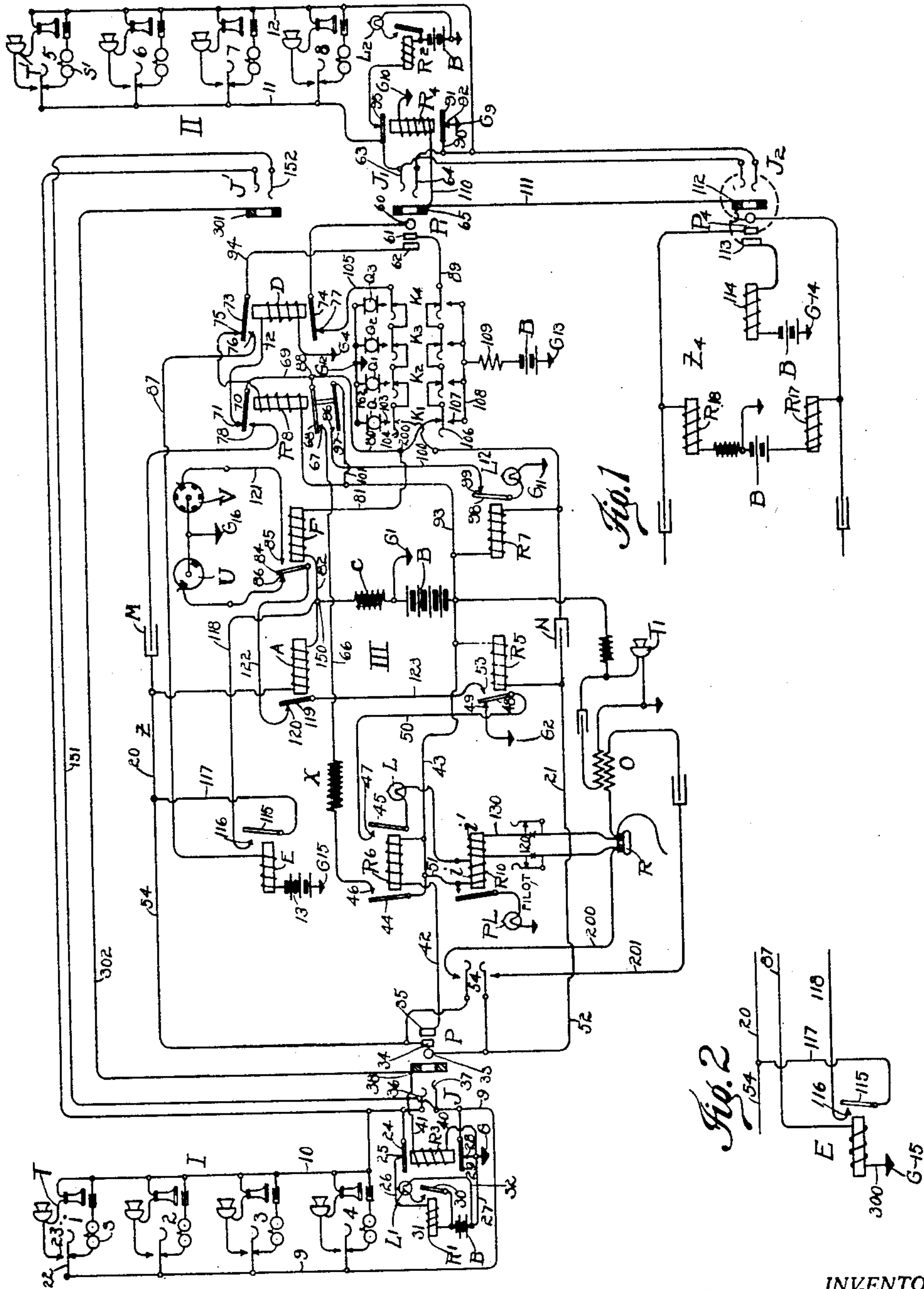


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TELEPHONE SYSTEM.

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TELEPHONE SYSTEM.

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To all whom it may concern:

Be it known that I, FRANK M. SLOUGH, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Telephone Systems; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to telephone systems and improvements therein, and especially to improvements in testing systems, one of the objects of my invention being to provide automatic means for giving an indication of when a line is busy or when the calling and called subscriber are upon the same line, in order that the operator may make connection immediately without first making a special testing operation, a practice now largely, if not universally, in vogue.

