Milwaukee
Automatic Record Changer

11600 SERIES

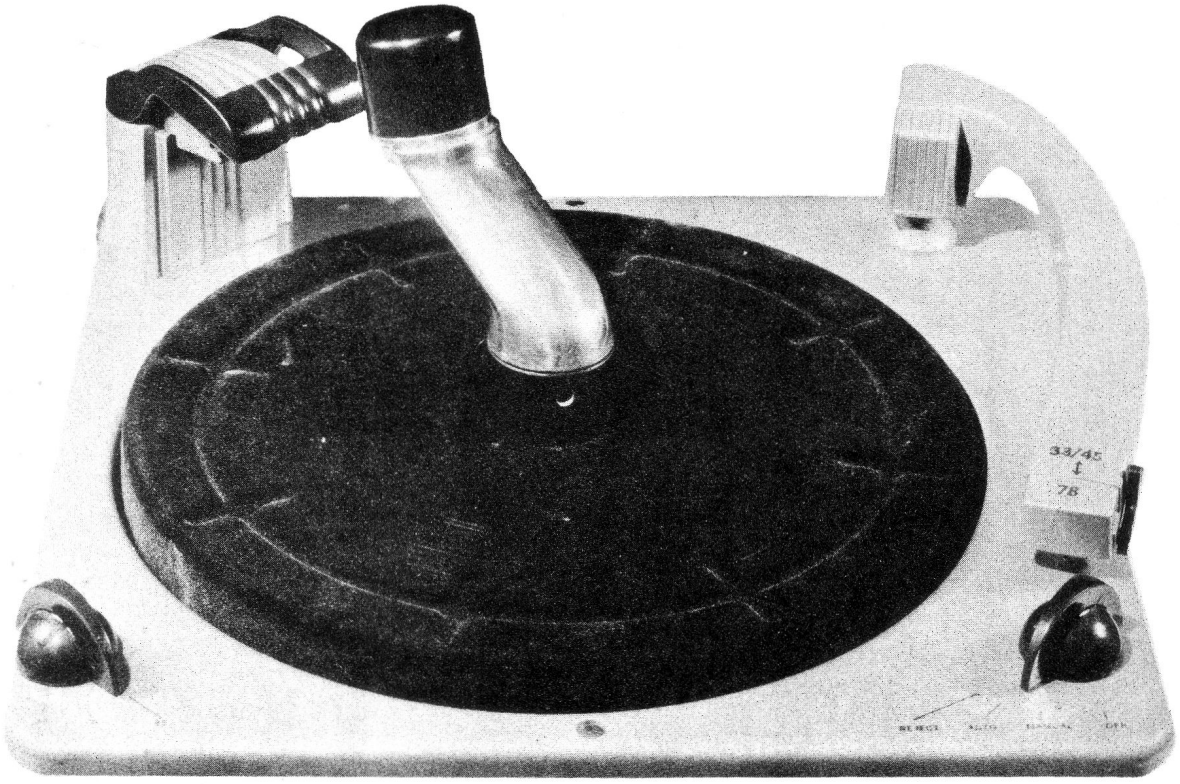


FIGURE 1

GENERAL INFORMATION

The Model 11600 automatic record changer is a precision-built, three-speed gearless and beltless mechanism, designed to play automatically twelve 7-inch or 10-inch records, or ten 12-inch records, not intermixed. In addition to the standard 78 R.P.M. records, it will also play microgroove 33 R.P.M. and 45 R.P.M. records. The last record will be repeated until the changer is turned off. This changer is a two-knob controlled mechanism; one provides Off, Manual, Automatic, and Reject operations, while the other controls the three speeds of the turntable. Any record may be rejected while playing by turning the control knob to Reject momentarily. Manual operation is provided for single records, home recordings, or odd-size records.

This changer is designed to operate on 117-volt, 60-cycle alternating current unless otherwise specified on motor.

