

PANEL SYSTEM
SUBSCRIBER RECORDING
COMPLETING TRUNK
TWO WIRE
OUTGOING TO TOLL SWBD
ARRANGED FOR COIN CONTROL

CHANGES

A. CHANGED AND ADDED FUNCTIONS

- A.1 Provides for trunk make-busy operation.

B. CHANGES IN APPARATUS

- B.1 Relay (MB) Y147 of Fig. G was added.

D. DESCRIPTION OF CIRCUIT CHANGES

- D.1 Figs. G and H were added.
D.2 Circuit Note 143 was added.

All other headings under "Changes", no change.

1. PURPOSE OF CIRCUIT

- 1.1 This circuit is designed for use in completing calls from panel system coin box subscriber's lines. It is a 2-wire circuit and functions between panel district selector or office selector circuits and 2-wire recording completing trunk equipment at the combined line and recording switchboard. It is arranged for the automatic return of the first coin, collection or return of subsequent coins from the panel "A" or toll board, recalling the subscriber and the automatic collection of coins when both the subscriber and the toll operator have disconnected.
- 1.2 A multiple of this circuit on the office link and connector circuit in a crossbar office located in the same building is provided on a provisional basis to permit the common use of this circuit by subscribers in both the panel and the crossbar offices. Extended subscriber loops are provided for by additional adjustments on the (A) relay to permit subscribers loops up to a maximum of 1500 ohms where earth potentials and panel office conditions permit. Also provision was made for testing this circuit from the test board in the crossbar office where the crossbar multiple is furnished.

2. WORKING LIMITS

- 2.1 Adjustment Number 1

- 2.11 The maximum external subscribers loop resistance over which relay (A) will flash satisfactorily is 1200 ohms.
- 2.12 The maximum earth potential with which relay (A) will operate satisfactorily is ± 20 volts.
- 2.13 The minimum external circuit loop resistance over which relay (A) will non-operate on its P2 winding alone is 1975 ohms.
- 2.14 The maximum external circuit loop resistance over which relay (A) will operate on its P2 winding alone is 750 ohms.
- 2.15 The maximum subscribers loop insulation resistance shall be 10,000 ohms.

2.2 Adjustment Number 2

- 2.21 The maximum external subscribers loop resistance over which relay (A) will flash satisfactorily is 1350 ohms.
- 2.22 The maximum earth potential with which relay (A) will operate satisfactorily is $+ 20$ volts and $- 13.5$ volts.
- 2.23 The minimum external circuit loop resistance over which relay (A) will non-operate on its P2 winding alone is 1975 ohms.
- 2.24 The minimum external circuit loop resistance over which relay (A) will operate on its P2 winding alone is 750 ohms.
- 2.25 The maximum subscribers loop insulation resistance shall be 10,000 ohms.

2.3 Adjustment Number 3

- 2.31 The maximum external subscribers loop resistance over which relay (A) will flash satisfactorily is 1500 ohms.
- 2.32 The maximum earth potential with which relay (A) will operate satisfactorily is $+ 20$ volts and $- 12$ volts.
- 2.33 The minimum external circuit loop resistance over which relay (A) will non-operate on its P2 winding alone is 2954 ohms.
- 2.34 The maximum external circuit loop resistance over which relay (A) will operate on its P2 winding alone is 750 ohms.
- 2.35 The maximum subscribers loop insulation resistance shall be 10,000 ohms.

- 2.4 The maximum external trunk circuit loop resistance with which relay (TK) will operate satisfactorily is 2800 ohms.
- 2.5 The minimum external trunk circuit loop resistance with which relay (TK) will non-operate satisfactorily is 14,450 ohms.
- 2.6 The minimum external trunk loop insulation resistance shall be 30,000 ohms.
- 2.7 The maximum external trunk circuit loop resistance to 97-111V 20 cycle ringing supply in series with an 8C or 8D lamp at the distant office shall be 2500 ohms.

