

Dec. 18, 1928.

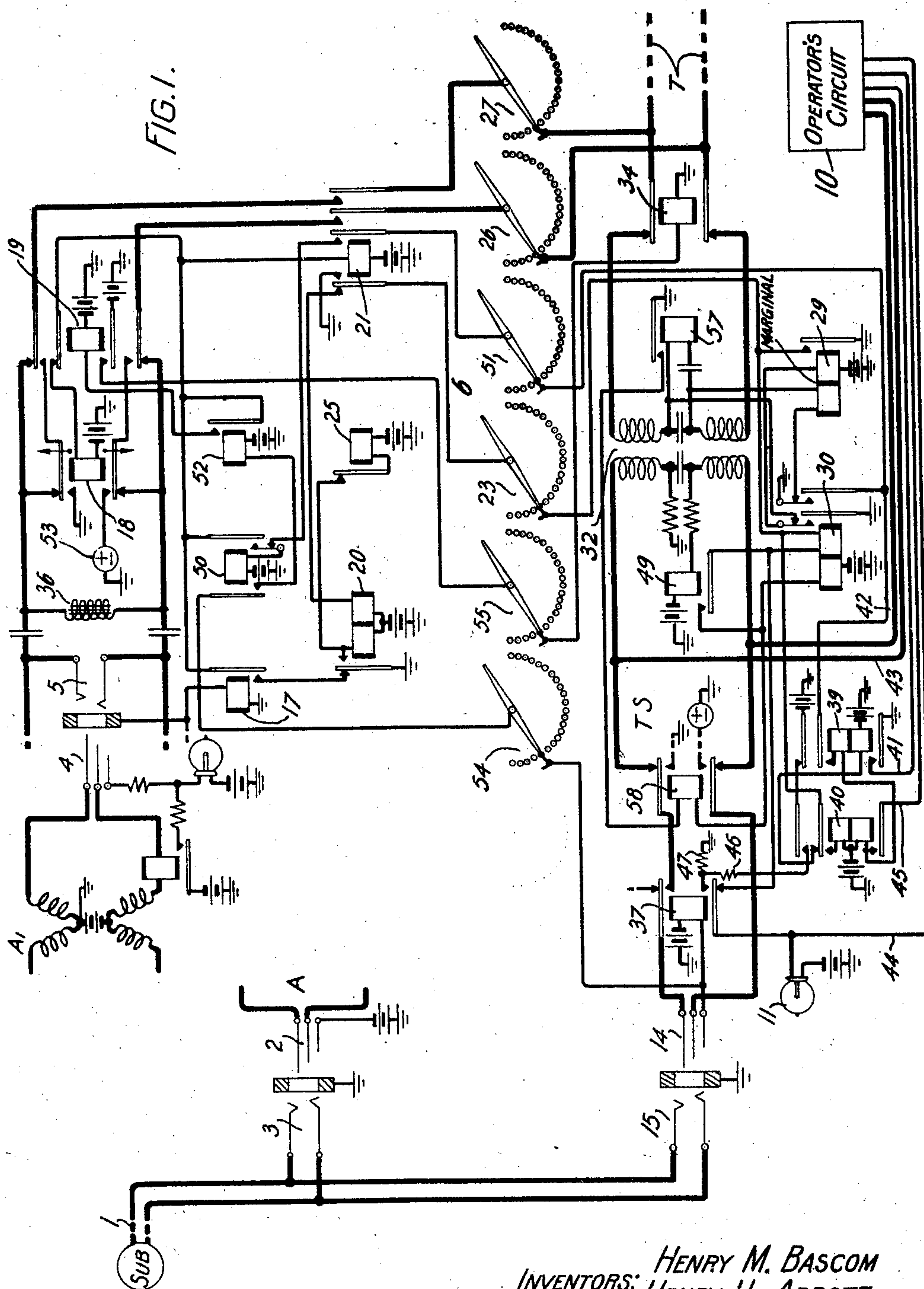
1,695,314

H. M. BASCOM ET AL

TELEPHONE SYSTEM

Filed April 20, 1927

2 Sheets-Sheet 1



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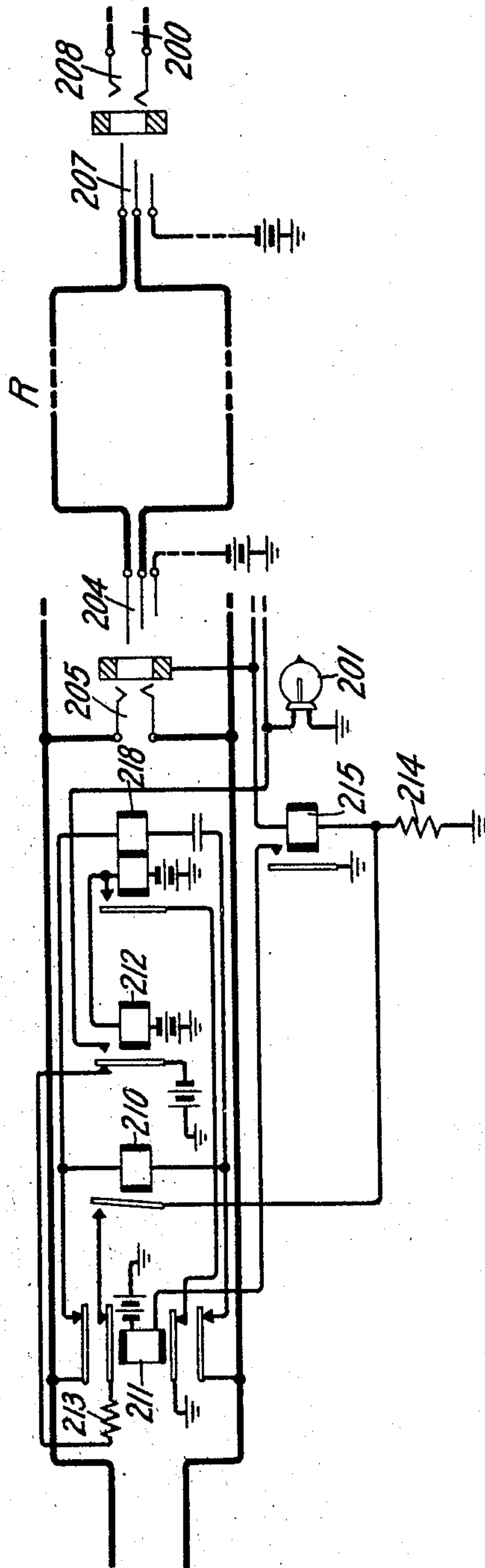
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2 Sheets-Sheet 2

FIG. 2.



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UNITED STATES PATENT OFFICE.

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TELEPHONE SYSTEM.

Application filed April 20, 1927. Serial No. 185,241.

This invention relates to telephone systems, and more particularly to improvements in trunking systems.

According to this invention, a trunking system comprising a plurality of trunks accessible at one end at a first and at a second position and at the other end at a third position is arranged for checking connections over said trunks originating at the first position and completed through the second and third positions.

According to one feature of the invention, a plurality of jacks are arranged at the first position, a plurality of trunks terminating in plugs at the second position and in jacks at the third position, with means responsive to the seizure of a jack at the first position by an operator through a link circuit for connecting said jack through automatic switches to an idle trunk; automatically associates an operator's telephone set with said trunk at the second position; establishes a busy condition for said trunk at the third position and actuates a signal associated with said trunk at the second position.

