

# Adjustments

## LEVELING ADJUSTMENTS - SEE FIGURE 31

For proper operation the phonograph must be installed with the cabinet floor level. Check the floor, front to back and side to side, with a carpenter's level. Adjust at the two leveling screws, accessible thru two holes in the floor just inside the front door. This adjustment should be made when the phonograph is installed and should be checked before any adjustments are attempted.

Adjustment of the chassis shelf is made at the factory. If a major repair is performed which requires removing the complete chassis, adjustment may be necessary during reassembly so that the front door will close without striking the chassis shelf. An adjusting screw is located under each corner of the shelf. Adjust the screws to provide 1/16-inch between the top of the shelf and the front door window retaining channels. Lock these studs with the locking screws which screw up through the adjusting screw.

A clearance of 1/8-inch, with 24 records and discs installed, must be maintained between the changer chassis and chassis shelf. The chassis is suspended from the shelf at four spring suspension mountings. At the bottom of each spring are two nuts. Loosening the lower lock nut makes possible adjustment of the top adjusting nut.

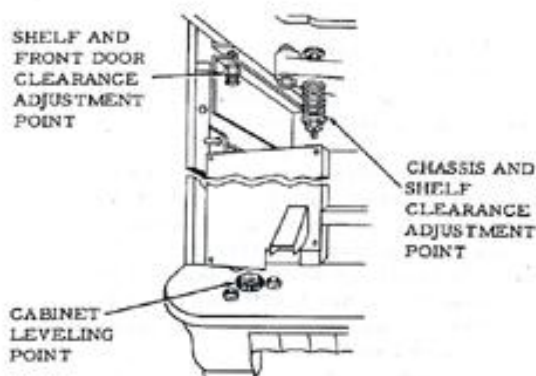


Figure 31- Leveling Adjustment

## TURNTABLE HEIGHT ADJUSTMENT

The proper record playing position is with the turntable lift cam at its highest point of elevation when the clutch disengages. To adjust the turntable height, loosen the set screw and locknut on



Figure 32-Turntable Height Adjusting Screw

the eccentric shoulder screw (see figure 32) and turn the shoulder screw to a position that will provide 3/32 to 1/8-inch from the top surface of the record to the lower edge of the stabilizer arm (see figure 33). Adjustment to this dimension will properly seat the point of the turntable shaft into the stabilizer arm bearing.



Figure 33-Record And Stabilizer Clearance

## RECORD TRAY STOP POST ADJUSTMENT

The stop post positions the record tray disc so the point of the turntable shaft enters the exact center of the tray disc. The bottom of the tray stop post is eccentric, allowing adjustment. To adjust, hold a tray against the post and raise the turntable manually to determine where the point of the shaft meets the record disc. Loosen the nut at the base of the stop post, beneath the top frame (see figure 34). Turn the post to a position where the center of the record disc is above the turntable shaft point with the tray against the post.



Figure 34-Record Tray Stop Post Adjustment

### tone arm mounting adjustment

The tone arm assembly is mounted on the mounting pin of the tone arm post assembly in a position which places the tone arm height adjusting screw in the approximate center of tone arm. The two set screws are then tightened to lock it in that position (see figure 35).

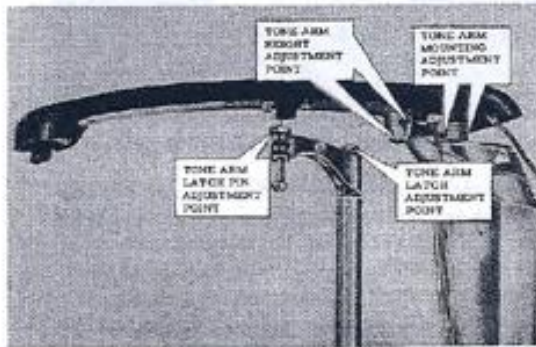


Figure 35-Tone Arm Adjustment

### tone arm height adjustment

The tone arm height should be adjusted so that the point of the needle clears the top record tray by 1/8-inch when the top tray moves to the stop post. The adjustment is accomplished by loosening the lock screw and positioning the height adjusting screw (see figure 35) to produce the proper tone arm height. After adjustment be sure to tighten lock screw.

### tone arm latch adjustment

When the turntable raises the record to its playing position, the point of the needle should contact the smooth outside rim of the record at a point 1/8-inch from the outer edge of the record. This adjustment is obtained by moving the latch pin arm (see figure 35) so that the tone arm latch will engage the latch pin to position the needle point 1/8-inch from outer edge of the record.

### tone arm latch pin adjustment

The tone arm latch must be raised above the latch pin when the record is lifted into playing position by the turntable. This is accomplished by loosening the latch pin lock-nut and adjusting the threaded pin (see figure 35) so that the tone arm latch clears the end of the latch pin by 1/16-inch.

### tone arm feed-in weight adjustment

The tone arm feed-in weight is provided to move the tone arm inward ONLY far enough for the needle to engage the feed-in groove (see figure 36). It is important that the phonograph be level before adjustment is made. Move the feed-in weight away from the chassis to produce greater feed-in action or toward the chassis for less feed-in action.

The feed-in action should cease before the needle reaches the playing groove of the record. A feed-in stop adjustment cam is provided for this purpose (see figure 36). It may be turned by loosening its binding screw.