3. FUNCTIONS

- 3.01 Provides means for preventing a false flash of the line signal during the trunk guard test by the sender circuit.
- 3.02 Provides means for signalling the toll operator when the district selector circuit has reached "awaiting operator" position.
- 3.03 Provides the toll operator with switchhook supervision after the district circuit has reached the "cut-through" position.
- 3.04 Provides the subscriber with ringing induction tone until the toll operator answers, and prevents the return of the ringing induction tone thereafter to prevent a second subscriber from mistaking it for dial tone.
- 3.05 Provides for the immediate reversal of the battery and ground to the district selector circuit in order to provide the "cut-through" condition in the district selector circuit without waiting for the toll operator to answer. This arrangement also includes both windings of the supervisory relay for operation over a maximum subscriber loop.
- 3.06 Permits the subscriber to abandon a call and release the switches before the primary line signal has answered, the first coin being returned by the district circuit.
- 3.07 Provides means for holding the connection under control of both the subscriber and operator after the primary line signal has been answered.
- 3.08 Provides a test busy condition to other hunting district selector or crossbar marker circuits after the district has reached the awaiting operator position.
- 3.09 Provides 48 volt transmission.

- 3.10 Provides means for reringing the subscriber's station.
- 3.11 Provides means for holding the switches connected to this trunk during the ringing period.
- 3.12 Automatically returns the initial coin. When the toll operator answers coin return battery is held on the line from one half to one second and one half second is allowed for the release of the coin magnet at all times. This function is repeated regardless of disconnection by the operator before the end of the timing cycle.
- 3.13 Prevents more than one automatic coin return pulse during a call should the operator fumble the plug or the circuit become terminated before the disconnection of the call.
- 3.14 This trunk is multiplied in the associated panel "A" board to provide means for collecting or returning subsequent coins manually.
- 3.15 Gives either a high or low tone to the toll operator during the collection or return of subsequent coins by the "A" operator ("F" wiring).
- 3.16 Provides means for automatically collecting all coins within the coin box when both ends are disconnected.
- 3.17 Provides means for restoring the circuit and connecting the apparatus to normal when the automatic coin collect has functioned after the completion of the call.
- 3.18 Arranged to prevent any interference with the automatic coin collect feature by the subscriber.
- 3.19 Prevents interference between the controls of the coin features. The operator cannot interrupt the automatic coin return feature and vice versa.
- 3.20 Opens the 48 volt talking circuit during the coin collect and return periods thereby preventing excessive clicks in the toll operator's telephone circuit.
- X 3.21 Provides means for connecting a test set for making routine operate tests.
- 3.22 Provides a connection to a "test and make busy" jack in the crossbar or panel "outgoing trunk test board" for testing the interoffice cable.
- 3.23 Provides a connection to a "test and make busy" jack in the crossbar or panel "outgoing trunk test board" for making operating tests.

- 3.24 Provides for the satisfactory operation of this circuit when used in areas where the PBX's are arranged for toll diversion.
- 3.25 Provides for reduced acoustic disturbance to subscriber during ringing and coin control.
- 3.26 Provides means for the direct control of the disposal of subsequent coins by the toll operator ("J" wiring).
- 3.27 Provides multiple of this circuit on the office link and connector circuit in a crossbar office located in the same building. This arrangement is provided on a "provisional" basis to permit the common use of this circuit by subscribers in both the panel and the crossbar offices.
- 3.28 Provides for trunk make busy operation.

4. CONNECTING CIRCUITS

- 4.01 "Sender Selector" district selector circuits.
- 4.02 "Link" district selector circuit.
- 4.03 Incoming 2-wire subscriber recording completing trunks.
- 4.04 Office selector circuit.
- 4.05 Power ringing circuit.
- 4.06 Test set circuit for 2-wire recording completing trunks.
- 4.07 "Test and make busy" jack circuit.
- 4.08 Test cord circuit for outgoing trunk at "outgoing trunk test board."
- 4.09 Coin control circuit in panel "A" board.
- 4.10 Miscellaneous interrupter frames.
- 4.11 Trunk coin control circuit.
- 4.12 Crossbar office link and connector circuit.
- 4.13 "Test and make busy" jack circuit - crossbar office.
- 4.14 Test code circuit for outgoing trunks at the outgoing trunk test board - crossbar office.
- 4.15 Trunk make busy circuit.

