

Jan. 9, 1940.

J. F. TOOMEY

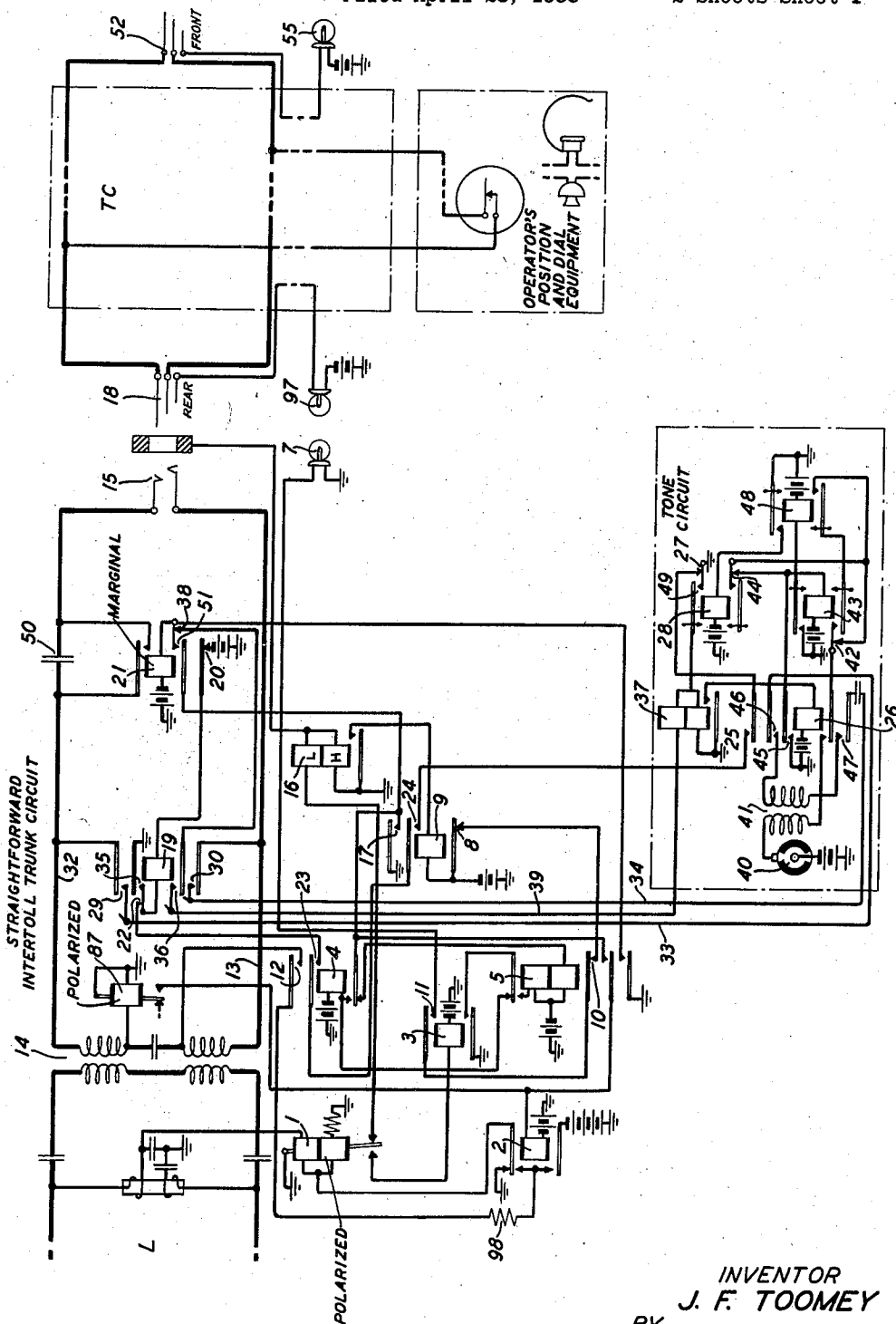
2,186,219

TELEPHONE SYSTEM

Filed April 28, 1938

2 Sheets-Sheet 1

FIG. 1



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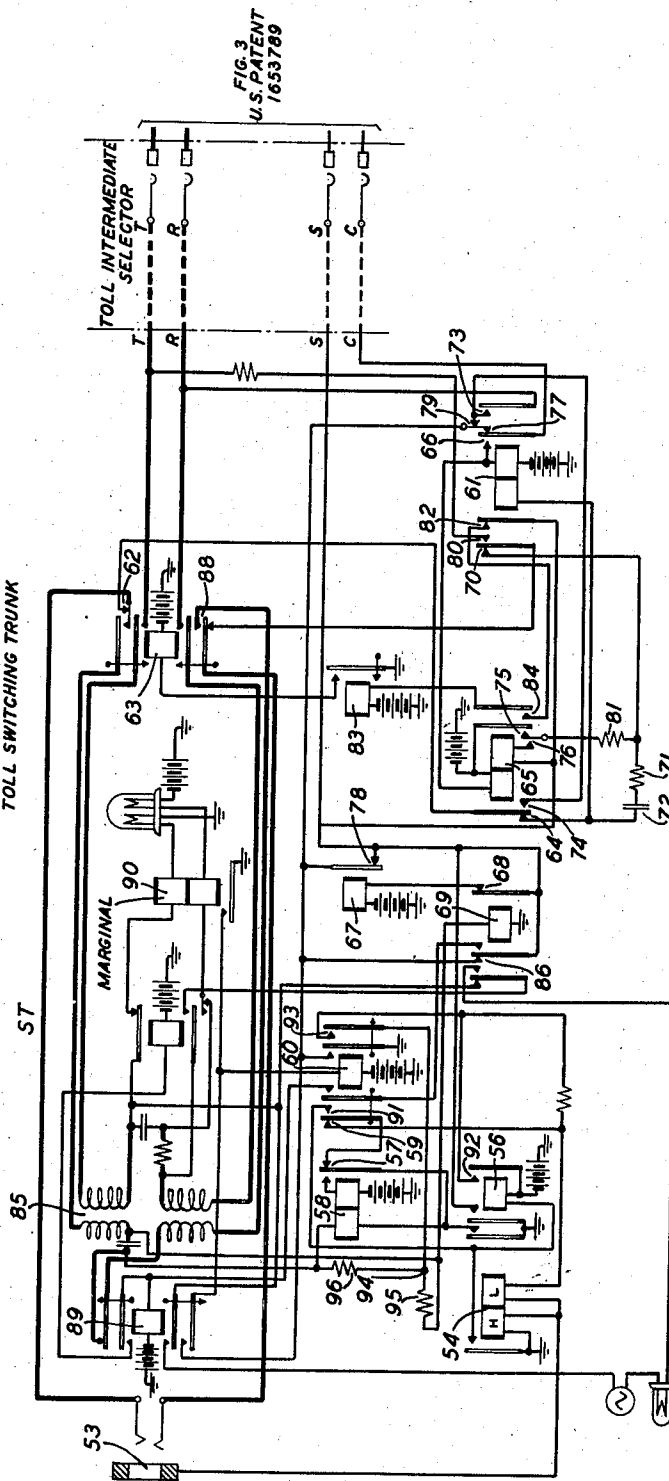
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FIG. 2
TOLL SWITCHING TRUNK



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TELEPHONE SYSTEM

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8 Claims. (Cl. 179-27)

This invention relates to telephone systems and more particularly to improvements in two-way straightforward, and toll switching, trunks terminating at a toll operator's position.

5 In the past when it has been desired to terminate two-way straightforward circuits at a toll board, it has been the practice to terminate the toll board end of the circuit in both a jack and also a cord and plug, which jack and plug terminals are located at different operators' positions, the jack being located at a so-called "outward" board and the cord and plug at a so-called "plug-ended position" of the "inward" board. One of the reasons for this is that on 10 inward calls for subscribers' lines reached over toll switching trunks, it is desirable that the originating or distant operator receive what is known as "thru supervision", i. e., any closure or opening of the called subscriber's switchhook contacts shall control the supervisory lamp at the originating operator's position and conversely 15 shall not affect any signal at the inward toll operator's position. Such an arrangement is shown in the U. S. patent to E. R. Smith 1,629,008, May 17, 1927, the circuit of which patent shows a straightforward two-way toll line terminating at each end in both a plug and also a jack.

