WURLITZER 1800

Service Manual & Parts Catalog

LEGEND

Pages

MODEL 1800 DESCRIPTION AND SPECIFICATIONS

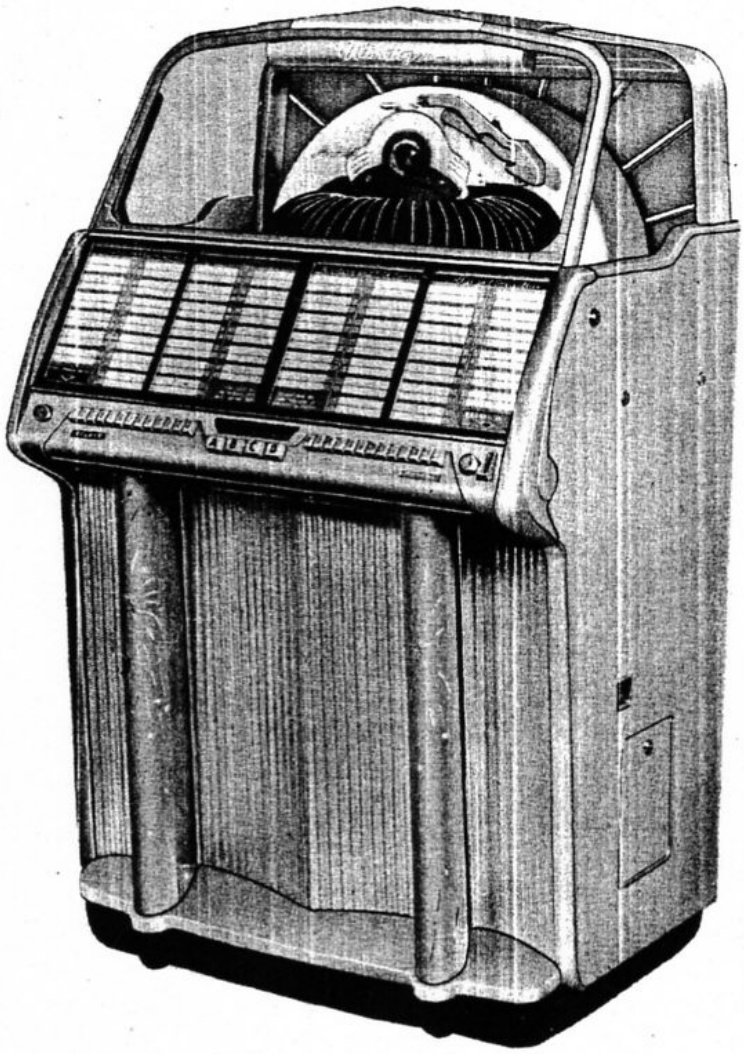


Figure 1

The Wurlitzer Model 1800 High Fidelity phonograph (Figure 1) is available in a selection of new 1955 sky colors, Dawn Mist, Horizon Blue, Sunset Red or Midnight Black.

Four removable plastic title strip holders are mounted in the new chrome finished selector panel located just above the row of large, white, edge-lighted selector buttons. Each of the four title strip holders has spaces for thirteen double title strips or a total of twenty-six per holder. The entire selector panel tilts forward and may be easily removed for quick accessibility to the selector switch mechanism.

The Carousel Record Changer is completely visible through a full width window, slanted to eliminate reflections and framed with chrome plated steel. This window lifts up and is held open by a fall support, making it easy to remove or replace records in the entire record carrier.

The record changer is constructed in four major sections. Each section may be readily removed from the cabinet for service without taking out the entire changer (see Section 6 of this manual.) Or the entire changer may be easily removed and will stand unsupported on its base for service.

This Model 1800 has two 12-inch bass woofers to cover the low range frequencies and one 12-inch mid-range speaker, plus a treble tweeter to cover the high range. These speakers are positioned in the cabinet to diffuse the sound over a full 180° arc. Wurlitzer's Dynatone Amplifier incorporates built-in, automatic volume level control, dual-tone controls and fader control plus a higher output transformer with more power for auxiliary speakers.

SPECIFICATIONS – – MODEL 1800

DIMENSIONS
Height – 55¼" Depth – 27-3/8"
Width – 32½" Weight – 309 lbs.
Packed for shipment – 379 lbs. approx.

COIN EQUIPMENT
Single coin entry 5-10-25¢. Three-in-one magnetic slug rejector. New simplified coin register mechanism. On-off automatic coin return.

RECORD CHANGER
Provides 104 selections from 52 seven-inch 45 RPM records. Playmeter included.

SOUND SYSTEM
Includes pre-amp automatic level control, volume control, dual tone controls and fader control for auxiliary speakers.

TONE ARM
Single, low pressure tone arm with Zenith Cobra Cartridge. Plays both record sides.

WATTAGE
Complete phonograph, 285. Standby, 120 watts.

LIGHTING
Three 20-watt fluorescents. One 14-watt fluorescent.

NUMBER OF SELECTIONS
104

TYPE OF RECORD PLAYED
Standard seven-inch 45 RPM, and seven-inch 45 RPM Extended Play.

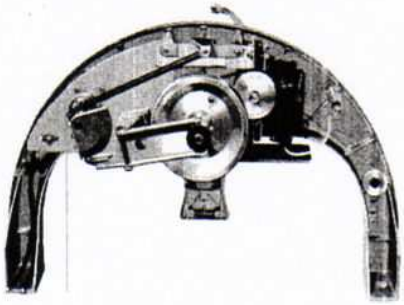
CABINET FINISH
Dawn Mist Sunset Red
Horizon Blue Midnight Black

REMOTE
New 104-selection wall box. Model 5207, used in conjunction with Model 257 Impulse Stepper.

AUXILIARY SPEAKERS
Will use any present Wurlitzer Speaker.

TUBE COMPLEMENT
1 type 5U4GA, 1 type 6J5, 2 type 6L6G, 2 type 6SJ7, 1 type 12AX7, 2 type 12BH7.

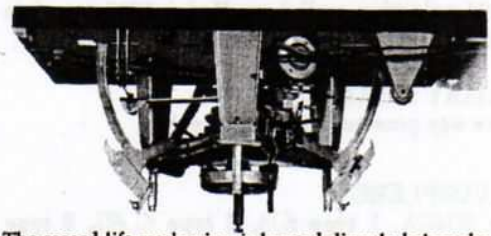
SIMPLEST CHANGER EVER OFFERED ON A MULTI-SELECTION PHONOGRAPH



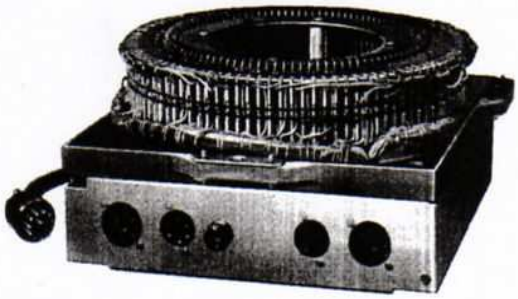
Each record has its own Playmeter registering up to 60 plays.

Semi-circular arch casting houses turntable motor, serves as a mount for tone arm and actuating mechanism. Turntable is flywheel balanced to assure accurate revolutions per minute.

Carousel record carrier always revolves clockwise. Each of 52 sections holds a record and has its own Playmeter. Entire carrier mounts on the largest star wheel ever used on a juke box assuring accurate selection. The record carrier has a release lever that enables the Carousel to free wheel for loading or record changing.



The record lift mechanism is located directly below the record carrier. Consisting of a single cam and two clutches, which operate the record lift arms and the tone arm position, this mechanism is actuated by a single reverse rotation direct current motor.

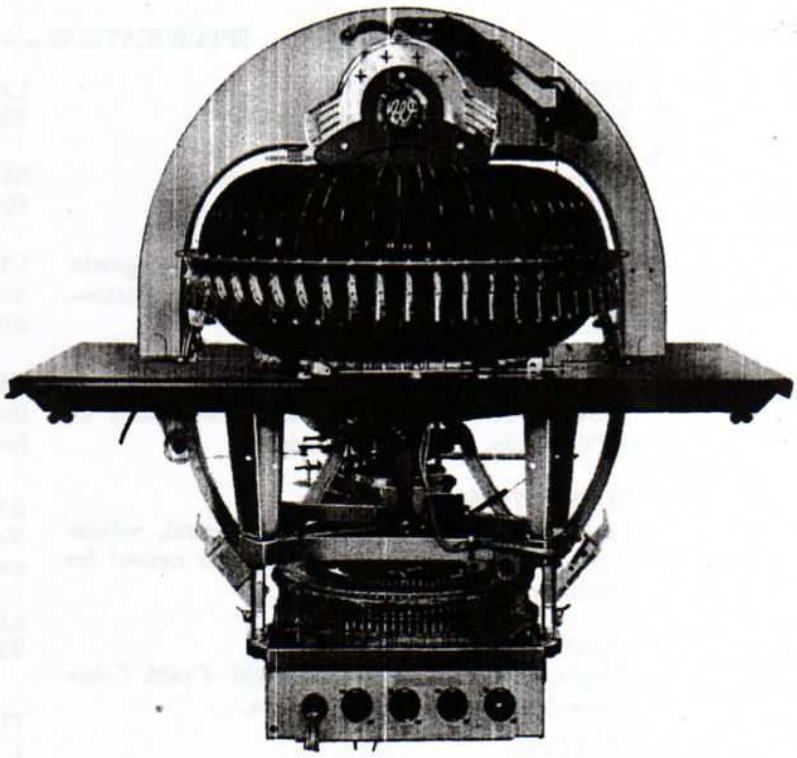


Suspended horizontally below the record lift mechanism is the selector drum and junction box. This selector unit completes the simplest mechanism ever offered on a multi-selection phonograph.

THE MODEL 1800 FEATURES the FAMOUS and PROVEN

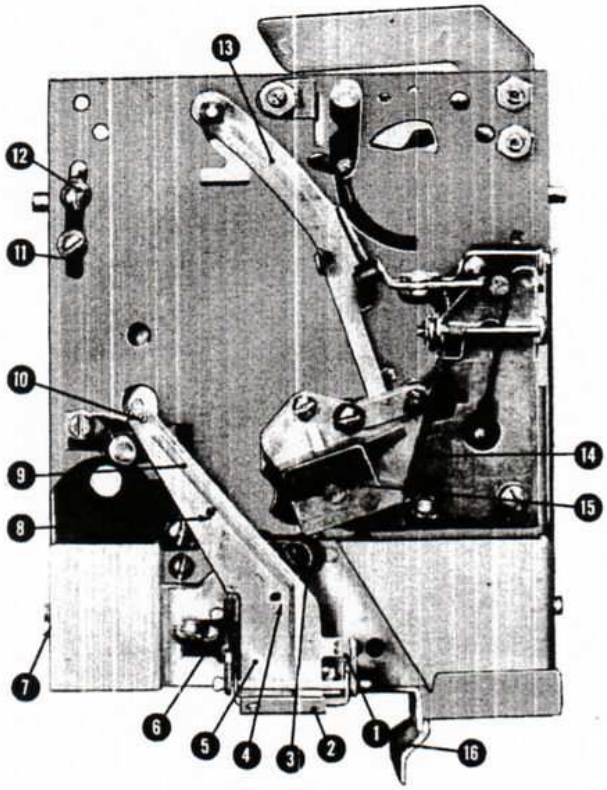
Wurlitzer

CAROUSEL RECORD CHANGER



This fine Wurlitzer Phonograph features the interest-intriguing, play-promoting Carousel Record Changer. Utilizing one tone arm, one Cobra Stylus and one turntable direction, it plays vertically both sides of 52 seven-inch records.

It's a super-simple changer, easily removed and able to stand unsupported on its base for service. Its colorful appearance and amazing action proved the greatest play stimulators ever introduced on an automatic phonograph. Proved on thousands of high-earning Wurlitzers last year, you can depend on the Carousel Record Changer for trouble-free operation, more play appeal — which means increased take.

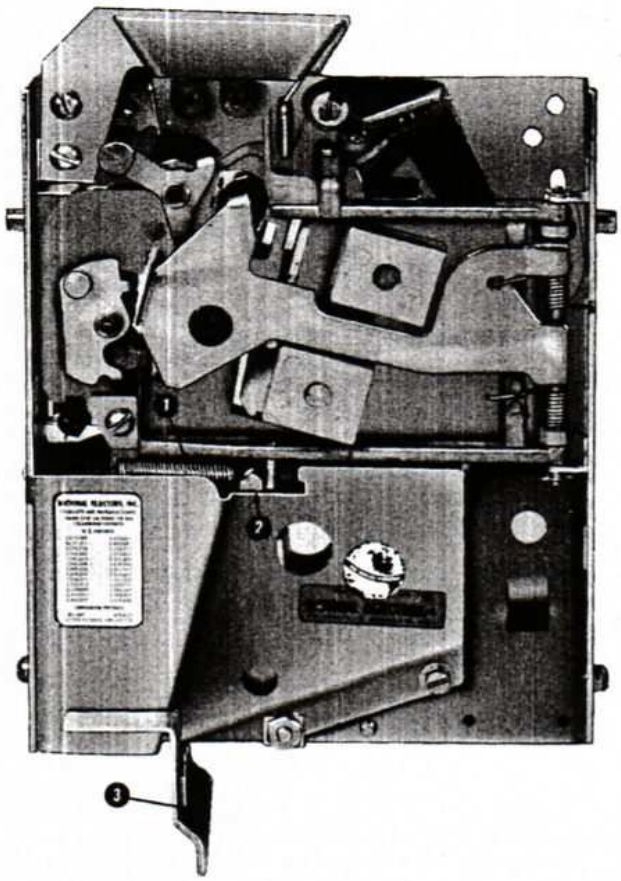


1. Stop Tab
2. Actuating Tab
3. 10¢ Size Slug, Brass, Lead, Zinc, or German Silver
4. 10¢ Return Pin
5. Coin Return Arm
6. 10¢ Copper Slug
7. Mounting Lug
8. 5¢ Return Pin
9. 5¢ Coin Track
10. 25¢ Return Pin
11. Wiper Blade Stop
12. 25¢ Size Slug, Brass, Lead, Zinc, or German Silver
13. Upper Blade
14. 10¢ Runway
15. 10¢ Magnet
16. Anti-Cheat Bracket

Figure 8. Slug Rejector With Anti-Cheat Bracket

9. SLUG REJECTOR

An anti-cheat bracket, part number 63262, has been added to the slug rejector (Fig. 8). However, the operation of the slug rejector on the Model 1800 Phonograph remains the same as that described on pages 1 through 3 of this section.



1. Nickel Return Spring
2. Nickel Pendulum
3. Anti-Cheat Bracket

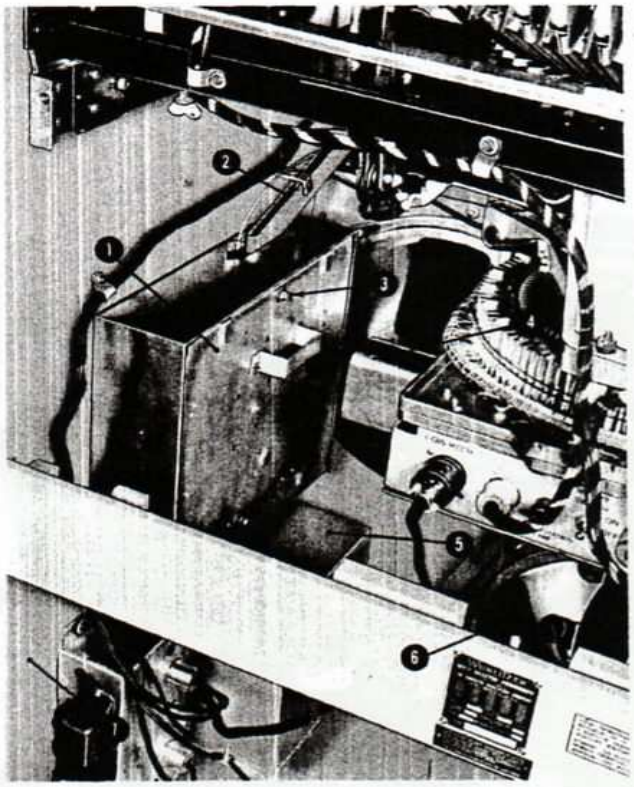
Figure 9. Slug Rejector – Nickel Return Spring

10. ONE PLAY, DIME

Where the 10¢ play is in operation, a nickel return spring is installed on the Model 1800 Phonograph. This holds the pendulum in the nickel coin track and automatically returns each nickel. One end of the nickel return spring is connected to the short lever on the nickel pendulum. The other end attaches to the upper left corner of the slug rejector cover (Fig. 9). The nickel return spring may be easily removed to return the operation to a nickel play.

11. ONE PLAY, 2 NICKELS

This may be accomplished in accordance with National Slug Rejectors, Inc. SERVICE BULLETIN "Instructions for Converting a Three-in-One Rejector to Two Nickel, One Dime or Quarter Operation".



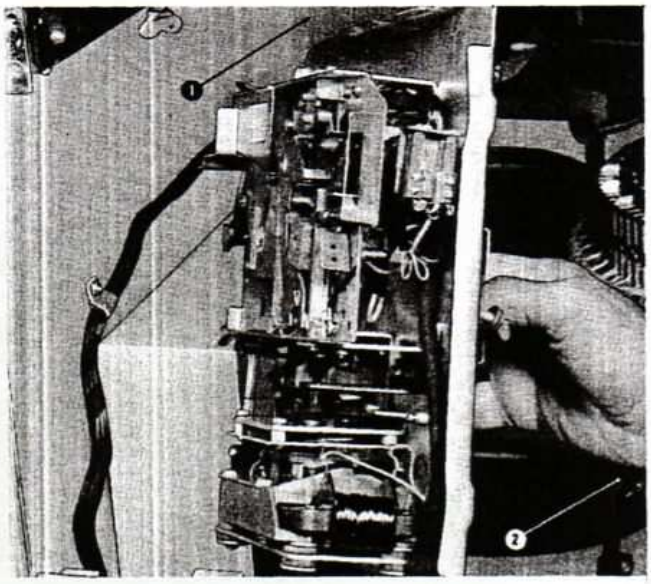
MODEL 1800 COIN REGISTER MECHANISM

1. Coin Register Mechanism
2. Coin Chute
3. Retaining Screw
4. Speaker, Low Range
5. Coin Bag Housing Assembly
6. Speaker, Mid Range
7. Cabinet Side Wall

Figure 1. Coin Register Mechanism Installed in Cabinet

1. GENERAL DISCUSSION

This unit is mounted on the inside right wall of the phonograph cabinet. The coin register mechanism receives coins from the slug rejector and registers credits on the coin counter according to denomination of coin. It also cancels one credit as each selection is made and keeps a record of the credits still due. (Electrically it is part of the selector system. For electrical sequence of operation see Section 12, Pages 71 through 91 of this manual).



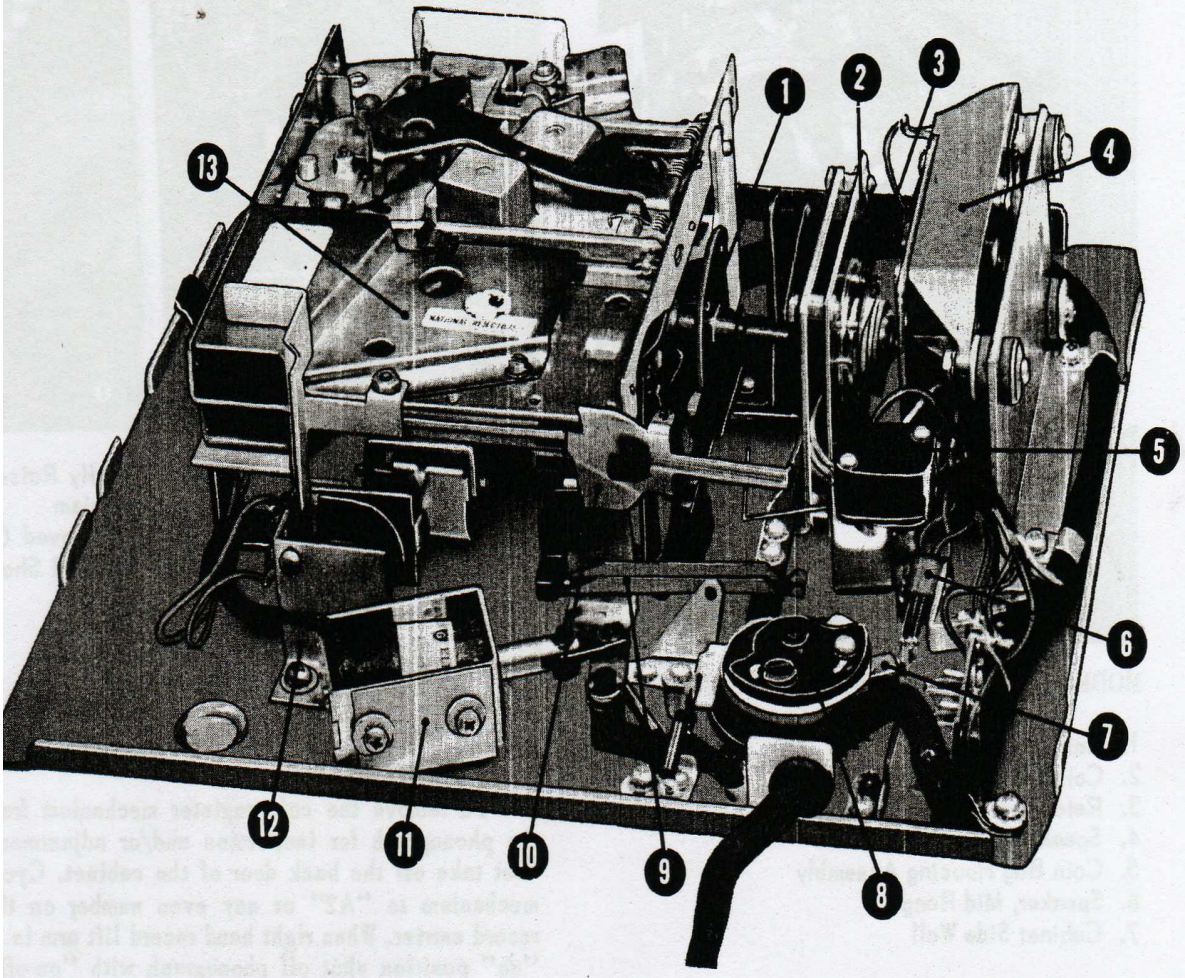
1. Record Lift Arm Should be Mechanically Raised To Remove The Coin Register Mechanism
2. Coin Mechanism Plug Should Be Removed Or Line Switch Should Be "Off" To Avoid Short Circuits

Figure 2. Removing Coin Register Mechanism From Cabinet

2. DESCRIPTION

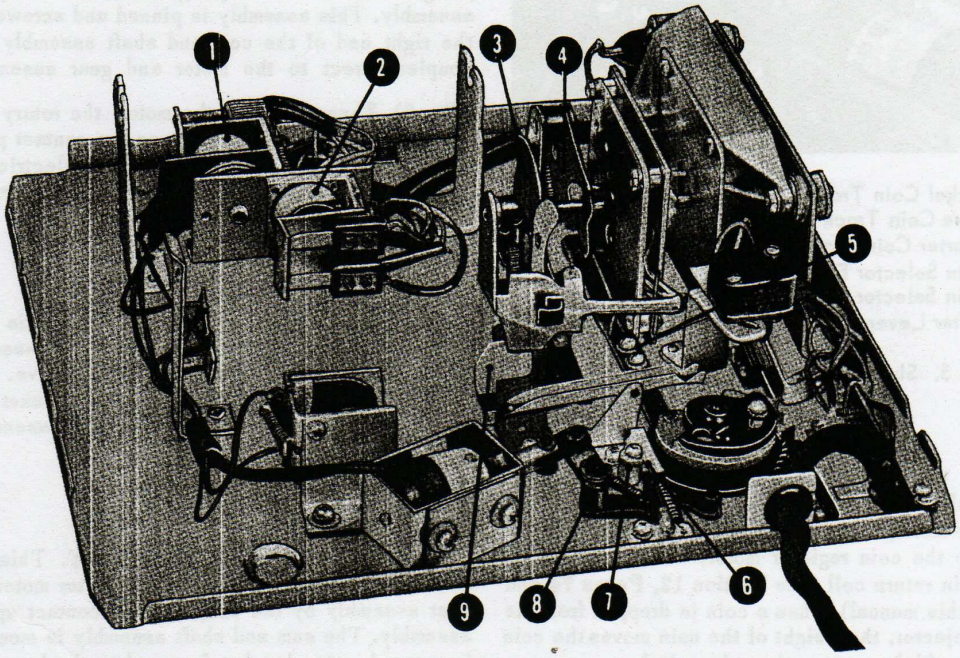
To remove the coin register mechanism from the phonograph for inspection and/or adjustment; first take off the back door of the cabinet. Cycle mechanism to "A2" or any even number on the record carrier. When right hand record lift arm is in "up" position shut off phonograph with "on-off" switch located on back of amplifier at rear left side of cabinet. Unplug the coin mechanism cable from the junction box (see Fig. 2). Remove the retaining screw, grasp handle and lift out the coin register mechanism.

The coin register mechanism consists of the coin switch, key switch, coin register motor and gear assembly, rotor contact arm assemblies, contact plate assembly, cam and shaft assembly, coin counter mechanism, coin return coil, cancel solenoid and coin switch paddle (see Fig. 3 and 4).



1. Cam Shaft Assembly
2. Contact Plate
3. Rotary Contact Arm Assembly
4. Motor and Gear Assembly
5. Coin Switch
6. Key Switch
7. Key Switch Trip Plate
8. Coin Counter Assembly
9. Coin Selector Lever
10. Coin Switch Paddle
11. Cancel Solenoid
12. Coin Return Relay
13. Slug Rejector

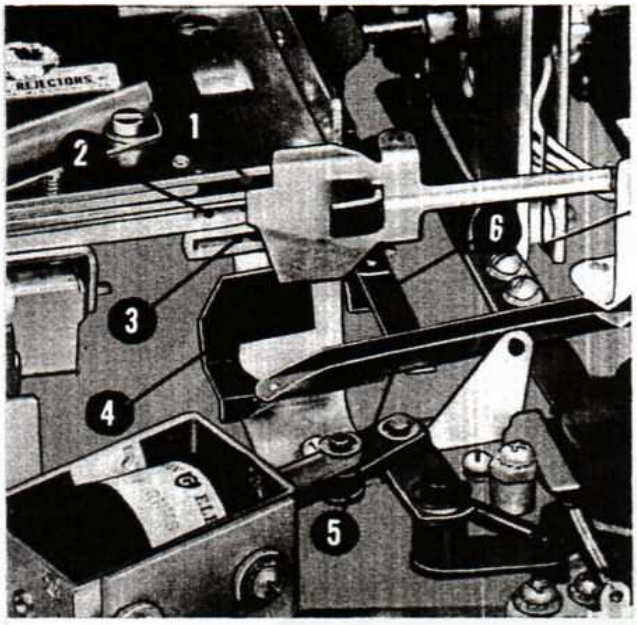
Figure 3. Coin Register Mechanism with Slug Rejector Attached



1. Pulse Relay
2. Set-up Relay
3. Coin Counter and Coin Drop Cam
4. Yielding Linkage, Coin Counter
5. Coin Counter Actuating Link
6. Shield, Cancel Pawl and Counter Wheel
7. Cancel Pawl Eccentric Stop
8. Cancel Lever and Pawl Assembly
9. Coin Selector Feeler

Figure 4. Coin Register Mechanism with Slug Rejector Removed

NOTE: Exploded views of the coin register mechanism will be found in Section 11, page 137 of this manual.



1. Nickel Coin Track
2. Dime Coin Track
3. Quarter Coin Track
4. Coin Selector Feeler
5. Coin Selector Lever
6. Lifter Lever, Coin Selector Lever

Figure 5. Slug Rejector – Bottom View

a. COIN SWITCH, located beneath the contact plate assembly (Fig. 3). This single-pole, double-throw, microswitch controls the initial circuit to the coin register motor, and the circuit to the coin return coil (see Section 12, Pages 74 and 75 of this manual). When a coin is dropped from the slug rejector, the weight of the coin moves the coin paddle which operates the coin switch.

b. KEY SWITCH. This is a single-pole, double-throw switch located below the coin switch (Fig. 3). As the coin counter disc turns, the key switch trip plate allows the key switch to close. This switch then remains closed until the last credit on the coin counter is used.

c. FULL CYCLE SWITCH. On the Model 1800 Phonograph the rotary contact arm assembly and the rotary contact plate (Fig. 3) assume the function of the full cycle switch. These contacts complete an independent circuit to the coin register motor, and keep the motor running until the end of of the cycle.

d. COIN REGISTER MOTOR AND GEAR ASSEMBLY. This unit (Fig. 3) drives the cam and shaft assembly and the rotary contact arm assembly through one complete cycle for each coin deposited. The motor is operated by 24-volt A.C.

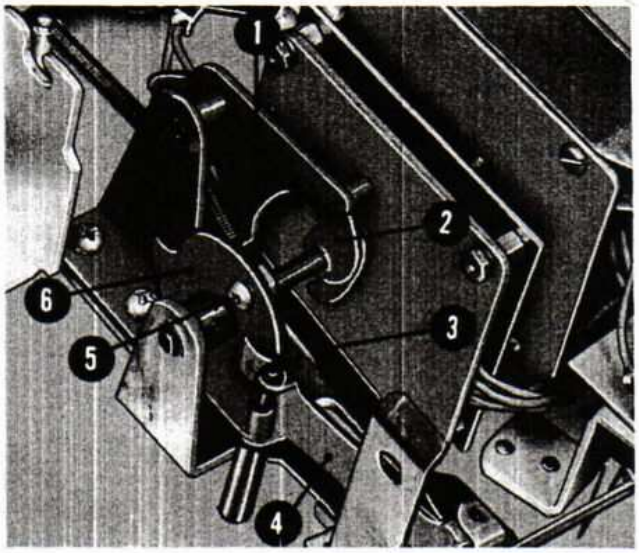
e. ROTARY CONTACT ARM ASSEMBLY (and Coupling). The rotary contact arms, with the coupling are called the coupling, insulator and spring assembly. This assembly is pinned and screwed to the right end of the cam and shaft assembly and coupled direct to the motor and gear assembly, (Fig. 3). When turned by the motor, the rotary arm assembly contacts the patches on the contact plate and make or break the circuits of the electric selector system. (See Section 12, Pages 71 through 91 of this manual).

f. CONTACT PLATE ASSEMBLY. This is a component of the contact plate and cable assembly which carries the circuits mentioned above. The contact plate is mounted on the same bracket and bushing assembly as the cam and shaft assembly (Fig. 3 and 4).

g. CAM AND SHAFT ASSEMBLY. This assembly is connected to the coin register motor and gear assembly by the coupling and contact spring assembly. The cam and shaft assembly is mounted in a two bearing bracket fastened to the base and aligned with the motor drive shaft, (Fig. 6).

As stated in paragraph f, this bracket also serves as a mounting for the rotary contact plate. From left to right, as seen in Figure 6, the functions of the cams are as follows:

(1) COIN SELECTOR LIFTER LEVER CAM AND SCREW (Coin Drop) This cam is the first one on the inside of the mounting bracket, moving from left to right in Fig. 6. The cam actuates the coin selector lifter lever. The 6-32 screw in the side of the cam operates the coin paddle mounting bracket to release the coin from the slug rejector.



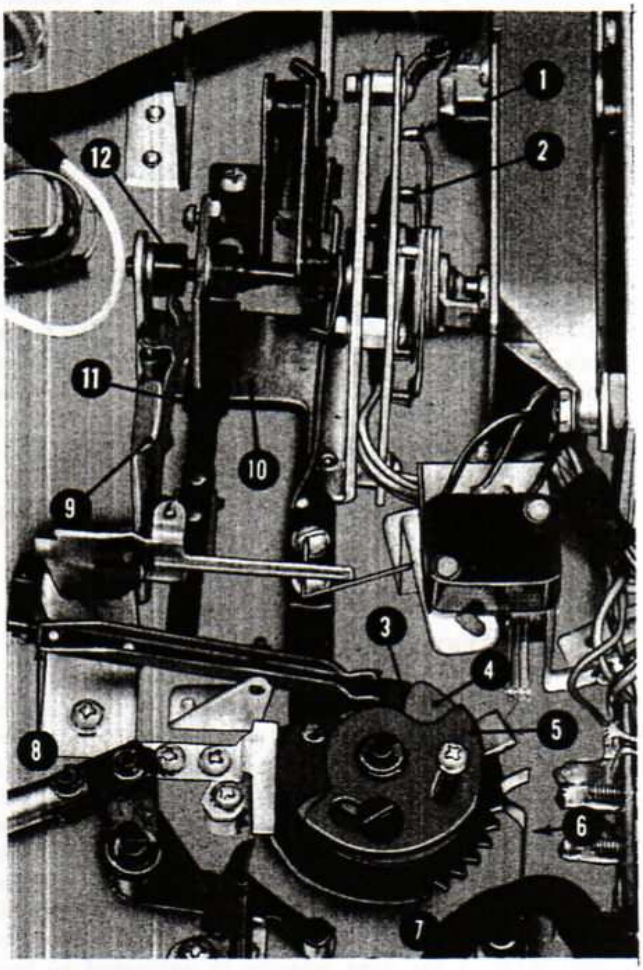
1. Yielding Linkage, Coin Counter
2. Counter Wheel Cam
3. Coin Counter Link
4. Coin Selector Lifter Lever
5. Coin Drop Actuating Screw
6. Cam, Coin Selector Lifter Lever

Figure 6. Cam and Shaft Assembly

(2) COUNTER WHEEL CAM. This is the last cam on the shaft (Fig. 6) and it is mounted next to the mounting bracket. This cam advances the counter wheel to one of the three predetermined stop settings of the three coin counter discs.

COIN COUNTER MECHANISM:

(1) COUNTER WHEEL AND COIN COUNTER DISC ASSEMBLY. The counter wheel and key switch trip plate, plus three coin counter discs record the credits for plays and activate the phonograph accordingly. The seven notches on the counter wheel record the accumulated credits. One of the six ratchet teeth on the counter wheel is engaged each time the cancel solenoid is energized. The trip plate attached to the counter wheel closes the key switch and releases the coin return coil when plays are registered by the counter wheel. When the plays have been made the trip plate reopens the key switch and energizes the coin return coil, preventing any more selections from being made until another coin is deposited.



1. Contactor (Selection)
2. Contactor (Full Cycle)
3. Nickle Coin Counter Disc
4. Dime Coin Counter Disc
5. Quarter Coin Counter Disc
6. Detent Spring
7. Counter Wheel and Coin Counter Disc Assembly
8. Return Spring, Coin Selector Lever
9. Bracket, Coin Paddle and Coin Drop
10. Mounting Bracket
11. Yielding Spring, Coin Selector Lifter Lever
12. Locking Collar, Cam Shaft

Figure 7. Coin Counter Mechanism

(2) COIN COUNTER LINKAGE transfers the movement of the counter wheel cam to the counter wheel as far as allowed by the coin selector lever. Part of the linkage is termed the yielding linkage (Fig. 6). This permits the coin counter cam roller to follow the counter wheel cam through a complete rotation, even though the coin selector lever may prevent the counter wheel from turning.

(3) COIN SELECTOR LIFTER LEVER AND COIN SELECTOR LEVER. The coin selector lifter lever operates off the coin selector lifter lever cam. This lever lifts the coin selector lever and feeler assembly to identify whatever coin may be resting on the coin paddle, and check the rotation of the counter wheel accordingly. The coin selector lifter lever pivots on a pivot bracket and is returned to its at rest position by a small coil spring. (See Fig. 7).

3. OPERATION

The coin register mechanism starts to function when the slug rejector drops a nickel, dime or quarter on the coin paddle. The weight of the coin causes the coin paddle to move the coin switch arm and close the coin switch. The closing of the coin switch starts the coin register motor which turns the cam and shaft assembly. The operation of the coin switch also breaks the coin return coil circuit. As the coil is demagnetized the coin return lever of the slug rejector is activated so that additional coins deposited during the cycle of accumulation will be returned in the coin return cup.

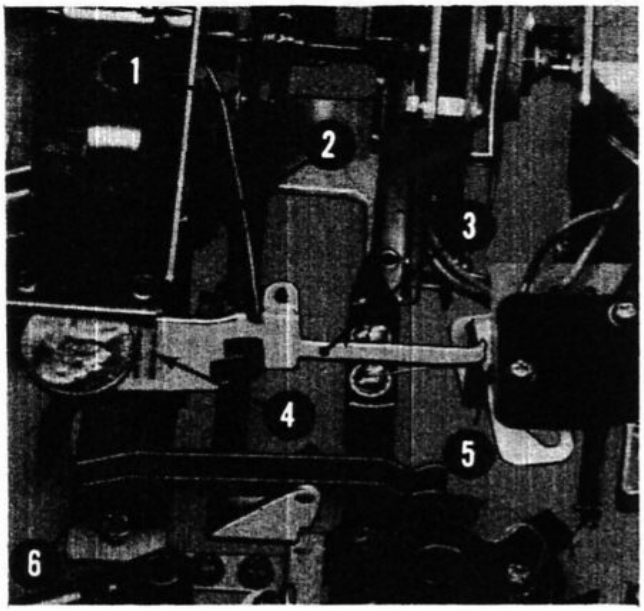
a. FIVE-CENT COIN DEPOSITED. When a nickel is deposited in the coin slot, it passes through the slug rejector and is received on the coin paddle in the forward coin track of the slug rejector (Fig. 14) (as viewed when the coin register mechanism has been removed). The weight of the coin on the coin paddle starts the coin register motor as explained in the preceding paragraph. As soon as the coin register motor starts, the coin selector lifter lever cam actuates the lifter lever which lifts the coin selector lever and feeler to determine the denomination of the coin on the coin paddle. Since, in this case the coin is a nickel, the coin feeler goes all the way across the bottom of the slug rejector to the nickel coin track. This causes the engaging end of the coin selector lever to stop the counter wheel from turning more than one accumulation. The coin counter linkage yields and allows the cam and shaft assembly to turn without turning the counter wheel. The yielding member of the coin counter linkage is shown in Figure 6.

b. TEN-CENT COIN DEPOSITED. When a dime is deposited in the coin slot it is received on the coin paddle in the center coin track of the slug rejector (Fig. 15). Since the coin is a dime, the coin feeler goes only part way across the bottom of the slug rejector to the dime coin track. The engaging end of the coin counter lever therefore allows the counter wheel and coin counter disc assembly to turn until the counter wheel has recorded the plays according to the setting of the ten-cent coin counter disc.

c. TWENTY-FIVE CENT COIN DEPOSITED. When a quarter is deposited in the coin slot it is received on the coin paddle in the rear coin track of the slug rejector (Fig. 16). Since the coin is a quarter, the coin feeler goes only a short distance across the bottom of the slug rejector to the quarter coin track. The engaging end of the coin counter lever therefore allows the counter wheel and coin counter disc assembly to turn until the counter wheel has recorded the plays according to the setting of the twenty-five cent coin counter disc.

4. ADJUSTMENTS

a. COIN DROP ADJUSTMENT. With slug rejector in place, adjust stop bracket so surface parallel to the bottom of the slug rejector is approximately 1/16" below bottom of the coin track exits. Elongated mounting holes in the slug rejector stop bracket allow the bracket to be moved sufficiently (Fig. 8). When the slug rejector stop bracket is properly adjusted, the coin feeler will slide freely across the stop bracket and will not catch on the bottom of the slug rejector or interfere with the coin paddle.



1. Coin Switch Paddle Cam Screw
2. Coin Paddle Mounting Bracket
3. Coin Paddle
4. Coin Drop Clearance 1/32" to 1/16"
5. Coin Switch Clearance
6. Slug Rejector Stop Bracket

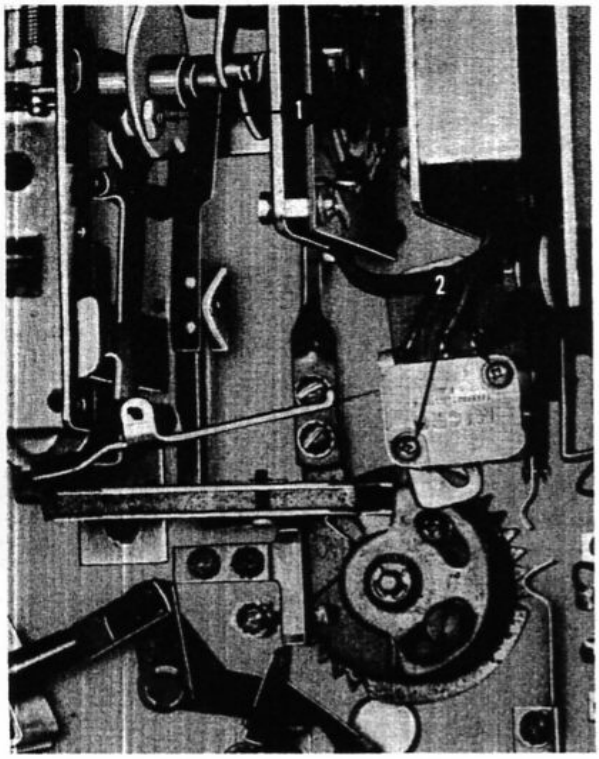
Figure 8. Coin Drop Adjustment

b. COIN DROP ADJUSTMENT. Remove the slug rejector and turn the cam assembly until the coin paddle is at maximum throw position. In this position there should be a minimum clearance of 1/8" between the right-hand end of the coin paddle (as you are looking at it) and the body of the coin switch. This clearance can be adjusted by loosening the jam nut on the cam screw (Fig. 8) and turning the cam screw to the position giving the proper clearance. This should also bring the coin paddle to within 1/32" to 1/16" from the side of a nickel or dime as they drop from their respective tracks in the slug rejector (Fig. 8).

c. COIN SWITCH. To adjust coin switch, set coin register in "at rest" position with slug rejector installed. Loosen coin switch mounting screws (Fig. 9) and move switch on its mounting bracket so arm of coin paddle will have overtravel of same distance in both directions when switch operates.

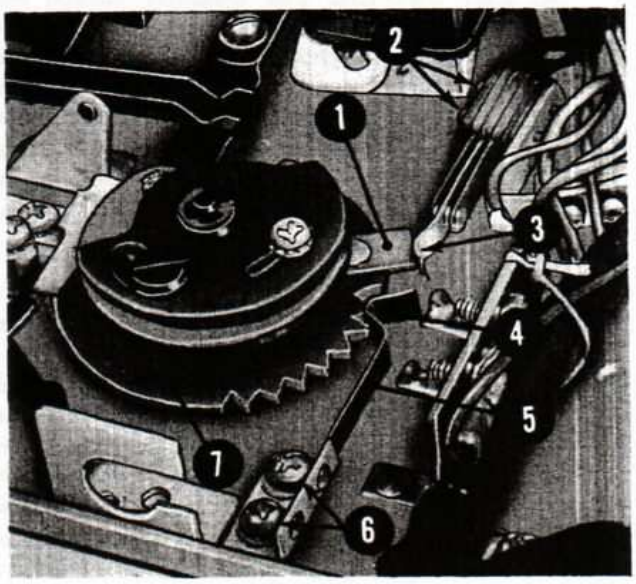
d. KEY SWITCH. The normally closed contacts of the key switch should have a contact pressure of 8 to 15 grams. The normally opened contacts of the key switch should have a contact pressure of 8 to 15 grams when closed. If the contact pressure of the key switch is not great enough, the key switch may be removed and disassembled. Reset the switch blades to increase the contact pressure slightly.

e. DETENT SPRING. The detent spring should press against the counter wheel with a pressure of 30 to 40 grams. This pressure should not be great enough to flex the yielding spring of the coin counter linkage. To make the detent spring setting, loosen the two mounting screws (Fig. 10). Rotate counter wheel and trip plate assembly so that key switch is open and a minimum of 50% of the flat portion of the formed switch blade is covered by the micarta trip plate. In this position set detent spring assembly in the first detent on the counter wheel. Adjust tension of 30-40 grams measured at the detent and tighten the two mounting screws. Rotate counter wheel counterclockwise until detent spring rests in second detent. Key switch contacts should be closed with key switch clear of counter wheel trip plate.



1. Adjusting Screw and Lock Nut, Coin Drop
2. Coin Switch Adjusting Screws

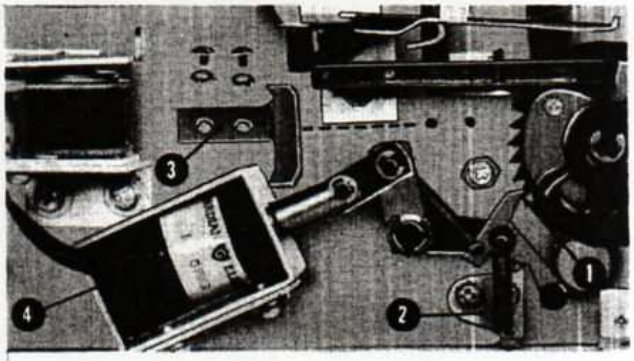
Figure 9. Coin Switch Adjustment



1. Trip Plate
2. Key Switch Mounting Screws
3. Key Switch, Center Contact
4. Detent Spring Pressure
5. Detent Spring
6. Detent Spring Adjusting Screws
7. Coin Counter Wheel

Figure 10. Key Switch and Detent Spring Adjustment.

f. FULL CYCLE SWITCH. The full cycle switch has been included in the rotary contact plate and requires no adjustment.



1. Cancel Pawl Engagement Point
2. Cancel Pawl Positioning Bracket
3. Shield, Cancel Pawl and Counter Wheel
4. Cancel Solenoid

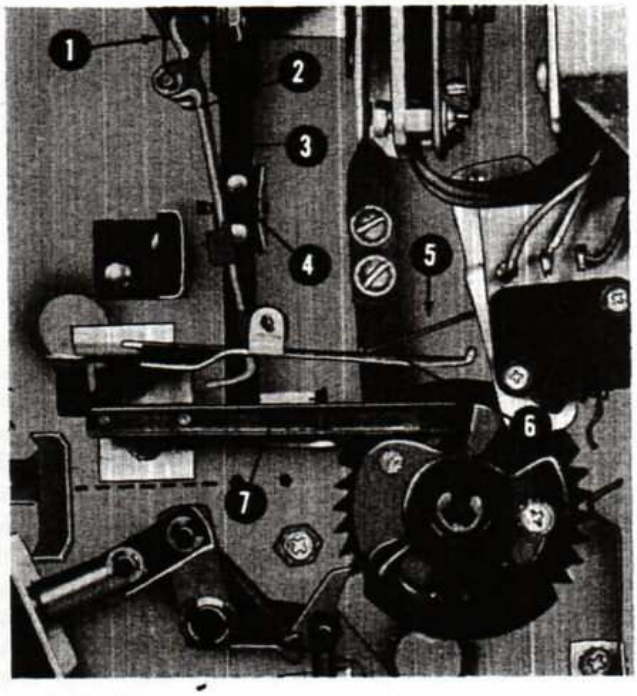
Figure 11. Cancel Solenoid Adjustment

g. LIFTER LEVER ASSEMBLY. The lifter lever for the coin selector lever (Fig. 12) has no adjustment. However, the lifter lever is provided with a yielding spring to permit overtravel after the coin selector lever has contacted a coin in the coin track and engaged its corresponding coin counter disc.

h. CANCEL SOLENOID AND CANCEL PAWL. (1) With detent spring in bottom of third notch of coin counter wheel, loosen the adjusting screw on the eccentric post. (Fig. 13). Adjust eccentric post to bear against cancel pawl when in full engagement of tooth of counter wheel, (Fig. 13). Repeat this adjustment on all notches of coin counter wheel to insure the best average engagement of the detent spring. Tighten adjusting screws.

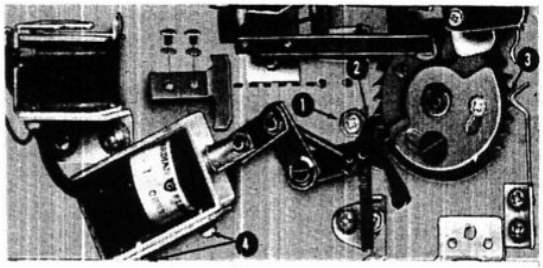
(2) Loosen the cancel solenoid mounting screws and adjust solenoid when cancel pawl is fully engaged so that plunger is bottomed (Fig. 13). Tighten screws.

(3) With adjusting screws (Fig. 11) adjust cancel pawl positioning bracket to 1/16" clearance between cancel pawl and coin counter wheel.



1. Torsion Spring
2. Coin Paddle, Mounting Bracket
3. Lifter Lever and Yielding Spring
4. Mounting Bracket, Lifter Lever
5. Coin Switch Arm.
6. Coin Paddle
7. Coin Selector Lever

Figure 12. Lifter Lever for Coin Selector Lever.

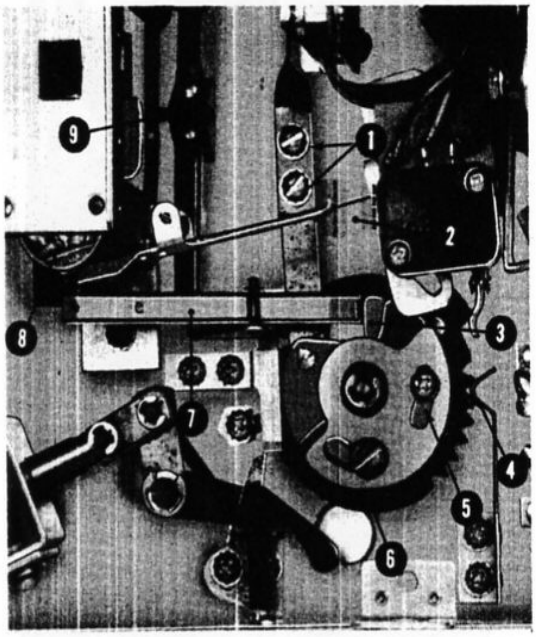


1. Cancel Pawl Eccentric Stop
2. Cancel Action
3. Detent Position of Coin Counter Wheel
4. Mounting Screws, Cancel Solenoid

Figure 13. Cancel Solenoid Adjustment 2.

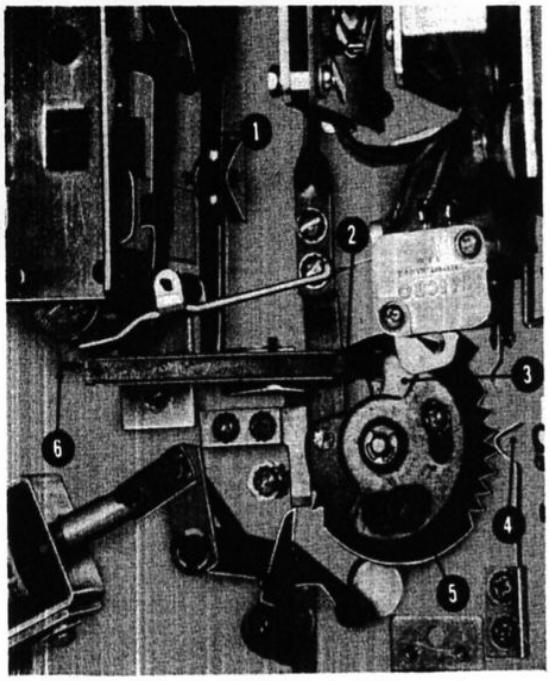
i. COIN COUNTER LEVER. Rotate counter wheel assembly so that detent spring is resting in first notch. Loosen the two screws in the coin counter link (Fig. 14). Hold the roller cam follower against the coin counter cam. Move the lower link so that it forces the stud of the coin counter disc against the left end of the curved slot in the counter wheel without moving the setting of the detent spring. Tighten the two adjusting screws.

Cycle the mechanism with a nickel on the coin paddle. The counter wheel may turn one tooth maximum on the detent spring. If it turns more than one tooth, shorten the coin counter linkage at the adjusting screws to limit the throw to one tooth maximum.



1. Adjusting Screws, Coin Counter Link
2. Clearance
3. Nickel Coin Counter Disc
4. Detent Position, 1 Play
5. Quarter Locking Screw
6. Dime Locking Screw
7. Coin Selector Lever
8. Nickel
9. Coin Selector Lifter Lever

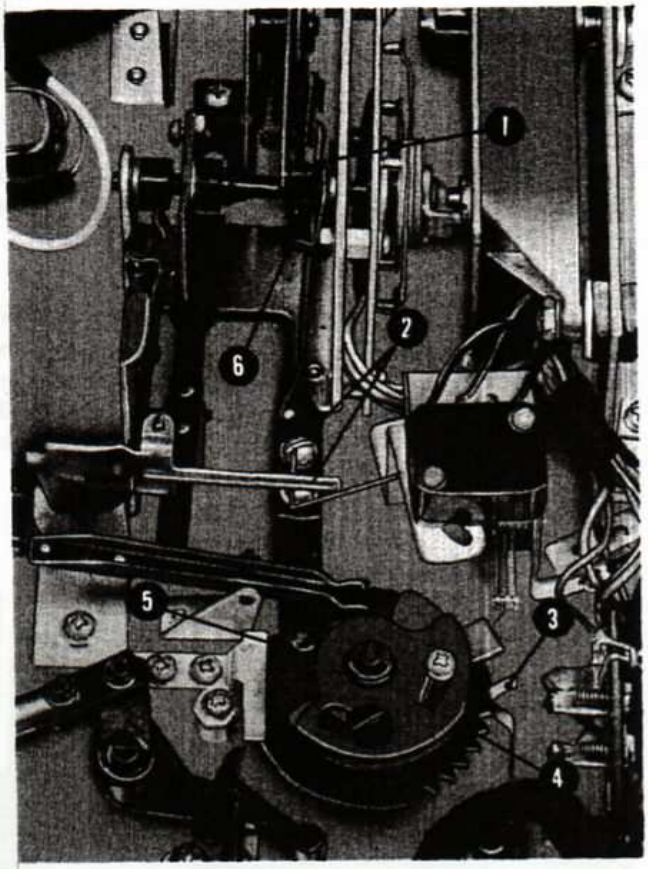
Figure 14. Coin Counter Link Adjustment



1. Yielding Spring, Lifter Lever
2. Coin Selector Lever
3. Dime Coin Counter Disc
4. Detent Position, 2 Plays
5. Locking Screw, Dime Coin Counter Disc
6. Dime

Figure 15. Ten-cent Coin Counter Disc Setting

j. COIN COUNTER DISC SETTING. The adjustment of the coin counter link explained above is the only adjustment necessary in making the five-cent coin or single play setting. The ten-cent setting of the coin counter discs is made as follows:



1. Roller, Cam Follower
2. Adjusting Screws, Coin Counter Linkage
3. Detent Spring
4. Coin Counter Wheel (Curved Slot Covered)
5. Stud, Coin Disc
6. Safety Stop

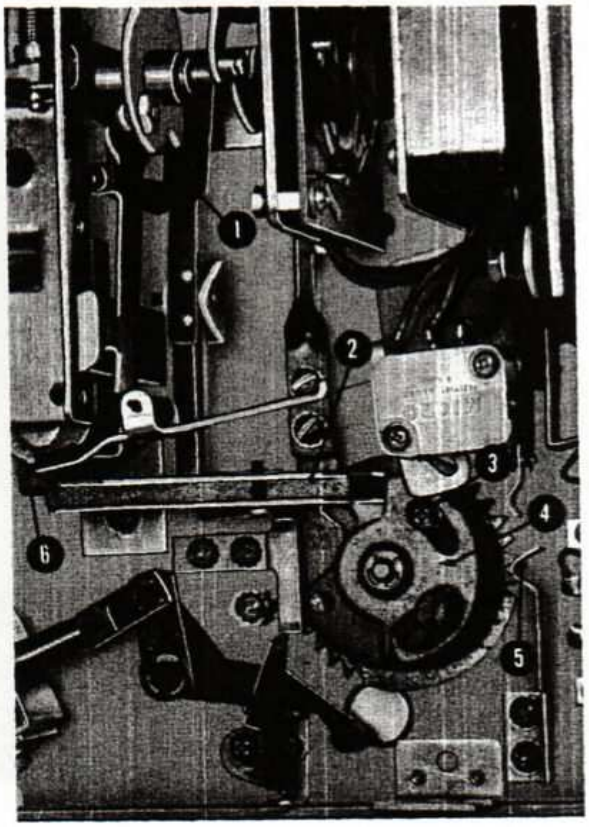
Figure 16. Coin Counter Lever Adjustment (For Yielding Spring on Lifter Lever)

(1) Loosen the locking screws holding the ten-cent and twenty-five cent coin counter discs (Fig. 15 and 17).

