

# AUTOMATIC RECORD CHANGERS

## Part No. 35-1285, 35-1286, 35-1289

The service information in this bulletin covers the adjustments and replacement parts for Philco automatic record changers Part No. 35-1285 (standard changer) and Part No. 35-1286, 35-1289 (Deluxe changers).

These record changers are identical with the exception of the color of the mounting plate, plating of parts on top of changers, motor, Light Beam Reproducer, and electrical wiring circuits for operation. The differences are indicated in the Replacement Part List, page 4, and the Electrical wiring diagrams, page 5.

### CHANGERS USED IN PHILCO MODELS

Changer Part No.	Philco Models
35-1285	42-1008, 42-1009, 42-1010, 42-1011, 42-1012, 42-1013
35-1286	42-1016
35-1289	42-1015

### GENERAL DESCRIPTION OF CHANGE CYCLE

An automatic record changer performs three principal functions.

- 1—Places record on turn table.
- 2—Lowers tone arm on record in playing position.
- 3—Raises tone arm at end of record or on reject.

These functions are controlled by three mechanisms, interconnected and built together, but each separate in its operation. The motion for each is originated in one central cam gear which has three different and individual cam surfaces. The cam gear is normally at rest while a record is being played, but is put into operation by a saw tooth clutch which takes its power from the turntable and drives an intermediate drive gear. This only takes place when the record changer is put into a change cycle. The cam gear then makes one full revolution to complete the change cycle and comes to rest in a normal position.

The record changing mechanism which places a record on the turntable is brought into operation by a lever with a roller at one end. The lever is attached to the shelf plate mounting post and is operated by a notch under the

cam gear. This causes the mounting post to move slightly, pushing the bottom record off the stack onto the turntable.

The pick-up operating mechanism is likewise brought into operation by the cam gear surface on the top side of the cam gear. The raising lever, when removing the pick-up from the record, receives a swinging motion from the cam gear through an eccentric track on the top outside surface of the cam gear. This eccentric track causes the pick-up to be carried out beyond the turntable while a record is being dropped on the turntable. The light beam pick-up is then brought back into playing position for 10" or 12" records (depending on the shelf positions on the shelf carrier).

The travel of the pick-up arm towards the turntable for lowering on a 10 or 12 inch record is stopped at the proper point for lowering by a movable track on the cam gear. This movable track is operated by a lever which is moved by a spring lever connected through a cord and spring attached to the 10" shelf plate. When the 10" shelf plate is lifted up the movable track is allowed to shift to the outer groove of the cam gear surface so that the pick-up needle will set properly on the outer edge of a 12" record. When the 10" shelf plate is in place for playing 10" records, the cord holds the spring lever and causes the movable track lever to shift to the inner groove as the cam gear revolves.

The electric reject trip causes the clutch to engage and allow the tone arm to be removed from the record by the cam gear. The reject trip operates through a pulsating plate and movable contact on the tone arm raising lever. When the pulsating plate and movable contact make connection, the solenoid is energized, releasing the clutch so that the cam gear can be revolved.

### OILING

These record changers should be lubricated once a year with a few drops of good light machine oil at the following points: Motor bearings, drive disc bearings and cam gear bearing.

## CLUTCH ROLLER AND LEVER ADJUSTMENT

The teeth of the clutch should have approximately 1/16 inch clearance, when the lever roller is engaged snugly in the cam gear. If the clutch does not have 1/16 inch clearance the clutch bracket should be slightly bent as indicated in Figure 1. Place ten, 12" records on turntable when this adjustment is made.

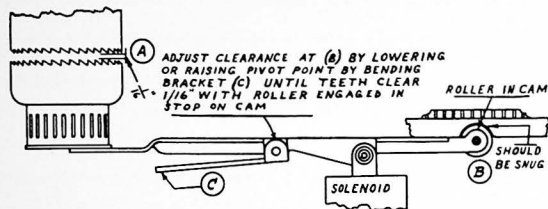


FIG. 1

## SOLENOID ADJUSTMENT

The solenoid Armature should set properly in the coil in order to prevent hum and chatter when the solenoid is energized. To make this adjustment, loosen solenoid mounting bracket screws and raise or lower solenoid until armature is set correctly in the coil. See Figure 2.

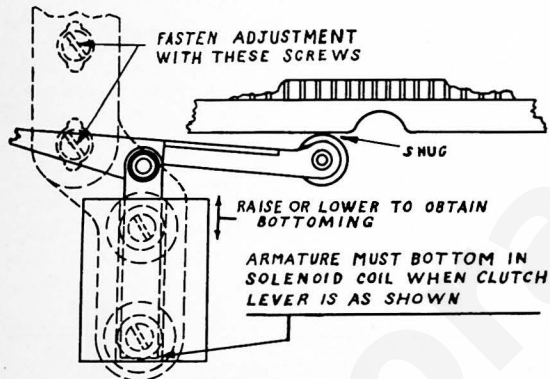


FIG. 2

## BUMP LEVER ADJUSTMENT

Set 12" shelf eccentrics bumper in outer position, neutral (large part of cam away from shelf) and then equalize each Bumper to touch edge of 12" record. See Figure 3.



