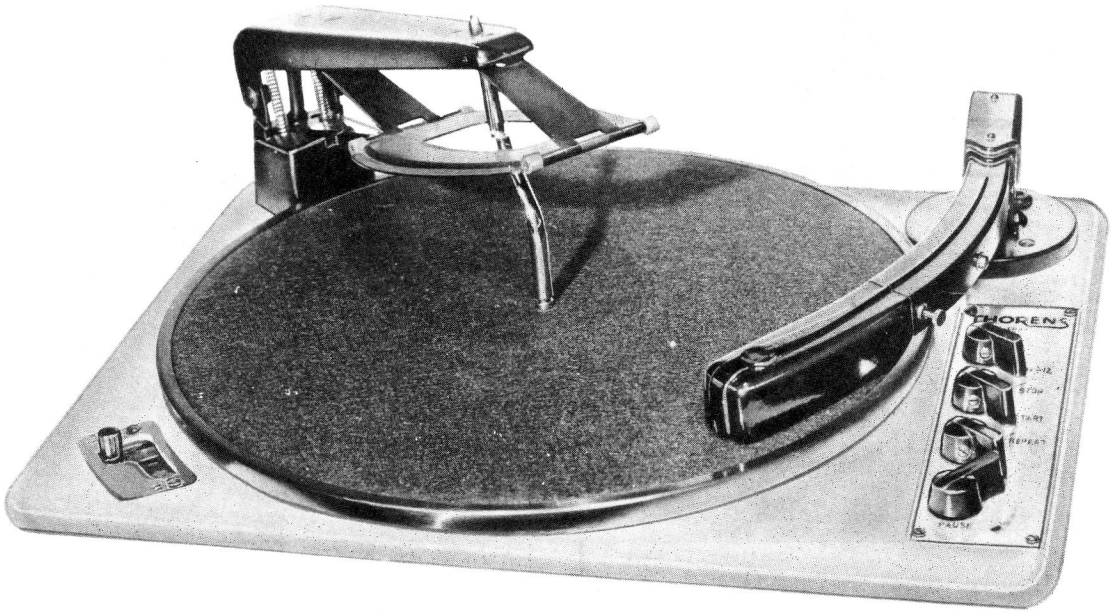

THORENS
MODEL CD43

Figure 1

GENERAL INFORMATION

The Thorens Model "Concert" CD-43 is designed to play standard 78 RPM fine-groove 45 RPM, or micro-groove 33 1/3 RPM records of standard commercial dimensions. Records up to 12" in diameter can be played.

Features of this changer include playing and automatically changing up to a 1" stack of records at any speed or about ten 10" or 12" records mixed in any order.

A full stack of twelve 7", 33 1/3 RPM records or a full stack of twelve 7", 45 RPM records (with the use of an adaptor) will also play on this changer.

The Thorens automatically shuts off after the last record has been played and the tone arm is returned to its rest position.

The motor used in this changer can be adapted to the following voltages:

100-120
125-150 Volts AC 50 to 60 cycles.
200-250

Manufactured by:
Thorens
Ste. Croix, Switzerland

Distributed in U. S. by:
Thorens Company
New Hyde Park, Long Island, N. Y.

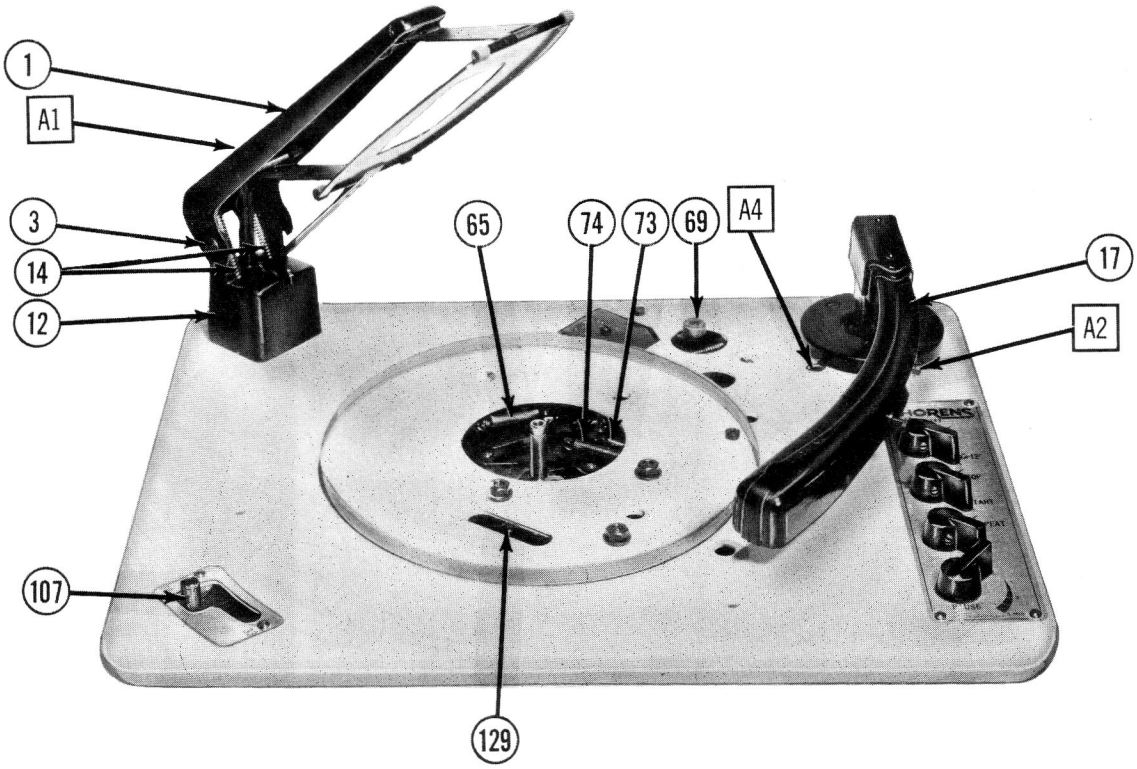

Figure 2

OPERATING INSTRUCTIONS

1. Raise the overarm (1) to its most upward position.

2. Place the spindle (6) in the center of the turntable, the sloping part leaning toward the overarm platform (12), and place the records to be played on the spindle.

3. Lower the overarm, the hole in the free end then holds the spindle in position. Make sure that the overarm is completely lowered on the spindle.

4. Place the knob of the speed selector (107) to the speed corresponding to the type records to be played and verify that the proper needle is used.

NOTE: Standard, fine-groove, and long-play records cannot be intermixed. The motor speed control knob must be reset for each type record.

5. Place the set-down position knob in the position suited to the records being played, either 7" or 10" - 12".

To Play Standard (78 RPM) Records-

1. The motor speed control knob must be in the "78" position.

2. Turn the stop control knob to start. The changer will now play the entire stack of records and on completion of the last record the tone arm will return to its rest position and the changer will automatically stop.

To Play Fine-Groove (45 RPM) Records-

1. The motor speed control knob must be in the "45" position.

2. Most 45 RPM records are manufactured with a 1 1/2" spindle hole. It is essential that an adaptor be used with all large hole records.

To Play Long-Play (33 1/3 RPM) Records-

1. The motor speed control knob must be in the "33" position.

Rejecting-

To reject a record at any time while changer is operating, turn reject-pause control knob to "Reject" and release.

