

COIN COLLECTORS

MULTISLOT TYPES

MAINTENANCE - PREPAYMENT

ADDENDUM NOTES

This addendum supplements Section C42.148, Issue 1. It is issued to include local instructions on some maintenance procedures.

The changed portions in the section shall be marked with the cross reference "see Addendum."

1.00 GENERAL

Subheading and Paragraphs 1.03 and 1.04 are added.

Special Instructions

1.03 Crocus cloth shall be used wherever No. 00 abrasive cloth is specified in this section.

1.04 While this stipulates the replacement of some of the component parts of the coin collector, it is to be understood that these replacements are only to be made on coin collectors that are otherwise in good condition from both a mechanical and appearance standpoint. Also, in some cases, it may be expedient to replace a part to make the coin collector serviceable until it can be replaced.

5.00 LOWER HOUSING AND BACKPLATE ASSEMBLY

Subheading and Paragraphs 5.02.1, 5.06.1, 5.11.1 and 5.11.2 are added.

Cleaning, Adjustment, and Replacement of Coin Vane

5.02.1 If the coin collector has a removable vane, do not replace the set if the trouble can be cleared by cleaning, adjusting

or replacing the vane. To remove vane, proceed as follows:

- (1) Remove coin trap (see Paragraphs 5.09 and 5.10).
- (2) Remove coin shield (see Paragraph 5.11).
- (3) Remove shoulder screw coin vane bearing from front of hopper and remove coin vane through slot in front of hopper.

**CAUTION: DO NOT LOSE LOCK WASHER FROM UNDER HEAD OF SHOULDER SCREW.**

- (4) If vane is in good condition, it may be re-used. If necessary, free coin vane roller with KS-7860 petroleum spirits. Clean vane thoroughly using KS-2423 cloth moistened with petroleum spirits. Vane shall be replaced if not in good condition.
- (5) When remounting coin vane, assure that lock washer is under head of the bearing screw. Check vane and hopper clearance as in Paragraph 5.02.
- (6) If vane scrapes on front of hopper, place No. 147 tool or equivalent, such as a No. 35 tool or KS-6854 screwdriver, as shown in Figure 12 and adjust front bearing outward by turning tool slightly. If vane scrapes against back of hopper, adjust rear bearing outward as described. In adjusting vane, be careful not to introduce any binding at bearings.
- (7) If vane binds at front bearing, place No. 147 tool or equivalent between coin vane and back wall of coin hopper and turn tool slightly. Tool should be placed about opposite coin vane pin in order not to produce burrs on coin vane or on shoulder of

stud used for coin vane bearing. If vane binds at back bearing, place tool between coin vane and front wall of hopper just below coin vane pin.

(8) To reduce excessive end play, adjust rear bearing outward as in Paragraph (6). Check for binding (Paragraph 5.02).

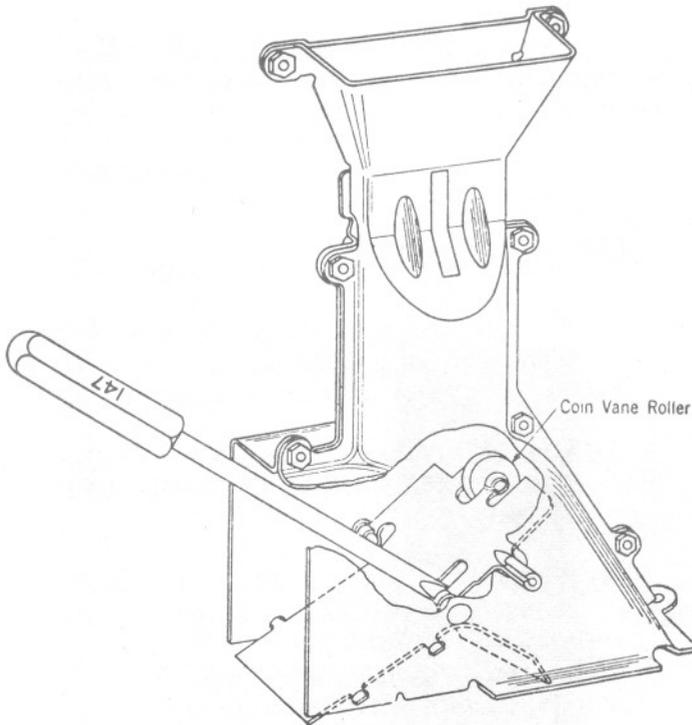


Figure 12

### Ground Spring Contact Pressure

5.06.1 To insure that there is no bind between the coin trigger lever and the cam surface of the trigger, clean these two surfaces with cleaning paper. Press parts together while withdrawing paper. Repeat with a new paper until paper shows no sign of dirt. If there is indication of excessive dirt on these parts, clean thoroughly with KS-7860 petroleum spirits. After cleaning make the following dime dropping test. A dime dropped into the coin hopper three consecutive times shall trip the coin trigger and cause the ground springs to make contact each time. Drop dime from a position against the front of hopper directly over the coin trigger and with the edge of dime not more than 1/8" above front edge of hopper. If relay does not meet the dime dropping test, it shall be replaced.

