

## STATIONS

### NO. 7-J AND NO. 7-K COIN COLLECTOR MAINTENANCE

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# STATIONS

## NO. 7-J AND NO. 7-K COIN COLLECTOR MAINTENANCE

### GENERAL

1. **Scope.** These specifications cover the maintenance of the #7-J and #7-K Coin Collectors at stations.

### TOOLS AND GAUGES

2. **The following tools and gauges** are needed for the cleaning and adjustment of the #7-J and #7-K Coin Collectors.

- #7 Sash Tool: Brush for cleaning coin chute.
- #37 Gauge: For gauging separation between ground spring contacts.
- #44 Gauge: For gauging stroke of operating arm.
- #63 Tool: For setting up armature pivot screw locknut.
- #72 Tool: For adjusting pivot screw of contact actuating lever. Also locknut on stud bolt which limits motion of contact actuating lever.
- #129 Tool: For setting up contact actuating lever pivot screw locknut.
- #139 Tool: For leveling coins in coin receptacle.
- #143 Tool: For adjusting stops and arms.
- #265 Tool: For cleaning contacts.

### REPAIR PARTS

3. **The repair parts** required for maintaining #7-J and #7-K Coin Collectors are given below in alphabetical order:

- Coil for Coin Relay.
- Coin Chute Cover.
- Coin Chute Cover Mounting Screws.
- Coin Relay for #7-J and #7-K Coin Collector.
- Coin Relay Mounting Screws.
- Contact Actuating Lever.
- Ground Contact Spring Assembly.
- Ground Contact Spring Assembly Mounting Screws.
- Housing for #7-J Coin Collector.

**Housing for #7-K Coin Collector.**

**Instruction Card.**

**Instruction Card Frame.**

**Instruction Card Frame Glass.**

**Instruction Card Frame Screws.**

**Locknut.**

For contact actuating lever pivot screw.

**Locknut.**

Used with stud bolt for adjusting contact actuating lever.

**Pivot Screw.**

For contact actuating lever.

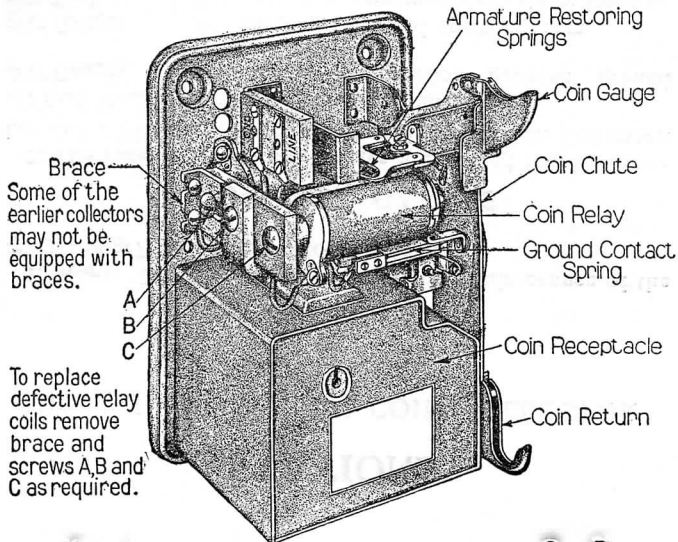
**Stud Bolt.**

For limiting movement of contact actuating lever.

