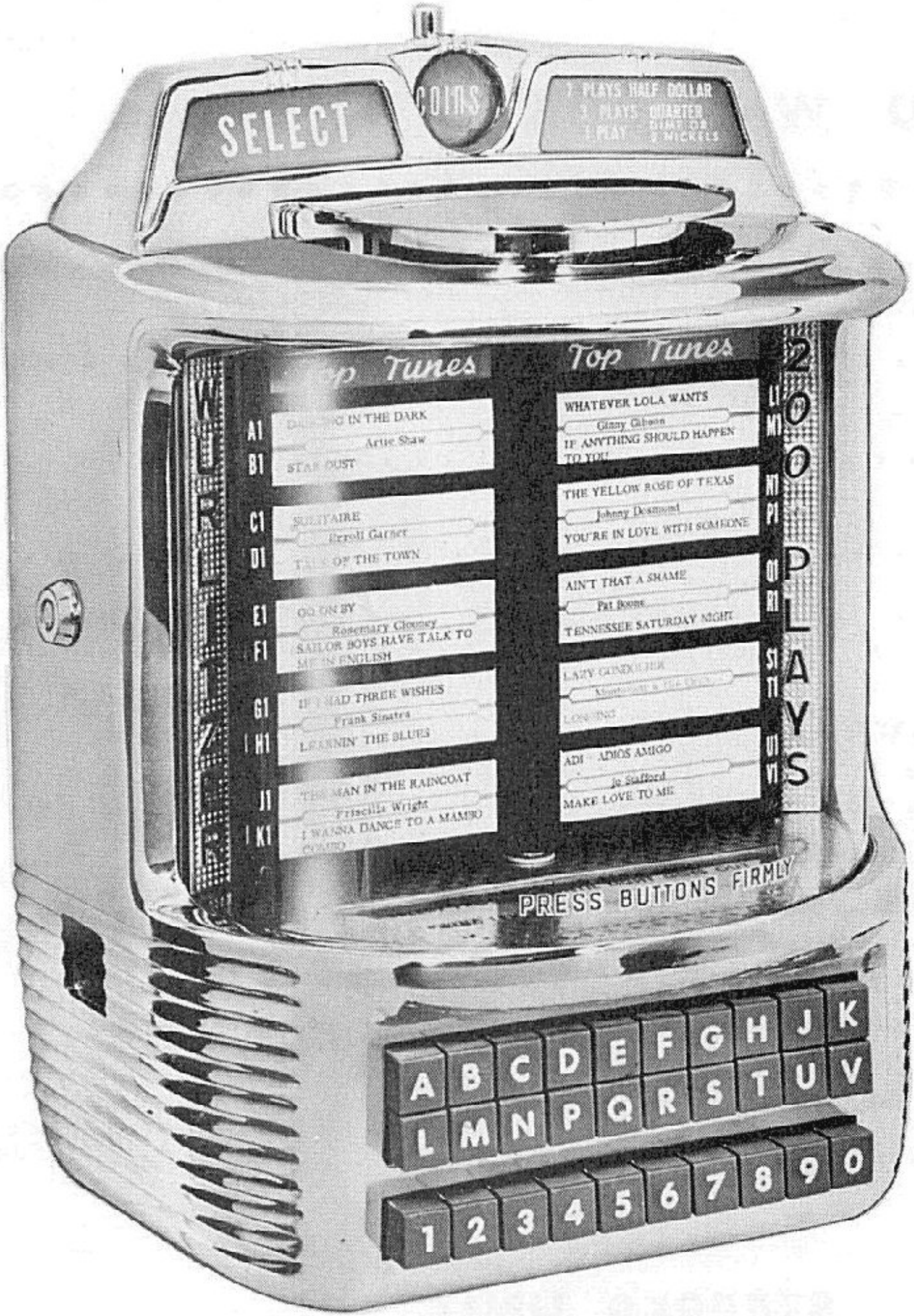
SELECT
COINS
7 PLAYS HALF DOLLAR
3 PLAYS QUARTER
1 PLAY DIME OR 2 NICKELS
Top Tunes
Top Tunes
A1
B1
Artie Shaw
C1
D1
Errol Garner
E1
F1
Rosemary Clooney
G1
H1
Frank Sinatra
J1
K1
Frisella Wright
WHATEVER LOLA WANTS
Gisny Gibson
IF ANYTHING SHOULD HAPPEN TO YOU
THE YELLOW ROSE OF TEXAS
Johnny Desmond
YOU'RE IN LOVE WITH SOMEONE
AIN'T THAT A SHAME
Pat Boone
TENNESSEE SATURDAY NIGHT
ADI ADIOS AMIGO
Jo Stafford
MAKE LOVE TO ME
PRESS BUTTONS FIRMLY
A B C D E F G H J K
L M N P Q R S T U V
1 2 3 4 5 6 7 8 9 0

WURLITZER
5250 WALL BOX
and 2100 STEPPER

THE WURLITZER COMPANY
NORTH TONAWANDA, NEW YORK

TABLE OF CONTENTS

MODEL 5250 WALL BOX

MODEL 2100 STEPPER UNIT

MODEL 5250 - 200 SELECTION WALL BOX

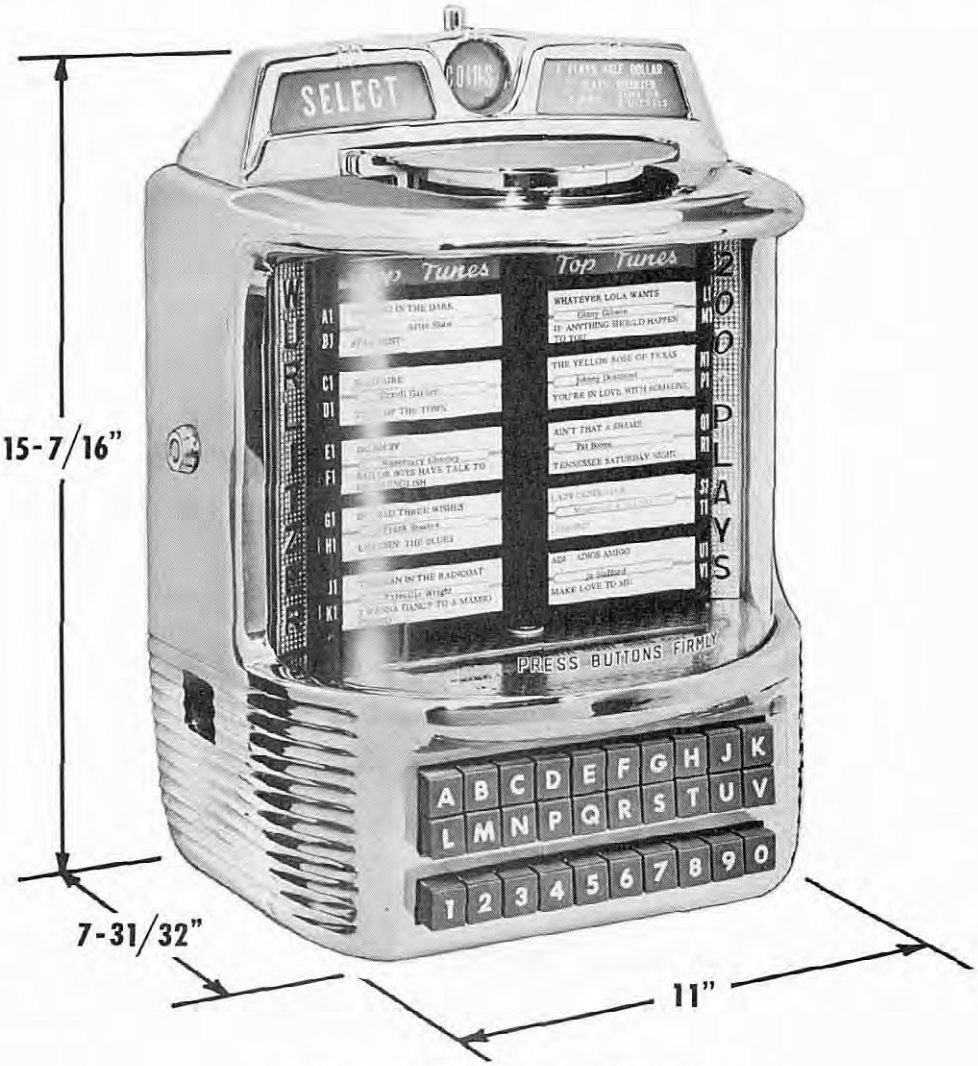

Fig. 1. MODEL 5250 WALL BOX

1. DESCRIPTION

a. The Model 5250 Wall Box (Fig. 1) features a well-lighted, wide range, glass program window, single coin entry for nickel, dime, quarter, and half dollar, lighted window to flash "SELECT" when credits are available at the accumulator. The coin return or "scavenger" button is located at the top, directly behind the coin entry.

b. The two button selection system is identical with that of the Model 5210. The first button pressed may be released by pressing another button of the same series, however when any button of the second series is also pressed, all buttons will be latched until the selection, indicated by the number and letter buttons depressed has been completed.

c. A single "ace lock" secures the chromium cover to the mounting base. The cover, in turn, retains the cash box (Item 6, Fig. 2) and the program page assembly (Item 3, Fig. 2). These two units are immediately accessible when the cover is removed as shown. Figure 3 shows the mounting arrangement for the "four denomination" slug rejector (Item 4, Fig. 3) and accessibility of the coin counter mechanism (Item 6, Fig. 3) and selector switch and button assembly (Item 7).

d. Following are basic specifications of the Model 5250 Wall Box:

Height	15-7/16"
Width	11"
Depth	7-31/32"
Weight	28 lbs.
Selections	200
Slug Rejector	National Four Denomination
Lock	Ace-Four Point Locking

2. ACCESSIBILITY

a. To remove the cover assembly, unlock the ace lock on the left side of the cover and slide the cover straight forward from the base assembly.

b. To remove the program page assembly for programming or access to the mechanism, depress the lock slide at the upper right hand corner of the page assembly (Item 4, Fig. 2) and slide the assembly forward off its mounting pins (Items 2 and 7, Fig. 2).

c. The cash box (Item 6, Fig. 2) is accessible for removal as soon as the cover has been removed. Slide the "coin return cup and cash box" assembly to the left and out of its mounting rails (See Fig. 4).

d. To remove the slug rejector (See Fig. 3) first remove the left hand hinge pin at (Item 1) for the top casting assembly (Item 4, Fig. 4) and raise the casting as shown. The coin separator (Item 8, Fig. 4) is locked in position by the spring latch (Item 2, Fig. 3). Unlatch the coin separator and lift it from the mounting channel. The 5, 10, 25¢ component (Item 9, Fig. 4) may now be raised enough to disengage its lower studs and then its upper studs. The 50¢ component of the slug rejector (Item 1, Fig. 4) is built into the mounting channel as shown in Figure 4. To remove the slug rejector mounting channel for access to the cam follower and the bracket for the slug rejector lock, remove the terminal strip (Item 1, Fig. 5) and then the three channel mounting screws (Item 3, 5. and 12, Fig. 4).

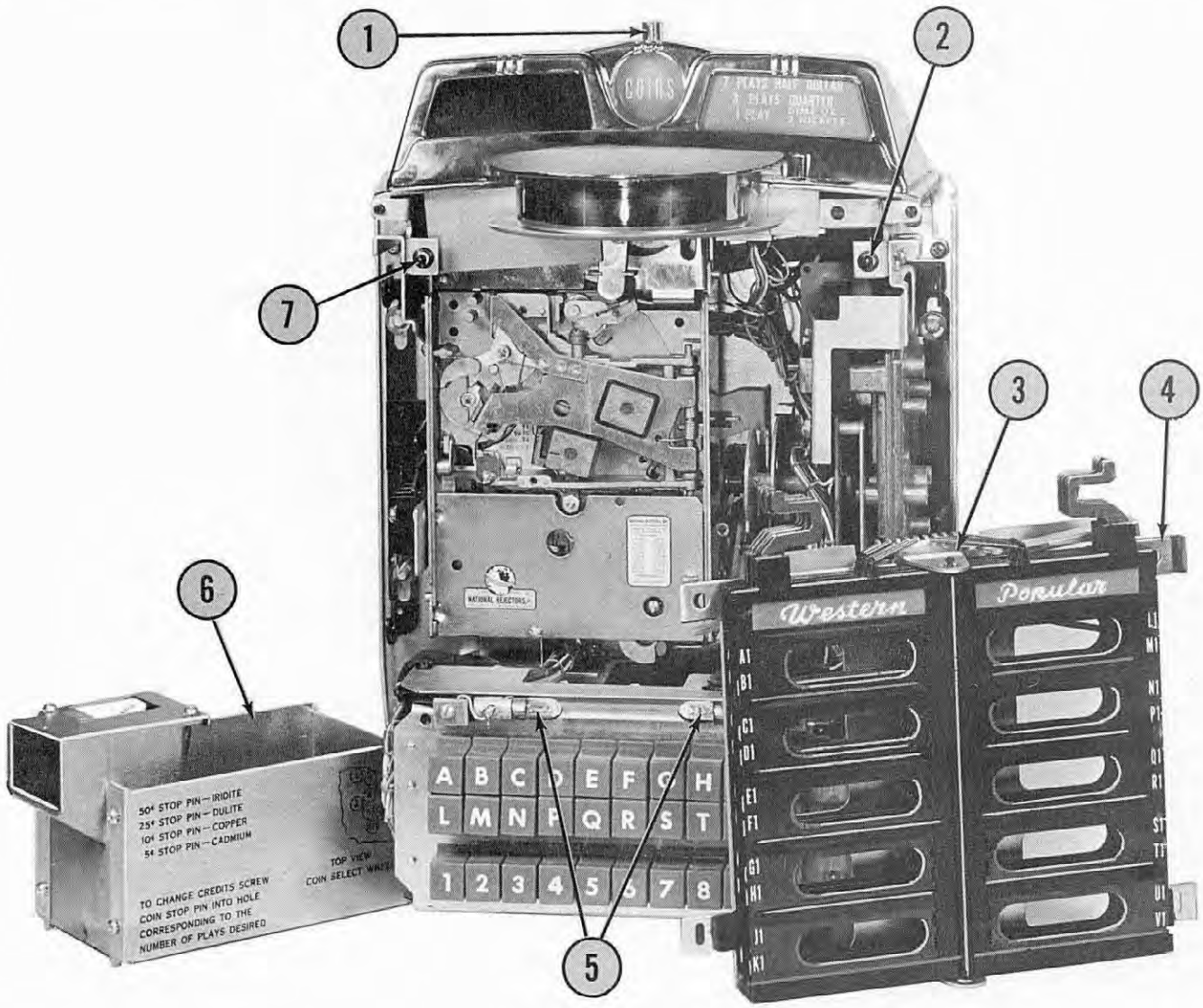

Fig. 2. ACCESSIBILITY

1.	Scavanger Rod and Lever Assembly	110224	5.	Program and Selector Button Lights, Mazda No. 47	45985
2.	Pin, Program Lock	67580	6.	Coin Return Cup and Cash Box Assembly	69995
3.	Program Page Assembly	110259	7.	Pin, Program Lock	67580
4.	Lock Slide, Program Page Assembly	67579			

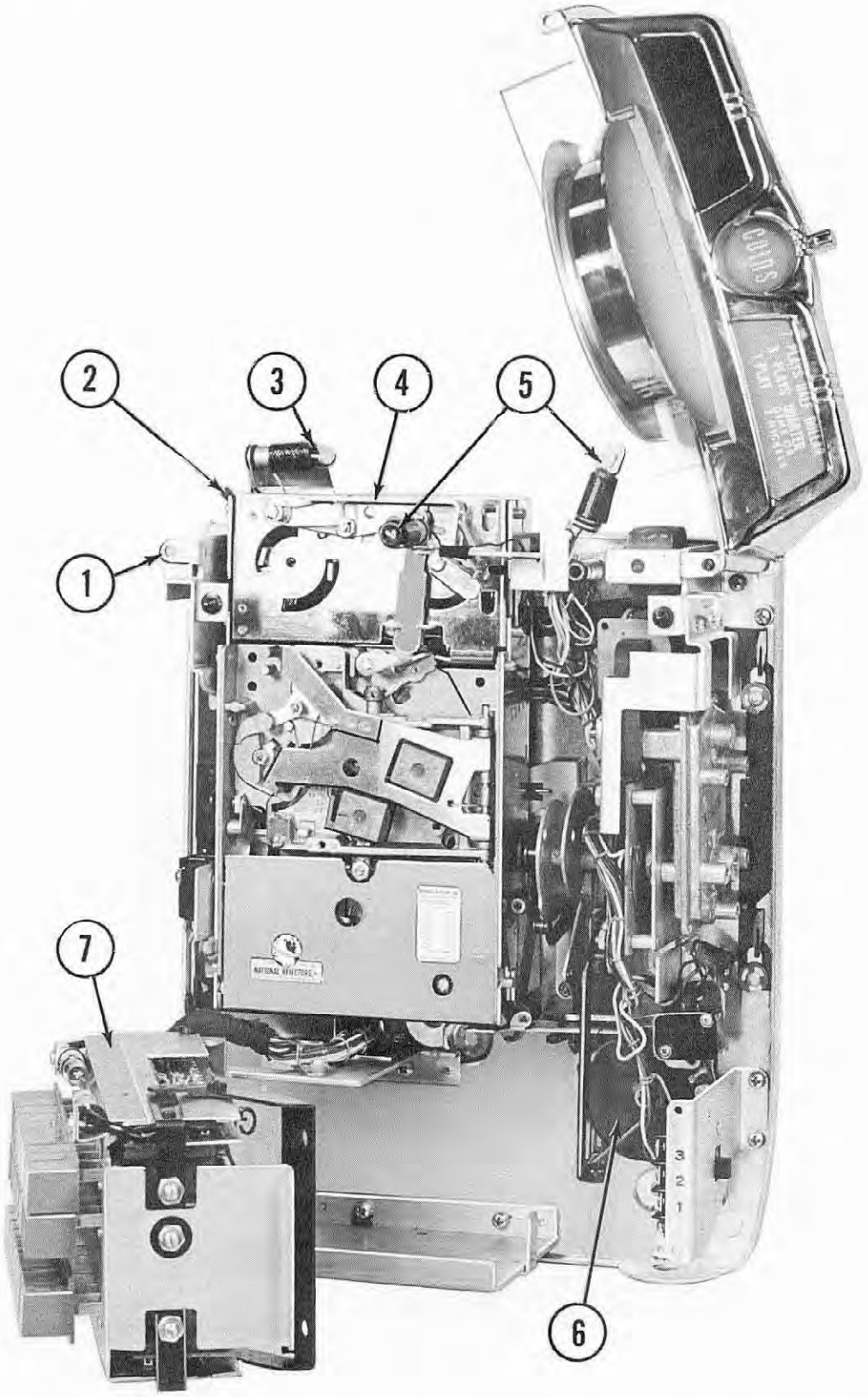

Fig. 3. COMPONENTS

1.	Hinge Pin, Top Casting	110149	
2.	Latch Spring, Slug Rejector (National Rejectors, Inc.)		
3.	"Make Selection" Light, Mazda No. 47	45985	
4.	Slug Rejector Assembly	110228	
5.	Coin Entry and Instruction Plate Lights, Mazda No. 47		45985
6.	Coin Selector Wheel, Hub, and Stop Pin Assembly		110209
7.	Selector Switch and Cable Assembly		110211

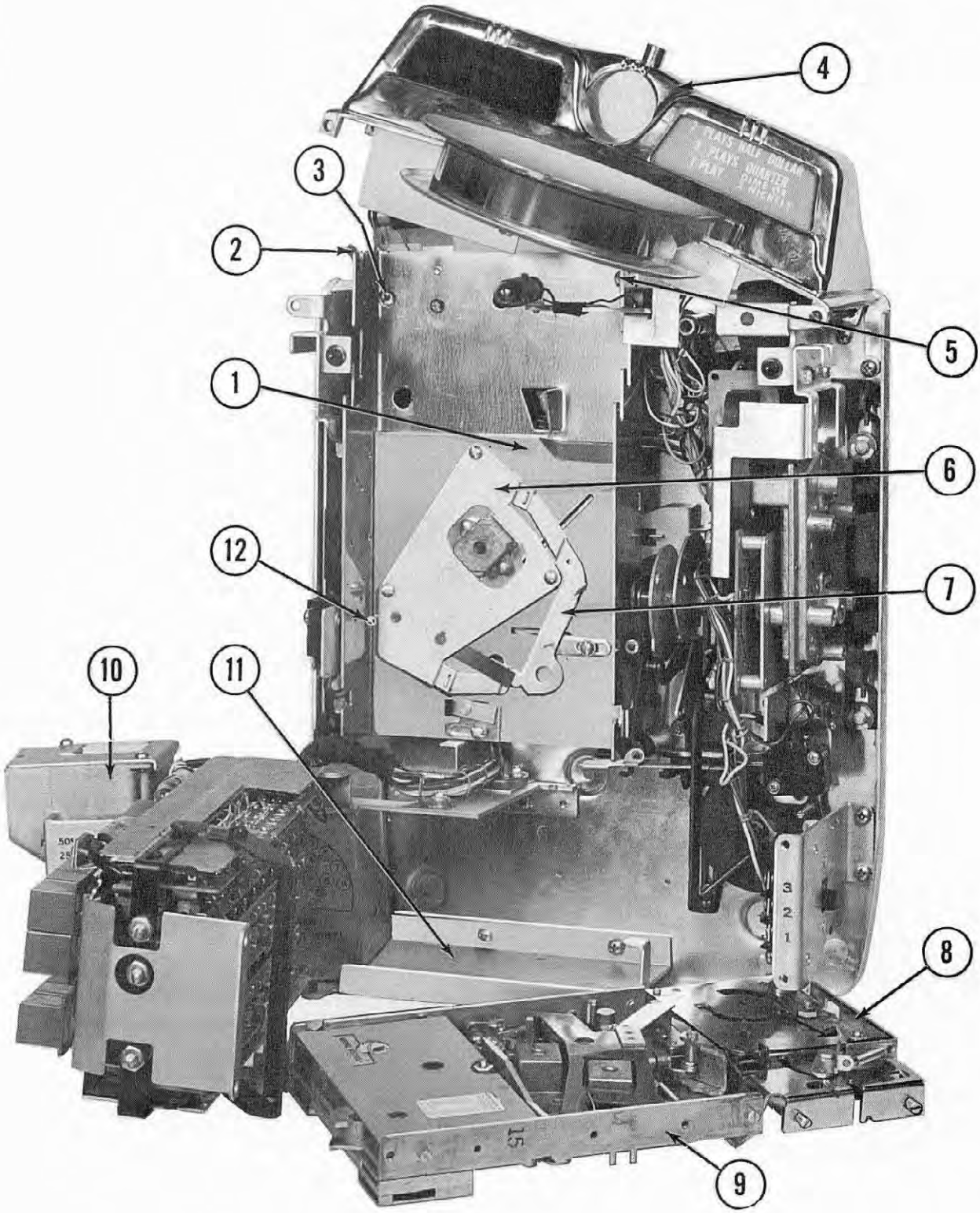

Fig. 4. COMPONENTS

1.	Mounting Channel and 50¢ Rejector Component (National Rejectors, Inc.)	
2.	Latch Spring, Coin Separator Component (National Rejectors, Inc.)	
3.	Screw, Slug Rejector Mounting	73533-33
4.	Top Casting Assembly	110223
5.	Screw, Slug Rejector Mounting	73533-33
6.	Spring and Mounting Plate Assembly, Rejector Lock	110253
7.	Hinge and Pin Assembly, Rejector Lock	110254
8.	Coin Separator Component (National Rejectors, Inc.)	
9.	5, 10, 25¢ Component (National Rejectors, Inc.)	
10.	Coin Return Cup and Cash Box Assembly	69995
11.	Slide and Stud Assembly, Cash Box	67151
12.	Screw, Slug Rejector Mounting	73533-33

e. As shown in Figures 4, and 5, the coin selector wheel, (Item 7, Fig. 5) and associated components are readily accessible when the hinge plate and selector switch assembly is swung open on its hinge pins. This assembly is held in place by the two screws at Items 6, Fig. 5.

3. OPERATION

The Model 5250 Wall Box is mechanically operated by its drive motor (Item 3, Fig. 6). The motor is controlled by the switching net work and thus drives the mechanism through one complete cycle of operation each time a selection is made.

