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GARRARD
MODEL 210

STORED in DIGITAL FORMAT

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GENERAL INFORMATION

The Garrard Model 210 is a four-speed record player and changer and is designed to play a stack of eight records in automatic sequence and shut off after the last record is played. Ten and twelve-inch records can be intermixed providing they are of the same speed.

The velocity trip mechanism is used for changing records.

A 45 rpm spindle or center hole adaptors are available for 7" 45 rpm records.

Connect this changer to an outlet supplying 117 volts, 60 cycles AC only.

Manufactured By:

The Garrard Engineering and Manufacturing Co. Ltd.
Swindon - Wiltshire - England

Distributed in the United States By:
Garrard Sales Corporation
80 Shore Road
Port Washington, New York

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

CQ437

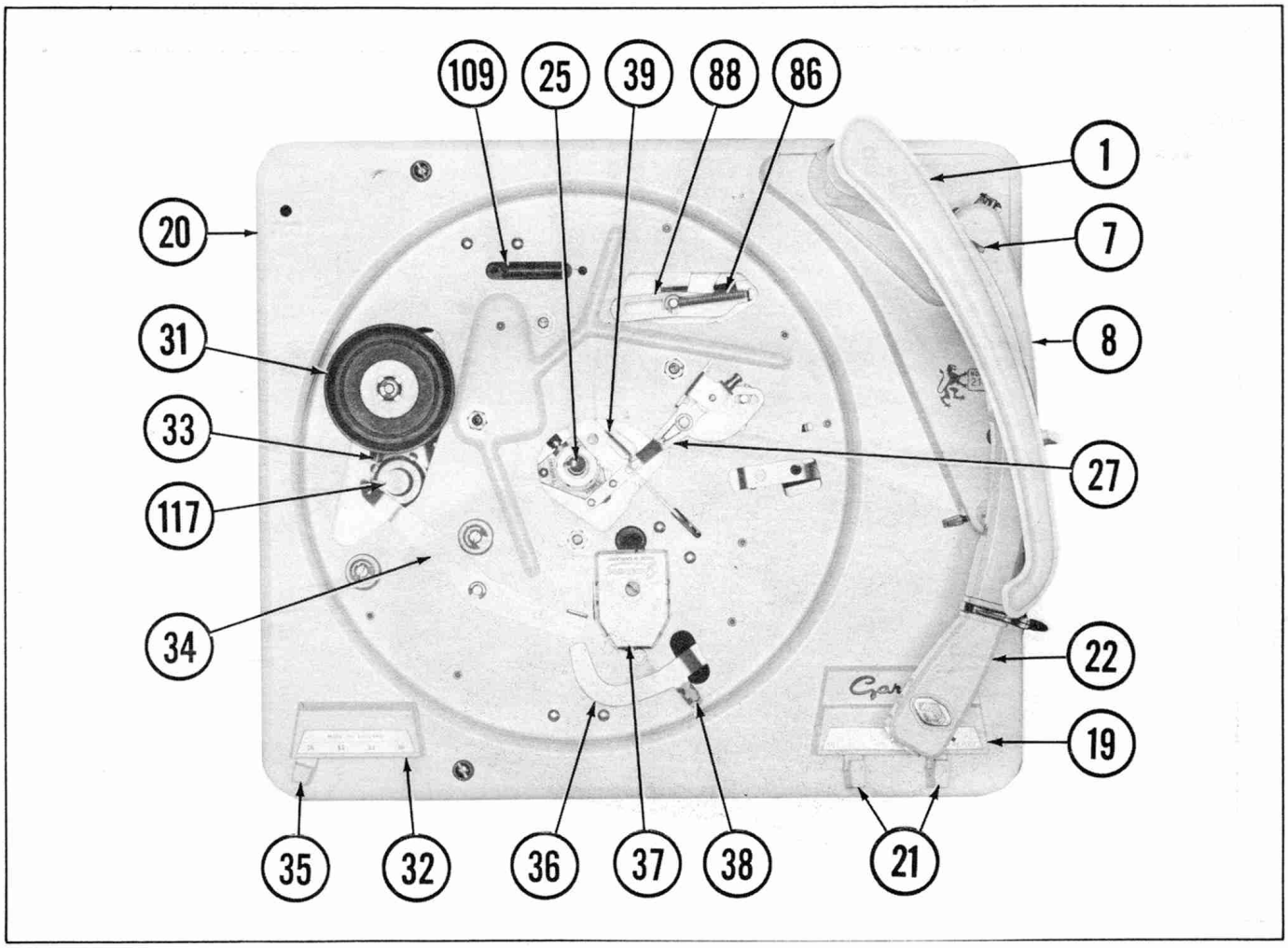


FIG. 1 TOP VIEW OF MECHANISM WITH TURNTABLE REMOVED

CONTROLS

Manual On-Off Control

Turning this control to the "On" position releases the turntable brake and applies power to the motor. Returning this control to the "Off" position, removes the power to the motor and applies the brake to the turntable.