Another object of my invention is to provide means for automatically completing the talking circuit if the connection is made with an idle line, and for maintaining an interrupted talking circuit if connection is made with a busy line, to prevent the conversation upon the busy line being heard upon the calling line.

Another object of my invention is to provide means whereby connection may be made with a busy line without placing such a busy line and the calling line in connection, and whereby communication is automatically made, as soon as the busy line is restored to idle condition.

Another object of my invention is to provide reverting busy indicating means or apparatus which indicates when connection is made with a multiple jack of a line already connected to the link conductors or cord circuit. It sometimes happens that the called for party is upon the same line as the calling party, when, due to the presence of the called party thereon, the busy signal will be given when connection is made with a multiple jack of the line. I provide improved means for giving a distinctive signal when this is done.

Another object of my invention is the provision of means for accomplishing the ob-

jects I have enumerated, without interference.

Other objects of my invention and the invention itself will probably be better understood from a description of a particular embodiment.

Figure 1 shows the preferred form of my invention.

Fig. 2 is a modification.

At I I show a telephone line, here illustrated as a party line and upon which, for the purpose of description, it will be assumed the calling party resides. At II I show a second line, which for the sake of convenience will be known as the called line. At III is shown a central station. Means are provided at the central station for connecting the lines together, and is here illustrated as a cord circuit Z. Suitable switching means are provided for connecting the cord circuit to the telephone lines, which are here shown as plugs and jacks. Each of the lines is led from the substations (1, 2, 3 and 4 of the calling line and 5, 6, 7 and 8 of the called line) by conductors 9 and 10 of the calling line and 11 and 12 of the called line to the central station where the lines terminate in multiple jacks. Here I have shown each line provided with two jacks—the calling line with the jacks J, J' and the called line with the jacks J¹ and J². The cord circuit is shown as terminating in the answering plug P and the calling plug P₁. These jacks and plugs comprise a plurality of contacts which may be arranged one behind the other, as illustrated in the diagram, the spring contacts of the jack being behind the face of the switchboard, so that it is necessary to insert the plug to cause one of the back contacts of the plug to engage one of the front contacts of the jack. Each substation on the calling line is provided with a talking set T and a signaling set S. Each substation on the called line is provided with a talking set T' and a signaling set S'. These have been referenced only at the substations 1 and 5, because these will be sufficient for the purpose of this description. The main station is provided with an operator's set O which includes a receiver R and a transmitter T₁. The lamps which are employed for giv-

ing the operator supervision over the connection ordinarily known as supervisory lamps, are shown at L and L¹². The pilot signal is shown at P L, and is common to a plurality of cords. The ringing machines are shown at Q, Q₁, Q₂, Q₃. At U and V is shown a pair of special signal producing devices, here shown as current interrupters, whose functions will be explained in connection with the description of the operation of the system. The line lamps are shown at L₁, L₂, and the line relays at R¹ and R², and the cut-off relays at R³ and R₄. The relays which are employed to control the lamp L, and ordinarily known as the supervisory relays, are shown as follows—the tip supervisory relay in the answering end of the cord at R⁵ and its companion supervisory relay at R⁶. In the calling end of the cord, the tip supervisory relay is shown at R⁷, and the relay performing the function of its companion relay, at R⁸. The switches employed for connecting the ringing generators to the line are shown at K¹, K², K³ and K⁴. In the form shown, the strands of the cord circuit 20 and 21 are separated by condensers M and N. A source of electrical energy is shown at B. While I have illustrated this at a number of places, it is understood that all of them may be one source, though they are illustrated at various places for convenience.

The general characteristics of all of the apparatus heretofore mentioned is well understood and a description of the details is unnecessary.

On the lower right hand portion of the drawing, in connection with the jack J₂, I have illustrated a portion of a cord circuit Z⁴, showing a plug P⁴ adapted to coöperate with the jack J₂ and the coils of two relays R¹⁸ and R¹⁷.