### Replacement of Coin Shield

5.11.1 On all routine visits and on "no coin return" complaints, make sure that the coin shield is the new modified type which can be identified by the upper right hand corner being cut away. This modification of the new shields is to prevent a binding action between the turned over (hinge) portion of the shield and the start of the loop in the shield pin. This binding action causes the pin and shield to move in unison instead of the shield swinging free on the pin.

5.11.2 All 195- and 197-type coin collectors shall have the coin return shield removed.

**COIN COLLECTORS**  
**MULTISLOT TYPES**  
**MAINTENANCE — PREPAYMENT**

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**Caution 1:** *Whenever removing or reassembling the upper housing from or to the backplate of a coin collector equipped for 10¢ operation, remove the receiver or the handset from the switchhook.*

**Caution 2:** *Never replace the upper housing without the P-349486, P-16A336, or KS-7994 shield over the relay, since the shield protects the relay coils from damage which may result if hit by the housing.*

**1.00 GENERAL**

**1.01** This section covers the specific items of maintenance required for prepayment multislot coin collectors. These items are in addition to all items covered in Section C42.144, General Maintenance of Multislot Coin Collectors.

**1.02** Items in brackets [ ] apply to all coin collectors except those 5¢ coin collectors equipped with lead coin chutes. The 10¢-type coin collectors may be used for 5¢ service with cutover clip in place.

**2.00 TOOLS, GAUGES, AND MATERIAL**

**2.01** In addition to the tools, gauges, and material required in Section C42.144, the following are required for maintenance of prepayment coin collectors:

<b>INDEX</b>	<b>ORDERING INFORMATION AND DESCRIPTION</b>
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<b>Gauge</b>	<b>GAUGE, 146A.</b> Bias margin test (see 5.03).
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<b>GAUGE, 147A.</b>	Trap and vane release test (see 5.01, 5.05, 7.03).
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<b>Tool</b>	<b>TOOL, COLLECTOR, COIN, KS-14995.</b> Trap and vane release test (see 5.01).
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**2.02** The 35F test set, or equivalent (see 8.02), has a very limited use and is needed only when required by local instructions.

3.00 CLEANING

COIN RELAY

3.01 If the relay is removed for any reason, clean and lubricate fork as described in Step 1 of 5.13, and remove magnetic particles as described in Step 2 of 5.13.

4.00 UPPER HOUSING

INTERFERENCE BETWEEN INDUCTION COIL AND COIN CHUTE

4.01 196- and 197-type coin collectors manufactured prior to the third quarter of 1954 have very little clearance between the induction coil and the coin chute electromagnet. The time of manufacture is indicated by a marking such as III 54 which means third quarter of 1954. This mark is inside the upper housing near the code number of the coin collector. If there should be any interference when the reject button is pressed, it will be necessary to change to a 101B induction coil (modified per B-905000) or replace the coin collector.

STUCK COIN TROUBLES

4.02 In addition to those listed in Section C42.144, stuck coin troubles are shown in Table A.

TABLE A  
Stuck Coin Troubles

Place	Probable Cause	Correction
Nickel edgewise at coin shield.*	Coin falls between coin return and coin chute.	Replace coin shield with off-set type.
	Coin return bent downward.	Replace upper housing or coin collector.
Dime at coin shield.	Shield pin bent or shield distorted, causing sticky shield.	Replace shield and pin.

\* May be found after removing upper housing.