Automatic Control

Turning this control to the "On-Reject" position releases the turntable brake, applies power to the motor, and causes the changer to go through a change cycle. The record selector arm will then swing in and feel the record so the tone arm will set down in the lead-in groove of the record. Returning this control to the "Off" position removes the power to the motor and applies the brake to the turntable.

Speed Change

This control selects the correct speed for the record or records being played.

OPERATING INSTRUCTIONS

Loading

1. Raise overarm (1) and move it to the right.
2. Load up to eight 10 or 12" records with a 1/4" center hole onto the spindle.
3. Place overarm (1) over the records.

NOTE : 10 and 12-inch records of the same speed can be intermixed.

Automatic Play

1. Set the speed selector to the type records to be played.
2. Turn the "Off-On-Reject" control to the "On-

Reject" position and release. The records will play automatically and the mechanism will shut off after the last record is played.

Manual Play

1. Set speed selector for type record to be played.
2. Place a record on the turntable.
3. Turn the manual "Off-On" control to the "On" position.
4. Place tone arm on the record.
5. The tone arm will return to its rest and the power to the motor will shut off after the record is played.

ADJUSTMENTS

Set-Down

Turn screw (13) clockwise to move tone arm inward and counterclockwise to move tone arm outward.

Stylus Pressure

Turn serrated screw (7) clockwise to increase the pressure and counterclockwise to decrease the pressure. The stylus pressure should be adjusted to that recommended by the manufacturer.

Tone Arm Height

To adjust the tone arm height, turn screw (11) clockwise to raise the tone arm and counterclockwise to lower the tone arm. It should be adjusted so the stylus point is 1" above the turntable as the tone arm returns to its rest position.

CHANGE CYCLE

Observe the change cycle by manually rotating the turntable clockwise. The action to be described can then be readily followed and each part's function more easily understood.

This changer has a velocity trip mechanism. The change cycle is started by the fast inward motion of the pickup arm when the needle enters the leadout groove at the end of a record.

As the pickup arm enters the leadout groove of a record, pickup arm lever assembly (8) strikes inter lever unit (78). Friction plate (28) rotates and moves operating lever unit (27) so it will contact and ride up on the turntable cam, raising stop lever assembly (39) so cam gear assembly (84) will engage the turntable gear.

As cam gear assembly (84) rotates, cam lever unit (85) rides on the bottom cam of cam gear assembly (84) and moves the pickup arm lever assembly (8) outward so the pickup arm will clear the records. Release lever assembly (101) is actuated as cam gear assembly (84) continues its rotation. In turn, release lever assembly (101) actuates the cam in the spindle (25) which drops one record onto the turntable.

As a record drops and cam gear assembly (84) continues its rotation, record cam (2) swings inward and contacts the edge of the record by action of the cam selector lever unit (91) riding on a pin on cam gear assembly (84).

At the same time, the pickup arm is raised by action of pickup cam assembly (56). As the pickup arm is raised and swings outward, a pin on pickup arm lever assembly (8) engages with control lever unit (43). The pickup arm is then pulled in against selector lever assembly by inter selector lever spring (49). As cam gear assembly (84) continues its rotation, pickup cam assembly (56) is rotated far enough so pickup arm lever assembly (8) disengages inter selector lever and the pickup arm sets down in the lead-in groove of the record.

The cam gear assembly (84) continues to rotate until it contacts stop lever assembly (39) and one cycle is completed.

When the last record has been played, the record cam (2) swings all the way in. When the record cam (2) swings in, it allows stop link (58) to move outward and the inter selector lever is prevented from moving in by the lance on stop link (58). As cam gear assembly (84) continues its rotation, cam lever (85) is rotated by a pin on cam gear assembly (84) which in turn pivots catch lever (79) and releases switch lever assembly (36), cutting the power to the motor.