Manufactured by

MILWAUKEE STAMPING COMPANY

MILWAUKEE 14, WISCONSIN

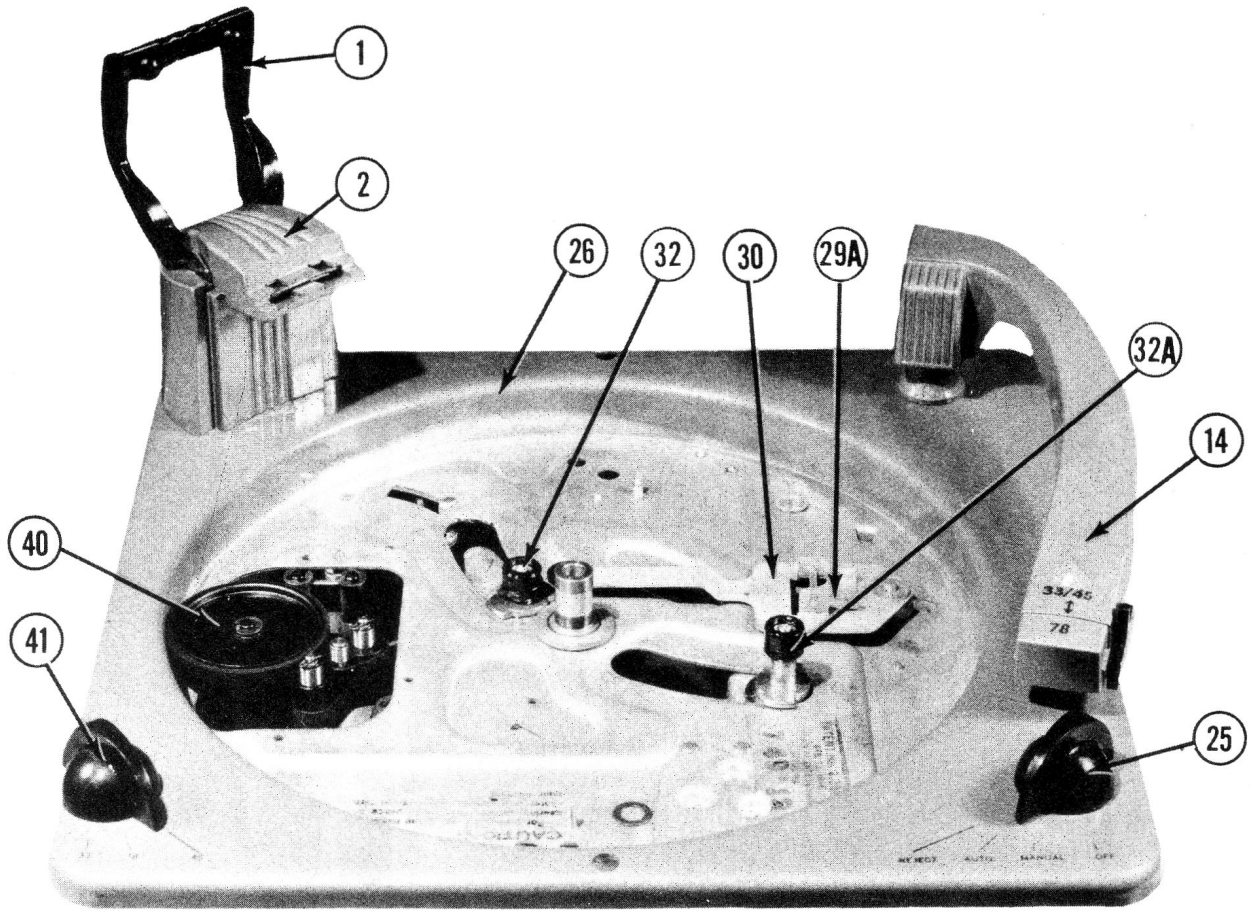


FIGURE 2

AUTOMATIC OPERATION

1. Be sure the pickup arm (14) is on the pickup arm rest (24).

2. Tilt cartridge so that arrow points to speed at which records are to be played (either 78 or 33/45).

3. Raise the balance arm (1) to a vertical position.

4. Place proper center post in place; (12) for 10″ or 12″ records, (11) for 7″ records with standard center hole, and (10) for 7″ records with 1½″ center hole.

5. For 7″ or 10″ records, lower the hinged 7/10-inch record support (2) to its rest position on the ejector box (9). For 12-inch records, raise the 7/10-inch record support to a vertical position.

6. Place a stack of records, not to exceed twelve 10-inch or 7-inch records, or ten 12-inch records, not intermixed, over the proper center post. All records must be for the same speed. The records will now rest on the step on the center post and on either of the ears of the ejector box on the ledge of the 7/10-inch record support, depending on the size of records being used and position of 10″ record support.

7. Lower the balance arm (1) to the records; this steadies the records and assures correct dropping of records.

8. Set speed control knob (41) on left-hand side to select proper speed (33, 45, or 78 R.P.M.).

9. Turn the right-hand control knob (24) momentarily to the "Reject" position and release it. This turns the changer on and starts the change cycle, thus dropping the first record to the turntable.

10. To reject a record being played, turn the control knob to "Reject" and release it.

11. To discontinue operation, all records should be dropped to the turntable by repeatedly turning the control knob to the Reject position until all unplayed records have dropped to the turntable. Place the pickup arm on the pickup arm rest and turn the control knob to the "Off" position.

