



MODEL RC88/4



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Garrard

AUTOMATIC
RECORD
CHANGER

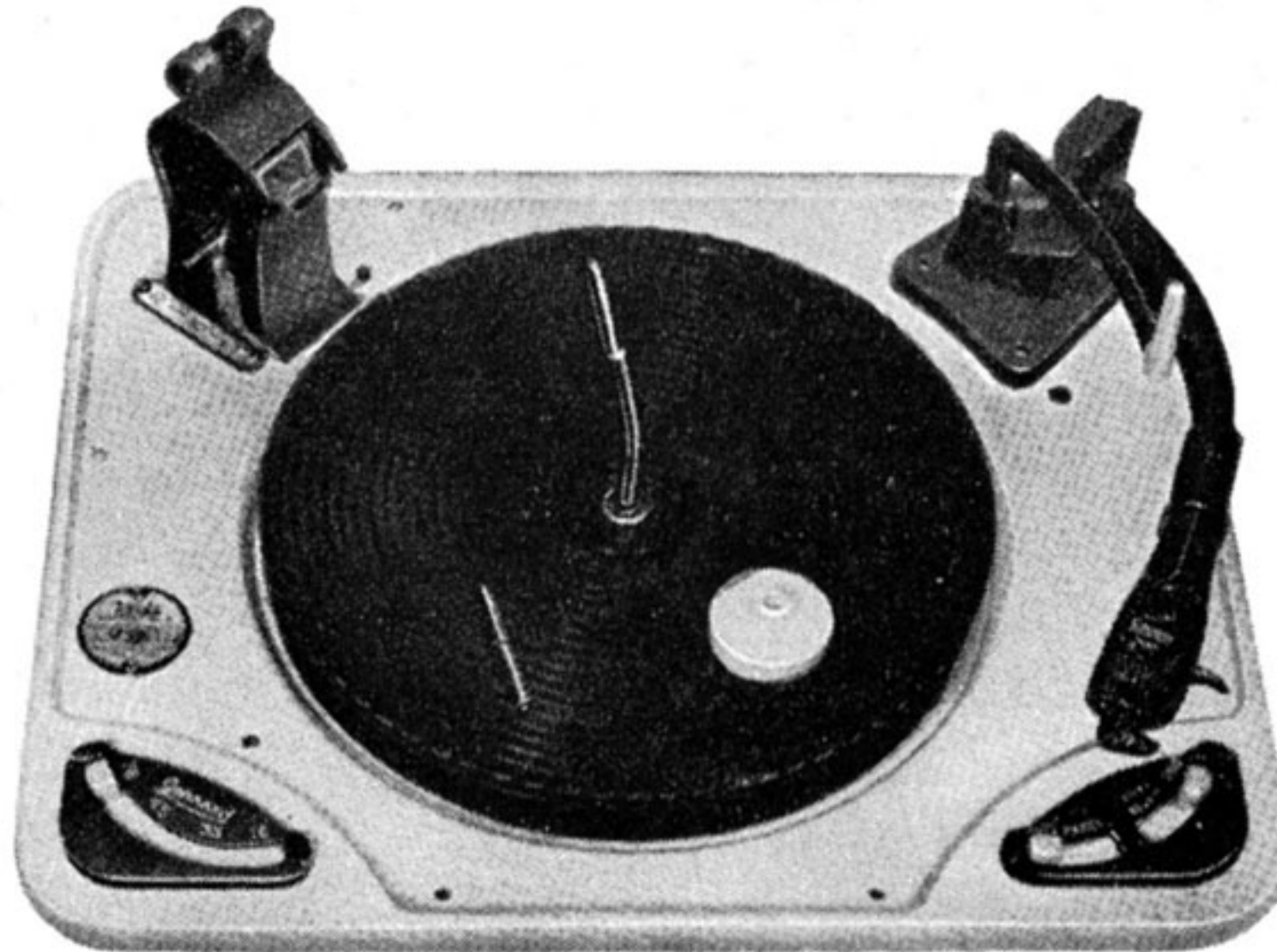


INSTALLATION
OPERATION
AND SERVICE
INSTRUCTIONS

The "Garrard" Model RC88/4 Record Changer

"GARRARD" Record Changers are simple and reliable in operation. They are thoroughly tested before leaving our works and will give a long period of satisfactory service.

Instructions for operating the Model R.C.88/4 are given in this manual—please follow these instructions carefully. In common with all mechanical devices, however, minor adjustments are sometimes necessary. The Service Instructions included have been com-



pleted to cover practically all the information necessary to ensure efficient operation.

If, after carefully perusing this manual you are still in doubt, our Technical Service Department will gladly assist you.

NOTE.

Always mention the Model Number, Schedule Number, and type of Pickup Head fitted when communicating with the company.

Address your enquiries to:—

The Garrard Engineering and Manufacturing
Company, Ltd.,
Technical Service Department,
Newcastle Street,
SWINDON, Wilts.

Telephone No.: Swindon 5381 (5 lines).

If you wish to make enquiries concerning the return of a Unit for repair, or to order spare parts, address your letter to:—

The Garrard Engineering and Manufacturing
Company, Ltd.,
Service and Spares Department,
50-54 Radnor Street,
SWINDON, Wilts.

Telephone No.: Swindon 2606

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The GARRARD Record Changer Model R.C.88/4 is made under the following patents:—

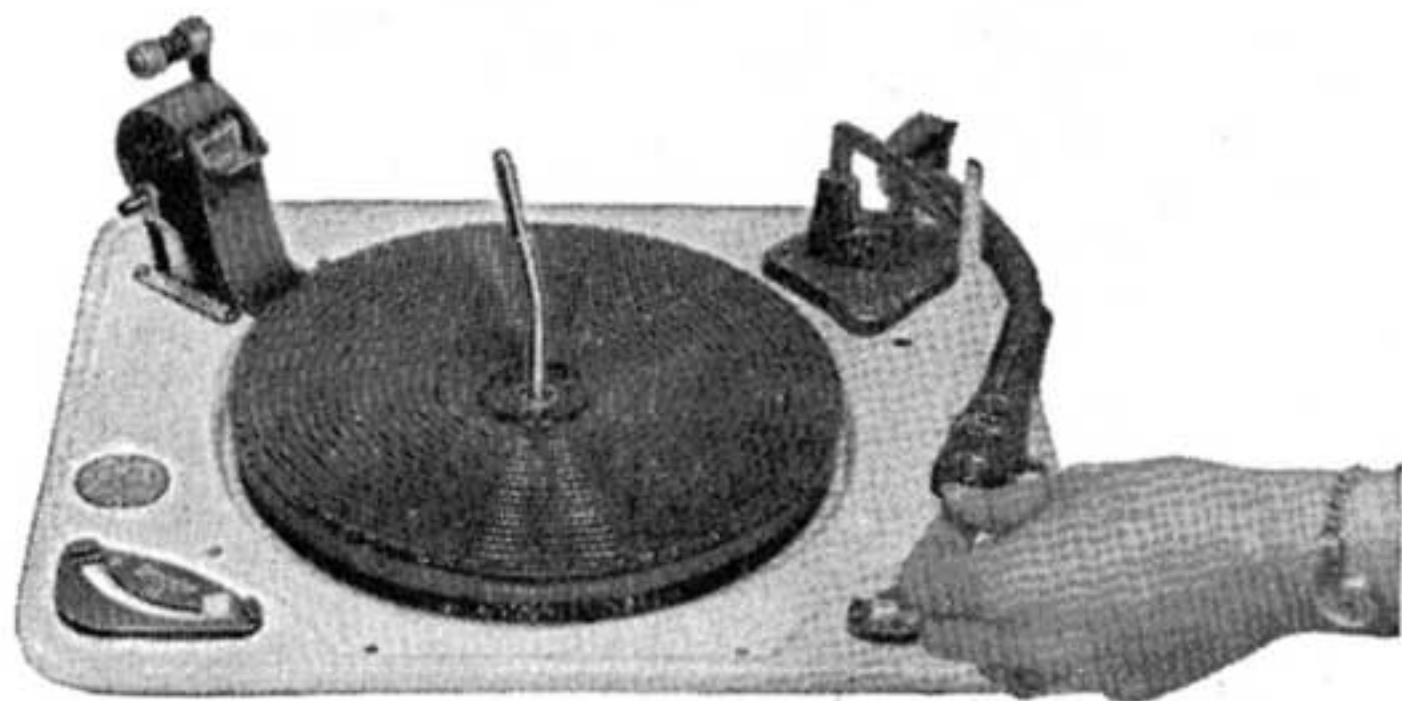
British	Australia	Canada	Holland	U.S.A.
741308	200074	507770	79585	2683039
715844	162107			
676021	157657			
673852	157656			
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Germany	Switzerland	Sweden	France	
666677	296388	144814	802949	
	290036			
	283111			

