70946

PANEL SYSTEMS
MISCELLANEOUS ALARMS FOR
LINK TYPE OFFICES

CHANGES

B. CHANGES IN APPARATUS

B.1 Added

10 - No. 2-type lamps, Fig. 170, 171 & 172

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Common Figs. 170, 171 & 172 and associated Table of Connections is added.

D.2 The following connections are covered in the Table:

Alarm	Lamp Desig.	Fig.	Item	Connecting Circuit
Trouble (Seizure Indicator (Reseizure	TIS TIR	170 171	201) 101)	Intertoll Trunk Concentrating Equipment Trouble Indicator Ckt.
Controller Timeout	CT	171	102	Intertoll Trunk Concentrating Equipment Controller Ckt.
Stuck Trouble Tracing Selector	STT	170	202	Alarm Circuit for Trouble Tracing Selector
Service	SV	172	203	Auxiliary Signal and Night Alarm Circuit

D.3 Connecting Information on Figs. 120, 121, 132, 133, 138 and 139 are expanded to include Figs. 170, 171, & 172.

D.4 Note 210 is added for record purposes.

D.5 Figs. 170, 171 & 172 are added to Options Used table.

D.6 Designation of Lamps table is discontinued since similar information is covered in the Table of Connections and Common Figures.

D.7 Option "L" per Fig. 120 was designated.

All other headings under Changes, no change.

1. PURPOSE OF CIRCUIT

1.1 To provide audible and visual signals when a trouble condition or a circuit failure takes place in the central office equipment.

2. WORKING LIMITS

2.1 None.

3. FUNCTIONS

3.1 To indicate the nature and approximate location of a trouble condition.

3.2 On each floor there is a floor alarm board or power alarm cabinet, which carries alarm signals associated with the equipment located on that floor. One floor alarm board may be equipped with class pilot signals, in which case it is called the main alarm board.

3.3 Alternating current ringers and direct current bells are provided as audible signals.

3.4 Test frame time alarms, information desk alarms, announcement desk alarms, fuse alarms, trip circuit alarms, start circuit alarms, and information desk trunk alarms are associated with aisle pilot lamps. Other alarms are arranged to light a pilot lamp associated with the floor alarm board.

4. CONNECTING CIRCUITS

When this circuit is shown on a key sheet, the connecting information thereon is to be followed.

4.01 Multifrequency Current Supply Circuit, SD95391-01.

4.02 Incoming Selector Arranged for Semi-selective Ringing, SD21043-01.

4.03 "A" Switchboard Coin Control Circuit, SD21705-01.

4.04 Air Raid Warning Control Circuit, SD95332-01.

4.05 Announcement Desk Circuit, SD90253-01.

4.06 Announcement Desk Transmitting Repeater Alarm Circuit, SD90255-01.

4.07 Announcement Supply Incoming Distributing and Alarm Circuit, Intermediate Office, SD90256-01.

4.08 Announcement Supply Incoming Distributing and Alarm Circuit, Terminating Office, SD90260-01.

4.09 Audible Alarm Circuit for Floor Alarm Board, SD21819-01.

4.10 Audible Alarm Circuit for Power Alarm Cabinet, SD21820-01.

4.11 Auxiliary Signal and Night Alarm Circuit, SD20374-01.

4.12 Calculagraph Alarm Circuit, SD95085-01.

4.13 Central Office Control and Distribution Circuit, SD96035-01.

4.14 Chief Switchman's Desk Auxiliary Signal Circuit, SD20391-01.

4.15 Clock Circuit, ES20016-01.

4.16 Coin Trunk, SD96366-01.

4.17 DC Toll Power Alarms, SD21483-01.

4.18 Dial Tone Speed Register Circuit, SD96403-01.

4.19 Emergency Alarm Circuit, SD90437-01.

4.20 Extension Alarm Circuit, SD21482-01.

4.21 Emergency Pilot Signal Circuit, ES226345.

4.22 Information Desk Start Circuit, SD90006-01.

4.23 Intercepting Trunk from Final Mult., SD21633-01.

4.24 Line Load Control Circuit, SD96387-01.

4.25 Miscellaneous Circuits for Frames, Typical, SD21221-01, SD21228-01, SD21229-01, SD21231-01, SD21244-01, SD21660-01.

4.26 Miscellaneous Circuit for M.R. Connector Frame, SD21535-01.

4.27 Miscellaneous Circuit for Sender Make Busy Frame, SD21236-01.

4.28 Motor Stop and Frame Busy Circuit, SD20143-01.

4.29 No. 3 Information Desk Allotter Alarm Circuit, SD90009-01.

4.30 No. 3 Information Desk Allotter Circuit, SD90003-01.

4.31 No. 3 Information Desk Start Circuit SD90006-01.

4.32 No. 3 Information Desk Trunk Alarm Circuit, SD90001-01.

4.33 No Such Number Tone Supply Circuit, SD96295-01.

4.34 Outgoing Trunk Test Board Auxiliary Signal Circuit, SD20388-01.

4.35 Overflow Register and Alarm for Call Indicator Trunk Groups, ES20260-01.

4.36 Power Alarm Circuit for Automatic Control of Rectifiers and M/G Sets, SD80801-01.

4.37 Power Circuit, SD80325-01, SD80082-01

4.38 Power Discharge Circuit, SD364002.

4.39 Power System Charge and Discharge Circuit, ES399479.

4.40 Power System Ringing Circuit, SD80420-01.

4.41 Power Tone Circuit, ES291061.

4.42 Private Line Conference Circuit, SD96391-01.

4.43 Pulse Checking Circuit, SD21536-01.

4.44 Pulse Machine Circuit, ES20181-01.

4.45 Pulse Machining Fuse and Battery Alarm Circuit, ES20235-01.

4.46 Relay Rack Circuit, SD21450-01.

4.47 Sender Pulse Fuse Alarm Circuit, ES20237-01.

4.48 Trip and Start Circuits, SD21713-01.

4.49 Test Trunk Sender Circuit, SD21645-01.

4.50 Ringer Test Circuit, SD96218-01.

4.51 Selector Coin Control and Link Time Alarm, ES20233-01.

4.52 Audible Alarm Switching Circuit, ES20410-01.

4.53 Alarm for Decoders Floor Alarm Board, SD21318-01.

4.54 Link District Auto. Testing Circuit, SD20240-03.

4.55 Floor Alarm Board Fuse and Time Alarm for B.C.O. Rel. Off. on Fl. Alm. Bd. with 24V Lamps, SD21851-01.

4.56 Floor Alarm Board Motor Alarm Circuit for B.C.O. Rel. Off., SD21852-01.

4.57 Floor Alarm Board Misc. and Aux. Alarm for B.C.O. Rel. Off. on Fl. Alm. Bd. with 24V Lamps, SD21853-01.

4.58 Floor Alarm Board Misc. and Aux. Alarm Circuit, SD21203-01.

4.59 Link Down Drive Alarm Circuit, SD21478-01.

4.60 Emergency Alarm Circuit not Arr. for Code Signaling, SD90560-01.

4.61 Power Alarm Cabinet Misc. and Aux. Alm. Ckt., SD21204-06.

4.62 Charging Generator Circuit, SD80571-01.

4.63 Power Supply Circuit, 130V, SD80760-01.

4.64 Multi-line Service Observing Circuits for use with Service Observing Desk No. 12.

4.641 Speed of Answer Observing, SD95563-01.

4.642 Toll Swbd. No. 1 Cord Observing, DC & MFKP, SD56298-01.

4.643 Toll Swbd. No. 1 Cord Observing DP, SD56296-01.

4.644 Toll Swbd. No. 1 Sleeve Supervision, Cord Observing, MFKP, SD56254-01.

4.645 Toll Swbd. No. 3 Cord Observing DC & MFKP, SD56316-01.

4.646 Toll Swbd. No. 3C or 3CL Cord Observing, DP, SD56295-01.

4.647 DSA Swbd. No. 13 or 15 Cord Observing, DC & MFKP, SD95564-01.

4.648 DSA Swbd. No. 13, 14 or 15 Cord Observing, DP, SD95605-01.

4.65 Alarm Receiving Circuit, SD95418-01.

4.66 Signaling Order Wire and Alarm Circuit, SD95142-01.

4.67 Application Schematic for Terminal Circuit, SD95121-01.

4.68 V.F. Alarm and Order Wire Signaling Circuit, SD95143-01.

4.69 Audichron Converter Circuit, Audichron Co. Dwg. No. 2000-A.

4.70 Revertive Call Trunk Circuit, SD95675-01.

4.71 Ringing Interrupter and Alarm Circuit, 8 Party Semiselective Ringing, SD95674-01.

4.72 Concentrating Circuit for Permanent Signal Holding Trunk, SD25766-01.

4.73 Motor Stop and Frame Busy Circuit, ES240176.

4.74 Alarm Transfer Circuit, SD20736-01.

4.75 Line Concentrator Identifier Circuit, SD95739-01.

4.76 Distributing and Alarm Circuit for Announcement System Nos. 4A or 6A, SD95546-01.

4.77 Key Cabinet No. 20 or 21 Transfer and Auxiliary Signal Circuit, SD95407-01.

4.78 Announcement System Control Circuit, SD96199-01.

4.79 Misc. Ckt. for Trunk Finder Frame, SD21562-01.

4.80 E2 and E3 Telephone Repeater Battery Supply and Conn. Circuit, SD95161-01.

4.81 Distribution Fuse, Common Aisle and Misc. Individual Alarm Circuit for Toll and Telegraph Systems, SD95072-01.

4.82 Operating Room Desk No. 23 Trunk Alarm Circuit, SD95523-01.

4.83 Announcement System No. 6A Control Circuit, SD95608-01.

4.84 Emergency Announcement System Control Circuit, SD95388-01.

4.85 Distributing and Alarm Circuit for Announcement Machine, SD95598-01.

4.86 Incoming Trunk Switch Circuit, SD95500-01.

4.87 Alarm Sending Circuit, SD95417-01.

4.88 Auxiliary Sender Circuit, SD96479-01.

4.89 Announcement Line and Alarm Circuit, SD96496-01.

4.90 Misc. Ckt. for Auxiliary Sender Link Frame, SD96492-01.

4.91 Intertoll Trunk Concentrating Equipment Trouble Indicator Circuit, SD56266-01.

4.92 Intertoll Trunk Concentrating Equipment Controller Circuit, SD56265-01.

4.93 Alarm Circuit for Trouble Tracing Selector, SD68246-01.

4.94 Auxiliary Signal and Night Alarm Circuit, SD55039-01.

DESCRIPTION OF OPERATION

5. GENERAL

5.1 Auxiliary Signals

Each floor alarm board and power alarm cabinet is provided with one AC ringer and one DC bell, which serve as auxiliary signals. Closure of any circuit connected to the AC1, CA or TR lead of a floor alarm board or power alarm cabinet, causes operation of the AC ringer. Closure of a circuit connected to a DC1, DCH or DCP lead or to a (DCH), (DCP), (EM), (DP) or (MS) relay operates the corresponding relay which closes the circuit of the DC bell at the corresponding board. The DC bell operates in series with interrupter contact (FA) or (PA). When "AL" wiring is furnished, closure of an

alarm board or power alarm cabinet auxiliary signal circuit operates a relay which operates the associated audible signal. When "AL" wiring is connected to the audible alarm switching circuit, closure of a power alarm cabinet DC auxiliary signal circuit operates a relay which operates the power alarm cabinet DC bell. When "AL" wiring is connected to the audible alarm circuit, closure of a power alarm cabinet DC auxiliary signal circuit operates the power failure audible signals on all floors. When a lamp is required to indicate Ringing Plant Failure the (MJ) relay of Fig. 100 will operate for a major ringing power failure or the (MN) relay of Fig. 99 will operate for a minor ringing power failure and in turn will ground leads "MJ" or "MN" to the Aud. Alm. Sw. Ckt. to operate the audible alarm signal relays which operate the AC or DC audible alarm.

The trouble desk auxiliary signals consist of an AC ringer or buzzer and a direct current bell. Closure of the circuit controlling relay (FT) or closure of any circuit connected to the trouble desk AC2 lead operates the corresponding (FT) or (AC2) relay, each of which closes the circuit of the trouble desk AX auxiliary signal. Closure of a circuit connected to the trouble desk DC2 lead or (DCP) relay operates the corresponding (DC2) or (DCP) relay either of which operates the DC bell.

The auxiliary signals for the main alarm board consist of the regular floor alarm board AC ringer, under control of a night alarm key and a direct current bell. Closure of the circuit controlling relay (FT) or closure of any circuit connected to lead (AC2) operates the FT or (AC2) relay, each of which closes the circuit of the AC ringer. Closure of a circuit connected to the main alarm board DC2 lead or (DCP) relay operates the corresponding (DC2) or (DCP) relay, each of which operates the DC bell ("ZH" option), or operates a relay in the audible alarm circuit ("ZI" option).

5.2 Office not Arranged to Transfer its Alarms to an Alarm Receiving Center (Option "ZJ")

Any circuit connecting ground to a lead shown on Table A operates the relay and audible alarm signal as indicated.

TABLE A

Lead	Fig.	Relay	Audible Alarm	Loc.
AD	83	AD	DC Bell	Main Bd.
NB	84	NB	DC Bell	Main Bd.
AC1	115	AC1	AC Ringer	Pwr.Cab.
AB1,RM1,FV	115	None	AC Ringer	Pwr.Cab.
AC1,AC	120	AC1	AC Ringer	Main Bd.
AG	120	None	AC Ringer	Main Bd.
DCH	126	DCH	DC Bell	Pwr.Cab.
DCH,DC,B,SF4	126	None	DC Bell	Pwr.Cab.
DC1	128	DC1	DC Bell	Pwr.Cab.
DCH	132	DCH	DC Bell	Main Bd.
DR,DG,EM,TB	132	None	DC Bell	Main Bd.
DCP	136	DCP	DC Bell	Main Bd.
DA,DB,DG	136	None	DC Bell	Main Bd.
DC2	138	DC2	DC Bell	Main Bd.
AC2,AM	139	AC2	AC Ringer	Main Bd.

5.3 Office Arranged to Transfer its Alarms to an Alarm Receiving Center (Option "ZK")

Any circuit connecting ground to a lead shown on Table B operates the relay and grounds the lead to the Alarm Transfer Circuit as indicated.

When alarms are supervised at the local office, ground is returned over the lead indicated to operate the audible alarm shown.

When alarms are supervised at the Alarm Receiving Center, the alarm transfer circuit transmits the alarm signal indicated.

