

Sparton

"RADIO'S RICHEST VOICE"

SERVICE NOTES

P-51

RECORD CHANGER

AS USED IN 1946-47 MODELS

Price 25 cents

SPARTON OF CANADA

SERVICE DEPT.

LONDON — ONTARIO

PARTS LIST

P-51

Key No.	DESCRIPTION
05087	Shipping Shim Assembly-----
07321	Spindle Gear Assembly-----
07329	Starting Lever Assembly-----
07330	Shelf Crank and Link Assembly-----
07332	Main Cam Rivet Assembly-----
07343	P. U. Socket Assembly-----
09217	Mounting Spring Assembly-----
13410	Turntable Drive Shaft and Bracket Assembly-----
13412	Auto Stop Switch and Bracket Assembly-----
13413	Record Support Shelf and Cover Assembly-----
13414	Tie plate Assembly-----
13434	Tone Arm Assembly-----
13435	Turntable-----
13510	Control Knob Assembly-----
13540	Drive Shaft and Gear Assembly-----
13544	Shelf Cover Arm & Record Hold-Down Rubber Assembly-----
13583	Idler Pulley used with Alliance Motor (see Fig. 3 page 3)
13584	Idler Pulley used with General Ind. Motor (see Fig. 3 page 3)
13613	Adjustable Changer Rack-----
15117	Trip Finger Assembly-----
15120	Spindle Assembly-----
15123	Tone Arm Support Tube & Bracket Assembly-----
15127	Record Support and Crank (R. H.)-----
15128	Record Support and Crank (L. H.)-----
17115	Plunger and Shelf Assembly-----
27239	Shielded P. U. Lead Wire-----
36127	Mounting Spring Cup-----
36137	Mounting Spring Retainer Nut-----
36347	#0 x 1/4" Drive Screw-----
36843	1/4"-28 x 2 3/8 HHM Bolt-----
36844	1/4"-28 Hex Half Nut-----
36845	#10 Flat Washer 3/4 OD-----
36847	Driv-Lok Pin Type B 5/64" Dia x 7/16" Lg-----
36848	6-32 x 3/8" Bristol Set Screw-----
36849	H. P. Cotter-----
36865	#10-24 x 1/2" HHMS-----
36878	Flat Washer-----
36882	H. P. Cotter-----
36888	#10-32 x 1" Bolt-----
36914	#10-32 x 2 1/4 Carriage Bolt-----
36934	H. P. Cotter-----
36949	3/8"-24 Std. Hex Nut-----
37066	10-32 Acorn Palnut-----
37067	Flat Washer-----
37157	Tubular Rivet .085 x 1/4"-----
37176	4-32 x 13/32 RHMS-----
37179	Flat Washer 7/8 OD x 1/16 thick-----
41107	Record Changer Mounting and Shipping Kit-----
41117	Kit of 12 Paper Washers #60438-----
44038	Phono Motor for 60 cycles-----
50204	Cork Washer 3/4" OD-----
54100	Spacer-----
54108	Tone Arm Crank-----
55179	Pin-----
56959	Thrust Bearing-----
56975	Record Plunger Rocker Arm-----
57158	Record Support Shelf-----
57160	Bracket-----
59164	Record Support Post-----
59165	Tone Arm Support-----
59166	Escutcheon-----
59175	Tone Arm Housing-----
59176	Shelf Cover-----
60297	Cork Washer-----
60438	Order by Kit (see #41117)-----
62086	Starting Lever Bumper-----
62094	Starting Lever Sleeve-----
62096	P. U. Damping Shim-----
64014	Upper Mounting Spring-----
64298	Tone Arm Lift Lever Spring-----
64301	Hold-Down Spring Record Support Post-----
64302	Interceptor Shaft Spring-----
64322	Record Lift Lever Spring-----
64324	Spring-----
64325	Tone Arm Return Lever Spring-----
64326	Tone Arm Brake Spring-----

PARTS LIST

P-51

Key No.	DESCRIPTION
64327	Reject Rod
64329	Plunger Rocker Spring
64330	Shelf Link Spring
64343	Tone Arm Spring
64356	Lower Mounting Spring
71214	Crystal Astatic
90145	Switch
92189	Felt Washer
561312	Spring
561317	Interceptor Shaft
561320	Tone Arm Lift Rod
561321	Shelf Post
561327	Trip Finger Spacer
561331	Indexing Spring
561332	Shelf Lever, Spacer
561333	Shelf Cover Spring
561335	Record Ejector Lever
561337	Tone Arm Hinge Pin
561338	Spacer
561340	Wave Washer
561341	Record Support Post Cover
561342	Shelf Crank Rivet
561347	Pin
561348	Spacer
561349	Spacer
561350	Tie Plate Mtg. Spacer
561351	Main Cam Tube
561354	Tone Arm Return Lever
561368	Turntable Drive Shaft
561402	Auto Stop Switch Cover
561403	Turntable Stop Washer
561404	P. U. Spacer
2000-209	#8-32 x 3/8" RHMS
2000-313	#10-32 x 1/2" RHMS
2000-327	#10-32 x 1 1/2" RHMS
2000-329	#10-32 x 1 3/4" RHMS
2000-330	#10-32 x 1 7/8" RHMS
2012-151	#6-32 x 1/8 Bdg. HMS
2012-157	#6-32 x 5/16" Bdg. HMS
2012-161	#6-32 x 7/16" Bdg. HMS
2012-209	#8-32 x 3/8 Bdg. HMS
2015-007	#10-32 Std. Hex Nut
2017-005	#10 Std. Flat Washer
2019-007	1/4" SP Int. Lockwasher
2019-045	#8 SP Ext. Lockwasher
2019-046	#10 SP Ext. Lockwasher

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FOREWORD

Due to the fact that a thorough understanding of the proper operation of a record changer is necessary before any attempt be made to repair or effect service adjustments, a description of the change cycle of the P-51 Record Changer is given.

The Record Shelf is set for the size record to be played by turning the Shelf to the position having the shortest distance from the Spindle for 10 inch records and to the position having the greatest

distance from the Spindle for 12 inch records. Then the correct number of records should be placed on the shelf. (Twelve 10" or ten 12" but not mixed). Do not turn the Record Shelf until the changer has stopped automatically after all the records are dropped or removed from the Record Shelves.

Badly chipped records or records with breaks should not be used.

