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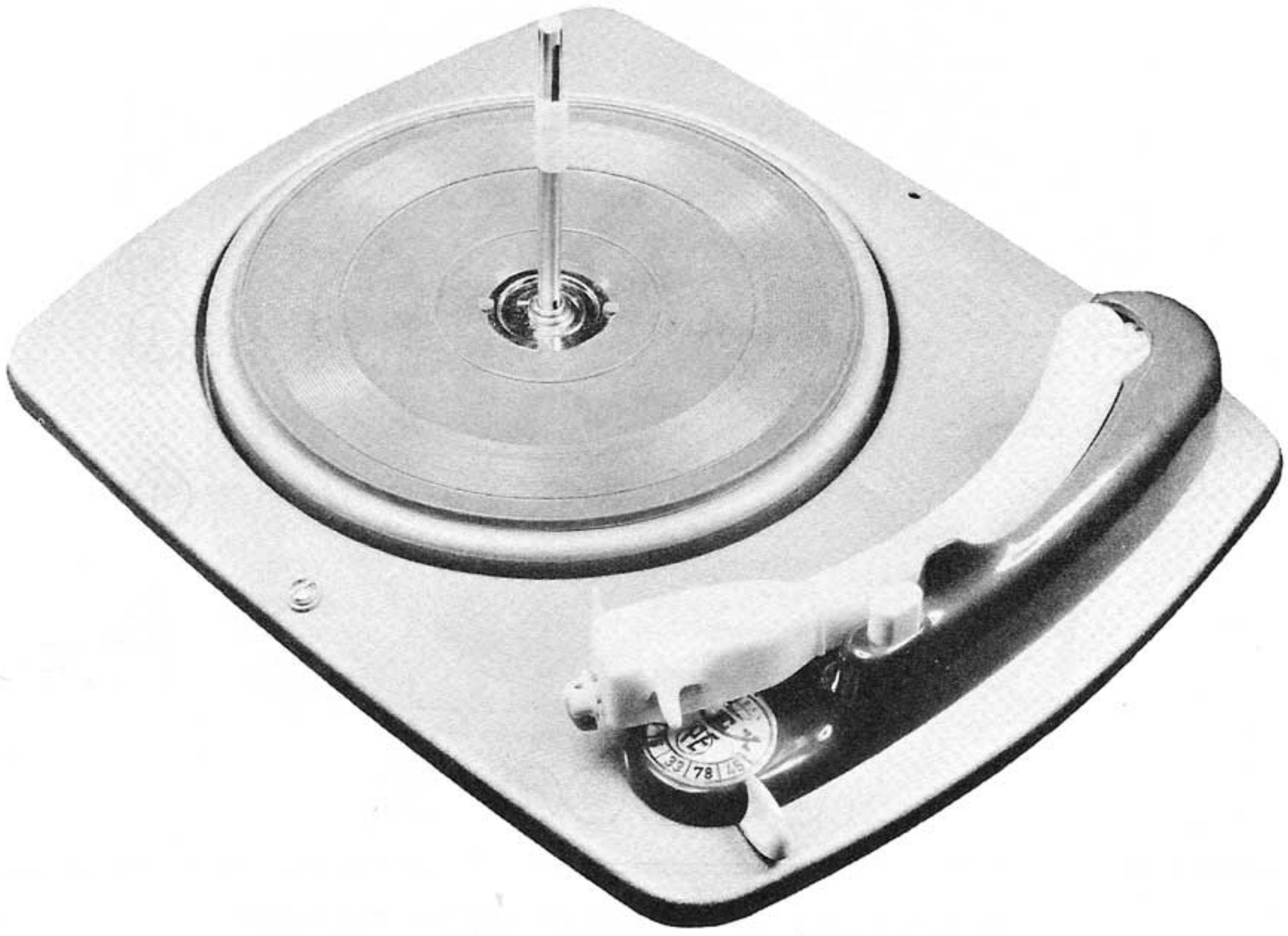
*TRADE MARK

PERPETUUM-EBNER
MODEL Rex Deluxe



PERPETUUM-EBNER
MODEL Rex Deluxe

GENERAL INFORMATION

The Perpetuum-Ebner Rex Deluxe record changer plays a stack of records in automatic sequence and shuts off after the last record has been played.

The tripping method is the velocity type. The recoil lever contacts the ejection cam, which rotates with the turntable to start the mechanism into cycle.

The mercury-type motor switch shuts off the changer after the last record of the stack has been played.

This record changer must be connected to an AC supply only.

Manufactured by:

Perpetuum-Ebner
St. Georgen Schwarzwald
Western Germany

Supplied by:

Majestic International Sales Corporation
743 West La Salle Street
Chicago 10, Illinois

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS, INDIANA

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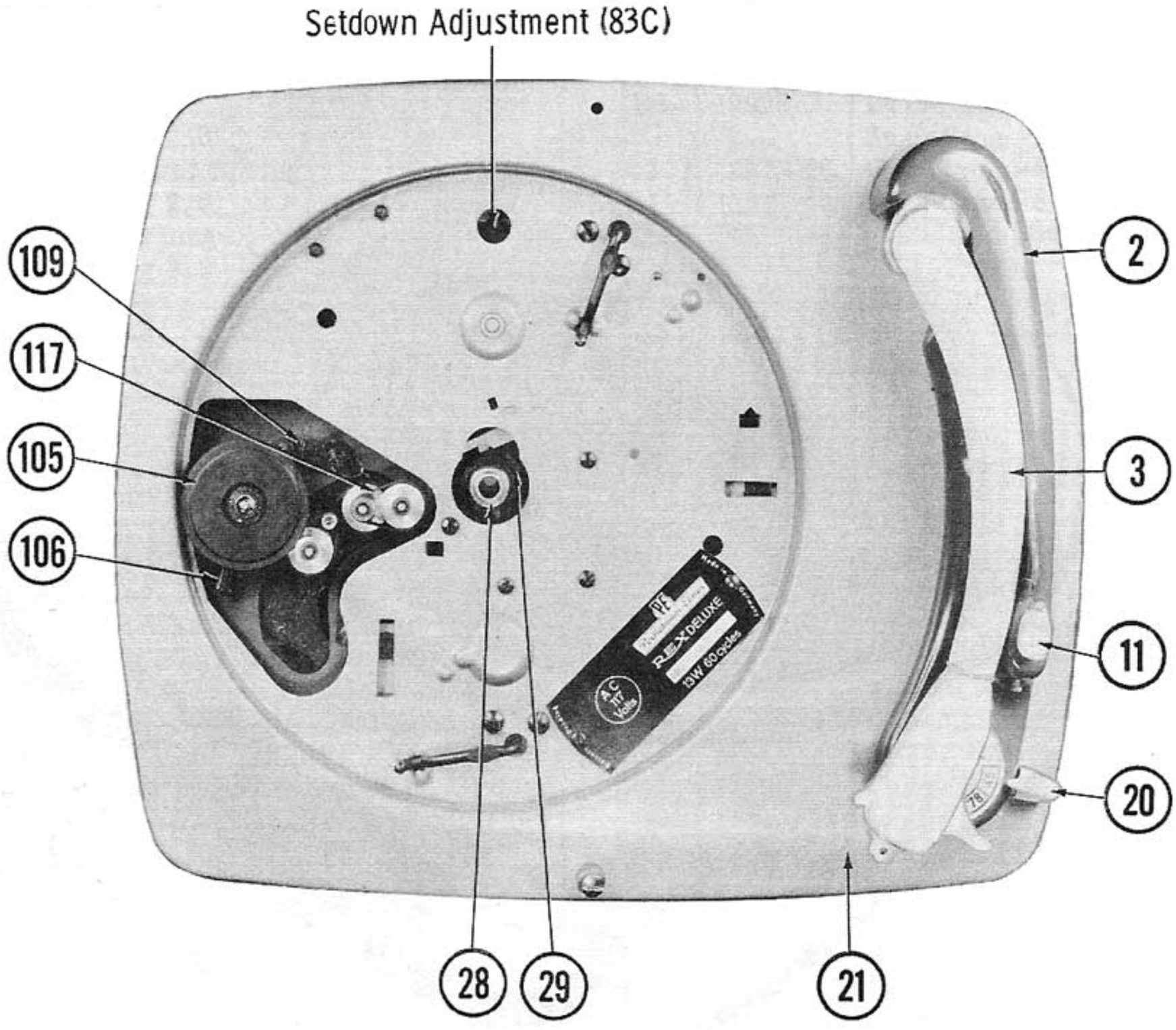