CLEANING

Clean all foreign matter from the turntable rim. Clean the idler wheel and motor pulley occasionally to remove any oil or grease from them to prevent slipping.

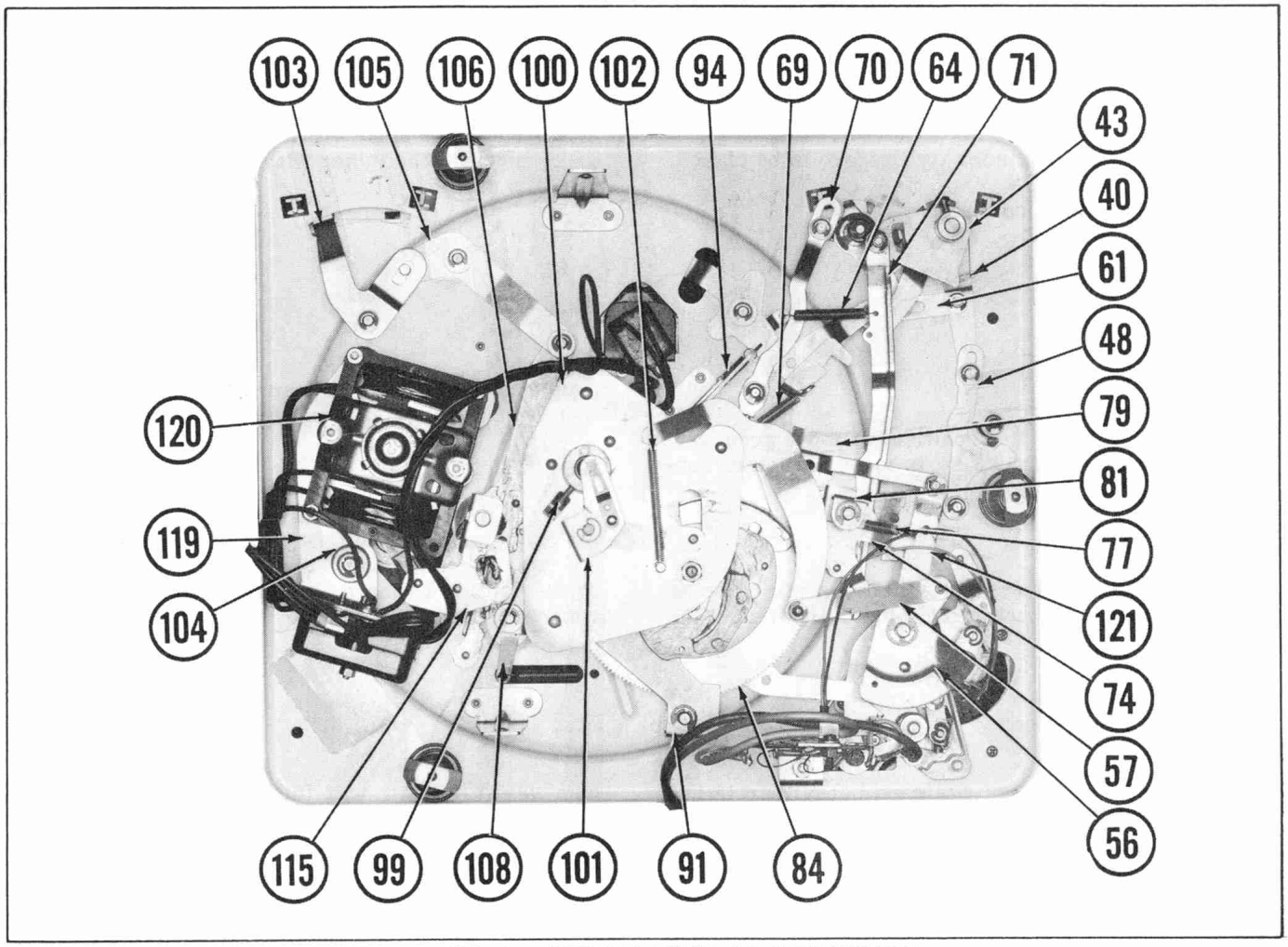


FIG. 2 BOTTOM VIEW OF MECHANISM

LUBRICATION

Motor bearings, turntable spindle, and idler wheel are of the oil retaining type and should need no oiling for a long period of time. When the need for oil is apparent, use it very sparingly.