Normally the jack terminations of the line at each end are disconnected and the line terminates 20 in the plugs only. When the line is seized at either end, to originate a call, the insertion of a cord circuit plug in the line jack causes the line to be connected to the jack at that end and disconnected from its plug terminations. At the 25 other end of the line which still terminates in a plug, a line signal is displayed and when the plug end is inserted in the jack of a trunk circuit to extend the connection to a called subscriber's station, and the subscriber removes his receiver from the hook, a supervisory signal is transmitted 30 back over the line to the originating end where it lights the supervisory lamp in the operator's cord circuit. Due to the fact that this is a plug-ended incoming line, no cord circuit being involved in the connection to the switching trunk, 35 there is no supervisory signal at this point.

The foregoing arrangement, however, necessitates two different types of inward operators' positions at offices where such lines terminate, 40 one being of the conventional type in which lines such as ringdown toll lines terminate in answering jacks which are adapted to be connected to other jack-ended circuits such as other toll lines, toll switching trunks, etc. by means of toll cord 45 circuits, and the other type being a so-called

plug-ended position in which the plug ends of such straightforward lines terminate in a cord and plug.

The present invention provides for the elimination of such plug-ended positions at the inward board and permits two-way straightforward 5 intertoll trunks of the character herein described to be terminated in jacks, along with other types of incoming lines, at the regular inward positions, while at the same time providing through supervision to the distant originating operator on calls incoming over the straightforward trunks which are extended over toll switching 10 trunks to called subscribers.

An object of the invention is to enable a toll 15 operator to complete either incoming or outgoing calls over a straightforward trunk circuit by means of her regular cord circuits and, in the case of incoming calls thereover and completed to a called subscriber's line over a toll switching trunk, to relay the called subscriber's switchhook supervision through the toll cord to the 20 straightforward trunk and thence to the originating operator without further affecting the toll cord supervisory lamp after it has been extinguished by the first removal of the receiver. 25

Another object of the invention is to cause a tone signal to be transmitted back over the straightforward trunk to the distant end when the toll operator plugs one of her cord circuits 30 into a jack terminating the straightforward trunk in response to a calling signal incoming over said trunk, but to prevent the transmission of such tone signals when the operator plugs into the same jack in the absence of a prior calling 35 signal.

A feature of the invention whereby the first object is attained resides in the provision of discriminating means in the straightforward trunk which, in cooperation with means in the toll 40 switching trunk employed to extend calls to a subscriber's station, functions to prevent switchhook movement at the called subscriber's station subsequent to the subscriber's answer, from affecting the supervisory lamp in the cord circuit, and to 45 relay all such switchhook supervision including the initial removal of the called subscriber's receiver, over a talking conductor of the cord circuit to the straightforward trunk and thence to the originating operator at the distant office, 50 only when the connection was established in response to a calling signal over the straightforward trunk and answered at the toll operator's position.

In other words, when the distant operator plugs 55

into the out jack of the straightforward trunk to originate a call, her cord supervisory lamp will be lighted and remain lighted until the distant called subscriber answers, whereupon the cord supervisory lamp thereat will be extinguished and so remain until the called subscriber hangs up, whereupon it relights, which is well-known standard toll supervision. At the inward or switching operator's position when the operator, in extending the call to a subscriber reached over a switching trunk arranged in accordance with this invention, plugs into the trunk, the supervisory lamp in the cord connected to the trunk is lighted the same as the lamp at the originating position and remains lighted until the called subscriber answers, at which time it is extinguished and remains dark thereafter and is not affected by any subsequent movement of the subscriber's switchhook.

A feature whereby the second object is attained resides in other means cooperating with said discriminating means in the straightforward trunk which other means is actuated to connect a source of tone current to the straightforward trunk only when a calling signal is received over the straightforward trunk and the toll operator subsequently plugs into the straightforward trunk jack to answer.

Fig. 1 shows a standard toll operator's cord circuit arranged for dialing and one end of a two-way straightforward intertoll trunk circuit arranged in accordance with the present invention, which trunk terminates thereat in a single jack; and

Fig. 2 shows an out-dial toll switching trunk extending from the toll operator's position to an automatic exchange where it can be connected to a called subscriber's line.