Other Patents Pending

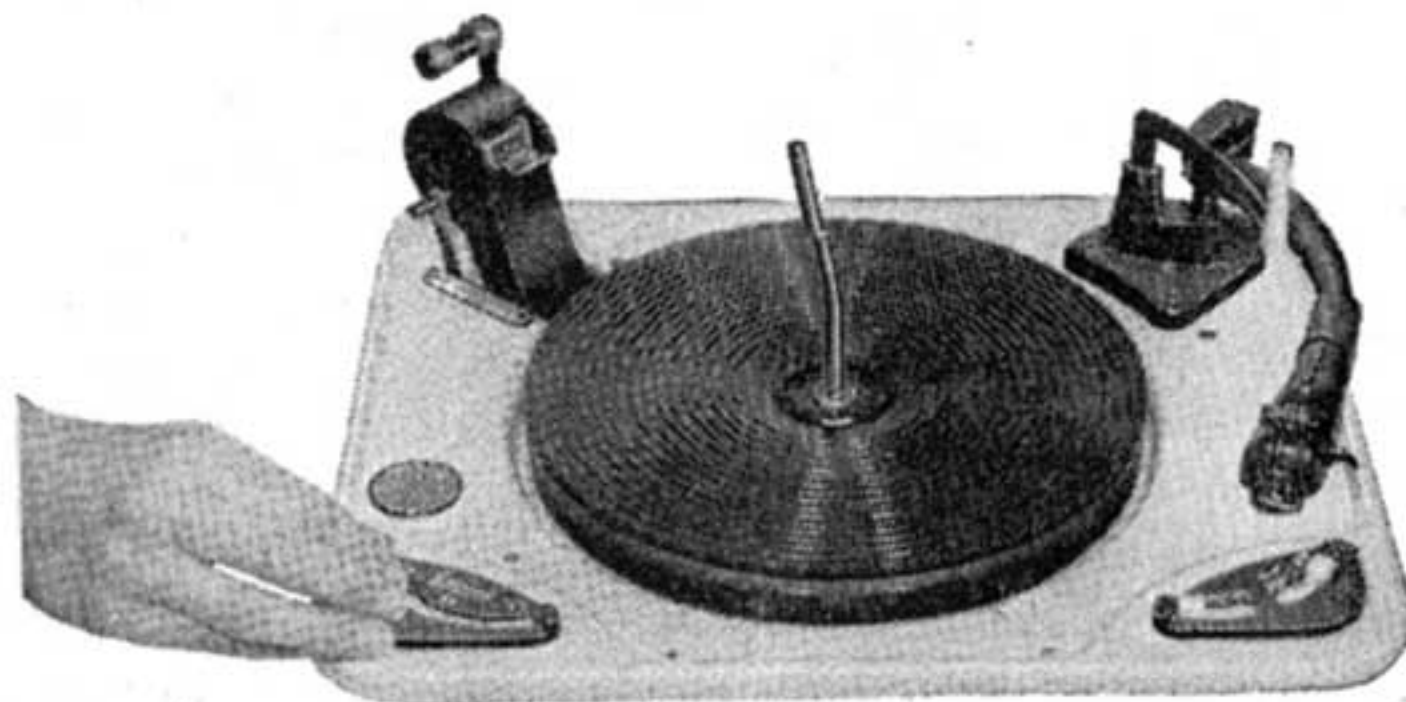
OPERATING INSTRUCTIONS

The "GARRARD" Model R.C.88/4 Record Changer will play automatically any number of records up to eight, of any one of the following types at each loading—10" or 12" at 78 r.p.m., 7", 10" or 12" at 33 $\frac{1}{3}$ r.p.m., 7" at 45 r.p.m. 7" records with large centre hole may be played using the large record spindle type LRS.3, available as an optional extra, or with centre hole clip in adaptors, available at record stores. Records may also be played manually. 16 $\frac{2}{3}$ r.p.m. records can also be played.

To OPERATE CHANGER PROCEED AS FOLLOWS—



1. Set correct stylus for type of record to be played.



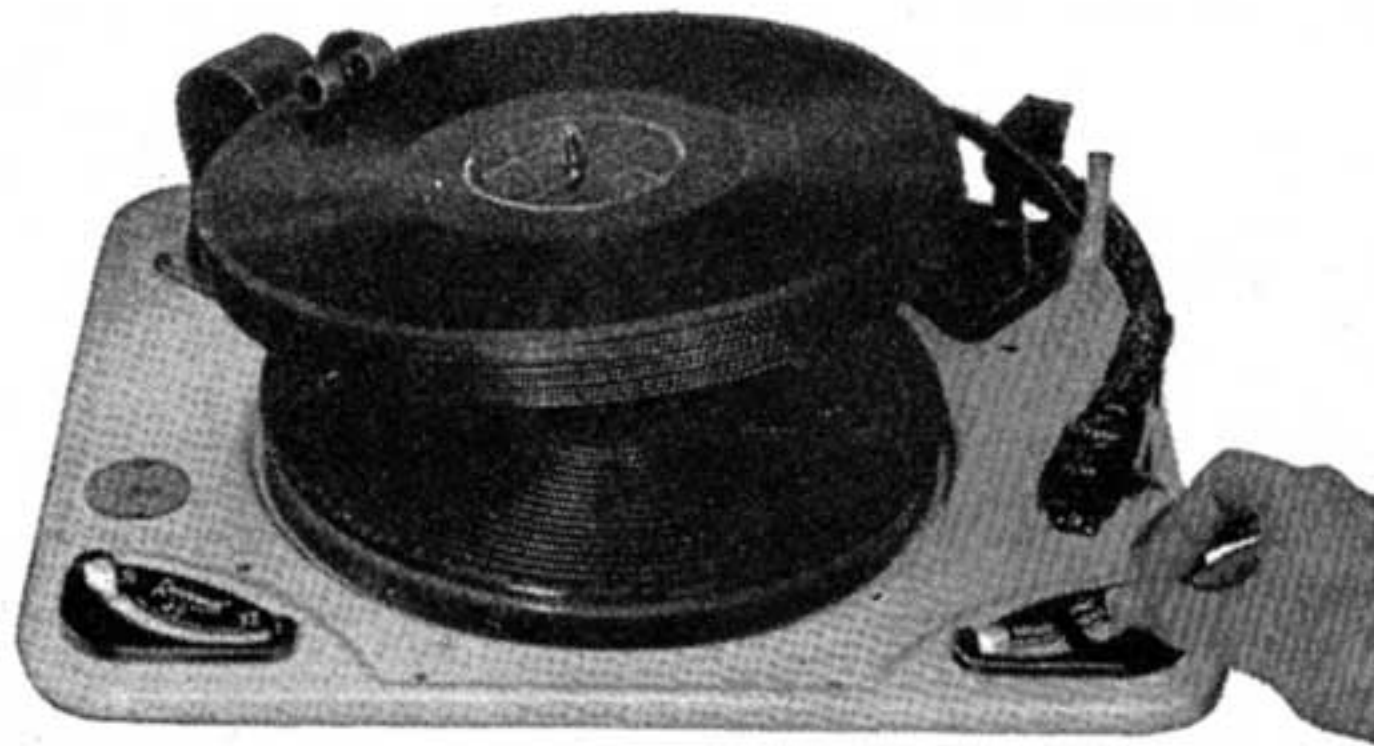
2. Move speed change knob to desired speed.



3. Set lever at side of platform to size of record to be played.



4. Place up to 8 records on record spindle and lower record clip.



5. Switch on.

NOTE: When using large record spindle. Type LRS3, for 7" 45 r.p.m. (Fine Groove) records the record clip is not lowered.

REJECT. To reject a record move the right hand knob to "REJECT" position.

STOP. If it is desired to stop the Changer before it does so automatically, move the right hand knob to "STOP" position. If this is done whilst a record is playing that record will be rejected on switching on again.

MANUAL CONTROL. The purpose of the manual control is to disconnect the changing mechanism so that single records can be played as on a single record player. To use this feature, move the Manual/Auto Knob to the Manual position, fit short spindle, supplied with unit, and switch on changer to allow the mechanism to complete its cycle. The pickup will then be free on its rest and can be handled and the unit used as a single record player. At the completion of the record the pickup will rise and return to its rest leaving the turntable revolving. To stop motor and turntable, move right hand control knob to "STOP." On switching on again time must be allowed for unit to complete cycle once again.

To return to Auto Working, move the Manual/Auto knob to Auto. If this is done while a record is playing, at the end of the record the pickup will return to the pickup rest and the auto stop will switch off the unit. If the control is moved to Auto when the pickup is on the rest, move the right hand knob to "REJECT," thus the mechanism will move into Auto working position and then automatically switch off unit.

NOTE. Should the Record Changer be stopped with the pickup arm not on its rest whilst the unit is set to Auto, the pickup should not be handled but the right hand knob should be moved to "START" when the mechanism will operate and the pickup arm will lift and return to its rest.

The pickup arm will not move from its rest unless one or more records are on the record spindle. This is a safety device designed to prevent the pickup being damaged should the Changer be switched on without being loaded with records.

PICKUP. To play 78 r.p.m. (Coarse Groove) records, the knob of the turnover pickup should show 78 or STD and for 16 $\frac{2}{3}$, 33 $\frac{1}{3}$ or 45 r.p.m. (Fine Groove) records it should show 33/45 or L.P.

RECORDS: To obtain the best results from your records care should be taken to see that records are stored and cleaned in the manner recommended by the record manufacturers. Do not leave records on the unit when not in use.

INSTALLATION

DIMENSIONS.

The cabinet space required for fitting is 15 $\frac{1}{2}$ " long x 13 $\frac{1}{4}$ " wide, with 5 $\frac{3}{4}$ " clearance above and 3 $\frac{7}{8}$ " clearance below the plate. An extra depth of 2" is required for the Universal and D.C. Models.

