Type 73-B
Professional Recorder

(MI-11825)

(MI-11826)

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION CAMDEN, N. J.

IB-24383

BROADCAST EQUIPMENT

INSTRUCTIONS

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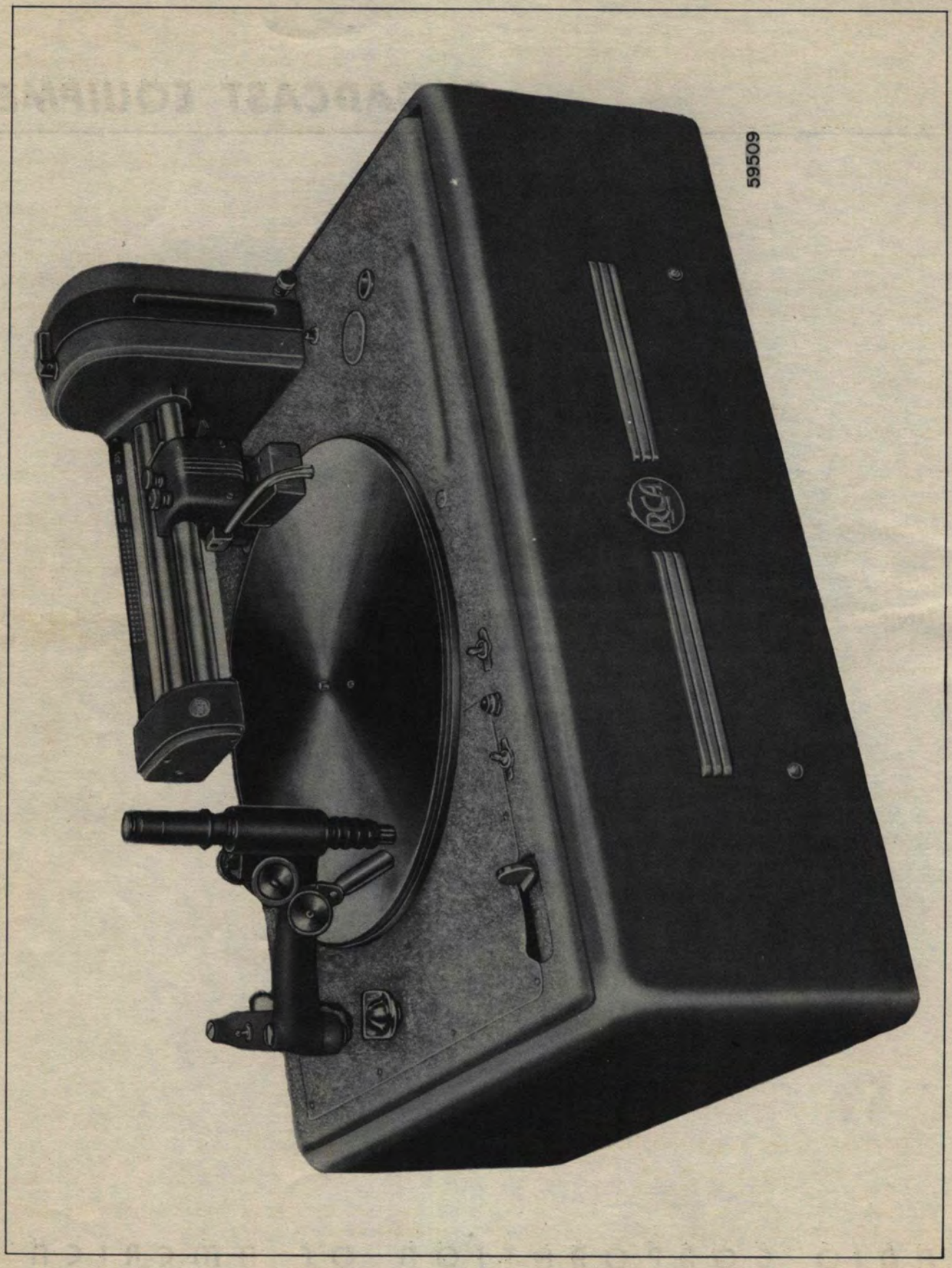

Figure 1—Type 73-B Professional Recorder

DESCRIPTION

Application

The RCA Type 73-B Professional Recorder is designed to make high-quality disc recordings at either 33⅓ or 78 revolutions per minute. It may be used in applications for preparing masters from which large numbers of records can be made. The recorder is highly suitable for broadcasting stations in recording programs for use on future broadcasts, for rehearsals, auditions and similar applications.