TABLE B

Lead, Fig.	Relay	Grd. Lead	Transmits Signal (see note)	Grd. Returned Lead. Fig.	Audible Alarm Signal
AC1,116	PN	PN2	Power Minor	AC3,116	AC Ringer
AB1,116	None	PN2	Power Minor	AC3,116	AC Ringer
DCH,117	PA3	PA6	*Power Minor	DCH,127	DC Bell
AC1,118	PA	PA5	*Power Minor	AC3,116	AC Ringer
AC1,119	MN	MN5	Switching Minor	AC3,116	AC Ringer
AC1,121	MN1	MN1	Switching Minor	AC1,121	AC Ringer
AG,R,121	None	MN1	Switching Minor	AC1,121	AC Ringer
DCH,122	PN3	RF	Power Minor	DB,133	DC Bell
AC1,123	PA1	PA1	*Power Failure	AC1,121	AC Ringer
AC1,124	PN1	PN1	Power Minor	AC1,121	AC Ringer
AC,AC1,125	MJ1	MJ4	Switching Major	AC1,121	AC Ringer
DCH,127	DCH	PFB	Power Failure	DCH,127	DC Bell
DC,B,127	None	PFB	Power Failure	DCH,127	DC Bell
DC1,129	PF3	PFB,127	Power Failure	DCH,127	DC Bell
DC1,130	PA2	PA4	*Power Minor	DCH,127	DC Bell

Lead, Fig.	Relay	Grd. Lead	Transmits Signal (see note)	Grd. Returned Lead, Fig.	Audible Alarm Signal
DC1,131	MJ2	MJ8	Switching Major	DCH,127	DC Bell
DCH,133	MJ	MJ3	Switching Major	DB,133	DC Bell
DG,DR,133	None	MJ3	Switching Major	DB,133	DC Bell
DCH,134	PF4	PF1	Power Failure	DB,133	DC Bell
DR,134	None	PF1	Power Failure	DB,133	DC Bell
DCH,135	AMJ	AMJ	Announce. Sys.Major	DB,133	DC Bell
DCP,136	DCP	CO1	None	DCP,136	DC Bell
DA,DB,136	None	CO1	None	DCP,136	DC Bell
DCP,137	MJ3	MJ7	Switching Major	DCP,136	DC Bell
DB,137	None	MJ7	Switching Major	DCP,136	DC Bell
DC2,138	DC2	CO1,136	None	DCP,136	DC Bell
AC2,139	AC2	CO2	None	AC2,139	AC Ringer
AB2,139	None	CO2	None	AC2,139	AC Ringer
AC2,140	MN2	MN2	Switching Minor	AC2,139	AC Ringer
AB2,140	None	MN2	Switching Minor	AC2,139	AC Ringer
NB,143	NB	MN1,121	Switching Minor	AC1,121	AC Ringer
NB,158	NB1	MJ9	Switching Major	AC1,121	AC Ringer
NB,159	NB2	PN3	Power Minor	AC1,121	AC Ringer
NB,160	NB3	PA10	*Power Minor	AC1,121	AC Ringer
AD,144	AD	MJ3,133	Switching Major	DB,133	DC Bell
AD,162	AD1	PF2	Power Failure	DB,133	DC Bell
AD,163	AD2	AMJ	Announce. Sys.Major	DB,133	DC Bell
AD,164	AD3	PA9	*Power Minor	DB,133	DC Bell
AC2,145	MJ5	MJ6	Switching Major	AC2,139	AC Ringer
AB2,145	None	MJ6	Switching Major	AC2,139	AC Ringer
DC2,146	MJ4	MJ5	Switching Major	DCP,136	DC Bell
DCH,147	PA5	PA2	*Power Minor	DB,133	DC Bell
DR,147	None	PA2	*Power Minor	DB,133	DC Bell
DCH,153	SF1	SF3	AC Comm.Power Failure	DCH,127	DC Bell
AC1,157	AMN	AMN	Announce. Sys.Minor	AC1,121	AC Ringer

Note * = Signal cutoff during a-c commercial power service failure

6. FRAME FUSE ALARMS (FIGS. 1 and 2)

Operation of a frame fuse lights the frame fuse panel lamp and operates a relay (A). Operation of relay (A), or connection of ground to lead BB or P, operates relay (A1) which lights the alarm board lamp to indicate the alarm group, lights the trouble desk or main alarm board lamp to indicate the floor, operates the trouble desk or main alarm board AC auxiliary signal, lights the aisle pilot lamp and operates the corresponding aisle pilot audible alarm. When the operated 1-1/3 ampere fuse is removed, the alarms are retired. The fuse in series with relay (A), or 24 volt frames, protects relay (A) in case one of the associated fuse alarm lamps becomes short-circuited. Operation of this fuse operates relay (A), bringing in the alarms. When "M" wiring is furnished, closure of the circuit for the alarm board lamp operates relay (CR), Fig. 39, which causes continuous operation of the AC auxiliary signal under control of the night alarm key.

7. MISCELLANEOUS, REPEATING COIL, LINE RELAY, LOW TONE, COIN BATTERY AND RINGING FUSE ALARMS (FIG. 3)

Operation of a 24 volt or a 48 volt miscellaneous, repeating coil line relay fuse or 24V PBX fuse "AH" option low tone fuse or negative coin battery fuse operates relay (A) and lights the fuse panel lamp. Operation of a positive coin battery fuse operates relay (+A) and lights the fuse panel lamp. Operation of relay (A) or (+A) operates relay (A1), Fig. 1, which lights the aisle pilot lamp and lights alarm board and trouble desk or main alarm board lamps and operates the corresponding AC auxiliary signals. When the operated fuse is removed, the alarms are retired. Operation of a fuse in series with an (A) or (+A) relay, operates the corresponding relay, causing the alarm to function.

When AI option is furnished, the operation of a 24V PBX fuse connects ground to the alarm transfer circuit which returns

ground on lead FA1. The circuit then functions as described above.

"AH" Option

When a fuse in a ringing lead operates, ringing current operates relay (AR) operating relay (B) which lights the fuse panel lamp and operates relay (A1) Fig. 1. When the operated fuse is removed, relay (AR) releases, retiring the alarms.

"AI" Option

When a ringing fuse operates, ground is connected to the alarm transfer circuit which returns ground on lead FA1. The circuit then functions as described for AH option.

8. CLOCK CIRCUIT FUSE ALARM (FIG. 3A) (OBSOLETE)

Operation of a fuse in a lead supplying interrupted battery to the group relays, operates relay (CA) which lights the fuse panel lamp and operates relay (A1), Fig. 1, lighting the aisle pilot lamp and lighting alarm board and trouble desk or main alarm board lamps and operating the corresponding AC auxiliary signals.

9. CLOCK CIRCUIT FUSE ALARM (FIG. 3B)

Operation of a fuse in a lead supplying interrupted battery to the group relays, operates relay (CA) thru its 200 ohm winding when the master clock contacts close. When the battery from the master clock is interrupted, the relay holds thru both windings in series. Operation of relay (CA) lights the fuse panel lamp and operates relay (A1), Fig. 1, which lights the aisle pilot lamp and lights alarm board and trouble desk or main alarm board lamps and operates the corresponding AC auxiliary signals.

10. DISTRIBUTING PANEL FUSE ALARM (FIG. 4)

Operation of a fuse at a battery distributing fuse panel operates the associated .5 ampere alarm type fuse, operating relay (A) which lights the alarm board lamp, lights a lamp at the trouble desk or main alarm board and operates the corresponding DC auxiliary signals. When the operated alarm type fuse is removed, relay (A) releases, retiring the alarms. When "XB" wiring is furnished, the main alarm board or trouble desk lamp is omitted, and operation of relay (A) operates the power failure audible signal.

11. SPECIAL "A" BOARD AUXILIARY SIGNAL AND NIGHT ALARM (FIG. 5)

When a fuse in a special "A" switchboard section operates, ground from the "A" board auxiliary signal and night alarm circuit lights a lamp at the trouble desk or main alarm board or at the floor alarm board, and operates the corresponding AC auxiliary signal. Removal of the operated fuse retires the alarms. When "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (NB), Fig. 75, 84 or 143.

12. MOTOR STOP ALARM AND GUARD (FIGS. 6 & 7)

When the "stop" contact of a motor stop alarm governor is closed by slowing down of the motor to less than its minimum rated speed, a relay in the motor stop and frame busy circuit operates. Operation of this relay lights the corresponding (MOTOR STOP PILOT) lamp at the trouble desk or main alarm board and operates the corresponding AC auxiliary signals. Operation of the motor stop key lights the (MOTOR STOP GUARD) lamp and releases the relay in the motor stop circuit, retiring the alarms. When the motor again runs at its rated speed, the circuit is closed, thru the operated motor stop key, lighting the (MOTOR STOP) lamps at the alarm board and trouble desk or main alarm board, and operating the AC auxiliary signals. Release of the motor stop key extinguishes the guard lamp and releases the relay in the motor stop circuit, disconnecting the alarms. When "EP" wiring is furnished operation of the floor alarm board auxiliary signal is controlled by relay (NB), Fig. 75,84 or 158.

13. SENDER PULSE LEAD FUSE ALARM (FIG. 8)

Operation of a sender pulse lead fuse connects ground to lead SF, operating relay (A1), Fig. 1, which lights the associated aisle pilot lamp and lights alarm board and trouble desk or main alarm board lamps and operates the associated AC auxiliary signals. When the operated fuse is removed and the sender pulse fuse alarm circuit release key is operated, the alarms are retired.

14. CIRCUIT BREAKER OR RECTIFIER ALARM (FIG. 10)

When a circuit breaker opens or current stops flowing thru a rectifier, relay (CB) or (R) operates and lights the (CIRCUIT BREAKERS) or (RECTIFIERS) lamps at the power alarm cabinet and trouble desk or main alarm board and operates the AC auxiliary signals. When the circuit breaker is closed, or the current flow thru the rectifier is reestablished, relay (CB) or (R) releases, restoring the circuit to normal.

15. PULSE MACHINE ALARM (FIG. 11 AND 12)

Operation of a pulse lead fuse or a ground supply fuse or crossing of a pulse lead with battery in the pulse machine fuse and battery alarm circuit, or opening or grounding of the timing lead in the pulse machine circuit, lights the corresponding lamp at the alarm board and operates relay

(PM). When "AK" wiring is furnished, operation of relay (PM) lights the (PM) lamp and operates the (DC) auxiliary signal at the trouble desk or main alarm board. When "AL" wiring is connected to the audible alarm switching circuit, operation of relay (PM) operates a relay which lights the (PM) lamp and operates the DC auxiliary signal at the trouble desk or main alarm board. When "AL" wiring is connected to the audible alarm circuit, operation of relay (PM) operates a relay which operates the floor alarm board DC auxiliary signal and operates the DC auxiliary signal at the trouble desk or main alarm board. After the trouble condition has been removed, operation of key (RLS), or operation of a similar key in the pulse machine fuse and battery alarm circuit, releases the alarms. Lighting of the (PM EM TMG) lamp indicates that the "emergency timing" key in the pulse machine circuit has been operated to connect the timing drum directly to the timing lead instead of thru the transfer relay.

16. POWER TRANSFER ALARM COMBINED COIN COLLECT AND RINGING GENERATOR (THREE UNIT) SET (FIG. 13)

When the alternating current supply to the ringing set fails, a path is closed in the power circuit to operate relay (PT), which lights lamp (CCR) operates the associated AC auxiliary signal and operates relay (AM). Operation of relay (AM) lights the trouble desk or main alarm board (RMA) lamp and operates the corresponding AC auxiliary signal. When "A" wiring is furnished operation of relay (AM) also operates relay (MA) which lights lamp (MA) and operates the AC auxiliary signal at the power alarm cabinet. When (AM) relay operates and Fig. 101 is furnished it will operate the (RMN) relay in that figure which will operate a Ringing Plant Failure Lamp at the Power Alarm Cabinet or Floor Alarm Boards or if another Power Room is in the same building it will operate a Ringing Plant Failure Lamp at the other Power Alarm Cabinet. When Option "AE" is furnished the (AM) relay is operated in series with the alarm lamp and the (MN) relay of Fig. 99. The (MN) relay operates a relay in the Aud. Alm. Sw. Ckt. over the "MN" lead which in turn operates the AC auxiliary signal in this circuit. The arrangement does not operate the Power Failure Lamp. When the alternating current to the set is restored, the circuit is opened at the AC control equipment, restoring the alarms to normal. Where "Y" and "EP" wiring are furnished, operation of the floor alarm board auxiliary signal is controlled by relay (NB), Fig. 75, 84 or 143.

17. AC FAILURE DUPLEX MOTORS (FIG. 14)

When the AC power service voltage varies beyond predetermined limits, the master switch opens, making inoperative the individual transfer alarm of Fig. 13. When "B" wiring is furnished, opening of the master switch operates relay (MF). When "F" wiring is furnished, opening of the master switch operates relay (MF1) which operates relay (MF), operating relay (MS) which lights the (MASTER SWITCH) lamps at the power alarm cabinet and trouble desk or main alarm board, operates the trouble desk or main alarm board DC auxiliary signal and operates the power alarm cabinet DC auxiliary signal or the power failure audible signals. Operation of the master switch guard key lights the (MASTER SW GUARD) lamp and releases relay (MS), which retires the alarms. When the AC power service is restored, the master switch closes, releasing relay (MF) which operates relay (MS), bringing in the alarms to indicate that AC service has been restored. The guard key is then released to retire the alarms.

18. PICK-UP ALARM (FIG. 15)

If an incoming selector pick-up lead becomes grounded between the pick-up lead resistance lamp and the selector frame, relay (PU) intermittently operates in series with the pick-up lead lamp, which lights as an indication of the selector group in trouble. Operation of relay (PU) lights the (PICK-UP) lamp at the alarm board or power alarm cabinet, operates the associated AC auxiliary signal and operates relay (AM) to light the trouble desk or main alarm board (RMA) lamp and operate the associated AC auxiliary signal. If "A" wiring is furnished, operation of relay (AM) also operates relay (MA) which lights a lamp (MA) and operates the AC auxiliary signal at the power alarm cabinet. When the pick-up lead is cleared, relay (PU) releases, retiring the alarms. Where "Y" and "EP" wiring are furnished, operation of the floor alarm board auxiliary signal is controlled by relay (NB), Fig. 75, 84, or 143.

