

**WURLITZER  
MODEL 5210  
WALL BOX  
and STEPPER**

THE RUDOLPH WURLITZER CO.  
NORTH TONAWANDA, NEW YORK

5. 5210 WALL BOX  
and STEPPER

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# MODEL 5210 - 200 SELECTION WALL BOX

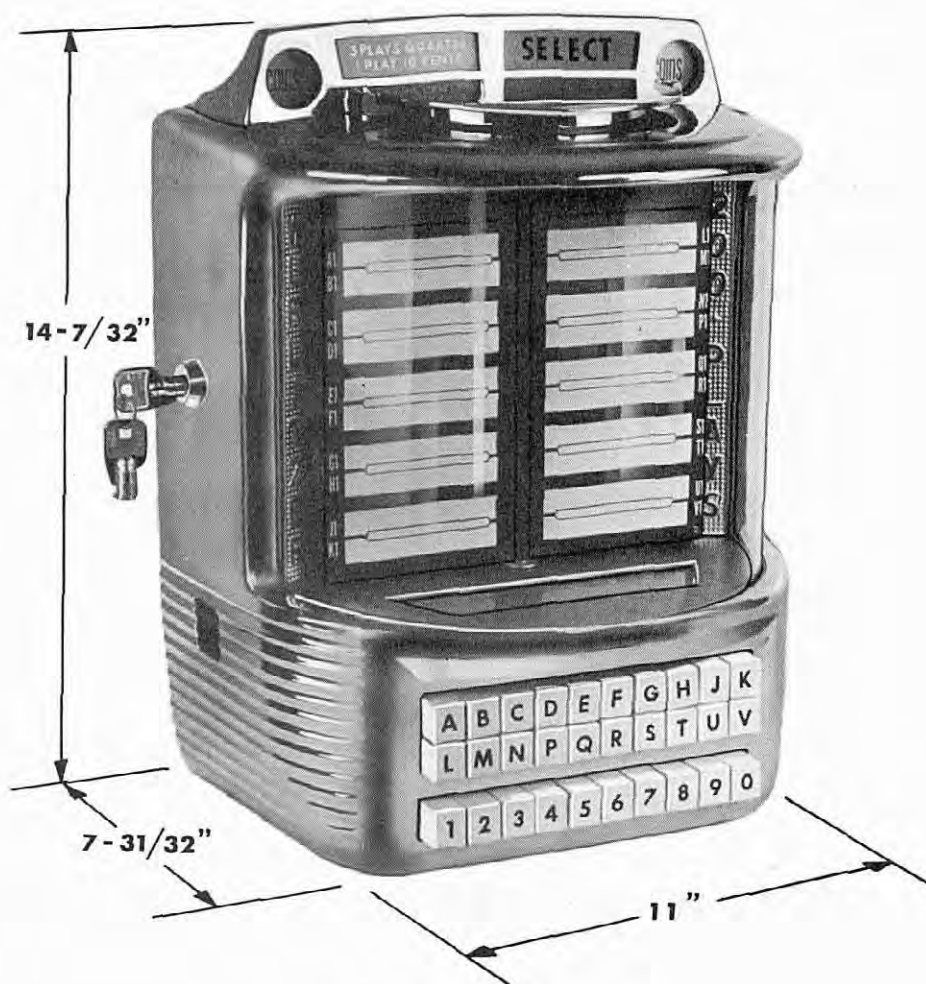


Fig. 1. MODEL 5210 WALL BOX

## 1. DESCRIPTION

a. The Model 5210 Wall Box (Fig. 1) features a well lighted, wide range, glass program window, with lights at both the top and bottom. Its three-in-one magnetic slug rejector is designed for handling a dime or two nickels for the 10¢ play. A "make selection" escutcheon at the top lights up when credits are banked on the coin counter mechanism. Behind the "make selection" escutcheon is located the coin return button. The two button selection system is identical with that of the Model 2000 phonograph. Two coin entries for nickel, dime, or quarter, are provided for convenience from either side. A single ace lock secures the chromium cover in place. The cover in turn, is the retainer for the cash box, which

is immediately accessible with the cover removed. As shown in Figure 2, both the cash box and the "program page assembly" are arranged for ease of service. Figure 3 shows the spring latch mounting for the slug rejector and the open "selector switch and bracket assembly" for accessibility.

b. The wall box dimensions as shown in Figure 1 are as follows:

Height	14-7/32"
Width	11"
Depth	7-31/32"
Weight	25 lbs.



## MODEL 5210 - 200 SELECTION WALL BOX

### 2. ACCESSIBILITY

a. To remove the program page assembly, press in the latch at the upper right hand corner (Item 3, Fig. 2) of the "mounting plate and lock slide" and disengage the assembly from its two lower guide studs and the two upper lock studs.

b. To remove the slug rejector, disengage it from the two spring latches (Item 3, Fig. 3) and move it upward and forward to disengage the two upper guide brackets (Items 4 and 5).

c. As shown in Figure 3, other components are readily accessible for adjustments or repair.

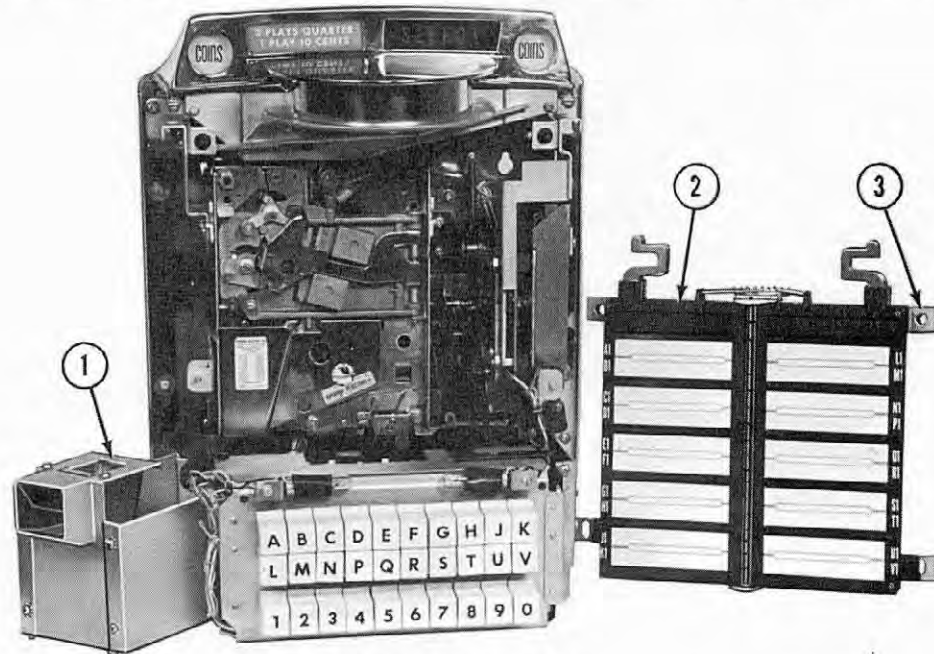


Fig. 2. ACCESSIBILITY

- 1. Cash Box and Coin Return Cup Assembly
- 2. Program Page Assembly

67412  
67440

- 3. Latch, Program Page Assembly

67579

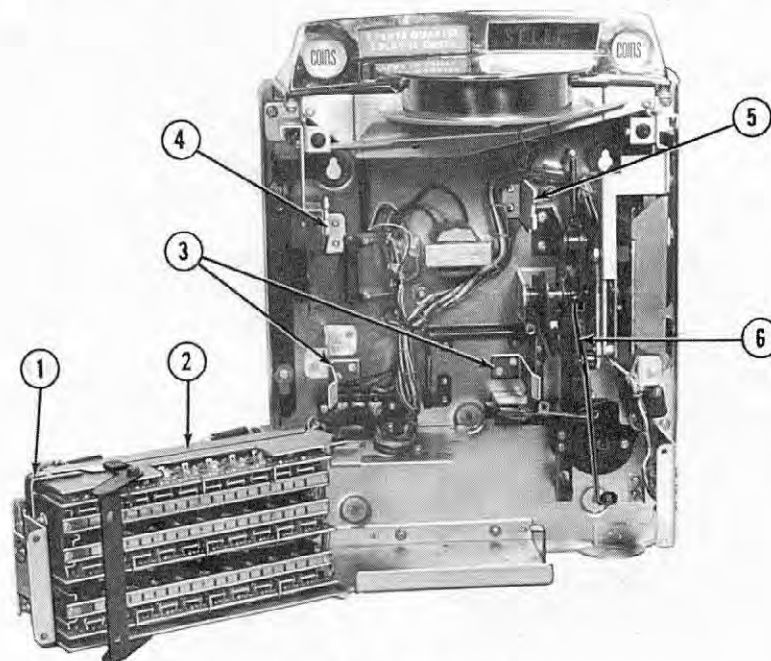


Fig. 3. COMPONENTS

- 1. Lock Bar and Adjusting Screw Assembly
- 2. Selector Switch and Bracket Assembly
- 3. Spring Latches, Slug Rejector Mounting

67436  
67425  
58220

- 4. Guide Bracket, L.H.
- 5. Guide Bracket, R.H.
- 6. Arm, Hub, and Roller Assembly

58290  
62725  
67424

### 3. OPERATION

The Model 5210 Wall Box is mechanically operated by its drive motor (Item 2, Fig. 4), through one complete cycle of operation for each selection made.

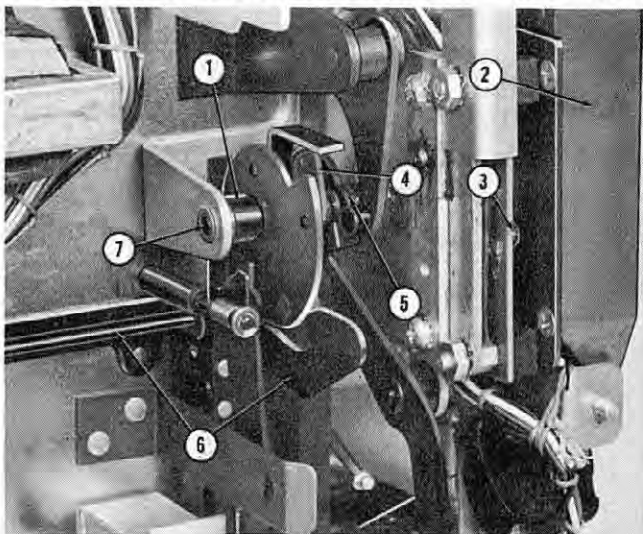


Fig. 4. MAIN SHAFT AND CAM FUNCTIONS

- |   |       |
|---|-------|
| 1. Cam, Hub, and Pin Assembly               | 67240 |
| 2. Motor Assembly                           | 67261 |
| 3. Coupling, Insulator, and Spring Assembly | 62718 |
| 4. Cancel Cam                               | 62752 |
| 5. Coin Counter Cam                         | 58269 |
| 6. Lock Assembly, Slug Rejector             | 62830 |
| 7. Main Shaft and Cam Assembly              | 67184 |

a. The motor is directly joined to the "coupling insulator and spring assembly" (Item 3) which is loosely coupled and accurately timed to the "shaft and cam assembly" (Item 7).

b. In mechanical sequence, the function of the "cam, hub, and pin assembly" (Item 1) is first to release the "slug rejector lock assembly" (Item 6) and effect coin return during the selection cycle, also to prevent acceptance of more than one coin at a time.

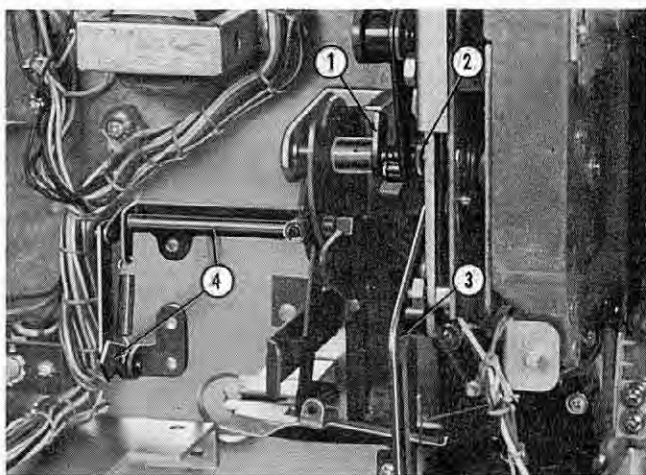


Fig. 5. MAIN SHAFT AND CAM FUNCTIONS

- |                                  |       |
|----------------------------------|-------|
| 1. Cancel Cam                    | 62752 |
| 2. Cam, Selector Switch Lock     | 62750 |
| 3. Arm, Hub, and Roller Assembly | 67424 |
| 4. Slug Rejector Lock Linkage    | 62830 |

c. The selector switch lock component of the "cam and hub assembly, counter wheel" (Item 2, Fig. 5) is the next to function by releasing the "arm, hub, and roller assembly" just enough to permit latching of the selector switches. The "lock bar and adjusting screw assembly" (Item 1, Fig. 3) is actuated by movement of the arm (Item 6) to produce the latching action described above.

d. The next action will be produced, again, by the "cam, hub, and pin assembly" (Item 5, Fig. 6) to actuate the "lifter lever assembly" (Item 7) and the "coin feeler and lever assembly" (Item 6). This action moves the coin feeler (Item 1) across the three coin exits of the slug rejector and the feeler therefore is intercepted in one of three different positions. The opposite end of the "feeler and lever" (Item 8) is thus positioned in one of three different planes to engage the "coin counter wheel and plate assembly" (Item 9).

e. As the cycle advances, the "cam and hub assembly" (Item 2, Fig. 5) again acts to further release the button latch bar and produce complete locking of the selector switch buttons.

f. Concurrent with the action described in "e", the cancel cam section of the "cam, hub, and pin assembly" (Item 4, Fig. 4) releases the "cancel slide and bracket assembly" which unlocks the "coin counter wheel and plate assembly" preparatory to action of the coin counter component of the cam and hub assembly (Item 5, Fig. 4).

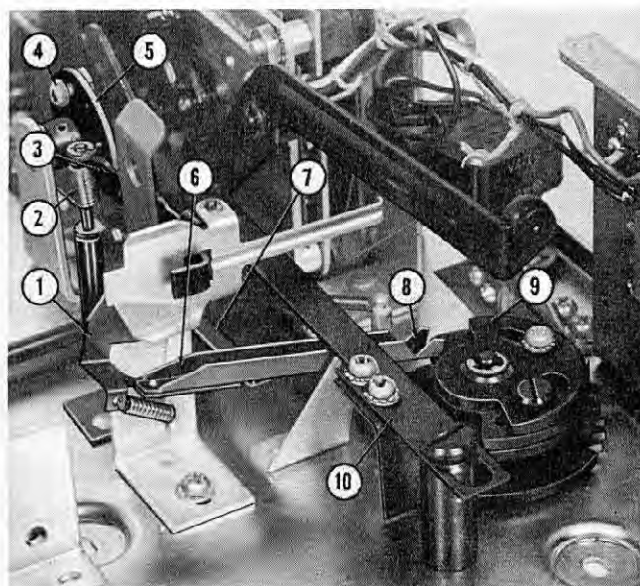


Fig. 6. COIN SELECTOR AND COIN COUNTER PHASES

- |  |          |
|--|----------|
| 1. Coin Feeler                               | 62148    |
| 2. Return Spring, Coin Paddle Mounting Lever | 61993    |
| 3. Mounting Bracket, Coin Paddle             | 62139    |
| 4. Round Head Screw, Coin Drop               | 73574-67 |
| 5. Cam, Hub, and Pin Assembly                | 67240    |
| 6. Coin Feeler and Lever Assembly            | 62146    |
| 7. Lifter Lever Assembly                     | 58320    |
| 8. Lever, Coin Feeler                        | 62147    |
| 9. Coin Counter Wheel and Plate Assembly     | 58299    |
| 10. Cancel Slide and Bracket Assembly        | 67186    |



g. Further action of the coin counter cam actuates the "arm and link assembly" (Item 4, Fig. 7). The arm and link, being linked to the "coin counter wheel and plate assembly", will rotate the wheel to be engaged by the end of the "coin feeler and lever assembly" as described in "d". The "arm and link assembly" is provided with a yielding link (Item 3) and spring (Item 5) to permit continuation of the cam action without advancing the counter wheel beyond its point of engagement, with the end of the "coin feeler and lever assembly" (Item 6).

h. As the coin counter cam passes its maximum point of actuation the cam follower on the yielding member of the "arm and link assembly" drops down the "quick return" side of the cam, returning the coin counter plate group to its "at rest" position and leaving the coin counter wheel, held by the detent spring, at a pre-determined position as set up by the credit settings of the coin counter disc group. Pressure is thus released from the "coin feeler and lever assembly".

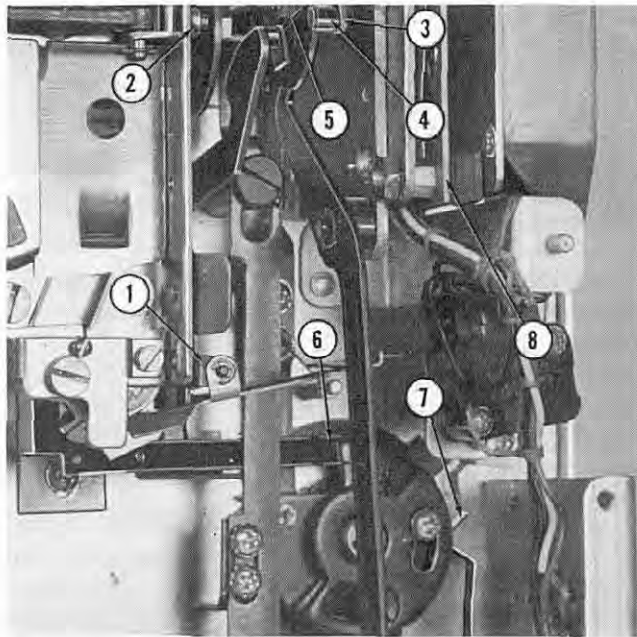


Fig. 7. COIN COUNTER PHASE

1. Mounting Bracket, Coin Paddle	62139
2. Round Head Screw, Coin Drop	73574-67
3. Yielding Link	58189
4. Arm and Link Assembly	67239
5. Yielding Spring	58777
6. Coin Feeler and Lever Assembly	62146
7. Detent Spring, Coin Counter Wheel	58310
8. Contact Plate Assembly	67426

i. The next action takes place due to the "quick return" side of the "cam, hub, and pin assembly" which started its functions in "b". The "lifter lever" is thus released and the "coin feeler and lever assembly" returns to the rest position, preparatory to "coin drop".

j. The dropping of the coin is provided for by a round head screw located in the side of the "cam,

hub, and pin assembly". The round head of the screw, at this time, engages the cam shaped end of the "coin paddle mounting bracket" (See Item 2, Fig. 7) and swings the coin paddle from under the coin exits of the slug rejector to drop the coin (See Items 4 and 3, Fig. 6).

k. Concurrently with the "coin drop" action, cancel action is provided by the return of the cancel cam component of the "cam, hub, and pin assembly" to its original "at rest" position (See Item 1, Fig. 5).

l. The next phase provides return of the coin paddle under spring loading (Item 2, Fig. 6) due to passing of the round head screw beyond the cam shaped end of the coin paddle mounting bracket.

m. The final phase for the "cam, hub, and pin assembly" re-engages the pin with the actuating arm of the slug rejector lock assembly (Item 4, Fig. 5).

n. Concurrently with the action described in "m" the "selector switch lock" component of the "cam, and hub assembly, counter wheel" actuates the "arm, hub, and roller assembly" to again release the selector buttons to their "at rest" or "make selection" positions, as determined by the electrical condition of the key switch.

o. The electrical conditions pertaining to the various phases of the cycle may be obtained by noting the functional schematic (Page 13) and watching the position of the "coupling, insulator and spring assembly" with relation to its accompanying "contact plate assembly".

p. During one complete cycle as described above, the coin counter wheel and plate assembly will function to set up credits in accordance with the denomination of the coin which intercepts the coin feeler. The credit action for a nickel has been described in "d", and shown as Item 9, Fig. 6.