FITTING TO CABINET.

The motor board should be cut and drilled as shown on template enclosed with each unit. Open carton, remove cardboard packing around turntable and lift out unit by means of string loops. Remove all elastic bands and string.

The spring suspensions, which will be found packed in a bag, should be assembled to the Unit Plate, diagram 1, in four of the six holes, the two transit fixing holes are shown on diagram 9. They are designed for motor boards $\frac{1}{2}$ " thick or less but should it be necessary to use a board thicker than $\frac{1}{2}$ " the fixing

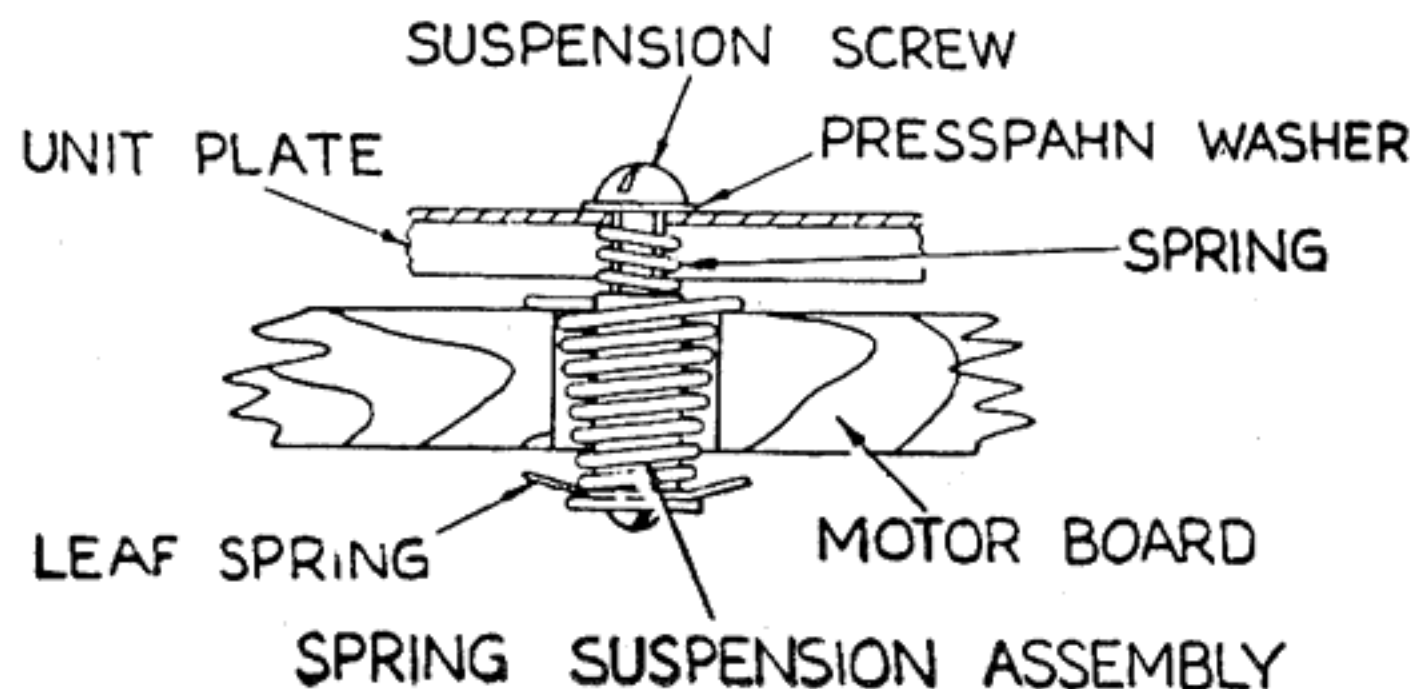


Diagram 1

holes should be recessed on the underside 1 $\frac{1}{4}$ " diameter and of sufficient depth to leave the board $\frac{1}{2}$ " thick.

A lead should be connected to the power supply block on the rear of the motor and the links in the block should be set to correspond with the voltage of the power supply, diagrams 5 to 8. Connect a length of screened pickup lead, for connection to the reproducer, to the tags on the pickup connecting strip, diagram 3, then connect a lead from the earthing tag on the motor, diagram 11, to a good earth point.

The changer should be placed in position and fixed to the motor board by pressing the spring suspension down through the holes in the motor board, the leaf springs flexing to pass through the holes. Adjustment to level the unit is made by turning each suspension screw — clockwise to lower the unit and counter clockwise to raise it.

It is essential to use the spring suspension assemblies on this model changer to prevent extraneous vibration from reaching the unit.

If the plug-in feature is to be used to change pickups, the transit screw under the pickup arm at rear of pickup should be removed. This screw should be replaced and tightened up for transit purposes only. See diagram 2.

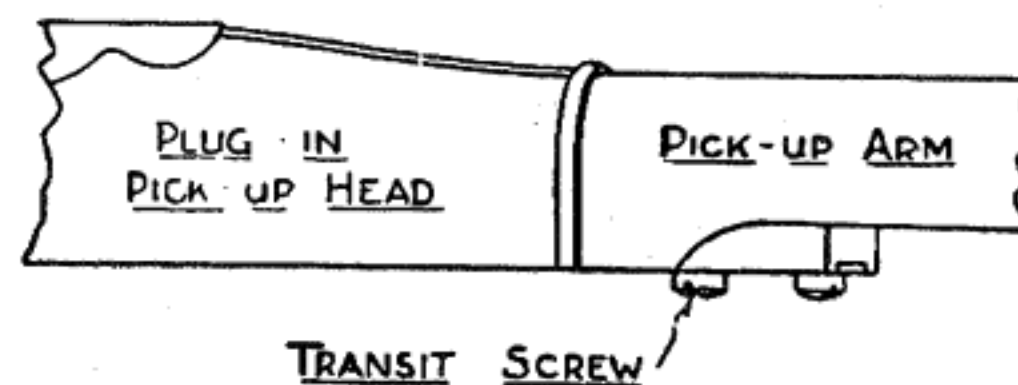
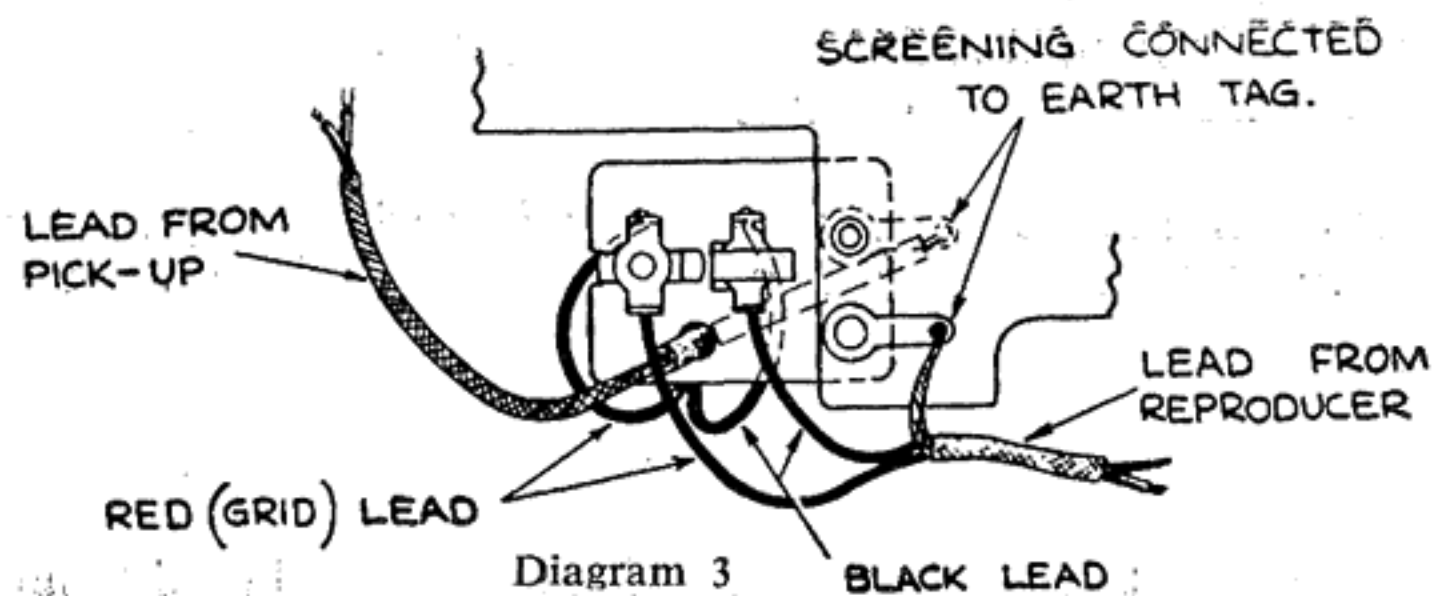
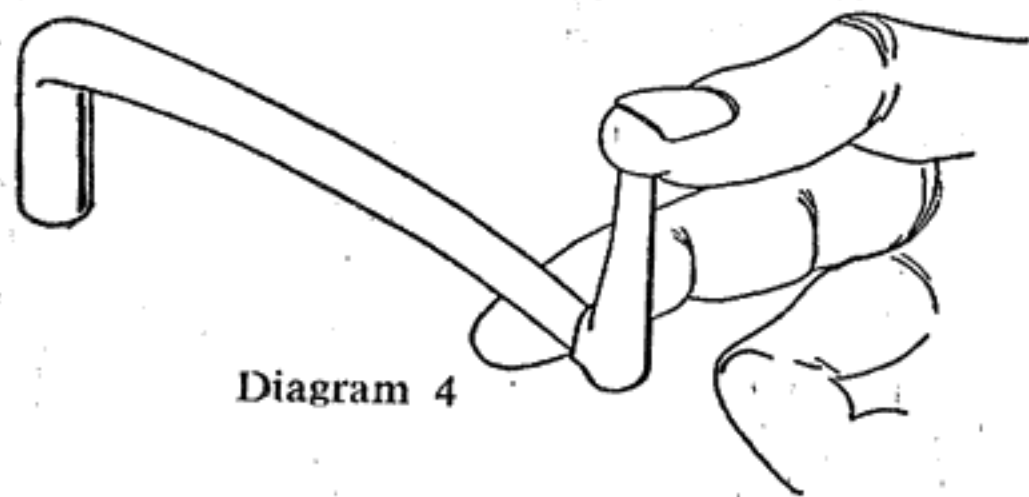