The details of the embodiment shown in the drawing and its functions will be better understood from a description of the operation, which is as follows: Assuming that the subscriber at the station 1 upon the line I desires to communicate with the subscriber at 5 upon the line II (first describing the operation when the line II is idle) the subscriber at 1 removes his receiver from the hook, whereupon the hook 22 rises, closing the switch 22—23. A circuit will then be closed as follows: 23—the talking set T—10—24—25—26—relay R¹—B—27—28—29—conductor 9 and 22. Current will flow over this circuit through the relay R¹, energizing the same, when it will attract its armature 30, closing the switch 30—31 and lighting the lamp L¹ over a circuit, including the lamp, the contacts 30 and 31 and the battery B. The lamp L¹ is located so that its illumination can be observed by the operator at the main station III. Generally, this lamp is located upon the front face of the

switchboard. Observing the illumination of the lamp, the operator inserts the plug P into the jack J, the tip 33, the sleeve 34 and shank 35 of the plug engaging respectively with the tip spring 36, the sleeve spring 37 and the thimble 38 of the jack J and making electrical engagement therewith. A circuit will then be completed from the ground at G—through conductor 40—relay R³—41—38—35—conductor 42—relay R⁶—conductor 43—battery B—to ground at G¹, energizing the relays R³ and R⁶. The relay R³ attracts its armatures 24 and 25, cutting off the line lamp and relay from the line. The relay R⁶ attracts its armatures 44 and 45, closing a switch 44—46 for a purpose to be described, and a switch 45—47 in the circuit of the supervisory lamp L, which would be lighted over its circuit G²—49—48—50—47—45—L—the pilot relay R¹⁰—51—43—B—to ground at G¹, except that the relay R⁵ is energized over the answering end of the cord and the calling line, owing to the fact that the bridge at the substation 1 is closed. This circuit comprises the battery B, the relay R⁵—the conductor 52—the tip contacts of the plug and jack, the two line limbs 9 and 10 and substation set, the conductor 54 of the cord, the relay A, the resistance C, back to battery. The relay R⁵ will attract its armature 48, opening the switch 48—49 and closing a switch 48—53 for a purpose to be described. The operator then operates the listening switch 54, connecting her set O with the plug, and through the plug and jack of the calling line with the calling subscriber at substation 1. Having learned that it is the subscriber at 5 that is wanted, the operator immediately inserts the plug P₁ into the jack J₁.

At the time the relay R⁶ was energized, the switch 44—46 was closed, as described, completing a circuit through the relay D as follows: ground at G¹—battery B—43—44—46—a resistance device X which I prefer to make an inductive resistance, and which is here shown as such—the conductor 66—contacts 67—armature 68—conductor 69—armature 70—contact 71—conductor 72—relay D—to ground at G⁴, energizing the relay D which attracts its armatures 73 and 74. The attraction of the armature 73 opens the switch 73—75, interrupting the circuit of the relay R⁸ and closing a switch 73—76 in the circuit of a relay E, which may be operated later, as will be described. The attraction of the armature 74 opens a switch 74—77 in the tip strand of the cord circuit, the sleeve strand being already interrupted at 70—78. The talking strands are now discontinuous.

When the relay R⁶ was operated, a circuit was completed for the relay F as follows: 46—X—66—67—68—80—81—F—

82—the resistance C—battery B—43—44. The relay F attracts its armature 84 opening a switch 84—86 and closing a switch 84—85, all for reasons which will appear later. If the line 2 is idle, which it is assumed to be, the operation will be as follows: When the plug was inserted, the tip contact 60, the sleeve contact 61 and the shank contact 62 engaged respectively with the tip spring 63, the sleeve spring 64 and the thimble 65 of the jack J_1 . When the plug is first inserted, the cut-off relay R^4 will not be operated because the circuit through it will include the high resistance relay E, the conductor 87 and the contacts 76 and 73. The resistance of the relay E is great enough to prevent a flow of current sufficient to operate R^4 . The engagement of the contact 61 and the spring 64 completed a shunt of the relay D, as follows: Beginning at a point 88—through conductor 80—the ringing springs—conductor 89—61—64—90—91—92—ground G^9 . In the form shown this shunt is a short circuit of the relay D. This relay will be deenergized, letting go its armatures 73 and 74, completing the tip strand of the cord at 74—77, breaking the circuit of the relay E and closing a circuit through the cut-off relay R^4 , as follows: G^1 —B—93—relay R^8 —75—73—94—62—65— R^4 —ground G^{10} . The relay R^4 is energized over this circuit, attracting its armatures 91 and 93 and cutting off the line relay R^2 and lamp L^2 , at the same time the relay R^8 is energized, interrupting the circuit of the relay D at 70 and 71, closing the sleeve strand of the cord at 70—78, interrupting the circuits of the relays D and F at 67 and 68 and closing the circuit of the lamp L^{12} at 96—97.