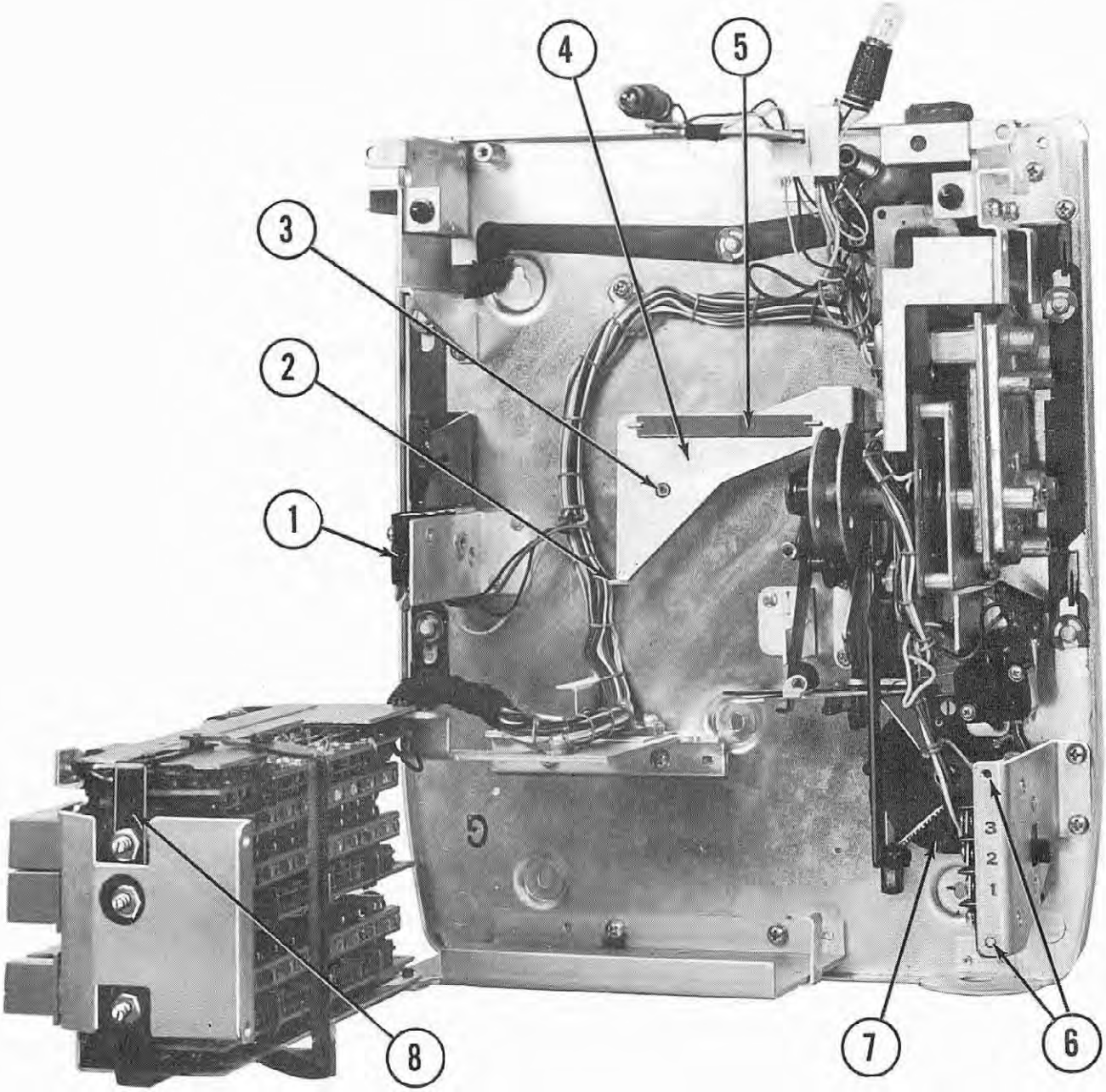

Fig. 5. COMPONENTS

1.	Terminal Strip	68920	5.	Spring, Retainer, Cam Follower	110137
2.	50¢ Lock Pin and 5 - 10 - 25¢ Actuator		6.	Screw, 8 - 32 x 1/4"	73533-34
3.	Spring, Return, Cam Follower	66072	7.	Coin Selector Wheel and Hub Assembly	110209
4.	Cam Follower and Pin Assembly, Rejector Lock	110212	8.	Lock Bar and Adjusting Screw Assembly	67079, 67433

a. The motor is directly connected to the "coupling, insulator, and spring" assembly (Item 4, Fig. 6), which is coupled to and accurately timed with the "main shaft and cam" assembly (Item 2, Fig. 6).

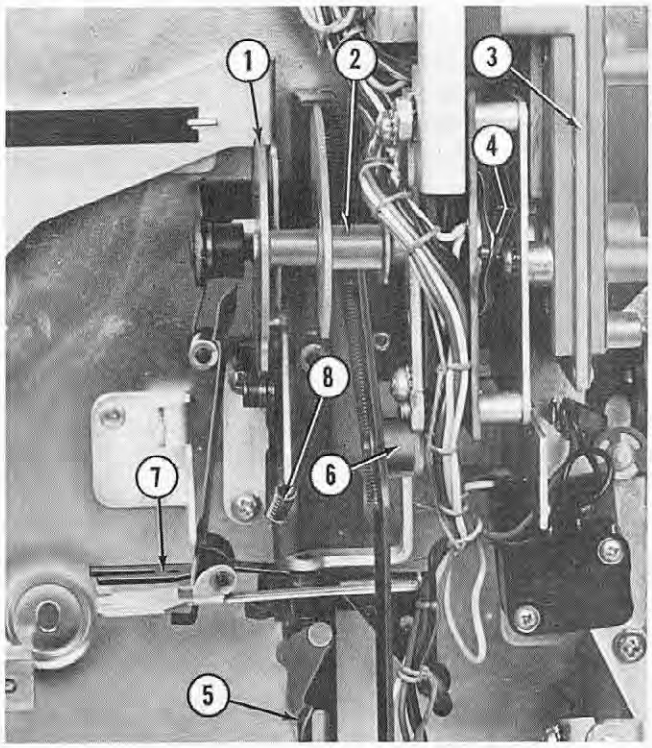

Fig. 6. MAIN CAM SHAFT FUNCTIONS

1.	Cam and Pin Assembly	110204
2.	Cam and Shaft Assembly	110202
3.	Motor Assembly	69918
4.	Coupling, Insulator, and Spring Assembly	110470
5.	Cancel Pawl	69905
6.	Arm, Hub, and Roller Assembly	67424
7.	Coin Feeler and Hub Assembly	69932
8.	Spring, Coin Feeler	110514

b. In mechanical sequence the function of the "cam and pin" assembly (Item 1, Fig. 6) is first to release the "cam follower and pin" assembly of the slug rejector lock components (Item 12, Fig. 7). This action produces "coin return" during the entire cycle of operation and prevents more than one coin at a time entering the coin tracks.

c. The selector switch lock component of the cam assembly (Item 5, Fig. 7) performs the next or simultaneous function by releasing the "arm, hub, and roller" assembly (Item 6, Fig. 6) to its selection position. The "lock bar (Item 8, Fig. 5) and adjusting screw" assembly is actuated by movement of the "arm, hub, and roller" assembly to produce latching action for the "make selection" phase of operation as described in paragraph 1, b.

d. Another simultaneous function is performed at this time, by the outer surface of the "cam and pin" assembly referred to in paragraph "b". The "quick return" segment (Item 10, Fig. 7) of this cam releases the cam follower (Item 12, Fig. 7) of the coin feeler arm (Item 9, Fig. 7). The coin feeler (Item 7, Fig. 6) is thus actuated under spring loading and engages the coin in its proper coin track. The right hand end of the coin feeler will engage a coin selector stop pin corresponding to the coin present on the coin paddle .

e. The selector switch lock component of the cam assembly described in paragraph "c" next releases the "arm, hub, and roller" assembly to a totally locked position of the selector switch latch bars. All selector buttons are thus held firmly in place until the mechanism has completed its selection cycle.

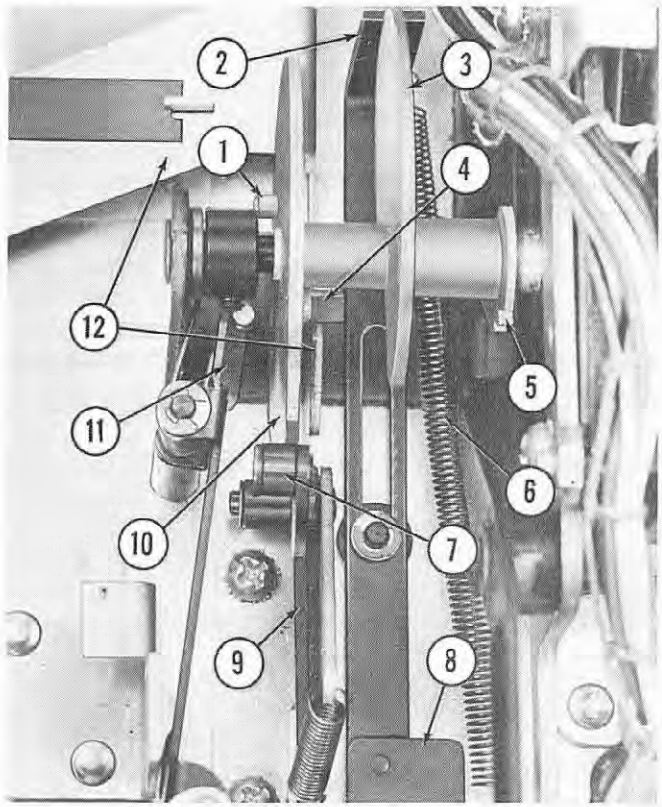

Fig. 7. FUNCTIONS, CAM AND PIN ASSEMBLY

1.	Cam Pin, Coin Drop	110242
2.	Accumulator Slide Bracket and Cancel Pawl Assembly	69904
3.	Cam, Cancel and Accumulator	69939
4.	Cam Pin, Rejector Lock	110559
5.	Cam, Selector Switch Latch	62750
6.	Spring, Accumulator Slide Bracket	110515
7.	Roller, Cam Follower, Coin Feeler	58188
8.	Bracket, Accumulator	69907
9.	Arm, Hub, and Roller Assembly, Coin Feeler	67424
10.	Quick Return Segment, Coin Feeler Action	
11.	Mounting Lever, Coin Paddle	69915
12.	Cam Follower and Pin Assembly, Reject Lock	110212

f. Immediately following the release of the coin feeler, described in "d", the cancel and accumulator cam" (Item 3, Fig. 7) starts release of the "accumulator slide, bracket, and pawl", (Item 2, Fig. 7) assembly which actuates under spring loading to advance the coin selector wheel and the cancel wheel to a point determined by the denomination of the coin,

the position of the coin feeler, and the setting of the stop pin for that particular coin.

g. At approximately the point where the accumulator bracket (Item 8, Fig. 7) has advanced the cancel wheel to one credit, the "coupling, insulator, and spring" assembly has started making electrical contacts for the pulse circuit to the stepper. These pulses will continue to a point, in the cycle of operation, where the button lock cam is about to release the selector buttons. The timing of the various operating cams and the "coupling, insulator, and spring" assembly is a built-in feature controlled by assembly fixtures used in production.

h. The next mechanical function will be performed by the return action of the "cancel and accumulator cam (Item 3, Fig. 7). During this return action, the cancel pawl (Item 5, Fig. 6) will engage the "cancel wheel and hub" assembly (Item 2, Fig. 8) and retard its accumulation one tooth. One credit is thus cancelled each time a selection cycle is executed.

i. Immediately following the action described in "h" the "cam and pin" assembly (Item 10, Fig. 7) produces "quick return" action for the coin feeler which was actuated as described in paragraph "d".

j. A second pin located on the "cam and pin" assembly (Item 1, Fig. 7) performs the next mechanical action by engaging the cam shaped upper end of the "coin paddle mounting lever" (Item 11, Fig. 7). This action swings the lower end of the mounting lever to the right and removes the coin paddle, dropping the coin into the cash box.

k. As soon as the pin passes the upper end of the "coin paddle mounting lever", the coin paddle will retract under spring loading to its original position for further acceptance of coins.

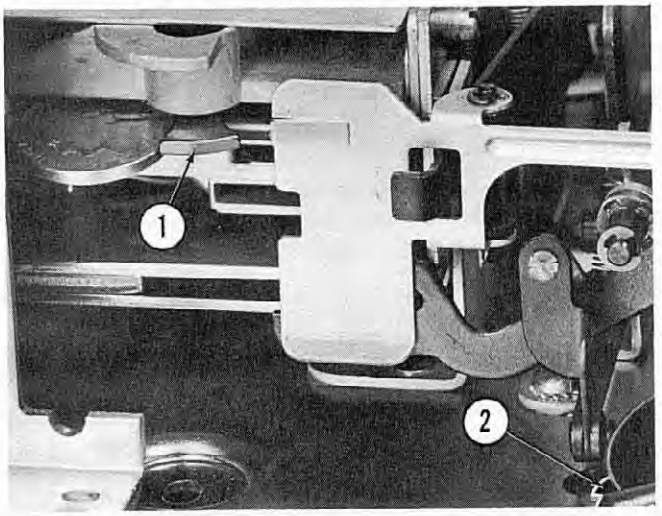

Fig. 8. COIN FLIPPER AND FIRST NICKEL

1. Nickel Flipper (National Rejectors, Inc.)
2. Cancel Wheel and Hub Assembly 69945

l. The first pin of the "cam and pin" assembly now re-engages the "cam follower and pin" assembly of the slug rejector lock components to reset the slug rejector for further acceptance of coins.

m. Concurrent with the action described in "k", the selector switch lock cam starts re-setting the arm, hub, and roller assembly (Item 6, Fig. 6). However, the selector switches will not be released until the outer contactor of the "coupling, insulator, and spring" assembly (Item 4, Fig. 6) has passed the last pulse patch on the contact plate.

n. The electrical conditions pertaining to the various mechanical phases of the cycle may be determined by noting the functional schematic diagram (Page 41), and watching the position of the "coupling, insulator, and spring" assembly with relation to the contact plate assembly.

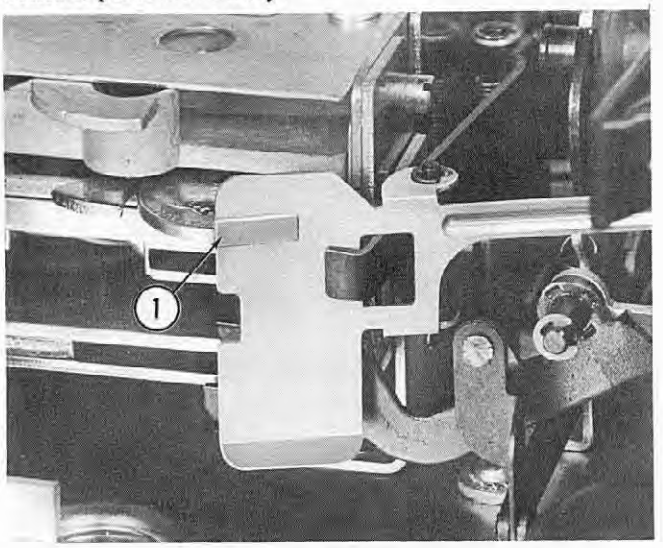

Fig. 9. COIN PADDLE AND SECOND NICKEL

1. Nickel Section of Coin Paddle 69916

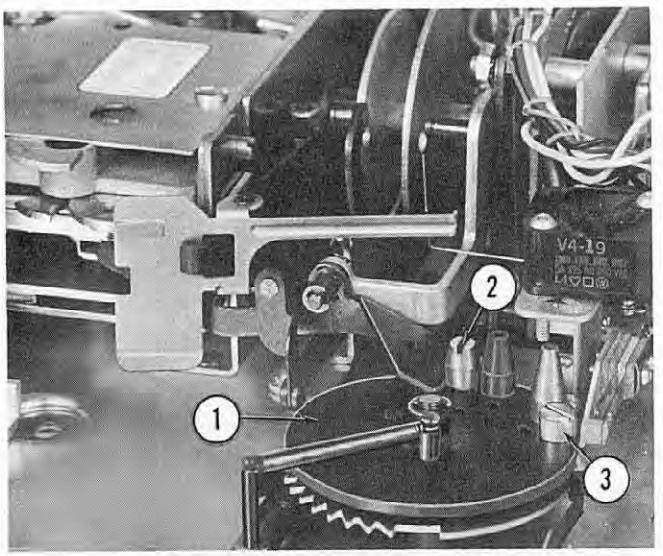

Fig. 10. ACCUMULATOR ACTION

1. Coin Selector Wheel and Pin Assembly 110210
2. Dime Stop Pin, 1 Dime or 2 Nickels 69886
3. Nickel Stop Pin, Out of Range 69885

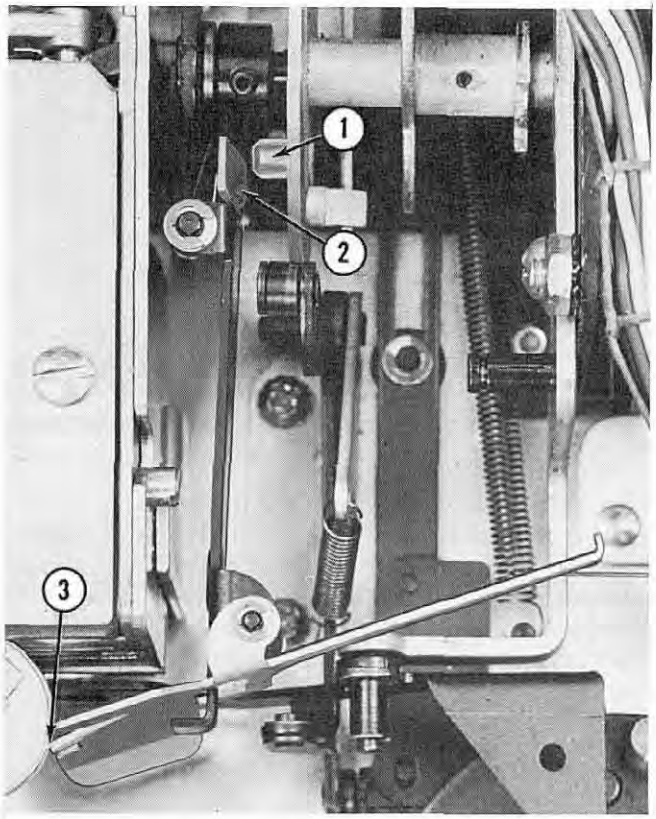

Fig. 11. NICKEL COIN DROP

1.	Coin Drop Pin, Cam and Pin Assembly	110204
2.	Cam Shaped End of Coin Paddle Mounting Lever	69915
3.	Nickel Section of Coin Paddle	69916

o. During one complete cycle as described above, the "coin selector wheel and pin" assembly (Item 1, Fig. 12) will function to set up credits in accordance with the denomination of the coin which intercepts the coin feeler. Due to slug rejector action the first nickel presented will be engaged by the "nickel flipper (Item 1, Fig. 8) which deflects it into the cash box without action on the coin paddle. The second nickel will be engaged by the opposite edge of the nickel flipper and guided to the coin paddle as shown at Item 1, Fig. 9. The dime "stop pin" (Item 2, Fig. 10) is set in the "coin selector wheel (Item 1, Fig. 10) to provide one play and the nickel stop pin (Item 3) is set in an inactive position. Therefore one play will be delivered for two nickels or for one dime.

p. As the coin drop pin component (Item 1, Fig. 11) of the cam and pin assembly engages the cam shaped end (Item 2, Fig. 11) of the coin paddle mounting lever, the coin paddle will be moved to the right as shown at Item 3, Fig. 11. The coin will accordingly be freed to drop into the cash box. The action is similar for the dime, quarter, or half dollar, at their several sections of the coin paddle (See Fig. 16).

q. When a quarter is accepted by the slug rejector, it will drop on next to the rear section of the coin paddle as shown in Figure 13. The "feeler and hub" assembly (Item 2, Fig. 13) will thus be positioned so that its right hand end will pass over

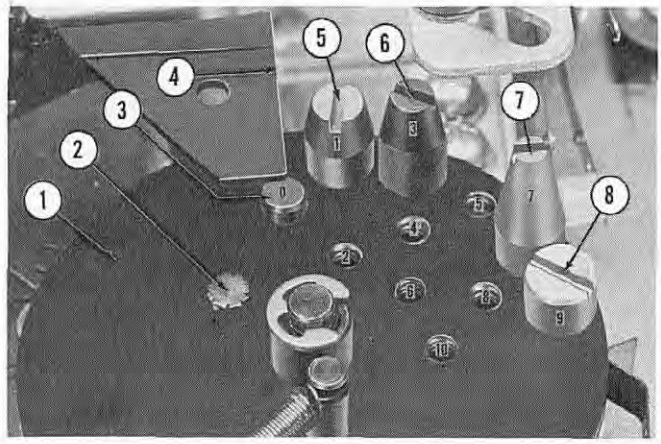

Fig. 12. COIN SELECTOR WHEEL

1.	Coin Selector Wheel, Hub, and Pin Assembly	110210
2.	Accumulator Drive Pin, Coin Selector Wheel	69899
3.	Zero Stop Pin, Coin Selector Wheel	69896
4.	Stop End of Coin Feeler and Hub Assembly	69932
5.	Dime Stop Pin	69886
6.	Quarter Stop Pin	69887
7.	Half Dollar Stop Pin	69891
8.	Nickel Stop Pin (Out of Range)	69885

the ten cent stop pin and the quarter stop pin will engage the coin feeler and stop the coin selector wheel at the pre-determined three play position as shown at Item 3, Fig. 13.

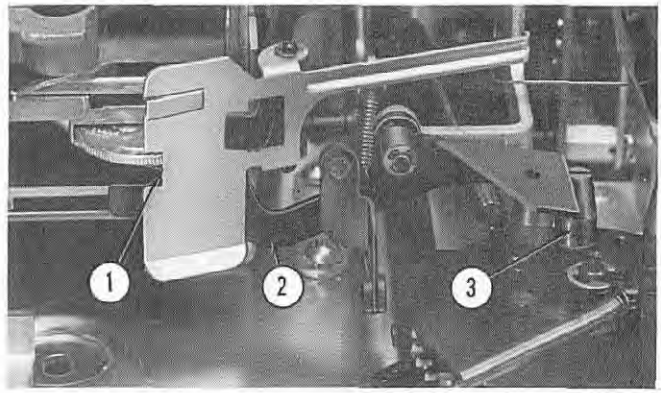

Fig. 13. COIN SELECTOR WHEEL

1.	Quarter Section of Coin Paddle	69916
2.	Coin Feeler and Hub Assembly	69932
3.	Quarter Stop Pin in 3 Play Position	69887

r. When a half dollar is accepted by the slug rejector, it will drop on the rear section of the coin paddle as shown in Figure 14. The "feeler and hub" assembly will thus be positioned so that its right hand end will pass the ten cent stop pin and the quarter stop pin. The fifty cent stop pin will thus engage the coin feeler and stop the coin selector wheel at the pre-determined seven play position as shown at Item 4, Fig. 14.

s. The cancel action described in "h" will retract the "cancel wheel and hub" assembly (Item 2, Fig. 14) one tooth for each selection cycle of the mechanism. The trip cam on the circumference of the cancel wheel will thus return to its original "at rest" position to open the key switch when the last credit has been cancelled.

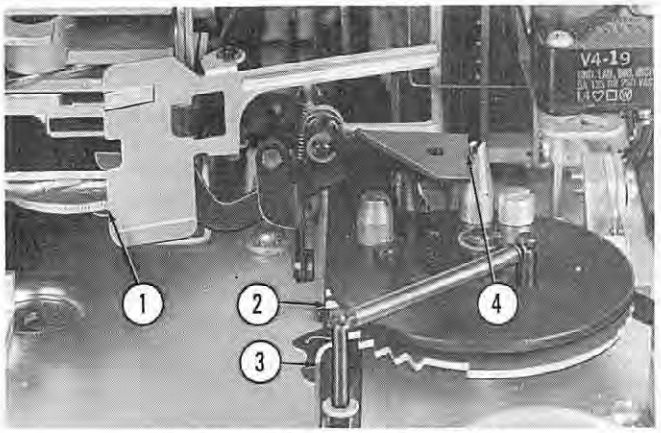

Fig. 14. COIN SELECTOR WHEEL

1.	Half Dollar Section of Coin Paddle	69916
2.	Cancel Wheel and Hub Assembly	69945
3.	Cancel Pawl	69905
4.	Half Dollar Stop Pin in 7 Play Position	69891

4. INSTALLATION

The Model 5250 Wall Box may be used with Wurlitzer 200 selection phonographs. Impulse stepper and junction box assembly is standard in current 200 selection models.

a. Cover and Program Holders

(1) Unlock the cover at the single "Ace lock" located on the left hand side, and slide the cover forward from its guide pins.

(2) Release the program holder at its upper right hand corner by pressing inward on the protruding latch. The assembly will slip forward off its mounting studs.

(3) Insert double title strips in each number group as indicated on the margin of the program pages. The selection letter and number should correspond with the arrangement of the selections as set up on the phonograph. Classification strips for the tops of the pages will be found packed in a small bag.

b. Preparation

(1) Remove the "cash box and coin return cup" assembly from the left hand side. Remove the left hand mounting stud for the top casting and raise the casting to clear the slug rejector. The slug rejector may be removed in the conventional manner by unlatching and removing the coin separator first.

(2) There are two hanger type mounting holes in the base plate, at the top about two inches from the sides of the base plate. The right hand hole is not accessible for a screw driver and will therefore be hung on a pre-set screw. The mounting channel of the slug rejector has a "cut-out" to accommodate a screw driver at the upper left hand mounting screw. A third mounting point is accessible directly beneath the slug rejector. Two auxiliary mounting points are provided near the lower edge of the base. These mounting holes have been indexed for use with counter brackets (Kit 142) Part No. 58681. "Knock-outs" are provided at the lower right and left hand corners of the base for use where concealed wiring is installed.

(3) The "anti-cheat guard" (Part No. 60321) is provided to cover the bottom cable entrance where concealed wiring has been installed. It functions to prevent tampering at the lower cable entrance.

c. Mounting

(1) 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 from the floor level for open wall mounting and one inch above the table level for booth or table mountings.

(2) Bar and counter mounting may be installed by using one Kit No. 142 (Part No. 58681) mounting bracket for each Wall Box to be so mounted.

d. Stepper Facilities

(1) The Model 5250 Wall Boxes are designed to function in parallel groups of four, maximum. The stepper junction box assemblies of Models 2000, 2100, and 2150 provide a terminal strip for one group of "one to four" Wall Boxes. Additional groups of Wall Boxes may be operated by using one Model 222 Booster (Part No. 46375) for each group of four.

(2) The stepper-junction box assembly of the Model 2017 provides a terminal strip for one group of four Wall Boxes as described in "a", and the control box assembly provides a second terminal strip for a second group of four Wall Boxes. Additional groups of four each may be operated by use of one Model 222 booster for each group.

e. Operation

(1) Connect Model 5250 Wall Boxes in parallel groups of four, maximum, and run three wire cable (Part No. 56066) from each group to the phonograph.