Turntable

The turntable of the recorder is 17½ inches in diameter and will accommodate blanks up to 18¼ inches in diameter and ⅜-inch thick. A removable rubber mat on the turntable provides a good record base and may be easily cleaned. Near the center of the turntable a drive pin is mounted over which fits any one of three drive holes in the record blank. When it is desired to make use of record blanks without drive holes, this drive pin may be pressed down so that it will be below the surface of the rubber mat. A plunger-release button is mounted alongside the drive pin, and when this button is pressed, the drive pin comes back into position.

Turntable Drive

The turntable is rim-driven by two synchronous motors coupled to drive wheels. Both motors are controlled by one ON-OFF lever which operates a motor switch. When the lever is turned OFF, a brake automatically is applied to the rim of the turntable, bringing it quickly to a stop. The motors are doubly rubber shock-mounted from the motor board.

Feed Screw and Drive

The feed screw is designed so that the recorder-head carriage may be used for either outside-in or inside-out recordings without changing feed screws. The feed-screw drive consists of a pulley-and-belt system between the drive shaft and turntable spindle. Mounted on the drive shaft above the turntable is a friction wheel which drives a flange on the end of the feed screw. The friction wheel may be moved up and down over the entire diameter of the flange by means of a knob on the outside of the drive-shaft housing. This adjustment selects the recording pitch and the direction of cut. An illuminated pointer and scale on the outside of the drive-shaft housing indicates the setting of lines per inch for both inside-out and outside-in recordings. A release lever mounted at the top of the housing disengages the friction wheel from the flange when turned counterclockwise to facilitate adjustment to the desired number of lines per inch. A spring attached to the friction wheel is adjusted at the factory to provide the proper pressure against the flange when the release lever is in the engaged position (turned clockwise).

TECHNICAL DATA

Power Supply Required

105 to 125 volts
60 cycles (MI-11825)
50 cycles (MI-11826)

Turntable-drive motors	85 watts
Pilot Lamps	5 watts
Total	90 watts
Spiralling motor (when operating)	145 watts

Turntable Speeds

33⅓ or 78 rpm (±½%)

Turntable Diameter

17½ inches (for blanks up to 18¼-inch diameter and ⅜-inch thick)

Turntable Speed Regulation (wows)

0.2% (peak to peak) at 78 rpm
0.4% (peak to peak) at 33⅓ rpm
0.07% (rms) at 78 rpm
0.14% (rms) at 33⅓ rpm

Recording Pitch

Continuously variable 96 to 152 lines per inch with detents provided in steps of 8 lines per inch.

Direction of Feed

Inside-out or outside-in

Dimensions and Weight

(a) *With cabinet*
Height—20 inches
Width—31¾ inches
Depth—22¼ inches
Weight—280 pounds

(b) *Without cabinet*
Height—20 inches
Width—30 inches
Depth—20½ inches

Note: See IB-24340 for MI-11850-C Recorder Head technical data.

Spiralling

A separate self-braking motor overdrives the feed screw to provide start and finishing spirals. This motor is coupled to the feed-screw drive shaft by a pulley-and-belt system. A non-locking push-button switch near the drive-shaft housing is used to operate this motor. The spiralling pitch is six lines per inch when the turntable speed is 78 rpm. For a turntable speed of 33⅓ rpm the spiralling pitch is reduced in proportion to the speed change.

Carriage

The recorder-head carriage is free to rotate about the feed-screw tube until a latch locks the carriage with the feed-screw tube when the carriage is in the raised or non-cutting position. When the carriage is raised from the cutting position, the feed-nut arm automatically disengages from the feed screw; the arm automatically engages when the carriage is released from the rest position.

The center thumb nut on the carriage controls the angle of the cut. The left-hand thumb nut adjusts the depth of the cutter.

The stylus-lowering lever is used to raise or lower the stylus. When the carriage is in the standby position, the feed-nut arm is engaged, and stylus is near the surface of the record, ready to be lowered to the record by operating this lever.

Recorder Head

The compensator, transformer, series resistor, high-off-low switch, pilot lamp and receptacle which are recommended for use with the MI-11850-C Recorder Head are all built into the recorder. For a complete description of the MI-11850-C, refer to the instruction book (IB-24340) shipped with it.

Calibrated Scales

Four timing scales are provided, each calibrated for 96, 104, 112, 120, 128, 136, 144 and 152 lines per inch:

One for inside-out recording at 33⅓ rpm,
One for inside-out recording at 78 rpm,
One for outside-in recording at 33⅓ rpm,
One for outside-in recording at 78 rpm.