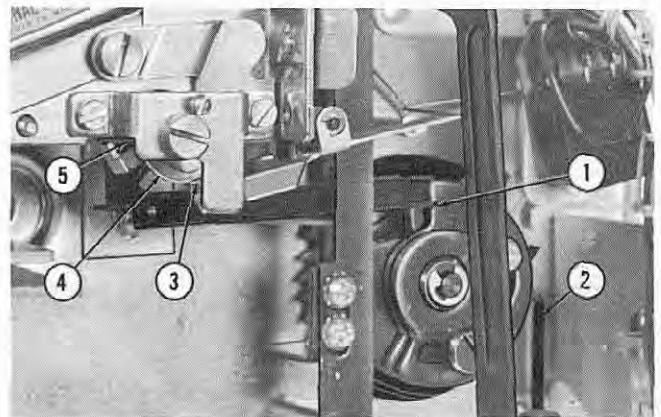


Fig. 8. COIN COUNTER, 10 CENT

1. 10¢ Coin Counter Disc and Coin Feeler Lever	58203
	62146
2. Detent Spring -	58310
3. Coin Paddle, Center (Longest)Section	62144
4. Dime	
5. Coin Feeler	62148

q. When a dime is accepted by the slug rejector, it will drop on the longest (or center section) of the coin paddle as shown in Figure 8. The coin feeler and lever assembly will intercept the ten cent coin counter disc and position the coin counter wheel as determined by the setting of the ten cent coin counter disc.

r. When a quarter is accepted by the slug rejector, it will drop on the rear section of the coin paddle as shown in Figure 9. The coin feeler and lever assembly will intercept the twenty-five cent coin counter disc and position the coin counter wheel as determined by the setting of the twenty-five cent coin counter disc.

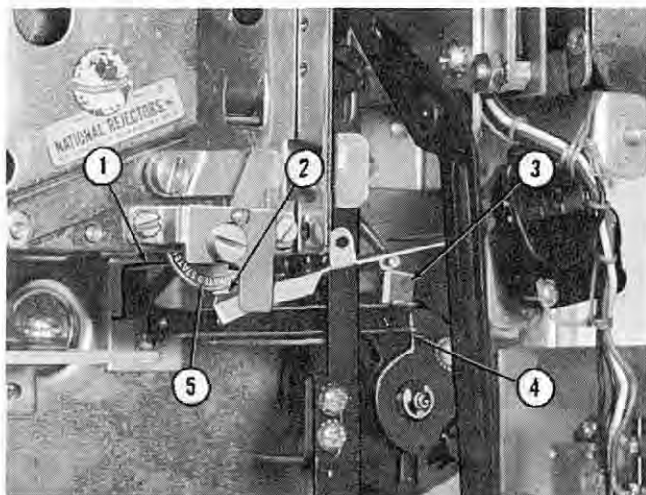


Fig. 9. COIN COUNTER, 25 CENT

- |  |       |
|--|-------|
| 1. Coin Feeler                                 | 62148 |
| 2. 25¢ (Rear) Section of Coin Paddle           | 62144 |
| 3. Trip Plate                                  | 58206 |
| 4. 25¢ Coin Counter Disc and Coin Feeler Lever | 58205 |
| 5. Quarter                                     | 62146 |

s. The cancel action described in "k" will retract the coin counter wheel one tooth for each selection cycle of the mechanism. The trip plate (Item 3, Fig. 9) will thus return to its original "at rest" position to open the key switch when the last credit has been cancelled.

#### 4. INSTALLATION

The Model 2000 Phonograph is provided with a stepper and junction box unit as an integral component of the 200 selection system.

Installation of the Model 5210 Wall Box may be accomplished as follows:

- a. Unlock and remove the cover.
- b. Release the program holder assembly at its upper right hand mounting stud and disengage it from the four mounting studs.

c. Insert the double title strips in each number group as indicated on the outer margins of the various title strip pages. The selection letter and number should correspond with the title strip arrangement of the selections as set up on the phonograph.

d. To prepare for mounting, remove the cash box and the slug rejector. Two slotted mounting holes will be found near the top and about two inches from the sides of the base. There is one mounting hole in the center of the base directly over the selector switch assembly and two back of the selector switch assembly. A half punched hole is provided at each of the lower corners of the back plate for cable entrance from the rear, when concealed wiring is used. The "Anti-cheat" guard (Part No. 60321) is included for use in covering the lower cable entrance to prevent tampering.

e. Mount the wall box in the desired location, in a perfectly level position, with suitable wood screws or anchor bolts as required. It is recommended that the height of the lower end of the wall box be 51 inches above the floor level for open wall mounting and one inch above the table level for booth and table locations.

Bar and counter mounting may be installed by using one (Kit No. 142) mounting bracket for each wall box to be so mounted. Instructions for installation of the mounting bracket are included with each Kit No. 142.

f. The stepper and junction box unit of the Model 2000 Phonograph provides a three conductor terminal strip for operation of one group of four Model 5210 Wall Boxes. The use of Model 222 Booster units will provide the necessary current and facilities to operate four additional wall boxes for each booster unit installed.

g. For operation of the Model 5210 Wall Boxes, connect one of the terminal strips of each of four (maximum) wall boxes in parallel with "three wire cable" (Part No. 46006) and run the cable to the phonograph.

(1) The cable should be concealed as far as practicable, and kept as dry as possible. Fasten the cable securely at all corners and every eighteen inches.

(2) Connect the cable from one of the groups of four wall boxes to the Model 2000 "junction box and stepper unit" as follows:

Wall Box Terminals No. 1 to Stepper  
Terminal No. 1 (Pulse)

Wall Box Terminals No. 2 to Stepper  
Terminal No. 2 (Common)

Wall Box Terminals No. 3 to Stepper  
Terminal No. 3 (24V Power)



(3) When one or more Model 222 Boosters are used for additional wall box groups, connect the three wire cable from each wall box group as follows:

Wall Box Terminals No. 1 to Booster Terminal No. 1 (Pulse)

Wall Box Terminals No. 2 to Booster Terminal No. 2 (Common)

Wall Box Terminals No. 3 to Booster Terminal No. 3 (24V Power)

NOTE: The spade connector on the cable of the Model 222 Boosters will be connected to the stepper terminal No. 1 or to the No. 1 terminal of a previously connected Model 222 Booster. In other words, all No. 1 (Pulse) cables will be connected together.

(4) A 3 Amp. Fustat is provided in each booster for protection of the transformer and the line to the wall boxes.

h. Line protection for the first group of wall boxes is provided by a 3 Amp. Fustat located in the stepper and junction box unit.

i. Test each wall box for proper acceptance of coins, rejection of slugs, mechanical operation, and correct selection at the phonograph.

## 5. ADJUSTMENTS

a. Slug Rejector.

The slug rejector is a product of National Rejectors, Inc. of St. Louis, Missouri. Information may be obtained from any of their branch offices by sending for their "Rejector Manual". Adjustments should be made in accordance with their recommendations.

b. Coin Switch Adjustment. (Fig. 10)

To adjust the coin switch, the mechanism should be in its "at rest" position with the slug rejector in place.

(1) Located in the right hand bracket for the selector button assembly, there is a slide switch (Item 3, Fig. 10) for use in servicing the mechanism. Turn this switch off and insert a coin in the slug rejector.

(2) Loosen the coin switch mounting screws (Item 2, Fig. 10) and move the switch on its mounting plate to a position that will provide actuating overtravel of the switch arm (Item 1) when the coin paddle (Item 4) is depressed by an accepted coin (Item 5). The amount of overtravel should be about equal when the switch actuates in either direction.

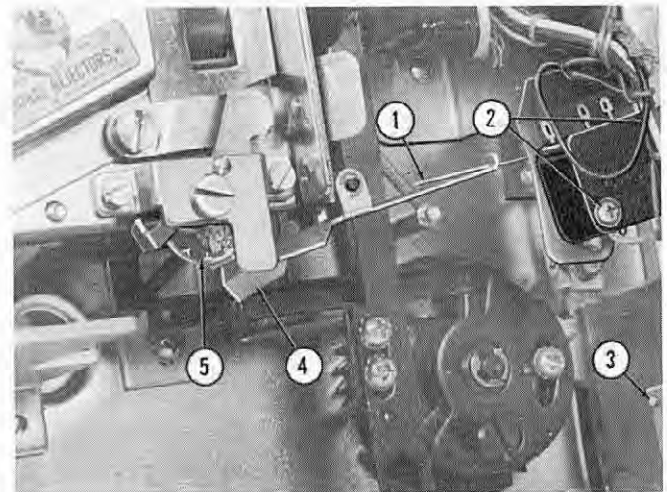


Fig. 10. COIN SWITCH ADJUSTMENT

1. Arm, Coin Switch	62164
2. Mounting Screws, Coin Switch	73503-29 and 31
3. Service Switch	61649
4. Coin Paddle	62143
5. Coin on Coin Paddle	

(3) Tighten the mounting screws and reinspect for proper switch action.

c. Coin Paddle Alignment. (Fig. 11)

The alignment of the coin paddle and mounting bracket assembly should meet the following requirements:

(1) The three separate sections of the paddle (Items 2, 7, and 6, Fig. 11) should align with the three corresponding coin exits of the slug rejector (Items 1, 9, and 8) respectively as shown with the nickel, dime and quarter coins.

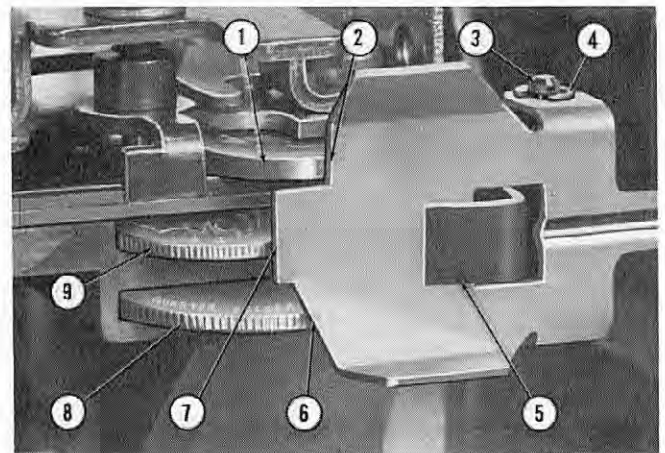


Fig. 11. COIN PADDLE ALIGNMENT

1. Nickel in Nickel Coin Track	
2. Nickel Section of Coin Paddle	
3. Shaft, Coin Paddle Mounting	62756
4. Retaining Ring	73724-12
5. Mounting Bracket, Coin Paddle	62139
6. Quarter Section of Coin Paddle	
7. Dime Section of Coin Paddle	
8. Quarter in Quarter Coin Track	
9. Dime in Dime Coin Track	

(2) The coin paddle must operate freely on its mounting bracket (Item 5) and the shaft (Item 3). The retaining ring (Item 4) must not bind.

(3) When a coin weighing 2.1 grams is placed in the dime coin exit, resting on the corresponding section of the coin paddle, its weight should tip the coin paddle and actuate the coin switch.

d. Coin Counter Linkage and 5¢ Stop Adjustment. (Figs. 12 and 13)

In making adjustments for the coin counter mechanism and linkage, the cancel bracket (Item 8, Fig. 12) should be removed to avoid interference. The basic adjustment of the coin counter mechanism may be accomplished as follows:

(1) Loosen the two adjusting screws (Item 9) and set the coin feeler lever (Item 7) to the five cent stop position.

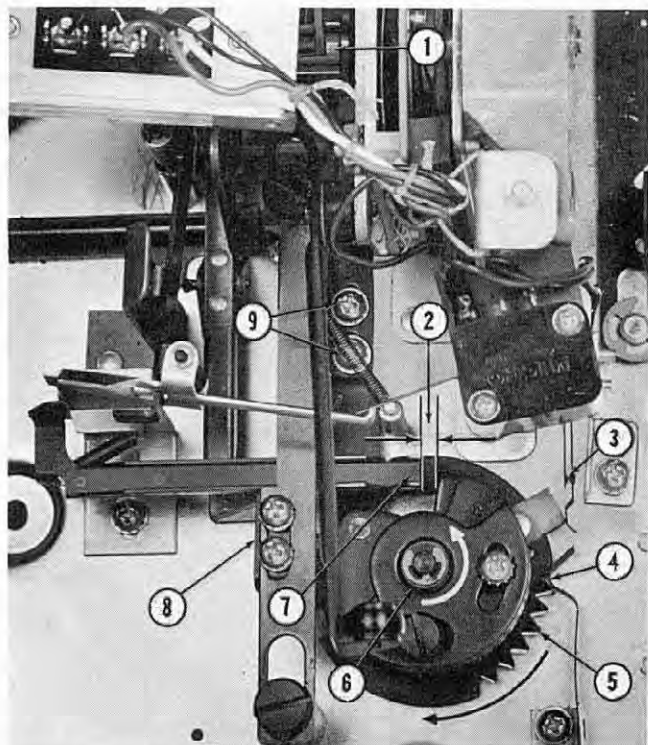


Fig. 12. COIN COUNTER LINKAGE AND 5¢ STOP ADJUSTMENTS

1. Arm and Link Assembly	67239
2. Measurement 1/16" to 1/8"	
3. Key Switch	67176
4. Detent Spring	58310
5. Coin Counter Wheel	58299
6. Coin Counter Disc Assembly	58306
7. Coin Feeler Lever	62146
8. Cancel Bracket	58210
9. Adjusting Screws	73533-22

(2) Disregard the key switch (Item 3), the detent spring (Item 4), and the counter wheel (Item 5). With the cam follower roller of the "arm and link assembly" (Item 1) against the "at rest" section of the cam, adjust the length of the link to provide 1/16" to 1/8" clearance at the five cent stop when all lost

motion is removed from the linkage by moving the counter disc assembly (Item 6) in a counter-clockwise direction as shown by the arrow on the 25¢ coin counter disc.

NOTE: Care should be exercised to avoid mistaking yielding action of the retracting spring for lost motion.

(3) Maintaining the position of the coin counter disc assembly as described in (2), turn the coin counter wheel (Item 5) clockwise as indicated by the arrow at its circumference until the end of the curved slot in the counter wheel contacts the drive stud in nickel coin counter disc. In this position, set the detent spring (Item 4) squarely in the first tooth of the coin counter wheel as shown in Item 4.

NOTE: At this step, actuation of the coin counter linkage should advance the coin counter wheel one tooth maximum, at the detent spring. Repeat steps (2) and (3) if necessary, to meet this requirement.

e. Detent Spring and Key Switch Adjustment. (Figs. 13 and 14)

The basic "at rest" setting of the coin counter mechanism, having been established in "d", pre-determines the position of both the detent spring (Item 5, Fig. 13) and the key switch (Item 3). Adjustment of these two components should meet the following requirements:

(1) Tension of the detent spring at the tip of the spring should measure 30 to 40 grams when its mounting screws (Item 6) are tightened.

(2) The position of the key switch (Item 3, Fig. 13) should place the "flat portion of the formed end of its moving blade" against the trip plate (Item 1, Fig. 13) at a point about half way across the flat

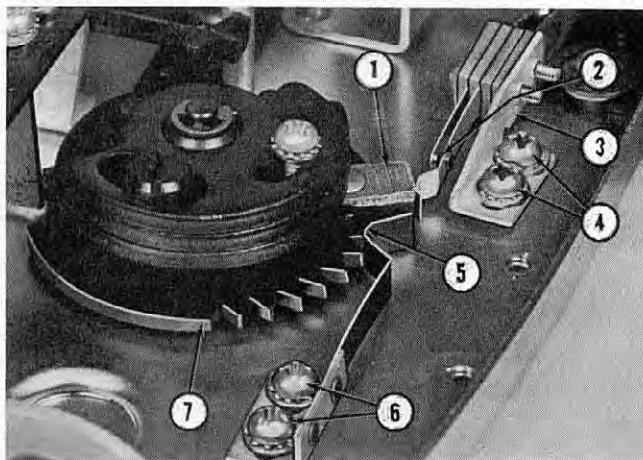


Fig. 13. DETENT SPRING AND KEY SWITCH ADJUSTMENT

1. Trip Plate	58206
2. Measurement 1/32" Contact Opening	
3. Key Switch and Bracket Assembly	67177
4. Mounting Screws	73533-22
5. Detent Pressure 30 to 40 Grams	
6. Mounting Screws	73533-22
7. Coin Counter Wheel	58299



portion as shown. At the same time the contacts should be held open 1/32" as shown at Item 2. After the key switch mounting screws (Item 4) have been tightened, re-inspect for the above requirements.

(3) The key switch is assembled to provide 20 to 30 grams contact pressure when released. This requirement should be checked and, if necessary, contact pressure should be adjusted by careful re-setting of the blades.

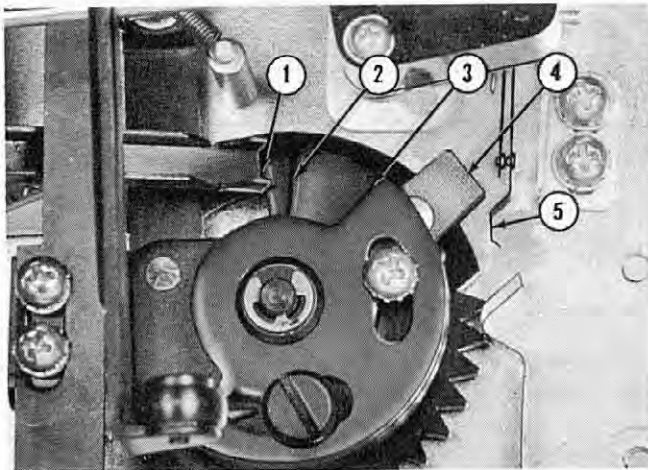


Fig. 14. KEY SWITCH AND 5¢ STOP

- 1. Five Cent Stop - 1 Play
- 2. Ten Cent Stop - 2 Plays
- 3. Twenty-five Cent Stop - 5 Plays
- 4. Trip Plate 58206
- 5. Formed Portion of Key Switch Moving Blade

(4) When the coin counter mechanism is operated for ten cent single play or five cent single play, as shown in Figure 14, the trip plate (Item 4) should clear the flat portion of the moving blade of the key switch by 1/16" minimum.

The setting of the coin counter discs are shown in Figure 14 for 1 play at the 5¢ stop (Item 1), 2 plays at the 10¢ stop (Item 2), and 5 plays at the 25¢ stop (Item 3).

f. Coin Counter Disc Settings. (Figs. 15 and 16)

(1) With the mechanism in the "at rest" position and the coin counter wheel (Item 10, Fig. 15) set in the first detent notch, loosen the twenty-five cent coin counter disc (Item 8) at its locking screw (Item 5), and the ten cent coin counter disc (Item 7) at its locking screw (Item 9). Move both of these discs clockwise away from the tip of the "coin feeler and lever assembly" (Item 4).