DESCRIPTION OF OPERATION

5. INCOMING CALL

When this trunk is seized by a district or office selector or marker circuit, battery through lamp (B) or (T) on the tip side of the trunk and ground through lamp (G) or (T) on the "P2" winding of relay (A) on the ring side of the trunk cause a momentary closure through the (TG) and overflow relays in the sender circuit, which is connected during the period of selection. Relay (A)* does not operate at this time. When the district selector or junctor circuit reaches the "awaiting operator" position, relay (A) operates in series with a polarized relay in the district selector or junctor circuit in turn operating relay (F). The operation of relay (F), (a) operates relay (B)**, which connects ground to the district sleeve circuit and lead "S1" in the crossbar office and operates relays (RV) and (C), (b) connects a preliminary ground to the district sleeve circuit. The operation of relay (RV)+, (a) reverses the battery supply to the district circuit and (b)++, arranges the connection to relay (A) to include both windings in the circuit. The operation of relay (C), (a)* connects ringing induction tone to the subscriber's line, (b) operates relay (W), if Fig. H is used or, if Fig. G is used, operates relay (MB) which in turn operates relay (W) (Fig. G functions as described in para. 17), (c) connects battery and ground through the windings of relay (TK) to the ring and tip conductors outgoing to the toll office causing a high resistance relay at the toll office to operate and light the line lamp, and (d) connects ground to lead "S" of the secondary multiple on the office link and connector circuit and the "test and make busy" jack in the crossbar office. Relay (TK) will not operate at this time due to the high resistance loop.

Should a subscriber at this time decide to abandon the call and restore the receiver to the switchhook, relay (A) releases in turn releasing relays (F), (B), (RV), (C) and (W) thereby restoring the circuit to normal and the initial coin is then automatically returned by the district circuit.

* Only one winding of relay (A) is connected to the circuit in order to obtain better non-operate adjustment margins to prevent the false operation of relay (A) during the trunk guard test by the sender circuit.

** Relay (B) is a slow to release relay to prevent release of the selector switches, should the subscriber flash the switchhook before the toll operator answers or if the subscriber dials an extra digit.

- + The talking battery is reversed in order to cause the stepping of the district circuit into the cut-through position. It is also necessary to connect battery to the ring side of the subscriber's line for the satisfactory operation of relay (A) when a coin is in the box.
- ++ Both windings of relay (A) are included in the circuit by the operation of relay (RV) to insure operation of relay (A) over the subscriber's loop.

6. THE TOLL OPERATOR ANSWERS

When the toll operator answers the high resistance is short-circuited at the toll board, thereby operating relay (TK) which in turn operates relay (SW). The operation of relay (SW), (a)* completes a flashing circuit for relay (F) and (b) operates relay (D). The operation of relay (D), (a) operates relays (AR) and (H), and (b) transfers the operating circuit for relay (B) to the winding of relay (SW) thereby placing the release of relay (SW) under control of both the subscriber and the toll operator. The operation of relay (H), (a) locks itself up under control of relay (B), (b)* opens the primary operating path for relay (F), (c), operates relays (CS), (d) connects ground to the winding of relay (R) thereby permitting it to operate whenever relay (W) releases (e)** disconnects the ringing induction tone from the subscriber's line and (f)+ closes the talking circuit through condenser (B). The circuit is then ready for the return of the initial coin.

- * The operating circuit for relay (F) is opened by the operation of relay (H) in order to prevent the operation of relay (F) when both the toll operator and the subscriber have disconnected long enough to release relay (SW). Thus the release of relay (SW) prevents the subscriber from interfering with the automatic collection of the coins.
- ** The ringing induction tone is locked out until the connection is completely broken down in order to prevent a second subscriber from mistaking it for dial tone if a second call is attempted before a complete breakdown of the first connection has taken place.
- + The talking circuit through the (B) condenser was left open until this time to prevent the false operation of relay (TK) due to the charging of condenser (B) during the buildup of the call.