FIG 1. TOP VIEW OF CHANGER WITH TURNTABLE REMOVED

FUNCTIONS OF THE CONTROLS

Starting Key

Depressing this key starts the changer into automatic operation. Also, a record may be rejected at any time by pressing this key.

Speed Control Lever

Speed control lever (20) determines the turntable speed, 16 2/3, 33 1/3, 45 or 78 rpm.

OPERATING INSTRUCTIONS

Loading

Place records on spindle and lower to spindle shelf.

Starting

To start the changer (after checking that the stylus and speed control lever are in the proper position for the records to be played), depress starting key (11) and release. The changer operates automatically until the last record has been played. At this time, the tone arm is returned to its rest and the supply to the motor is switched off.

Rejecting

To reject a record at any time while the changer is operating, depress starting key (11) and release.

DESCRIPTION OF MAJOR FUNCTIONS

Starting Mechanism Functions

When starting key (11) is depressed, safety catch (16) is pushed back, freeing tone arm (3). Simultaneously, starting bar (37) moves into groove of starting rod (13), and switch latch (17) is brought forward to ready position. This puts tension on friction wheel spring (106) through action of switch bar (41) moving backward, pressing spring tensed friction wheel (105) against drive shaft of motor and inner edge of turntable.

Mercury-type motor switch is actuated by switch bar (41), setting turntable (26) into motion. When starting bar (37) hits back of switch latch (17), the changeover process is begun. Switch bar (41) pushes back recoil lever (80), pushing leaf spring against ratchet (83A). This releases the stop for the toothed segment allowing it to fall into the gap between the teeth. By this action, tooth gear (83) is engaged with the turntable driver pinion (28).

Function of Motor and Wheel Driver

The motor and the shafts for the four speeds are so fastened to mounting plate (110) that the motor can swing freely. To drive turntable, friction wheel (105) engages the step of the proper shaft. Individual shafts

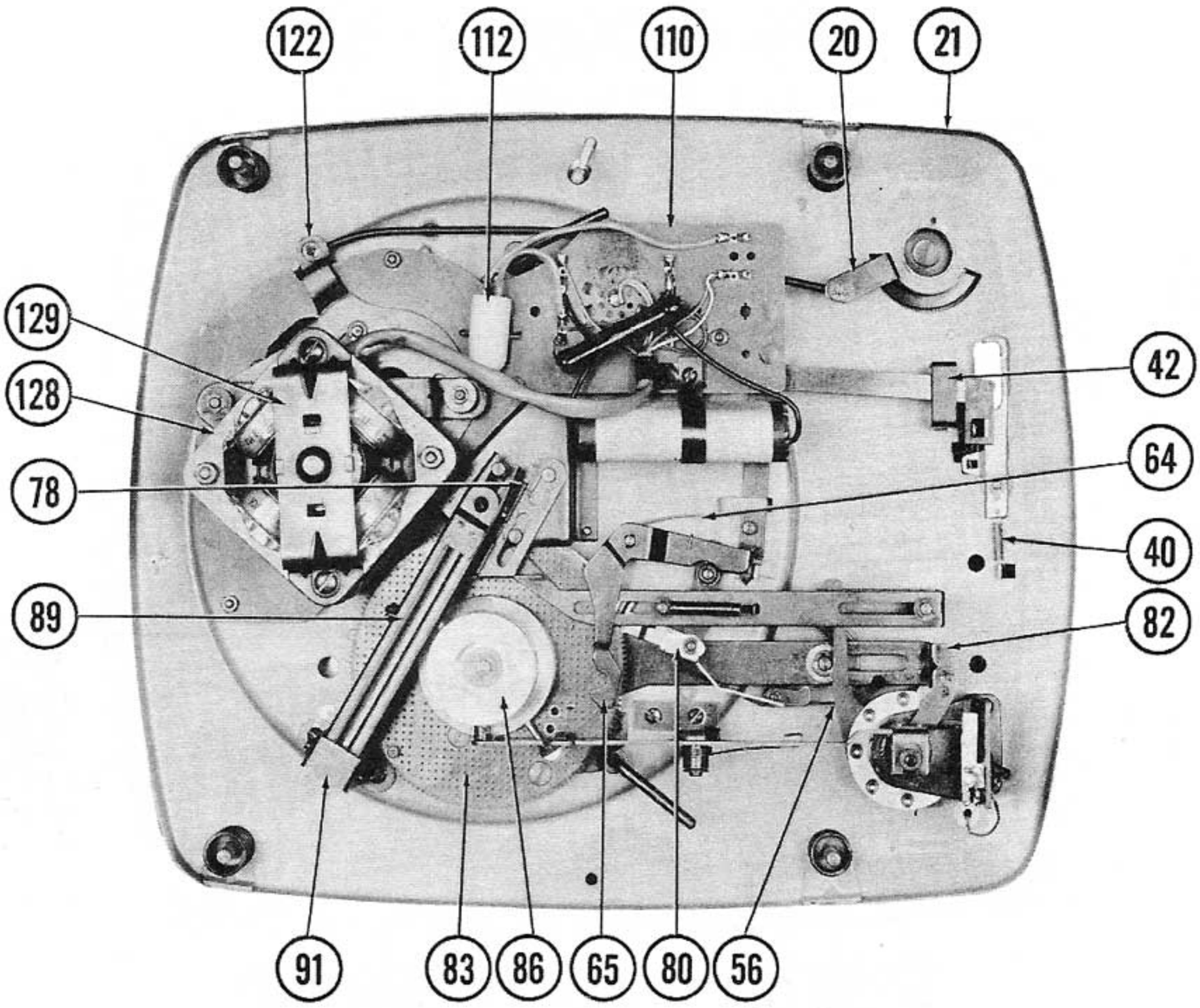


FIG 2. BOTTOM VIEW OF CHANGER

are driven from the motor shaft by means of drive belts (117).

