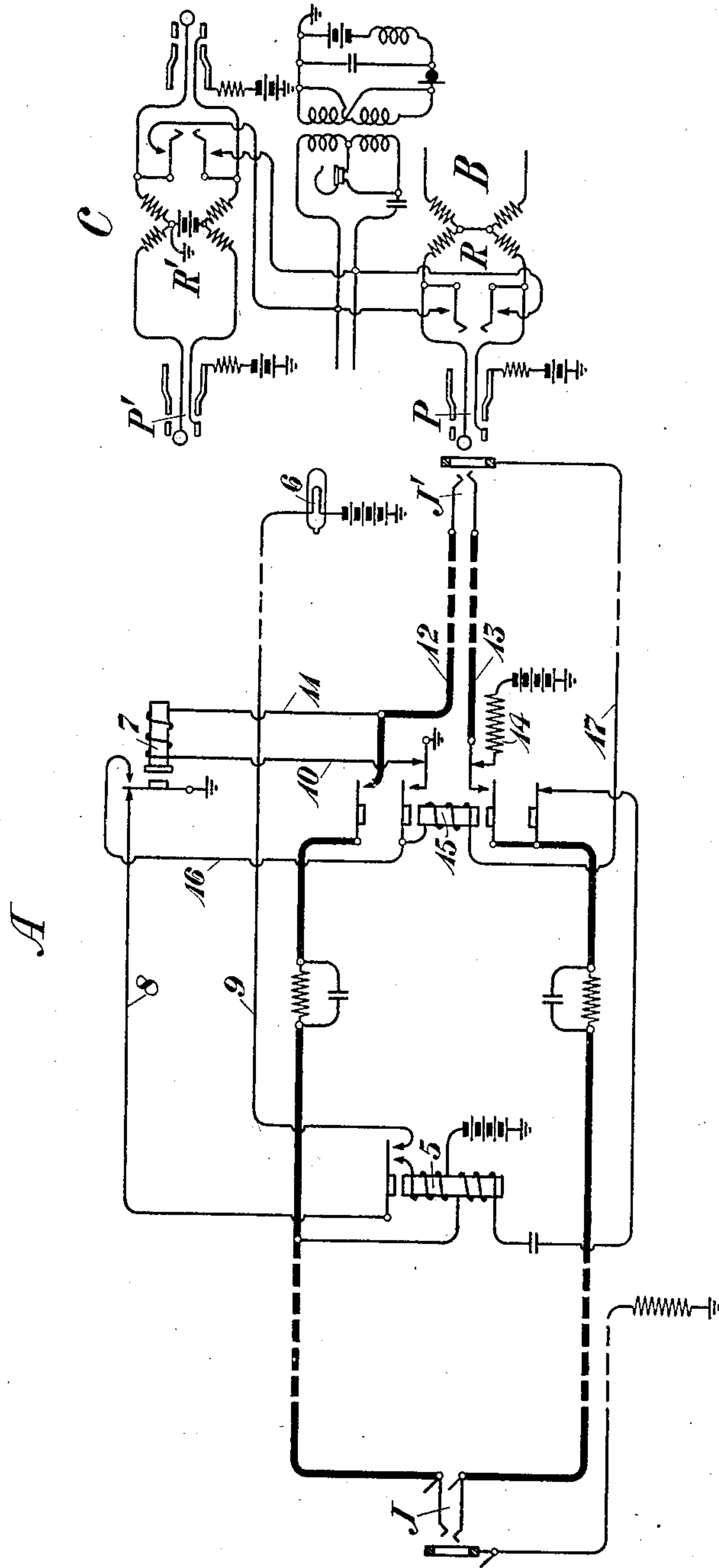


J. F. TOOMEY.
 TELEPHONE TOLL CIRCUITS.
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1,348,909.

Patented Aug. 10, 1920.



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TELEPHONE TOLL-CIRCUITS.

1,348,909.