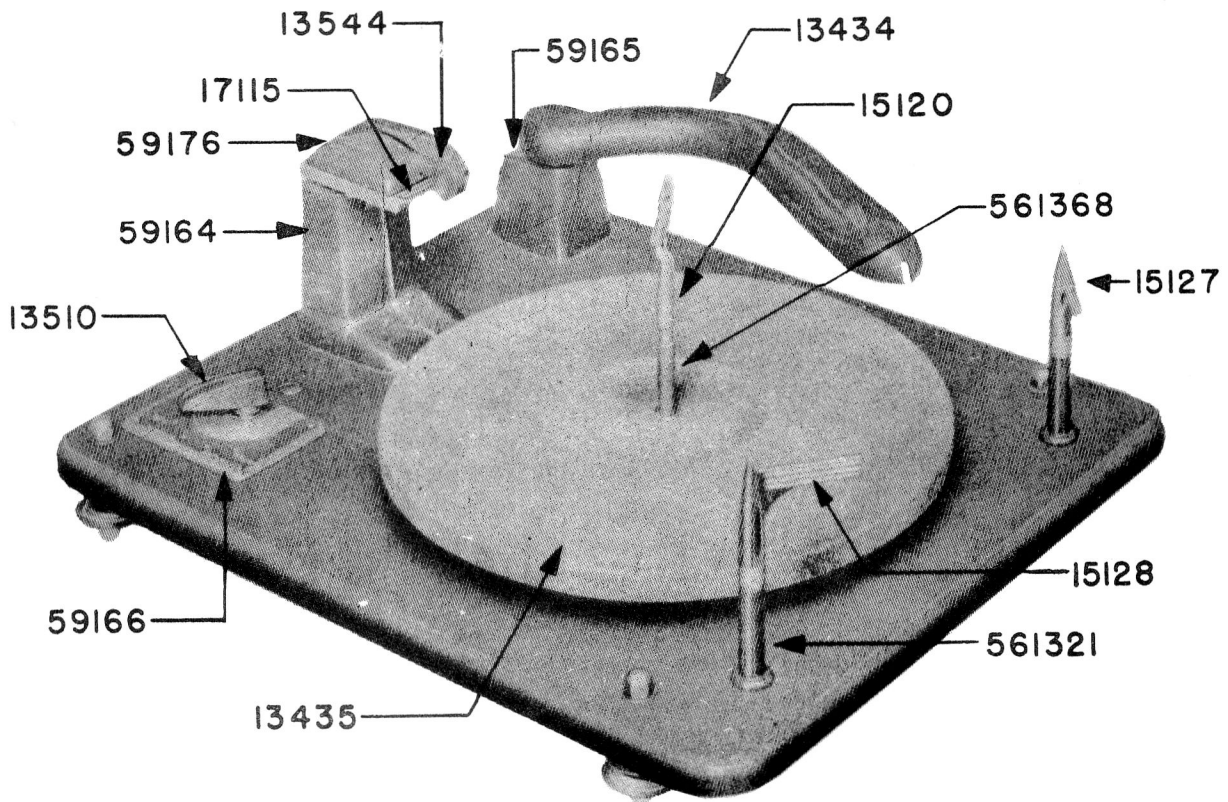


FIGURE 1

TOP VIEW OF P-51 RECORD CHANGER

- 13434 Tone Arm Assembly
- 13435 Turntable
- 13510 Control Knob Assembly
- 13544 Shelf Cover and Record Hold-Down Rubber Assembly
- 15120 Spindle Assembly
- 15127 Record Support and Crank Assembly (R.H.)
- 15128 Record Support and Crank Assembly (L.H.)
- 17115 Plunger and Shelf Assembly
- 59164 Record Support Post
- 59165 Tone Arm Support
- 59166 Escutcheon
- 59176 Shelf Cover
- 561321 Shelf Post
- 561368 Turntable Drive Shaft

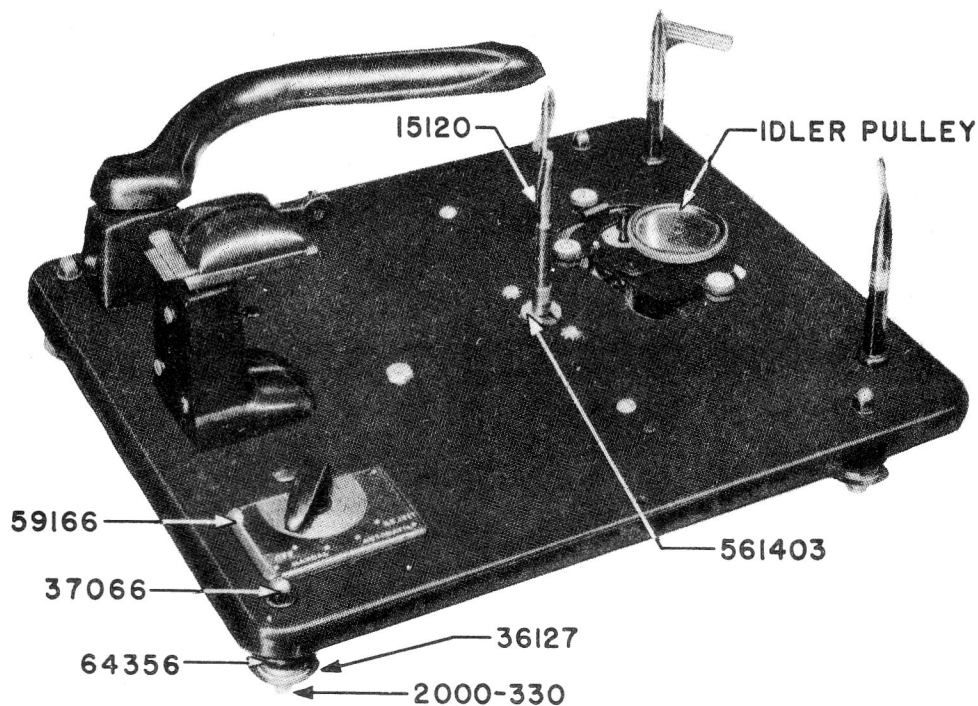


FIGURE 2
TOP VIEW WITH TURNTABLE REMOVED

09217 Mounting Spring Assembly	15120 Spindle Assembly
36127 Cup	37066 Acorn Nut
36137 Retainer Nut	59166 Escutcheon
64014 Upper Spring	561403 Turntable "C" Stop Washer
64356 Lower Spring	
2000-330 #10-32 x 1 7/8" Rd. Hd. M. S.	

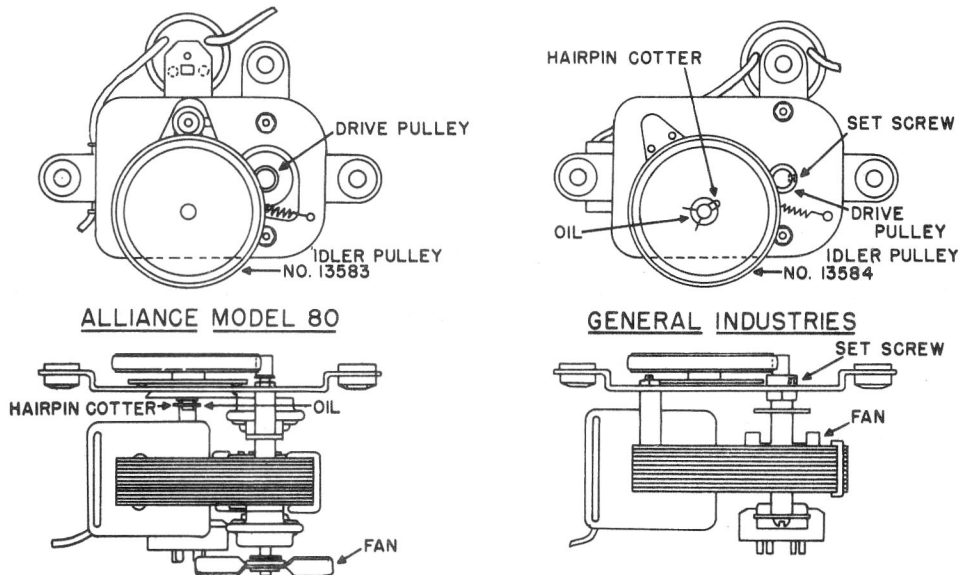


FIGURE 3

The Two makes of motors used on the P-51 Automatic Record Changers are the Alliance Motor and the General Industries Motor. The complete motors are interchangeable, but it is necessary to identify the make of motor when ordering an Idler

Pulley. Either make may readily be distinguished by noting the location of the fan on the motor and the location of the hair pin cotter holding the Idler pulley as shown in above figure 3.