FIG. 3

## FORWARD SHELF MOTION ADJUSTMENT— MINIMUM SIZE

(12" Record Push-Off)

1. Place 12" record on spindle and 12" shelf as shown in Figure 4. Start changer in cycle, and then stop the change cycle when the crown on the cam gear touches the roller on the shelf lever as shown in Figure 4.

2. In this position loosen screw "A" and lock nut on screw "C"; turn out screw "C" slightly and then retighten screw "C" until eccentric record bumpers fit snugly against 12" record. Then tighten screw "A" and lock nut of screw "C."

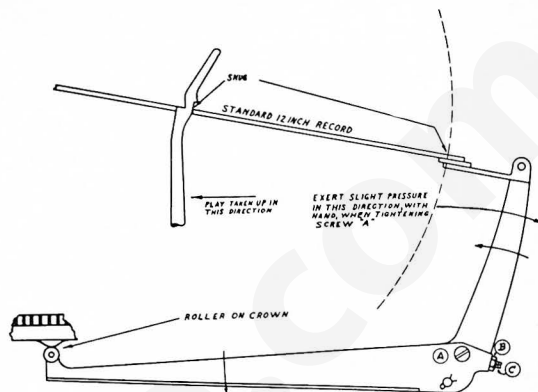


FIG. 4

## NEUTRAL SHELF POSITION

(Bump Lever Eccentric)

When the changer is in Neutral position (out of change cycle) the shelf lever should be in the position as shown in Figure 5. To make this adjustment, proceed as follows:

1. Place standard 12" record on the turntable spindle and 12" record shelf plate as shown in Figure 5. The roller of the shelf lever must be off the crown of the cam gear when this adjustment is being made.
2. Hold record snugly against the spindle and shelf bumpers.
3. Loosen screw and adjust eccentric (A) Figure 5, until it touches shelf lever.

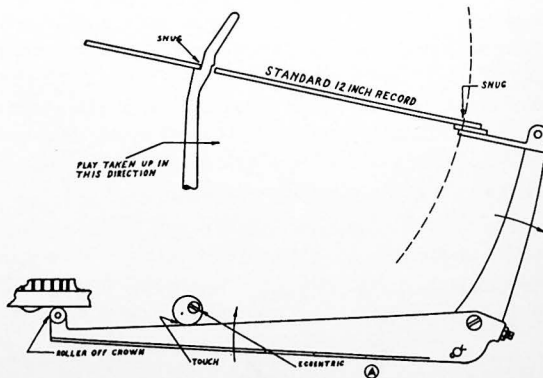


FIG. 5

## 10" SHELF ECCENTRIC ADJUSTMENT

The 10" shelf bump buttons are equalized as follows:

Place standard 10" record on spindle and 10" record shelf. The record should be snug against spindle notch as shown in Figure 5 for 12" records.

Adjust 10" shelf bump buttons so that they are equalized and just touch record.

Do Not Change "Bump Lever Eccentric" shown in Figure 5 and which should be adjusted as given in paragraph "Neutral Shelf Position."

## TRIP ARM ADJUSTMENT

1. Rotate turntable so that the crown on the cam under the turntable is OFF roller of pulsating lever. (See Figure 7.)
2. Move tone arm in towards record until the rubber roller and contact is at the outer edge of pulsating plate. See Figure 7.
3. Turn screw (A) Figure 7 on trip arm until rubber roller just touches pulsating plate, then turn screw (A) slightly further so that the plate moves slightly.

## 10" AND 12" RECORDS

1. Load the turntable with twelve 10" records.
2. Start changer through its cycle, then stop when tone arm is in full raised position and swinging towards records on turntable. If adjustment is correct, the jewel needle will clear the top record by  $\frac{1}{8}$ " as the tone arm swings into position for landing on record. If it does not clear top record by  $\frac{1}{8}$ ", adjust screw No. 14 in top of tone arm (see Figure 9) until distance is obtained.

## ADJUSTING TONE ARM TO INDEX ON 10" AND 12" RECORDS

The position at which the pick-up jewel lowers on the edge of the record is controlled by a vernier adjustment screw on the raising lever. This screw is reached through the hole (12) Figure 9 in the top of the base plate near the tone arm pivot. This screw is used for normal adjustments of the tone arm set down and moves the pick-up approximately  $\frac{1}{4}$ ". Adjust the screw so that the tone arm needle will set down approximately  $\frac{1}{8}$ " in on record edge. When set for either size record, the adjustment will also take care of the other size record positioning point.