(2) 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.

(3) Connect the cable from one group of Wall Boxes to the junction box-stepper unit of the phonograph 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 (Power)

f. Model 222 Booster Operation

(1) When one or more Model 222 Boosters are used for additional Wall Box groups, connect the three wire cables, in parallel, from one of the separate groups 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 Terminals No. 3 (24V Power)

(2) The spade connector on the adapter 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 Wires) will be connected together.

(3) The current run of Model 222 Boosters have been wired to eliminate the use of the green wire with the spade lug. The pulse circuit has been carried through the No. 1 pin of the adapter socket and plug. However, on stepper Models 2000, 257, and 253, the eight prong booster socket has not been connected to the No. 1 terminal of the Wall Box terminal strip, of the stepper. It will, therefore, be necessary to provide a jumper from the No. 1 pin of the booster socket to the No. 1 terminal of the Wall Box terminal strip on the stepper. This change may easily be accomplished inside the chassis pan of the stepper unit.

g. Fuse Protection

(1) A 3 Amp. Fustat is provided in each Model 222 Booster for protection of the transformer and the line to the Wall Boxes.

(2) Line protection for the first group of Wall Boxes is provided by a 3 Amp. Fustat located on the junction box-stepper unit of the phonograph.

h. Inspection

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. Service information and parts may be obtained from them or their branch offices. Adjustments should be made in accordance with recommendations contained in their "Rejector Manual".

b. Coin Paddle Alignment

The coin paddle is a pre-set component which has been fixture aligned in production to meet the following requirements:

(1) The four separate sections of the coin paddle (Items 2, 1, 7, and 6, Fig. 15) should align with the four corresponding coin exits of the slug rejector as shown with the nickel, dime, quarter, and half dollar coins resting on and depressing the coin paddle to the stop tab (Item 5, Fig. 15) of the coin paddle mounting lever.

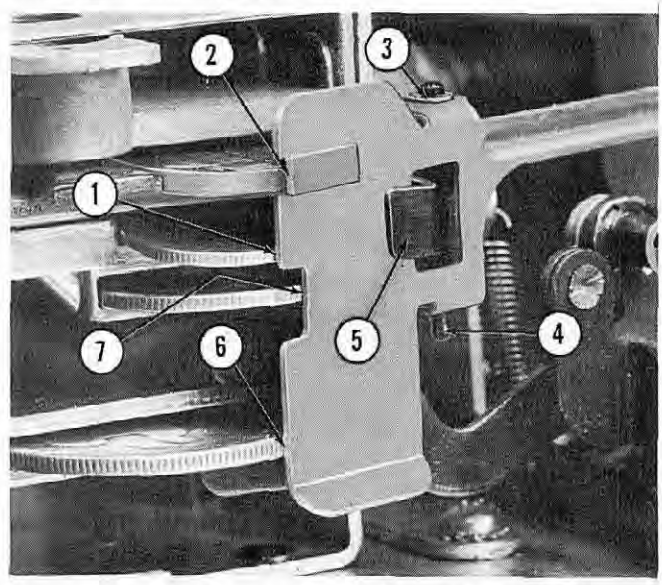

Fig. 15. COIN PADDLE ALIGNMENT

1.	Dime Section of Coin Paddle	69916
2.	Nickel Section of Coin Paddle	69916
3.	Retaining Ring	73724-9
4.	Shaft, Coin Paddle Mounting	62756
5.	Stop Tab, Coin Paddle Mounting Lever	69915
6.	Half Dollar Section, Coin Paddle	69916
7.	Quarter Section, Coin Paddle	69916

(2) The coin paddle must operate freely on its mounting bracket and shaft (Item 4, Fig. 15). There must be no friction at the retaining ring (Item 3).

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

c. Coin Switch Adjustment

Adjustment of the coin switch should be accomplished with the mechanism in its normal "at rest" position. The service switch (Item 3, Fig. 17) located on the right hand mounting bracket for the selector switches, should be turned "off".

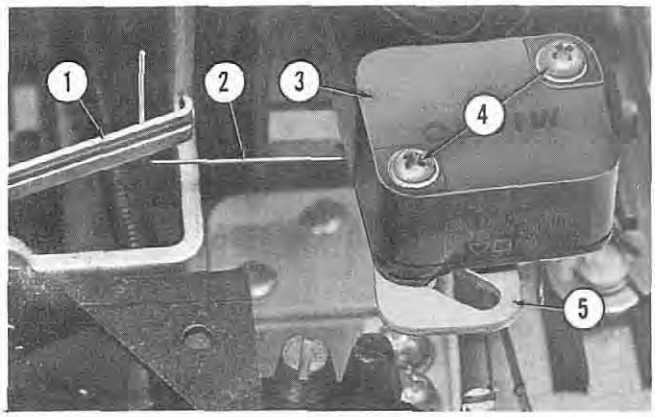

Fig. 16. COIN SWITCH ADJUSTMENT

1.	Extension, Coin Paddle	69916
2.	Arm, Coin Switch	62164
3.	Coin Switch	57851
4.	Mounting Screws, Coin Switch	73503-29, 73503-31
5.	Elongated Mounting Hole	

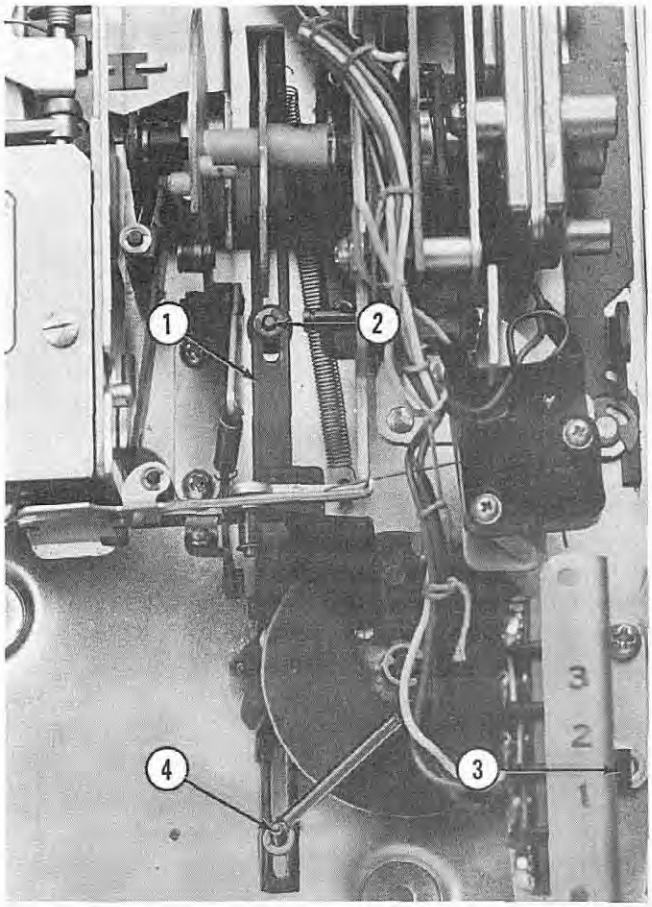

Fig. 17. ACCUMULATOR SLIDE BRACKET AND CANCEL PAWL

1.	Accumulator Slide, Bracket, and Cancel Pawl	69904
2.	Mounting Stud, Upper, Accumulator Slide	69938
3.	Slide Switch (Service)	61649
4.	Mounting Stud, Lower, Accumulator Slide	110291

(1) Insert a coin in the slug rejector and note the action of the coin paddle on the arm of the coin switch (Item 2, Fig. 16). The arm should be raised enough to actuate the coin switch and provide over - travel of 1/8" as measured at the tip of the switch arm.

Adjustment may be made by loosening the two mounting screws (Item 4, Fig. 16) and adjusting the switch on its mounting bracket to provide an equal amount of over-travel after closing and after opening.

(2) Following the tightening of the two mounting screws the switch should be re-checked for proper action. If necessary, repeat the adjustment.

d. Accumulator Slide, Bracket, and Cancel Pawl

(1) The accumulator slide, bracket, and cancel pawl assembly(Item 1, Fig. 17) is assembled to operate freely on its two mounting studs (Items 2 and 4, Fig. 17). Its requirements for engagement with the accumulator wheel (Item 11, Fig. 18) are

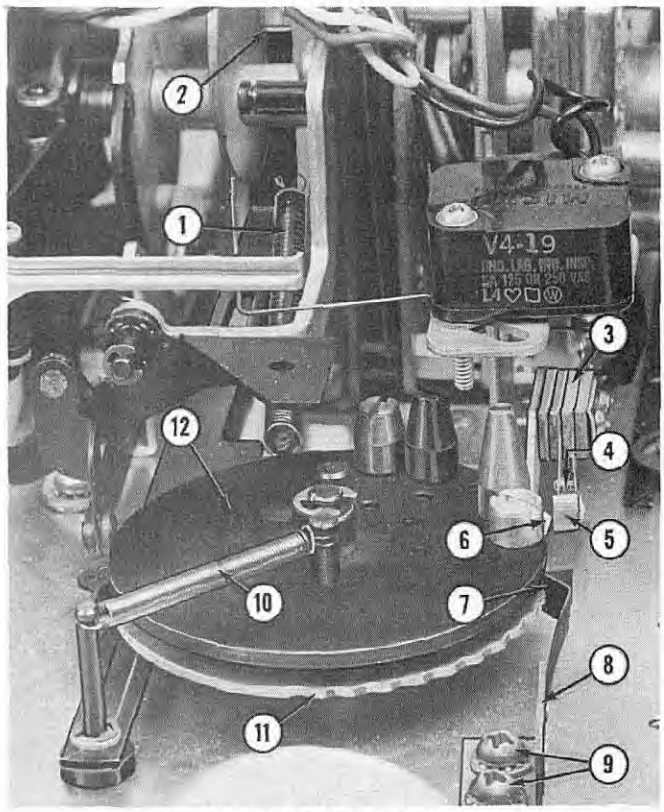

Fig. 18. DETENT SPRING SETTING

1.	Spring, Accumulator Slide	110515
2.	Accumulator Slide at Maximum Throw	
3.	Key Switch and Bracket Assembly	110247
4.	Contact Opening 1/32"	
5.	Nylon Actuator	
6.	Trip Tooth of Accumulator Wheel	
7.	Formed End of Detent Spring	
8.	Detent Spring and Bracket Assembly	110207
9.	Screws, Detent Spring Mounting	73533-21
10.	Retracting Spring, Coin Selector Wheel	110516
11.	Cancel Wheel and Hub Assembly	69945
12.	Coin Selector Wheel, Hub, and Pin Assembly	110210

governed by fixture assembly, thus requiring no adjustment. In case of damage or excessive wear the assembly should be replaced.

(2) The cancel pawl has been aligned by fixture assembly to provide engagement with the accumulator cancel teeth as shown at Item 1, Fig. 19. With the accumulator slide raised to its maximum by the cancel cam (Item 2, Fig. 18) the engagement of the cancel pawl with the cancel teeth (Item 2, Fig. 19) should be one half the depth of the tooth (Item 2, Fig. 19). It is important that the cancel pawl clears the second tooth below the cancelled tooth to insure cancellation of one play only during the following cancel function.

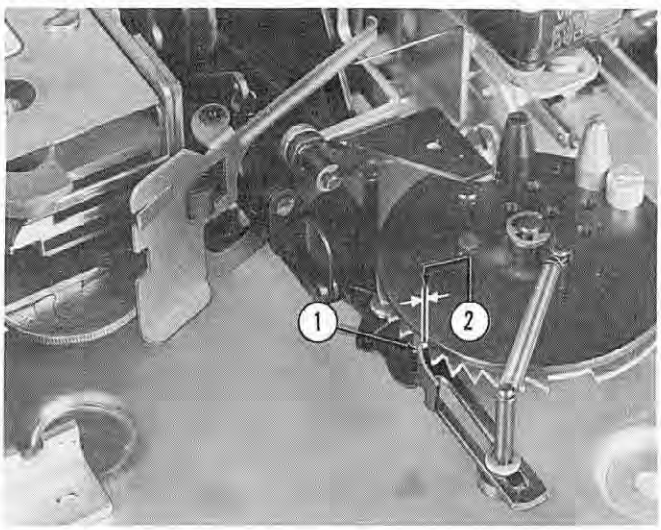

Fig. 19. CANCEL ACTION

1. Cancel Pawl Engagement
2. Measurement, 1/2 Tooth Depth

(3) The position of the accumulator wheel at the time of total cancellation is thus determined by the cancel pawl, the accumulator slide bracket, and the cancel cam in its position of maximum throw.

e. Detent Spring Adjustment

With the several requirements, described in "d", established, the setting of the detent spring and bracket assembly (Item 8, Fig. 18) may be accomplished by loosening the two mounting screws (Item 9, Fig. 18) and moving the bracket to a position that will seat the formed end of the detent spring (Item 7, Fig. 18) in the first detent of the accumulator wheel. The pressure of the spring on the accumulator wheel at Item 7 should be about 40 grams, but in no case, great enough to resist the accumulator action of the driving spring (Item 1, Fig. 18). It should be noted at this time that the tension of the driving spring must over-ride the combined influence of the detent spring and the retracting spring (Item 10, Fig. 18) of the coin selector wheel to insure full credit for a half dollar deposit.

f. Key Switch Adjustment

(1) The requirements described in "d" and "e" pre-determine the setting of the key switch and bracket assembly (Item 3, Fig. 18). The key switch and bracket have been assembled to provide 20 to 30 grams contact pressure when released. This is a requirement and should be checked to insure good conductivity. If necessary, the individual blades should be carefully re-formed to provide the required pressure.

(2) The two mounting screws for the key switch and bracket assembly may be loosened to permit moving the bracket on its elongated mounting holes. With the accumulator wheel in its fully cancelled position and the mechanism "at rest" as shown, the bracket should be set to position the nylon actuator (Item 5, Fig. 18) against the trip tooth (Item 6, Fig. 18) of the accumulator wheel and provide contact opening of 1/32".

(3) When the "coin selector wheel and stop pin" assembly is actuated for 2 nickels, single play, the stop end of the coin feeler (Item 1, Fig. 20) will engage the dime stop pin (Item 2, Fig. 20) at a low point on the body of the pin. In this mechanical condition the trip tooth (Item 4, Fig. 20) should be entirely clear of the nylon actuator (Item 3, Fig. 20) and the detent spring fully seated in the second detent of the accumulator wheel as indicated at Item 6. When the nickel stop pin (Item 5, Fig. 20) is used for five cent play, it would be engaged as indicated at Item 2, and the key switch condition would be as indicated at Items 4 and 3.

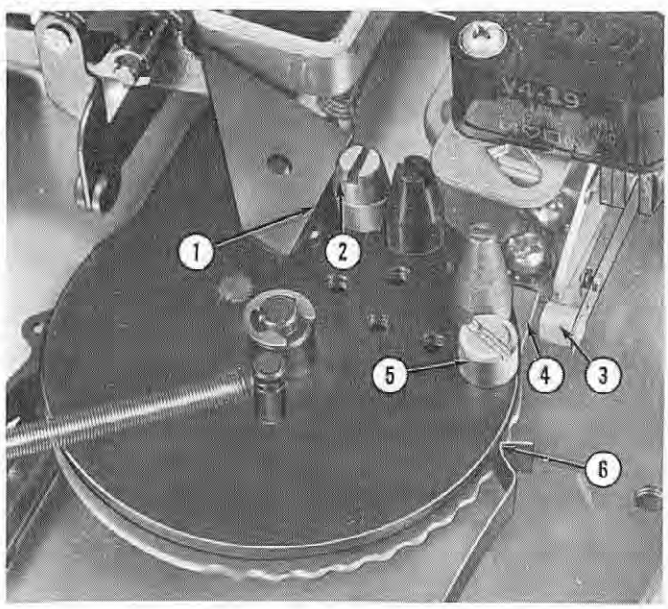

Fig. 20. SINGLE PLAY SETTING, COIN SELECTOR STOP PINS

1.	Stop Edge of Coin Feeler	69932
2.	Stop Pin, 10¢	69886
3.	Nylon Actuator	
4.	Trip Tooth of Accumulator and Cancel Wheel	69945
5.	Stop Pin, 5¢	69885
6.	Formed End of Detent Spring	110207

(4) When the "coin selector wheel and stop pin" assembly is actuated for a dime as shown at Item 6, Fig. 21, the coin feeler will intercept the dime stop pin (Item 1, Fig. 21) near the top of the pin (Item 2, Fig. 21). The advance of the accumulator wheel will be one detent, only, as described in (3) and the trip tooth (Item 3, Fig. 21) of the cancel wheel must be completely clear of the nylon actuator (Item 4, Fig. 21).

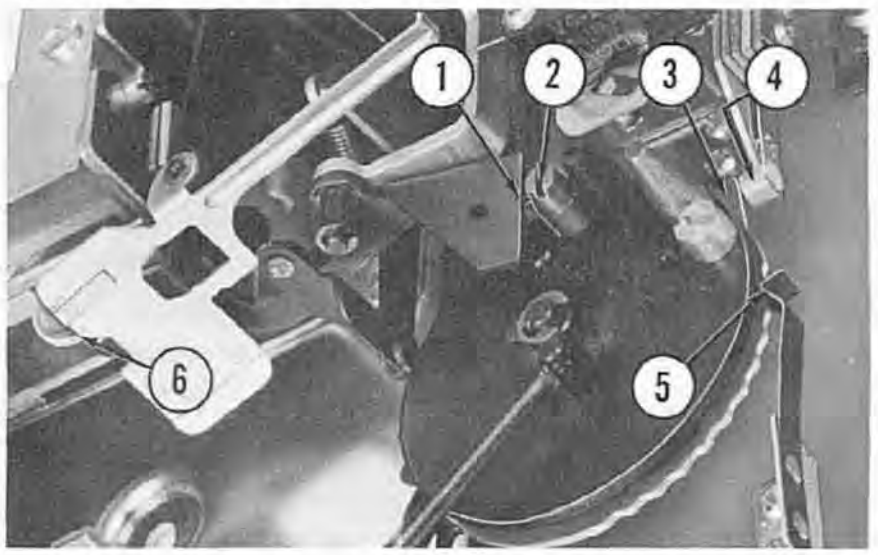

Fig. 21. SINGLE PLAY FOR DIME

1.	Stop Edge of Coin Feeler	69932
2.	Stop Pin, 10¢	69886
3.	Trip Tooth of Cancel Wheel	69945
4.	Nylon Actuator	
5.	Formed End of Detent Spring	110207
6.	Dime Section of Coin Paddle	69916

(5) When the "coin selector wheel and stop pin" assembly is actuated for a quarter as shown at Item 1, Fig. 22, the stop edge (Item 2, Fig. 22) of the coin feeler will intercept the 25 cent stop pin (Item 3, Fig. 22) near the top of the pin and the accumulator wheel will advance to the fourth detent as shown at Item 4. This setting of the quarter stop pin provides three plays.

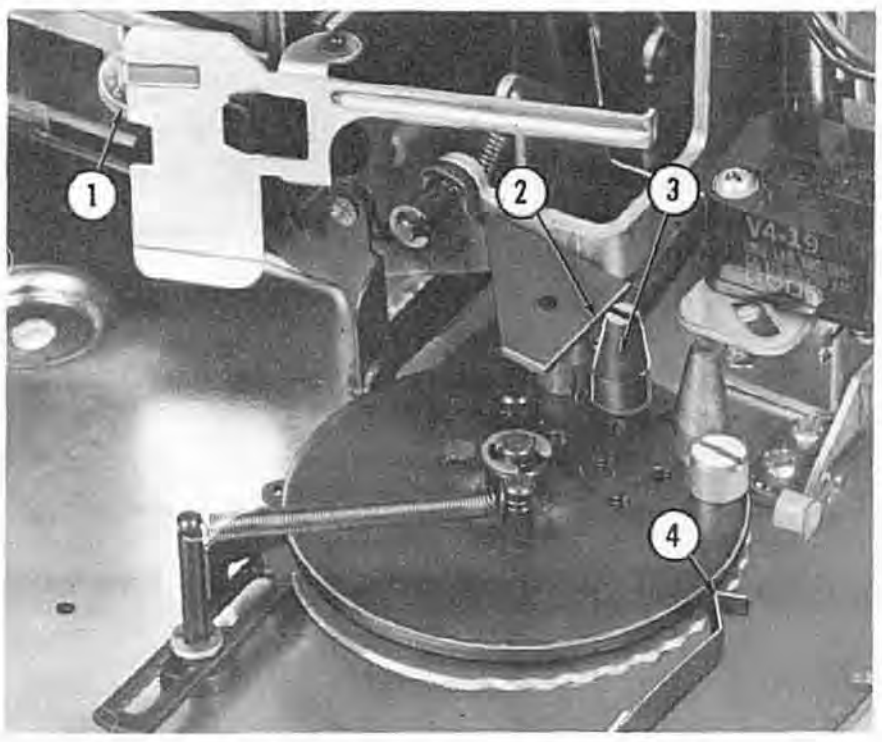

Fig. 22. THREE PLAYS FOR QUARTER

1.	Quarter Section of Coin Paddle	69916
2.	Stop Edge of Coin Feeler	69932
3.	Quarter Stop Pin	69887
4.	Formed End of Detent Spring	110207

(6) When a half dollar drops on the coin paddle as shown at Item 1, Fig. 23, it drops between the two forked tips of the coin feeler and positions the stop edge (Item 2, Fig. 23) of the coin feeler to intercept the 50¢ stop pin (Item 3, Fig. 23) at its standard setting of seven plays. The accumulator wheel is thus advanced to the eighth detent position as shown at Item 4.

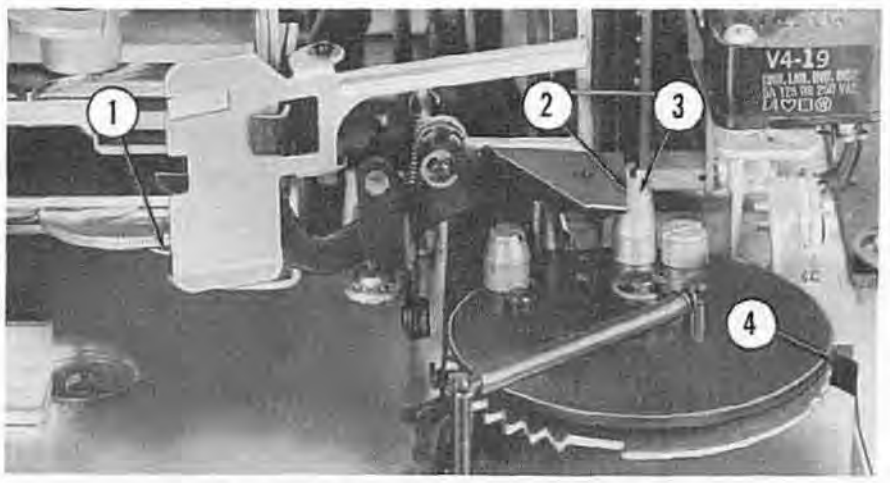

Fig. 23. SEVEN PLAYS FOR HALF DOLLAR

1.	Half Dollar Section of Coin Paddle	69916
2.	Stop Edge of Coin Feeler	69932
3.	Stop Pin, 50¢	69891
4.	Formed End of Detent Spring	110207

(7) The number of credits accumulated for each of the four acceptable coins may be changed by screwing the various stop pins into the coin selector wheel at holes corresponding to the number of credits desired. Figure 24 represents the location in the coin selector wheel, of the various settings available and the numerals indicate the number of credits accumulated at that particular stop position.

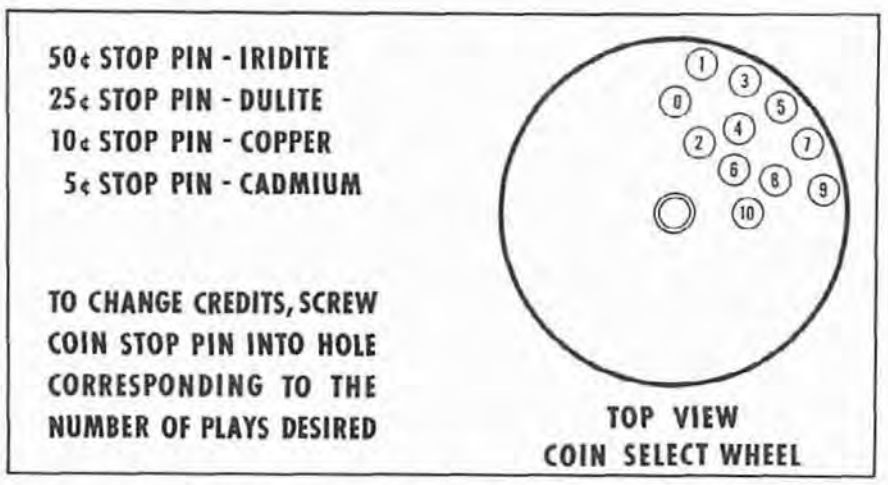

Fig. 24. COIN SELECTOR WHEEL SETTINGS

g. Coin Drop Requirements

As the coin drop pin (Item 3, Fig. 25) passes the maximum point of actuation at the cam shaped end of the coin paddle mounting lever (Item 4, Fig. 25) the coin paddle must be moved far enough to the right to provide complete freedom of the coin between the two points Item 6, and Item 7, Figure 25. This requirement applies to each of the four coins as located in their respective sections of the coin paddle as shown in Figure 15. Particular attention should be given the nickel coin drop to insure proper re-set of the nickel flipper.

h. Cam Shaft End Play Adjustment

On the left of the main cam shaft assembly is a collar with a socket head set screw (Item 2, Fig. 25). This collar should be positioned and locked to the cam shaft at a point that will provide .003 " to .007" clearance as measured between the collar and the flanged surface of the left end bearing (Item 1, Fig. 25).