To change speeds, starting lever (122) is actuated by speed changing lever (20) through a connecting bar (34). To reduce friction in the horizontal movement of friction wheel (105), it is mounted on a ball bearing. When changer is at rest, friction wheel (105) does not contact motor shaft.

Tone Arm Vertical Functions

The rising and falling of tone arm is controlled by rocking lever (51). The original setting of the bolt on rocking lever (51) must be at the deepest point of cam mount (86). As soon as tooth gear (83) is no longer in neutral, rocking lever (51) lifts tone arm by means of lifting spindle (52). At the same time, coupling flange (43) is pressed onto deflection lever (56) by way of the coupling plate, and tone arm friction comes into effect. The friction coupling for the tone arm is brought about by tone arm striking the record, also obtaining the record diameter. The friction coupling is under friction until the tone arm touches the first record on turntable.

When rocking lever (51) is again in its deepest point of cam mount (86) at the end of the cycle, coupling disk (43) disengages from deflection lever (56) by its weight. The muting switch for the tone arm is actuated by the free end of rocking lever. In the out-of-cycle position, the muting switch contacts are open. Turning tooth gear (83) approximately four teeth closes the contacts. The tone arm height is adjustable by the lifting spindle (52), which is secured by a nut.

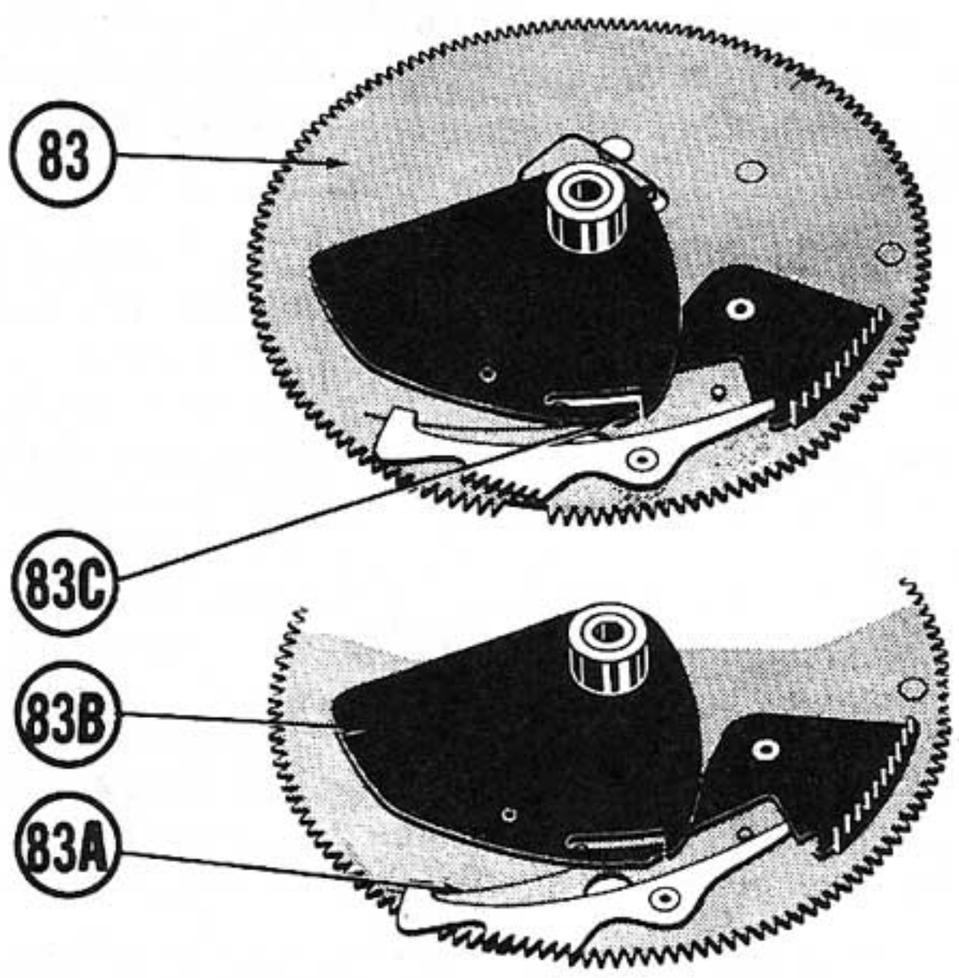


FIG 3. TOP VIEW OF TOOTH GEAR

Tone Arm Horizontal Functions

Movement of the tone arm is brought about by conveyor lever (82) and cam on tooth gear (83). Conveyor lever (82), under friction and coupled with arresting stirrup (43), presses tone arm with its feeler against edge of record as it swings in toward spindle.