Diagram 2



To facilitate packing, the plastic selector arm extension is removed and packed separately in an envelope. When the unit is finally in position the extension should be fitted on the selector arm and pressed into position while supporting the arm as shown in diagram 4.



TRANSIT SCREWS.

Two copper plated wood screws are supplied for use in clamping the changer to the motor board for transit purposes. The small presspahn washers should be fitted under these screws to prevent marking the unit plate. These screws must be removed before using the Record Changer. The position of the transit screws are shown on diagram 9.

VOLTAGE AND FREQUENCY.

The Garrard R.C.88/4/A.C. Record Changer is suitable for use on either 100/130 volts or 200/250 volts AC, 50 or 60 cycles according to the motor pulley fitted. A motor driving pulley can be supplied for 50 or 60 cycle power supply as required. The links in the power supply terminal block should be set to correspond to the voltage of the power supply as shown in diagram 5.

The model R.C. 88/4/D.C. Record Changer is suitable for use on 100/130 and 200/250 volts direct current only and the link on the terminal block should be set to the correct position to correspond to the voltage of the power supply, as diagram 6. Models also available for low voltage.

The Model R.C. 88/4/Univ. Record Changer is suitable for use on 100/130 and 200/250 volts D.C. and A.C. 25/100 cycles with rectifier supplied. The links on the terminal block should be set to the correct position to correspond to the voltage of the power supply, if A.C. as diagram 7 or if D.C. as diagram 8.

The speed of the Univ. and D.C. motors is governor controlled and information for adjusting the speed will be found under "Service Adjustments."

As supplied, the mains dropping resistance on the D.C. and A.C./D.C. Models is fixed to the underside of the unit plate which tends to warm up from the heat dissipated by the resistance. It is therefore recommended that where convenient the resistance should be removed from the unit plate and fixed by two wood screws to an adjacent cabinet side, the lead from the motor to the resistance being sufficiently long to allow this to be done.

The motor should be earthed by connecting a lead from the earthing tag (located under one of the end cover screws) to a good earth connection.

The moulded cover on the terminal block is coloured to distinguish the type of motor.

BROWN—Motor for A.C. only.

BLUE—Motor for D.C. only.

GREEN—Low voltage D.C. motor only.

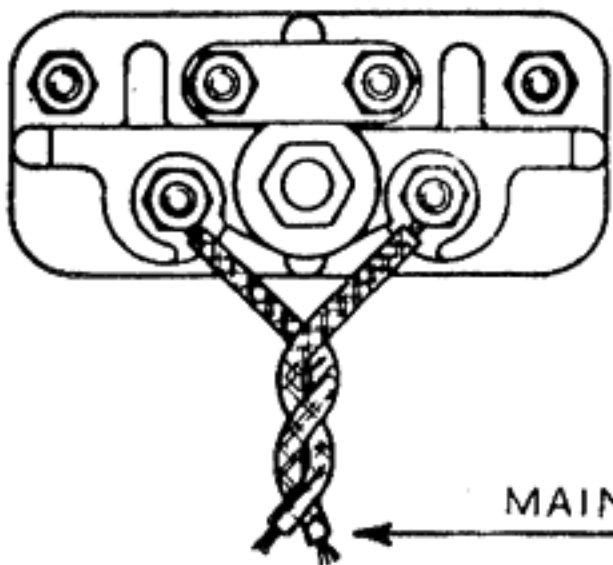
RED—Universal motor for A.C. or D.C.

If the record changer is to be used with a radio set or amplifier having a Universal (A.C./D.C.) chassis or if the reproducer is a battery set coupled to a Universal H.T. battery eliminator, it is essential to make sure that isolating components (condensers or transformers) are incorporated in the pickup input circuit in the set otherwise the pickup circuit can become "live."

Should the isolating components not be included in the set they should be fitted externally in series with the pickup leads. Consult your radio dealer if in doubt.

LINK CONNECTIONS FOR A.C. MODEL

CONNECT BOTH BARS
THUS FOR
200/250 Volts A.C.



CONNECT BARS
THUS FOR
100/130 Volts A.C.

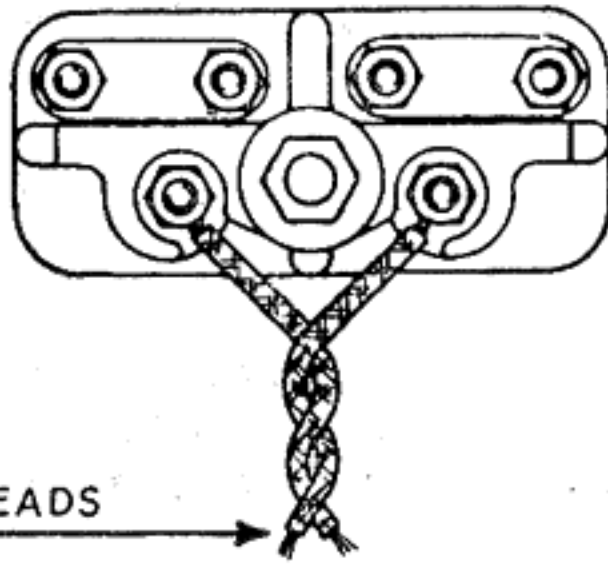
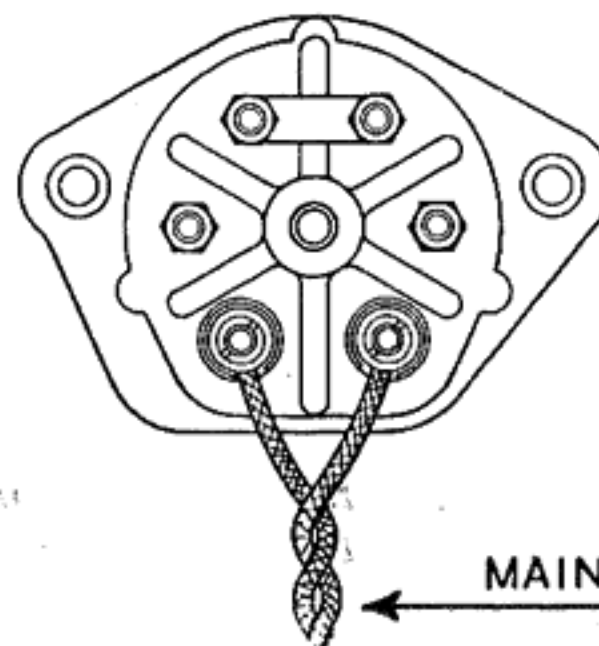


Diagram 5

LINK CONNECTION FOR D.C. MODEL

CONNECT BAR
THUS FOR
200/250 Volts D.C.



CONNECT BAR
THUS FOR
100/130 Volts D.C.