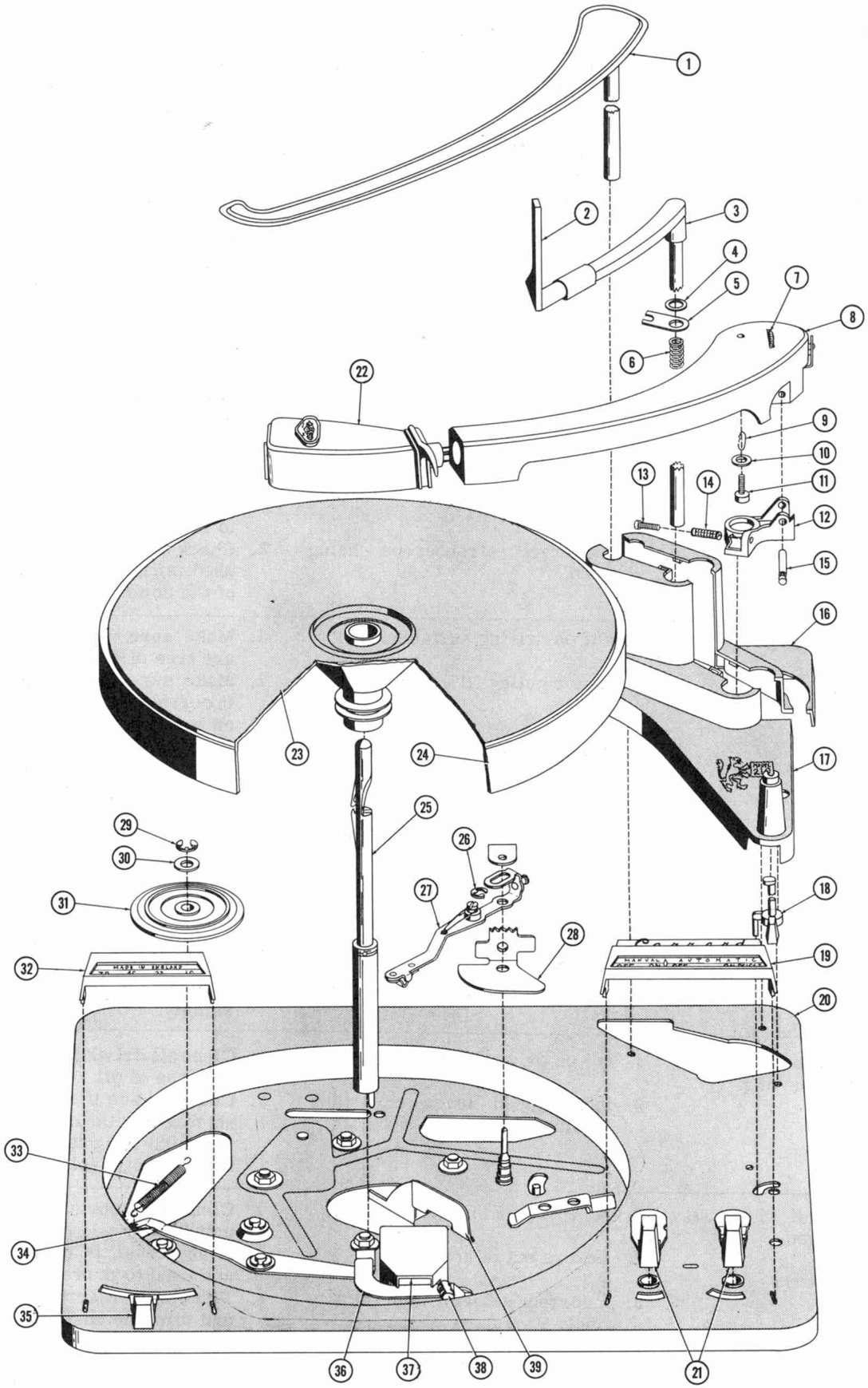
Apply a light coat of grease to all cam faces, pins and rollers, and all lever pivots.

TROUBLE CHART

Symptom	Cause	Remedy
Changer does not cycle when tone arm reaches the center of record.	1. No run out groove in record. 2. Pitch of record run out groove not sufficient. 3. Automatic trip operating lever (27) height incorrect.	1. Trip mechanism with the reject control. 2. The run out groove of the record should not be less than 3/32". 3. Turn adjusting screw to raise or lower the automatic trip operating lever (27) so the bottom face of the felt pad engages approxi - mately half way up the cam face on the turntable striker as it revolves.