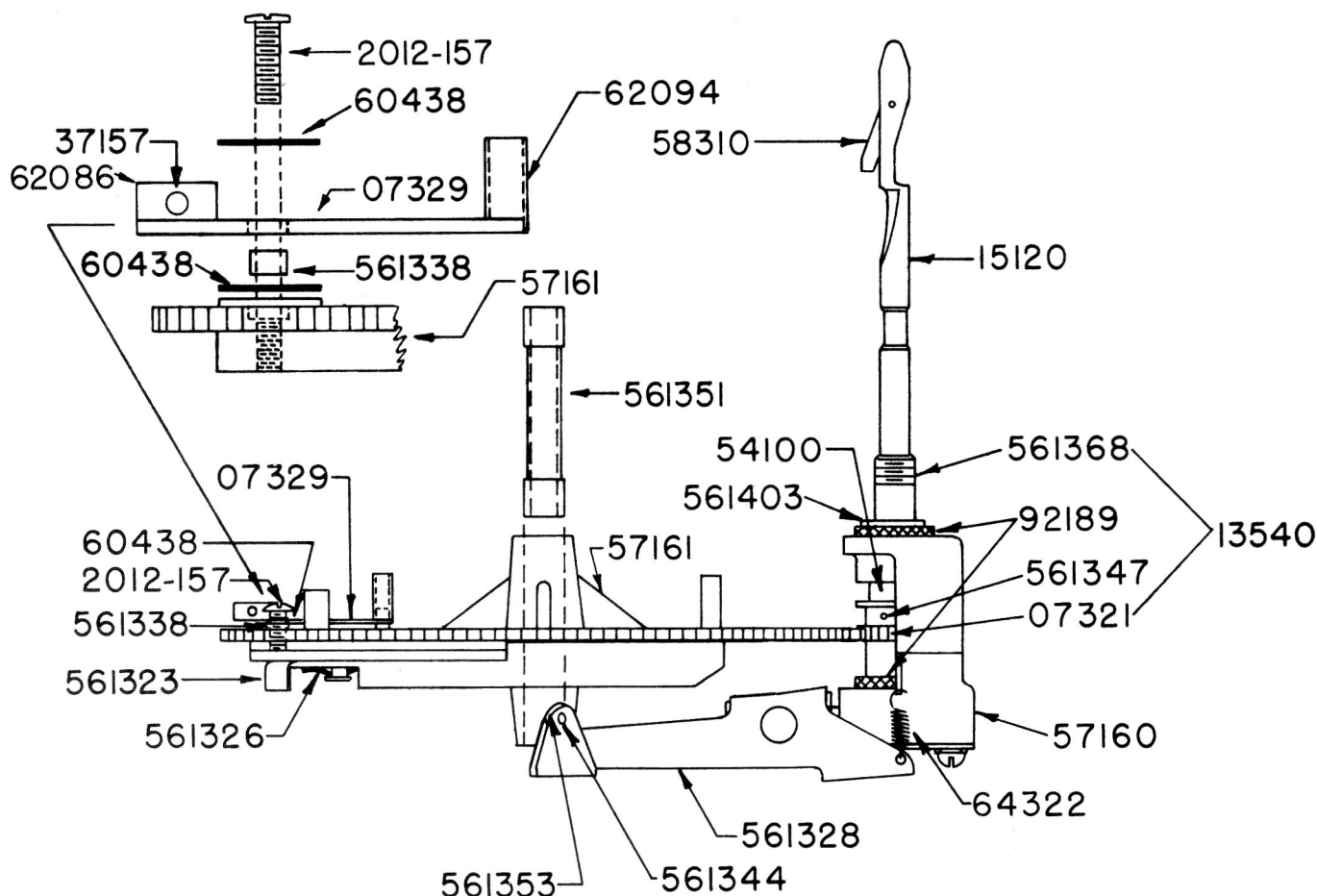
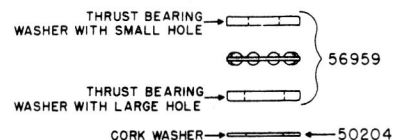


FIGURE 4

**MAIN CAM AND SPINDLE SUPPORT
BRACKET ASSEMBLY**

Part No.	Description
07321	Spindle Gear Assembly
07329	Starting Lever Assembly
13540	Drive Shaft and Gear Assembly (561368 and 07321 assembled)
15120	Turntable Spindle Assembly
37157	Tubular Rivet .085" x 1/4"
50204	Cork Washer 3/4" O.D.
54100	Spacer
56959	Thrust Bearing
57160	Bracket
57161**	Main Cam
58310*	Automatic Record Latch
60438	Paper Washer
62086	Starting Lever Bumper
62094	Starting Lever Sleeve
64322	Record Lift Lever Spring
92189	Felt Washer
561311*	Tone Arm Lift Lever Rivet
561323*	Automatic Stop Pawl
561326*	Spring Washer
561328*	Record Lift Lever
561338	Spacer

561344*	Pin
561346*	Record Lift Lever Rivet
561347	Pin
561351	Main Cam Tube
561353*	Record Lift Lever Roller
561368	Turntable Drive Shaft
561403	Turntable Stop Washer
2012-157	#6-32 x 5/16" Bdg. HMS
* Not Sold Separately.	
**Order Main Cam by Assembly No. 07332.	



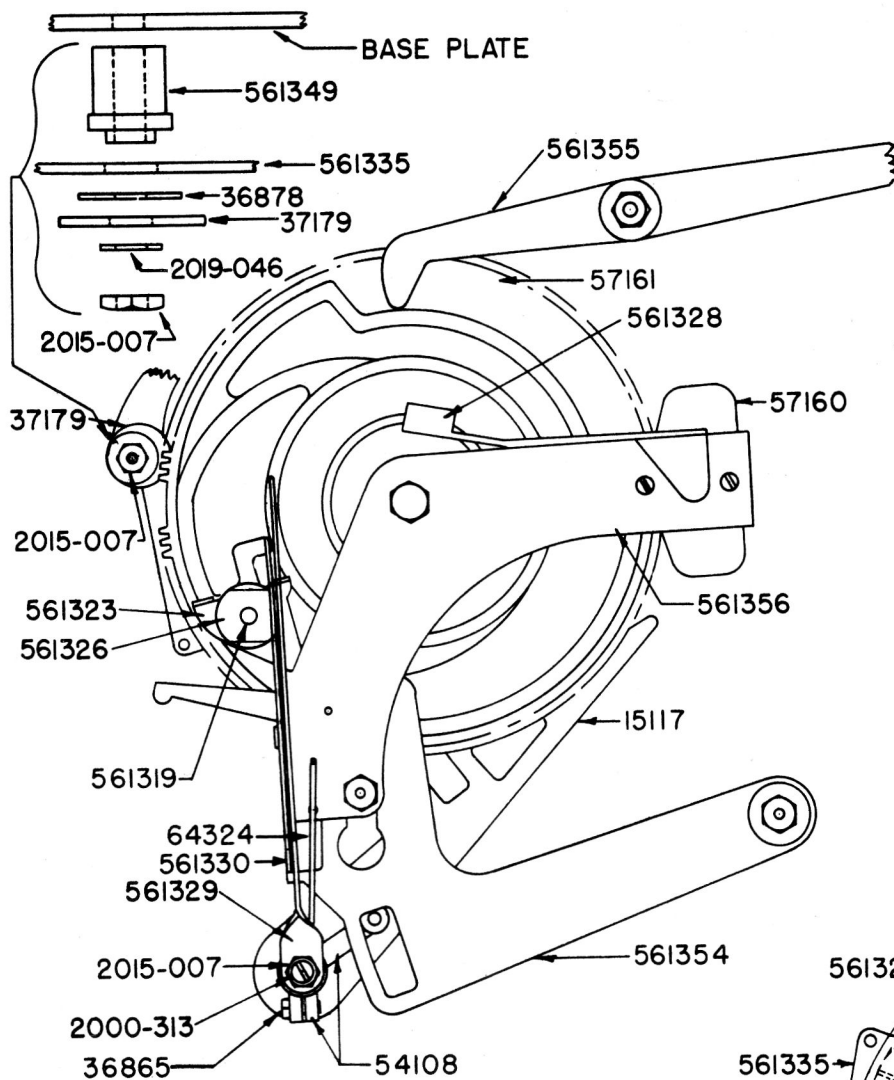


FIGURE 5

MAIN CAM AND ASSOCIATED ASSEMBLIES

07329	Starting Lever Assembly
15117	Trip Finger Assembly
36865	#10-24 x 1/2" HHMS
36878	Flat Washer
37179	Flat Washer 7/8 O. D. x 1/16 Th.
54108	Tone Arm Crank
57160	Spindle Support Bracket
57161**	Main Cam
60438	Paper Washer
64324	Spring
561319**	Stud
561323**	Automatic Stop Pawl
561326**	Spring Washer
561328*	Record Lift Lever
561329*	Tone Arm Lift Rocker
561330*	Tone Arm Stop Lever
561335	Record Ejector Lever
561349	Spacer
561354	Tone Arm Return Lever

561355*	Shelf Lever
561356*	Tie Plate
2000-313	#10-32 x 1/2" RHMS
2015-007	#10-32 Std. Hex Nut
2019-046	#10 SP Ext. Lockwasher

* Not Sold Separately. See Page 7.