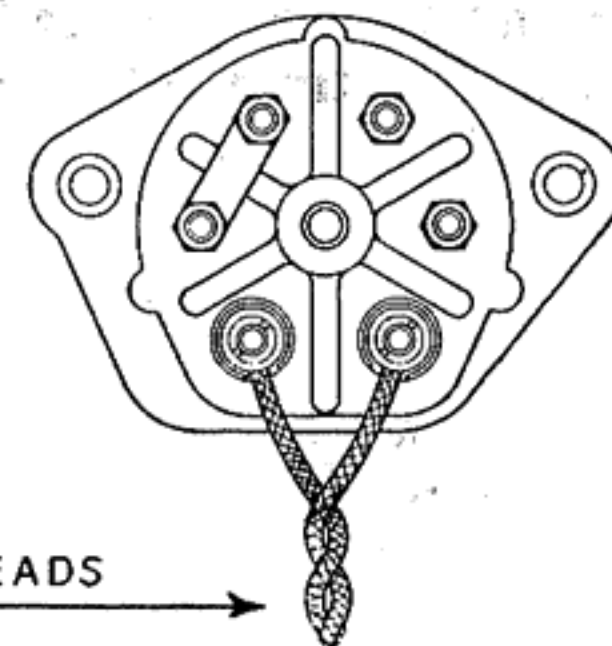
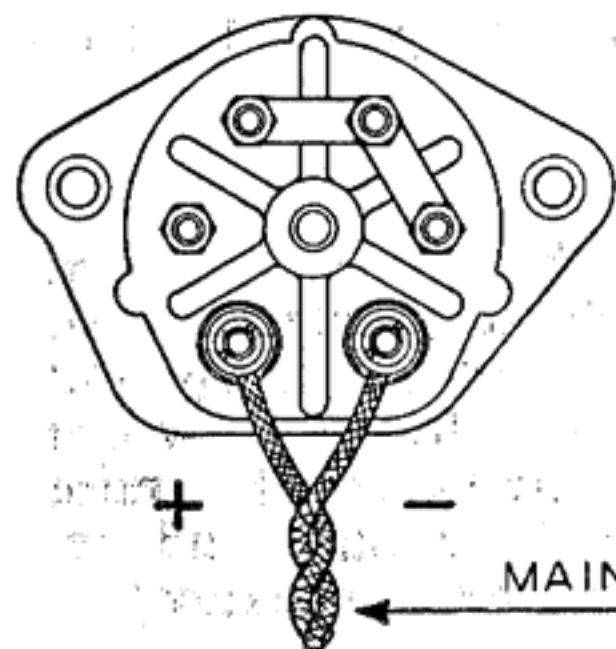


Diagram 6

LINK CONNECTIONS FOR UNIVERSAL MODEL

CONNECT BARS
THUS FOR
200/250 Volts A.C.



CONNECT BARS
THUS FOR
100/130 Volts A.C.

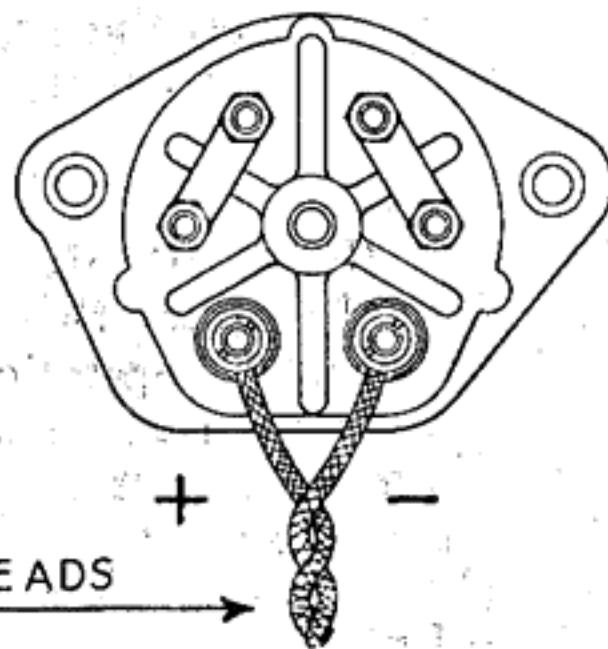
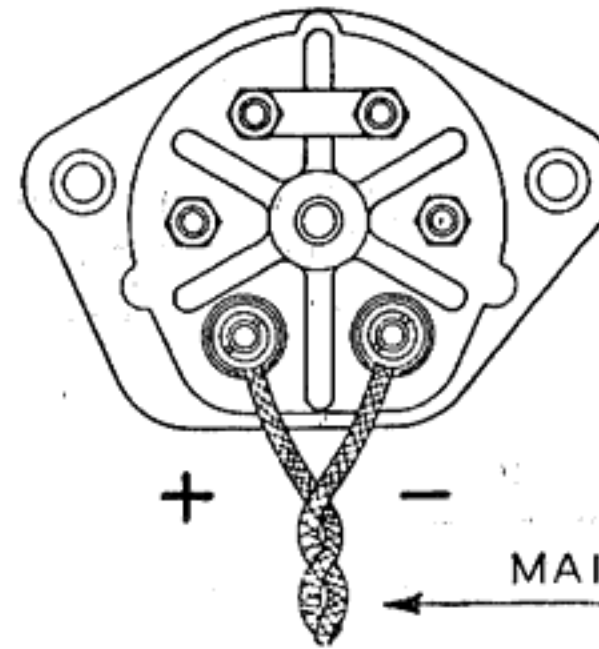


Diagram 7

CONNECT BOTH BARS
TOGETHER THUS FOR
200/250 Volts D.C.



CONNECT BOTH BARS
TOGETHER THUS FOR
100/130 Volts D.C.

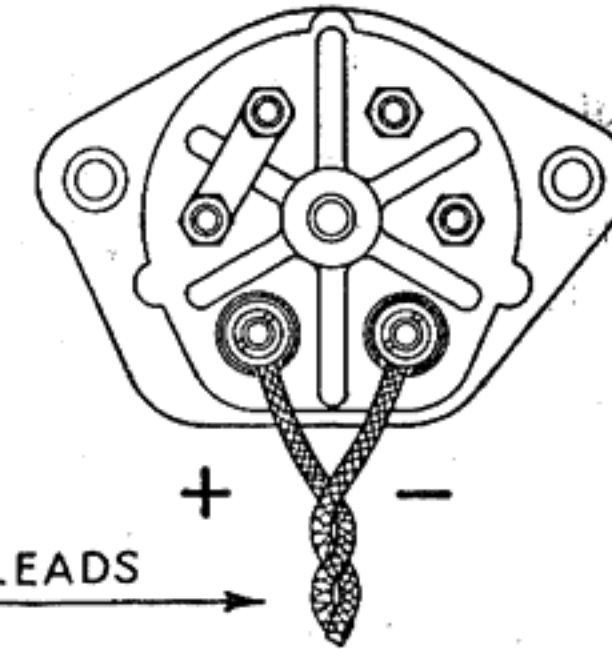


Diagram 8

MAINTENANCE

The motor and intermediate wheel bearings are of the oil retaining type and rarely need lubricating; when the need for oil is apparent, hold the intermediate wheel out of the way and lubricate the top motor bearing with a fine grade of machine oil. Carefully remove all traces of surplus oil before running. The

intermediate wheel rubber tyre, motor pulley and inside of turntable rim must be kept free of oil.

To lift off turntable remove the retaining clip, diagram 9, and the turntable can then be removed by carefully lifting with equal pressure on diametrically opposite sides. Turntable should be replaced with the changer in switched off position.

SERVICE ADJUSTMENTS

These notes are included to help the owner of the Record Changer make any minor adjustments that may become necessary. When making any adjustments, fit the protecting clip to the pickup, or, if the turnover knob has a safety mid-position, turn it to this position to protect the sapphire styli from possible damage.

SPEED.

The Model R.C. 88/4 motor is designed to give the desired turntable speed within close tolerances. Should the turntable run excessively fast or slow and the speed change knob is set correctly, examine the motor pulley to see if it is the correct one to suit the frequency of the power supply.

To assist identification the motor pulley is colour finished as follows to distinguish the two types.

Nickel	-	50 cycles
Brass	-	60 cycles

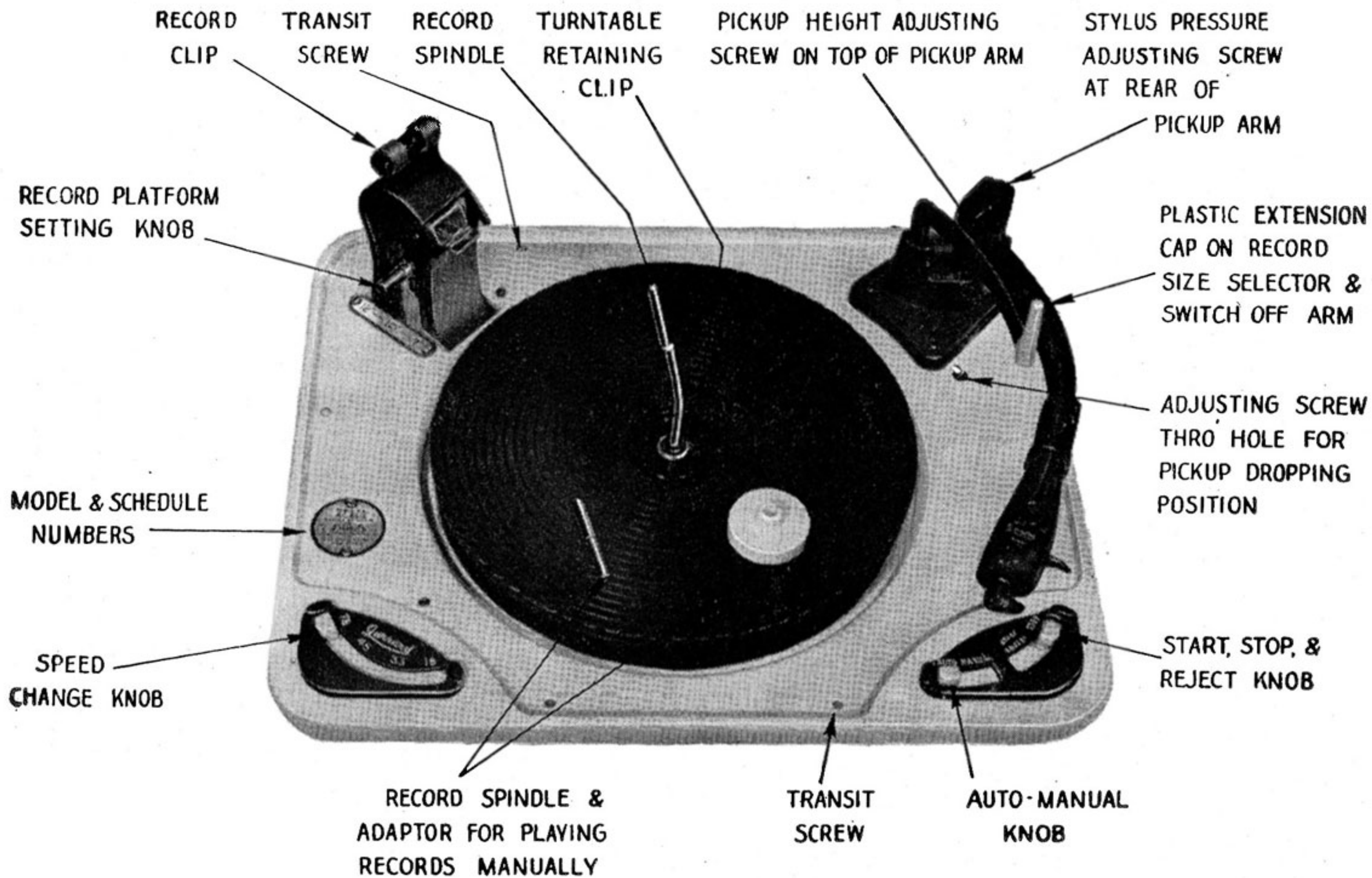
The motor pulley used on the D.C. and Universal motors is always nickel plated.