TROUBLE CHART (CON'T.)

Symptom	Cause	Remedy
	4. Automatic trip operating lever (27) binding.	4. Lift automatic trip operating lever (27) off the friction plate to see if it is free on its pivot. Do not lubricate.
When tone arm nears center of record, it repeats in record groove.	1. Stylus worn. 2. Stylus pressure too light. 3. Stylus leads too tight or in wrong position. 4. Automatic trip operating lever (27) set incorrectly. 5. Automatic trip operating lever (27) and tone arm binding.	1. Replace stylus. 2. Adjust stylus pressure to that recommended by the manufacturer. 3. Make sure the leads move freely in the slot of the tone arm base. 4. Make sure automatic trip operating lever (27) is free on its pivot. 5. Check all associated levers for stiffness and see if they are not obstructed by any leads.
Turntable runs excessively fast or slow.	1. Motor pulley size incorrect. 2. Incorrect stroboscope being used.	1. Check for correct pulley size. 50-cycle motor pulley is nickel plated and 60-cycle motor pulley is brass. 2. Check to see if stroboscope being used is correct for the frequency of the power supply.
Erratic turntable speed.	1. Oil on driving surfaces. 2. Motor pulley (117) loose. 3. Motor pulley (117) out of position.	1. Make sure all driving surfaces are free of oil. 2. Make sure motor pulley (117) is in correct position and then tighten both set screws. 3. Position motor pulley (117) so the idler wheel (31) is about 1/64" above the adjacent pulley step.
Wow	1. Dirt on inside of turntable rim. 2. Turntable spindle tight. 3. Flat spots on idler wheel (31). 4. Motor pulley (117) loose. 5. Bent motor shaft or unbalanced rotor.	1. Remove turntable and clean turntable rim. 2. Remove turntable and clean and lubricate spindle. 3. Replace idler wheel (31). 4. Tighten the two set screws in motor pulley. 5. Replace the rotor and shaft assembly.
Turntable does not revolve when motor is running.	1. Oil on driving surfaces. 2. Inter speed lever unit (105) binding.	1. Clean all driving surfaces so they are free of oil. 2. Check to see if motor leads are not touching the inter speed lever unit (105) and put a drop of oil on the bracket pivot.
Fails to turn off when last record has played.	1. K. O. lever unit (121) sticking. 2. Levers out of position. 3. Incorrect selector arm (3) setting.	1. Clean and lubricate K. O. lever unit (121). 2. If any lever is bent, remove it and bend to correct position. 3. Place a 10" record on the spindle and turn the changer on with the "On-Reject" control. As soon as the record drops and the selector arm moves outward, turn the changer off with the manual off control. Move selector arm outward until a spring resistance is felt. The plastic cam should be 6 1/8" to 6 3/16" radius from the center of the record spindle. Adjust the adjusting screw, in the