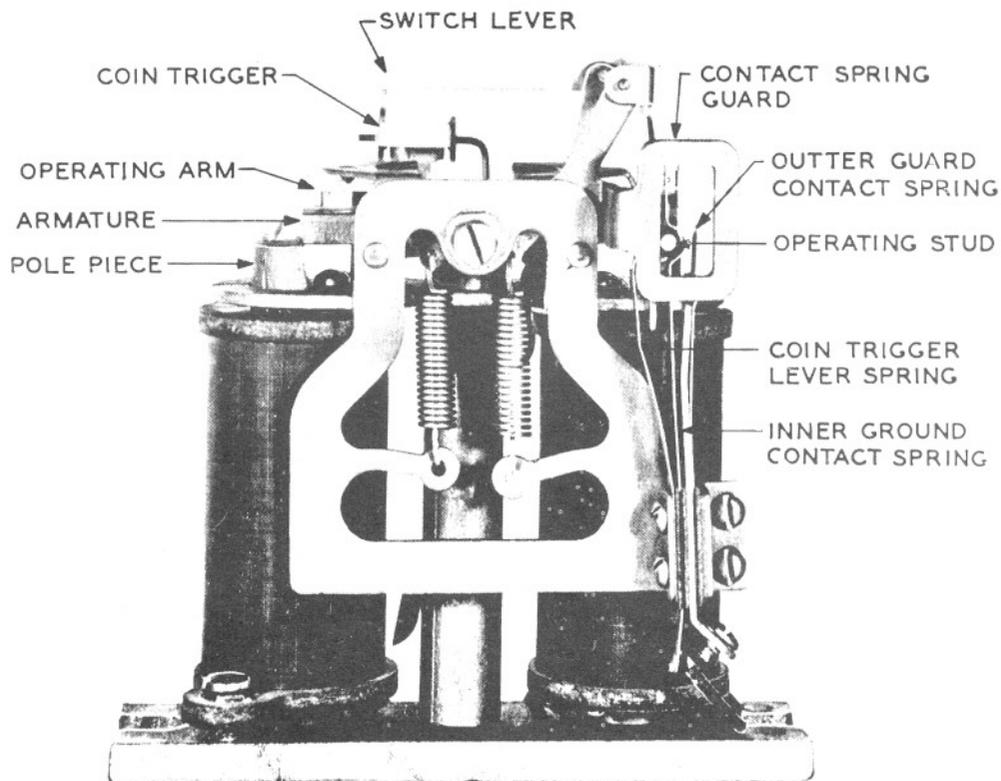


FIG. 1 — COIN RELAY

## 5.00 LOWER HOUSING AND BACKPLATE ASSEMBLY

**Caution:** No modifications or adjustments of relay or hopper other than specified herein should be made.

### TRAP AND VANE RELEASE TEST

**5.01** When the armature and the trap have been fully operated manually, and the trap is permitted to restore slowly by means of a KS-14995 coin collector tool inserted through the hopper throat, the trap, vane, and relay shall restore fully to their non-operate positions against a torque of 70 gram-inches applied to the relay operating arm with a 147A gauge. This test should be made three times for each direction of operation as follows:

1. Remove shield from relay.

2. Apply slot marked "70" of 147A gauge to right rear horizontal portion of relay operating arm (see Fig. 4). Make sure that end of slot bears against edge of operating arm and that weight on gauge is uppermost.
3. Press down on 147A gauge to fully operate relay and vane to the limits of their travel.
4. Insert KS-14995 coin collector tool into throat of hopper. Let KS-14995 tool down as far as it will go and hold it in place. Do not force.
5. Release pressure on 147A gauge.
6. Slowly withdraw KS-14995 tool. Take at least 5 seconds.
7. Observe that vane and relay return to their unoperated positions.