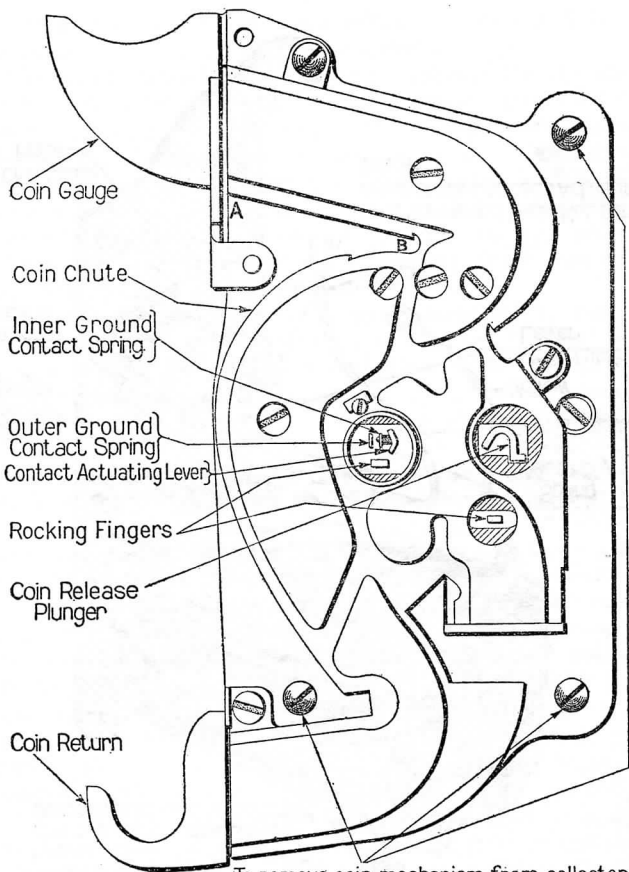
## DESCRIPTION OF COIN COLLECTOR

4. The #7 type coin collector is a prepayment collector for nickels only and the illustration shown below is of the #7-J Coin Collector. The #7-K Collector is the same as the #7-J except that it has a larger cash compartment.

### NO. 7-J COIN COLLECTOR WITH COVER REMOVED

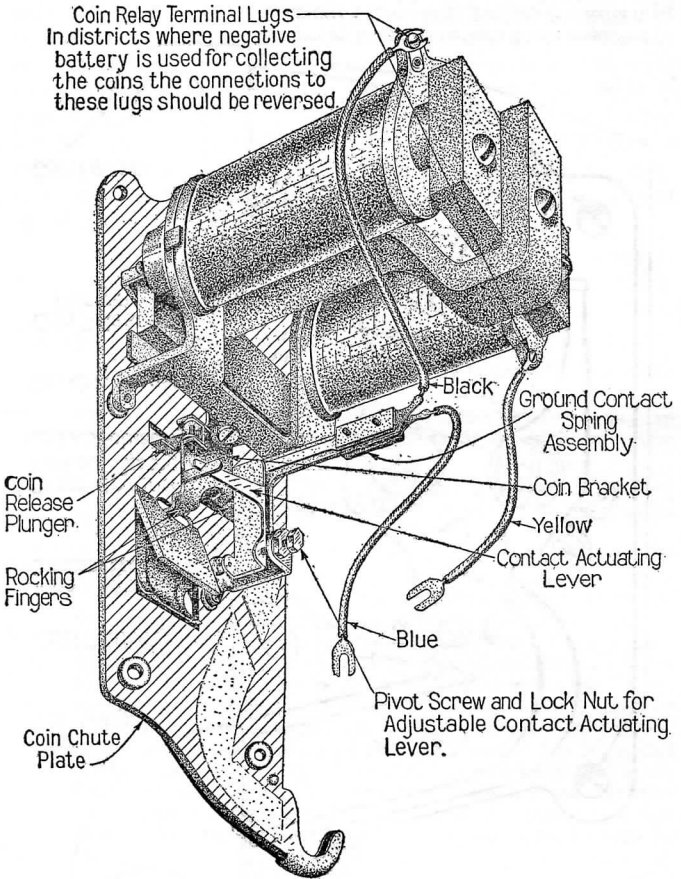


# VIEW SHOWING SIDE OF COIN MECHANISM



To remove coin mechanism from collector take out these three screws and loosen screw A, page 4, holding relay to brace.

# REAR VIEW OF COIN MECHANISM REMOVED FROM COLLECTOR



## OPERATION

5. The operation of the coin collector is described below as an aid in making repairs to the collector.

The coin is carried from the coin slot through the coin chute to the coin release plunger and the contact actuating lever where it is stopped. The weight of the coin resting against the contact actuating lever causes this lever to operate the inner ground contact spring which then makes contact with the outer ground contact spring. This contact closes the circuit from the tip side of the line through the coin relay to ground and is maintained until the armature of the coin relay has been operated and nearly restored.

When a deposited coin is to be collected in the case of manual equipment, the operator depresses the "collect" key. This key sends 110 volts positive battery to tip side of line which operates the coin relay so that the armature is drawn toward rear pole piece. The coin release plunger is operated to the left and the rocking fingers on the coin bracket operate, thereby opening the chute so that the coin may pass into the coin receptacle. With machine switching equipment the collection is made automatically when the calling party hangs up after a completed local connection, or by means of cord circuit keys or other means on calls involving an operator.