19. TEST FRAME TIME ALARM (FIG. 16)

When an automatic test circuit fails to complete a test, on account of failure of itself or of the circuit under test, relay (TF) operates in series with the alarm lamps of the test frame. Operation of relay (TF) lights the (TEST FRAME) lamps at the alarm board and at the trouble desk or main alarm board, operates the associated AC auxiliary signals, lights the associated aisle pilot lamp and operates the associated aisle pilot audible alarm. When "M" wiring is furnished, operation of relay (TF) operates relay (TR), Fig. 39, which closes the circuit of relay (RT). Relay (RT) operates on machine ringing current to ring intermittently the floor alarm board ringing. When the test circuit restores to normal, or proceeds with the test, relay (TF) releases, retiring the alarms.

20. POWER BOARD FUSE ALARM (FIG. 17)

Operation of a power board fuse causes operation of the associated .5 ampere fuse,

which operates relay (PF), lighting corresponding lamps at the power alarm cabinet and trouble desk or main alarm board, operating the trouble desk or main alarm board d-c auxiliary signal and operating the power alarm cabinet d-c auxiliary signal or the power failure audible signals. Removal of the operated .5 ampere fuse retires the alarms.

21. COIN POWER FAILURE ALARM (FIG. 18)

When negative coin power fails, or the fuse protecting the alarm circuit operates, relay (-CB) releases. When positive coin power fails, or the alarm circuit fuse operates, relay (+CB) releases. Release of either relay lights the alarm boards (COIN POWER) lamp and operates the alarm board d-c auxiliary signal or the power failure audible signals. Where "R" and "AR" wiring are furnished, relay (GA) also operates, lighting the trouble desk or main alarm board (RMD) lamp and operating the d-c auxiliary signal. When "BR" wiring is furnished, the no-voltage alarm will not function if the power failure is caused by operation of a coin power fuse, Fig. 29 or 30, which operates relay (RB). When (GA) relay operates and Fig. 101 is furnished it operates the (RMJ) relay in that figure which will operate a Ringing Plant Failure Lamp at the Power Alarm Cabinet or the Floor Alarm Boards or if another power room is in the same building it will operate a Ringing Plant Failure Lamp at the other Power Alarm Cabinet. When option "AE" is furnished and (GA) relay operates the (MJ) relay of Fig. 100 also operates. The (MJ) relay operates a relay in the Aud. Alm. Sw. Ckt. which in turn operates the DC auxiliary signal in this circuit. This arrangement does not operate the Power Failure Lamp. When "A" and "AE" wiring is furnished, operation of relay (GA) also operates relay (RM), which lights lamp (RM) and operates the DC auxiliary signal at the power alarm cabinet or operates the power failure audible signals. When "A" and "AE" wiring are furnished the operation of relay (RM) operates lamp (RM) at the Power Alarm Cabinet and also operates a DC audible alarm relay in the Aud. Alm. Sw. Ckt. to operate the DC audible in this circuit. This arrangement prevents the Power Failure Lamp from operating in the Aud. Alm. Sw. Ckt. When "Z" and "AZ" wiring are furnished, release of relay (-CB) or (+CB) operates relay (GA1) instead of relay (GA). Operation of relay (GA1) lights trouble desk or main alarm board lamp (CB) and operates the associated DC auxiliary signal. This auxiliary signal will be cancelled if fuse alarm relay (ZB) is operated, where "BZ" wiring is furnished. When coin power is restored, relay (-CB) or (+CB) operates, retiring the alarms. Where "Y" and "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (SR), Fig. 77 or 85.

22. "B" SENDER EMERGENCY ALARM (FIG. 19)

In case of trouble with the numeric keys of the "B" switchboard, a key at the "B" switchboard is operated, lighting the (CORDLESS EMERGENCY) lamp at the alarm board and operating relay (EM), which operates the DC auxiliary signals at the alarm board and trouble desk or main alarm board and lights the trouble desk or main alarm board (CORDLESS EMERGENCY) lamp. When the key at the "B" switchboard is released, the alarms are retired. Where "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (DE), Fig. 73.

23. PULSE MACHINE MOTOR STOP ALARM (FIG. 20)

When the "stop" contact of a pulse machine governor closes by slowing down of the motor to less than its minimum rated speed, a relay in the pulse machine motor stop circuit operates, lighting the alarm board and trouble desk or main alarm board (PULSE MACH MOTOR STOP) lamp and operating the associated DC auxiliary signals. When the motor again runs at normal speed, the pulse machine motor stop circuit relay releases, retiring the alarms. Where "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (DE) Fig. 73.

24. DC SERVICE FAILURE ALARM (FIG. 21)

Failure of DC power causes release of the transfer relay in the power control circuit, operating relay (DS) which operates relay (DF), lighting the (DC SERVICE FAILURE) lamps, operating the DC auxiliary signal at the trouble desk or main alarm board and operating the power alarm cabinet DC auxiliary signal or the power failure audible signals. Operation of the DC service failure guard key lights the (DC SERVICE FAILURE GUARD) lamp and retires the alarms. When the DC service is restored, the transfer relay operates, releasing relay (DS). With the DC service failure guard key operated, release of relay (DS) operates relay (DF), which lights the (DC SERVICE FAILURE) lamps and operates the alarms. When the key is restored, the (DC SERVICE FAILURE GUARD) lamp is extinguished and the alarms are retired.

25. ALARM FOR EMERGENCY LIGHTING FUSE (FIG. 22)

If the emergency lighting fuse opens, relay (EL) releases, operating relay (FL) which lights the power alarm cabinet and trouble desk or main alarm board (EMERGENCY LIGHTING FUSE) lamp and operates the associated AC auxiliary signals. When the open emergency lighting fuse is replaced, relay (EL) operates, retiring the alarms.

26. HIGH-LOW VOLTAGE ALARM (FIG. 23)

When the potential across the winding of the voltmeter relay is less than 46 volts or more than 50.5 volts, the contacts of the voltmeter relay close, operating relay (HL). With V option, operation of relay (HL) operates relay (VA). With Q option, operation of relay (HL) operates relay (VT) when interrupter (HL) closes its front contact. Relay (VT) locks under control of relay (HL) and operates relay (VA) when interrupter (HL) closes its back contact. Relay (VA) operating, locks under control of relay (HL). With either Q or V option, relay (VA) operating, lights the (HIGH-LOW VOLTAGE) lamps, operates the DC auxiliary signal at the trouble desk or main alarm board and operates the power alarm cabinet DC auxiliary signal. When the potential returns to normal, the voltmeter relay contacts open, retiring the alarms.

27. FLOATING BATTERY ALARM (FIG. 23)

When the potential across the winding of the 48 volt voltmeter relay is less than 48 volts or greater than 50 volts, relay (F48) is operated. When the potential across the winding of the 24 volt voltmeter relay is less than 24 volts or greater than 25 volts, relay (F24) is operated. Operation of either relay (F48) or (F24) operates relay (V). If (V) option is furnished, relay (V) operating, operates relay (FA) at the power alarm cabinet and, with BA and E or J option, also operates relay (FT) at the trouble desk or main alarm board. If Q option is furnished, relay (V operating, operates relay (FT1) when interrupter (FT) closes its front contact, and with BA and AA options also furnished, operates relay (FT2) when interrupter (FT1) closes its front contact. Relays (FT1) and (FT2) operating, lock under control of relay (V), and when interrupters (FT) and FT1) close their back contacts, operate relay (FA) at the power alarm cabinet and relay (FT) at the trouble desk or main alarm board, respectively. These relays lock under control of relay (V). With either Q and AA, or V and E or J options, relays (FA) and (FT) light the corresponding (FLOATING VOLTAGE) lamps and operate the associated AC auxiliary signals. Momentary operation of the (ALARM RELEASE) key operates relay (FV) which locks, under control of relay (V), lights the (FLOATING VOLTAGE GUARD) lamps and releases relays (FA) and (FT), which retire the alarms. When the battery reaches a voltage within the required limits, the voltmeter relay contacts open, releasing the operated relays.

28. DISCHARGE AND CHARGE FUSE ALARMS (FIG. 24)

Operation of a discharge fuse operates relay (D), which lights the (DISC FUSE) lamps, operates the DC auxiliary signal at the trouble desk or main alarm board and operates the power alarm cabinet DC auxiliary signal. Operation of a charge fuse operates relay (C), which lights the (CHG FUSE) lamps and operates the AC auxiliary signals at the power alarm cabinet and trouble desk or main alarm board.

29. RINGING GENERATOR NO VOLTAGE ALARM (FIG.25)

Failure of ringing generator current or opening of the alarm circuit fuse, releases relay (RG) which operates relay (GA), lights the (RING GEN) lamp at the alarm board or power alarm cabinet and operates the corresponding DC auxiliary signal or the power failure audible signals. Operation of relay (GA) lights the trouble desk or main alarm board (RMD) lamp and operates audible signals at the main alarm board or trouble desk. When (GA) relay operates and Fig. 101 is furnished it operates the (RMJ) relay in that figure which will operate a Ringing Plant Failure Lamp at the Power Alarm Cabinet or the Floor Alarm Boards or if another Power Room is in the same building it will operate a Ringing Plant Failure Lamp at the other Power Alarm Cabinet. When option "AE" is furnished and (GA) relay operates the (MJ) relay of Fig. 100 also operates. The (MJ) relay operates a relay in the Aud. Alm. Sw. Ckt. which in turn operates the DC auxiliary signal in this circuit. This arrangement does not operate the Power Failure Lamp. When ringing generator current is restored, relay (RG) operates retiring the alarms. When "BR" wiring is furnished, operation of a ring lead fuse would operate relay (RB), which disconnects this alarm. When a coin control filter is furnished with a "P" type ringing machine, removal of a slip ring brush will cause ringing current to flow thru part of the transformer winding and thru the filter condensers. This current operates relay (RV), which operates relay (GA), lights the (RING GEN) lamp at the alarm board or power alarm cabinet and operates the corresponding DC auxiliary signal or the power failure audible signals. Operation of relay (GA) lights the trouble desk or main alarm board (RMD) lamp and operates the main alarm board or trouble desk audible signals. When (GA) relay operates and Fig. 101 is furnished it operates the (RMJ) relay in that figure which will operate a Ringing Plant Failure Lamp at the Power Alarm Cabinet or the Floor Alarm Boards, or if another Power Room is in the same building it will operate a Ringing Plant Failure Lamp at the other Power Alarm Cabinet. When option "AE" is furnished and (GA) relay operates the (MJ) relay of Fig. 100 also operates. The (MJ) relay operates a relay in the Aud. Alm. Sw. Ckt. which in turn operates the DC auxiliary signal in this circuit. This arrangement does not operate the Power Failure Lamp. When the slip ring brush is restored, relay (RV) releases, retiring the alarms. When "A" and "AE" wiring

is furnished operation of relay (RM) operates the (RM) lamp and the DC auxiliary signals at the Power Alarm Cabinet. When "A" and "AE" wiring are furnished the operation of relay (RM) operates lamp (RM) at the Power Alarm Cabinet and also operates a DC audible alarm relay in the Aud. Alm. Sw. Ckt. to operate the DC audible in this circuit. This arrangement prevents the Power Failure Lamp from operating in the Aud. Alm. Sw. Ckt. When "Y" and "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (SR), Fig. 77 or 85.

30. MACHINE RINGING NO VOLTAGE ALARM (FIG. 26)

Failure of machine ringing current or opening of the alarm circuit fuse, releases relay (MR), which short circuits relay (RA). Release of relay (RA) operates relay (M1) which locks up, operates relay (GA), lights the (MACH RING) lamp and operates the DC auxiliary signal or the power failure audible signals. Operation of relay (FA) lights the (RMD) lamp and operates the DC audible signals at the trouble desk or main alarm board. When (GA) relay operates and Fig. 101 is furnished it operates the (RMJ) relay in that figure which will operate a Ringing Plant Failure Lamp at the Power Alarm Cabinet or the Floor Alarm Boards, or if another Power Room is in the same building it will operate a Ringing Plant Failure Lamp at the other Power Alarm Cabinet. When option "AE" is furnished and (GA) relay operates the (MJ) relay of Fig. 100 also operates. The (MJ) relay operates a relay in the Aud. Alm. Sw. Ckt. which in turn operates the DC auxiliary signal in this circuit. This arrangement does not operate the Power Failure Lamp. When machine ringing current is restored, relays (MR) and (RA) operate, and operation of the (MACH RING ALM) key releases relay (M1), retiring the alarms. Relay (RA) is slow acting to prevent its release in case relay (MR) releases momentarily on machine ringing current. Where "BR" wiring is furnished operation of a power circuit fuse will disconnect this alarm by operating relay (RB). When "A" and "AE" wiring are furnished, operation of relay (RM) operates the (RM) lamp and the DC auxiliary signals at the Power Alarm Cabinet. When "A" and "AE" wiring are furnished the operation of relay (RM) operates lamp (RM) at the Power Alarm Cabinet and also operates a DC audible alarm relay in the Aud. Alm. Sw. Ckt. to operate the DC audible in this circuit. This arrangement prevents the Power Failure Lamp from operating in the Aud. Alm. Sw. Ckt. Where "Y" and "EP" wiring are furnished, operation of the floor alarm board auxiliary signal is controlled by relay (SR), Fig. 77 or 85.

31. RINGING AND COIN CONTROL FUSE ALARM (FIGS. 27, 28, 29, AND 30)

Operation of a cartridge type fuse in the ringing power board operates an alarm type fuse which connects current from the machine to relay (TL), (RL), (-CF) or (+CF). Operation of relay (TL) or (RL) and, where "BZ" or "Z" and "AZ" wiring are not furnished, operation of relay (-CF) or (+CF) operates relays (GA) and (RB), lights the (RING LEAD FUSE) lamp and operates the DC auxiliary signal or the power failure audible signals. Operation of relay (RB) disconnects the associated no-voltage alarms. Operation of relay (GA) lights the (RMD) lamp and operates the DC audible signal at the trouble desk of main alarm board. When (GA) relay operates and Fig. 101 is furnished it operates the (RMJ) relay in that figure which will operate a Ringing Plant Failure Lamp at the Power Alarm Cabinet or the Floor Alarm Boards, or if another Power Room is in the same building it will operate a Ringing Plant Failure Lamp at the other Power Alarm Cabinet. When option "AE" is furnished and (GA) relay operates the (MJ) relay of Fig. 100 also operates. The (MJ) relay operates a relay in the Aud. Alm. Sw. Ckt. which in turn operates the DC auxiliary signal in this circuit. This arrangement does not operate the Power Failure Lamp. Removal of the operated alarm type fuse retires the alarms. When "A" and "AE" wiring are furnished, operation of relay (RM) operates the (RM) lamp and the DC auxiliary signal in the power alarm cabinet. When "A" and "AE" wiring are furnished the operation of relay (RM) operates lamp (RM) at the Power Alarm Cabinet and also operates a DC audible alarm relay in the Aud. Alm. Sw. Ckt. to operate the DC audible in this circuit. This arrangement prevents the Power Failure Lamp from operating in the Aud. Alm. Sw. Ckt. When "BZ" or "Z" and "AZ" wiring are furnished, operation of relay (-CF) or (+CF) lights the (COIN BAT FUSE) lamp, operates relay (ZB), when furnished and brings in the DC auxiliary signals at the power alarm cabinet, instead of lighting the (RING LEAD FUSE) lamp and operating the associated auxiliary signal. Operation of relay (-CF) or (+CF) also operates relay (GA1) which lights trouble desk or main alarm board lamp (CB) and operates the associated DC auxiliary signal. Operation of relay (ZB) cancels the coin power failure alarms. Where "Y" and "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (SR), Fig. 77 or 85.