The speed of the R.C. 88/4 D.C., Univ. and low voltage models is governor controlled. The governor is located at the lower end of the motor, being screwed on to the armature shaft and held in position by a set screw through the governor collar. To adjust the speed, loosen the screw in the governor and turn the governor a very small amount clockwise to increase the speed, or counter-clockwise to reduce it. Tighten the screw before running the motor to check the speed.

SPEED VARIATION.

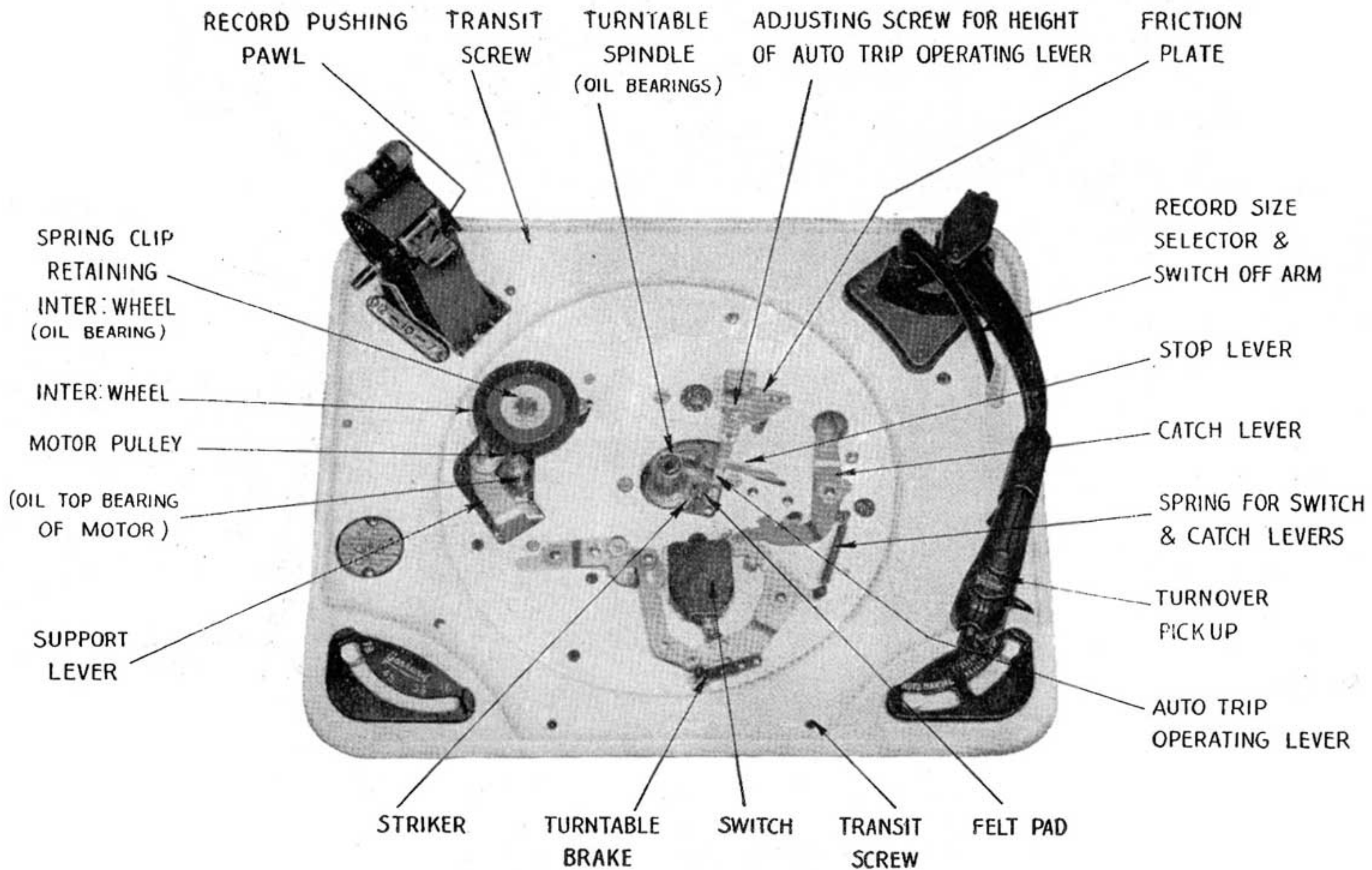
Should the speed vary during playing, remove the turntable as described under "MAINTENANCE" and examine the motor pulley intermediate wheel and inside of turntable rim for traces of oil and if necessary wipe thoroughly with a clean cloth. Also check that the motor pulley is in its correct position on the motor shaft; switch the Changer on and see that the inter-wheel runs in the centre of the appropriate step on the pulley and does not foul the side of the adjacent step. If necessary, loosen the screws holding pulley to shaft and move to its correct position.

See that the turntable spindle has a small amount of end play. To check this, with the turntable removed grip the turntable spindle firmly, lifting it up and down. If no movement is felt, loosen the screws which hold the fixed portion of the turntable spindle, raise the turntable spindle a very small amount and re-tighten the screws. There should be approximately 0.005" end play.



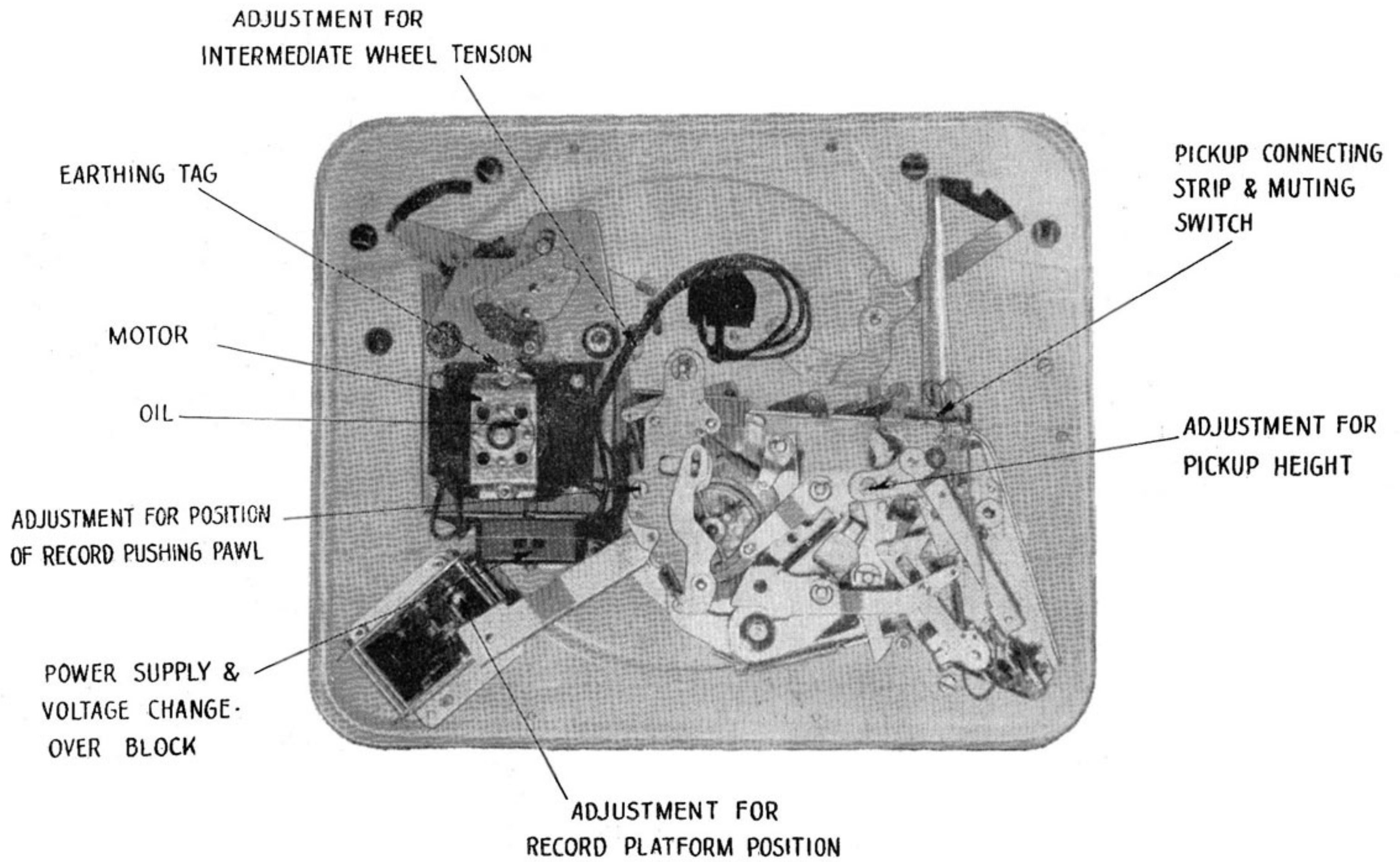
Top View of RC.88/4

Diagram 9



Top View with Turntable removed

Diagram 10



Underside View of RC.88/4

Diagram 11

MOTORS.