Microscope

A high-quality 36-power microscope with an associated arm assembly is provided for mounting alongside the turntable. The microscope scale is calibrated so that each division represents 0.001 inch on the object viewed. This permits actual measurement of groove and wall widths of the record face, and by comparison of the dimensions thus obtained with known standards for recording work, and with proper interpretation, superior recordings may be made.

The microscope may be moved over the entire record surface. A small lamp is mounted on the adjustable arm to illuminate the record grooves. An on-off toggle switch for this lamp is mounted on the microscope arm.

Transformer

A transformer mounted on the recorder base supplies the power for the pilot lamps and heater kit. On some of the units two transformers are supplied for this purpose.

INSTALLATION

Unpacking

Take extreme care in unpacking and handling the equipment, with special regard to the microscope assembly. Prevent any dirt or foreign matter from entering the turntable-spindle bearing.

Connections

Make all audio connections to the TB-2 terminal board at the front of the recorder. Connect the a-c power leads to the TB-1 terminal board at the rear of the recorder. Refer to the schematic and wiring diagrams for the proper terminals to be used (figures 3 and 4).

Mounting

Mount the recorder on a sturdy flat surface. Install the cabinet over the recorder using two machine screws and washers provided. Place the turntable over the spindle carefully.

When the cabinet is not used, allow ⅛-inch minimum clearance around the sides of the recorder to allow for floating of the shock mounting on the skid assembly. Refer to figure 2 for the mounting dimensions of the recorder. Be sure the four wood blocks on the skid assembly are exactly in a level horizontal plane.

Installing Microscope

Mount the microscope-arm assembly on the recorder base by means of the threaded shaft provided.

Pull the two leads from the microscope lamp through the opening on the recorder near the threaded shaft, and connect these leads to the secondary winding terminals of transformer T-1 as