According to another feature, means are provided whereby when the plug at the second position is inserted in a multiple jack of the calling subscriber's line, the connection to the calling subscriber therethrough is temporarily disassociated from the trunk until the calling subscriber's line is disconnected from the jack at the first position, at which time the calling subscriber's line is reconnected to the trunk by way of said connection established at the second position.

The invention may be applied to a so-called recording and completing trunking system, in which the recording and completing trunks terminate at one end in the multiple banks of switches associated with recording jacks located at "A" operators' positions and in plugs at toll switching operators' positions and, while at the other end these trunks terminate in jacks at recording and completing operators' positions. Connections from calling subscribers that originate at the recording jacks may be checked and completed over the trunks from the recording and completing operators' positions to the calling subscriber by way of the toll switching operators' positions.

The invention has been illustrated in the accompanying drawings, as applied to a sys-

tem of the above mentioned type. Figure 1 shows a calling subscriber's line terminating in jacks at an "A" operator's position and a toll switching operator's position. It also shows a recording and completing trunk arranged in accordance with this invention accessible from the "A" operator's position and the toll switching operator's position and portions of two "A" operator's cords for connection with the calling subscriber's line and the trunk respectively. Fig. 2 shows the opposite end of said recording and completing trunk terminating at a recording and completing operator's position, with an operator's cord and the incoming end of a toll line.