To Pause Between Records-

A pause of 5 minutes maximum duration at 78 RPM can be introduced between two records by placing the reject-pause knob on the desired position. The changer will maintain the pause between records until the control knob is turned away from the "Pause" position. The change cycle may be resumed any time during the pause by turning the control knob away from the "Pause" position.

To Repeat a Record-

Any record may be repeated by turning the repeat control knob to the "Repeat" position. After the record has been repeated, the changer is automatically tripped, starting a new change cycle which drops the next record, unless the record that is repeated is the

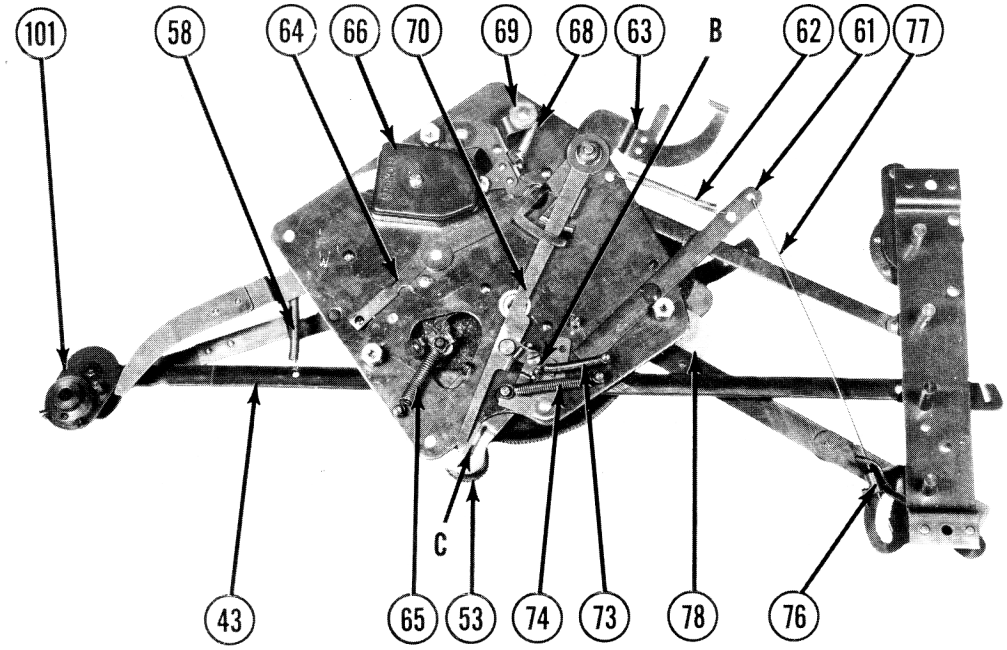

Figure 3

last record, in which case the changer will automatically shut off.

Stopping-

The changer can be stopped at any time by turning the stop-start control knob to position "Stop". It will start again if the knob is placed on position "Start", resuming playing at the place where it was interrupted.

CAUTION: The movements of the tone arm are controlled by the changer mechanism. The tone arm should therefore never on any account be forced into position by hand. The overarm should not be raised from the spindle while playing to avoid risk of damaging the records.

CHANGE CYCLE

It is recommended that the change cycle operation be observed by rotating the turntable by hand. The action described below can then be readily followed and the function of each part more easily understood.

A three-speed, governor controlled, 4-pole motor is used to drive the changer mechanism. Power is transmitted to the turntable directly by the motor shaft. The turntable speed is determined by the position of speed adjustment lever (107).

As the tone arm moves into the eccentric groove of a record, the stud (A) of the tone arm control lever (21) moves against the trip lever actuating fork (63), which in turn, carries the trip lever (70) in toward the turntable hub. Trip lever (70) is fed inwards by the friction provided by its own weight resting on the trip lever actuating fork (63). As the trip lever (70) moves inward it latches at point (B) (Fig. 3) with the clutch stop lever. The drive gear striker pad (126), turning with drive gear (128), strikes the trip lever (70) at point (C) (Fig. 3) causing the trip lever to move away from the turntable hub. Since the trip lever (70) and the clutch stop lever are latched together, the outward travel of trip lever (70) disengages the clutch lever from the clutch plate. The tension of the clutch plate spring (74) moves the clutch plate in to permit the clutch pinion gear (53) to mesh with drive gear (128) and start the change cycle.

The clutch pinion (53) now turns the pause gear (83) which, in turn, rotates anytime the changer mechanism is in any phase of the change cycle. The pause gear is coupled to the main gear (82) by means of a spring loaded stud which is rivited on top of main gear (82). Thus, the pause gear (83) drives the main gear (82) throughout the change cycle.

The main gear (82) is fastened to the shaft of the main cam (91); therefore, the main cam turns with the main drive gear.

As the cam turns, the finger of the cam lever (92) rides up the groove of the cam. This causes the lift bracket (96) to be pivoted upward, thus raising the tone arm off the record. The main cam (91) is so shaped that when the finger of the cam lever (92) rides around the groove in the top of the cam, the cam lever is pivoted; this moves the tone arm actuating lever (97) out which, in turn, moves the tone arm out clear of the records.

The roller nearest the hub on top of main gear (82) comes in contact with the cam that is mounted on the ejector lever (43), thus actuating the ejector lever causing it to turn the ejector lever crank (101) and record selector shaft (10). The selector shaft is fastened to the ejector lever crank by the set screws (100). As the selector shaft and roller (8) turn, it pulls the push lever actuating link, located in the overarm (1), against the push lever (5) dropping a record to the turntable.

At the same time the ejector lever crank (101) turns, the stud (D) of this crank turns the selector crank (104). When a 12" record is to be dropped to the turntable, the weight of the record on the selecting feeler pivots the feeler against the selector latch (115). Therefore, the selector latch is moved against the selector crank cam (104). As the selector cam re-

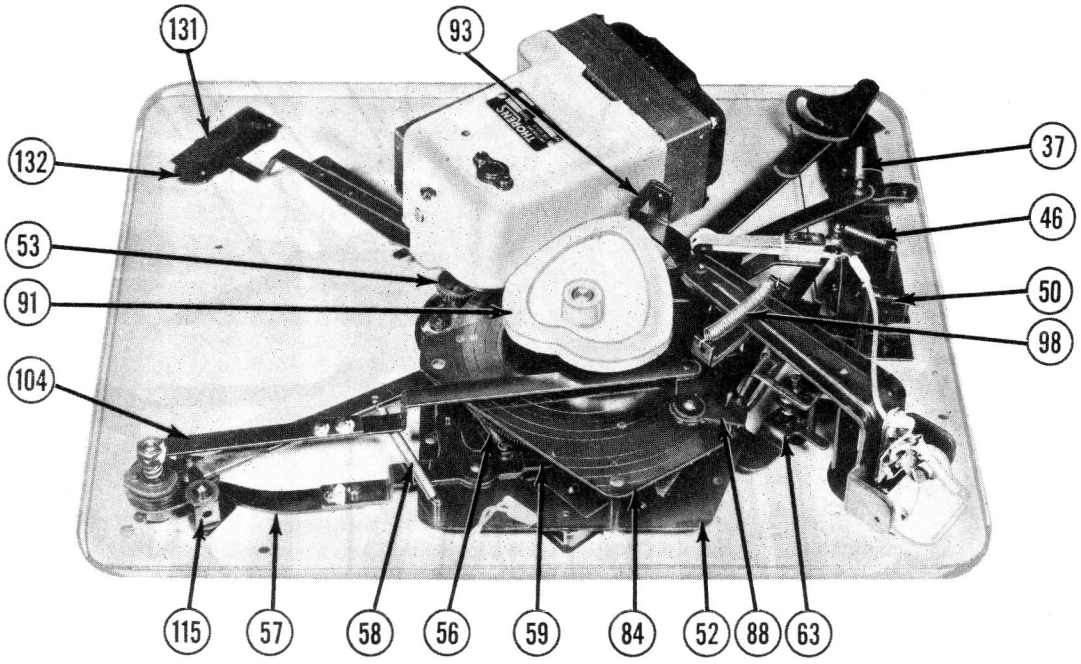

Figure 4

verses in motion, it is stopped by the selector latch making contact with the step (E) of the selector crank (104), thus setting the landing position cam (88) for 12" set down.