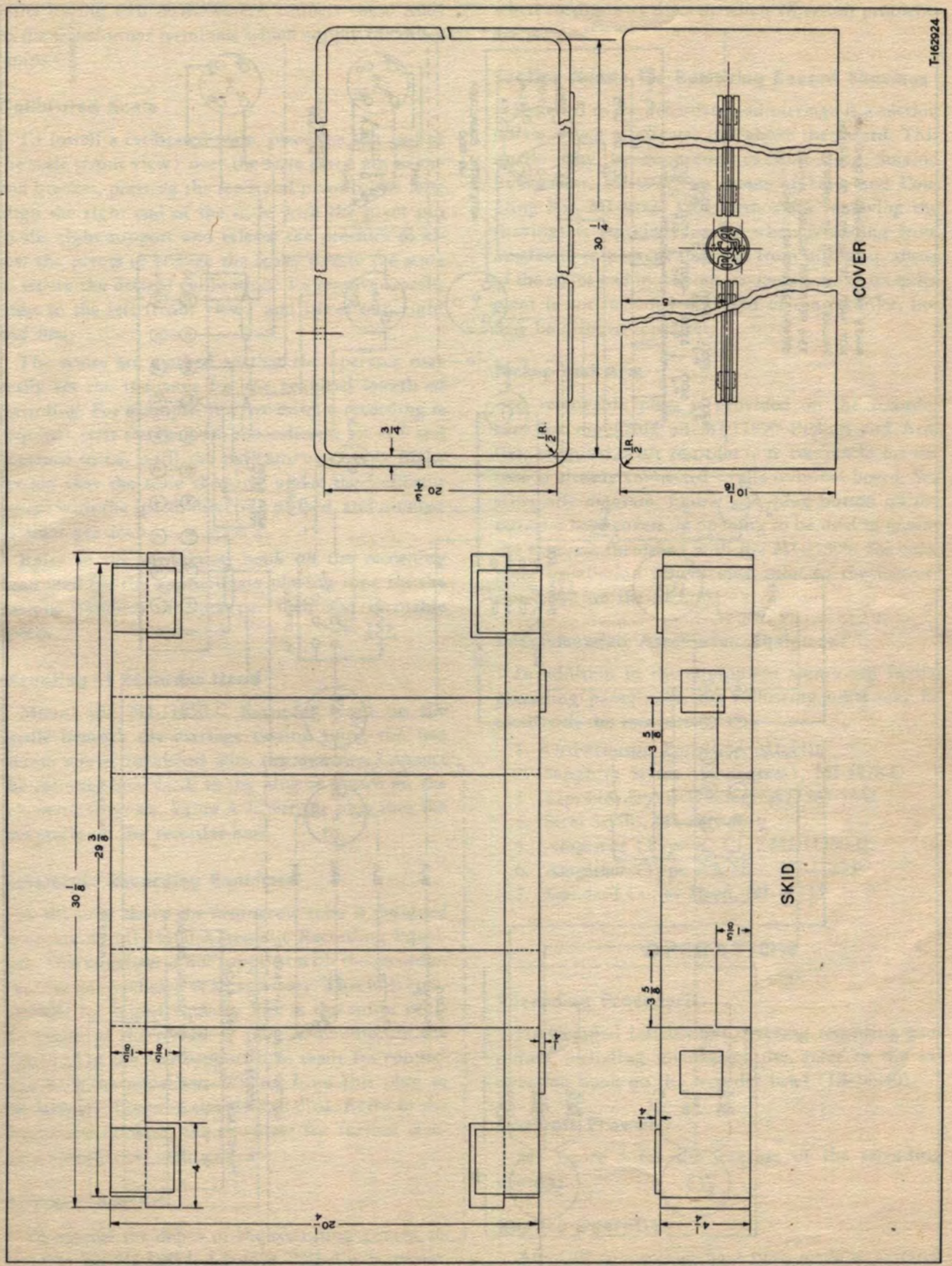

Figure 2—Mounting Details of Recorder

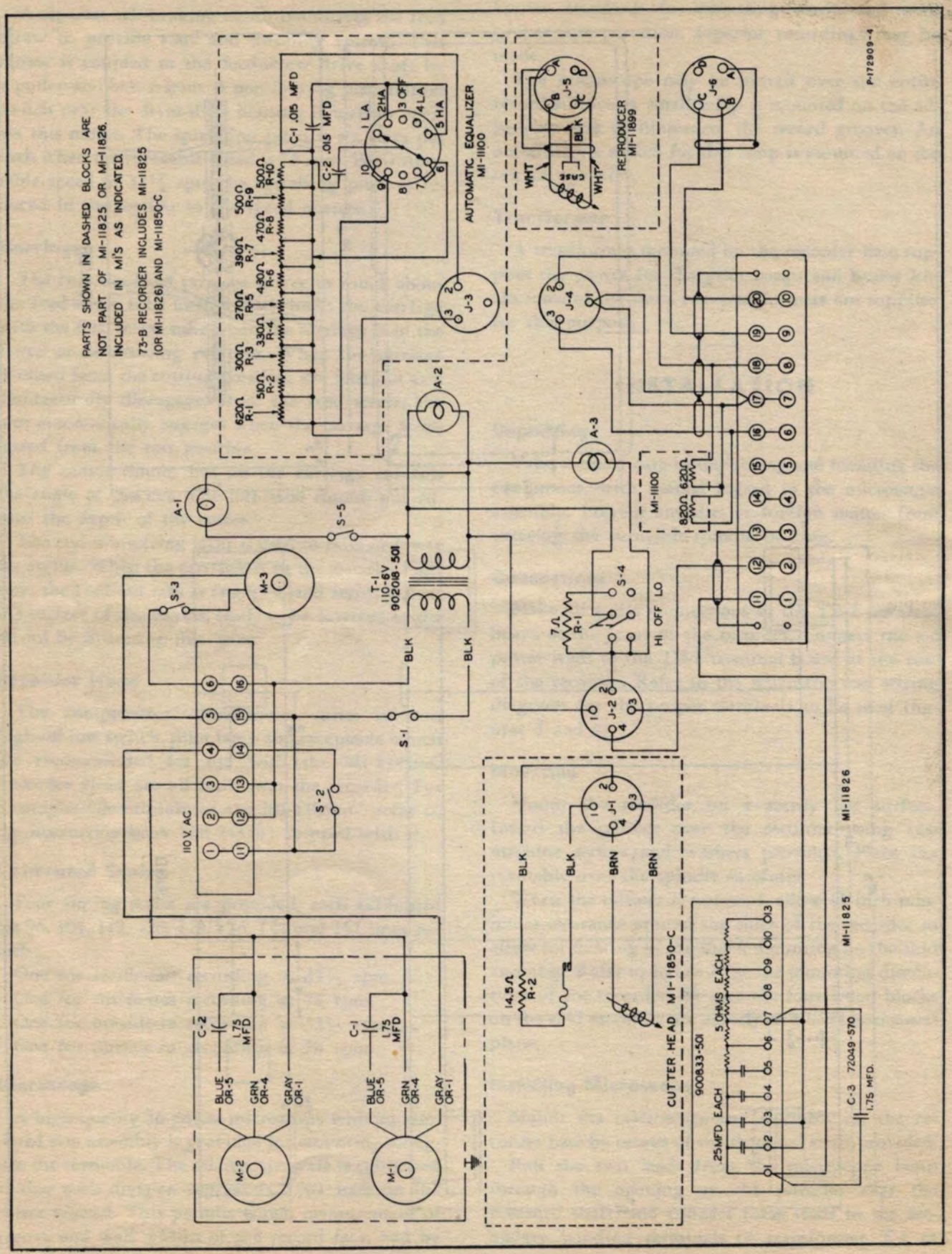

Figure 3—Schematic Diagram of 73-B Recorder

shown on the wiring diagram, figure 4. (On those units having two transformers, connect these leads to the transformer terminals which supply the other lamps.)