(2) Insert a dime in the ten cent coin exit (Item 2, Fig. 15) and advance the cycle until coin feeler function is established as shown at Item 1. At this point the tip of the coin feeler lever, at Item 4, should clear the surface five cent coin counter disc (Item 6) by 1/32" to 1/16", to insure freedom of coin counter action. The coin feeler lever may be shaped, if necessary, at the point indicated at Item 4.

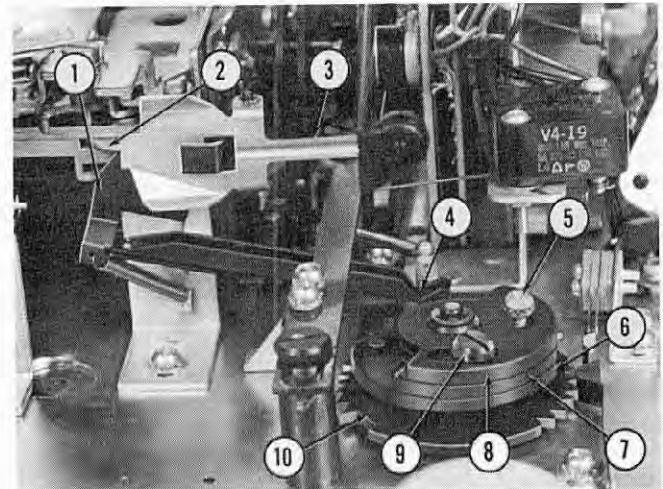


Fig. 15. COIN COUNTER DISC SETTINGS - 10¢

- 1. Coin Feeler Function
- 2. Ten Cent Coin Exit
- 3. Coin Paddle 62144
- 4. Coin Feeler and Lever Assembly 62146
- 5. Locking Screw, 25¢ 73533-25
- 6. Coin Counter Disc, 5¢ 59367
- 7. Coin Counter Disc, 10¢ 58203
- 8. Coin Counter Disc, 25¢ 58205
- 9. Locking Screw, 10¢ 59027
- 10. Coin Counter Wheel 58299

(3) Ten Cent Coin Counter Disc Setting.

Advance the cycle until the coin counter cam has rotated the coin counter discs to maximum. Now rotate the coin counter wheel only, (Item 10) by hand in a clockwise direction, against the tension of the yielding spring, to a detent position, one or two plays as desired. Holding the coin counter wheel in this position, set the ten cent coin counter disc (Item 7) against the tip of the coin feeler lever (Item 4) and tighten the ten cent locking screw (Item 9). Test under power for correct coin count with no overtravel.

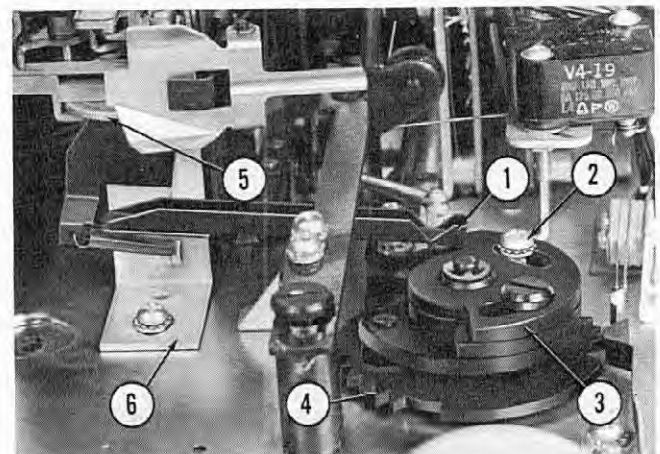


Fig. 16. COIN COUNTER DISC SETTINGS - 25¢

- 1. Coin Feeler Lever 62146
- 2. Locking Screw, 25¢ 73533-25
- 3. Coin Counter Disc - 25¢ 58205
- 4. Coin Counter Wheel 58299
- 5. Twenty-five Cent Coin Exit
- 6. Stop Bracket, Slug Rejector 62165



(4) Twenty-five Cent Coin Counter Disc Setting.

Insert a quarter in the twenty-five cent coin exit (Item 5, Fig. 16) and advance the cycle until the coin counter cam has rotated the coin counter discs to maximum. Now rotate the coin counter wheel, only, (Item 4) by hand, in a clockwise direction against the tension of the yielding spring, to a detent position, three to six plays as desired. Holding the coin counter wheel in this position, set the twenty-five cent coin counter disc (Item 3) against the tip of the coin feeler lever (Item 1) and tighten the twenty-five cent locking screw (Item 2). Test under power for correct coin count with no overtravel.

g. Cancel Slide and Bracket Adjustment. (Fig. 17)

Following the correct adjustments of the coin counter components, the cancel slide bracket (Item 5, Fig. 17) may now be installed and adjusted in accordance with the following procedure:

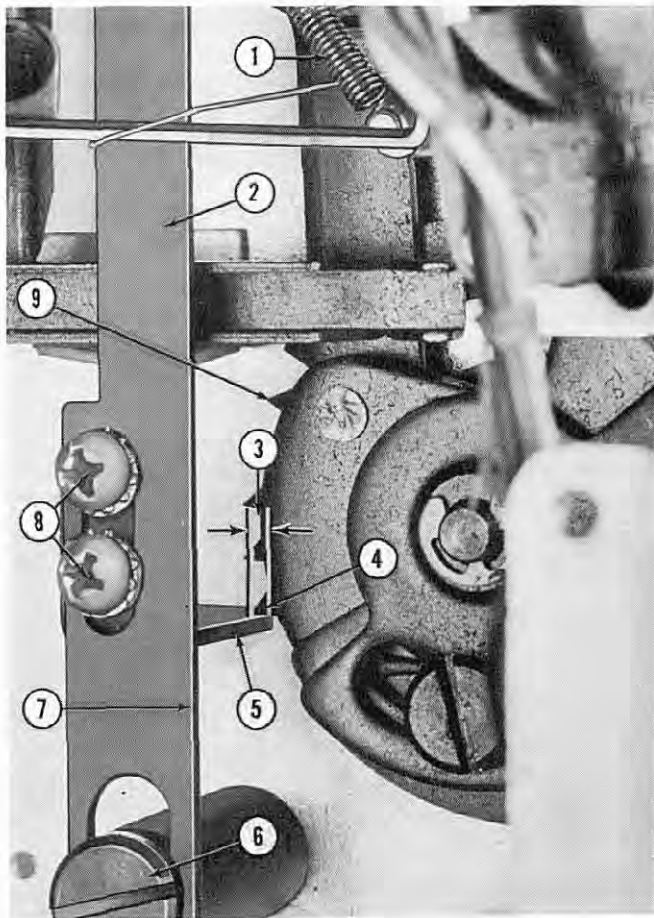


Fig. 17. CANCEL SLIDE AND BRACKET ADJUSTMENT

- |  |          |
|--|----------|
| 1. Spring, Cancel Slide                  | 58781    |
| 2. Cancel Slide                          | 67073    |
| 3. 1/2 of the Depth of the Tooth         |          |
| 4. First Cancel Tooth                    |          |
| 5. Bracket, Cancel Slide                 | 58210    |
| 6. Shoulder Screw, Cancel Slide, Lower - | 58180    |
| 7. Lateral Position of Cancel Slide      |          |
| 8. Screws, Bracket Adjusting             | 73533-22 |
| 9. Cancel Teeth of Coin Counter Wheel    |          |

(1) Set the main shaft and cam assembly to a position where the cancel slide (Item 2) is actuated to maximum. The cancel slide must float freely in a lateral direction on its lower guide (shoulder screw, Item 6). The cancel slide actuating spring (Item 1) functions to engage the slide and bracket assembly with the cancel teeth (Item 9) of the coin counter wheel.

(2) Set the coin counter wheel in its first detent position (no credits) and adjust the bracket (Item 5) to provide engagement with the first cancel tooth (Item 4) to a depth no greater than one half of the depth of the tooth (Item 3). At this setting the cancel slide should be at its extreme lateral position toward the counter wheel as indicated by arrow (Item 7).

(3) Tighten the two mounting screws (Item 8) and re-inspect for correct setting.

(4) Check operation, under power, at various detent positions. Cancellation should be one full detent position for each cycle of operation. Any variation should be corrected by repeating steps (1) to (3).

h. Slug Rejector Stop Bracket Adjustment. (Fig. 16)

(1) Adjust the slug rejector stop bracket (Item 6, Fig. 16) to position its under surface 1/16" below the parallel lower surface of the three coin exits. When properly adjusted, the coin feeler will slide freely over the stop bracket and will also slide freely under the three coin exits of the slug rejector without interference with coin paddle function.

i. Coin Drop Adjustment. (Fig. 18)

(1) Advance the cycle to a point where the round head screw (Item 3, Fig. 18) causes maximum deflection of the cam shaped end of the coin paddle mounting bracket (Item 2).

(2) Loosen the lock nut (Item 4) and adjust the round head screw to provide 1/8" minimum clearance (Item 5) between the coin paddle arm and the coin switch.

(3) Insert a quarter and power operate the mechanism, observing the clearance between the coin (Item 1) and the coin paddle (Item 6) at the coin drop phase of operation. The coin must be freely released to drop in the coin box.

j. Cam Shaft End Play Adjustment.

On the left of the main cam shaft assembly is a collar with a socket head set screw. This collar should be positioned and locked to the cam shaft at a point where clearance between the collar and the flanged surface of the left end bearing will be .003" to .007".

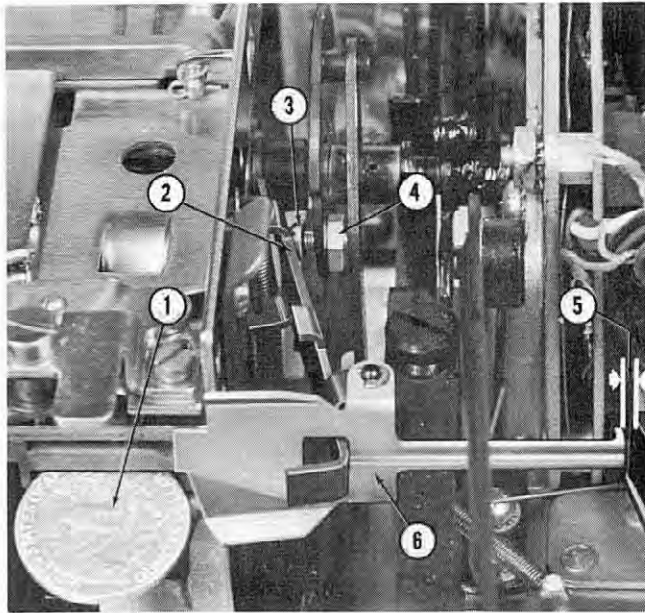


Fig. 18. COIN DROP ADJUSTMENT

- |                                  |          |
|----------------------------------|----------|
| 1. Quarter, Coin                 |          |
| 2. Mounting Bracket, Coin Paddle | 62139    |
| 3. Round Head Screw              | 73574-67 |
| 4. Lock Nut, Coin Drop           | 73601-6  |
| 5. Measurement, 1/8" Clearance   |          |
| 6. Coin Paddle                   | 62143    |

k. Button Latch Adjustment. (Figs. 19, 20, and 21)

The three phases of button latching are governed by the button latch cam (an integral part of the coin counter cam and hub assembly) as shown in Item 6, Fig. 19. The first phase, in the "at rest" position of the mechanism, is governed by the cam surfaces

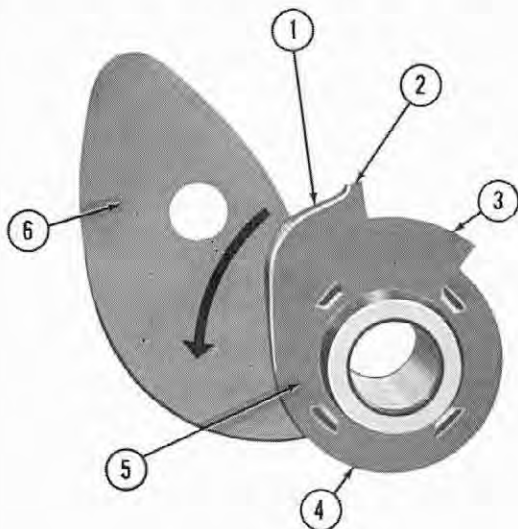


Fig. 19. BUTTON LATCH CAM

- |   |       |
|---|-------|
| 1. Cam Surface "At Rest Phase"          |       |
| 2. Cam Surface, Leaving "At Rest Phase" |       |
| 3. "Make Selection" Surface             |       |
| 4. Low Surface of Cam Track             |       |
| 5. Button Latch Cam                     | 62750 |
| 6. Cam and Hub Assembly, Coin Counter   | 67182 |

shown at Items 1, and 2. In this position the arm, hub, and roller assembly (Item 5, Fig. 20) will have its maximum effect on the "pivot arm and pin assembly" (Item 6, Fig. 20) and the "lock bar and adjusting screw assembly" (Item 1, Fig. 20). When the adjusting screws are properly set, the mechanical condition of the three selector switch latch bars (Item 5, Fig. 21) will be as represented in Figure 21, to leave all buttons entirely free of any latching action. An approved method for latch bar adjustment follows:

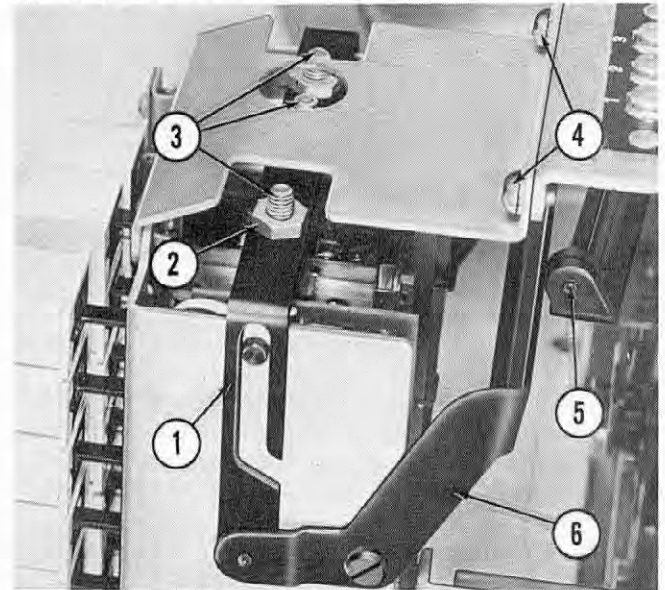


Fig. 20. BUTTON LATCH LINKAGE

- |  |         |
|--|---------|
| 1. Lock Bar and Adjusting Screw Assembly | 67436   |
| 2. Lock Nuts                             | 73603-8 |
| 3. Adjusting Screws                      | 67433   |
| 4. Hold Screws                           |         |
| 5. Arm, Hub, and Roller Assembly         | 67424   |
| 6. Pivot Arm and Pin Assembly            | 67618   |

(1) With the button latch cam (Item 5, Fig. 19) in the "at rest" phase of the cycle, set the adjusting screws (Item 3, Fig. 20) to just produce latching action of the switch rods (Item 3, Fig. 21) when buttons are pressed.

(2) Slowly turn the adjusting screws in until the latched button is released.

(3) From this point, turn the screw in one complete turn and set the lock nuts (Item 2, Fig. 20).

(4) If this setting is accurately accomplished, the latch bar (Item 5, Fig. 21) will not bottom when the cam follower of the "arm, hub, and roller assembly" (Item 5, Fig. 20) is on the highest point (Item 2, Fig. 19) of the "button latch cam". Also all buttons should be locked out, or in, when the cam follower is on the low surface of the cam track (Item 4, Fig. 19). The intermediate section of the cam track (Item 3, Fig. 19) is the "make selection" surface. It produces latch bar action to a point shown at Item 1, Figure 21, where buttons will be latched when pressed, but may be released by pressing another button in the same group. Items 1, 2, and 4, Figure 21 show the three latch bar positions.



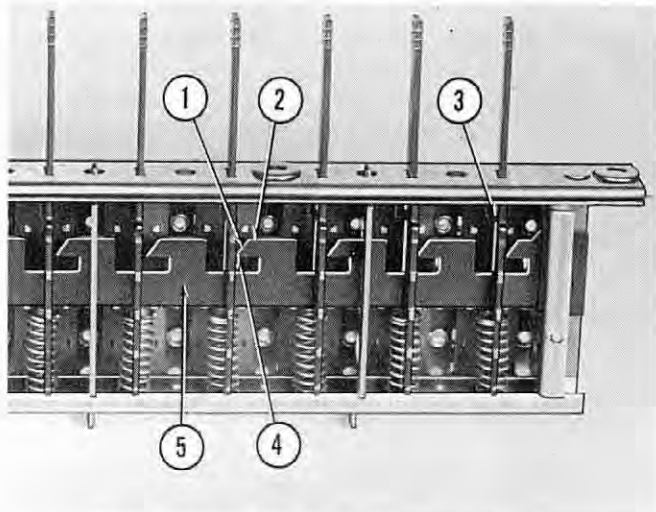


Fig. 21. SELECTOR SWITCH LATCH BAR

1. "Make Selection" Point of Latching
2. Full Latched Position
3. Latch Strike in Switch Rods
4. Full Released Position
5. Selector Switch Latch Bars

66894

(5) During the selection phase of the cycle, when the cam follower is on the low section of the cam (Item 4, Fig. 19), the selector switches will be latched to the full depth as shown at Item 2, Figure 21, where no buttons may be pressed and none may be released. Under operating conditions, release of the buttons must not occur before the selector contact of the "coupling insulator and spring assembly" has passed the last pulse patch on the contact plate.

#### 1. Test Requirements, Mechanical.

For trouble free operation, the wall box should meet the following test requirements:

(1) With power off, place the cam shaft in the normal "at rest" phase.

(2) Drop a dime into the slug rejector. With the dime resting on the coin paddle, advance the cycle until the coin feeler rests against the dime, and the ten cent coin counter disc is approaching the right hand tip of the coin feeler lever. There should be 1/32" to 1/16" clearance between the tip of the coin feeler lever and the surface of the five cent coin counter disc as described in paragraph f, (2). Continue advancing the cycle until the coin counter disc stops against the tip of the coin feeler lever. In this position the detent spring should be resting in the second or third detent for one or two plays as desired.

(3) Test the coin counter action for quarter play in the same manner described in (2). The detent spring should be resting in the fourth, fifth, sixth or seventh detent for 3, 4, 5, or 6 plays, as desired.

#### m. Test Requirements, Electrical.

(1) Set the coin switch in the "Off" position and the key switch open.

(2) Set the mechanism in the "at rest" position and the service switch "On", and manually turn the "coupling, insulator, and spring assembly", in a clockwise direction, as viewed from the motor end, until the rotor contacts completes a circuit to the motor, which will tend to drive the coupling in the opposite direction. This action must occur when the long contact arm is still on the "at rest" patch of the contact plate.

(3) Turn the service switch "off" and manually turn the "coupling, insulator, and spring assembly" counter-clockwise, as viewed from the motor end, until the cam follower of the "arm, hub, and roller assembly" is on the highest point of the "button latch cam". Turn the service switch on. The motor must drive the contact arm on to the "make selection" patch, and the "button latch cam" to the "make selection" position.

(4) Turn the service switch "off". Set the long contact arm in the blank space between the "at rest" and "make selection" patches. Turn the service switch "on". Power must drive the long contact arm on to the "make selection" patch.

(5) With the mechanism in the "make selection" position, turn the service switch "off" and turn the cam and shaft assembly clockwise, as viewed from the motor end, until stopped against the high point of the button latch cam. Turn the service switch "on". The long arm contact must still be on the "make selection" patch.