When a 10" record is to be dropped to the turntable, the diameter of the 10" record isn't great enough to allow the edge of the record to contact the selecting feeler (16); therefore, the selecting feeler stays in a raised position and the selector latch (115) will not engage with step (E) of selector crank (104). This action permits step (E) of selector crank (104) to move past selector latch (115), thus setting the landing position cam (88) for 10" set down.

When a 7" record is dropped to the turntable, the set-down action is the same as for 10" records except that the 7", 10" and 12" set-down control knob is placed in the 7" position. When in this position, the stud of the set-down positioning cam (47) becomes entirely disengaged from the 7" abutment lever (95). This action permits the 7" abutment lever (95) to be moved against the stud of set-down adjusting screw (22) by force exerted by the 7" abutment lever spring (94). Therefore, the tone arm is carried in for 7" set-down by the 7" abutment lever.

The action of main cam (91) moves the tone arm actuating lever (97) in to contact the landing position cam (88). As the actuating lever moves in, it contacts the stud of the set-down adjusting screw (22), thus moving the tone arm in for set down.

For 7" and 10" records, the finger of the tone arm actuating lever will contact the landing position cam (88) at point (G), and for 12" records, it will contact the landing position cam at point (F).

The cam lever (92) now rides down the incline of main cam (91), lowering the tone arm to the record.

At this time, the roller located nearest the hub on top of main drive gear (82) contacts the clutch actuator lever (55). This action latches the clutch plate so as to disengage the clutch pinion (53) from the drive gear (128), thus completing the change cycle.

PAUSE ACTION

When the control knob is placed in the "Pause" position, the pause lever (78) moves in between main drive gear (82) and pause gear (83). As the changer starts its next cycle, both gears (82) and (83) are turned by clutch pinion (53) until the spring loaded stud, located on main drive gear (82), comes in contact with the pause lever (78). When this takes place, the stud of the main drive gear rides up on top of pause lever (78) thus, disengaging the stud from the pause gear (83). Since the main drive gear is driven by the pause gear thru this stud, the rotation of the main gear stops, although the pause gear continues to turn. The main cam (91) which is fastened to the main gear (82) also stops. The finger on the bottom of the pause gear strikes the star wheel (79) on every revolution of the pause gear. The star wheel turns the pinion gear (79) which turns the main gear (82) a definite amount. This continues until the stud of the main gear has been moved far enough to ride off of the top of pause lever (78). When this happens, the stud of the main gear engages with the pause gear again, thus continuing the change cycle.

A pause of 5 minutes maximum duration at 78 RPM can be introduced between two records. The duration of the pause is determined by the width of the pause lever (78) at the point where the stud of main gear (82) rides. When the control knob is in the 1 minute pause position the stud of the main drive gear rides across the narrow tip of the pause lever (78) whereas, when in the 5 minute position the stud rides across the widest part of the pause lever.

REPEAT ACTION

When the control knob is turned to the "Repeat" position, the repeat control crank (41) moves the record ejector lever (43) out a definite amount so that the

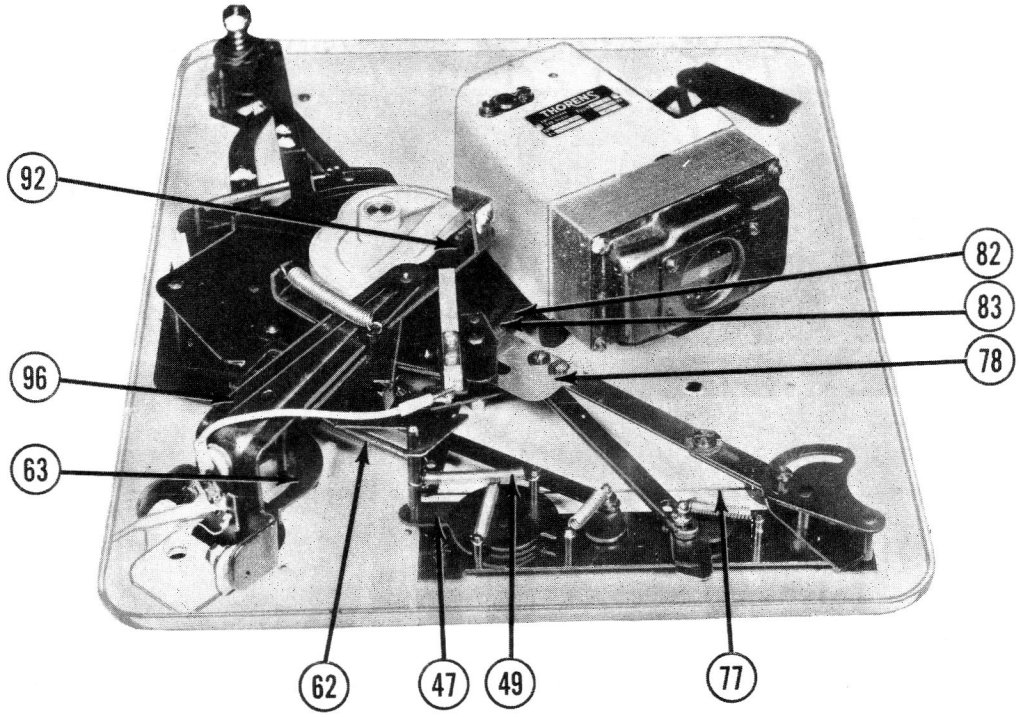

Figure 5

roller nearest the hub on top of main drive gear (82) will not contact the cam on ejector lever (43). This action prevents the record dropping mechanism from being actuated and, consequently, the tone arm moves in and sets down again on the record that just completed playing. As the tone arm is being lowered to the record, the roller farthest away from the hub on main gear (82) moves against the back of the cam on the ejector lever (43). This moves the control knob off "Pause" position, thus returning the ejector lever to its normal position.

ADJUSTMENTS

Tone Arm Height-

The tone arm is adjusted so that when the arm is lowered the needle of the tone arm will be level with the velvet of the turntable. To adjust the height of the tone arm, bend the height adjustment bracket (20) at point (A3). The tone arm should be raised for access to this bracket.

Tone Arm Landing Position-

The landing position of the tone arm should be approximately 1/8" in from the edge of a record. Turn the reject control knob to "Reject". Turn the turntable, by hand, and note where the needle first touches the record. The point at which the needle drops on the record may be adjusted by screw (22). This screw can be reached through hole (A4) (Fig. 2) with the tone arm resting on a 10" record.