When a coin is to be returned in the case of manual equipment, the operator depresses the "return" key which sends 110 volts negative battery to the tip side of the line which operates the coin relay so that the armature is drawn toward the front pole piece. The coin release plunger is operated to the right and the rocking fingers on the coin bracket operate, permitting the coin to be refunded. With machine switching equipment, coins are returned automatically when the calling party hangs up if the connection was completed to a free number, or if for any other reason the coin is to be returned.

When the collect or return voltage is removed from the line the coin relay armature restores to its normal position, the coin release plunger and contact actuating lever return to their normal positions and the circuit is opened at the ground spring contacts.

Normally the armature is held in position by two spiral restoring springs. These springs restore the armature when operating voltage is removed from the line. The motion of the armature is limited by the ends of the operating arm. The operating arm carries the coin bracket upon which rests the contact actuating lever when the relay is operated. The contact actuating lever rests on this bracket until the relay is almost restored so that the ground will not be removed until the "collect" or "return" operations are complete. When the relay armature is fully restored the contact actuating lever rests in a notch in the coin bracket and allows the ground spring contacts to open.

## STANDARD ADJUSTMENTS

**6. The following general rules shall be observed:**

- (a) Coin collectors have standard adjustments when received from the Western Electric Company through company's storerooms. It should not, in general, be necessary to check the adjustments at installations of such coin collectors.
- (b) On removals, in case coin collectors are reused without going through the storeroom, check all adjustments and if necessary adjust.
- (c) If trouble is experienced with collector at new installations check adjustments and if necessary adjust.

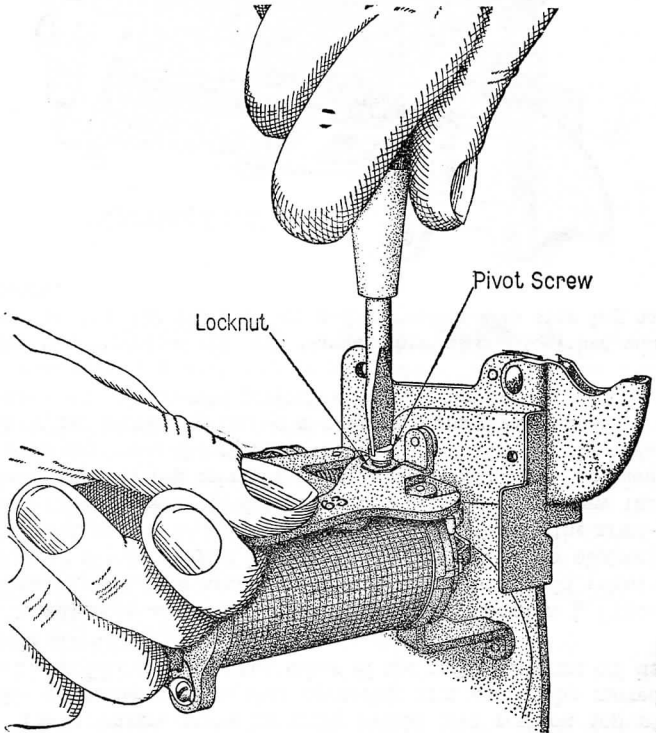
The separation between the armature and pole pieces, the tension on the armature restoring springs and the position of the bracket arms are adjusted by the manufacturer so that the coin relay should operate satisfactorily under the maximum and minimum voltage conditions met with in service. It is not practicable to make these adjustments on a coin collector in service, as the proper operation of the relay under the high and low voltage limits cannot readily be determined. **Therefore, the tension of the armature restoring springs and the position of the bracket arms and the separation between the armature and the pole pieces should never be changed on a coin collector in service.** If the coin relay cannot be made to operate properly without adjusting these parts, a new coin relay should be substituted.

- (d) Make adjustments so that they will be correct when all nuts and screws are set up tight.



- (e) If collector does not operate properly when adjusted according to these specifications (and cannot be made to operate properly by replacing parts as permitted by these specifications) replace collector.
- (f) The adjustments included in Sections 7 to 11 inclusive should be made when required by (a), (b) and (c) above and to clear the troubles given in Sections 14 to 22 inclusive.