32. LOW TONE 1 NO VOLTAGE ALARM (FIG. 31)

Failure of "low tone 1" current releases relay (LT1), which operates relay (GA), lights the (DIAL TONE) lamp, and

operates the DC auxiliary signal. Operation of relay (GA) lights the trouble desk or main alarm board (RMD) lamp and operates the corresponding DC audible signal. When (GA) relay operates and Fig. 101 is furnished it operates the (RMJ) relay in that figure which will operate a Ringing Plant Failure Lamp at the Power Alarm Cabinet or the Floor Alarm Boards, or if another Power Room is in the same building it will operate a Ringing Plant Failure Lamp at the other Power Alarm Cabinet. When Option "AE" is furnished and (GA) relay operates the (MJ) relay of Fig. 100 also operates. The (MJ) relay operates a relay in the Aud. Alm. Sw. Ckt. which in turn operates the DC auxiliary signal in this circuit. This arrangement does not operate the Power Failure Lamp. When "RB" wiring is furnished, operation of any fuse associated with the (RING LEAD FUSE) lamp will operate relay (RB), which disconnects this alarm. When "A" and "AE" wiring are furnished, operation of relay (RM) operates the (RM) lamp and the DC auxiliary signal in the power alarm cabinet. When "A" and "AE" wiring are furnished the operation of relay (RM) operates lamp (RM) at the Power Alarm Cabinet and also operates a DC audible alarm relay in the Aud. Alm. Sw. Ckt. to operate the DC audible in this circuit. This arrangement prevents the Power Failure Lamp from operating in the Aud. Alm. Sw. Ckt. When "Y" and "EP" wiring are furnished, operation of the floor board auxiliary signal is controlled by relay (SR), Fig. 77 or 85.

33. LOW TONE 2 NO VOLTAGE ALARM (FIG. 32)

Failure of "low tone 2" current releases relay (LT2), which operates relay (GA), lights the (BUSY TONE AND ALL PATHS BUSY TONE) lamp, and operates the DC auxiliary signal or the power failure audible signals. Operation of relay (GA) lights the trouble desk or main alarm board (RMD) lamp and operates the DC audible signal. When (GA) relay operates and Fig. 101 is furnished it operates the (RMJ) relay in that figure which will operate a Ringing Plant Failure Lamp at the Power Alarm Cabinet or the Floor Alarm Boards, or if another Power Room is in the same building it will operate a Ringing Plant Failure Lamp at the other Power Alarm Cabinet. When Option "AE" is furnished and (GA) relay operates the (MJ) relay of Fig. 100 also operates. The (MJ) relay operates a relay in the Aud. Alm. Sw. Ckt. which in turn operates the DC auxiliary signal in this circuit. This arrangement does not operate the Power Failure Lamp. When "RB" wiring is furnished, operation of any fuse associated with the (RING LEAD FUSE) lamp will operate relay (RB), which disconnects this alarm. When "A" and "AE" wiring are furnished, operation of relay (RM) operates the DC audible signals. When "Y" and "EP" wiring are furnished, operation of the floor alarm board auxiliary signal is controlled by relay (SR), Fig. 77 or 85.

34. HOWLER AND PERMANENT SIGNAL TONE FUSE ALARMS (FIG. 33)

Operation of a fuse in either tone lead operates an alarm type fuse which connects interrupted battery to relay (HF). Operation of relay (HF), operates relay (HA) which operates relay (AM) and lights the (HIGH TONE FUSE) lamp and operates the AC auxiliary signal at the alarm board or power alarm cabinet. When (AM) relay operates and Fig. 101 is furnished it will operate the (RMN) relay in that figure which will operate a Ringing Plant Failure Lamp at the Power Alarm Cabinet or Floor Alarm Boards or if another Power Room is in the same building it will operate a Ringing Plant Failure Lamp at the other Power Alarm Cabinet. When Option "AE" is furnished the (AM) relay is operated in series with the alarm lamp and the (MN) relay of Fig. 99. The (MN) relay operates a relay in the Aud. Alm. Sw. Ckt. over the "MN" lead which in turn operates the AC auxiliary signal in this circuit. This arrangement does not operate the Power Failure Lamp. Operation of relay (AM) lights lamp (RMA) and operates the AC auxiliary signal at the trouble desk or main alarm board. When "A" and "AC" wiring is furnished operation of (MA) relay operates the (MA) lamp at the Power Alarm Cabinet and operates a relay in the Aud. Alm. Sw. Ckt. to operate the AC auxiliary audible signal. When "A" and "AE" wiring is furnished, operation of the (MA) relay operates the (MA) lamp at the Power Alarm Cabinet and a relay in the Aud. Alm. Sw. Ckt. to operate the AC auxiliary audible signal. This arrangement does not operate the Power Failure Lamp in the Aud. Alm. Sw. Ckt. Removal of the operated alarm type fuse retires the alarms. Where "Y" and "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (NB), Fig. 75, 84 or 143.

35. RINGING MACHINE PILOT LAMPS

When the ringing machine is located near a floor alarm board or main alarm board, the lamps associated with trouble desk or main alarm board lamp (RMD) may be located at the alarm board, and relay (RM) may be provided. When a Ringing Plant Failure Lamp only is required indicate a Ringing Plant Failure and a Power Failure Lamp only is required to indicate other Power Failures, a Ringing Plant Failure Lamp (Fig. 102) may be provided at the Floor Alarm Boards or Power Alm. Cab. when the (RMD), (RMA), RM or MA lamp is not provided. When the circuit is closed to light lamp (RMD), relay (RM) operates to light lamp (RM) and operate the DC auxiliary signal at the power alarm cabinet or operate the power failure audible signals. The lamps associated with trouble desk or main alarm board lamp (RMA) are located at the alarm board, and relay (MA) is furnished. When lamp

(RMA) lights, relay (MA) operates, lighting lamp (MA) and operating the AC auxiliary signal at the power alarm cabinet.

36. AISLE PILOT AUDIBLE ALARMS (FIGS. 34, 35 AND 36)

Relay (LF), (SF) or (F) when operated by application of ground to the corresponding lead F, connects continuous ringing current to the associated subset. When ground is connected to lead LT, ST or T, the corresponding relay operates to connect machine ringing current to the associated subset. If both relays of any figure are operated at the same time, the relay which is operated over the F lead opens the circuit for machine ringing current and connects continuous ringing current to the subset.

37. ALARM BOARD FUSE ALARM (FIG. 37)

Operation of a fuse at the power alarm cabinet, floor alarm board or main alarm board, operates relay (AF) which lights the alarm board (FUSE) lamp, lights the trouble desk or main alarm board frame fuse alarm lamp, Fig. 1, and operates the associated AC auxiliary signal. When the operated fuse is removed, relay (AF) releases, retiring the alarms. Where "FF" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (NB), Fig. 75, 84 or 159.

38. TRAFFIC REGISTER RACK FUSE ALARM (FIG. 38)

Operation of a fuse at the traffic register rack lights lamp (FUSE) and operates relay (A), operating relay (A1), which lights the (TRR FUSE) lamps at the alarm board and trouble desk or main alarm board and operates the corresponding AC auxiliary signals. When the operated fuse is removed, the alarms are retired. Operation of the fuse in series with relay (A) will operate relay (A) bringing in the alarms. Where "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (NB), Fig. 75 or 84 or 143.

39. ALARM BOARD NIGHT ALARM (FIG. 39)

When ground is connected to a lamp associated with lead CR or TR, the corresponding relay operates. With key (NA) normal, operation of relay (CR) closes the AC auxiliary signal circuit. Operation of relay (TR), with key (NA) normal, causes relay (RT) to operate on machine ringing current and release on the silent periods, intermittently operating the AC auxiliary signal.

40. 24 AND 48 VOLT FUSE ALARM (FIG. 40)

Operation of a fuse in the 24 or 48 volt supply to the ringing power circuit, operates relay (BS) which operates relays (GA) and (RB) and lights the (RING LEAD FUSE) lamp and operates the DC auxiliary signal. Operation of relay (GA) lights lamp (RMD) and operates the DC audible signal at the trouble desk or main alarm board. When (GA) relay operates and Fig. 101 is furnished it operates the (RMJ) relay in that figure which will operate a Ringing Plant Failure Lamp at the Power Alarm Cabinet or the Floor Alarm Boards, or if another Power Room is in the same building it will operate a Ringing Plant Failure Lamp at the other Power Alarm Cabinet. When Option "AE" is furnished and (GA) relay operates the (MJ) relay of Fig. 100 also operates. The (MJ) relay operates a relay in the Aud. Alm. Sw. Ckt. which in turn operates the DC auxiliary signal in this circuit. This arrangement does not operate the Power Failure Lamp. Operation of relay (RB) disconnects the associated no-voltage alarms. Removal of the operated alarm type fuse retires the alarms. When "A" and "AE" wiring are furnished, operation of relay (RM) operates the (RM) lamp and the DC audible signals. When "A" and "AE" wiring are furnished the operation of relay (RM) operates lamp (RM) at the Power Alarm Cabinet and also operates a DC audible alarm relay in the Aud. Alm. Sw. Ckt. to operate the DC audible in this circuit. This arrangement prevents the Power Failure Lamp from operating in the Aud. Alm. Sw. Ckt. Where "Y" and "EP" wiring are furnished, operation of the floor alarm board auxiliary signal is controlled by relay (SR), Fig. 77 or 85.

41. SUP. - FUSE ALARM (FIG. 41)

Operation of a fuse in the power lead supplying negative superimposed ringing current operates an alarm type fuse which connects negative superimposed current to relay (-S). Operation of relay (-S) operates relay (GA) and (RB) and lights the (RING LEAD FUSE) lamp and operates the DC auxiliary signal. Operation of relay (GA) lights lamp (RMD) and operates the DC audible signal at the trouble desk or main alarm board. When (GA) relay operates and Fig. 101 is furnished it operates the (RMJ) relay in that figure which will operate a Ringing Plant Failure Lamp at the Power Alarm Cabinet or the Floor Alarm Boards, or if another Power Room is in the same building it will operate a Ringing Plant Failure Lamp at the other Power Alarm Cabinet. When Option "AE" is furnished and (GA) relay operates the (MJ) relay of Fig. 100 also operates. The (MJ) relay operates a relay in the Aud. Alm. Sw. Ckt. which in turn operates the DC auxiliary signal in this circuit. This arrangement does not operate the Power Failure Lamp. Operation of relay (RB) disconnects the associated no-voltage alarms. Removal of the operated alarm type fuse retires the alarms. When "A" and "AE" wiring is furnished, operation of relay (RM) operates the DC audible signals. When "A" and "AE" wiring are furnished the operation of relay (RM) operates lamp (RM) at the Power Alarm Cabinet and also operates a DC audible alarm relay in

the Aud. Alm. Sw. Ckt. to operate the DC audible in this circuit. This arrangement prevents the Power Failure Lamp from operating in the Aud. Alm. Sw. Ckt. Where "Y" and "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (SR), Fig. 77 or 85.

42. START CIRCUIT MAKE BUSY SIGNAL (FIG. 42)

When ground is connected to lead MBA or MBB by operation of the corresponding group make-busy key in the link circuit, lamp (MBA) or (MBB) lights and relay (MB) operates, lighting lamp (MB) at the main alarm board or trouble desk. When the link circuit is released, the lamps are extinguished.

43. START CIRCUIT ALARM (FIG. 43)

When the (SA) relay in the start circuit operates due to failure of a line finder to start or failure of a link to advance, lamp (SC) or (SC1) is lighted and relay (STA) operates, operating relay (SP), which lights lamp (SP) at the alarm board and lights lamp (SP) and operates the DC auxiliary signal at the main alarm board or trouble desk. When "TA" wiring is furnished, the AC auxiliary signals and the aisle pilot audible alarms are operated, instead of the DC auxiliary signals. When the start circuit relay releases, the alarms are retired.

44. TRIP CIRCUIT LOCKING ALARM (FIG. 44) (OBSOLETE)

When the trip circuit fails to release within a predetermined time interval, ground is connected to lead TA, lighting lamp (TA) and operating relay (PL), which lights lamp (PL) and operates the AC or DC auxiliary signals. When the trouble condition has been removed, key (TR) is depressed, releasing the trip circuit relay, which retires the alarm. Where "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (NB), Fig. 75, 84 or 143 or relay (AD), Fig. 74, 83 or 144.

45. TRIP CIRCUIT NON-LOCKING ALARM (FIG. 45)

When the trip circuit fails to release within a predetermined time interval, ground is connected to lead AP2, lighting lamp (TC) and operating relay (TA), which operates relay (TA1). Operation of relay (TA1) lights alarm board lamp (TA) and lights lamp (TA) and operates the DC auxiliary signal at the main alarm board or trouble desk. When "TA" wiring is furnished, the AC auxiliary signals and the aisle pilot audible alarm are operated, instead of the DC auxiliary signals. When the trip circuit releases, the alarms are retired.

46. CONSTANT VOLTAGE CHARGING ALARM (FIG. 46)

When the voltage at the power circuit voltmeter relay is less than 26.7 volts or more than 27.8 volts, the voltage relay contacts close to operate relay (CV), operating relay (CV1) which operates relay (CV3) and (CV4). Operation of relay (CV3) lights lamp (CV) and operates the AC auxiliary signal at the power alarm cabinet. Operation of relay (CV4) lights lamp (CV) and operates the AC auxiliary signal at the trouble desk or main alarm board. Momentary operation of key (CV) operates relay (CV2) which locks under control of relay (CV), lights the (CVG) lamp and releases the (CV3) and (CV4) relays, which silence the alarms. When the voltage is again within the required limits, the (CV), (CV1) and (CV2) relays release, extinguishing the (CVG) lamp.