A description of the operation of the circuit of the invention will now be given.

Assuming a call from the distant toll office, incoming over the intertoll trunk of Fig. 1, for a subscriber reached over the switching trunk of Fig. 2: When the distant operator inserts her plug in the outgoing jack (not shown) of the intertoll trunk line, battery is connected in a well-known manner, to the tip of the line which operates the polarized line relay 1 through its upper winding to ground at the upper normal contact of relay 2. Relay 1 in operating operates relay 3. Relay 2 in operating operates relay 4 in a circuit from ground, lower contact of relay 3, upper back contact of relay 5, and winding of relay 4 to battery. Relay 3 in operating also closes its contact 11 thereby completing a circuit to light the line lamp 7 which can be traced from battery, contact 8 of relay 9, contact 10 of relay 5, contact 11 of relay 3, and lamp 7 to ground. The operation of relay 4 closes its contacts 12, thereby connecting the lower or ring conductor 13 of line L through the lower right-hand winding of repeating coil 14, and a resistance 98, to the normally open contacts of relay 2, for a purpose to be hereinafter referred to.

When the operator notes the lighted lamp 7 she inserts the answering plug 18 of the toll cord TC in jack 15 of the line thereby completing a circuit to operate sleeve relay 16 in a circuit from battery on the sleeve of the plug 18, through the lower (high resistance) winding of relay 16 to ground. Supervisory lamp 97 in the cord does not light in this high resistance circuit. Relay 16 in operating operates relay 9. Relay 9 in operating closes its contact 17 thereby completing a holding path for relay 4. Contact 24 of relay

9 closes a circuit to operate relay 19 which can be traced from battery, contact 20 of relay 21, winding and contact 22 of relay 19, contact 23 of relay 4, contacts 24 of relay 9, contact 25 of relay 26, and contacts 27 of relay 28 to ground. Operation of relay 9 opens its contacts 8 thereby opening the previously traced circuit for line lamp 7 which is immediately extinguished.

Operation of relay 19 connects, at its contacts 29 and 30, the respective tip and ring line conductors 32 and 13 to conductors 33 and 34 leading to the tone circuit at the bottom of the drawing. Relay 19 also closes its contact 35 thereby completing a locking circuit for itself from battery and contacts 20 of marginal relay 21. Relay 19 further closes its contact 36 thereby completing a circuit to operate the tone start relay 37 in the tone circuit which can be traced from battery, winding and contacts 38 of marginal relay 21, contact 36 of relay 19, and conductor 39 to ground through the upper (low resistance) and lower (high resistance) winding of relay 37 in series. Due to the combined resistances in the two windings of relay 37, relay 21 cannot operate at this time. Relay 37, however, operates and closes a circuit to operate relay 26 which in operating closes a circuit from battery, interrupter 40, through the left-hand winding of tone transformer 41 which can be traced over the inner lower contact of relay 26, contact 42 of relay 43, contact 44 of relay 28, and contact 45 of relay 26 to ground. Relay 26 at the same time closes its contacts 46-47, thereby connecting the secondary or right-hand winding of the transformer 41 to the tip and ring conductors 32 and 13 of the trunk whereupon an alternating current of audible frequency is transmitted from transformer 41 to the line L and thence to the originating operator.

When relay 26 operated it closed its contacts 45 and also completed a circuit to operate slow-acting relay 43 which after a short interval operates, thereby opening the previously traced circuit of interrupter 40 whereupon the tone applied to the line ceases but to be reapplied by the operation of control relay 43 which occurs, after a short interval, due to its energizing circuit being closed by the operation of relay 43 thereby reclosing the interrupter circuit. Operation of relay 43 operates relay 28 thereby again opening, at its contact 44, the interrupter circuit and disconnecting the application of tone to the line which impulses have now been applied twice at quickly recurring intervals. Operation of relay 28 closes its contact 49 thereby short-circuiting the lower and high resistance winding of relay 37, thus lowering the resistance of the circuit previously traced for operating this relay, which circuit includes marginal relay 21, which relay now receives sufficient current to cause its operation. When relay 21 operates it closes its upper contact thereby closing a short circuit around condenser 50 and at its contact 51 completes a locking circuit for itself over contacts 17 under control of relay 9, and by opening its contact 20 releases relay 19. When relay 19 releases it disconnects the tone conductors 33 and 34 from the tip and ring of the trunk and at its contact 36 introduces a break in the operating circuit for relay 37 which was opened when relay 21 operated. This prevents a repetition of the two-tone impulse when relay 21 releases at the time the plug 14 is removed from jack 15.