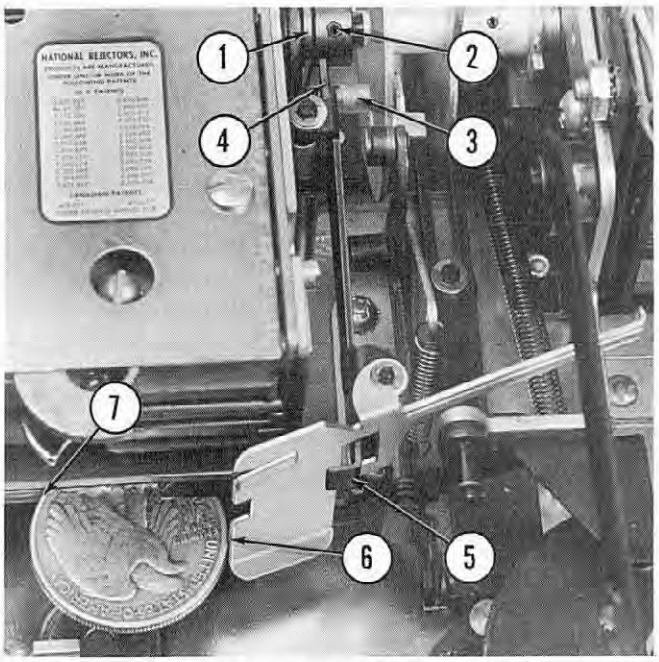

Fig. 25. COIN DROP REQUIREMENTS

1.	Flange of L.H. Bushing	58175
2.	Collar and Set Screw	62743, 73511-19
3.	Cam Pin, Coin Dump	110242
4.	Cam Shaped End of Coin Paddle Mounting Lever	69915
5.	Stop Tab End of Coin Paddle Mounting Lever	69915
6.	Half Dollar Section of Coin Paddle	69916
7.	Edge of Half Dollar Coin Track	

i. Selector Switch Lock Adjustment, Figs. 26, 27, and 28.

The three phases of selector switch locking are governed by the "selector switch lock" cam (Item 1, Fig. 26) which is an integral part of the whole cam assembly (Fig. 26). The first phase of the selector switch lock linkage, in the "at rest" position of the mechanism is controlled by the two surfaces of the cam shown at Items 3, and 4, Fig. 26. In the "at rest" position, the "arm, hub, and roller" assembly (Item 5, Fig. 27) will have its maximum effect on the "pivot arm and pin" assembly (Item 6, Fig. 27). When the "lock bar and adjusting screws (Item 3, Fig. 27) are properly set, the mechanical condition of the three "selector switch latch bars (Item 4, Fig. 28) will be as represented in Figure 28, to leave all selector switches entirely free of any latching action as indicated at Item 5, Figure 28. An approved method for selector switch latch bar adjustment may be accomplished as follows:

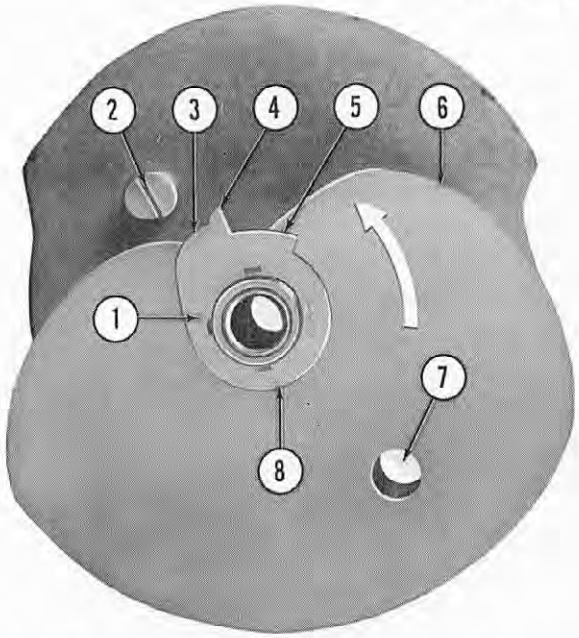

Fig. 26. SELECTOR SWITCH LOCK CAM

1.	Cam, Selector Switch Lock	62750
2.	Pin, Slug Rejector Lock	110559
3.	Cam Surface, "At Rest"	
4.	High Point of Cam, Leaving "At Rest"	
5.	Cam Surface, "Make Selection"	
6.	Cancel and Accumulator Cam	69939
7.	Fixture Guide Holes	
8.	Low Surface, Selector Phase of Cycle	

(1) With the "selector switch lock cam" (Item 1, Fig. 26) in the "at rest" position and its cam follower on the surface indicated at Item 3, Figure 26, set the adjusting screws (Item 3, Fig. 27) to just produce latching action of the switch push rods (Item 3, Fig. 28) when buttons are depressed.

(2) Slowly turn the screws clockwise until the latched push rods are released.

(3) Starting at the released condition established in " (2) " continue to turn the adjusting screws one complete turn in the clockwise direction to provide approved over-travel of 1/32".

(4) If the above adjustment is accurately accomplished, the "selector switch latch bar" (Item 4, Fig. 28) will not bottom when the cam follower of the "arm, hub, and roller" assembly (Item 5, Fig. 27) is on the highest point (Item 4, Fig. 26) of the "selector switch lock cam". Also all selector switches should be locked out or in when the cam follower is on the low surface (Item 8, Fig. 26) of the cam. The intermediate section (Item 5, Fig. 26) of the cam is the "make selection" sector. It positions the selector switch latch bar to engage the switch rods at a point (Item 1, Fig. 28) where switches will be latched when depressed, but may be released by pressing another in the same group. Items 1, 2, and 5, Fig. 28 indicate the points of engagement of the latch bar in the three conditions created by the selector switch lock cam.

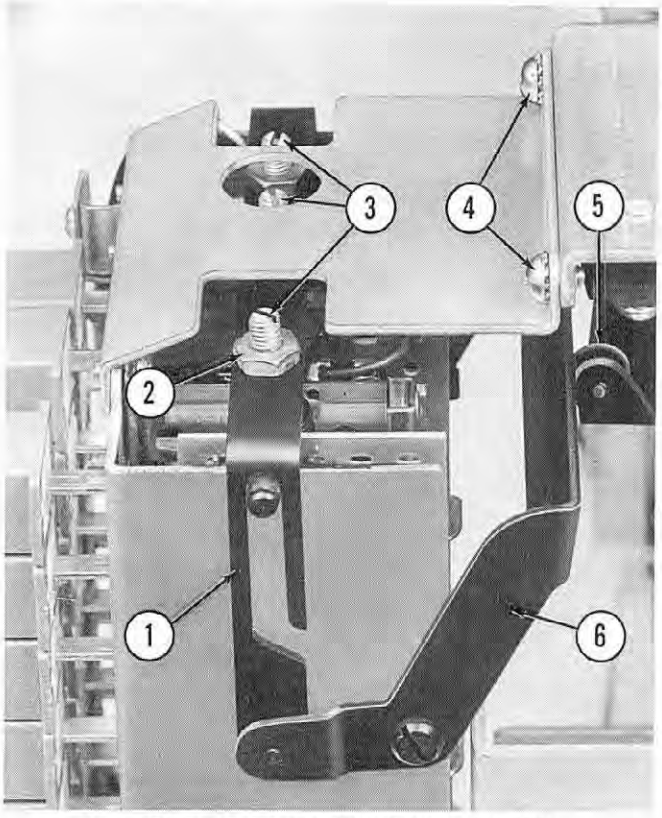

Fig. 27. SELECTOR SWITCH LOCK LINKAGE

1.	Lock Bar	67079
2.	Lock Nuts, 10 - 32 Hex.	73603-8
3.	Adjusting Screws	67433
4.	Screw, 8 - 32 x 3/16" R.H. Sems	73533-33
5.	Roller, "Arm, Hub, and Roller Assembly"	67398
6.	Pivot Arm and Pin Assembly	67618

(5) During the selection phase of the cycle, when the cam follower of the "arm, hub, and roller" assembly is on the low section (Item 8, Fig. 26) of the cam, the selector switches will be latched to full depths as indicated at Item 2, Fig. 28. In this condition, no switches may be depressed and none may be released. Under operating conditions,

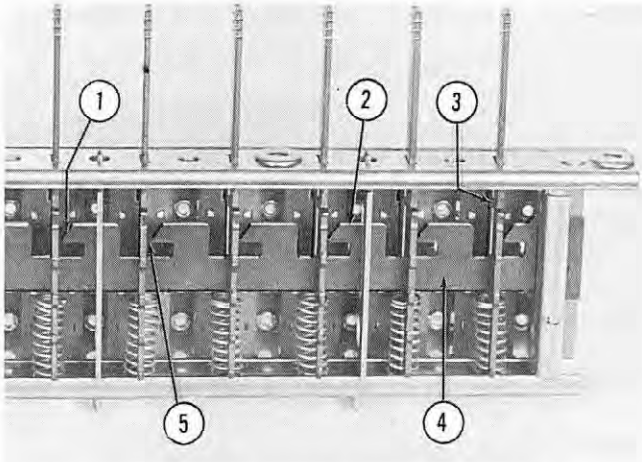

Fig. 28. SELECTOR SWITCH LATCH BAR

1. "Make Selection" Point of Latching
2. Full Latched Position (Selection Phase)
3. Latch Strike in Switch Rods
4. Selector Switch Latch Bar 66894
5. Full Released Position (At Rest Phase)

release of the selector switches must not occur before the selector contact of the "coupling, insulator, and spring" assembly has passed the last pulse patch on the contact plate.

j. Test Requirements, Mechanical

For trouble free operation, the Wall Box should meet the following mechanical test requirements:

(1) With the power turned off, and no credits accumulated, place the cam shaft in the normal "at rest" position.

(2) Drop a dime into the coin entry. With the dime resting on the coin paddle, advance the cycle manually until the coin feeler is intercepted by the dime and the "coin selector wheel and stop pin" assembly has started to rotate. Slowly continue advancing the cycle and watch the advance of the accumulator wheel with relation to the formed end of the detent spring. When the rotation of the coin selector wheel is stopped by the coin feeler and the 10¢ stop pin, the accumulator wheel should have advanced exactly one detent position, coming to rest in the second detent for one play.

(3) Test the coin selector mechanism in the same manner for "3 plays for a quarter" and for "7 plays for a half dollar.

(4) When all credits are cancelled, the last cancellation should move the "accumulator and cancel wheel" exactly into the first detent position and the trip tooth should actuate the key switch to 1/32" contact opening.

k. Test Requirements, Electrical

(1) With the mechanism in the "at rest" position, with no credits on the accumulator wheel, and the power switch "on", manually turn the "coupling, insulator, and spring" assembly in a clockwise direction, as viewed from the motor end of the drive shaft, until the rotor contact completes a circuit to the motor. This contact should tend to drive the coupling back in a counter-clockwise direction. The driving tendency must occur while the contact of the long arm is still on the "at rest" patch of the contact plate.

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

(3) 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 should be on the "make selection" patch of the contact plate.

(4) With the power still on, advance the long arm contact along with the "make selection" patch in its normal direction of rotation. Before the contact leaves the "make selection" patch, the motor must start and drive the mechanism through the remainder of the 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, it is recommended that each Wall Box receive periodic inspection of the test requirements, cleaning of the coin equipment in accordance with National's "Rejector Manual" and bulletin "National Rejector Cleaning Procedure", and cleaning of the operating components of the Wall Box, and lubrication. Lubricants should be applied very lightly at the points indicated in Figure 29 and the accompanying list:

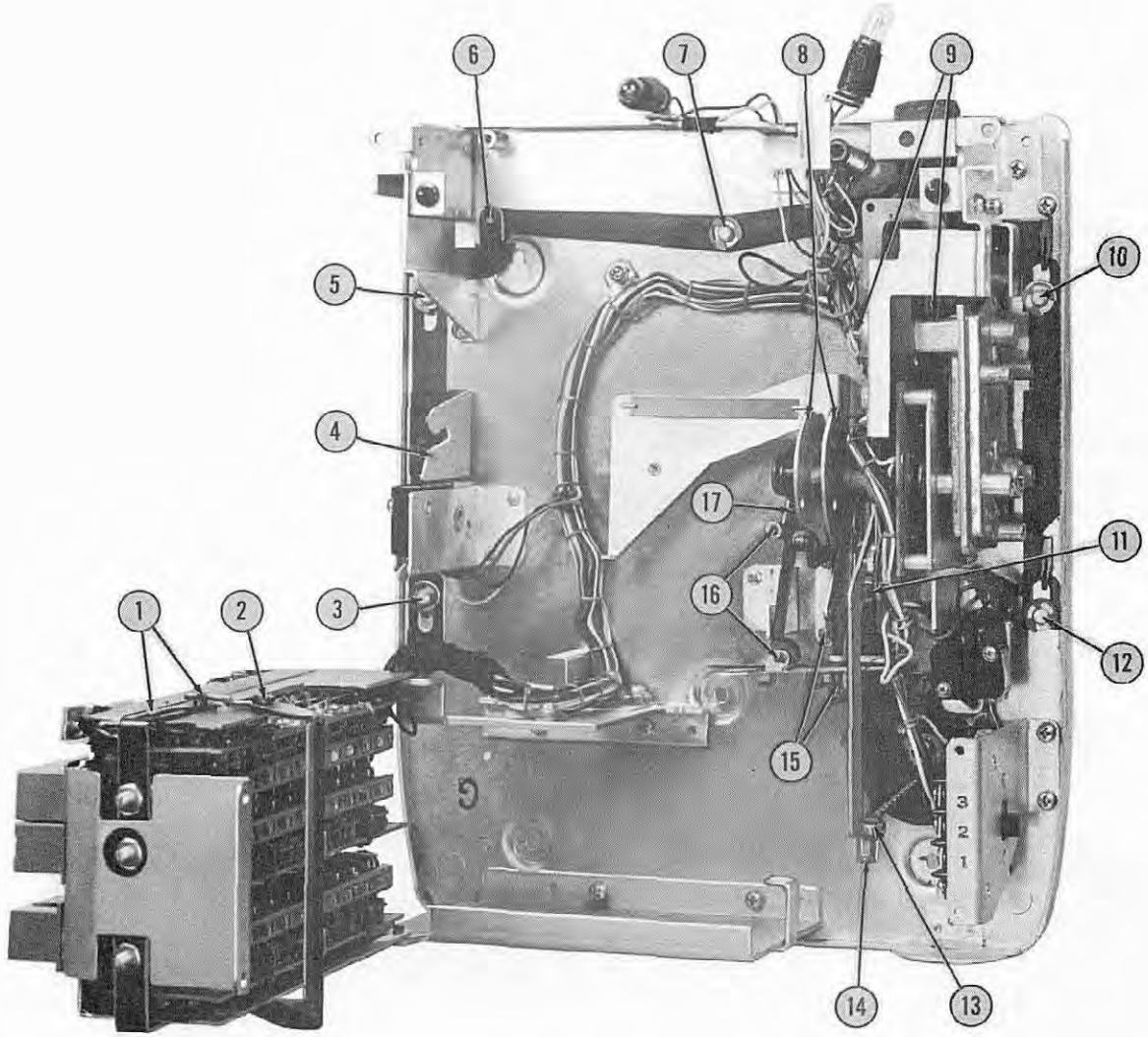

Fig. 29. LUBRICATION

Grease - Keystone, C.P. Soft (1 lb. Can) 67500A
Oil, Wax Free and Acid Free S.A.E. 10

1.	Fulcrum Points, Guide Pins, Selector Switch Lock	C.P. Soft	
2.	Fulcrum Points, Pivot Arm and Pin	S.A.E. 10	
3.	Guide Pin, Cover Lock Bar	C.P. Soft	
4.	Lock Strike, Cover Lock Bar	C.P. Soft	
5.	Guide Pin, Cover Lock Bar	C.P. Soft	
6.	Link Pins, Lever and Pin Assembly	S.A.E. 10	
7.	Pivot Pin, Lever and Pin Assembly	S.A.E. 10	
8.	Working Surfaces of Main Cams	C.P. Soft	
9.	Motor Bearings, Left and Right	S.A.E. 10	
10.	Guide Pin, Cover Lock Bar	C.P. Soft	
11.	Fulcrum Point, Arm, Hub, and Roller Assembly	S.A.E. 10	
12.	Guide Pin, Cover Lock Bar	C.P. Soft	
13.	Roller, Selector Switch Lock Actuating	S.A.E. 10	
14.	Cancel and Accumulator Slide and Pawl	S.A.E. 10	
15.	Fulcrum and Link Points, Coin Feeler	S.A.E. 10	
16.	Shaft Coin Paddle	S.A.E. 10	
	Mounting Stud, Coin Paddle Mounting Lever	S.A.E. 10	
17.	Cam Shaped End of Mounting Lever	C.P. Soft	

MODEL 2100 STEPPER UNIT

1. DESCRIPTION

a. The Models 2100 and 2150, 200 Selection, Stepper Components are integral parts of the junction box-stepper units as indicated in Figure 30.

b. The impulse stepping functions of this unit are provided by two stepper switches (Items 1, and 2, Fig. 30). These units are identical before wiring is added to adapt them to their two selection functions i. e. number selection and letter selections. The mechanical operation and the mechanical adjustments of these units are very similar to those of the Model 257 Stepper and the Model 2000 Stepper.

c. The Model 2100 Stepper operates on 28 V. D. C. furnished by the rectifier mounted on the chassis pan of the Model 532 Amplifier. The two stepper units also handle the flow of 24 V.A.C. from the low voltage power transformer, mounted on the chassis of the Model 532 Amplifier. In the selector system the 28 V.D.C. is used for number coils and timing relay number two, the 24 V.A.C. is used for the letter coils. A separate winding is provided on the low voltage transformer to furnish 24 V.A.C. at the Wall Box terminal strip (Item 5, Fig. 30) for operation of one group of four Wall Boxes. The 28 V.D.C. circuit is protected by the 0.3 Amp. Fusetron (Item 4, Fig. 30) the 24 V. A. C. stepper circuit is protected by the 0.8 Amp. Fusetron (Item 9, Fig. 30) and the Wall Box circuit is protected by the 3 Amp. Fustat (Item 3, Fig. 30). The 24 V. A. C. letter coil circuit and the 24 V. A. C. coin magnet circuit (a play-rak circuit) are designed for momentary contact operation, continued current flow will therefore blow the coil protective fuses.

d. The number timing relay and the letter timing relay are shown at Items 8 and 6, respectively of Figure 30. The transfer relay (Item 7, Fig. 30) as well as the number and letter timing relays are assembled to work in conjunction with the two stepper units in the handling of the D.C. pulses transmitted by the wall circuit. The step magnet assembly (Item 9, Fig. 32) is the driving component for the stepping switch and the release relay (Item 2, Fig. 32) is the holding component for the stepping switch.

e. Other components of the stepper system are mounted on the under side of the junction box chassis pan as shown in Figure 31. The 500 Mfd. timing capacitor (Item 3, Fig. 31) and several other smaller capacitors combine with the various stepper circuits.

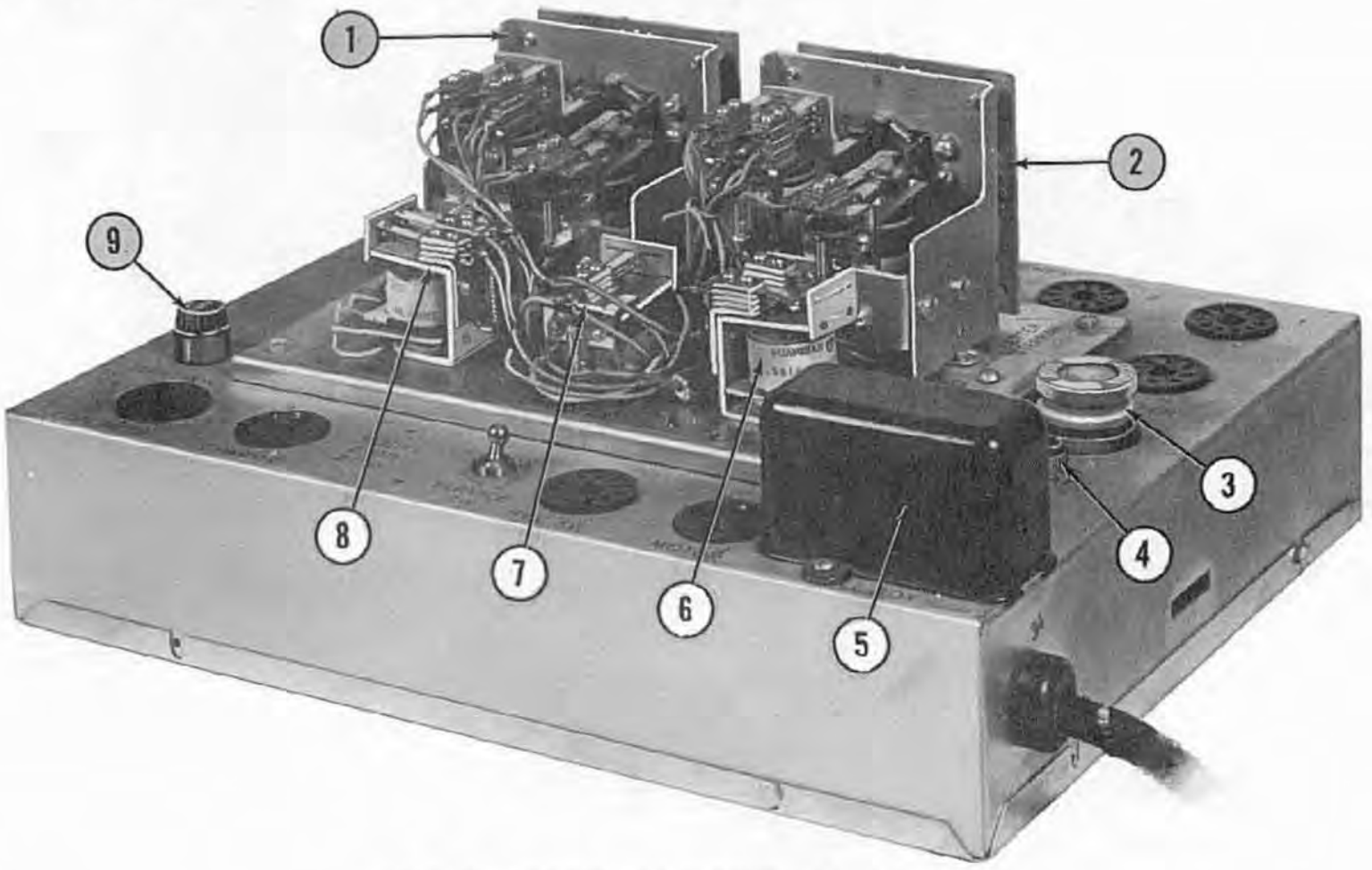

Fig. 30. STEPPER - JUNCTION BOX ASSEMBLY

1.	Number Stepping Switch	68823	6.	Letter Timing Relay	68941
2.	Letter Stepping Switch	68823	7.	Transfer Relay	65748
3.	Fustat, 3 Amp.	61858	8.	Number Timing Relay	68940
4.	Fusetron, 0.3 Amp. (Number Coils and T.R. 2)	45588	9.	Fusetron, 0.8 Amp. (Selector Coils)	14524
5.	Wall Box Terminal Strip (Under Cover 44943)	60570			

f. *The fuse posts (Items 1, and 10, Fig. 31)* for the two Fusetrons and the socket (Item 9) for the 3 Amp. Fustat are also mounted underneath the chassis pan. A pulse relay (Item 8, Fig. 31) is used in the Wall Box pulse circuit to minimize the arcing of contacts at the Wall Box rotor.