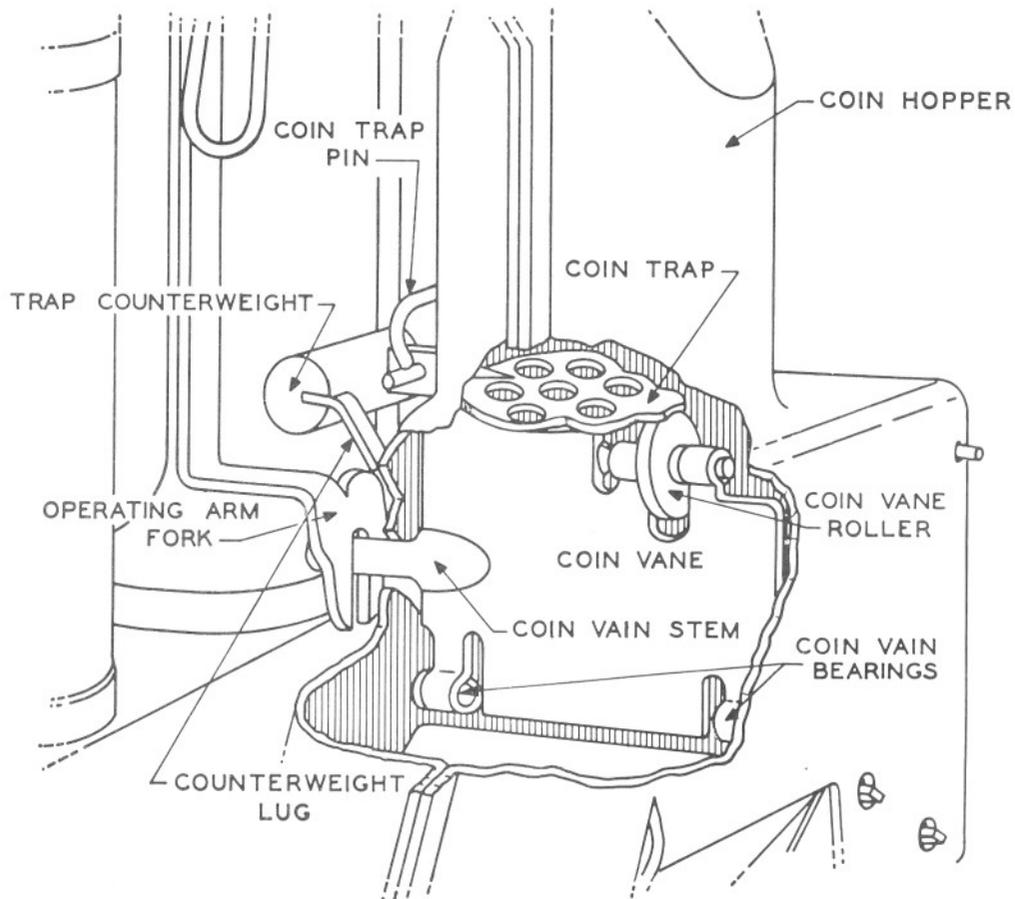


FIG. 2—COIN HOPPER AND REAR OF COIN RELAY

8. Make test three times with gauge on the right (collect) side and three times on the left (refund) side.

**5.02** *If the mechanism fails, remove relay and proceed as follows:*

1. If hopper is equipped with a brass coin vane, the coin collector should be replaced.
2. Check vane for binding on its bearings.
  - Hold vane almost vertical but slightly to the right.
  - The vane shall drop to the fully-operated refund position (right) when released.
  - Hold vane almost vertical but slightly to the left.
  - The vane shall drop to the fully-operated collect position (left) when released. If vane binds on its bearings, the coin collector should be replaced.
3. Check vane for binding on hopper.
  - Hold vane pin with the fingers.
  - With vane as far forward as possible move vane over its full travel in each direction three times, feeling that it does not scrape on the front of hopper.

- Push vane to rear of hopper and move vane over its full travel in each direction, feeling that it does not scrape on the back of hopper. Do not push hard enough to distort hopper. If vane binds on hopper, the coin collector should be replaced.
4. Check trap for catching on vane or on vane roller as follows:
    - Hold vane in fully-operated collect position (to the left), using the left hand.
    - With the right hand, lift trap counterweight to its fully-operated position.
    - Move vane slowly until it engages trap.
    - Continue moving vane toward vertical position while gently restraining the trap. The vane shall move smoothly to the vertical position.
    - Repeat test on refund side (to the right), reversing use of hands. If trap catches on vane or vane roller, replace trap as in 5.09 and repeat test. If replacement trap still catches, the coin collector should be replaced.
  5. Check clearance between the trap and the vane roller.
    - With trap in unoperated position, place a finger lightly on the counterweight.

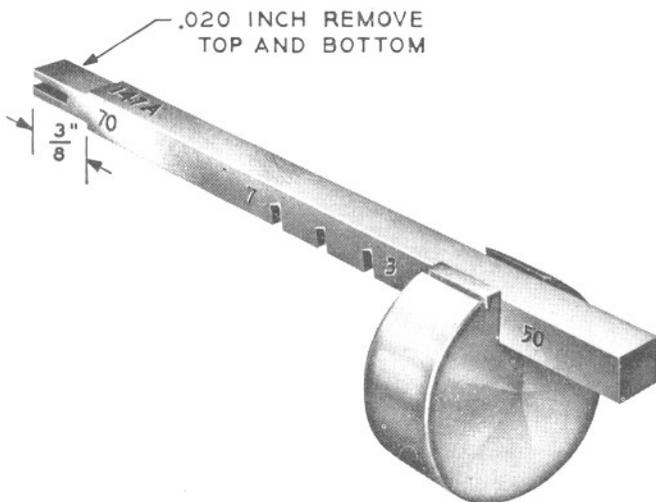


FIG. 3 — MODIFIED 147A GAUGE

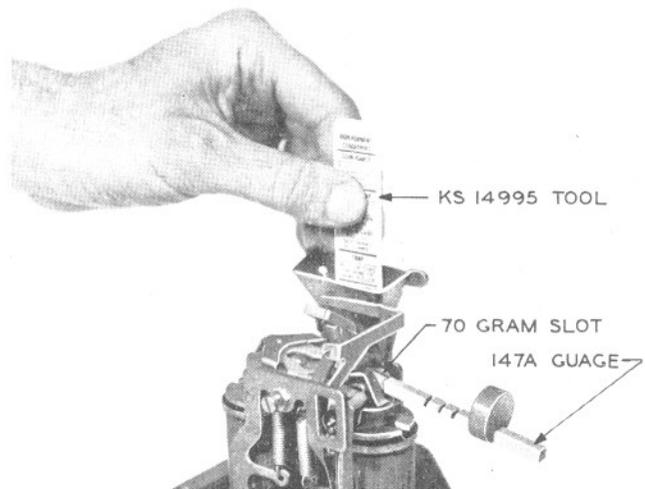


FIG. 4 — TRAP AND VANE RELEASE TEST

- Move vane to vertical position. The vane shall not rub on the trap. If vane rubs, adjust trap counterweight lug so that trap will just clear vane.
  - With vane in vertical position, lift trap counterweight. Trap shall not move more than a few degrees before touching vane roller. Adjust by bending counterweight lug.
6. Check the operating arm fork and the vane pin for roughness and *clean and lubricate* as described in Step 1 of 5.13. Also check operating stud. If stud is of roller type, replace relay as in 5.13.
  7. Reassemble relay as in 5.13 and repeat trap and vane release test. If mechanism fails, replace relay. If replacement relay fails, the coin collector should be replaced.