(2) With a dime in the center coin track, advance the cam and shaft assembly to the maximum throw position of the coin counter cam and lever as shown in Figure 15.

(3) Hold the engaging surface of the ten-cent coin counter disc against the end of the coin selector lever and set the counter wheel to the detent position for one or two plays as desired. Tighten the ten-cent coin counter disc screw and test the mechanism for proper operation on a dime (Fig.15).

(4) Set the twenty-five cent coin counter disc for from three to six plays, as desired, using the method described above for the ten-cent coin disc. (Fig. 17).

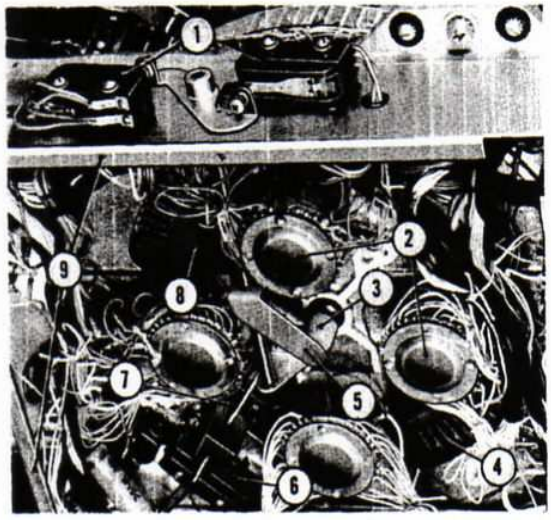


1. Yielding Spring, Lifter Lever
2. Coin Selector Lever
3. Locking Screw, Quarter Coin Counter Disc
4. Quarter Coin Counter Disc
5. Detent Position, 5 Plays
6. Quarter

Figure 17. Twenty-five Cent Coin Counter Disc Setting

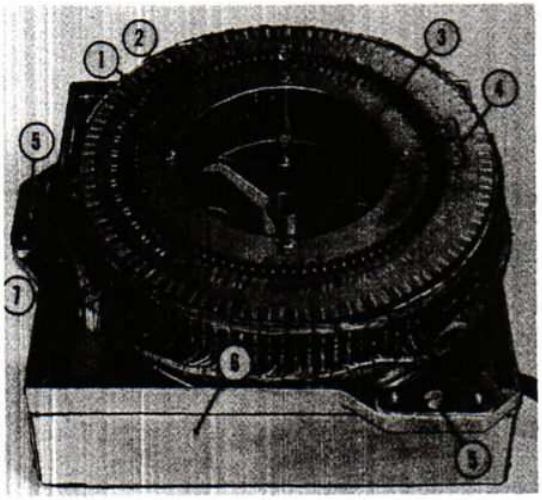
c. Electric Selector and Junction Box Assembly. The electric selector and junction box assembly are wired directly together and form one physical unit. The selector casting serves as a mounting base for the junction box and the selector drum. The selector and junction box assembly are hung from the chassis frame casting by three supports (see Figures 39 through 44 of Section 6).

(1) Electric Selector Assembly. The electric selector consists of 104 selector magnets and selector pins mounted in a circle on the selector casting. When any one of these 104 magnet coils is energized, its selector pin is released. The released selector pin moves upward and displaces the wobble plate, which is mounted under the selector drum, thus actuating the override switch yoke and operating the override switch. Although the 104 selector coils are a complete physical unit they are divided electrically into four groups. Each group contains 26 selector coils and is designated by a letter -- A, B, C, or D. The circuit to one side of one group of 26 selector coils is completed when one of the four letter group relays is energized by pressing a letter button switch. The four group relays are mounted on the underside of the selector casting (see Figure 9).



1. Reversing Switches
2. Group Relay Coils
3. Reversing Switch Plunger Actuator
4. Bottom of Selector Pins
5. Reversing Switch Lever
6. Override Switch
7. Override Switch Yoke Assembly
8. Wobble Plate
9. Sides of Junction Box

Figure 9. Junction Box Assembly (Bottom View)

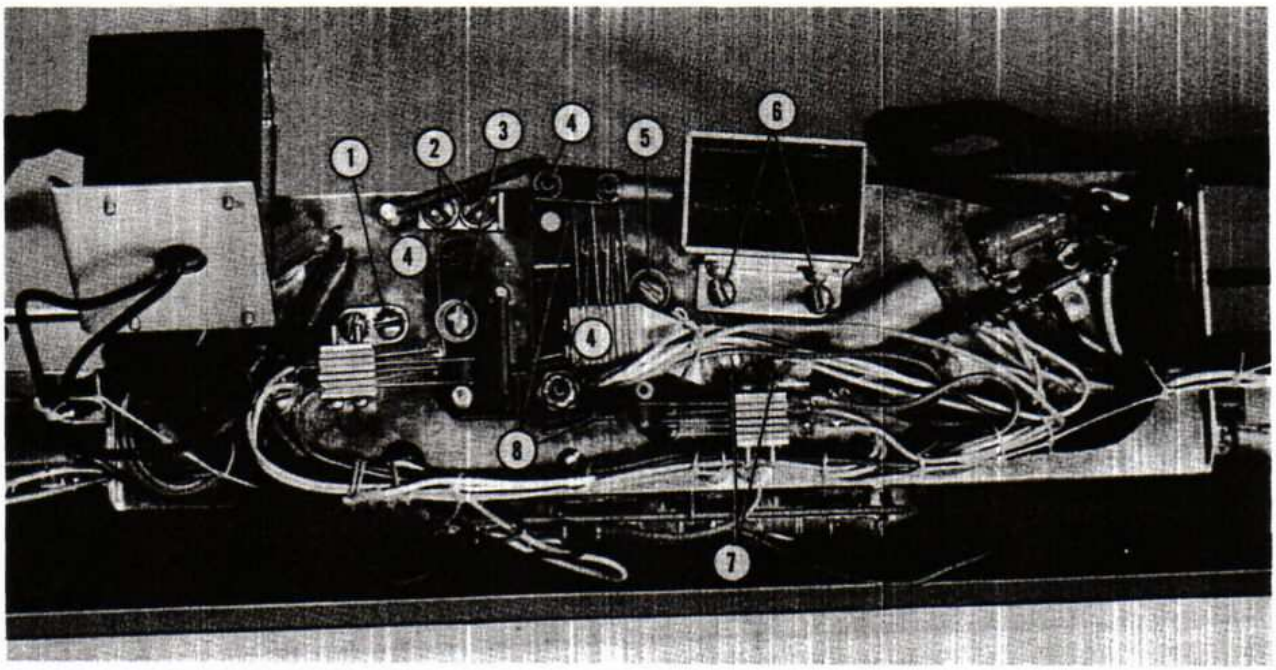


1. Selector Drum
2. Override Switch Yoke
3. Wobble Plate
4. Selector Coil Numbers
5. Holes for Support
6. Junction Box
7. Wiring Harness

Figure 10. Selector Drum and Junction Box Assembly

The other side of the selector coil is energized when the corresponding number button switch is pressed. Thus, it is necessary to press one letter button switch and one number button switch in order to complete the circuit through any particular selector coil. Selector coil numbers are silk screened on the top of the selector (see Figure 10).

(2) Junction Box Assembly. The junction box houses the override switch, the reversing switch, and the four group relays. The electrical wiring that leads from these components to plug receptacles mounted in the sides of the box is also housed in the junction box. The front side of the box mounts the receptacles for the selector button switch assembly and the power input plugs. The right side mounts the receptacles for the stepper plugs and the back side mounts the receptacles for the coin mechanism plugs, plugs for the turntable motor power supply, leads from the trip switch and safety switch, fuse holder, record changer motor power supply, mute and play switch, and transfer switch.



1. Number Switch Adjusting Screw
2. Stop Bracket Adjusting Screws
3. Number Trip Lever Adjusting Screw
4. Oil
5. Letter Trip Lever Adjusting Screw
6. Latch Solenoid Adjusting Screws
7. Latch Solenoid Switch Adjusting Screws
8. 1/32 of an inch clearance

Figure 20. Selector Switch Adjustments

4. ADJUSTMENTS – SELECTOR SWITCH ASSEMBLY

The first step in checking the adjustments of the selector pushbutton switch assembly is to make sure that all the pushbuttons press easily and go all the way in. Otherwise, the trip lever actuated by pressing a button will not move far enough to allow the latch pin and pawl to move into the latching position (see Figure 20).

All letter and number pushbuttons should snap all the way out when they are released after making a selection. Any pushbutton which does not come all the way out will cause the latch bar to remain displaced, thus preventing any other buttons from being pressed. The various selector switch pushbutton assembly adjustments are made as follows:

a. Latch Bar. The number switch latch bar adjusting screw is merely a coupling screw which ties the two number switch latch bars together (refer to Figure 4). If the number pushbuttons fail to work properly, check the latch bar adjustment in the following manner:

(1) Remove the latch bar adjusting screw.

(2) Be sure that each number latch bar works freely when the pushbuttons that actuate it are pressed individually. Test each pushbutton separately.

(3) When it is certain that both latch bars work satisfactorily when actuated separately, insert the latch bar adjusting screw and tighten it while the latch bars are in their rest position, thus coupling the two bars together in their best operating position. By repeating this procedure two or three times, the smoothest possible operation of the latch bars may be obtained.

b. Latch Solenoid Stop Bracket. This bracket is adjusted by loosening the adjusting screws (Figure 20) and moving the bracket toward, or away from, the latch solenoid. The stop bracket should be positioned to provide one thirty-second of an inch clearance between the letter latch pin and pawl and the letter trip lever when the latch solenoid is not energized. This adjustment should provide similar or slightly greater clearance between the number latch pin and pawl and the number trip lever.

c. Release Lever and Latch Solenoid Switch. Before making these adjustments, loosen the latch solenoid switch adjusting screws (Figure 20) and move the latch solenoid switch out of the way to avoid bending the switch blades. The latch solenoid itself may be moved on its elongated mounting holes, thus providing a variation in the travel distance of the plunger and release lever. Make the adjustments as follows:

(1) Loosen the latch solenoid switch adjusting screws as stated above (Figure 20).

(2) Loosen the latch solenoid mounting (and adjusting) screws so that the latch solenoid can be moved.

(3) Position the latch solenoid so that when the plunger is at the bottom of the stroke, and both latches are fully engaged, one thirty-second of an inch clearance (indicated in Figure 20) is obtained between the closest of the two latch pawls and its accompanying release latch lever tab.

(4) Tighten the latch solenoid screws when the above clearance has been obtained.

(5) Position the latch solenoid switch so that when the latch solenoid actuates, the normally closed set of contacts open, and the two normally open sets of contacts close.

NOTE: Be sure the normally open contacts of the latch solenoid switch, as well as the letter and number latch switches, close firmly with a slight wiping movement. Also be sure that the normally closed contacts of the latch solenoid switch open cleanly.

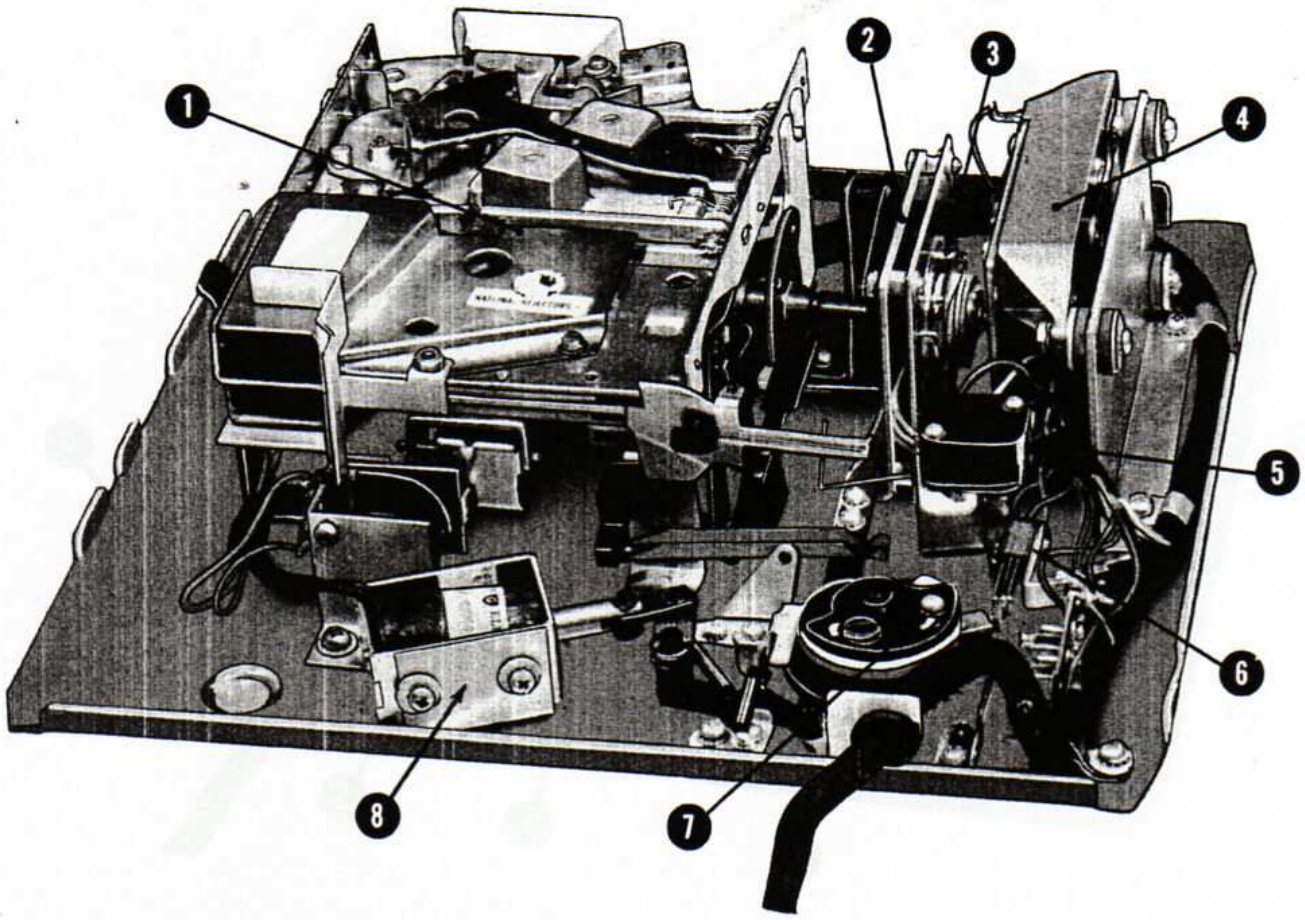
d. Latch Switch. The elongated holes in the mounting brackets for the letter and number latch switches enables the adjustment of the switches (see Figure 20). The blades of the switches, when free, should provide one thirty-second of an inch clearance between contacts.

e. Trip Levers. Each trip lever has an adjusting screw (see Figure 20). Adjust the trip levers so that the latch pawls are fully engaged with the latch pins when the letter and number pushbuttons are depressed to their latching positions.

5. LUBRICATION -- SELECTOR SWITCH ASSEMBLY.

Figure 20 shows the various points of lubrication of the selector switch assembly. One drop of S. A. E. No. 10 should be applied to these points when necessary.

All electrical contacts are made of silver. To clean, use carbon tetrachloride and a clean cloth. Burnish the contacts with a clean dry cloth or a strip of heavy bond paper. Do not use abrasives.



1. Slug Rejector
2. Contact Plate
3. Contact Arms
4. Motor
5. Coin Switch
6. Key Switch
7. Coin Counter Assem. (Accumulator)
8. Cancel Solenoid

Figure 1. Coin Register Mechanism With Slug Rejector Attached

MODEL 1800 SELECTOR SYSTEM

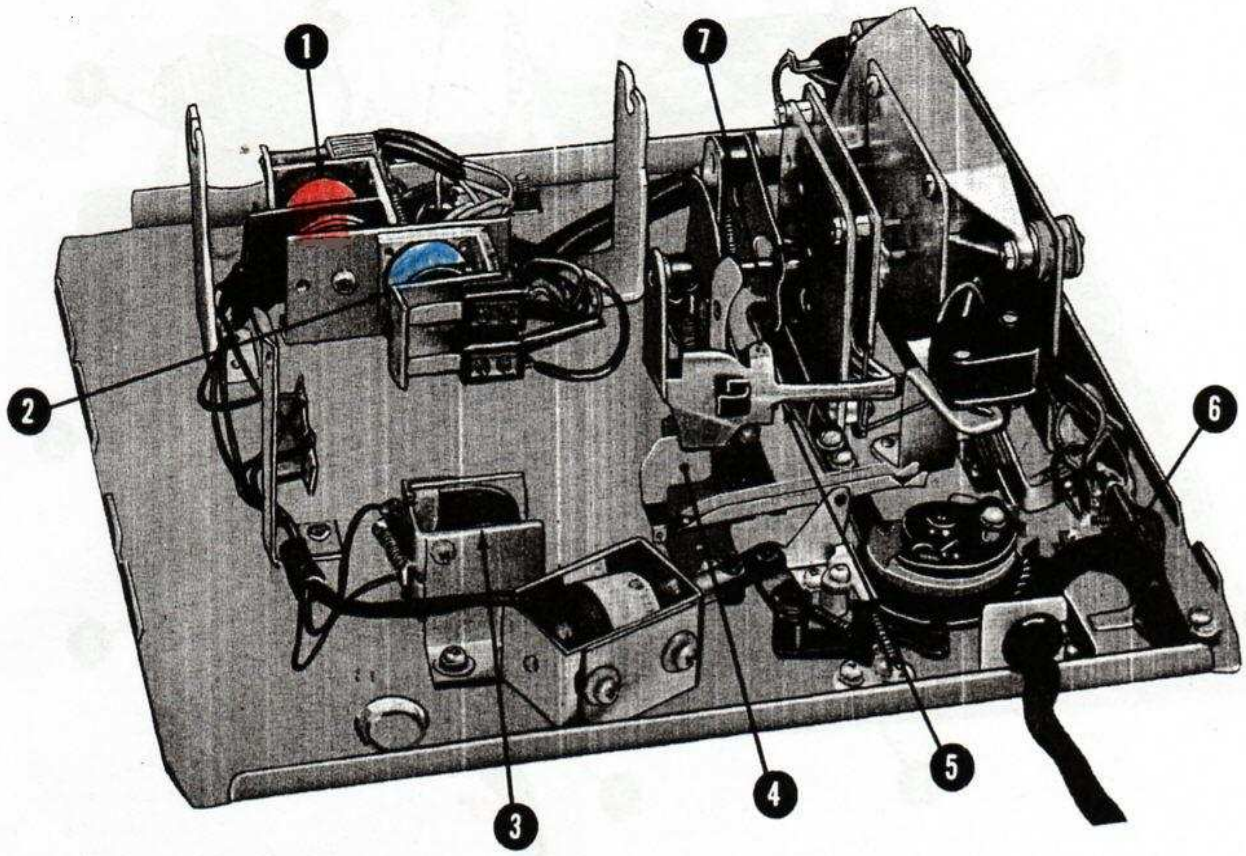
1. GENERAL DISCUSSION

The Wurlitzer Model 1800 selector system includes the coin register mechanism, the selector switch pushbutton assembly, and the electric selector and junction box assembly. It is through the electric selector system that the phonograph is started, operated and stopped.

2. DESCRIPTION

a. COIN REGISTER MECHANISM, composed of coin switch, coin register motor, contact plate assembly, rotor contact arm assembly, coin counter, coin return coil and key switch (Fig. 1 and 2). This section of the service manual is devoted to the function of the coin register mechanism only as it is related to the electric selector system. (For the operation and adjustment of these components see Section 4, Pages 21 through 31 of this manual).

The coin register mechanism in relation to the electric selector system, has four functions. (1) Receive coins from the slug rejector. (2) Register credits according to the denomination of the coin received. (3) Complete the circuit starting the coin register motor on its cycle of operation. (4) Reject coins while registration is in progress.

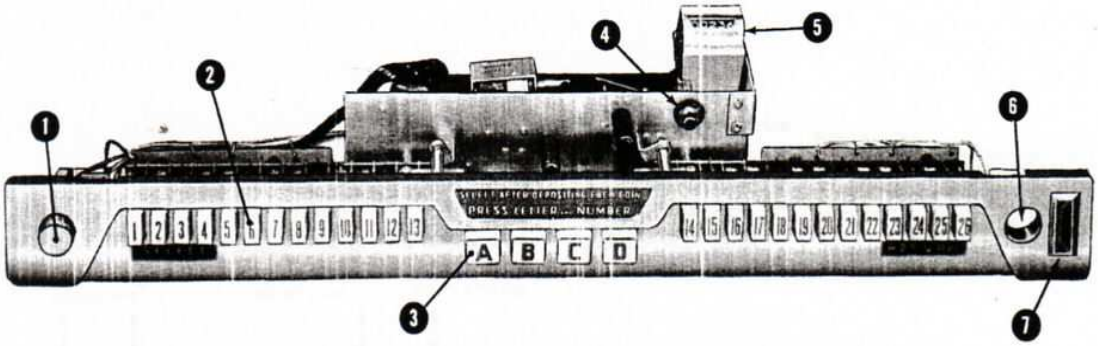


1. Pulse Relay
2. Set-up Relay
3. Coin Return Relay
4. Coin Feeler
5. Coin Paddle
6. Terminal Strip
7. Cam Shaft Assembly

Figure 2. Coin Register Mechanism With Slug Rejector Removed

b. SELECTOR SWITCH BUTTON ASSEMBLY, composed of 4 letter button switches, 26 number button switches, pushbutton latching mechanism, latch solenoid and switches, pushbutton latch switches, release switch, free play switch, make selection light, coin return light, electric play counter, and two resistors. The letter button switches are linked mechanically to one pushbutton latch switch, and the number button switches are linked mechanically to the other pushbutton latch switch. Since each pushbutton latch switch has two sets of contacts, four separate circuits are affected when either a letter button switch or number button switch is pressed (see Fig. 5). See sequence schematic Section 12, Pages 84 through 87, for the function of the latch switches.

One set of contacts of the letter button switches is connected in series with one set of contacts of the number button switches. This series circuit starts from ground and the key switch, and runs through the number and letter buttons series to the set-up relay coil, through normally closed contacts 1 and 2 of the pulse relay to the 24 volt A.C. supply at the transformer. This circuit disconnects the selection circuits until the selection has been electrically completed and all pushbuttons returned to their original position when set-up relay will again be energized in case the key switch is closed. The second bank of switches contains the isolation circuit which prevents more than one selection coil or group relay from being energized. This circuit starts from the 24 volt A.C. supply and continues



1. Selector Button Release Switch
2. Number Switch Buttons
3. Letter Switch Buttons
4. Free Play Switch
5. Electric Play Counter
6. Position of Coin Return Button
7. Coin Slot

Figure 3. Selector Switch Assembly

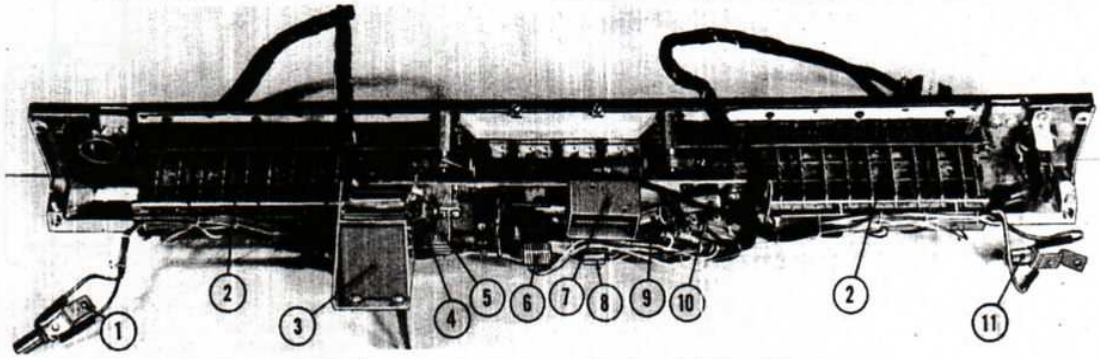
through contacts 7 and 8 of the pulse relay, contacts 5 and 6 of the latch solenoid switch, the 0.8 amp. fuse, the numbers selection switches, a number coil, the group relay switch, the letters selection switches, patches G and F of the rotary contact plate, the jumper or stepper isolation contacts, the numbers and letters latch switches, to ground. The purpose of this circuit is to prevent more than one selector coil or group relay from being energized. When a letter button switch or number button switch is pressed, this circuit is opened at that point and isolates all buttons beyond that point as shown in Figure 8. The latch solenoid, latch solenoid switches, latching mechanism, resistors, and electric coin counter are mounted on the back of the selector switch button assembly (Fig. 4). The release switch is located on the left front side of the selector switch button assembly. By pressing this switch, either a letter button switch or a number button switch, pressed in error may be released. However, once they both have been pressed, the electrical cycle is completed due to the timing action of the pulse relay.

NOTE 1. For Adjustments and Lubrication Of Selector Switch Assembly See Pages 36 and 37 of This Section.

3. OPERATION

The operation of the electric selector system is governed by the operation of the manually, mechanically and electrically operated switches that are part of the selector system. The operation of the electric selector system has been broken down into ten phases in order of occurrence. Each phase is illustrated by a schematic drawing and will be found in Section 12 beginning with page 71. These sequence schematics will show the serviceman the position of switches, relays, etc. and assist him in making continuity and voltage checks or in pinpointing trouble.

NOTE 2. For Description of the Electric Selector and Junction Box Assembly – Refer to Page 17 of This Section.



1. Coin Return Light Socket
2. Latch Bar
3. Electric Play Counter
4. Free Play Switch
5. Number Button Latch Switch
6. Latch Solenoid Switch
7. Latch Solenoid
8. Letter Button Latch Switch
9. Resistor, Latch Solenoid
10. Resistor, Make Selection Light Circuit
11. Make Selection Light Socket

Figure 4. Selector Switch Assembly (Rear View)

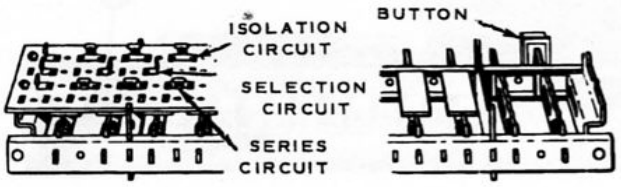


Figure 5. Selector System

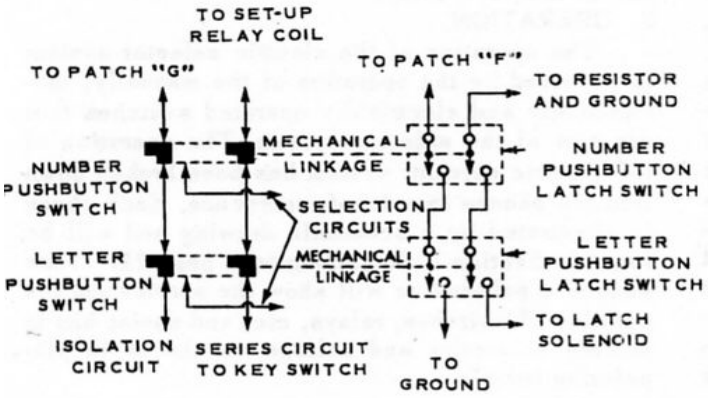


Figure 6. Schematic of Selector Switch Arrangement

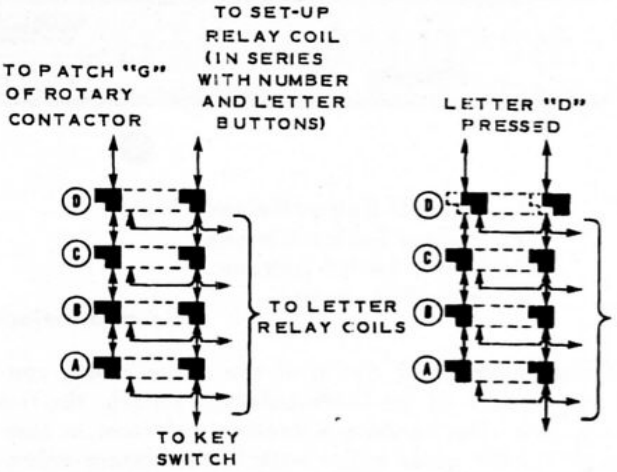


Figure 7. Circuitry of Letter Button Switches

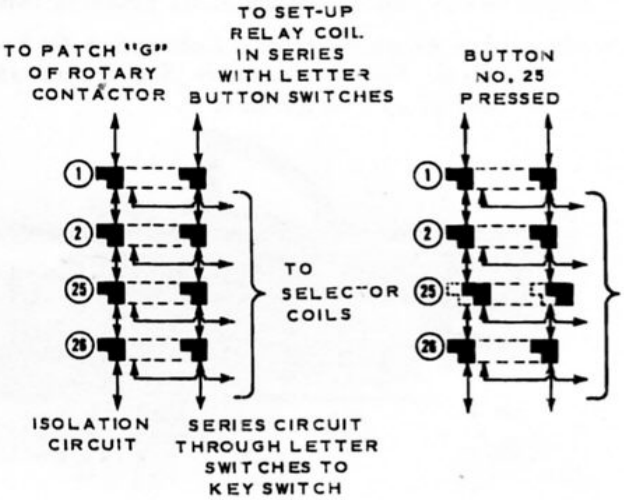
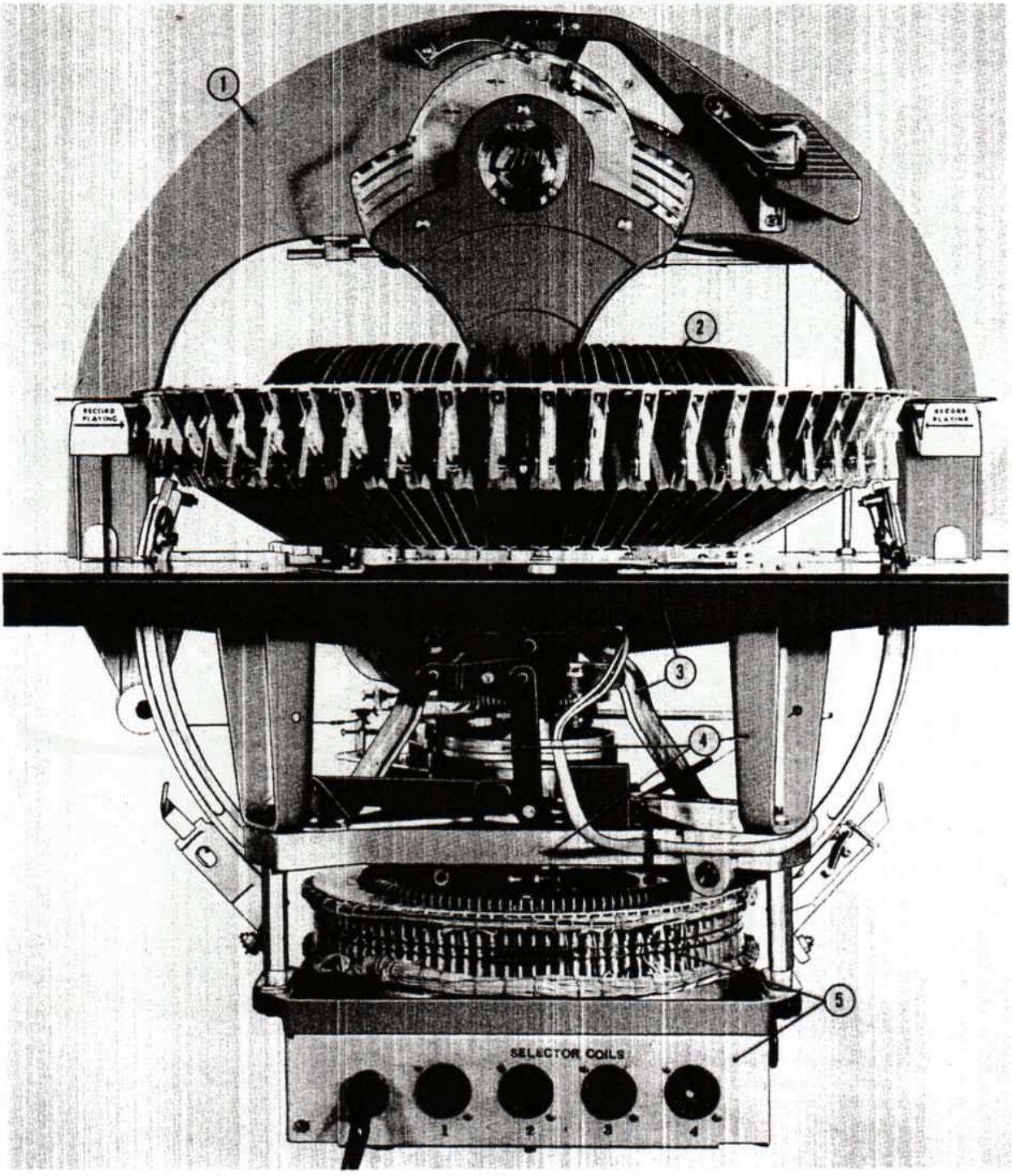


Figure 8. Circuitry of Number Button Switches

MODELS 1700 AND 1700F RECORD CHANGER

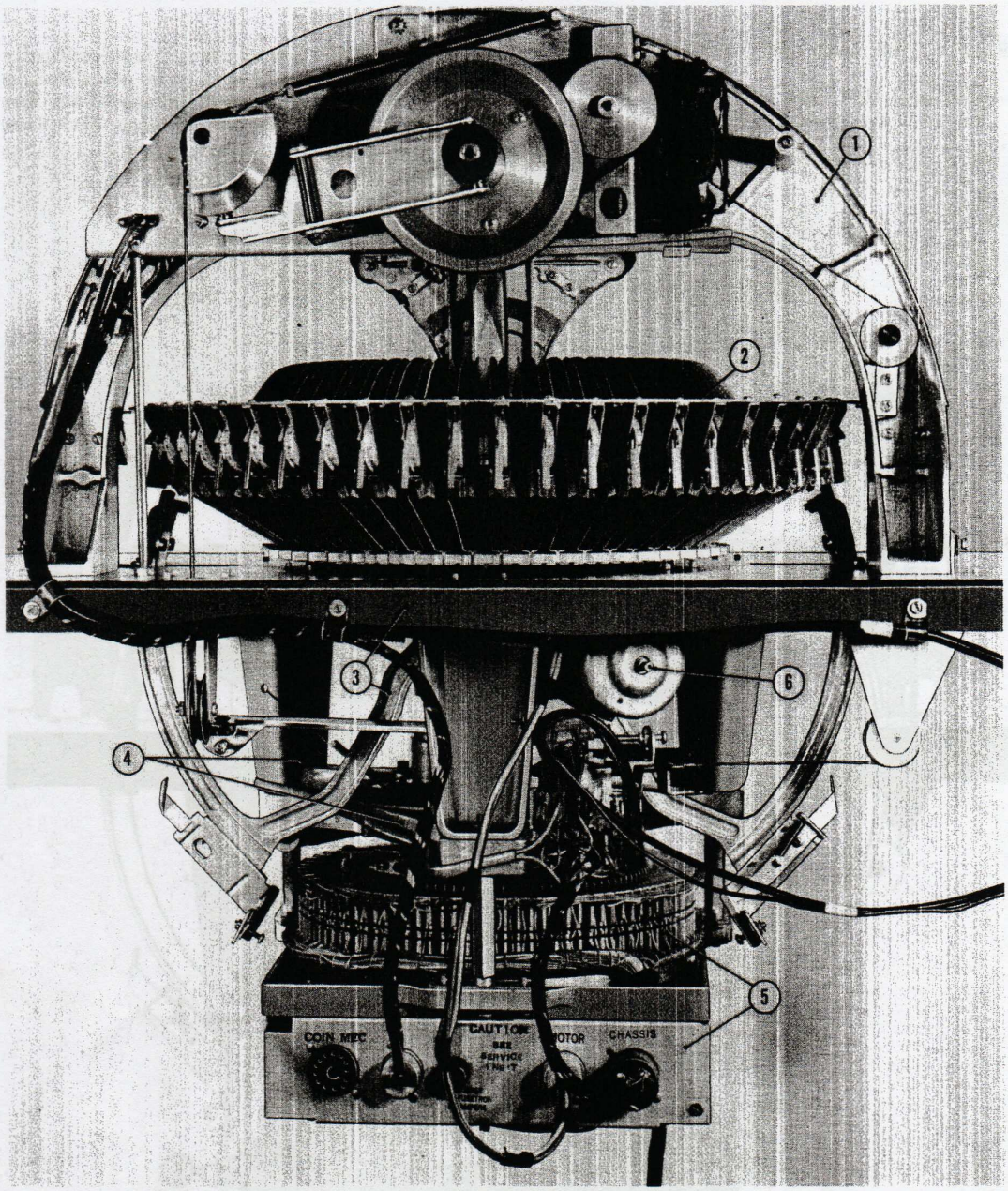
1. GENERAL DISCUSSION

Modern in every respect, the new Wurlitzer Models 1700 and 1700F record changer is scientifically designed and fabricated and it is calculated to function without interruption throughout its service life. All components and systems have been



1. Top Support Casting Assembly
2. Record Carrier Assembly
3. Chassis Mounting Plate and Record Lift Arm Assembly
4. Chassis Frame Assembly
5. Selector and Junction Box Assembly

Figure 1. Complete Record Changer (Front View)



1. Top Support Casting Assembly
2. Record Carrier Assembly
3. Chassis Mounting Plate and Record Lift Arm Assembly
4. Chassis Frame Assembly
5. Selector and Junction Box Assembly
6. Record Changer Motor

Figure 2. Complete Record Changer (Rear View)

NOTE: Unless otherwise stated, the sides of the phonograph are called "right" and "left" as the phonograph is viewed from the front.

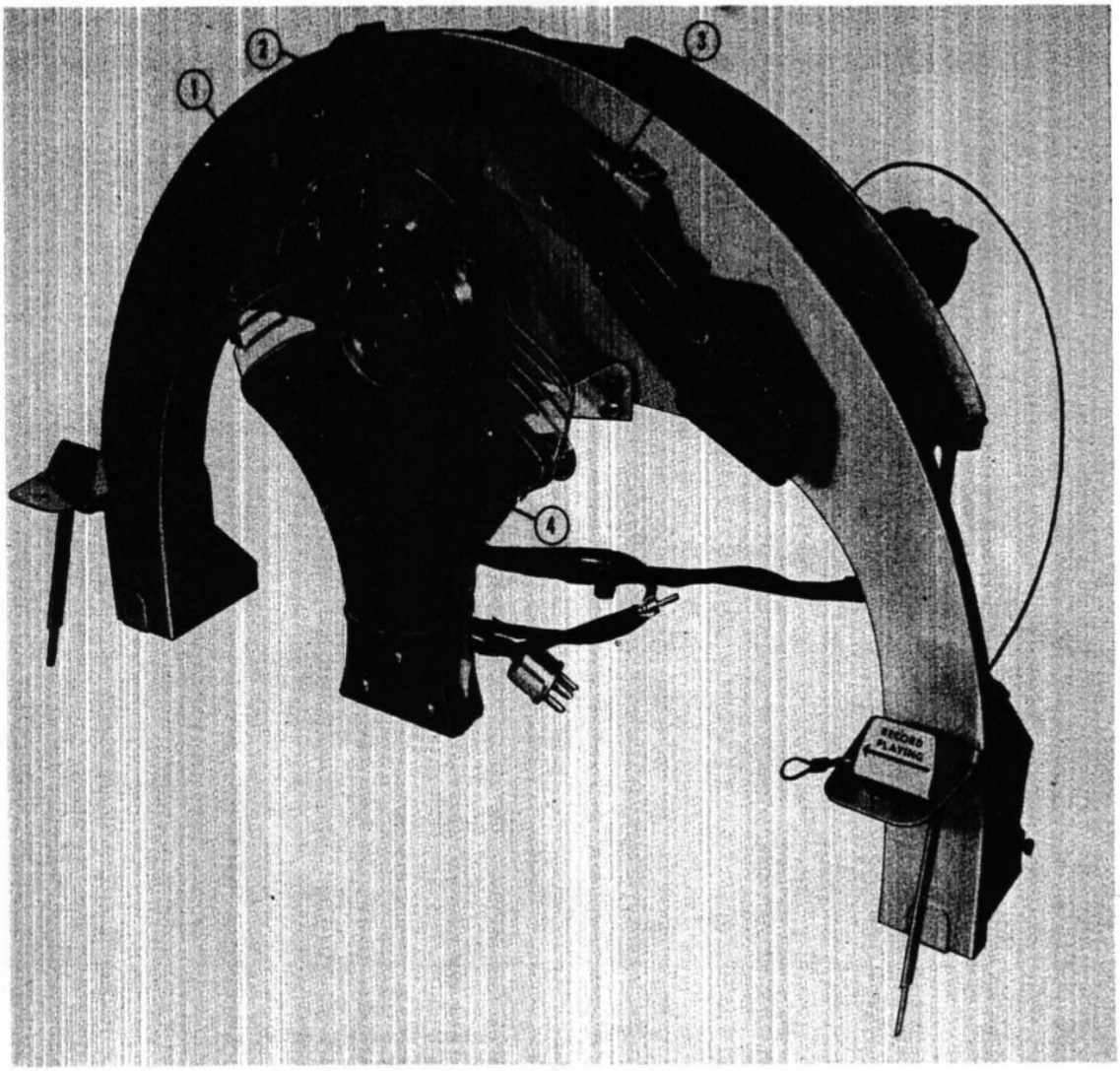
carefully factory-tested and adjusted, thus minimizing the possibility of breakdown or mal-functioning. The record changer accomodates 52 seven-inch, 45 rpm records, and provides a choice of 104 selections. Outstanding features of the changer mechanism are simplicity of design and built-in timing. Normally, only minor field adjustments will be necessary. However, this service manual, if studied carefully, will equip service personnel for meeting practically all service requirements that may arise. The new Wurlitzer record changer is a precision-built mechanism, and although sturdily made, it should be handled like any other finely made instrument.

2. DESCRIPTION

Five major assemblies, or groups of assemblies, make up the record changer. These five assemblies are as follows: (1) top support casting assembly which includes the turntable assembly and the tone arm assembly, (2) record carrier assembly, (3) chassis mounting plate and record lift arm assembly, (4) chassis frame assembly, which includes the selector shaft assembly, and (5) electric selector and junction box assembly. Each of these assemblies is described separately in the following paragraphs.

NOTE: Detailed breakdowns of these assemblies are shown by the exploded views in Section 11 of this manual.

a. Top Support Casting Assembly. The top support casting assembly is attached to the chassis mounting plate with four screws. The entire top support casting assembly can be detached as a



1. Top Support Casting
2. Tone Arm Brush
3. Tone Arm Assembly
4. Record Guide Assembly

Figure 3. Top Support Casting Assembly (Front View)

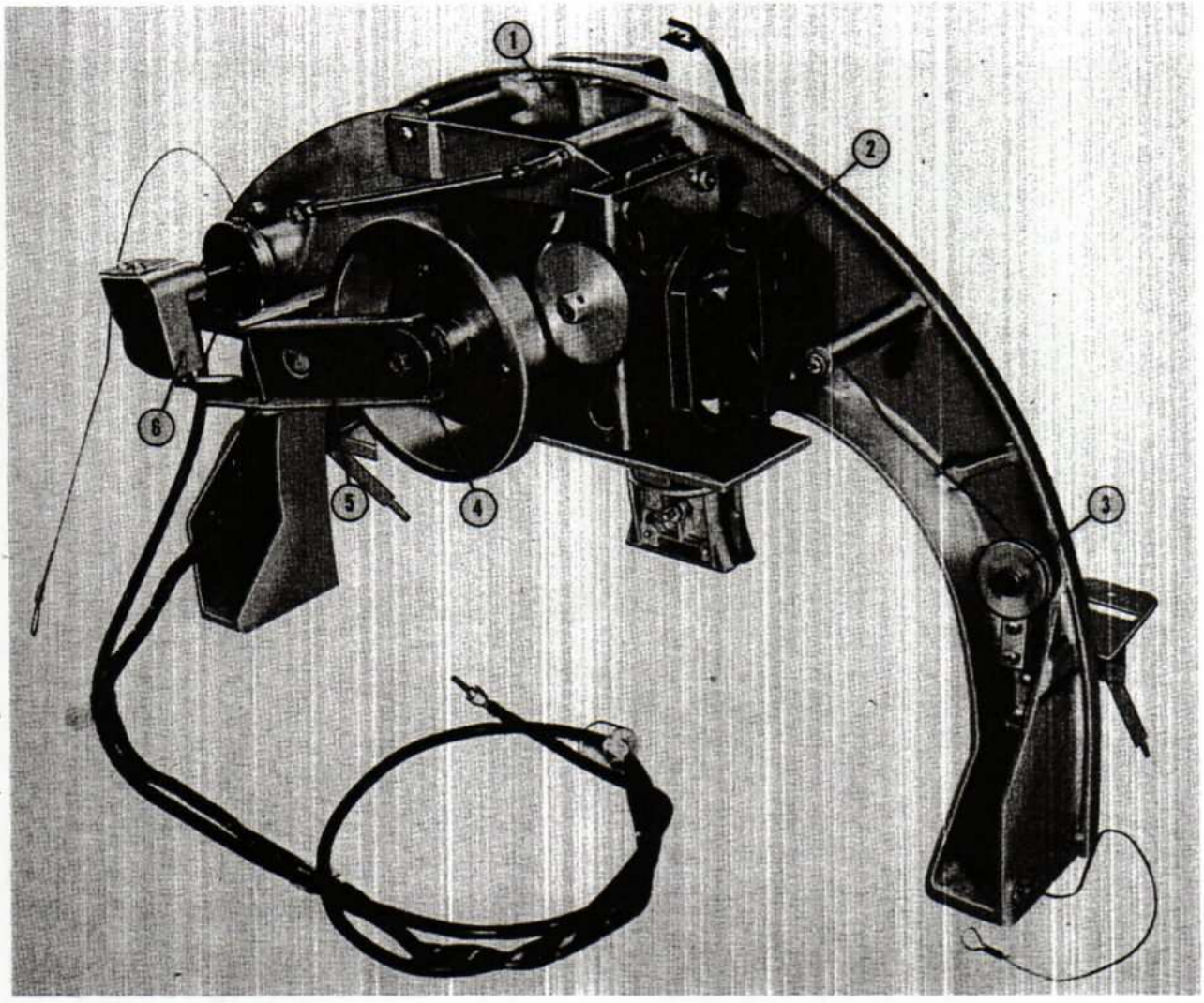
unit by removing the four screws and disconnecting the electrical connections and two actuating cables. (Three views of the detached top support casting assembly are shown in Figures 3, 4, and 5.)

The assemblies and components attached to the top support casting are as follows:

(1) Tone Arm Assembly. A bracket on the right front side of the top support casting mounts the tone arm assembly (see Figure 3). The complete tone arm assembly consists of the tone arm casting, mounting casting and pin assembly, gimbal and stop nut assembly, feed-in guide bracket, cap, counterweights, speed clip, and output wiring harness.

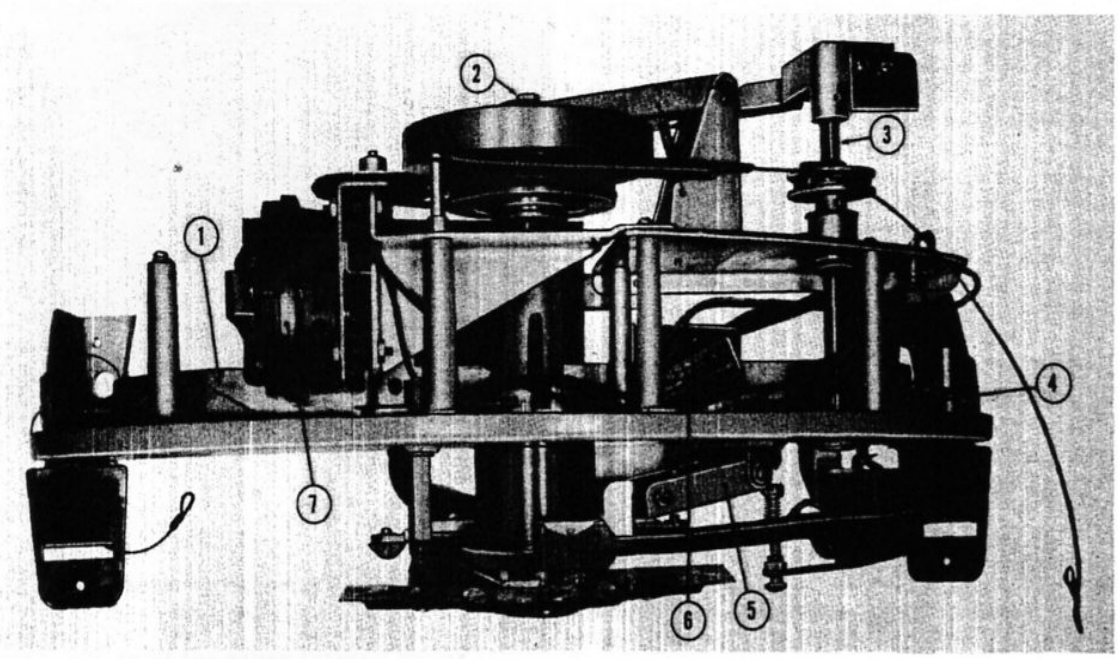
(2) Tone Arm Release Lever Shaft. The tone arm shaft is hung in two bearings -- one in the support casting and one in the back plate (see Figure 5). Mounted on the shaft are the feed-in guide lever actuating cam and the record clamp cam. The actuating pulley, to which is connected the record clamp cable, is also mounted on the tone arm shaft. The record clamp lever, tone arm release and feed-in lever, and the tone arm itself are all actuated by the tone arm shaft and record clamp cam.

(3) Tone Arm Release Lever and Bracket Assembly. This release lever is mounted behind the tone arm on the upper front right side of the support casting. (See Figure 5.) The function of the release lever is to guide the tone arm needle to



1. Top Support Casting
2. Turntable Motor
3. Cable Guide Pulley
4. Record Clamp Plate
5. Record Clamp Lever and Bracket Assembly
6. Record Clamp Cam

Figure 4. Top Support Casting Assembly (Rear View)



1. Top Support Casting
2. Turntable Shaft and Record Clamp Assembly
3. Tone Arm Release Lever Shaft
4. Trip Switch
5. Tone Arm Release Lever and Bracket Assembly
6. Safety Switch
7. Turntable Motor

Figure 5. Top Support Casting Assembly (Top View)

the feed-in groove of the record to be played. The tone arm release and feed-in lever guides the tone arm through the tone arm feed-in guide bracket. The feed-in adjustment screw is located in one end of the tone arm release bracket (see paragraph 4, q for tone arm feed-in adjustment instructions).

(4) Record Guide Assembly. This assembly is attached to the lower center of the support casting by a shaft through a pivot casting (Figure3). This method of mounting allows the complete assembly to pivot and operate a safety switch if the mechanism becomes jammed by a warped or broken record. The record track is, in turn, pivoted to the bottom of the record guide assembly. Four record guide bumpers also are part of this assembly. The safety switch is operated by a bracket and stop nut assembly attached to the record guide assembly. The record guide assembly is spring-loaded to assure return to its normal at rest position when the cause for jamming has been removed.

(5) Turntable Motor and Gear and Shaft Assembly. The turntable motor and mounting bracket assembly is mounted on the left rear of the top support casting assembly (Figure 4). The motor operates on 115-volt, 60-cycle, ac. Power is supplied to this motor when the override switch operates and actuates the override relay in the amplifier (see paragraph 3, b).

(6) Turntable Shaft and Record Clamp Assembly. The turntable shaft and record clamp assembly is made up of two shafts, one fitted inside the other. These two shafts are assembled inside a removable sleeve, which, in turn, is mounted in the top support casting. The inner, sliding shaft operates the record clamp mechanism. The outer shaft operates the turntable. A drive pulley and a flywheel are mounted on the rear of the outer shaft. The record clamp plate is mounted on the end of the inner, record clamp shaft.

(7) Record Clamp Lever and Bracket Assembly. This assembly is mounted on the right back plate of the top support casting assembly (Figure 4). The record clamp lever is pivoted on its mounting bracket. The record clamp cam (Figure 4), attached to the end of the tone arm shaft, actuates the the record clamp lever. The record clamp cam, in turn, is actuated by a cable connected to the record clamp lever which operates off the main cam.

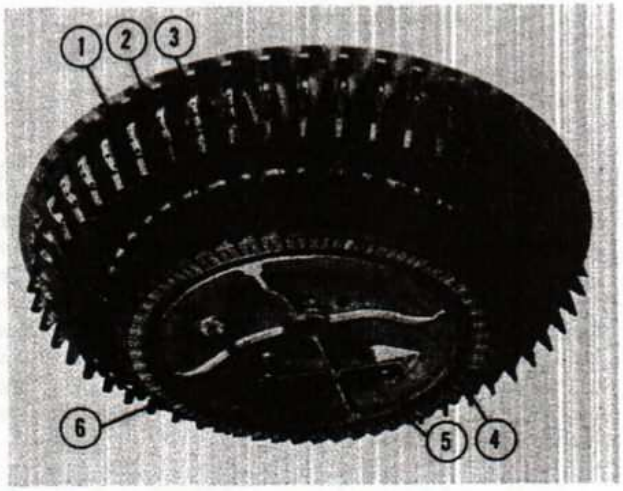
(8) Tone Arm Brush Assembly. This assembly is mounted on the upper left center of the support casting and is actuated by a cable linkage to the transfer switch. Since the transfer switch operates each time a record is played, the needle brush is also operated each time a record is played. The brush moves out of the path of the tone arm after being actuated.