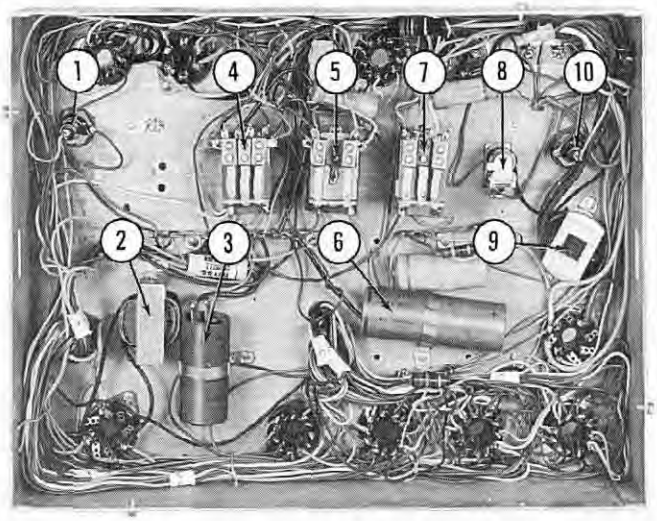

Fig. 31. STEPPER COMPONENTS

1.	Fuse Post	51485
2.	Transformer, Panel Lights	58357
3.	Capacitor, 65 - 93 Mfd., 50 V.A.C.	70901
4.	Reversing Relay	65750
5.	Timing Relay No. 2	68942
6.	Capacitor, 500 Mfd., Timing	71816
7.	Timing Relay No. 3	68943
8.	Pulse Relay	65752
9.	Socket, Fustat	61857
10.	Fuse Post	45352

2. OPERATION

Both the number stepper and the letter stepper (Fig. 30) function in the same mechanical manner and the same electrical manner.

a. The step magnet assembly (Item 9, Fig. 32) pulls its armature (Item 8) down each time the coil is energized. The driving pawl (Item 7) is thus engaged with the ratchet wheel (Item 3) and advances the contact arm (Item 4) one contact for each pulse. Due to closing of the contacts of the pulse switch (Item 1) a series of circuits is started and the release relay (Item 2) will be energized and the holding dog (Item 5) engaged with the ratchet wheel to hold the advance of the contact arm for succeeding pulses.

b. The timing relay (Item 8, Fig. 30) and the release relay will hold their charges for a short period after their coil circuits have been opened, due to shorting rings below their coils. This delayed action permits rapid release and re-energizing of the step magnet to advance the stepper arm in accordance with the number of successive pulses received from the Wall Box.

c. The transfer relay, shown at Item 7, Fig. 30, shifts the Wall Box pulse circuit from the letter stepping unit to the number stepping unit to determine which number solenoid will be energized.

d. The 500 Mfd. capacitor (Item 6, Fig. 31) provides additional current, beyond the holding capacity of the letter release relay, to maintain holding of that relay until the set-up action of the number stepping unit has been accomplished. The contact arm of stepping units function as an integral part of the ratchet wheel and shaft assemblies. Therefore when the release relays are de-energized and their holding dogs released, the contact arms will retract under spring loading to their original "at rest" positions.

e. The following electrical sequence schematic diagrams are provided for detailed descriptions of stepping operations and as a guide to electrical continuity and voltage measurements as used by service personnel in the isolation of electrical malfunctions:

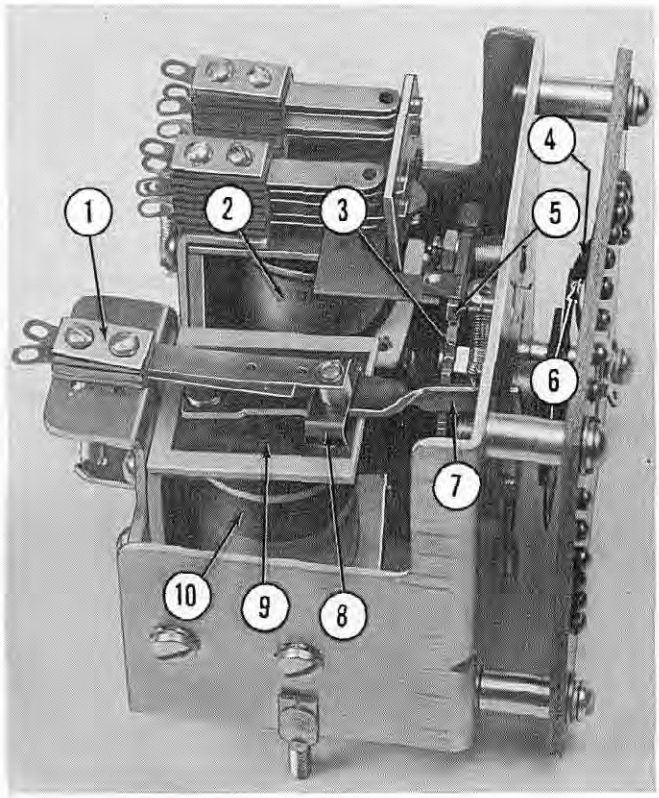

Fig. 32. STEPPING SWITCH UNIT

1.	Pulse Switch	63326
2.	Release Relay	68823-1
3.	Ratchet Wheel	61005
4.	Contact Arm	68823-3
5.	*Holding Dog*	61005-A
6.	Common Contact	
7.	Driving Pawl (Part of 60997)	
8.	Armature Assembly	60997
9.	Step Magnet Assembly	
10.	Coil, Step Magnet	61900

3. ADJUSTMENTS

Mechanical adjustments for the Models 2100, and 2150 steppers are identical with those published for the Model 2000 Stepper. See pages 26, 27, and 28 of your Model 5210 Wall Box Manual, contained in this volume.

4. INSTALLATION

Instructions for installation of Wall Boxes with steppers, are furnished with each Wall Box.

5. STEPPER MAINTENANCE

Refer to paragraph 5, page 28, of your Model 5210 Wall Box Manual, contained in this volume.

ELECTRICAL SEQUENCE SCHEMATIC DIAGRAMS

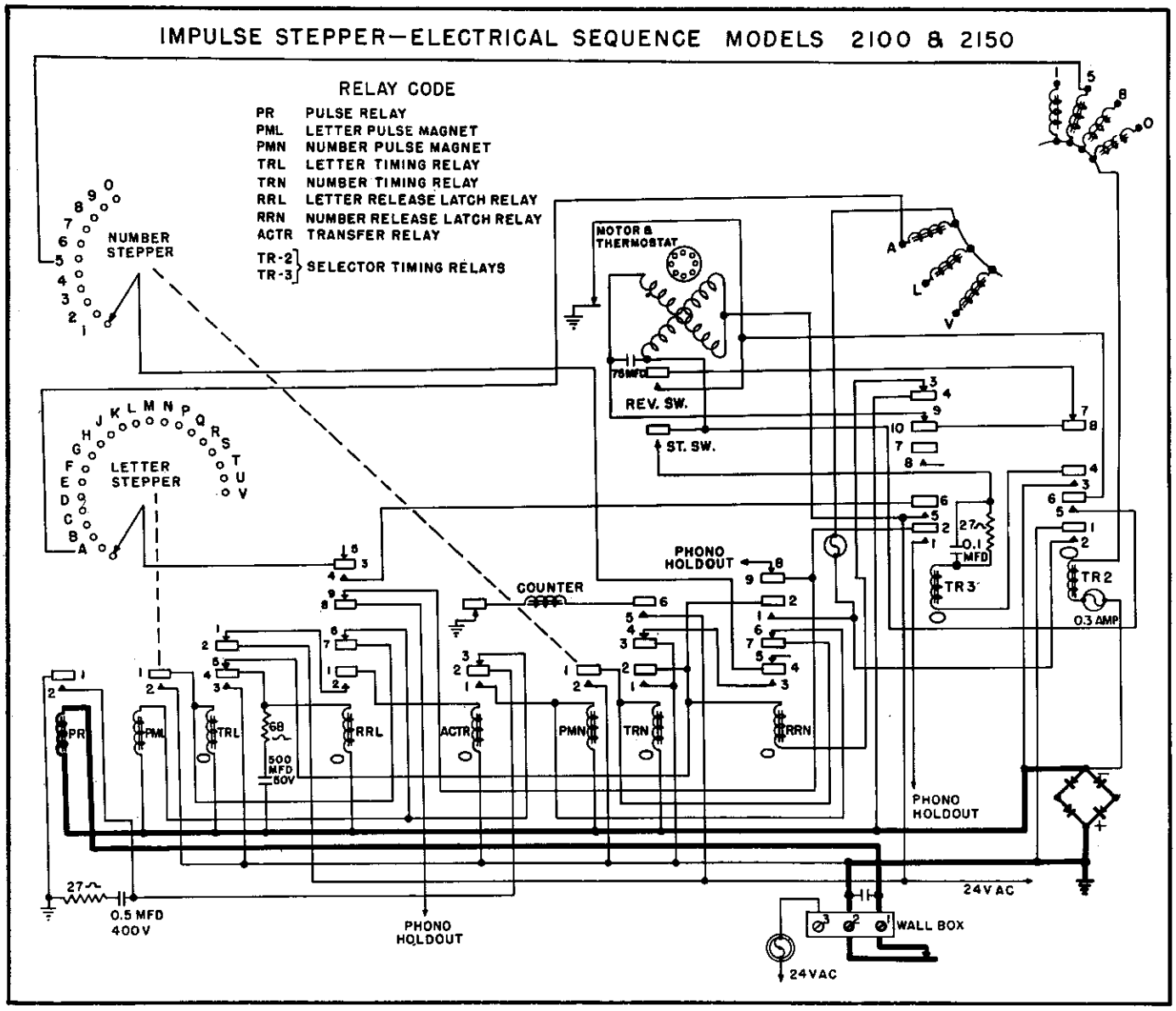

Fig. 33. PHASE 1 - WALL BOX PULSE CIRCUIT FOR LETTER STEPPER

The rotary contactor of the Wall Box creates a series of contacts from number one terminal to number 2 terminal (common ground). The pulse circuit is shown in solid line from the negative side of the 28 V. D. C. rectifier, through the coil of the pulse relay to Wall Box terminal No. 1, through the Wall Box rotary contactor to Wall Box terminal No. 2, to common ground and the positive side of the 28 V.D.C. rectifier.

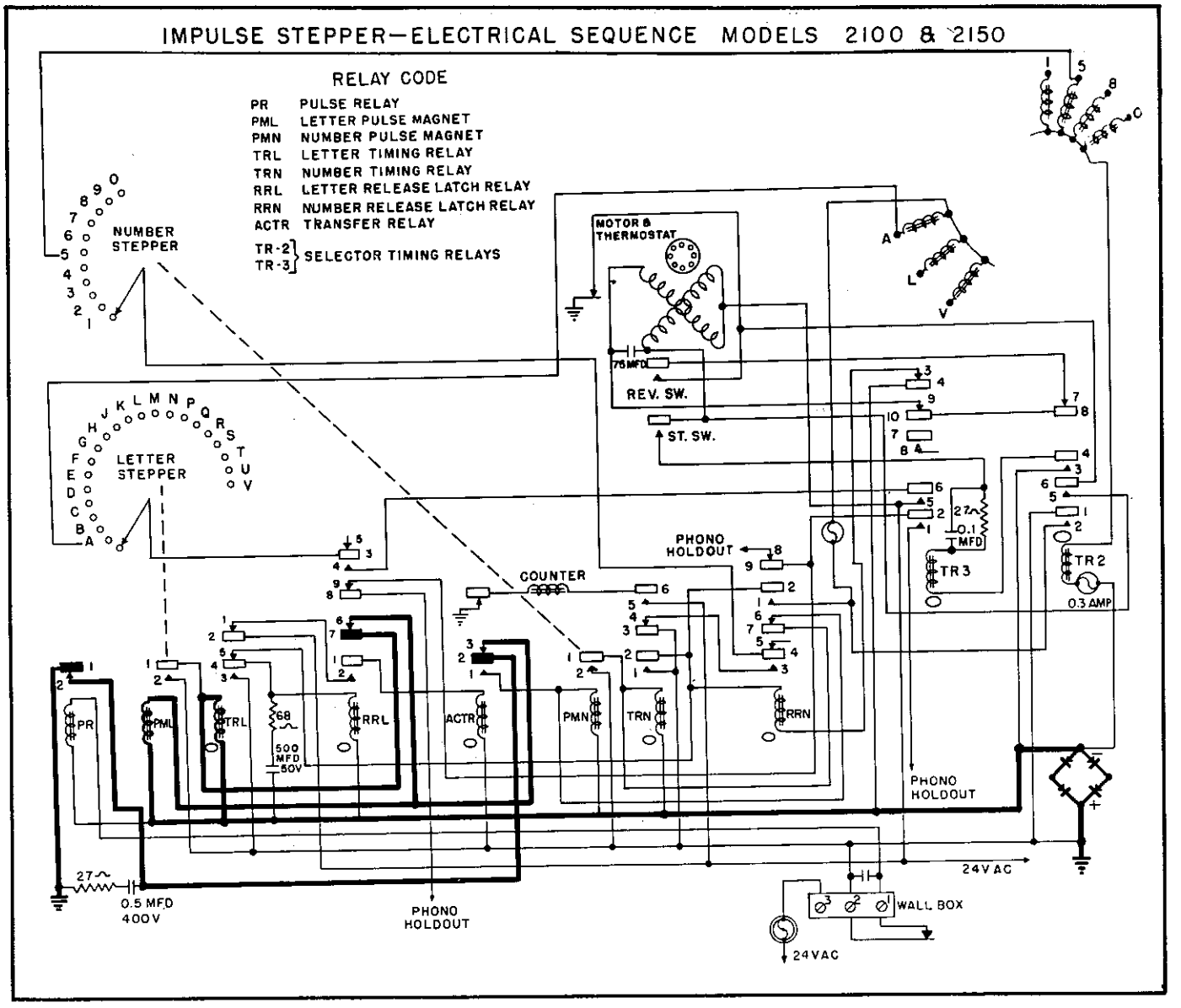

Fig. 34. PHASE 2 - PULSE RELAY FUNCTION, CONTACTS 1 & 2

a. Each time the grounded rotary contactor of the Wall Box produces the circuit described in phase 1, by brushing over the selector contacts, the pulse relay will be actuated and released. Thus contacts 1 & 2 of the pulse relay will produce a series of impulse circuits as shown in heavy line from the negative side of the 28 V.D.C. rectifier, through the coil of the letter pulse magnet, contacts 3 & 2 of the transfer relay, and contacts 2 & 1 of the pulse relay to common ground and the positive side of the 28 V.D.C. rectifier.

b. Concurrent with the above circuit, a circuit is completed to the letter timing relay as shown in heavy line from the negative side of the 28 V. D. C. rectifier, through the coil of the letter timing relay, normally closed contacts 7 & 6 of the letter release latch relay, contacts 3 & 2 of the transfer relay, and contacts 2 & 1 of the pulse relay, to common ground and the positive side of the 28 V.D.C. rectifier. This circuit is provided to speed up the action of the letter timing relay.

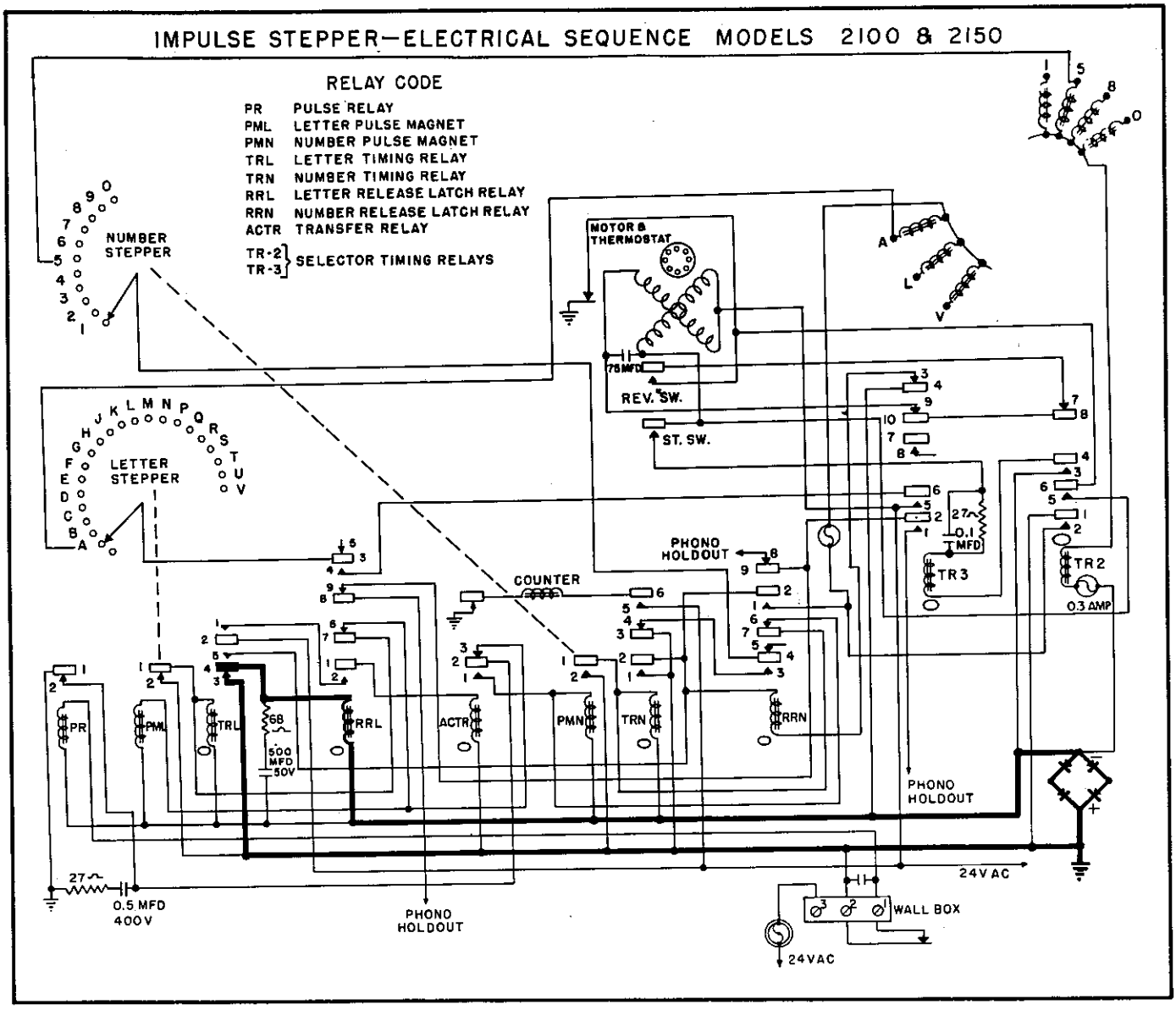

Fig. 35. PHASE 3 - LETTER TIMING RELAY FUNCTION, CONTACTS 3 & 4

When the letter timing relay is actuated, its contacts 3 & 4 close to complete a circuit to the coil of the letter release latch relay, as shown in heavy line, from the negative side of the 28 V.D.C. rectifier, through the coil of the letter release latch relay, and contacts 4 & 3 of the letter timing relay to common ground and the positive side of the 28 V.D.C. rectifier. The armature of the letter release latch relay is mechanically connected to the stepper holding dog. As long as the release latch relay remains actuated, stepper switch advances will be held by the holding dog.

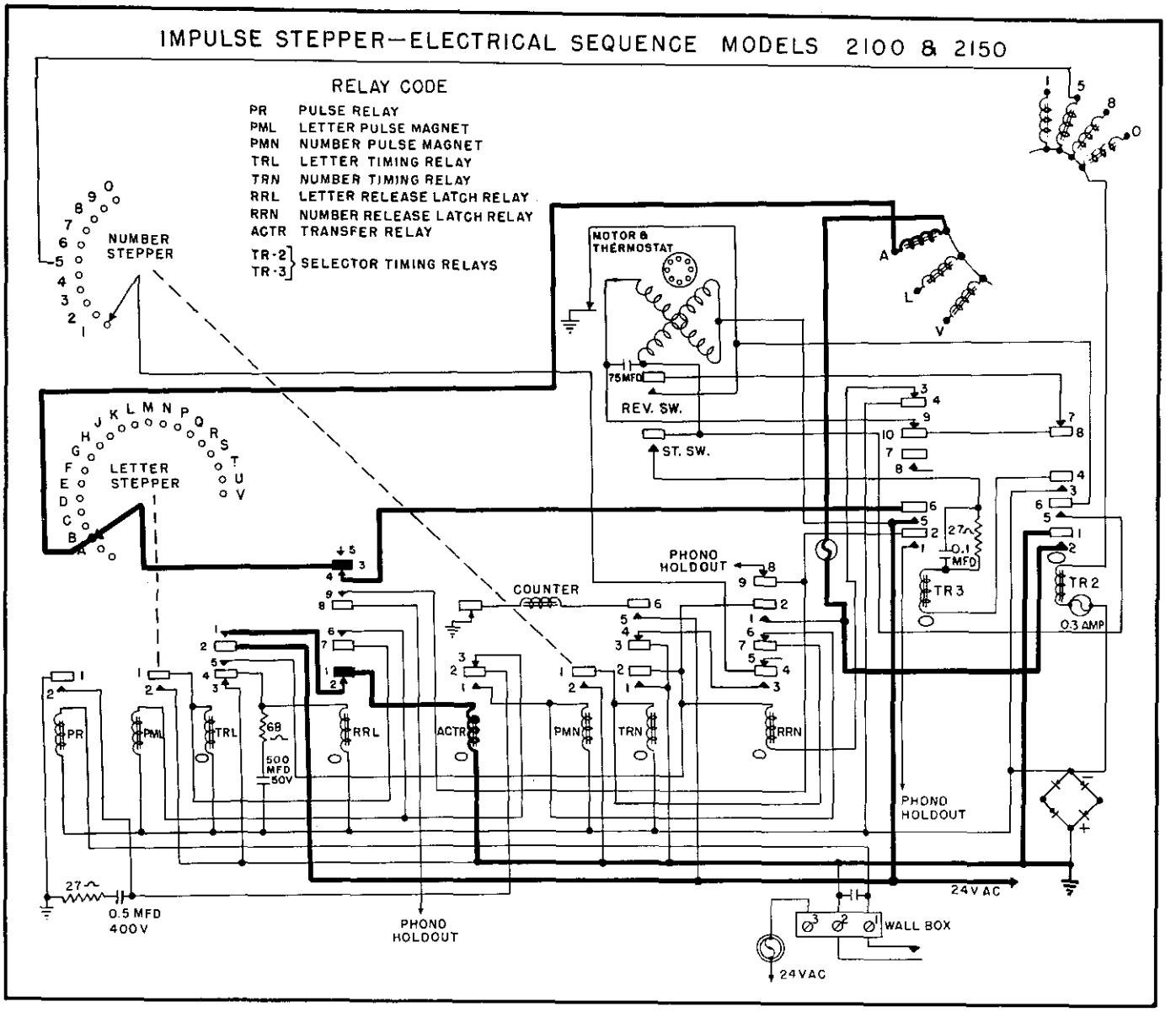

Fig. 36. PHASE 4 LETTER RELEASE LATCH RELAY FUNCTION, CONTACTS 1 & 2 AND 3 & 4

a. When the letter release latch relay is energized, its contacts 1 & 2 close to prepare a 24 V.A.C. circuit for the transfer relay. This circuit is shown in solid line from the hot side of the 24 V.A.C. winding of the low voltage transformer to open contact No. 2 of the letter timing relay, and then, from open contact No. 1, through contacts 2 & 1 of the letter release latch relay, and the coil of the transfer relay to common ground and the other side of the 24 V.A.C. side of the low voltage transformer. Thus when the letter timing relay receives no more successive pulses, from the letter pulse magnet, the holding effect of the shorting rings on its coils will dissipate and its armature will be released to close its contacts 1 & 2 and 4 & 5, and open its contacts 3 & 4.

b. The closing of contacts 3 & 4 of the letter release latch relay forms the first of three parts of the letter solenoid circuit. This is a 24 V.A.C. circuit shown in solid line, from the hot side of the 24 V. A. C. winding of the low voltage transformer to normally open contacts 5 & 6 (open) of the timing relay No. 3, then through contacts 4 & 3 of the letter release latch relay, the letter stepper switch and letter solenoid "A", the 0.8 Amp. protective fuse, to the normally open contacts 2 & 1 (open) of timing relay No. 2, and then to common ground and the other side of the 24 V. A. C. winding of the low voltage transformer.

c. The opening contacts 8 & 9 of the letter release latch relay isolates the D.C. latch switch circuit of the phonograph to interrupt the completion of any selection which has been or may be made at the key board of the phonograph. Such selections will be immediately completed following the selection of the Wall Box and closing of the stepper isolation contacts.

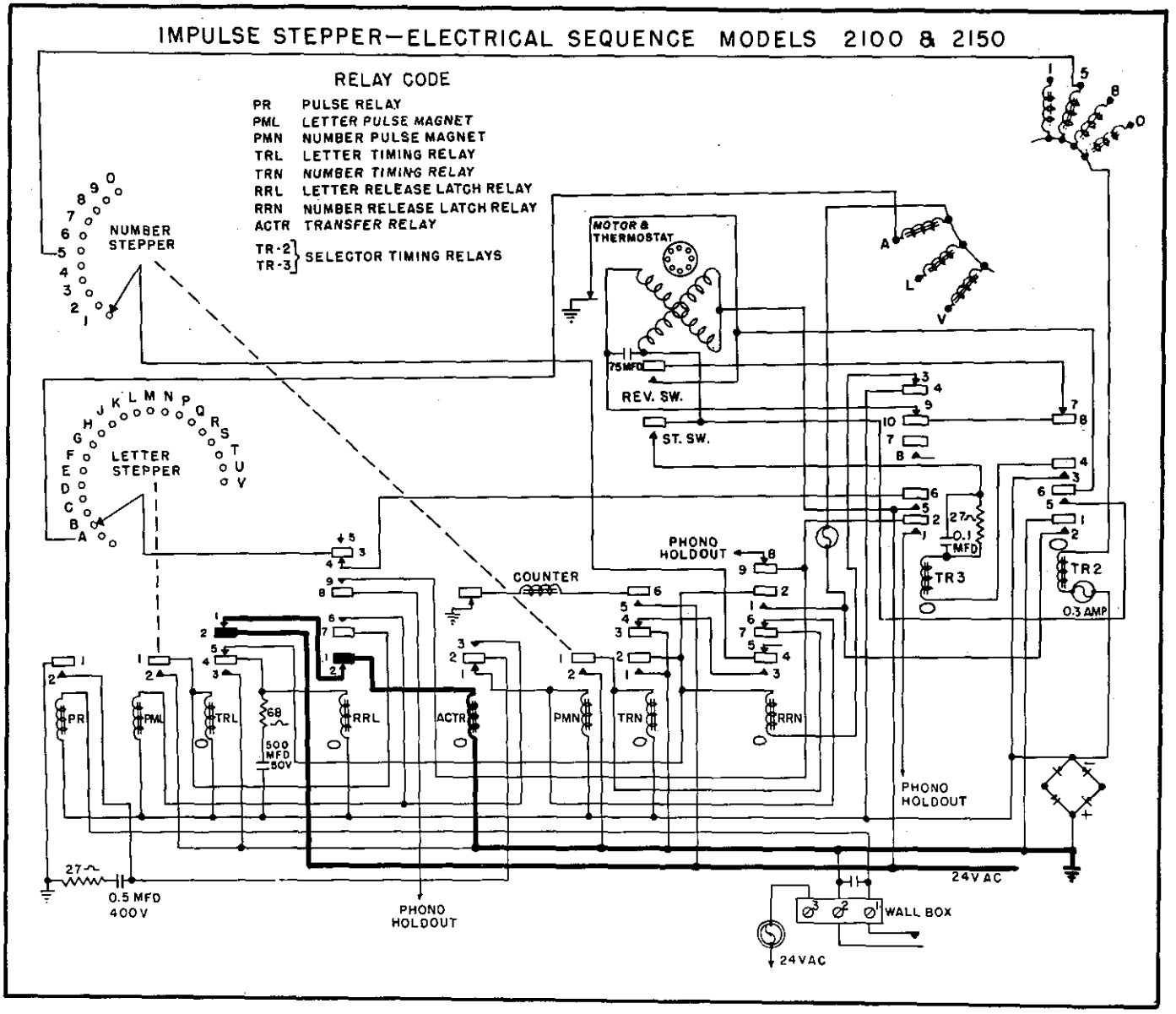

Fig. 37. PHASE 5 - LETTER TIMING RELAY RELEASED FUNCTION, CONTACTS 1 & 2

a. As the Wall Box contactor leaves the letter contacts, there will be a time interval of sufficient duration for the letter timing relay to become de - energized. Is normally closed contacts 1 & 2 will therefore close to complete the 24 V.A.C. circuit to the transfer relay as shown in heavy line from the hot side of the 24 V.A.C. winding of the low voltage transformer winding, through contacts 2 & 1 of the letter timing relay, contacts 2 & 1 of the letter release latch relay, and the coil of the transfer relay to common ground and the other side of the 24 V.A.C. winding of the low voltage transformer.

b. The second series of Wall Box pulses will thus become number pulses by virtue of the transfer relay functions.

c. It should be noted at this phase that the letter release relay has no source of power except the delayed action influence of its shorting rings and the direct current stored in the 500 Mfd. capacitor. In this manner, the letter release relay will be held and the letter stepper switch will be held until the number stepper components are set-up to take over the holding function.

