

AUG 29 1942

PANEL SYSTEM
POWER ALARM CIRCUIT
DIRECT CURRENT AND MISCELLANEOUS

CHANGES

B. CHANGES IN APPARATUS

B.1 Added

4-2Y Lamps - Fig. 12
4-E543 Relays - Fig. 12
1-E563 Relay - Fig. 12

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Fig. 12 is added.

All other headings under "Changes", no change.

1. PURPOSE OF CIRCUIT

1.1 To provide alarms for direct current and miscellaneous power.

2. WORKING LIMITS

2.1 None.

3. FUNCTIONS

3.1 To provide alarms for trouble conditions in the equipment furnishing direct current power and in miscellaneous power room equipment.

4. CONNECTING CIRCUITS

4.1 Power circuits and power alarm circuits.

4.2 Power alarm cabinet miscellaneous and auxiliary alarm circuit.

4.3 Audible alarm circuit for power alarm cabinet.

4.4 Power alarm circuit for ringing, coin control, tone and associated lead.

DESCRIPTION OF OPERATION

5. MAJOR DISCHARGE FUSE ALARM (FIG. 1)

Operation of a major discharge fuse operates relay (D) which lights lamp (DISCHG FUSE) and operates the power alarm cabinet DC auxiliary signal.

6. CHARGE AND MINOR DISCHARGE FUSE ALARM (FIG. 2)

Operation of a charge or minor discharge fuse operates relay (C) which lights lamp (CHARGE & MINOR DISCHG FUSE) and operates the power alarm cabinet AC auxiliary signal.

7. CIRCUIT BREAKER ALARM (FIG. 3)

When a circuit breaker opens, relay (CB) operates, lighting lamp (CIRCUIT BREAKER) and operating the power alarm cabinet AC auxiliary signal.

8. TUNGAR RECTIFIER ALARM (FIG. 4) (A & M ONLY)

When a tungar rectifier fails to function properly, relay (R) operates, lighting lamp (RECTIFIER) and operating the power alarm cabinet AC auxiliary signal.

9. HIGH-LOW BATTERY ALARM (FIG. 5)

When the potential across the winding of the voltmeter relay is above the maximum or below the minimum permissible value, relay (HL) operates, after which, the first closure of the F contact of the interrupter operates relay (VT), which locks under control of relay (HL) and closes the circuit to operate relay (VA) when the B contact of the interrupter closes. Operation of relay (VA) lights lamp (HIGH-LOW VOLTAGE) and operates the power alarm cabinet DC auxiliary signal.

10. FLOATING BATTERY ALARM (FIG. 6)

When the potential across the winding of the 48 volt voltmeter relay is above the maximum or below the minimum, relay (FH) is operated. When the potential across the winding of the 24 volt voltmeter relay is above the maximum or below the minimum, relay (FL) is operated. Operation of either relay operates relay (V), after which the first closure of the F contact of the interrupter operates relay (FT), which locks under control of the operated relay and closes the circuit to operate relay (FA) when the B contact of the interrupter closes. Operation of relay (FA) lights lamp (FLOATING VOLTAGE) and operates the power alarm cabinet AC auxiliary signal. Momentary operation of key (FLOAT VOLTAGE) operates relay (FV), releasing relay (FA), to disconnect the alarms, locking under control of relay

(V), and lighting lamp (FLOATING VOLTAGE GUARD). When the battery reaches a voltage within the required limits, the voltmeter relay contacts open, releasing the operated relays.

11. CONSTANT VOLTAGE CHARGING ALARM CIRCUIT (FIG. 7) (A & M ONLY)

When the potential across the winding of the voltmeter relay is above the maximum or below the minimum permissible value, relay (CV) is operated, operating relay (CV1), which operates relay (CV3). Operation of relay (CV3) lights lamp (CONSTANT VOLTAGE CHARGE) and operates the power alarm cabinet AC auxiliary signal. Momentary operation of key (CV) operates relay (CV2), releasing relay (CV3), to disconnect the alarms, locking under control of relay (CV1) and lighting lamp (CONSTANT VOLT GUARD). When the voltage is again within the required limits, the voltmeter relay contacts open, releasing the operated relays.

12. ALARM SYSTEM BATTERY FUSE ALARM (FIG. 8)

Operation of the fuse supplying battery to the alarm system operates relay (AFA) which lights lamp (ALARM SYS BAT FUSE) and operates the power alarm cabinet AC auxiliary signal or the alarm battery supply audible signal.

13. AC SERVICE FAILURE ALARM (FIG. 9)

When the AC power service voltage varies beyond predetermined limits, the master switch opens, removing the short circuit from relay (SA) which operates, operating relay (MF), which operates relay (MS). Operation of relay (MS) lights lamp (MASTER SWITCH) and operates the power alarm cabinet DC auxiliary signal. Operation of key (MASTER SW GD) lights lamp (MASTER SWITCH GD) and releases relay (MS), which disconnects the alarms. When the AC power service is restored, the master switch is closed, releasing relay (SA), which releases relay (MF), which operates relay (MS) thru the operated guard key. Operation of relay (MS) brings in the alarms to indicate that the (MASTER SW GD) key should be released to restore the circuit to normal.

14. CIRCUIT BREAKER PILOT LAMP (FIG. 10)

Operation of relay (CB), Fig. 3, lights lamp (CIRCUITS BREAKER) to indicate that a circuit breaker has operated.

15. 135 VOLT AND 170 VOLT POSITIVE POTENTIAL ALARM (FIG. 11)

If the positive 135 volt potential or the positive 170 volt potential rises above or falls below specified limits the (B1) relay of the DC power alarm circuit operates and connects ground to leads "DG" and "D" which cause the audible alarm to sound and the pilot lamp to light indicating a

trouble condition in the 135 volt and 170 volt power plant. A similar indication is given if a battery distributing fuse in the 135 volt and 170 volt power plant operates causing relay (FA) to operate.

16. 135 CYCLE SUPPLY ALARM (FIG. 12)

When the 135 cycle supply leads are transferred to the reserve generator, the (L) or (M) relay operates, operating relay (RT) which operates relay (HT) to light lamp (135 CYCLE TRANSFER) and close the circuit to operate the minor alarm signal. If, under this condition, the reserve generator fails, the (L) and (M) relays are both operated, releasing relay (HT) and operating relay (HS), which lights the (135 cycle failure) lamp and closes the circuit to operate the audible signal. The AC auxiliary signal may be silenced by momentarily operating the (ACO) key, operating relay (TG) which locks, releases relay (HT) to silence the alarms and lights (135 cycle guard) lamp. The release of the (L) or (M) relay then releases relay (RT) which releases relay (TG), extinguishing the (135 cycle guard) lamp. Operation of the fuse supplying 135 cycle current causes the operation of the (NF) relay which lights the (135 cycle fuse) lamp and closes the circuit to operate the audible signal. Removal of the operated alarm type fuse disconnects the alarms.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3340

HDC) IK
FJS)