It will now be observed that due to the fact that an incoming call was received, which the

operator answered by inserting a plug in the jack, two short impulses of tone were immediately connected to the trunk and transmitted back to the originating operator as an indication to her that the toll operator had connected to the line. If relay 4, which is only operated in response to an incoming signal, had not been operated, no circuit would have been prepared for the operation of relay 19 and this latter relay would not have operated to start operation of the tone circuit when the plug 18 was inserted in jack 15. Hence, it will be seen that if the intertoll trunk were seized to pass an outgoing call by inserting plug 18 in jack 15, relay 4 would not be operated and no tone impulses would be transmitted.

Connecting to toll switching trunk

We will now continue the description of the completion of a call to a distant dial subscriber and which we assume is reached over the dial switching trunk shown in Fig. 2. Upon receiving the details of the wanted subscriber's number the toll operator inserts plug 52 into jack 53 of the switching trunk ST whereupon the relay 54 in the trunk operates in a circuit from battery, through the cord supervisory lamp 55, over the sleeve circuit and through the high resistance (left-hand) winding of relay 54 to ground. Operation of relay 54 closes an obvious circuit for operating relay 56 which immediately connects the right-hand low resistance winding of relay 54 in parallel with the left-hand winding thereby lowering the resistance of the sleeve circuit and permitting lamp 55 in the cord to light, it being noted that this lamp does not receive enough current to cause it to light when in series with the high resistance winding of relay 54 alone. The foregoing circuit from the right-hand winding of relay 54 can be traced from the right-hand terminal of left winding of relay 54, through the low resistance, (right-hand) winding of relay 54, contact 59 of relay 60, contact 57 of relay 58, to ground at the outer left contact of relay 56. Operation of relay 56 connects ground, at its inner left contact, to the S lead extending to the distant automatic switching equipment and also operates relay 67 in a circuit which includes contact 68 of relay 69.

The operator now actuates the dial key in her position circuit whereupon battery is connected to the tip of the plug 52 in a well-known manner which does not need explanation here. Battery connected to the tip of the trunk operates relay 61 through its left-hand winding over contact 62 of relay 63 and contact 64 of relay 65. Relay 61 in operating locks at its contacts 66 to ground on the C lead extending to the automatic switches, which is a well-known condition at this stage of the connection and needs no explanation. Closure of contact 66 also connects ground, from the C lead, to relay 65 which operates. Operation of relay 61 opens its contact 70 thereby removing the termination, comprising resistance 71 and condenser 72, from its normal connection in bridge of the trunk extending to the toll board, and at its contact 73, in series with contacts 74 of relay 65, connects the tip of the trunk from the toll office to the ring trunk conductor extending to the dial office. Closure of contact 80 similarly connects the ring conductor from the toll office through to the tip conductor leading to the dial office.

Operation of relay 65 opens, at its contact 64, the original operating circuit for relay 61 and

locks up over its contacts 75 and 76 to ground at the inner left contacts of relay 56. The tip and ring of the trunk are now clear of all bridges and extend through to the dial office.

The operator now dials in the usual manner and if the called line is idle, seizure of the line by the connector, as fully described in U. S. Patent 1,653,789, in connection with Fig. 3 thereof, disconnects ground from the C lead thereby causing the release of relay 61 by opening the previously traced locking circuit thereof including its right-hand winding.