A PHOTOFACT "EXPLODED" VIEW

FIG.3A EXPLODED VIEW OF PARTS ABOVE BASEPLATE

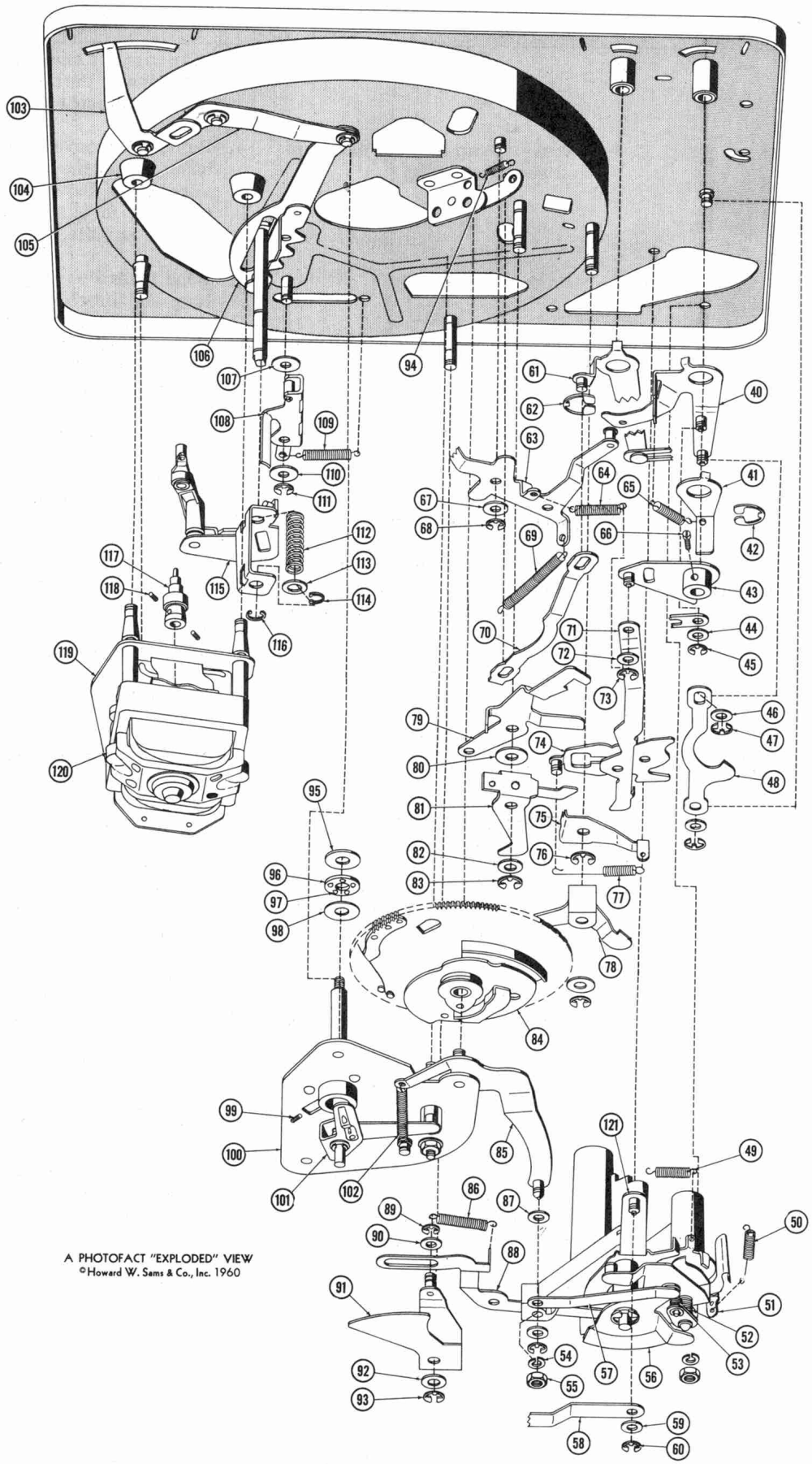


FIG.3B EXPLODED VIEW OF PARTS BELOW BASEPLATE

Symptom	Cause	Remedy
		rear cover, a small amount in one direction or the other while holding the selector arm in this position.
	4. Excessive gap between overarm and record spindle.	4. Remove the cover on the tone arm base, loosen the bracket retaining screws and move overarm in until there is 1/8" gap between it and the spindle.
	5. Levers rubbing.	5. Bend levers so they are not rubbing and lubricate the selector arm pivot with light oil.
	6. Excessive friction on stop link (58).	6. Turn adjusting screw on K. O. lever unit (121) a small amount to reduce friction.
Changer turns off without playing record.	1. Record cam (2) not in vertical position.	1. Record selector arm is in a horizontal position for shipping purposes and must be positioned in a vertical position.
	2. Control knob not free.	2. Lubricate the pivot points and where the levers slide.
Tone arm lands too far in or out.	1. Tone arm out of adjustment.	1. See "Set-Down Adjustment".
	2. Broken or disconnected springs.	2. Check to see if all springs are connected to their levers or replace if necessary.
	3. Selector arm (3) out of adjustment.	3. See remedy 3 under "Fails to turn off when last record has played."
Records do not drop.	1. Overarm (1) tight.	1. Clean the overarm shaft and lubricate with light oil.
	2. Spindle (25) damaged.	2. Replace spindle (25).
	3. Records warped.	3. Replace records.
	4. Burrs in center hole of record.	4. Remove burrs from center hole with penknife.
Two records drop at the same time.	1. Record latch in record spindle unit (25) sticking.	1. Clean record latch so it will move up and down freely.
Mechanical noise.	1. Lack of lubrication.	1. Lubricate all bearings, cam faces, and operating pins.
	2. Flat spots on idler wheel unit (31).	2. Replace idler wheel unit (31).
	3. Lever loose.	3. Check all levers for tightness.
Rumble.	1. Lack of lubrication.	1. Lubricate turntable bearings, idler wheel unit (31), and motor (120).
	2. Defective motor mountings.	2. Replace motor mountings (104).
	3. Motor power supply leads preventing motor from floating freely on its mountings.	3. Make sure power supply leads to motor have plenty slack and are not caught between the motor mounting plate and baseplate.
	4. Dirty idler wheel unit (31).	4. Lightly scrape the surface of idler wheel unit (31) to remove all dirt.
	5. Rubber tire of idler wheel unit (31) worn out.	5. Replace idler wheel unit (31).
	6. Motor pulley (117) out of position.	6. Make sure the idler wheel unit (31) is riding squarely on the pulley (117) steps.
	7. Idler wheel tension spring (33) too strong.	7. Stretch or replace idler wheel tension spring (33).
	8. Rotor shaft bent or motor pulley (117) defective.	8. Replace the rotor or motor pulley (117).