When the tone arm is removed for replacement or greater movement of the tone arm is desired, beyond that obtainable with the preceding vernier adjustment, the two set screws in the collar of the pull-in lever underneath the changer should be adjusted. This is done by loosening one set screw and tightening the other, depending on which way the tone arm is to be moved. Under ordinary circumstances this adjustment will not be required as it has been preset at the factory for proper positioning. When making this adjustment, a .005 shim gauge should be placed between the ball race washer and the tone shaft bearing.

## PULSATING PLATE ADJUSTMENT

When the turntable is revolving the pulsating plate of the reject mechanism should clear the main plate by  $\frac{1}{32}$  of inch when the crown on the cam attached to the underside of the turntable touches the pulsating lever roller at its highest point. See Figure 6. To make this adjustment proceed as follows:

1. Rotate turntable until the crown of the cam under turntable touches roller of pulsating lever as shown in Figure 6.
2. Adjust screw on pulsating lever until pulsating plate is  $\frac{1}{32}$  of an inch from main plate (use gauge).

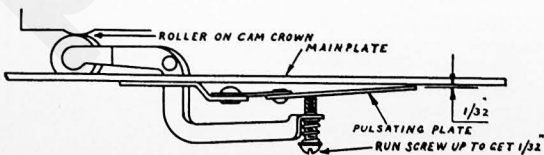


FIG. 6

## REJECT CONTACT TRAVEL ADJUSTMENT

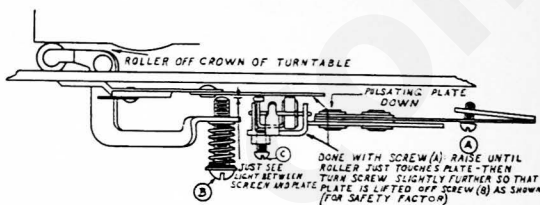


FIG. 7

## TURNTABLE SPEED ADJUSTMENT

Place a record on turntable and tone arm in playing position about halfway in on playing lines of the record. In this position the contact operated by the rubber roller on the trip arm should be carried to within  $\frac{1}{16}$  to  $\frac{3}{32}$  of an inch of the pulsating plate as the roller moves towards center of changer. (See Figure 8) If contact does not have this spacing as the roller moves and pulls contact up, then adjust screw (C) Figure 8 until correct spacing is obtained.

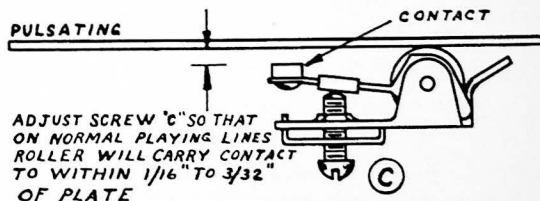


FIG. 8

## TURNTABLE SPEED ADJUSTMENT

To set the turntable speed control for the speed range covered by the control, proceed as follows:

1. Push speed lever knob to the "normal" position. Turn ball knob until the motor mounting plate drops to its lowest position. In this position the turntable should be turning at approximately 77 R.P.M. This is indicated by the lines on the edge of the turntable appearing to be slightly moving backwards (counter-clockwise). In order to see these lines move the neon lamp must be energized.
2. If the lines do not travel slightly backward, the nuts on the motor mounting plate retaining shaft should be loosened and the plate moved up or down to get the proper speed, then tighten nuts.
3. After this adjustment, set ball knob to the point where lines on turntable appear to be standing still.