The release of relay 61 reconnects ground, at its contact 77, to the C lead which can be traced from the inner left contacts of relay 56, over contacts 86 of relay 69, and at its contact 79, in series with contact 74 of relay 65, connects this same ground to the tip conductor of the trunk leading back to the toll board over contacts 62 of relay 63. Relay 61 in releasing also closes contacts 70 thereby connecting battery to the ring conductor of the trunk extending back to the toll cord. This circuit can be traced from battery, contact 75 of relay 65, resistance 81, contact 70 of relay 61, and the lowermost contacts of relay 63.

This battery supply now furnished the dial circuit of the toll cord is in a reverse direction from that received from the dial office during dialing and is also reduced in value by the series inclusion of resistance 81 and accordingly, as is well understood in the art, causes a polarized relay, in the dial circuit to operate which causes the dial to be disconnected. Further, when relay 61 releases it closes its contacts 82 thereby completing an energizing circuit for slow-operating relay 83 which can be traced from battery, winding of relay 83, contacts 84 of relay 65 and contact 82 of relay 61 to ground at the inner left contact of relay 56. Relay 83 operates relay 63 which is also sluggish in its operation. Relay 63 in operating connects the toll cord side of the trunk to the left-hand half of the repeating coil 35 and the dial office side of the trunk to the right-hand side of the repeating coil, thus interposing the repeating coil 35 in the trunk which is now in the "cut-through" condition in readiness for conversation when the subscriber is rung and answers. Operation of relay 63 disconnects the previously applied reversed battery supply to the trunk conductors leading to the toll cord which releases the polarized relay in the dial circuit. When the polarized relay releases battery is connected to the tip of the trunk in a well-known manner, for a short interval which causes relay 69 to operate in an obvious circuit. Relay 69 operated disconnects ground from the C lead by opening its contact 86 and by opening its contact 68 releases relay 67. Relay 67, however, in releasing closes its contact 78 thereby reconnecting ground to the C lead. During the period between the operation of relay 69 and the release of relay 67, i. e., while ground is disconnected from the C lead, a relay in the distant connector at the dial office is released which initiates machine ringing to the called subscriber's line in a well-known manner.

When the operator releases the dial key thereby disconnecting the dial circuit from the cord, the conductors of the cord are connected through and now the calling trunk line L of Fig. 1 is connected through the cord to switching trunk ST and thence to the called subscriber's line and the connection is ready for conversation when the called subscriber answers.

When the subscriber answers, marginal relay 75

90 operates which in turn operates relay 60. Relay 60 disconnects ground, at its contacts 59, from the right-hand low resistance winding of relay 54, thereby increasing the resistance of the sleeve circuit and extinguishing the supervisory lamp 55, and connects ground at its contacts 91 to hold relay 56 operated independent of relay 54. With relays 60 and 56 operated battery can be traced over contact 92 of relay 56 and contacts 93 of relay 60 to a point 94 at the mid-point of a simplex bridge, comprising resistances 95 and 96, connected across the tip and ring of the trunk ST at the middle of the left-hand winding of repeating coil 85. Battery flows back over the tip and ring conductors in parallel through the cord and incoming trunk line L to the repeating coil 14 where this battery, on the tip conductor 32, encounters ground through polarized relay 87 which relay now operates. Operation of relay 87 connects ground to operate the signal relay 2 which closes its upper and lower front contacts and opens its upper back contacts, thereby substituting battery for the normal ground connected to the line and causes the cord supervisory lamp at the originating office to be extinguished in a well-known manner.

Operation of relay 2 also connects battery to the ring conductor 13 of the line over the previously traced circuit including resistance 98, contacts 12 of relay 4 and the lower right winding of repeating coil 14. This battery now flows over the ring conductor of cord TC to the ring of the switching trunk, over contacts 88 of relay 63, now operated, lower left winding of repeating coil 85, uppermost contacts of relay 89, and through the left-hand winding of relay 58 to ground at the outer left front contacts of relay 56. Relay 58 locks over its right-hand winding to relay 56, and opens its contacts 57 thereby interposing a break in the previously traced circuit for shunting the left-hand high resistance winding of relay 54 and preventing the sleeve resistance being lowered and the supervisory lamp 55 relighted when relay 60 releases due to the called subscriber depressing his switchhook.