12. To remove the records from the turntable:

a. Raise the balance arm (1) and the 7/10-inch support upward—if the record support is in a hori-

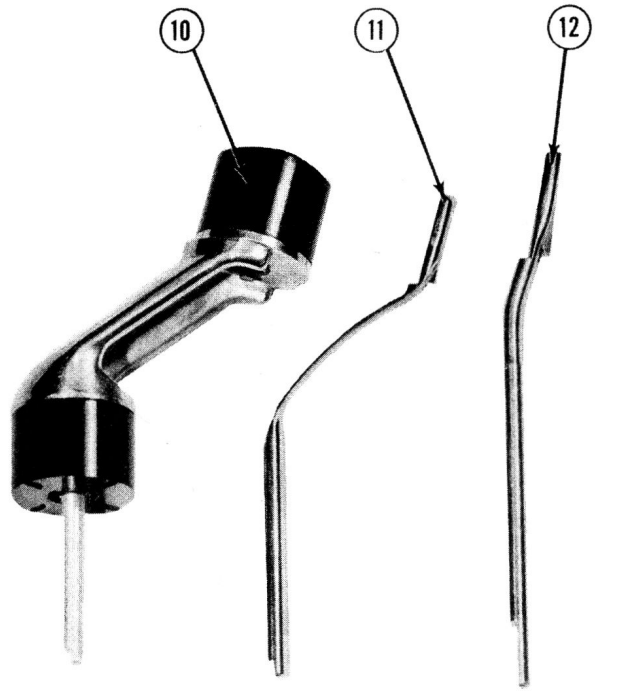


FIGURE 3

zontal position—to permit easy removal of records.

b. Remove center post and lift the records from the turntable.

MANUAL OPERATION

1. Raise the balance arm (1) and the hinged 7/10-inch record support (2) to a vertical position.

2. Place a record on the turntable.

3. Turn the control knob to the "Manual" position. This action starts the rotation of the turntable. The position of the selector lever (102) blocks the movement of the lead bearing pin (32A), thus preventing the changer from cycling.

4. Place the pickup arm on the lead-in groove at the edge of the record.

5. When the record has finished playing, return the pickup arm to the arm rest and turn the control knob to the "Off" position.

THE CHANGE CYCLE

The change cycle may be started by turning the right-hand control button (25) to "Reject." The selector lever (102) then, being pivoted through the action of the notched washer, moves the intermediate selector lever (100) which, in turn, rotates trip lever upper (30) to a position such that gravity trip dog (29A) falls behind the dropping lever (95).

The first revolution of the turntable cam will then rotate the trip arm upper assembly, causing the dropping lever (95) to move away from the lead roller shoulder nut (94) "x."

This allows the lead roller bearing pin (32A) to rise through the action of the compression spring (53) and to enter the spiral of the turntable, thus starting the change cycle.

As the lead roller of the swing arm follows the spiral on the underside of the turntable, the swing arm (104) cam engages the plunger pin (20), thus raising the pickup arm.

The ratchet arm friction springs (77 and 78) engage the ratchet arm (75), swinging the pickup arm out to a position where it is stopped by the ratchet arm contacting the stop bracket (105) figure 4. The swing arm now pushes against the cam roller of the ejector idler lever (52), which, in turn, moves the lower push pin (47), the ejector lever (37), and the 12-inch record slide bolt (4), thus pushing a 12-inch record off the record shelf.

When 7 or 10-inch records are being played, the 12-inch record slide moves forward pushing the 7/10-inch record slide bolt (3), thus dropping a 7 or 10-inch record to the turntable.

As the swing arm nears the end of its swing, the cammed dropping lever (62) comes in contact with the lever trip bracket (66), allowing the return roller pin (32) to rise and enter the spiral groove.

The lead roller pin assembly is pushed back out of the spiral groove of the turntable by the cam surface at the center of the spiral, and is held in position by the flange of the lead roller dropping lever (95). The swing arm is now moved back as the return roller follows the spiral.

The ejector assembly is now returned to its original position.

The pickup arm is moved back toward the record for set down by the friction springs (77 and 78). The pickup arm is stopped in proper position by the engagement of the ratchet arm (75) and the ratchet arm lever (72). The position of the ratchet arm lever is determined by the change lever (68) and the change lever ejector (34), which are operated by the 10-inch record support (2); that is, when 10" and 12" records are being played.