**Order by Assembly No. 07332.

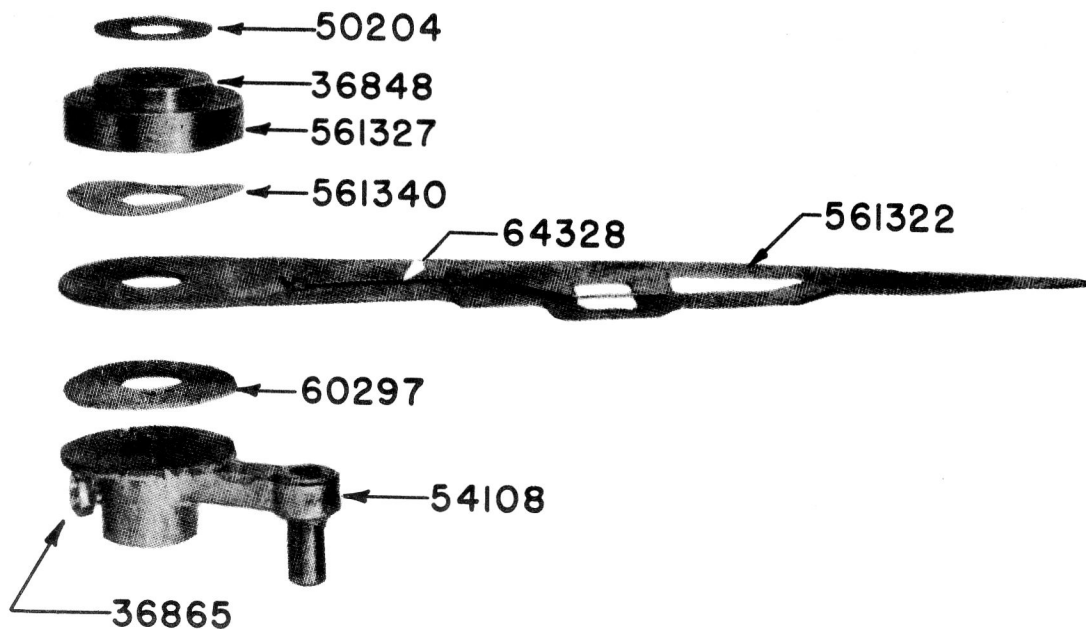


FIGURE 6
FRICTION TRIP ASSEMBLY

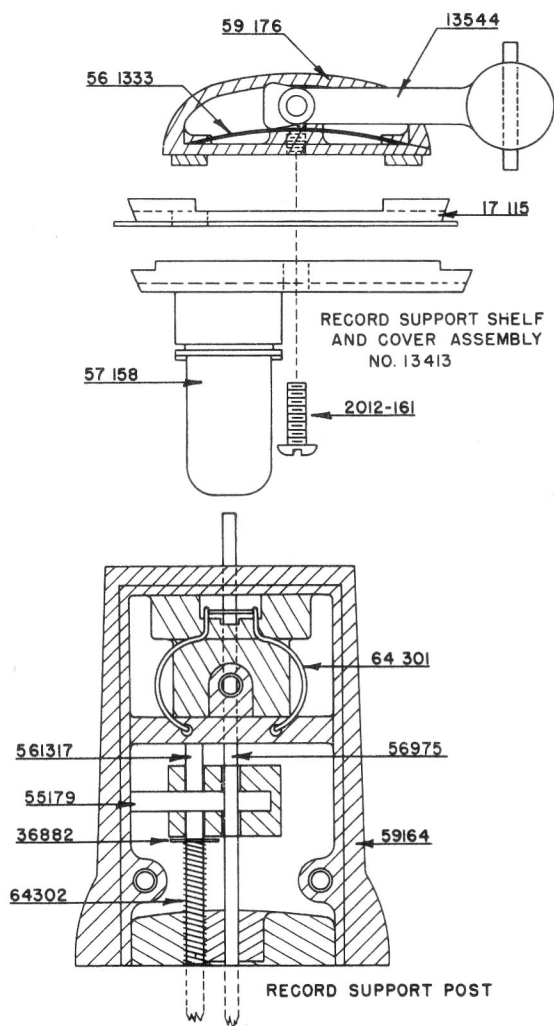


FIGURE 7

Part No.	Description
36848	6-32 x 3/8" Bristol Set Screw
36865	#10-24 x 1/2" HHMS
50204	Cork Washer 3/4" O. D.
54108	Tone Arm Crank
60297	Cork Washer
64328**	Spring
561322**	Trip Finger
561327	Trip Finger Spacer
561340	Wave Washer

**Order by Assembly No. 15117.

FIGURE 7
RECORD SUPPORT POST AND SHELF

Part No.	Description
13544	Shelf Cover Arm & Record Hold Down Rubber Assembly
17115	Plunger and Shelf Assembly
36882	Hairpin Cotter
55179	Pin
56975	Record Plunger Rocker Arm
57158	Record Support Shelf
59164	Record Support Post
59176	Shelf Cover
64301	Record Support Post Hold Down Spring
64302	Interceptor Shaft Spring
561317	Interceptor Shaft
561333	Shelf Cover Spring
2012-161	#6-32 x 7/16" Bdg. HMS

NOTE:—Record Plunger Rocker Arm 56975 is inserted in the elongated hole in Ejector Plunger No. 17115.