(6) With the power still on, advance the long arm contact along the "make selection" patch in its normal direction. Before the contact leaves the "make selection" patch, the motor must start and drive the mechanism through one cycle to the "at rest" position.

NOTE: The timing factor is determined by fixture assembly in production.

Failure to perform as described above may indicate bent contact arms, bent drive pin or electrical failure.

## 6. MAINTENANCE

For trouble free operation of this equipment, "preventive service" or well organized maintenance is recommended.

(1) Cams, linkage, detent and cancel teeth of the coin counter wheel, and gear teeth should be lubricated with Houghton Absorbed Oil, Type L-3. Motor bearings, cam shaft bearings, and various pivot points should be kept clean and lightly oiled with S.A.E. No. 10.

(2) For cleaning of the glass window and the chromium finish, soap and water or recognized glass cleaners are recommended.



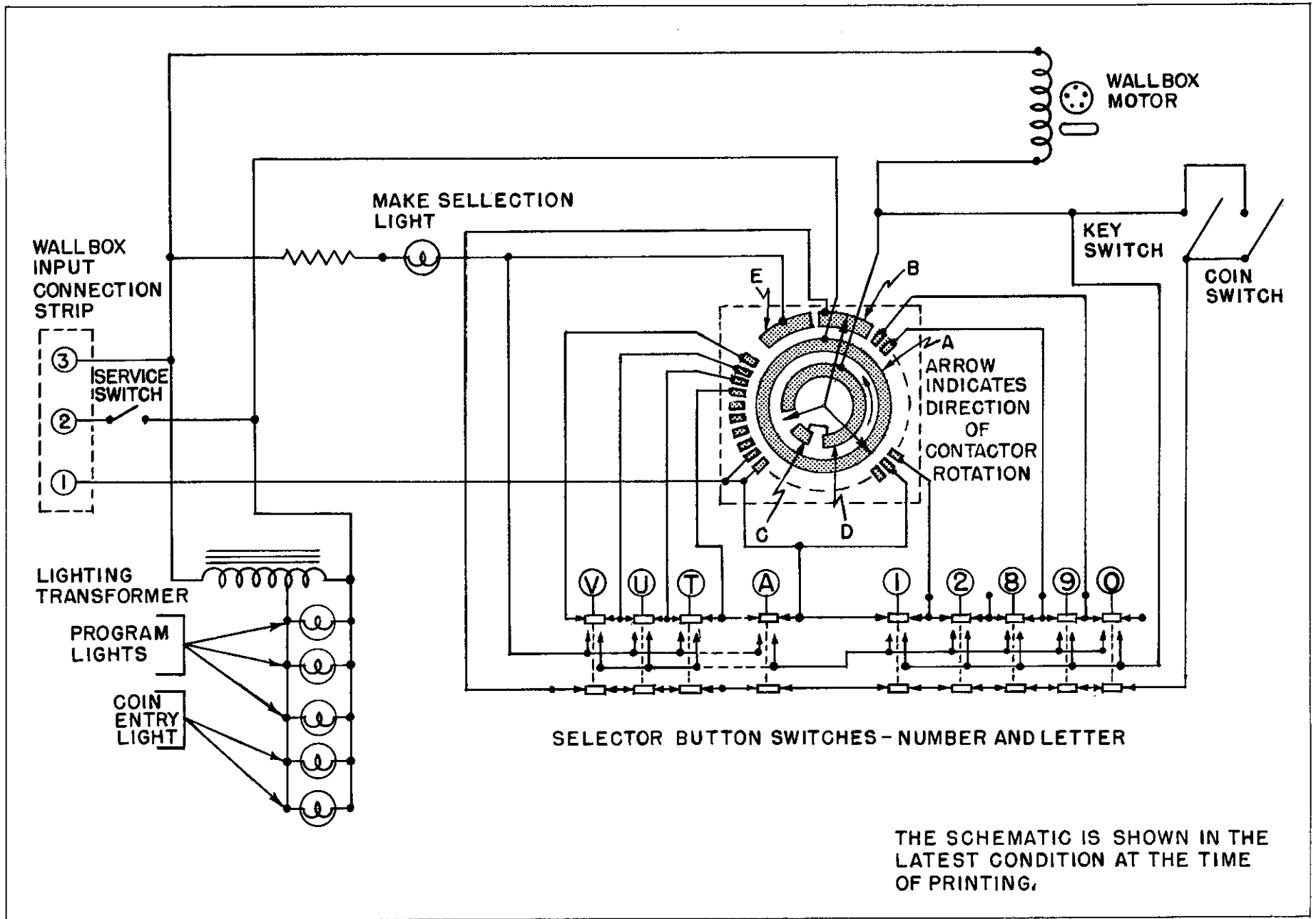


Fig. 22. SCHEMATIC WIRING DIAGRAM - 5210 WALL BOX



e. Other components of the stepper are mounted on the under side of the junction box as shown in Figure 24. The 500 Mfd. timing capacitor (Item 2), the 100 Mfd. timing capacitor (Item 1), the 0.5 Mfd. filter capacitor (Item 3) and several other smaller capacitors combine with the various stepper circuits.

f. The fuse post (Item 5) for the 0.8 Amp. fuse and the socket (Item 6) for the 3 Amp. Fustat are also mounted under the junction box. A pulse relay (Item 4) functions to reproduce the wall box pulses at the pulse magnets with a minimum of contact arcing at the wall box.

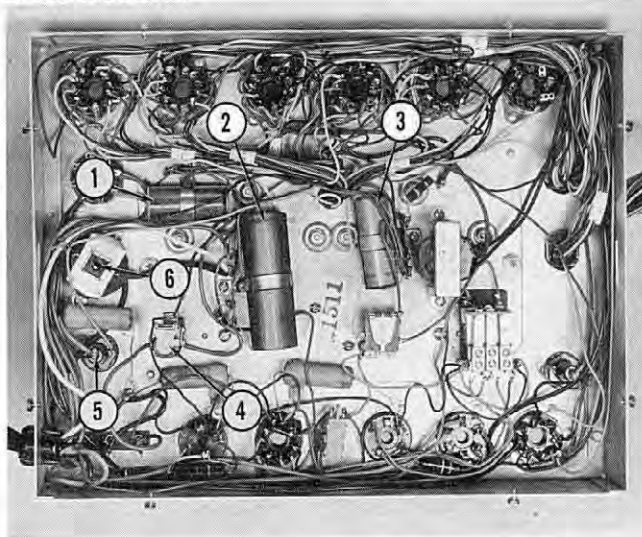


Fig. 24. STEPPER COMPONENTS

1. Capacitor, 100 Mfd.	73862
2. Capacitor, 500 Mfd.	71816
3. Capacitor, 0.5 Mfd.	73099-140
4. Relay, Pulse	65752
5. Fuse Post	51485
6. Socket, Fustat	61857

## 2. OPERATION

Both of the stepping units (Fig. 25) function in the same electrical and mechanical manner.

a. The step magnet (Item 9) pulls the armature (Item 7) down, actuating the driving pawl (Item 1) and closing the pulse switch (Item 10). As the driving pawl engages the ratchet wheel (Item 4) the stepper contact arm (Item 8) is advanced. Due to closing of the contacts of the pulse switch, the release relay (Item 2) will be energized and the holding dog (Item 3) engaged with the ratchet wheel to hold the advanced contact blade for succeeding selection pulses.

b. The timing relay (Item 10, Fig. 23) and the release relay will hold their charge for a short period after their coil circuits have been opened. This delayed action permits rapid release and re-energizing of the step magnet to advance the stepper arm as desired.

c. The transfer relay, shown at Item 9, Figure 23, shifts the wall box pulse circuit from the letter stepping unit to the number stepping group to provide for selection of the proper number group.

d. The 500 Mfd. capacitor, shown at Item 2, Figure 24, provides current for holding the letter release relay until the number group has been selected and their associated "common contacts" (Items 6 and 7) pass current to the selected number group relay and the selected letter latch coil of that particular number group. The rotary contact arms function as an integral part of the ratchet wheel and shaft assembly. These arms are retracted to their original positions by torsion springs when the release relays are de-energized and the holding dogs (Item 3, Fig. 25) released from the ratchet wheels.

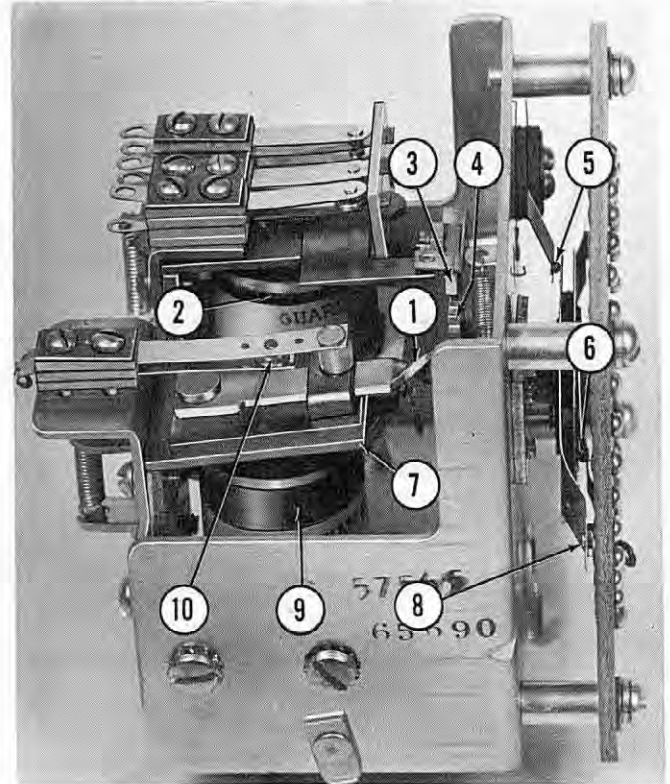


Fig. 25. STEPPING UNIT

	65690
1. Driving Pawl, Part of	60997
2. Release Relay	65690-5
3. Holding Dog	61005-A
4. Ratchet Wheel	61005
5. Common Contact, Even	
6. Common Contact, Odd	
7. Armature, Step Magnet	60997
8. Contact Arm Assembly	65690-2
9. Step Magnet (Coil Only)	61900
10. Pulse Switch	63326

e. The following electrical sequence schematic diagrams are provided for detailed description of stepping operations and as a guide to electrical continuity and voltage checks to aid service personnel in locating mal-functions:

Phase 1, Fig. 26 to Phase 9, Fig. 34



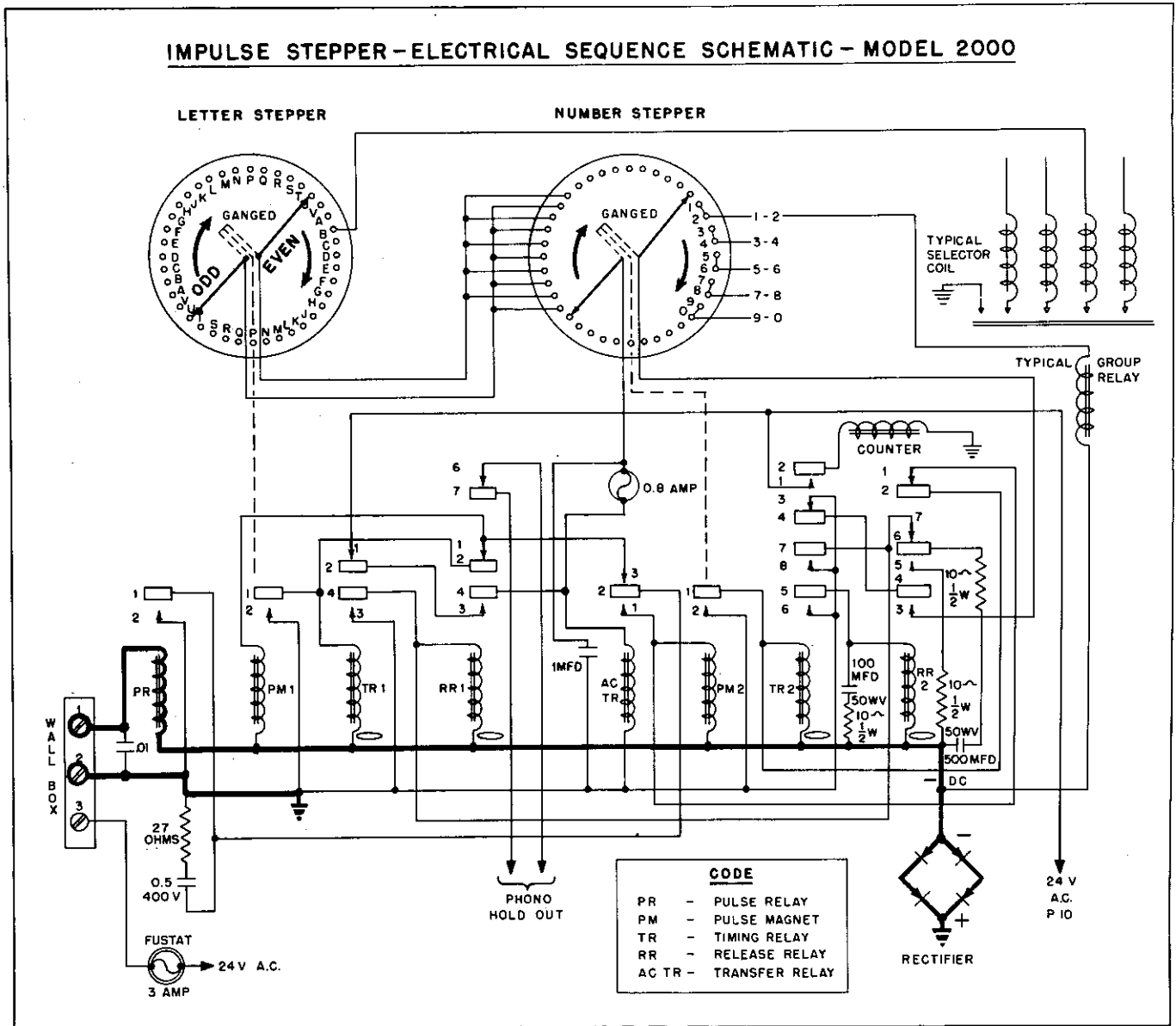


Fig. 26. PHASE 1 - LETTER PULSES

The letter pulse contacts from the wall box will establish a series of pulses of long enough duration, to completely energize the relay components of the letter stepping unit. The first phase is represented by the heavy line shown from the 28V. negative side of the rectifier, through the coil of the pulse relay to the wall box terminal No. 1. Successive circuits will

be made, by the wall box contactor, to terminal No. 2, which completes the circuit to positive ground. The pulse relay is thus actuated as many times as the wall box contactor completes and opens this circuit. The pulse relay functions to transmit operating pulses to the stepper units, with minimum power loss, by the closing of its contacts 2 and 1.

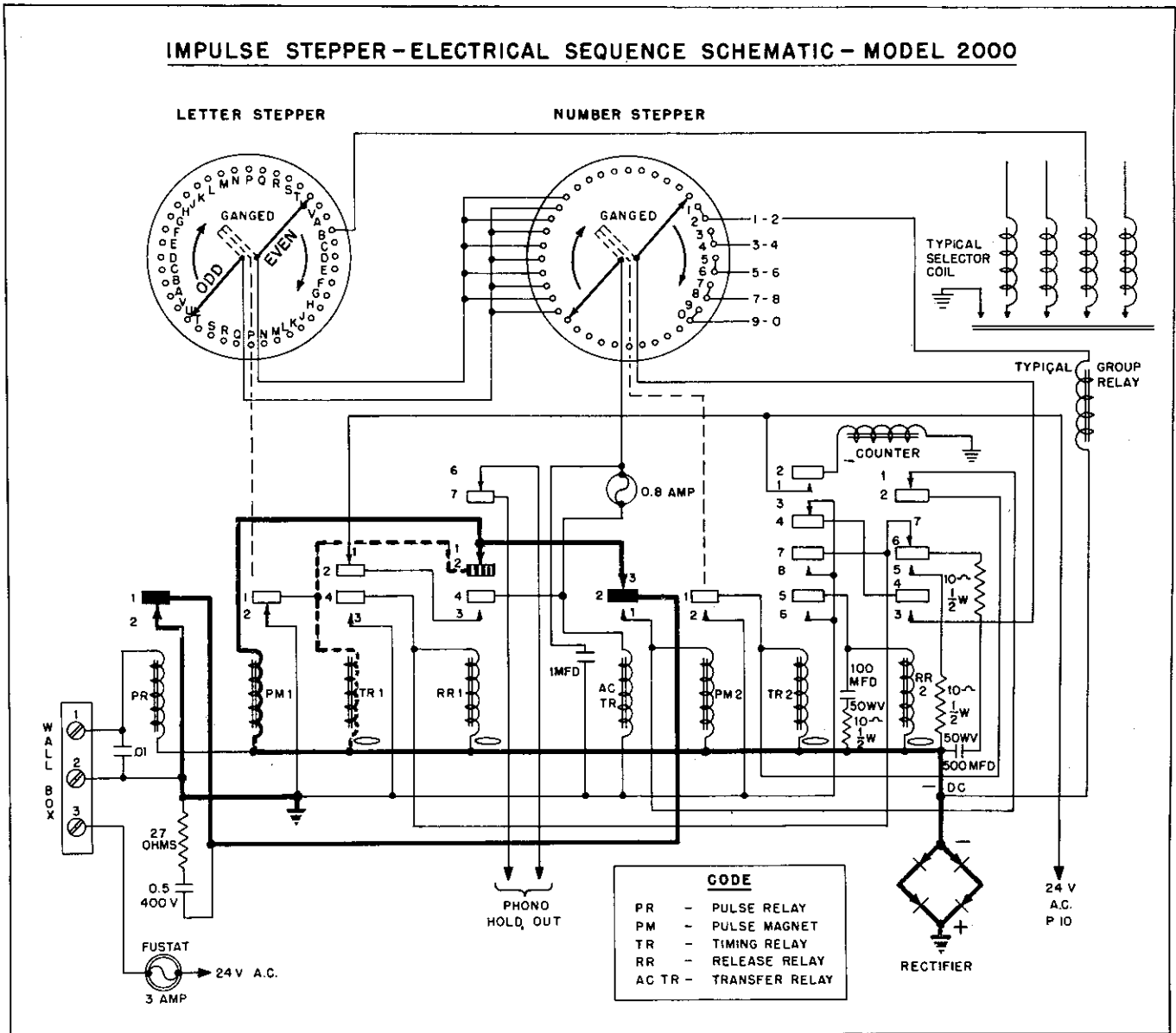


Fig. 27. PHASE 2 - PULSE MAGNET FUNCTION

When contacts 2 and 1 of the pulse relay close, a circuit, as shown in heavy line, is completed from negative 28V. D.C. through the coil of the pulse magnet, contacts 3 and 2 of the transfer relay and contacts 1 and 2 of the pulse relay to common positive ground. The pulse magnet is thus energized. Con-

currently, a circuit shown in dotted line is completed from the negative side of the 28V. D.C. rectifier, through the coil of timing relay No. 1, contacts 2 and 1 of the release relay, contacts 3 and 2 of the transfer relay, and contacts 1 and 2 of the pulse relay to common ground and the positive side of the rectifier.