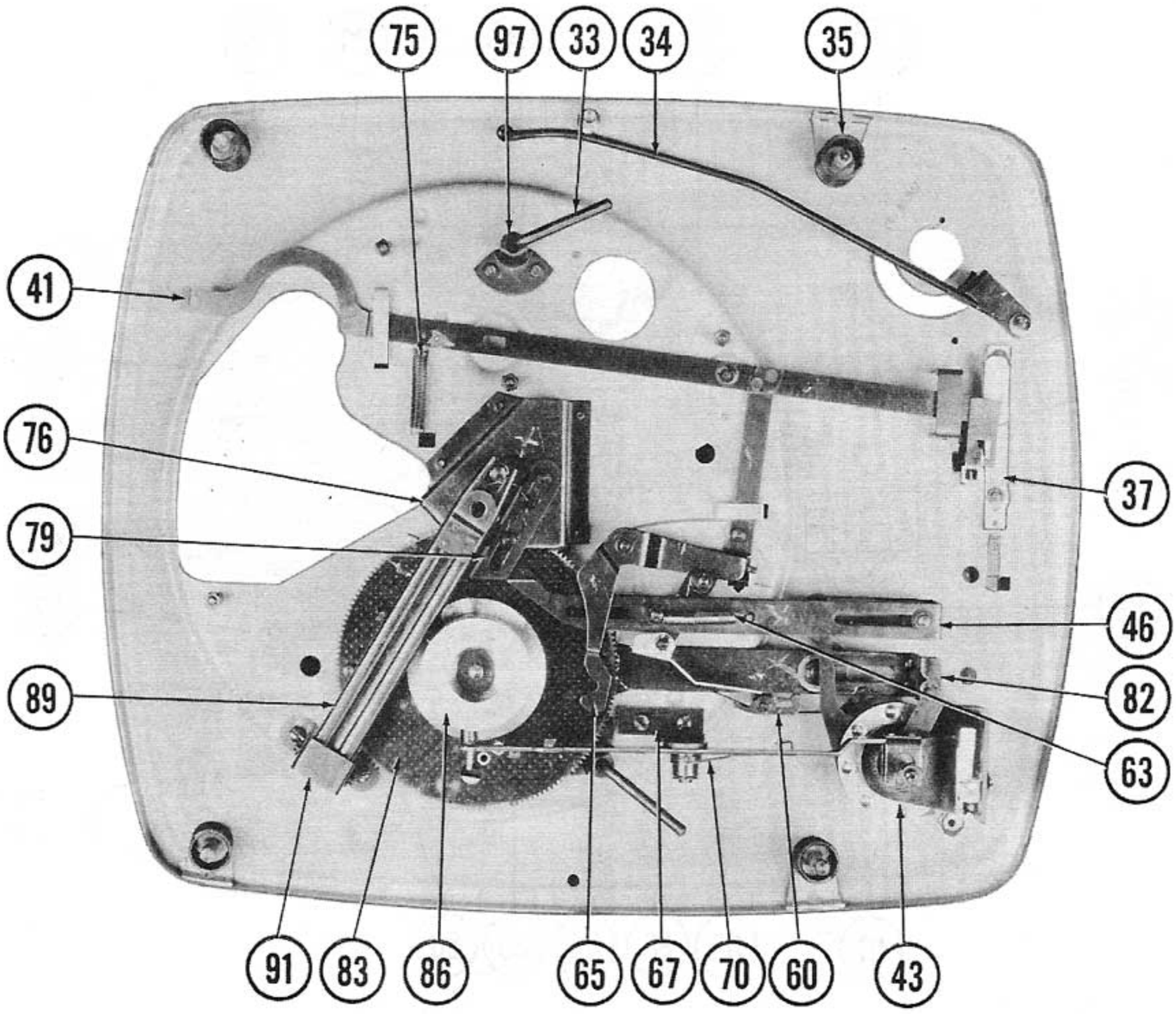


FIG. 4 BOTTOM VIEW OF CHANGER WITH MOTOR REMOVED

The friction coupling is adjusted to the size of the record. After gauging the diameter of the record, the tone arm swings about 1/64" away, permitting the record to fall freely. Meanwhile, return spring (83A), riveted to tooth gear (83), momentarily pushes back conveyor lever (82).

After record has fallen, tone arm swings toward the inside by means of conveyor lever (82), moving cam (83B) so the needle is poised directly over the starting groove. In this position, the tone arm is lowered onto the record. Cam (83B) has an adjustment plate with which the point of the engagement can be changed (see Fig. 3).

CHANGE CYCLE

The change cycle operation should be observed by manually rotating the turntable. The following action can then be followed and the function of each part more easily understood.

This changer is provided with a velocity trip mechanism. The change cycle is started by the faster motion of the tone arm when the needle enters the trip grooves at the end of the record. Only records with fast-finishing grooves will operate this trip.

While the record is playing, the tone arm moves slowly to the center of the turntable. By this movement, deflection lever (56) is also swung inward, taking along with it recoil lever (80), which is under friction..

When the tone arm has played the record over a radius of 2 3/8", the point of the recoil lever comes into the reach of deflection cam (29). As long as the progress of the tone arm in the playing groove continues, recoil lever (80) is kept pushed back by deflection cam (29). As soon as the tone arm runs into the finishing groove, the advance of the tone arm and with it the recoil lever, is greater with every revolution. Recoil lever (80) is pushed back by deflection cam (29).

Through this movement, the leaf spring on recoil lever (80) pushes back the spring catch so that toothed segments fall into gap of tooth gear (83) and contact turntable driver pinion (28). As tooth gear (83) rotates, changer cycle begins.

Spring on recoil lever (80) latches again, pushing bearing lever and recoil lever toward the front; spring (59) of rebound lever latch (60) brings bearing lever, and with it the recoil lever, back to its original position. The tooth segment is pushed back from turntable driver pinion (28) by the rotation of tooth gear (83) through the protruding end of lever connected with the segment. By this action, the gap in tooth gear (83) is left open and tooth segment is held by the ratchet.

The records drop when ejector bar in spindle shaft is moved down. The ejection bar is coupled with release lever (89), which operates from cam mount (86) and gives an up and down motion to release lever (89), causing ejector to move up and down in the spindle.