#### BIAS MARGIN TEST

**5.03** The relay shall operate in the collect and in the refund direction against the torque of a 146A gauge attached to the armature (see Fig. 5) with appropriate coin battery applied. Coin trigger shall restore. Proceed with test as follows:

1. Connect hand test set across line terminals (R and Y).
2. Place a 146A gauge on left side of armature (collect).
3. Trip coin trigger.

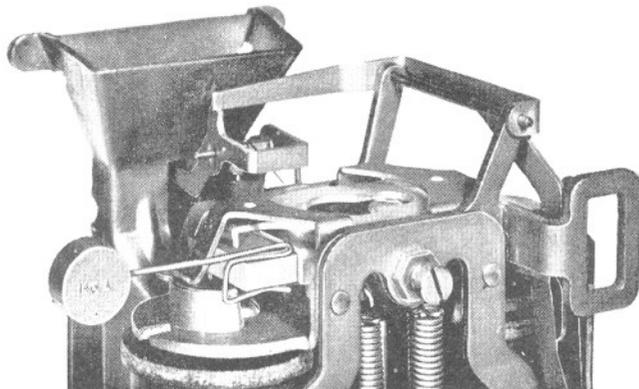


FIG. 5 — BIAS MARGIN TEST

4. Obtain collect current by any available local arrangement. Relay shall operate to collect (lifting gauge). Tripper shall restore when relay releases. Observe at least three operations.
5. Place 146A gauge on right side of armature (refund).
6. Trip coin trigger.
7. Relay shall operate to refund (lifting gauge). Trigger shall restore when relay releases. Observe at least three operations.

**5.04** If relay fails to operate in the correct direction or if trigger fails to restore, check for and remove magnetic particles as in Step 2 of 5.13, or replace relay as in 5.13. If replacement relay fails, the coin collector should be replaced.

**Note:** Make sure that line and ground are satisfactory and that coin battery is being applied.

#### GROUND SPRING CONTACT PRESSURE

**5.05** Ground spring contact pressure shall be minimum 5 grams measured with the 147A gauge (see Fig. 6). Proceed with test as follows:

1. With ground lead connected to coin collector, place 5-gram slot of 147A gauge on horizontal portion of coin trigger lever (see Fig. 6).
2. Connect hand test set across terminals R and Y of coin collector and trip coin trigger. Dial tone should be heard in dial areas or operator should answer in manual areas.

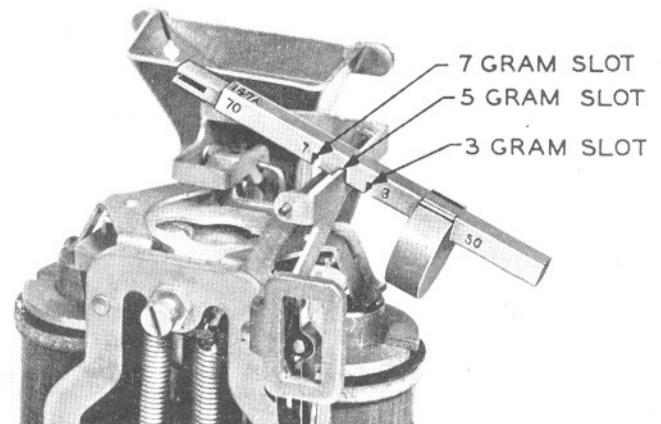


FIG. 6 — GAUGE FOR GROUND SPRING CONTACT PRESSURE

3. In areas where dial tone is received before deposit, dial any digit except "1" to determine whether the contacts are closed as indicated by dial tone going off.

**5.06** If relay fails on above tests, proceed as follows:

1. If contacts are open (pressure is less than 5 grams), replace relay as in 5.13.
2. If contacts touch but test open, burnish contacts with 265C tool.
3. If dial tone is not heard, short-circuit the contact springs.
  - If dial tone is heard when contact springs are shorted, replace relay as in 5.13.
  - If dial tone is not heard when contact springs are shorted, look for open relay coils or trouble in ground or line circuits.

#### GROUND SPRING CONTACT CONTINUITY

**5.07** When the coin trigger is tripped, the contacts shall be made and shall be held without break while the armature is moved from its normal to its fully-operated position. This test shall be made three times in each direction (collect and refund). To make this test, proceed as follows:

1. Use hand test set to call operator, test desk, or local test code to obtain talking battery on the line.

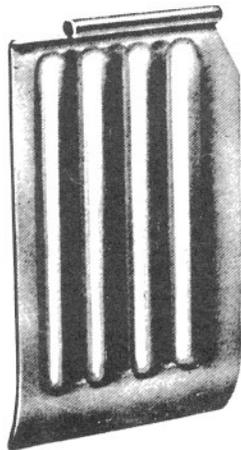


FIG. 7 — COIN SHIELD

2. With the coin trigger held tripped, operate relay rapidly by hand to the fully-operated collect position. No clicks shall be heard in the receiver on the operate stroke. Frying noise heard on the operate stroke or clicks heard during release stroke should be disregarded.