Record Feeding Mechanism-

If a record does not drop from the spindle step, or drops late, examine first of all if the center of the record is of standard thickness and not worn. Also check to see if spindle is clean. If the defect is not caused by this, remove the records, start the changer and then stop it just at the moment when the push lever (5) is out at its maximum point. Then verify that push lever (5) is in line with the spindle body at the spindle step. If push lever (5) is out of adjustment, adjust by turning screw (A1) in the proper direction.

Tone Arm Pressure Adjustment-

The tone arm pressure should be adjusted to the cartridge manufacturers specifications. Adjustment may be made by loosening screw (A2) and pivoting the tone arm pressure spring mounting lug to increase or decrease the tension on the tone arm pressure spring (18), as required.

Turntable Brake-

The turntable brake is connected to the switch bracket (69). If the brake pad becomes worn, it will allow the turntable to overrun resulting in the motor not starting at the beginning of a new stack of records. This can be rectified by slightly turning the leather pad to present a new surface to the turntable rim.

LUBRICATION

Motor and Cycling Mechanism-

The motor and cycling mechanism needs lubricating from time to time, generally after 500 hours use. To do this, remove the turntable and introduce a few drops of good quality thin oil (SAE 20) into the lubricating holes (colored red). Do not use a consistent oil which might retard the motor and cycling mechanism. After a few years use it is advisable to replace the hardened grease of the cams, gears and other rubbing surfaces with fresh clean grease.

Record Spindle-

It is essential that the record spindle fit perfectly free in the hole of the turntable spindle when the overarm (1) is in playing position. This hole should be kept clean.

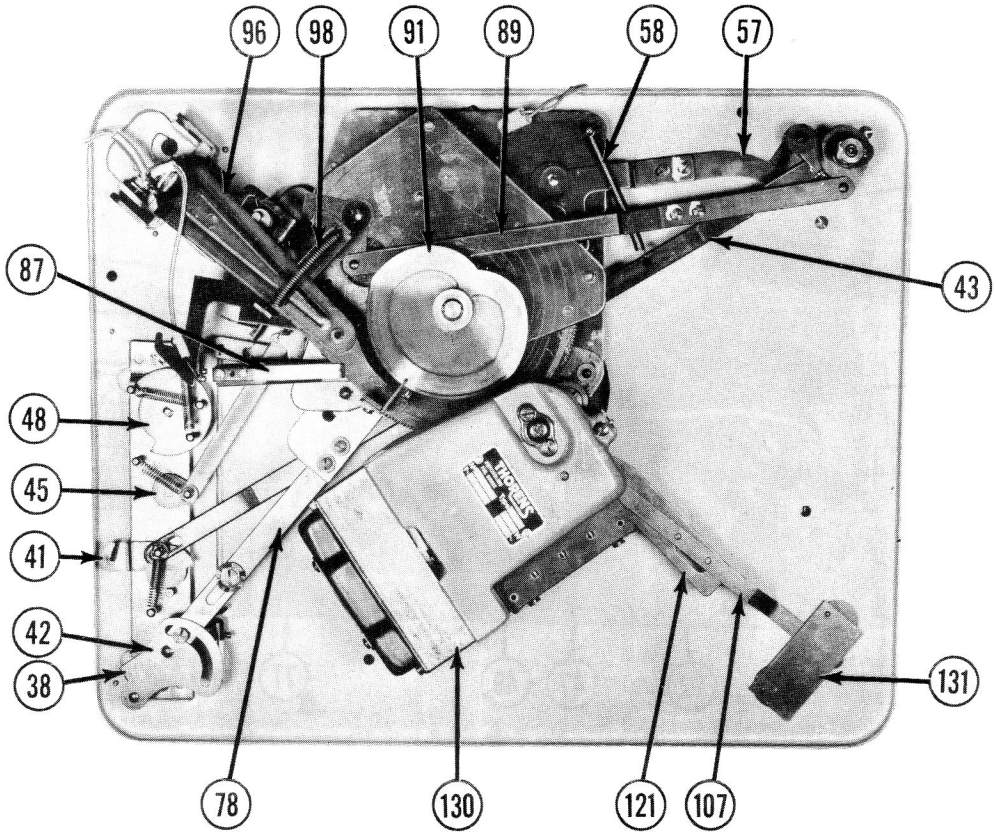

Figure 6

Apart from cleaning push lever (5) periodically, it is advisable when oiling the motor to introduce a drop of thin oil into the hole of the turntable spindle where the record spindle pivots.

CAUTION: Do not, under any circumstances, allow any oil or grease to come in contact with the following parts:

1. Stop feeler (15).
2. Selecting feeler (16).
3. Between trip lever actuating fork (63) and trip lever (70).

TROUBLE CHART

SYMPTON	CAUSE	REMEDY
Turntable and Motor		
I. Turntable does not revolve when control is set to "START". Remark: Hold control for one or two seconds in the "START" position. Caution: Do not force turntable to revolve when stuck.	(1) No current at motor.	(a) Check that current is reaching AC leads of changer. (b) Remove turntable and check if voltage adjusting screw (129) is tight and set for correct line voltage. For 110-115 Volts 60 cycles power supply, screw (129) must be in the 125-150 V position. (c) Open power switch cover (66) and check contact adjustment. Replace broken contact springs (part # A130).
	(2) Unlubricated motor.	See instructions for correct motor lubrication.
	(3) Motor defective.	(a) Withdraw motor from changer by untightening three nuts (28) and screws (33) of speed control escutcheon (34). (b) Open motor top cover and check fibre gear. If worn, replace the whole assembly, part #ME150.

SYMPTOM	CAUSE	REMEDY
		(c) Withdraw speed change gears and check that rotor shaft revolves freely. If stuck, withdraw motor end cover and loosen the two screws of speed governor to take out the rotor. (Do not untighten the four stator screws).
		(d) If no mechanical defect is to be found, check commutator wiring and field coils.
II. Incorrect turntable speed.	(1) Incorrect setting of voltage adjusting screw (129).	See § I l b .
	(2) Speed selector out of adjustment.	(a) Two circular cams (132), eccentrically mounted on screws (33), determine the end positions of the speed selector. For the normal adjustment of those cams, the exact speed, 33 1/3, 45, 78 RPM, is reached when the knob is in contact with the proper abutment. To displace these cams, slightly loosen the two screws (33) using a stroboscope to determine the proper speed. Tightening the screws will fix the cams.
III. Irregularities in turntable speed.		
Flutter	Spring coupling on turntable shaft tight or broken.	(a) Withdraw motor from changer by untightening the three nuts (28) and screw (33) of speed selector.
		(b) Open motor top cover and check spring coupling. If broken replace with part # MR613.
Wows and Waves	(1) Defective record.	Warped records may slip on one another. Enlarged center holes can also cause wows.
	(2) Record spindle unlubricated.	Remove record spindle and put a drop of thin mineral oil into center hole of turntable spindle.
	(3) Center hole in turntable spindle clogged by accumulation of dirt.	Record spindle must fit into center hole of turntable spindle. If spindle binds clean thoroughly center hole with a hardened steel point until thrust ball is entirely freed.
	(4) Record spindle bent.	Record spindle should fit perfectly free in center hole of turntable spindle when the overarm is in playing position.
		Raise overarm and bend record spindle in the proper direction very carefully.
	(5) Unlubricated motor.	See instructions for correct motor lubrication.
	(6) Foreign matter in motor gear.	Withdraw and open motor and carefully clean gears and their shafts with Naphta. Lubricate before reassembling.
	(7) Fibre gear defective.	Check each tooth of fibre gear and, if defective, replace the whole assembly, part # ME150.
	(8) Turntable shaft bent.	When forwarding, turntable must be removed from its shaft and packed separately, otherwise bending of the shaft may occur.
IV. Noise during playing of record. Noise ceases when pickup is lifted from record.	(1) Motor rumble.	
	Frequency between 100 and 200 cycles.	(a) Exagerated bass boost on the amplifier. Adjust bass control for a natural reproduction.