**REPLACEMENT PARTS  
AUTOMATIC RECORD CHANGER  
PART NUMBERS 35-1285, 35-1286, 35-1289**

Photo No.	Description	Part No.	Photo No.	Description	Part No.
1.	10 inch Record Shelf (Changer 35-1285)	318-2805	26.	Shelf Lever and Roller	318-2814
	10 inch Record Shelf (Changer 35-1286)	35-2545	27.	Spring	35-2603
	10 inch Record Shelf (Changer 35-1289)	35-2545	28.	Eccentric Cam (Adjusting Shelf Lever)	218-1404
	String Guide (Plastic)			Mtg. Screw	W-465FA3
2.	Record weight assembly (Changer 35-1285)	318-2804	29.	Male Plug (Phono Input)	217-1496
	Record weight assembly (Changer 35-1286, 1287)	35-2559	30.	Intermediate Gear (2 required)	218-1391
	Mtg. Screws	W-685FA3		Screw	W-2150FA3
3.	12 inch Record Shelf (Changer 35-1285)	318-2806		Washer	218-1392
	12 inch Record Shelf (Changer 35-1286, 1289)	35-2546		Spring Washer	218-1507
	Mtg. Shaft (Changer 35-1285)	218-1440	31.	Shelf Lever Roller (Part of 26)	
	Mtg. Shaft (Changer 35-1286, 1289)	35-2550	32.	Cam Gear Assembly	318-2787
	Mtg. Spring	218-1439		Mtg. Screw	W-2284
4.	Speed Control Knob (Changer 35-1285)	318-2815		Late Type Washer for Hub	217-1419
	Speed Control Knob (Changer 35-1286-128)	35-2548	32A.	Mtg. Bracket (Intermediate and Cam Gears)	318-2768
	Escutcheon (Changer Standard)	218-1473		Mtg. Screw (Brackets to spindle bracket)	W-685FA3
	Escutcheon (Changer Deluxe)	35-2558	33.	Cam Switch Assembly	318-2816
	Mtg. Screws	218-1474		Mtg. Ring	218-1461
5.	Mtg. Screws	218-1471	34.	Shelf Lever Bump (Part of 32)	
6.	Mtg. Springs	218-1470	35.	Clutch Lever and Roller Assembly	318-2810
7.	Changer Carrier Assembly	318-2818		Mtg. Screws	W-685FA3
8.	Automatic-Manual — Off Plate		35A.	Solenoid Armature (Part of 35)	
	(For Changer Standard)	218-1444	36.	Reject Solenoid	318-2875
	(For Changer Deluxe)	35-2557		Mtg. Screws	218-1398
9.	Knob (Standard)	217-1393		Mtg. Washers	218-1397
	Knob (Deluxe)	35-2552	37.	Manual Switch Lever and Bracket Assembly	318-2813
10.	Reject Switch (For Changer Standard)	412-1025		Mtg. Screws	W-2150FA9
	(For Changer Deluxe)	35-2555	38.	Spring (Manual Switch Lever)	35-2565
11.	Tone Arm Support (For Changer 35-1285)	318-2796	39.	Pulsating Plate and Lever Assembly	318-2785
	(For Changer 35-1286)	35-2549		Mtg. Screws	W-2150FA3
	Mtg. Rivet	W-2293FA3		Pulsating Spring	218-1378
12.	Tone Arm Positioning Adjusting Hole		40.	Spring (Positioning Lever)	35-2566
13.	Tone Arm Assembly (For Changer 35-1285)	35-2518	41.	Trip and Positioning Assembly	318-2786
	Tone Arm Assembly (For Changer 35-1286, 1289)	35-2519	41A.	Lead in Spring	218-1463
	Tone Arm Support Bracket	318-2790	41B.	Lead in Spring Link	218-1462
	Tone Arm Adjusting Ratchet and Shaft Assy.	318-2800	42.	Velocity Trip Lever (Part of 41)	
	Tone Arm Bracket	218-1424	43.	Tone Arm Positioning Lever (Part of 41)	
	Tone Arm Stem	218-1425	44.	Selector Cam	217-1386
	Screw (Adjusting Tone Arm)	218-1428		Mtg. Screw	97-0138FA3
	Nut (Adjusting Screw)	218-1426		Spring	218-1393
	Snap Ring	218-1431	45.	Spring (Cam Switch)	35-2562
	Ratchet Spring	218-1427	46.	Spring (Shelf Plate String)	318-2817
	Counter Weight	318-2799	47.	Adjusting Screw (Pulsating Lever)	218-1384