3. Repeat as in Step 2 above but operate relay to refund direction.

**5.08** If clicks are heard in the receiver, or severe arcing or relay chatter is observed during the operate stroke on either collect or refund indicating that contacts open momentarily, replace relay as in 5.13.

#### REPLACEMENT OF COIN TRAP

**5.09** To replace coin trap in earlier style hoppers:

1. Remove coin return shield by inserting the blade of a cabinet screw driver in loop of pin. Twist screw driver sufficiently to release end of pin from hole in hopper and slowly pull the shield and pin out together.
2. Move vane to the right.
3. Fasten a piece of string or wire to trap counterweight.
4. Remove trap pin by lifting the right end of the loop and sliding the pin to the left.
5. Push trap into hopper and allow it to drop into the coin return.
6. Fasten string or wire to replacement trap and pull trap up to slot in front of hopper.
7. Position replacement trap with lugs uppermost and assemble trap pin.
8. Recheck clearance between the trap and the vane roller as in Step 5 of 5.02.

**5.10** Coin traps in *later* style hoppers may be replaced through front of hopper without removing coin shield.

#### REPLACEMENT OF COIN SHIELD

**5.11** If coins are stuck due to a damaged or distorted coin shield or if a bent shield pin causes the shield to stick, shield pin and shield shall be replaced as follows:

1. Place pin through groove in top of shield so that turned-over portion on bottom of shield is toward hopper when loop of pin is to the front.

2. Hold loop of pin with long-nose pliers or fingers and place coin shield pin hole in rear of hopper.
3. Hold shield in place with fingers and secure end of loop in front hole of hopper with the aid of long-nose pliers.
4. Adjust loop in such a manner that pin does not come out when play is taken up in either direction.

#### PULL BUCKET

**5.12** The pull bucket should operate without binding. It should not be broken and should be free from sharp burrs and nicks that could cause personal injury. The bucket should restore freely to the fully closed position when released slowly from the fully opened position. If these conditions are not met, pull bucket should be replaced.

#### REPLACEMENT OF COIN RELAY

**5.13** In every case, before assembling the relay proceed as follows:

1. Clean and lubricate the fork and the vane pin. If bearing surfaces of fork are so rough that they cannot readily be made smooth, replace relay; otherwise, smooth rough spots using a small piece of No. 00 abrasive or finer cloth folded as shown in Fig. 8. Clean off with a

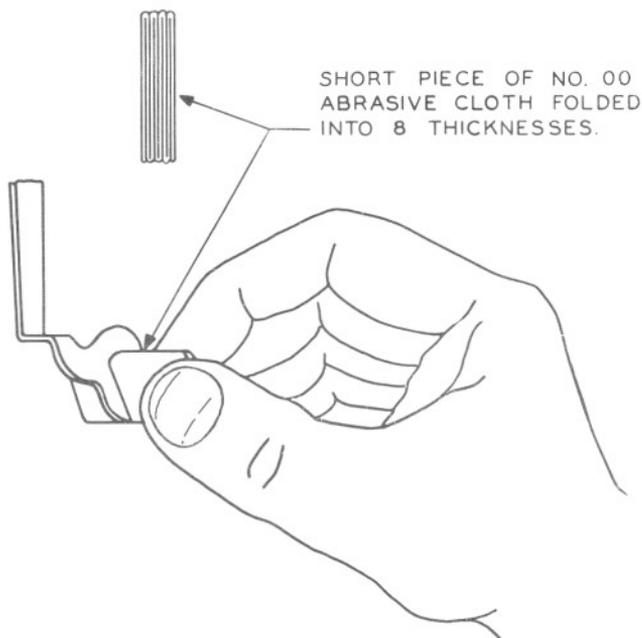


FIG. 8 — POLISHING OF FORK SLOT

KS-2423 cleaning cloth moistened with KS-7860 petroleum spirits. Apply the lead of a grade 2B or softer lead pencil to bearing surfaces of fork slot. Rub the lead on these surfaces so as to deposit as continuous a coating as practicable.

2. Remove magnetic particles from adjacent surfaces of armature and pole pieces or top of magnet with rubber tape or the equivalent. Place a piece of rubber tape about 1 inch long on top of the pole piece on the left side of the relay so that at least 1/4 inch extends into the air gap. Press down on the armature on the left side until it squeezes the rubber tape. Magnetic particles will become imbedded in the tape which should be discarded. Repeat on the right side with an unused piece of rubber tape. Use tape folded over orange stick to remove particles from top of magnet.
3. When assembling the relay, it shall be as close as possible to the hopper, but there shall be at least 1/6-inch clearance between the fork and the hopper, between the vane stem and the relay, and between the trap counterweight and the relay. The coin trigger shall not touch at upper end of slot in coin hopper or bind on sides of slot at any point of its travel. The full thickness of the vane shall be visible in center hole of coin trap (see Fig. 9). If this cannot be obtained with a replacing relay, the coin collector should be replaced.