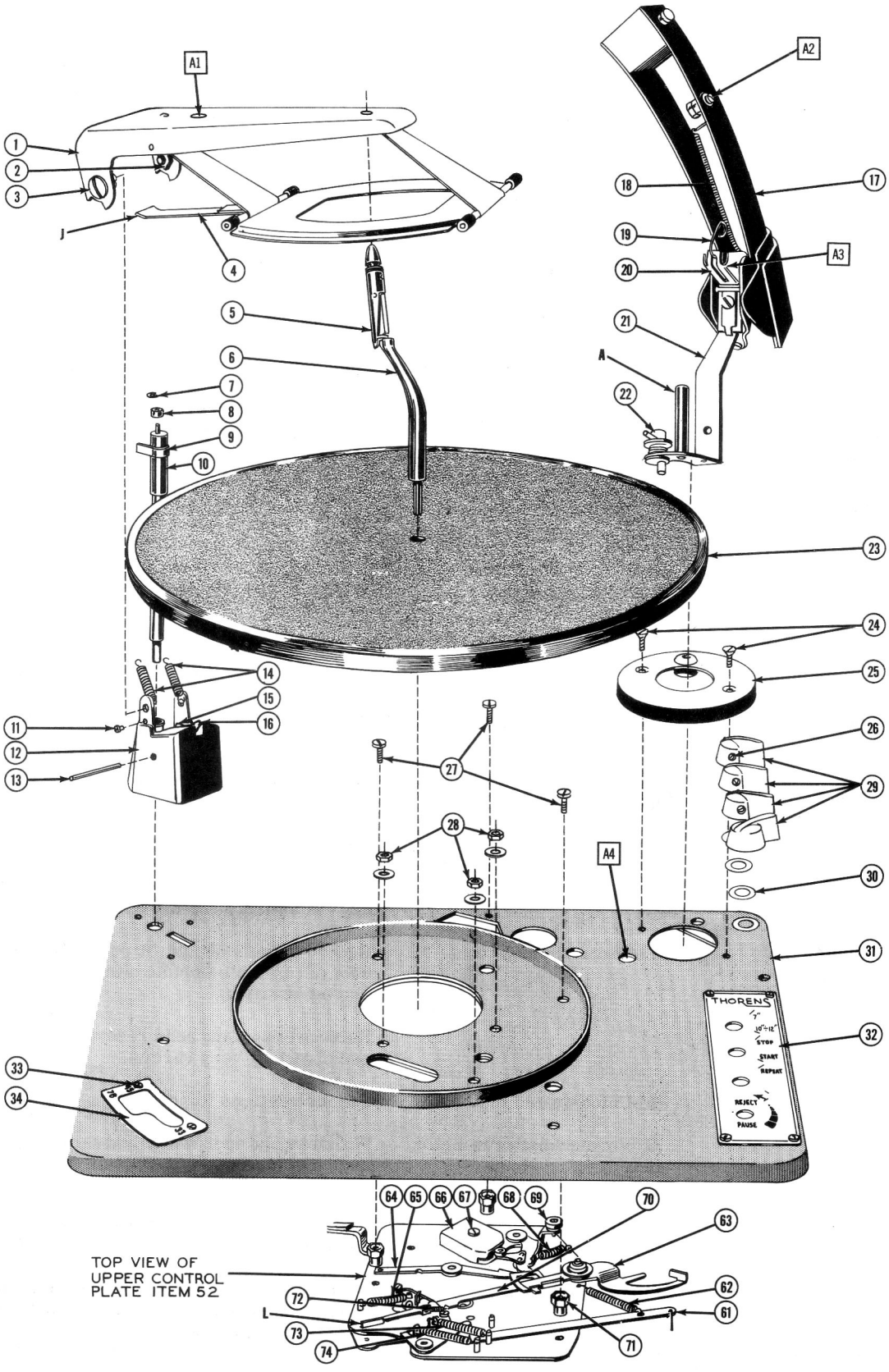

Figure 7A. Exploded View Of Parts Above Baseplate.