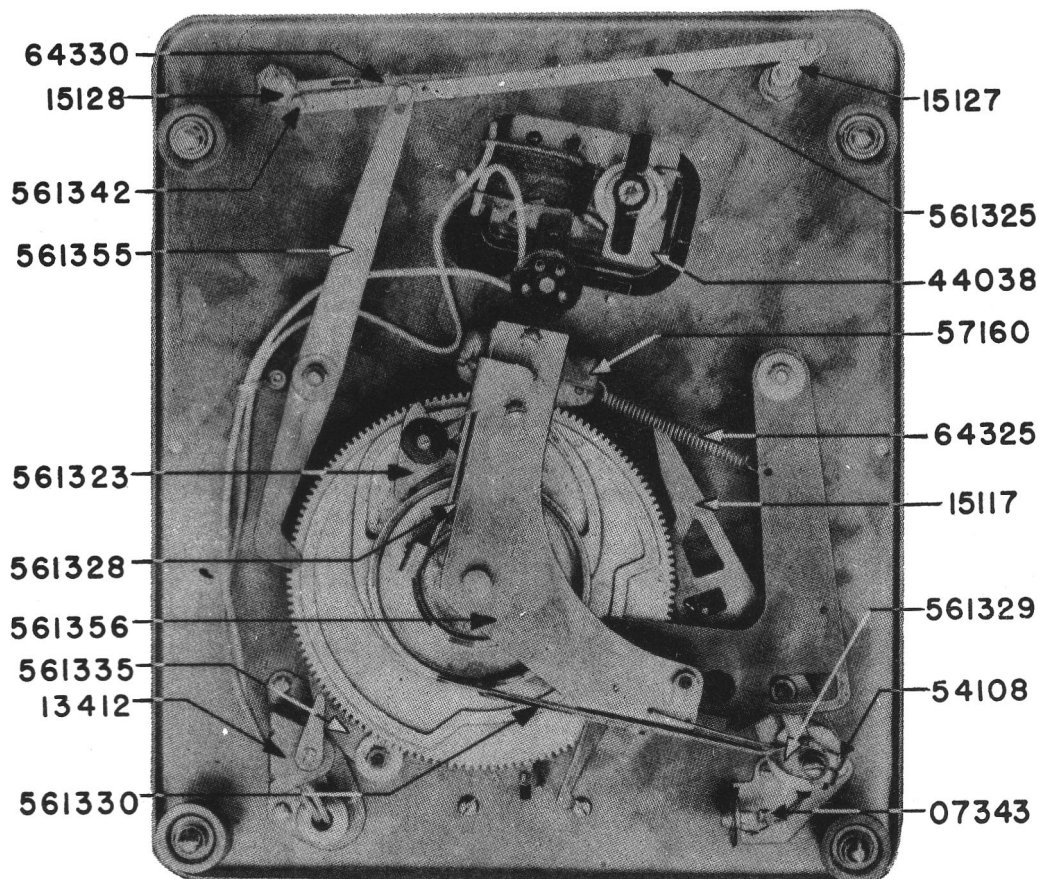


FIGURE 8
BOTTOM VIEW

07343	P. U. Socket Assembly
13412	Auto. Stop Switch and Bracket Assembly
15117	Trip Finger and Spring
15127	Record Shelf and Crank Assembly (R.H.)
15128	Record Shelf and Crank Assembly (L.H.)
44038	Phono Motor
54108	Tone Arm Crank
56975	Record Plunger Rocker Arm
57160	Bracket
57161**	Main Cam
64325	Tone Arm Return Lever Spring
64330	Shelf Link Spring
561323**	Automatic Stop Pawl
561325*	Shelf Crank Lever
561328*	Record Lift Lever
561329*	Tone Arm Lift Rocker
561330*	Tone Arm Stop Lever
561335	Record Ejector Lever
561342	Shelf Crank Rivet
561355*	Shelf Lever
561356*	Tie Plate

*Not sold separately. Part numbers 561325, 561355 with R.H. and L.H. crank sold as assembly #07330. Part numbers 561328, 561329, 561330 and 561356 sold as assembly #13414.

**Order by assembly No. 07332 which includes 57161 and 561323.

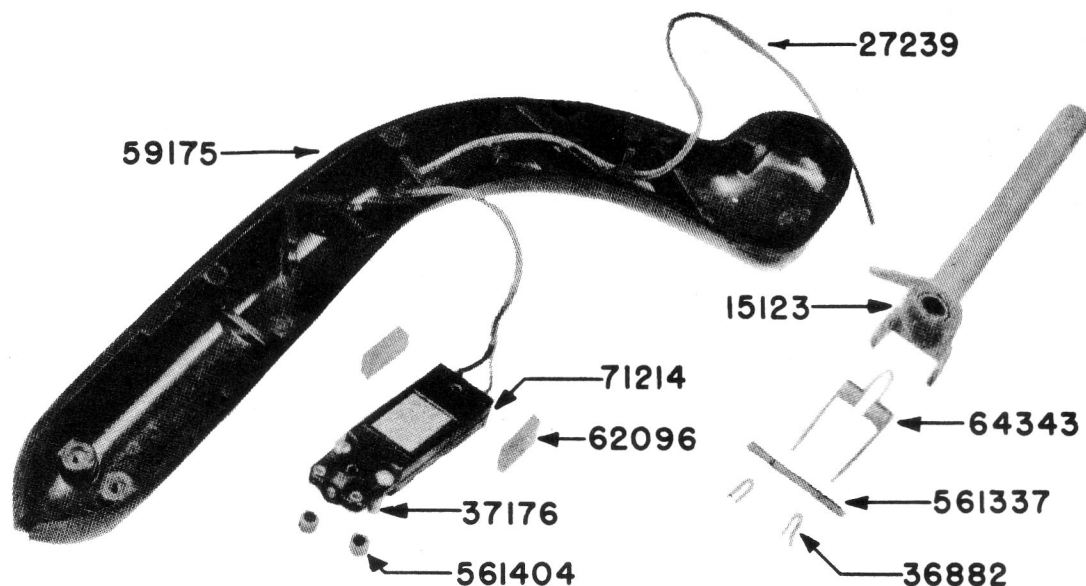


FIGURE 9 TONE ARM ASSEMBLY No. 13434

15123	Tone Arm Bracket and Support Tube Assembly	62096	P. U. Damping Shim
27239	Shielded P. U. Conductor	64343	Tone Arm Spring
36882	Hairpin Cotter Hubbard #111 x .026"	71214	Cartridge, Webster or Astatic
37176	#4-36 x 13/32 RHMS	561337	Hinge Pin
59175	Tone Arm Housing	561404	P. U. Spacer

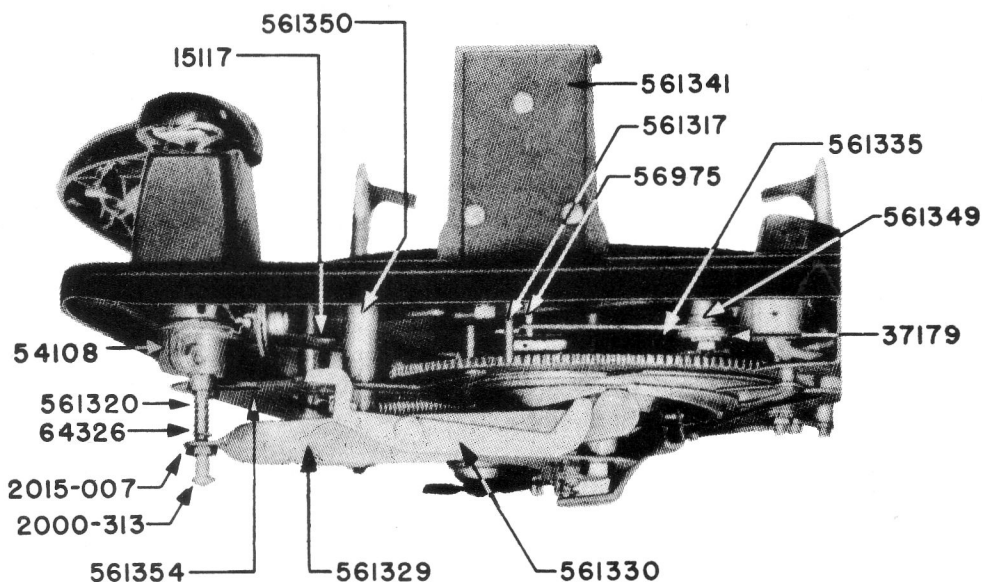


FIGURE 10 TONE ARM LIFT LEVER

15117	Trip Finger Assembly	561335	Record Ejector Lever
54108	Tone Arm Crank	561341	Record Support Post Cover
37179	Flat Washer	561349	Spacer
56975	Record Plunger Rocker Arm	561350	Tie Plate Mounting Spacer
64326	Tone Arm Brake Spring	561354	Tone Arm Return Lever
561317	Interceptor Shaft	2000-313	#10-32 x 1/2" RHMS
561320	Tone Arm Lift Rod	2015-007	#10-32 Std. Hex Nut
561329*	Tone Arm Lift Rocker		
561330*	Tone Arm Stop Lever		

* Sold only as part of assembly 13414.