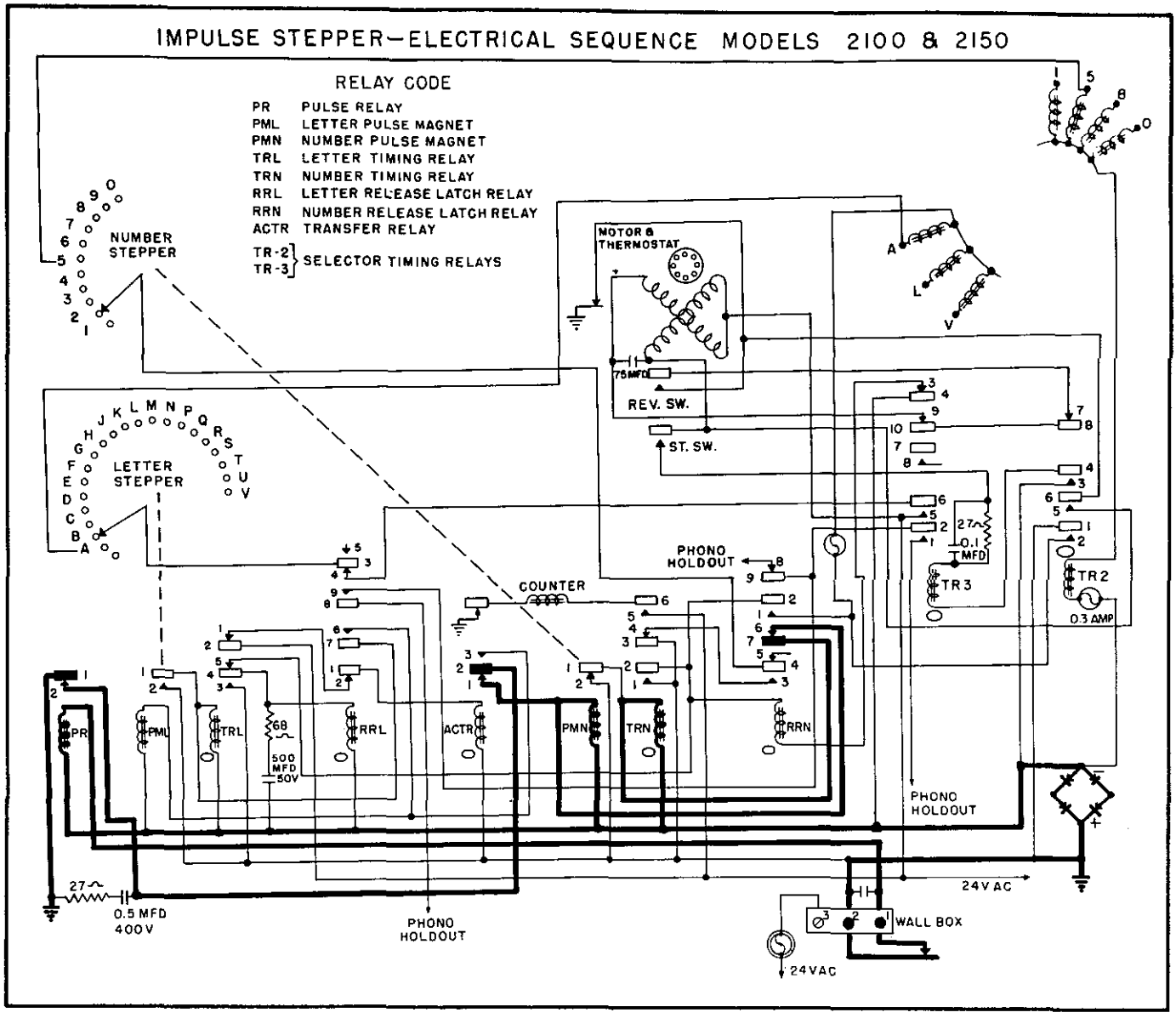

Fig. 38. PHASE 6 - WALL BOX PULSE CIRCUIT FOR NUMBER STEPPER

a. The Wall Box pulse circuit continues after an interruption of sufficient duration to permit the letter timing relay to discharge. The circuit is shown in heavy line from the negative side of the 28 V.D.C. rectifier, through the coil of the pulse relay and the rotary contactor of the Wall Box to common ground and the positive side of the 28 V.D.C. rectifier. While the circuit for the pulse relay is identical with that shown in phase 1, the difference in the condition of the various other circuits and prepared circuits, as well as the physical difference in stepper components, should be noted at this phase of selection. The set-up for letter selection is held in obeyance for the completion of the set-up for the number selection.

b. Concurrent with the circuit provided in phase 6 a., contacts 1 & 2 of the pulse relay complete a circuit, shown in heavy line, to the coil of the number timing relay. It starts with the negative side of side of the 28 V.D.C. rectifier and flows through the coil of the number timing relay, normally closed contacts 7 & 6, of the number release latch relay, contacts 1 & 2 of the transfer relay, and contacts 2 & 1 of the pulse relay to common ground and the positive side of the 28 V.D.C. rectifier.

c. At the same time the timing relay is energized the actuation of the number pulse magnet causes mechanical action of the number stepper switch as described for the letter pulse magnet. The switch is thus advanced one contact for each successive pulse received from the Wall Box.

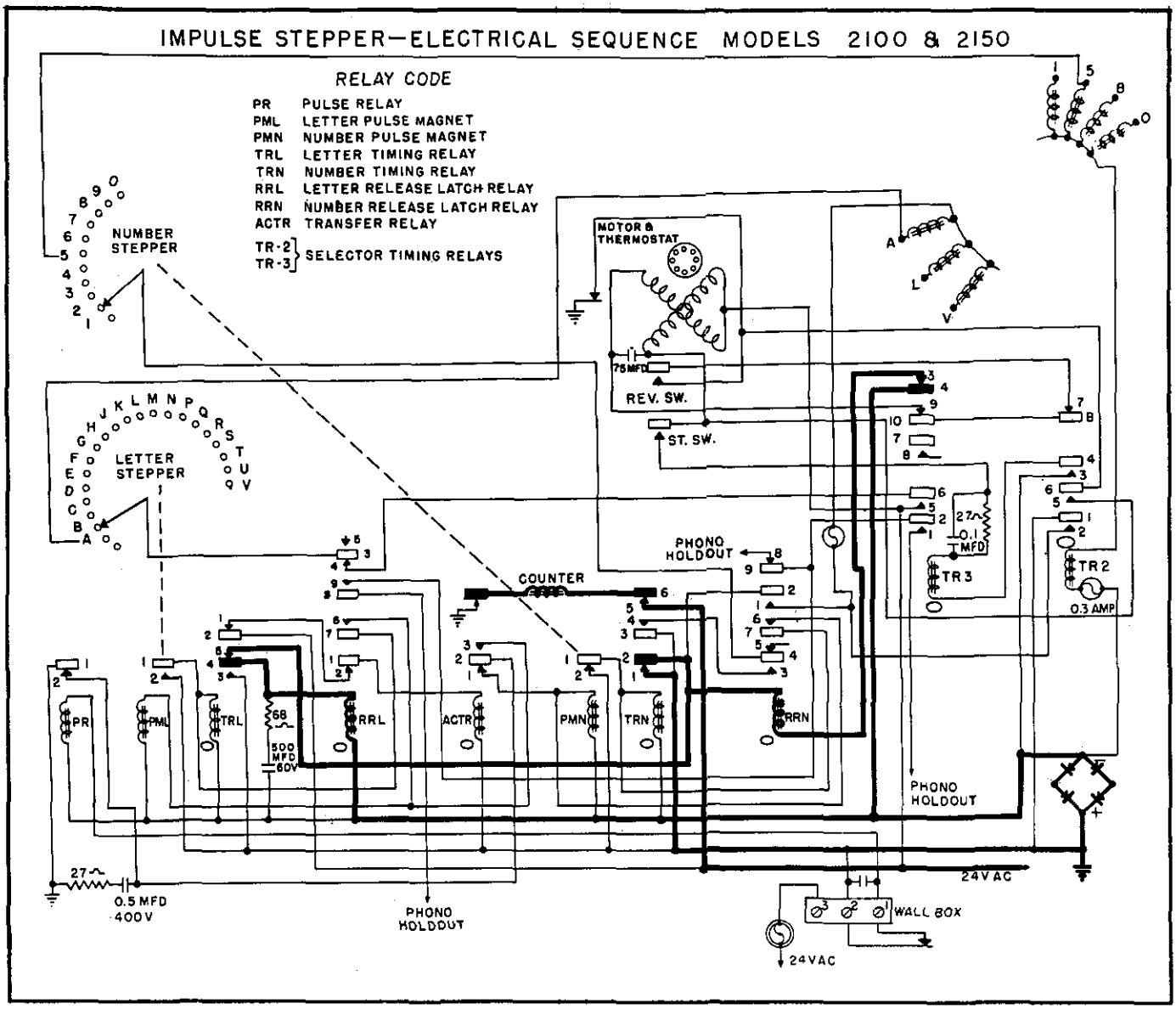

Fig. 39. PHASE 7 - NUMBER TIMING RELAY FUNCTION, CONTACTS 1 & 2 AND 5 & 6

a. When the number timing relay is actuated, its contacts 1 & 2 close to complete a circuit to the coil of the number release latch relay, as shown in heavy line, from the negative side of the 28 V.D.C. rectifier, through normally closed contacts 4 & 3 of timing relay No. 3, the coil of the number release latch relay and contacts 2 & 1 of the number timing relay to common ground and the positive side of the 28 V.D.C. rectifier. The armature of the number release latch relay is mechanically connected to the number holding dog, as in the case of the letter release latch relay in phase 3. As long as this relay remains energized, any stepper switch advances will be maintained by the holding dog, until the relay is released.

b. At the same time that contacts 1 & 2 of the number timing relay perform the function described in above, they complete the holding circuit for the letter release latch relay which was prepared earlier, by the release of the letter timing relay. This circuit maintains the holding function of the letter release latch relay as shown in heavy line from the negative side of the 28 V.D.C. rectifier, through the coil of the letter release latch relay, contacts 4 & 5 of the letter timing relay, and contacts 2 & 1 of the number timing relay to common ground and the positive side of the 28 V.D.C. rectifier. This second function of contacts 1 & 2 is only transient and will later be replaced by still another circuit to hold the letter release latch relay actuated.

c. When contacts 5 & 6 of the number timing relay close, 24 V.A.C. circuit is completed to the electric counter. As shown in heavy line, this circuit flows from the hot side of the 24 V.A.C. winding of the low voltage transformer, through contacts 5 & 6 of the number timing relay, the coil of the electric counter, and the free-play switch to common ground and the other side of the 24 V.A.C. winding of the low voltage transformer.

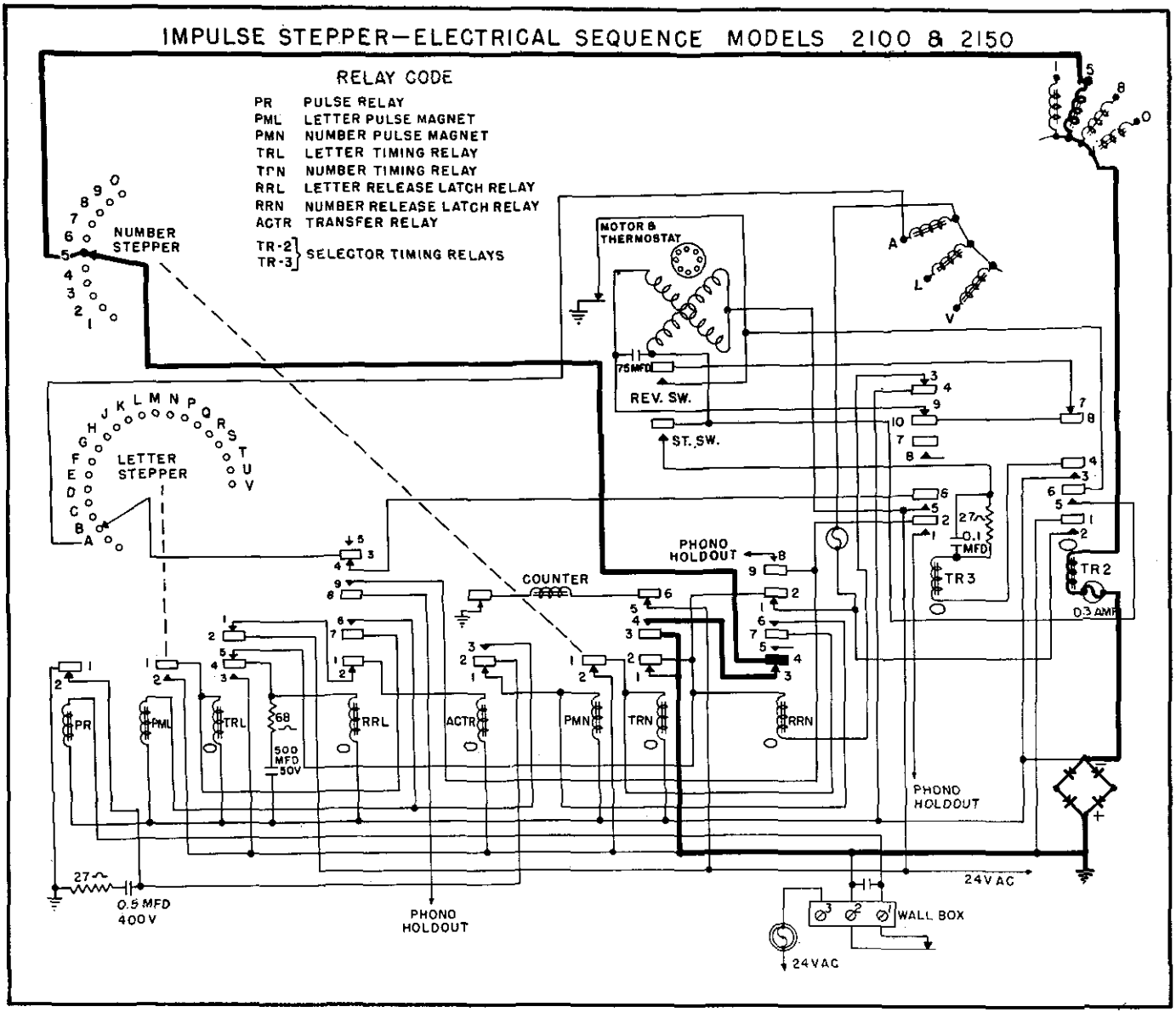

Fig. 40. PHASE 8 - NUMBER RELEASE LATCH RELAY FUNCTION, CONTACTS 3 & 4

When the number release latch relay was energized as described in phase 7, its contacts 3 & 4 close to prepare a circuit for the series connected, number solenoid and timing relay No. 2. As shown in heavy line, this circuit will flow from the negative side of the 28 V.D.C. rectifier, through the 3/10 Amp. protective fuse, the coil of timing relay No. 2, the coil of number solenoid No. 5, stepper contact No. 5, and contacts 4 & 3 of the number release latch relay to open contacts 4 & 3 of the number timing relay. When the number timing relay is released, its contacts 4 & 3 will complete the circuit to common ground and the positive side of the 28 V.D.C. rectifier.

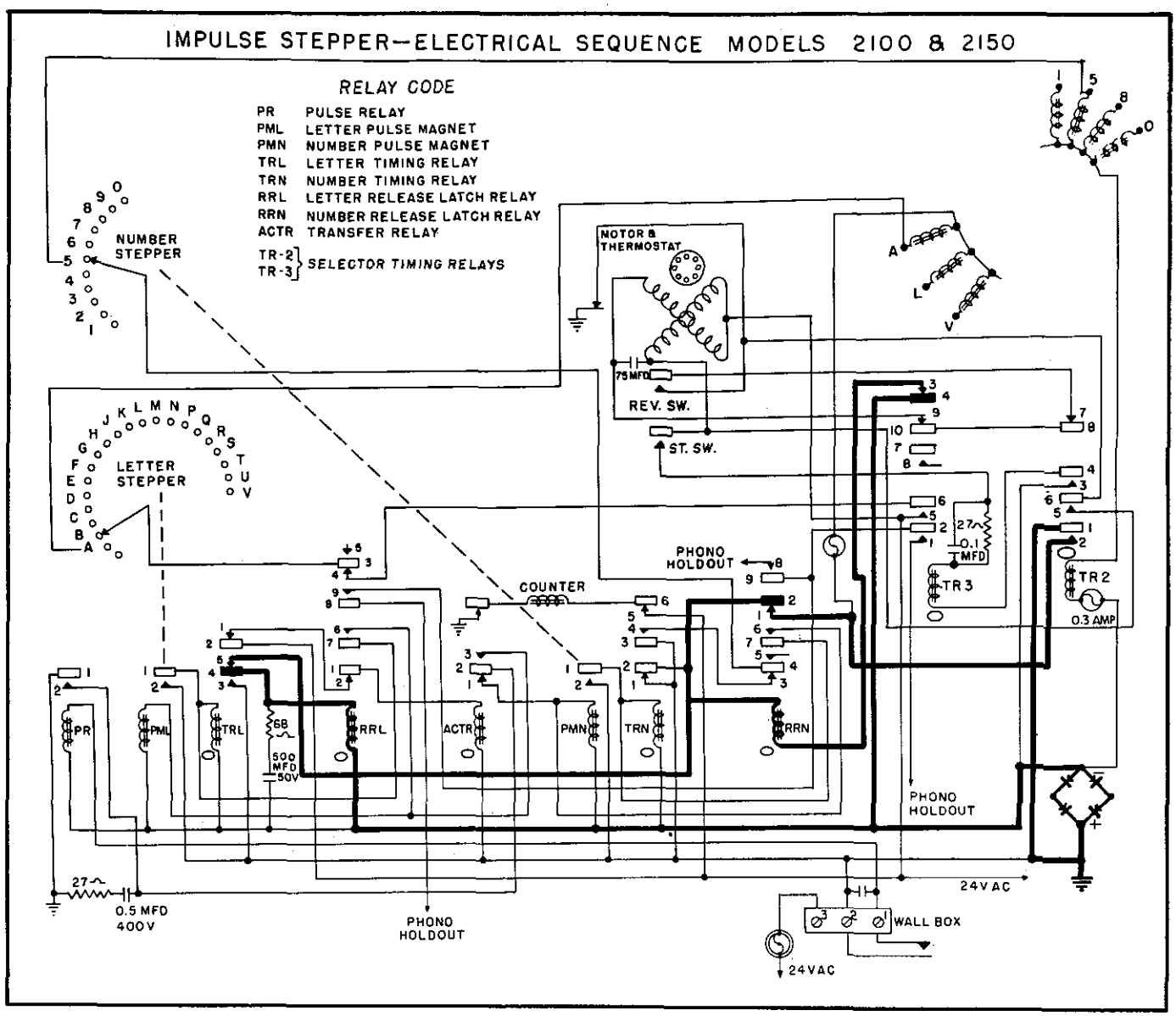

Fig. 41. PHASE 9 - NUMBER RELEASE LATCH RELAY FUNCTION, CONTACTS 1 & 2

a. When the number release latch relay is actuated, its contacts 1 & 2 close to prepare a circuit which will continue to hold the letter release latch relay and interlock the number release latch relay after the number timing relay has been released and the holding circuit shown in phase 7 has been opened. As shown in heavy line, this circuit will flow from the negative side of the 28 V.D.C. rectifier, through the coil of the letter release latch relay, normally closed contacts 4 & 5 of the letter timing relay, and contacts 2 & 1 of the number release latch relay to open contacts 2 & 1 of timing relay No. 2. When timing relay No. 2 is energized, its contacts 2 & 1 will complete the two circuits to common ground and the positive side of the 28 V.D. C. rectifier.

b. Contacts 1 & 2 of the number release latch relay also prepares an interlock circuit for its own coil as shown in heavy line from the negative side of the 28 V.D.C. rectifier, through normally closed contacts 4 & 3 of timing relay No. 3, the coil of the number release latch relay, contacts 2 & 1 of the number release latch relay, to open contact No. 2 of timing relay No. 2. It will continue from contact No. 1 of timing relay No. 2 to common ground and the positive side of the 28 V.D.C. rectifier.

c. Contacts 8 & 9 of the number release latch relay open to isolate the phonograph number selector switch bank during stepper operation. Any selection set up at the phonograph key board during stepper operation, will be completed by the closing of these contacts and contacts 8 & 9 of the letter release latch relay.

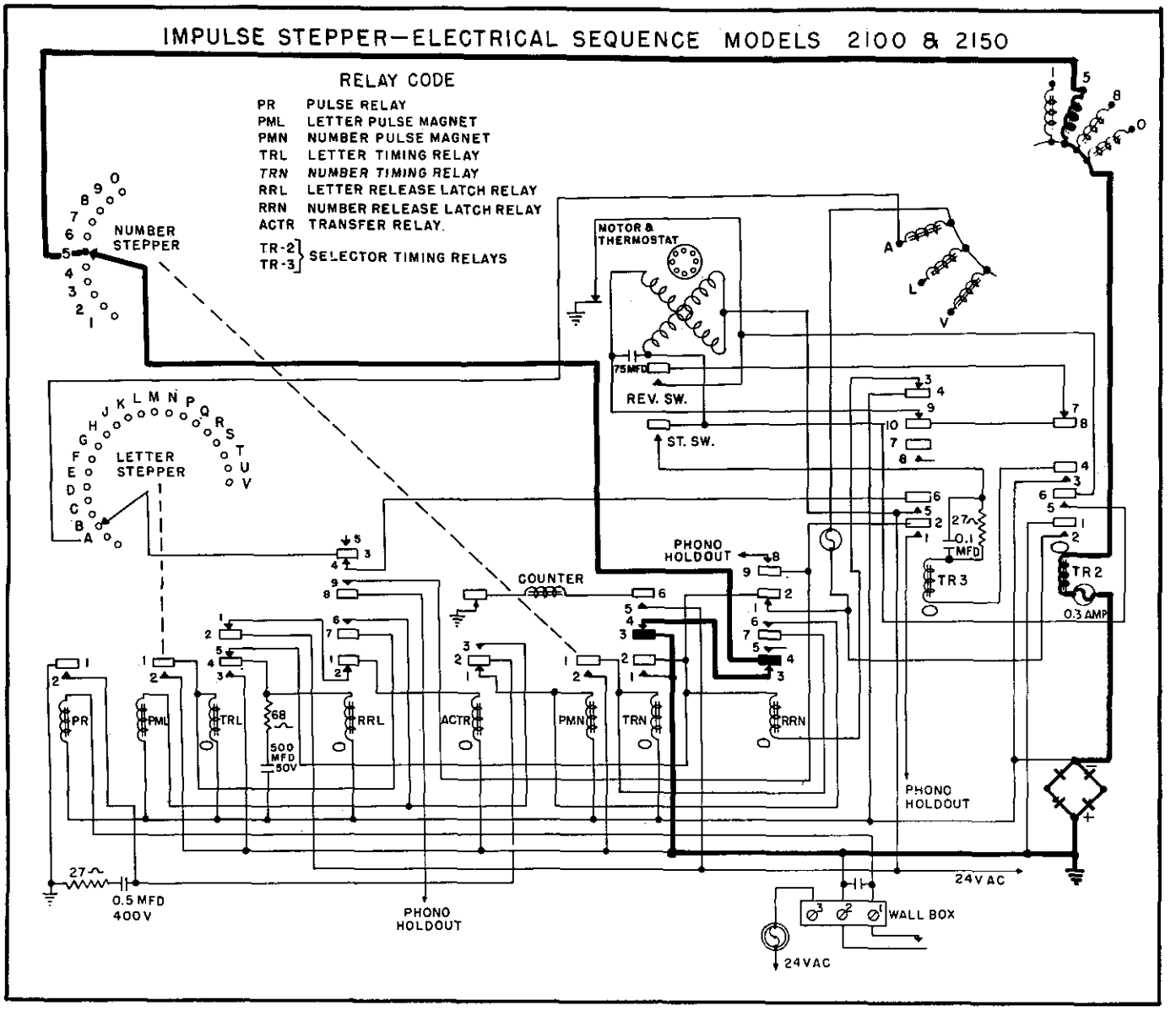

Fig. 42. PHASE 10 - NUMBER TIMING RELAY RELEASED FUNCTION, CONTACTS 3 & 4

When successive number pulses from the Wall Box stop at contact No. 5 of the number stepper switch, the loading effect of the shorting rings on the number timing relay will dissipate and the relay will be released to close its contacts 3 & 4 and complete the number selection circuit prepared in phase 8. As shown in heavy line, from the negative side of the 28 V.D.C. rectifier, through the 3/10 Amp. protective fuse, number solenoid No. 5 contact No. 5 of the number stepper switch, contacts 4 & 3 of the number release latch relay, and contacts 4 & 3 of the number timing relay to common ground and the positive side of the 28 V.D.C. rectifier, stop solenoid No. 5 will be actuated to provide proper indexing of the number quadrant, and timing relay No. 2 will be actuated.