**7. Adjusting armature.** In adjusting armature for side play follow directions given below.



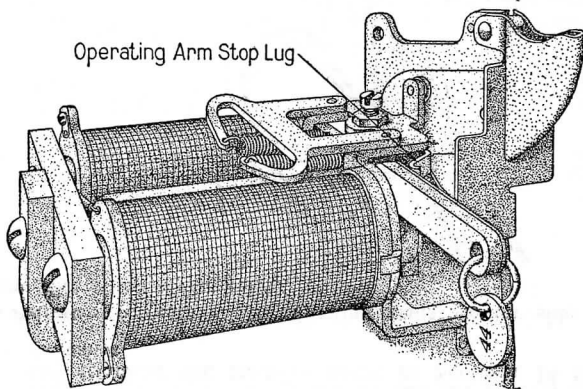
- 1 Loosen Locknut.
- 2 Adjust pivot screw so that armature will work freely without unnecessary sideplay.
- 3 Hold pivot screw in position while tightening locknut.

**8. Adjusting armature restoring arms.** With the armature in normal position the restoring arms should rest on their respective pole pieces. In adjusting, bend arms with the #143 Tool or equivalent as shown in Section 9.

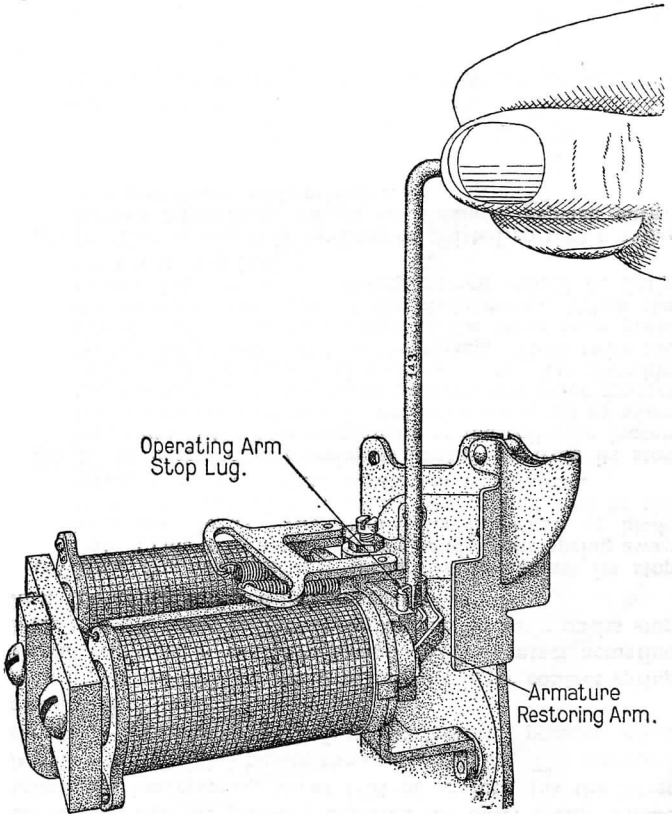
The armature restoring arms should also rest on top of the operating arm so that operating arm cannot be moved without lifting one or the other of the restoring arms off its pole piece.

**9. Adjusting operating arms.** Referring to Section 4, Pages 5 and 6, with the armature in normal position, coin release plunger should project into the coin chute so as to obstruct the passage of a nickel. In the "collect" position of the armature this plunger should recede until it is slightly below the outer edge of the coin chute plate. In the "return" position of the armature the plunger should project through the coin chute far enough to enable a new or slightly worn nickel to pass easily the curved projection on the plunger.

The operating arm stop lugs should be adjusted so that the two blades of the #44 Gauge when placed together will just fit between relay frame and operating arm stop lug as below.



If necessary to obtain proper gauge adjustment between stop lugs and frame, bend lugs carefully with #143 Tool or equivalent as below:



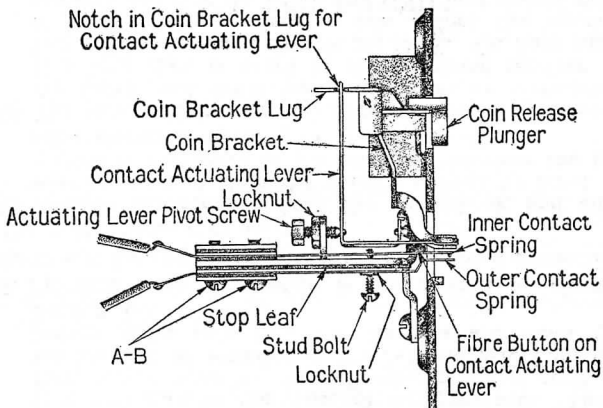
If the rocking fingers on the coin bracket are bent or twisted so that coins are not collected or refunded when stop lugs are properly adjusted replace collector and return for repairs.