#### COIN RELAY SHIELD

**5.14** A plastic coin relay shield P-349486 replaces the KS-7994 fiber shield. It is held in place with a P-13A963 hairpin clamp. To install clamp, grip closed end with long-nose pliers while exerting

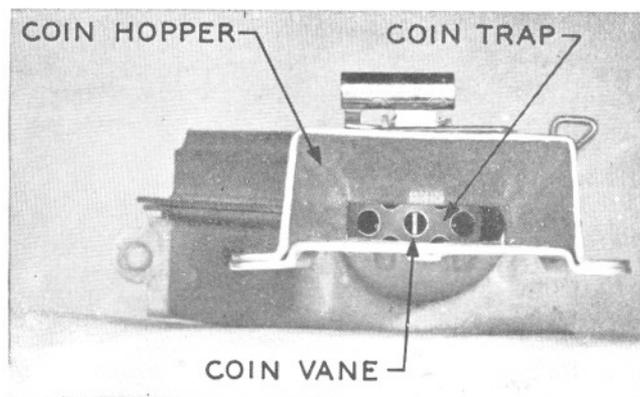


FIG. 9 — POSITION OF VANE WHEN RELAY IS CENTERED

slight pressure on shield near pivot screw hole; then snap clamp in place between locknut and head of coin relay pivot screw. On coin collectors equipped with a D-95365 contact device, use the P-16A336 shield which is the same as the P-349486, except that the lower left corner is cut away so as not to interfere with the contact device. When new shields are not available, the KS-7994 shields may be used.

**6.00 FINAL TESTS**

**COIN CHUTE OPERATION AND REFUND TEST**

**6.01** To ensure that the coin chute and the coin return paths are clear and that the station is operating satisfactorily, make a final check as follows:

1. [With the upper housing locked in place and with the receiver or handset *on* switchhook, deposit a nickel. Coin shall drop into coin return. Repeat test five times and coin shall be returned each time.]
2. With upper housing locked in place with receiver or handset *off* switchhook, deposit a nickel. [When operating on a 10¢ initial charge basis, the first nickel shall be held at the first latch. Deposit a second nickel. The second nickel shall release the first nickel and permit both coins to pass through the coin chute.] Dial tone shall be heard at dial stations or the operator shall answer at manual stations. [Deposit a third nickel. The third nickel shall

pass through the coin chute (observed by gong tone) and reach the trap in the coin hopper. (The latter shall also occur in case a dime or a quarter is first deposited.)]

3. At dial stations, when dial tone is heard, hang up receiver or handset. Coins shall drop into coin return on hangup. At manual stations, when operator answers, request that coins be refunded.
4. With upper housing locked in place and with receiver or handset *on* switchhook, deposit a quarter. [The quarter shall drop into the coin chute (stopped by open gate) but no gong signal shall be heard. Lift receiver or handset *off* switchhook.] The quarter [shall be released and] should strike the gong. Dial tone shall be heard or operator should answer.
5. With upper housing locked in place and with receiver or handset *off* or *on* switchhook, deposit a dime. The gong shall be struck twice. If the dime is deposited before the quarter or separately, dial tone shall be heard or operator should answer.
6. At dial stations, when dial tone is heard, dial any digit except "1" to break dial tone, then hang up receiver or handset. Coins shall drop into coin return on hangup. At manual stations when operator answers, request that coins be returned.