(9) Tone Arm Brush Cable Guide Pulley. This is a plastic pulley attached to the inside of the left side of the support casting by a removable bracket (Figure 4). Its purpose is merely to guide the needle brush linkage cable.

(10) Trip Switch. This component is mounted on the inside of the support casting, near the tone arm shaft (Figure 5). It is actuated by the tone arm when the playing of a record is completed. The function of the trip switch is described in the section on operation, paragraph 3, g.

(11) Safety Switch. As described in paragraph (4), this switch is the means by which power is shut off if a record becomes jammed. It is mounted inside the support casting, behind and slightly to the right of the record guide assembly (Figure 5).

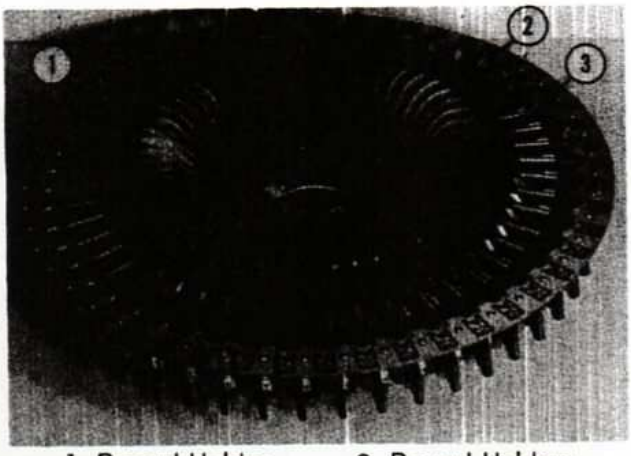
b. Record Carrier Assembly. The record carrier assembly is made up of the record carrier casting, the carrier drive pawl arm, carrier drive pawl arm spring, 52 individual record holders and record play counters, and the carrier ring and silk screen assembly. (Figure 6 shows the side and bottom of of the record carrier. The top of the carrier ring and silk screen assembly is shown in Figure 7). The silk screen assembly is divided into four segments.



1. Carrier Ring and Silk Screen Assembly
2. Record Holders
3. Play Counters
4. Record Carrier Casting
5. Carrier Drive Pawl Arm
6. Carrier Drive Pawl Arm Spring

Figure 6. Record Carrier Assembly

The record carrier assembly is mounted on the selector shaft and is held in place by a C-ring. The record carrier assembly is removable as a unit. The individual record holders can be removed separately. The record play counters may be taken out without removing the record holders. The subassemblies of the record carrier assembly may be described as follows:



1. Record Holder Clamp
2. Bushing
3. Record Holders

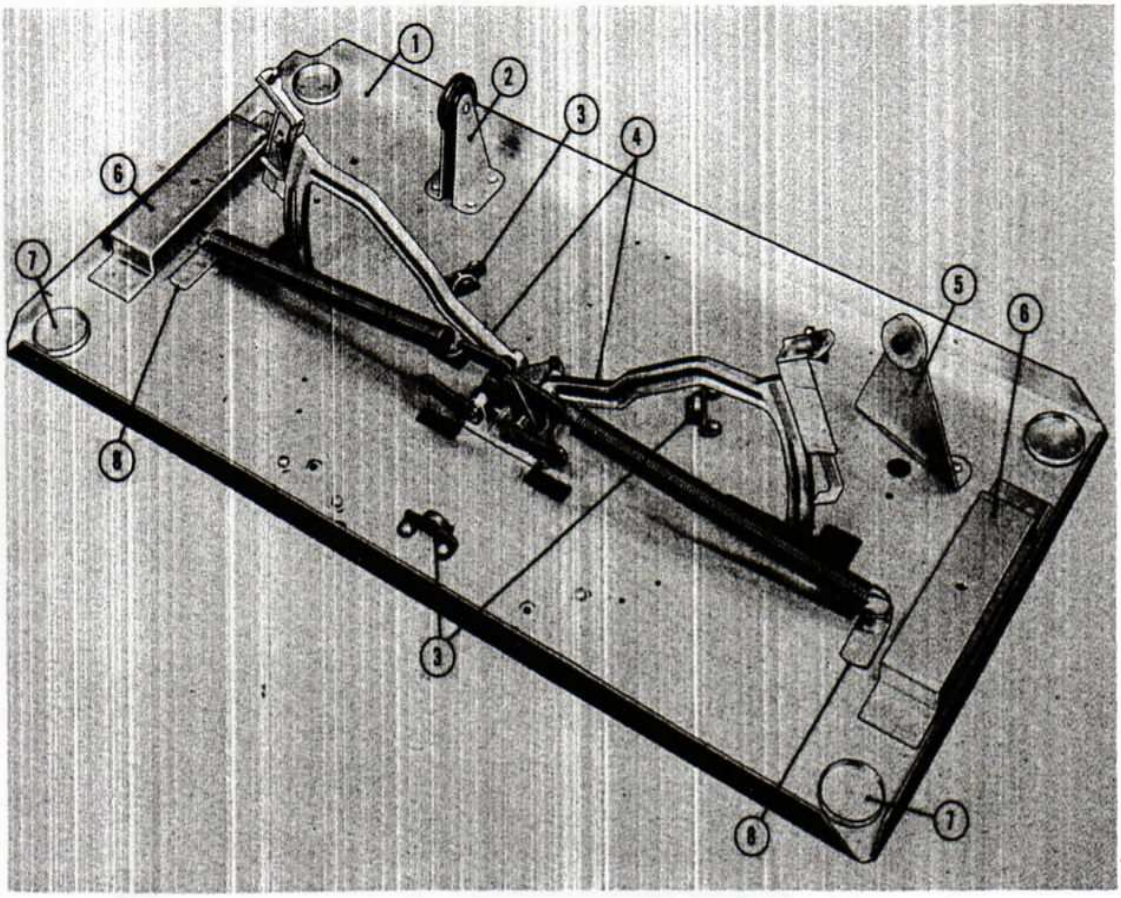
Figure 7. Record Carrier Assembly (Top View)

(1) Record Carrier Casting and Drive Arm. This casting is the foundation for the carrier and mounts the 52 record holders which are held in place by the teeth of the casting. These teeth also engage the back stop pawls which prevent the carrier from turning backward when it stops to allow a selection to be played. The carrier drive arm and spring are mounted on the underside of the casting (Figure 6). The record carrier turns only in a clockwise direction, the carrier drive arm being engaged at all times. The record carrier casting is fitted with a bushing, and holes are provided for the installation of the center ring plate which holds the tips of the record holders in place.

(2) Record Holders. The record holders are replaceable units. Each holder accomodates a record play counter which is held in place by a single screw. Thus, individual record play counters can also be replaced if necessary. The play counters count up to 60 plays for each record.

(3) Carrier Ring and Silk Screen Assembly. This assembly is made up of four quarter-circle segments which together form the carrier ring (see Figure 7). Thirteen record holders are fastened to each segment by small screws. The four sections are identified as the A, B, C, and D sections. Every selection, that is, each side of every record, is identified by a letter and a number such as A1, B12, and D17. These numbers are silk screened on the carrier ring.

c. Chassis Mounting Plate and Record Lift Arm Assembly. The chassis mounting plate is the supporting member of the record changer. The following items are considered integral parts of the mounting plate; reinforcement plates, spring cups, hold-down clamps, and lift arm spring brackets. Attached to the mounting plate to make up the assembly are three record carrier rollers, the tone



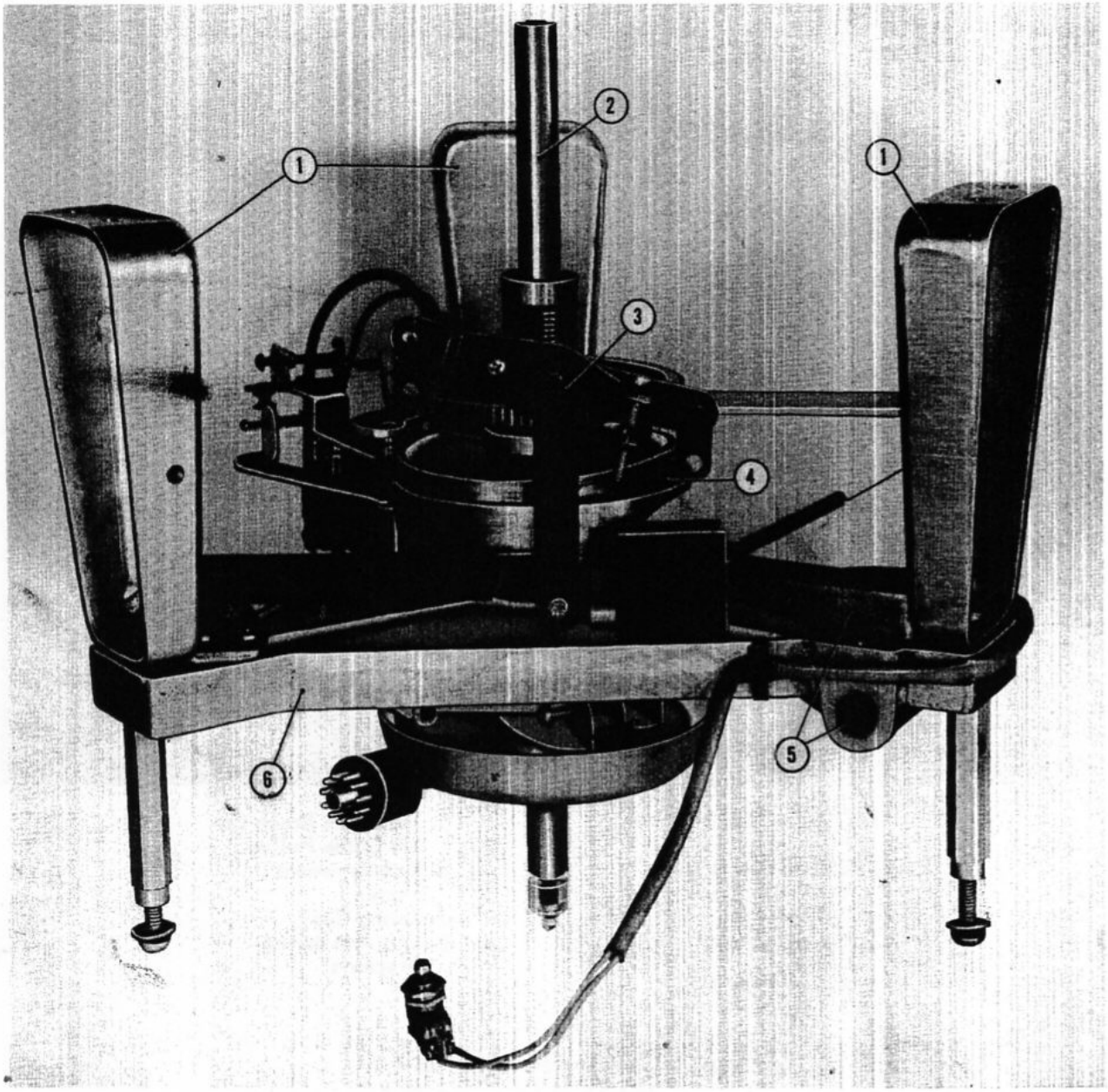
1. Chassis Mounting Plate
2. Record Clamp and Tone Arm Cable Guide Pulley
3. Record Carrier Rollers
4. Record Lift Arm Assembly
5. Tone Arm Brush Cable Guide Pulley
6. Reinforcement Plates
7. Spring Cups
8. Lift Arm Spring Brackets

Figure 8. Chassis Mounting Plate and Record Lift Arm Assembly

arm brush cable guide pulley bracket and pulley, and the record clamp and tone arm cable guide pulley bracket and pulley (see Figure 8).

Although the record lift arm assembly may be considered a sub-assembly, it is included in the chassis mounting plate and record lift arm assembly. The record lift arms are attached to the chassis mounting plate by a bracket and screws. The chassis mounting plate supports the top support casting, the record changer motor, and the chassis frame assembly. The chassis frame assembly is hung from the chassis mounting plate by three chassis frame supports. Two backstop pawls and a backstop pawl release lever are mounted on the top of the chassis mounting plate. The release lever disengages the backstop pawls and turns off the service switch. It is used primarily when some of the records are being changed.

d. Chassis Frame Assembly. The chassis frame assembly includes the chassis frame casting, the selector shaft assembly, and three chassis frame supports. This assembly serves as a mount for the main cam, record arm link and lever assembly and roller guide, record clamp and tone arm lever, shaft and cancel arm assembly, mute and play switch actuator arm assembly, transfer switch actuator arm assembly, mute and play switch, and transfer switch (see Figures 9 and 10).



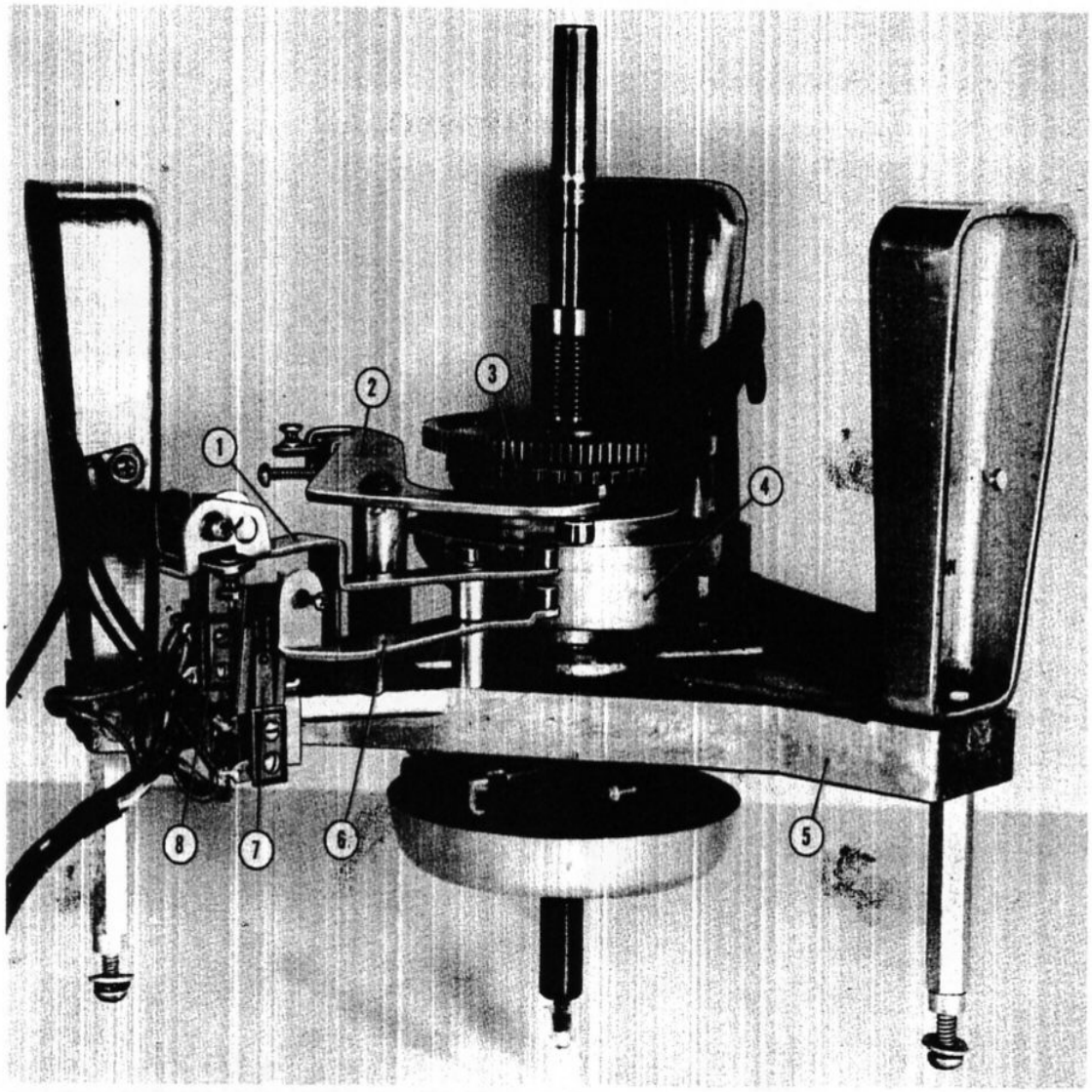
1. Supports
2. Selector Shaft Assembly
3. Link and Lever Assembly
4. Main Cam
5. Shaft and Cancel Arm Assembly
6. Chassis Frame Casting

Figure 9. Chassis Frame Assembly (Front View)

(1) Link and Lever Assembly. The function of the link and lever assembly is to transmit the movement of the record lift arm cam roller to whichever record lift arm is free (Figure 9). (Only one record lift arm can operate at one time because the record carrier is offset and blocks the arm not required for a particular selection.) The link and lever assembly is attached to the chassis frame casting by a bracket. A roller guide track is provided to assure the vertical movement of the link and lever assembly.

(2) Record Clamp and Tone Arm Lever. This lever is mounted separately on the rear of the chassis frame casting and actuates the record clamp cam and tone arm shaft and cam (Figure 10).

(3) Shaft and Cancel Arm Assembly. The cancel arm is pinned on a shaft mounted through the right front member of the chassis frame casting (Figure 9). Also pinned to this shaft is the cancel lever which operates off the main cam. The function of the cancel arm is to actuate the mechanism



1. Transfer Switch Actuating Arm
2. Record Clamp and Tone Arm Lever
3. Ratchet Wheel and Pawl Assembly
4. Main Cam
5. Chassis Frame Casting
6. Mute and Play Switch Actuating Arm
7. Mute and Play Switch
8. Transfer Switch

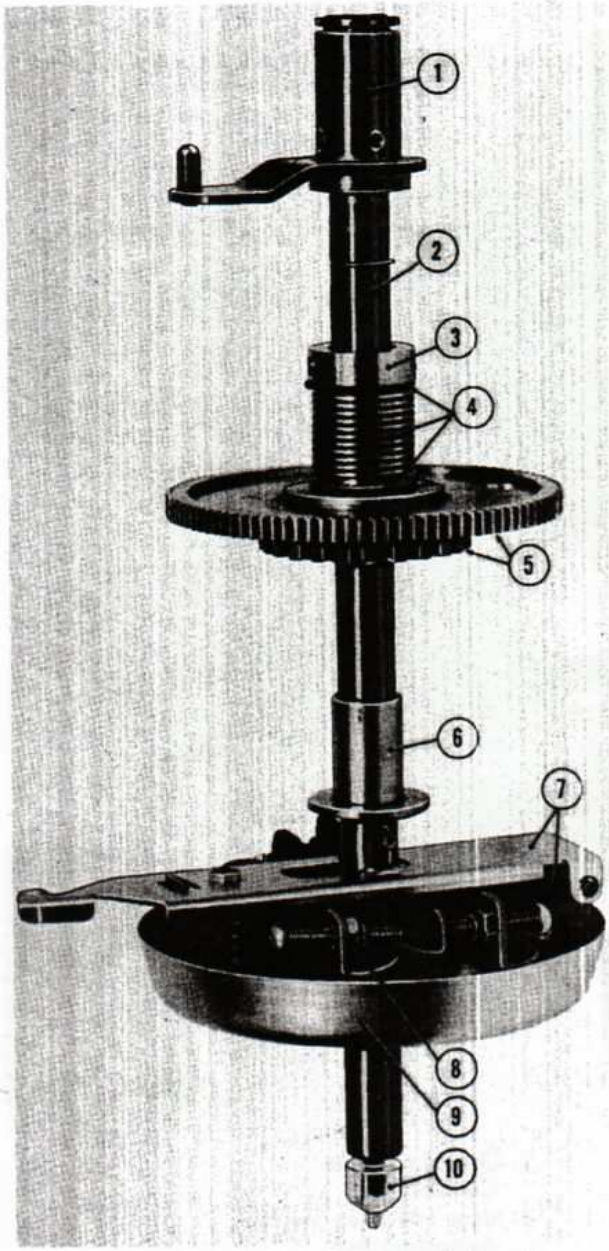
Figure 10. Chassis Frame Assembly (Rear View)

that resets the selector pin and reversing switch after a selection has been played.

(4) Mute and Play Switch Actuator Arm and Transfer Switch Actuator Arm. These two actuator arms are mounted on the same shaft on the back side of the chassis frame casting. These arms actuate the mute and play switch and the transfer switch respectively. (See Figure 10.)

(5) Mute and Play Switch and Transfer Switch. The mute and play switch and the transfer switch are mounted near the rear chassis frame support (Figure 10). The mute and play switch actuator arm stop pin is mounted on the chassis frame casting and restricts the backward movement of the arm. The functions of these two switches are described in paragraph 3, f.

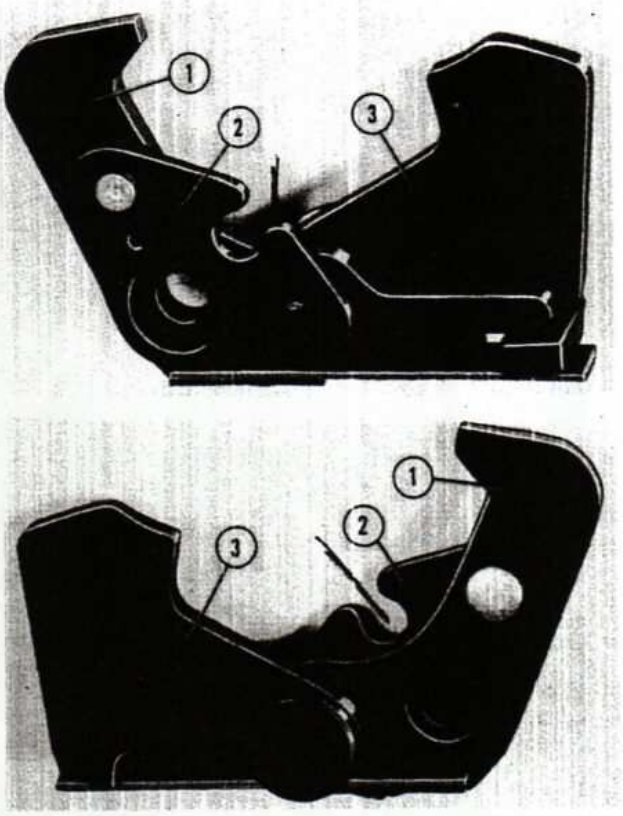
e. Selector Shaft Assembly. This assembly includes the arm and hub assembly, selector drive clutch hub, drive clutch spring and felt washers, gear and ratchet wheel assembly, sleeve and bushing assembly, pawl assembly, strap and spring assembly, main cam and bushing assembly, cancel arm sleeve, selector crank and mounting plate assembly, adjusting bracket and stop nut assembly, drip pan, and the motor reversing switch plunger and switch actuator (see Figures 10 and 11).



1. Arm and Hub Assembly
2. Selector Shaft
3. Selector Drive Clutch Hub
4. Drive Clutch Spring and Felt Washers
5. Gear and Ratchet Wheel Assembly
6. Cancel Arm Sleeve
7. Selector Crank and Mounting Plate Assembly
8. Adjusting Bracket and Stop Nut Assembly
9. Drip Pan
10. Reversing Switch Actuator and Plunger

Figure 11. Selector Shaft Assembly

(1) Arm and Hub Assembly. This assembly is pinned to the end of the selector shaft with a roll pin. The arm of this assembly engages the record carrier drive arm on the underside of the record carrier casting and drives the record carrier (see Figures 6 and 11).



1. Engaging Arm
2. Pivot Arm
3. Lever

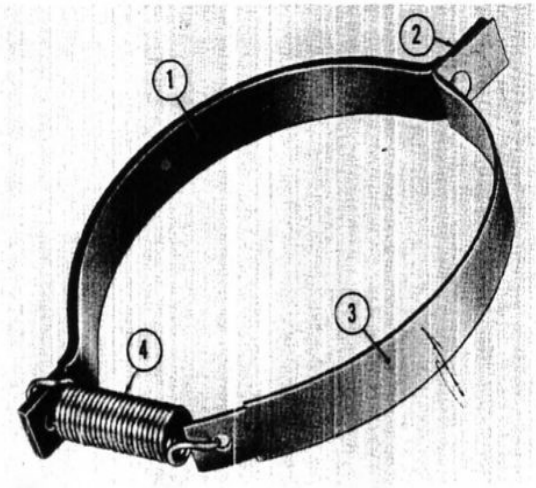
Figure 12. Pawl Assembly

(2) Drive Clutch Hub. The drive clutch hub is pinned to the selector shaft and holds the drive clutch spring in place.

(3) Drive Clutch Spring. This spring is attached to the gear and ratchet wheel assembly. (See Figure 11.) The drive clutch grips the selector shaft only when turned in a clockwise direction. Thus, when the changer motor reverses, the drive clutch spring disengages and the selector shaft and record carrier stop turning.

(4) Gear and Ratchet Wheel Assembly. This gear assembly is mounted on the selector shaft by a bushing assembly (Figure 11). As stated above, the selector shaft is driven by this gear when it is turned in a clockwise direction. When the changer motor reverses and turns the gear in a counter-clockwise direction, the ratchet wheel on the underside of the gear is engaged by the pawl assembly on the main cam. Thus, the main cam is turned in a counter-clockwise direction.

(5) Pawl Assembly. Although the pawl assembly is included here as part of the selector shaft assembly, it is actually attached to the main cam (see Figure 12). As stated above, the pawl engages the ratchet wheel and drives the main cam.

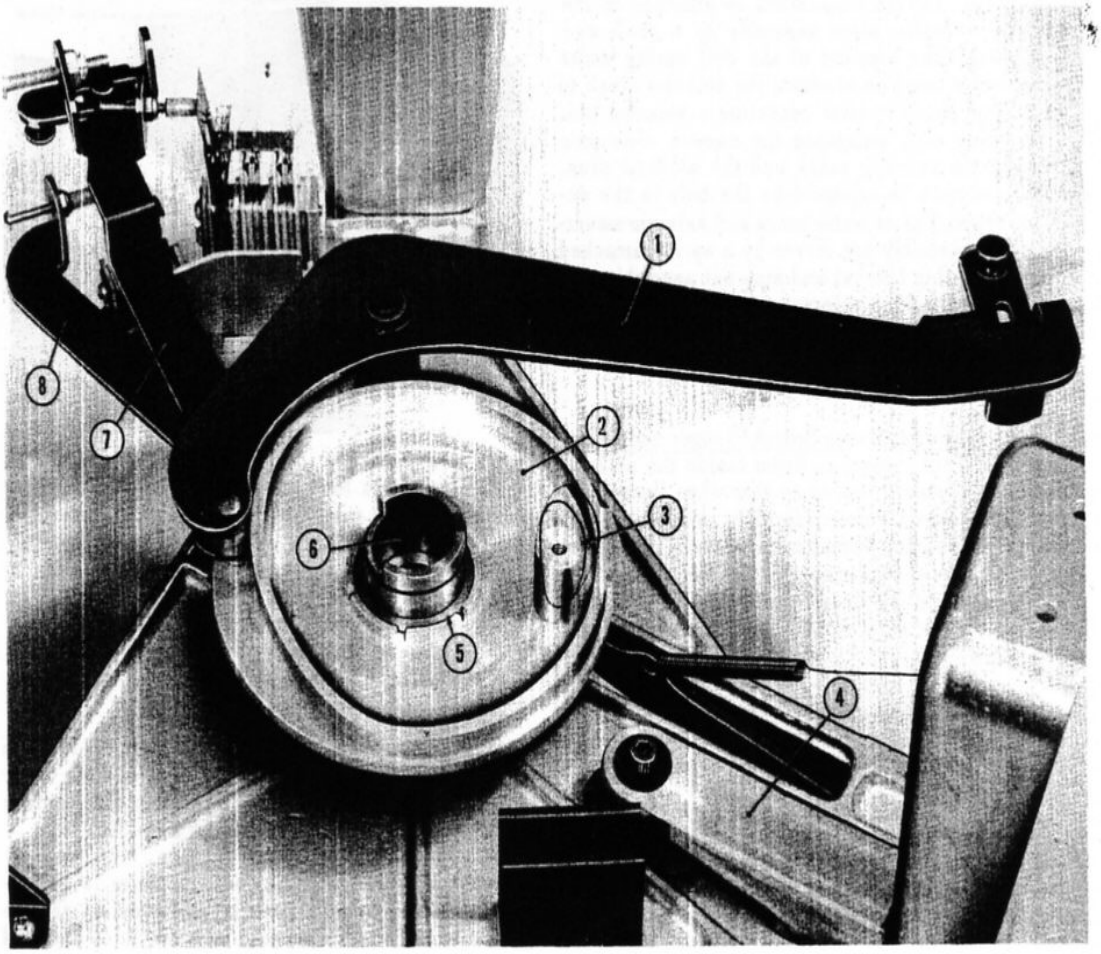


1. Strap
2. Engaging Point
3. Spring
4. Friction Spring

Figure 13. Strap and Spring Assembly

(6) Strap and Spring Assembly. This assembly is composed of a circular strap and spring which are riveted together on one end and held in tension by a coil spring on the other (Figure 13).

When the gear and ratchet wheel assembly are turning in a clockwise direction, the strap and spring assembly engages the pawl assembly and holds the engaging arm of the pawl assembly away from the ratchet wheel teeth. This eliminates any noise that might otherwise be caused by the engaging arms of the pawl assembly dragging on the ratchet wheel teeth. During this operation the strap and spring assembly slides on the gear and ratchet wheel assembly. When the gear and ratchet wheel assembly turn in a counterclockwise direction, the strap and spring assembly releases the pawl assembly which then engages the ratchet wheel, thus turning the main cam.



1. Record Clamp Lever
2. Main Cam
3. Mounting Stub for Pawl Assembly
4. Cancel Lever
5. Bushing
6. Shaft
7. Transfer Switch Actuating Arm
8. Mute and Play Switch Actuating Arm

Figure 14. Main Cam and Bushing Assembly

(7) Main Cam and Bushing Assembly. The main cam is mounted on the chassis frame assembly (see Figure 9) and is assembled on the selector shaft just below the gear and ratchet wheel assembly. The cam has five cam tracks for five cam rollers as follows: record lift arm link and lever assembly, cancel arm, transfer switch, mute and play switch, and record clamp cam (See Figures 14 and 15).

(8) Cancel Arm Sleeve. The cancel arm sleeve is mounted on the selector shaft so that it rides lightly on the crossarm of the motor reversing switch plunger (see Figure 11). The function of the cancel arm sleeve is to provide the means by which the cancel lever presses down on the crossarm of the reversing switch plunger, thus resetting the reversing switch and canceling the released selector pin.

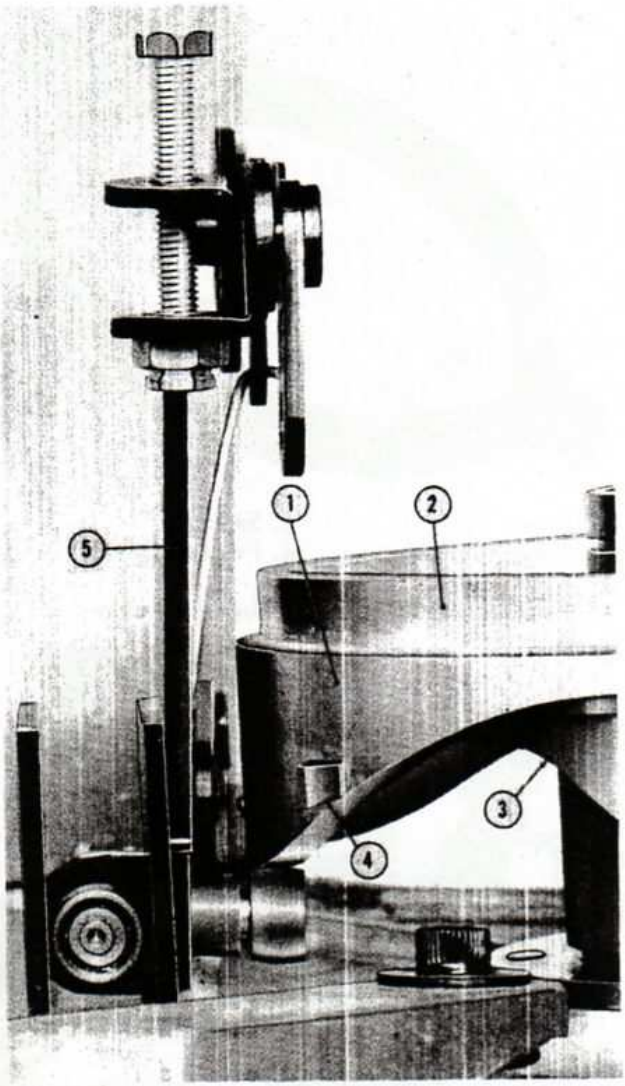
(9) Selector Crank and Mounting Plate Assembly. This assembly consists of the selector crank, mounting plate assembly, and the adjusting bracket and stop nut assembly including the drip pan (see Figure 11). The selector crank is attached to the selector mounting plate assembly by a shaft and E-washers. The purpose of the coil spring under the selector crank is to return the selector crank to its at rest position after canceling a selector pin. This spring also maintains the correct clearance between the selector crank and the selector pins. This clearance is adjusted by the bolt in the selector crank. The selector crank and selector mounting plate assembly are driven by a spring attached to the adjusting bracket and stop nut assembly. An important part of the selector mounting plate assembly is the release arm which releases the motor reversing switch plunger when the selector crank strikes a released selector pin.

(10) Motor Reversing Switch Plunger and Switch Actuator. This plunger is fitted inside the selector shaft and is spring loaded so that when the release arm of the selector mounting plate is actuated, the plunger and switch actuator are released and spring upward. This upward movement of the plunger and switch actuator reverses the reversing switches located on the side of the junction box assembly (See Figure 11).

f. Selector and Junction Box Assembly. This assembly is attached to the chassis frame casting by three bolts and three supports (see Figures 16 and 17).

The selector and junction box assembly includes the electric selector, group relays, wiring harness, wobble plate, selector casting, reversing switch, junction box, and override switch.

(1) Electric Selector. The electric selector consists of 104 magnet coils and selector latch pins and four letter relays – A, B, C, and D. A complete description of the selector and its operation is given in Section 5, paragraph c, of this manual.



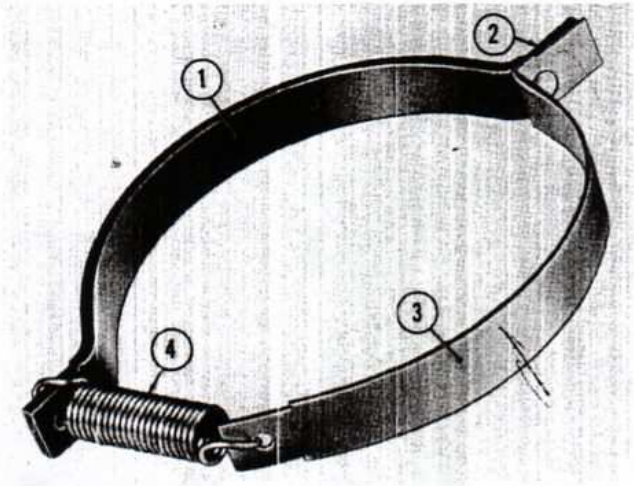
1. Main Cam
2. Cam Track for Record Clamp Lever
3. Cam Track for Cancel Lever
4. Cam Lobe for Mute and Play Switch
5. Link and Lever Assembly

Figure 15. Main Cam and Link and Lever Assembly

(2) Wiring Harness. The wiring harness is made up of the selector magnet coil leads and the letter relay leads. These leads are fed into the junction box receptacles (see Figures 16 and 17).

(3) Wobble Plate. The wobble plate is spring-loaded lightly against the ledge formed by the inside shoulder of the selector pins. It is mounted so that it moves the override switch yoke assembly and operates the override switch when any of the selector pins are released. (See Figure 17).

(4) Selector Casting. The selector casting is the mounting base for the selector drum, override switch, reversing switch, group relays, and junction box.



1. Strap
2. Engaging Point
3. Spring
4. Friction Spring

Figure 13. Strap and Spring Assembly

(6) Strap and Spring Assembly. This assembly is composed of a circular strap and spring which are riveted together on one end and held in tension by a coil spring on the other (Figure 13).

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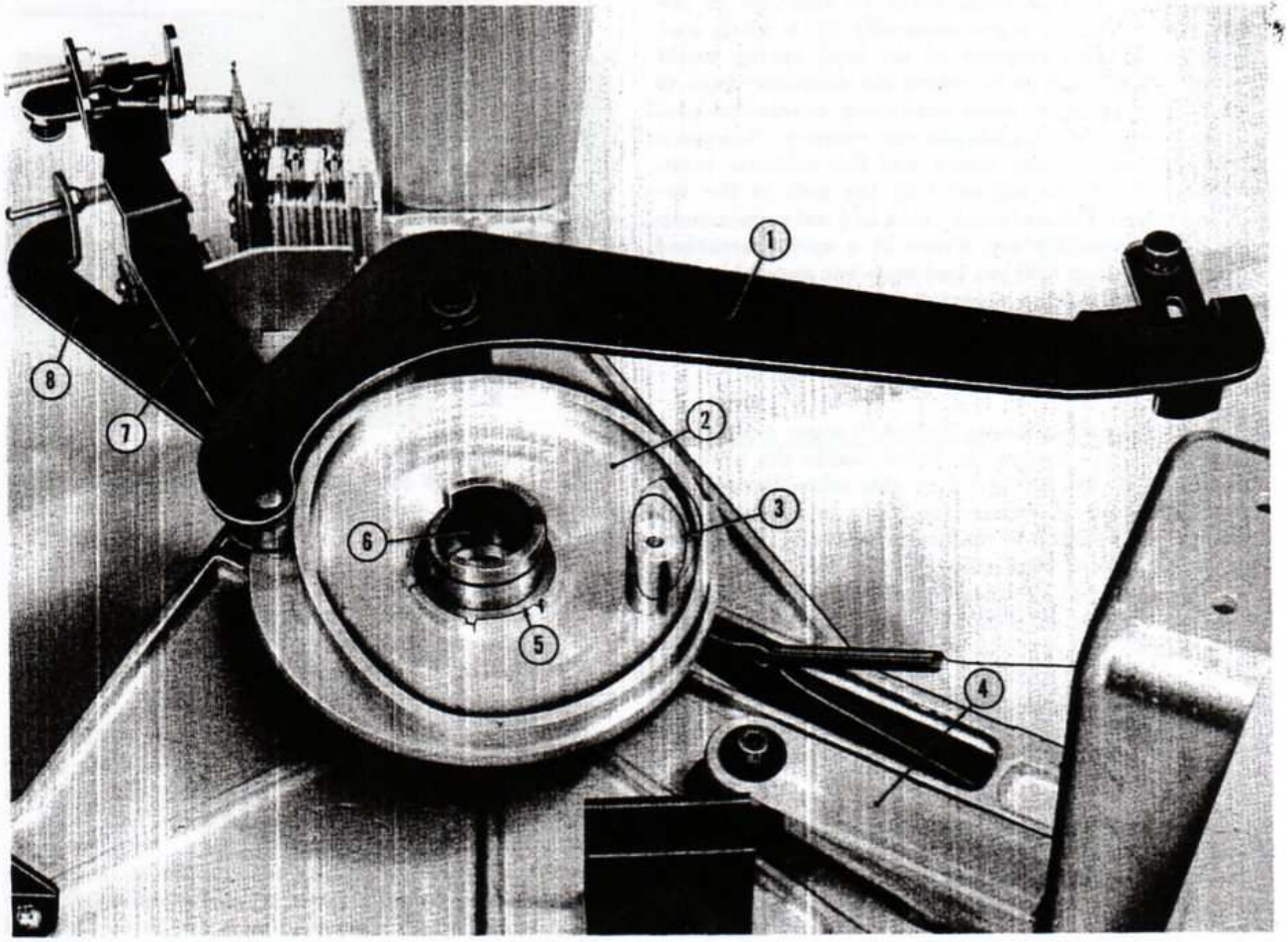


1. Record Clamp Lever
2. Main Cam
3. Mounting Stub for Pawl Assembly
4. Cancel Lever
5. Bushing
6. Shaft
7. Transfer Switch Actuating Arm
8. Mute and Play Switch Actuating Arm

Figure 14. Main Cam and Bushing Assembly

(7) Main Cam and Bushing Assembly. The main cam is mounted on the chassis frame assembly (see Figure 9) and is assembled on the selector shaft just below the gear and ratchet wheel assembly. The cam has five cam tracks for five cam rollers as follows: record lift arm link and lever assembly, cancel arm, transfer switch, mute and play switch, and record clamp cam (See Figures 14 and 15).

(8) Cancel Arm Sleeve. The cancel arm sleeve is mounted on the selector shaft so that it rides lightly on the crossarm of the motor reversing switch plunger (see Figure 11). The function of the cancel arm sleeve is to provide the means by which the cancel lever presses down on the crossarm of the reversing switch plunger, thus resetting the reversing switch and canceling the released selector pin.

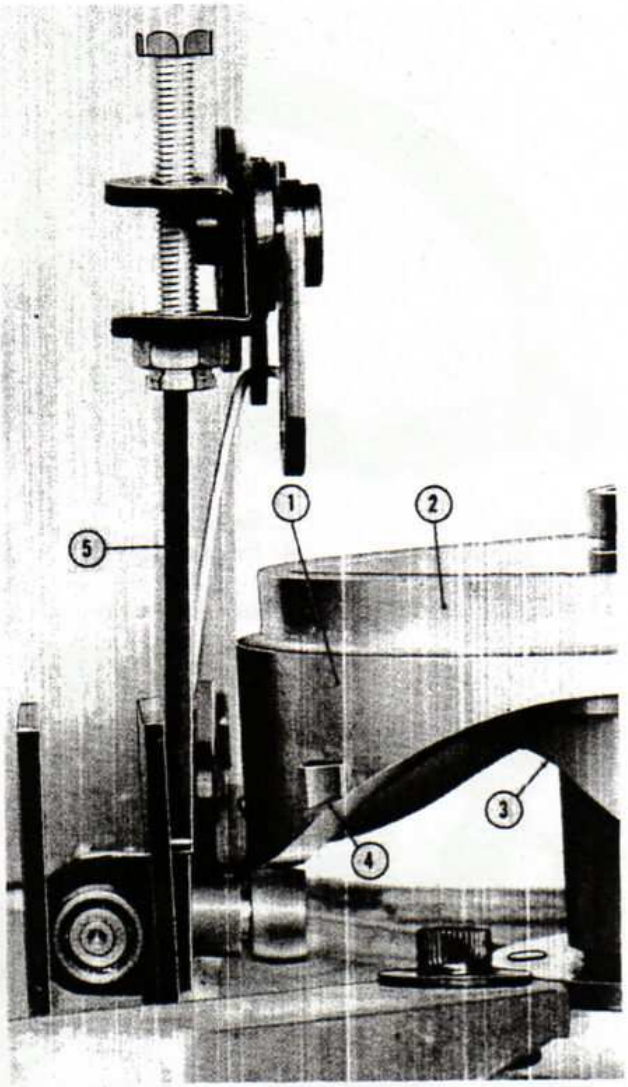
(9) Selector Crank and Mounting Plate Assembly. This assembly consists of the selector crank, mounting plate assembly, and the adjusting bracket and stop nut assembly including the drip pan (see Figure 11). The selector crank is attached to the selector mounting plate assembly by a shaft and E-washers. The purpose of the coil spring under the selector crank is to return the selector crank to its at rest position after canceling a selector pin. This spring also maintains the correct clearance between the selector crank and the selector pins. This clearance is adjusted by the bolt in the selector crank. The selector crank and selector mounting plate assembly are driven by a spring attached to the adjusting bracket and stop nut assembly. An important part of the selector mounting plate assembly is the release arm which releases the motor reversing switch plunger when the selector crank strikes a released selector pin.

(10) Motor Reversing Switch Plunger and Switch Actuator. This plunger is fitted inside the selector shaft and is spring loaded so that when the release arm of the selector mounting plate is actuated, the plunger and switch actuator are released and spring upward. This upward movement of the plunger and switch actuator reverses the reversing switches located on the side of the junction box assembly (See Figure 11).

f. Selector and Junction Box Assembly. This assembly is attached to the chassis frame casting by three bolts and three supports (see Figures 16 and 17).

The selector and junction box assembly includes the electric selector, group relays, wiring harness, wobble plate, selector casting, reversing switch, junction box, and override switch.

(1) Electric Selector. The electric selector consists of 104 magnet coils and selector latch pins and four letter relays – A, B, C, and D. A complete description of the selector and its operation is given in Section 5, paragraph c, of this manual.



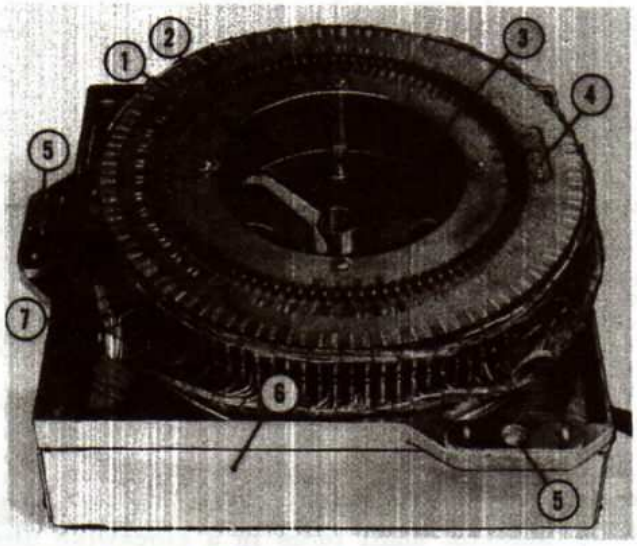
1. Main Cam
2. Cam Track for Record Clamp Lever
3. Cam Track for Cancel Lever
4. Cam Lobe for Mute and Play Switch
5. Link and Lever Assembly

Figure 15. Main Cam and Link and Lever Assembly

(2) Wiring Harness. The wiring harness is made up of the selector magnet coil leads and the letter relay leads. These leads are fed into the junction box receptacles (see Figures 16 and 17).

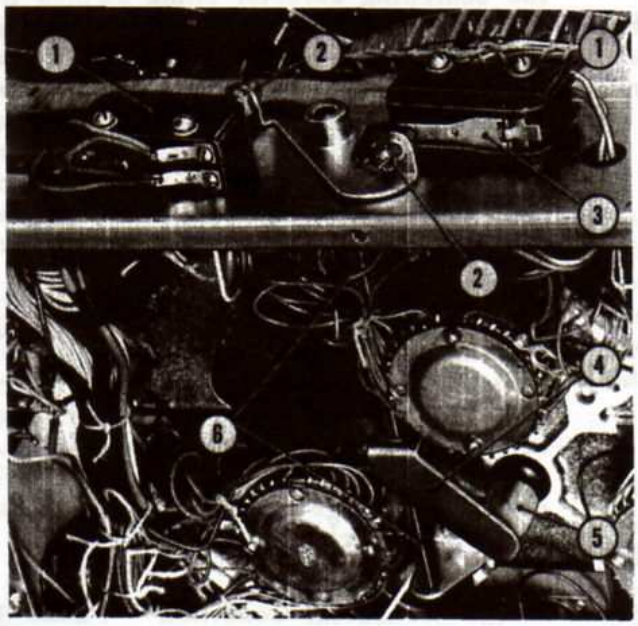
(3) Wobble Plate. The wobble plate is spring-loaded lightly against the ledge formed by the inside shoulder of the selector pins. It is mounted so that it moves the override switch yoke assembly and operates the override switch when any of the selector pins are released. (See Figure 17).

(4) Selector Casting. The selector casting is the mounting base for the selector drum, override switch, reversing switch, group relays, and junction box.



1. Selector Drum
2. Override Switch Yoke
3. Wobble Plate
4. Selector Coil Numbers
5. Holes for Supports
6. Junction Box
7. Wiring Harness

Figure 16. Selector and Junction Box Assembly



1. Reversing Switches
2. Adjusting Screws
3. Reversing Switch Actuator Arm
4. Reversing Switch Actuating Lever
5. Reversing Switch Plunger
6. Shaft

Figure 17. Reversing Switches

(5) Reversing Switches. These switches are mounted on the side of the junction box and are operated by the reversing switch actuator arm. This arm is attached to the reversing switch shaft which is turned by the actuator lever located inside the junction box. (See Figure 20.) The function of the reversing switches is described under the section on operation, paragraph 3, c.

(6) Junction Box. The junction box houses the various electrical wiring that leads to plug receptacles mounted in the sides of the box. The front side of the box mounts the receptacles for the selector button switch assembly, and power input plugs. The right side mounts the receptacles for the stepper plugs. The back side mounts the receptacles for the coin mechanism plugs as well as the receptacles for the turntable motor power supply, trip switch and safety switch leads, and mute and play switch leads. The back side also mounts receptacles for the record changer motor power supply, and transfer switch and toggle switch leads. In addition to these receptacles, the back side also mounts the .8 amp Fusetron fuse which is in the anti-cheat circuit.

(7) Override Switch. The override switch is mounted on the underside of the selector casting in the right rear corner of the junction box (see Figure 17). The override switch yoke assembly extends through a hole in the wobble plate and is curved to rest against the upper side of the plate. Consequently, any upward motion of the wobble plate operates the override switch. (The function of the override switch is described in the following writeup of the theory of operation of the phonograph paragraph 3, b.)

3. OPERATION

The Model 1700 record changer goes through a complete operating cycle each time a record is played. This cycle begins with the phonograph in its "at rest" position and passes through nine distinct phases of operation until the phonograph returns to its original "at rest" position. All of the mechanical operations of the record changer depend upon the operation, in proper sequence, of the override switch, selector switch, transfer switch, mute and play switch, and trip switch or cancel switch. Therefore, this description of the operation of the phonograph is divided into nine phases based on the sequential operation of the above electrical switches. These nine phases are:

a. Phase 1 -- Phonograph at Rest. In describing the electrical and mechanical conditions of the record changer during this first phase, it is assumed that the phonograph has been plugged in and is ready for the insertion of a coin in the coin register mechanism. In other words, the phonograph is in a "stand-by" condition. In this "stand-by" condition the fluorescent lights and the coin entry light are on, the coin return magnet in the coin register mechanism is energized, and partial heater voltage is applied to the heaters of the amplifier tubes (see Figure 18).

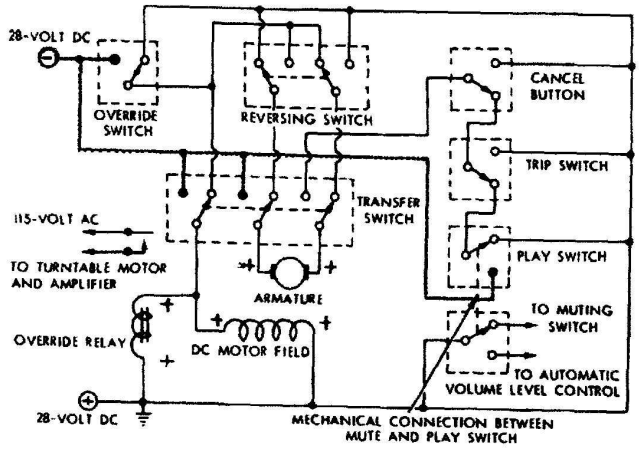


Figure 18. Phase 1 -- Phonograph at Rest

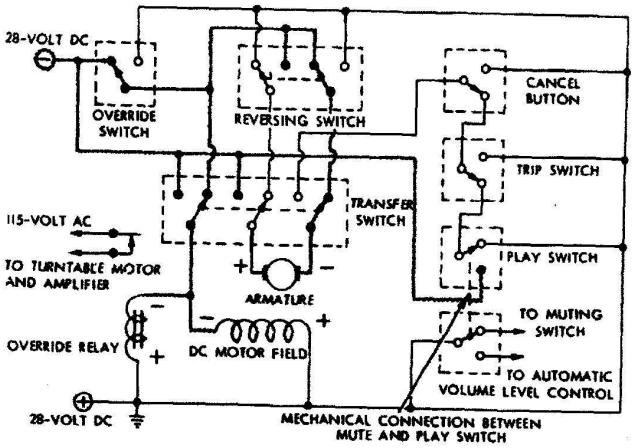


Figure 19. Phase 2 -- Override Switch Operates

(1) Electrical Condition -- Phase 1. The electrical condition of the record changer during the stand-by or at rest phase is shown in Figure 18. Negative 28-volt dc is applied to one pole of the override switch, two poles of the transfer switch, and one pole of the play switch. Positive 28-volt dc is fed through the override relay, d-c motor field, and all the remaining circuitry. No action takes place because the circuit is not completed at any point.

(2) Mechanical Condition -- Phase 1. When the phonograph is at rest, the record lift arms are down, there is no movement of the main cam, and all the cam rollers are at rest at the beginning of their respective cycles of operation.

b. Phase 2 -- Override Switch Operates. When a coin is inserted in the coin register mechansim and a selection is made, a circuit is completed which causes a selector pin in the electric selector to be released. This, in turn, causes the wobble plate in the selector to move and operate the override switch.

(1) Electrical Condition -- Phase 2. When the override switch operates, negative dc is fed through the override switch and the transfer switch and is applied to one side of the override relay (which turns on the amplifier and starts the turntable motor), and to one side of the field of the d-c record changer motor (see Figure 19).

The negative d-c circuit is also completed through the selector switch and transfer switch to one side of the armature of the d-c record changer motor. Figure 19 shows positive dc applied to the opposite sides of the override relay, d-c motor field, and d-c motor armature. Therefore, the override relay operates and completes the amplifier circuit and turntable motor circuit as mentioned above. The d-c record changer motor starts running and, through the spring clutch mechanism, starts turning the selector shaft in clockwise direction.

(2) Mechanical Condition -- Phase 2. When the selector shaft turns in a clockwise direction, the record carrier and the selector crank also turn in a clockwise direction until the selector crank strikes the released selector pin. Meanwhile, the main cam remains stationary. Consequently, there is no motion transmitted to the various cam rollers and cam arms.

c. Phase 3 -- Reversing Switch Operates. When the searching selector crank strikes the released selector pin, the selector crank and mounting plate assembly act to release the motor reversing switch plunger and the reversing switch is operated. The release arm that releases the motor reversing switch plunger is actuated by the adjusting bracket and stop nut assembly which continues to turn with the selector shaft for a few degrees after the selector crank strikes the released selector pin.

(1) Electrical Condition -- Phase 3. The reversing switch is a double-pole, double throw switch. Its operation reverses the direction of the d-c circuit through the d-c motor armature and thus reverses the direction of the d-c motor. Figure 20 shows that the reversing of this circuit is the only electrical change effected by the operation of the reversing switch.

(2) Mechanical Condition -- Phase 3. After the adjusting bracket and stop nut assembly has released the reversing switch plunger and operated the reversing switch, the direction of the d-c record changer motor is reversed. Therefore, the selector shaft spring clutch disengages and the selector shaft and record carrier do not turn. Meanwhile, the ratchet wheel on the underside of the drive gear is engaged by the main cam pawl assembly. Thus, the main cam starts turning in a counterclockwise direction and the various cam rollers start rolling on their respective cam tracks. After the main cam turns a few degrees, the transfer switch actuator arm roller drops from a lobe on its cam track and the transfer switch is operated.