The center post (12), figure 3, used in playing 10" and 12" records, is longer and, when used, engages the discriminator lever (59). This engagement pivots the finger of the lever (59) clear of the ratchet lever (72), thus allowing this engagement of the ratchet arm (75) and lever (72), as described in the preceding paragraph. However, when 7" records are being played (33 or 45 R.P.M.), their spindles are shorter, which allows the discriminator lever (59) to stay in a raised position; therefore, as the tone arm swings in for set down, the ratchet arm lever (72) engages the finger of the discrimi-

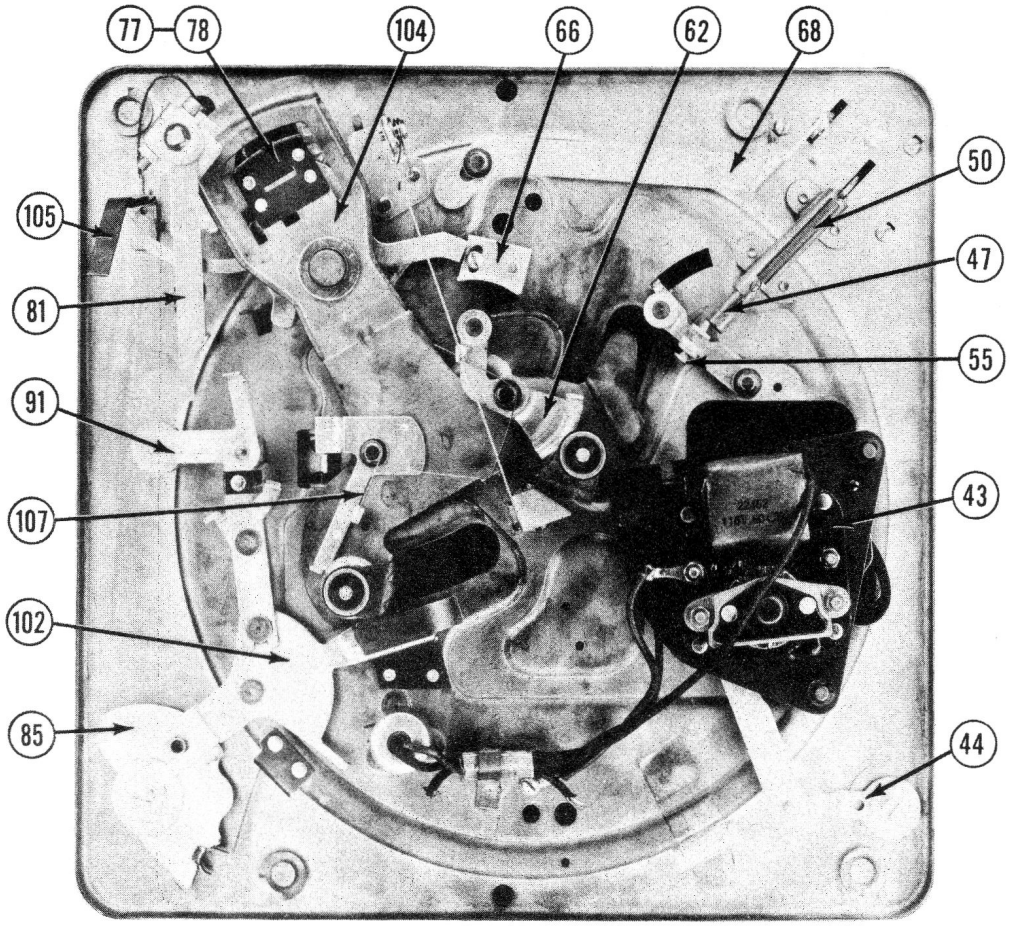


FIGURE 4

nator lever (59), thus positioning the arm for 7″ set down.

As the cycle nears completion, the swing arm contacts the brake spring (106), figure 4, which prevents acceleration of the swing arm, thus assuring gentle lowering of the pickup arm to the record as the plunger pin rides down the cam of the swing arm. The friction springs (77 and 78) and the ratchet arm lever (72) are moved away from the ratchet arm through the movement of the swing arm; therefore, the pickup arm is free to move across the record.

The return roller pin assembly is pushed back out of the spiral groove of the turntable by the cam surface at the center of the spiral, and is held in position by the cammed dropping lever (62). This completes the change cycle.

Positive tripping action takes place when the needle moves beyond the recorded area. The trip arm (81), which moves with the pickup arm, moves the lower trip lever (91), which, in turn, drops the trip dog (29A) behind the lead roller drop lever (95) so when the cam on the turntable strikes the upper trip lever (30) it moves the drop lever starting a new cycle.