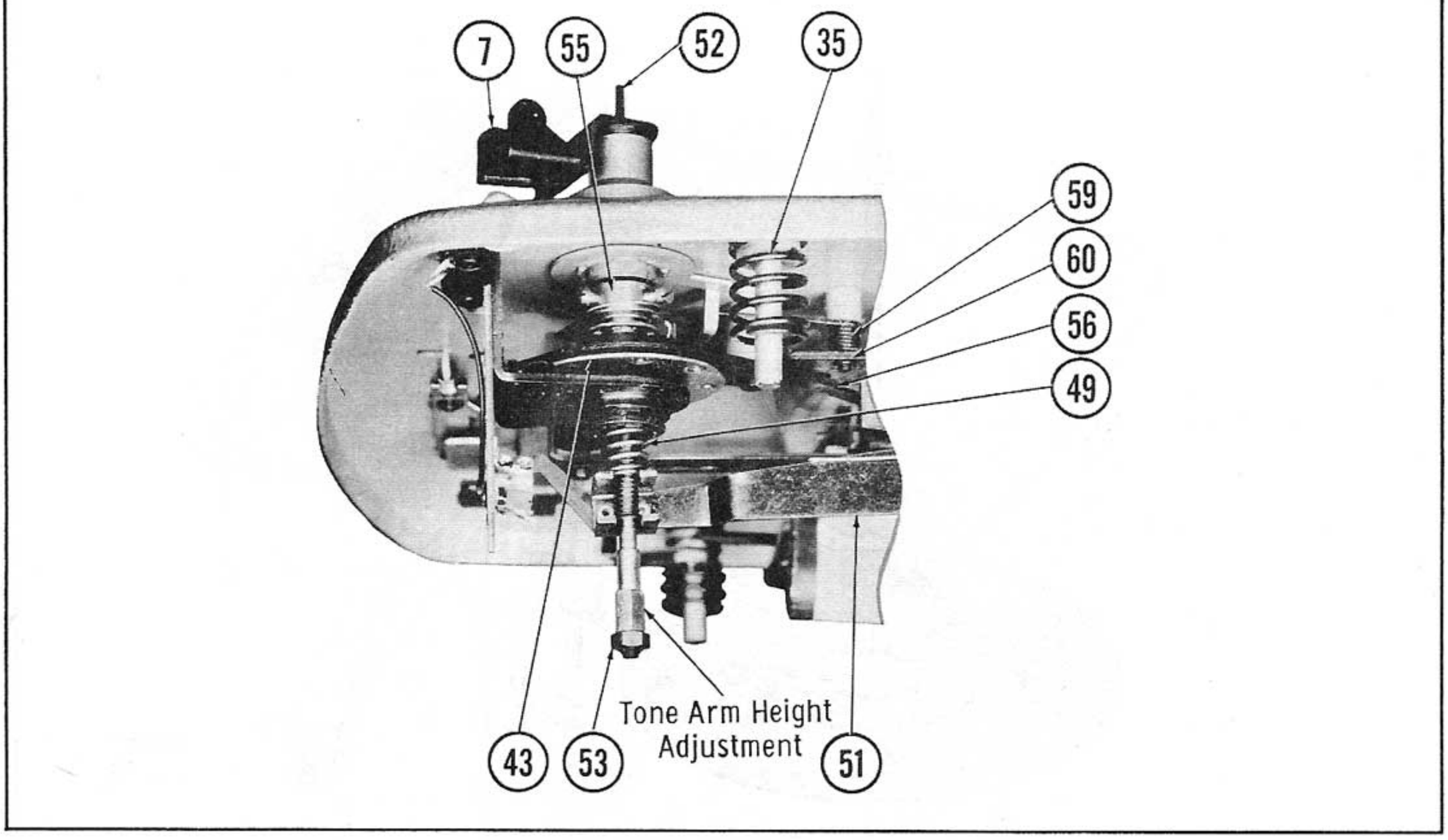


FIG. 5 TONE ARM OPERATING MECHANISM

AUTOMATIC SHUTOFF

After the last record has been played, the change cycle mechanism is disengaged. The tone arm swings out and then inward again. Since it finds no records in place to gauge, the friction coupling is not activated, and the tone arm swings in a greater distance than the diameter of the smallest record would allow. At the same time, return latch (55A) on return switch (55) rises along slant of the segment. Also, return lever (46) is swung out by means of the bolts on tooth gear (83), engaging return latch (55A), pushing it back until the tone arm hits starting key (11). Return lever (46) falls back into its starting position; the tone arm drops and is latched.

The crossbar (part of tone arm), through its own weight, pushes down switch latch (17). Switch bar (41) is released by starting bar (37). As a result, switch bar (41) returns to its original position and presses starting rod (13). The motor switch is opened and the friction wheel spring is tensed. The projection of starting key (11) now releases safety catch (16), which falls forward and stops the tone arm.

REMOVING EJECTION BAR

Ejection bar (76A) is locked into hollow shaft of turntable mount (76) and can be inserted or removed only with tooth gear (83) in its out-of-cycle position. Shortly before the out-of-cycle position, arresting bar (79), under the bridge of turntable mount (76) is pushed back far enough by the pin on cam mount (86) to release the bolt on the locking device. Bolt can now be removed from turntable mount (76).

ADJUSTMENTS

Tone Arm Height Adjustment

Press starting key (11) and rotate turntable until tone arm begins to swing inward. In this position, the distance between the upper edge of the feeler horn (part of tone arm) and the plate must be 2 3/4". Adjust tone arm by loosening hex nut (53) and turning adjustment screw of lifting spindle (52).

Tone Arm Friction Adjustment

The required tone arm friction, measured at the feeler horn, must be 25-30 grams. Regulate friction by adjusting deflection lever (56) on vertical shaft of support (7) with the two set screws provided for this adjustment.

Tone Arm Setdown Adjustment

Remove turntable. Turn tooth gear (83) by means of turntable driver pinion (28) until setdown adjustment (83C) appears through hole at rear of chassis plate. Setdown adjustment (83C) can be bent in or out with a screwdriver. If setdown adjustment (83C) is bent in, contact point of needle shifts to inside; if bent out, contact point of needle shifts to outside.

Tone Arm Pressure Adjustment

Tone arm pressure adjustment can be reached by removing tone arm casing (2). To adjust, turn screw counterclockwise to decrease tone arm pressure, clockwise to increase tone arm pressure.

Reject Adjustment

When tone arm has moved across record to a radius of about 2 3/8", the reject process begins. To

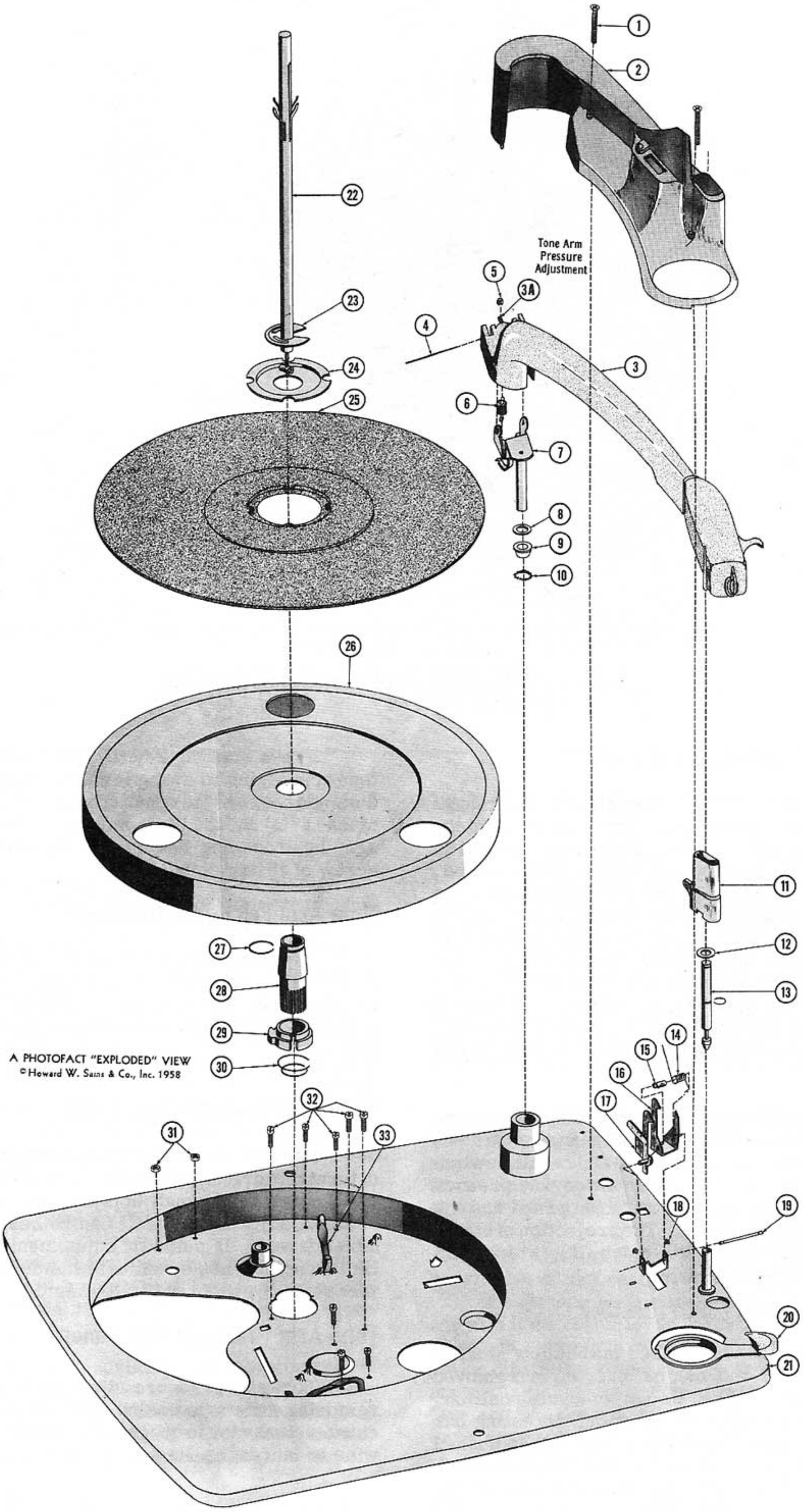
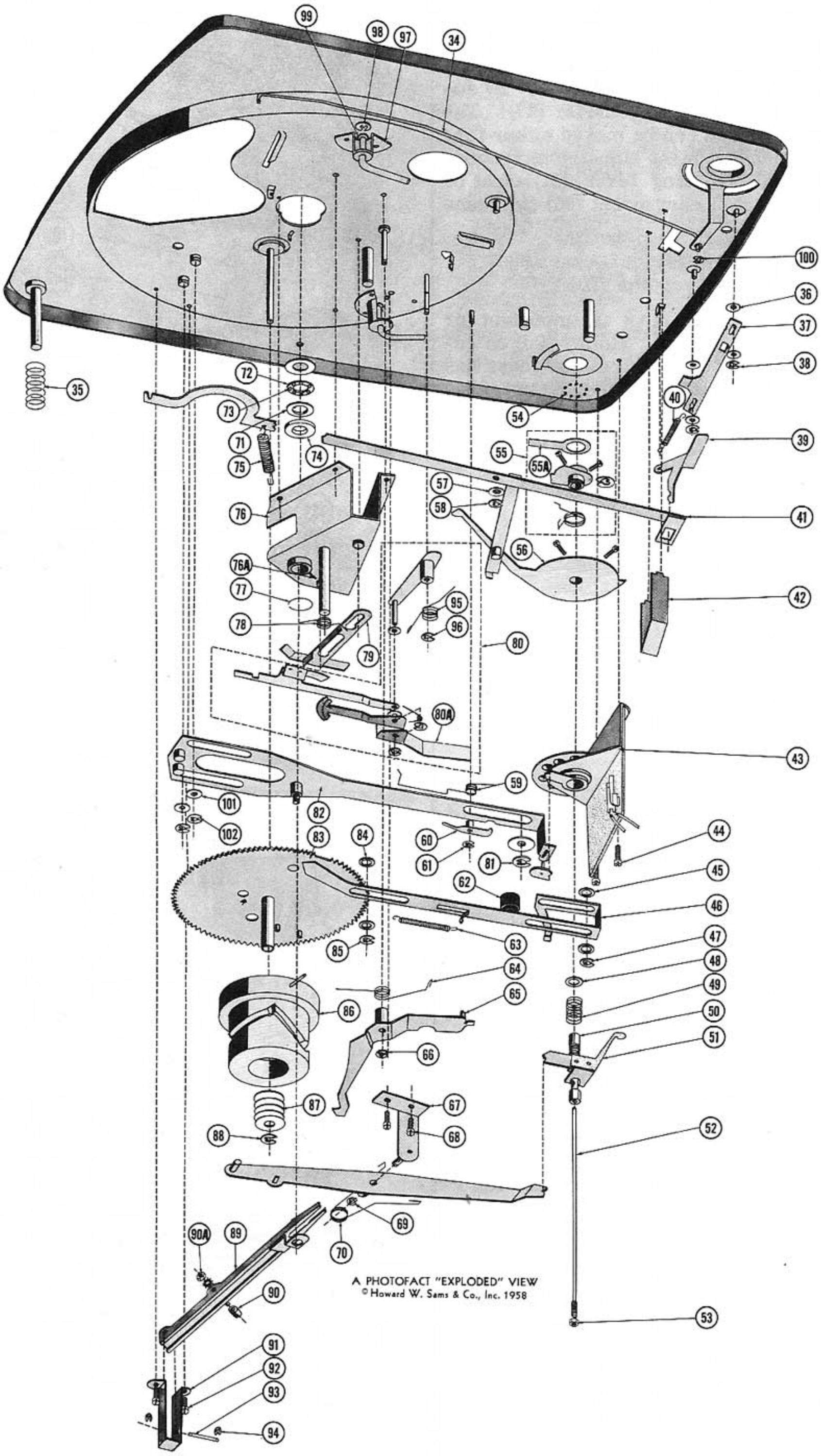