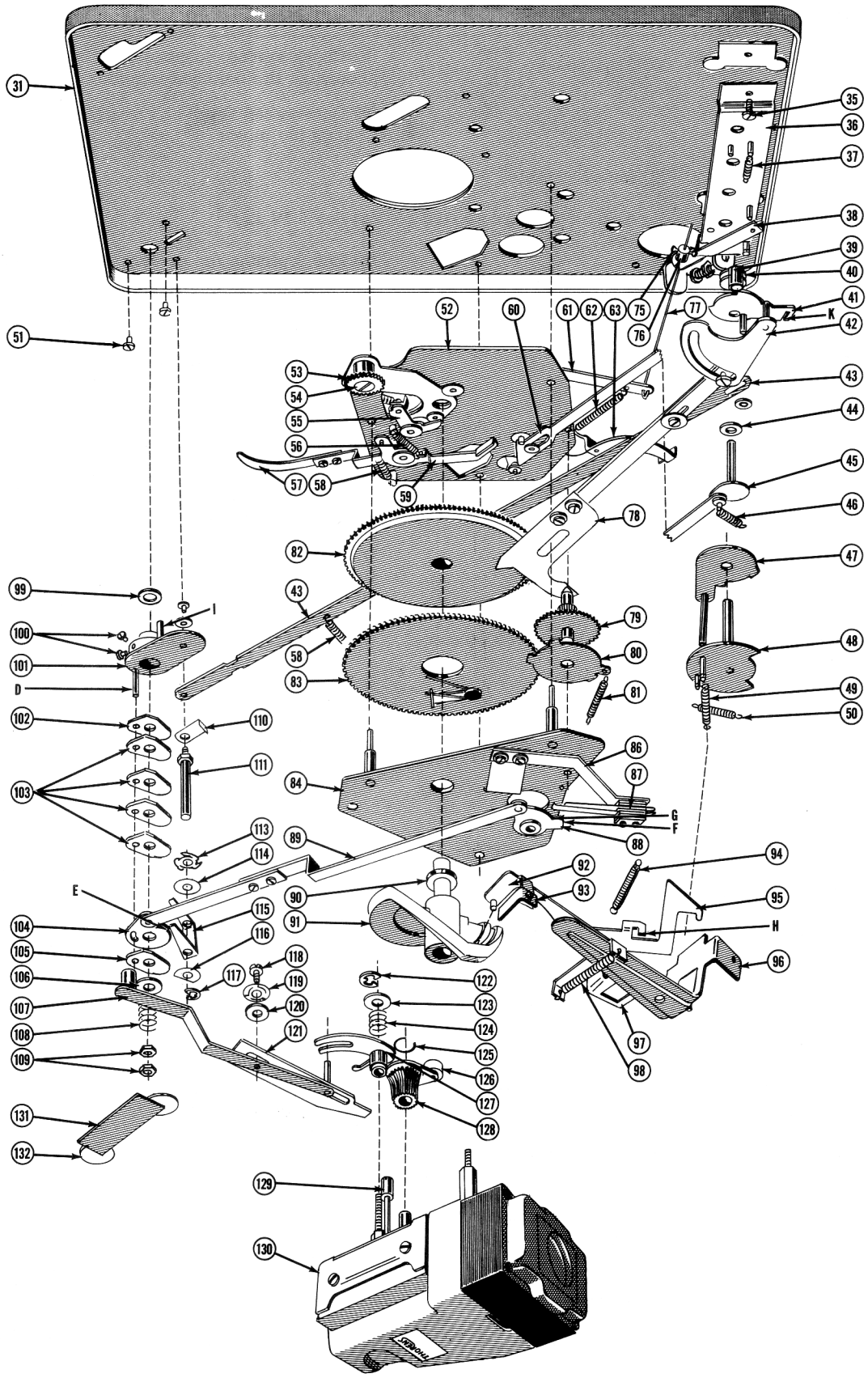

Figure 7B. Exploded View Of Parts Below Baseplate.

TROUBLE CHART - Con't.

SYMPTOM	CAUSE	REMEDY
		(b) Check spring suspension of record changer according to furnished template.
		(c) Uncentered rotor through shock on stator. Change the motor.
	(2) Motor rumble.	
	Frequency under 100 cycles.	(a) See § IV 1a.
		(b) Check pickup for perfect vertical freedom and correct vertical pressure.
	3. Acoustic feed-back.	(a) The changer must be floated freely on the mounting springs according to the furnished template. When forwarding, secure the changer with cardboard props introduced between base plate and mounting board.
		(b) Lower the level of the pickup with an appropriate network not allowing this level to go beyond the point where distorsion appears in the amplifier and loudspeaker.
		(c) Lower the bass boost for a natural reproduction. For a crystal cartridge shunt the pickup with a 0.3 to 0.5 Meg. resistor.
V. Noise persists when pick-up is lifted from record.	(1) Incorrect pickup connection.	Check wiring of pickup.
	(2) Defective wiring.	Check pickup lead for a short or open lead.
	(3) Defective amplifier.	
	(4) Loose pickup cartridge terminal clips.	
	(5) Defective cartridge.	
VI. No sound during playing.	See § V.	
VII. Distorsion of recorded sound.	(1) Defective record.	Worn, dusty or defective records cause needle scratch and distort the recorded sound. Make a trial with a new and good recording.
	(2) Needle clogged by accumulation of dust.	Clean dust around needle tip.
	(3) Improper needle tip.	Verify that the proper needle tip is used for the type of records played.
	(4) Incorrect pickup weight or height.	
	(5) Incorrect matching of pickup to amplifier.	Verify that the radio set or amplifier is well adapted to the type of pickup cartridge. See pick-up cartridge wiring diagram.
	(6) Defective amplifier.	
	(7) Defective needle.	Check needle under microscope or try a new needle.
	(8) Defective cartridge.	Replace.
VIII. Control knob does not remain in the "START" position when starting the changer.	(1) Last Record Stop Lever (57) engaged on last record stop feeler.	After checking that Last Record Stop Feeler (15) on the platform is not free to move, grasp it with small pliers and lift it slowly until Last Record Stop Lever (57) is freed.

SYMPTOM	CAUSE	REMEDY
NOTICE: To start the changer, always hold control for one or two seconds in the "START" position.	(2) Last Record Stop Lever engaged on Stop Bracket (110).	Bring lever (57) in the position shown on Fig. 4.
Record Feeding Mechanism		
IX. Record does not drop when changer cycles.	(1) Record too thick.	Check for record thickness around center hole. Standard thickness is between .06" to .10". Exceptionally thicker records require a special spindle (part No. CD441).
	(2) Hole in record too large.	Check the diameter of hole in the record.
	(3) Overarm not properly lowered on record spindle.	Remove records from spindle. Start the changer and provoke a normal last record stop. Check then that overarm may be completely lowered on the record spindle. If hindered by record pusher (5), check turntable brake so that no overrun of the mechanism takes place.
	(4) Last Record Stop mechanism out of adjustment.	If changer overruns the regular stop position, first record may not drop. Check leather pad of Stop lever (69).
	(5) Record pusher (5) binding.	Remove record spindle (6) and check record pusher for perfect freedom of movement. Remove all foreign matter from pusher and lubricate slightly.
	(6) Record spindle out of position through accumulation of dirt in center hole of turntable spindle or bent.	See § III Nos. 3 and 4.
	(7) Record pusher (5) out of adjustment.	With a record on the spindle step, start the changer, maintaining by hand the speed of the turntable very slow. Then verify that record pusher (5) moves out first far enough to push the record from the spindle step. Adjust at point (A1), shown on exploded view. CAUTION: Adjustment must be made in the direction for increasing protrusion of pusher. If protrusion is already too large, first decrease it largely, then increase slowly to the right position. Check result during several cycles of changer.
	(8) Record ejector lever (43) binding.	Record ejector lever (43) must be perfectly free on its two end connections. Stop changer in the regular Last Record Stop position and move manually the ejector lever. This lever must be energically brought back into rest position by coil spring (58). If binding, see that base plate of changer has not been bent or is not distorted by the mounting device. Adjust carefully lever (43) by bending.
	(9) Record Selector shaft (10) binding.	Record Selector shaft (10) must turn freely in the bearings of the platform. Lubricate and, if necessary, remove shaft from platform. For this operation proceed as follows: (a) Remove the two nuts (109), spring (108), and parts (102), (103), (104), (105) and (106).

TROUBLE CHART - Con't.

SYMPTOM	CAUSE	REMEDY
		(b) Mark ejector lever crank (101) and shaft (10) with a tracing point to allow for exact positioning when mounting again. (c) Loosen set screws (100) of ejector lever crank (101). (d) Take away the two stop screws (11) of overarm and bring overarm in vertical position. Take away the two nuts and pivoting screws (2) and (3) of overarm to allow withdrawal of shaft (10). (e) File off burrs and rough surfaces. Polish and lubricate. If bent, replace Record Selector Shaft.
X. Two records drop at once.	(1) Hole in record too large.	Check the diameter of the hole. Eliminate worn or split records.
	(2) Record too thin.	Check for record thickness around center hole. (Use special gauge 01526.) Records thinner than .06" at center may jam the feeding mechanism and wear out prematurely.
	(3) Record pusher out of adjustment.	See § IX Nos. 4, 5 and 6.
XI. Premature wear around center hole of record.	(1) Loading operations roughly made.	Records must be placed carefully on the record spindle. mixed records of different diameters are advantageously loaded one by one on the spindle. Do not allow records to take an inclined position on the spindle.
	(2) Non standard records.	See § IX and X.
	(3) Feeding mechanism out of adjustment.	See § IX and X.
XII. Record hits pickup arm when dropping.	(1) Record too thick or too thin.	See § IX Nos. 1 and 2, and § X Nos. 1 and 2.
(Delay in record dropping).	(2) Record pusher out of adjustment, or binding.	See § IX Nos. 3 to 8.
Pickup Arm Adjustment		
XIII. Minor unadjustment in needle set down about 10" and 12" positions.	(1) Incorrect adjustment of adjusting screw (22).	First, verify that control is correctly set on 10"-12". Place a 10" record on the turntable and start the changer. Stop it with the pickup in playing position. With a screwdriver adjust screw (22) through hole (A4) (Fig. 2). Clockwise to move pickup in. Counterclockwise to move pickup out. If pickup control arm (21) has not been bent, the set down on 12" is correct when properly adjusted for 10".
	(2) Pickup control arm (21) bent.	When adjustment of set down through screw (22) is impossible, pickup control arm (21) has been bent. If badly bent, replace the whole control arm.
XIV. Difference in needle set down between first and last record of a stack.	Pickup control arm (21) bent.	If a compromise set down may not be realized through screw (22), check pickup control arm as above.