SERVICE PROCEDURES

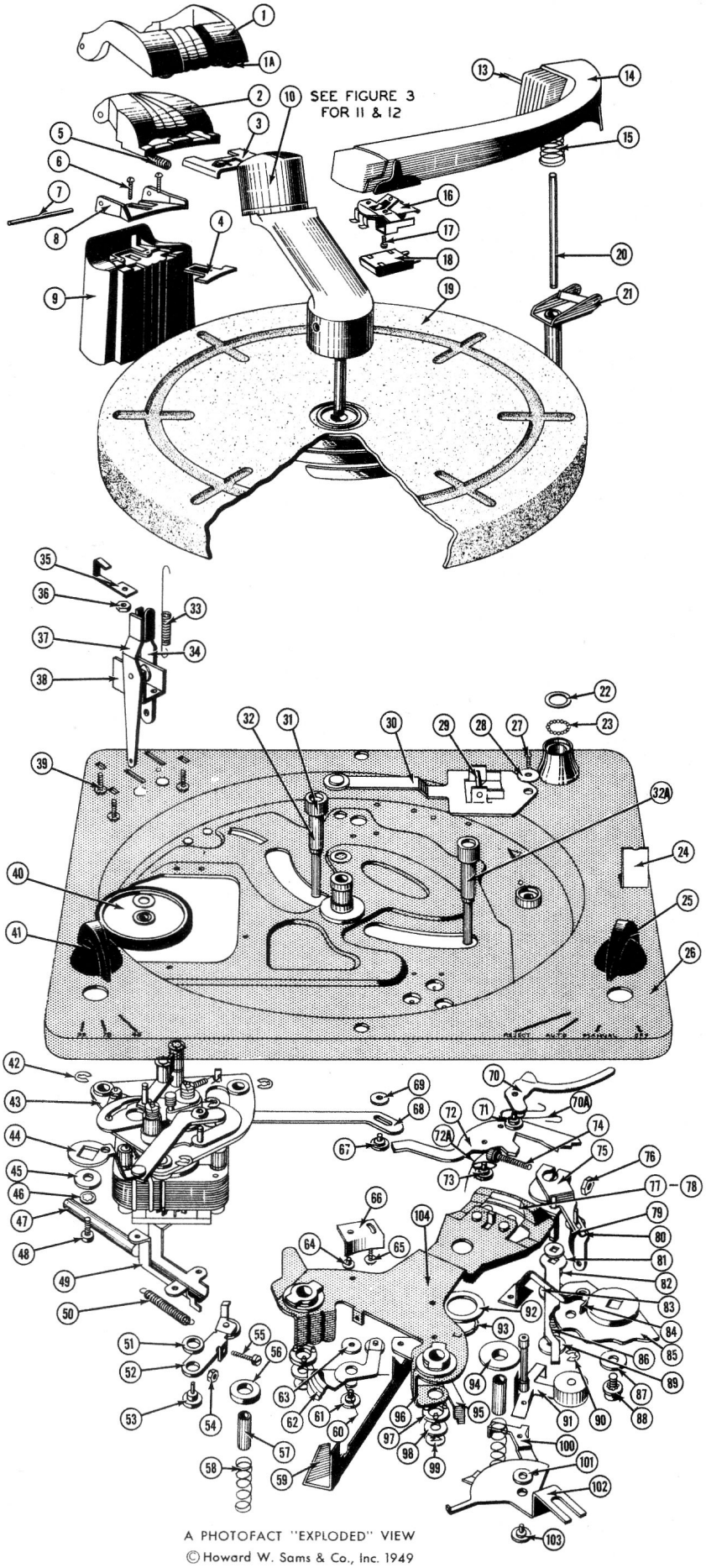
Records Fail to Drop

1. Trip the changer and rotate the turntable, by hand, until the swing arm (104) completes the first half of the cycle:

a. Adjust screw (55) until the 12-inch record slide bolt (4) extends 1/32″ past the ears of the ejector box.

b. If 12-inch records fail to drop to turntable, check the ejector arm extension spring (50) to see if it is loose or missing. If loose, or missing, the 12-inch record slide bolt (4) and the ejector lever (37) will stay in a forward position; thereby the ejector mechanism will not be actuated and the records will not be dropped to the turntable.

c. If 7-inch and 10-inch records fail to drop to the turntable, check the 10-inch record support (2) to see if it is completely resting on the ears of the ejector box. Check to see if the ejector compression spring (5) is missing. If this spring is missing, the 10-inch record slide bolt (3) will stay in a forward position.