If the motor fails to start when the Changer is switched on, first check the power supply to see if current is reaching the motor. If correct, switch off the power supply and examine the blades in the switch block to see that they are clean and are making good contact when the switch is in the "ON" position. Clean and adjust if necessary. Check that all connections in the power supply circuit are tight and secure.

See that the motor shaft is free; if it is not, try lubricating with very thin oil and spinning the shaft. THICK OIL must NOT be used.

Should the motor momentarily start and then stop when switching on, lift off the turntable and examine the levers on top of the unit plate that are moved by the START/STOP/REJECT knob. Ensure that they are quite free and not sticky with congealed oil or foreign matter and that the spring is correctly in position. See diagram 10.

If the motor appears to run too hot check that the voltage changeover links in the power supply and changeover block are set correctly to correspond to the voltage of the power supply, diagrams 5 to 8.



Diagram 12

If correct check the motor windings by inserting an AC ammeter in either motor lead.

The maximum current consumption of the R.C.88/4 A.C. should not exceed 0.26 amp. on 100/130 volts 50/60 cycles, or 0.13 amp. on 200/250 volts 50/60 cycles. On the R.C.88/4/Univ. the current should not exceed 0.14 amp. A.C. and 0.18 amp. D.C. on 100/130 volts or 0.2 amp. A.C. and 0.25 amp. D.C. on 200/250 volts. On the R.C.88/4/D.C. the current should not exceed 0.18 amp. on 100/130 volts or 0.25 amp. on 200/250 volts. On the low voltage 12 volt model the current should not exceed 1.1 amps, or the 6 volt model 2 amps.

If readings in excess of the above figures are obtained, the motor should be returned for examination.

PICKUP DROPPING POSITION.

The pickup arm dropping position is factory set for optimum accuracy but should any minor adjustment be required to accommodate abnormal records rotate the screw accessible through the hole in the unit plate as shown in diagram 9. This adjustment can only be made with the pickup arm on its rest.

PICKUP HEIGHT.

The distance the pickup lifts can be adjusted by turning the screw on top of pickup arm, diagram 12, with a small screwdriver. Eight 12" 78 r.p.m. (Coarse Groove) records should be placed on the turntable and the pickup height adjusted so that as the pickup returns to the rest on completion of the top record the tip of the pickup stylus clears the record surface by $\frac{1}{8}$ ".

If found necessary further adjustment may be obtained by turning screw accessible underneath changer, diagram 11.

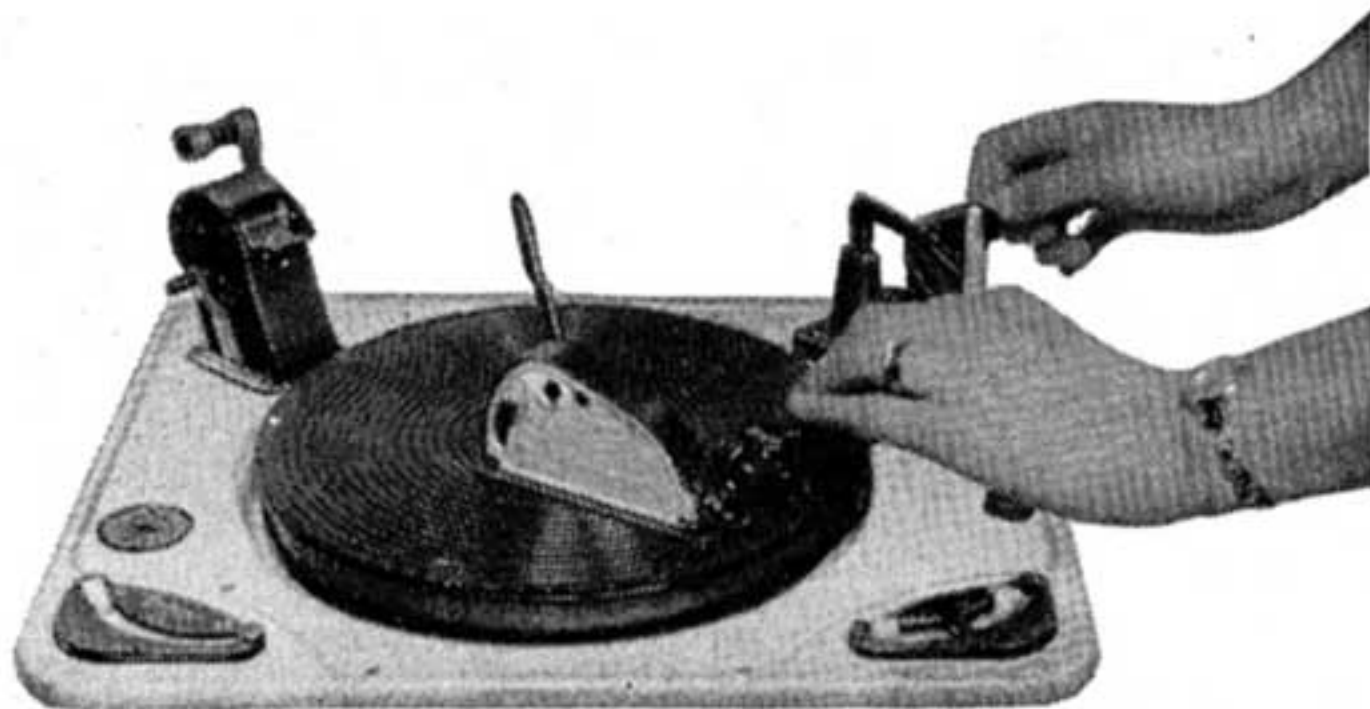


Diagram 13

PICKUP STYLUS PRESSURE.

The recommended stylus pressure for playing records should be 10 grammes and it is strongly recommended that an occasional check be made with a "GARRARD" Stylus Pressure Gauge obtainable from your dealer. To adjust the stylus pressure turn the screw at the rear of the pickup arm, diagram 13, clockwise to reduce pressure and counter-clockwise to increase it.

PICKUP TRACKING.

Should there be a tendency for the pickup to track incorrectly, especially on the first record, check the stylus pressure and if required adjust as explained under 'Pickup Stylus Pressure.'

If the pickup does not run into the record groove after alighting on the record edge, see that the record changer is level by placing a spirit level on a record on the turntable. Also make sure that the flexible wire leading to the pickup is not twisted or held in such a manner as to prevent the free movement of the pickup arm; further, see that the associated levers are free.

CAUTION.

When making any adjustments to the Pickup Arm it should NEVER on any account be forced into position. If the turntable is turned by hand it should NOT be turned backwards.

PICKUP HEADS.

Two types of stylus are necessary for playing the different types of record, a stylus having a point radius of 0.0025" for standard (Coarse Groove) 78 r.p.m. records and one with a point radius of 0.001" for 16 $\frac{2}{3}$, 33 $\frac{1}{3}$ and 45 r.p.m. microgroove (Fine Groove) records. To obviate stylus changing two plug-in pickup heads can be used or a turnover type pickup having two styli can be fitted.

Should a pickup be used, which was not supplied with the Changer it may be necessary to reset the stylus pressure, pickup height and dropping position.

Care must be taken never to use the Microgroove (Fine Groove) stylus on 78 r.p.m. (Coarse Groove) records and vice versa. Turnover pickups are set correctly when the type or speed of record is showing on top of the turnover knob. Should there be an arrow on the knob it indicates the direction in which the knob should be turned when a change is required. Some pickups use a colour code to indicate the type of record it is designed to play — usually green for 78 r.p.m. (Coarse Groove) and red for 16 $\frac{2}{3}$, 33 $\frac{1}{3}$ and 45 r.p.m. (Fine Groove) records.

Should trouble be experienced with the reproduction from a pickup it should be returned to the manufacturer whose name or trade mark appears on the cartridge.

NOTE.

A continuity test cannot be carried out on crystal cartridges with an ohmmeter. Pickup cartridges must not be opened or the manufacturer will disclaim all responsibility.

PICKUP MUTING SWITCH.