47. ALARM SYSTEM BATTERY FUSE ALARM (FIG. 47)

Operation of the power circuit fuse which supplies current for the alarm system, operates relay (AFA) which lights the (AFA) lamps and operates the AC auxiliary signals or the alarm battery supply audible signals. When the operated fuse is removed, the alarms are retired.

48. PICK-UP VOLTAGE ALARM (FIG. 48)

Relays (BR1), (BR2) and (BR3) are connected to pick-up brushes 1, 2 and 3, respectively, and operate in rotation as the grounded segment of the interrupter makes contact with each brush. If a brush becomes open, all three relays will be normal at the same time, releasing relay (OB), which operates relay (GA) and lights lamp (PUA) and operates the DC auxiliary signal or the power failure audible signals. Operation relay (GA) lights the (RMD) lamp and operates the DC audible signal at the trouble desk or main alarm board. When (GA) relay operates and Fig. 101 is furnished it operates the (RMJ) relay in that figure which will operate a Ringing Plant Failure Lamp at the Power Alarm Cabinet or the Floor Alarm Boards, or if another Power Room is in the same building it will operate a Ringing Plant Failure Lamp at the other Power Alarm Cabinet. When option "AE" is furnished and (GA) relay operates the (MJ) relay of Fig. 100 also operates. The (MJ) relay operates a relay in the Aud. Alm. Sw. Ckt. which in turn operates the DC auxiliary signal in this circuit. This arrangement does not operate the Power Failure Lamp. Relay (OB) will operate and retire the alarms when two of the (BR1), (BR2) and (BR3) relays are operated. If the Pk. U.A. brush becomes open and a pick-up lead becomes grounded, there will be some part of the cycle when relays (BR1), (BR2) and (BR3) are operated,

releasing relay (AB), which brings in the pick-up alarms, Fig. 15. Relay (AB) will operate and retire the alarms when two of the (BR1), (BR2) and (BR3) relays are released. Jack (PU) is provided for use in testing relays (BR1), (BR2) and (BR3). When "A" and "AE" wiring are furnished, operation of relay (RM) operates the (RM) lamp and the power alarm cabinet audible signals. When "A" and "AE" wiring are furnished the operation of relay (RM) operates lamp (RM) at the Power Alarm Cabinet and also operates a DC audible alarm relay in the Aud. Alm. Sw. Ckt. to operate the DC audible in this circuit. This arrangement prevents the Power Failure Lamp from operating in the Aud. Alm. Sw. Ckt. Where "Y" and "EP" wiring are furnished, operation of the floor alarm board auxiliary signal is controlled by relay (NB), Fig. 75, 84 or 143.

49. DIAL TESTER ALARM (FIG. 49)

When the dial tester remains off-normal longer than predetermined time interval, lamp (DT) is lighted and the alarm board, trouble desk or main alarm board AC auxiliary signal is operated. Where "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (NB), Fig. 75, 84 or 143.

50. RINGER TEST CIRCUIT ALARM (FIG. 50)

When a ringer test circuit fails to return to normal after a predetermined time interval, lamp (TL) is lighted and the alarm board, trouble desk or main alarm board AC auxiliary signal is operated. Where "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (NB), Fig. 75, 84 or 143.

51. INFORMATION DESK TIME ALARM (FIG. 51)

When an information desk circuit fails to function with a predetermined time interval, ground is connected to leads TA and DR, lighting the (FT) lamps and operating the DC auxiliary signals at the alarm board and at the trouble desk or main alarm boards.

52. INCOMING CALL SIGNAL LAMPS FOR CHIEF SWITCHMAN'S DESK AND O.G.T. TEST BOARD (FIG. 52)

An incoming call to the chief switchman's desk lights lamps (CS) at all alarm boards and at the power alarm cabinet. An incoming call to the outgoing trunk test board lights lamps (TD) at all alarm boards and at the power alarm cabinet.

53. FLOOR PILOT LAMPS FOR EXTENSION ALARM CIRCUIT FROM PBX OR COMMUNITY DIAL OFFICE (FIG. 53)

When a major or minor alarm is received at the main cabinet for P.B.X. and community dial office, lamps (PBX A) or (PBX B), respectively, are lighted at all alarm boards and at the power alarm cabinet.

54. CHARGE CIRCUIT GENERATOR LEAD FILTER FUSE ALARM (FIG. 54)

Operation of a fuse in the filter circuit for the charge circuit generator lead operates relay (EC) which lights lamps (EC) and operates the AC auxiliary signals at the power alarm cabinet and trouble desk or main alarm board.

55. INFORMATION DESK OR OPERATING ROOM DESK TRUNK ALARM (FIG. 55)

When the line relay of an incoming information trunk fails to release within a predetermined time interval or when a subscriber fails to disconnect within a predetermined time interval after the operator releases the associated incoming trunk, a relay operates to operate relay (TA2) and light lamp (TA) and operate the intermittent ringing night alarm Fig. 39, operation of relay (TA2) operates the aisle pilot audible alarm for the alarm group nearest the relay rack and lights lamp (TA) and operates the AC auxiliary signal at the trouble desk or main alarm board.

56. INFORMATION DESK TOLL TRUNK ALARM (FIG. 56)

A trouble condition in the toll trunk or in the associated information desk start circuit, operates a start circuit relay which operates relay (TT) and lights lamp (TG) and operates the intermittent ringing night alarm, Fig. 39. Operation of relay (TT) operates the aisle pilot audible alarm for the alarm group nearest the relay rack, and lights lamp (TG) and operates the AC auxiliary signal at the trouble desk or main alarm board.

57. ANNOUNCEMENT DESK ANNOUNCEMENT SUPPLY ALARM (FIG. 57)

When the repeater switch is improperly operated, when the repeater tube fails to function properly, or when a line becomes open, lamp (SA), (RA), or (LA), respectively, lights and the DC auxiliary signal operates at the alarm board. Lamp (AS) at the trouble desk or main alarm board lights when any of these alarms is operated. Lamp (P) is lighted when a key in the announcement supply circuit is operated to silence the alarms. Where "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (AD), Fig. 83 or 163.

58. ANNOUNCEMENT DESK ALARMS (FIG. 58)

When the (TBL) key in the announcement desk circuit is operated, or when there is failure of the plate or filament circuit of an associated repeater lamps (TD) are lighted and the DC auxiliary signals are operated at the floor alarm board and trouble desk or main alarm board. Where "EP" wiring is furnished, operation of the floor alarm board

auxiliary signal is controlled by relay (AD), Fig. 74, 83, or 163.

59. ANNOUNCEMENT POWER ALARM FOR 130 VOLT POWER SUPPLY (FIG. 59)

Trouble in the power supply unit causes operation of a relay which lights lamp (PP) and operates the DC auxiliary signals at the floor alarm board and main alarm board or trouble desk. Lamp (G) is lighted when a key in the power supply circuit is operated to silence the alarms. Where "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (AD), Fig. 74, 83 or 162.

60. TUNGAR RECTIFIER ALARM (FIG. 60)

When the tungar rectifier fails to function properly, relay (R) operates lighting the (RECT) lamps and operating the AC auxiliary signals at the power alarm cabinet, and trouble desk or main alarm board.

61. MESSAGE REGISTER CONNECTOR FRAME FUSE ALARM (FIG. 61)

Operation of a fuse on the message register connector frame operates relay (F), operating relay (FP) which operates the DC bell at the message register connector frame, lights lamps (FL) and operates the DC auxiliary signals at the alarm board and trouble desk, and lights the fuse alarm aisle pilot lamp associated with the message register connector frame.

62. MESSAGE REGISTER CONNECTOR TIME ALARM (FIG. 62)

Operation of the (S3) relay in the message register connector circuit, operates relay (TA) which operates the DC bell at the message register connector frame, and lights lamps (TL) and operates the DC auxiliary signals at the alarm board and trouble desk. Lead B1 supplies battery for the time alarm aisle pilot lamp, which is lighted when the (S3) relay operates.

63. TIME PULSE CHECKING CIRCUIT ALARM (FIG. 63)

When an extra pulse is produced by the district timing circuit, when any secondary group relay fails to release, and when any secondary group relay fails to operate, the pulse checking circuit disconnects the timing circuit from the districts and lights lamps (PC) and operates the DC auxiliary signals at the alarm board and trouble desk, under control of key (PC), Fig. 64. Where "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (AD), Fig. 74, 83 or 144.

64. TIME PULSE CHECKING CIRCUIT KEY (FIG. 64)

Momentary operation of key (PC) releases the time pulse checking alarm, Fig. 63.

65. ANNOUNCEMENT POWER ALARM OR MULTI-FREQUENCY OSCILLATOR POWER ALARM FOR 130 VOLT POWER SUPPLY (FIG. 65)

Operation of a battery discharge fuse or service fuse operates a relay in the power supply circuit, lighting lamps (MA) and operating the DC auxiliary signals at the floor alarm board and main alarm board or trouble desk. Failure of current from the charging rectifier operates a relay in the power supply circuit, lighting lamps (EA) and operating the AC auxiliary signals at the floor alarm board and main alarm board or trouble desk. The (EA) lamps and associated AC auxiliary signals may be retired by operation of an alarm transfer key in the power supply circuit, the operation of which lights lamp (G), in this circuit when the 603A power plant is used, or operates an "A" lamp in the power supply circuit when the 403A power plant is used. When rectifier current is restored, the power supply circuit relay operates, lighting lamps (EA) and operating the AC auxiliary signals. When the key is released, the alarms are retired. Where "EP" wiring is furnished, operation of the floor alarm board DC and AC auxiliary signals is controlled by relays (AD) and (NB), respectively, Figs. 74, 83 or 162 and 75, 84 or 159.

66. GROUND ALARM FOR COIN CONTROL CKT. FOR INCOMING SELS. AND RECORDING COMPLETING TRKS. (FIG. 66)

A trouble ground in the coin control circuit causes operation of a relay which lights lamps (TG) and operates the AC auxiliary signals at the alarm board and trouble desk. Where "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (NB), Fig. 75, 84 or 143.

67. ALARM FOR EMERGENCY ALARM CKT. (FIG. 67)

Operation of the emergency alarm circuit auxiliary signal circuit or failure of alarm circuit battery, causes operation of a relay which lights lamps (A) and operates the DC auxiliary signals at the alarm board and trouble desk. Where "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relays (AD), Fig. 74, 83 or 144.

68. TEST TRUNK SENDER STUCK SENDER ALARM (FIG. 68)

Sticking of a sender causes operation of a relay which lights lamps (TS) and causes intermittent operation of the alarm board and trouble desk night alarms.

69. RECTIFIER NO-VOLTAGE ALARM (FIG. 69)

When the relay in the rectifier circuit is released by a voltage drop, relay (VA) operates, lighting the alarm lamp and operating the AC auxiliary signals at the alarm board and main alarm board or trouble desk. When "G" wiring is furnished, operation of relay (VA) is delayed for a time interval sufficient to insure that normal operation of the grid controlled rectifier will not bring in the alarms. To silence the alarms, key (RING BAT ALM REL) is momentarily operated, operating relay (V) which locks up, releases relay (VA) and lights lamp (GUARD).

When the voltage is again normal, relay (V) releases, extinguishing lamp (GUARD).

70. COMMERCIAL RINGING MACHINE SLIP-RING BRUSH ALARM (Fig. 70)

When a coin control current filter is furnished with a commercial type ringing machine, removal of a slip-ring brush will cause ringing current to flow, thru part of the transformer winding and thru the filter condensers. This current operates relay (VN) or (VP), which operates relay (CR) when the front contact of the interrupter closes. Relay (CR) locks up under control of relays (VN) and (VP) and prepares the circuit for operating relay (CA) if relay (VN) or (VP) remains operated until the back contact of the interrupter closes. Operation of relay (CA) operates relay (GA), lights the (RING GEN) lamp and operates the DC auxiliary signal or the power failure audible signals. Operation of relay (GA) lights the trouble desk or main alarm board (RMD) lamp and operates the power failure audible signal. When the slip-ring brush is restored, relay (VN) or (VP) releases, retiring the alarms. If condenser (M) or (N) becomes short-circuited, relay (CP) or (CN) operates, connecting its secondary winding in circuit to protect the winding of relay (VP) or (VN), and operating relay (CA), which brings in the alarms. When "A" and "AE" wiring are furnished, operation of relay (RM) operates the (RM) lamp and the power failure audible signals. When "A" and "AE" wiring are furnished the operation of relay (RM) operates lamp (RM) at the Power Alarm Cabinet and also operates a DC audible alarm relay in the Aud. Alm. Sw. Ckt. to operate the DC audible in this circuit. This arrangement prevents the Power Failure Lamp from operating in the Aud. Alm. Sw. Ckt. Where "Y" and "EP" wiring are furnished, operation of the floor alarm board auxiliary signal is controlled by relay (SR), Fig. 77 or 85.

71. POWER TRANSFER ALARM (FIG. 71)

When the alternating current supply to the ringing set fails or a coin control supply lead is transferred from a rectifier to another source of power, relay (NT) is operated, operating relay (PT) which lights alarm board lamp (CCR), operates the associated AC auxiliary signal and operates relay (AM). Operation of relay (AM) lights the trouble desk or main alarm board (RMA) lamp and operates the corresponding AC auxiliary signal. When (AM) relay operates and Fig. 101 is furnished it will operate the (RMN) relay in that figure which will operate a Ringing Plant Failure Lamp at the Power Alarm Cabinet or Floor Alarm Boards, or if another Power Room is in the same building it will operate a Ringing Plant Failure Lamp at the other Power Alarm Cabinet. When option "AE" is furnished the (AM) relay is operated in series with the alarm lamp and the (MN) relay of Fig. 99. The (MN) relay operates a relay in the Aud. Alm. Sw. Ckt. over the "MN" lead which in turn operates the AC auxiliary signal in this circuit. This arrangement does not operate the Power Failure Lamp. When "A" and "AC" wiring is furnished, operation of (MA) relay operates the (MA) lamp at the Power Alarm Cabinet and operates a relay in the Aud. Alm. Sw. Ckt. to operate a Power Failure Lamp and the AC auxiliary audible signal. When "A" and "AE" wiring is furnished, operation of the (MA) relay operates the (MA) lamp at the Power Alarm Cabinet and a relay in the Aud. Alm. Sw. Ckt. to operate the AC auxiliary audible signal. This arrangement does not operate the Power Failure Lamp in the Aud. Alm. Sw. Ckt. The alarms may be silenced by momentarily operating a key in the power circuit, operating relay (MG) which locks up, releases relay (PT) to silence the alarms and lights lamp (TG). When the alternating current supply is restored, release relay (NT) releases relay (MG) which extinguishes the (TG) lamp. Where "Y" and "EP" wiring are furnished, operation of the floor alarm board auxiliary signal is controlled by relay (NB) Fig. 75 or 84.