7. THE AUTOMATIC RETURN OF THE INITIAL COIN - X WIRING

When the toll operator answers, relays (SW), (D), (AR), (H) and (CS) operate. The operation of relay (AR), (a)* holds relay (B) operated and, (b) disconnects the coin collect battery and connects coin return battery. The operation of relay (CS), (a)** connects ground to the winding of relay (F) holding it operated, (b)+ opens the 48 volt talking circuit, (c) if Fig. X is used connects battery to the winding of relay (Cl) causing it to operate in unison with the closed periods of the interrupter and connects the associated contact of relay (Cl) to the winding of relay (CT). If Fig. X is not used, the winding of relay (CT) is connected directly to the interrupter or indirectly through the interrupter alarm circuit. With either arrangement relay (CT) operates in unison with the closed periods of the interrupter. The first operation of relay (CT) operates relay (CC) on its primary winding. The operation of relay (CC), (a) locks itself up through its secondary winding to battery in series with the secondary winding of relay (CO), (b) operates relay (CR). The operation of relay (CR), (a) opens the tip and ring of the trunk, releasing relay (a) and connecting the coin return battery to the tip and ring of the subscriber's line. At the end of the one half second period relay (CT) releases. In releasing relay (CT) operates relay (RC). The operation of relay (RC), (a) locks itself up under control of relay (CO), (b) holds relay (CR) operated for an additional one half second and (c) disconnects ground from the lower contact of relay (CT). On the next closed period of the interrupter, relay (CT) again operates and ground is connected to the secondary winding of relay (CO), shunting the secondary winding of relay (CC), thereby causing it to release. The release of relay (CC), (a) removes the coin return battery from the tip and ring of the subscriber's line, (b) opens the operating circuit for relay (RC) and (c) opens the operating circuit for relay (CR). At the end of this one half second period++ relay (CT) again releases operating relay (CO). The operation of relay (CO), (a) locks itself up under control of relays (D) and (H), (b) releases relay (RC) and (c)+++ disconnects ground from the (D) condenser. The release of relay (RC), (a) opens the operating circuit for relay (CO) and (b) releases relay (CR). The release of relay (CR) closes the tip and ring of the trunk through to the subscriber's station. When relay (CT) again releases relay (CON) operates. The operation of relay (CON), (a) locks itself up under control of relay (CO), (b) completes a holding circuit for relay (AR) and (c) releases relay (CS). The release of relay (CS), (a) disconnects ground from the winding of relay (F), placing it again under control of relay (A), (b) releases relay (Cl) and (c) closes the 48 volt talking circuit+. With the operation of relays (CO) and (CON) the automatic coin return circuit is prevented from reoperating until both the subscriber and the toll operator have disconnected. The circuit is now arranged for talking.

- * Relay (B) is a slow to release relay and does not release during the time that the (D) and (AR) relays operate.
- ** Relay (F) is held operated in order to insure the completion of the automatic coin return cycle if the toll operator should disconnect in error or fumble the plug.
- + The 48 volt talking circuit is open at this time to prevent an excessive click due to the operation and release of relay (CR).
- ++ A one half second period is allowed between the time of disconnection of the coin battery and the completion of the 48 volt talking battery circuit to insure the release of the coin magnet.
- +++ Ground is only connected to the (D) condenser during the operation of the automatic coin return and coin collect feature, in order to prevent the use of two surge absorption circuits during the handling of subsequent coins.

8. COLLECTION OR RETURN OF SUBSEQUENT COINS - X & F WIRING

Subsequent coins are collected or returned by the "A" operator who is informed whether to collect or return the coin by means of a call wire circuit from the toll operator. When the "A" operator operates a coin return or coin collect key associated with this trunk, relay (CS) operates on its primary winding. The operation of relay (CS), (a) operates relay (F), (b)* opens the 48 volt talking circuit, (c)** locks up to lead "SR", when specified and (d) operates relay (CR). Relays (CI) and (CT) operate in unison with the interrupter but no function is performed. The operation of relay (CR), (a) disconnects tip and ring of the trunk from the subscriber's line, (b) connects coin return or collect battery through to the subscriber's station from lead "CR", (c)+ completes the coin tone circuit from lead "TO" to the tip conductor on the toll end of the trunk and (d) holds relay (CS) operated on its secondary winding. When the coin control key at the "A" board is released relay (CS) releases, unless a holding ground is connected to lead "SR".** When ground is removed from lead "SR" relay (CR) releases. The release of relay (CR), (a) connects the tip and ring of the trunk through to the subscriber's line, (b)++ disconnects lead "CR" from the subscriber's line, (c) opens the coin return circuit and (d) releases relay (CS). The release of relay (CS), (a) disconnects ground from the winding of relay (F) again placing it under control of relay (A) and (b) closes the 48 volt talking circuit*. The circuit is again arranged for talking.

- * A one half second period is allowed between the time of disconnection of the coin battery and the completion of the 48 volt talking battery circuit to insure the release of the coin magnet.
- ** Lead "SR" is used when an adverse ground potential of 8 volts or more obtains at the coin boxes. A ground over lead "SR" causes a delay in closing through the 48 volt talking battery circuit to insure the release of the coin magnet.
- + The tone is furnished to the toll operator to enable her to check whether or not the correct key has been operated by the "A" operator and if the coin control voltage is being connected to the trunk.
- ++ A coin current surge absorption circuit is connected to the subscriber's line via lead "CR" during the one half second period immediately following the disconnection of the coin control battery.