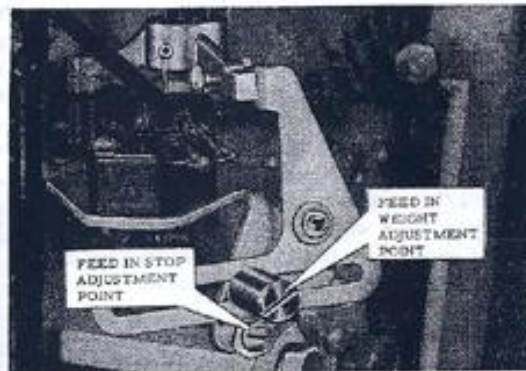


Figure 36-Tone Arm Feed-In Weight Adjustment

### selector segment gear adjustment

The selector segment gear rotates on an eccentric bushing (see figure 37). To regulate the mesh between the segment gear and the pinion gear on the selector shaft, loosen the hex-head machine screw which holds the bushing in place and turn the bushing until the desired mesh is obtained. Tighten the hex-head machine screw. Following adjustment of the bushing always move the selector segment gear through several cycles, as too close a mesh will cause the selector segment gear to bind in the raised position. Also make certain that the proper selector shaft travel has been maintained as turning the bushing will also affect this adjustment.

A complete cycle of the selector shaft assembly is 23/24 of a complete turn. When the selector shaft does not cycle 23/24 of a complete turn, adjust the round head screw on the segment gear lift plate (see figure 37). By

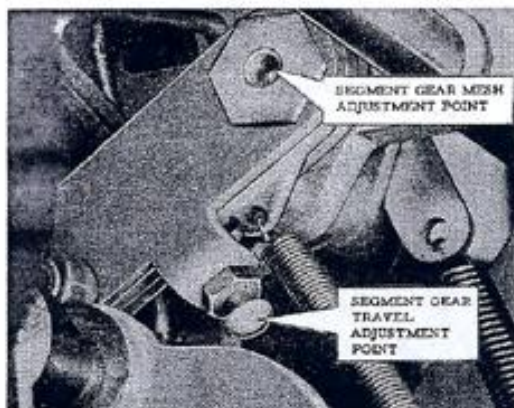


Figure 37-Selector Segment Gear Adjustment

loosening the locknut and turning the screw inward slightly, the travel distance of the segment gear and thus the travel of the selector shaft assembly and the star wheel will be increased. The proper adjustment is obtained when the rotary arm pin on the rotary arm assembly contacts the bevel of the correct tooth in the star wheel and turns the wheel and the shaft backward slightly.

#### Note

In order to start the motor without pulling a pin, plug the motor into a light socket in the junction box. This will start the phonograph free wheeling and make it possible to determine the proper cycling of the selector shaft.

#### TORSION SPRING ADJUSTMENT

The torsion spring on the selector shaft assembly must have six turns from a normal position and then be secured behind the spring stud on the selector drum. The selector shaft assembly is then rotated through the tension of the torsion spring and the segment gear and pinion. In some cases, in order to maintain a smoother action on the selector shaft assembly, it becomes necessary to wind the torsion spring an additional turn. Winding the torsion spring too tightly on the shaft will cause it to grip and stall the selector shaft.

#### RECORD TRAY SELECTOR BLOCK ADJUSTMENT

When operating properly the record tray selector block should move freely in the center

of the tray grooves and should stop in the exact center of the selected record (see figure 39). The tray selector rod is held to the bearing and link assembly by a cotter pin. To adjust the height of the block, remove the cotter pin and turn the rod in the block so as to increase or decrease its effective length. Make this adjustment with the rotary wheel locked in position by the rotary arm assembly. Set the block at both ascending and descending positions of the heart shaped selector cam so that it is never high or low enough to engage two trays at once.

If the selector block does not move freely in the tray grooves the tray take-out rod must be adjusted. Remove the cotter pin at the bottom plate and turn the rod in the knee action link to increase or decrease its effective length (see figure 39). The selector block should move up and down in the tray grooves without touching either edge of the grooves.

#### TRIP SWITCH AND TRIP CATCH ADJUSTMENT

An adjusting screw is provided in the trip arm and roller assembly on the end of the tone arm shaft for adjustment of the trip switch (see figure 38). Adjustment may be made by loosening the adjusting screw locknut and turning the screw in or out to a point where the trip switch will close when the tone arm and needle has moved into the eccentric trip groove of the record.

#### Note

Occasionally records will be encountered with faulty grooves which make it appear that the trip mechanism is out of adjustment. Be sure that normal records are used when checking the trip adjustment.

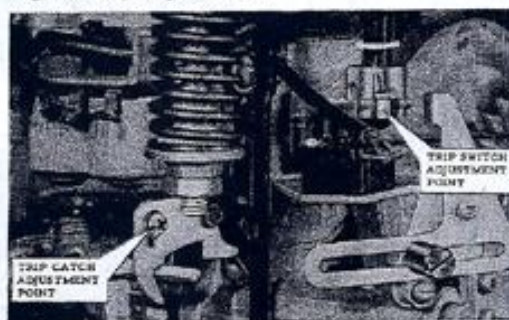


Figure 38-Trip Switch And Trip Catch Adjustment

When the trip arm adjusting screw moves the trip switch actuator far enough to close the switch, the trip coils are energized. Their armature moves upward and raises the adjustable trip catch. The catch should clear the trip support arm by 1/32-inch. Adjustment is accomplished by loosening two mounting screws in the catch (see figure 38).

#### RELEASE SWITCH ADJUSTMENT

The release of the trip support arm allows the arm, by spring loading, to open the trip coil release switch 1/32-inch. This switch should have a contact pressure sufficient to cause GOOD wiping action, but not enough to over-ride the spring load of the trip support arm.