TROUBLE CHART (CON'T.)

Symptom	Cause	Remedy
Motor will not run.	1. No power reaching motor (120). 2. Loose connection. 3. Switch contacts bad. 4. Defective motor coils.	1. Check power leads for openings. 2. Inspect wiring connections to motor. 3. Replace switch. 4. When connected for high voltage, the total resistance should be 780 ohms. When connected for low voltage range, the total resistance should be 195 ohms.
Motor runs slow.	1. Motor bearings need lubrication. 2. Motor bearings out of alignment. 3. Polarity of motor coils incorrect. 4. Motor coil opens.	1. Lubricate motor bearings with fine machine oil. 2. Give the motor a sharp blow with a piece of wood and self-aligning bearings will line up and free the motor shaft. 3. The polarity of the poles on which the coils are assembled should be the same, both north or both south. 4. Replace motor coil.
Motor runs hot.	1. Motor coil shorted. 2. Incorrect voltage. 3. Defective insulation.	1. Replace motor coil. 2. Be sure the motor coils are connected for the correct power supply. 3. Replace motor coils.
Tone arm lands on record and jumps first few grooves.	1. Stylus worn or wrong size. 2. Changer not level. 3. Pickup leads binding tone arm.	1. Make sure stylus is set for type records being played. If stylus is worn or damaged, replace. 2. Level changer. 3. Make sure the pickup leads are free in the slot in unit plate at rear of pickup arm base and have enough loop in the leads so the movement of the tone arm is not restricted.
Tone arm does not lower onto record.	1. Stylus pressure too light. 2. Tone arm pivot tight. 3. Lack of lubrication.	1. Adjust stylus pressure to that recommended by the manufacturer. 2. Clean tone arm pivot and lubricate. 3. Put one drop of thin oil on pickup lifting rod and move it up and down. Put a little thick grease on pickup cam ass'y. (56).
Tone arm begins to lower then swings inward.	1. Lack of lubrication. 2. Excessive play in pickup arm vertical pivot.	1. Grease the face of pickup cam assembly (56) and oil the roller riveted to it. 2. Loosen the screw in the U-shaped lever under the pivot and move it upward and retighten the screw. Make sure the tone arm moves freely after making any adjustments.