FIG. 6A EXPLODED VIEW OF PARTS ABOVE BASEPLATE



A PHOTOFACT "EXPLODED" VIEW
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FIG. 6B EXPLODED VIEW OF PARTS BELOW BASEPLATE

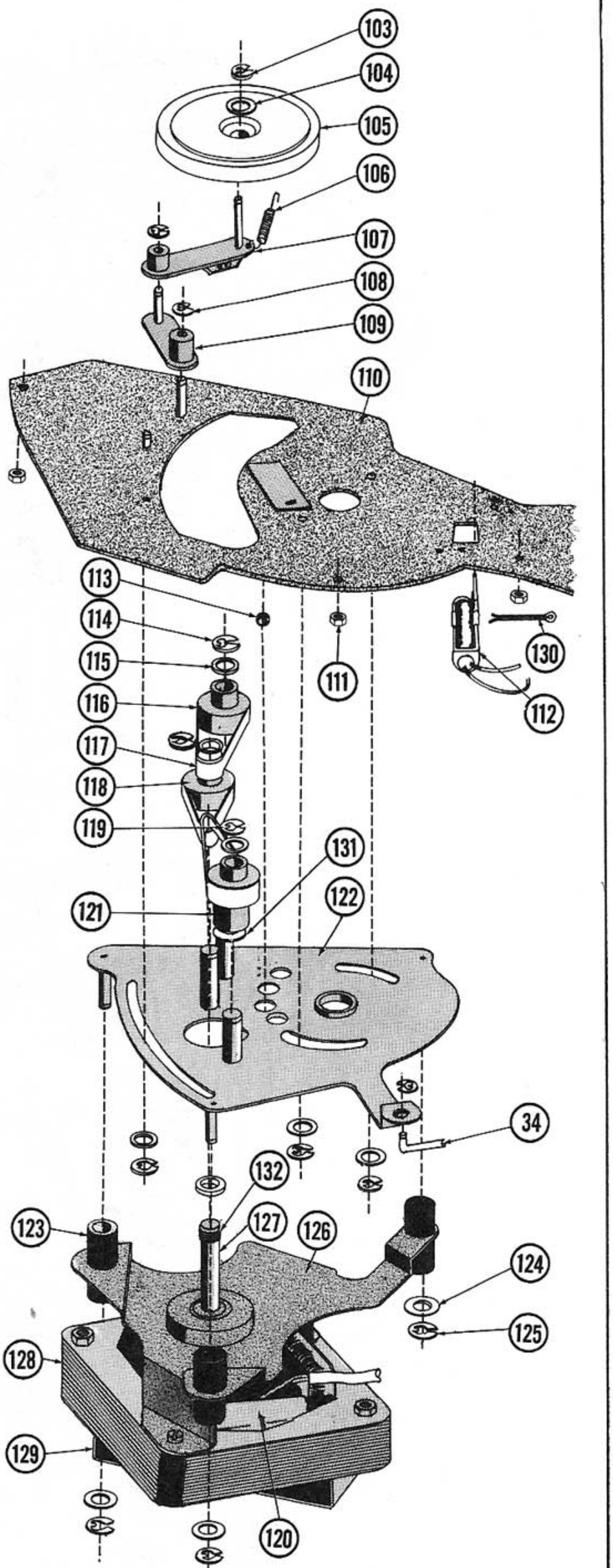
vary start of reject, bend bearing lever (80A) of recoil lever (80) forward or backward.