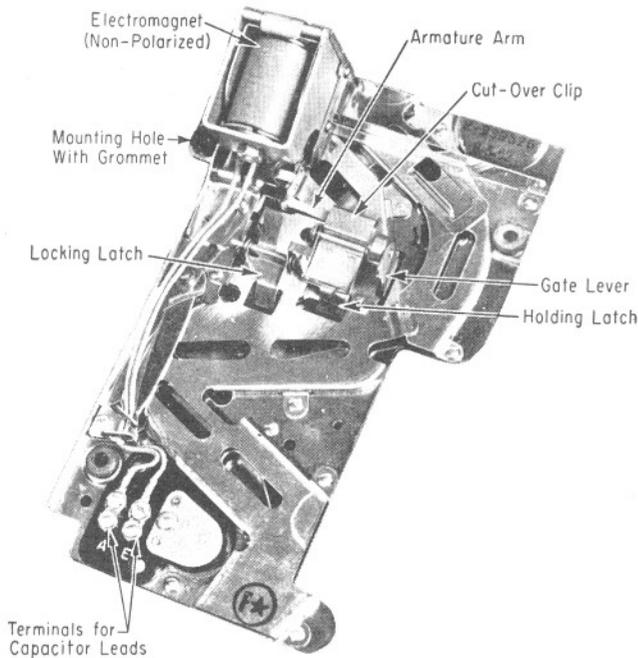


FIG. 10 — PREPAYMENT STEEL COIN CHUTE — WITH CUTOVER CLIP FOR 5¢ SERVICE

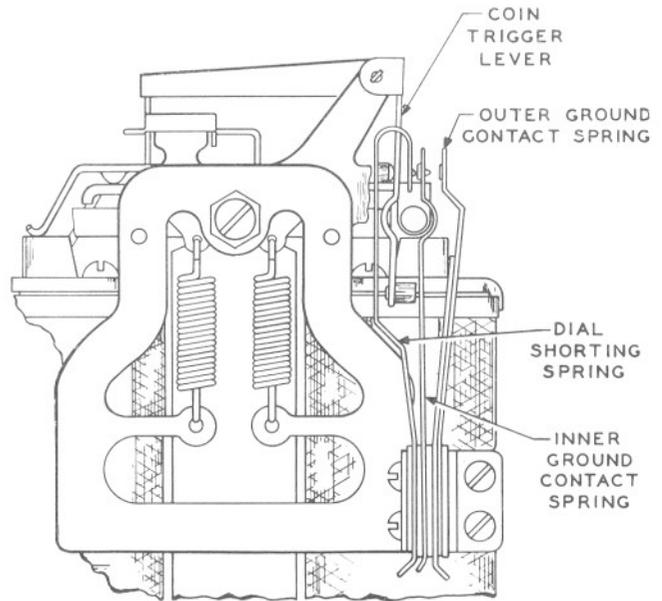


FIG. 11 — 3-SPRING (DIAL SHORTING) RELAY — CONTACT SPRING GUARD CUT AWAY

## COIN SIGNAL TEST

**6.02** Call the operator and inform her that you are about to test coin signals and that she should return coins deposited. Deposit a nickel, a dime, and a quarter. If operator does not identify signals correctly, the upper housing should be replaced.

**6.03** If coin collector does not meet the tests specified above, first look for cause at station and correct as specified above. If station appears satisfactory, report to test desk.

## 7.00 DIAL SHORTING COIN COLLECTORS

## GENERAL

**7.01** The following parts and paragraphs of this section apply to these coin collectors.

- Parts 3 and 4.
- Part 5, except 5.05 through 5.08 (ground spring contacts).
- Parts 6 and 7.

## SEPARATION OF GROUND SPRING CONTACTS

**7.02** With the coin trigger and operating arm in their normal positions, the dial shorting spring (see Fig. 11) shall follow the inner ground contact spring for a minimum of 0.010 inch; judge visually.

**7.03** With the coin trigger tripped and the operating arm in its normal position, the force required to open the contacts between the inner and outer ground contact springs (see Fig. 11) shall not be less than 3 grams. This pressure shall be measured with the 147A gauge (see Fig. 6).

## FINAL TESTS

**7.04** The dial shorting contacts shall shunt the dial pulsing contacts when the coin trigger is in the unoperated position. Check as follows:

1. Before replacing upper housing, check that *GRD* lead is connected.
2. Strap Y terminal of coin collector to left coin terminal of relay.
3. Make sure that coin trigger is *not* tripped.
4. Place upper housing on coin collector and wait for dial tone.
5. When dial tone is heard, dial any digit except "1."

6. If dial tone is not broken in Step 5, remove strap and proceed with tests.

7. If dial tone is broken, the dial shorting contact is not shunting the dial.

8. Clean relay contacts and recheck follow of dial shorting springs (7.02).

9. If dial tone is still broken in Step 5 above, replace relay.

**7.05** Check that dial shorting contacts in the unoperated position are not touching the housing. At stations where coin collector housing (or booth lining) is *not* grounded, proceed as follows:

1. Block relay in refund position. Use folded paper or wood cleat.
2. Temporarily disconnect yellow wire which connects the left coin terminal of relay to outer ground spring.
3. Remove receiver or handset from switchhook and lock upper housing in place.
4. Push housing to the right as far as possible.
5. Apply test for crosses, holding the housing in this position.
6. Remove relay blocking and reconnect yellow wire when test is completed.

## 8.00 LONG LOOP COIN COLLECTORS

## GENERAL

**8.01** The coin collectors shall meet the requirements in Parts 3 to 6. However, an S36 relay is housed in the subscriber set of this station arrangement. Therefore, if trouble is experienced on collect or refund of coins, the subscriber set should be replaced. Check operation and adjustment of S36 relay in accordance with 8.02.

## ADJUSTMENT OF RELAY

**8.02** Use 35F test set, or equivalent. Receiver or handset shall be on the switchhook and the red wire shall be disconnected from the RR terminal of the induction coil while testing.

## Direct Current Flow Requirements

Operate—Test 47.0 ma, readjust 44.5 ma

Nonoperate—Test 37.5 ma, readjust 39.6 ma

**Note:** Slowly increase current to the above values using a battery supply of not less than 3 volts.