Specification of Letters Patent. Patented Aug. 10, 1920.

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To all whom it may concern:

Be it known that I, JOHN F. TOOMEY, residing at New York, in the county of New York and State of New York, have invented certain Improvements in Telephone Toll-Circuits, of which the following is a specification.

This invention relates to telephone apparatus and circuits for use in connection with telephone toll systems.

In telephone toll systems it is sometimes difficult to complete a connection because, for example, of a change in number of a called subscriber. When a number has been changed a special marking is placed on the jack at a switching position. In such instances, it is customary for the toll switching operator to connect with a so-called multiple marking operator, in order that the toll operator may obtain the desired information. The multiple marking operator also handles trunks from local switchboard positions, and completes calls from these trunks through her own position. The completion of calls for toll service by the multiple marking operator is not desirable, however, because of transmission losses incurred by the additional circuits and apparatus involved. It is desirable, therefore, that the multiple marking operator be provided with special cord circuits for answering toll calls of the type above referred to, and with other cord circuits for completing local connections. One of the principal features of this invention is the provision of means whereby cords of the former type may be used for answering toll calls only, and cannot be used for completing toll connections; while cords of the latter type cannot be used for communication over the toll trunks. Further phases of the invention will hereinafter appear.

This invention is realized by providing means in connection with the toll trunks whereby the transmission circuit of the trunk is only rendered operative when one of the special cord circuits above referred to is associated therewith. The transmission circuit remains inoperative when one of the cords employed for handling local trunks is associated therewith.

The invention will be described in detail

in connection with the accompanying drawing illustrating diagrammatically a system in which it is embodied.

At A a trunk circuit is shown leading from the toll operator's position to a multiple marking operator's position, and at B and C are illustrated cord circuits for use in connection with the marking operator's position, the cord circuit B being adapted for answering toll calls, and the cord circuit C being adapted for completing local connections. The details of this circuit may be sufficiently understood from a description of the operation, which is as follows:—

It will be assumed that a toll operator desires to be connected with a marking operator. In such case, the plug of a toll switching trunk (not shown) is inserted in the jack J, and upon application of ringing current from the toll switching trunk, relay 5 is energized in a well known manner, and is locked up over a circuit as follows: grounded battery, through upper winding of relay 5, including its contact and armature, conductor 8, contact and armature of relay 7 to ground. Upon the energization of relay 5, its armature is attracted and a current path is established for lighting lamp 6, from ground, armature and back contact of slug-gish relay 7, conductor 8, armature and contact of relay 5, conductor 9, through said lamp to grounded battery. The multiple marking operator is thus signaled, and upon inserting plug P in jack J¹, relay 7 is energized by the following circuit: ground, middle back contact of relay 15, conductor 10, winding of relay 7, conductors 11 and 12, tip contacts of jack J¹, and plug P, through repeating coil R, ring contacts of plug P and jack J¹, talking conductor 13, inner lower back contact of relay 15, resistance 14 to grounded battery. The energization of relay 7 causes it to attract its armature, and the circuit previously mentioned in connection with the lighting of lamp 6, as well as the locking circuit of relay 5, is broken. The energization of relay 7 therefore causes the relay 5 to release its armature. Relay 15 is now operated and locked by a circuit which may be traced from ground, armature and front contact of relay 7, conductor 16,

winding of relay 15, conductor 17, sleeve contacts of jack J^1 and plug P to grounded battery. The relay 15 in operating attracts its armatures, breaks the circuit previously mentioned for the energization of relay 7, and also provides a talking connection by way of conductors 12 and 13 of trunk A from the marking operator to the toll switching operator. The circuit remains in this condition until the multiple marking operator removes plug P from the jack J^1 , whereupon the circuits and apparatus resume their normal arrangement.