#### CLUTCH ADJUSTMENT

The clutch trip arm assembly moving against the clutch cam forces the clutch pin out of a slot in the main worm wheel just as the turntable reaches the full height. This position is attained when the lift roller is at the top of the turntable lift cam (see figure 40).

The trip arm assembly is adjusted by backing off one pivot screw and taking up on the pivot screw at the opposite end of the shaft.

This permits movement of the trip arm assembly in either direction as the case may require in order that the clutch pin may be moved from the slot in the main worm wheel at the proper time. When positioned correctly,

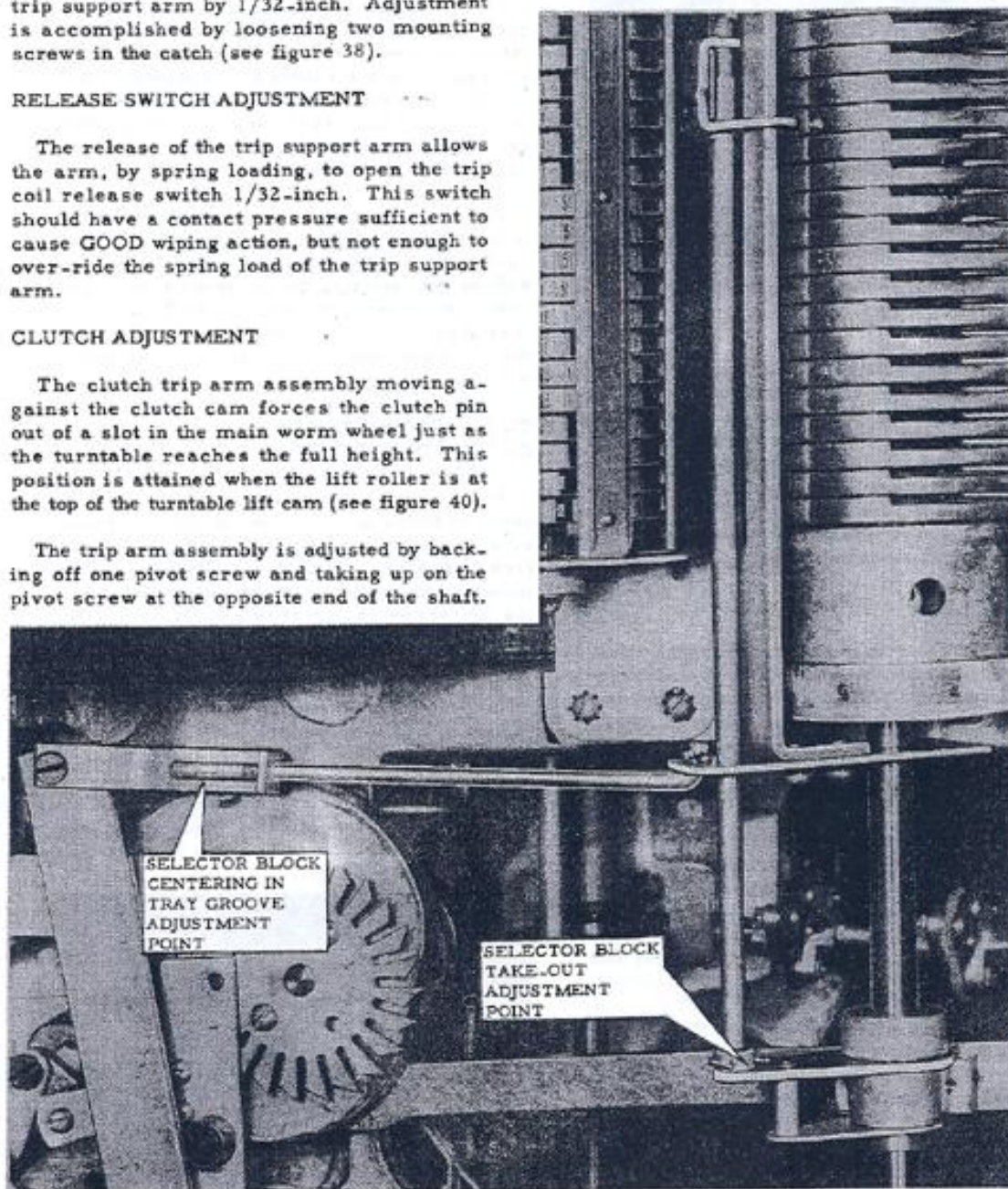


Figure 39-Record Tray Selector Block Adjustment

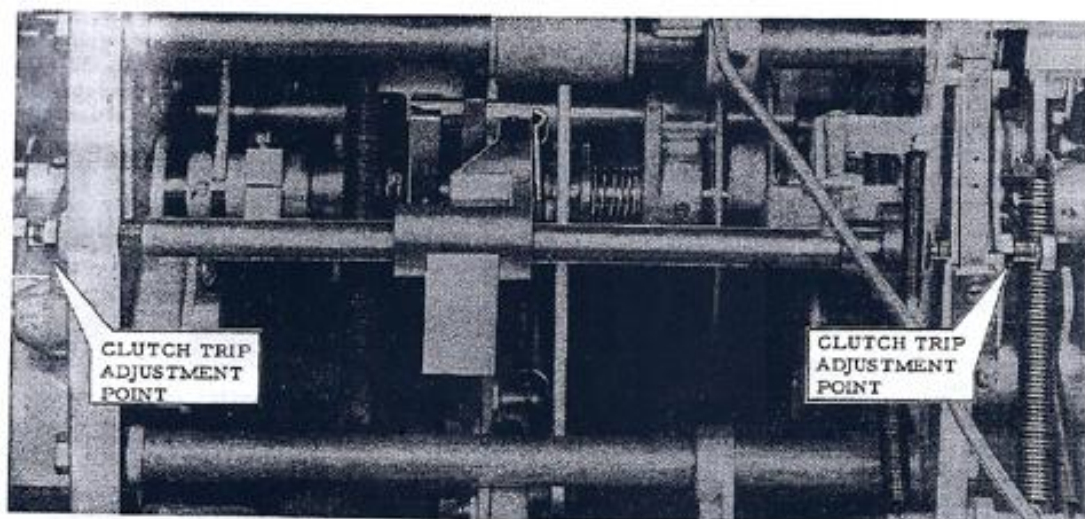


Figure 40-Clutch Adjustment

tighten the locknut on one screw and adjust the remaining screw to provide the shaft with approximately 1/64-inch end play. This prevents binding. Hold the remaining pivot screw and tighten the locknut.

#### tone arm return screw adjustment

The tone arm return screw which is actuated by the knee action lever at the rear of the record changer, should return the tone arm so that the latch moves across the latch pin and comes to rest 1/8-inch behind the pin. Adjustment is made by lengthening or shortening the effective length of the return screw (see figure 41).

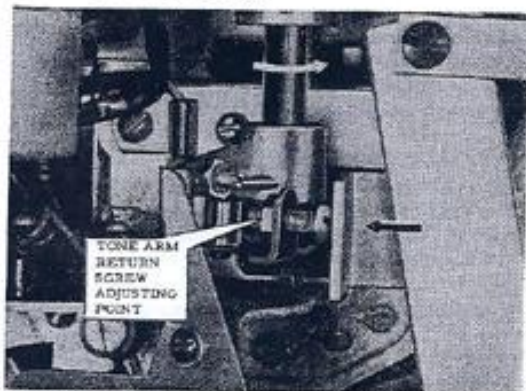


Figure 41-Tone Arm Return Screw Adjustment

#### ELECTRIC SELECTOR DRUM ADJUSTMENT

The electric selector drum is secured to the chassis front frame at THREE SLOTTED FITTINGS which permits positioning of the electric selector to obtain proper adjustment with relation to the selector arm (see figure 42). Loosen the three mounting bolts and nuts to position the electric selector drum. This should be done only when the rotary arm pin is locked in the star wheel. Definite clearance should be provided between the selected pin and the contacting face of the selector arm. Too much clearance between the selected pin and the arm may cause cancellation of two pins at the same time.