A PHOTOFACT "EXPLODED" VIEW

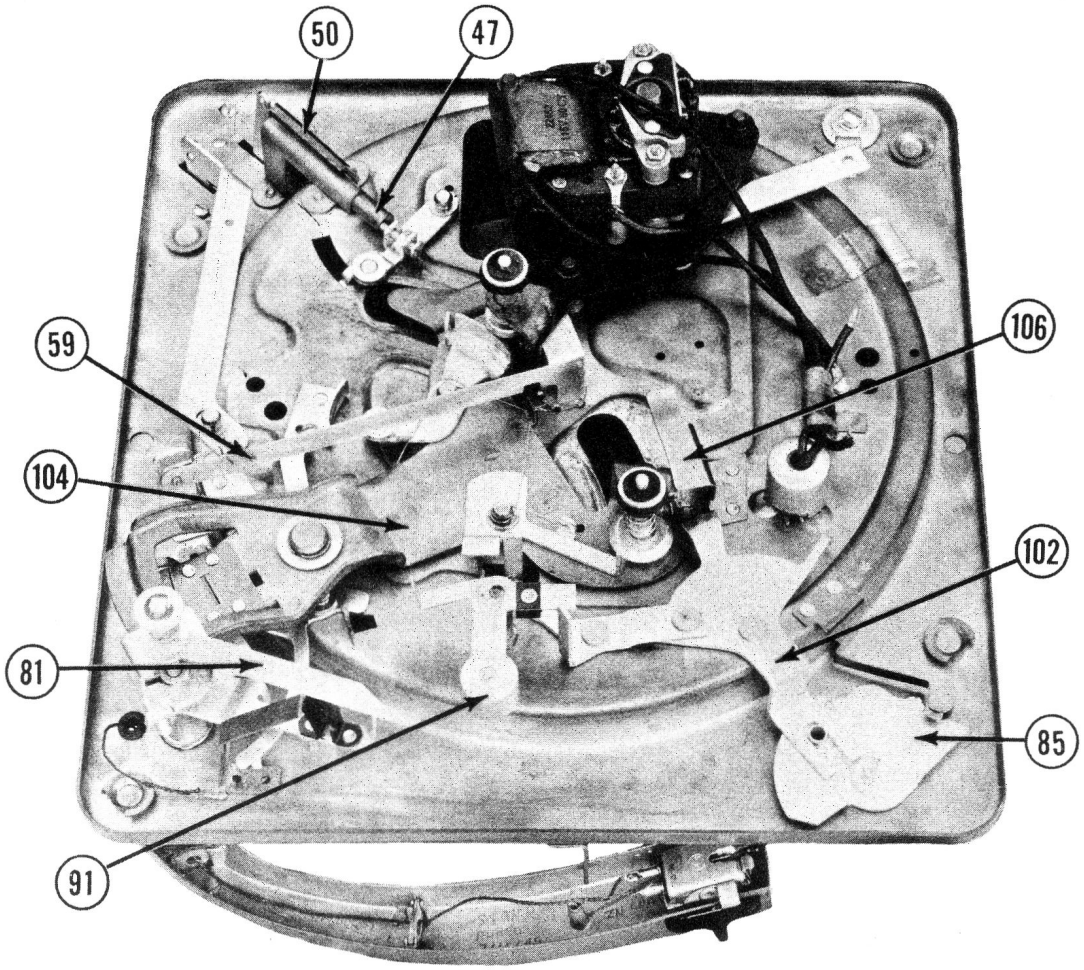


FIGURE 5

If 7″ records fail to shuttle, check to see that two lugs on the record slide bolt (3) protrude approximately .020″ above shelf to engage record.

Pickup Arm Does Not Set Down in Correct Position

1. With the control knob turned to "Off" position, trip mechanism and rotate the turntable, by hand, through the cycle; note where the needle lands. Correction may be made by loosening the clamp screw (74) and moving the pickup arm slightly with respect to the ratchet arm (75). The needle should land approximately ⅛″ from the edge of the record.

2. Check spring (72A) to see if it is missing or too weak to actuate ratchet arm lever (72).

Pickup Arm Drops Fast When Setting Needle on Record

1. Check the friction brake spring (106); it may be weak or broken.

Mechanism Trips Before Record Is Completed

1. The lead roller lever torsion spring (107), figure 4, is loose, allowing lever (95) to slip from beneath the lead roller (32A).

Mechanism Fails to Trip at End of Record

1. Check lever (81) to see if it is making contact with the trip lever (91).

2. Check the compression spring (58). It may be too weak to actuate the lead roller bearing pin assembly, and may not raise it sufficiently to enter the spiral of the turntable. If this is true, the mechanism will not operate when the control knob is turned to Reject.

3. Trip lever (91) binding.

4. Trip dog (29A) binding in an outward position.

5. Spring (86) weak or missing; therefore, the trip arm (81) is not being held in frictional contact with ratchet arm (75).