Calibrated Scale

To install a calibrated scale, place the left end of the scale (front view) over the scale pivot pin in the end bracket, pressing the scale and pivot to the left; align the right end of the scale with the pivot pin in the right support and release the pressure to allow the pivots to engage the scale. Rotate the scale to secure the desired calibration. To remove a scale, press to the left (front view) and lift it out, right end first.

The scales are marked so that the operator may easily set the indicator for the required length of recording. For example, if a five-minute recording is required, start the cut with the indicator set at 5 and continue to cut until the indicator reaches 0. Make certain that the scale showing under the indicator agrees with the speed, direction of feed, and number of lines per inch.

Refer to the instruction book on the recording head used for the approximate playing time for the various numbers of lines per inch and turntable speeds.

Mounting of Recorder Head

Mount the MI-11850-C Recorder Head on the cradle beneath the carriage casting using the two thumb screws furnished with the recorder. Connect the recorder-head leads to the plug as shown on the schematic diagram, figure 3. Insert the plug into the receptacle on the recorder base.

Automatic Recording Equalizer

A slit tube above the feed-screw tube is designed to mount an MI-11100 Automatic Recording Equalizer. This equalizer is not supplied with the recorder, but may be purchased as an accessory. This unit compensates for high-frequency loss as the cutter nears the center of the record. A plug is mounted in the right end of the rear support tube ready for connection with the equalizer. Wiring from this plug to the terminal board is already installed. Refer to the instruction book on the equalizer for further complete installation instructions.

Advance Ball Kit

To control the depth of the recording groove accurately, an MI-11851 Advance Ball Kit is recommended for use with the MI-11850-C Recorder Head when cutting wax discs or when vibration problems are serious.

Suction Nozzle for Removing Record Shavings

Fastened to the recorder-head carriage is a suction nozzle which terminates just above the record. This nozzle may be connected to Recording Suction Equipment, MI-4922, by means of Hose and Coupling Kit, MI-4923. This method for removing the shavings is especially useful when recording from outside-in to prevent shavings from piling up ahead of the stylus and impairing its operation. This equipment is not included as a part of the recorder, but may be ordered separately.

Pickup and Arm

A removable plate is provided on the recorder base for mounting an MI-11899 Pickup and Arm (not supplied with recorder). A receptacle on the base is already connected to the terminal board. See schematic diagram, figure 3. A plug button on the recorder base covers an opening to be used to mount the arm rest furnished with the MI-11899. For complete installation instructions, refer to the instruction book on the pickup.

Recommended Associated Equipment

In addition to the equipment mentioned in the preceding paragraphs, the following units may be used with the recorder:

1. Orthacoustic Equalizer, MI-4916
2. Sapphire Stylus (90-degrees), MI-4878-C
3. Sapphire Stylus (70-degrees), MI-4842
4. Steel Stylus, MI-4879-A
5. Amplifier (Type 82-C1), MI-11209-B
6. Amplifier (Type BA-4A), MI-11223
7. Standard Cutter Head, MI-11853

OPERATION

Recording Procedure

For detailed instructions covering recording procedure including microscope use, refer to the instruction book on the recorder head (IB-24340).

Controls Provided

See figure 5 for the location of the recording controls.