72. ALARM FOR SUBSCRIBER OPERATED ANNOUNCEMENT SERVICE (FIG. 72)

Failure of either announcement channel operates a relay which lights lamps (AT) and operates the DC auxiliary signals at the floor alarm board and at the trouble desk or main alarm board. Lamp (AG) is lighted when a key is operated to silence the alarms. Where "EP" wiring is furnished, operation of the floor alarm board auxiliary signal is controlled by relay (AD), Fig. 74, 83 or 101.

73. DC ALARM RELAY (FIG. 73)

Operation of any associated alarm operates relay (DE), which operates the DC auxiliary signal and lights the floor alarm board pilot lamp.

74. DC AUXILIARY RELAY (FIG. 74) (MFR. DISC.)

Operation of any associated alarm operates relay (AD), which operates the DC auxiliary signal and lights the floor alarm board pilot lamp.

75. AC AUXILIARY RELAY (FIG. 75) (MFR. DISC.)

Operation of any associated alarm operates relay (MB), which operates the AC auxiliary signal and lights the floor alarm board pilot lamp.

76. NIGHT ALARM RELAY (FIG. 76)

When key (NA), Fig. 39 is normal, and leads AG and BG are connected together by the associated alarm circuit, relay (NA) operates, operating the AC auxiliary signal and lighting the floor alarm board pilot lamp.

77. POWER FAILURE RELAY FOR RINGING MACHINE (FIG. 77) (MFR. DISC.)

Operation of any associated alarm operates relay (SR), which operates an (RP) relay to operate the power failure audible signals and prevent operation of the exit pilot lamps which would indicate the trouble condition to be in the power room. Operation of relay (SR) also operates the floor

signal relay for the floor on which the ringing machine is located.

78. FUSE BOARD 48V. ALARM BATTERY SUPPLY FUSE ALARM (FIG. 78)

Operation of an alarm battery supply fuse lights lamp (FA) and operates relay (K), Fig. 79.

79. 48V. ALARM BATTERY SUPPLY FUSE ALARM RELAY (FIG. 79)

Operation of a fuse board fuse operates relay (K), operating relay (AS), which lights the aisle pilot lamp, Fig. 1, lights lamp (ABS), and operates relays which operate the alarm battery supply audible signals on all floors and light "other floor" pilot lamps and exit pilot lamps on other floors.

80. TALKING BATTERY FUSE ALARM (FIG. 80)

Operation of a talking battery fuse operates relay (D), which lights the aisle pilot lamp, Fig. 1, and operates relay (MF), Fig. 81.

81. MAJOR FUSE ALARM RELAY (FIG. 81)

Operation of a talking battery fuse operates relay (D), Fig. 80, operating relay (MF) which lights lamps (TB) and operates the DC auxiliary signals at the alarm board and at the trouble desk or main alarm board.

82. INTERCEPTING TRUNK ALARM FOR TROUBLE GROUNDS (FIG. 82)

A trouble ground in an intercepting trunk circuit causes operation of relay (GA) which closes the circuit for intermittently operating the associated aisle pilot audible alarms and lights lamps (GA) and causes intermittent operation of the night alarms at the alarm board and trouble desk.

83. DC AUXILIARY RELAY (FIG. 83)

Operation of any associated alarm operates relay (AD), which operates the DC auxiliary signal and lights the floor alarm board pilot lamp.

84. AC AUXILIARY RELAY (FIG. 84)

Operation of any associated alarm operates relay (NB), which operates the AC auxiliary signal and lights the floor alarm board pilot lamp.

85. POWER FAILURE RELAY FOR RINGING MACHINE (FIG. 85)

Operation of any associated alarm operates relay (SR), causing the (RP) relay in the audible alarm circuit to operate. The (RP) relay operated, operates the power failure audible signals and prevents operation of the exit pilot lamps which would indicate the trouble condition to be in the power room. Operation of relay (SR), also operates the floor signal relay for the floor on which the ringing machine is located.

86. HIGH LOW VOLTAGE 48V. + BATT. ALARM (FIG. 86)

When the potential across the winding of the voltmeter relay is above the maximum or below the minimum permissible value, relay (BV) is operated, operating relay (V) which operates relay (FA). Relay (FA) lights the (+48V) lamp and operates the DC auxiliary signal at the alarm board thru Fig. 74, 83 of 164 with Option ZA. When the alarms of Figure 86 are supervised from the power alarm cabinet option ZB is used. In this case when relay (FA) operates ground is closed to lead "DC1" which operates the (DC1) relay in the power alarm cabinet to cause the AC audible alarm to sound. Momentary operation of the (High Low Voltage Release) key, or a key in the charge and discharge circuit, operates relay (FV), which locks to the contact of relay (V), retires the alarm by releasing relay (FA) and lights the (+48V DG) lamp. When the voltage returns to normal, relays (BV), (V) and (FV) release, extinguishing the guard lamp.

87. NO SUCH NUMBER TONE SUPPLY ALARM (FIG. 87)

When a trouble condition occurs in the no such number tone supply circuit, ground is connected to leads "NT" and "AG" to light lamps (NT) and to operate the AC auxiliary signal at the trouble desk or main alarm board. When "ZA" wiring is furnished the (NB) relay (Figure 84 or 143) operates and lights the lamp at the floor alarm board and operates the minor audible signal.

84. POWER SUPPLY TRANSFER TO RESERVE ALARM (FIG. 88)

This alarm operates when there is a failure in the 60 cycle power used for calculagraphs. The power supply circuit under this condition will transfer automatically to a DC reserver and operate a relay in the calculagraph supply and distribution fuse alarm circuit. Ground is connected to lead "F" lighting lamp (TRS) and causing the audible alarm to sound in the usual way by operating either relay (NB) in Fig. 75, 84 or 160 or by operating relay (AC1) associated with Fig. 120 or 123. The alarm may be silenced by operating a key in the calculagraph supply and fuse alarm circuit but lead "F" will be grounded again, as a warning to restore the key, when the 60 cycle power is restored and the power supply circuit transfers from the reserve power.

89. POWER SUPPLY NO VOLTAGE ALARM (FIG. 89)

When there is a failure in the 60 cycle power used for calculagraphs a relay in the calculagraph supply and fuse alarm circuit releases and connects ground to lead "DF". Lamp (CAL) lights and the major alarm sounds in the usual way by the operation of relay (AD) in Fig. 74, 83 or 164 or by the operation of relay (DCH) Fig. 132 or PA5 Fig. 147.

90. DISTRIBUTION FUSE ALARM (FIG. 90)

When a fuse supply 60 cycles 20-24V battery operates lead F is grounded and lamp (CF) lights. The audible alarm sounds in the usual way when relay (NB) in Fig. 75, 84 or 159 operates, or when relay (AC1), Fig. 120 or PN1 Fig. 124 operates. If it is desirable to provide more than one lamp.

indication on the floor alarm board the (CF) lamps may be multipled.

91. POWER SYSTEMS MINOR ALARM (FIG. 91)

This figure serves as a connecting link between various power systems circuits and the power alarm cabinet for the floor alarm board or main alarm board. If the connecting power systems circuit fails, leads "F" and "A" are grounded. This causes the associated alarm lamps in Fig. 91 to light and the audible alarm to sound over lead "AC1" or "NB" thereby identifying the particular power equipment in trouble.

92. POWER SYSTEMS MAJOR ALARM (FIG. 92)

This figure serves as a connecting link between various power systems circuits and the power alarm cabinet or the floor alarm board or main alarm board. If the connecting power system circuit fails, leads "DF" and "D" are grounded. This causes the associated alarm lamp in Fig. 92 to light and the audible alarm to sound over lead "DC1", "DCH", or "AD", thereby identifying the particular power equipment in trouble.

93. ALARM FOR OUTGOING TRUNK CIRCUIT FOR DIAL COIN ZONE SERVICE (FIG. 93)

When the time alarm relays in the outgoing coin trunk circuit operate ground is connected to lead "T" operating relay (CZS). Lamp (CZS) lights and the audible alarm will operate under control of the (NA) key of Fig. 39. If aisle pilot audible alarms are provided, one of these alarms will operate under control of ground on lead "T", "LT" or "ST"

94. ALARM FOR LINE LOAD CONTROL FEATURE (FIG. 94)

When the Class B or Class C keys of the line load control circuit are operated to suspend outward service on those classes of lines, ground is connected to leads G and DL, lighting lamps (LLC) and causing the audible alarm to sound over lead "DCH" or lead "AD" as a warning signal that these keys have been operated. The alarms are retired by the operation of another key in the line load control circuit. Likewise, an alarm will be given if one of the load control relays in the trip and start circuit becomes falsely operated because of trouble condition.

95. ALARM FOR PRIVATE LINE CONFERENCE CIRCUIT OR AIR RAID WARNING CONTROL CIRCUIT (FIG. 96)

If a trouble occurs in a private line conference circuit, a lamp individaul to that circuit lights and ground is connected to leads "G" and "DL". Lamp (PLC) will light, and the major audible alarm will sound over lead "DCH" or "AD".

If a trouble occurs in an air raid warning control circuit, ground is connected to leads "G" and "DL". Lamp (ARA) will light, and the major audible alarm will sound over lead "DCH" or "AD".

96. DIAL TONE SPEED REGISTER CIRCUIT ALARM (FIG. 97)

When the dial tone speed register circuit fails to cut through to dial tone within a certain interval after a test call has been started, ground is connected to leads "G" and "AG". Lamp (DTS) will light, and the minor audible alarm will sound on the operation of relay (AC1) over lead "AC1".

97. MULTIFREQUENCY CURRENT SUPPLY AND DISTRIBUTION CIRCUIT ALARM (FIG. 98)

In case of ground on any conductor of an output pair in the multifrequency and current supply distribution circuit, a lamp individual to that circuit lights and ground is connected to lead "D" Lamp (MF) will light, and the major audible alarm will sound over lead "DCH" or "AD".

98. MINOR AUXILIARY SIGNAL RELAY (FIG. 99)

When a ringing plant failure occurs which requires an AC auxiliary signal and a ringing plant failure lamp only is to operate the (MN) relay in this figure is in series with the lamp which indicates the type of failure, thru the contacts of the alarm relay and the (AM) relay. The (MN) relay operated grounds the "MN" lead to the Audible Alarm Switching Circuit to operate the audible alarm relay in that circuit which in turn operates the AC auxiliary signal in this circuit. This arrangement does not operate the Power Failure Lamp in the Aud. Alm. Sw. Ckt.

99. MAJOR AUXILIARY SIGNAL RELAY (FIG. 100)

When a ringing plant failure occurs which requires a DC auxiliary signal and a ringing plant failure lamp only is to operate the (MJ) relay in this figure is in series with the lamp, which indicates the type of failure, thru the contacts of the alarm relay and the (GA) relay. The (MJ) relay operated grounds the "MJ" lead to the Audible Alarm Switching Circuit to operate the audible alarm relay in that circuit which in turn operates the DC auxiliary signal in this circuit. This arrangement does not operate the Power Failure Lamp in the Aud. Alm. Sw. Ckt.

100. AUXILIARY SIGNAL RELAY FOR RINGING PLANT FAILURE (FIG. 101)

When a ringing plant failure lamp only is to operate and a minor ringing plant failure occurs the (AM) relay of Fig. 3 will operate the (RMN) relay. The (RMN) relay operated will operate the ringing plant failure lamp of Fig. 102 at the power alarm cabinet or floor alarm boards, and at the other power alarm cabinets if more than one power room is in the same building.

When a ringing plant failure lamp only is to operate and a major ringing plant failure occurs the (GA) relay of Fig. 25 will operate the (RMJ) relay. The (RMJ) relay operated will operate the ringing plant failure lamp of Fig. 102 at the power alarm cabinet or floor alarm boards and at the other power alarm cabinets if more than one power room is in the same building.

101. PILOT LAMP FOR RINGING PLANT FAILURE (FIG. 102)

The ringing plant failure lamp is operated by the relays of Fig. 101. This lamp is provided at power alarm cabinet or floor alarm boards.

102. PILOT LAMP FOR RINGING PLANT FAILURE FOR OTHER RINGING PLANTS WHEN MORE THAN ONE ARE IN THE SAME BUILDING (FIG. 103)

The ringing plant failure lamp is operated by relays in the power alarm ckt. for ringing, coin control and tone leads or in the floor alarm board miscellaneous and auxiliary alarm circuit.

103. CHARGING GENERATOR FUSE AND CIRCUIT BREAKER ALARM (FIG. 104)

When a circuit breaker or a fuse in the charging generator circuit operate, the charging generator circuit connects ground to lead "GF" or battery to lead "FA" to operate relay (GF). Relay (GF) operated lights lamp (GEN FA & CKT BKR) and connects ground to lead "AB1" to operate a minor audible alarm.

104. FUSE BOARD FUSE ALARM FOR POSITIVE OR NEGATIVE 130 BATTERY (FIGS. 105 AND 106)

When a 130V fuse operates, battery is connected to the associated alarm bar, lighting fuse panel lamp (FO) Fig. 105 and operating relay (FO) Fig. 106. Relay (FO) operated, lights lamp (FO1) at the main alarm board or floor alarm board and operates the major audible signal.

105. TIMED RELEASE SENDER STUCK SENDER ALARM (FIG. 107)

If a sender fails to release within a predetermined time interval, lead "A" is grounded to operate relay (SS) which in turn lights the SS lamps at the floor alarm board and trouble desk to indicate a stuck sender alarm. Relay (SS) also connects ground in series with the (SS) lamps to leads "AC1" and "AC2" to operate the minor audible signal.

106. MULTILINE SERVICE OBSERVING CIRCUIT OR NO. 12 DESK CORD AND SPEED OF ANSWER CIRCUITS ALARM (FIG. 108)

When a trouble condition occurs in a service observing circuit, the "F" and "G" leads are grounded causing the (SO) lamp to light and the minor audible alarm signal to operate over leads "AC1" and "AC2".