CYCLE OF OPERATION

Turn on the control which starts the phonograph and move the Control Knob to reject position and hold until the Tone Arm begins to move toward the Turntable, then release the knob. The changer will go into cycle. The Tone Arm should swing clear of the stack, a record should drop to the Record Ejector Plunger, pause, then gently settle to the Turntable. The Tone Arm should swing over the record and be lowered to the starting groove on the record. When the record is played the above cycle is repeated until there are no records remain-

ing on the Record Shelf. After the last selection has been played the changer will automatically stop.

The above cycle of operation for the P-51 Changer is explained in the following description and illustrations.

When the Control Knob is moved to reject position, the Reject Lever pulls the Starting Lever against the Starting Pawl on the Spindle Gear and Pawl Assembly, which makes the Main Cam mesh with the Spindle Gear.

Figure A. The Turntable is screwed onto the Spindle Gear and both are driven through the Idler Pulley by the motor. When the cycle is completed

the Main Cam disengages from the Spindle Gear because several teeth are left off the Main Cam Gear. This is called the playing position.

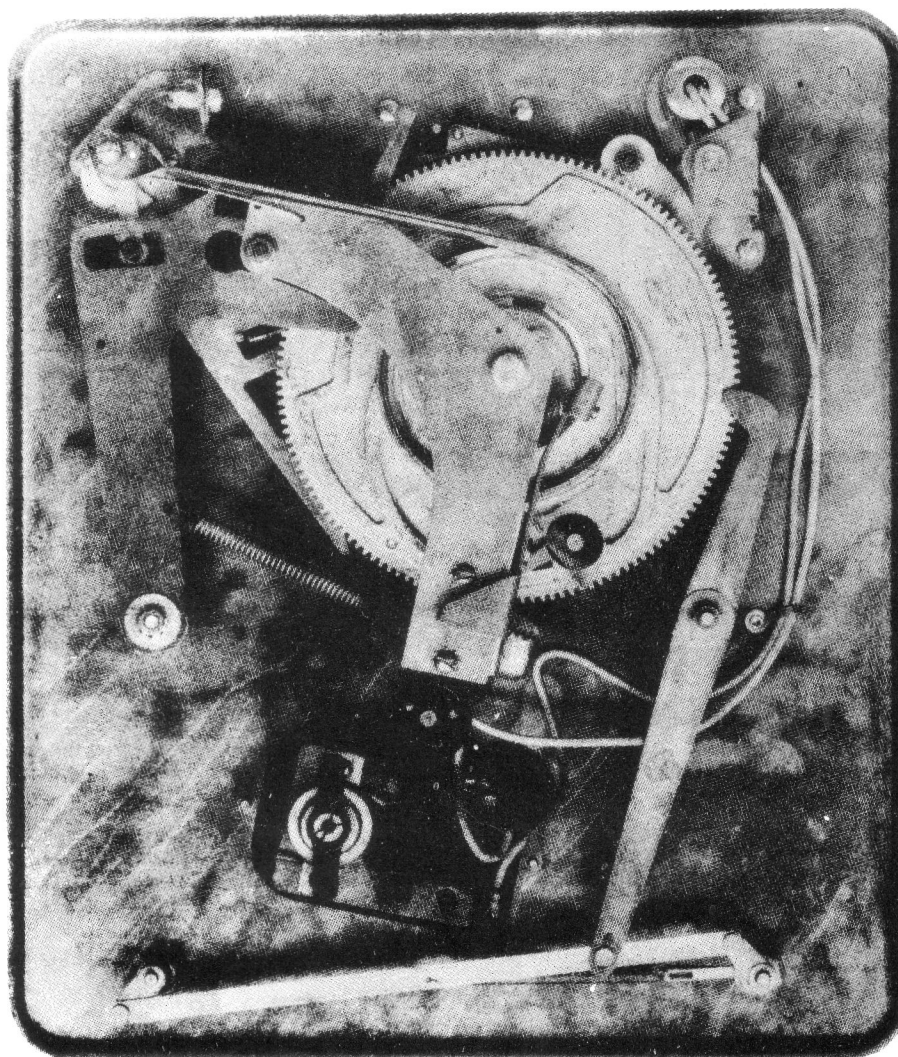


FIGURE A

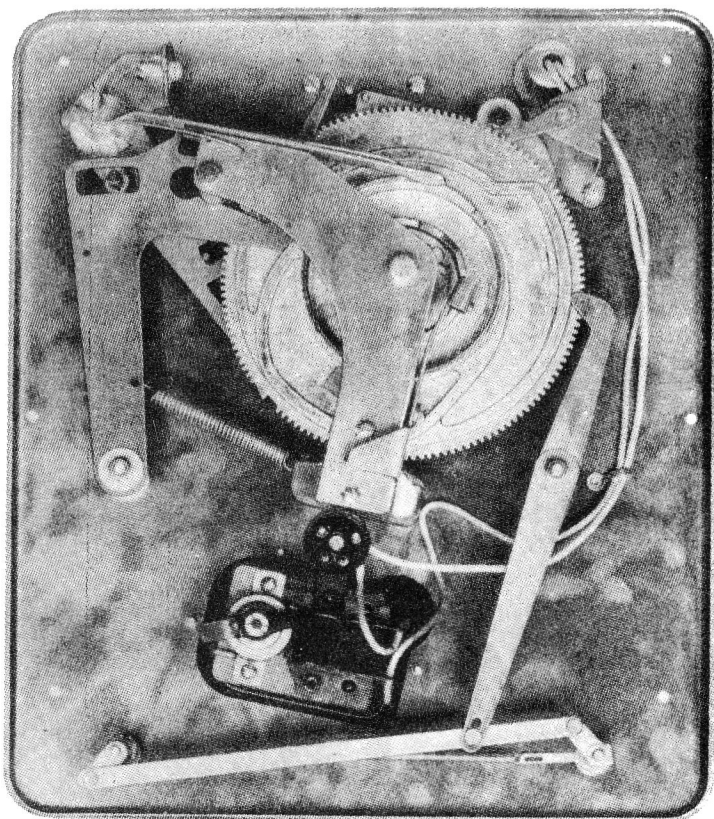


FIGURE B

Figure B. The change cycle has just started. The Tone Arm Lift Lever has raised the Tone Arm from the record and the Tone Arm Return Lever has started to move the Tone Arm away from the Turntable. The Record Lift Lever Assembly has started to raise the Spindle and stack of records resting on it.

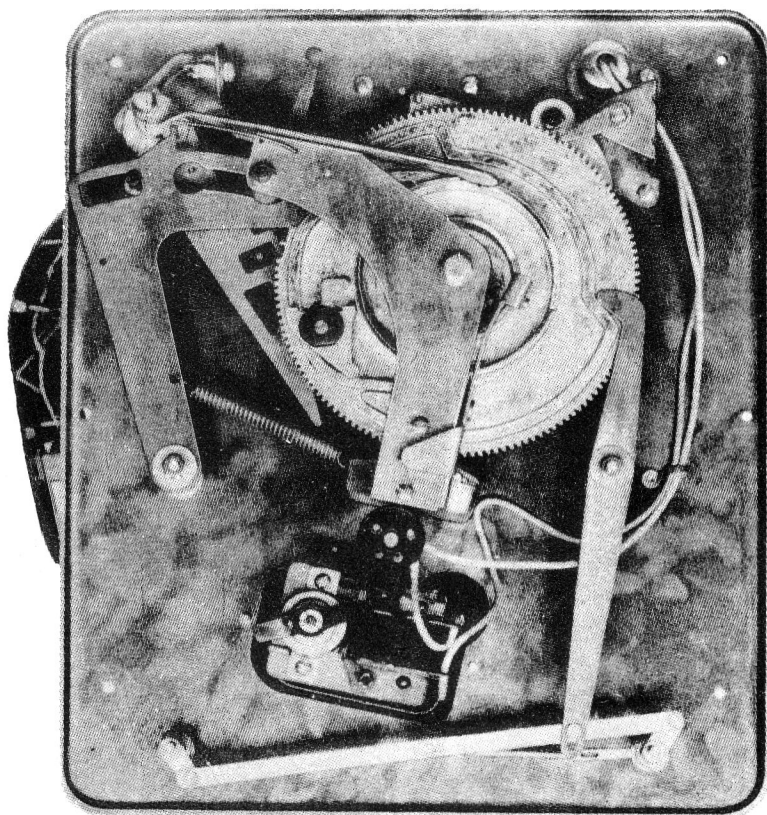


FIGURE C

Figure C. The Shelf Lever has moved in toward the center of the Main Cam which moves the Support Shelves in under the record stack. At the same time the Record Lift Lever has started to lower the Spindle and the stack of records.