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	B. 56406	Overarm Assembly
2	A. 56710	Record Cam
3	A. 56417	Selector Arm Assembly
4	A. 40777	Presspahn Washer
5	A. 40859	Tab Washer
6	A. 41869	Spring
7		Serrated Screw
8	B. 57250	Pickup Arm Assembly
9		Lock Spring for Height Adjusting Screw
10		Washer
11		Height Adjusting Screw
12	A. 56357	Pivot Bracket
13		Set Down Adjusting Screw
14		Tension Spring
15	A. 54734	Pivot Spindle
16	C. 56451	Pickup Base Cover (Rear)
17	C. 56450	Pickup Base Cover (Front)
18	A. 56965	Latch
19	A. 56317	Control Cover Front
20	C. 56303	Baseplate
21	B. 56393	Knob
22	A. 56804	Pickup Head MPM5 (Closed Front)
	A. 56802	Pickup Head MPM5 (Open Front)
23	C. 54848/ B	Turntable Mat
24	B. 53394	Turntable Unit
25	B. 54638	Record Spindle Unit
26	A. 41723	Spring Clip
27	A. 56616	Operating Lever Unit
28	A. 56373	Friction Plate
29	A. 41723	Spring Clip
30	A. 40773	Washer
31*	B. 53883*	*Idler Wheel Unit
32	A. 56318	Speed Cover Unit
33	A. 41792	Idler Wheel Tension Spring
34	A. 56368	Tension Lever
35	B. 56316	Knob
36	B. 56350	Switch Lever Ass'y.
37	B. 51322	Switch Block
38	A. 45064	Brake Pad
39	A. 56374	Stop Lever Ass'y.
40	A. 56331	Return Lever
41		Start Lever
42		Spring Clip
43	A. 56322	Control Lever Unit
44		Washer
45		Spring Clip
46	A. 40537	Washer
47	A. 41723	Spring Clip
48	B. 56439	Latch Release Lever
49	A. 41506	Inter Selector Lever Spring
50	A. 41853	Pickup Arm Counterbalance Spring
51	A. 56642	Anchor Bracket
52	A. 41833	Friction Spring
53	A. 41796	Return Spring
54		Lock Washer
55		Hex Nut
56	A. 56584	Pickup Cam Ass'y.

Ref. No.	Part No.	Description
57	A. 56513	Cam Link Unit
58	A. 54662	Stop Link
59	A. 40537	Washer
60	A. 41723	Spring Clip
61		Manual Control Lever
62		Spring Clip
63	B. 56350	Switch Lever Ass'y.
64	A. 41631	Control Link Spring
65	A. 41630	Start and Return Lever Spring
66	A. 44076	Control Lever Unit Screw
67	A. 40695	Shim Washer
68	A. 41723	Spring Clip
69	A. 41503	Stop Cam Lever Spring
70	A. 56380	Switch Link
71	A. 56329	Control Link
72	A. 40695	Shim Washer
73	A. 41723	Spring Clip
74	A. 56627	Stop Catch Lever Unit
75	A. 56359	Fixing Plate
76	A. 43800	Stop Catch Lever Spring Clip
77	A. 41845	Spring
78	A. 56376	Inter Lever Unit
79	B. 56332	Catch Lever
80	A. 40836	Separating Washer
81	B. 56625	Stop Cam Lever
82	A. 40864	Washer
83	A. 43800	Spring Clip
84	B. 56388	Cam Gear Ass'y.
85	A. 56334	Cam Lever Unit
86	A. 41848	Selector Spring
87		Shim Washer
88	A. 56401	Selector Link
89	A. 43800	Spring Clip
90	A. 40795	Shim Washer
91	A. 56425	Cam Selector Lever Unit
92	A. 40759	Washer
93	A. 43800	Spring Clip
94	A. 41759	Stop Lever Ass'y. Spring
95	A. 40789	Thrust Washer
96	A. 51224	Ball Race Cage
97	A. 43201	Ball Bearings (5)
98	A. 40804	Thrust Washer
99	A. 40155	Lower Set Screw
	A. 40488	Upper Set Screw (Not Shown)
100	C. 56362	Bridge Sub Ass'y.
101	A. 54656	Release Lever Ass'y.
102	A. 41852	Cam Lever Spring
103	A. 56315	Speed Lever
104	A. 43123	Motor Mount
105	A. 56312	Inter Speed Lever Unit
106	B. 56309	Speed Cam Lever Unit
107	A. 40695	Washer
108	A. 56306	Index Lever Unit
109	A. 41630	Index Lever Spring
110	A. 40695	Washer
111	A. 41723	Circlip
112	A. 41841	Lifting Spring

MECHANICAL PARTS LIST (CON'T.)

Ref. No.	Part No.	Description
113	A. 40867	Lifting Spring Washer
114	A. 41723	Spring Clip
115	A. 56453	Support Lever Ass'y.
116	A. 43813	Spring Clip
117	A. 55644	60 Cycle Pulley
	A. 55643	50 Cycle Pulley
118	A. 44052	Pulley Set Screws
119	B. 56445	Motor Plate
120	B. 56440	Dual Range Motor
121	A. 56342	K. O. Lever Unit

* Idler Wheel Unit Walsco
Part No. 1479