Routine Operation

After all connections have been made to external

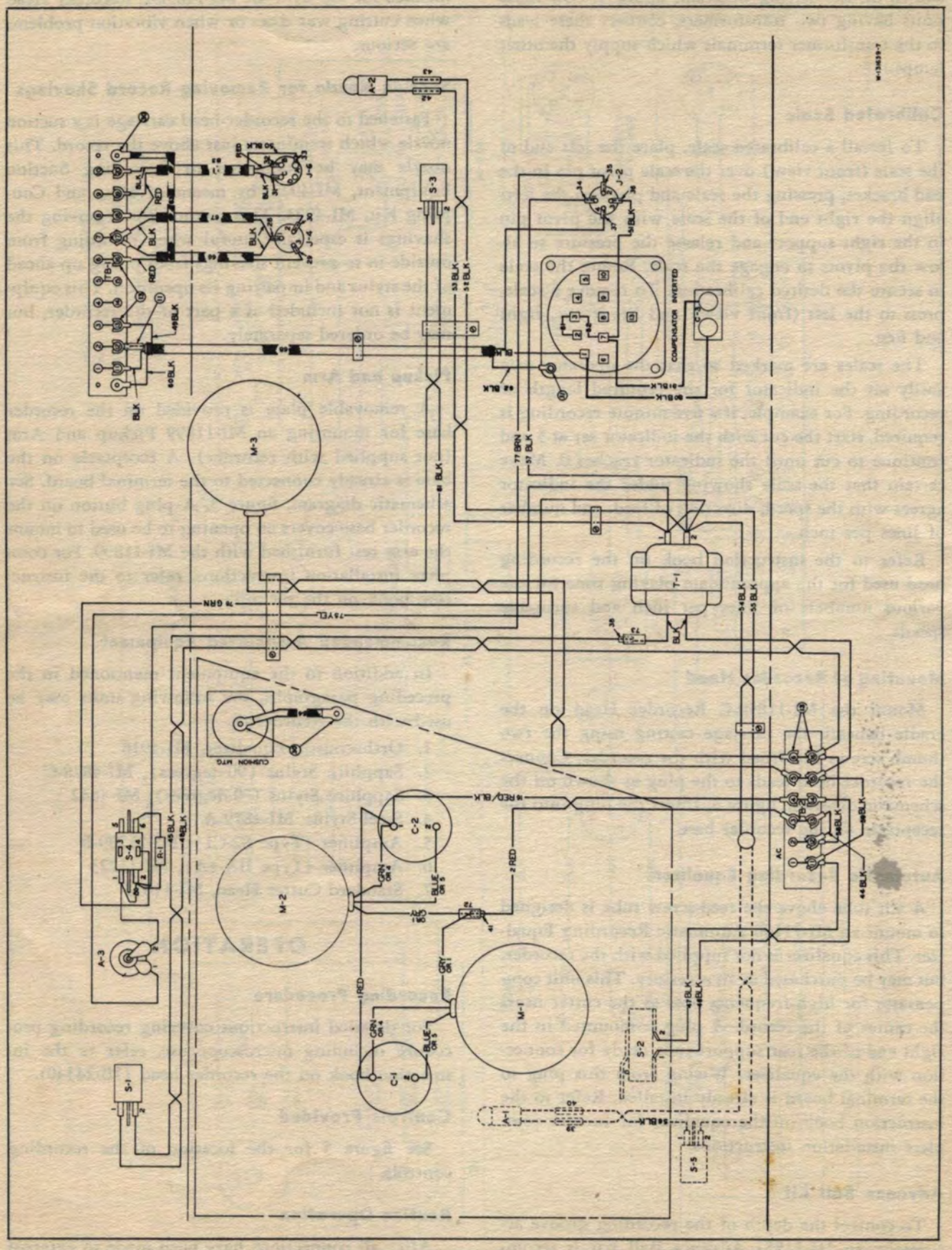

Figure 4—Wiring Diagram of MI-11825 and MI-11826

equipment in accordance with the instructions supplied with them, follow the procedure below:

1. With the turntable platter stationary, press plunger-release button near the center of the turntable platter allowing the record-drive pin to come up into position.

2. Place a recording blank on the turntable so that one of the holes in the record fits over the record-drive pin.

3. Be sure the stylus is satisfactory (worn styli should be reground or discarded). Check all styli for form and cutting edge upon receipt from the vendor.

4. Turn ON the master lamp switch.

5. Set the heater switch to the desired position. The HI position short-circuits the 7-ohm resistor in the recorder-head heater circuit for quick warm-up or for operation in ambient temperatures between 40-degrees and 65-degrees Fahrenheit. The heater-indicator lamp is on when this switch is on HI or LOW. In the off position (switch arm vertical), the heater circuit is not energized, and this lamp is off.

6. Turn on the microscope lamp switch.

7. Set the speed-shift control knob to the desired speed position.

8. With the feed-screw drive release lever in the disengaged position (turned counterclockwise), set the lines-per-inch control knob to the desired setting as shown by the indicator on the illuminated scale. Put the release lever in the engaged position (turned clockwise).

9. Rotate the calibrated scale to the proper position to agree with the setting of the speed-shift knob and lines-per-inch setting.

10. Turn ON the motor.

11. With the recorder head in the standby position, press the feed-nut lever and slide the carriage horizontally until it is in the desired position over the record. By means of the stylus-lowering lever, lower the stylus to the record.