A Pickup Muting Switch is connected across the pickup to short circuit the pickup during the time that the changing mechanism is in action. Diagram 11.

AUTO-TRIP MECHANISM.

The auto trip mechanism is the velocity type, that is, it operates by the quick inward movement of the pickup arm when the pickup reaches the run off groove at the end of the record. It is of a special patented design to be very light and sensitive in operation and is set to commence operation when the stylus reaches a $2\frac{1}{8}$ " radius from the centre. If the auto trip fails to operate the pickup will remain running in the centre of the record and to correct this remove the turntable and raise the auto trip operating lever by giving the "adjusting screw for height of auto trip operating lever," diagram 10, about half a turn in a clockwise direction. This will raise the auto-trip operating lever and enable it to engage the cam on the striker when the pickup runs into the record run-off groove.

TEMPLATE FOR R.C.88/4 RECORD SPINDLE.

Should the sloping record spindle be accidentally bent out of position through being dropped, or other reasons, the record dropping will be affected. If trouble is experienced with erratic record dropping, lay the record spindle on the template, diagram 14, and check that it conforms to the shape thereof.

RECORD DROPPING.

If the changer fails to drop records other than the 45 r.p.m. type having a large centre hole, first make sure that the records are not badly warped. If they are reasonably flat, the record pushing pawl setting should be checked and adjustments made if necessary. To adjust the position of the record pushing pawl, the eccentric pin accessible under the unit plate (see diagram 11) should be turned with a screwdriver. Also check the record spindle by laying it on the template (diagram 14) to see that it is not bent out of position.

Should records fail to drop correctly when using the large diameter record spindle type LRS.3, replace this spindle with the sloping one and see that it leans towards the record platform and is directly in line with it. If this spindle is out of position, it should be set correctly by loosening the two 4BA screws in the base of the turntable spindle housing and which hold the fixed part of the turntable spindle in position. Turn the record spindle until it is in line with the centre of the record platform and retighten the screws. After tightening the screws, see that the turntable spindle has a slight amount of end play, as described under "Speed Variation" (Page 8) and adjust if necessary.

Should the record changer stall just before a record drops on to the turntable, the cause may be due to lack of lubrication of the Switch Off and Selector Arm mechanism. Thin grease should be applied to the pin on the cam which moves the lever controlling this mechanism. Check the tracks in the cam unit and if they are dry, lubricate them with a thin smear of light grease, also grease the cam followers on the levers.



Diagram 14

SPARE PARTS LIST FOR RC88/4

The Schedule Number printed on the name plate of the Record Changer is changed whenever non-interchangeable variations are introduced into the mechanism. It is therefore essential when ordering spare parts to quote the Schedule Number of the Record Changer as well as the Reference Number of the part required.

Name of Part	Ref. No.	Name of Part	Ref. No.
Record Spindle (Sloping)	B.52764	Fixing Nut	A.41012
Record Spindle (Large) Type LRS3 ...	B.52950	Cover for Switch Block	A.51327
Record Spindle (Manual)	A.51347	Fixing Screw	A.40343
Adaptor for 45 r.p.m. records	A.50391	Switch Contact Spring	A.41686
Turntable	C.52406	Rotor Spindle with Rotor	A.48319
Rubber Mat	C.51286	Garrard MPM/2 Multi Purpose Plug-in Pickup Case Assembly (less cartridge) with open front for turnover cartridges	A.52225
Pickup Arm	B.52900	Garrard MPM/2 Multi Purpose Plug-in Pickup Case Assembly (less cartridge) with closed front for turnround or single purpose cartridges	A.52226
Intermediate Rubber Drive Wheel	A.53884		
Motor Pulley 50 cycles	A.53950		
Motor Pulley 60 cycles	A.53951		
Cover for Changeover Block (A.C. Units) ...	B.51161		

REPLACEMENT STYLI

For **Garrard GC2 and GCE4 Turnover Pickups-**

(Check make of pickup cartridge before obtaining replacement styli as other pickups are sometimes fitted to Garrard Units).

GC2/3 Sapphire Stylus (Green) for 78 r.p.m. (Coarse Groove) records.

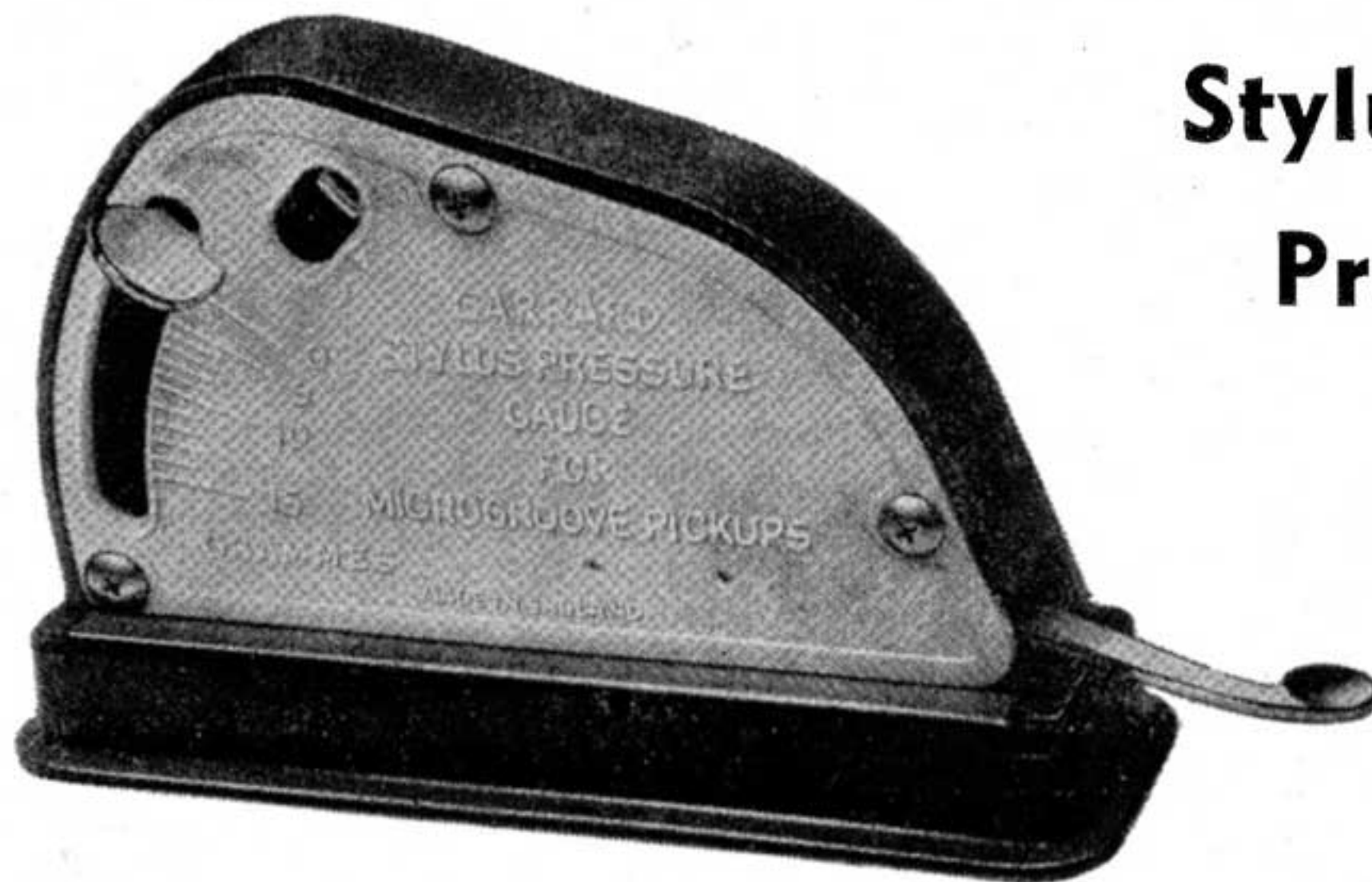
GC2/3D Diamond Stylus (Green) for 78 r.p.m. (Coarse Groove) records.

GC2/1 Sapphire Stylus (Red) for microgroove (Fine Groove) records.

GC2/1D Diamond Stylus (Red) for microgroove (Fine Groove) records.



The GARRARD



Stylus Pressure Gauge

MODEL SPG 2

This Gauge, having a range of 0 to 15 grammes, provides a simple, accurate and inexpensive instrument for measuring the stylus pressure of pickups for playing Microgroove (Fine Groove) Records.

The slide off base, containing a spirit level for checking the level of the turntable, should be fitted when used with a record changer as this will give the pressure at $\frac{1}{2}$ " above the turntable and thus the mean reading for a stack of records as used on record changers.

With the base removed the reading is taken as near as possible to the turntable top, the stylus pressure thus being measured at the equivalent height of one record.

To prevent excessive record wear when playing Microgroove (Fine Groove) Records, the turntable should be quite level and stylus pressure not exceed 10 grammes.

Protect your records by making a periodical check of stylus pressure and adjusting counter-balance if necessary. Obtainable with or without slide off base.

EVERY GRAMOPHONE ENTHUSIAST AND RADIO SERVICE MAN SHOULD POSSESS ONE OF THESE GAUGES



Garrard

GRAMOPHONE EQUIPMENT

FOR

QUALITY

REPRODUCTION