When the called subscriber hangs up relay 90 will release which in turn releases relay 60 which disconnects battery, at its contact 93, from the simplex and releases polarized relay 87 in the incoming trunk line, which in turn releases relay 2 and reconnects ground on the line leading back to the originating office where it again lights the cord supervisory lamp, all in a well-known manner. Due to the fact, however, that relay 58 is locked up to relay 56 as long as the connection remains established, supervisory lamp 55 of the toll cord is not affected for the reason that the resistance of the sleeve circuit remains high.

When the originating operator, upon noting the relighting of her supervisory lamp, and determining that the conversation is finished, disconnects from the intertoll trunk, relay 1 releases thereby releasing relay 3 and by reclosing its lower contacts, connects ground directly to the upper (low resistance) winding of the sleeve relay 16 thereby lowering the resistance of the previously traced sleeve circuit to a point where the cord supervisory lamp 97 receives sufficient current to cause it to light whereupon the toll operator removes plugs 18 and 52, from the respective jacks to which they are connected, and the circuits restore to normal.

In case the toll operator desires to extend an outgoing call to the distant toll office reached over the intertoll trunk L the operator will in-

sert plug 18 in jack 15 thereby operating sleeve relay 16 to ground at the back contacts of relay 1 which relay is not operated at this time.

The circuit of relay 16 is now through its upper or low resistance winding and hence cord supervisory lamp is lighted at once. Operation of relay 16 operates relay 9 which in turn operates relay 5 in a circuit from ground, contacts 17 of relay 9 and lower back contacts of relay 4. Relay 5, in operating, closes its lowermost contacts to operate relay 2 in a circuit from ground over contacts 17 of relay 9 and opens its upper inner back contacts to prevent operation of relay 4 when relay 3 operates.

Relay 2 in operating substitutes battery for ground on the tip of the line L through the upper winding of polarized relay 1 which does not operate, however, at this time due to the direction of the current flow in the upper winding but this direction of current flow over the line lights the line lamp at the distant office.

When relay 3 operates it completes, at its lower contacts, a previously prepared locking circuit for relay 5 over its inside upper contacts.

Relay 5 in operating closes its uppermost contacts to operate relay 21 which short-circuits condenser 50 for speech transmission reasons. Operation of relay 21 performs no other function at this time.

When the distant operator answers battery is connected to the tip of the line L which permits relay 1 to operate due to current in its lower winding, thereby increasing the resistance of the sleeve circuit and extinguishing supervisory lamp 97.

Due to the fact that relay 4 is prevented from operating by the operation of relay 5, on a call in this direction, no order tone impulses are transmitted. Further, due to the non-operation of relay 4 its contacts 12 remain open and battery is not connected to the ring conductor 13.

What is claimed is:

1. In a telephone system, a trunk line terminating in a combined inward and outward jack, means operated in response to calling signals incoming over said trunk, an operator's cord circuit adapted for connection to said trunk by way of said jack, a source of audible frequency current, means for connecting said source to said trunk, and circuit means, jointly controlled by the operation of said calling signal responsive means and connection of the cord circuit to said jack, to operate said means for connecting said audible frequency current to said trunk.

2. In a telephone system, an operator's position, cord circuits thereat, two-way trunks terminating in said position in combined inward and outward jacks, means associated with said trunk adapted to be operated in response to a calling signal incoming over said trunk at said position, and means jointly responsive to operation of said signal receiving means and connection of said cord circuit to said trunk jack to transmit a tone signal over said trunk.

3. In a telephone system, an operator's position, a trunk circuit terminating at said position in a combined inward and outward jack, cord circuits at said position adapted to be connected to said jack, a relay associated with said trunk adapted to be operated only in response to a calling signal received over said trunk prior to connection of said cord circuit to said jack, and means jointly responsive to the operated condition of said relay and the subsequent connection of said cord circuit to the jack to transmit a

plurality of momentary tone signals over said trunk.