TROUBLE CHART - Con't.

SYMPTOM	CAUSE	REMEDY
XV. Correct set down for 10" and 12" records, but minor unadjustment for 7" records.	Incorrect adjustment of 7" abutment lever (95).	First, check for exact set down for 10" and 12" records, then regulate 7" set down by bending ear (H) of abutment lever (95).
XVI. No 7" set down or no 10" set down.	7" control binding or bent.	Start the changer, after a regular last record stop, and stop it just after one complete revolution only of the turntable. Stud of set down control cam (47) must be entirely disengaged from 7" abutment lever (95). Actuate 7" control knob and check switch mechanism for perfect freedom. Stud must come in and out of path of abutment lever for respectively 10" - 12" and 7" positions of control knob.
XVII. Pickup abruptly jumps towards center of record after having set down on 12" record.	(1) Overarm remained in loading position.	When loading the records on the spindle, the arm (4) for Last Record Stop is engaged by the stop ring (9) on Record Selector shaft (10). For correct functioning of cycle mechanism, disengage arm (4) by lowering overarm.
	(2) Record Ejector lever (43) binding.	See § IX 8 .
	(3) Record Selector shaft (10) binding.	See § IX 9 .
	(4) Landing Position cam (88) out of adjustment.	See § XVIII 4 and 8 .
XVIII. Needle sets down on 10" for 12" records or inversely.	(1) Single record operation.	When a record is put directly on the turntable without having been dropped from the record spindle, the pickup will set down on 10" diameter, irrespective of the diameter of this record. To play a single 12" record, either put it on the record spindle, or place it directly on the turntable, pressing with a finger on the index feeler (16) during the beginning of the cycle.
	(2) Record dropping late from record spindle.	See § XII 1 and 2 .
	(3) Selector Feeler (16) on the platform binding or stuck.	The feelers on the platform should not be oiled. When stuck through oil or dirt, put Naphta on the feelers through platform split until they become perfectly free to move and return to their upper rest position when depressed.
	(4) Selector latch (115) binding or bent.	Selector latch must be freely pivoting on pin (111) and submitted only to the light friction of spring washer (113).
	(5) Record Ejector Lever (43) binding.	See § IX 8 .
	(6) Record Selector Shaft (10) binding.	See § IX 9 .
	(7) Selector Link (89) binding or bent.	Selector link must be perfectly free on its connections to both cams (104) and (88) and sufficient play must be present in those connections.
	(8) Landing Position Cam (88) out of adjustment.	First, check the functioning with 10" records. Selector feeler (16) being out of reach of record edges must remain in upper rest position and Selector Latch (115) out of engagement with the notch (E) of Selector cam (104) during the snap back action of Record Ejector Lever (43).

SYMPTOM	CAUSE	REMEDY
		Functioning with 12" records. When dropping from the record spindle, 12" records push Selector feeler (16) down, thus holding Selector latch (115) in position for engagement with notch (E) of selector cam (104). The tone arm actuating lever (97) must then contact landing position cam (88) at point (F). If necessary, adjust this by slightly loosening the screws on the selector link (89). IMPORTANT: The engagement between Selector latch (115) and Selector cam (104) is only maintained while the pickup is landing. Before the cycling is completed, Record Ejector lever (43) snaps back crank (101), and pin (I) of ejector lever crank (101) disengages selector latch (115) from notch (E) of the selector crank (104).
XIX. Needle always sets down on 12" for single record operation or last record of the stack.	Arm for Last Record Stop (4) out of adjustment.	Arm (4) must contact only the Last Record Stop feeler (15) when there are no records on the record spindle, and be out of contact with Selector feeler (16). If arm (4) is out of form, adjust it by bending carefully at point (J).
Clutch Mechanism		
XX . Changer continues to cycle for 10" or 12" records. For 7" records only, see § XXIII.	(1) Reject mechanism binding.	Clutch Stop lever must be perfectly free on its pivoting axis under the action of spring (73) and must be free from oil or grease. Check that lever (61) is out of contact with Clutch Stop lever when control is not on Reject position.
	(2) Clutch plate binding or bent.	When Clutch Stop lever is in the reject position, the clutch plate must be perfectly free to move under the action of spring (74). Oil or grease between Upper Mechanism plate (52) and Clutch plate may impare this freedom of movement.
	(3) Changer mechanism binding.	When a too great force is required to cycle the changer, the clutch plate may be unable to disengage Clutch pinion gear (53) from drive gear (83). Check mechanism for normal freedom of all parts; actuation of cycle must be possible without effort when turning cycling cam (91) counterclockwise with the hand. If binding occurs, check for foreign matter in the gear teeth or bent parts. Straighten or replace. Clean and lubricate.
Auto-trip Mechanism		
XXI . Changer does not cycle when record has been played.	(1) No finishing trip groove on record.	
	(2) Needle jumps out of grooves in record.	(a) Check pickup height. With a too high pickup adjustment, the needle will not track properly until the end of the first record. (b) Check pickup pressure on the record. (c) Needle clogged by accumulation of dust or worn. (d) The record may be defective; check with a record that is known to be good. (e) Trip Lever Actuating Fork (63) binding or bent.

SYMPTOM	CAUSE	REMEDY
	(3) Trip lever (70) binding.	The friction between Trip Lever Actuating Fork (63) and trip lever (70) does not depend on a spring and is not adjustable. It is thus essential that trip lever does not touch any other part than Fork (63) and Clutch Stop lever. Check that no foreign matter or grease is lodged between Trip lever and Upper Mechanism plate.
	(4) Trip Catch binding or out of normal position.	The Trip Catch must be perfectly free to move on the pivoting pin on Trip lever (70). Check that spring (72) brings back Trip Catch against abutment of Trip lever when slightly displaced. There must be no oil or grease on these parts. Trip Catch must touch Clutch Stop lever only on bent part and not on horizontal surface. Adjust by carefully bending Trip lever (70). IMPORTANT: Don't modify the original adjustment of arm on Trip Catch.
	(5) Trip lever (70) out of adjustment.	Bent extremity L of Trip lever (70) allows an adjustment of sensitivity of auto trip mechanism. Bending outside diminishes and bending inside increases this sensitivity.
	(6) Clutch Stop lever binding.	See § XX 1.
	(7) Changer mechanism binding.	If Reject control does not operate, see § XXII 3).
XXII. Changer trips before needle reaches end of record.	(1) Hole in record too large.	If the hole in the record is too large, the groove may turn eccentric with the spindle and cause premature tripping.
	(2) Trip lever (70) out of adjustment.	If sensitivity of auto trip mechanism is too great, adjust by slightly bending extremity L of Trip lever (70) outside of lever.
XXIII. Changer trips at the beginning of 7" records.	Auto trip mechanism operating on a too large diameter.	Pin on Pickup Control Arm (21) cooperates with Trip Lever Actuating Fork (63) to actuate auto trip mechanism. Bent slightly pin in the proper direction after having checked that arm (21) is not bent. See § XIII No. 2.
Last Record Stop Mechanism		
XXIV Changer stops instead of repeating single or last record.	Repeat control crank (41) out of adjustment.	Introduce a screw driver in notch K of repeat crank (41) and increase slightly its width to obtain a better locking action when in repeat position.
XXV. Changer stops before last record has been played.	(1) Arm for Last Record Stop (4) out of adjustment.	See § XIX.
	(2) Last Record Stop feeler (15) on the platform binding or stuck.	See § XVIII 3.
XXVI. Changer does not stop after last record has been played.	(1) Last Record Stop feeler (15) binding or stuck.	See § XVIII 3.
	(2) Last Record Stop lever (57) out of adjustment.	Lever (57) must be free to move under the action of spring (56). Press on feeler (15) and check that the extremity of lever (57) is stopped by this feeler when the changer is cycling, at the moment where the tone arm is out. For this adjustment bring tone arm in playing position and loosen slightly the two screws on lever (57); then tighten again.