Figure D. The record stack has been lowered to the Record Support Shelves. Simultaneously the bottom record has been pushed off the stationary shelf and rests on the Record Ejector Plunger.

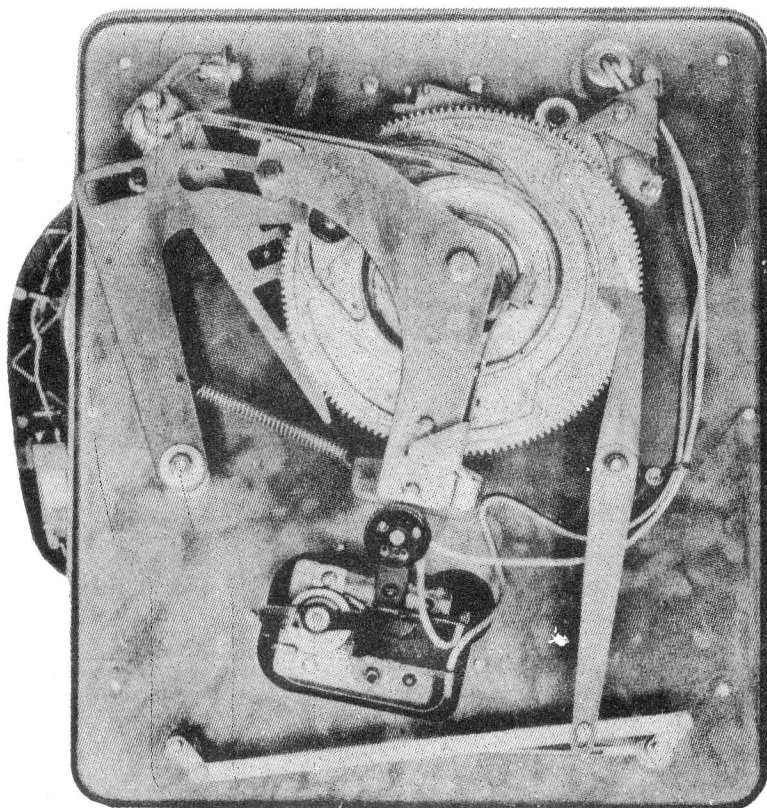


FIGURE D

Figure E. The Record Ejector Plunger retracts at the same time both of the Record Support Shelves move out from under the bottom record which then drops to the Turntable.

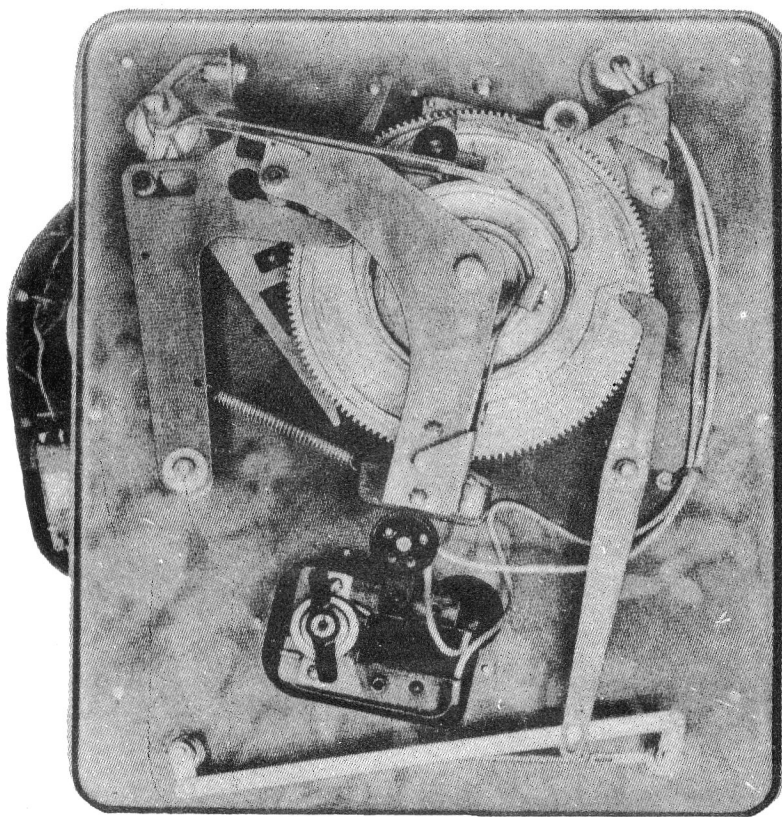
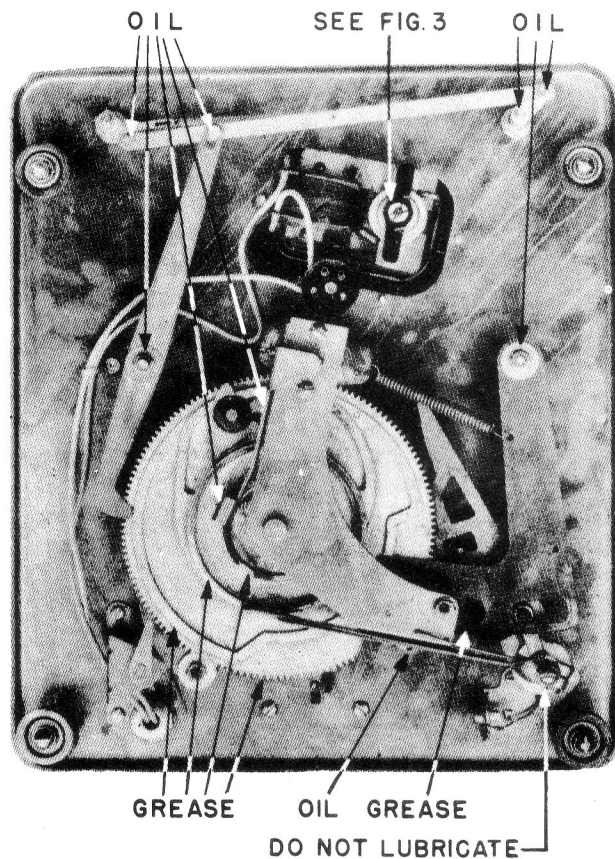
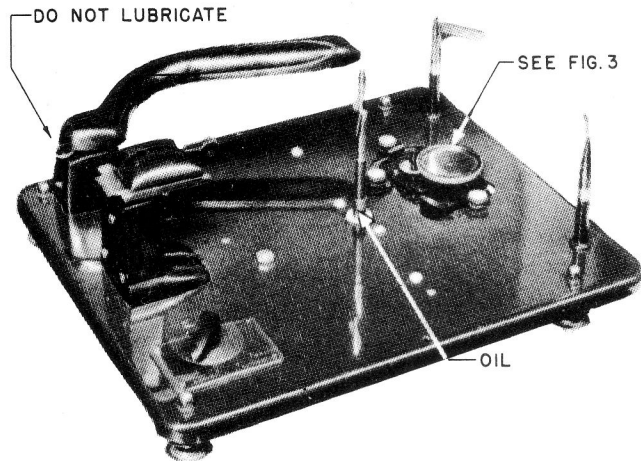


FIGURE E

LUBRICATION POINTS

(FIGURE 11)



LUBRICATION

The record changer should be lubricated and cleaned periodically or when a major part or assembly is replaced. Dirt, old oil or grease may be removed with carbon tetrachloride or other similar cleaning fluid.