IMPULSE STEPPER - ELECTRICAL SEQUENCE SCHEMATIC - MODEL 2000

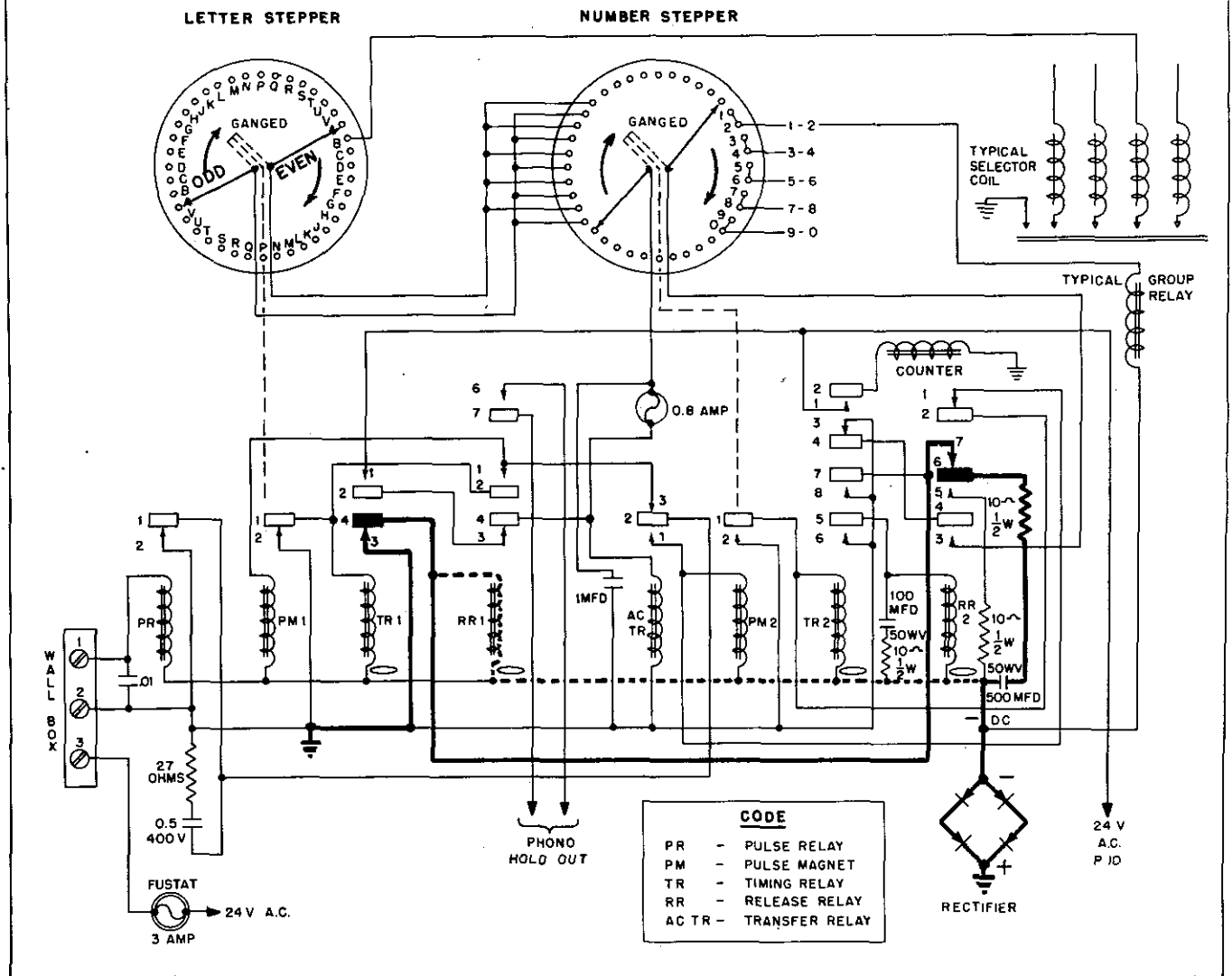


Fig. 28. PHASE 3 - NO. 1 TIMING RELAY AND RELEASE RELAY FUNCTIONS

a. When timing relay No. 1 is energized, its contacts 1 and 2 open, and contacts 3 and 4 close. The opening of contacts 1 and 2 isolates the 24V. A.C. circuit to be used later for operation of the transfer relay and the A.C. selector coil. Contacts 3 and 4 complete a D.C. circuit as shown in heavy line from negative 28V. D.C. at the rectifier through the 500 Mfd. capacitor, the 10 Ohm resistor, contacts 6 and 7 of release relay No. 2, and contacts 4 and 3 of timing relay No. 1 to common ground and the positive side of the rectifier. Concurrently, a 28V. D.C. circuit shown in dotted line is completed from the 28V. D.C. negative side of the rectifier, through the coil of release relay No. 1, and contacts 4 and 3 of timing relay No. 1 to common ground and the positive side of the rectifier. Release relay No. 1 is thus energized

and provided with 500 Mfd. as a D.C. power supply, to keep it energized during the transfer from letter to number stepping phases.

b. When release relay number 1 is energized, its contacts 1 and 2, and also 6 and 7 are opened. Contacts 3 and 4 close. Contacts 1 and 2, having performed their function in Phase 2, isolate that section of the circuit until all phases of the sequence are completed as shown in Phase 1. The latching action of release relay No. 1 will prevent the letter stepping arm from return action until after all pulses from the wall box have been completed. The stepping arm will therefore advance to the selected letter contact and remain there until the selection pulse has been completed.



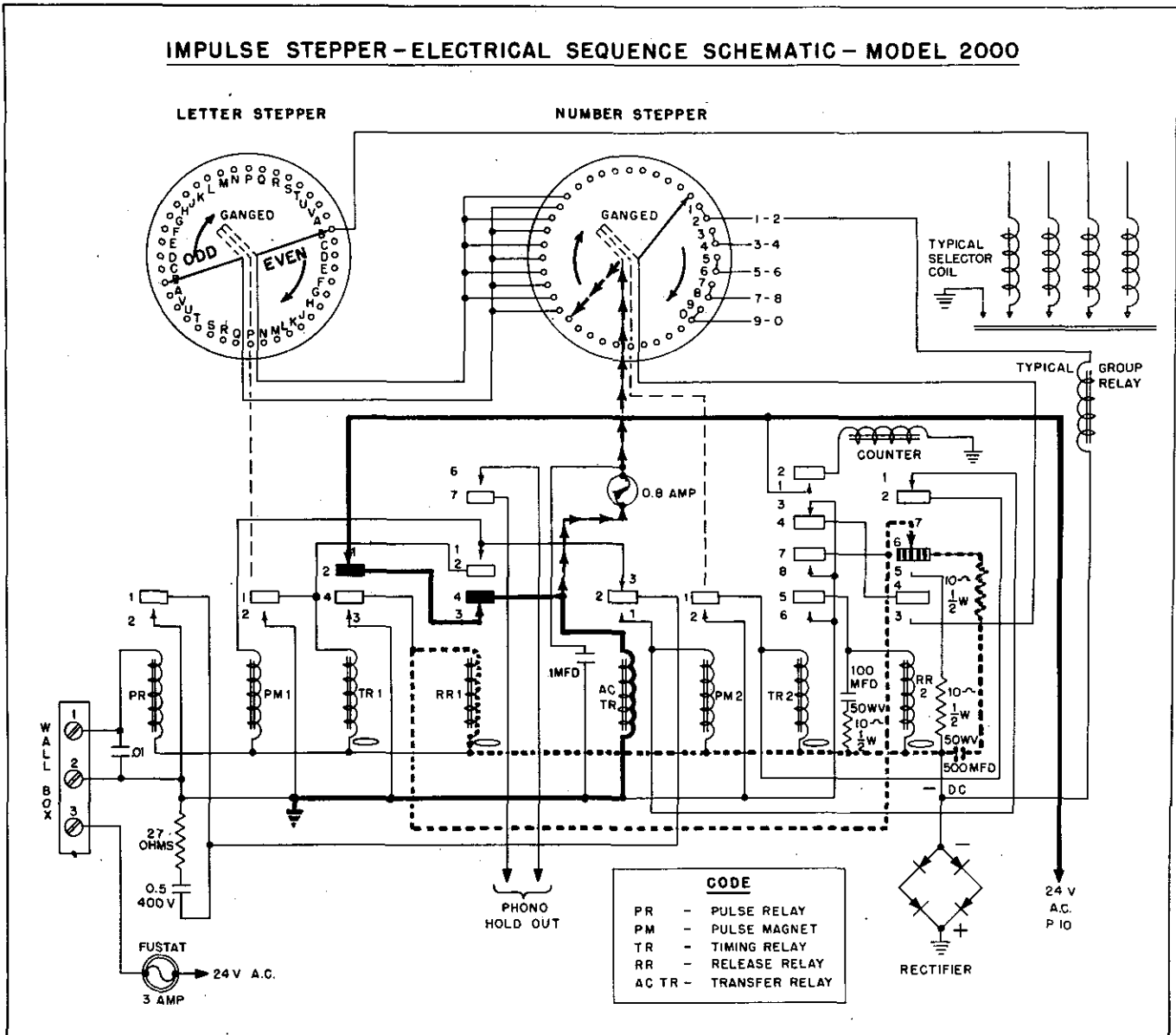


Fig. 29. PHASE 4 - RELEASE RELAY

c. Contacts 3 and 4 prepare a circuit, from the 24V. A.C. power supply. Contacts 6 and 7 function to isolate the phonograph selector circuit during stepper

operation. Concurrently, an A.C. circuit is prepared for the selected latch coil as shown by arrows at the number stepping unit.

DELAYED ACTION - TIMING RELAY NO. 1

a. As the wall box contactor leaves the letter contacts, there will be a time interval of sufficient duration for timing relay No. 1 to become de-energized. Its normally closed contacts 1 and 2 will therefore close to complete the circuit to the A.C. transfer relay, as shown in heavyline, from the 24V. A.C. power supply, through contacts 1 and 2 of timing relay

lay No. 1, contacts 3 and 4 of release relay No. 1, and the coil of the A.C. transfer relay, to common ground and the 24V. A.C. source of power.

b. The second series of pulses from the wall box will therefore become number pulses by virtue of transfer relay functions.

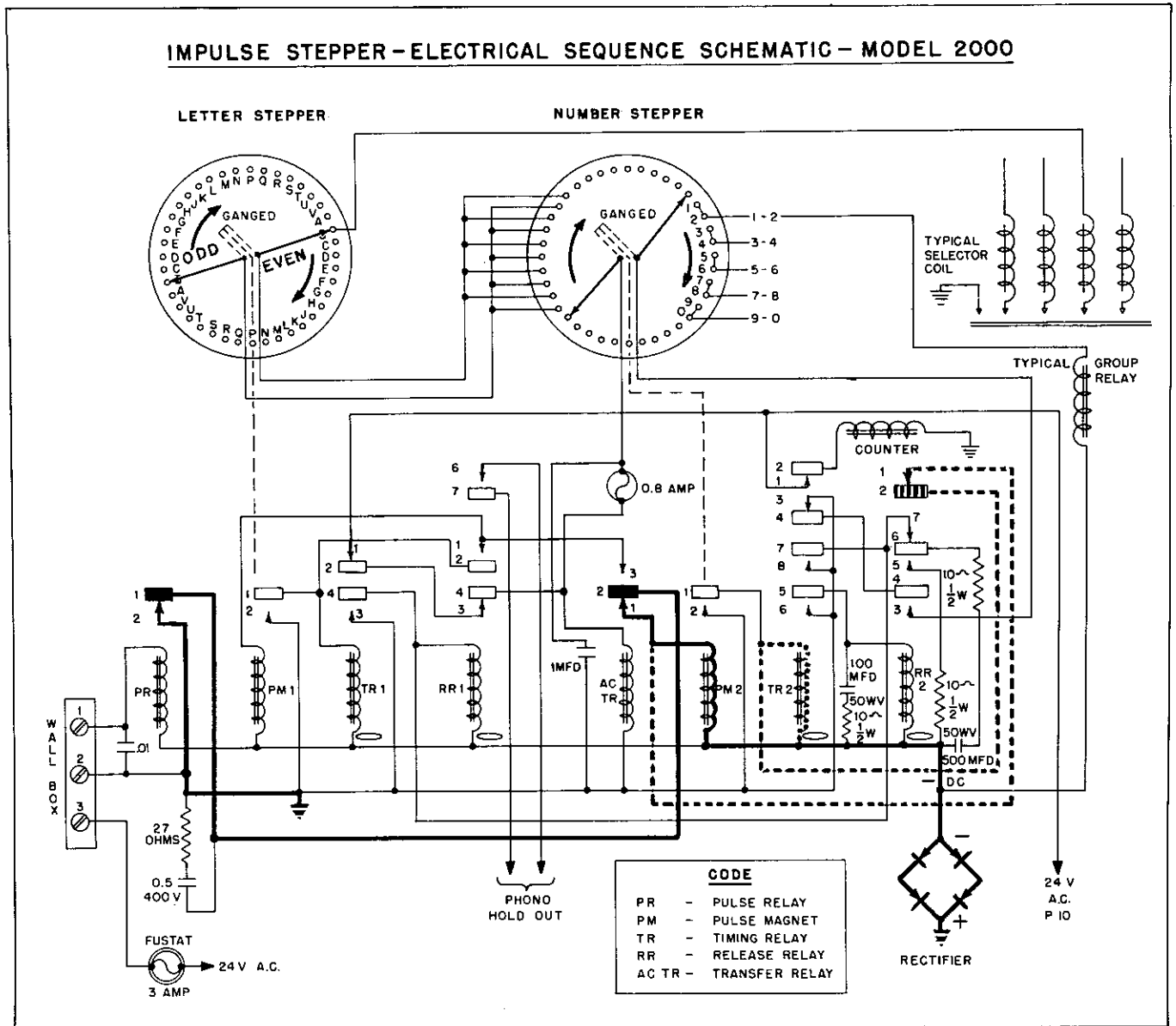


Fig. 30. PHASE 5 - TRANSFER RELAY FUNCTIONS

a. As the transfer relay is energized, its contacts 2 and 3 open, and contacts 1 and 2 close. Additional wall box pulses will thus be transmitted to the number stepping unit while the letter stepping unit is held in its selected position by release relay No. 1 and the current supplied by the 500 Mfd. capacitor.

b. With the transfer relay held in the condition described, wall box pulses will produce mechanical action of the number stepping unit as described for the letter stepping unit in Phase one, two, and three.

When contacts 1 and 2 of the pulse relay close, a 28V. D.C. circuit is completed to pulse magnet No. 2 and to timing relay No. 2 as follows:

c. Pulse Magnet.

As shown in heavy line from the negative side of the 28V. D.C. rectifier, through the coil of pulse magnet No. 2, contacts 1 and 2 of the transfer relay, and contacts 1 and 2 of the pulse relay to common ground and the positive side of the 28V. D.C. rectifier.

d. Timing relay No. 2 will be energized concurrently, as shown in dotted line from the negative side of the 28V. D.C. rectifier, through the coil of timing relay No. 2, normally closed contacts 2 and 1 of release relay No. 2, contacts 1 and 2 of the transfer relay, and contacts 1 and 2 of the pulse relay to common ground and the positive side of the 28V. D.C. rectifier.

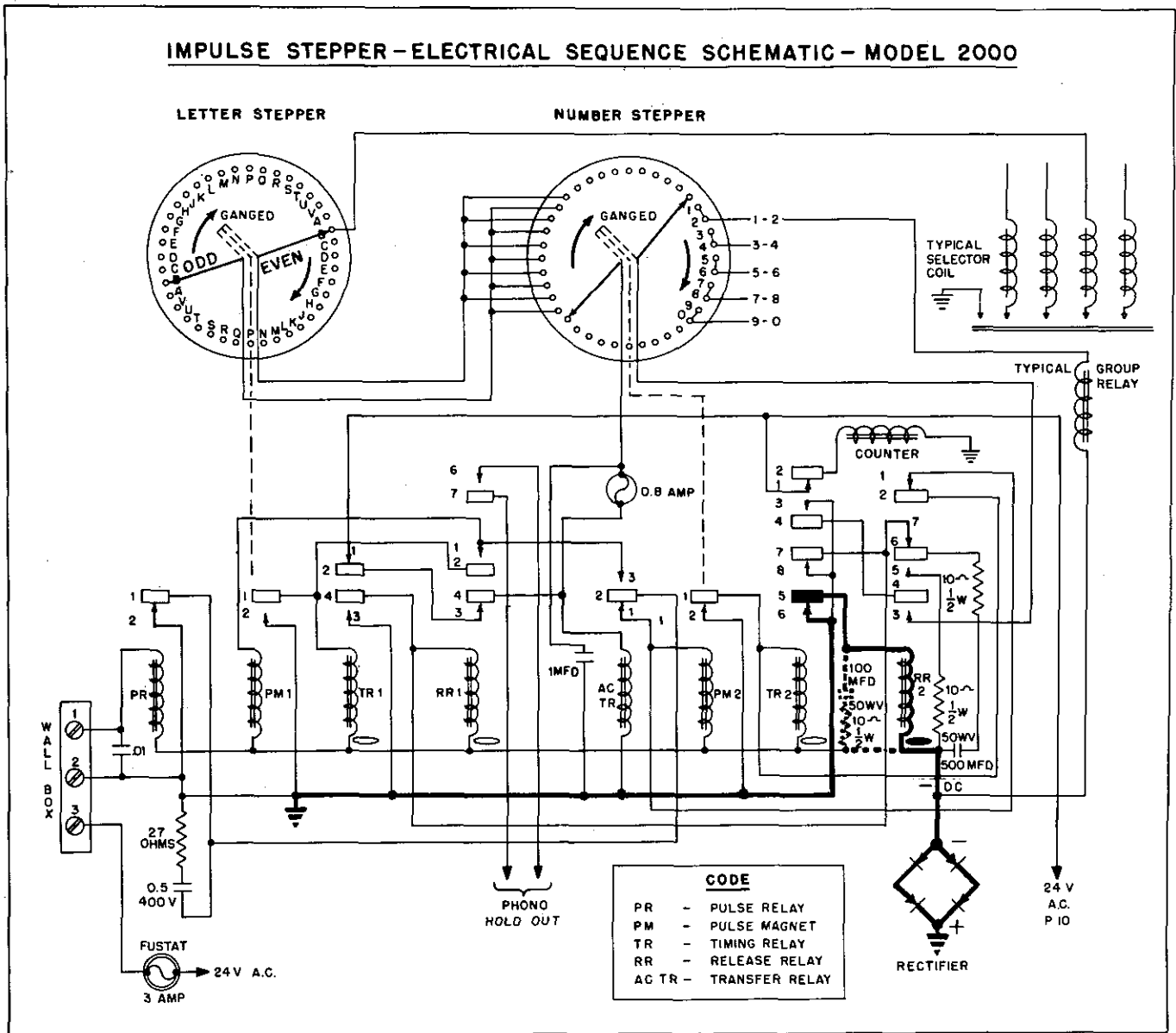


Fig. 31. PHASE 6 - NO. 2 TIMING RELAY FUNCTIONS

a. When pulse magnet No. 2 and timing relay No. 2 are energized, contacts 1 and 2 of pulse magnet No. 2 will close, contacts 2 and 1, contacts 7 and 8, and contacts 5 and 6 of timing relay No. 2 will close, also contacts 4 and 3 of timing relay No. 2 will open.

b. The closing of contacts 5 and 6 of timing relay No. 2, completes a circuit to release relay No. 2, shown in heavy line from the negative side of the 28V. D.C. rectifier, through the coil of release relay No. 2, and contacts 5 and 6 of timing relay No. 2 to

common ground and the positive side of the 28V. D.C. rectifier. At the same time a circuit is completed to the 100 Mfd. capacitor, as shown in dotted line from the negative side of the 28V. D.C. rectifier, through the 10 Ohm resistor and the 100 Mfd. capacitor, and contacts 5 and 6 of timing relay No. 2 to common ground and the positive side of the 28V. D.C. rectifier.

c. The opening of contacts 3 and 4 isolates a circuit for the selection pulse, which will occur later.