Referring now to the drawings, a connection may be established from the subscriber of line 1 over trunk T to a subscriber accessible over toll line 200, or from such a subscriber over trunk T to the subscriber of line 1. In establishing a connection from the subscriber of line 1 to the wanted subscriber over toll line 200, the procedure in general is as follows: The subscriber of line 1 calls the operator at "A" in the usual manner and this operator inserts the answering plug 2 of a cord "A" at her position into jack 3 of line 1 and determines the type of connection desired, that is, whether a local subscriber is wanted or a subscriber that may only be reached over a toll connection. The operator also ascertains the calling subscriber's number. If a toll connection is desired, the "A" operator then tests a multiple recording jack in the usual manner with plug 4 of another cord A₁ at her position and if jack 5, for example, is idle, she inserts this plug 4 into jack 5. This connection causes the jack 5 to be connected, through switches 6 with an idle recording and completing trunk such as T. Switches 6 are of the ordinary standard step-by-step switches continuously rotating type well known in the art. The arrangement is such that a plurality of recording jacks like 5 and their associated circuits are normally associated with individual switches like 6 which have their brushes normally resting on the terminals of an idle recording and completing trunk multiplied to said switches. A plurality of such trunks may be connected to these switches of a number larger than the number of switches and their corresponding recording jacks. When this connection between an "A" operator's cord and an idle

trunk is completed various actions follow: First, the toll switching operator's telephone set (not shown but connected at 10 at the toll switching operator's position TS) is automatically connected through switch 6 to the "A" operator's cord; second, a tone, for example, of the "double zip" type, is transmitted to the "A" operator's telephone set connected to the cord A₁, third, the toll switching operator's lamp 11 is caused to flash; and fourth, the jack of trunk T at the recording operator's position at R is made busy. The tone indicates to the "A" operator that her telephone set is connected through cord A₁ and switches 6 to a toll switching operator's telephone set, and the flashing of lamp 11 indicates to the toll switching operator that her telephone set is connected to an "A" operator's telephone set.

When the "A" operator hears the tone she will pass the number of a calling subscriber's line 1 to the toll switching operator and the toll switching operator thereupon removes her telephone set from the trunk T and inserts the plug 14 of trunk T into the multiple jack 15 of line 1.

When this connection is made the toll switching operator's plug 14 and associated circuits are temporarily disconnected from the trunk T and the circuits and apparatus associated with the recording jack 5 are actuated to transmit a ringing current impulse over the trunk T which causes a lamp 201 to be lighted at the recording and completing operator's position. The recording and completing operator now answers this call by inserting plug 204 of a cord R into jack 205 of the trunk T. The "A" operator now gives the recording operator the number of the calling subscriber and disconnects by removing plug 4 of her cord A₁ from jack 5. She also disconnects plug 2 from jack 3. On the removal of plug 4 from jack 5, the trunk T is reconnected to the toll switching operator's plug 14 and the associated circuits, while the switch 6 is advanced to connect the recording jack 5 to the next idle trunk. As the recording and completing operator now has her telephone set connected to the calling subscriber's line 1 through the toll switching operator's position she will ask the calling subscriber for his own number and the number of the wanted subscriber, whereupon this operator completes the connection desired by way of toll line 200 by inserting plug 204 into jack 208. The connection is now, therefore, completed to the subscriber of line 1 and the wanted subscriber by way of toll line 200, trunk T and the connection through the toll switching operator's position. This arrangement permits the recording and completing operator to check and record the calling subscriber's number and to complete the connection to the wanted subscriber.

This recording and completing trunk T

may also be employed as an ordinary toll switching trunk for calls from the recording and completing operator's position to a wanted subscriber through the toll switching operator's position. In this case, the toll switching operator at TS will be called directly by the recording and completing operator without involving the recording jacks and the associated circuits and switches. It should be understood that when a connection of this type is made, the moment trunk T is taken for use the switches 6 and all other switches associated with recording jacks will be advanced to connect with the next idle recording and completing trunk. These switches will therefore always be ready to connect their respective recording jacks with an idle trunk.