	Mtg. Screw	218-1432		Spring Adjusting Screw	218-1382
	Tone Arm Ball Bearings	218-1466	48.	Trip Switch Assembly	35-2563
	Retainer Assembly (Balls)	218-1465		Roller Hub	218-1387
	Washer (For Bearing Retainer)	218-1464		Screw	218-1385
	Tone Arm Shaft Bearing (Deluxe)	35-2551		Lock Nut	218-1386
	Tone Arm Shaft Bearing (Standard)	218-1467		Contact Lever	318-2770
	Mtg. Nut	218-1468		Contact Lever Shaft	218-1383
	Mtg. Lockwasher	218-1469		Insulator	217-1383
14.	Tone Arm Height Adjusting Screw	218-1428		Pigtail	218-1375
15.	Turntable (For Record Changer 35-1285)	318-2807		Rubber Roller	217-1385
	Turntable (For Record Changer 35-1286)	35-2554	49.	Pulsating Lever (Part of 39)	
	New Type	318-2838	50.	Automatic Changeover Switch	35-2547
	Deluxe New Type	35-2611	51.	Pulley Assembly (Cord Guide)	318-2798
16.	Spindle Assembly (Standard)	318-2794		Mtg. Screw	218-1415
	Spindle Assembly (Deluxe)	35-2560	52.	Rubber Grommet (Black)	217-1391
	Spindle Nut	218-1408		Grommet Sleeve	218-1434
	Spindle Sleeve Nut	218-1409	53.	Rubber Grommet (Light Color)	217-1390
	Ball Bearing and Retainer Assembly	318-2793		Mtg. Screw	W-1649FA3
	Washer	218-1406		Grommet Sleeve	218-1434
	Clutch and Gear (Bakelite)	218-1401	54.	Drive Disc Assembly (Motor)	35-2564
	Spring	218-1403	55.	Turntable Drive Disc Assembly	318-2811
	Washer	218-1405		Bearing	218-1448
	Sleeve (For Top of Spindle)	218-1402		Brass Cup Washer	218-1447
	Turntable Cone and Spindle Sleeve	318-2795		Collar and Screw	318-2812
	Spring New Type	318-2839		Washer (2 required)	218-1446
	Deluxe	35-2606		Turntable Drive Wheel	218-1448
17.	Manual-Automatic Positioning Plate (Part of 50)			Screw	218-1450
18.	Motor (115 Volts, 60 cycles, for changer 35-1285)	318-2802		Vertical Shaft Drive	218-1521
	(115 Volts, 60 cycles for changer 35-1286, 35-1289)	35-2553	56.	Neon Lamp Socket	318-2808
	Connectors Solderless (cable)	217-1395		Neon Lamp (Standard)	34-2482
	Motor Mtg. Plate Assembly	318-2803		Neon Lamp (Deluxe)	34-2483
	Mtg. Washers (Copper)	218-1433	57.	Clutch and Gear (Part of 16)	
	Rubber Mtg. Grommets (Light Color)	217-1390	58.	Turntable Hub and Core (Part of 15)	
	Rubber Mtg. Grommets (Black)	217-1391	59.	Shelf Carrier and Stud Assembly (Standard)	318-2755
	Mtg. Sleeves	218-1434		Shelf Carrier and Stud Assembly (Deluxe)	35-2561
	Mtg. Screws	W-1649FA3		Carrier Shaft	218-1451
19.	Spring (Drive Tension)	218-1453		Carrier Clips	218-1452
20.	Upper Bearing Support	218-1520		Rubber Bump	217-1392
21.	Spring (Upper Bearing Support)	218-1459	60.	Spring (Speed Adjusting Knob)	218-1453
22.	Screw	218-1460	61.	Washer (Holds 60 in place)	218-1456
	Nuts	W-317FA3		Wire Pin (Holds 60 in place)	218-1457
23.	Motor Mtg. Plate	318-2803	62.	Speed Control Hook	218-1454
	Screws	W-1475FA3	63.	Spring (Speed Lever)	218-1455
	Nuts	W-317FA3	64.	Motor Control Assembly (Includes Shaft and Bracket)	
	Trunnion Bearing	35-2604			318-2820
24.	Screw (Shelf Lever)	W-1475FA3	65.	Motor Control Adjusting Nuts	W-317
	Nut (Shelf Lever)	W-544FA3		Washers	218-1442
25.	Shelf Lever Adjusting Screw	35-2567			
	Nut	35-2568			