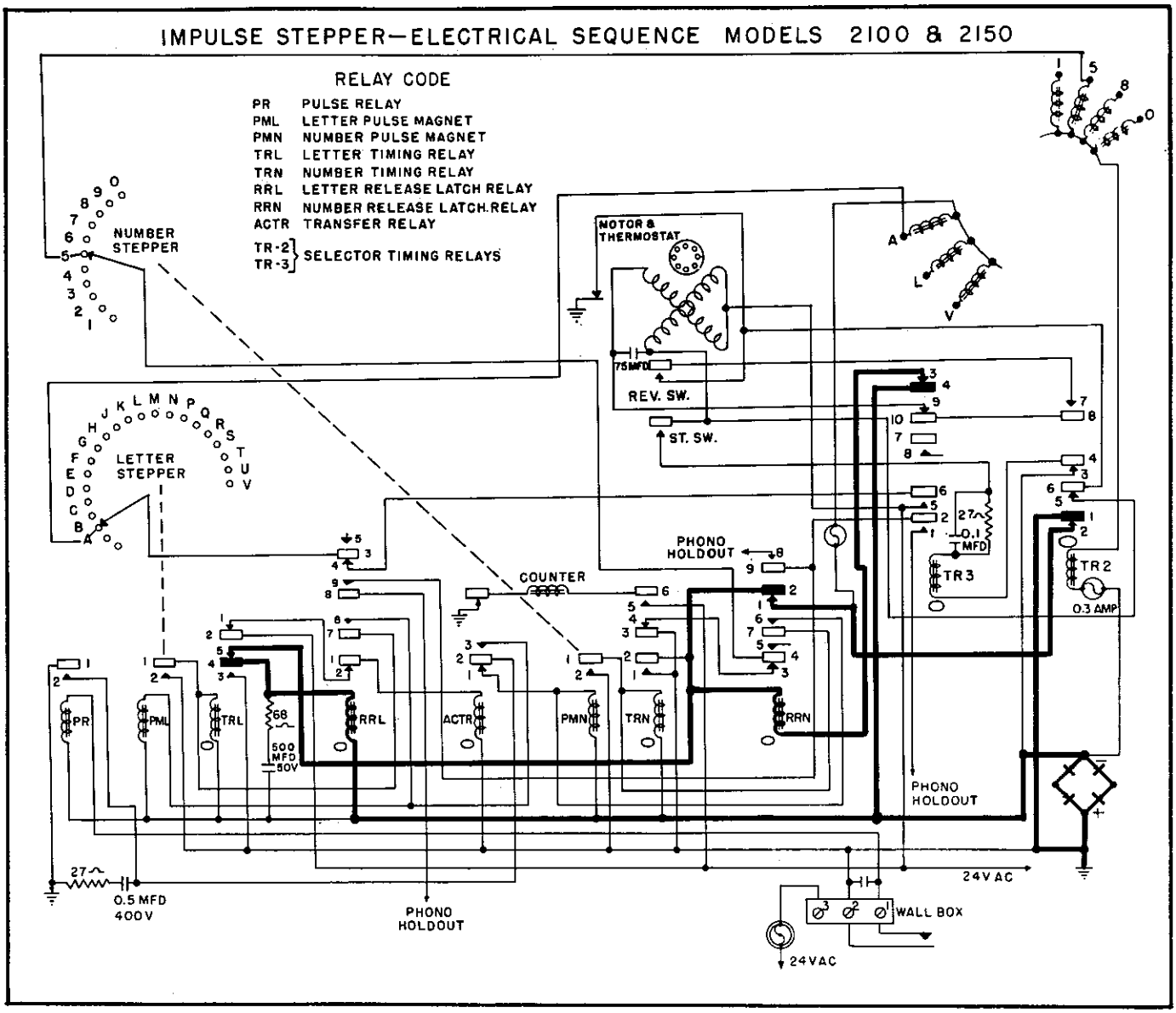

Fig. 43. PHASE 11 - TIMING RELAY NO. 2 FUNCTION, CONTACTS 1 & 2

a. As timing relay No. 2 is actuated, its contacts 1 & 2 close to complete the holding circuit for the letter release latch relay and the interlock circuit set up in phase 9 for the number release latch relay. The circuit is shown in heavy line from the negative side of the 28 V.D.C. rectifier, through the coil of the letter release latch relay, contacts 4 & 5 of the letter timing relay, contacts 2 & 1 of the number release latch relay, and contacts 2 & 1 of timing relay No. 2 to common ground and the positive side of the 28 V.D.C. rectifier.

b. Contacts 1 & 2 of timing relay No. 2 also provide a 28 V.D.C. interlock circuit for the number release latch relay as shown in heavy line from the negative side of the 28 V.D.C. rectifier, through normally closed contacts 4 & 3 of timing relay No. 3, the coil of the number release latch relay, contacts 2 & 1 of the number release latch relay, and contacts 2 & 1 of timing relay No. 2 to common ground and the positive side of the 28 V. D. C. rectifier.

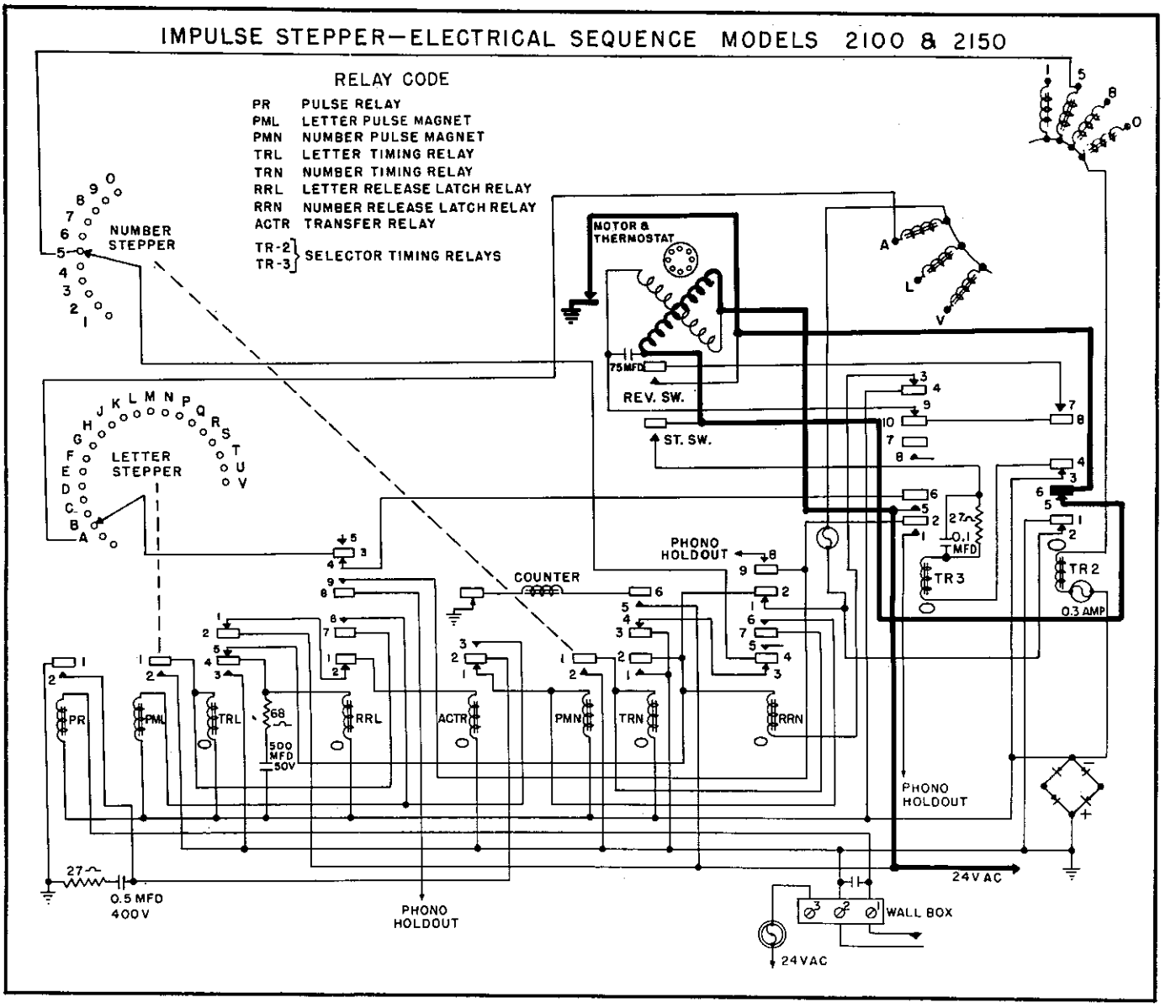

Fig. 44. PHASE 12 - TIMING RELAY NO. 2 FUNCTION, CONTACTS 5 & 6

Closing contact 5 & 6 of timing relay No. 2 completes a 24 V.A.C. circuit to the selector motor as shown in heavy line from the hot side of the 24 V. A. C. winding of the low voltage transformer, through one field of the selector motor, contacts 5 & 6 of timing relay No. 2, and the motor thermo cut-out switch to common ground and the other side of the 24 V. A. C. winding of the low voltage transformer. Simultaneously, the other field of the selector motor will be energized through the 75 Mfd, A.C. capacitor at a phase difference which will produce good torque at the rotor of the selector motor. The motor will thus drive the "rotating plate and rocker arm assembly" in a clockwise direction to index and stop at the point determined by the number 5 stop solenoid and the number quadrant stop screw setting.

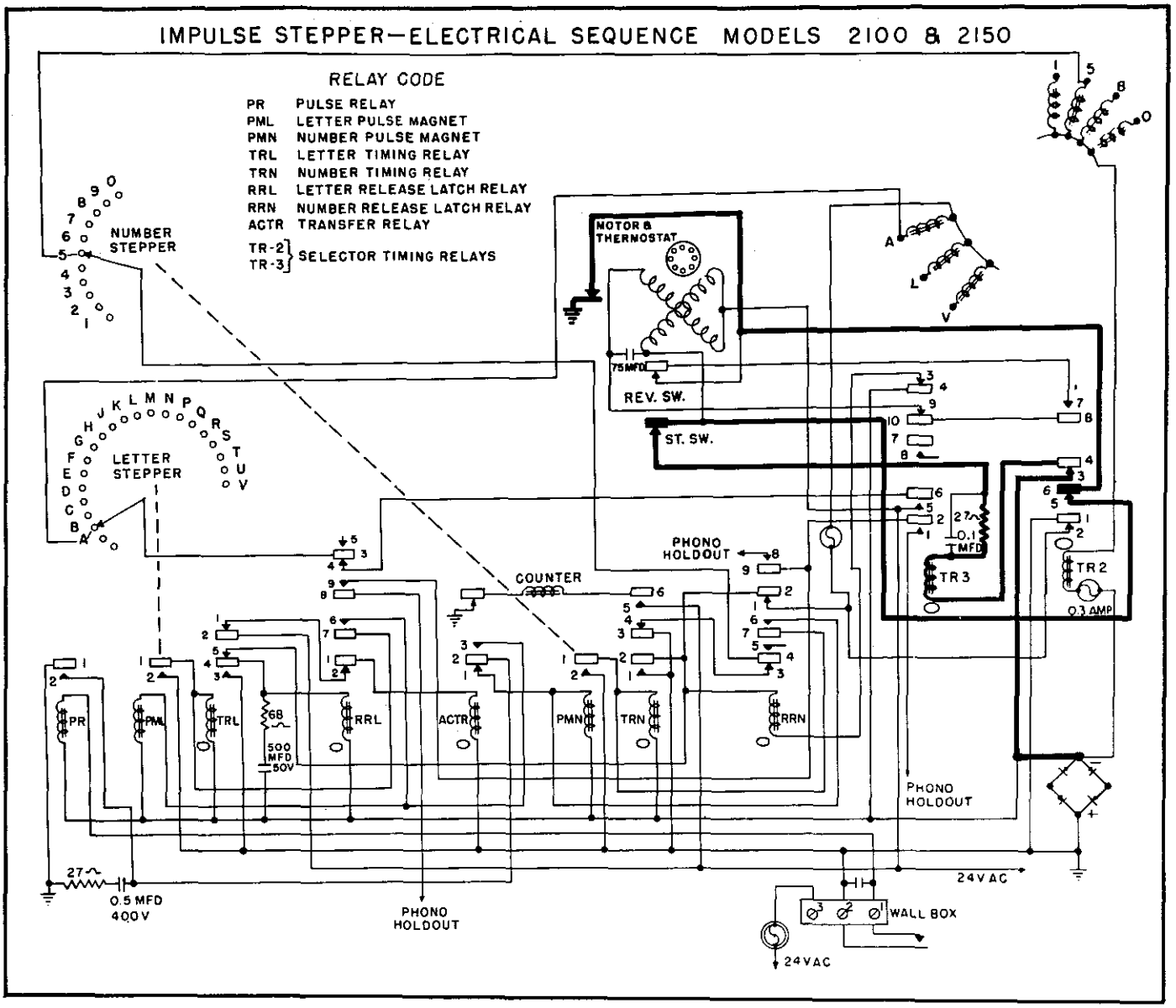

Fig. 45. PHASE 13 - START SWITCH AND REVERSE SWITCH ACTUATED

a. As the clockwise rotation of the selector motor progresses as described in phase 12, one of the stop pins on the rotating plate will engage the plunger of stop solenoid No. 5 and drive the number quadrant to its indexed stop setting where both the reverse switch and the start switch will be actuated.

b. Closing of the start switch completes a 28 V.D.C. circuit as shown in heavy line from the negative side of the 28 V. D. C. rectifier, through contacts 3 & 4 of timing relay No. 2, the coil of timing relay No. 3, the 27 Ohm resistor, the closed start switch, contacts 5 & 6 of timing relay No. 2, and the thermo cut-out switch of the selector motor, to common ground and the positive side of the 28 V.D.C. rectifier. Timing relay No. 3 is thus energized.

c. Closing of the reverse switch prepares a part of a 24 V.A.C. circuit to be used for counter-clock-wise rotation of the selector motor to release lateral pressure from the selected number solenoid.

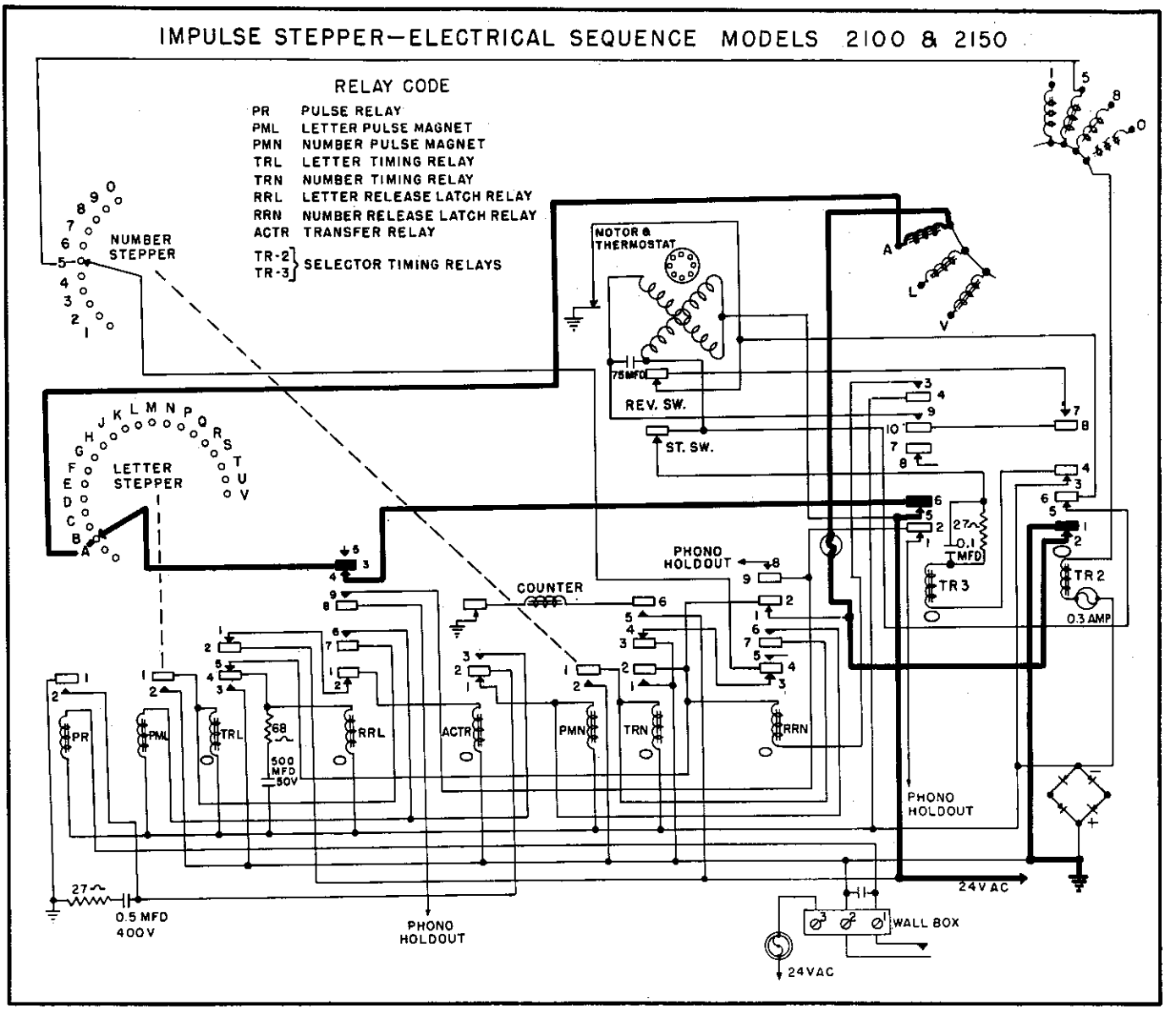

Fig. 46. PHASE 14 - TIMING RELAY NO. 3 FUNCTION, CONTACTS 5 & 6

a. Closing contacts 5 & 6 of timing relay No. 3 completes the 24 V.A.C. letter solenoid circuit prepared in phase 4 as shown in heavy line from the hot side of the 24 V.A.C. winding of the low voltage transformer, through contacts 5 & 6 of timing relay No. 3, contacts 4 & 3 of the letter release latch relay, letter stepper switch contacts "A", letter solenoid "A", the protective 8/10 Amp. fuse, and contacts 2 & 1 of timing relay No. 2, to common ground and the other side of the 24 V.A.C. winding of the low voltage transformer.

b. Letter solenoid "A" will thus release the selector latch pin "A-5".

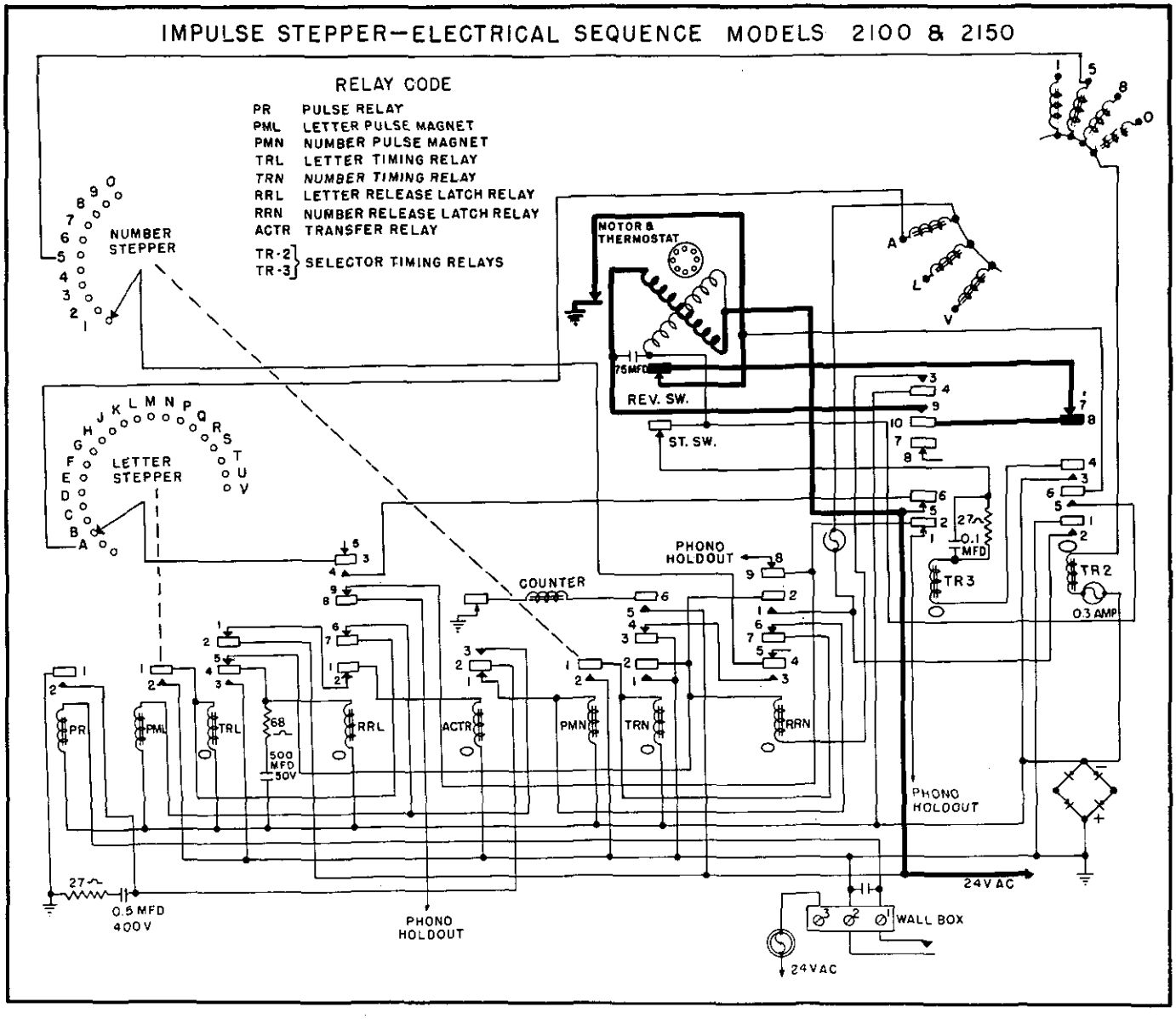

Fig. 47. PHASE 15 - TIMING RELAY NO. 2, RELEASED FUNCTION, CONTACTS 7 & 8

a. Since the number timing relay has been released as shown in phase 10, and timing relay No. 3 has been energized by action of the start switch as shown in phase 13, all holding circuits have been opened and due to the influence of the shorting rings, the number release latch relay will dissipate and release first, timing relay No. 2 will follow due to lack of holding rings, then timing relay No. 3, and finally the letter release latch relay due to effect of its shorting rings and the 500 Mfd. holding capacitor.

b. As shown in heavy line, contacts 7 & 8 of timing relay No. 2 close to prepare the selector motor counter clock-wise circuit from the hot side of the 24 V.A.C. winding of the low voltage transformer through one field coil of the selector motor to open contacts 9 & 10 of timing relay No. 3. From open contacts 9 & 10, the circuit will continue through contacts 8 & 7 of timing relay No. 2, the closed reverse switch and the thermo cut-out switch of the selector motor to common ground and the other side of the 24 V.A.C. winding of the low voltage transformer.