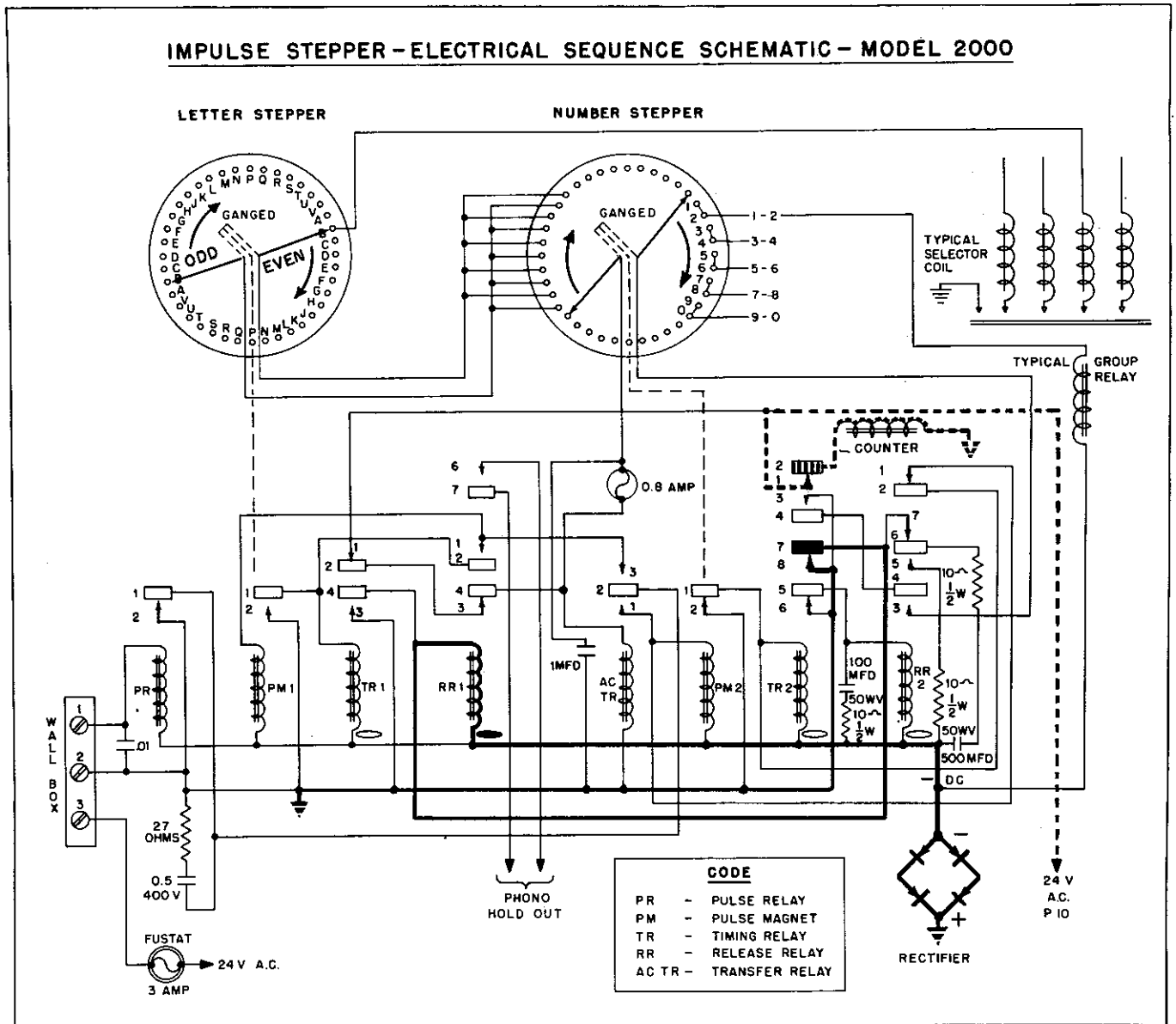


Fig. 32. PHASE 7 - NO. 2 TIMING RELAY FUNCTIONS (CONTINUED)

a. Closing of contacts 7 and 8 of timing relay No. 2, completes a circuit to release relay No. 1 as shown in heavy line from the negative side of the 28V. D.C. rectifier, through the coil of release relay No. 1, and contacts 7 and 8 of timing relay No. 2 to common ground and the positive side of the 28V. D.C. rectifier.

b. When contacts 1 and 2, of timing relay No. 2, close, a 24V. A.C. circuit is completed to the electric counter, shown in dotted line, from the 24V. A.C. source of power, through contacts 1 and 2 of timing relay No. 2, and the coil of the electric counter to common ground and the source of power.

IMPULSE STEPPER - ELECTRICAL SEQUENCE SCHEMATIC - MODEL 2000

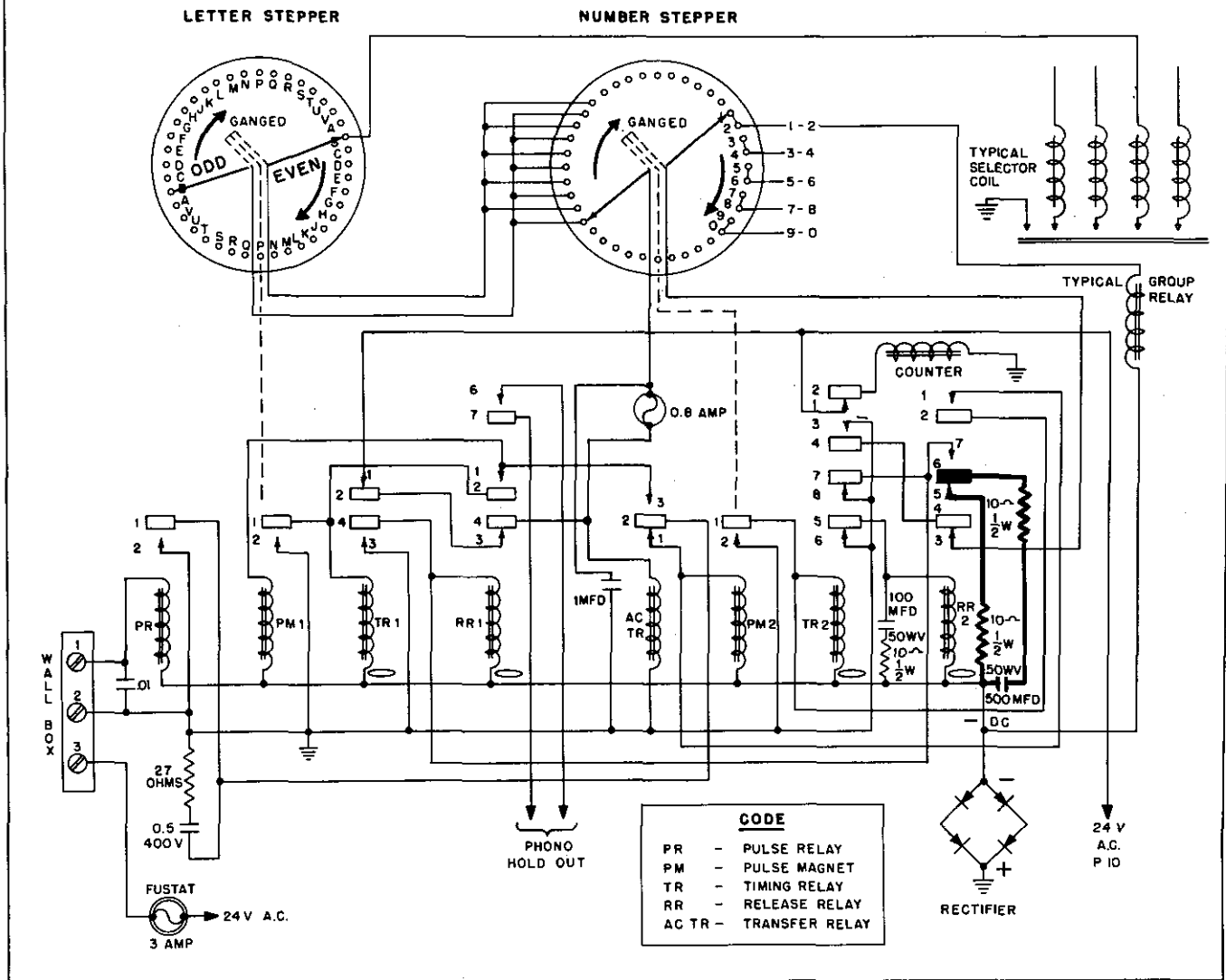


Fig. 33. PHASE 8 - NO. 2 RELEASE RELAY FUNCTIONS

When release relay No. 2 was energized, as shown in Phase 6, its contacts 1 and 2, and contacts 6 and 7 open. Also its contacts 5 and 6 and contacts 3 and 4 will close.

a. The latching action of release relay No. 2, like release relay No. 1, will prevent the number stepping arm from return action until the after pulses from the wall box have stopped. The stepping arm will therefore advance to the selected number.

b. Contacts 1 and 2, having performed their function in Phase 5, isolate that section of the circuit until all phases of the sequence are completed, as shown in Phase 1.

c. The opening of contacts 6 and 7, serves to isolate the charging circuit, shown in Phases 3 and 4, for the 500 Mfd. capacitor.

d. The closing of contacts 5 and 6 serves to discharge the 500 Mfd. capacitor as shown in heavy line between the negative side of the capacitor, through a 10 Ohm resistor, contacts 5 and 6 of release relay No. 2, and a second 10 Ohm resistor to the positive side of the 500 Mfd. capacitor. Thus, release relay No. 1 is now being held energized only by contacts 7 and 8 of timing relay No. 2 as shown in Phase 7.

e. The closing of contacts 3 and 4 of release relay No. 2 prepares the D.C. selection circuit.

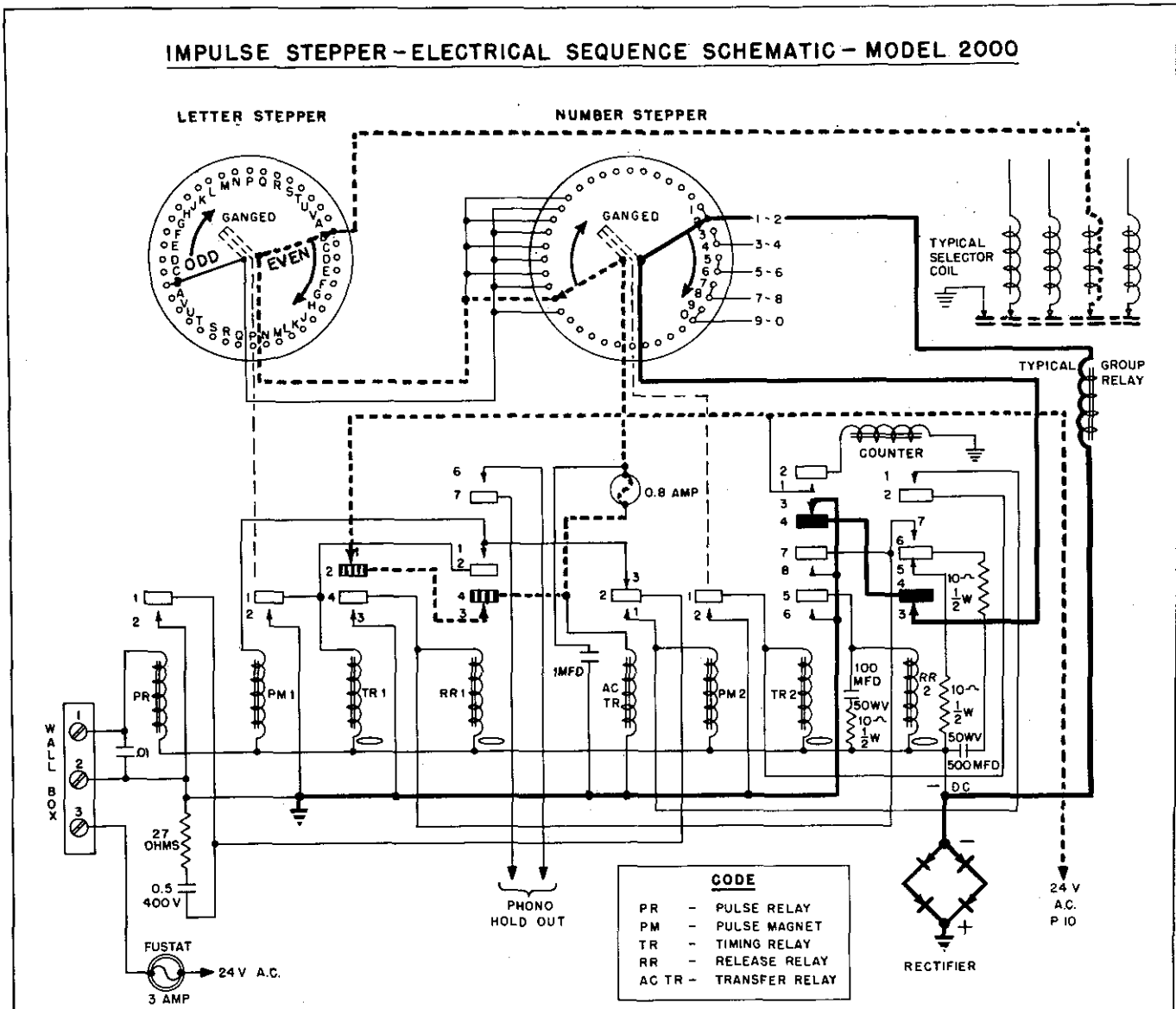


Fig. 34. PHASE 9 - SELECTION PULSES - 28 VOLT D.C. AND 24 VOLT A.C.

a. When the wall box pulses stop, timing relay No. 2, release relay No. 1, and release relay No. 2, will drop out consecutively in accordance with their shorting rings which provide the correct delayed action.

b. As timing relay No. 2 is released, due to lack of pulses from the wall box, its contacts 3 and 4 close completing a 28V. D.C. circuit to the selected group relay as shown in heavy line from the negative side of the 28V. D.C. rectifier, through the coil of the selected group relay, the contact plate and stepper arm of the number stepping unit, contacts 3 and 4 of release relay No. 2, and contacts 4 and 3 of timing relay No. 2, to common ground and the positive side of the 28V. D.C. rectifier.

c. The energizing of the selected group relay closes contacts of that particular relay and completes the A.C. selection circuit started in Phase 3 and completed in Phase 9, as shown in dotted line from the 24V. A.C. source of power supply, through contacts

1 and 2 of timing relay No. 1, the 0.8 Amp. protective fuse, the contact plate and arm of the number stepping unit, the contact plate and arm of the letter stepping unit, and the selected latch coil to common ground and the 24V. A.C. power supply.

d. As soon as the delayed action of its shorting rings has dissipated, release relay No. 1 will open A.C. circuit and then release the letter stepping arm to retract to its "at rest" position.

e. Due to the 100 Mfd. capacitor, release relay No. 2 will hold slightly longer before releasing the number stepping arm and the group relay.

f. At this time, the stepper will be ready for another selection and any selection which may have been made, on the phonograph during the wall box and stepper sequence, will have been completed by the closing of contacts 6 and 7 of release relay No. 1 when it dropped out.



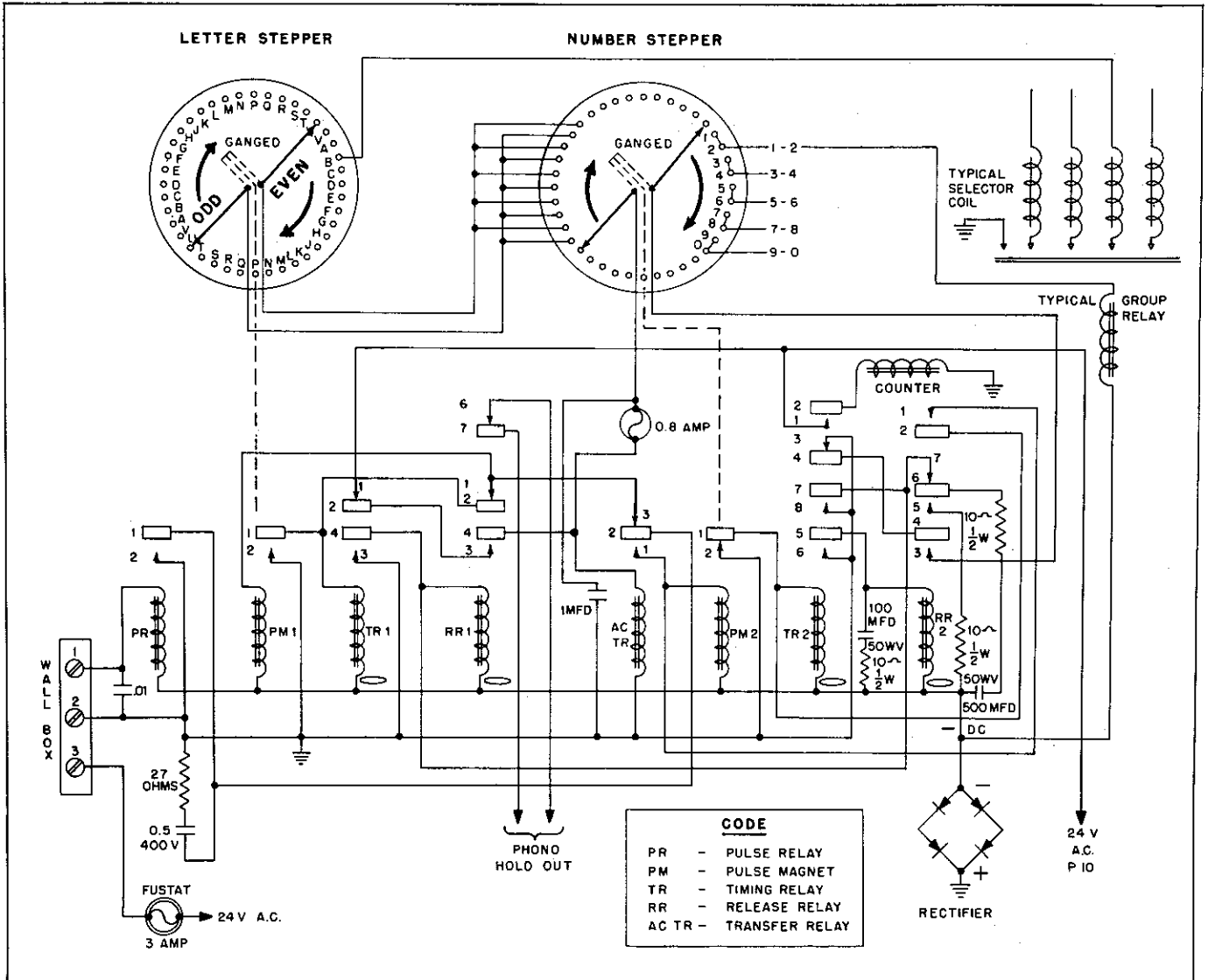


Fig. 35. MODEL 2000 STEPPER - FUNCTIONAL SCHEMATIC

### 3. ADJUSTMENTS

#### a. Ratchet. (Fig. 36)

The ratchet torsion spring tension (Item 9) should be adjusted at the anchor holes (Item 4) in the mounting bracket to provide retracting tension of the contact arm assembly (Item 8). With the contact arm at its zero position, and the contact plate (Item 6) moved away from the contact arms to prevent friction, the tension, as measured at the tip of the arm, should be minimum 55 grams. End play in the shaft assembly should be .002" to .010" for complete freedom of stepper operation. The forming of the ends of the torsion spring should provide minimum friction against the ratchet wheel to insure freedom of operation.

