

This Appendix was prepared from Issue 18 of Drawing ES-226379.

METHOD OF OPERATION

Panel System - Line Finder Time Alarm Circuit - Panel Line Finder -
Battery Grounded at one End

3.2 At end of paragraph change (Fig. B) to read (Fig. B or C).

Add paragraph 6.1 which reads:-

6.1 Time Alarm with Trip Circuit Release (Fig. C)

The circuit operation of this figure is similar to that described for Figure "B" in that after relays (A) and (B) operate relay (KR) operates and performs its function as above described. When the interrupter contacts open, relay (KR) releases in turn releasing the stepper magnet and causing advance to terminal 2. Advance to terminal 3 takes place from ground closure thru arc (R). In case the line has not been found when the interrupter contacts again close, after approximately 7 seconds, the stepper magnet is again energized from the interrupter ground through relay (A) contacts and brush and terminal 3 of the (STP) arc. The next opening of the interrupter contacts will release the stepper magnet, causing the switch to advance to terminal 4. Ground through the (R) arc then advances the stepper to terminal 5, where the trip circuit lamp is lighted and an alarm is brought in as explained in paragraph 5.

Change paragraph 7 to read:-

7. RESTORING TO NORMAL

Should the circuit over lead B be opened before the fifth terminal is reached by the selector, the A and B frame relays release. The (B) relay released, causes the selector to advance to the next normal position, awaiting closure of lead B, as previously described. In case the line has not been found by the time the switch advances to the 5th terminal, the operation of the (NL) key with the (B) relay operated steps the selector brushes to the next normal position by way of the (STP) bridging brush (Fig. A), or the (R) bridging brush (Figs. "B" or "C"), and 5th, 10th, 15 or 20th terminal as the case may be. If the selector has been at normal position 6, 11 or 16, when the (BA) relay operated, the operation would have been the same as described for position 1.

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January 11, 1938
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Add paragraph 6.1 which reads:-

6.1 Time Alarm with Trip Circuit Release (Fig. C)

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Change paragraph 7 to read:-

7. RESTORING TO NORMAL

Should the circuit over lead B be opened before the fifth terminal is reached by the selector, the A and B frame relays release. The (B) relay released, causes the selector to advance to the next normal position, awaiting closure of lead B, as previously described. In case the line has not been found by the time the switch advances to the 5th terminal, the operation of the (ML) key with the (B) relay operated steps the selector brushes to the next normal position by way of the (STP) bridging brush (Fig. A), or the (R) bridging brush (Fig. "B" or "C"), and 5th, 10th, 15 or 20th terminal as the case may be. If the selector has been at normal position 5, 11 or 15, when the (HA) relay operated, the operation would have been the same as described for position 1.

This Method of Operation was prepared from Issue 17 of Drawing ES-226379

METHOD OF OPERATION

Panel System - Line Finder Time Alarm Circuit - Panel Line Finder - Battery Grounded at one End.

DEVELOPMENT

1. PURPOSE OF CIRCUIT

- 1.1 This circuit is used to provide a timing feature on signals to the attendant, when an originating call is not connected to a line finder in a specified time period.

2. WORKING LIMITS

- 2.1 None

OPERATION

3. FUNCTIONS

The principal functions of this circuit are:

- 3.1 To provide a time interval of 35 seconds before a signal is given on calls where a line finder fails to find the calling line. (Fig. A)
- 3.2 To release the trip circuit and allow a second line finder to start after a time interval of 7 to 14 seconds has elapsed, and to give a signal in case the line is not found after 14 to 21 seconds. (Fig.B)
- 3.3 To return to normal.
- 3.4 To advance to the next normal terminal when the key is operated.

4. CONNECTING CIRCUITS

This circuit will function with:

- 4.1 Miscellaneous alarm circuit
- 4.2 Any sender selector type trip circuit.