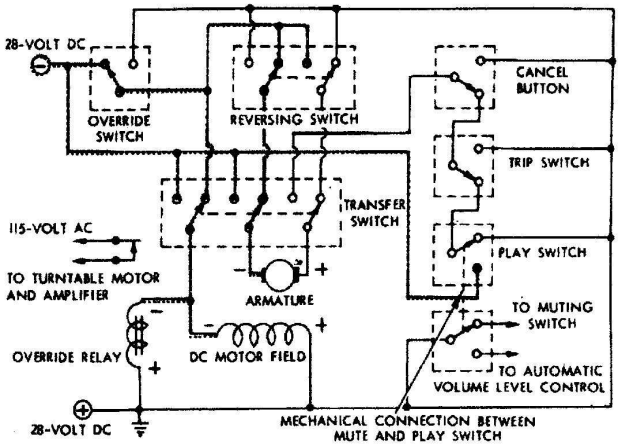


Figure 20. Phase 3 -- Reversing Switch Operates

d. Phase 4 -- Transfer Switch Operates. One function of the transfer switch is to transfer the d-c record changer motor circuit from the reversing switch so that the reversing switch can be reset (returned to the position shown in Figure 18). Another function of the transfer switch is to transfer the override switch and override relay circuit so that the selector pin can be cancelled. This transfer is necessary because if only one selection has been made, the cancellation of the lone selector pin would cause the wobble plate to release the override switch and remove the 28-volt dc from the changer motor prematurely, before the selection is played.

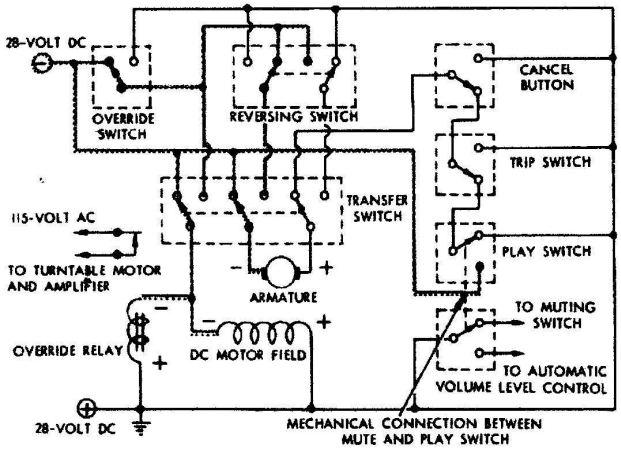


Figure 21. Phase 4 -- Transfer Switch Operates

(1) Electrical Condition -- Phase 4. An examination of Figure 21 shows the d-c record changer circuit and the override switch and relay circuit after being transferred. Although these circuits are still maintained, they no longer involve the reversing switch and override switch.

(2) Mechanical Condition -- Phase 4. After the transfer switch operates, the main cam continues to turn in a counterclockwise direction. The free record lift arm is started upward by the action of the link and lever assembly, and the cancel lever is actuated by the cancel arm operating off its main cam track. The cancel arm presses down on the cancel sleeve and pushes the reversing switch plunger back to its starting position, thus resetting the reversing switch and canceling the selector pin.

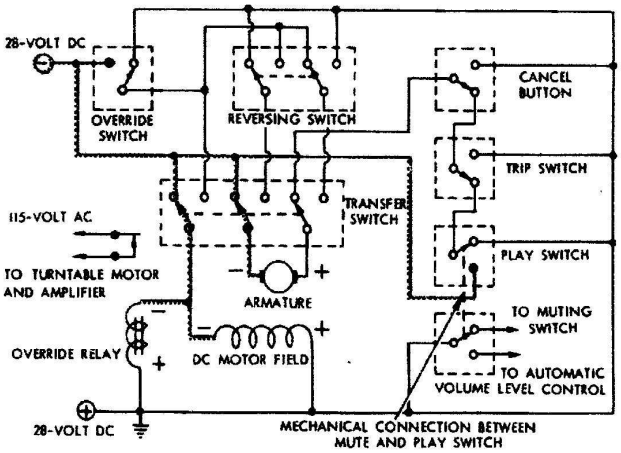


Figure 22. Phase 5 – Reversing Switch Reset, Override Switch Reset

e. Phase 5 – Reversing Switch Reset.

(1) Electrical Condition – Phase 5. Figure 22 shows the electrical condition after the reversing switch and override switch has been reset. Although power is still applied to the changer motor and the override relay, the reversing switch and and override relay are by-passed and therefore their resetting does not break the circuits. It should be noted if more than one selection has been made, the wobble plate will remain displaced and will not operate the override switch and the cycle of operation of the record changer will start again when the first cycle is completed.

(2) Mechanical Condition – Phase 5. During this phase the main cam continues to operate the record lift arm mechanism (link and lever assembly) until the selected record has been lifted into place in front of the record clamp assembly. This movement of the record lift arm records a play on the playmeter and actuates the "Record Now Playing" sign. At this point the record clamp cam roller operating off the main cam actuates the record clamp cam and the record is clamped in playing position. Following this action, the tone arm is released and the needle is guided to the feed-in groove on the record. This is done by the tone arm release lever. After the record is clamped in place and the needle has been guided to the feed-in groove on the record, the mute switch and the play switch (mechanically linked) operate, having been actuated by the mute and play switch cam arm operating off the main cam.

f. Phase 6 – Mute and Play Switch Operate. When the play switch operates, positive 28-volt dc is removed from the armature of the record changer motor, and negative 28-volt dc is applied, thus shorting the armature upon itself. This condition produces dynamic breaking and the record changer motor remains motionless while the record is played. (See Figure 23).

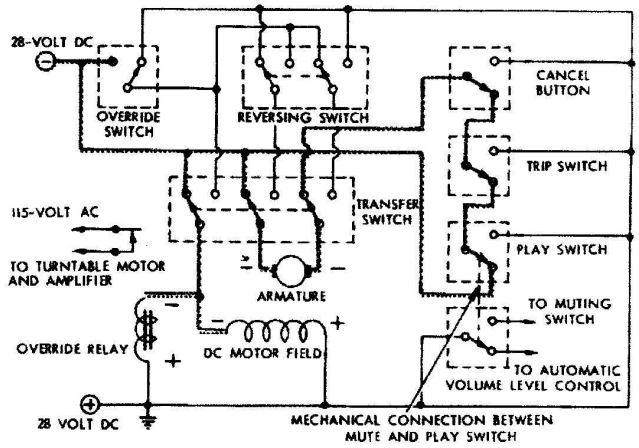


Figure 23. Phase 6 – Mute Switch and Play Switch Operate

(1) Electrical Condition – Phase 6. Figure 23 shows negative 28-volt dc fed through the play switch, trip switch, cancel switch, and transfer switch to the armature of the dc record changer motor with results as explained above. Negative 28-volt dc is still applied to one side of the override relay and one side of the field of the dc record changer motor. Positive 28-volt dc is still applied to the opposite sides of the override relay and field of the dc record changer motor. A common ground connection is now provided for the automatic volume level control circuit of the amplifier. This connection is made through the mute switch, which is a single-pole, double-throw switch mechanically linked to the play switch.

NOTE: The mute switch provides a common ground for either the muting circuit or the automatic level volume control circuit. When the mute switch is operated by the mechanical linkage to the play switch as described above, the muting circuit is broken and the automatic level volume control circuit is completed.

(2) Mechanical Condition – Phase 6. During this phase the d-c record changer motor is at rest, the record lift arm that lifted the record also remains at rest in an "up" position. Meanwhile, the turntable operates until the record is played and the tone arm operates the trip switch.

g. Phase 7 – Trip Switch Operates. The function of the trip switch is to apply positive 28-volt dc to one side of the record changer motor for a few seconds until the main cam has turned far enough to actuate the play switch cam lever and reset the play switch. The play switch then takes over the positive 28-volt d-c circuit to the changer motor and the main cam continues to turn. The spring-loaded trip switch, meanwhile, returns to its original position having performed its function.

(1) Electrical Condition – Phase 7. An examination of Figure 24 shows negative 28-volt dc applied to one side of the override relay, one side of the d-c record changer motor field, and one side of the d-c record changer motor armature. Although the play switch has not yet operated, the negative 28-volt d-c circuit it carried has been broken by the trip switch.

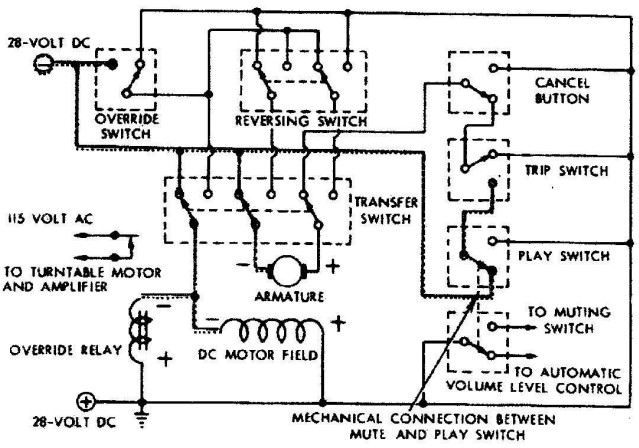


Figure 24. Phase 7 – Trip Switch Operates

(2) Mechanical Condition – Phase 7. When the trip switch operates, the record changer motor starts the main cam turning in a counterclockwise direction. After it has turned a few degrees, the main cam actuates the play switch cam lever which operates the play switch. The play switch takes over the changer motor circuit from the trip switch and the main cam continues to turn until the transfer switch cam lever is actuated and the transfer switch operates, turning off the changer motor, turntable motor, and stopping the phonograph in its rest position.

h. Phase 8 -- Play Switch Operates. The function of the play switch has been described under Phase 7.

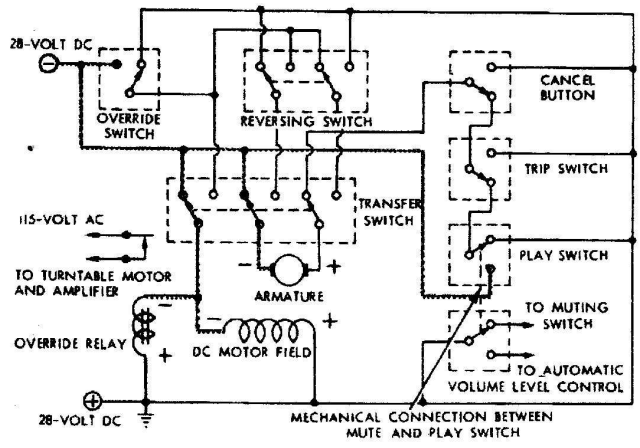


Figure 25. Phase 8 -- Play Switch Operates

(1) Electrical Condition -- Phase 8. Figure 25 shows the play switch completing the positive 28-volt dc circuit to one side of the armature of the changer motor. The trip switch has returned to its normal position.

(2) Mechanical Condition -- Phase 8. As soon as the play switch operates, the main cam actuates the record lift arm mechanism (link and lever assembly) and the record that has been played is

returned to the record carrier, the record lift arm meanwhile returning to its original "down" position. As stated under Phase 7, the main cam continues to turn until the transfer switch cam lever is actuated and the transfer switch operates.

i. Phase 9 -- Transfer Switch Operates. When the transfer switch operates, the override switch and the reversing switch are again brought into the override relay circuit and the d-c record changer motor circuit. Consequently, if no other selector pin has been released, the wobble plate will not be displaced and will not operate the override switch and the record changer will remain at rest. However, if there is another selector pin released, the wobble plate will operate the override switch and the record changer will again start its cycle of operation.

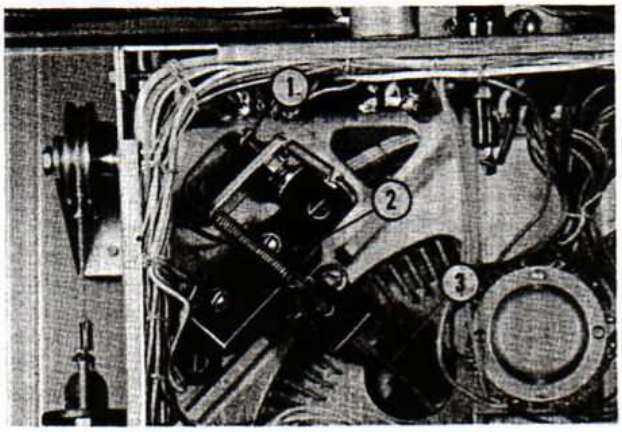
(1) Electrical Condition -- Phase 9. The electrical condition at this point (completion of the operating cycle of the phonograph) is exactly the same as it is in Phase 1 (see Figure 18). As the result of the operation of the transfer switch, the record changer motor is shut off. The override relay is de-energized, thus shutting off the turntable motor and the main power supply to the amplifier, leaving only the partial heater circuit of the amplifier energized.

(2) Mechanical Condition -- Phase 9. At the end of this phase the phonograph is again in its "at rest" condition. Therefore, the record lift arms are retracted and are ready to lift the next selection up to the turntable. As explained above the record changer motor is shut off and there is no mechanical action taking place.

4. ADJUSTMENTS

Although each Wurlitzer Model 1700 and 1700F phonograph is carefully adjusted at the factory, various factors such as rough handling during shipping may make it necessary to check these adjustments. Before making any adjustments it should be remembered that the mechanical operation of the phonograph depends primarily upon the proper operation of a number of switches. Therefore, if the phonograph fails to function properly, check the adjustment of the various switches first. When it is certain that all the switches are operating properly, it will be easier to find the reason for any mechanical malfunctioning.

a. Override Switch. The override switch is actuated when a selector pin is released and the wobble plate actuates the override switch yoke assembly. The override switch adjusting screw can be seen through the hole in the top right rear corner of the junction box. Although this adjustment can be made without removing the bottom cover from the junction box, Figure 26 shows the override switch and the override switch adjusting screw as seen when looking into the bottom of the junction box with the cover removed.

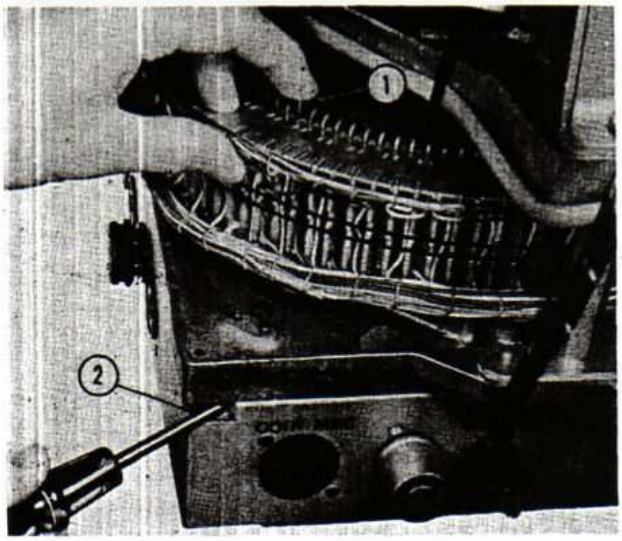


1. Adjusting Screw
2. Override Switch
3. Override Switch Yoke Assembly

Figure 26. Override Switch and Adjusting Screw

The adjustment is made as follows:

(1) Insert a screwdriver through the hole in the junction box and engage the adjusting screw (Figure 27).



1. Selector Pin 2. Adjusting Screw Opening

Figure 27. Setting the Override Switch

(2) Release a selector pin.

(3) Push the released selector pin in and out slowly, meanwhile listening closely to determine at what point the override switch operates. (The adjusting screw should be set so that the switch operates at approximately one-half the travel distance of the selector pin, that is, half way between its engaged position and its released position. Turning the adjusting screw in a clockwise direction will make the switch operate late or in the latter part of the outward movement of the selector pin. Turning the screw in a counterclockwise direction will make the switch operate early or in the first part of the outward movement of the selec-

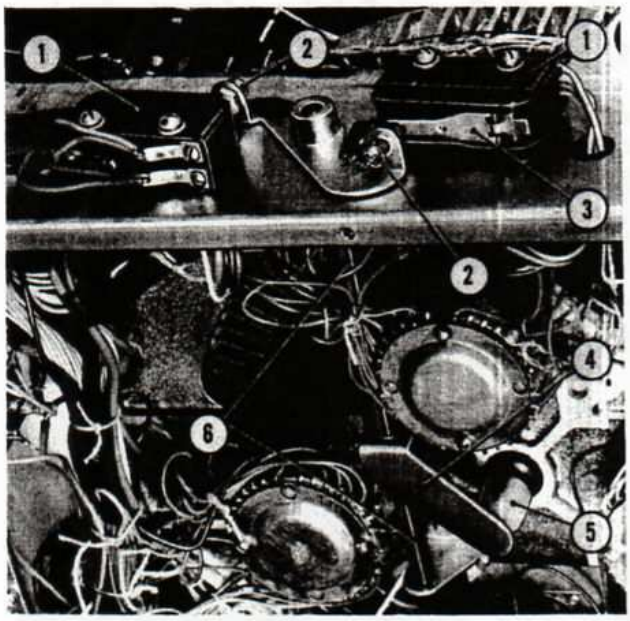
tor pin.) There should always be a safety factor of pin travel after actuation of the switch driving release stroke and also after the canceling stroke of the selector pin.

(4) Check the operation of the override switch in at least eight places around the selector drum to assure proper operation at all points.

b. Reversing Switches. The two reversing switches located on the side of the junction box (see Figure 28) control the direction of rotation of the record changer motor. Adjust these switches as follows:

(1) Turn off the service switch.

(2) With the phonograph in its at rest position, set the tips of the adjusting screws against the switch actuators so that each screw will move between one thirty-second of an inch and one sixteenth of an inch before the switches operate.



1. Reversing Switches
2. Adjusting Screws
3. Reversing Switch Actuator Arm
4. Reversing Switch Actuating Lever
5. Reversing Switch Plunger
6. Shaft

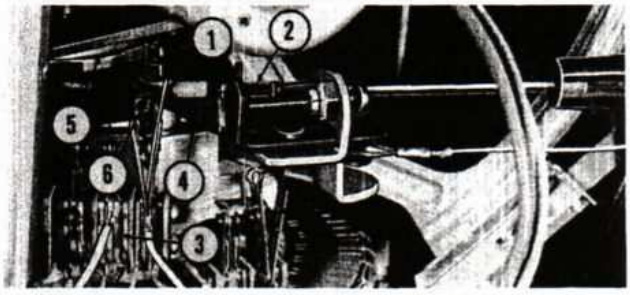
Figure 28. *Setting the Reversing Switches (Phonograph in the "At Rest" Position)*

(3) Release a selector pin and rotate the record carrier by hand until the selector crank strikes the released pin and the reversing switch plunger is released and moves upward. This upward motion of the plunger causes the actuator lever to turn the shaft and operate the reversing switches.

(4) After the reversing switch plunger has been released and the switches have operated, check the reversing switch actuators to see that each screw has at least one thirty-second of an inch overtravel.

c. Transfer Switch. The transfer switch is mounted on the chassis frame casting and is located under the record changer motor in the rear of the phonograph. The transfer switch actuating arm mounts two adjusting screws which distinguish the transfer switch from the mute and play switch. One of these adjusting screws regulates the tension in the needle brush actuating cable; the other is the transfer switch adjusting screw. The transfer switch actuating lever is pivoted on the chassis frame casting and is operated by the long lobe on the side of the main cam. Adjust the transfer switch as follows:

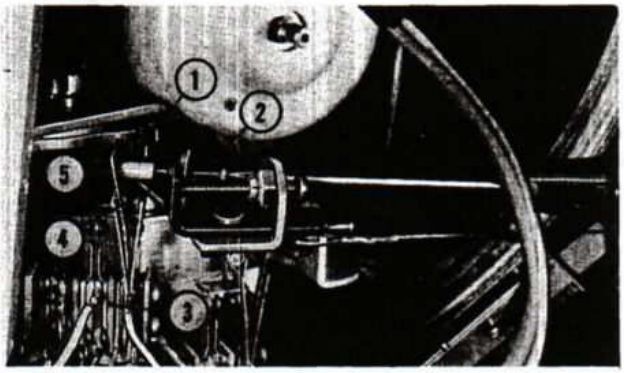
(1) Operate the record changer mechanically until the transfer switch cam roller is just ready to climb the long lobe on the main cam. Turn off the service switch and stop the main cam at this point. In this position the transfer switch actuating screw should be backed off far enough to be free from the switch, and the switch should be thrown to the position shown in Figure 29.



1. Cam Roller
2. Transfer Switch Actuating Screw
3. Transfer Switch
4. Transfer Switch Actuating Lever
5. Long Lobe on Main Cam
6. Over-Center Spring.

Figure 29. Setting the Transfer Switch (Cam Roller Before Starting to Climb Long Lobe)

(2) Turn the main cam slowly in a counterclockwise direction until the roller on the lever rides up on the long lobe of the cam as shown in Figure 30.



1. Cam Roller
2. Transfer Switch Actuating Screw
3. Transfer Switch
4. Transfer Switch Actuating Lever
5. Long Lobe on Main Cam

Figure 30. Setting the Transfer Switch (Cam Roller After Climbing the Long Lobe)

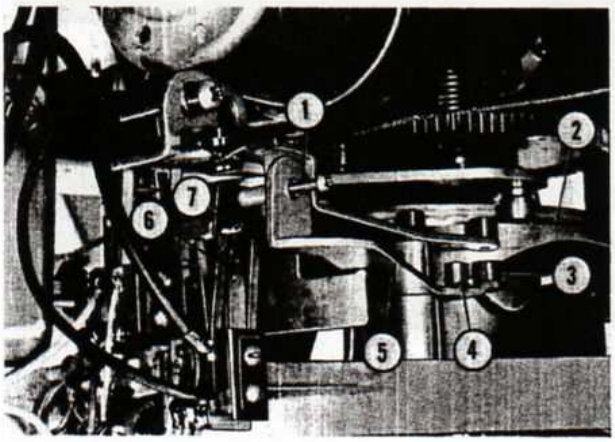
(3) Set the switch actuating screw to throw the transfer switch to the position shown in Figure 30. Allow from one thirty-second to one sixteenth of an inch overtravel of the switch actuating screw after the transfer switch operates by the over-center spring action.

(4) Turn on the service switch.

NOTE: When the roller is on the long lobe of the cam and the transfer switch is in the position shown in Figure 30, the machine is in position to start searching for a released selector pin on the selector drum. This position is referred to as the "at rest" position of the phonograph.

d. Mute and Play Switch. The mute and play switch actuating arm is pivoted on the chassis frame casting and is operated by the small lower lobe on the side of the main cam. This switch is adjusted as follows:

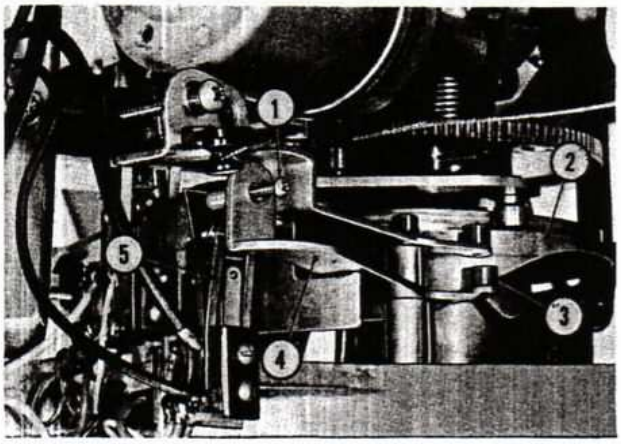
(1) Operate the record changer electrically until the mute and play switch cam roller is just ready to climb the small lower lobe on the main cam. Turn off the service switch and stop the main cam at this point. In this position the mute and play switch actuating screw should be free from the mute and play switch, and the switch should be thrown to the position shown in Figure 31.



1. Mute and Play Switch Actuating Screw
2. Main Cam
3. Cam Roller
4. Small Lobe
5. Mute and Play Switch Actuating Arm
6. Mute and Play Switch
7. Over-Center Spring

Figure 31. Setting the Mute and Play Switch (Cam Roller Before Starting to Climb the Small Lobe.)

(2) Turn the main cam slowly in a counterclockwise direction until the cam roller rides up on the small lobe of the cam as shown in Figure 32.



1. Mute and Play Switch Actuating Screw
2. Main Cam
3. Cam Roller on small Lobe
4. Mute and Play Switch Actuator Arm
5. Mute and Play Switch

Figure 32. Setting Mute and Play Switch (Cam Roller After Climbing Small Lobe)

(3) Set the switch actuating screw to throw the mute and play switch to the position shown in Figure 32.. Allow one thirty-second of an inch to one sixteenth of an inch overtravel for the switch actuating screw after the switch operates.

(4) Turn on the service switch.

e. Trip Switch. (See Paragraph t for directions for adjusting the trip switch.

f. Record Lift Arm Roller Guides. Before adjusting the record lift arm roller guides, it may be advisable to check the alignment of the record lift arms. If such an alignment is considered necessary, the top support casting and the record carrier must first be removed. Proceed as follows:

(1) Remove the four screws that hold the top support casting to the chassis mounting plate.

(2) Take out two screws and remove the stop plate on the turntable cam. (Refer to Figure 53.)

(3) Rotate the turntable cam in a counterclockwise direction until there is enough slack in the cable to allow it to be unhooked from the cable slide pin on the turntable clamp lever.

(4) Unfasten the several cable clamps that hold the electrical wiring to the mounting plate and disconnect the wiring by pulling the plugs from the receptacles in the junction box.

(5) Unhook the needle brush actuating cable from the slide pin on the transfer switch actuating lever.

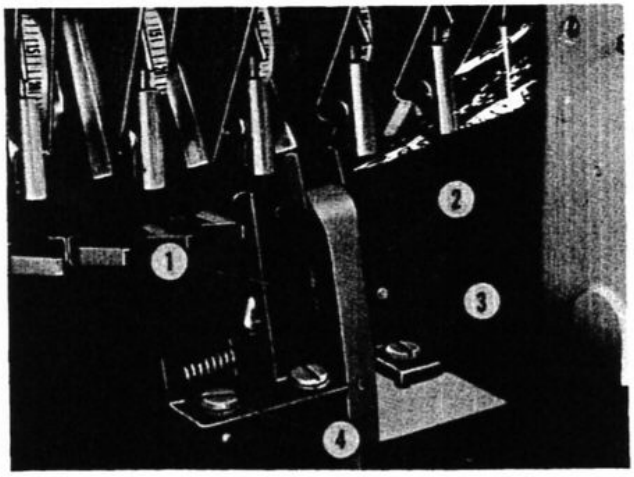
(6) Remove the top support casting.

(7) Remove the C-ring that holds the record carrier on the selector shaft and lift off the record carrier.

(8) Loosen the three screws that mount the lift arm assembly casting to the chassis mounting plate.

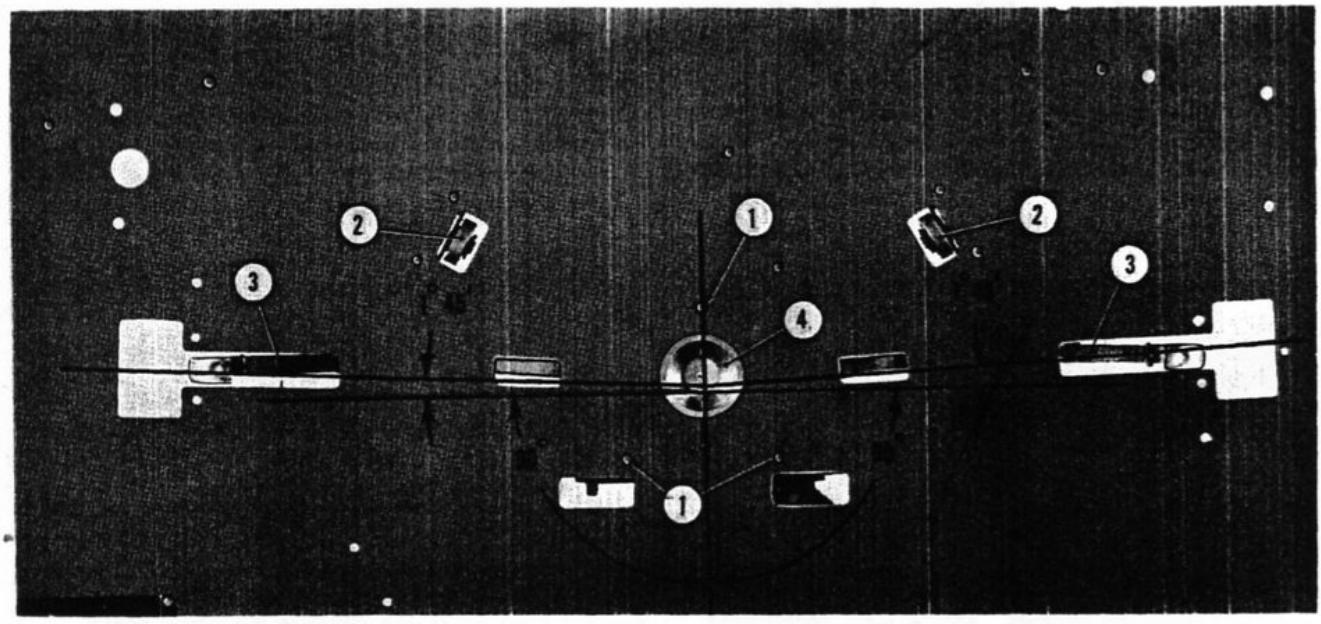
(9) Shift the entire assembly until the lift arms are in the proper angular position in relation to the center. (See Figure 33 for the angular position of the lift arms and note that each arm is one degree and forty-five minutes off the straight angle through the center.)

NOTE: Eliminate steps (1) through (9) if it is certain the record lift arms are properly aligned and only the roller guide adjustment is necessary.



1. Spring Loaded Guide
2. Stationary Guide
3. Screw (Stationary Guide)
4. Screws (Adjustable Guide)

Figure 34. Roller Guide Setting



1. Screws
2. Rollers
3. Lift Arms
4. Selector Shaft

Figure 33. Angular Position of Lift Arms

(10) After the lift arms are properly aligned set the stationary lift arm roller guides and tighten the screws. (See Figure 34).

(11) Set the spring loaded guides against the record lift arms and tighten the screws.

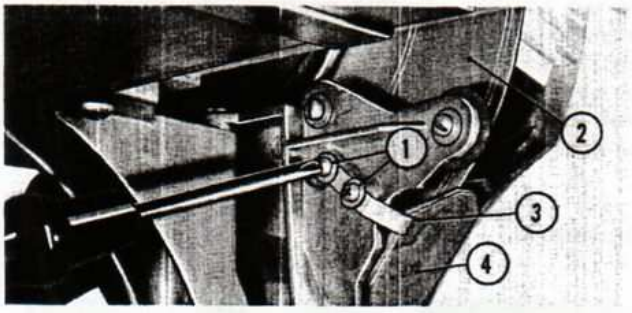
(12) Check the lift arms for free operation without undesirable looseness.

(13) Replace the record carrier and top support casting.

g. Record Lift Setting. Each record arm is equipped with a lift bracket, stop nut and screw assembly. The screw strikes the underside of the mounting plate and controls the height to which the arms move. The point at which the screw stops the record lift arm is, in turn, determined by the movement neceesary to position the record properly. Therefore, to determine how to adjust the screw, it is first necessary to make any required adjustment of the record track stop brackets. Proceed as follows:

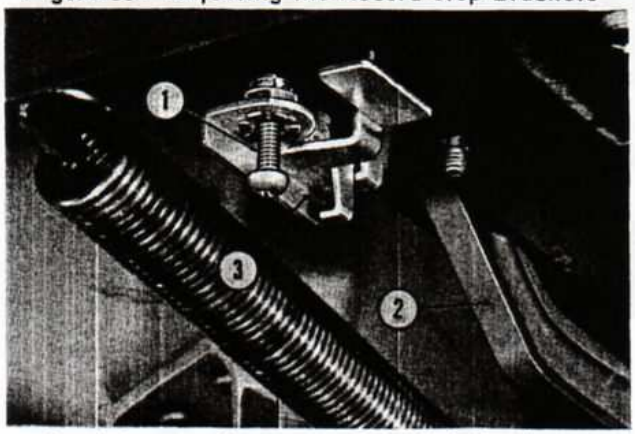
(1) Clamp record disc X-42226 on the turntable.

(2) Loosen the two screws that hold each record stop bracket (Figure 35.)



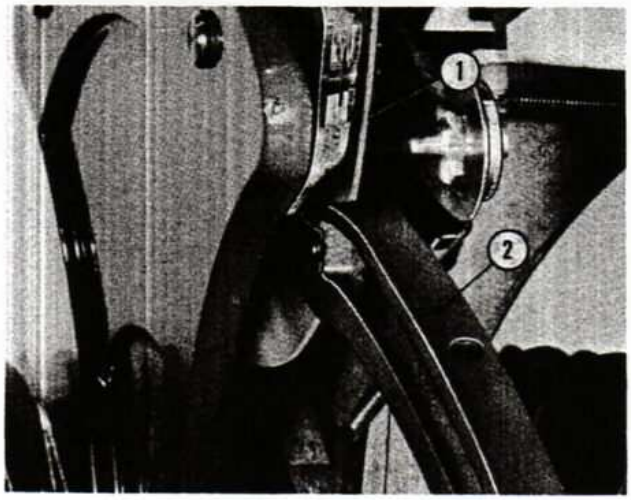
1. Screws 3. Record Stop Bracket
2. Record Disc X-42226 4. Record Track

Figure 35. Adjusting the Record Stop Brackets



1. Adjusting Screw 3. Lift Bracket
2. Record Lift Arm

Figure 36. Record Lift Setting



1. Record Disc X-42226 2. Record Lift Arm

Figure 37. Lift Arm in "Up" Position.

(3) Move the stop brackets until the record track rests lightly against the outside diameter of the record disc.

(4) Tighten the screws holding the record stop bracket.

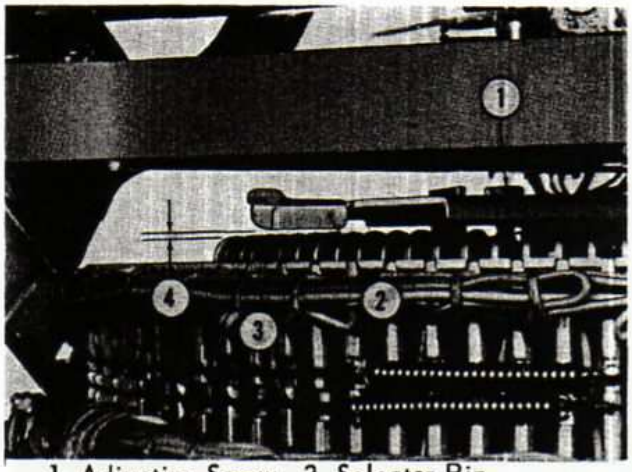
(5) Remove the record disc and move the record track to the opposite side of the record guide assembly from that upon which the first adjustment has been made.

(6) Make the same record stop bracket adjustment described in steps (3) and (4) above.

(7) Set the screw in each lift bracket and stop nut assembly so that it stops the record lift arm with the top end of the lift arm just touching the outside diameter of record disc X-42226 (See Figures 36 and 37.)

NOTE: If this adjustment is made in the field where the record disc is not available, set the screw in the lift bracket and stop nut assemblies so that the center of the record clamp hub is at 11 o'clock and 1 o'clock to the center of a record lifted by the left lift arm and the right lift arm, respectively.

h. Selector Crank Clearance. The selector crank, as it turns, should clear the top of the selector pins between a minimum of one thirty-second of an inch and a maximum of one sixteenth of an inch (see Figure 38.)



1. Adjusting Screw
2. Selector Crank
3. Selector Pin
4. 1/32 in. to 1/16 in. Clearance

Figure 38. Selector Crank Clearance

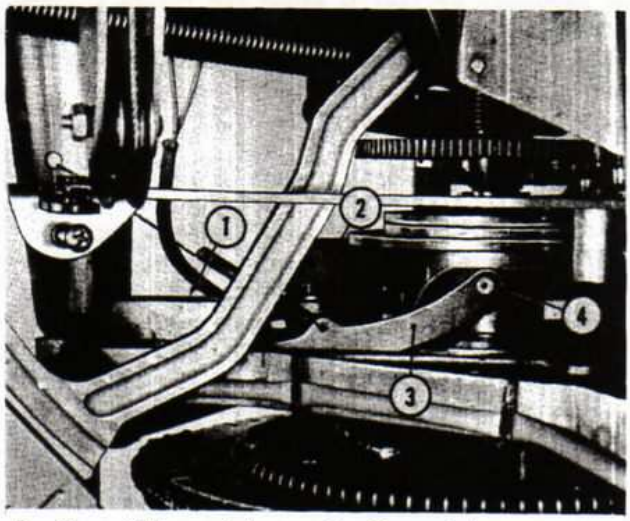
This adjustment is made by turning the hexagon cap screw in the top of the selector crank, as follows:

(1) Turn the selector crank by hand until the hexagon adjusting cap screw is accessible.

(2) Press the selector crank down slightly so that an end wrench can be applied to the cap screw.

(3) Turn the cap screw as necessary to obtain the desired clearance between the selector crank and the selector pins.

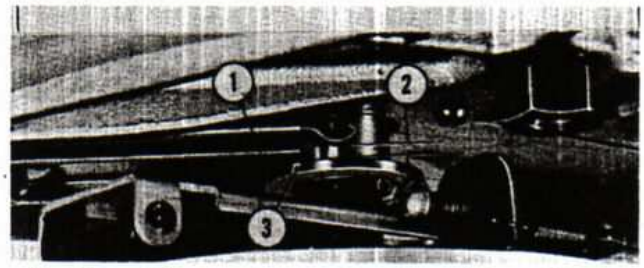
(4) Rotate the selector crank completely around the drum and check the clearance throughout the entire rotation.



1. Top of Cancel Arm
2. Adjusting Screw
3. Cancel Arm
4. Cancel Arm Roller

Figure 39. Cancel Arm, Roller, and Main Cam

i. Cancel Arm. Clearance of one-eighth of an inch to five thirty-seconds of an inch must be maintained between the engaging prongs of the lower cancel arm and the brass cancel sleeve. This setting is made by turning the Allen head adjusting screw on the top of the cancel arm. In making this setting, the cancel lever cam roller must be in contact with the main cam. To make the setting simply turn the Allen head adjusting screw until the required clearance is obtained. (See Figures 39 and 40.)

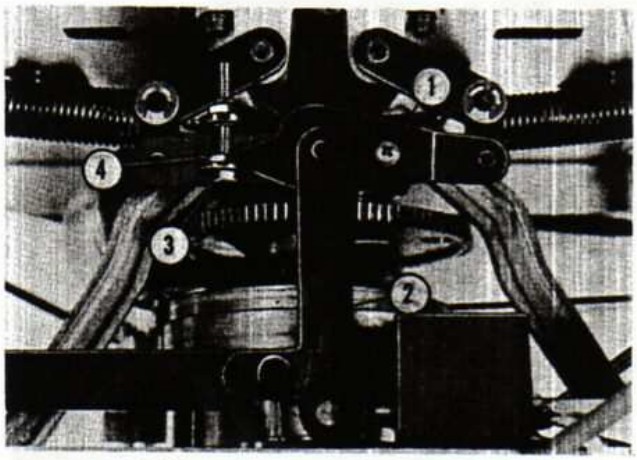


1. Cancel Lever
2. 1/8 in. to 5/32 in.
3. Cancel Arm Sleeve

Figure 40. Cancel Lever and Cancel Arm Sleeve

j. Retracted Position of Record Lift Arms. When the main cam of the record changer is in the "at rest" position, the link and lever assembly cam roller will be on its high position on the cam track and the record lift arms will be in the retracted position. In this position, the tips of the record lift arms should clear the underside of the record carrier holders. The record lift arms should not bottom too tightly, nor should there be any undesirable looseness in the bottoming position of the arms. The adjustment is made as follows:

(1) Loosen screw "A" and the lock nut (see Figure 41).



1. Screw "A"
2. Record Lift Arm Link
3. Hex Head Screw
4. Lock Nut

Figure 41. Record Lift Arm Setting (Retracted Position)

(2) Turn the hex head screw in or out to obtain clearance between the tips of the record lift arms and the record holders. Rotate the record carrier to check the clearance at all points.

(3) When clearance as described above has been obtained, hold one record lift arm down so that the stop shoulder of the lift arm is against the stop bracket.

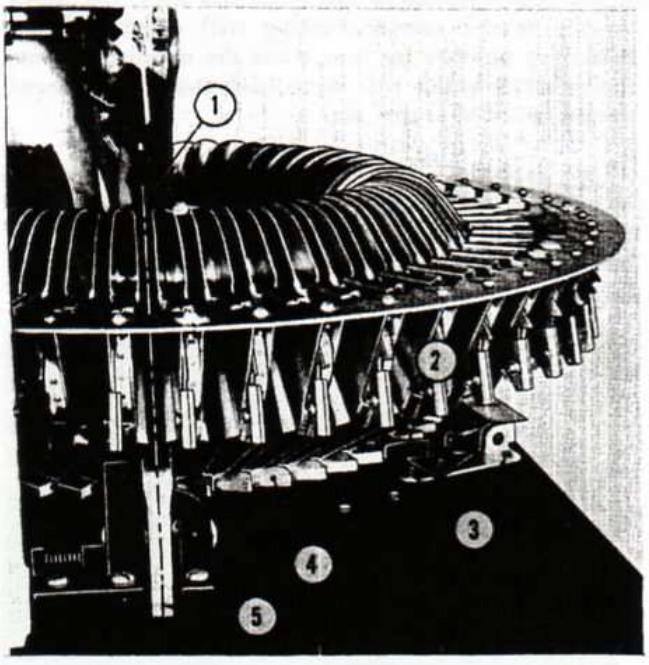
(4) Turn the hex head screw until the stop shoulder on the other lift arm is touching its respective stop bracket.

(5) Tighten screw "A" and tighten the lock nut.

k. Back Stop Pawls. The two back stop pawls are located on the top of the chassis mounting plate. Each of these pawls must be adjusted separately. However, the adjusting procedure is the same for both pawls. With the record carrier installed and the record carrier drive pawl engaged with the drive pin, that is, in normal operating condition, the back stop pawls are adjusted as follows:

(1) Loosen the four screws holding the two back stop pawls to the chassis mounting shelf.

(2) Turn the record carrier slowly by hand until the center of one of the record holder slots is aligned directly with the center of the left record lift arm.



1. Centerline -- Record Holder Opening
2. Back Stop Pawl
3. Screws
4. Record Carrier Casting Teeth
5. Centerline -- Record Lift Arm

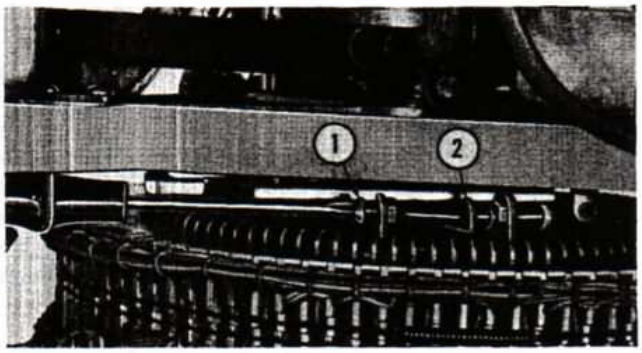
Figure 42. Back Stop Pawl Setting

(3) Set the left back stop pawl so that it engages the tooth of the record carrier casting wheel with the outside of the pawl one thirty-second to one sixteenth of an inch below the end of the tooth. Tighten the screws in this position (see Figure 42).

(4) Use the method described above to set the right back stop pawl with the right record lift arm.

(5) Check the alignment of the record lift arm with the record holder openings in at least 12 places around the record carrier. Be sure the tooth of the record carrier casting is against the back stop pawl for each check. The record lift arm alignment with the center of the record holders must be kept within a tolerance of one thirty-second of an inch.

l. Plunger Latch Stop Screw. This adjusting screw is mounted in one end of the adjusting bracket assembly. Rotate the record carrier and the adjusting bracket assembly until the two screws on the adjusting bracket are in the front of the phonograph. When facing the record carrier in this position, the head of the plunger latch stop screw is on the left (see Figure 43).



1. Stop Screw
2. Plunger Latch

Figure 43. Plunger Latch Stop Screw

The setting of the plunger latch stop screw is accomplished as follows:

(1) Be sure the reversing switch plunger is latched in the "down" position.

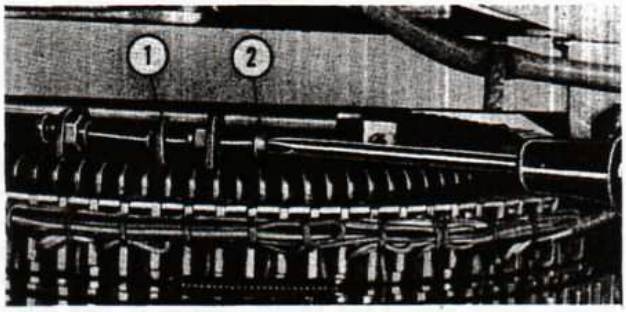
(2) Hold the end of the adjusting bracket assembly in which the screw is mounted firmly with one finger of the right hand.

(3) Turn the plunger latch stop screw in until it presses lightly against the end of the reversing plunger release arm.

(4) Hold the end of the reversing plunger release arm against the reversing stop screw and back the reversing stop screw off until the reversing plunger release arm releases the plunger. Continue turning the screw for another one-quarter or one-half turn.

(5) Reset the reversing plunger by pressing down on the top of the cancel arm (see Figure 20).

m. Plunger Latch Actuating Screw. This screw points directly toward the plunger latch stop screw described in Paragraph l (See Figure 44).



1. Latch 2. Plunger Latch Actuating Screw

Figure 44. Plunger Latch Actuating Screw

The function of the plunger latch actuating screw is to control the position at which the reversing switch operates and reverses the direction of the record changer motor. By turning the screw in a clockwise direction the reversing switch can be made to actuate sooner and by turning the screw in a counterclockwise direction the action of the reversing switch can be delayed. The adjustment procedure is as follows:

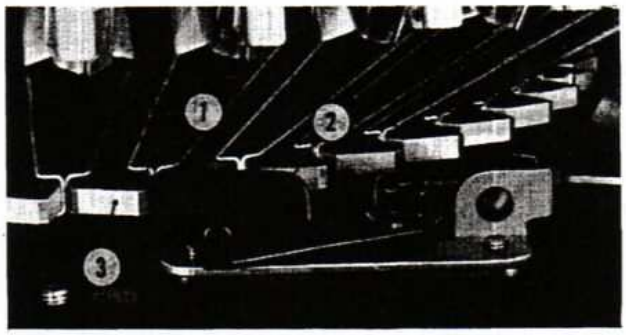
(1) Make sure the selector switch reversing plunger is latched in its "down" position.

(2) Release the A5 selector pin.

(3) Turn the record carrier slowly by hand until the selector crank is against the released A5 selector pin.

(4) Continue to turn the record carrier until the left hand back stop pawl falls in the proper tooth of the record carrier casting. (The correct tooth can be located by observing when the record carrier is in a position that permits the left hand record lift arm to lift out the A5 record.)

(5) When the correct tooth described above has over-traveled the back stop pawl from one-sixteenth to three thirty-seconds of an inch (see Figure 45) adjust the plunger latch actuating screw so that the plunger latch releases the plunger.



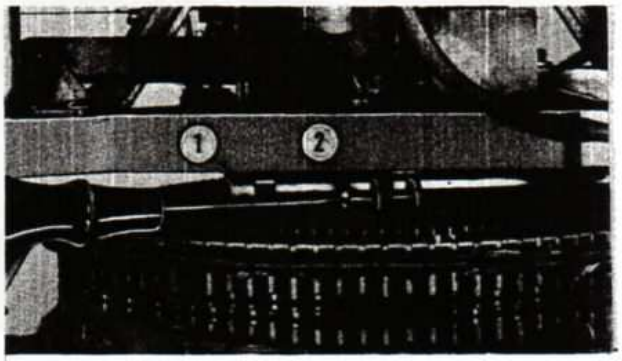
1. 1/16 in. to 3/32 in. clearance
2. Back Stop Pawl
3. Record Carrier Assembly Tooth

Figure 45. Back Stop Pawl Clearance

(6) Re-latch the reversing plunger by pressing down on the top of the upper cancel arm (see Figure 39) and release selector pin C19. Using the right hand record lift arm and the right hand back stop pawl, check the release position of the plunger release latch in the same manner as described above.

(7) Check the release position at eight positions around the selector drum. If the screw actuates the latch too early, or just as the back stop pawl drops into engagement with a tooth on the record carrier casting, there will be no back-up of the selector crank for canceling the selector pin. If the screw actuates the latch too late, the tooth on the record carrier casting will overtravel the back stop pawl so far that, when the motor reverses, the selector crank will move back too far to cancel the released selector pin.

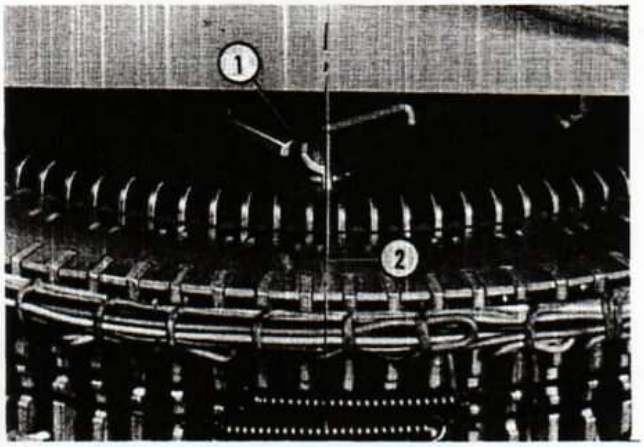
n. Selector Crank Centering Screw. This screw is mounted on the end of the adjusting bracket opposite the plunger latch stop screw and the plunger latch actuating screw.



1. Selector Crank
2. Selector Crank Centering Screw

Figure 46. Setting Selector Crank Centering Screw

This screw must always be adjusted so that the selector crank will stop in a position to allow for the release of the two pins on either side of the selector crank. (See Figure 47).



1. Selector Crank 2. Center Line -- Crank and Space

Figure 47. Position of Crank When Screw is Adjusted Properly

Adjust the selector crank centering screw as follows:

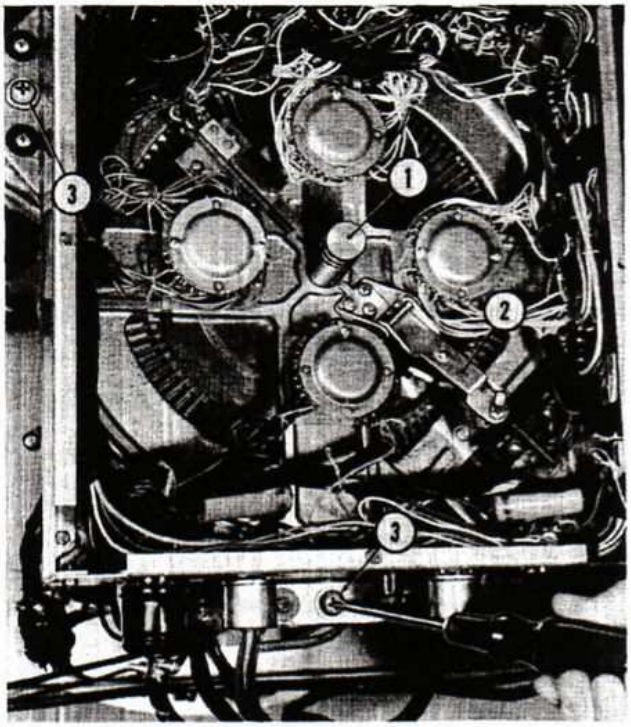
(1) With the reversing plunger latched in its "down" position, release any convenient selector pin.

(2) Turn the record carrier and selector crank slowly by hand until the selector crank strikes the released selector pin and the reversing plunger is unlatched.

(3) Make sure that a tooth on the record carrier casting has engaged the proper back stop pawl.

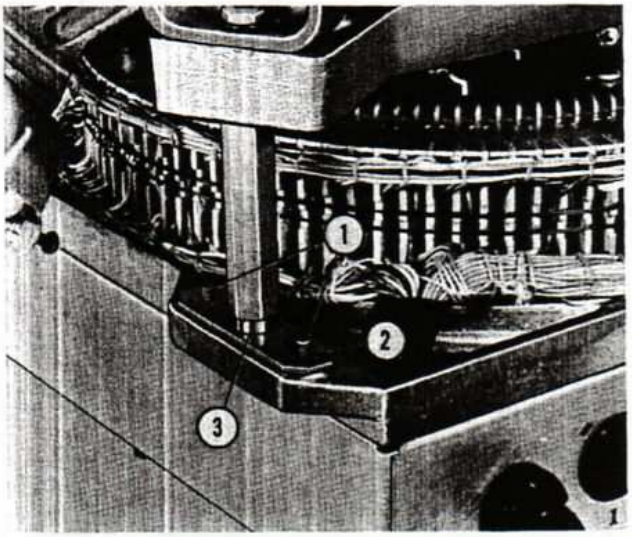
(4) Set the selector crank centering screw so that when the released pin is canceled the selector crank will stop in a position to allow for the release of the two pins on either side of the selector crank as shown in Figure 47.

o. Selector Centering. The selector and junction box assembly are carefully aligned and checked at the factory and need for realignment of the selector should not occur in normal usage of the machine. However, if for some unforeseen reason it is necessary to install a new selector, or if realignment becomes necessary due to rough handling, it is recommended that a fixture be used to make the alignment. This fixture can be seen in Figure 48.



1. Centering Fixture 3. 1/4 - 20 Screw
2. Reversing Switch Lever

Figure 48. Centering Selector



1. Screws 3. Turned Portion of Stud
2. Guide Plate

Figure 49. Guide Plate Screws

The selector is centered as follows:

(1) Loosen the six screws holding the three selector guide plates (see Figure 49).

(2) Remove the bottom cover from the junction box.

(3) Unhook one end of the reversing switch lever spring so that the reversing switch lever can be pivoted out of the way of the centering fixture (Figure 48).

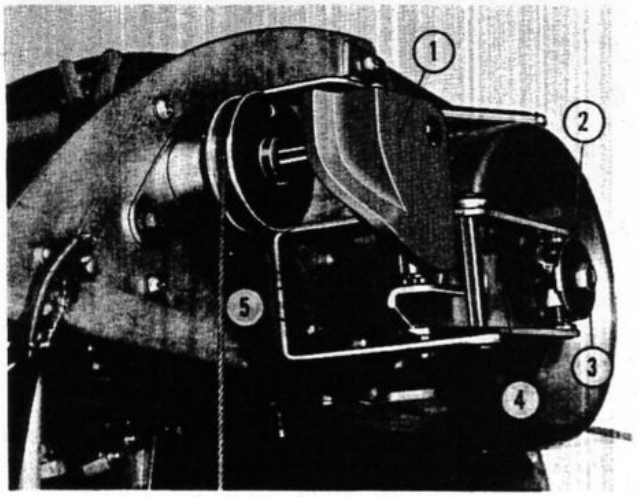
(4) Center the selector around the main selector shaft, using the centering fixture, and tighten the three 1/4 - 20 screws that mount the selector. The three selector guides should be centered on the turned portion of the three mounting studs.