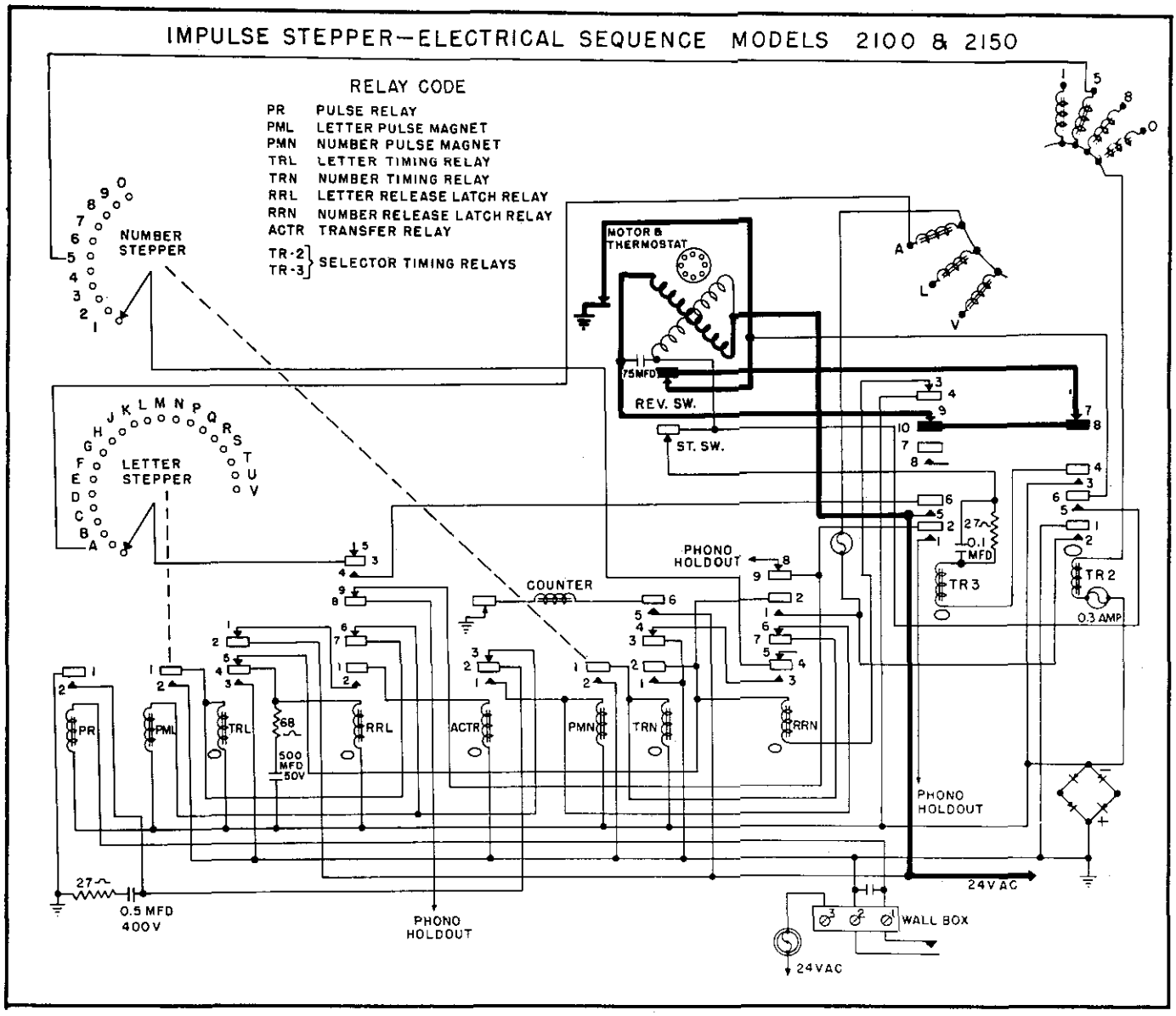

Fig. 48. PHASE 16 - TIMING RELAY NO. 3, RELEASED FUNCTION CONTACTS 9 & 10

a. As described in phase 15 timing relay No. 3 will release next, closing its contacts 9 & 10 to complete the counter-clockwise circuit to the selector motor. The main circuit is shown in heavy line from the hot side of the 24 V.A.C. winding of the low voltage transformer, through the counter-clockwise field coil of the selector motor, contacts 9 & 10 of timing relay No. 3, contacts 8 & 7 of timing relay No. 2, the closed reverse switch, and the thermo cut-out switch of the selector motor to common ground and the other side of the 24 V.A.C. winding of the low voltage transformer. Simultaneously, the other field of the selector motor will be energized through the 75 Mfd. A.C. capacitor at a phase difference that will produce good torque at the rotor of the selector motor. The motor will thus drive the rotating plate in a counter-clockwise direction to release the number quadrant and open the reverse and start switches. As soon as the reverse switch has opened, the counter-clock-wise rotation will cease, leaving the electric selector in its "at rest" condition, as shown in phase 1.

b. The release of selector latch pin A-5, in phase 14, has displaced the wobble ring and closed one or more of the over-ride switches to start the record changer in its cycle of operation. The electrical and mechanical conditions of record changer cycle are discussed under "Operation", page 40, Model 2100 Manual (312-S, Vol. II).

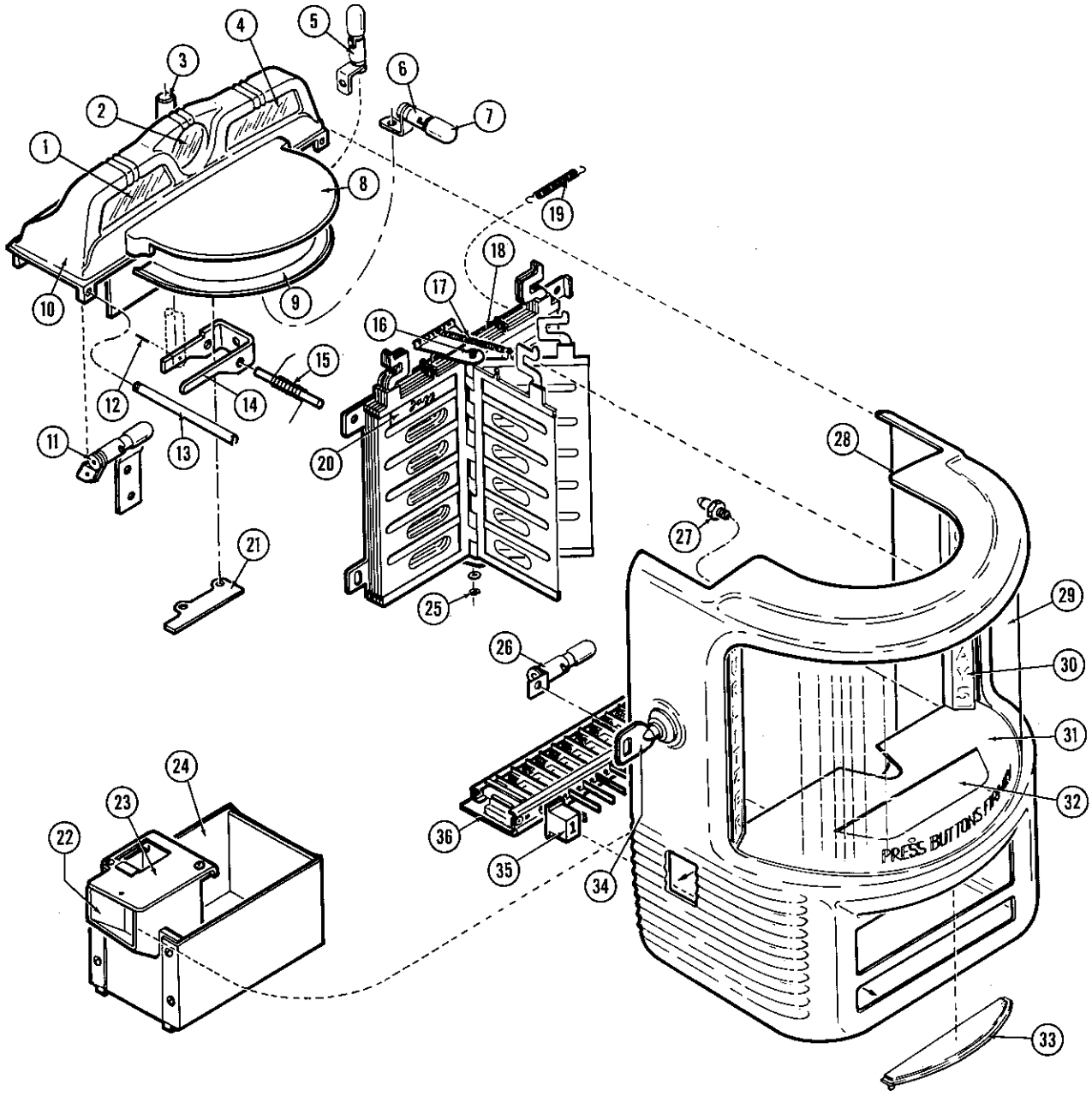

Fig. 49. COVER AND PROGRAM HOLDER GROUPS

Fig. 49. COVER AND PROGRAM HOLDER GROUPS

1.	Escutcheon Plate, Select	69981
	Instruction Plate, Blank, Red	110069
2.	Coin Entry, Plastic	69868
3.	Rod, Scavanger	69895
4.	Coin Denomination Plate	
	(7 Plays-Half Dollar, 3 Plays-Quarter 1 Play -Dime or 2 Nickels)	69980
	(9 Plays-Half Dollar, 4 Plays Quarter 1 Play -Dime or 2 Nickels)	110437
	Instruction Plate, Blank, Clear	110070
5.	Lamp Socket and Wire Assembly	110455
6.	Lamp Socket and Wire Assembly	110456
7.	Lamp #47	45985
8.	Top Casting, Front	67011
9.	Plate, Top Casting	67522
10.	Top Casting, Rear	69952
11.	Lamp Socket and Bracket Assembly	110460
12.	Roll Pin	73782-30
13.	Hinge Pin, Top Casting	110149
14.	Scavanger Lever	69910
15.	Hinge Pin	69898
	Spring, Return, Scavanger Rod	110513
16.	Rod, Program Holder	67098
17.	Spring, Page Return	67744
18.	Program, Page Assembly	110259
	A0 - K0	67204
	L8 - V8	67205
	A1 - K1, L3 - V3	67206
	A2 - K2, L1 - V1	67207
	A3 - K3, L5 - V5	67208
	A4 - K4, L2 - V2	67209
	A5 - K5, L7 - V7	67210
	A6 - K6, L4 - V4	67211
	A7 - K7, L9 - V9	67212
	A8 - K8, L6 - V6	67213
	A9 - K9, L0 - V0	67214
19.	Spring, Latch	110269
20.	Classification Slip, (Jazz)	68018
	(Rock and Roll)	68011
	(Popular)	68012
	(Rythm - Blues)	68013
	(Specialties)	68014
	(Polkas)	68015
	(Folk Tunes)	68016
	(Classical)	68017
	(Old Favorites)	68019
	(Western)	68020
	(Top Tunes)	68397
21.	Clamp, Coin Entry, Plastic	110000
22.	Coin Return Cup, Casting	69919
23.	Cover and Bracket Assembly, Cash Box	69994
24.	Coin Return Cup and Cash Box Assembly	69995
25.	Retaining Ring	73724-9
26.	Lamp Socket and Wire Assembly	110458
27.	Stud, Centering	68286
28.	Cover Casting and Pin Assembly	110231
	Cover Assembly	110230
29.	Glass, Program	67010
	Rubber Channel, Bulk, Specify Quantity	64510
30.	Pilaster, R.H. (200 Plays)	67178
	L.H. (Wurlitzer)	67110
31.	Decorative Shelf and Plate Assembly	67447
32.	Instruction Plate and Silk Screen Assembly	67217
33.	Window Glass	67221
34.	Lock and Key Assembly	110265
35.	Selector Buttons, 1 to 0	66103 to 66112
	A to K	66083 to 66092
	L to V	66093 to 66102
36.	Switch Assembly, Bottom (Numerals)	66895
	Switch Assembly, Upper (Letters)	66896

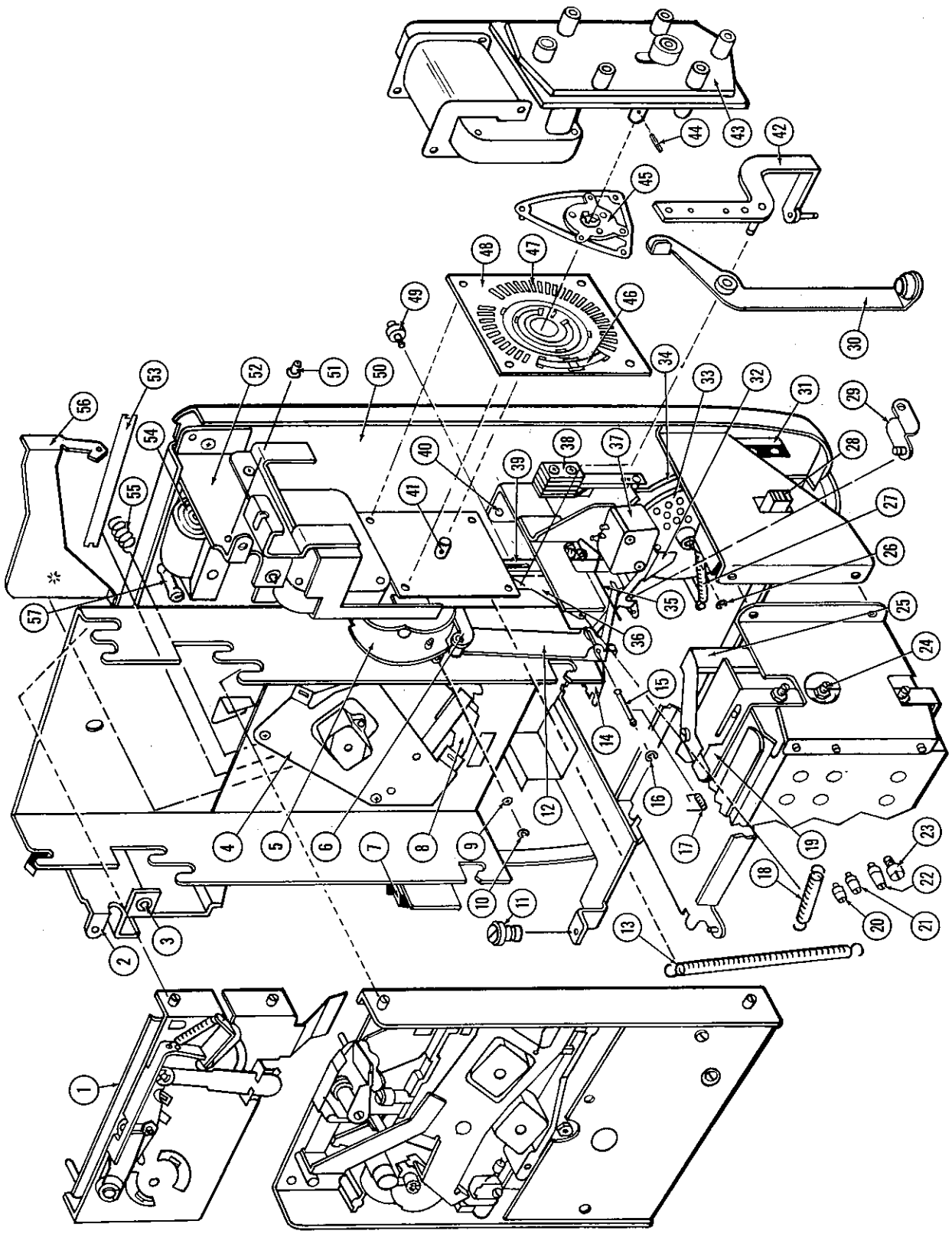

Fig. 50. MECHANICAL GROUP

Fig. 50. MECHANICAL GROUP

1.	Slug Rejector Assembly	110228
2.	Bracket and Pin Assembly, L.H.	69959
3.	Pin, Program Lock	67580
4.	Spring and Mounting Plate Assembly	110253
5.	Cam and Shaft Assembly	110202
6.	Lever, Cam Follower Assembly	110112
7.	Terminal Strip	68920
8.	Hinge and Pin Assembly	110254
9.	Washer	28078
10.	Retaining Ring	73724-12
11.	Shoulder Screw	67619
12.	Mounting Lever, Coin Paddle	69915
13.	Spring, Accumulator	110515
14.	Coin Paddle	69916
15.	Shaft, Coin Switch Actuator	62756
16.	Retaining Ring	73724-9
17.	Spring, Return	61993
18.	Spring, Return, Coin Feeler	110514
19.	Lock Bar	67079
20.	Stop Pin, 10¢, Copper	69886
21.	Stop Pin, 25¢, Dulite	69887
22.	Stop Pin, 50¢, Iridite	69891
23.	Stop Pin, 5¢, Cadium	69885
24.	Adjusting Screw	67433
25.	Pivot Arm and Pin Assembly	67618
26.	Retaining Ring	73724-18
27.	Spring, Return, Coin Selector Wheel	110516
28.	Slider Switch	61649
29.	Pin and Link Assembly	69931
30.	Arm, Hub, and Roller Assembly	67424
31.	Spring and Mounting Bracket Assembly	110207
32.	Feeler and Hub Assembly	69932
33.	Coin Selector Wheel, Hub, and Pin Assembly	110210
34.	Cancel Wheel and Hub Assembly	69945
35.	Arm, Micro Switch	62164
36.	Mounting Bracket and Stud Assembly	110095
37.	Micro Switch	57851
38.	Switch and Bracket Assembly, Key	110247
39.	Accumulator Slide, Bracket, and Pawl Assembly	69904
40.	Rivet	36679
41.	Roll Pin	73782-4
42.	Mounting Bracket, Stud, and Pin Assembly	69937
43.	Motor	69918
44.	Roll Pin	73782-4
45.	Coupling, Insulator and Spring Assembly	110470
46.	Contact Strip	62715
47.	Contact Strip	62714
48.	Contact Plate Assembly	67426
49.	Mounting Stud, Accumulator Lever	69938
50.	Base and Stud Assembly	110201
51.	Rivet	38534
52.	Mounting Bracket, R.H.	69925
53.	Spring, Retainer	110137
54.	Transformer	110227
55.	Spring, Return	66072
56.	Cam Follower and Pin Assembly	110212
57.	Resistor, 125 Ohms, 10%, 10 Watt	72935-2

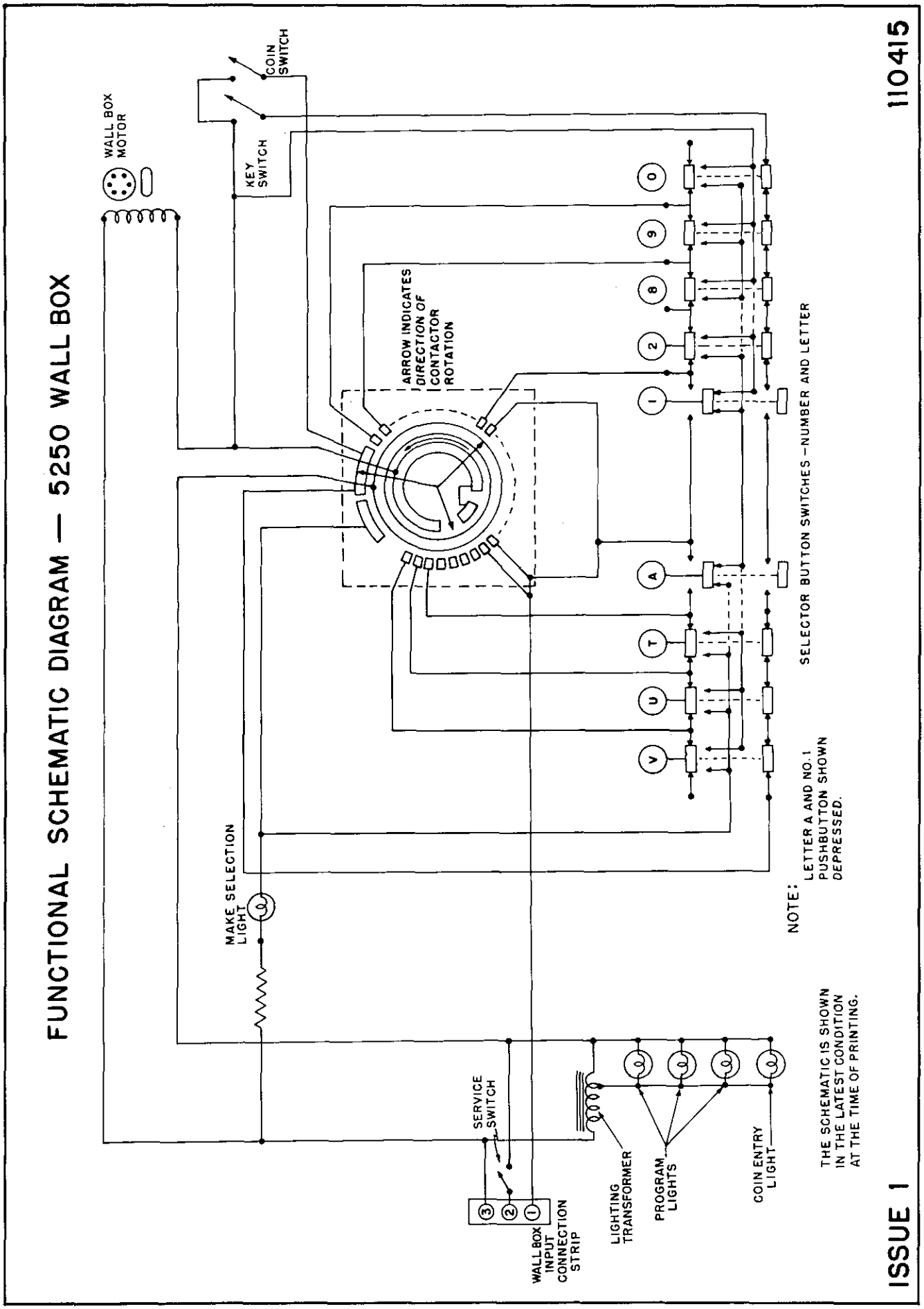

Fig. 51. MODEL 5250 WALL BOX - FUNCTIONAL SCHEMATIC DIAGRAM

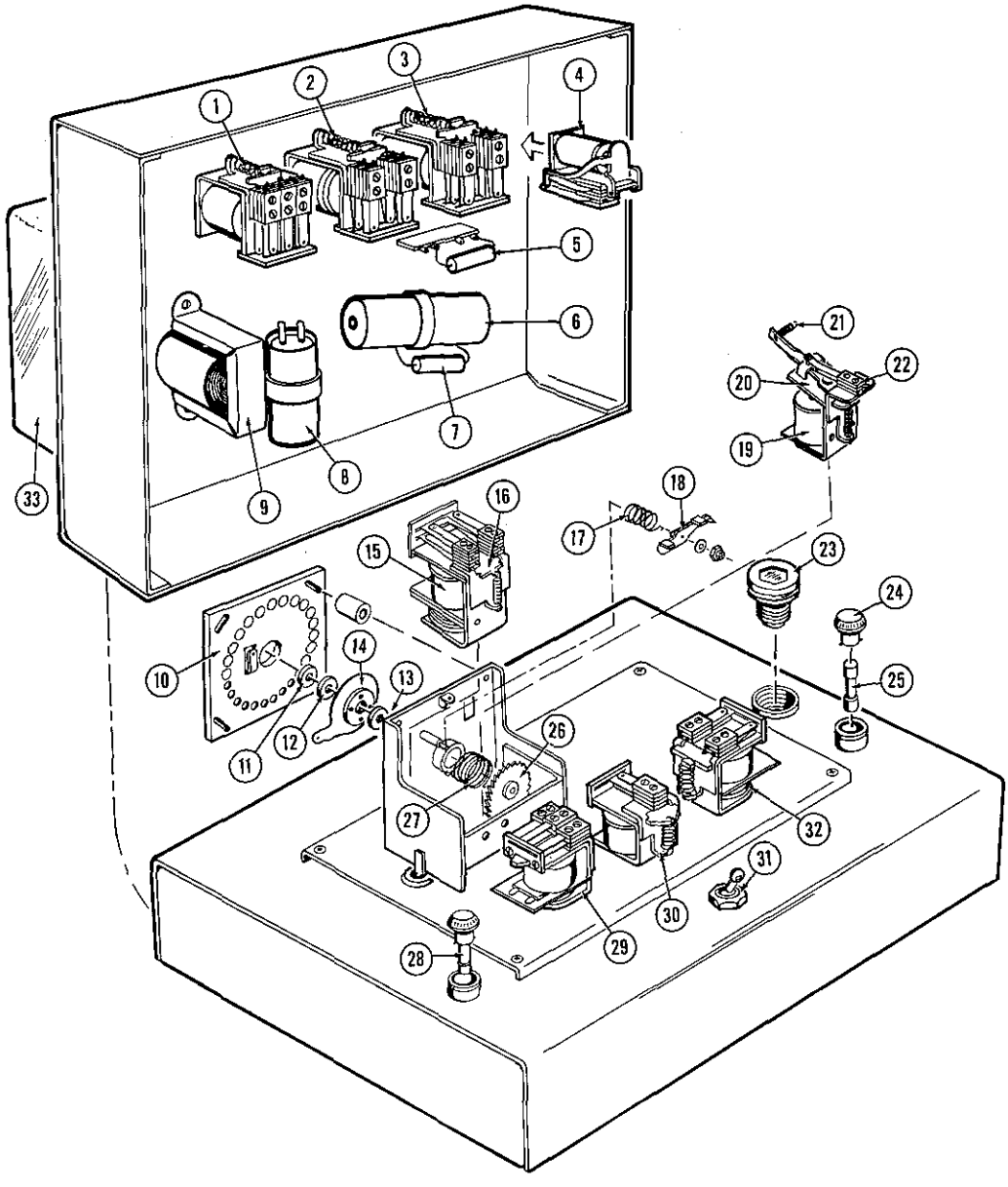

Fig. 52. JUNCTION BOX AND STEPPER UNIT

1.	Reverse Relay	65750	17.	Spring, Dog	61001
2.	Timing Relay No. 2	68942	18.	Dog	61005-A
3.	Timing Relay No. 3	68943	19.	Field Assembly, Pulse Coil	61900
4.	Pulse Relay	65752	20.	Armature Assembly	60997
5.	Resistor, 27 Ohm, 1 Watt	72298-32	21.	Spring, Pawl Return	61003
6.	Condensor, 500 Mfd.	71816	22.	Pulse Switch	63326
7.	Resistor, 68 Ohm, 2 Watt	72452-32	23.	Fustat, 3 Amp.	61858
8.	Electrolytic Capacitor		24.	Fuse Post	45352
	65 - 93 Mfd., 50 V.A.C.	70901	25.	Fusetron, 3/10 Amp.	45588
9.	Transformer	58357	26.	Ratchet Assembly	61005
10.	Contact Plate	68823-2	27.	Spring, Torsion, Arm Return	65690-4
11.	Washer	61004-C	28.	Fusetron, 8/10 Amp.	14524
12.	Washer, Slotted	61004-B	29.	Timing Relay, Number Unit	68940
13.	Washer, Teflon	61004-A	30.	Transfer Relay	65748
14.	Contact Arm	68823-3	31.	Toggle Switch	53648
15.	Coil Release Latch Relay	65690-1	32.	Timing Relay, Letter Unit	68941
16.	Release Magnet Assembly	68823-1	33.	Plastic Cover	65801

NUMERICAL PARTS LIST

NOTES