4. In a telephone system, a toll operator's position, a two-way straightforward trunk circuit and a toll switching trunk each terminating at said position in a jack, an operator's toll cord circuit for interconnecting said trunks to extend calls in either direction, a supervisory lamp associated with the cord circuit adapted to be lighted when said cord and switching trunk are connected, means for connecting the other end of said switching trunk to a called subscriber's line, discriminating means in said straightforward trunk only operated in response to a calling signal incoming over said trunk, and when the straightforward trunk jack is idle, signaling means in said straightforward trunk, effective when operated to transmit a supervisory signal over said straightforward trunk, means in said switching trunk, operated when the two trunks are connected and a called subscriber answers at the distant end of said switching trunk, to extinguish said supervisory lamp and to operate said signaling means in the straightforward trunk over a talking conductor of said cord circuit, and other means in said switching trunk controlled over another talking conductor of said cord circuit and responsive to operation of said signaling means, when said discriminating means is operated, to disable said supervisory lamp and prevent its further lighting during the remainder of the connection.

5. In a telephone system, an operator's position, a cord circuit thereat, a two-way straightforward trunk circuit terminating in a jack at said position, discriminating means associated with said straightforward trunk adapted to be operated only in response to a calling signal incoming over said trunk, means jointly responsive to operation of said discriminating means and connection of one end of said cord circuit to said jack to transmit a momentary tone signal over said trunk, a toll switching trunk terminating in a second jack at said position, means at the other end of said switching trunk for extending the trunk to a subscriber's line, a supervisory relay in said switching trunk responsive to removal of the called subscriber's receiver, signal transmitting means in said straightforward trunk for transmitting a supervisory signal thereover and operated over connected talking conductors of said switching trunk, cord circuit and straightforward trunk when said discriminating means and supervisory relay are operated, a supervisory lamp in the sleeve circuit of the cord connected to said switching trunk and adapted to be lighted when the cord is connected to the switching trunk and extinguished when the supervisory relay operates, and other means in said switching trunk, controlled over other connected talking conductors of said straightforward trunk, cord circuit and switching trunk, by the joint operation of said discriminating means and signal transmitting means to disable said supervisory lamp and prevent said supervisory relay from exercising further control thereof.

6. In a telephone system, a toll operator's position, a cord circuit thereat having a supervisory signal, a two-way straightforward inter-toll trunk extending therefrom to a distant toll office and a toll switching trunk extending therefrom to a distant subscriber exchange, both of which trunks terminate in jacks at said toll position and are adapted for interconnection by said cord circuit, said cord supervisory signal being adapted to be displayed when the cord is connected to the switching trunk, signal receiving means associated with said intertoll trunk adapted to operate in response to signals transmitted from the distant toll office, and means for transmitting signals over the intertoll trunk to said distant toll office, means in said switching trunk responsive to a called subscriber's answer to retire said cord supervisory signal and to operate said means in the intertoll trunk for transmitting signals thereover to the distant toll office, and other means in the switching trunk responsive to operation of said signal transmitting means in the intertoll trunk if the signal receiving means is operated to prevent further display of said cord supervisory signal.

7. In a telephone system, an operator's position, a two-way straightforward and an outgoing toll switching trunk terminating thereat, a toll cord circuit at said position for interconnecting said trunks, a supervisory lamp in said cord adapted to be lighted when the cord is connected to the switching trunk, supervisory relay means in the switching trunk responsive when a called subscriber, reached thereover, answers to extinguish the cord lamp, means in the straightforward trunk actuated by operation of said supervisory relay means in the switching trunk, if the call originated over the straightforward trunk, to cause a supervisory signal to be transmitted back over the calling straightforward trunk, and other means in said switching trunk operated in response to transmission of said supervisory signal to prevent relighting of said cord supervisory lamp during the remainder of the connection.

8. In a telephone system, an operator's position, inward and outward trunk circuits terminating thereat, a cord circuit for interconnecting said trunks, a supervisory lamp in said cord circuit adapted to be lighted when the cord is connected to the outward trunk, supervisory relay means in the outward trunk responsive when a called subscriber, reached thereover, answers to extinguish the cord lamp, means in the inward trunk actuated by operation of said supervisory relay means in the outward trunk, if the call originated over the inward trunk, to cause a supervisory signal to be transmitted back over the inward trunk, and other means in the outward trunk operated in response to the transmission of said supervisory signal to prevent relighting of said supervisory lamp during the remaining duration of the connection between the cord circuit and the outward trunk.

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