NOTE: If a centering fixture is not available, the selector may be centered as follows: Center the hole in the selector casting around the outside diameter of the selector shaft at the point where it extends through the hole in the selector casting.

(5) Tighten the screws that fasten the three guide plates.

(6) Remove the centering fixture and hook up the reversing switch lever spring.

p. Record Clamp Setting. The turntable release arm is pivoted on a bracket which is mounted on the back plate of the top support casting. The turntable release arm rollers must be centered around the hub of the record clamp plate. This is done by loosening the two screws (marked "A" in Figure 50) which hold the pivot bracket, centering the rollers and re-tightening the screws.

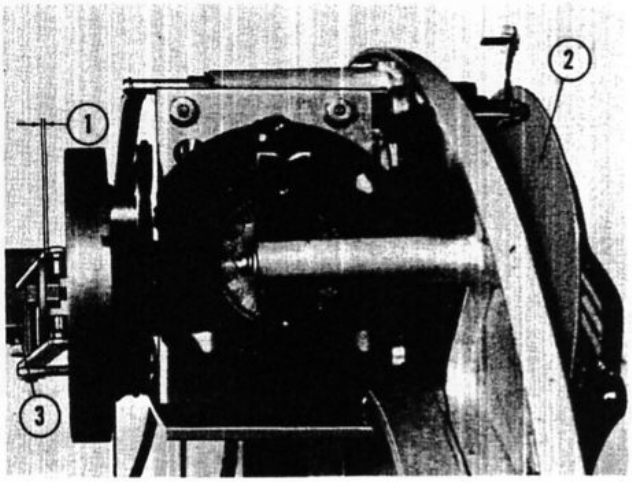


1. Record Clamp Cam
2. Record Clamp Plate
3. Lock Nut
4. Turntable Release Arm
5. Screws "A"

Figure 50. Release Arm Roller Adjustment

The centering of the turntable release arm rollers described above should be checked before making the complete record clamp setting. After this has been done, proceed with the rest of the adjustment as follows:

(1) Rotate the record clamp cam until the turntable release arm is released to clamp the record disc X-42226 on the turntable (see Figure 51).



1. Clearance Between Rollers and Record Clamp Plate
2. Record Disc X-42226
3. Record Clamp Cam

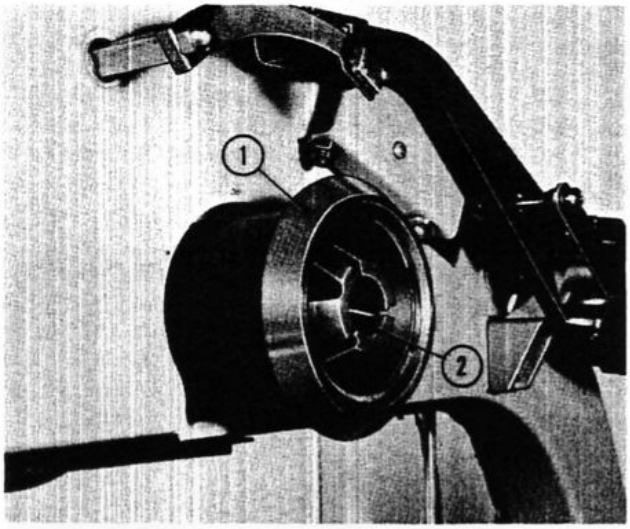
Figure 51. Record Clamp Plate Adjustment

(2) Loosen the locking nut that holds the record clamp plate and move the plate in or out to obtain one thirty-second to one-sixteenth of an inch clearance between the two rollers on the release arm and the record clamp plate. Then this clearance is obtained, tighten the locking nut.

(3) Rotate the record clamp cam approximately 90 degrees to the position that retracts the turntable pilot (see Figure 51). In this position the front surface of the turntable pilot should be from one thirty-second of an inch to one-sixteenth of an inch behind the front surface of the turntable (see Figure 52).

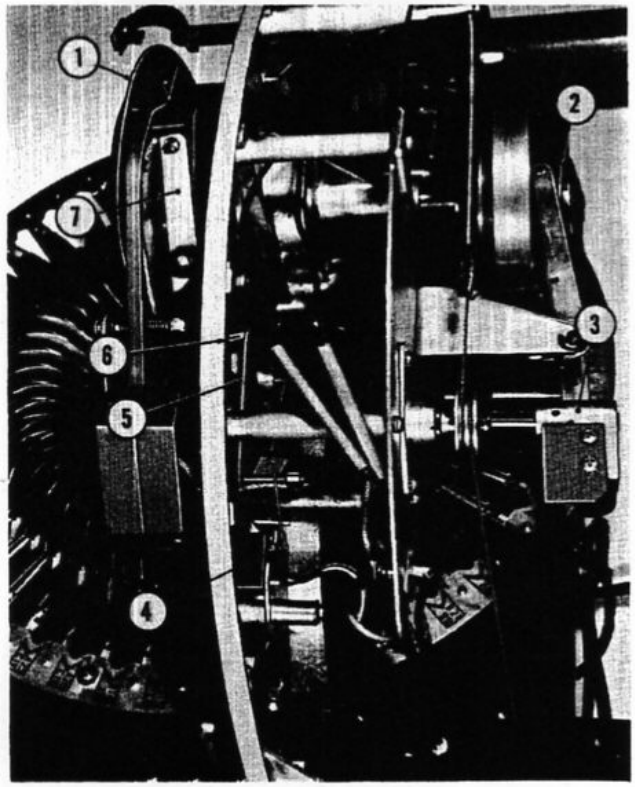
(4) The record clamp plate should be set so that when the turntable pilot is fully retracted, the front face of the pilot is behind the front surface of the turntable. When a record is clamped in playing position, and the turntable release arm is against the low portion of the record clamp cam, the two rollers on the arm should clear the clamp plate as explained in step (2).

q. Tone Arm Feed-In. There are two methods of making the tone arm feed-in adjustment. One of these methods utilizes record disc X-42226 and the other depends upon measurements made from the center of the turntable pilot to the playing needle. Record disc X-42226 should be used whenever it is available. However, both methods are described below:



1. Turntable 2. Turntable Pilot Inside Turntable

Figure 52. Turntable Pilot Setting



1. Record Disc X-42226
2. Record Clamp Plate
3. Turntable Cam and Stop Plate
4. Trip Switch
5. Tone Arm Cam
6. Rounded Pin
7. Tone Arm Release Bracket

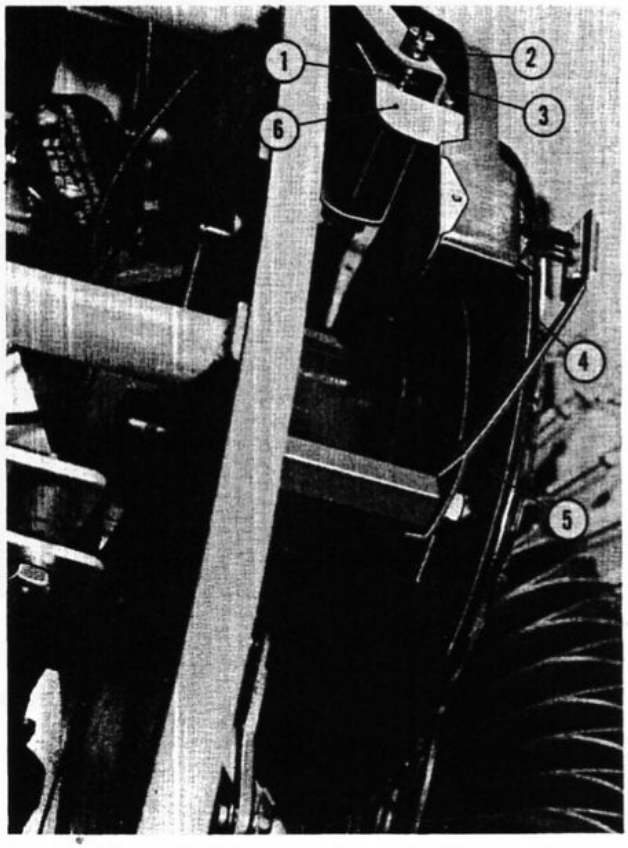
Figure 53. Tone Arm Released and Record Disc X-42226 Clamped on the Turntable.

Method 1 – Using Record Disc X-42226

(1) Operate the phonograph mechanically until the turntable cam actuates the record clamp and the tone arm is released. Turn off the service switch at this point.

(2) Operate the record clamp manually by pulling out the record clamp plate behind the flywheel, and clamp record disc X-42226 on the turntable (see Figure 53). Be sure the side of the record having the two grooves is facing the turntable, and that the two grooves are at the top of the disc.

(3) With the latch bracket in the feed-in groove of the feed-in screw, turn the feed-in screw in or out to position the needle so that it falls into the outside groove of record disc X-42226 (see Figure 54.)



1. Groove of Feed-In Screw
2. Feed-In Screw
3. Tone Arm Release Bracket
4. Feed-In Groove on Record Disc
5. Record Disc X-42226
6. Latch Bracket

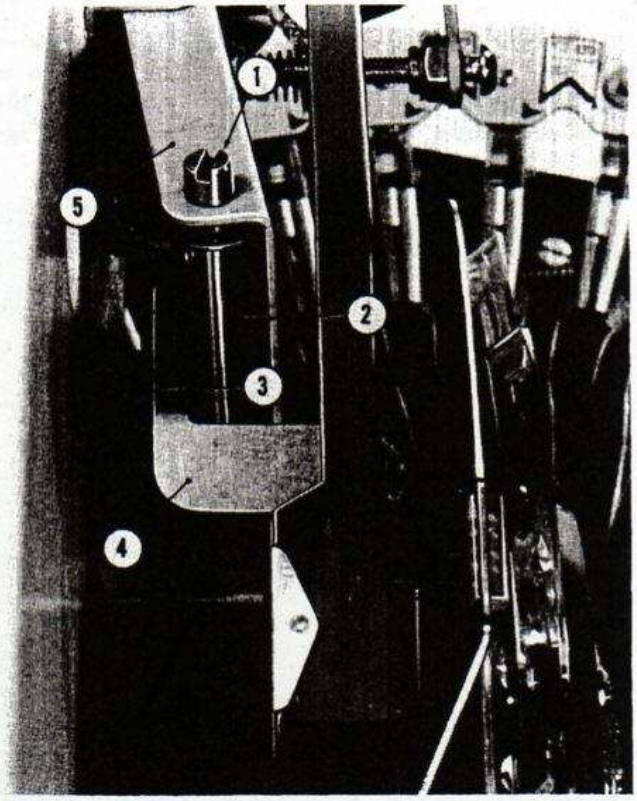
Figure 54. Feed-In Adjustment

Method 2 -- Adjusting Feed-In by Measurement

(1) Operate the phonograph mechanically until the turntable cam actuates the record clamp and the tone arm is released. Turn off the service switch at this point.

(2) With the latch bracket in the feed-in groove of the feed-in screw, turn the feed-in screw in or out as necessary to position the needle so that it is between 3-5/16 in. and 3-5/8 in. from the center of the turntable pilot.

r. Tone Arm and Latch Bracket Clearance. When the tone arm is released and the needle is touching a record, the clearance between the rear face of the tone arm and the release bracket should be the same as the clearance between the latch bracket and the feed-in screw (see Figure 55).



1. Feed-In Screw
2. Clearance Between Rear Face of Tone Arm and Release Bracket
3. Clearance Between Latch Bracket and Screw.
4. Latch Bracket
5. Tone Arm Release Bracket

Figure 55. Tone Arm Latch Bracket Clearance

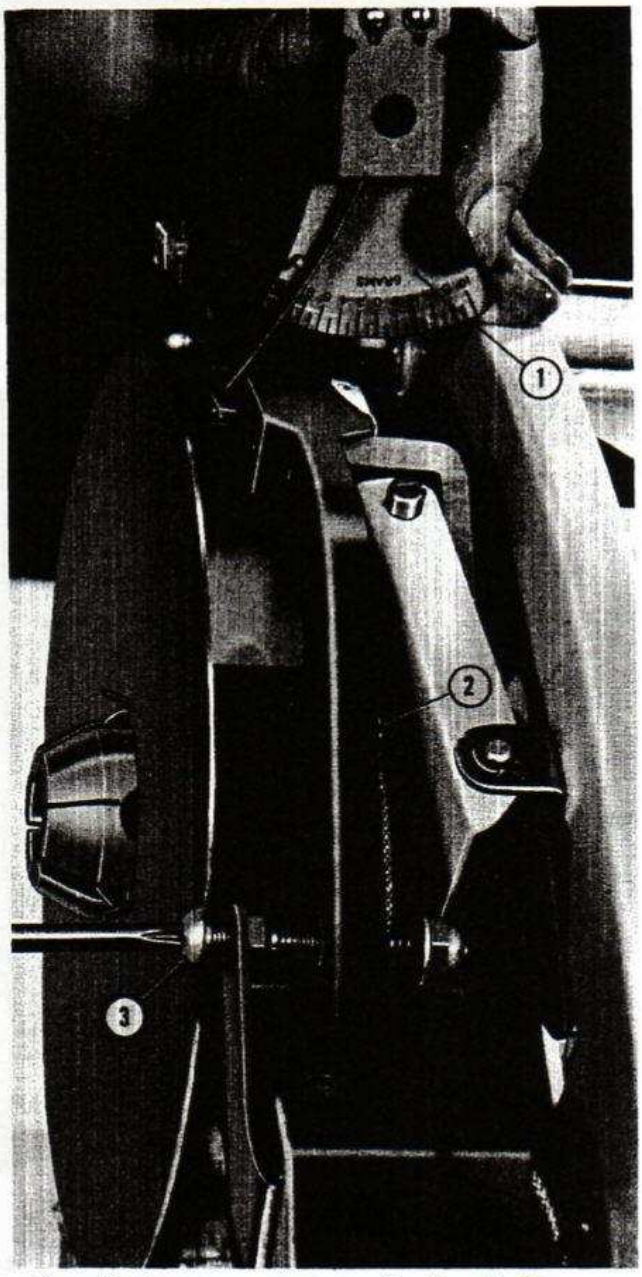
Make the above clearance adjustment as follows:

(1) Operate the phonograph mechanically until the turntable cam actuates the record clamp and the tone arm is released. Turn off the service switch at this point.

(2) With the needle touching the record, check the clearance between the rear face of the tone arm and the release bracket. Also check the clearance between the latch bracket and the feed-in screw.

(3) Turn the tone arm release bracket screw in or out until the clearances shown in Figure. 55 are obtained.

s. Needle Pressure. The needle pressure setting is obtained by turning the needle pressure adjusting screw in a clockwise direction to reduce the needle pressure, or in a counterclockwise direction to increase the needle pressure. Needle pressure against the record should be set to measure from 10 to 12 grams (see Figure 56).



1. Gram Scale
2. Tone Arm Release Bracket Adjusting Screw
3. Needle Pressure Adjusting Screw

Figure 56. Adjusting Needle Pressure

Make the needle pressure adjustment as follows:

(1) Operate the phonograph mechanically until the turntable cam actuates the record clamp and the tone arm is released allowing the needle to touch the record. Turn off the service switch at this point.

(2) Using a gram scale, turn the needle pressure adjusting screw to obtain the 10 to 12 gram reading described above. (see Figure 56).

t. Trip Switch. The trip switch is actuated by the trip switch actuating pin attached to the tone arm. The action of the trip switch is advanced or retarded by turning the adjusting screw mounted in the trip switch mounting bracket. The trip switch should operate when the playing of the record is completed. As in making the feed-in adjustment. there are two methods of making the trip switch adjustment -- one utilizes record disc X-42226, and the other depends upon measurement..

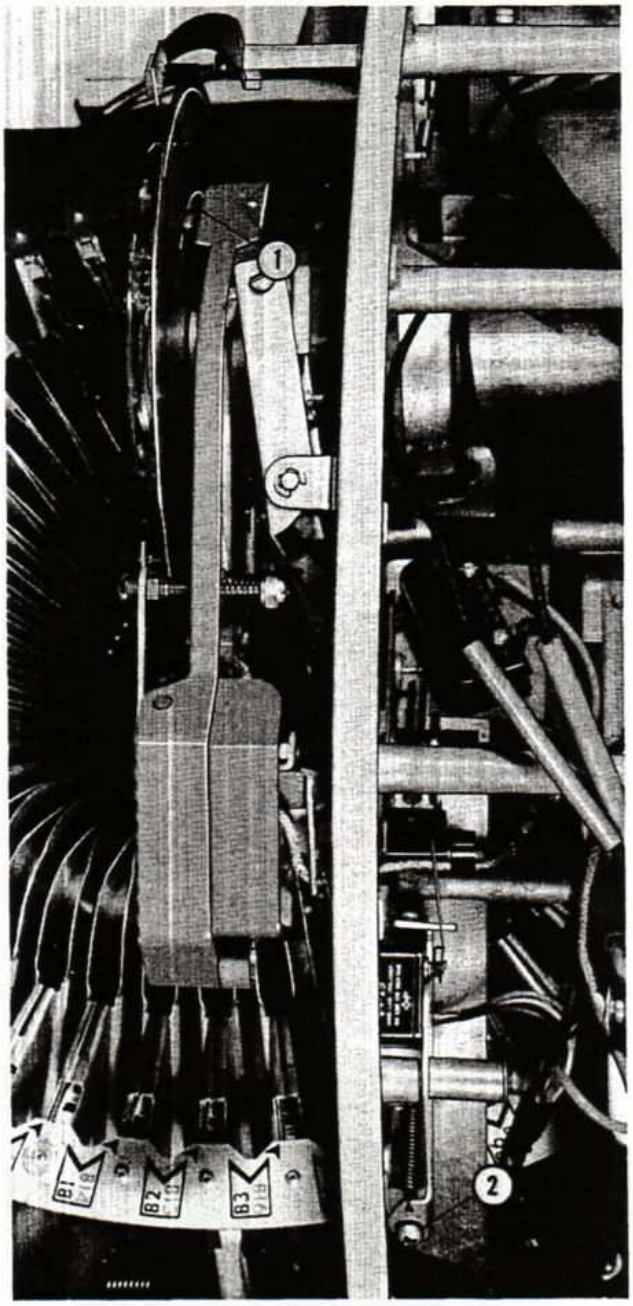
Method 1 -- Using Record Disc X-42226

(1) Operate the phonograph mechanically until the turntable cam actuates the record clamp and the tone arm is released. Turn off the service switch at this point.

(2) Operate the record clamp manually by pulling out the record clamp plate behind the flywheel and clamp record disc X-42226 on the turntable (see Figure 53). Be sure the side of the record hav the two grooves is facing the turntable, and that the two grooves are at the top of the disc.

(3) Release the tone arm and move it down until the needle falls into the inside groove of record disc X-42226.

(4) Turn the trip switch adjusting screw so that the trip switch operates when the needle reaches the point described above (see Figure 57).



1. Trip Groove 2. Trip Switch Adjusting Screw

Figure 57. Trip Switch Adjustment

Method 2 -- Adjusting the Trip Switch by Measurement.

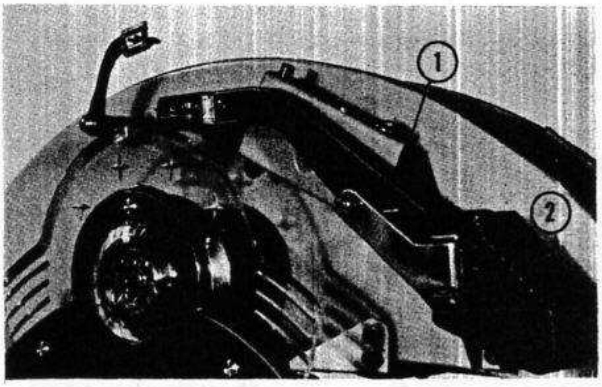
(1) Operate the phonograph mechanically until the turntable cam actuates the record clamp and the tone arm is released. Turn off the service switch at this point.

(2) Turn the trip switch adjusting screw so that the trip switch operates when the playing needle is between 2-3/32 in. and 2-5/32 in. from the center of the turntable pilot.

u. Tone Arm Balance. The tone arm is balanced on the gimbal upon which it is mounted. Lead washers are added to or taken from the end of the tone arm as required to maintain proper balance. This adjustment is made without a record on the turntable. Proceed as follows:

(1) Operate the phonograph until the tone arm is in the free position for playing and then turn off the service switch.

(2) Insert a portion of a toothpick or small splinter (of negligible weight) between the tone arm and the needle pressure regulating screw bracket as shown in Figure 58.



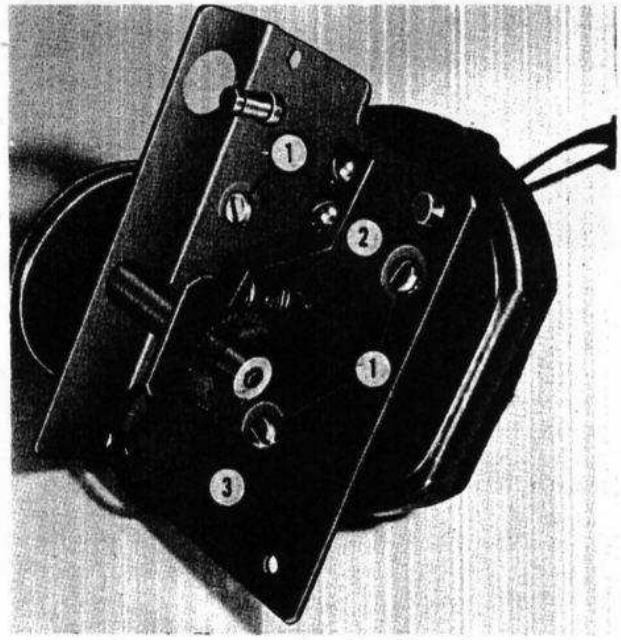
1. Toothpick 2. Balancing Washers

Figure 58. Testing Tone Arm Balance

(3) Test the weight of the needle end of the tone arm with a gram scale. By adding or subtracting lead washers, the tone arm should be balanced so that, at the feed-in position, it will move into the record with a weight of not more than one gram. Using a gram scale, lift the tone arm from the point at which it finishes playing a record up to its feed-in position. At no point should the weight exceed one gram.

(4) Remove the tone arm and add or subtract washers to obtain the balance described above.

v. Turntable Drive Gears Backlash Setting. The turntable drive gears must operate freely at all times. The tension of the spring against the ball in the end of the motor shaft should be set to measure 3 oz. plus or minus ½ oz. Adjust the gears to obtain the minimum backlash as follows:



1. Screws 3. Fibre Gear
2. Worm Gear

Figure 59. Turntable Drive Gears

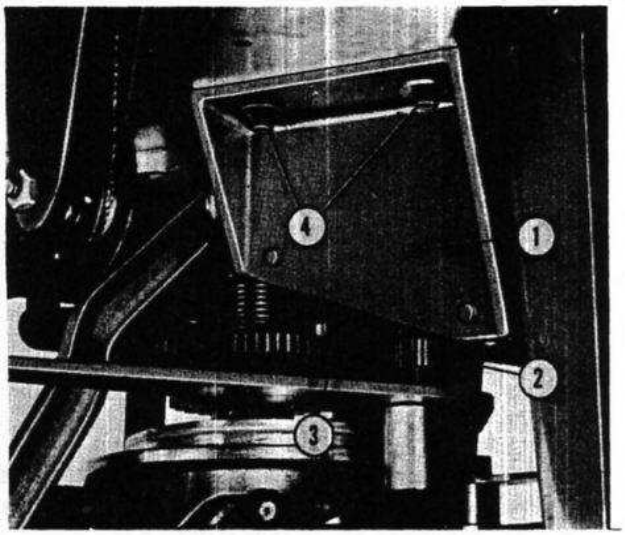
(1) Dismount the motor and motor mounting plate from the mounting bracket.

(2) Loosen the three screws that mount the motor to the mounting plate and shift the position of the worm on the motor shaft in relation to the fibre gear until the minimum backlash is obtained with free running gears (see Figure 59).

(3) Tighten the screws and remount the motor and motor mounting plate.

w. Main Gear and Motor Pinion Gear Setting. The record changer motor mounting bracket is provided with an oversize hole under one of the mounting screws. Make this setting as follows:

(1) Loosen both mounting screws and pivot the entire motor and bracket assembly around the screw in the fitted hole to engage the motor pinion and the main gear teeth to provide minimum gear clearance and free operation of the gears (see Figure 60)

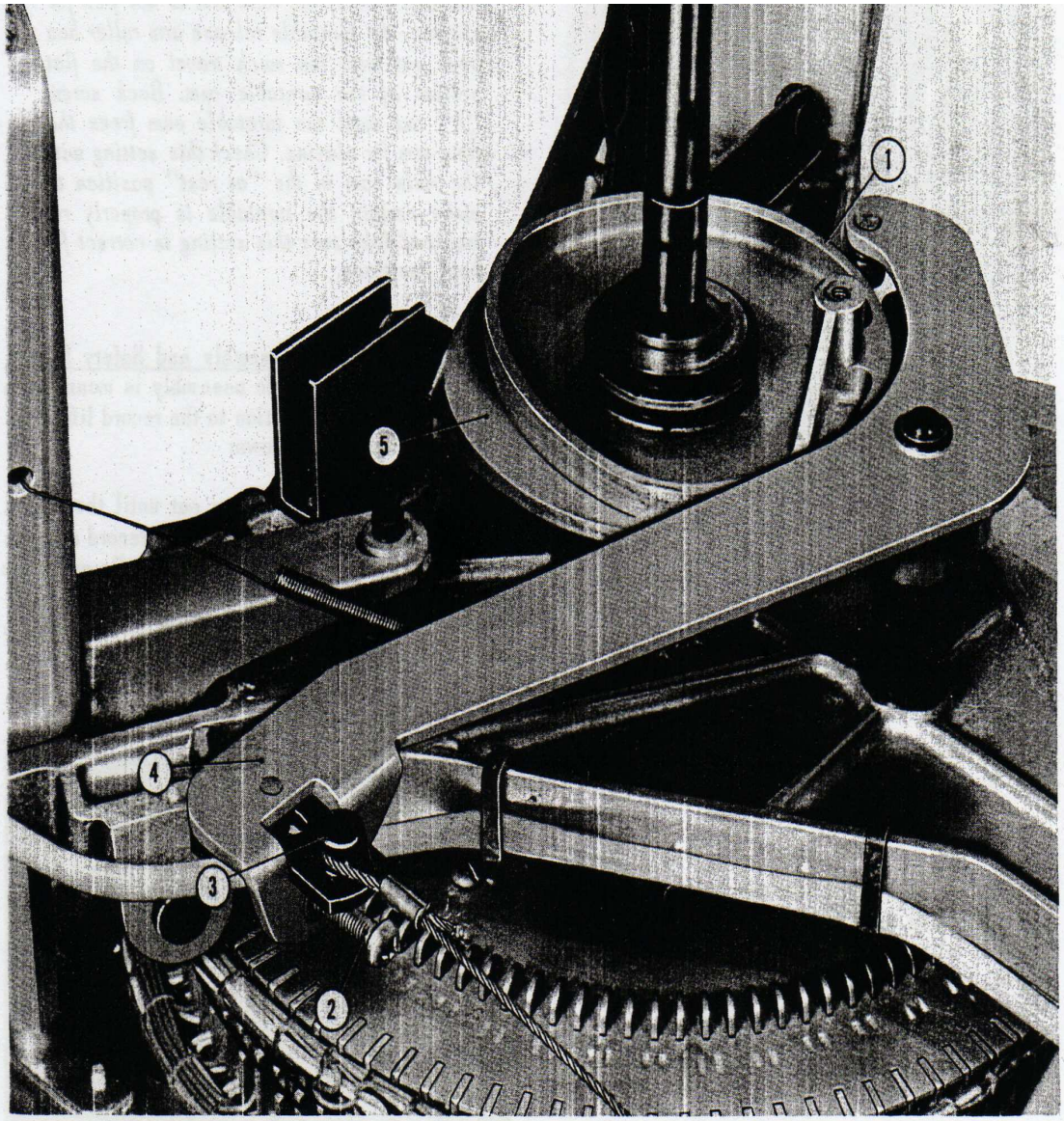


1. Motor Mounting Bracket 3. Main Gear
2. Pinion 4. Screws

Figure 60. Record Changer Motor Gear and Pinion

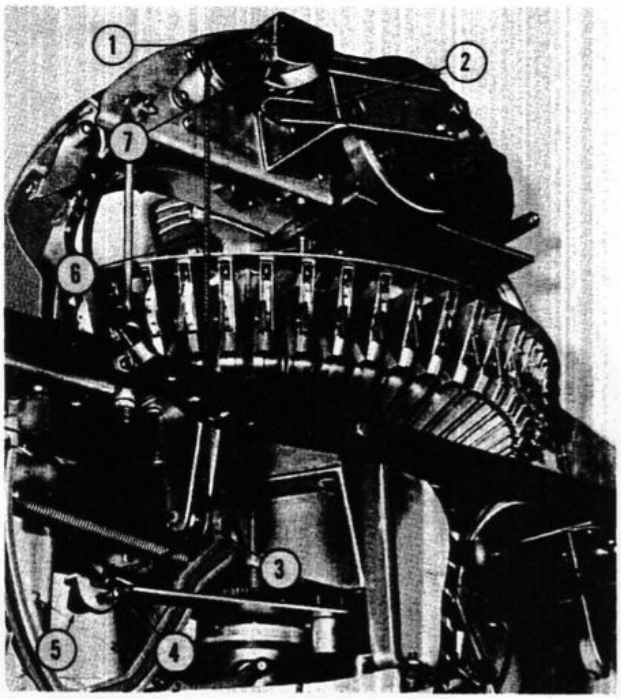
x. Turntable and Tone Arm Cable Setting. The turntable and tone arm cable must be set to operate the turntable cam to free the tone arm for playing; it also must be set to properly retract the tone arm after playing. When the main cam is in the "at rest" position, the tone arm must be retracted. When the main cam is in the "play" position, the tone arm must be free for playing. If a new turntable and tone arm cable are being installed, or if for some reason the cable is unhooked, proceed as follows:

(1) Be sure the main cam is in the "at rest" position (see Figure 61).



1. Top Cam Track
2. Screw "A"
3. Cable Slide Pin
4. Turntable Clamp Lever
5. Main Cam

Figure 61. Main Cam and Turntable Clamp Lever



1. Turntable Cam
2. Turntable Release Lever
3. Idler Pulley
4. Screw "A"
5. Cable Slide Pin
6. Cable
7. Stop Plate

Figure 62. Turntable and Tone Arm Cable

(2) Take out the two screws and remove the stop plate on the turntable cam (see Figure 62).

(3) Rotate the turntable cam in a counterclockwise direction until there is enough slack in the cable to allow hooking the eye of the cable over the cable slide pin and around the idler wheel.

NOTE: If the cable is already installed and merely needs an adjustment, eliminate steps (2), (3), and (4).

(4) Rotate the turntable cam back in a clockwise direction making sure the roller of the turntable release lever is on the proper side of the turntable cam as shown in Figure 53.

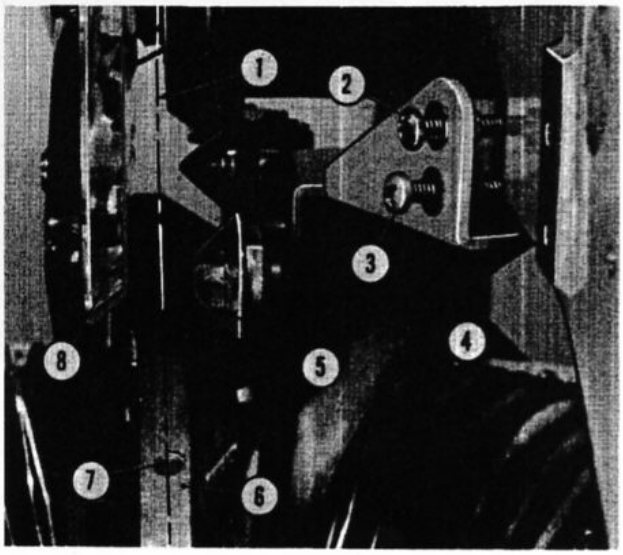
(5) Turn screw "A" in the turntable clamp lever to tighten the cable and position the turntable cam so that the roller of the turntable release lever is on the flat portion of the turntable cam.

(6) Replace the stop plate on the turntable cam.

NOTE: The amount of travel of the turntable cam is controlled by the top track on the main cam and the turntable clamp lever (see Figure 61).. Rotate the main cam to the "play" position and check for freeing of the tone arm. If the tone arm is not free for playing, the turntable release arm roller has been set with too much travel on the flat portion of the turntable cam. Back screw "A" out until the turntable cam frees the tone arm for playing. Check this setting with the main cam in the "at rest" position to make certain the turntable is properly retracted. Make sure this setting is correct for both positions.

y. Record Guide Assembly and Safety Switch Setting. The record guide assembly is mounted on a pivot and is set in relation to the record lift arms. Make this setting as follows:

(1) Turn screw "A" in or out until the record guide assembly is aligned with both record arms as shown for one record arm in Figure 63. Be sure the record lift arms are centered between the plastic guides. One adjustment centers the guides for both arms.



1. Center Line Through Record Clamp
2. Screw "B"
3. Screw "A"
4. Record Guide Assembly
5. Plastic Guide Tip
6. Lift Arm
7. Center Line of Lift
8. Plastic Guide Plate

Figure 63. Guide Plate Assembly

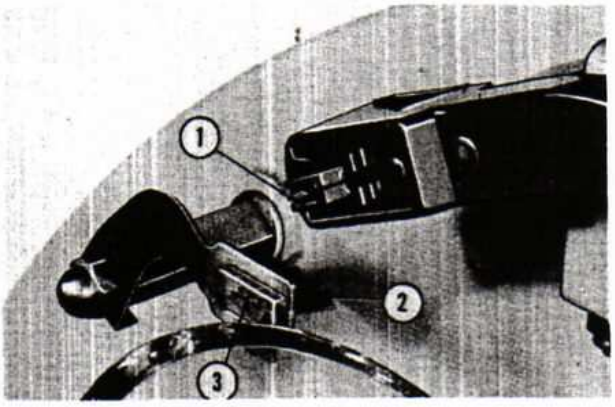
(2) After the record guide assembly has been set as described in step (1), and the end of screw "A" is against the top support casting, turn screw "B" in a counterclockwise direction until the safety switch operates.

(3) Turn screw "B" back in a clockwise direction until the switch operates again.

(4) Continue to turn screw "B" from one-half to one full turn in a clockwise direction after the switch operates. This will allow a very slight movement of the record guide assembly before the safety switch operates.

z. Tone Arm Brush Setting. The tone arm brush is operated by a cable attached to the transfer switch actuating arm. The action of the tone arm brush is adjusted as follows:

(1) Operate the phonograph to the "at rest" position and make sure the tone arm is latched.

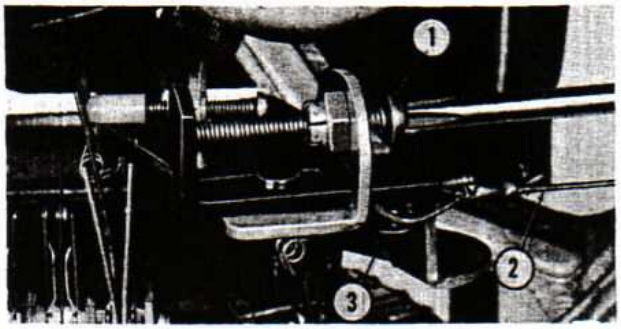


1. Needle
2. Tone Arm Brush
3. Brush Holder

Figure 64. Tone Arm Brush

(2) Set the brush holder arm so that when the brush is actuated it just wipes the needle slightly (see Figure 64).

(3) Turn the screw marked "A" in Figure 65 to position the brush between 1/4 in. and 1/2 in. below the needle when the phonograph is in the "at rest" position.



1. Screw "A"
2. Tone Arm Brush Cable
3. Sliding Pin

Figure 65. Tone arm Brush Cable Setting

5. LUBRICATION – RECORD CHANGER

Lubrication of the record changer should be checked periodically. When necessary, oil or grease should be added as recommended below:

Houghton Absorbed Oil, Type L3, Part No. 54070 may be used at points where a non-fluid lubricant is required, such as the following:

Main Cam Working Surfaces (Cam Tracks)
Gears and Pinions
Turntable Worm Gear and Pinion
All Spring and Anchor Points

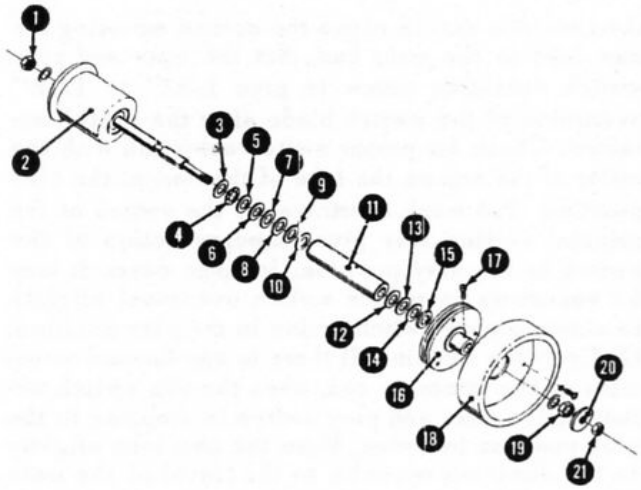
S.A.E. No. 10, or a good grade of light oil that is acid free and wax free, may be used at the following points:

Record Actuator Guide Bearings
Three Annular Record Carrier Bearings
(Under the Record Carrier)
Turntable Drive Shaft
Tone Arm Shaft
Record Carrier Shaft and Bearings
Selector Shaft
Turntable Sleeve
Fulcrum Points of All Lightweight Link and Lever Assemblies

A one-half inch hole, an inch and a quarter off center, will be found in the record carrier. This hole should be aligned with a corresponding hole in the chassis mounting plate. It will be found that these two holes line up squarely at the front of the record changer. Oil applied at this point will be absorbed by felt pad which lubricates the record actuator arms and linkage at their fulcrum points where the heaviest load is applied.

The gears of the record changer motor are packed with a non-fluid lubricant (Alvania No. 1). There is one oiler on top of the motor to supply the center bearing.

The selector shaft may be lubricated by placing a small quantity of light oil at the top and center of the main cam.



1. Hex Nut
2. Turntable Shaft Assembly
3. Thrust Washer
4. Ball Bearing
5. Thrust Washer
6. Fibre Washer
7. Metal Washer
8. Fibre Washer
9. Metal Washer
10. Fiber Washer
11. Sleeve Bearing, Rear
12. Fibre Washer
13. Metal Washer
14. Fibre Washer
15. Thrust Washer
16. Pulley
17. Screw
18. Flywheel
19. Nut
20. Plate and Hub Assembly
21. Nut

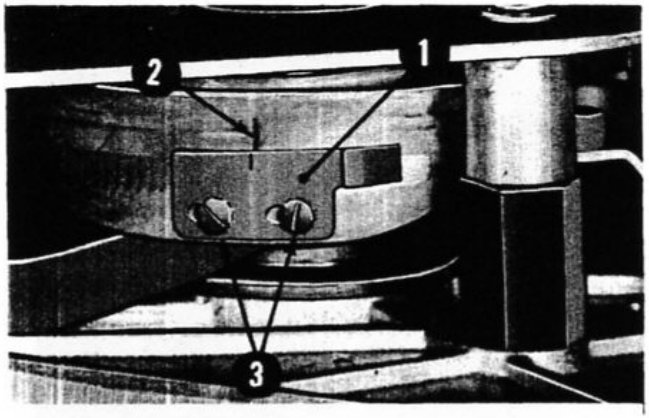
Figure 1. Shim Procedure For Turntable Shaft

MODEL 1800 RECORD CHANGER

For General Discussion, Description, Cycle Of Operation and Service of the Model 1800 Record Changer – see pages 35 through 67 of this section. Adjustments for the Model 1800 will also be found on pages 35 through 67 of this section excepting the Shim Procedure for Turntable Shaft and the Mute and Play Switch Setting. These differ from the Model 1700 and adjustment procedure is as follows:

1. ADJUSTMENTS

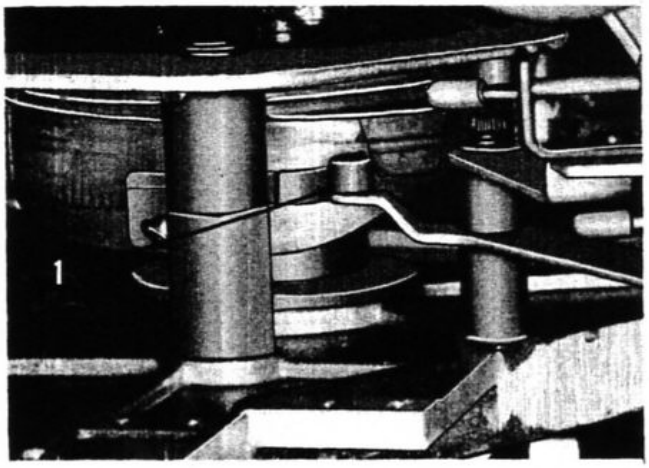
a. SHIM PROCEDURE FOR TURNTABLE SHAFT. Two metal shim washers and three fibre washers must always be used on the turntable end of the turntable shaft as shown in Fig. 1. Metal shim washers and fibre washers should always be installed on the fly wheel end of the turntable shaft in the order shown in Fig. 1. In all cases the fibre washers must be oiled before assembly and should be separated by a metal washer or washers (Fig. 1). The final washer assemblies must always start and finish with a fibre washer.



1. Adjustable Cam, Mute and Play Switch
2. Index Lines For Initial Timing
3. Locking Screws, Adjustable Cam

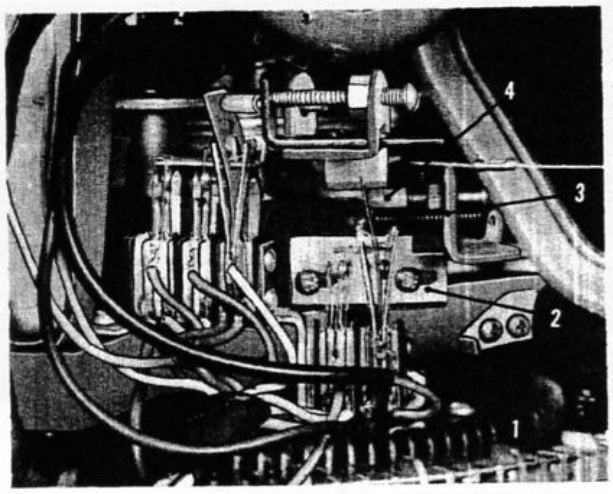
Figure 2. Timing Of Mute And Play Switch

b. MUTE AND PLAY SWITCH SETTING. The cam lobe that operates the mute and play switch is fastened to the main cam with screws and is movable to advance or delay the action of the switch. To advance the action of the switch, move this cam lobe in the direction of the travel of the main cam. To delay the action of the switch move the cam lobe in the direction opposite to the travel of the main cam. (1) Set the cam lobe so that its timing mark lines up with the timing mark on the main cam (Fig. 2). (2) Set the actuating arm stop plate (Fig. 3) with the roller of the arm just touching to 1/64" clearance to the portion of



1. Position Of Roller On Adjustable Cam For Adjustment of Stop Plate

Figure 3. Requirements For Stop Plate Setting



1. Mute And Play Switch
2. Adjustable Stop Plate
3. Actuating Lever, Mute And Play Switch
4. Switch Actuating Screw

Figure 4. Adjustment Of Mute And Play Switch And Mute And Play Switch Stop Plate

the cam lobe that is above the screws mounting the cam lobe to the main cam. Set the mute and play switch actuating screw to give 1/32" to 1/16" overtravel of the switch blade after the switch actuates. Check for proper switch actuation with the roller of the arm on the lobe of the cam at the play position. Too much overtravel of the switch at the original setting may give improper action of the switch in the play position. In some cases it may be necessary to reduce switch overtravel slightly to obtain proper switch action in the play position. (3) Cycle the machine. If there is any forward movement of the turntable cam when the trip switch actuates, the mute and play switch is stopping in the play position too soon. Move the cam lobe slightly in the direction opposite to the travel of the main cam until there is no forward movement of the turntable cam. If there is any reverse action of the turntable cam when the mechanism stops in the play position, the mute and play switch is stopping in the play position too late. Move the cam lobe slightly in the same direction as the travel of the main cam until there is no reverse movement of the turntable cam. This insures that the stop switch is stopping the machine in the play position with the maximum of tone arm freeing.

MODEL 1800 SOUND SYSTEM

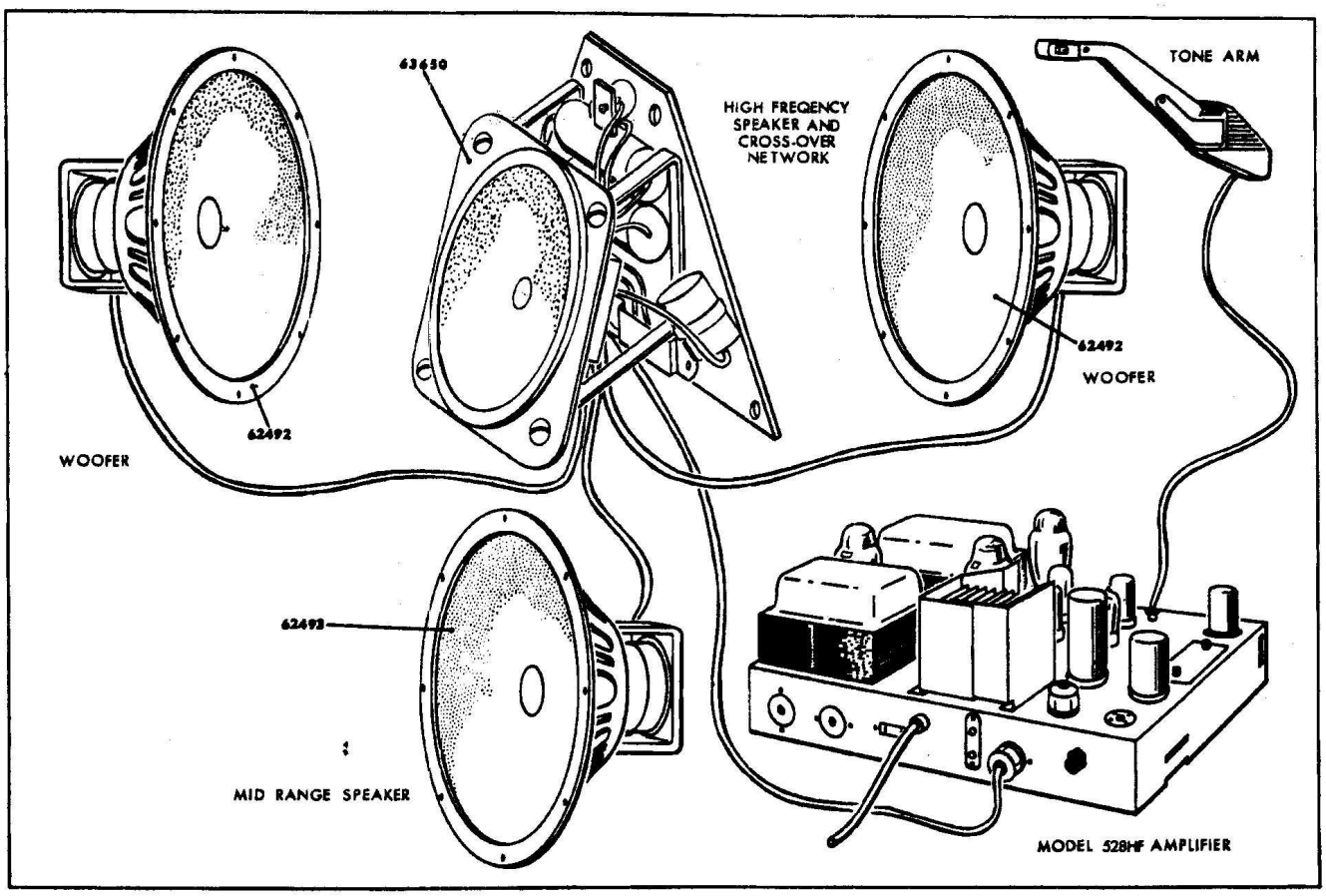


Figure 1. Sound System - Model 1800

1. GENERAL DISCUSSION

The Wurlitzer Model 1800 phonograph sound system consists of: a Dynatone Model 528HF amplifier; a wide range speaker network in its acoustically designed baffle; a built-in complete automatic volume level control; a low inertia tone arm equipped with the exclusively Wurlitzer Zenith Cobra pickup (Fig.1). The reproducer system for the Model 1800 High Fidelity phonograph consists of two 12-inch woofers, one 12-inch mid-range and one high frequency speaker, all dust protected and equipped with appropriate crossover network. These reproducers are driven by the 528HF amplifier which has provisions for all types of auxiliary speakers in the present Wurlitzer line. By use of a special Hi-Fi on - off switch, the flexibility of the 528HF amplifier is increased to meet the requirements of any location. Remote volume control of the over-all sound system is available through the installation of plug-in Kit No. 143 with built-in volume control.

2. DESCRIPTION

a. TONE ARM. The low inertia tone arm is perfectly balanced (See Section 6, Paragraph 2, r and s, Pages 60, 61 and 62). This tone arm is equipped with the Wurlitzer exclusive Zenith Cobra Microgroove cartridge designed for use with 45 RPM regular or Extended Play records.

b. AMPLIFIER. The amplifier is mounted on the inside right wall of the cabinet (as viewed from the back of the phonograph). The on-off line switch, cancel switch and volume control are on the back of the amplifier just inside the opening in the lower back door of the cabinet.

The fader control and 115-volt service outlet are also on the back of the amplifier but the lower rear door of the cabinet must be removed in order to reach these.

The bass control and treble control are next to the tubes on the side of the amplifier and can be reached by removing the back door of the cabinet.

The following outlets and controls are located on the top of the amplifier and are accessible by removing the back door of the cabinet:

Hi-Fi, "On-Off" Switch
Speaker Socket
Auxiliary Speaker 500 Ohm and 8 Ohm Line Outlet
Fuse Plug (2 Amp) DC
Fuse Plug (2 Amp) Amplifier
Fuse Plug (8 Amp) AC
Fuse Plug (15 Amp) Line
Ballast Output
Junction Box Receptacle
Remote Volume Control Jumper Plug

Through the amplifier, the complete sound system is connected to the power units and supply that operate the record changer and selection circuits. The functions of the amplifier tubes are as follows:

Type	Description	Use
6J5	Triode	Oscillator and Detector
6SJ7(2)	Pentode	Voltage Amplifier
12AX7	Dual Triode	Voltage Amplifier and Rectifier
12BH7	Dual Triode	Voltage Amplifier and Resistance Tube
12BH7	Dual Triode	Cathode Follower and Phase Inverter
6L6G(2)	Tetrode	Power Output
5U4GA	Dual Diode	Full Wave Rectifier

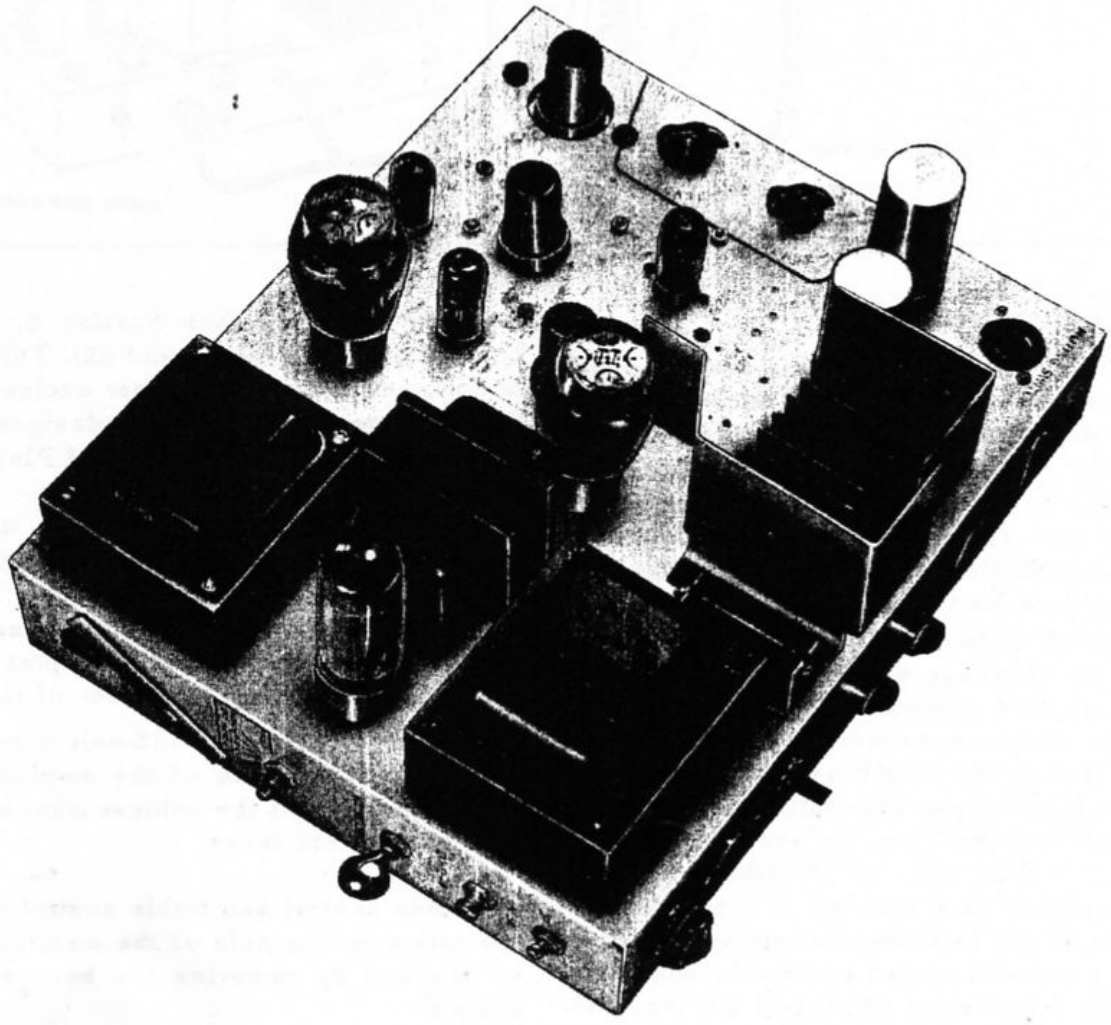


Figure 2. Model 528HF Amplifier

3. THEORY OF ORERATION

a. OSCILLATOR AND PICKUP (SEE FIG. 3 FOR BLOCK DIAGRAM). The oscillator (6J5) operates at approximately 2.5 mc and is loaded electrically by the Zenith pickup which forms part of the oscillator circuit. The vibration of of the pickup stylus varies the voltage at the plate of the 6J5. Accordingly, the flexing or moving of the pickup stylus in the record grooves varies in the plate voltage of the oscillator at the same rate it is flexed in the record groove. The pickup does not generate voltage but it controls the oscillator energy, bringing wear on the record grooves to a minimum. The varying voltage at the 6J5 plate is filtered by resistor R-2 and capacitor C-4. This removes the 2.5 mc carrier and leaves only the audio signal (see schematic in Section 12, Page 68). The audio signal is then applied to the first 6SJ7, through a high pass network R-4, R-5, R-7, C-5 and R-6. The 6SJ7 amplifies the applied audio signal and develops it across R-11 and R-10. Here it is applied to the 12AX7 voltage amplifier and the 12BH7 in the level control circuit.

b. LEVEL CONTROL. Some of the audio voltage is applied to the 12AX7 where it is amplified and rectified into DC voltage, appearing across the time constant circuit at resistor R-22, and the grid of the 12BH7 variable resistance tube. When a high cut record is played, this voltage at R-22 will be high. When a low cut record is played, this voltage will be low. With this variation of voltage at the grid of the 12BH7, the variable resistance tube automatically raises or lowers the listening level of the record. The audio signal is them amplified in the second section of the 12BH7. With this level control action an even output is maintained, regardless of the records played.

c. MUTE AND PLAY SWITCH. This is a single-pole, double-throw switch located on the record changer (See Section 6, Page 53). The left-hand contacts (as viewed from the rear) mute the amplifier when the record changer is in its normal at rest position. The right-hand contacts apply a DC voltage across resistor R-22, preventing the sound system from blasting when the pickup needle plays the first few grooves of a record.

d. POWER AMPLIFIER SECTION. The power amplifier section supplies power to the speaker network. This amplifier section (Fig.3) consists of the 6SJ7 voltage amplifier, the phase inverter half of the 12BH7, and the 6L6G power amplifier with its negative feed back loop. The damping characteristics of the feed back loop give maximum power output with minimum distortion.

e. FILAMENT STANDBY VOLTAGE. The amplifier secures its total filament voltage from two transformer windings connected in series. When the phonograph is on standby, however, the amplifier tubes are partially heated with voltage from the power transformer T2 only. Accordingly, the amplifier operates immediately with no delay for warm-up.