Figure 42-Electric Selector Drum Adjustment

### OVER-RIDE SWITCH ADJUSTMENT

As the selector arm resets the last selected pin, the wobble plate on the electric selector drum is moved forward, the center shaft actuating the over-ride switch. This switch makes and breaks an electrical circuit to the motor and amplifier, through the junction box. The throw of the arm which actuates the switch is regulated by an adjustable screw assembly secured to the center shaft (see figure 43). The arm is positioned by a hex nut on the screw assembly.

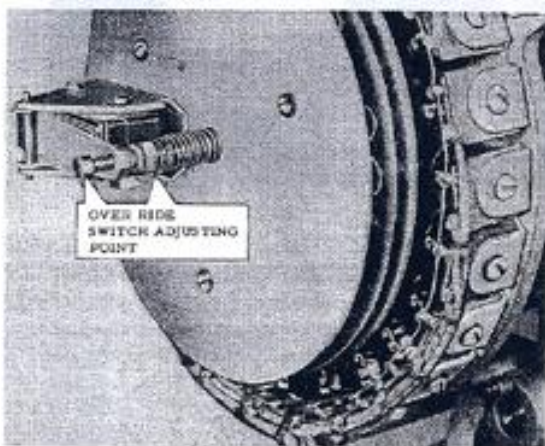


Figure 43-Over-Ride Switch Adjustment

### MOTOR CUT-OFF SWITCH ADJUSTMENT

The motor cut-off switch is attached to the front frame of the phonograph with two machine screws, the upper screw passing through an elongated hole. This permits adjustment of the length of throw of the switch arm, when the cancel cam roller strikes it.

The motor cut-off switch is in parallel with the over-ride switch and acts as a carry over in that it maintains a completed circuit to the motor and amplifier from the time the last selector pin is reset to the full stop position of the phonograph. This switch is opened by action of the cancel cam roller, so that the record tray just coasts into position in the record tray stack. This timing is accomplished by loosening the two set screws in the cancel cam and positioning the roller to open the switch at the time when the tone arm is latched the selected tray is returned to the stack and the rotary arm is locked in the selector wheel (see figure 44).

### MUTING SWITCH ADJUSTMENT

The muting switch is provided to cut-off

amplification during the selection cycle. It should be adjusted so that it has good wiping action when closed and should be opened 1/32-inch by the turntable lift cam and roller assembly when it is raised to the playing position.