There being nobody on the called line, the lamp L^{12} will be lighted over the following circuit: G^{11} — L^{12} —98—99—100—96—97—101—93—battery B—ground at G^1 . The operator receiving no signal to indicate that the called line is busy, proceeds to operate the ringer at the station 5 by connecting to the line the ringing current adapted to operate such ringer. In this case, we will assume that it is the generator Q, and that the operator operates the key K^1 . Generator current will flow as follows: G^{12} —102—Q—103—104—105—77—74—60—63—11— S' —12—64—61—89—106—107—108—109—B—to G^{13} . When the calling subscriber responds, the relay R^7 will be actuated over the cord and line circuit and through the plugs and jacks, interrupting the circuit of the lamp L^1 at 98 and 99. The conversational circuit is now complete and the conversation takes place.

When the conversation is completed, the subscribers hang up their receivers, interrupting the circuits of the relays R^5 and R^7 , which restores the circuits of the lamps L

and L^1 , indicating to the operator that the conversation is completed. The plugs are then withdrawn from the jacks, interrupting the circuits of the relays R^6 and R^8 and restoring the system to normal. 70

Assuming that the line II was busy at the time the plug P_1 was inserted into the jack J_1 , under these conditions the plug of some other cord—for example, the plug P^4 of the cord Z^4 will be plugged into one of the multiple jacks, say the jack J^2 , the connection being illustrated by broken lines in the right-hand corner of the drawing. The cut-off relay R^4 would have been operated before P_1 was inserted into J_1 over the following circuit: G^{10} — R^4 —110—111—112—113—114—battery B—to ground at G^{14} . The switch 91—92 will be open, so that the shunt of the relay D through the conductors 80 and 89, which was previously described as being made when the line was idle, will not be made, and the relay D will remain operated, the relay E having been operated when the plug was inserted over the following circuit: G^{10} — R^4 —110—65—62—94—73—76—87—E—B— G^{15} . The relay E attracts its armature 115, closing the switch 115—116, which places a shunt about the relay A, as follows: 117—115—116—118 causing the deenergization of the same, which releases its armature 119, closing a switch 119—120 and completing a circuit as follows: G^{10} —V—121—85—84—122—120—119—123—53—48—50—47—45—L— R^{10} —51—43—battery B to ground at G^1 . The interrupter V being constantly rotating, this circuit will be constantly made and broken in a characteristic manner, determined by the nature of the interrupter V. The making and breaking of the circuit will cause the lamps L and PL to flash and will induce through the coil i an interrupted current in the coil i' in the circuit 130 of the operator's receiver, giving her also an audible signal of the busy condition of the line II. It will be apparent that either of the visible signals, or the audible signal may be employed independently of the other, though I prefer to use them both. 100

If at the time the plug is inserted into the jack of the busy line, the listening key 54 is depressed, the busy signal which is conveyed to the receiver of the operator will also be conveyed to the calling subscriber over the lines 200 and 201 of the receiver R—through the tip and sleeve contacts of the plug and jack and the line conductors of the line I. The operator may interrupt this connection by throwing the listening key 54 to normal position. The subscriber may, if he receives the busy signal, recognize the same and hang up his receiver, whereupon the answering supervisory signal will be operated and the operator will pull down the connections, or the oper- 105 110 115 120 125 130