4. AUXILIARY SPEAKERS.

a. METHOD OF CONNECTION. The label on the heat deflector over the amplifier gives brief instructions for connecting auxiliary speakers. Detailed instructions are as follows:

1. Auxiliary speakers may be connected to the Model 528HF amplifier at a terminal strip located near the front of the top of the amplifier. The output for auxiliary speakers is designed for speakers that have been provided with 500 ohm line transformers, and for 8 ohm speakers, as indicated at the terminal strip and on the instruction label fastened to the heat deflector. If required, one to three 8 ohm speakers may be connected in SERIES at terminals "GND" and "8 OHM". The 8 ohm terminal is not controlled by the fader switch. Speakers with 500 ohm line transformers may be connected in parallel to terminals "GND" and "500 OHM" as follows:

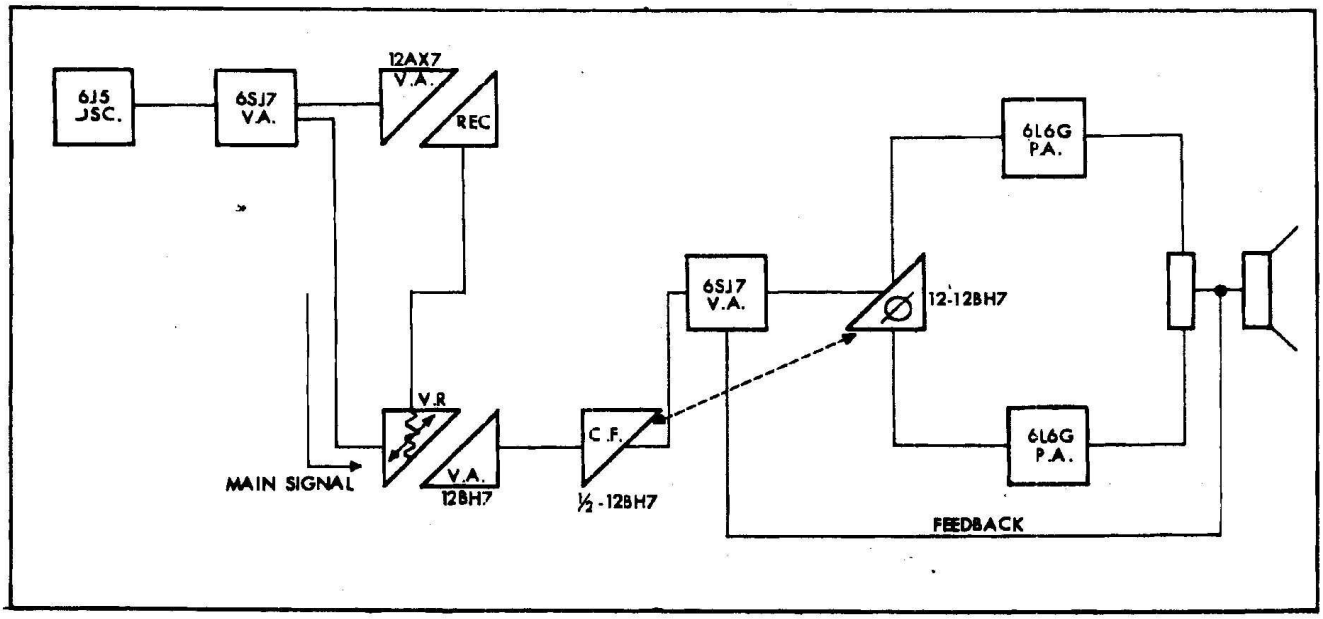


Figure 3. Model 528HF Amplifier, Block Diagram

With the fader control set at "Phono Only" all of the amplifier output will be delivered to the phonograph speakers and the 8 ohm line, if connected.

With the fader control set at "A", 90% of the amplifier output will be delivered to the phonograph speakers (and the 8 ohm line, if connected) and 10% will be delivered to the 500 ohm line. One to three auxiliary speakers may be used.

With the fader control set at "B", 40% of the amplifier output will be delivered to the phonograph speakers (anc the 8 ohm line, if connected) and 60% will be delivered to the 500 ohm line. One to five auxiliary speakers may be used.

With the fader control set at "C", 15% of the amplifier output will be delivered to the phonograph speakers (and the 8 ohm line, if connected) and 85% will be delivered to the 500 ohm line. One to eight auxiliary speakers may be used.

With the fader control set at "D", 5% of the amplifier output will be delivered to the phonograph speakers (and the 8 ohm line, if connected) and 95% will be delivered to the 500 ohm line. One to eight auxiliary speakers may be used.

2. NOTE:

With speakers that are equipped with Wurlitzer tapped transformers for individual volume control, more speakers than indicated above may be connected to the 500 ohm line if the speakers are set to one of the three reduced volume settings.

3. Installation with 500 ohm line distribution permits longer runs with low loss and enables the use of 3.5 ohm and 8 ohm voice coil impedence as desired.

4. The current line of Wurlitzer speakers and many of the earlier Wurlitzer speakers are originally equipped with 500 ohm line transformers. Speaker Models 5110, 5110A, 5112, 5115, 5116 and 5117 are provided with tapped transformers

and individual volume controls as mentioned in paragraph 2. There are line transformers available for such other speakers as are not equipped with them. For 3-1/2 ohm voice coil, line transformer (Part No. 50214) and for 8 ohm voice coil, line transformer (Part No. 49775) may be obtained from Wurlitzer distributors.

5. Whenever the auxiliary speaker load is removed, the fader control should be re-set to "Phono Only" position.

6. The phonograph volume control governs the phonograph speakers, the 8 ohm line load, and the 500 ohm line load. However the ratio of signal distribution will remain as described in paragraph 1.

7. Should additional sound distribution be required, the Model 528HF amplifier is provided with an auxiliary amplifier output socket which is not governed by the phonograph volume control but does have the advantage of the automatic level control. Model 230 (Part No. 61954) which includes a Model 229 auxiliary High Fidelity amplifier is available for connecting to the Model 528HF amplifier at the socket mentioned. The Model 229HF amplifier will provide additional power output of 20 watts. It is equipped with its own volume control which is entirely independent of the phonograph volume control. For a complete description of this unit, refer to pages 10 and 11, paragraph 5 and 6, of this section.

PARTS CATALOG

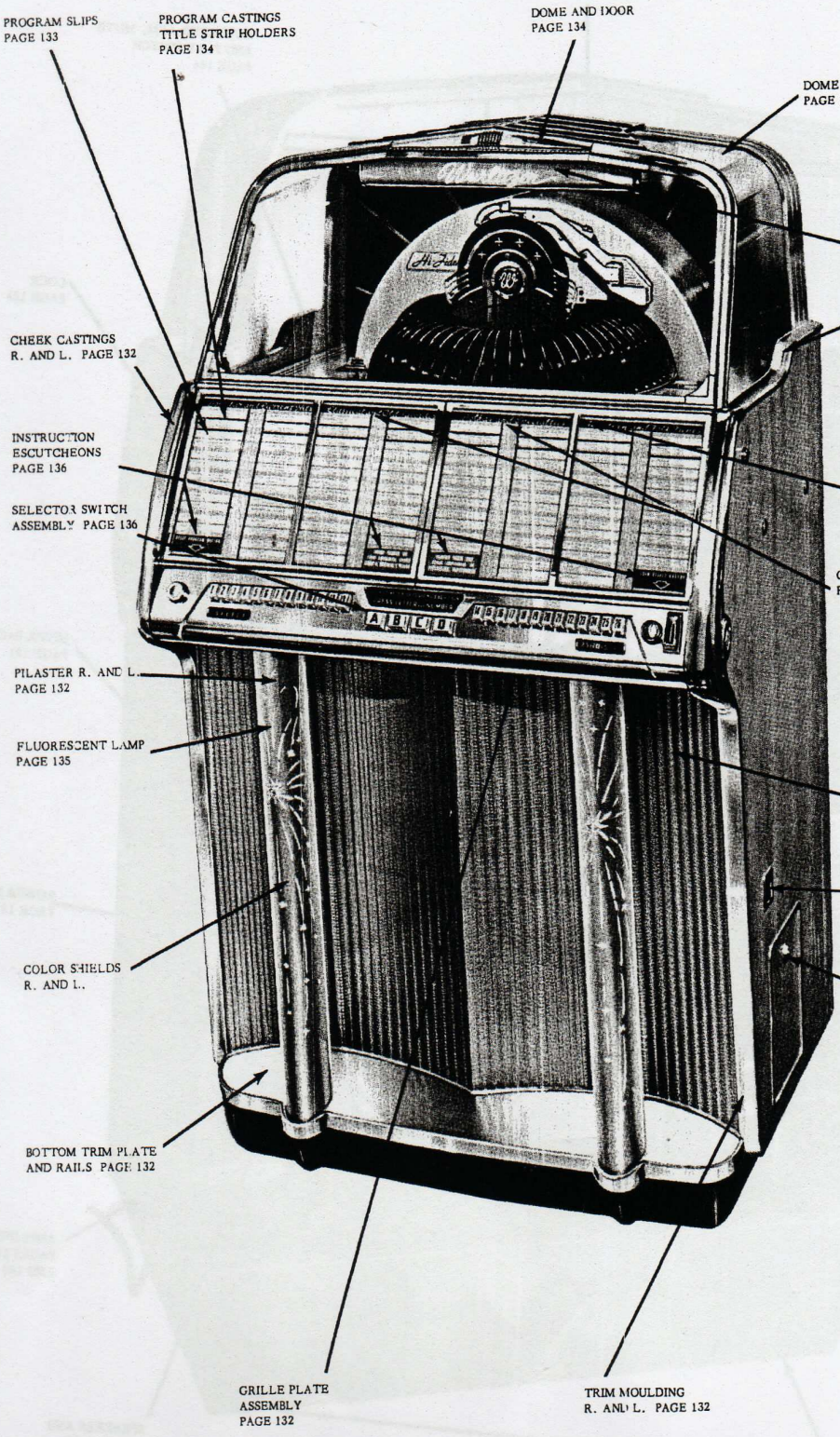
for

WURLITZER

Model 1800

PHONOGRAPH

ALPHABETICAL LIST OF ILLUSTRATIONS


PROGRAM SLIPS
PAGE 133
PROGRAM CASTINGS
TITLE STRIP HOLDERS
PAGE 134
DOME AND DOOR
PAGE 134
DOME WINDOWS R. AND L.
PAGE 134
INSIDE TRIM
PAGE 134
TRIM MOULDING
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CHEEK CASTINGS
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SELECTOR SWITCH
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PROGRAM LIGHT
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PILASTER R. AND L.
PAGE 132
FLUORESCENT LAMP
PAGE 135
FRONT GRILLE
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COIN RETURN
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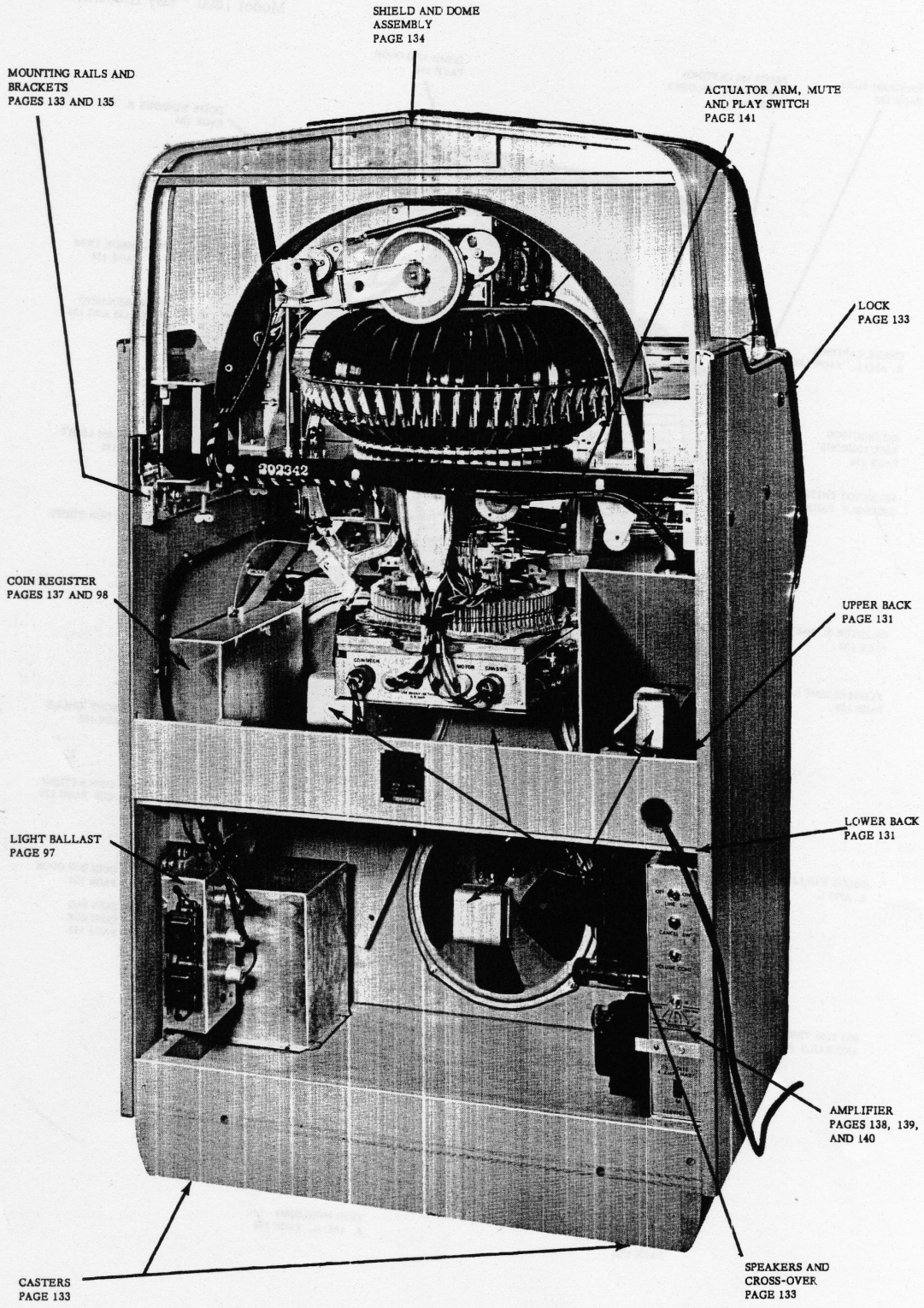
COIN BOX DOOR
PAGE 132
COIN BAG
COIN BOX
PAGE 133
BOTTOM TRIM PLATE
AND RAILS PAGE 132
GRILLE PLATE
ASSEMBLY
PAGE 132
TRIM MOULDING
R. AND L. PAGE 132


SHIELD AND DOME ASSEMBLY PAGE 134
MOUNTING RAILS AND BRACKETS PAGES 133 AND 135
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COIN REGISTER PAGES 137 AND 98
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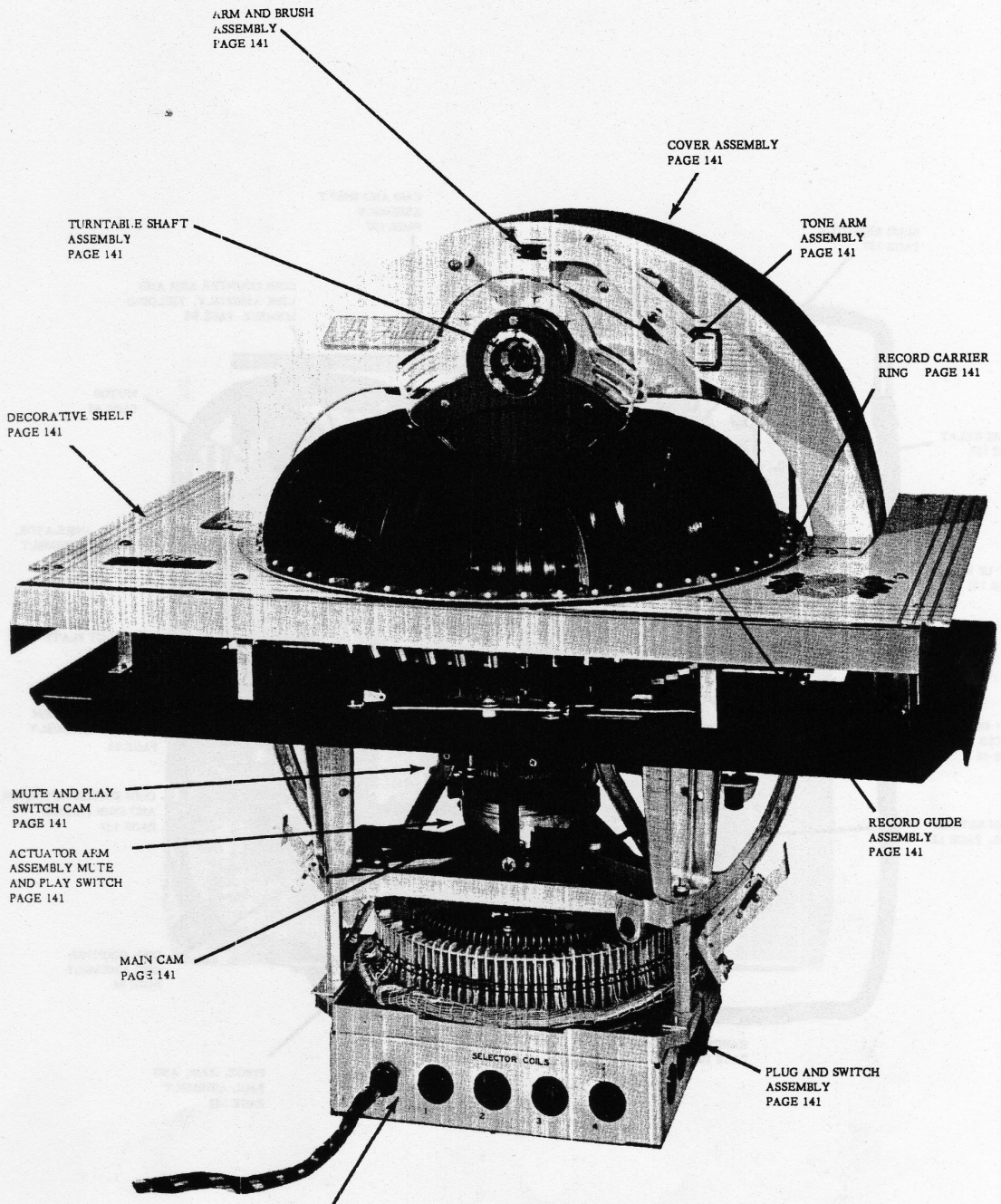
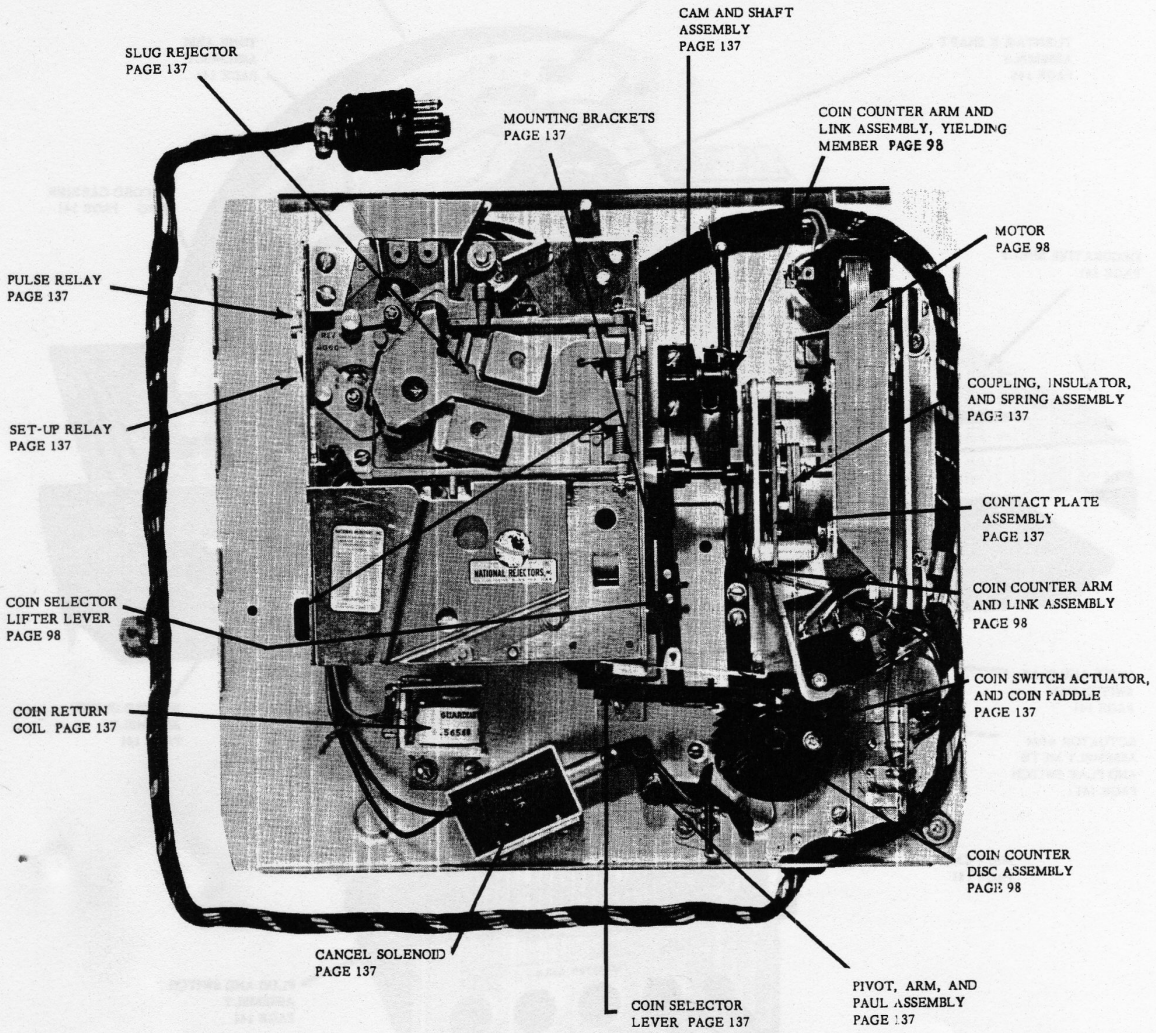
LIGHT BALLAST PAGE 97
LOWER BACK PAGE 131
AMPLIFIER PAGES 138, 139, AND 140
CASTERS PAGE 133
SPEAKERS AND CROSS-OVER PAGE 133

Model 1800 - Key Illustrations

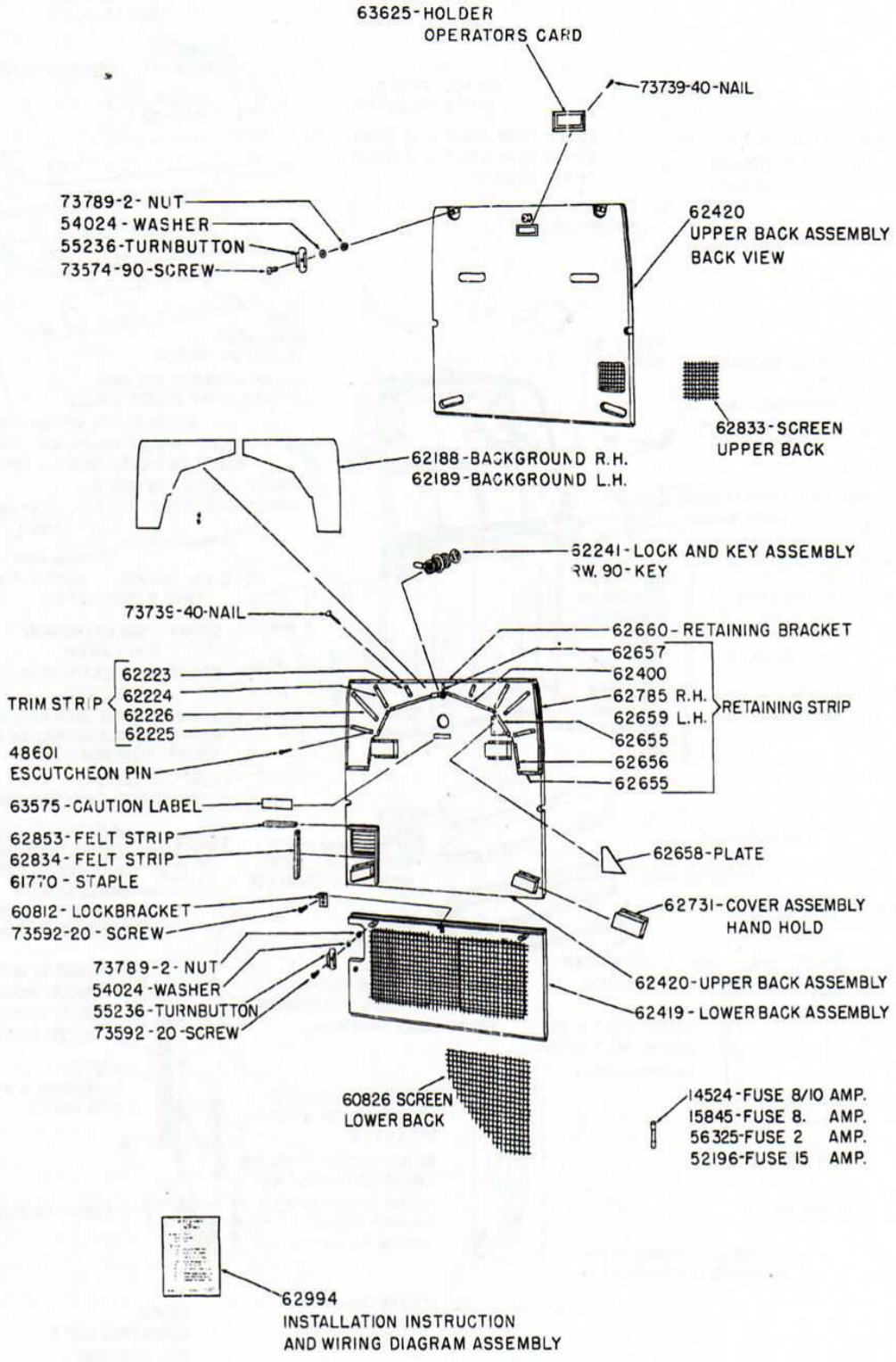


FOR COMPONENTS NOT SHOWN ON PAGE 141 , SEE PAGES 83 THRU 92 OF THIS SECTION.

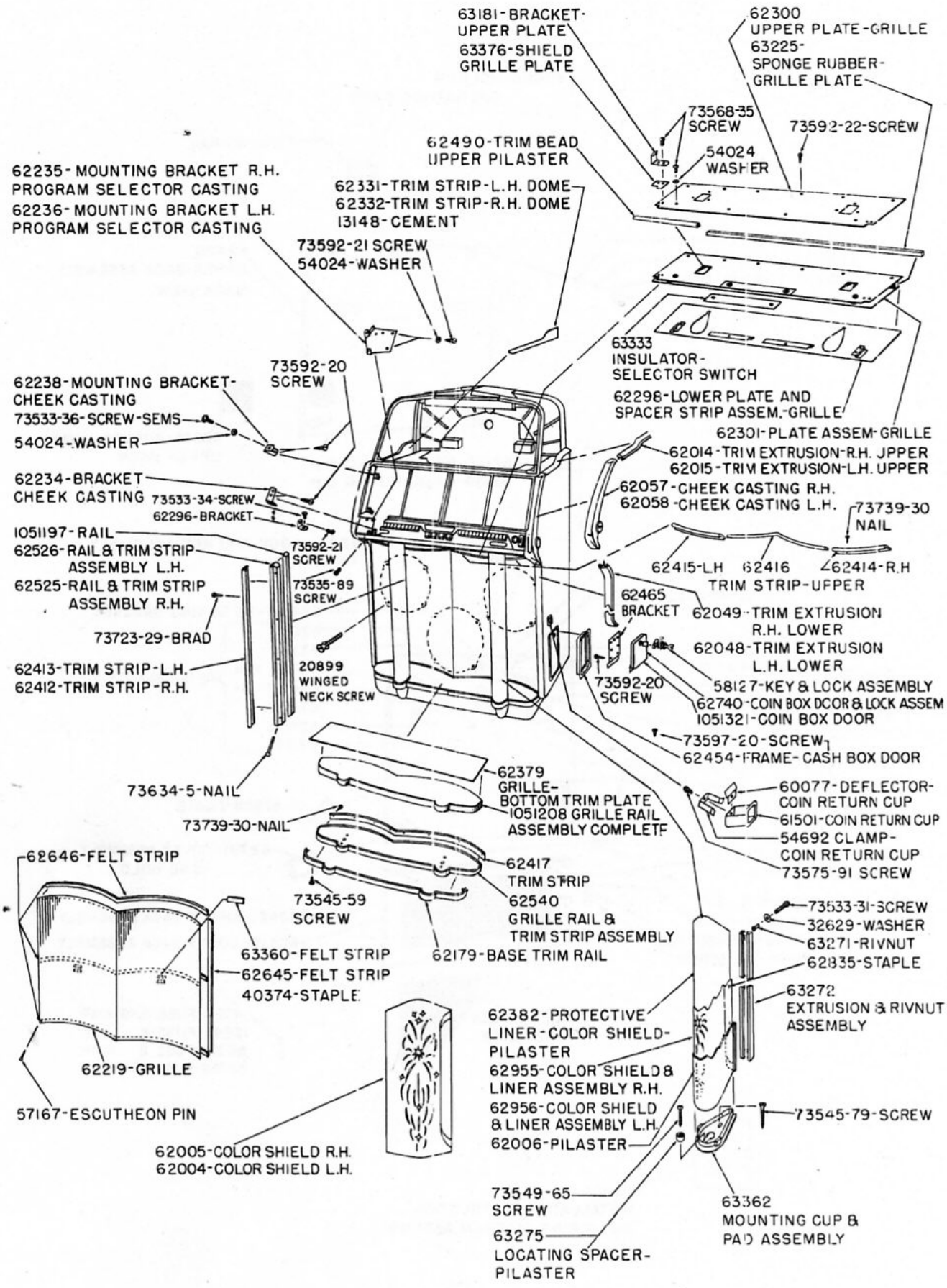
Model 1800 - Key Illustrations

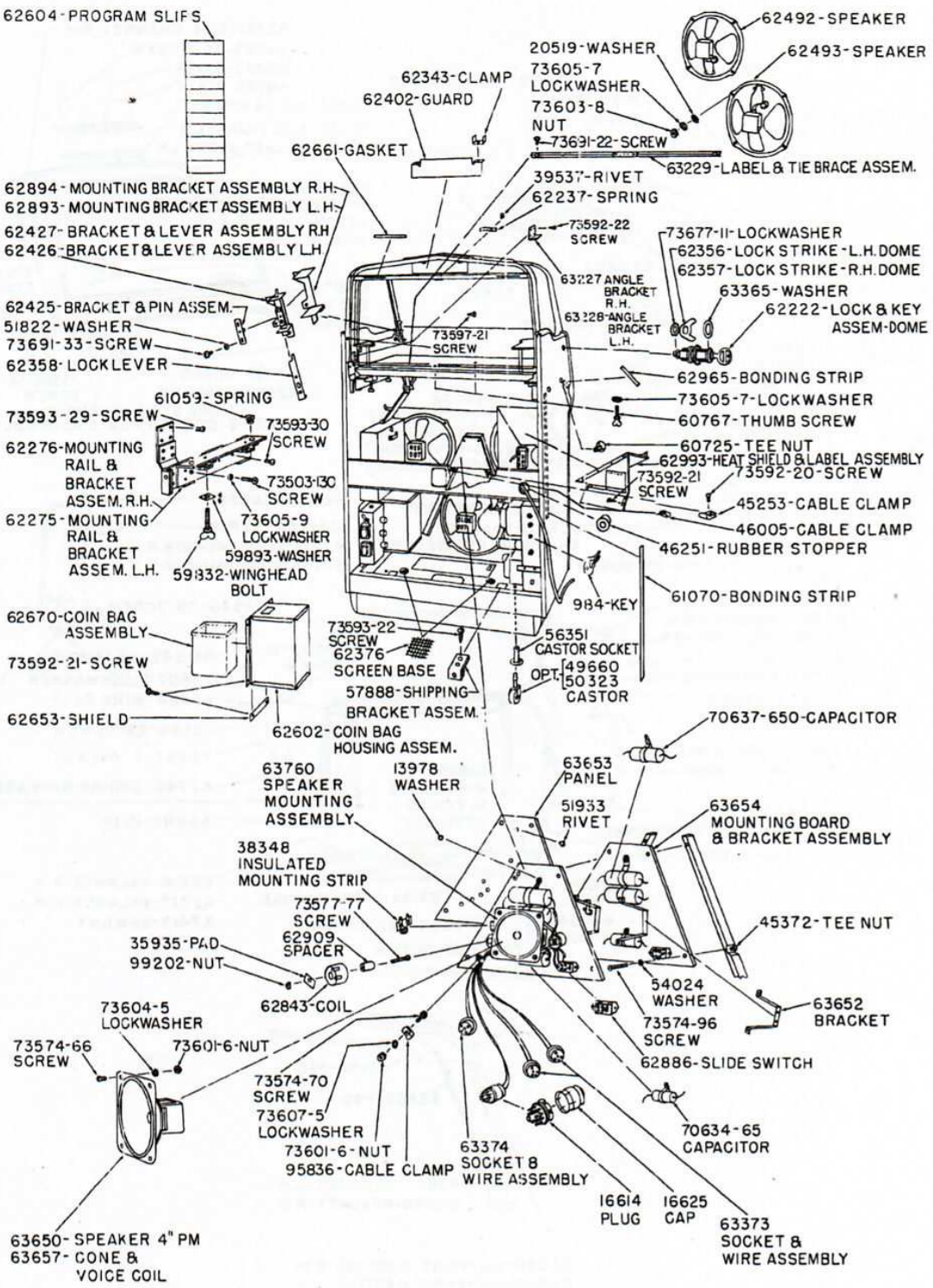


Model 1800 - Back Assembly



Model 1800 - Trim Assembly - Front

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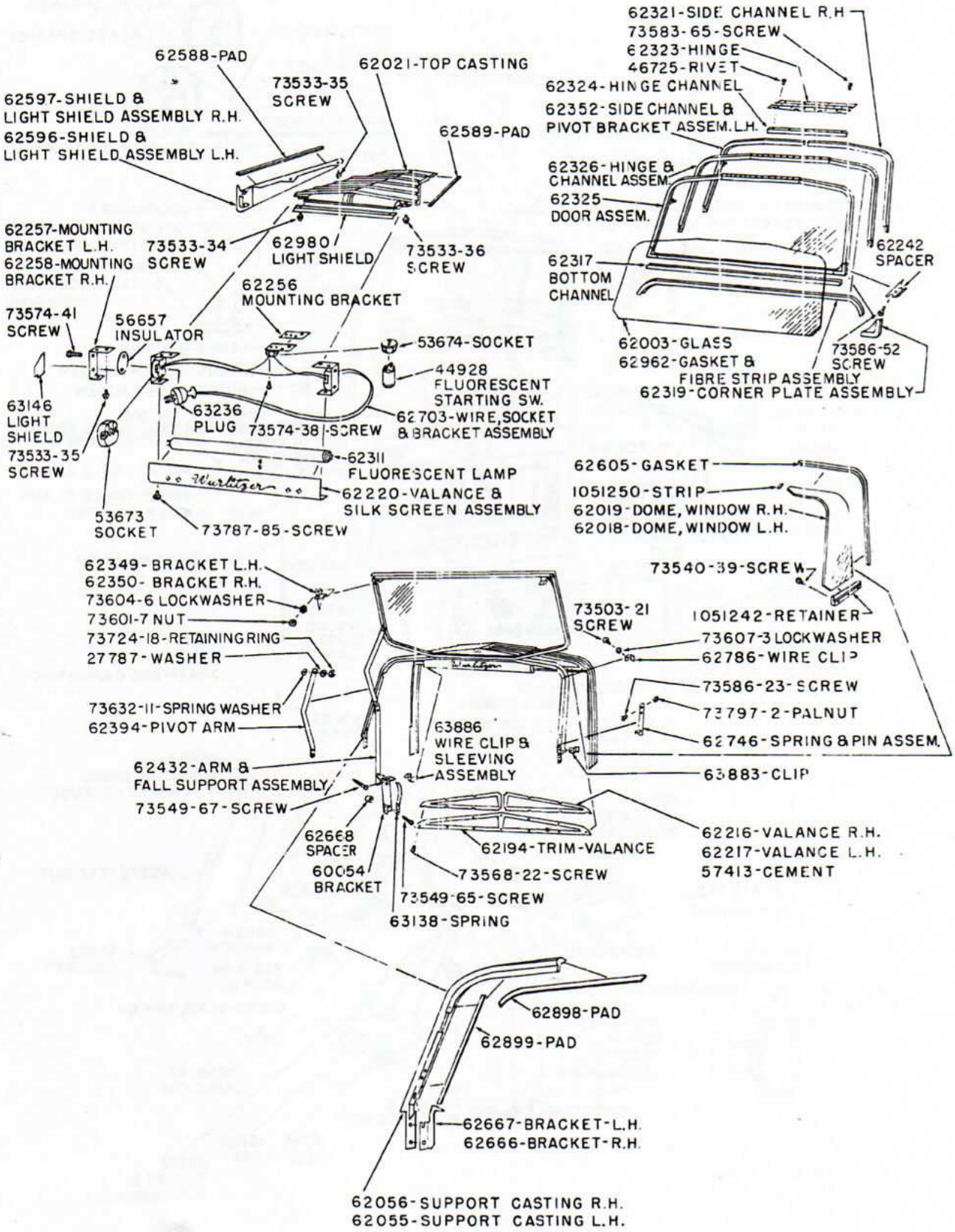
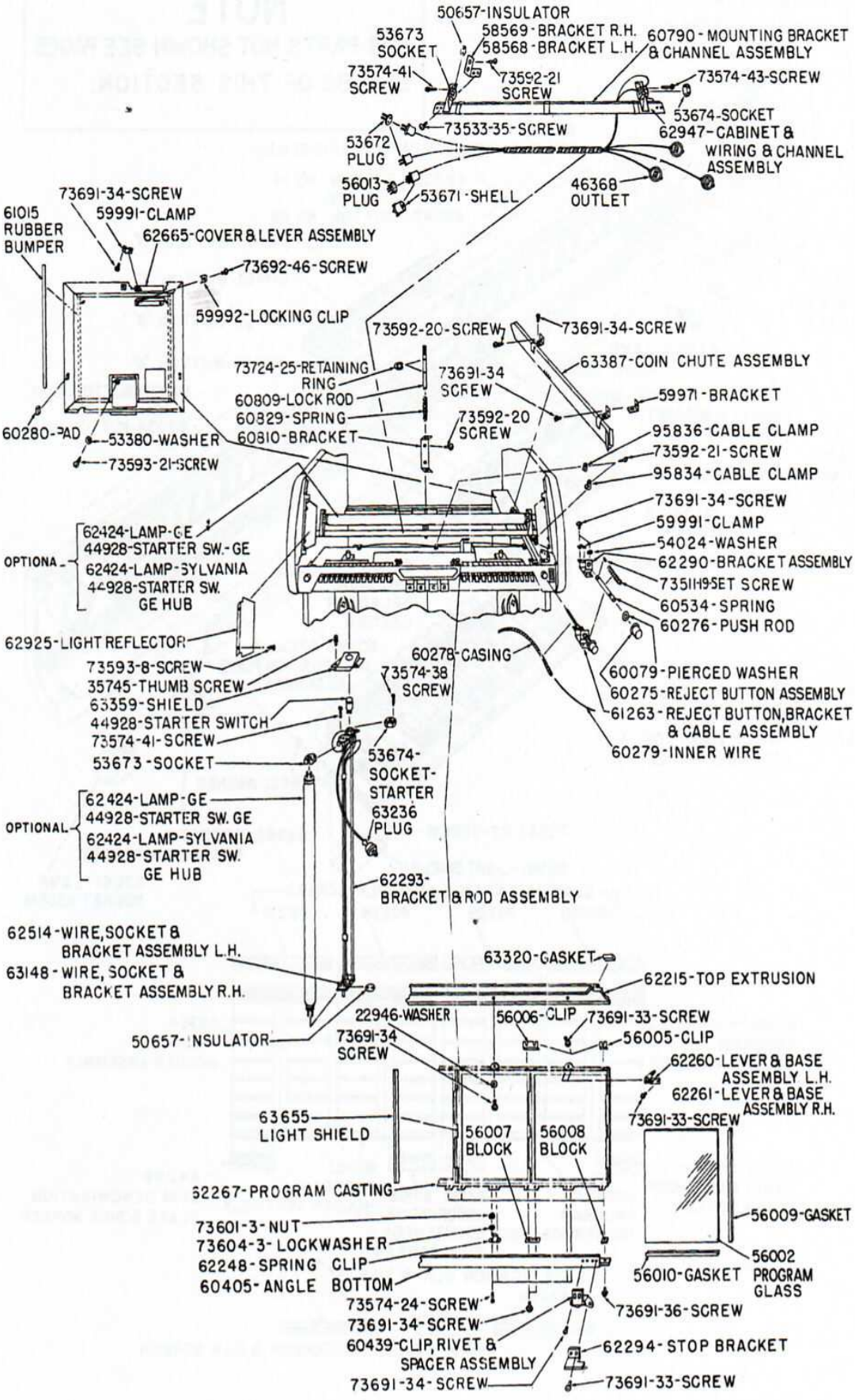
62492-SPEAKER
62493-SPEAKER
20519-WASHER
73605-7 LOCKWASHER
73603-8 NUT
62343-CLAMP
62402-GUARD
73691-22-SCREW
63229-LABEL & TIE BRACE ASSEM.
62661-GASKET
39537-RIVET
62237-SPRING
62894-MOUNTING BRACKET ASSEMBLY R.H.
62893-MOUNTING BRACKET ASSEMBLY L.H.
62427-BRACKET & LEVER ASSEMBLY R.H
62426-BRACKET & LEVER ASSEMBLY L.H
73592-22 SCREW
73677-11-LOCKWASHER
62356-LOCK STRIKE-L.H. DOME
62357-LOCK STRIKE-R.H. DOME
63365-WASHER
62222-LOCK & KEY ASSEM-DOME
63227 ANGLE BRACKET R.H.
63228-ANGLE BRACKET L.H.
62425-BRACKET & PIN ASSEM.
51822-WASHER
73691-33-SCREW
62358-LOCK LEVER
73597-21 SCREW
62965-BONDING STRIP
73605-7-LOCKWASHER
60767-THUMB SCREW
61059-SPRING
73593-29-SCREW
73593-30 SCREW
62276-MOUNTING RAIL & BRACKET ASSEM. R.H.
60725-TEE NUT
62993-HEAT SHIELD & LABEL ASSEMBLY
73592-20-SCREW
73592-21 SCREW
73503-130 SCREW
45253-CABLE CLAMP
46005-CABLE CLAMP
62275-MOUNTING RAIL & BRACKET ASSEM. L.H.
73605-9 LOCKWASHER
59893-WASHER
59832-WINGHEAD BOLT
46251-RUBBER STOPPER
984-KEY
61070-BONDING STRIP
62670-COIN BAG ASSEMBLY
73593-22 SCREW
62376 SCREEN BASE
56351 CASTOR SOCKET
OPT. 49660 50323 CASTOR
73592-21-SCREW
57888-SHIPPING BRACKET ASSEM.
62653-SHIELD
62602-COIN BAG HOUSING ASSEM.
70637-650-CAPACITOR
63760 SPEAKER MOUNTING ASSEMBLY
13978 WASHER
63653 PANEL
51933 RIVET
63654 MOUNTING BOARD & BRACKET ASSEMBLY
38348 INSULATED MOUNTING STRIP
73577-77 SCREW
62909 SPACER
45372-TEE NUT
35935-PAD
99202-NUT
62843-COIL
54024 WASHER
73574-96 SCREW
63652 BRACKET
73604-5 LOCKWASHER
73574-66 SCREW
73601-6-NUT
62886-SLIDE SWITCH
73574-70 SCREW
73607-5 LOCKWASHER
70634-65 CAPACITOR
73601-6-NUT
95836-CABLE CLAMP
63374 SOCKET & WIRE ASSEMBLY
16614 PLUG
16625 CAP
63650-SPEAKER 4" PM
63657-CONE & VOICE COIL
63373 SOCKET & WIRE ASSEMBLY