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	CD. 385	Overarm	66	A. 127	Switch Cover
2	M5VSM12699	Nut, Overarm Mounting		A. 130	Switch Contact Springs
3	CD. 122	Screw, Overarm Mounting	67	VSM12156	Screw, Switch Cover Mounting
4	CD. 265	Last Record Stop Arm	68	CD. 138	Brake Spring
5	CD. 279	Record Push Lever	69	CD. 345	Switch & Brake Bracket
6	DE. 270	Spindle (complete)	70	CD. 571	Trip Lever
7	CD. 1640	"C" Washer	71		Upper Control Plate Mounting Spacers
8	CD. 111	Record Selector Roller			
9	CD. 275	Stop Ring	72	CD. 929	Trip Spring
10	CD. 295	Record Selector Shaft	73	CD. 240	Clutch Stop Lever Pivot Spring
11	M4X6/3F. 42	Stop Screw for Overarm	74	CD. 163	Clutch Plate Spring
12	CD. 277	Overarm Platform	75	2XM23X4F38	Set Screw for Reject Rod Collar
13	CD. 115	Pin for Mounting Springs 14	76	CD. 1606	Reject Rod Adjusting Collar
14	CD. 136	Overarm Tension Springs	77	CD. 1637	Reject Rod
15	CD. 293	Stop Feeler	78	CD. 403	Pause Lever
16	CD. 402	Selecting Feeler	79	CD. 352	Pinion Gear & Star Wheel Assembly
17	PU. 690	Tone Arm			
18	PU. 693	Tone Arm Pressure Spring	80	CD. 233	Pause Cam
19	CD. 274	Tone Arm Rest Spring	81	CD. 240	Pause Cam Tension Spring
20	CD. 1574	Height Adjustment Bracket	82	CD. 351	Main Drive Gear
21	CD. 59	Tone Arm Control Lever	83	CD. 349	Pause Gear
22	CD. 72	Screw, Set-Down Adjusting Stud	84	CD. 405	Lower Control Plate
			86		Switch Mounting Bracket
23	PT. 30	Turntable	87		Muting Switch
24	M3X12F. 26	Screws, Tone Arm Mounting Base Cover	88	CD. 155	Landing Position Cam
			89	CD. 11	Selector Link
25	CD. 64	Tone Arm Mounting Base Cover	90	CD. 254	Main Cam Spacer Washer
			91	CD. 353	Main Cam
26	M4X55F48	Set Screws, Control Knob Mounting	92		Cam Lever
			93	CD. 63	Cam Lever Retaining Bracket
27	M4X7F1	Screws, Upper Control Plate Mounting	94	GI. 38	7" Abutment Lever Tension Spring
28	F. 1034	Nuts, Motor Mounting	95	CD. 316	7" Abutment Lever
29	CD. 27	Control Knobs	96	CD. 56	Lift Bracket
30	F. 1039	Flat Washer, Fiber	97	CD. 309	Tone Arm Actuating Lever
31	CD. 415	Baseplate	98	CD. 213	Tone Arm Actuating Lever Spring
32		Control Panel Escutcheon			
33	F37	Screw, Speed Control Escutcheon Mounting	99		Fiber Washer
			100	M3. 5X8. 5F. 38	Set Screws, Ejector Lever Crank
34	ME. 94	Speed Control Escutcheon			
35		Screw, Control Shaft Mounting Plate	101	CD. 333	Ejector Lever Crank
			102	CD. 214	Clutch Washer, Fiber
36		Control Shaft Mounting Plate	103	CD. 99	Clutch Washer, Metal
37	GI. 63	Repeat Lever Spring	104	CD. 97	Selector Crank
38	CD. 317	Reject Actuating Arm	105	CD. 214	Clutch Washer, Fiber
39	CD. 319	Spacer	106	F1040	Flat Washer
40	F. 1041	Flat Washers	107		Speed Adjustment Lever
41	CD. 334	Repeat Control Crank	108	CD. 137	Coil Spring
42		Pause & Reject Control Crank	109	M6VSM12699	Hex Nut
43	CD. 400	Record Ejector Lever	110	CD. 205	Last Record Stop Lever Guide Plate
44	F. 1040	Flat Washer			
45		Start & Stop Control Crank	111	CD. 296	Selector Pivot Pin
46	GI. 14	Start & Stop Crank Spring	113		Spring Washer
47	CD. 399	7", 10" & 12" Set-Down Positioning Cam & Stud	114	F. 1096	Flat Washer, Fiber
			115	CD. 100	Selector Latch
48	CD. 398	Set-Down Position Actuating Cam	116	F. 1096	Flat Washer, Fiber
			117	ME. 578	"C" Washer
49	CD. 321	Spring	118		Speed Adjustment Lever Adjusting Screw
50	GI. 38	Spring			
51	M3. 5X7F37	Screw, Overarm Platform Mounting	119		Spring Washer
			120		Flat Washer Fiber
52	CD. 425	Upper Control Plate	121	CD. 412	Speed Adjusting Link
53	CD. 257	Clutch Pinion	122		"C" Washer
54	M4X6F. 7	Screw, Clutch Pinion Mounting	123		Flat Washer
55	CD. 130	Clutch Actuator Lever	124		Compression Spring
56	GI. 38	Stop Lever Spring	125		Drive Gear Retainer
57	CD. 297	Last Record Stop Lever	126	CD. 32	Drive Gear Striker Pad, Leather
58	CD. 322	Record Ejector Lever Spring			
59	CD. 150	Stop Lever	127	ME. 42	Motor Control Cam
60		Start Link (Part of item 45)	128	CD. 40	Drive Gear
61	CD. 313	Reject Lever	129	ME. 132	Voltage Adjusting Screw
62	CD. 323	Reject Lever Return Spring	130	DE. 269	Motor, Complete
63	CD. 251	Trip Lever Actuating Fork	131	ME. 96	Bracket for Speed Lever
64	CD. 344	Repeat Stop Lever	132	ME. 97	Speed Selector Abutment Cams
65	CD. 133	Clutch Actuator Lever Spring			