107. ALARMS FROM DISTANT OFFICE (FIG. 109)

A major or minor alarm signal from a distant office causes the alarm receiving circuit to connect ground to leads "DG" or "AG" at Fig. 109. When "BC" option is used, this ground lights lamp DCR or ACR at the floor alarm board and operates the audible signal. When "BA" option is used on ground on leads "DG" or "AG" operates relays (DCR) or (ACR) respectively, which in turn lights lamps DCR or ACR at both the floor alarm board and trouble desk and operates the audible signal.

108. TYPE "N" CARRIER ALARMS (FIG. 110)

When a trouble condition occurs in the type "N" carrier circuits, the "F" and "G" leads are grounded causing the "N" carrier lamps in the floor alarm board and trouble desk to light and operating the minor audible signal over leads "AC1" and "AC2".

109. POWER SUPPLY ALARM FOR ANNOUNCEMENT SYSTEM NO. 4A (FIG. 111)

When power to the Audichron converter circuit fails ground is connected to lead "C" operating relay (WP). Relay (WP) operated, operates the minor audible alarm signal and lights the lamps at the floor alarm board or power alarm cabinet and at the main alarm board or trouble desk. The momentary operation of the (ACO) key operates relay (WG) which in turn locks to ground in the audichron converter circuit, releases relay (WP), silences the minor alarm, extinguishes the visual signals and lights a guard lamp. When power to the audichron converter is restored, ground is removed from lead "C" releasing relay (WG) which in turn extinguishes the guard lamp.

110. REVERTING CALL TRUNK TROUBLE ALARM (FIG. 112)

When a trouble condition, such as bridged (STP) relay contacts, occurs in the reverting call trunk the "RC" lead is grounded. When BC option is used ground on the "RC" lead lights the lamp on the floor alarm board and operates the major audible alarm signal. When BA option is used, ground on the "RC" lead operates relay (RC) which in turn lights the lamps on the floor alarm board and main alarm board or trouble desk and operates the major audible alarm signals.

111. 8-PARTY SEMISELECTIVE RINGING ALARM (FIG. 113)

If the interrupter circuit is not functioning properly, or there is a falsely open or falsely grounded lead in the 8 party semiselecting ringing circuit, ground is connected to the "AL" and "DR" leads lighting lamps RL at the floor alarm board and trouble desk and operating the major audible alarm signal over leads "DC1" and "DC2".

112. CONCENTRATING CIRCUIT FOR PERMANENT SIGNAL HOLDING TRUNK (FIG. 114)

When a trouble condition occurs on the concentrating circuit, for permanent signal holding trunk, the "D" lead is grounded. When BC option is used, ground on the "D" lead lights a lamp on the floor alarm board and operates the minor audible alarm signal. When BA option is used, ground on the "D" lead operates relay (PS) which in turn lights the lamps on the floor alarm board and main alarm board or trouble desk, and operates the minor audible alarm signals.

113. POWER ALARM CABINET MINOR AUDIBLE SIGNAL CIRCUIT (FIG. 115)

Operation of any associated alarm operates relay AC1 which operates the minor audible alarm in the power alarm cabinet. Any figure or circuit connecting ground to lead AB1 operates the minor power alarm cabinet signal directly.

114. POWER ALARM CABINET MINOR AUDIBLE SIGNAL CIRCUIT ARRANGED TO TRANSMIT A MINOR POWER ALARM WITH NO CUTOFF DURING AN A.C. COMMERCIAL POWER SERVICE FAILURE (FIG. 116)

Operation of any associated alarm operates relay PN which operates the minor audible signal in the power alarm cabinet. When the alarms are supervised at the local office the alarm transfer circuit will return ground over lead AC3 to operate the minor audible signal in the power alarm cabinet. When the alarms are supervised at the alarm receiving center the alarm transfer circuit will transmit a minor power alarm signal to the alarm receiving center and withhold ground from the AC3 lead to silence the local alarm.

115. POWER ALARM CABINET AUXILIARY SIGNAL RELAY ARRANGED TO TRANSMIT A MINOR POWER ALARM WITH CUTOFF DURING AN A.C. COMMERCIAL POWER FAILURE (FIG. 117)

When an associated alarm connects ground to the DCH lead the PA3 relay operates and grounds lead PA6 to the alarm transfer circuit. When the alarms are supervised at the local office ground is returned over the DCH lead to operate the power alarm cabinet major audible signal. When the alarms are supervised at the alarm receiving center the alarm transfer circuit will transmit a minor power alarm signal and withhold ground from the DCH lead silencing the local alarm.

116. POWER ALARM CABINET AUXILIARY SIGNAL RELAY ARRANGED TO TRANSMIT A MINOR POWER ALARM WITH CUTOFF DURING AN A.C. COMMERCIAL POWER SERVICE FAILURE (FIG. 118)

When an associated alarm connects ground to the AC1 lead the PA relay operates and grounds lead PA5 to the alarm transfer circuit. When the alarms are supervised at the local office ground is returned over the AC3 lead to sound the power alarm cabinet minor audible signal. When the alarms are supervised at the alarm receiving center the alarm transfer circuit transmits a minor power alarm and withholds ground from the AC3 lead silencing the local alarm.

117. POWER ALARM CABINET AUXILIARY SIGNAL RELAY ARRANGED TO TRANSMIT A MINOR SWITCHING ALARM (FIG. 119)

When an associated alarm connects ground to the AC1 lead the MN relay operates grounding the MN5 lead to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the AC3 lead to operate the power alarm cabinet minor audible alarm. When the alarms are supervised at the alarm receiving center the alarm transfer ckt. transmits a minor power alarm and withholds ground from the AC3 lead silencing the local alarm.

118. MAIN ALARM BOARD OR FLOOR ALARM BOARD MINOR AUDIBLE SIGNAL CKT. (FIG. 120)

Operation of an associated alarm operates the AC1 relay which operates the minor audible alarm in the main or floor alarm board.

119. MAIN ALARM BOARD OR FLOOR ALARM BOARD AUXILIARY SIGNAL CIRCUIT ARRANGED TO TRANSMIT A MINOR SWITCHING ALARM (FIG. 121)

When an associated alarm connects ground to the AC1 lead the MN1 relay operates grounding the MN1 lead to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the alarm transfer circuit AC1 lead to operate the main or floor alarm board minor audible signal. When the alarms are supervised at the alarm receiving center the alarm transfer circuit transmits a minor switching alarm and withholds ground from the alarm transfer circuit AC1 lead silencing the local alarm.

120. MAIN ALARM BOARD OR FLOOR ALARM BOARD AUXILIARY SIGNAL RELAY ARRANGED TO TRANSMIT A MINOR POWER ALARM WITH NO CUTOFF DURING AN A.C. COMMERCIAL POWER FAILURE (FIG. 122)

When an associated alarm connects ground to the DCH lead the PN3 relay operates

grounding the RF lead to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the DB lead to operate the main or floor alarm board major audible signal. When the alarms are supervised at the alarm receiving center, the alarm transfer circuit transmits a minor power alarm and withholds ground from the DB lead silencing the local alarm.

121. MAIN ALARM BOARD OR FLOOR ALARM BOARD AUXILIARY SIGNAL RELAY ARRANGED TO TRANSMIT A MINOR POWER SIGNAL WITH CUTOFF DURING AN A.C. COMMERCIAL POWER FAILURE (FIG. 123)

When an associated alarm connects ground to the AC1 lead the PA1 relay operates and grounds the PA1 lead to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the alarm transfer circuit AC1 lead to operate the main or floor alarm board minor audible signal. When the alarms are supervised at the alarm receiving center, the alarm transfer circuit transmits a minor power signal and withholds ground from the alarm transfer circuit AC1 lead silencing the local alarm.

122. MAIN ALARM BOARD OR FLOOR ALARM BOARD AUXILIARY SIGNAL RELAY ARRANGED TO TRANSMIT A MINOR POWER ALARM WITH NO CUTOFF DURING AN A.C. COMMERCIAL POWER SERVICE FAILURE (FIG. 124)

When an associated alarm connects ground to the AC1 lead the PN1 relay operates and grounds lead PN1 to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the alarm transfer circuit AC1 lead to operate the main or floor alarm board minor audible signal. When the alarms are supervised at the alarm receiving center the alarm transfer circuit transmits a minor power alarm and withholds ground from the alarm transfer circuit AC1 lead silencing the local alarm.

123. MAIN ALARM BOARD OR FLOOR ALARM BOARD AUXILIARY SIGNAL RELAY ARRANGED TO TRANSMIT A MAJOR SWITCHING ALARM (FIG. 125)

When an associated alarm connects ground to the AC1 lead the MJ1 relay operates and grounds lead MJ4 to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the AC1 lead from the alarm transfer circuit to operate the main or floor alarm board minor audible signal. When the alarms are supervised at the alarm receiving center, the alarm transfer circuit transmits a major switching alarm and withholds ground from the alarm transfer circuit AC1 lead silencing the local alarm.

124. POWER ALARM CABINET MAJOR AUDIBLE SIGNAL CIRCUIT (FIG. 126)

When an associated alarm connects ground to the DCH lead the DCH relay operates and operates the power alarm cabinet major audible signal.

125. POWER ALARM CABINET MAJOR AUDIBLE SIGNAL CIRCUIT ARRANGED TO TRANSMIT A POWER FAILURE ALARM (FIG. 127)

When an associated alarm connects ground to the DCH lead the DCH relay operates and grounds lead PFB to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the alarm transfer circuit DCH lead to operate the power alarm cabinet major audible alarm. When the alarms are supervised at the alarm receiving center, the alarm transfer circuit transmits a power failure signal and withholds ground from the DCH lead silencing the local alarm.

126. POWER ALARM CABINET AUXILIARY MAJOR AUDIBLE SIGNAL RELAY (FIG. 128)

When an associated alarm connects ground to the DC1 lead the DC1 relay operates and connects ground to the DC lead to Fig. 126 to sound the power alarm cabinet major audible alarm.

127. POWER ALARM CABINET AUXILIARY SIGNAL RELAY ARRANGED TO TRANSMIT A POWER FAILURE ALARM (FIG. 129)

When an associated alarm connects ground to the DC1 lead the PF3 relay operates and connects ground to the DC lead to Fig. 127. From this point circuit operation proceeds as in paragraph 125.

128. POWER ALARM CABINET AUXILIARY SIGNAL RELAY ARRANGED TO TRANSMIT A MINOR POWER ALARM WITH CUTOFF DURING AN A.C. COMMERCIAL POWER SERVICE FAILURE (FIG. 130)

When an associated alarm connects ground to the DC1 lead the PA2 relay operates and grounds the PA4 lead to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the DCH lead to operate the power alarm cabinet major audible signal. When the alarms are supervised at the alarm receiving center, the alarm transfer circuit transmits a minor power alarm and withholds ground from the DCH lead, silencing the local alarm.

129. POWER ALARM CABINET AUXILIARY SIGNAL RELAY ARRANGED TO TRANSMIT A MAJOR SWITCHING ALARM (FIG. 131)

When an associated alarm connects ground to the DC1 lead the MJ2 relay operates and grounds the MJ8 lead to the alarm

transfer circuit. When the alarms are supervised locally, ground is returned over the DCH lead to operate the power alarm cabinet major audible signal. When the alarms are supervised at the alarm receiving center the alarm transfer circuit transmits a major switching alarm and withholds ground from the DCH lead silencing the local alarm.

130. MAIN ALARM BOARD OR FLOOR ALARM BOARD MAJOR AUDIBLE SIGNAL CIRCUIT (FIG. 132)

When an associated alarm connects ground to the DCH lead the DCH relay operates and operates the main alarm board or floor alarm board major audible signal.

131. MAIN ALARM BOARD OR FLOOR ALARM BOARD MAJOR AUDIBLE SIGNAL CIRCUIT ARRANGED TO TRANSMIT A MAJOR SWITCHING ALARM (FIG. 133)

When an associated alarm connects ground to the DCH lead the MJ relay operates and connects ground to the MJ3 lead to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the DB lead to operate the main alarm board or floor alarm board major audible signal. When the alarms are supervised at the alarm receiving center the alarm transfer circuit transmits a major switching signal and withholds ground from the DCH lead silencing the local alarm.

132. MAIN ALARM BOARD OR FLOOR ALARM BOARD AUXILIARY SIGNAL RELAY ARRANGED TO TRANSMIT A POWER FAILURE ALARM (FIG. 134)

When an associated alarm connects ground to the DCH lead the PF4 relay operates and connects ground to the PF1 lead to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the DB lead to operate the main alarm board or floor alarm board major audible signal. When the alarms are supervised at the alarm receiving center, the alarm transfer circuit transmits a power failure signal and withholds ground from the DB lead silencing the local alarm.

133. ALARM FOR ANNOUNCEMENT SYSTEM NO. 3A, 4A or 6A REPEATING CIRCUIT (FIG. 135)

When a failure occurs in the announcement desk circuit as described in paragraphs 57, 58 and 150, ground is connected to the DCH lead to operate the AMJ relay which in turn grounds the AMJ lead to the alarm transfer circuit, When the alarms are supervised locally, ground is returned over the DB lead to operate the main alarm board or floor alarm board major audible signal. When the alarms are supervised as the alarm receiving center the alarm transfer circuit transmits an announcement system major alarm and withholds ground from the DB lead silencing the local alarm.

134. MAIN ALARM BOARD OR TROUBLE DESK MAJOR AUDIBLE SIGNAL CIRCUIT (FIG. 136)

When an associated alarm connects ground to the DCP lead the DCP relay operates and connects ground to the CO1 lead to the alarm transfer circuit. When the alarms are supervised locally ground is returned over the DCP lead from the alarm transfer circuit to operate the main alarm board or trouble desk major audible signal. When the alarms are supervised at the alarm receiving center, the alarm transfer circuit functions to open the CO1 lead thus preventing transmission of an alarm and also silencing the local alarm.

135. MAIN ALARM BOARD OR TROUBLE DESK MAJOR AUDIBLE SIGNAL CIRCUIT ARRANGED TO TRANSMIT A MAJOR SWITCHING ALARM (FIG. 137)

When an associated alarm connects ground to the DCP lead the MJ3 relay operates and connects ground to the MJ7 lead to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the alarm transfer circuit DCP lead to operate the main alarm board or floor alarm board major audible signal. When the alarms are supervised at the alarm receiving center, the alarm transfer circuit transmits a major switching signal and withholds ground from the DCP lead silencing the local alarm.