More detailed descriptions will now be made of a connection from the calling subscriber of line 1 to a wanted subscriber over toll line 200 and a connection in the opposite direction. When a toll connection is desired and the "A" operator has inserted plug 4 of cord A₁ into jack 5, an obvious circuit is completed for the operation of relay 17. The operation of this relay causes the operation of relay 18 as follows: Battery, winding of relay 18, upper inner armature and back contact of relay 19, armature and front contact of relay 17, armature and back contact of relay 20 to ground. The operation of relay 18 prepares this circuit for the application of ringing current to trunk T in a manner that will be described more fully hereinafter. Another obvious circuit is completed from ground at the armature and back contact of relay 20 for the operation of relay 21. The immediate effect of the operation of relay 21 is to connect the ground at the left hand armature and front contact of this relay to the terminal on which the brush of bank 23 of switches 6 rests. As this terminal is multiplied to the corresponding terminals of all other switches associated with other recording jacks, the brushes of these other switches will be advanced one step from the terminals of trunk T to the terminals of the next idle trunk. The circuit for actuating these switches may be traced from battery through the right hand windings of the relays corresponding to relay 20, left hand armatures and back contacts of the relays corresponding to relay 21, the brushes of the contact banks corresponding to contact bank 23 through the connected terminal of contact bank 23 and the left hand armature and front contact of relay 21 to ground. These circuits cause the relays corresponding to relay 20 to be operated and these relays in operating close obvious circuits for the stepping magnets corresponding to the stepping magnet 25. These stepping magnets will, therefore, operate to advance the brushes of these other switches to the next idle terminals. If the next trunk is busy the stepping magnets will,

of course, continue to operate until an idle trunk is found. It is obvious that the brushes of switches 6 will not advance at this time as the corresponding circuit for relay 20 will not be completed.

The operation of relay 21 completes the tip and ring leads from jack 5 through its two outer right hand armatures and front contacts, terminal banks 26 and 27 to the tip and ring of trunk T. It will be noted that a circuit to battery and ground is normally connected through the trunk T for normally maintaining relay 210 operated as follows: Battery, right hand winding of relay 29, inner left hand make-before-break contacts of relay 30, upper right hand winding of repeating coil 32, upper armature and back contact of relay 34, tip conductor of trunk T, upper outer armature and back contact of relay 211, winding of relay 210, lower outer armature and back contact of relay 211, ring conductor of trunk T, lower armature and back contact of relay 34, lower right hand winding of repeating coil 32, left hand winding of relay 29 to ground at the outer right hand make-before-break contacts of relay 30. Thus, as stated, relay 210 is normally operated while the electrical characteristics of relay 29 are such that it will normally remain released. When the above mentioned connection through the two outer right hand armatures and front contacts of relay 21 is completed, a loop circuit will extend from the battery and ground at relay 29 through the low resistance of the retardation coil 36 and cause relay 29 to operate while relay 210 is released. That is the circuit through the winding of relay 210 is shunted by the low resistance circuit through retardation coil 39.

Relay 210 in releasing establishes a connection from battery at the armature and back contact of relay 212 through a resistance 213, the upper inner armature and back contact of relay 211, armature and back contact of relay 210 to a point between the resistance 214 and ground and the winding of relay 215. Thus, as the other end of the winding of relay 215 is connected to the sleeve of jack 205, a busy condition is established on the sleeve, so that the trunk T will test busy to any recording and completing operator attempting to establish a connection over this trunk.

Relay 29 in operating connects ground to one side of the right hand winding of relay 30. Practically simultaneously a ground is connected at the left hand armature and front contact of relay 21 so that these ground connections cause the operation of relay 30 and the lighting of lamp 11 over a circuit as follows: Battery, lamp 11, lower armature and back contact of relay 37, right hand winding of relay 30, armature and front contact of relay 29 to ground or to the ground

at the left hand armature and front contact of relay 21. The operation of relay 30 opens the connections to battery and ground for the windings of relay 29 through its make-before-break contacts to the retardation coil 32, but relay 29 is maintained operated by the operation of relay 30 over a circuit from battery through the right hand winding of relay 29, inner right hand armature and front contact of relay 30 to ground. The lighting of lamp 11 is of no particular importance at this time, except to warn the toll switching operator that a connection may be desirable through this trunk.