ator may advise him that the line is busy, or the calling subscriber may be left waiting for the termination of the conversation taking place over the cord Z^4 , the operator in the meantime attending to other affairs, interrupting, if she desires, the busy signaling circuit through her receiver by actuating the switch 120, but retaining supervision through the signal PL. When the plug P^4 is withdrawn from the jack J_2 , the relay R^4 will be deenergized, and the switch 91—92 closed, whereupon the operation would be the same as that described in connection with the operation when the line II was idle. The energization of the relay A, due to the shunt being removed, will interrupt the special busy circuit controlled by the device V and the cessation thereof will be a signal to the operator to ring the called subscriber. Should, however, the subscriber at 1 desire not to wait, he will open his switch hook, which will interrupt the busy signal circuit, causing the lamps L and PL to discontinue flashing. The hanging up of the receiver will also complete the supervisory circuit, so that the supervisory lamp will now burn steadily. The operator observing this, will withdraw the plugs P and P^1 , and the circuits will be restored to normal.

Assuming that the subscriber called for is upon the same line as the subscriber 1; for example, assume that it is the subscriber at 2 that is wanted, the plug P_1 would be inserted into a multiple jack of the line I, for example, the jack J^1 , and the calling subscriber being upon that line would, of course, get the special busy signal controlled by the device V, unless some means were provided for disabling the busy signal apparatus or for giving a peculiar signal to indicate when the called party is on the same line as the calling party. I provide means for both disabling the ordinary testing means and for giving a peculiar signal to aid in preventing the confusion which would otherwise result when this condition arises.

Assume now that the plug P_1 is inserted into the jack J^1 of the line I, the operation will be the same as that described in connection with the insertion of the plug P_1 into the jack J_1 when the line II was busy, except that a shunt will be completed about the relay F, as follows: beginning at the point 150—118—116—115—117—54—34—37—the multiple conductor 151—152—the contact 61 of the plug P_1 —89—the normal contacts of the ringing springs to the point 200. The relay F will be deenergized, opening the switch 84—85, disabling the ordinary busy signal apparatus and closing a switch 84—86, substituting the device U for the device V in the special busy signaling circuit and producing a signal determined by the

character of the device U which is different from the device V. This signal is recognized as indicating that the called and calling party are on the same line, whereupon the operator will advise the calling party to hang up. When this is done, the system will be reduced to the condition described in connection with the insertion of the plug into the jack of the idle line. The operator will then withdraw the plug P and signal the subscriber at 2 in the usual manner, the calling subscriber later coming on the line. At the termination of the conversation, as indicated by the lamp L^{12} , the plug P_1 is withdrawn from the jack J_1 , whereupon the system will be restored to normal.

In the modification shown in Fig. 2, the relay E is connected directly to ground through a conductor 300. The circuit of the relay E will then be as follows: G^{15} —300—E—87—76—73—94—62 (and assuming that the plug P_1 is inserted into the jack of a busy line) the thimble 65—conductor 111—112—113—114—battery B—to ground at G^{14} .

Assuming that the plug P_1 was inserted into the jack J_1 of the calling line, the circuit of the relay E would be as follows: G^{15} —300—E—87—76—73—94—62—301—302—38—35—42— R^6 —43—B—to ground at G^1 . Upon the completion of either of these circuits, the relay E would be energized and the description of the operation of the associated apparatus would be the same as before. With this arrangement I am enabled to use a lower resistance relay at E.

While I have shown this particular form, these particular types of apparatus, and these particular details, I do not wish to be limited thereto, having used them as a means of illustrating my invention. It will readily be understood that many departures may be made from the form, types and details shown, without departing from the spirit of the invention.

I claim:

1. In a telephone system, the combination of a main station, a plurality of substations, telephone lines leading from the substations to the main station, one of said lines having a plurality of substations on the same, multiple terminals at the main station for said telephone lines, a cord circuit at the main station for connecting the lines together, means for connecting the cord circuit to the terminals of the lines, busy test signaling means for giving a signal when a busy line is tested, and means for disabling said busy test signaling means when a test is made upon a multiple conductor of a line already connected to the link conductors.

2. In a telephone system, the combination of a main station, a plurality of substations, telephone lines connecting the substations and the main station, a plurality of substa-

tions upon one of such lines, multiple terminals at the main station for the telephone lines, link conductors at the main station, means to connect the link conductors to the telephone lines through such terminals, busy tone test signaling means at the main station for indicating the busy condition of a tested line, distinctive signaling means at the main station for indicating when a test is made upon the terminal of a line to which the link conductors are already connected, and means for disabling said busy test signaling means and rendering operative said distinctive signaling means when the test is made upon the terminal of a line already connected to the link conductors.