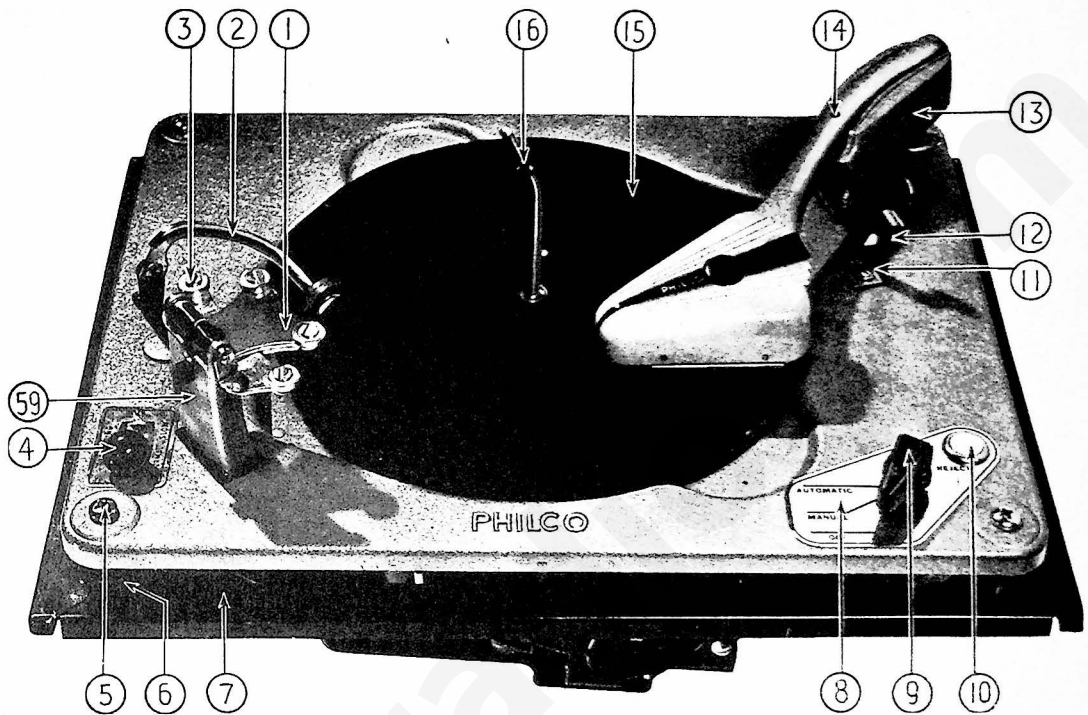
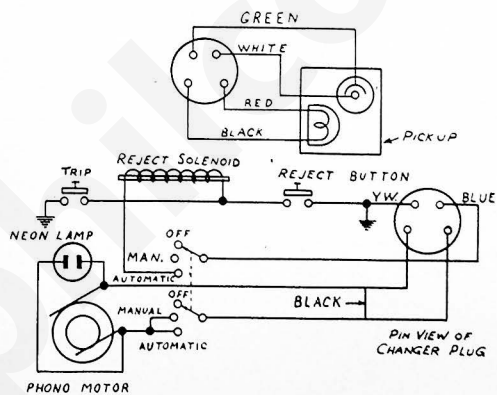
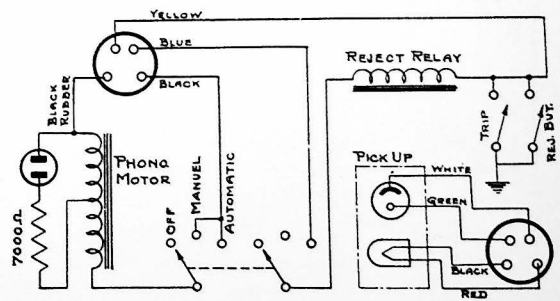