It should be noted that the ground at the armature and front contact of relay 29 and the ground at the left hand armature and front contact of relay 21 are connected for the operation of relay 39 over a circuit as follows: Battery, lower winding of relay 39, upper inner armature and back contact of relay 40 to said grounds. Relay 39 in operating closes a circuit to ground for lead 41 at its lower armature and front contact. This connection to ground causes the toll switching operator's telephone set to be connected through leads 42 and 43 to the trunk T and causes an intermittent battery connection to be made through lead 44 for the flashing of lamp 11. It also causes a tone of the "double zip" type to be applied to a lead 42. The circuits for accomplishing these functions form no part of this invention but are illustrated completely in the Patent No. 1,665,338, to Wiley Whitney. Leads 42, 43, 41, 44 and 45 of the present application correspond respectively to leads 12, 13, 10, 9 and 11 in Fig. 1 of the Whitney application. The "double zip" tone applied to lead 42 is transmitted over the ring conductors through the repeating coil 32 to the "A" operator's telephone set of cord A₁ to indicate to this operator that the toll switching operator's telephone set has been connected to the trunk, while the flashing of lamp 11 indicates to the toll switching operator that her telephone set has been connected to this particular trunk. The operation of relay 30 applies a ground at the outer right hand armature and front contact through the upper inner armature and front contact of relay 39, so that a circuit will now be completed from battery through the lower winding of relay 40 and upper winding of relay 39, to this ground. This circuit causes the operation of relay 40 and maintains relays 40 and 39 in operated condition as long as relay 30 is operated. The operation of relay 40 opens at its upper inner armature and front contact the original operating circuit for relay 39 and prepares by closing a connection at the upper outer armature and front contact a circuit for the control of lamp 11 in a manner hereinafter to be described.

The "A" operator now passes the number

of the calling subscriber to the toll switching operator and the toll switching operator thereupon inserts plug 14 into jack 15 of this calling subscriber's line 1. However, previous to the insertion of this plug into jack 15, she will operate a key to remove her telephone set from the trunk. In accordance with the above mentioned copending application to Wiley Whitney, a ground will be connected under these circumstances to lead 45, which as stated corresponds to lead 11 of the Whitney application. This ground maintains relay 40 energized through the lower winding, but short-circuits the upper winding of relay 39 so that this latter relay will now release. On the release of this relay a circuit will be completed, as soon as plug 14 is inserted in jack 15 and relay 37 is energized through the sleeve circuit, to cause the lamp 11 to be short-circuited, as follows: Battery through the upper outer armature and back contact of relay 39, upper outer armature and front contact of relay 40, low resistance 46, high resistance 47 to ground. If this circuit had not been closed the lamp 11 would be lighted steadily on the operation of relay 37 through the circuit established at its lower armature and front contact to ground through the high resistance 47. If the lamp 11 had lighted steadily through this circuit, it would have indicated to the toll switching operator that she had neglected to remove her telephone set from the trunk.

The operation of relay 37 opens the above mentioned holding circuit for relay 30, but as the subscriber of line 1 has already removed his receiver from the hook a circuit will be completed through the tip and ring conductors of the trunk and the left hand windings of repeating coil 32 through the winding of the relay 49, so that relay 49 in operating will maintain relay 30 operated over a circuit from battery to the left hand winding of relay 30, armature and front contact of relay 49, right hand winding of relay 30 to ground at the armature and front contact of relay 29.

It will be noted that when relay 30 first operated, a circuit was completed for the operation of relay 50 as follows: Battery, winding of relay 50, make-before-break contacts of this relay through the inner right hand armature and front contact of relay 21, terminal bank 51, outer right hand armature and front contact of relay 30 to ground. Relay 50 in operating opens its energizing circuit, but completes a locking circuit for itself through its right hand armature and front contact to ground at the armature and back contact of relay 20. Relay 50 in operating thus prepares a path for the operation of relay 52, which is completed on the insertion of plug 14 into jack 15 as follows: Battery, winding of relay 52, left hand armature and front contact of relay 50, terminal bank 53, sleeve terminals of plug 14 and jack 15 to

ground. Relay 52 in operating closes an obvious circuit for the operation of relay 19 to the ground at the armature and back contact of relay 20. The operation of relay 19 completes a circuit from a source of ringing current at 53 through the armatures and front contact of relay 18 and upper and lower outer armatures and front contacts of relay 19 to the tip and ring conductors of trunk 10. The energizing circuit for relay 18 is open on the operation of relay 19, but as relay 18 is slow to release, a short impulse of ringing current from source 53 will now be applied to the tip and ring terminals of trunk T. This impulse will be received at the recording and completing operator's position to momentarily operate the ringing relay 218. Relay 218 in operating closes a holding circuit for itself and also a circuit through its armature and front contact for the operation of relay 212 to the ground at the inner lower armature and back contact of relay 211. The relay 212 in operating removes the battery that was connected, as hereinbefore stated, for making jack 205 busy. Relay 212 in operating completes a circuit for this battery for the lighting of lamp 201 to indicate to the recording and completing operator that a connection is desired over this trunk.