12. Set the correct depth and angle of cut by the two knobs atop the carriage.

13. Keep the input signal at the proper strength throughout the recording.

14. To cut a spiral for beginning, ending, or separating portions of a recording, press the spiralling switch. Do not use the spiralling motor continuously for any length of time other than to cut the necessary spirals on the record.

15. At the conclusion of the recording, raise the stylus-lowering lever which lifts the recorder head from the record; then raise the carriage until it locks automatically in the rest position.

16. Turn OFF the motor, and press the lever firmly to stop the turntable. Remove the record.

CAUTION: When the recorder is not being used, care should be taken to see that the motor lever and switches are OFF and the feed-screw drive lever is in the disengaged position (turned counterclockwise).

MAINTENANCE

Four wrenches are provided to disassemble the recorder for servicing. Lubrication instructions are given in the following paragraphs.

Turntable-Drive Motors

Two oil holes are provided in each drive motor (one in each end bell) for the lubrication of the motor bearings. Use a light high-grade, non-gumming machine oil, such as SAE-10. Put six or seven drops in each oil hole at intervals of one month. Each oil hole is covered with a ball and spring seal to keep out dirt and dust. To gain access to the oil holes, first remove the cabinet. Use an oiler with a $\frac{1}{16}$-inch (maximum) spout. This lubrication may be most easily accomplished from the front and rear of the recorder.

Turntable Spindle and Spindle Bearing

To lubricate the turntable spindle and bearing, use petroleum jelly.

Carriage Drive-Shaft Bearings

To lubricate the carriage drive-shaft bearings use a non-fluid oil such as "N. Y. and N. J. Lubricant Co. Type K-00 Special Graphited" (RCA dwg. 183440-11).

NOTE: Do not lubricate the carriage support tube or the feed screw. If these parts become dusty or dirty, wipe them off with a clean dry rag free from lint.

Replacement Parts

The following parts list is included to provide identification when ordering replacement parts. Order from *"RCA Replacement Parts Department,*