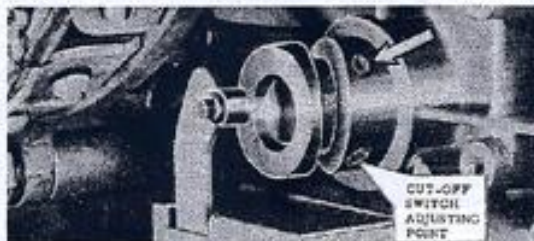


Figure 44-Motor Cut-Off Switch Adjustment

### COIN SELECTOR MECHANISM (See Figure 45)

If 25 cent size brass, lead, zinc, or german silver slugs are accepted, move the adjustment down. If it is moved too far, quarters will be rejected (see figure 45). To control the rejection of 25 cent size copper slugs, adjust the lower gauge. Move it in or out; if it is moved too far out, however, quarters will also be rejected.

The upper of the two 10 cent gauges controls the rejection of 10 cent size brass, lead, zinc, or german silver slugs. If slugs of this type are being accepted, move the gauge in. If it is moved too far in, however, dimes will be rejected. For copper slugs of the 10 cent size, adjust the lower gauge out to reject. If it is moved too far, dimes will be rejected.

No adjustment is necessary for the 5 cent coins. If nickels are rejected, clean all parts of the mechanism thoroughly with alcohol, gasoline, or carbon tetrachloride; wipe all parts dry. It should not be necessary to remove the magnets. However, if they are taken off, extreme care should be exercised so that each is put back in its original position.

When the coin selector is mounted and in a vertical position the coin return arm should move freely to its disengaged position. Be sure that the 10¢ return pin is entirely out of the 10¢ coin track. Adjustment is accomplished by moving the coin return coil on its two mounting screws in the coin register and changing the angle of the bend in the coin return arm of the slug rejector (see figure 45 and 46). Positioning of the coin selector over the coin chutes to the coin gate is effected by adjustment of the eccentric collar on the side of the coin selector.

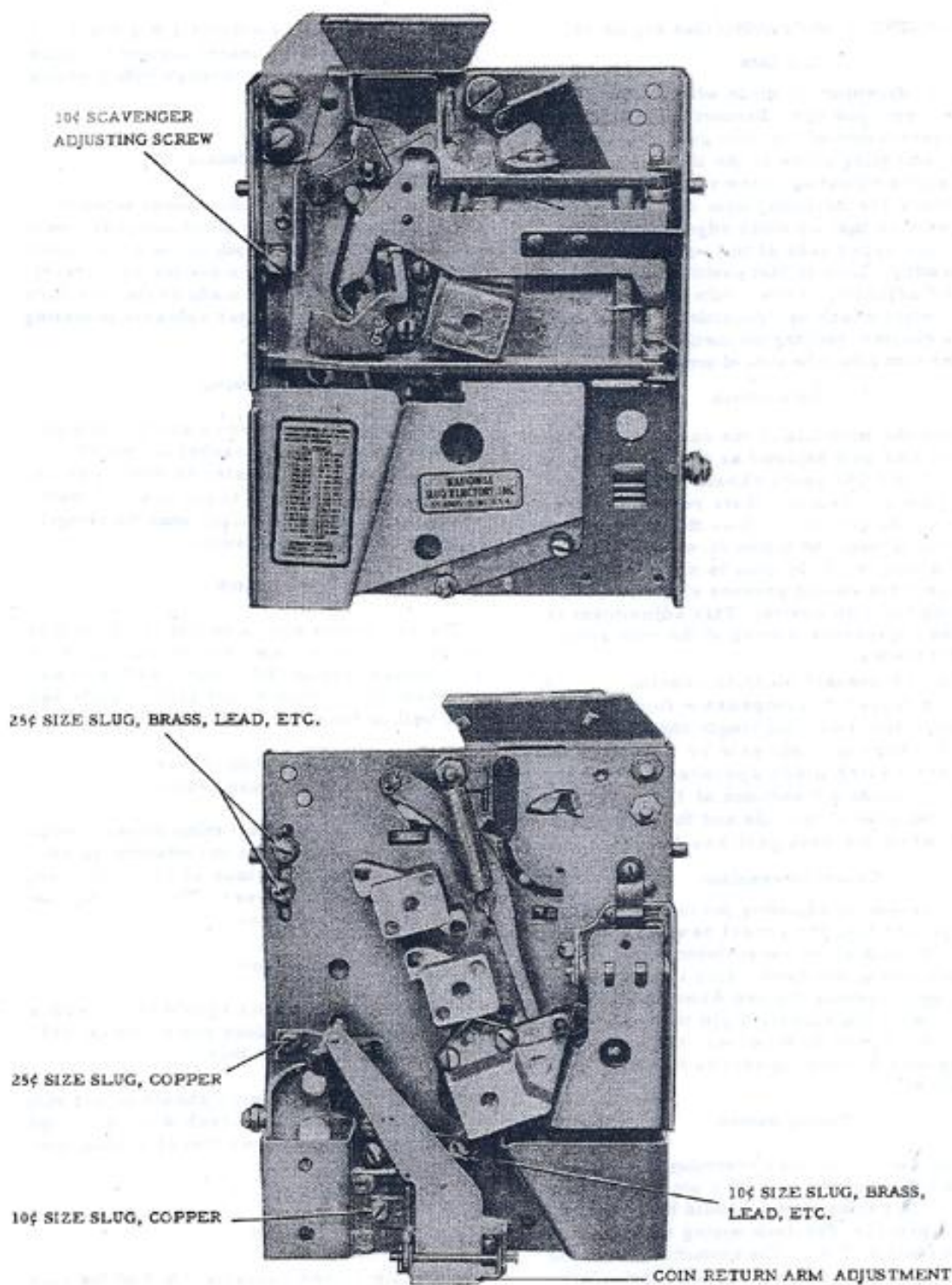


Figure 45.-Coin Selector Mechanism Adjustment

## COIN REGISTER MECHANISM (See Figure 46)

### Coin Gate

This adjustment is made with the motor in its "at rest" position. Remove the coin chute for observation of the coin gate and access to the adjusting screw in the link bell crank. Loosen the adjusting screw in the bell crank and move the adjusting arm to position the coin gate so that its outer edge is 1/16-inch from the upper side of the square boss on the casting. Lock in that position by tightening the adjusting screw. After making this adjustment check by depositing a dime and then a quarter, rotating the mechanism manually for each coin to be sure of proper operation.