The recording and completing operator at "R" now inserts plug 204 into jack 205 and thus causes the operation of relay 215. This relay in operating closes an obvious circuit for the operation of relay 211 and this relay in operating removes the relays 210 and 218 from across the tip and ring terminals of the trunk and causes the release of relays 212 and 218 so that the tip and ring conductors are now clear of these bridges normally connected across these conductors. The "A" operator will now communicate with the recording operator and give her the number of the calling subscriber, and then remove her plug 4 of cord A, from jack 5. The "A" operator will also remove plug 2 of cord A from jack 3 at this time. It should be noted that after relay 19 has operated and relay 18 has released, a talking connection is completed from the "A" operator to the recording operator over the tip and ring conductors connected at the armatures and back contacts of relay 18 and upper and lower outer armatures and front contacts of relay 19.

It should also be observed that when relay 19 operates a circuit is completed for the operation of relay 34 as follows: Battery, lower inner armature and front contact of relay 19, terminal bank 55, winding of relay 34 to ground. Relay 34 in operating temporarily disconnects the tip and ring conductors of the trunk T from the tip and ring conductors leading through the repeating coil 32 to the calling subscriber's line over plug 14 and jack 15, so that when the recording and completing operator is called, ring-

ing current will not be transmitted to the calling subscriber and so that when the "A" operator passes the number of the calling subscriber to the recording and completing operator, the toll switching operator and the calling subscriber will not be involved.

On the removal of the plug 4 from jack 5 relay 17 releases which in turn causes the release of relays 50, 52, 19 and 21. When relay 21 releases, switch 6 advances its brushes to the terminals of an idle trunk. That is, a circuit is completed for relay 20 from the ground at the right hand armature and front contact of relay 29 through the terminal bank 23, the left hand armature and back contact of relay 21, right hand winding of relay 20 to battery. Relay 20 in operating causes the stepping magnet 25 to advance the brushes of switch 6 to the next idle trunk. The release of relay 19 will, of course, cause the release of relay 34, so that a connection will now be completed between the calling subscriber of line 1 through the toll switching operator's position TS over trunk T to the recording operator's position at R. The recording and completing operator now asks the calling subscriber for his own number and the number of the wanted subscriber and then completes the connection through plug 207 and jack 208 to the wanted subscriber over toll line 200 in the usual manner. When this connection is completed and the wanted subscriber has been called in the usual manner, conversation between the calling subscriber and the called subscriber may take place. Thus the connection may be checked, recorded and completed by the recording and completing operator.

If trunk T is used as an ordinary toll switching trunk for calls originating at the recording and completing operator's position, the recording and completing operator will after having received the call from a subscriber over toll line 200, insert plug 204 in jack 205 to extend the connection through to the wanted subscriber. The immediate effect of this connection will be the operation of relay 215 and relay 215 in operating completes an obvious circuit for relay 211. Relay 211 clears the tip and ring conductors from the bridged relays 210 and 218. The tip and ring conductors are connected through from the recording and completing operator's cord to battery and ground through the windings of relay 29. This causes relay 29 to operate and apply ground at its armature and front contact for the connection of the toll switching operator's telephone to the trunk as hereinbefore described and also to cause lamp 11 to flash to indicate to the toll switching operator that a connection is desired over this trunk. The ground at the armature and front contact of relay 29 is also applied through the associated terminals of terminal bank 23 and all other cor-

responding banks, thus making switch 6 and all the other switches advance to the next idle trunk. The operation of relay 30 on the operation of relay 29 removes, as is evident, battery and ground from the tip and ring conductors of the trunk T.

After the toll switching operator has received the number of the wanted subscriber, she will cause her telephone set to be removed from the line, as hereinbefore described, and insert plug 14 in jack 15 of the desired subscriber's line 1. This connection causes the operation of relay 37 and the circuit for relay 30 is thereby opened so that this relay when releasing will again connect battery and ground to the tip and ring conductors through the windings of relay 29. This connection causes the usual supervisory signal at the recording and completing operator's cord R to be lighted, indicating to this operator that she may ring the wanted subscriber's line. In applying ringing current to the trunk T in the usual manner relay 57 will operate. The operation of this relay closes an obvious circuit for the operation of relay 58. It will be noted that the circuit for relay 58 also extends from battery through the left hand winding of relay 30, so that relay 30 will operate at this time to prevent relay 29 from releasing during ringing. Relay 58 in operating applies ringing current to the wanted subscriber's line. When the called subscriber answers by removing the receiver from the hook, relay 49 will operate as soon as the recording and completing operator ceases ringing and this relay in operating will complete a circuit for maintaining relay 30 operated. This circuit may be traced from battery through the left hand winding of relay 30, armature and front contact of relay 49, right hand winding of relay 30 to ground at the armature and front contact of relay 29. The purpose of operating relay 30 was as stated, to maintain relay 29 operated during the ringing period, as it is well known in the art that when the ringing key is operated the direct current loop through this cord R is opened. When the ringing ceases, and relay 49 operates, there will be no battery or ground connections for trunk T and the supervisory signal of the recording and completing operator's cord will, therefore, be extinguished to indicate that the wanted subscriber has answered. Conversation between the called subscriber of line 1 and the calling subscriber of line 200 may now begin.