Controlling Cam Adjustment

In the out-of-cycle position of cam mount (86), tooth gap in tooth gear (83) must be distributed symmetrically against turntable drive pinion (28) by adjusting rocking lever (51) with its carrier (67). The carrier has slotted holes and can be moved either forward or backward, depending on the adjustment needed. Furthermore, note that rocking lever (51) must be pressed into deepest point of cam mount (86) by means of spring (70).

Record Dropping Adjustment

Release lever (89) adjustment is important for proper functioning of the spindle. Roller (90) on release lever (89) must be adjusted so release lever has a play of about 1/64". Adjust by loosening nut (90A) and turning roller.



A PHOTOFACT "EXPLODED" VIEW

FIG. 6C MOTOR & MOUNTING ASSEMBLY

TROUBLE CHART

Symptom	Cause	Remedy
Turntable does not rotate when starting key (11) is pressed.	1. No current to motor.	1. (a) Check to see if current is reaching AC leads of changer. (b) Check to see if mercury switch (112) is functioning correctly. (c) Check all wiring and the solder terminals to and from mounting plate (110).
	2. Motor defective.	2. Remove turntable and allow motor to operate without load. If motor spindle is not rotating but AC current reaching the motor, motor is faulty and should be replaced.
	3. Friction wheel (105) not engaging turntable rim.	3. (a) Check friction wheel, must be free to pivot. (b) Check friction wheel spring (106), must be correctly positioned. (c) Carefully clean inside rim of turntable and rubber tire on friction wheel (105) to insure that they are free from oil and other foreign matter.
Noise while record is playing.	1. Faulty suspension of motor on rubber mountings (123), producing low-pitched rumble from loudspeaker.	1. Check motor rubber mounts (123); be sure motor is freely suspended on them. The motor lead wires should have slack to allow the motor to float freely.
	2. Defective turntable bearing or bearings.	2. Check for foreign matter in bearings (72); defective balls; binding between balls, ball race, and washers. Grease ball race and washers.
	3. Defective friction wheel.	3. A rapid thumping sound while the motor is running may indicate a flat spot on the friction wheel (105). Remove turntable and check rubber tire on friction wheel. If surface of rubber tire is not smooth, replace. If bearing of friction wheel shows signs of wear, replace friction wheel (105).
Distortion of recorded sound.	1. Defective record.	1. Worn or defective records cause needle scratch and distortion of recorded sound. If record is warped, it may slip on the other records, causing wow. An enlarged hole in the record can also cause wow.
	2. Defective amplifier.	2. Check both amplifier and speaker.
	3. Bad cartridge.	3. Replace.
	4. Dust on needle.	4. Wipe off dust with finger.
Turntable speed too slow.	1. Binding in turntable steel ball (73).	1. Check turntable steel ball (73); if it does not turn freely when disengaged from friction wheel (105), remove turntable, clean off foreign matter, and lubricate with light mineral oil.
	2. Friction wheel (105) slips.	2. Remove turntable and clean rim of friction wheel (105). Be sure to remove any trace of oil from friction wheel or inside of turntable.
	3. Voltage too low.	3. Voltage should be no less than 100 volts.
	4. Operating temperature too low.	4. If changer has been standing in a cold area or has been operated in surroundings of less than 45°F., turntable speed at the start may be too slow.

TROUBLE CHART CON'T

Symptom	Cause	Remedy
Record does not drop when changer cycles.	1. Release lever (89) improperly adjusted.	1. Adjust. (See "Record Dropping Adjustment").
	2. Roller (90) damaged.	2. Replace.
	3. Release spindle (22) defective.	3. Replace.
Needle does not track across record.	1. Needle may be clogged with dust, or it may be worn.	1. (a) Clean foreign matter from needle. (b) Replace needle if tip is broken or bent.
	2. Tone arm lead too tight.	2. Give tone arm lead enough slack to move across record.
	3. Changer not level.	3. Level changer.
	4. Binding or friction in support (7).	4. Be sure all moving parts and bearing surfaces in this assembly are free and lightly oiled.
	5. Insufficient needle pressure.	5. Check and adjust.
	6. Worn records, or records with damaged groove.	6. Replace record.
Tone arm does not locate correctly on records.	1. Tone arm not adjusted properly.	1. See "Tone Arm Setdown."
	2. Bent needle.	2. Replace.
Tone arm remains on last groove of record.	1. No fast finishing or run-out groove on record.	1. Check record for eccentric run-out groove in center of record, which some older records and home recordings do not have.
	2. Needle jumps out of groove in record.	2. (a) Check to see that needle pressure is correct. (b) Make sure record is not defective; the run-out groove may be too shallow. (c) Needle point may be damaged or have excessive accumulation of dust. Replace or clean. (d) There may be binding in support (7). Be sure all moving parts are free and lightly oiled.
Tone arm does not move in when set down on record.	1. No run-in groove on record.	1. Check to see if record is standard type with a run-in groove from outside edge of record recorded section. Some older records and home recordings do not have this run-in groove.
Four-speed control does not select 16, 33, 45, or 78 rpm when moved to that speed.	1. Connecting bar (34) loose.	1. Replace.
No sound.	1. Defective cartridge.	1. Replace.
	2. Defective wiring.	2. Check tone arm lead for short or open.
	3. Defective amplifier or speaker.	3. Check amplifier and speaker.
	4. Loose cartridge socket tip.	4. Remove, tighten slightly, and replace.