Model 1800 - Trim Assembly - Dome

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53673 SOCKET
58569-BRACKET R.H.
58568-BRACKET L.H.
60790-MOUNTING BRACKET & CHANNEL ASSEMBLY
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73592-21 SCREW
73574-43-SCREW
53674-SOCKET
73533-35-SCREW
62947-CABINET & WIRING & CHANNEL ASSEMBLY
53672 PLUG
56013 PLUG
53671-SHELL
46368 OUTLET
73691-34-SCREW
59991-CLAMP
61015 RUBBER BUMPER
62665-COVER & LEVER ASSEMBLY
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59992-LOCKING CLIP
73592-20-SCREW
73691-34-SCREW
63387-COIN CHUTE ASSEMBLY
73724-25-RETAINING RING
60809-LOCK ROD
60829-SPRING
60810-BRACKET
73691-34 SCREW
73592-20 SCREW
59971-BRACKET
95836-CABLE CLAMP
73592-21-SCREW
95834-CABLE CLAMP
60280-PAD
53380-WASHER
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73691-34-SCREW
59991-CLAMP
54024-WASHER
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60534-SPRING
60276-PUSH ROD
OPTIONAL
62424-LAMP-GE
44928-STARTER SW.-GE
62424-LAMP-SYLVANIA
44928-STARTER SW. GE HUB
62925-LIGHT REFLECTOR
73593-8-SCREW
35745-THUMB SCREW
63359-SHIELD
44928-STARTER SWITCH
73574-41-SCREW
53673-SOCKET
60278-CASING
73574-38 SCREW
60079-PIERCED WASHER
60275-REJECT BUTTON ASSEMBLY
61263-REJECT BUTTON, BRACKET & CABLE ASSEMBLY
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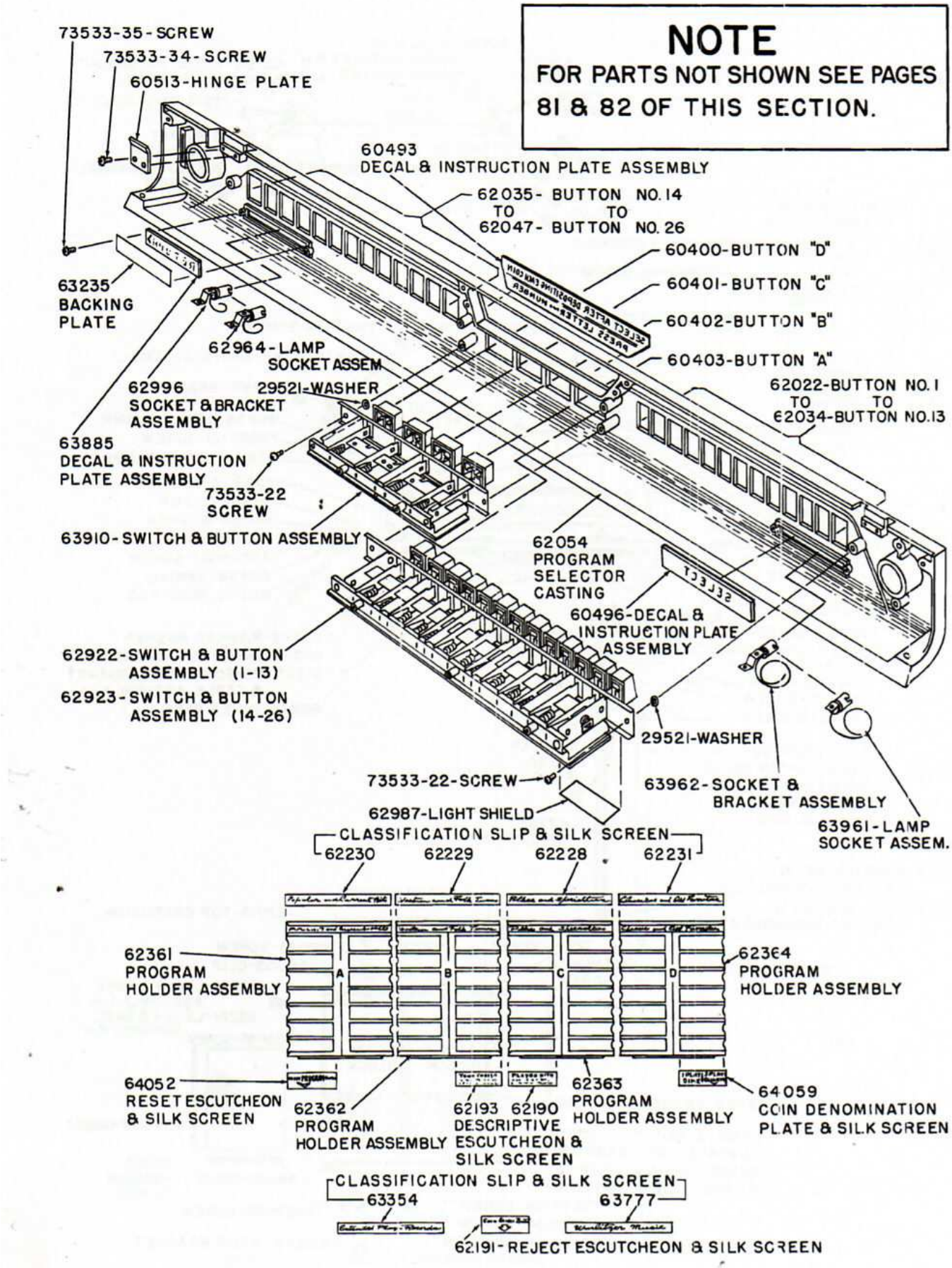
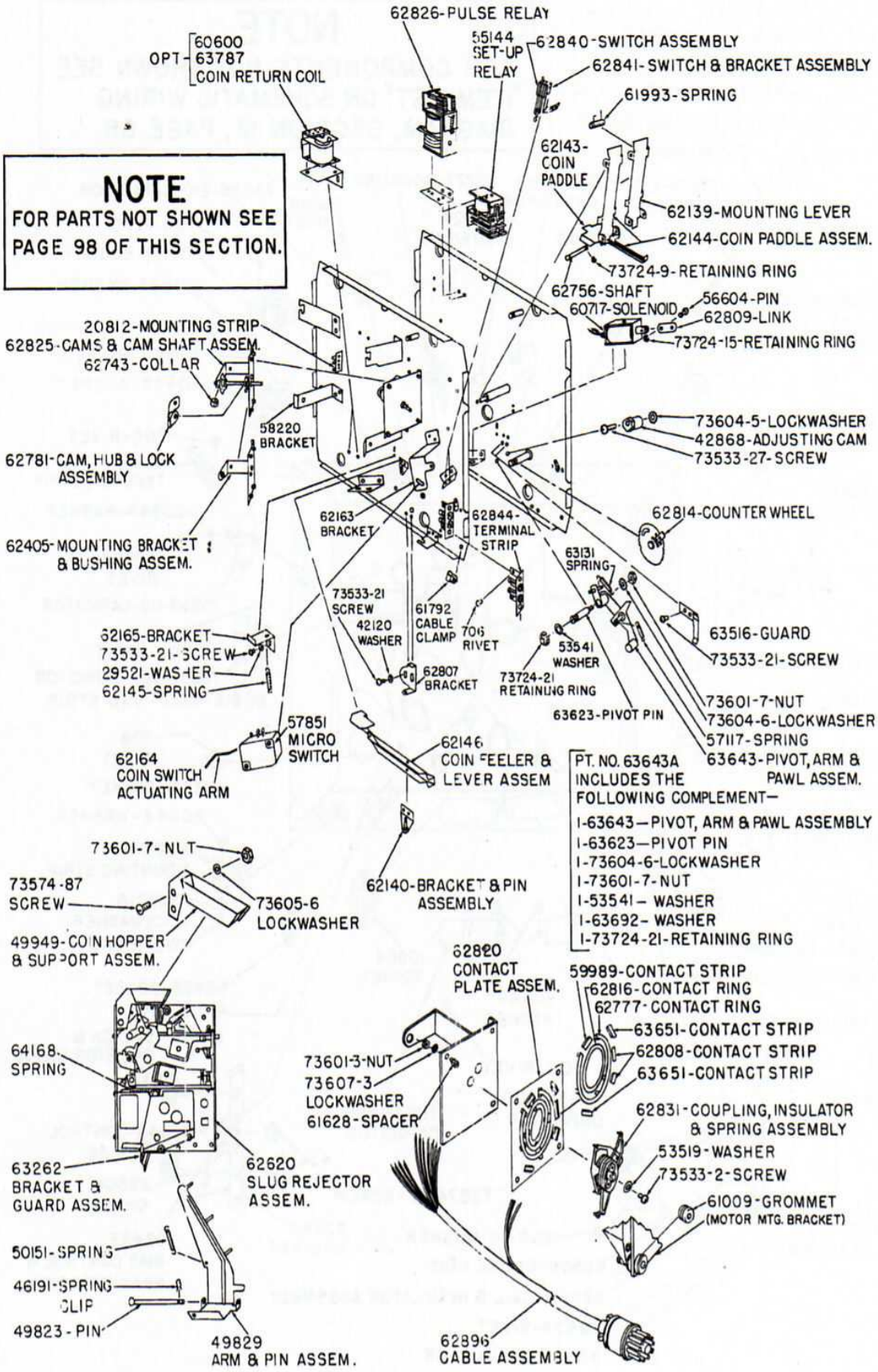
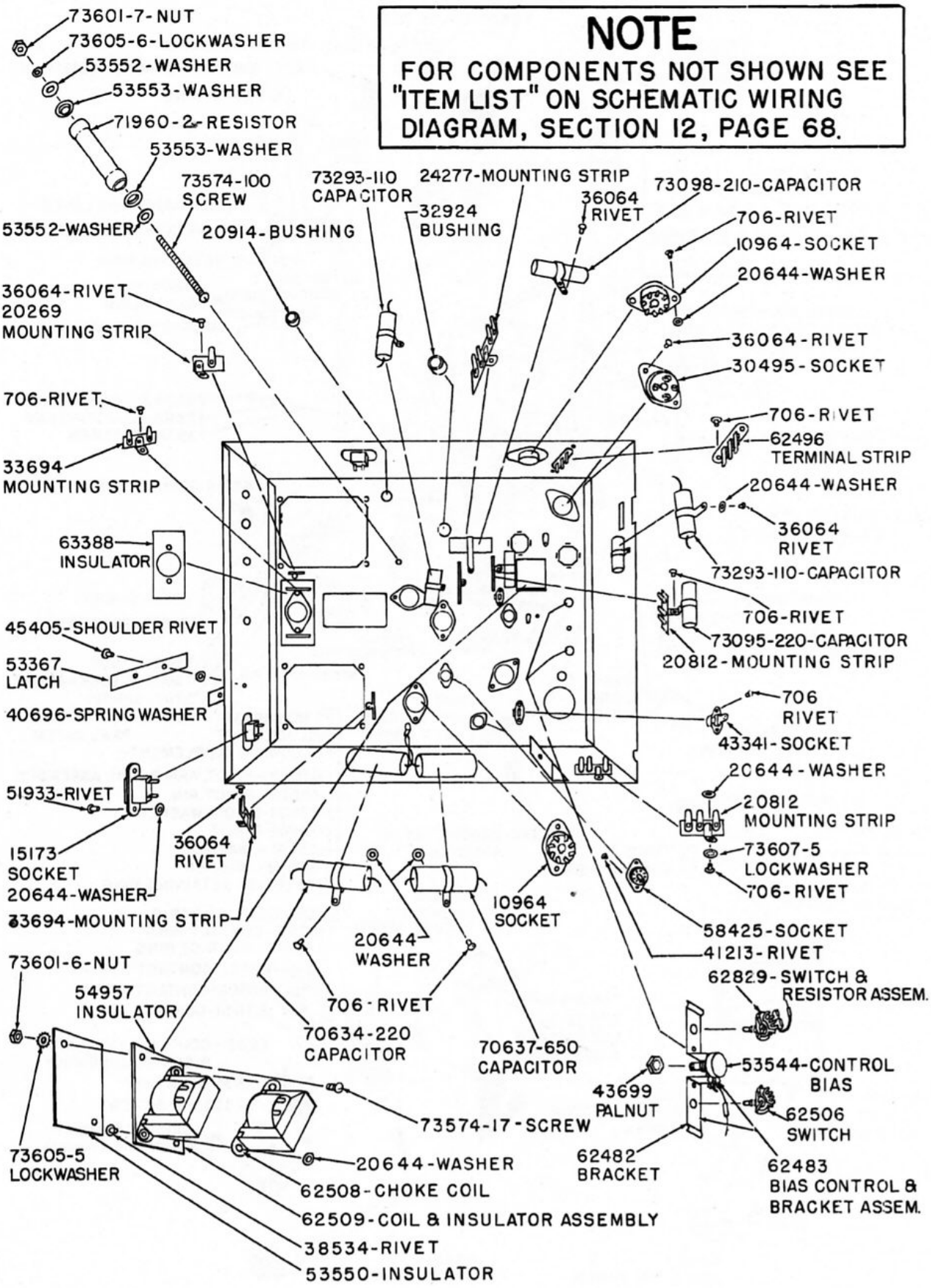
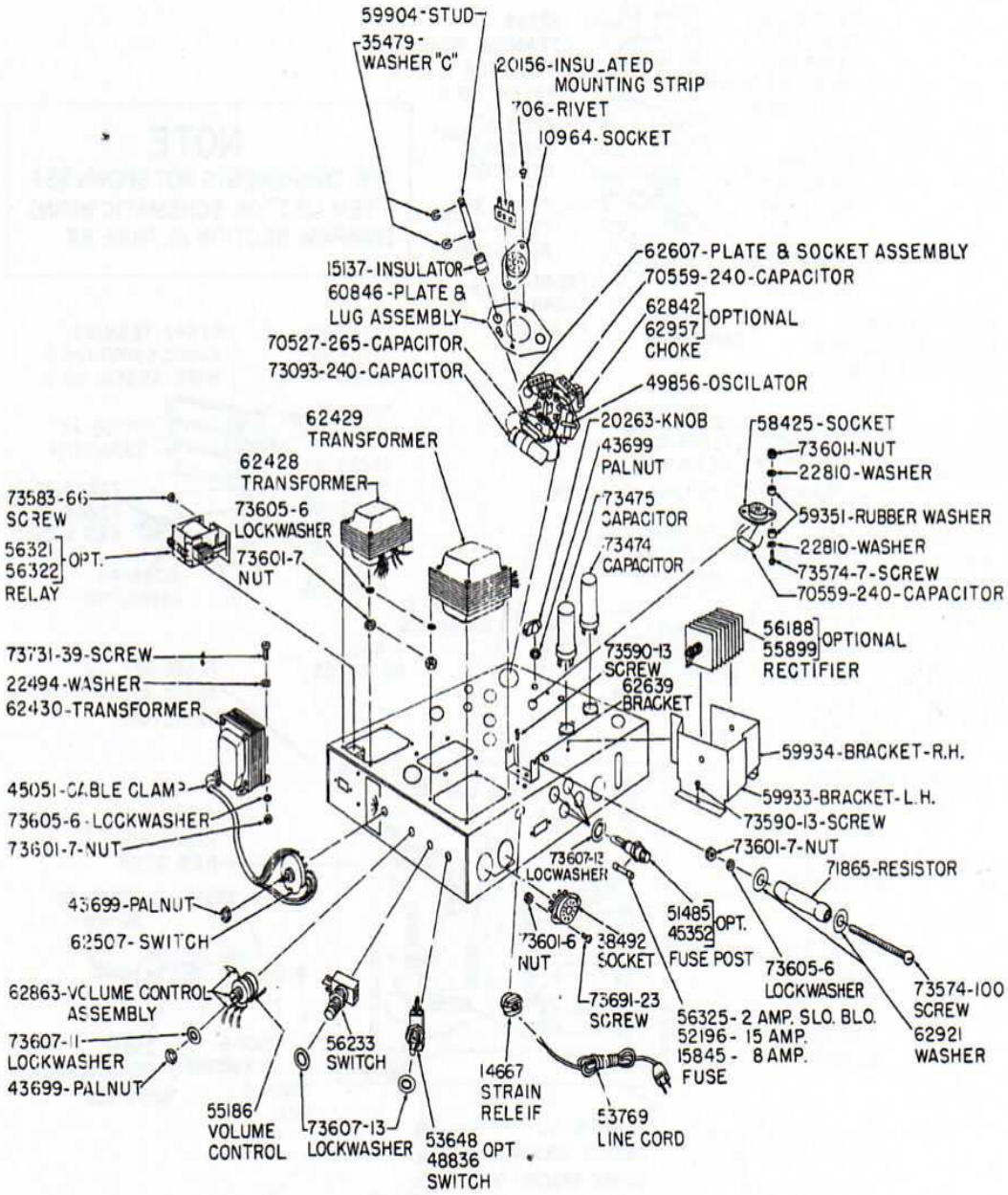
53674-SOCKET-STARTER
63236 PLUG
OPTIONAL
62424-LAMP-GE
44928-STARTER SW. GE
62424-LAMP-SYLVANIA
44928-STARTER SW. GE HUB
62293-BRACKET & ROD ASSEMBLY
62514-WIRE, SOCKET & BRACKET ASSEMBLY L.H.
63148-WIRE, SOCKET & BRACKET ASSEMBLY R.H.
63320-GASKET
62215-TOP EXTRUSION
22946-WASHER
56006-CLIP
73691-33-SCREW
56005-CLIP
50657-INSULATOR
73691-34 SCREW
62260-LEVER & BASE ASSEMBLY L.H.
62261-LEVER & BASE ASSEMBLY R.H.
73691-33-SCREW
63655 LIGHT SHIELD
56007 BLOCK
56008 BLOCK
52267-PROGRAM CASTING
56009-GASKET
73601-3-NUT
73604-3-LOCKWASHER
62248-SPRING CLIP
60405-ANGLE BOTTOM
56010-GASKET
56002 PROGRAM GLASS
73574-24-SCREW
73691-34-SCREW
73691-36-SCREW
60439-CLIP, RIVET & SPACER ASSEMBLY
62294-STOP BRACKET
73691-34-SCREW
73691-33-SCREW


NOTE
FOR PARTS NOT SHOWN SEE PAGES 81 & 82 OF THIS SECTION.
73533-35-SCREW
73533-34-SCREW
60513-HINGE PLATE
60493
DECAL & INSTRUCTION PLATE ASSEMBLY
62035- BUTTON NO. 14
TO TO
62047- BUTTON NO. 26
60400-BUTTON "D"
60401-BUTTON "C"
60402-BUTTON "B"
60403-BUTTON "A"
62022-BUTTON NO. 1
TO TO
62034-BUTTON NO. 13
63235
BACKING PLATE
62964-LAMP SOCKET ASSEM.
62996
SOCKET & BRACKET ASSEMBLY
29521-WASHER
63885
DECAL & INSTRUCTION PLATE ASSEMBLY
73533-22
SCREW
63910-SWITCH & BUTTON ASSEMBLY
62054
PROGRAM SELECTOR CASTING
60496-DECAL & INSTRUCTION PLATE ASSEMBLY
62922-SWITCH & BUTTON ASSEMBLY (1-13)
62923-SWITCH & BUTTON ASSEMBLY (14-26)
29521-WASHER
73533-22-SCREW
62987-LIGHT SHIELD
63962-SOCKET & BRACKET ASSEMBLY
63961-LAMP SOCKET ASSEM.
CLASSIFICATION SLIP & SILK SCREEN
62230
62229
62228
62231
62361
PROGRAM HOLDER ASSEMBLY
A
B
C
D
62364
PROGRAM HOLDER ASSEMBLY
64052
RESET ESCUTCHEON & SILK SCREEN
62362
PROGRAM HOLDER ASSEMBLY
62193
62190
DESCRIPTIVE ESCUTCHEON & SILK SCREEN
62363
PROGRAM HOLDER ASSEMBLY
64059
COIN DENOMINATION PLATE & SILK SCREEN
CLASSIFICATION SLIP & SILK SCREEN
63354
63777
62191-REJECT ESCUTCHEON & SILK SCREEN


NOTE
FOR PARTS NOT SHOWN SEE PAGE 98 OF THIS SECTION.
62826-PULSE RELAY
OPT- 60600 63787 COIN RETURN COIL
55144 SET-UP RELAY
62840-SWITCH ASSEMBLY
62841-SWITCH & BRACKET ASSEMBLY
61993-SPRING
62143- COIN PADDLE
62139-MOUNTING LEVER
62144-COIN PADDLE ASSEM.
73724-9-RETAINING RING
62756-SHAFT
60717-SOLENOID
56604-PIN
62809-LINK
73724-15-RETAINING RING
20812-MOUNTING STRIP
62825-CAMS & CAM SHAFT ASSEM.
62743-COLLAR
58220 BRACKET
62781-CAM, HUB & LOCK ASSEMBLY
62405-MOUNTING BRACKET & BUSHING ASSEM.
73604-5-LOCKWASHER
42868-ADJUSTING CAM
73533-27-SCREW
62814-COUNTER WHEEL
62163 BRACKET
62844- TERMINAL STRIP
63131 SPRING
73533-21 SCREW
42120 WASHER
61792 CABLE CLAMP
706 RIVET
53541 WASHER
73724-21 RETAINING RING
63516-GUARD
73533-21-SCREW
62165-BRACKET
73533-21-SCREW
29521-WASHER
62145-SPRING
62807 BRACKET
63623-PIVOT PIN
73601-7-NUT
73604-6-LOCKWASHER
57117-SPRING
63643-PIVOT, ARM & PAWL ASSEM.
57851 MICRO SWITCH
62164 COIN SWITCH ACTUATING ARM
62146 COIN FEELER & LEVER ASSEM
PT. NO. 63643A INCLUDES THE FOLLOWING COMPLEMENT—
1-63643—PIVOT, ARM & PAWL ASSEMBLY
1-63623—PIVOT PIN
1-73604-6-LOCKWASHER
1-73601-7-NUT
1-53541— WASHER
1-63692- WASHER
1-73724-21-RETAINING RING
73601-7-NUT
73574-87 SCREW
73605-6 LOCKWASHER
62140-BRACKET & PIN ASSEMBLY
49949-COIN HOPPER & SUPPORT ASSEM.
62820 CONTACT PLATE ASSEM.
59989-CONTACT STRIP
62816-CONTACT RING
62777-CONTACT RING
63651-CONTACT STRIP
62808-CONTACT STRIP
63651-CONTACT STRIP
64168- SPRING
73601-3-NUT
73607-3 LOCKWASHER
61628-SPACER
62831-COUPLING, INSULATOR & SPRING ASSEMBLY
53519-WASHER
73533-2-SCREW
61009-GROMMET (MOTOR MTG. BRACKET)
63262 BRACKET & GUARD ASSEM.
62620 SLUG REJECTOR ASSEM.
50151-SPRING
46191-SPRING CLIP
49823-PIN
49829 ARM & PIN ASSEM.
62896 CABLE ASSEMBLY


NOTE
FOR COMPONENTS NOT SHOWN SEE "ITEM LIST" ON SCHEMATIC WIRING DIAGRAM, SECTION 12, PAGE 68.
73601-7-NUT
73605-6-LOCKWASHER
53552-WASHER
53553-WASHER
71960-2-RESISTOR
53553-WASHER
73574-100 SCREW
53552-WASHER
20914-BUSHING
73293-110 CAPACITOR
24277-MOUNTING STRIP
32924 BUSHING
36064 RIVET
73098-210-CAPACITOR
706-RIVET
10964-SOCKET
20644-WASHER
36064-RIVET
20269 MOUNTING STRIP
36064-RIVET
30495-SOCKET
706-RIVET
706-RIVET
62496 TERMINAL STRIP
33694 MOUNTING STRIP
20644-WASHER
36064 RIVET
63388 INSULATOR
73293-110-CAPACITOR
706-RIVET
45405-SHOULDER RIVET
73095-220-CAPACITOR
53367 LATCH
20812-MOUNTING STRIP
706 RIVET
40696-SPRING WASHER
43341-SOCKET
20644-WASHER
51933-RIVET
20812 MOUNTING STRIP
36064 RIVET
73607-5 LOCKWASHER
15173 SOCKET
706-RIVET
20644-WASHER
33694-MOUNTING STRIP
10964 SOCKET
58425-SOCKET
20644 WASHER
41213-RIVET
73601-6-NUT
62829-SWITCH & RESISTOR ASSEM.
54957 INSULATOR
706-RIVET
70634-220 CAPACITOR
70637-650 CAPACITOR
53544-CONTROL BIAS
43699 PALNUT
62506 SWITCH
73574-17-SCREW
73605-5 LOCKWASHER
20644-WASHER
62482 BRACKET
62483 BIAS CONTROL & BRACKET ASSEM.
62508-CHOKE COIL
62509-COIL & INSULATOR ASSEMBLY
38534-RIVET
53550-INSULATOR



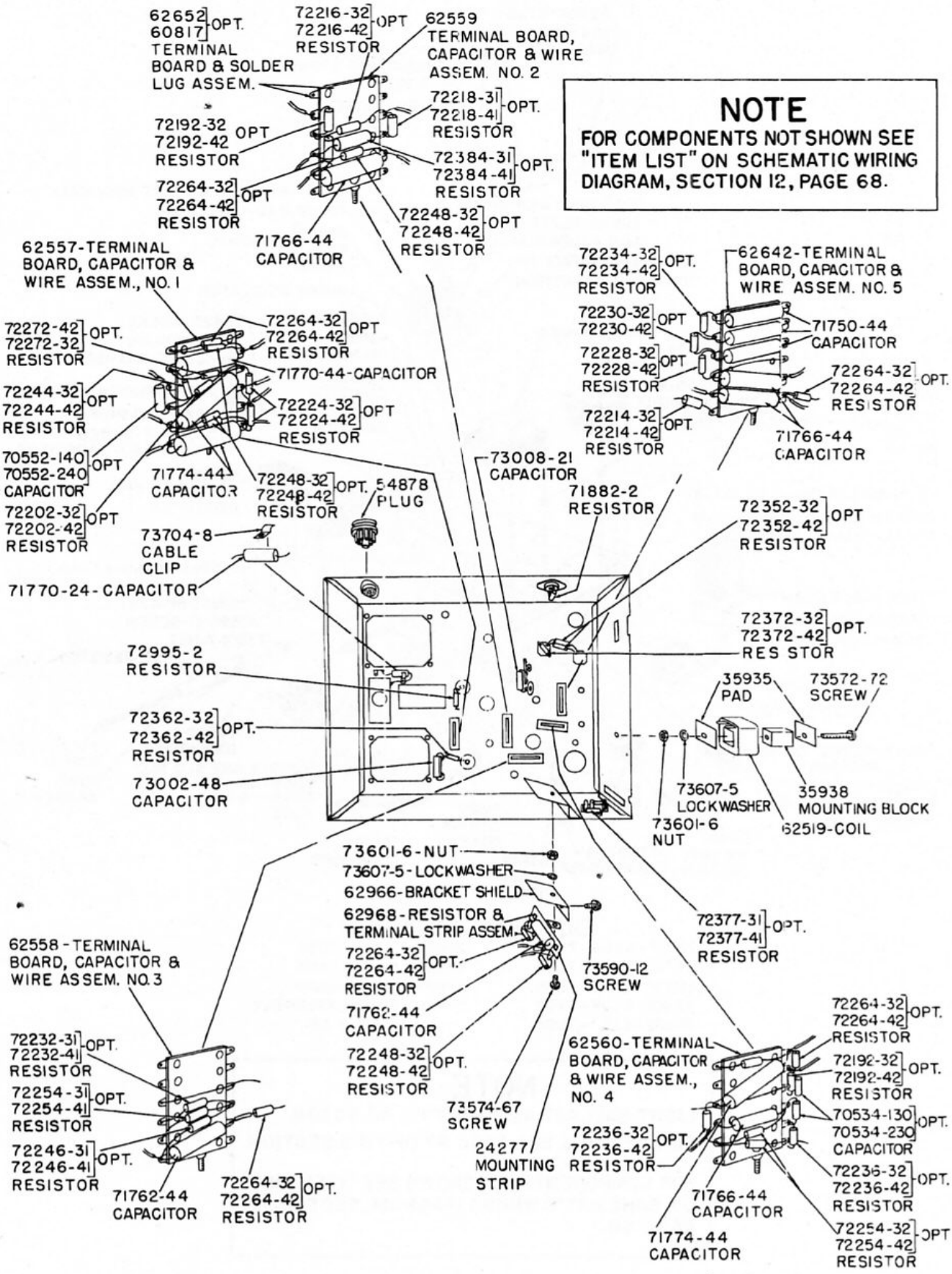
TUBE COMPLEMENT

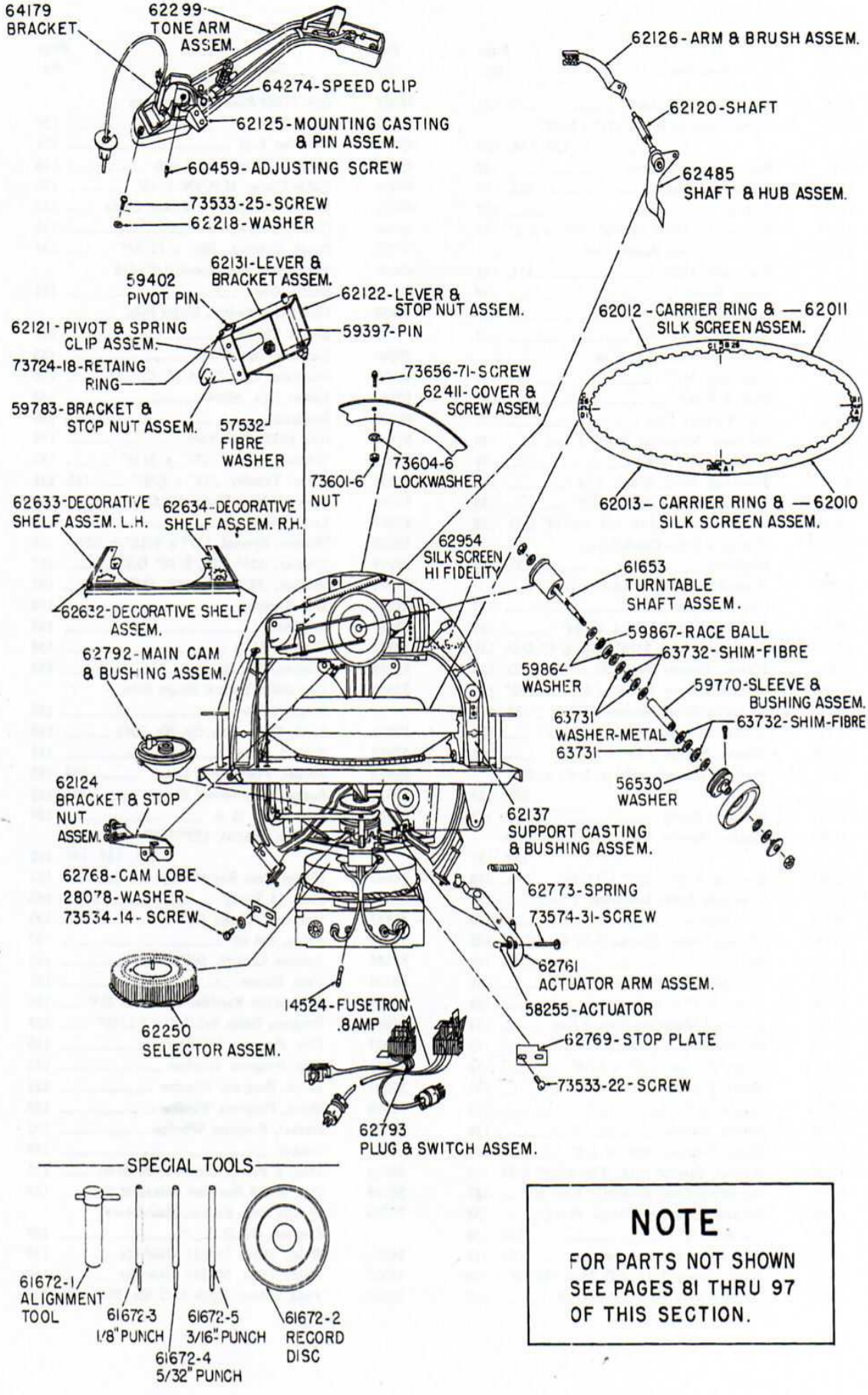
28157-6L6G-TUBE	58427-12AX7-TUBE
62741-5U4GA-TUBE	45985-NO. 47-LAMP
62456-12BH7-TUBE	24689-NO. 44-LAMP
49360-6SJ7-TUBE	59956-COVER ASSEMBLY AMPLIFIER
36332-6J5 -TUBE	

NOTE

LIGHT BALLAST ASSEMBLY PT. NO. 59838
FOR DETAILS SEE PAGE 97 OF THIS SECTION.

FOR COMPONENTS NOT SHOWN SEE "ITEM LIST" ON SCHEMATIC WIRING DIAGRAM, SECTION 12, PAGE 68.


62652 60817 OPT. TERMINAL BOARD & SOLDER LUG ASSEM.
72216-32 72216-42 OPT RESISTOR
62559 TERMINAL BOARD, CAPACITOR & WIRE ASSEM. NO. 2
72218-31 72218-41 OPT. RESISTOR
72192-32 72192-42 OPT RESISTOR
72384-31 72384-41 OPT. RESISTOR
72264-32 72264-42 OPT RESISTOR
72248-32 72248-42 OPT RESISTOR
71766-44 CAPACITOR
NOTE
FOR COMPONENTS NOT SHOWN SEE "ITEM LIST" ON SCHEMATIC WIRING DIAGRAM, SECTION 12, PAGE 68.
62557-TERMINAL BOARD, CAPACITOR & WIRE ASSEM., NO. 1
72272-42 72272-32 OPT. RESISTOR
72264-32 72264-42 OPT RESISTOR
71770-44-CAPACITOR
72244-32 72244-42 OPT RESISTOR
72224-32 72224-42 OPT RESISTOR
70552-140 70552-240 OPT CAPACITOR
71774-44 CAPACITOR
72248-32 72248-42 OPT. RESISTOR
72202-32 72202-42 OPT RESISTOR
54878 PLUG
73704-8 CABLE CLIP
71770-24-CAPACITOR
72234-32 72234-42 OPT. RESISTOR
62642-TERMINAL BOARD, CAPACITOR & WIRE ASSEM. NO. 5
72230-32 72230-42 OPT
71750-44 CAPACITOR
72228-32 72228-42 OPT RESISTOR
72264-32 72264-42 OPT. RESISTOR
72214-32 72214-42 OPT. RESISTOR
71766-44 CAPACITOR
73008-21 CAPACITOR
71882-2 RESISTOR
72352-32 72352-42 OPT RESISTOR
72372-32 72372-42 OPT. RES STOR
72995-2 RESISTOR
35935 PAD
73572-72 SCREW
72362-32 72362-42 OPT. RESISTOR
73002-48 CAPACITOR
73607-5 LOCKWASHER
35938 MOUNTING BLOCK
73601-6 NUT
62519-COIL
73601-6-NUT
73607-5-LOCKWASHER
62966-BRACKET SHIELD
62968-RESISTOR & TERMINAL STRIP ASSEM.
72377-31 72377-41 OPT. RESISTOR
73590-12 SCREW
62558-TERMINAL BOARD, CAPACITOR & WIRE ASSEM. NO.3
72264-32 72264-42 OPT. RESISTOR
71762-44 CAPACITOR
72232-31 72232-41 OPT. RESISTOR
72254-31 72254-41 OPT. RESISTOR
72246-31 72246-41 OPT. RESISTOR
72248-32 72248-42 OPT. RESISTOR
73574-67 SCREW
24277 MOUNTING STRIP
62560-TERMINAL BOARD, CAPACITOR & WIRE ASSEM., NO. 4
72264-32 72264-42 OPT. RESISTOR
72192-32 72192-42 OPT. RESISTOR
70534-130 70534-230 OPT. CAPACITOR
72236-32 72236-42 OPT. RESISTOR
72236-32 72236-42 OPT. RESISTOR
71766-44 CAPACITOR
72254-32 72254-42 OPT RESISTOR
71774-44 CAPACITOR



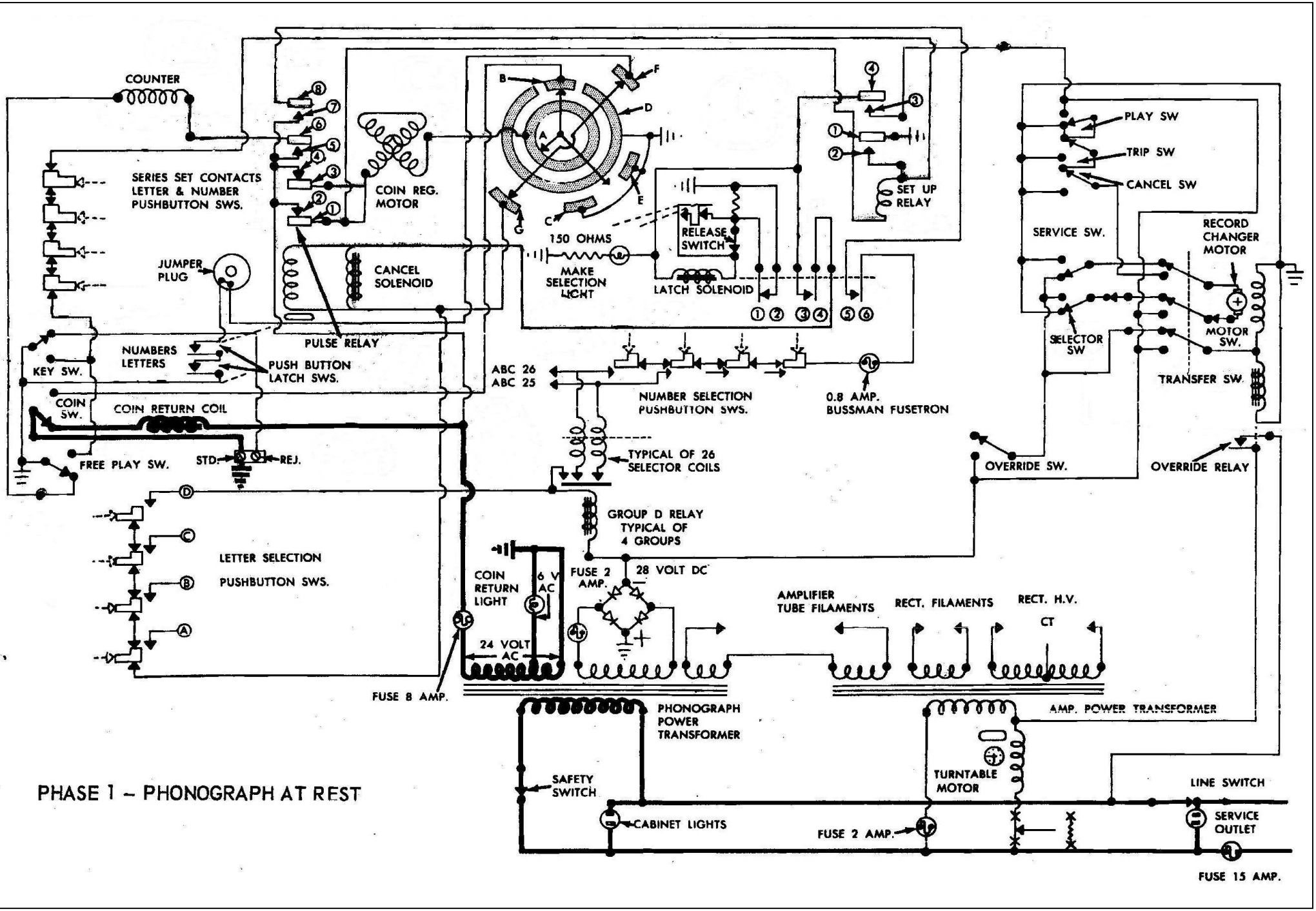
NOTE

FOR PARTS NOT SHOWN SEE PAGES 81 THRU 97 OF THIS SECTION.

NUMERICAL PARTS LIST

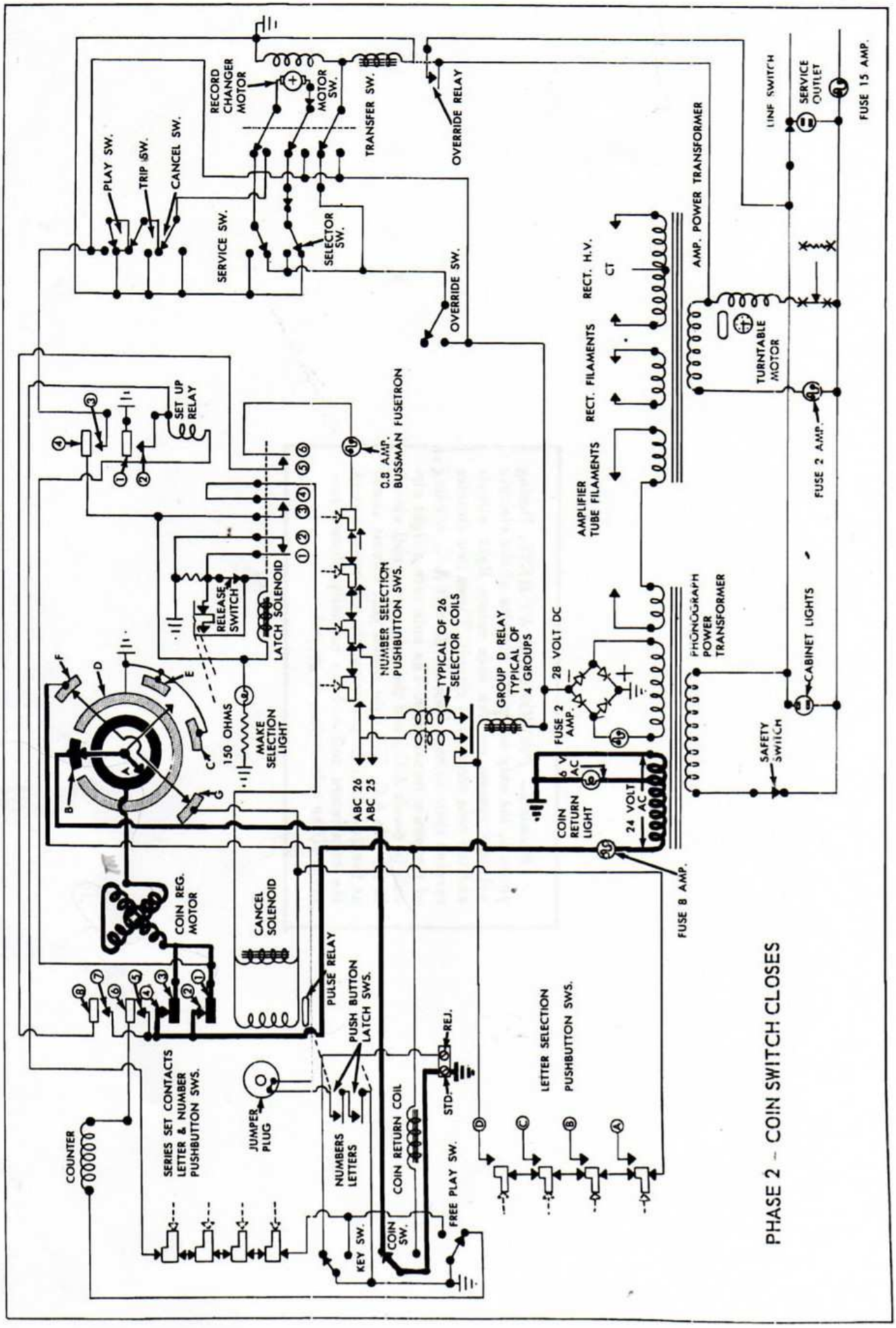
Part No.	Description	Page No.
R. W. 90	Key, Back Door Lock	131
706	Rivet, Tubular, Brass .121" x 5/32"	137, 138, 139
984	Key, Volume Control	133
10964	Socket, 8 Prong	138, 139
13148	Cement	132
13978	Washer, for Rivet Special .136" x 1/2"	133
14524	Fuse 8/10 Amp. Fusetron or Bussmann MDL	131, 141
14667	Strain Relief	139
15137	Insulator	139
15173	Receptacle, 2 Prong	138
15845	Fuse 8 Amp. Little Fuse or Bussmann MTH	131, 139
16614	Plug, 8 Prong	133
16625	Cap, 8 Prong Plug	133
20156	Insulated Mounting Strip, 2 Lug	139
20263	Knob, Tone Control	139
20269	Mounting Strip, Single Lug	138
20519	Washer, Special .203" x 1/2"	133
20644	Washer, Special .128" I.D. x 5/16" O.D.	138
20812	Mounting Strip, Cinch-3 lug, Insulated	137, 138
20899	Winged Neck Screw, 10-32 x 1-1/2" F.H. Machine	132
20914	Bushing, Fibre .432" x 13/64"	138
22494	Washer, Special 3/16" I.D. 3/4" O.D.	139
22810	Washer, Special .091" I.D. x .253" O.D.	139
22946	Washer, Special 11/64" x 3/8" x 1/32"	135
24277	Mounting Strip, Insulated 4 Lug	138, 140
27787	Washer, Special .196" x 3/8"	134
28078	Washer, Special .125" x 1/4"	141
29521	Washer, Special .145" x 1/4" x .031"	136, 137
30495	Socket, 4 Prong	138
32629	Washer, Special .148" I.D. 7/16" O.D.	132, 137
32924	Bushing, Fibre, .535" x 13/64"	138
33694	Mounting Strip, Insulated, 2 Lug	138
35479	"C" Washer	139
35745	Thumb Screw, Special 8-32 x 1/4"	135
35935	Pad	133, 140
35938	Mounting Block, Choke Coil	140
36064	Rivet, 1/8" x 1/8"	138
38348	Insulated Mounting Strip 2 Lug	133
38492	Socket, 11 Prong Amph., #M1P11	139
38534	Rivet, Tubular .121" x 3/16"	138
39537	Rivet, Tubular .088" x 3/16" I.	133
40374	Staple, 3/8"	132
40696	Spring Washer	138
41213	Rivet, Tubular .088" x 1/8"	138
42120	Washer, Special .144" I.D. 5/16" O.D.	137
42868	Adjusting Cam, Eccentric Hex Hd.	137
43341	Socket, Connector, Single Prong	138
43699	Pal-nut 3/8" -32	138, 139
44928	Fluorescent Starting Switch	134, 135
45051	Cable Clamp, 7/16" I.D. Mod. HP 7N	139
45253	Cable Clamp H. P. 3N., 3/16'	133
45352	Opt. 51485 Fuse Post Bussman Type H. K. P.	139
45372	Tee Nut 8-32	133
45405	Shoulder, Rivet for Latch	138
46005	Cable Clamp, H.P. 2N, 1/16"	133
46251	Rubber Stopper, for Power Cable	133
46368	Outlet, Convenience	135
46725	Rivet, Tubular, .088" x 11/64"	134
48601	Escutcheon Pin, Monel, 3/8"-#16 Stub's Gage	131
48836	Opt. 53648 Switch, Single Pole, Single Throw	139
49660	Caster — Opt. 50323	133
49856	Oscillator Coil, Q-2.5 M. C.	139
50323	Caster Opt. 49660	133
50657	Insulator	134, 135
51485	Opt. 45352 Fuse Post	139
51822	Washer, Special .177" x 5/16"	133
51933	Rivet, Tubular .121" x 9/32"	133, 138
52196	Fuse 15 Amp. Type A.B.C.	131, 139
53367	Latch, Amplifier	138
53380	Washer, Special .177" x 9/16" x .0598"	135
53519	Washer, .125" I.D., 5/16" O.D.	137
53541	Washer, .253" I.D., 3/8" O.D.	137
53544	Bias Control	138
53550	Insulator	138
53552	Washer, Mica	138
53553	Washer, Special	138
53648	Opt. 48836 Switch, Single Pole, Single throw	139
53671	Shell, Cinch Mfg. Co. No. 7002	135
53672	Plug, 2 Prong	135
53673	Socket, Fluorescent Lamp	134, 135
53674	Socket, Fluorescent Starter	134, 135
53769	Line Cord, 16 ft.	139
54024	Washer, Special, 193"-189"	131, 132, 133, 135
54692	Clamp, Coin Return Cup	132
54878	Plug, 11 Prong	140
54957	Insulator, Choke Coil	138
55144	Relay, Set up	137
55186	Volume Control, 50K, 7.5K	139
55236	Turn Button	131
55899	Opt. 56188 Rectifier Selenium 28V	139
56002	Program Glass, 9-1/16" x 7-1/16"	135
56005	Clip, Program Window	135
56006	Clip, Program Window	135
56007	Block, Program Window	135
56008	Block, Program Window	135
56009	Gasket, Program Window	135
56010	Gasket	135
56013	Plug, 6 Prong, Cinch Type M-61	135
56188	Opt. 55899 Rectifier Selenium 28V	139
56233	Switch, Push Button, Momentary Contact, S.P.D.T.	139
56321	Relay (Opt. 56322) Override	139
56322	Relay (Opt. 56321) Override	139
56325	Fuse, 2 Amp. Type 3AG Slo. Blo.	131, 139

ELECTRICAL SEQUENCE
SCHEMATICS FOR MODEL 1800

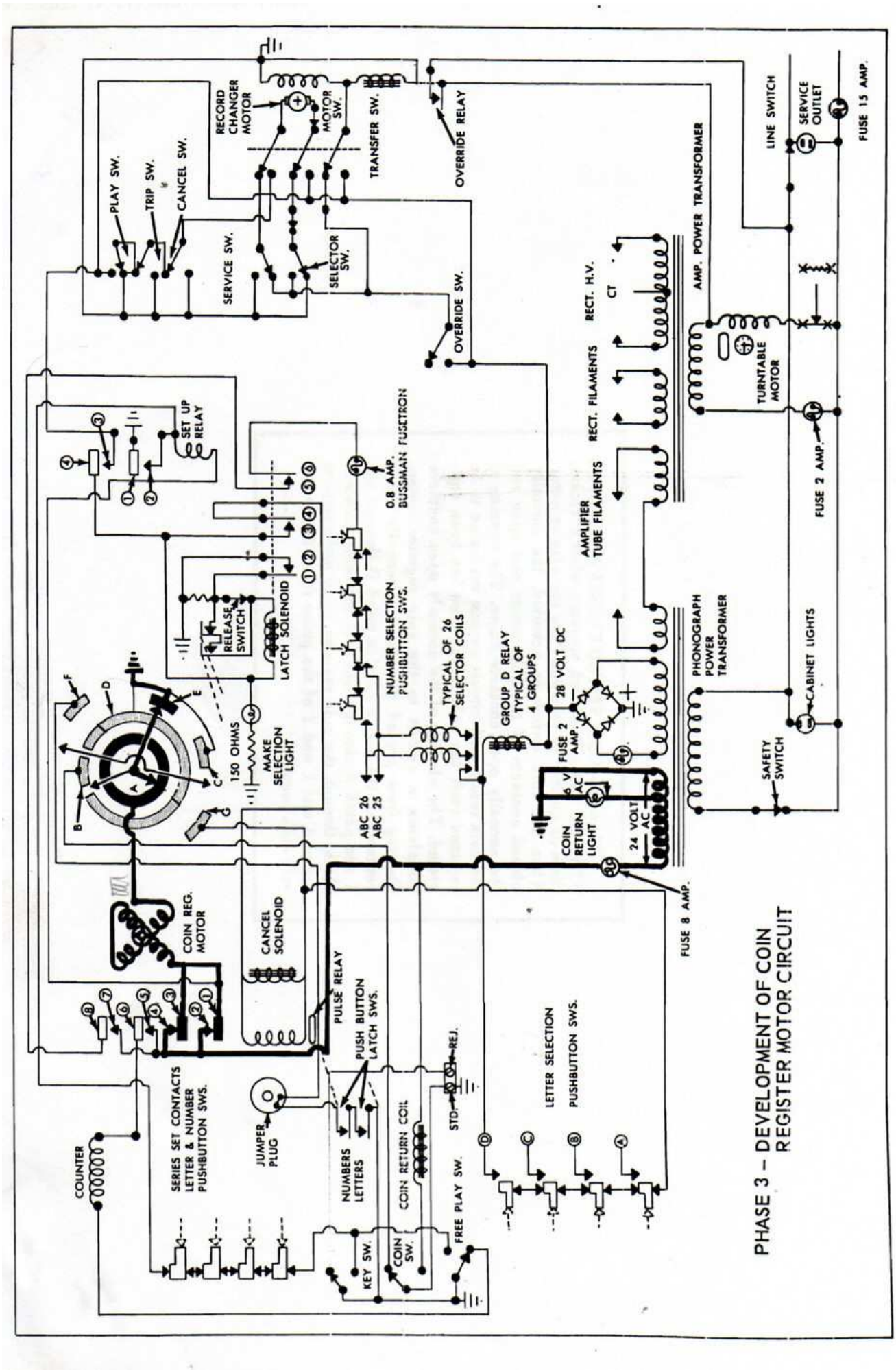


PHASE 1 – PHONOGRAPH AT REST

Phase 1– PHONOGRAPH AT REST. During phase 1, the only energized circuits of the electric selector system are the coin return light circuit and the coin return coil circuit. These two circuits receive their voltage from the 24-volt A.C. winding of the power transformer. The coin return light circuit is 6-volt A.C., and the coin return coil circuit is 24-volt A.C. The coin return coil circuit starts at the 24-volt A.C. power supply and runs through the coin return coil and the normally closed contacts of the coin switch to ground.

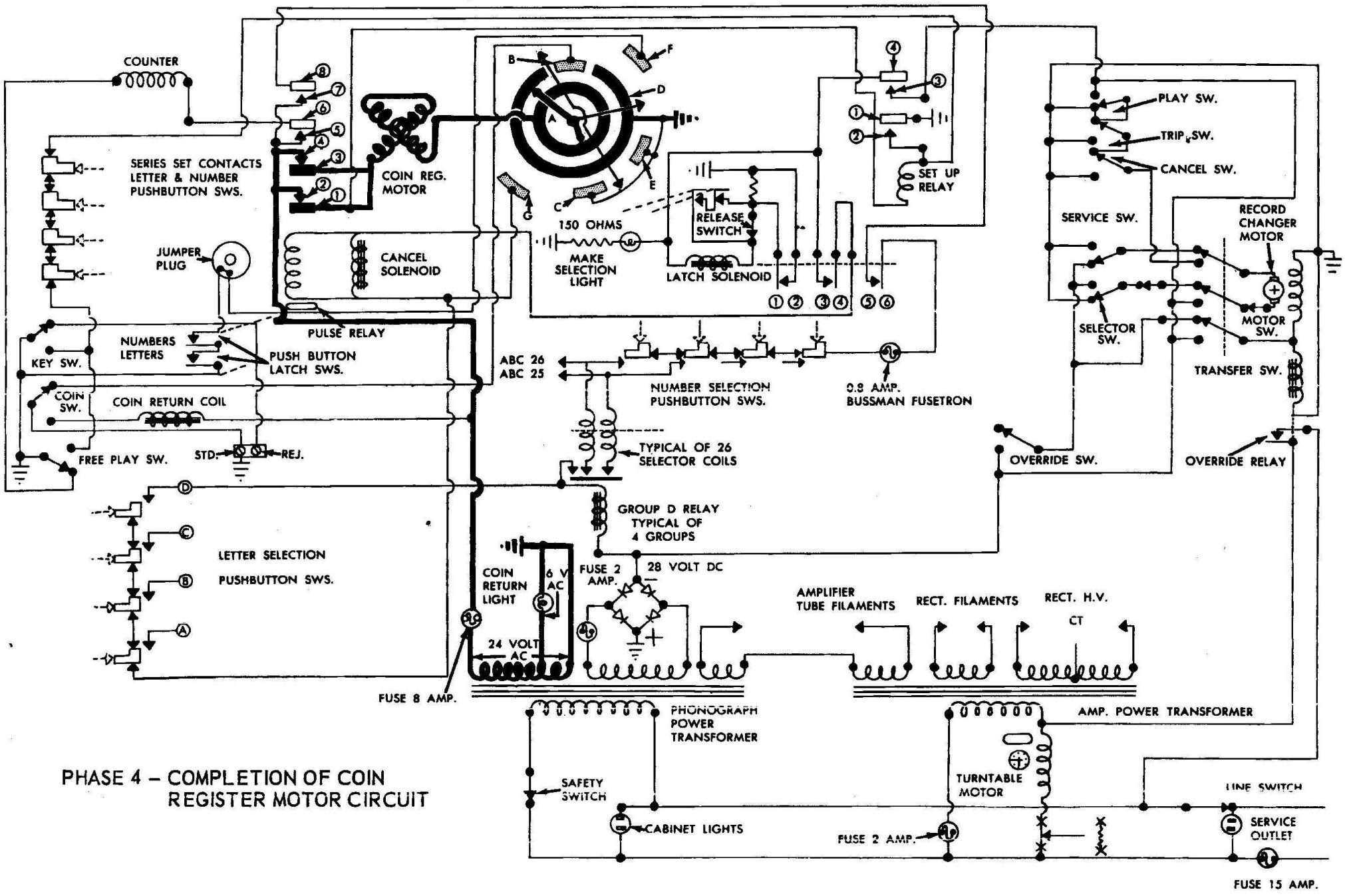

RECORD CHANGER MOTOR
MOTOR SW.
TRANSFER SW.
OVERRIDE RELAY
PLAY SW.
TRIP SW.
CANCEL SW.
SERVICE SW.
SELECTOR SW.
OVERRIDE SW.
LINE SWITCH
SERVICE OUTLET
FUSE 15 AMP.
AMP. POWER TRANSFORMER
RECT. H.V. CT
RECT. FILAMENTS
AMPLIFIER TUBE FILAMENTS
TURNTABLE MOTOR
SET UP RELAY
0.8 AMP. BUSSMAN FUSETRON
FUSE 2 AMP.
RELEASE SWITCH
LATCH SOLENOID
NUMBER SELECTION PUSHBUTTON SWS.
TYPICAL OF 26 SELECTOR COILS
GROUP D RELAY TYPICAL OF 4 GROUPS
28 VOLT DC
FUSE 2 AMP.
PHONOGRAPH POWER TRANSFORMER
CABINET LIGHTS
SAFETY SWITCH
150 OHMS
MAKE SELECTION LIGHT
ABC 26
ABC 25
6 V AC
COIN RETURN LIGHT
24 VOLT AC
FUSE 8 AMP.
COIN REG. MOTOR
CANCEL SOLENOID
PULSE RELAY
PUSH BUTTON LATCH SWS.
REJ.
STD.
LETTER SELECTION PUSHBUTTON SWS.
SERIES SET CONTACTS LETTER & NUMBER PUSHBUTTON SWS.
JUMPER PLUG
NUMBERS LETTERS
COIN RETURN COIL
COUNTER
KEY SW.
COIN SW.
FREE PLAY SW.
PHASE 2 - COIN SWITCH CLOSES

Phase 2– COIN SWITCH CLOSES AND MOTOR STARTS. The coin switch operates when a nickel, dime or quarter is received from the slug rejector. When the coin switch is actuated, the normally closed contacts of the coin return coil open and the normally open contacts close. The opening of the coin return coil circuit causes any coins to be rejected until the coin registration has been completed. The closing of the normally open contacts completes a circuit to the coin register motor. Starting from ground through the normally open contacts of the coin switch to patch B through arm 1 and patch A through arm 2 of the rotary contact plate, through the coin register motor and contacts 3 and 4 and 1 and 2 of the pulse relay to the 24-volt A.C. supply.



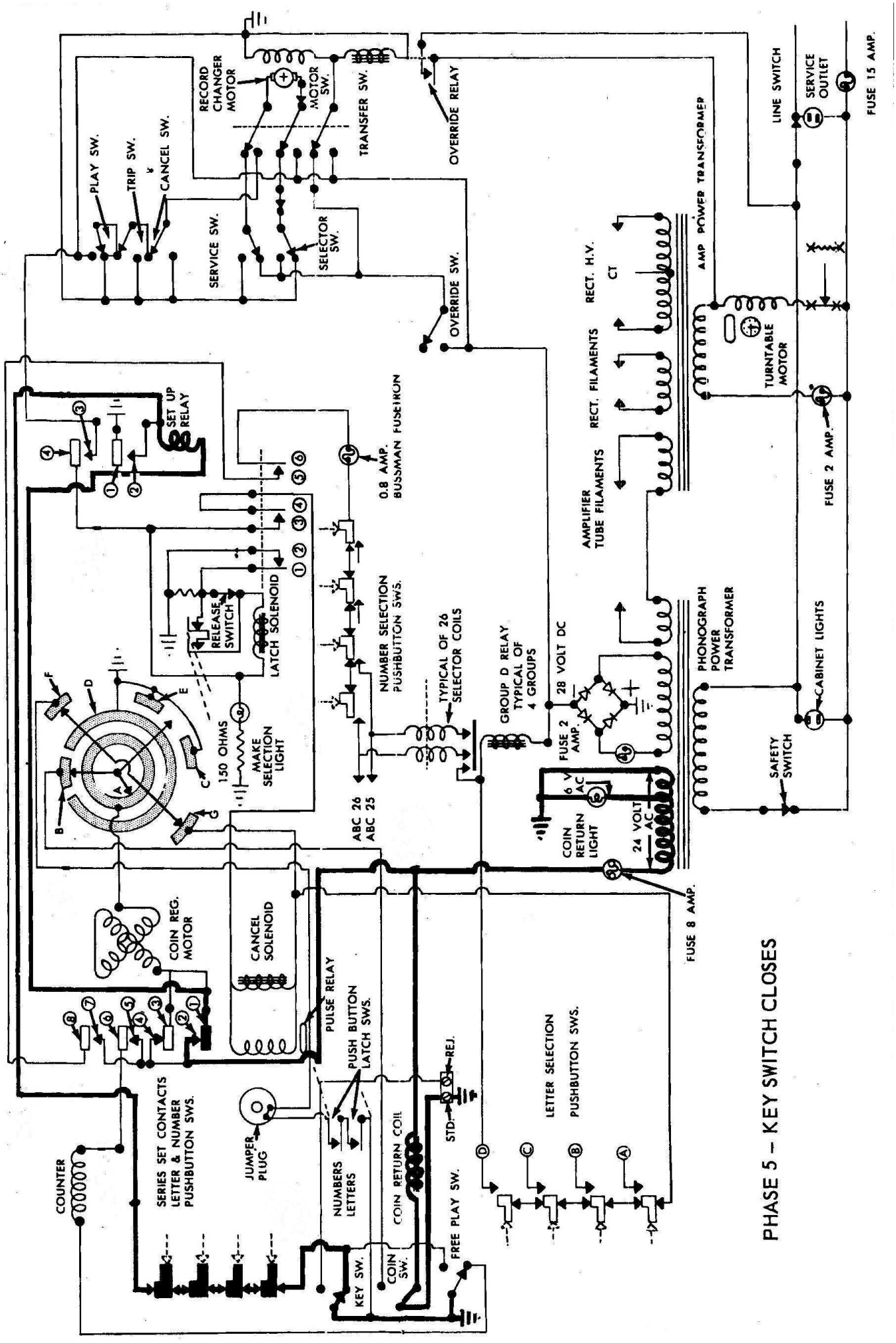
PHASE 3 – DEVELOPMENT OF COIN REGISTER MOTOR CIRCUIT

Phase 3– DEVELOPMENT OF COIN REGISTER MOTOR CIRCUIT. Starting the coin register motor moves the rotary contact arm 1 from patch B so that the motor is no longer energized from the coin switch. Simultaneously arm 3 contacts patch E and continues to operate the motor until arm 1 reaches patch D.