DO NOT LUBRICATE THE FOLLOWING PARTS:

Friction Trip Assembly
Tone Arm Support Tube No. 15123
Starting Lever Assembly No. 07329
Tone Arm Hinge Pin No. 561337

USE LIGHT MACHINE OIL ON FOLLOWING PARTS:

Turntable Drive Shaft Felts No. 92189
Tone Arm Lift Lever Rivet
Record Lift Lever Rivet and Roller Pin
Tone Arm Return Lever No. 561354 at the Spacer No. 561350
Phono Motor (one drop on felt at each end of shaft)
Idler Pulley (see fig. 3 page 3)
Crank Link Lever at Pivot Point
12" Interceptor Shaft at bearing in baseplate

USE LIGHT GREASE OF VASELINE TYPE AT FOLLOWING POINTS:

Very light film at Spindle and tube bearing surface
Main Cam Tube or Stud
Main Cam at Gear Teeth and Cam Track
Tone Arm Return Lever at Guide Spacer
At Record Lift Lever and Spindle Ball
Auto Stop Switch Indexing Spring.

Use only a good grade of machine oil with a viscosity of SAE 10.

Care should be exercised to prevent an excess of oil being used on any part and that no oil gets on the motor pulley, idler pulley or turntable rim.

Every six months or once a year a thin coat of light grease of the vaseline type may be applied to all surfaces of the main cam that contact lift levers and tone arm lift lever.

SERVICE SUGGESTIONS

1. TO REMOVE TURNTABLE 13435.

See figure 1.

The Spindle Gear may be wedged by a wooden block or a wrapped screw driver between it and the Main Cam, to prevent it from turning while the Turntable is being unscrewed from the Spindle, (by rotating counter-clockwise). When replacing Turntable, see that the "C" Washer (No. 561403) remains fully inserted in the Turntable shaft and make sure the Turntable does not bind on the Idler Pulley. The Turntable may then be properly tightened. The Record Latch must be entirely in the recess in the Spindle to permit the Turntable to be replaced. NEVER USE GAS PLIERS TO HOLD SPINDLE.

2. TO REMOVE IDLER PULLEY.

See figure 3.

After the Turntable has been removed, the Idler Pulley can be removed by slipping off the small hairpin cotter on the end of the Idler Pulley shaft.

When replacing the Pulley a single drop of oil should be used on the pulley shaft.

CAUTION: Do not allow oil to get on either the Idler Pulley or the Turntable Rim.

3. FRICTION TRIP ASSEMBLY

See Figure 5.

The Trip Finger Spacer, part No. 56137, is set on the Tone Arm Support Tube (15123) with an allowance of eight thousandths of an inch clearance between the Cork Washer (50204) and the Baseplate. No attempt should be made to adjust the Friction Trip by changing this clearance. The Friction Trip is adjusted by raising or lowering the Tone Arm Crank (54108) on the Tone Arm Support Tube, after loosening Tone Arm Crank set screw.

4. STARTING TRIP ASSEMBLY

The Starting Lever (07329) is a part of the Main Cam Assembly (See fig. 4). This Lever is changed from trip position to play position by striking washer No. 37179 (see fig. 5) during the change cycle. If the washer does not move the Starting Lever far enough, the changer will trip again as soon as the change cycle is completed. To correct

adjustment, loosen Lock Nut 2015-007 and move Washer 37179 in toward the Main Cam. Tighten Lock Nut securely after proper adjustment has been made.

5. TONE ARM DROP AND NEEDLE LANDING

The Needle should drop on the record at a position equi-distance from the outer edge and the first playing groove of a standard record. Make sure the changer is in playing position; that is, the Tone Arm has moved over so the Needle is on the record. To make adjustment for 10-inch records, loosen the Tone Arm Crank set screw and move the Tone Arm Crank (54108) clockwise to move the needle out. When making this adjustment, be careful not to disturb Friction Trip adjustment. After the 10-inch setting has been properly made and the set screw tightened, the 12-inch landing will usually be correct. If not it will be necessary to slightly bend the Tone Arm Return Lever (561354) near the point where it touches the 12-inch interceptor Shaft (561317), see fig. 10. In both adjustments, the Record Shelf must be in the corresponding 10-inch or 12-inch position.

6. TONE ARM HEIGHT See Fig. 10

The Tone Arm height during change cycle is adjusted by raising or lowering screw (2000-313) on the Tone Arm Lift Lever. With records on the Shelf and Spindle, the top of the Tone Arm at the highest point during change cycle should be 3/16" below the bottom of the lowest record of the record stack.

7. RECORD LATCH CHATTER

Any chatter developing in the Record Latch (56130) Figure 4, may be corrected by applying a drop of light oil between the moving part of the Turntable Drive Shaft (561368 and the stationary spindle, (15120).

8. When repairs are being made a careful check should be made of all moving parts in order to make sure that no binding occurs. Check all moving parts for binding before springs are connected.

Service Suggestions—continued

All levers which operate on shoulder studs should be assembled with the burred side of the retaining washer away from the lever. This method is necessary to prevent the washer from binding on the lever.

9. CHECKING CHANGER IN CABINET

Before checking any P-51 record changer in the cabinet, make sure the mounting bolts are released and the cardboard spacers are removed; otherwise the changer will not properly feed records from the record support shelf and the tone arm will not position properly on the record. If any adjustments are made with the changer bolted down and the mounting bolts then released these adjustments will have to be remade.

When setting up a P-51 changer it should be checked for a needle landing with a full stack of records, both 10-inch and 12-inch. This is done by loading the record support shelf with 12 ten-inch records and moving the control knob to reject, allow the record to play through and trip, check the landing on the second record, then trip records up to and including eleven. Allow the eleventh record to play through and feed number twelve automatically, observe needle landing and automatic trip. Repeat above using ten 12-inch records, only instead of records eleven and twelve, substitute records nine and ten in the preceding section.

10. CAUTION: The use of force in an effort to raise the Tone Arm to a greater height than permitted by the Tone Arm Support may result in breaking of the Tone Arm.

11. REPLACING THRUST BEARING

When replacing Thrust Bearing 56959, see fig. 4, the thrust bearing washer having the smaller hole must be placed in the turntable drive shaft bracket 57160 first, that the shoulder on the turntable drive shaft may rest on the washer.

12. REPLACING INDEXING SPRING

Move control knob to Automatic position and pull off knob. Remove the two screws holding switch assembly to baseplate. Push the reject rod from hole and remove switch assembly. Remove the hairpin cotter from shaft and pull shaft forward so that pawl will not interfere with spring. Replace spring. Hold the spring against bracket away from pawl and push shaft into place. Be sure the lip on the pawl enters the slot in the switch. Replace hairpin cotter and assembly is ready to be replaced.

50 CYCLE CONVERSION

The Service Department will, upon request furnish information pertaining to the conversion of 60 cycle operated changers to 50 cycle operation.

WARNING

Do not use 10-inch and 12-inch records at the same time.

Do not use badly warped records as the reproduction of these will not be satisfactory.

Do not use this instrument except at frequency and voltage on name plate.

Do not use more than ten 12-inch records or more than twelve 10-inch records.

Do not attempt to move or apply force to the outer Record Supports.

Do not turn the Record Shelf until the changer has stopped automatically after all the records have dropped or have been removed from the shelf.

Do not try to force any part that seems stuck or locked. This will probably spring or break a part of the instrument.