6. If the above are correct and the changer still

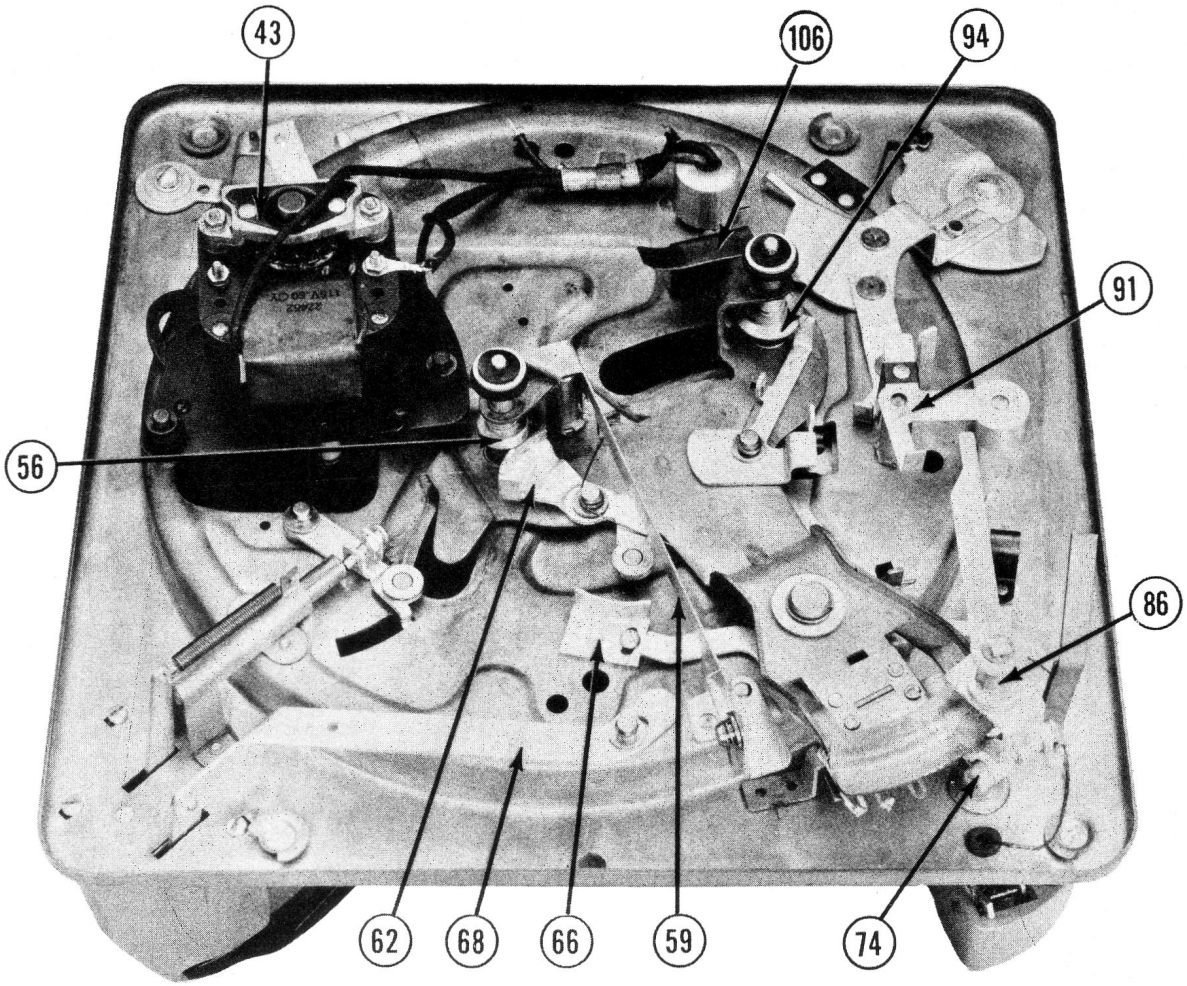


FIGURE 6

does not trip, rotate turntable until turntable cam rotates trip arm (30) to its maximum position. At this point, trip dog (29A) should overlap the edge of lead roller dropping lever (95) by .030" to .035". This dimension is very important to the proper operation of the tripping mechanism.

Mechanism Jams in Second Half of Change Cycle

1. Check dropping lever torsion spring (107) to see if it is loose or missing. If this spring is not connected, the dropping lever will not be actuated, thus not holding the roller pin (32A) down when it is pushed down by the cam surface at the center of the spiral of turntable. This allows both rollers in the spiral at the same time, thereby jamming the mechanism.

Clicking of Mechanism and Jamming at the Start of the Change Cycle

1. Check the cammed dropping lever torsion spring (60) to see if it is loose or broken. This will allow both bearing pins to stay in a raised position.

Continuous Cycling

1. Check the selector lever spring (84) to see if it is broken or bent.

Changer Does Not Complete Change Cycle But Turntable Continues to Rotate

1. Check the compression spring (58). If spring is too weak to raise the bearing pin (32) the swing arm will not return to its proper position, thus leaving the pickup arm in an outward and raised position.

Mechanism Fails to Trip When Knob (25) Is Turned to "Reject"

1. Flat spring on trip lever (91) bent or broken, thereby not allowing the intermediate selector lever (100) to contact the spring to move the trip lever (91) when the selector lever (100) is actuated.