DETAILED DESCRIPTION

5. LINE FINDER TIME ALARM WITHOUT TRIP CIRCUIT RELEASE (FIG. A)

When Fig. A is used and a line finder does not find the subscriber's line within 28 to 35 seconds after the receiver at the calling station is removed from the switchhook, an alarm is given in the following manner: When the receiver at the calling station is removed from the switchhook, various relays in the line and trip circuits operate and connect battery to lead B, winding of the (B) (frame) relay, brush and terminal 1 of the (ST) arc of the time alarm selector, break contact of the (A) (frame) relay, to the interrupter contact. When the interrupter contact closes, the (B) relay operates. The (A) (frame) relay does not operate, however, on account of its winding being short circuited by ground on the interrupter. When the interrupter contact opens the short circuit is removed from the winding of the (A) relay, which now operates in series with the winding and make contact of the (B) relay, to ground on the armature of the (B) relay, thus holding both relays operated. The next operation of the interrupter operates the STP magnet, over a circuit from ground on the make contact of the interrupter, make contact of the (A) relay, terminal 1 and brush of the (STP) arc of the selector, to battery through the winding of the STP magnet. When the interrupter contact opens, the STP magnet releases and steps its brushes one step on its back stroke. The selector brushes advance one step for each make and break of the interrupter contact, which is of an interval of 7 seconds, until the fifth terminal of the selector is reached when the circuit through the interrupter is opened. When the fifth terminal of the selector is reached, the (BA) lamp in the trip circuit lights from battery on the armature of the A (frame) relay, terminal 5 and brush of the (L) arc of the selector, lead A, through the make contact of the (BA) relay, (BA) lamp, lead C, to ground through the winding of the (B) (aisle) relay in the time alarm circuit which operates. The (B) relay operated, operates the (A) (aisle) relay. The (A) relay operated, ("Z" wiring) lights lamps on the floor alarm boards or trouble desk and operates the "AC" ringer. When "W" wiring is used, and aisle pilot is lighted and a lamp at the power alarm cabinet or floor alarm board is also lighted bringing in the "AC" ringer as heretofore. When the source of trouble is removed and the (BA) relay, in the trip circuit has released, the circuit over leads A and B are opened, in turn releasing both the frame and aisle (A) and (B) relays, extinguishing the lamps and silencing the alarm. The release of the (B) (frame) relay also closes a circuit from ground on its armature, through terminal 5 and the bridging brush of the (R) arc of the selector to battery through the break contact and winding of the STP magnet, which operates and steps the selector brushes to terminal 6, in which position it awaits the next closure of lead B.

6. LINE FINDER TIME ALARM WITH TRIP CIRCUIT RELEASE (FIG. B)

When Fig. B is used, the operation of this circuit is the same as when Fig. A is used, with the following exceptions: After frame relays (A) and (B) are locked up, the next closure of the interrupter operates relay (KR) over a circuit from ground on the make contact of the interrupter, make contact of the (A) relay, brush and terminal of the (STP) arc, to battery thru the (KR) relay winding. The operation of the (KR) relay removes ground from the "D" lead to trip circuit thereby releasing the trip circuit and permitting another line finder to start and hunt for the calling line. The (KR) relay also operates a register to indicate the number of times the trip circuit is held for 7 to 14 seconds, and energizes the stepper magnet. When the interrupter opens, relay (KR) releases, restoring ground to the "D" lead and releasing the stepper magnet, thereby allowing the stepper to advance to terminal 2. When the interrupter contact again closes, after an additional period of 7 seconds, in case the line has not been found, the stepper magnet is again energized from the interrupter ground thru the (A) relay contacts and brush and terminal 2 of the (STP) arc. The opening of the interrupter contact again releases the stepper magnet, causing the stepper to advance to terminal 3. Ground on the (R) arc then advances the stepper to position 5, where the trip circuit lamp is lighted and an alarm is brought in as covered in paragraph 5.

7. RESTORING TO NORMAL

Should the circuit over lead B be opened before the fifth terminal is reached by the selector, the A and B frame relays release. The (B) relay released, causes the selector to advance to the next normal position, awaiting closure of lead B, as previously described. The operation of the (NL) key steps the selector brushes to the next normal position by way of the (STP) bridging brush (Fig. A), or the (R) bridging brush (Fig. B), and 5th, 10th, 15th or 20th terminal as the case may be. If the selector has been at normal position 6, 11 or 16, when the (BA) relay operated, the operation would have been the same as described for position 1.

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March 22, 1933.
ED.

6. LINE FINDER TIME ALARM WITH TRIP CIRCUIT RELEASE (FIG. 5)

When Fig. 5 is used, the operation of this circuit is the same as when Fig. 4 is used, with the following exceptions: After frame relays (A) and (B) are locked up, the next closure of the interrupter operates relay (KR) over a circuit from ground on the make contact of the interrupter, make contact of the (A) relay, brush and terminal of the (STP) arc, to battery thru the (KR) relay winding. The operation of the (KR) relay removes ground from the "D" lead to trip circuit thereby releasing the trip circuit and permitting another line finder to start and hunt for the calling line. The (KR) relay also operates a register to indicate the number of times the trip circuit is held for 7 to 14 seconds, and energizes the stepper magnet. When the interrupter opens, relay (KR) releases, restoring ground to the "D" lead and releasing the stepper magnet, thereby allowing the stepper to advance to terminal 5. When the interrupter contact again closes, after an additional period of 7 seconds, in case the line has not been found, the stepper magnet is again energized from the interrupter ground thru the (A) relay contacts and brush and terminal 5 of the (STP) arc. The opening of the interrupter contact again releases the stepper magnet, causing the stepper to advance to terminal 5. Ground on the (R) arc then advances the stepper to position 5, where the trip circuit lamp is lighted and an alarm is brought in as covered in paragraph 5.

7. RESTORING TO NORMAL

Should the circuit over lead B be opened before the fifth terminal is reached by the selector, the A and B frame relays release. The (R) relay released, causes the selector to advance to the next normal position, awaiting closure of lead B, as previously described. The operation of the (KR) key steps the selector brushes to the next normal position by way of the (STP) bridge brush (Fig. 4) or the (R) bridging brush (Fig. 5), and 5th, 10th, 15th or 20th terminal as the case may be. If the selector has been at normal position 6, 11 or 16, when the (BA) relay operated, the operation would have been the same as described for position 1.

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