#### b. Holding Dog. (Fig. 36)

The holding dog (Item 2) is also operated by a torsion spring (Item 3) whose tension may be adjusted by means of anchor holes in the mounting bracket as described in "a". Adjustment may be made as follows:

(1) To insure complete freedom of action, the holding dog should be free on its shaft and the end play adjusted by means of the elastic stop nut (Item 1) to produce minimum .005" end play of the dog on its mounting shaft.

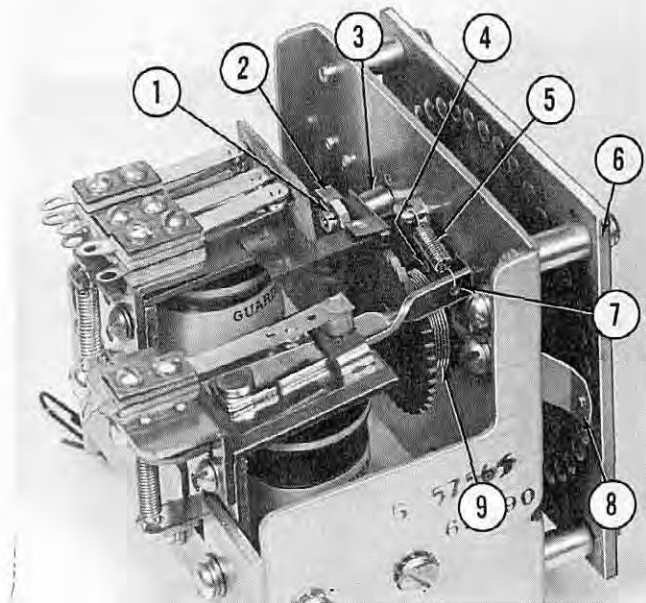


Fig. 36. RATCHET AND PAWL ADJUSTMENTS

- |                                  |         |
|----------------------------------|---------|
| 1. Elastic Stop Nut              |         |
| 2. Holding Dog                   | 61005-A |
| 3. Torsion Spring, Holding Dog   | 61001   |
| 4. Anchor Holes                  |         |
| 5. Return Spring, Driving Pawl   | 61003   |
| 6. Contact Plate Assembly        | 61006   |
| 7. Driving Pawl, Part of         | 60997   |
| 8. Contact Arm Assembly          | 65690-2 |
| 9. Torsion Spring, Ratchet Wheel | 65690-4 |

(2) With the torsion spring hooked under the tail end of the dog, tighten the torsion and hook the other end of the spring in one of the anchor holes that will provide pressure of the holding dog on the ratchet wheel. As measured at the tip of the dog, this pressure should be 15 grams. When these torsion springs are accurately adjusted, dropping of the ratchet a distance of one tooth against the holding dog will not cause any bounce or skipping of tooth.

#### c. Driving Pawl. (Fig. 37)

(1) With the step magnet armature depressed slightly to provide clearance between the top of the driving pawl and shutter (Item 3, Fig. 37), the tension of the driving pawl return spring (Item 2) should be sufficient to create driving pawl lateral pressure of minimum 15 grams as measured on the driving pawl at a point where it engages the ratchet wheel.

(2) When the step magnet is actuated, the knife edge of the driving pawl should strike the "Vee" at the base of all teeth except "Zero" (at rest) position within .015". At "Zero" position, the pawl should clear the outer surface of the next tooth (Item 4) by .010" minimum, and at all other positions by not less than .005".

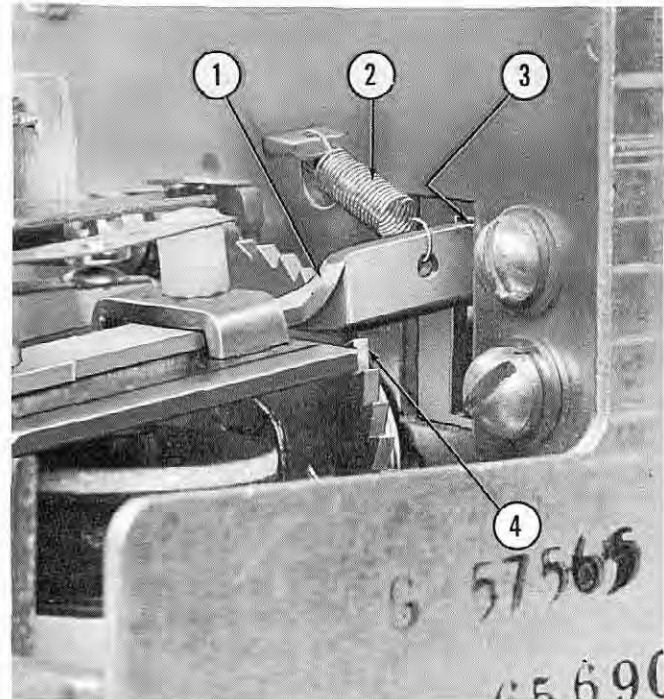


Fig. 37. SHUTTER ADJUSTMENT

- |                                       |       |
|---------------------------------------|-------|
| 1. Point of Measurement, Driving Pawl |       |
| 2. Driving Pawl Return Spring         | 61003 |
| 3. Inside Upper Edge of Shutter       |       |
| 4. Outer Surface of First Tooth       |       |

#### d. Shutter Settings. (Fig. 38)

The requirement described in c, (2) should be provided by the proper setting of the shutter (Item 3) which follows:

(1) With the step magnet energized and the armature depressed, as shown in Figure 38, the clearance (Item 4) between the vertical side of the driving pawl and the inside vertical edge of the shutter should be set to .002" to .008". The two adjusting screws (Item 5) are provided for shutter settings.

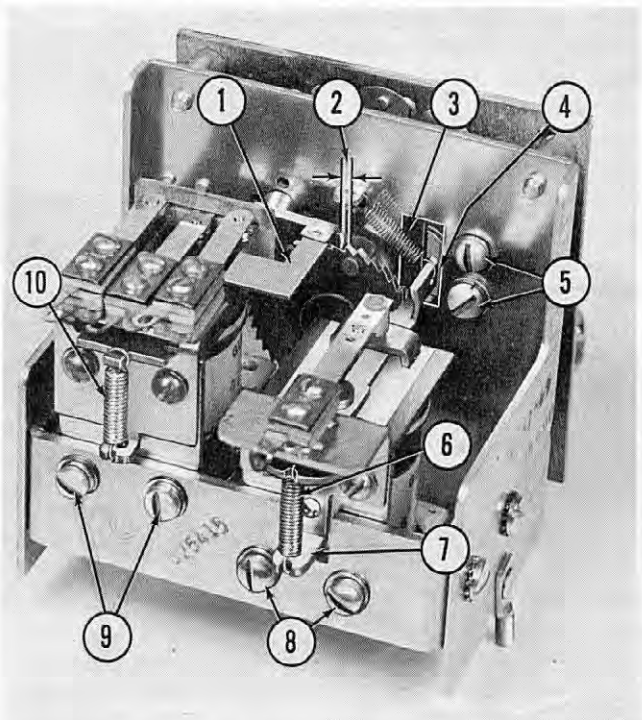


Fig. 38. SHUTTER ADJUSTMENTS

1. Armature Extension
2. Over-travel .005"
3. Shutter
4. Clearance .002" to .008"
5. Shutter Adjusting Screws
6. Armature Return Spring, Step Magnet
7. Anchor Post, Return Spring
8. Adjusting Screws, Step Magnet
9. Adjusting Screws, Release Relay
10. Release Relay Return Spring

(2) Concurrent with the setting described in (1), the inside upper edge of the shutter, (See Item 3, Fig. 37) will be set to provide clearance, between the knife edge of the driving pawl and the ratchet wheel teeth, of minimum .005". This clearance applies to all teeth when the driving pawl is retracted.

e. Step Magnet Adjustment. (Fig. 38)

(1) The tension of the armature return spring (Item 6) as measured at the front end of the armature should be minimum 50 grams. This tension may be changed by setting of the return spring anchor post (Item 7).

(2) Two adjusting screws (Item 8) are provided for up and down adjustment of the step magnet. With the step magnet and the release relay in the energized position, as shown in Figure 38, adjust the step magnet up or down as required to provide over-

travel of the ratchet teeth beyond the tip of the holding dog. The amount of overtravel as shown at Item 2, should be minimum .005". Re-check this adjustment at all teeth, except zero, of the ratchet wheel after tightening the adjusting screws. The above adjustments, if accurately made, will provide approximately .100" armature gap as measured between the core of the step magnet and the residual plate of the armature.

f. Contact Arm Settings. (Fig. 39)

(1) The pressure of the contact arms (Item 6, Fig. 39) against the contacts on the contact plate assembly should be minimum 15 grams as measured at the tip of the contact arm. If proper pressure does not exist, it is recommended that the arm assembly be replaced. The moving contact should center with any one of the plate contacts within .020" as indicated at Item 4. Provisions for this adjustment are at the four mounting screws shown at Item 3.

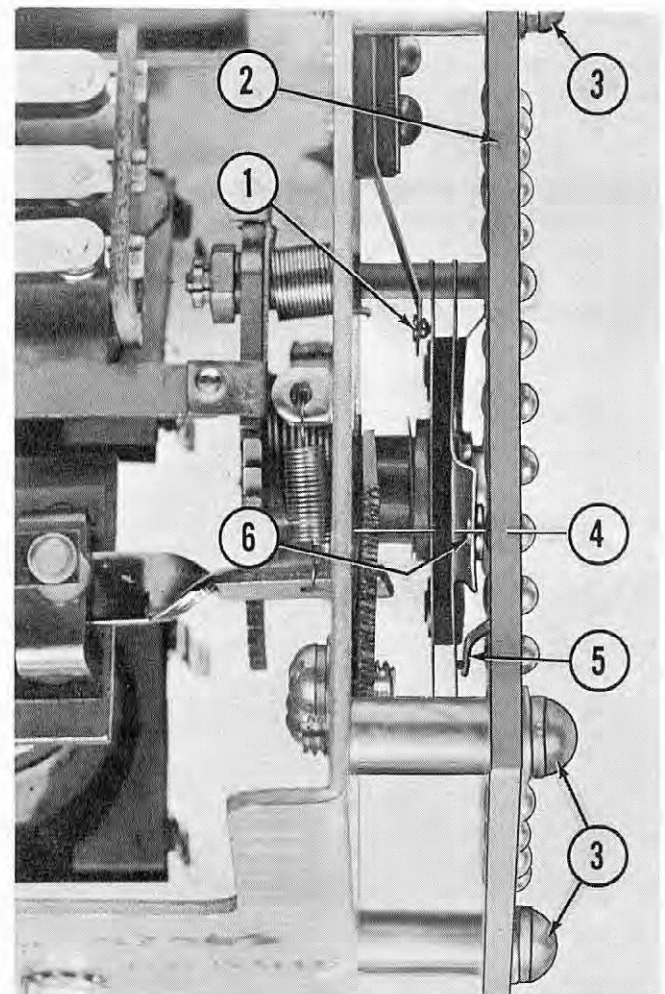


Fig. 39. CONTACT ARM SETTINGS

- |   |         |
|---|---------|
| 1. Common Contact                           |         |
| 2. Contact Plate Assembly                   | 61006   |
| 3. Adjusting Screws, Contact Plate Assembly |         |
| 4. Center Line, Contacts                    |         |
| 5. Common Contact with Bracer               |         |
| 6. Contact Arm                              | 65690-2 |



(2) Contact pressure of the common contacts (Items 1 and 5) against their respective commutators should be minimum 20 grams. Any change in setting should be made with the contact plate removed. The arms may then be shaped to provide the required pressure. The common contact that is mounted in the contact plate assembly consists of a contact blade and a bracer blade. The bracer blade should be set so that its tip clears the contact blade by .025".

g. Release Relay Adjustments. (Fig. 38)

(1) The return spring tension (Item 10) should be set to provide approximately 125 grams upward pressure as measured at the armature extension (Item 1). Without aid from the holding dog torsion spring, the 125 grams should just move the armature from its stop. The tension must be sufficient to raise the holding dog from any of the ratchet teeth.

(2) When actuated, the tip of the armature extension must clear the holding dog by minimum .010" at its closest point of operation.

(3) Vertical adjustment of the release relay may be made by loosening the two screws (Item 9). The vertical adjustment should raise holding dog to a point that will clear the ratchet teeth .010" minimum when the relay is released and the ratchet wheel is retracting to zero position.

h. Relays.

(1) Normally open contacts should be dressed to provide a minimum gap of .005" and minimum contact overtravel of .010".

(2) Normally closed contacts should be dressed to provide a minimum gap of .015", when open, and a minimum contact overtravel of .006" when closed.

#### 4. INSTALLATION

Complete instructions for installations of Wall Boxes is furnished with each wall box.

#### 5. STEPPER MAINTENANCE

a. Lubricate all moving parts with a light application of S.A.E. No. 10 oil.

b. The contact discs should be sparingly lubricated with white petroleum jelly, using a clean, lint free, cloth which has been impregnated with the lubricant. All excess lubricant must be removed.

c. All switch and relay contacts should be kept clean with carbon tetrachloride and a clean dry cloth. Burnishing of contacts with a strip of heavy bond paper is recommended. Abrasives should be avoided.



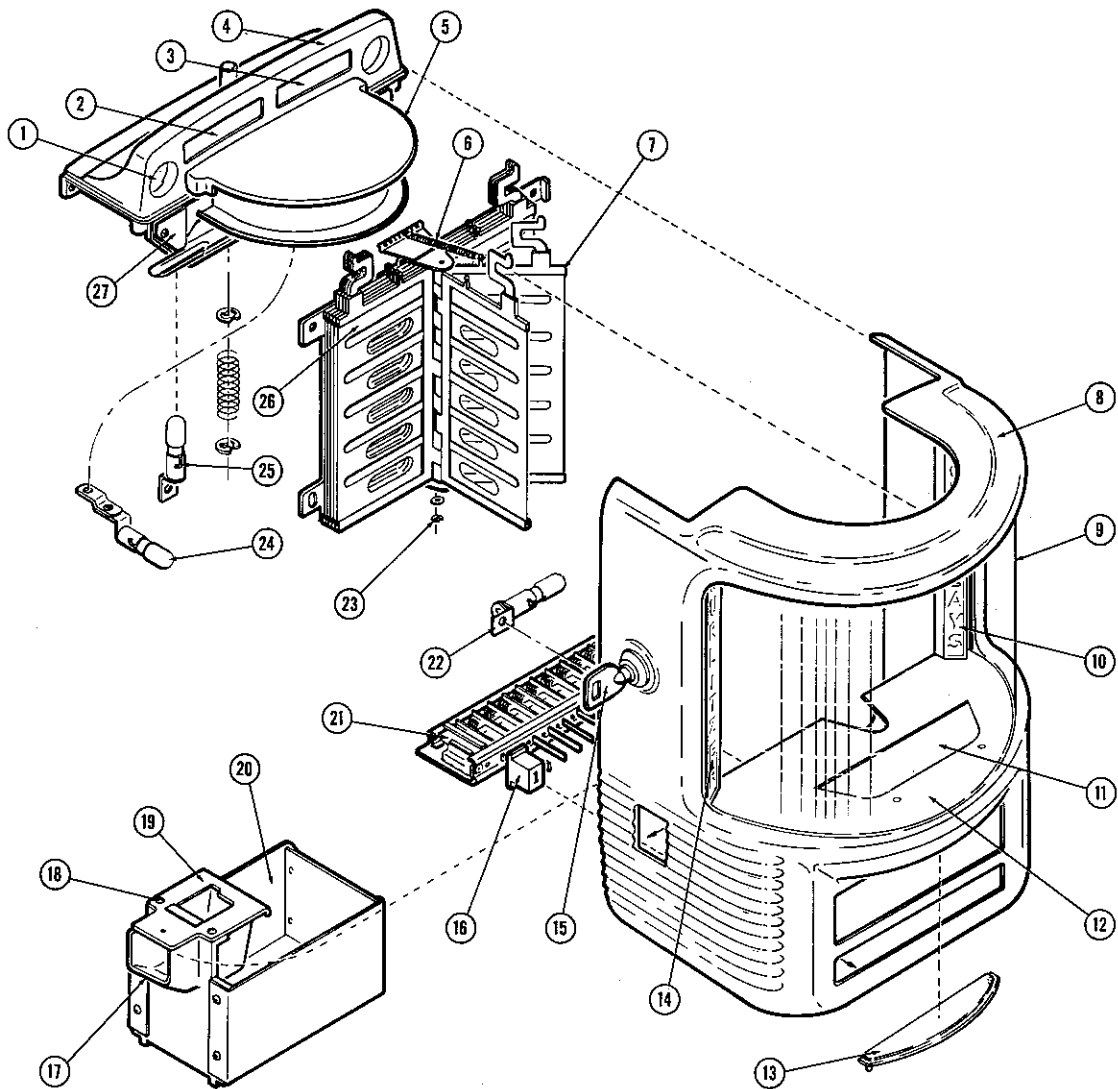


Fig. 40. COVER AND PROGRAM HOLDER GROUPS

1. Coin Entry, Plastic - Coins	67160	14. Pilaster, Wurlitzer	67110
2. Coin Plate		15. Lock and Key	67083
3 Plays Quarter, 1 Play 10 Cents	67161	16. Selector Buttons	
4 Plays Quarter, 1 Play 10 Cents	67988	A to V	66083 to 66102
5 Plays Quarter, 2 Plays Dime, 1 Play Nickel	68319	1 to 0	66103 to 66112
3. Escutcheon Plate, Select	67162	17. Coin Return Cup Casting	67403
Instruction Plate, Blank, Clear	67642	18. Screw, 6-32 x 3-16, Cash Box	73533-21
Instruction Plate, Blank, Red	67643	19. Bracket and Guide, Cash Box	67831
4. Top Casting, Rear	67015	20. Cash Box, Sub Assembly	67227
5. Top Casting, Front	67011	21. Selector Switch	
6. Spring, Return, Program Page	67744	Numbers	66895
7. Program Holder and Page Assembly		Letters	66896
(A0-K0)	67204	22. Lamp #44	24689
(L8-V8)	67205	23. Retaining Ring	73724-9
(A1-K1, L3-V3)	67206	24. Lamp #44	24689
(A2-K2, L1-V1)	67207	25. Lamp #47	45985
(A3-K3, L5-V5)	67208	26. Classification Slip	
(A4-K4, L2-V2)	67209	Rock and Roll	68011
(A5-K5, L7-V7)	67210	Popular	68012
(A6-K6, L4-V4)	67211	Rhythm and Blues	68013
(A7-K7, L9-V9)	67212	Specialties	68014
(A8-K8, L6-V6)	67213	Polkas	68015
(A9-K9, L0-V0)	67214	Folk Tunes	68016
8. Cover Casting	67442	Classical	68017
9. Glass, Program, Curved	67010	Jazz	68018
10. Pilaster, 200 Plays	67178	Old Favorites	68019
11. Instruction Glass	67217	Western	68020
12. Decorative Shelf, Less Glass	67447	Top Tunes	68397
13. Window, Plastic	67221	27. Coin Chute	67075