### Coin Switch

When the motor is in the cut-off position, and the coin gate adjusted as described above, the 10¢ and 25¢ coins should be held on the coin gate and depress their respective coin levers sufficiently to close the coin switch contacts firmly and follow through with good wiping action. A 5¢ coin is not held by the coin gate but should produce a like action in passing its coin switch. This adjustment is obtained by careful setting of the coin switch contact blades.

The 10¢ contact blade is provided with a release finger to compensate for the light weight of that coin. Its length should be such that it clears the coin gate by 1/16-inch as the coin switch blade operates. Its shape should provide a clearance of 1/16-inch between the edge of the coin and the coin switch blade when the coin gate has fully opened.

### Cancel Mechanism

The eccentric adjusting pin is provided to engage and trip the cancel pawl 1/32-inch pass the tooth of the escapement wheel after cancellation of one tooth. This is made possible by loosening the two Allen set screws and turning the eccentric pin to the proper position. It may be necessary to loosen the timing switch mounting screws to obtain this adjustment.

### Timing Switch

When the cancel lever assembly is fully retracted against the eccentric pin as adjusted above, the timing switch should be in a position to provide .006-inch wiping action of the closed contacts 5 & 6. The contact arm assembly should have a minimum of .005-inch clearance at its stop bracket. The timing switch adjustment is obtained by loosening the two

mounting screws. Contacts 1 & 2 and 3 & 4 should close when the cancel plunger is pulled down and should follow through with a wiping action of .010-inch.

### Cancel Solenoid

When the plunger of the cancel solenoid is at the bottom of its stroke the cancel pawl should have passed one full tooth of the escapement wheel and 1/2 of a tooth more for over travel. This adjustment may be made at the four slots and screws in the cancel solenoid mounting bracket.

### Release Switch

The two mounting screws and the long slot in the release switch bracket permit the release switch to be adjusted to open after engagement of cancel pawl in the first full tooth and to have a gap of 1/32-inch when the plunger is at the bottom of its stroke.

### Key Switch

The key switch blades should be set so that on the first half escapement the contacts have a maximum gap of .005-inch. With this adjustment the contacts will close firmly and wipe well on the second half of the escapement.

### Full Cycle Anti-Cheat Relay Release Switch

The full cycle anti-cheat relay release switch is adjusted by means of its two mounting screws. The contacts should close at 2/3 of the cam action in raising the lever. They should open at 2/3 of the return travel.

### Relays

Normally open points should be set with a minimum gap of .015-inch and minimum contact over travel of .010-inch.

Normally closed points should be set with a minimum gap of .015-inch when open and should have contact over travel of minimum .006-inch.

### Note

Normally closed contacts 3 & 4 of the coin isolation relay should have a minimum gap of .006-inch when open.