9. SIGNALING THE TOLL OPERATOR

Relay (A) follows the operation of the switchhook at the subscriber's station and relay (F) operates and releases in unison. The operation and release of relay (F) reverses the battery and ground to the toll office end of the trunk causing the supervisory lamp in the connected toll cord circuit to flash in unison as a recall signal or to light as a disconnect signal.

10. RECALLING THE SUBSCRIBER

10.1 X Wiring

The toll operator recalls the subscriber by operating a ringing key in the connected toll cord circuit which causes the operation of relay (AC) in this circuit. The operation of relay (AC) releases relay (W)* which in turn operates relay (R). The operation of relay (R), (a) holds relay (SW) operated, (b) disconnects the tip and ring of the trunk from the subscriber's line and (c) connects the ringing voltage to the subscriber's line. When the ringing key at the toll position is restored to normal relay (AC) releases in turn operating relay (W). The operation of relay (W) releases relay (R) which (a) again closes the tip and ring of the trunk to the subscriber's line (b) disconnects the ringing voltage and (c) disconnects ground from the winding of relay (SW) placing it again under control of relays (F) and (TK). The circuit is again arranged for talking.

- * Relay (W) is a slow to release relay and is designed to remain operated during false operation of relay (AC).

10.2 Y Wiring

When Y wiring is used the operation of the circuit is the same as described in paragraph 10.1 except that the operation of the (R) relay does not open the tip and ring of the circuit but performs its switching operations inside the windings of the repeat coil. This arrangement effects a considerable reduction in acoustic disturbance to the subscriber (1) by preventing abrupt changes in current thru the subscribers instrument when the 48 V talking battery is disconnected and reconnected (condenser acts as reservoir of energy causing gradual decay; Rep. coil acts as retard causing gradual buildup) (2) by filtering out the high frequency transients incident to the starting and stopping of ringing. In the latter case the condenser and repeat coil windings act as a low pass filter. The (A) resistance prevents the contacts of the (R) relay from becoming welded together if two or more trunks in the same group of five connected to a common Ringing Lead ring simultaneously. The (D) resistance and unsymmetrical wiring of the (AC) relay prevent the (AC) relay from holding up on ringing current fed back thru the repeat coil.

11. HOLDING AND DISCONNECT

A connection is held as long as the toll operator's cord is connected to the trunk or the subscriber has the receiver off the hook. When the subscriber disconnects relays (A) and (F) release and function as described in paragraph 9. When the toll operator disconnects relay (TK) releases. The release of relays (TK) and (F) cause the release of relay (SW)*. The release of relay (a)** opens the flashing circuit for relay (F) and (B) releases relay (D). The circuit is now arranged for the automatic collection of coins.

* Relay (SW) is a slow to release relay, the time slightly greater than the normal switchhook period is required to release it.

** The flashing circuit for relay (F) is open to prevent the subscriber from interfering with the automatic coin collection feature.

12. AUTOMATIC COLLECTION OF A COIN UPON DISCONNECTION

When both the toll operator and the subscriber have disconnected relays (D), (CO), (CON) and (AR) release. The release of relay (CO), (a) connects ground to condenser (D)*, (b) restores ground to the contact of relay (CT) for the operation of the automatic coin circuit. The release of relays (CO) and (CON) disconnects the coin control leads from the "A" board. The release of relay (AR), (a) operates relay (CS), (b) removes the holding ground from the

winding of relay (B) but through its back contact substitutes a ground circuit from relay (CS) which holds relay (B) operated until the coin circuit has completely functioned, (c) substitutes coin collect battery for the coin return battery and (d) prepares a locking circuit for relay (CO) placing its release under control of relay (H). The operation of relay (CS) operates relays (CI) and (CT) which in turn operate relays (CC), (CR), (RC), (CO) and (CON) as previously described in paragraph 8 except that the coin collect battery is connected to the subscriber's station instead of the coin return battery. In addition, relay (CO) now locks up under control of relay (H). The operation of relay (CON) releases relay (CS) which in turn releases relay (B). The release of relay (B) removes ground from the panel sleeve circuit and lead "S1" in the crossbar office, and releases relays (RV), (H) and (C). The release of relay (H) releases relays (CO) and (CON). The release of relay (C), (a) opens the signaling circuit to the toll board and removes ground from the crossbar sleeve lead "S". Disconnecting ground from the panel and crossbar sleeve circuit causes the connected switches to release and the circuit to restore to normal.