Should the multiple marking operator attempt to employ the cord C, which is intended only for use with local interconnections, to answer a call on trunk circuit A, the relay 7 will not operate. The insertion of the plug P^1 of cord C in the jack J^1 will not provide for current flow because a short circuiting path may be traced from ground, conductor 10, winding of relay 7, conductors 11 and 12, tip contacts of jack J^1 and plug P^1 , upper left hand winding of repeating coil R^1 to ground. It will therefore be seen that no operative circuit is established.

As described in connection with plug P of cord B and trunk circuit A, the operation of relay 15 furnishes a talking circuit for the marking operator, but if the cord C were employed by said operator no talking circuit would be established because of the non-operation of relays 7 and 15. The lamp 6 would not be extinguished by the employment of the cord C, and the operator noting these irregularities would readily be apprised of her mistake, and would at once substitute the correct or B cord.

By the arrangement just disclosed, it will be apparent that a toll operator is enabled to obtain any desired information from a multiple marking operator, and is in a position to complete a toll call without increased loss in transmission, and that said multiple marking operator is provided with cords and trunks for connection with the toll operator, but such cords and trunks are not capable of completing toll calls. Further, that the multiple marking operator is provided with other cords which are capable of interconnecting local calls, but are inoperative in connection with toll trunks.

It will be obvious that the general principles herein disclosed may be embodied in many other organizations widely different from those illustrated without departing from the spirit of the invention, as defined in the following claims.

Having thus described my invention, what I desire to secure by Letters Patent is:

1. In a telephone system, a toll trunk, talking conductors for said trunk, a cord circuit for answering calls incoming over said trunk, a second cord circuit for com-

pleting local connections, and means including a relay bridged across the talking conductors of said trunk whereby a talking connection may be established with said first mentioned cord circuit only.

2. In a telephone system, a toll trunk, talking conductors for said trunk, a cord circuit operable with said trunk, a second cord circuit associated therewith and operable with other trunks, and means including a relay bridged across the talking conductors of said trunk whereby the talking circuit is prevented from becoming operative when the second mentioned cord circuit is connected with said trunk.

3. In a telephone system, a toll trunk, talking conductors for said trunk, a cord circuit for answering calls incoming over said trunk, a second cord circuit for completing local connections, means including a relay bridged across the talking conductors of said trunk whereby the talking connection is completed when said first mentioned cord circuit is connected with the said trunk and whereby the talking circuit is held inoperative when the second mentioned cord circuit is connected with said trunk.

4. In a telephone system, a toll trunk, talking conductors for said trunk, a cord circuit, a second cord circuit associated therewith, means including a relay bridged across the talking conductors of said trunk for completing a talking circuit only when the first mentioned cord circuit is connected with said trunk, said second cord circuit being inoperative when so associated.

5. In a telephone system, a toll trunk, talking conductors for said trunk, a cord circuit for answering calls incoming over said trunk, a second cord circuit for completing local connections, means including a slow acting relay bridged across the talking conductors of said trunk whereby the talking connection may be completed when said first mentioned cord circuit is connected with said trunk and whereby the talking circuit is rendered inoperative when the second mentioned cord circuit is connected with said trunk.

6. In a telephone system, a toll trunk, talking conductors for said trunk, a cord circuit, a second cord circuit associated therewith, a sleeve relay for controlling the completion of the circuit over said talking conductors, means including a relay bridged across the talking conductors of said trunk for controlling the sleeve relay, said relay being only operable when said first mentioned cord circuit is associated with said trunk and being inoperative when said second cord circuit is so associated.

7. In a telephone system, a toll trunk, talking conductors therefor, a relay bridged

across said conductors, a signal controlled
thereby, a cord circuit, a second cord circuit
associated therewith, means including a re-
lay bridged across the talking conductors in
5 said trunk in series with a battery operative
only upon the association of the first cord
circuit with said trunk for completing a

talking connection, said last mentioned relay
also comprising means for deenergizing said
first relay and retiring said signal.

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In testimony whereof, I have signed my
name to this specification this 19th day of
February, 1919.

JOHN F. TOOMEY.