136. MAIN ALARM BOARD OR TROUBLE DESK MAJOR AUDIBLE SIGNAL RELAY (FIG. 138)

When an associated alarm connects ground to the DC2 lead, the DC2 relay operates and connects ground to the DA lead Fig. 136. From this point operation proceeds as described in paragraph 134.

137. MAIN ALARM BOARD OR TROUBLE DESK MINOR AUDIBLE SIGNAL CIRCUIT (FIG. 139)

When an associated alarm connects ground to the AC2 lead the AC2 relay operates and connects ground to the CO2 lead to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the alarm transfer circuit AC2 lead to lead RK or S to operate the trouble desk or main alarm board minor audible signal. When the alarms are supervised at the alarm receiving center, the alarm transfer circuit functions to open the AC2 lead and thereby prevents transmission of a signal and also silences the local alarm.

138. MAIN ALARM BOARD OR TROUBLE DESK AUXILIARY RELAY ARRANGED TO TRANSMIT A MINOR SWITCHING ALARM (FIG. 140)

When an associated alarm connects ground to the AC2 lead to the MN2 relay operates and connects ground to the MN2 lead to the alarm transfer circuit. When the alarms are supervised locally, ground is

returned over the alarm transfer circuit AC2 lead to operate the main alarm board or trouble desk minor audible signal. When the alarm are supervised at the alarm receiving center the alarm transfer circuit transmits a minor switching alarm and withholds ground from the AC2 lead silencing the local alarm.

139. MACHINE RINGING SUPPLY FOR MINOR AUDIBLE SIGNAL (FIG. 141)

When the alarms are supervised locally machine ringing current is sent over the C010 lead to the alarm transfer circuit and returned over lead C09 to those alarms connected to this source of supply. When the alarms are supervised at the alarm receiving center the alarm transfer circuit functions to open the C09 and C10 silencing the local alarm.

140. CONTINUOUS RINGING SUPPLY FOR MINOR AUDIBLE SIGNAL (FIG. 142)

In this figure circuit action is identical with the above paragraph except that leads C015 and C016 are used.

141. AC AUXILIARY RELAYS FOR ALARMS NOT EQUIPPED WITH AISLE PILOTS (FIGS. 143, 158, 159 AND 160)

When an alarm circuit grounds one of the NB leads the associated relay will operate lighting the floor alarm board pilot lamp. The NB relay connects ground to the AG lead to Fig. 121. From this point the circuit operation proceeds as in paragraph 119 after the grounding of the MN1 lead to the alarm transfer circuit. When one of the numbered NB- relays operates it connects ground to its associated alarm transfer circuit lead. When the alarms are supervised locally, the alarm transfer circuit returns ground over the AC1 lead to operate the floor alarm board minor signal. When the alarms are supervised at the alarm receiving center, the alarm transfer circuit transmits the desired signal and withholds ground from the AC1 lead silencing the local alarm.

142. DC AUXILIARY RELAYS FOR ALARMS NOT EQUIPPED WITH AISLE PILOTS (FIGS. 144, 162, 163 AND 164)

When an alarm circuit grounds one of the AD leads the associated relay will operate lighting the floor alarm board pilot lamp. The AD relay connects ground to the DG lead to Fig. 133. From this point the circuit operation proceeds as in paragraph 131 after the grounding of the MJ3 lead to the alarm transfer circuit. When one of the numbered AD- relays operates it connects ground to its associated alarm transfer circuit lead. When the alarms are supervised locally, the alarm transfer circuit returns ground over the DB lead to operate the floor alarm board major signal. When the alarms are supervised at the alarm receiving center the alarm transfer circuit transmits the desired signal and withholds ground from the DB lead silencing the local alarm.

143. MAIN ALARM BOARD OR TROUBLE DESK AUXILIARY RELAY ARRANGED TO TRANSMIT A MAJOR SWITCHING SIGNAL (FIG. 145)

When an associated alarm connects ground to the AC2 lead the MJ5 relay operates grounding the MJ6 lead to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the alarm transfer circuit AC2 lead to operate the main alarm board or trouble desk minor audible signal. When the alarms are supervised at the alarm receiving center, the alarm transfer circuit transmits a major switching signal and withholds ground from the AC2 lead silencing the local alarm.

144. MAIN ALARM BOARD OR TROUBLE DESK AUXILIARY RELAY ARRANGED TO TRANSMIT A MAJOR SWITCHING ALARM (FIG. 146)

When an associated alarm connects ground to the DC2 lead the MJ4 relay operates grounding the MJ5 lead to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the alarm transfer circuit DCP lead to operate the main alarm board or trouble desk major audible signal. When the alarms are supervised at the alarm receiving center, the alarm transfer circuit transmits a major switching signal and withholds ground from the DCP lead silencing the local alarm.

145. MAIN ALARM BOARD OR FLOOR ALARM BOARD AUXILIARY SIGNAL RELAY ARRANGED TO TRANSMIT A MINOR POWER ALARM WITH CUTOFF DURING AN AC COMMERCIAL POWER SERVICE FAILURE (FIG. 147)

When an associated alarm connects ground to the DCH lead to PA5 relay operates grounding the PA2 lead to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the DB lead to operate the main or floor alarm board audible major signal. When the alarms are supervised at the alarm receiving center, the alarm transfer circuit transmits a minor power alarm and withholds ground from the DB lead silencing the local alarm.

146. POWER SYSTEMS ALARMS FOR POWER CIRCUITS REQUIRING A MINOR ALARM WITH NO CUTOFF DURING AC COMMERCIAL POWER SERVICE FAILURE WHEN OFFICE ALARMS ARE TRANSFERRED (FIG. 148)

POWER SYSTEMS ALARMS FOR POWER CIRCUITS REQUIRING A MINOR POWER ALARM WITH CUTOFF DURING AC COMMERCIAL POWER FAILURE WHEN OFFICE ALARMS ARE TRANSFERRED (FIG. 149)

These figures are connected to the power systems alarms as required. The AC1

or NB leads are connected as shown and the consequent circuit operation proceeds as described in preceding paragraphs.

147. A.C. POWER SERVICE FAILURE TRANSFORMER CIRCUIT (FIGS. 150 AND 151)

MINOR POWER ALARMS AND AC SERVICE FAILURE ALARM CIRCUIT (FIG. 152)

MAJOR SIGNAL AUXILIARY RELAY ARRANGED TO TRANSMIT AN AC POWER FAILURE (FIG. 153)

When an AC commercial power failure occurs the current feeding rectifiers RF1 and RF2 is removed allowing SF relay to release. The SF relay in releasing connects ground to the DCH lead to Fig. 126 or Fig. 153 and the DCP lead to Fig. 136 (BA option) thru the alarm lamps. When transfer of alarms is not used or when transfer is used and the alarms are supervised locally the major alarm signals in the power alarm cabinet or main alarm board or trouble desk are operated. Upon receiving the AC service failure alarm the operation of the ACF key will silence the alarms and light the AC service failure guard lamp. When the AC power is restored the SF relay will reoperate thru the ACF key contacts and lock thru its own contacts again sounding the alarms as an indication that service has been restored. When the ACF key is restored to normal the alarms will be silenced and the guard lamp extinguished.

When the alarms are supervised at the alarm receiving center the release of the SF relay will operate the SF1 relay which in turn will transmit a power service failure alarm to the alarm receiving center. The operation of the alarm release key at the alarm receiving center will cause the alarm transfer circuit to function and close a path from the SF5 to the SF6 leads (Fig.152).

This closure provides a path to reoperate the SF relay if the AC power has been restored. The SF relay in operating releases relay SF1 which removes ground from the alarm transfer circuit SF3 lead retiring the AC power service failure signal.

148. ALARM TRANSFER GROUND GUARD CIRCUIT (FIG. 154)

If the alarm transfer circuit is normal and any alarm release, major alarm or power alarm relay falsely operates ground over the DL and DL1 leads will operate the main alarm board, floor alarm board or trouble desk major signal as an indication that such a failure has occurred.

149. LINE CONCENTRATOR IDENTIFIER FUSE AND TIME ALARMS (FIG. 155)

When a time alarm occurs in the line concentrator identifier circuit, leads "DG" and "W" are grounded, lead "DG" lights the (CI) lamp on the floor alarm board and operates the major audible alarm. When BA option is furnished, ground on lead "W" lights the (CI) lamp on the trouble desk and operates the major audible alarm. When a fuse alarm occurs in the line concentrator identifier circuit, leads "BA" and "BB" are grounded, lead "BA" lights the (CF) lamp on the floor alarm board and operates the minor audible alarm. When BA option is furnished, ground on lead "BB" lights the (CF) lamp on the trouble desk and operates the minor audible alarm.

150. ALARM FOR ANNOUNCEMENT SYSTEM NOS. 3A, 4A OR 6A OR EMERGENCY OR ANNOUNCEMENT LINE (FIG. 156)

Failure of either announcement channel causes operation of a relay in the control circuit which lights the RA lamp and the AF lamp and operates the a-c auxiliary signal at the floor alarm board when BC wiring is used. When BA wiring is used the AFL relay operates and lights the AFL lamps and operates the a-c auxiliary signals at both floor alarm board and trouble desk.

Failure of both announcement channels, or failure of the load announcement machine during recording lights the DFL lamp and causes the operation of the d-c auxiliary signal at the floor alarm board when BC wiring is used. When BA wiring is used, the DFL relay operates and lights the DFL lamp and operates the d-c auxiliary signals at both floor alarm board and trouble desk. When the release key in the control circuit is operated to silence the auxiliary signal, lamp P is lighted.

151. ANNOUNCEMENT SYSTEM MINOR ALARM CIRCUIT (FIG. 157)

When a failure occurs in the announcement system as described in paragraph 150, ground is connected to the AC1 lead to operate the AMN relay, which in turn grounds the AMN lead to the alarm transfer circuit. When the alarms are supervised locally, ground is returned over the AC1 lead to operate the floor alarm board minor signal. When the alarms are supervised at the alarm receiving center, the alarm transfer circuit transmits an announcement system minor alarm and withholds ground from the AC1 lead silencing the local alarm.

152. INCOMING CALL SIGNAL LAMP FOR KEY CABINET NO. 20 OR 21 (FIG. 161)

An incoming call through the key cabinet connects ground to leads "KC" and "AG", lighting the (SC) lamp and operating the minor audible alarm.

153. E2 AND E3 TELEPHONE REPEATER ALARMS OR TOLL AND TELEGRAPH MISC. ALARMS (FIG. 165)

When the fuse alarm relay in the E2 and E3 telephone repeater circuit or the

toll or telegraph circuit operates, leads "F" and "R" are grounded. Ground on lead "F" lights the (TR) lamp on the floor alarm board and operates the minor audible alarm. When option BA is furnished, ground on lead "R" lights the TR lamp on the trouble desk and operates the minor audible alarm.

154. OPERATING ROOM DESK NO. 23 INCOMING TRUNK SWITCH CIRCUIT TIME ALARM (FIG. 166)

When the incoming trunk switch circuit times out, it connects ground to leads TA and DR lighting lamps TA at the floor alarm board and trouble desk and operating the major audible alarm signal.

155. AUXILIARY SENDER STUCK SENDER ALARM (FIG. 167)

When the auxiliary sender encounters a stuck sender condition, ground is connected to leads "F" and "W". Ground on lead "F" lights the (AS) lamp on the floor alarm board and operates the minor audible alarm. When option BA is furnished, ground on lead "W" lights the (AS) lamp on the trouble desk and operates the minor audible alarm.

156. ALARM SENDING CIRCUIT NO VOLTAGE ALARM (FIG. 168)

When the -48V or +130V fuse at the alarm sending circuit operates, leads "R", "AS", and "MR" are grounded. Ground on lead "R" lights the (NV) lamp on the floor alarm board. Ground on lead "AS" operates the major audible alarm on the floor alarm board. This alarm will operate even when alarms are transferred to an alarm receiving center since operation of the +130V or -48V fuse causes a false transfer.

When option BA is furnished, ground on lead "MR" operates relay (NV) which lights the (NV) lamp on the trouble desk and operates the major alarm.

157. AUXILIARY SENDER LINK ALARM (FIG. 169)

When the Auxiliary Sender Link timeout leads "F" and "W" are grounded. Ground on lead "F" lights the (LR) lamp at the floor alarm board and operates the minor audible alarm. When option BA is furnished, ground on lead "W" lights the (LR) lamp at the trouble desk and operates the minor audible alarm.

180. INTERTOLL TRUNK CONCENTRATING EQUIPMENT TROUBLE INDICATOR ALARMS (FIG. 170 & 171) ITEMS 101 and 201

When the trouble indicator is seized, leads "AG" and "AG1" are grounded. Ground on lead "AG" lights lamp (TIS) at the floor alarm board and operates the minor audible alarm. When option BA is furnished ground on lead "AG1" lights lamp (TIS) at the trouble desk and operates the minor audible alarm.

When a reseizure of the trouble indicator is attempted, ground is transferred from leads "AG" &"AG1" to leads "DG" and "DG1". Ground on lead "DG" lights lamp (TIR) at the floor alarm board and operates the major audible alarm. When option BA is furnished, ground on lead "DG1" lights lamp (TIR) at the trouble desk and operates the major audible alarm.

181. INTERTOLL TRUNK CONCENTRATING EQUIPMENT CONTROLLER TIMEOUT ALARM (FIG. 171) ITEM 102

When the intertoll trunk concentrating equipment controller circuit times out, leads "DG" and "DG1" are grounded. Ground on lead "DG" lights lamp (CT) at the floor alarm board and operates the major audible alarm. With option BA, ground on lead "DG1" lights lamp (CT) at the trouble desk and operates the major audible alarm.

182. STUCK TROUBLE TRACING SELECTOR ALARM (FIG. 170) ITEM 202

When a trouble tracing selector fails to release, leads "AG" and "AG1" are grounded. Ground on lead "AG" lights lamp (STT) at the floor alarm board and operates the minor audible alarm. With option BA, ground on lead "AG1" lights lamp (STT) at the trouble desk and operates the minor audible alarm.

183. SERVICE ALARMS (FIG. 172) ITEM 203

When alarms are supervised locally and a service alarm is received, leads "SV" and "SV1" are grounded. Ground on lead "SV" lights lamp (SV) at the floor alarm board and operates the minor audible alarm. With option BA, ground on lead "SV1" lights lamp (SV) at the trouble desk and operates the minor audible alarm.

When alarms are supervised at the alarm receiving center, the "COSV" lead is opened by the alarm transfer circuit to prevent transmission of a minor alarm to the alarm receiving center.