When the called subscriber hangs up his receiver on the hook, relay 49 releases causing the release of relay 30 and thus causes a supervisory signal to be given at cord R and the recording and completing operator may now take down the connection by removing plugs 204 and 207 from jacks 205 and 208, respectively. Upon the removal of plug 204 from

jack 205 relays 215 and 211 will release to bridge relays 210 and 218 across the line, causing the release of relay 29. Relay 29 in releasing causes the release of relay 40 and the short-circuit from lamp 11 is thus removed so this lamp now lights to indicate to the toll switching operator that disconnection is desired. The toll switching operator by removing plug 14 from jack 15 causes the return of the circuit at this end of the trunk to normal.

It should be understood that the trunking system described in this specification is merely illustrative of one application of the invention and that the various features of the invention may readily be adapted to other systems having similar traffic conditions to meet without departing from the spirit of the invention.

What is claimed is:

1. In a telephone system, a trunk accessible at one end from a first operator's position and terminating at the same end at a second operator's position and at the other end at a third operator's position, a subscriber's line having connecting terminals at the first and second positions, a link circuit at the first position for connection with said trunk, means responsive to the connection of said link circuit with said trunk for signaling the operator at said second position and for establishing a busy condition on the trunk at said third position, means for connecting said trunk and said subscriber's line at said second position, a signal at the third position, means responsive to said last mentioned connection for actuating said signal and for telephonically disconnecting said subscriber's line at said second position from said trunk, and means responsive to the release of said trunk from said link circuit at the first position for reconnecting said subscriber's line telephonically at said second position to said trunk.

2. In a telephone system, a trunk accessible at one end from a first operator's position and terminating at the same end at a second operator's position and at the other end at a third operator's position, a subscriber's line having connecting terminals at the first and second positions, a link circuit at the first position for connection with said trunk, an operator's telephone set at the second position, means responsive to the connection of said link circuit with said trunk for signaling the operator at the second position for establishing a busy condition on the trunk at the third position and for automatically connecting said operator's telephone set to said trunk at the second position, means for connecting said trunk and said subscriber's line at the second position, a signal at the third position, means responsive to said last mentioned connection for actuating said signal and for telephonically disconnecting said subscriber's line at the second position from

said trunk, and means responsive to the release of said trunk from said link circuit at the first position for reconnecting said subscriber's line telephonically at the second position to said trunk.

3. In a telephone system, a first, a second and a third operator's position, a plurality of trunks, one end of said trunks terminating at the second position in individual connecting terminals and at the other end at the third position in individual connecting terminals, a plurality of sets of connecting terminals at the first position, an automatic switch associated with each set of connecting terminals at the first position, a subscriber's line having connecting terminals at the first and second positions, a link circuit at the first position for connection with any set of connecting terminals at this position, means responsive to the connection of said link circuit with one of said sets of connecting terminals at the first position for automatically connecting said set of connecting terminals with an idle trunk through the associated switch, means for connecting said seized trunk and said subscriber's line at said second position, a signal at the third position associated with each of said trunks, means responsive to the establishing of said last mentioned connection for actuating the signal at the third position associated with said seized trunk and for telephonically disconnecting said subscriber's line at the second position from said trunk, and means responsive to the release of said set of connecting terminals at the first position from said link circuit for disconnecting said set of connecting terminals from the trunk and for reconnecting said subscriber's line telephonically at the second position to said trunk.

4. In a telephone system, a first, a second and a third operator's position, a plurality of trunks, one end of said trunks terminating at the second position in individual connecting terminals and at the other end at the third position in individual connecting terminals, a plurality of sets of connecting terminals at the first position, an automatic switch associated with each set of connecting terminals at the first position, a subscriber's line having connecting terminals at the first and second positions, a link circuit at the first position for connection with any set of connecting terminals at the first position, means responsive to the connection of said sets of said link circuit with one of connecting terminals at the first position for automatically connecting said set of connecting terminals with an idle trunk through the associated switch, means for connecting said seized trunk and said subscriber's line at the second position, a signal at the third position associated with each of said trunks, means responsive to said last mentioned connection for actuating the signal at the third

position associated with said seized trunk and for telephonically disconnecting said subscriber's line at the second position from said trunk, and means responsive to the release of said set of connecting terminals at the first position from said link circuit for disconnecting said set of connecting terminals from said trunk and connecting the associated switch with the next idle trunk and for reconnecting said subscriber's line telephonically at the second position to said trunk.