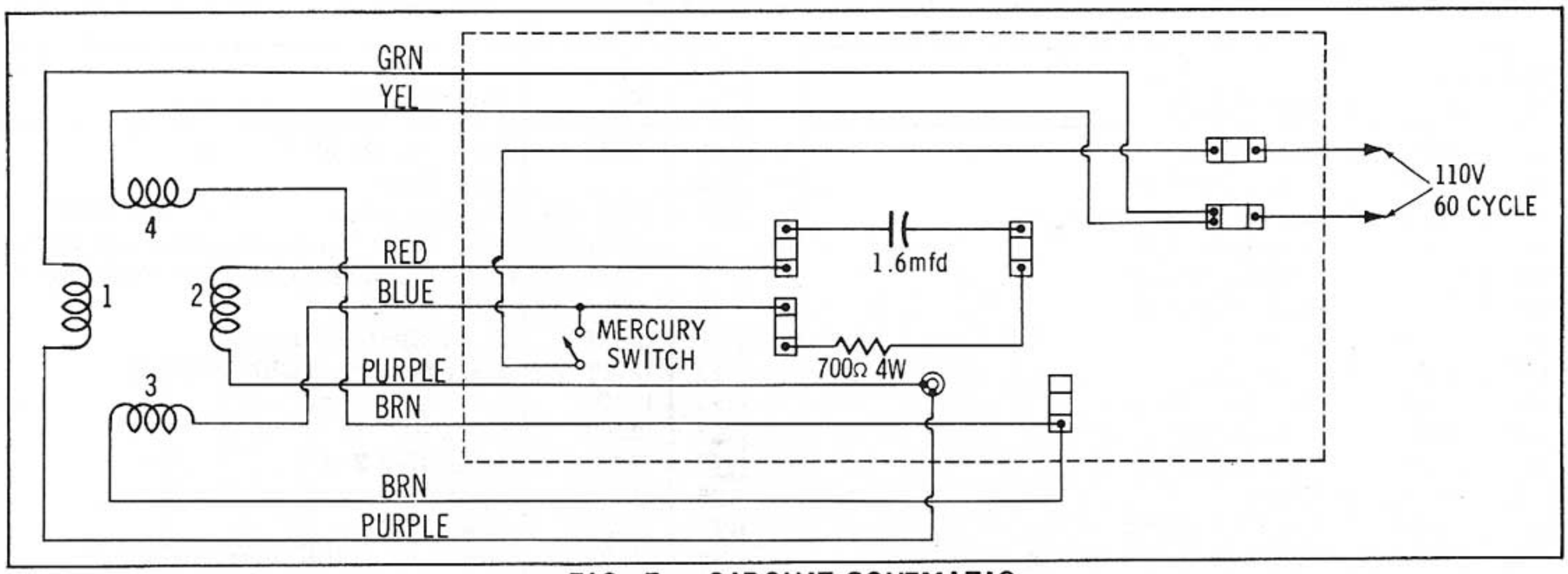


FIG. 7 CIRCUIT SCHEMATIC

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	13099	Fillister Head Screws M 3 x 4
2	13096	Tone Arm Casing
3	13074	Tone Arm
4	13093	Bearing Bolt
5		"C" Washer
6		Tone Arm Spring
7	13052	(Suspended) Support
8	13055	Shim (Compensating Washer)
9	13036	Upper Cone
10	13057	Steel Ball 2mm Dia.
11	13095	Starting Key
12	12713	Rubber Washer
13	12710	Starting Rod
14	12700	Spring
15		Sleeve
16	12699	Safety Catch
17	12687	Switch Latch
18	12701	Snap Ring 1. 9
19	12702	Bearing Bolt for Latches
20	12528	Speed Changing Lever
21	12502	Chassis Plate
22	13200	Release Spindle 7mm Dia.
	13250	38mm or 45rpm Spindle "Rex Deluxe"
23	13165	Snap Ring 12
24	13164	Covering Washer
25	13163	Turntable Cover
26	13152	Turntable
27	12748	Wire Ring
28	12739	Turntable Driver Pinion
29	12742	Deflection Cam (Drift Cam)
30	12747	Wire Ring
31	12759	Hexagonal Nut
32	12540	Fillister Head Screw M 3 x 4
33	12536	Safety Lever
34	13010	Connecting Bar
35	12525	Suspension Spring
36	12705	Starting Rod Washer
37	12703	Starting Bar
38	12706	Snap Ring 2. 3
39	12694	Starting Lever
40	12704	Starting Bar Tension Spring
41	12716	Switch Bar
42	12720	Stirrup Guard
43	12571	Arresting Stirrup with Coupling
44	12592	Fillister Head Screw M 3 x 5
45	12654	Washer

Ref. No.	Part No.	Description
46	12650	Return Lever
47	12655	Snap Ring
48	12682	Sliding Disc
49	12681	Pressure Spring
50	12680	Adjusting Bushing
51	12661	Rocking Lever
52	12679	Lifting Spindle
53	12683	Hex Nut N 4
54	13057	Steel Ball 2mm Dia.
55	13061	Return Switch
56	12544	Deflection Lever
57	12722	Washer
58	12723	Snap Ring 2. 3
59	12566	Spring
60	12562	Return Latch
61	12567	Snap Ring 1. 9
62	12657	Damping Rubber
63	12656	Tension Spring
64	12657C	Spring
65	12657A	Retarding Lever
66	12657D	Snap Ring 2. 3
67	12670	Rocking Lever Carrier
68	12684	Fillister Head Screw M 3 x 4
69	12673	Snap Ring 4
70		Rocking Lever Spring
71	12736	Steel Washers
72	12737	Ball Race
73	12738	Steel Ball 2mm
74	12735	Damping Washer
75	12721	Tension Spring for Switch Bar
76	12728	Turntable Mount
77		Snap Ring
78	12741A	Arresting Bar Spring
79	12741	Arresting Bar
80	12596	Recoil Lever Complete
81	12558	Snap Ring 4
82	12552	Conveyor Lever
83	12622	Tooth Gear
84	12654	Washer
85	12655	Snap Ring 3. 2
86	12641	Cam Mount
87	12646	Washer
88	12647	Hex Nut
89	12755	Release Lever
90	12763	Release Lever Roller
91	12753	Stirrup Bearing
92	12764	Fillister Head Screw M 3 x 4

MECHANICAL PARTS LIST CON'T

Ref. No.	Part No.	Description
93	12760	Bearing Bolt
94	12761	Snap Ring 2.3
95	12614	Recoil Lever Spring
96	12615	Snap Ring 2.3
97	12537	Bearing Flange
98	12539	Snap Ring 3.2
99	12538	Washers
100	13011	Snap Ring
101	12557	Bottom Washer
102	12558	Snap Ring 4
103	13007	Snap Ring 2.3
104	13006	Washer
105	12998	Friction Wheel
106	13008	Friction Wheel Spring
107	12992	Friction Wheel Mount
108	13009	Snap Ring. 2.3
109	12986	Friction Wheel Mount Lever
110	12947	Mounting Plate with Potential Divider & Mercury Switch -110/220V
	12947/1	Mounting Plate with Condenser & Mercury Switch -220V.
	12947/2	Mounting Plate with Potential Divider & Mercury Switch -110/125/160/220V
111		Hex Nuts
112	12978	Mercury Switch
113	13014	Steel Ball 5mm
114	12937	Snap Ring 1.9
115	12936	Small Damping Washer
116	12926	Drive Shaft-16 2/3 rpm
117	12941	Drive Belts

Ref. No.	Part No.	Description
118	12929	Drive Shaft-33 1/3 rpm
119		Snap Ring
120	12810-46	One Complete Coil Unit-110/220V
	12810-46/1	One Complete Coil Unit-110 or 220V
	12810-46/2	One Complete Coil Unit-110/125/160/220V
121	12932	Drive Shaft-45 rpm
122	12918	Starting Lever without Shaft
123	12900	Rubber Mounts
124	12902	Washer
125	12903	Snap Ring 2.3
126	12888	Upper Mount
127	12850	Armature
128	12801	Motor KM7-110/220V without Mounting Plate & Shaft
	12801/1	Motor KM7-110 or 220V without Mounting Plate & Shaft
	12801/2	Motor KM7-110/125/160/220V without Mounting Plate & Shaft
129	12860	Upper Mount
130	12982	Cotter Pin
131	12935	Large Damping Washer
132	12940/10	Motor Shaft 78-60 Cycles
133	12800	Motor KM7 Complete with Shaft & Commutator
	12800/1	Motor KM7 Complete with Shaft & Capacitor -110 or 220V.
	12800/2	Motor KM7 Complete 110/125/160/220V with Shaft & Commutator
		Motor KM6 Complete