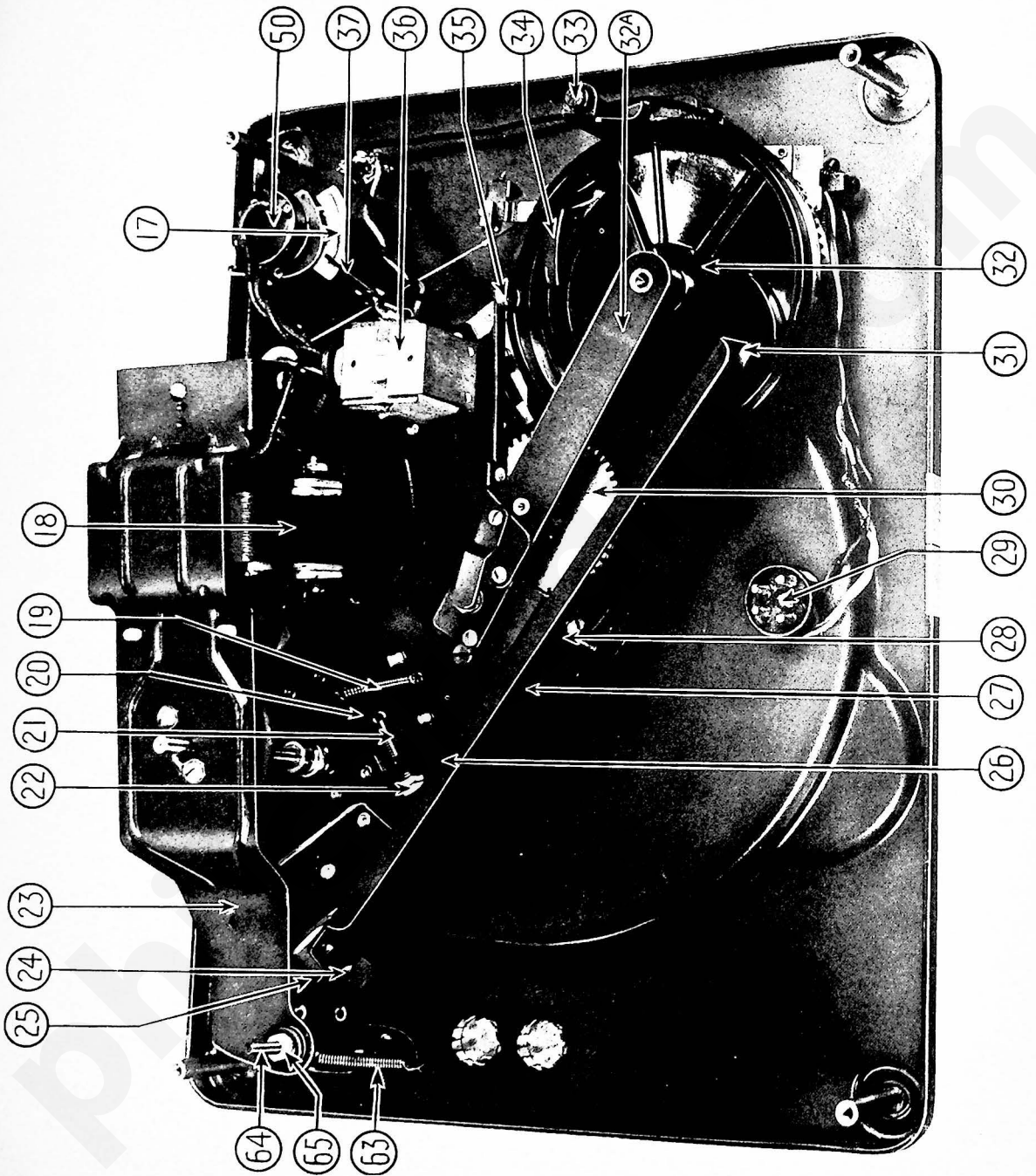
FIG. 9



ELECTRICAL WIRING, CHANGER PART Nos. 35-1285; 35-1289



ELECTRICAL WIRING, CHANGER