3. In a telephone system, the combination of a multi-party line, a cord circuit, a plurality of jacks for the party line, multiple conductors connecting said jacks, plugs for connecting the cord to the jacks of telephone lines, and a reverting busy test circuit controlled over a multiple conductor and the sleeve of the calling plug.

4. In a telephone system, the combination of a party line having a plurality of terminals at the main station connected by multiple conductors, a cord circuit at the main station, means for connecting the cord circuit to the terminals, reverting testing means associated with the cord circuit, means to condition said reverting testing means to operate, said last named means being operative only when the cord circuit is completely connected at both ends to the terminals of a telephone line.

5. In a telephone system, the combination of a party line terminating in a plurality of jacks, a cord circuit and plugs connected thereto, reverting testing means, and means to condition said reverting testing means to operate, said last named means being operative only when such plugs are inserted into the multiple jacks of the party line.

6. In a telephone system, the combination of a party line, multiple jacks in which said party line terminates, said jacks being provided with a front contact and a second contact behind the first, and reverting testing apparatus controlled through such second contact of the jack.

7. In a telephone system, the combination of a party line terminating in multiple jacks, said jacks having a front contact and a second contact behind the same, a cord circuit terminating in plugs having a front contact and a second contact behind the same, and reverting testing means controlled through the second contact of the jack and the second contact of the plug.

8. In a telephone system, the combination of a party line terminating at a main station in multiple jacks, said jacks having front contacts and second contacts to the rear thereof, multiple conductors connect-

ing the corresponding contacts of the jacks, the multiple conductor connected to the second contacts being connected to one of the limbs of the talking line, a cord circuit at the main station, and reverting testing means associated with the cord circuit controlled over the multiple strand connected to the limb of the telephone line.

9. In a telephone system, the combination of a party line terminating at a main station in multiple jacks, a cord circuit and means for automatically giving a reverting test when the calling plug of a cord circuit is inserted into the jack of a line already connected to the answering end of the cord.

10. In a telephone system, the combination of a multi-party telephone line, a plurality of terminals for said line, a cord circuit for connecting telephone lines together, means for connecting the cord circuit to the terminals of telephone lines and means for automatically giving a reverting test when one end of said cord circuit is completely connected to the terminal of a telephone line already connected to the front end of said cord circuit.

11. In a telephone system, the combination of a main station, a multi-party telephone line leading to the main station and terminating thereat in multiple jacks, a cord circuit, plugs for connecting the cord circuit to the jacks, reverting testing means associated with the cord circuit controlled by a subscriber on the multi-party telephone line when said line is completely connected to said cord.

12. In a telephone system, the combination of a main station, link conductors thereat, a plurality of telephone lines, one of which is a multi-party line, leading from the substations to the main station, means for connecting the link conductors to the telephone lines, a supervisory signal associated with the link conductors, and means to intermittently operate said supervisory signal in a distinctive manner when both ends of the link conductor are connected to the same telephone line.

13. In a telephone system, the combination of a telephone line, a cut-off relay associated therewith, a cord circuit, reverting testing means associated with said cord circuit, controlling means therefor, and a shunt of said controlling means governed by the cut-off relay through contacts thereof.

14. In a telephone system, the combination of a cord circuit, supervisory means in the answering end thereof including a relay, reverting testing means, controlling means for said reverting testing means, and a shunt of said controlling means controlled by said supervisory relay.

15. In a telephone system, the combination of a multi-party telephone line terminating in multiple jacks, a plurality of cord

circuits and means common to said cord circuits for indicating when both ends of one of said cord circuits are completely connected to the same line.

5 16. In a telephone system, the combination of a multi-party telephone line, a cord circuit, listening keys associated with said cord circuit and reverting testing means independent of said listening keys associated
10 with the cord circuit.

17. In a telephone system, the combination of a main station, a plurality of substations, telephone lines, one of which is a party line, leading from the substations to
15 the main station, said party line terminating in multiple jacks at the main station, a cord circuit at the main station, plugs for connecting the cord circuits to jacks of telephone lines, an operator's set, means for
20 connecting the operator's set to the cord circuit, reverting testing mechanism associated with the cord circuit for indicating when both ends of the cord are connected to the same telephone line, said mechanism being
25 independent of the means for connecting the operator's set to the cord circuit.