- * Ground is only connected to the condenser during the operation of the automatic coin feature in order to prevent the use of two surge absorption circuits during the handling of subsequent coins.

13. TESTING

To make this trunk busy to hunt panel district selectors or crossbar markers connect ground to the "S" lead at the panel district or office multiple and at the local IDF or to the "S1" lead on the office link and connector frame (secondary multiple) in a crossbar office.

To make routine operating tests in a panel office a plug of the test set will be inserted into the jack (TST) shown in Fig. 2. The insertion of the plug will (a) connect the tip and ring of the trunk to the tip and ring of the test set, respectively, (b) open the sleeve circuit to the panel district selector circuit between the trunk and the district or office multiple, (c) connect ground to the associated sleeve terminal in the district or office multiple on the "S1" lead on the secondary multiple of the office link and connector frame, (d) connect the trunk sleeve circuit to the test set. When the testing is completed a plug of the test set is removed and the circuit is restored to normal.

To test this circuit from the outgoing trunk test board in the panel office the outgoing test cord shall be connected to the "test and make busy" jack, wiring for which is shown in Fig. 3. When the test cord is connected to this jack ground will be connected to the sleeve of this circuit on

the panel office multiple and on the "S1" lead of the crossbar secondary multiple thereby providing a busy condition to hunting panel district selectors or crossbar markers. To test the conductors used for connecting this trunk to the toll office a connection shall be made at the outgoing trunk test board in the panel office to the associated "test and make busy" jack. The wiring for this is shown on the trunk side of this circuit. When the test circuit is connected ground will be connected to the sleeve of this circuit on the panel office multiple and to the "S1" lead on the crossbar secondary multiple of the office link and connector frame, thereby providing a busy condition to the hunting panel district selectors or crossbar markers.

To test the conductors that are used for connecting this trunk to the toll office the connection may be made to the associated "test and make busy" jack at the outgoing trunk and test board in the crossbar office the wiring for which is shown in Fig. 1. When the test circuit is connected ground will be connected to the sleeve of this circuit in the panel office multiple and the "S1" lead of the secondary multiple of the crossbar office link and connector circuit, thereby providing a busy condition to hunting selectors or markers.

To make routine operating tests on this circuit from the outgoing trunk test board in a crossbar office a connection is made to the circuit at the test board via the test jack which is shown on the office link and connector circuit.

14. TOLL DIVERSION

Toll diversion is not a feature of this circuit and when it is used in an area where the sender circuits are arranged for toll diversion no change will be necessary to provide satisfactory operation of this circuit, and it will function as described in this description.

15. COIN CONTROL - "Y" WIRING

When Y wiring is used the operation of the circuit is the same as described in paragraphs 7, 8 and 12 with the exception that the (CR) relay does not open the tip and ring conductors but performs its switching operations inside the windings of the repeat coil. Abrupt changes of current are prevented with the arrangement since the (A) condenser during the travel time of the contacts of the (CR) relay serves as a reservoir of energy to slow down the decay of current when the 48 volt talking battery is disconnected. The (C) resistance protects the contacts of the (CR) relay when short-circuiting the (A) condenser.

16. COIN CONTROL BY TOLL OPERATOR ("J" WIRING)

When the circuit is arranged for the control of coins by the toll operator ("J" wiring) the operation is the same as described in paragraphs 7, 8, 12 and 15 with the following exceptions: (1) The (CS) relay does not hold to the "SR" lead when the coin control key is restored. (2) No tone is connected to the trunk.

17. TRUNK MAKE BUSY OPERATION (FIG. G)

When the group of trunks are made busy in the distant toll switchboard through the operation of a trunk group make busy key, ground is connected to lead "S" of Figure G. If this circuit is busy at the time, relay (MB) will be operated. When the circuit becomes idle, release of relay (C) in turn releases relay (MB) which then connects the sleeve lead to lead "S" of the trunk make busy circuit. The ground on this lead makes this trunk test busy to hunting district or office selectors.

Relay (MB) is made slow releasing to permit the connected district and office selectors to disconnect on the preceding call before this circuit can be made busy by the trunk make busy circuit.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3350

GNS)
RSW) DP