PARTS LIST

Ref. No.	Part No.	DESCRIPTION
1	11212-A	Balance arm assembly
1A	11211	Balance arm bumper
2	11424	7-in. and 10-in. record support
3	11422	7-in. and 10-in. record slide bolt
4	11217	12-in. record slide bolt
5	11215	Ejector compression spring
6	11232	No. 4-40 x 3/8 R.H. steel machine screw
7	11223	Ejector box hinge pin
8	11209	Slide bolt cover
9	11208	Ejector box
10	11430	1½-in. spindle assembly—45 R.P.M.
11	11418-A	10-in. and 12-in. center post assembly
12	11425	7-in. spindle assembly
13	11461-C	Pin for yoke
14	11475-D	Tone arm
15	11462-C	Dual tone arm spring
16	10753-EV3	EV cartridge with No. 3-48 screws
17		
18		
19	11480	Turntable assembly
20	11460	Plunger pin
21	11447-A	Swing post assembly
22	11470	.008 x 13/32 x 9/16 ph. bronze washer
23	11450	3/32 dia. ball bearings
24	11419	Arm rest, part of baseplate item 26
25	11203	Control knob
26	11499-C	Mechanism plate
27	10834	No. 4-40 x ¼ steel fil. hd. screw
28	11466	.031 x .125 x ½ steel washer
29	11485	Trip dog pin
29A	11486	Trip dog
30	11487	Trip lever—upper
31	11248	Roller
32	10743	Bearing pin
32A	10743	Bearing pin
33	11216	Balance arm spring
34	11222	Change lever ejector
35	11220	Ejector pressure spring
36	11241	No. 4-40 steel hex nut
37	11218	Finger lever ejector
38	11219	Ejector pivot channel
39	10831	No. 6-32 x 3/8 thread cutting screw
40		Idler wheel—part of item 43
41	11203	Speed control knob
42	11395	No. 16064 E-washer
43	11420	3 speed motor
44	11399GE	Motor repeat lever
45		Steel washer
46	10848	Lockwasher (part of 48)
47	10804	Lower push pin
48	10848	Screw (part of 46)
49	10724	Ejector pin guide
50	10728	Ejector arm ext. spring
51	10782	.102 x .258 x 7/16 brass washer
52	108B-A	Ejector idler lever assembly
53	10781	Lever fulcrum pin
54-55	10792	Adjusting screw and lock nut 6-32 x 5/8
56	10742	Bearing pin shoulder nut
57	10751	Bearing pin spacer
58	10750	Compression spring
59	11437	Discriminator lever
60	10733	Dropping lever tension spring
61	10787	Kickoff lever fulcrum pin
62	10730	Cammed dropping lever
63	10805	.012 x .136 x 7/16 brass slide washer
64	1156	2½/16 tub. riv.
65	10831	No. 6-32 x 3/8 thread cutting screw
66	10811	Lever trip bracket
67	10787	Lever fulcrum pin
68	11236	Change lever
69	10805	.012 x .136 x 7/16 brass slide washer
70	11426	Brake lever
71	10787	Fulcrum pin
72	11436	Ratchet arm lever
72A	11417	Ratchet arm spring
73	10787	Fulcrum pin
74	10837	No. 10-32 x 1 socket head cap screw
75	11415-A	Ratchet arm assembly
76	10810	No. 10-32 steel hex. nut
77	10735	Ratchet arm friction spring
78	10791	Ratchet arm friction spring
79	11428	Ratchet arm spring
80	1156	9/16 tubular rivet
81	11494	Trip arm
82	11468	.031 x .160/.170 x ½ brass washer
83	11492	.060 x .190 x 5/8 steel washer
84	11226	Selector lever spring
85	11225	Notched washer
86	11491	Trip arm compression spring
87	10801	.060 x .190 x 5/8 steel bearing washer
88	10848	No. 10-32 x 3/8 sems screw
89	11492	.060 x .190 sq. x 5/8 steel washer
90	11395	No. 16064 E-washer
91	11482	Trip lever—lower
92	11239	.050 x 33/64 x 7/8 steel washer
93	11240	½ x SC—122 retaining ring
94	11242-F	Flat lead roller shoulder nut
95	11489	Lead roller drop lever
96	10745	Swing arm clamp
97	11244	Roller cushion
98	10801	.060 x .190 x 5/8 steel bearing washer
99	10765	3/16 speed nut
100	11457	Intermediate selector lever
101	10805	.012 x .136 x 3/16 brass slide washer
102	11205	Selector lever
103	10773	Change lever fulcrum pin
104	11490-A	Swing arm assembly
105	11473	Tone arm stop bracket
106	11427	Brake spring (part of base plate 26)
107	11488	Lead roller lever torsion spring

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