18. In a telephone system, the combination of a main station, a multi-party telephone line terminating at the main station
30 in multiple jacks, a cord circuit terminating in plugs adapted to cooperate with said jacks and means for automatically giving a distinctive reverting busy signal when both ends of the cord are completely connected to jacks of the same line.
35

19. In a telephone system, the combination of a calling telephone line, a cord circuit, means to give a distinctive reverting busy signal when both ends of the cord circuit are connected to the same line and
40 means to prevent the transmission of the distinctive signal to the calling line.

20. In a telephone system, the combination of a main station, a plurality of substations, telephone lines connecting the substations to the main station, a cord circuit
45 at the main station provided with a plug at each end for connecting telephone lines together, jacks in which the lines terminate, apparatus for automatically giving a busy test when the plug at the calling end of the
50 cord is inserted into the jack of a busy line and a supervisory relay connected to the answering plug in the answering end of the cord controlling said apparatus.
55

21. In a telephone system, the combination of a main station, a plurality of substations, telephone lines connecting said
60 stations, link conductors at the main station for connecting the telephone lines together, plugs in which the conductors terminate, jack terminals for the telephone lines, apparatus including a signal device for automatically indicating when the calling
65 plug of the link conductors is inserted

into the jack of a busy line and means including said signal device for indicating when the calling subscriber has hung up his receiver.

22. In a telephone system, the combination of a plurality of substations and a main station, telephone lines leading from the substations to the main station and terminating thereat in switchboard jacks, a cord circuit for connecting the lines together, plugs in which the strands of the
75 cord circuit terminate adapted to cooperate with said jacks for connecting the cord and lines together, said jacks including a front contact and a second contact behind the
80 front contact, apparatus associated with the cord circuit for automatically giving a busy signal when the calling plug is connected to the jack of a busy line, said apparatus being controlled through the second contact of the jack of a telephone line and a
85 portion of one of the talking strands of the cord circuit.

23. In a telephone system, the combination of a plurality of telephone lines, one of which is a called line, substations on said
90 lines and a main station at which the lines terminate, link conductors for connecting the telephone lines together, apparatus for automatically giving a busy signal when the link conductors are connected to a busy line, an electromagnet controlling said apparatus
95 and a relay device at the main station associated with the called line provided with contacts through whose operation it is adapted to cause the deenergization of said electromagnet.
100

24. In a telephone system, the combination of a plurality of telephone lines, including a called line, substations on said
105 lines, a main station at which the telephone lines terminate, a cord circuit at said main station for connecting telephone lines together, means for automatically giving a busy signal when the cord circuit is connected to a busy line, an electromagnet controlling said apparatus, a relay device at the
110 main station associated with the called line provided with contacts through the operation of which it is adapted to cause the deenergization of said electromagnet and a second cord circuit adapted to be connected to the called line controlling said relay device.
115

25. In a telephone system, the combination of a main station, substations, telephone lines connecting the main station and substations, link conductors at the main station
120 for connecting the telephone lines together, apparatus for automatically giving a busy signal when the link conductors are connected to a busy line, an electromagnet controlling said apparatus, a circuit for said electromagnet, a resistance device in said
125 circuit, a relay device in the answering end

of the link conductors controlling said circuit, a shunt of said electromagnet and a relay device at the main station associated with the called line controlling said shunt.

5 26. In a telephone system, the combination of substations, a main station, telephone lines connecting the substations and the main station, link conductors for connecting the telephone lines together including
10 talking strands, means for interrupting the talking strands prior to completing the connection of the link conductors to the telephone lines, an electromagnet controlling

said interrupting means, a circuit for said electromagnet, a resistance device in said circuit, a relay device controlling said circuit, a shunt of said electromagnet and a relay at the main station associated with the called line controlling said shunt.

In witness whereof, I have signed my name in the presence of two witnesses this 14th day of July, 1914.

FRANK M. SLOUGH.

Witnesses:

JOHN S. RICHEY,
META SMITHBERGER.