**10. Adjusting ground contact springs.** With the armature in normal position and the contact actuating lever resting exactly in the bottom of the notch in the lug of the coin bracket the separation of the contacts should be approximately equal to the .012 leaf of the #37 Gauge. If the ground contact springs are properly adjusted the outer spring should follow the inner spring about 1/64 of an inch (as the latter is pulled to the right) before the contacts open. The armature should be in either the "collect" or "return" position when making this test.

In normal position of the armature the inner contact spring should rest against the fibre button on the contact actuating lever and the outer contact spring should lie flatly on its stop leaf. To adjust follow directions given below:

- (a) Hold the outer contact spring firmly against its stop leaf. (This is to assure against bending the spring away from stop leaf.) Then, with the fingernail or blade of a small screwdriver, adjust the contact end of the spring until the correct separation is obtained.
- (b) If the outer contact spring is bent away from its stop leaf, remove the coin mechanism of the collector, loosen the screws A-B (shown in cut below) enough to allow the insertion of a thin blade between the outer contact spring and its stop leaf and close to the assembly "piling" or terminal end of the spring. Then twist the left side of the blade **up** and at the same time press the spring to the right of the blade **down**. When the screws A-B are set up tightly, spring should lie flatly against its top leaf.
- (c) If either spring is badly bent or twisted so that a satisfactory adjustment cannot be obtained, replace entire spring assembly with new one.

**TOP VIEW SHOWING COIN MECHANISM WITH COIN  
RELAY CUT AWAY AND COIN CHUTE  
COVER REMOVED**



**11. Adjusting contact actuating lever.** With the armature in normal position the contact actuating lever should rest in bottom of the notch in lug on the coin bracket. If necessary to adjust remove coin mechanism (see Section 4, page 5) and bend lever carefully to right or left with finger until proper adjustment is secured. Make sure that lever slides smoothly on sides of notch when relay armature is operated to either "collect" or "return" positions.

The lever pivot screw (see Section 10) should be so adjusted that the actuating lever works freely without side play. Use #129 and #72 Tools in adjusting this screw.

With armature operated to either "collect" or "return" position adjust the stud bolt on the coin contact bracket with the #72 Tool so that the contact actuating lever may be raised with the finger above the top of the notch a distance equal to the .012 leaf of the #37 Gauge. **Make this adjustment carefully** to insure correct coin operation of the collector.

If contact actuating lever is badly bent or twisted, replace with new one.

## LOCATING TROUBLES

**12. General.** When stations are visited to clear troubles always,—

- (a) Make sure that the line and subscriber's set are clear of trouble.
- (b) Test coin relay for operation as given in Section 23.
- (c) Make sure that the collectors are fastened securely and in case reinstallation is required report through the proper channels. See specifications on STATION APPARATUS INSTALLATION for method of installing collectors.
- (d) Make sure that coin chute cover is in close contact with base along AB (see page 5) otherwise bend cover to obtain close contact or replace with new cover.
- (e) One of the most common causes of trouble on the No. 7-J and No. 7-K Coin Collectors is dirty contacts. When the coin collector fails to operate and after removing the cover the coin is found to close the contact satisfactorily it is good practice to remove the coin and clean the contacts as this very often clears the trouble and saves the time of testing. If arcing occurs at the contacts while the operator is collecting or returning this is an indication of insufficient pressure on the contacts and may be the cause of dirty contacts. Therefore, before applying the following practical tests for the location of troubles in No. 7-J and 7-K Coin Collectors make sure that the contacts are clean (see Section 15).

**13. Practical tests.** If trouble is not cleared by cleaning contacts test for continuity of the line and ground connections of the coin collector as follows:

- (a) Remove the receiver from the switchhook and alternately open and close the contact springs by hand. If a click is not heard in the telephone receiver the coin relay circuit is open.
- (b) The local collector ground circuit is tested by shorting the LINE and GND lugs with pliers or screwdriver. If a loud click is heard in the telephone receiver the line and local ground circuits are O. K. On lines where it is necessary to drop a coin before the operator answers, crossing the LINE and GND lugs should signal the operator. If the operator does not answer, the local coin collector ground is open.
- (c) Make a visual inspection to determine whether any connections have been broken off at the coin collector terminals.

If the above tests check O. K., the continuity of the coin relay is tested as follows:

- (a) Remove the coin from the slot.
- (b) Connect one clip of the test set to the ground terminal, and with the other clip of the test set proceed as follows:
  1. Touch line terminal of coin relay coil.
  2. Touch other terminal of same coil.
  3. Touch opposite coil on strap terminal.
  4. Touch opposite terminal of this coil.