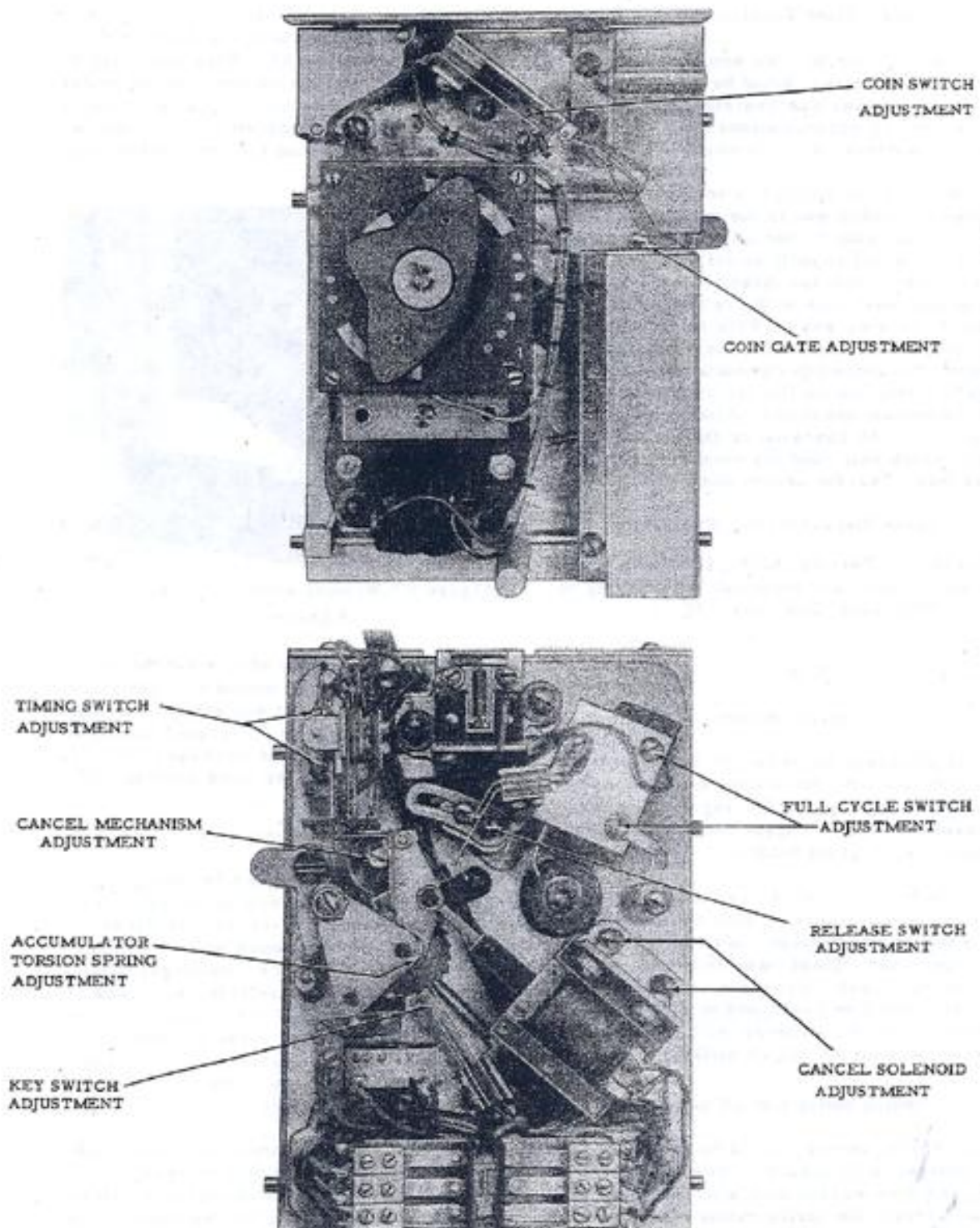


Figure 46.-Coin Register Mechanism Adjustment

### Accumulator Torsion Spring

The normal tension of the accumulator ratchet wheel torsion spring should be two turns when 21 accumulations are registered, and three turns when all accumulations have been canceled. Adjustment is accomplished as follows:

With the torsion spring in a relaxed condition, engage its hooked end in the anchor provided for it on the under side of the escapement. Raise the wheel slightly on its shaft and turn in a counter-clockwise direction until the stop pin on the under side of the ratchet wheel has passed the stop post. With this point as a starting place, turn the escapement wheel counter-clockwise two complete turns and engage the stop pin on the far side of the stop post to prevent unwinding. After assembling, 21 plays can be canceled on the accumulator wheel which will wind the torsion spring the third turn. Test for proper operation.

Three Plays-25¢, One Play-10¢

Kit No. 86, Part No. 50586, is provided with full instructions and material for changing to Three Plays-25¢, One Play-10¢.

### PROGRAM SELECTOR

#### Program Holders

The program holders are adjustable for alignment on their drive hubs and pivot studs. In the end plate at the driving end are three elongated holes to adjust the stopped positions of the program holder.

To position the holder concentric with its axis three outer screws with thick positioning washers are provided on each end of each program holder. These washers are the mounting for the plastic program carriers. The carriers should be positioned by shifting these washers until the holders will rotate in the selector without binding or striking.

#### Winding Motor Cut-off Switch

The spring motor should be wound by the 110 volt winding motor to provide between four and five escapements of the program holders before the spring motor unwinds when all current is off. After removing the back cover, this adjustment is accomplished with the current on, by backing out the motor cut-off switch actuating screw on the cut-off yoke and allowing the motor to wind the spring to

a stalled position. Then turn the adjusting screw in (clockwise) until the motor circuit is opened (see figure 47). This point may be observed by watching for the winding motor to lose its torque. Turn the cut-off adjusting screw one more complete turn (clockwise) for safe over-ride and lock in position with the lock nut.

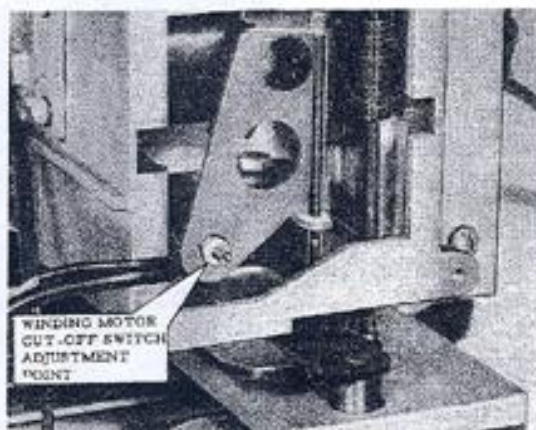


Figure 47-Winding Motor Cut-Off Switch Adjustment

After performing this adjustment the spring motor will usually be wound so tightly that the program escapement will not operate when the "Press to Change Program" button is pressed. It will then be necessary to back off the winding shaft by hand until the bind is relieved.

#### Program Change Key

The travel of the "Press to Change Program" key is determined by an adjustable stop. By loosening two screws (see figure 48) the stop may be positioned so that the program change key is correctly aligned in its rest position with the selector keys and so that the rest position of the program change key is controlled by the stop and not by the key coming to rest against the front trim casting. Tighten the screws after the correct position has been obtained.

After the above adjustment has been made, it will usually be necessary to readjust the position of the program change key extension lever, by loosening the machine screw shown in figure 48 and positioning the lever so that correct escapement action results when the program change key is operated. This action is correct when the program change key-extension lever has 1/16-inch overtravel

after escapement. Tighten the screw after the correct position is obtained.