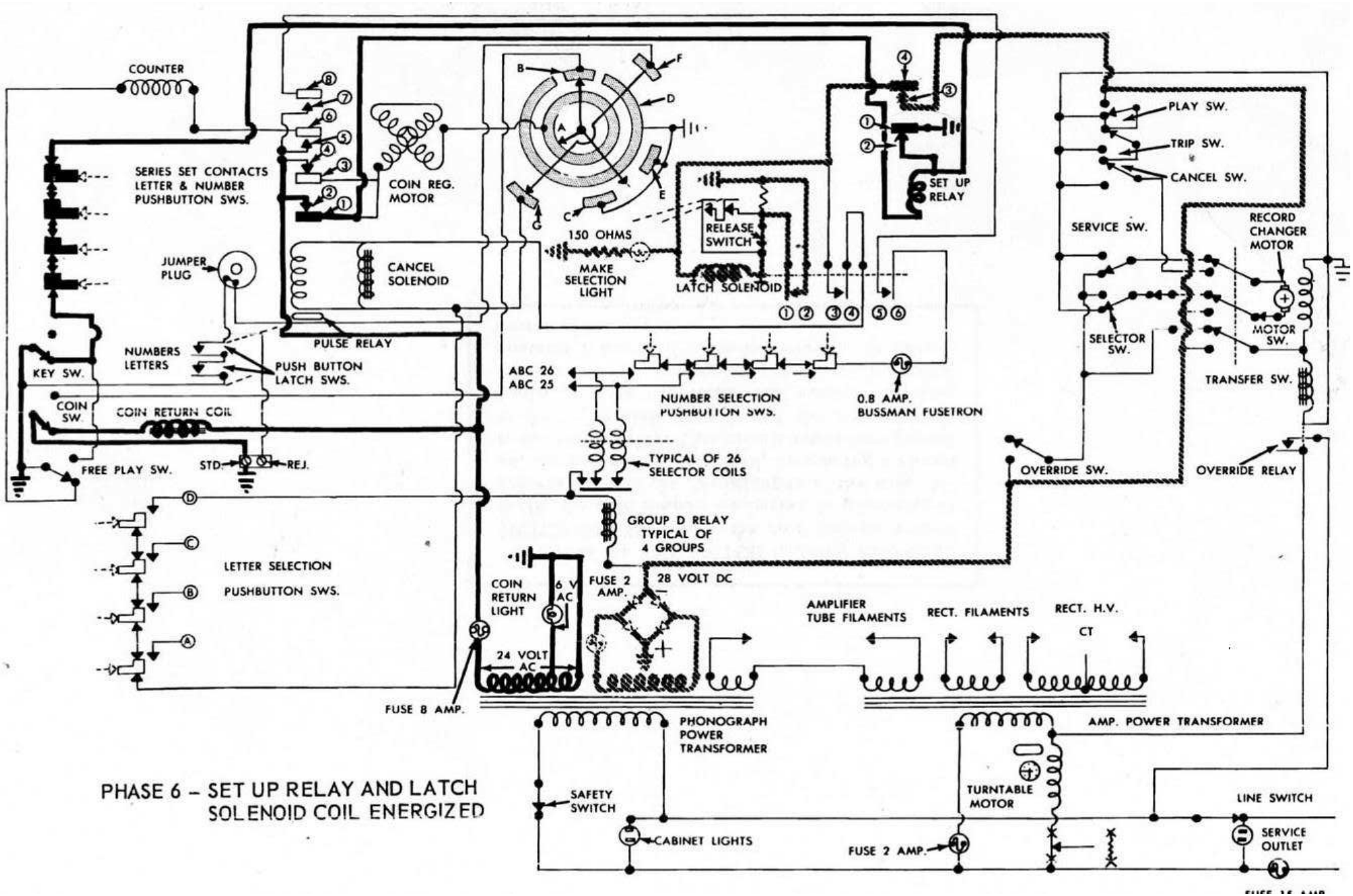
PHASE 4 – COMPLETION OF COIN REGISTER MOTOR CIRCUIT

Phase 4– COMPLETION OF COIN REGISTER MOTOR CIRCUIT. Rotary contact arm 1 reaches patch D to keep motor running until the end of its cycle. When the coin register motor has completed its cycle, the coin has been dropped from the coin paddle and the coin return coil is again energized preparatory to receiving the next coin.



PHASE 5 – KEY SWITCH CLOSES

Phase 5– KEY SWITCH CLOSES AND COIN SWITCH OPENS. During the coin register motor's cycle, the coin counter mechanism is advancing in accordance with the denomination of the coin. Also, the key switch is closed, completing a circuit to the set-up relay. This circuit starts from ground at the key switch, runs through the series switch banks of both the letter and number switches; through the set-up relay coil, the normally closed contacts 1 and 2 of the pulse relay to the 24-volt source of supply.



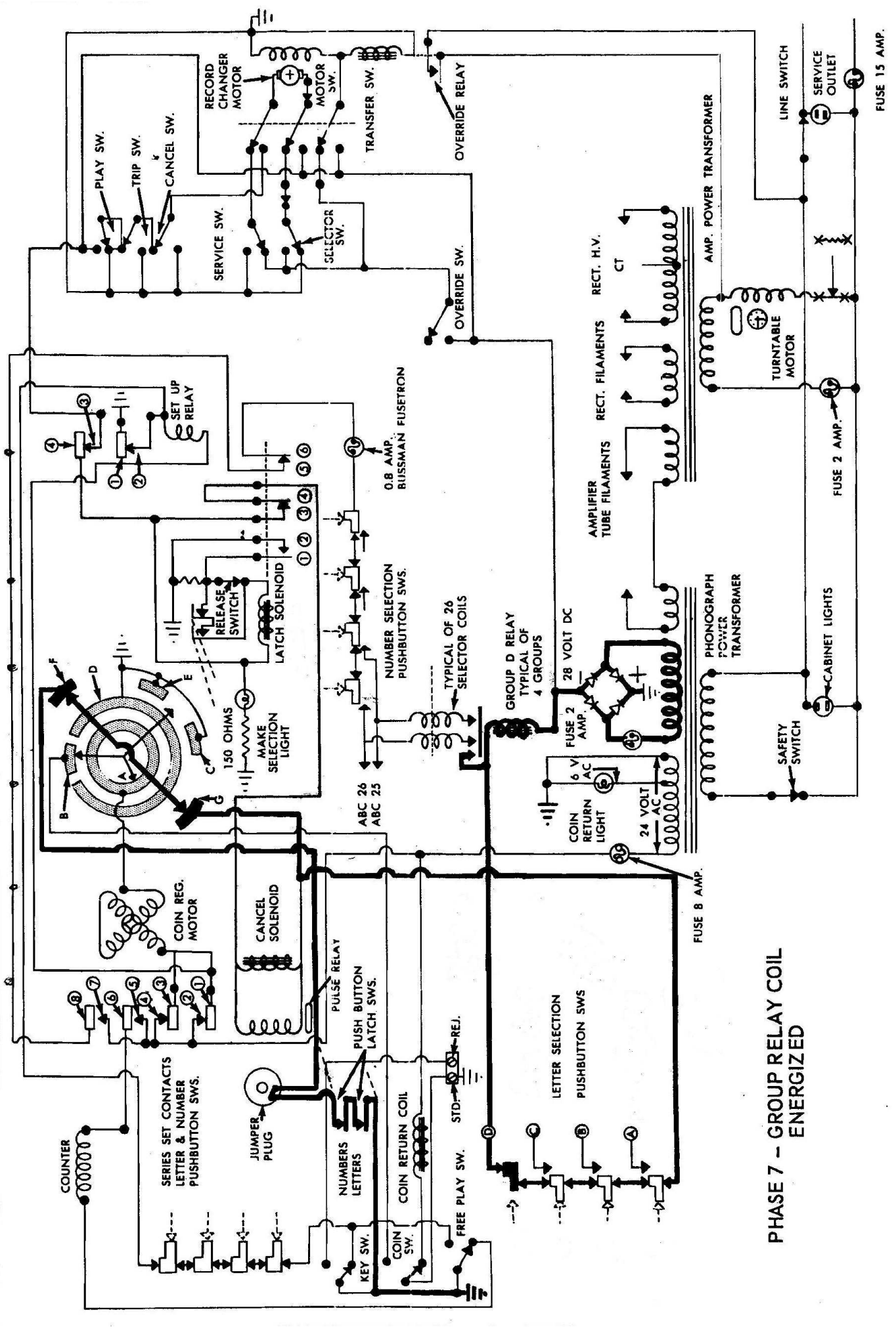
PHASE 6 – SET UP RELAY AND LATCH SOLENOID COIL ENERGIZED

Phase 6– SET-UP RELAY ENERGIZED AND LATCH SOLENOID COIL ERERGIZED. When the set-up relay becomes energized its normally open contacts 2 and 1 close to form an interloek circuit for the set-up relay. This eliminates the necessity of the series circuit, which will be opened as soon as a letter or number button is pushed. The inner-lock circuit starts at ground and contact 1 and 2 and continues through the set-up relay coil, through the normally closed contacts 1 and 2 of the pulse relay to the 24-volt A.C. source of supply.

Contacts 3 and 4 close to establish a D.C. circuit for the latch solenoid. Starting at ground, this goes through the normally closed contacts 1 and 2 of the latch solenoid switch, through the latch solenoid coil, contacts 4 and 3 of the set-up relay to the negativc D.C. supply.

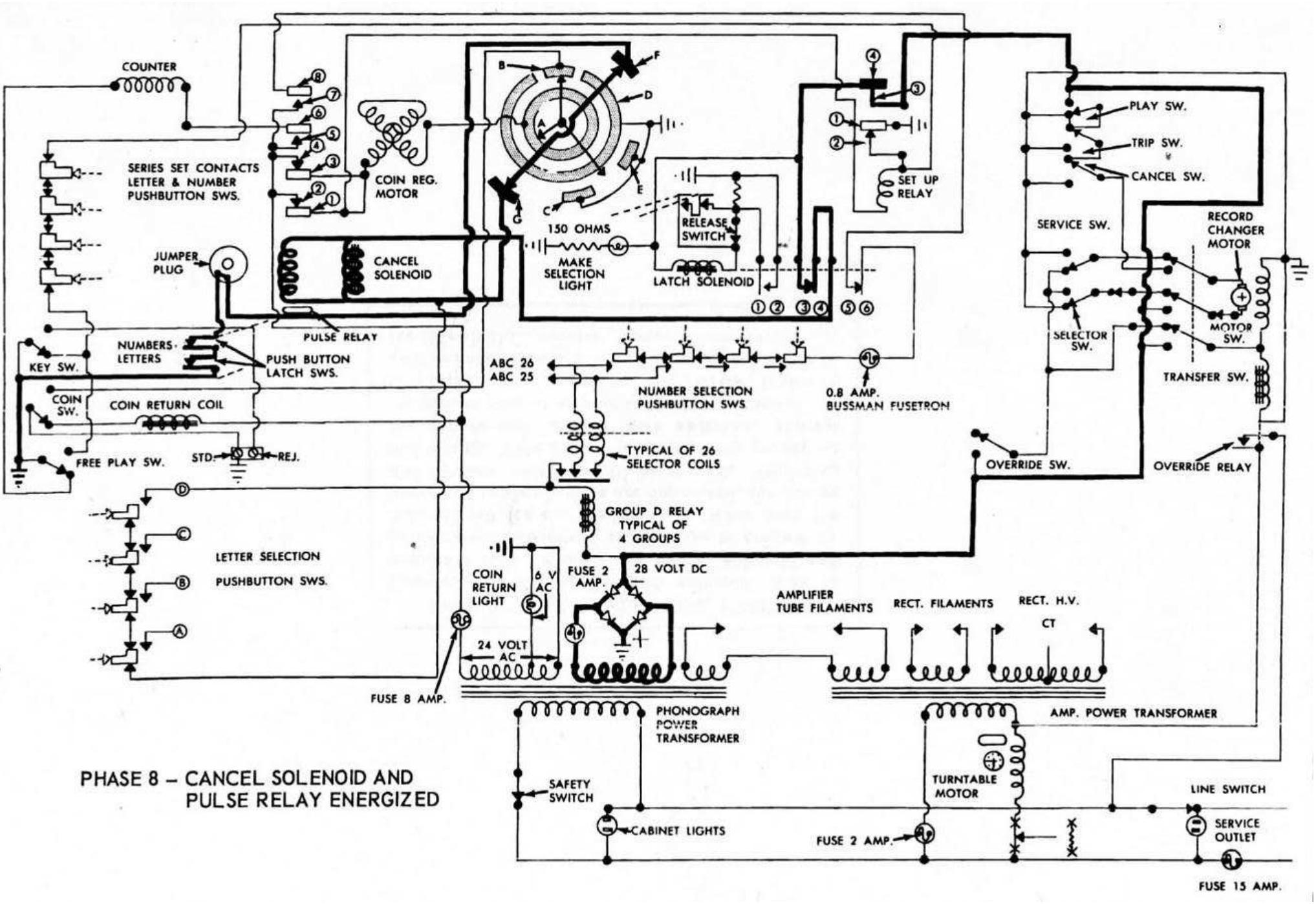
At the same time the latch solenoid is energized with the 28 volt D.C. circuit, the make selection light circuit is completed from ground through its current limiting 150 ohm resistor, contacts 4 and 3 of the set-up relay to the negative D.C. source of supply.

When the latch solenoid is energized, contacts 1 and 2 open. However, a parallel circuit through the release switch and a current limiting resistor supply a circuit to ground which interlocks the latch solenoid.



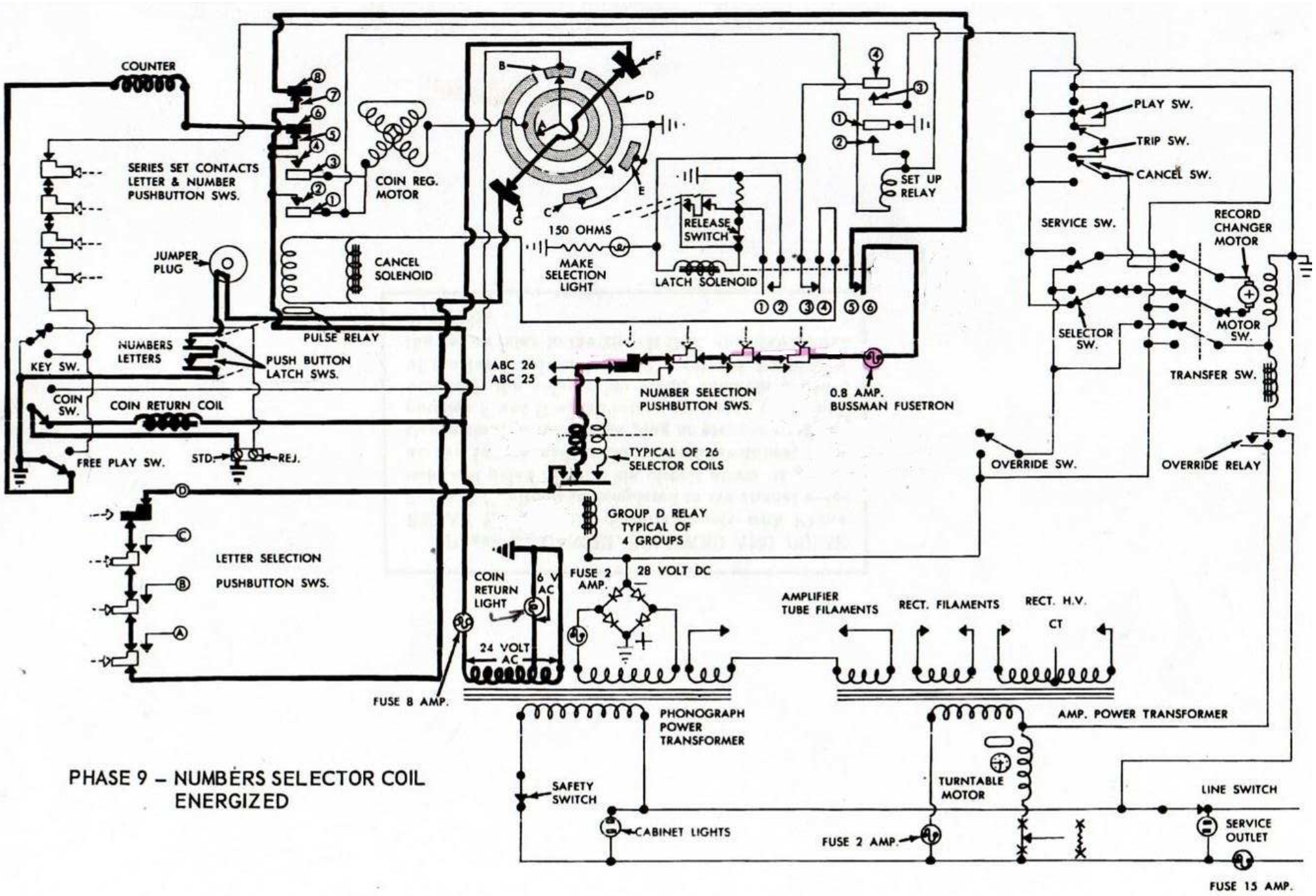
PHASE 7 – GROUP RELAY COIL ENERGIZED

Phase 7– GROUP RELAY COIL ENERGIZED. Contacts 3 and 4 of the latch solenoid close to prepare a D.C. circuit to the cancel solenoid and pulse relay. Contacts 5 and 6 close to prepare an A.C. circuit for the number coils. When both the letter and number buttons are depressed, the letters and numbers switches will be closed, completing the circuit. This circuit proceeds from ground at the letters and numbers latch switches, through the jumper plug or stepper contacts, patches F and G of the rotary contactor, the letters isolation switch bank to switch D and group relay coil D to the 28-volt D.C. negative source of supply.



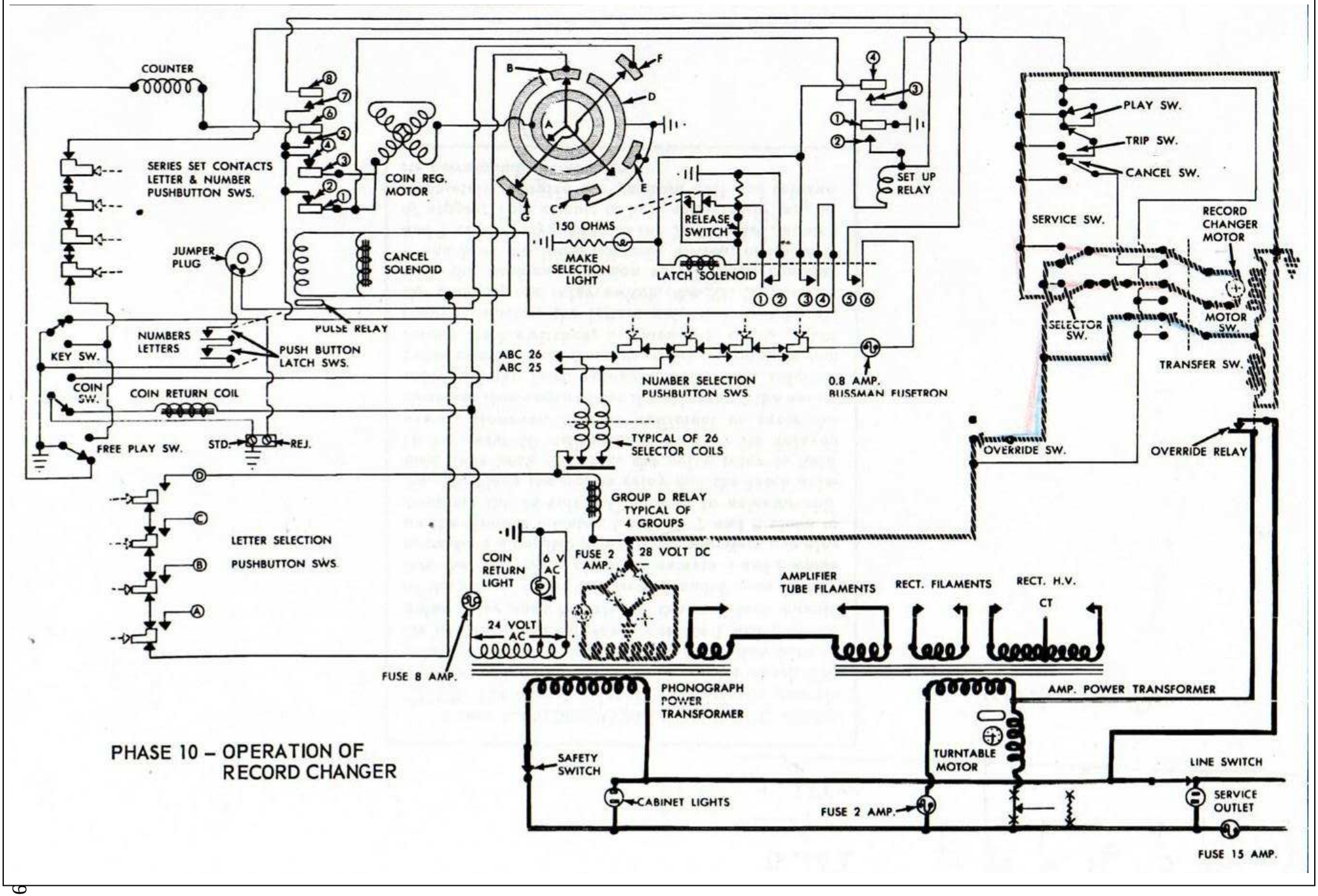
PHASE 8 – CANCEL SOLENOID AND PULSE RELAY ENERGIZED

Phase 8– CANCEL SOLENOID AND PULSE RELAY ENERGIZED. Simultaneously with Phase 7, the D.C. circuit is completed to the cancel solenoid and pulse relay. This circuit starts at ground at the letters and numbers latch switches, continues through the jumper plug or stepper contacts, patches F and G of the rotary contactor, the cancel solenoid, the pulse relay coils, contacts 4 and 3 of the latch solenoid switch, contacts 4 and 3 of the set-up relay to the 28-volt D.C. negative source of supply.



PHASE 9 – NUMBERS SELECTOR COIL ENERGIZED

Phase 9– NUMBERS SELECTOR COIL ENERGIZED. The cancel solenoid mechanically cancels one play at a time from the coin counter wheel. The pulse relay has a delayed action function both in its operation and release. Contacts 1 and 2 of the pulse relay open to release the innerlock circuit of the set-up relay. Contacts 3 and 4 open to isolate the A.C. motor circuit. Contacts 5 and 6 close to produce a counter pulse which registers one play on the electric counter. Contacts 7 and 8 close to complete the 24-volt A.C. circuit to selector coil No. 26. Since the set-up relay and the latch solenoid have been released, the pulse relay is held in for about 50 milliseconds only by its delayed action. However, this is sufficient to cover the transient time required for the release of the set-up relay and the latch solenoid. This A.C. selector pulse circuit starts from ground at the numbers and letters latch switches, to patches F and G of the rotary contactor, the letters selection switchbank, the closed group relay switch, the No. 26 selector coil, the numbers selection switch bank, contacts 6 and 5 of the latch solenoid switch, contacts 8 and 7 of the pulse relay to the 24-volt A.C. source of supply. This circuit is held sufficiently long to completely energize the numbers coil and release its corresponding latch pin.

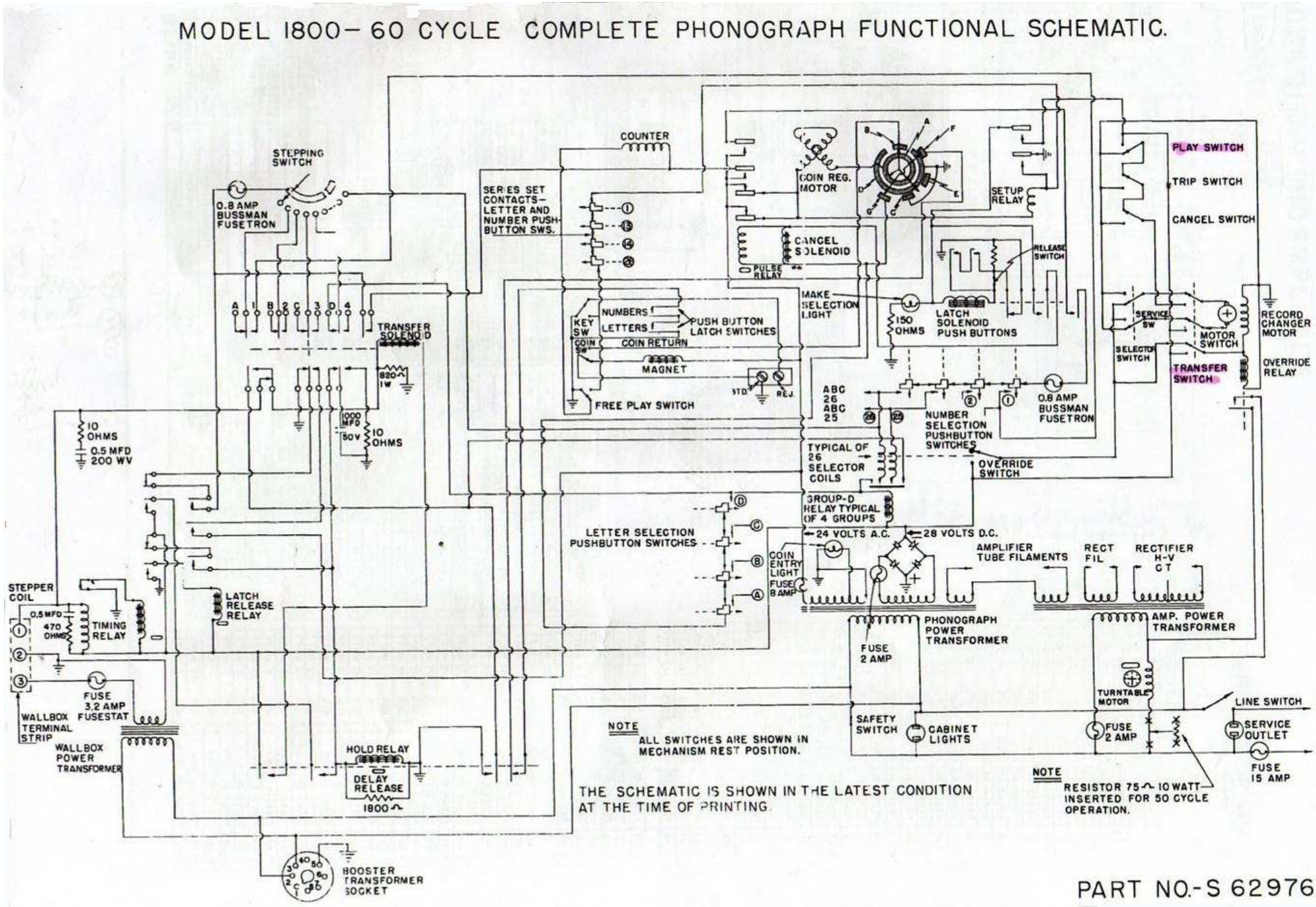


PHASE 10 – OPERATION OF
RECORD CHANGER

Phase 10– ENERGIZING RECORD CHANGER MOTOR AND OVERRIDE RELAY, AMPLIFIER, POWER TRANSFORMER AND TURNTABLE MOTOR CIRCUITS. When one or more latch pins are released, the wobble plate in the selector drum is tilted. This actuates the override switch yoke. The normally closed override switch, (which is being held open by the yoke), is allowed to close, energizing the record player motor and the override relay. When the override relay is energized its contacts close, supplying 110 volts A.C. to the amplifier, power transformer and turntable motor.

NOTE: The "Std. - Rej." terminal connection and the two S.P.S.T. switches mechanically coupled to the number and letter switches respectively have no function under normal selection procedures. They have been included to discourage button manipulation for the purpose of cheating.

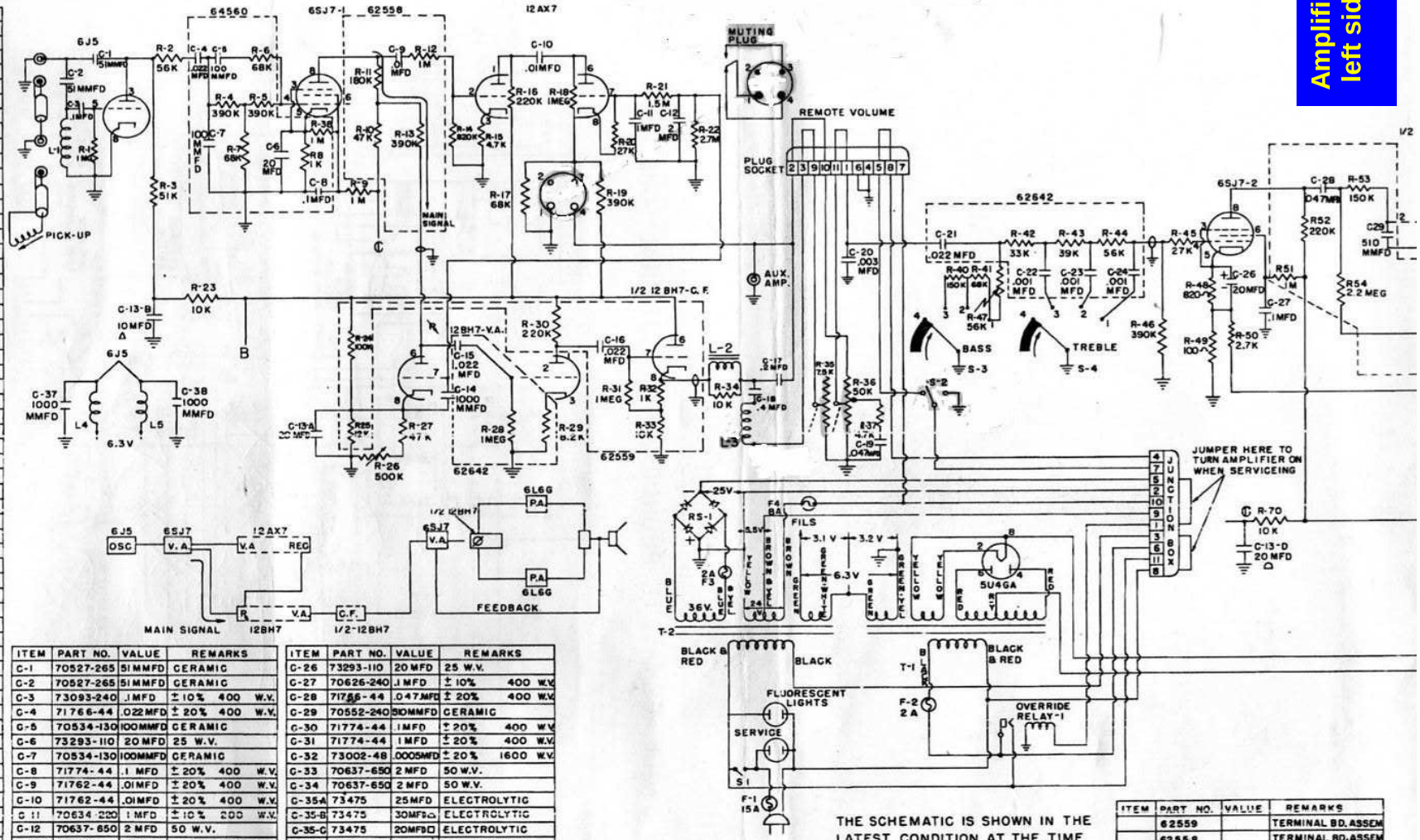
MODEL 1800 – 60 CYCLE COMPLETE PHONOGRAPH FUNCTIONAL SCHEMATIC.



PART NO.-S 62976

SCHEMATIC WIRING DIAGRAM—528 HF AMPLIFIER

Amplifier left side



ITEM	PART NO.	VALUE	REMARKS
R-1	72264-32	1 MEG	±10% 1/2 WATT
R-2	72234-32	56K	±10% 1/2 WATT
R-3	72377-31	51K	±5% 1 WATT
R-4	72254-32	390K	±10% 1/2 WATT
R-5	72254-32	390K	±10% 1/2 WATT
R-6	72236-32	68K	±10% 1/2 WATT
R-7	72236-32	68K	±10% 1/2 WATT
R-8	72192-32	1K	±10% 1/2 WATT
R-9	72264-32	1MEG	±10% 1/2 WATT
R-10	72232-31	47K	±5% 1/2 WATT
R-11	72246-31	180K	±5% 1/2 WATT
R-12	72264-32	1 MEG	±10% 1/2 WATT
R-13	72254-31	390K	±5% 1/2 WATT
R-14	72262-32	820K	±10% 1/2 WATT
R-15	72208-32	4.7K	±10% 1/2 WATT
R-16	72248-32	220K	±10% 1/2 WATT
R-17	72236-32	68K	±10% 1/2 WATT
R-18	72264-32	1MEG	±10% 1/2 WATT
R-19	72254-32	390K	±10% 1/2 WATT
R-20	72226-32	27K	±10% 1/2 WATT
R-21	72268-31	1.5 MEG	±5% 1/2 WATT
R-22	72274-31	2.7 MEG	±5% 1/2 WATT
R-23	72216-32	10K	±10% 1/2 WATT
R-24	72384-31	100K	±5% 1 WATT
R-25	72218-31	12K	±5% 1/2 WATT
R-26	53544	500K	BIAS CONTROL
R-27	72232-32	47K	±10% 1/2 WATT
R-28	72264-32	1MEG	±10% 1/2 WATT
R-29	72214-32	8.2K	±10% 1/2 WATT
R-30	72248-32	220K	±10% 1/2 WATT
R-31	72264-32	1 MEG	±10% 1/2 WATT
R-32	72192-32	1K	±10% 1/2 WATT
R-33	72216-32	10K	±10% 1/2 WATT
R-34	72216-32	10K	±10% 1/2 WATT
R-35	55186	7.5K	VOLUME CONTROL
R-36	55186	50K	VOLUME CONTROL
R-37	72208-32	4.7K	±10% 1/2 WATT
R-38	72264-32	1 MEG	±10% 1/2 WATT
R-40	72244-32	150K	±10% 1/2 WATT
R-41	72236-32	68K	±10% 1/2 WATT
R-42	72228-32	33K	±10% 1/2 WATT
R-43	73230-32	39K	±10% 1/2 WATT
R-44	72234-32	56K	±10% 1/2 WATT
R-45	72226-32	27K	±10% 1/2 WATT
R-46	72254-32	390K	±10% 1/2 WATT
R-47	72234-32	56K	±10% 1/2 WATT
R-48	72190-32	820Ω	±10% 1/2 WATT
R-49	72168-31	100Ω	±5% 1/2 WATT
R-50	72202-31	2.7K	±5% 1/2 WATT
R-51	72264-32	1MEG	±10% 1/2 WATT
R-52	72248-32	220K	±10% 1/2 WATT
R-53	72244-32	150K	±10% 1/2 WATT
R-54	72272-32	2.2 MEG	±10% 1/2 WATT
R-55	72202-32	2.7K	±10% 1/2 WATT
R-56	72224-32	22K	±10% 1/2 WATT
R-57	72224-32	22K	±10% 1/2 WATT
R-58	72248-32	220K	±10% 1/2 WATT
R-59	72248-32	220K	±10% 1/2 WATT
R-60	72995-2	250Ω	±10% 5 WATT
R-61	72362-32	12K	±10% 1 WATT
R-62	72180-31	330Ω	±5% 1/2 WATT
R-63	72190-32	820Ω	±10% 1/2 WATT
R-64	71865	5.2K	±10% 20 WATT
R-65	71882-2	15Ω	±10% 5 WATT
R-66	71960-2	1250Ω	±10% 20 WATT
R-67	72352-32	4.7K	±10% 1 WATT
R-68	72352-32	4.7K	±10% 1 WATT
R-69	72372-32	33K	±10% 1 WATT
R-70	72216-32	10K	±10% 1/2 WATT
R-71	72296-32	22Ω	±10% 1 WATT

ITEM	PART NO.	VALUE	REMARKS
C-1	70527-265	51MMFD	CERAMIC
C-2	70527-265	51MMFD	CERAMIC
C-3	73093-240	.1MFD	±10% 400 W.V.
C-4	71766-44	.022MFD	±20% 400 W.V.
C-5	70534-130	100MMFD	CERAMIC
C-6	73293-110	20 MFD	25 W.V.
C-7	70534-130	100MMFD	CERAMIC
C-8	71774-44	.1 MFD	±20% 400 W.V.
C-9	71762-44	.01MFD	±20% 400 W.V.
C-10	71762-44	.01MFD	±20% 400 W.V.
C-11	70634-220	1 MFD	±10% 200 W.V.
C-12	70637-650	2 MFD	50 W.V.
C-13A	73474	20MFD	ELECTROLYTIC
C-13B	73474	10 MFDΔ	ELECTROLYTIC
C-13C	73474	20MFD□	ELECTROLYTIC
C-13D	73474	20MFD○	ELECTROLYTIC
C-14	70559-240	1000MMFD	CERAMIC
C-15	71766-44	.022MFD	±20% 400 W.V.
C-16	71766-44	.022MFD	±20% 400 W.V.
C-17	73095-220	.2 MFD	±10% 200 W.V.
C-18	73098-210	.4 MFD	±10% 100 W.V.
C-19	71770-24	.047 MFD	±10% 400 W.V.
C-20	73008-21	.003MFD	±10% 100 W.V.
C-21	71766-44	.022MFD	±20% 400 W.V.
C-22	71750-44	.001MFD	±20% 400 W.V.
C-23	71750-44	.001MFD	±20% 400 W.V.
C-24	71750-44	.001MFD	±20% 400 W.V.

ITEM	PART NO.	VALUE	REMARKS
C-26	73293-110	20 MFD	25 W.V.
C-27	70626-240	.1 MFD	±10% 400 W.V.
C-28	71766-44	.047MFD	±20% 400 W.V.
C-29	70552-240	510MMFD	CERAMIC
C-30	71774-44	1MFD	±20% 400 W.V.
C-31	71774-44	1MFD	±20% 400 W.V.
C-32	73002-48	.0005MFD	±20% 1600 W.V.
C-33	70637-650	2 MFD	50 W.V.
C-34	70637-650	2 MFD	50 W.V.
C-35-A	73475	25MFD	ELECTROLYTIC
C-35-B	73475	30MFD□	ELECTROLYTIC
C-35-C	73475	20MFD□	ELECTROLYTIC
C-35-D	73475	20MFDΔ	ELECTROLYTIC
C-36	70634-650	1MFD	50 W.V.
C-37	70559-240	1000MMFD	CERAMIC
C-38	70559-240	1000MMFD	CERAMIC

REL-1	56321		RELAY
L-1	49856		OSCILATOR COIL
L-2	62508	26 H	COIL
L-3	62518	29H	COIL
L-4	62842	—	CHOKE
L-5	62842	—	CHOKE
	53769		LINE CORD
RS-1	56188		RECTIFIER OPT.
RS-1	55899		RECTIFIER
LS-1	62494		TWEETER

ITEM	PART NO.	VALUE	REMARKS
LS-2	62493		12" PM SPEAKER-H.R.
LS-3	62492		12" PM SPEAKER-L.R.
LS-4	62492		12" PM SPEAKER-L.R.
T-1	62428		AMP. POWER TRANS.
T-2	62429		JUNC. POWER TRANS.
T-3	62430		OUTPUT TRANS.
F-1	52196	15 AMP.	FUSE
F-2	56325	2 AMP.	SLO BLOW FUSE
F-3	56325	2 AMP.	SLO BLOW FUSE

ITEM	PART NO.	VALUE	REMARKS
F-4	15845	8 AMP	FUSE
S-1	53648		LINE SWITCH
S-2	56233		CANCEL SWITCH
S-3	62506		BASS
S-4	62506		TREBLE
S-5	62507		FADER SWITCH
S-6	62886		HI-FI ON OFF
	64560		TERMINAL BD. ASSEM.
	62642		TERMINAL BD. ASSEM.

ITEM	PART NO.	VALUE	REMARKS
	62559		TERMINAL BD. ASSEM.
	62558		TERMINAL BD. ASSEM.
	62557		TERMINAL BD. ASSEM.

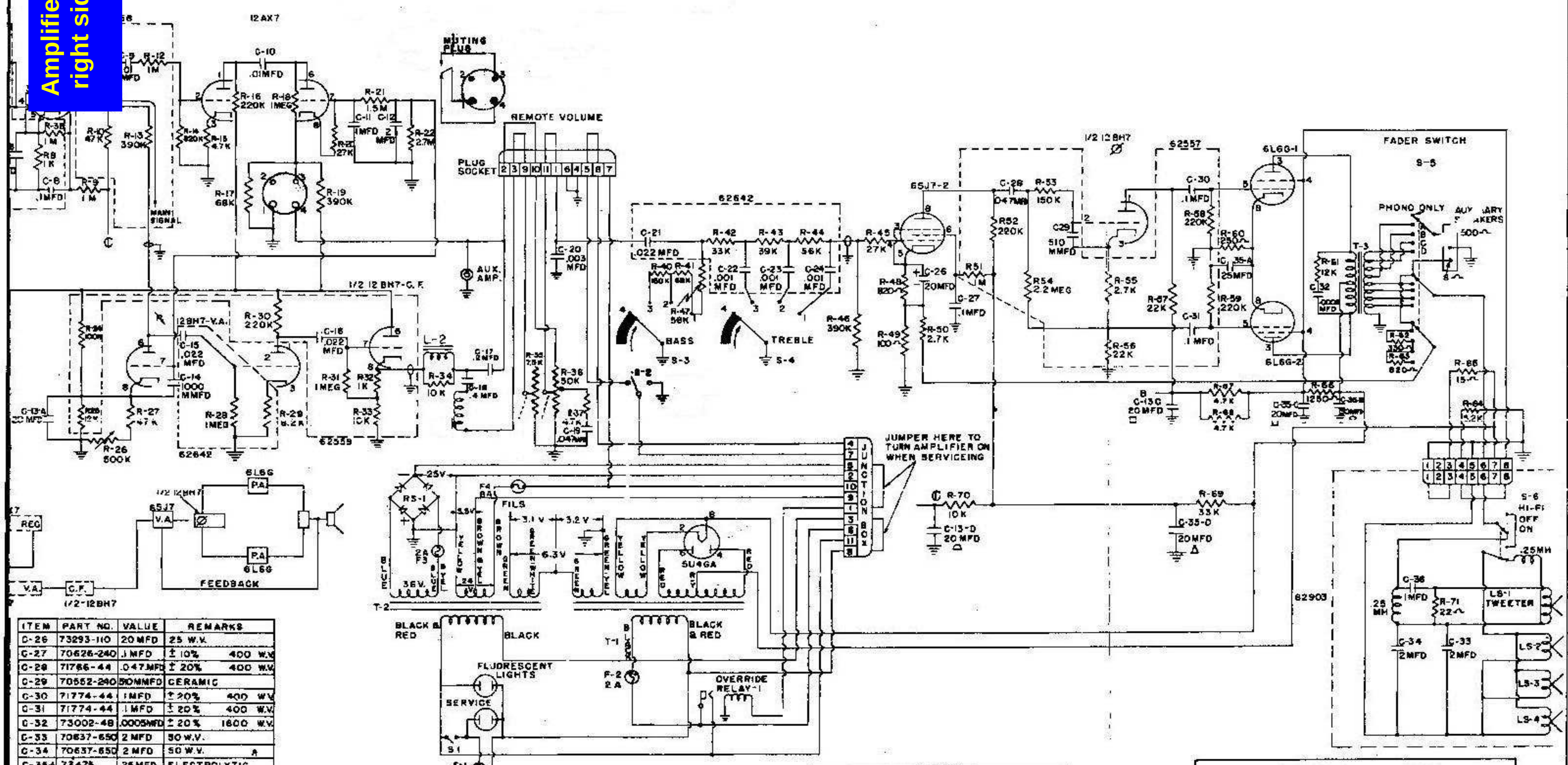
THE SCHEMATIC IS SHOWN IN THE LATEST CONDITION AT THE TIME OF PRINTING.

VOLTAGE READING AT 117 V.A.C.

TUBE	PIN# ON TUBE SOCKET 1	2	3	4	5	6	7	8
5U4GA		405V		361AC		361AC		405
6L6G-1	N.C.	6.3	400V	304V	—	N.C.	GND	23½
6L6G-2	N.C.	6.3	400V	304V	—	N.C.	GND	23½
½ 12BH7-B	144V	—	62.5V	BIAS 7½ VOLTS				
6SJ7-2	GND	6.3	1.2V	—	1.2V	30V	GND	104
½ 12BH7-C.F.	BIAS 8V			63V	6.3V	265V	—	84
½ 12BH7-V.A.	100V	-	6V	GND	GND			
½ 12BH7-R						250V		27
6SJ7-1	GND	GND	1.2V		1.2V	32V	6.3V	80
6J5	GND	63	45*	—	.4K*	—	GND	GND
12AX7	150	—	2	GND	GND			

Amplifier right side

SCHEMATIC WIRING DIAGRAM—528 HF AMPLIFIER



ITEM	PART NO.	VALUE	REMARKS
C-26	73293-110	20 MFD	25 W.V.
C-27	70626-240	.1 MFD	± 10% 400 W.V.
C-28	71766-44	.047 MFD	± 20% 400 W.V.
C-29	70552-240	510 MMFD	CERAMIC
C-30	71774-44	.1 MFD	± 20% 400 W.V.
C-31	71774-44	.1 MFD	± 20% 400 W.V.
C-32	73002-48	.0005 MFD	± 20% 1600 W.V.
C-33	70637-650	2 MFD	50 W.V.
C-34	70637-650	2 MFD	50 W.V.
C-35A	73475	25 MFD	ELECTROLYTIC
C-35-B	73475	30 MFD △	ELECTROLYTIC
C-35-C	73475	20 MFD □	ELECTROLYTIC
C-35-D	73475	20 MFD Δ	ELECTROLYTIC
C-36	70634-650	1 MFD	50 W.V.
C-37	70559-240	1000 MMFD	CERAMIC
C-38	70559-240	1000 MMFD	CERAMIC

REL-1	56321		RELAY
L-1	49856		OSCILATOR COIL
L-2	62508	26 H	COIL
[illegible]	[illegible]	29 H	COIL
L-4	62842	—	CHOKE
L-5	62842	—	CHOKE

	53769		LINE CORD
RS-1	56188		RECTIFIER } OPT.
RS-1	55899		RECTIFIER } OPT.
LS-1	62494		TWEETER

ITEM	PART NO.	VALUE	REMARKS
LS-2	62493		12" PM SPEAKER-H.R.
LS-3	62492		12" PM SPEAKER-L.R.
LS-4	62492		12" PM SPEAKER-L.R.
T-1	62428		AMP. POWER TRANS.
T-2	62429		JUNC. POWER TRANS.
T-3	62430		OUTPUT TRANS.
F-1	52198	15 AMP.	FUSE
F-2	56325	2 AMP.	SLO BLOW FUSE
F-3	56325	2 AMP.	SLO BLOW FUSE

ITEM	PART NO.	VALUE	REMARKS
F-4	15845	6 AMP	FUSE
S-1	53648		LINE SWITCH
S-2	56233		CANCEL SWITCH
S-3	62506		BASS
S-4	62506		TREBLE
S-5	62507		FADER SWITCH
S-6	62886		HI-FI ON OFF
	64560		TERMINAL BD. ASSEM.
	62642		TERMINAL BD. ASSEM.

THE SCHEMATIC IS SHOWN IN THE LATEST CONDITION AT THE TIME OF PRINTING.

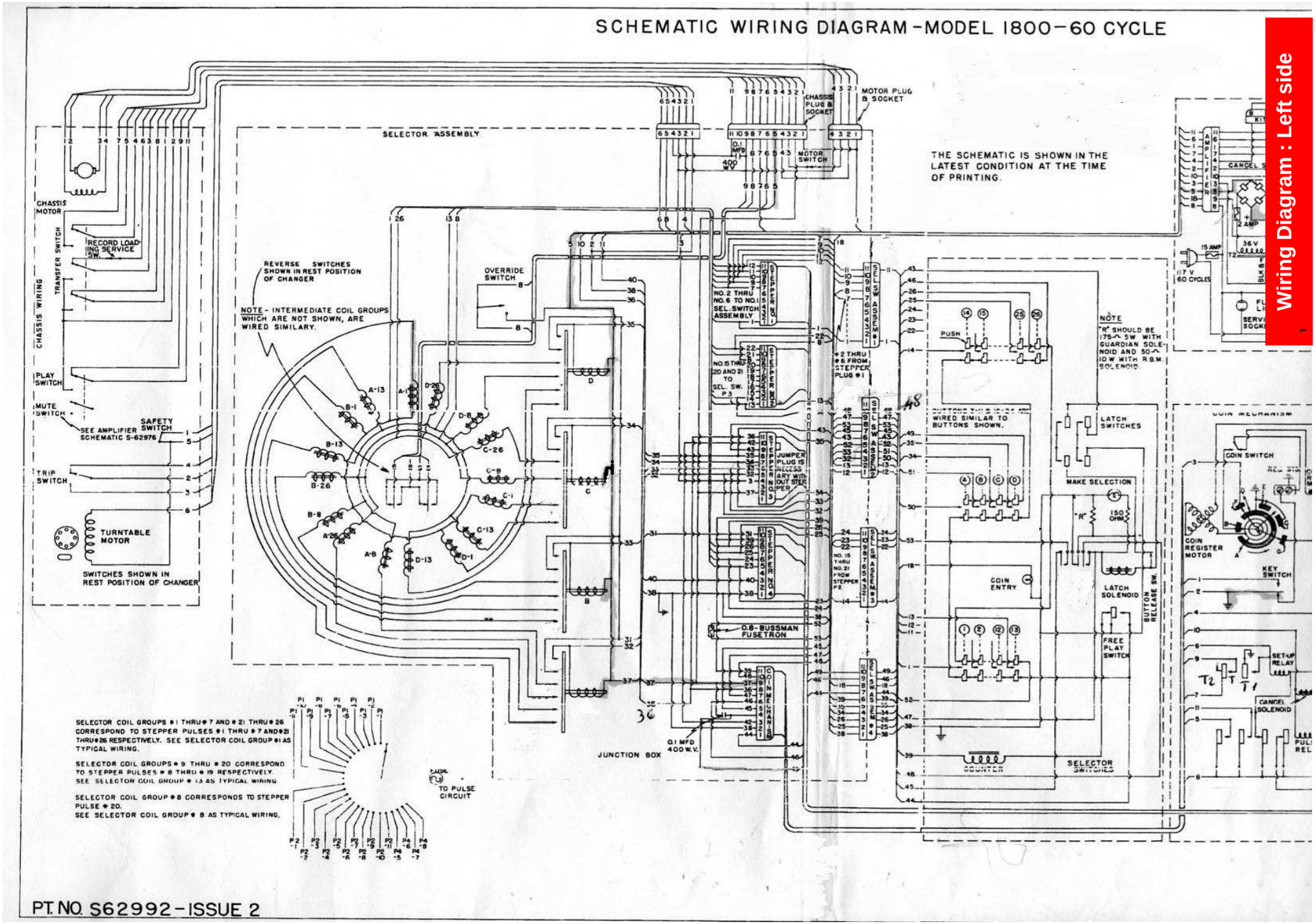
ITEM	PART NO.	VALUE	REMARKS
	62659		TERMINAL BD. ASSEM
	62558		TERMINAL BD. ASSEM
	62557		TERMINAL BD. ASSEM

VOLTAGE READING AT 117 V.A.C.

TUBE	PIN # ON TUBE SOCKET 1	2	3	4	5	6	7	8	9
5U4GA		405V		361AC		361AC		405V	
6L6G-1	N.C.	6.3	400V	304V	—	N.C.	GND	23½V	
6L6G-2	N.C.	6.3	400V	304V	—	N.C.	GND	23½V	
½ 12BH7-Ø	144V	—	62.5V	BIAS 7½ VOLTS					-
6SJ7-2	GND	6.3	1.2V	—	1.2V	30V	GND	104V	
½ 12BH7-C.F.	BIAS 8 V			6.3V	6.3V	265V	—	84V	GND
½ 12BH7-V.A.	100V	—	8V	GND	GND				6.3V
½ 12BH7-R						250V		27V	
6SJ7-1	GND	GND	1.2V		1.2V	32V	6.3V	80V	
6J5	GND	63	45*	—	.4**	—	GND	GND	
12AX7	150	—	2	GND	GND				63

SYMBOLS AND NOTES

Ø - PHASE INVERTER
C.F. - CATHODE FOLLOWER
V.A. - VOLTAGE AMPLIFIER
R - VARIABLE RESISTANCE TUBE
* - INPUT REMOVED. WITH PICK-UP IN AND CIRCUIT OSCILLATING 80V. AT JUNCTION R2 - C4
** - INPUT REMOVED. WITH PICK-UP IN AND CIRCUIT OSCILLATING, 4.5 V USING VTVM


SCHEMATIC WIRING DIAGRAM - MODEL 1800 - 60 CYCLE
THE SCHEMATIC IS SHOWN IN THE LATEST CONDITION AT THE TIME OF PRINTING.
SELECTOR ASSEMBLY
CHASSIS MOTOR
RECORD LOADING SERVICE SW.
TRANSFER SWITCH
CHASSIS WIRING
PLAY SWITCH
MUTE SWITCH
SAFETY SWITCH
SEE AMPLIFIER SCHEMATIC S-62976
TRIP SWITCH
TURNTABLE MOTOR
SWITCHES SHOWN IN REST POSITION OF CHANGER
REVERSE SWITCHES SHOWN IN REST POSITION OF CHANGER
NOTE - INTERMEDIATE COIL GROUPS WHICH ARE NOT SHOWN, ARE WIRED SIMILARY.
OVERRIDE SWITCH
CHASSIS PLUG & SOCKET
MOTOR PLUG & SOCKET
MOTOR SWITCH
0.1 MFD 400 W.V.
JUMPER PLUG IS NECESSARY WITH OUT STEPPER
0.8 - BUSSMAN FUSETRON
JUNCTION BOX
0.1 MFD 400 W.V.
TO PULSE CIRCUIT
SELECTOR COIL GROUPS #1 THRU #7 AND #21 THRU #26 CORRESPOND TO STEPPER PULSES #1 THRU #7 AND #21 THRU #26 RESPECTIVELY. SEE SELECTOR COIL GROUP #1 AS TYPICAL WIRING.
SELECTOR COIL GROUPS #9 THRU #20 CORRESPOND TO STEPPER PULSES #8 THRU #19 RESPECTIVELY. SEE SELECTOR COIL GROUP #13 AS TYPICAL WIRING
SELECTOR COIL GROUP #8 CORRESPONDS TO STEPPER PULSE #20. SEE SELECTOR COIL GROUP #8 AS TYPICAL WIRING.
NOTE "R" SHOULD BE 175 Ω 5W WITH GUARDIAN SOLENOID AND 50 Ω 10 W WITH R.B.M. SOLENOID.
WIRED SIMILAR TO BUTTONS SHOWN.
PUSH
LATCH SWITCHES
MAKE SELECTION
150 OHM
COIN ENTRY
LATCH SOLENOID
FREE PLAY SWITCH
BUTTON RELEASE SW.
COUNTER
SELECTOR SWITCHES
COIN MECHANISM
COIN SWITCH
COIN REGISTER MOTOR
KEY SWITCH
SET-UP RELAY
CANCEL SOLENOID
117 V 60 CYCLES
15 AMP
36 V
2 AMP
PT. NO. S62992 - ISSUE 2

Wiring Diagram : Right side