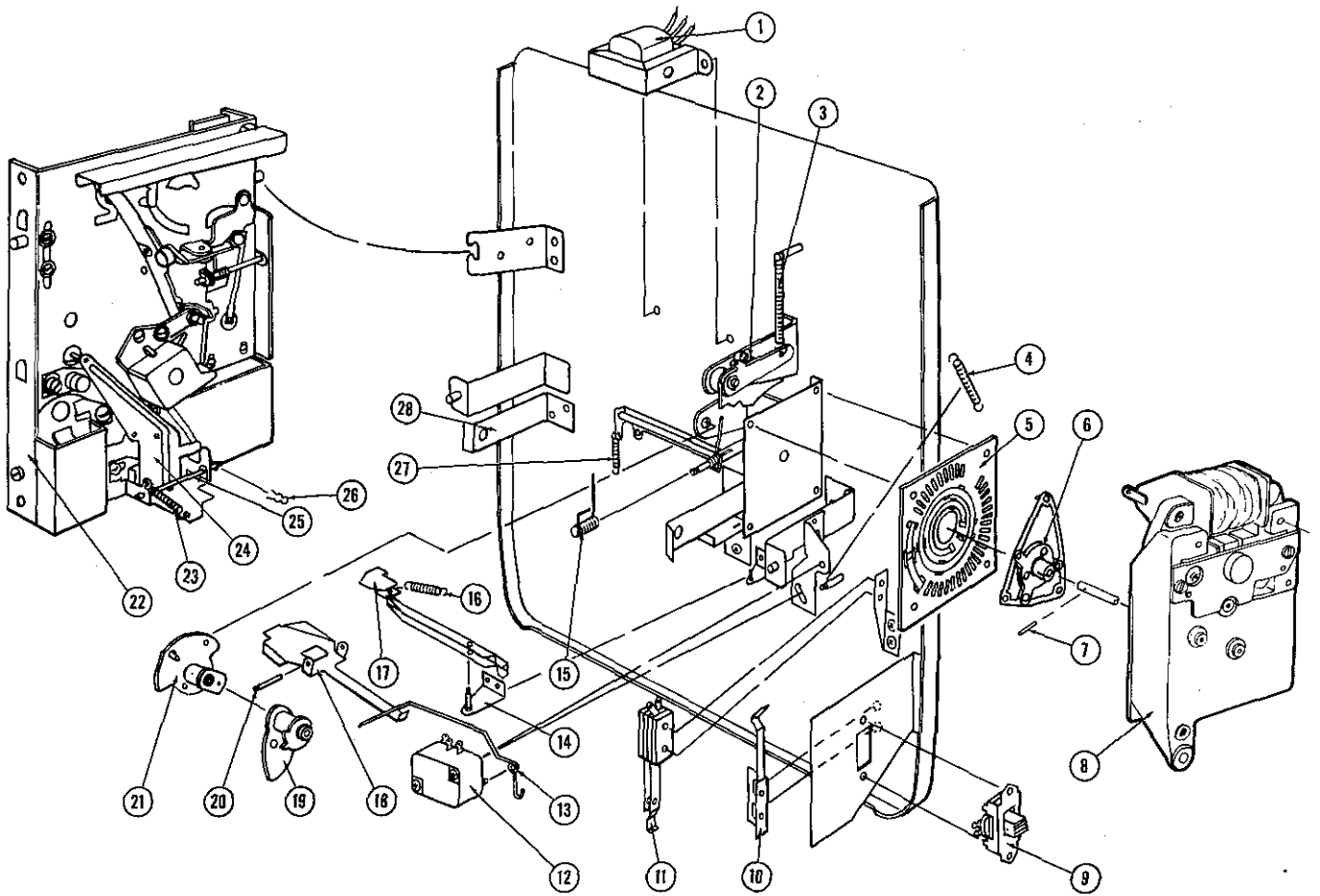


Fig. 41. MECHANICAL GROUP

1. Transformer	67234	15. Spring Torsion	61993
2. Spring, Yielding	58777	16. Spring, Coin Selector Lever	62145
3. Spring, Return	58776	17. Coin Selector Lever	62146
4. Spring, Cancel	58781	18. Coin Paddle	62143
5. Contact Plate Assembly	67426	19. Cam Hub, Counter Wheel and Lock	67182
6. Coupling and Spring	62718	20. Shaft	62756
7. Roll Pin	73782-4	21. Cam Hub and Pin, Lifter Lever	67240
8. Motor	67261	22. Slug Rejector	67321
9. Switch, Slider	61649	23. Spring	50151
10. Detent Spring and Bracket	58310	24. Arm and Pin	58327
11. Switch, Key	67176	25. Pin, Coin Reject	49823
12. Micro Switch	57851	26. Spring Clip	46191
13. Arm, Micro Switch	62164	27. Spring, Return	58780
14. Bracket and Pin Assembly	62140	28. Mounting Bracket	58220



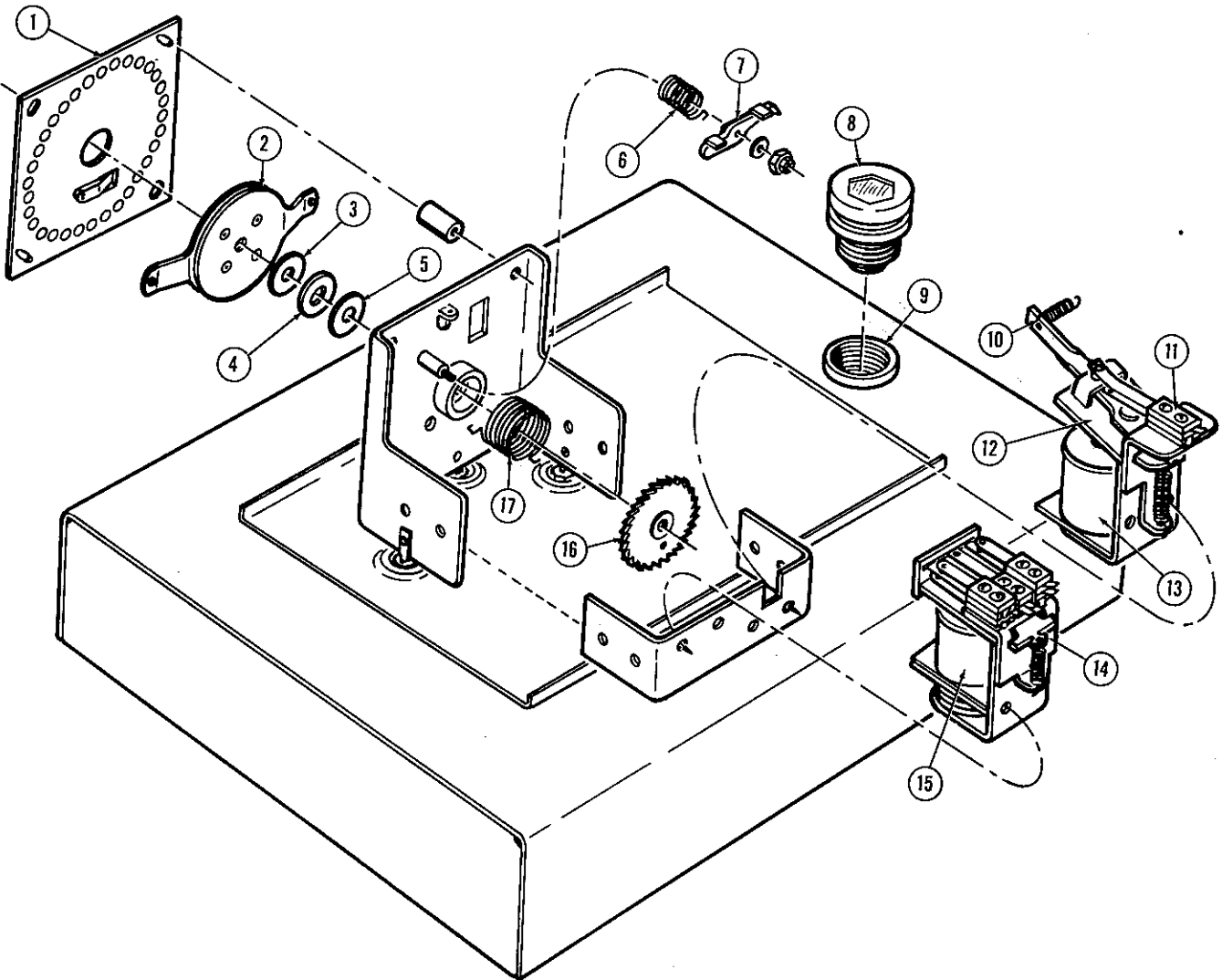


Fig. 42. MODEL 2000 STEPPING UNIT

- |                            |         |                                 |         |
|----------------------------|---------|---------------------------------|---------|
| 1. Contact Plate Assembly  | 61006   | 10. Spring, Pawl Return         | 61003   |
| 2. Contact Finger Assembly | 65690-2 | 11. Pulse Switch                | 63326   |
| 3. Washer                  | 61004-C | 12. Armature Assembly           | 60997   |
| 4. Washer, Slotted         | 61004-B | 13. Field Assembly, Pulse Coil  | 61900   |
| 5. Washer, Tylon           | 61004-A | 14. Relay, Release Latch        | 65690-5 |
| 6. Spring, Dog             | 61001   | 15. Coil, Release Latch Relay   | 65690-1 |
| 7. Dog                     | 61005-A | 16. Ratchet Assembly            | 61005   |
| 8. Fustat, 3 Amp.          | 61858   | 17. Spring, Arm Return, Torston | 65690-4 |
| 9. Fuse Socket             | 61857   |                                 |         |

NOTE: For components not shown on this page refer to Page 26, Fig. 42, Model 2000 Phonograph Manual.

# NUMERICAL PARTS LIST

Part No.	Description	Page No.	Part No.	Description	Page No.
14524	Fusetron, .8 Amp or Bussman M.D.L. . . . . .	14	62143	Coin Paddle . . . . .	7, 11, 30
24689	Lamp #44 . . . . .	29	62144	Coin Paddle and Bracket Assembly . . . . .	5, 6, 9
45985	Lamp #47 . . . . .	29	62145	Spring, Coin Selector . . . . .	30
46191	Spring Clip, Slug Rejector . . . . .	30	62146	Coin Feeler and Lever Assembly. . . . .	4, 5, 6, 8, 9, 30
49823	Pin, Slug Rejector . . . . .	30	62147	Lever, Coin Selector . . . . .	4
50151	Spring, Slug Rejector . . . . .	30	62148	Coin Feeler . . . . .	4, 5, 6
51485	Opt. 45352 Fuse Post . . . . .	15	62164	Coin Switch Actuating Arm. . . . .	7, 30
57851	Micro Switch . . . . .	30	62165	Stop Bracket, Slug Rejector . . . . .	9
58180	Shoulder Screw, Cancel Slide . . . . .	10	62718	Coupling, Insulator, and Spring Assembly (Contactor) . . . . .	4, 30
58189	Yielding Link . . . . .	5	62725	Mounting Bracket, Upper R.H., Slug Rejector . . . . .	3
58203	Coin Counter Disc, 10¢ . . . . .	5, 9	62750	Cam, Selector Switch Lock . . . . .	4, 11
58205	Coin Counter Disc, 25¢ . . . . .	6, 9	62752	Cancel Cam . . . . .	4
58206	Trip Plate (Key Switch) . . . . .	6, 8, 9	62756	Shaft, Coin Switch Actuator . . . . .	7, 30
58210	Bracket, Cancel Slide . . . . .	8, 10	62830	Lock Assembly, Slug Rejector . . . . .	4
58220	Mounting Bracket, Slug Rejector (Lower) . . . . .	3, 30	63326	Pulse Switch . . . . .	15, 31
58269	Coin Counter Cam . . . . .	4	65690	Stepping Unit, Letters or Numbers . . . . .	14, 15
58290	Mounting Bracket, Upper L.H. . . . .	3	65690-1	Field Coil, Release Relay . . . . .	31
58299	Coin Counter Wheel and Plate Assembly . . . . .	4, 8, 9	65690-2	Contact Arm Assembly . . . . .	15, 26, 27, 31
58306	Counter Disc Assembly . . . . .	8	65690-4	Spring, Arm Return, Torsion . . . . .	26, 31
58310	Spring and Mounting Bracket Assembly, Detent . . . . .	5, 8, 30	65690-5	Relay, Release Latch . . . . .	14, 15, 31
58320	Coin Selector Lifter Lever . . . . .	4	65747	Relay, Timing, Number Unit . . . . .	14
58327	Arm and Pin Assembly . . . . .	30	65748	Relay, Transfer . . . . .	14
58776	Spring, Coin Counter Return . . . . .	30	65749	Relay, Timing, Letter Unit . . . . .	14
58777	Yielding Spring, Coin Counter Linkage . . . . .	5, 30	65752	Relay, Pulse . . . . .	15
58780	Spring, Coin Selector Lever . . . . .	30	66083 to		
58781	Cancel Spring . . . . .	10, 30	66102	Selector Buttons (A to V) . . . . .	29
59027	Shoulder Screw, Dime Coin Counter Disc . . . . .	9	66103 to		
59367	Coin Counter Disc, 5¢ . . . . .	9	66112	Selector Buttons (1 to 0) . . . . .	29
60570	Terminal Strip for Wall Boxes . . . . .	14	66894	Latch Bar, Selector Switch . . . . .	12
60997	Armature Assembly . . . . .	15, 26, 31	66895	Selector Switch (Numbers) . . . . .	29
61001	Torsion Spring, Holding Dog . . . . .	26, 31	66896	Selector Switch (Letters) . . . . .	29
61003	Return Spring, Driving Pawl . . . . .	26, 31	67010	Glass, Program, Curved . . . . .	29
61004-A	Washer, Tylon . . . . .	31	67011	Top Casting, Front . . . . .	29
61004-B	Washer, Slotted . . . . .	31	67015	Top Casting, Rear . . . . .	29
61004-C	Washer . . . . .	31	67073	Cancel Slide . . . . .	10
61005	Ratchet Assembly . . . . .	15, 31	67075	Coin Chute . . . . .	29
61005-A	Holding Dog . . . . .	15, 26, 31	67083	Lock and Key . . . . .	29
61006	Contact Plate Assembly. . . . .	26, 31	67110	Pilaster, (Wurlitzer) . . . . .	29
61649	Service Switch, Slider, S.P.S.T. . . . .	7, 30	67160	Coin Entry Plastic . . . . .	29
61857	Socket, Fustat . . . . .	15, 31	67161	Coin Plate, 3 Plays-Quarter, 1 Play-10¢ . . . . .	29
61858	Fustat, 3 Amp. . . . .	14, 31	67162	Escutcheon Plate, Select . . . . .	29
61900	Field Assembly, Pulse Coil . . . . .	14, 15, 31	67176	Key Switch . . . . .	8, 30
61993	Torsion Spring, Coin Paddle Mounting Lever . . . . .	4, 30	67177	Key Switch and Bracket Assembly . . . . .	8
62139	Mounting Bracket, Coin Paddle . . . . .	4, 5, 7, 11	67178	Pilaster (200 Plays) . . . . .	29
62140	Bracket and Pin Assembly, Coin Feeler . . . . .	30	67182	Cam and Hub Assembly, Coin Counter . . . . .	11, 30
			67184	Main Shaft and Cam Assembly . . . . .	4
			67186	Cancel Slide and Bracket Assembly . . . . .	4

Part No.	Description	Page No.	Part No.	Description	Page No.
67204	Program Holder and Page Assembly (A0-K0) . . . . .	29	67440	Program Page Assembly . . . . .	3
67205	Program Holder and Page Assembly (L8-V8) . . . . .	29	67442	Cover Casting . . . . .	29
67206	Program Holder and Page Assembly (A1-K1, L3-V3) . . . . .	29	67447	Decorative Shelf (Less Glass) . . . . .	29
67207	Program Holder and Page Assembly (A2-K2, L1-V1) . . . . .	29	67579	Latch, Program Page Assembly . . . . .	3
67208	Program Holder and Page Assembly (A3-K3, L5-V5) . . . . .	29	67618	Pivot Arm and Pin Assembly . . . . .	11
67209	Program Holder and Page Assembly (A4-K4, L2-V2) . . . . .	29	67642	Instruction Plate, Blank, Clear . . . . .	29
67210	Program Holder and Page Assembly (A5-K5, L7-V7) . . . . .	29	67643	Instruction Plate, Blank, Red . . . . .	29
67211	Program Holder and Page Assembly (A6-K6, L4-V4) . . . . .	29	67744	Spring, Return, Program Page . . . . .	29
67212	Program Holder and Page Assembly (A7-K7, L9-V9) . . . . .	29	67831	Bracket and Guide, Cash Box . . . . .	29
67213	Program Holder and Page Assembly (A8-K8, L6-V6) . . . . .	29	67988	Coin Plate - 4 Plays Quarter, 1 Play 10 Cents . . . . .	29
67214	Program Holder and Page Assembly (A9-K9, L0-V0) . . . . .	29	68011	Classification Slip (Rock and Roll) . . . . .	29
67217	Instruction Glass . . . . .	29	68012	Classification Slip (Popular) . . . . .	29
67221	Window, Plastic . . . . .	29	68013	Classification Slip (Rhythm and Blues) . . . . .	29
67227	Cash Box, Sub Assembly . . . . .	29	68014	Classification Slip (Specialties) . . . . .	29
67234	Transformer . . . . .	30	68015	Classification Slip (Polkas) . . . . .	29
67239	Arm and Link Assembly . . . . .	5, 8	68016	Classification Slip (Folk Tunes) . . . . .	29
67240	Cam, Hub, and Pin Assembly . . . . .	4, 30	68017	Classification Slip (Classical) . . . . .	29
67261	Motor Assembly . . . . .	4, 30	68018	Classification Slip (Jazz) . . . . .	29
67321	Slug Rejector . . . . .	30	68019	Classification Slip (Old Favorites) . . . . .	29
67403	Coin Return Cup, Casting . . . . .	29	68020	Classification Slip (Western) . . . . .	29
67412	Cash Box and Coin Return Cup Assembly . . . . .	3	68319	Coin Plate, 5 Plays Quarter, 2 Plays Dime, 1 Play Nickel . . . . .	29
67424	Arm, Hub, and Roller Assembly . . . . .	3, 4, 11	68397	Classification Slip (Top Tunes) . . . . .	29
67425	Selector Switch and Bracket Assembly . . . . .	3	71816	Capacitor, 500 Mfd. . . . .	15
67426	Contact Plate Assembly . . . . .	5, 30	73099-140	Capacitor, 0.5 Mfd. Std. 400V . . . . .	15
67433	Adjusting Screw . . . . .	11	73503-29	Screw, 4-40 x 3/4" R.H. Machine . . . . .	7
67436	Lock Bar and Adjusting Screw Assembly . . . . .	3, 11	73503-31	Screw, 4-40 x 1" R.H. Machine. . . . .	7
			73533-21	Screw, 6-32 x 3/16" R.H. Sems . . . . .	29
			73533-22	Screw, 6-32 x 1/4" R.H. Sems . . . . .	8, 10
			73533-25	Screw, 6-32 x 7/16" R.H. Sems. . . . .	9
			73574-67	Screw, 6-32 x 5/16" R.H. . . . .	4, 5, 11
			73601-6	Nut, 6-32 Hex. . . . .	11
			73603-8	Nut, 10-32 Plain Hex. . . . .	11
			73724-9	Retaining Ring Truarc No. 9 . . . . .	29
			73724-12	Retaining Ring No. 12 . . . . .	7
			73782-4	Roll Pin . . . . .	30
			73862	Capacitor, Electrolytic Tubular, 100 Mfd. - 50V. . . . .	15

## NOTES