Figure 48-Program Change Key Adjustments

#### Note

The above described adjustments of the program change key stop and the program change key escapement lever will be necessary only in exceptional cases as when the program selector has been disassembled for replacement of parts, or when keys have been replaced. In the event that either of these adjustments has been altered, it will usually be necessary to compensate by adjusting the position of the interlock bracket assembly, the interlock bracket adjusting screw and the release switch adjusting screw as described in the following paragraphs.

#### Interlock Bracket

The interlock bracket assembly is mounted between two cone point screws which may be adjusted to position the interlock bracket laterally so as to properly engage the program change interlock lever and to operate the release microswitch (see figure 49). When the bracket has been properly positioned and the lock nuts secured, there should be approximately 1/64-inch end play between the ends of the cone point screws and the ends of the interlock shaft.

The program change interlock lever should clear the interlock arm on the interlock bracket assembly by 1/8-inch when all keys are at rest (see figure 49). This adjustment is accomplished by turning the adjusting screw on the interlock bracket assembly (lower of two screws, see figure 49) clockwise to increase the clearance and counterclockwise to decrease the clearance. Any alteration

in this adjustment must be compensated by readjusting the release switch adjusting screw.

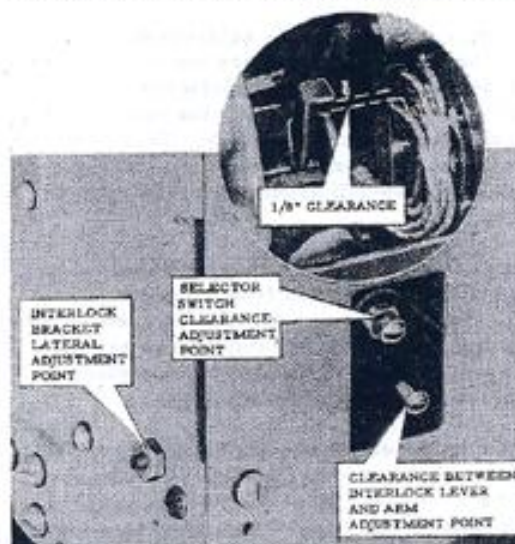


Figure 49-Interlock Bracket Adjustments

#### Release Switch

The release switch should close when any selector key is depressed to the end of its stroke. This adjustment is made by adjusting the release switch adjusting screw (see figure 49) to actuate the switch when the front edge of the front opening on any selector switch

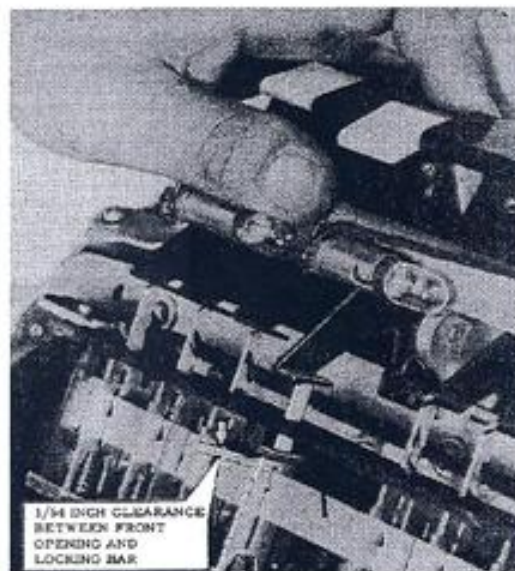


Figure 50-Release Switch Adjustment

plunger is 1/64-inch from the selector switch locking bar (see figure 50).

If after performing this adjustment the selector keys and switches are not uniform in their action in actuating the release switch, it will be necessary to adjust the position of the selector switch assembly. This is accomplished by loosening six screws holding the selector switch assembly to the support flange.

The selector switch assembly should then be positioned so that the front ends of the selector switch plungers are spaced 1/64-inch (maximum) from the selector key levers and the interlock bracket assembly rests uniformly against the rear ends of the plungers.

If a considerable change is necessary in the position of the selector switch assembly, it may be necessary to repeat the adjustment of the interlock bracket adjusting screw to assure correct clearance between interlock bracket and interlock arm and to repeat the adjustment of the release switch adjusting screw to assure the actuation of the release switch at the end of the selector key stroke.

#### Idler Gear

There are four gears in the gear train which operates the program holders, number rollers, and contact arm assemblies. This gear train is driven by the spring motor gear. The Parts Catalog section of this Handbook shows the positions of these gears when they are assembled. The idler gear is adjustable through a shoulder bushing and machine screw,

to properly mesh with the program holder gear and the number roller gear. The correct adjustment is obtained when full meshing of the idler gear with the other two gears is accomplished without back lash or binding. This is accomplished by spacing the gear teeth to not more than .005 inch.

Adjustment of the idler gear should only be necessary in cases where the program selector gear box has been disassembled for replacement of parts, etc. Care should be taken that the two lock washers are in place on either end of the bushing.

#### Contact Moulding

An adjustable key has been provided on the two contact mouldings to compensate for wear or lag in the position of the contact arm and spacer assembly. It may be adjusted by moving the mechanism by hand and checking the position of the contact arm and spacer assembly with a continuity tester. The blades should be squarely on the contact pins when selection is made.

#### Program Selector Positioning

At the lower front sides of the program selector assembly are plates on which the program selector rests when installed in the front door. Loosening three machine screws holding each plate makes it possible to position the plates so that the program selector will be correctly centered when installed. Tighten the screws after adjusting the position of the plates.