A click should be heard at each point. When a click is not heard the trouble has been passed. If the open is in the coils, replace the open coil (see page 4), otherwise repair where necessary.

The foregoing tests are the same in either manual or machine switching districts.

## **CLEARING TROUBLES**

**14. General.** The most common troubles located by the tests and inspections given in Sections 12 and 13 are listed below in Sections 15 to 21 inclusive. The causes of these troubles are covered and the methods for clearing them are specified.

**15. No ground.** May be due to:

- (a) Dirty contacts on ground springs. Clean contacts with #265 Tool and check contacts for arcing. See Section 12.
- (b) Contact actuating lever pivot screw may be too tight so that weight of coin is not enough to operate lever. Re-adjust pivot screw. See Section 11.
- (c) Stud bolt which limits movement of contact actuating lever may be screwed forward too far. Readjust stud bolt. See Section 11.
- (d) Inside and outside ground contact springs not making contact when contact actuating lever is operated. See Sections 10 and 11.
- (e) Open at ground clamp or in ground wire. Repair as necessary.
- (f) Open relay coils, strap or connecting leads. See Section 13.

To test for (a), (b), (c), (d), (e) and (f) see Section 13.

**16. 1000 ohm ground** caused by inside and outside ground contact springs in permanent contact. May be due to:

- (a) Ground springs out of adjustment. See Section 10.
- (b) Full coin receptacle. To clear this trouble temporarily, use #139 Tool or small screwdriver (through hole in side of coin receptacle) to distribute coins evenly in receptacle. Report that a collection should be made.
- (c) Contact actuating lever bent so that it rests on the side of the notch in the coin bracket lug. See Section 11.
- (d) Armature stuck due to striking pole pieces when operated. See Section 6.
- (e) Armature stuck due to lack of side play at pivots. See Section 7.
- (f) Armature stuck due to filings or dirt. Remove any accumulation of filings or dirt from ends of armature or pole pieces with piece of cheesecloth.
- (g) Ground contact springs short circuited. May be caused by particles of metal lodged between the springs or by burned out bushings. Clean springs with cheesecloth. If trouble is not readily cleared replace the ground spring assembly with a new one.

**17. Can't Collect or Return.** May be due to:

- (a) Full coin receptacle. See Section 16 (b).
- (b) Too much tension on armature restoring springs. See Section 6.
- (c) Armature or operating arm out of adjustment. See Section 7 to 9 inclusive.
- (d) Dirty protector blocks. Inspect and clean blocks in accordance with instructions given in specifications for STATION AND PRIVATE BRANCH EXCHANGE PROTECTOR INSTALLATION.
- (e) Can't collect or return with receiver on hook. Coin box connected to wrong side of line. Should be connected to tip side.
- (f) Rocking fingers on coin bracket being bent or twisted. See Section 9.

**18. Can't Call.** May be due to:

- (a) Coins or foreign material stuck in coin chute. In case coins or foreign material are lodged in chute, remove chute cover and take out obstructions. If chute and chute cover are in good condition brush out runway and replace in collector. If runways are covered with a sticky substance, clean with alcohol or carbon tetrachloride.



In case a good coin is lodged, due to excessive wear at any point in chute, replace chute cover with new one.

Make sure that all attaching screws are tight.

(b) No ground—See Section 15.

(c) Open in wire between coin collector and subscriber set or between subscriber set and line. Repair wiring if required and tighten connection when necessary.

(d) Ground potential interfering with operation of line signal.

**19. Relay chatters.** May be due to poor adjustment of ground springs. Adjust springs according to Section 10.

**20. Coins collected when they should be returned and returned when they should be collected.** Usually caused by a reversal of relay connecting leads.

**21. Coins returned all the time or collected all the time.** May be due to coin relay armature adjustment. (See Section 6.)

**22. Trouble not cleared.** When the trouble is of such a nature that repairman cannot clear it (as in case a new machine is required) he should immediately advise Test Desk.

## TESTS

**23. After all necessary adjustments** have been made, remove the receiver from the switchhook and operate the contacts by holding the contact actuating lever in the operative position. When operator answers, request her to return and collect successively. Note that the relay armature operates positively in each direction.

To make sure that the coin collector is connected to the tip side of the line, ask operator to operate the return and collect keys successively after the receiver has been placed on the hook. If relay operates positively in each direction collector is connected to tip side of line.