PART No. 35-1286



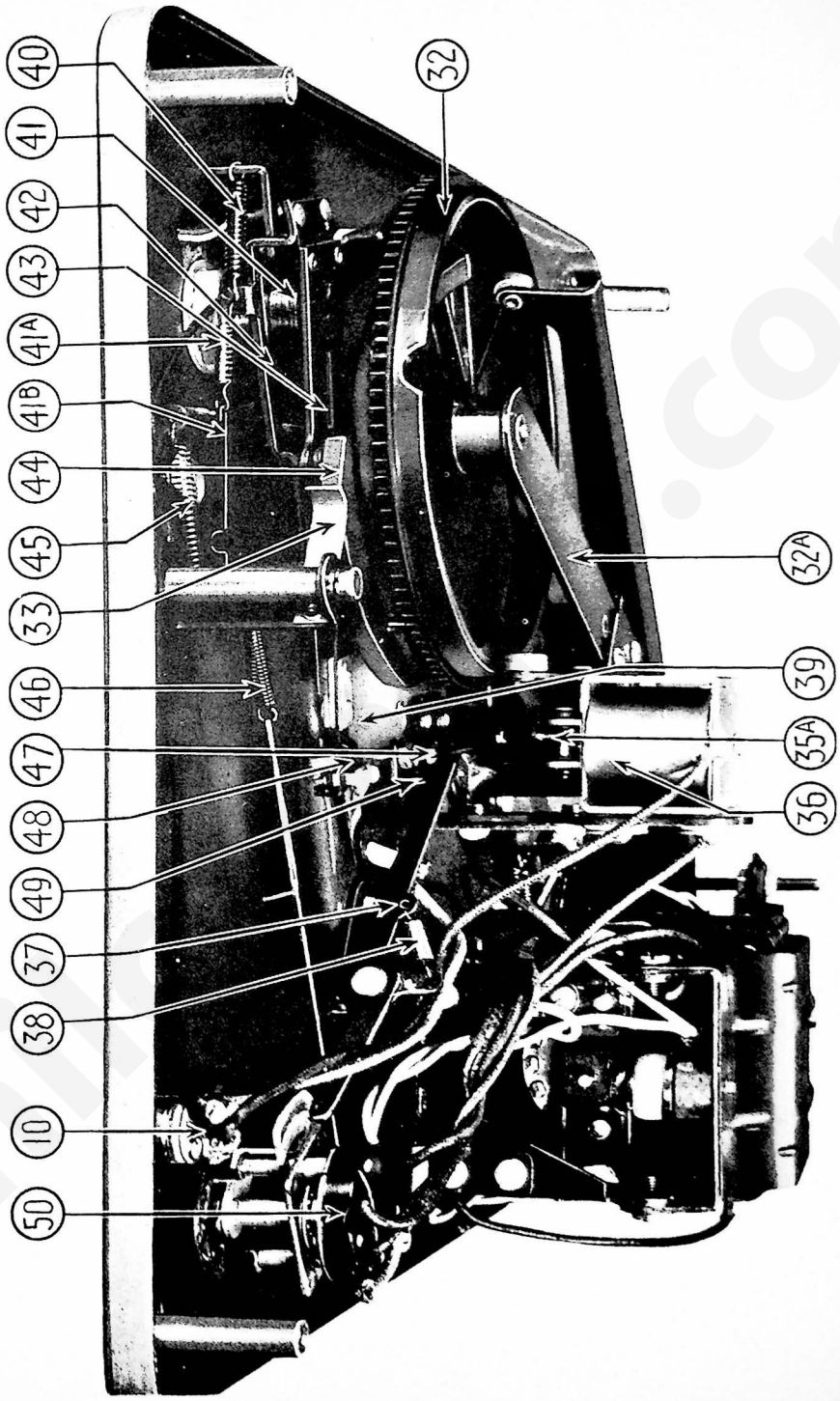


FIG. 11

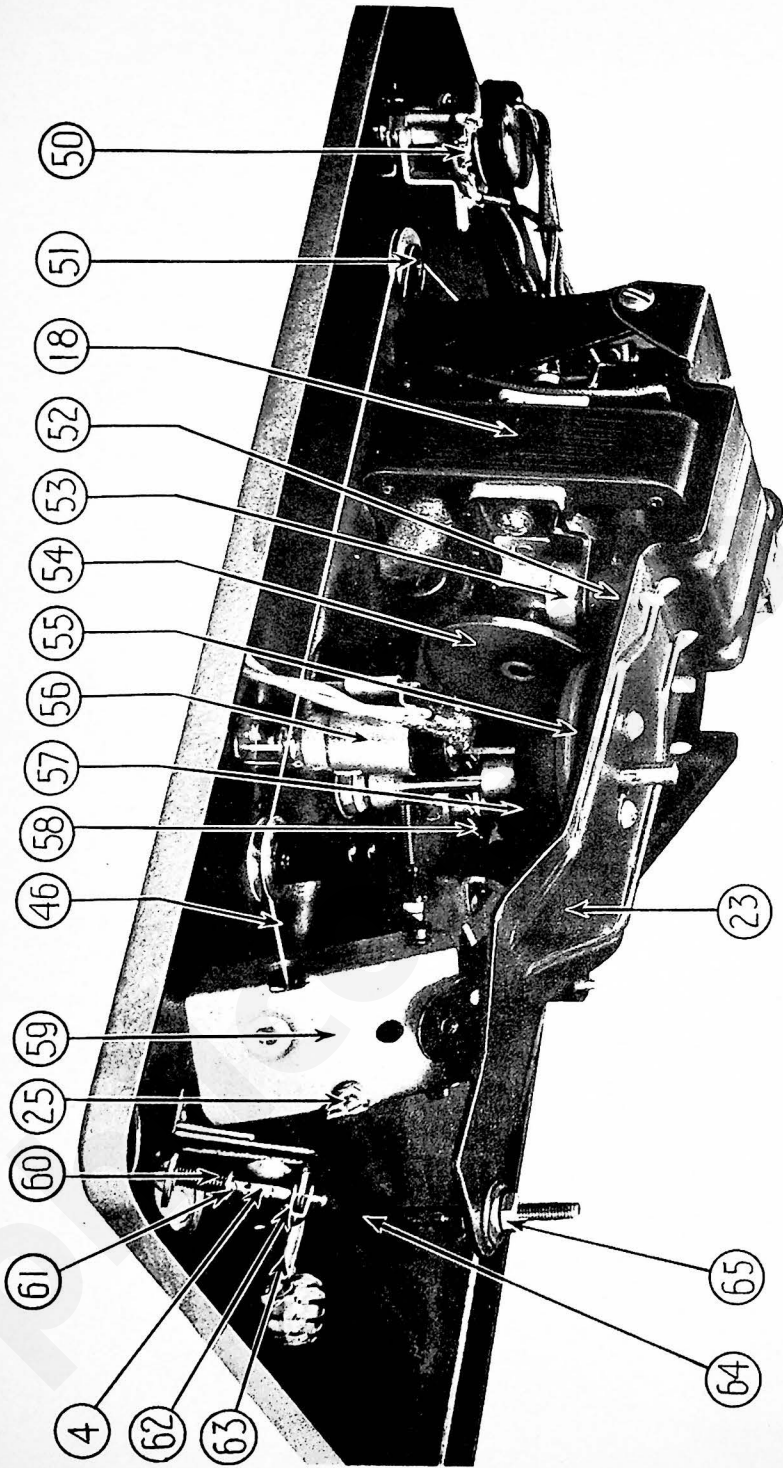


FIG. 12