5. In a telephone system, a first, a second and a third operator's position, a plurality of trunks, one end of said trunks terminating at the second position in individual connecting terminals and at the other end at the third position in individual connecting terminals, a plurality of sets of connecting terminals at the first position, an automatic switch associated with each set of connecting terminals at the first position, a subscriber's line having connecting terminals at the first and second positions, a link circuit at the first position for connection with any set of connecting terminals at the first position, means responsive to the connection of said link circuit with one of said sets of connecting terminals at the first position for automatically connecting said set of connecting terminals with an idle trunk through the associated switch and for connecting the associated switches of the remaining connecting terminals at the first position with the next idle trunk, means for connecting said seized trunk with said subscriber's line at the second position, a signal at the third position associated with each of said trunks, means responsive to said last mentioned connection for actuating the signal at the third position associated with said seized trunk and for telephonically disconnecting said subscriber's line at the second position from said trunk, and means responsive to the release of said sets of connecting terminals at the first position from said link circuit for disconnecting said set of connecting terminals from the trunk and for reconnecting said subscriber's line telephonically at the second position to said trunk.

6. In a telephone system, a first, a second and a third operator's position, a plurality of trunks, one end of said trunks terminating at the second position in individual connecting terminals and at the other end at the third position in individual connecting terminals, a plurality of sets of connecting terminals at the first position, an automatic switch associated with each of said sets of connecting terminals at the first position, a subscriber's line having connecting terminals at the first and second positions, a link circuit at the first position for connection with any set of connecting terminals at the first position, means responsive to the connection of said link circuit

with one set of connecting terminals at the first position for automatically connecting said set of connecting terminals with an idle trunk through the associated switch, for signaling the operator at the second position and for establishing a busy condition on the seized trunk at the third position, means for connecting said seized trunk and said subscriber's line at the second position, a signal at the third position associated with each of said trunks, means responsive to said last mentioned connection for actuating the signal at the third position associated with said seized trunk and for telephonically disconnecting said subscriber's line at the second position from said trunk, and means responsive to the release of said set of connecting terminals at the first position from said link circuit for disconnecting said set of connecting terminals from the trunk and for reconnecting said subscriber's line telephonically at the second position to said trunk.

7. In a telephone system, a trunk accessible at one end from a first position and terminating at the same end at a second position and at the other end at a third position, sets of connecting terminals at the first position, automatic switches associated with each set of connecting terminals and having access to said trunk, a subscriber's line terminating at the first and at the second position, a link circuit at the first position for connection with any set of connecting terminals thereat, means responsive to the seizure of a set of connecting terminals by said link circuit for automatically connecting said set of terminals to the trunk through the associated switch for signaling the operator at the second position and for establishing a busy condition at the third position, means for connecting said trunk with said subscriber's line at the second position, a signal at the third position, means responsive to the establishing of said last mentioned connection for operating said signal and telephonically disconnecting said subscriber's line from said trunk at the second position, and means responsive to the release of said set of connecting terminals through the link circuit at the first position for disassociating said set of connecting terminals from the trunk and for reconnecting said subscriber's line telephonically at the second position to said trunk.

8. In a telephone system, a trunk accessible at one end from a first position and terminating at the same end at a second position and at the other end at a third position, means for establishing a telephonic connection from the first to the second position and from the first to the third position, a subscriber's line, means for connecting said subscriber's line to said trunk at the second position and preventing telephonic connection to the second position over the trunk, and means for reestablishing

lishing telephonic connection to the second position over said trunk from the third position only.

9. In a telephone system, a plurality of
5 trunks accessible at one end from a first position and terminating at the same end at a second position and at the other end at a third position, a plurality of switches, means
10 for establishing a telephonic connection over any one of said switches from the first position to an idle trunk, means for telephonically

disabling the portion of a seized trunk terminating at the second position, and means for disabling the telephonic connection from the first position to the trunk and reestablish- 15
ing the telephonic connection to the second position over the trunk.

In testimony whereof, we have signed our names to this specification this 19th day of April 1927.

HENRY M. BASCOM.
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