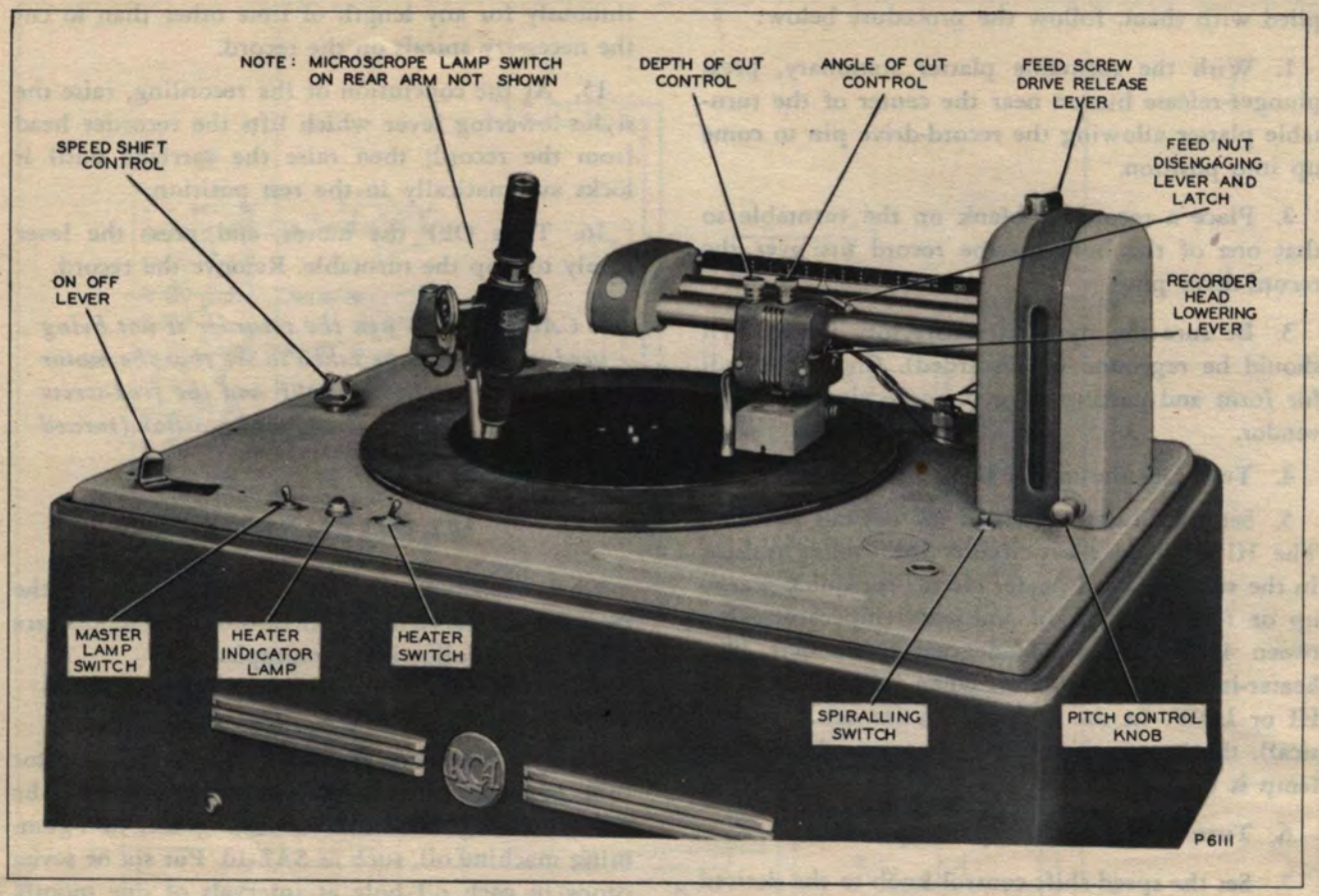

Figure 5—Recording Controls

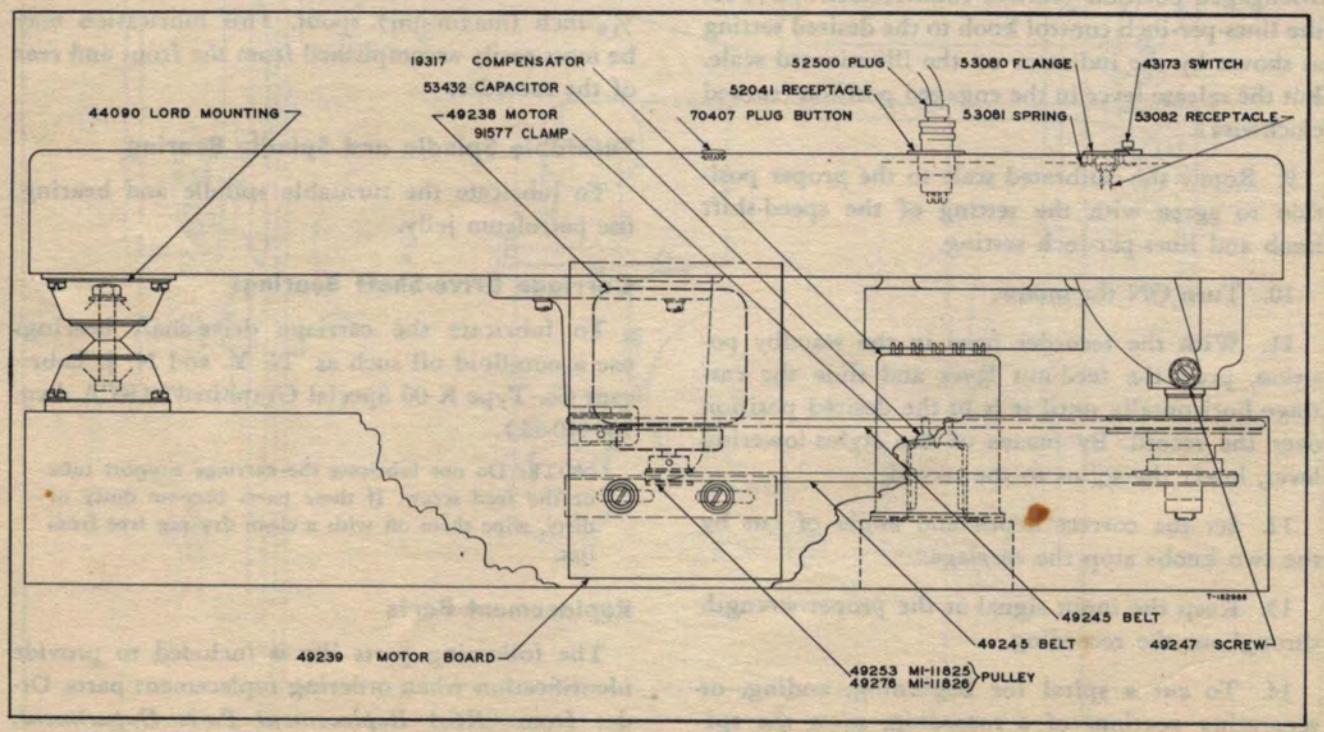

Figure 6—Main Assembly

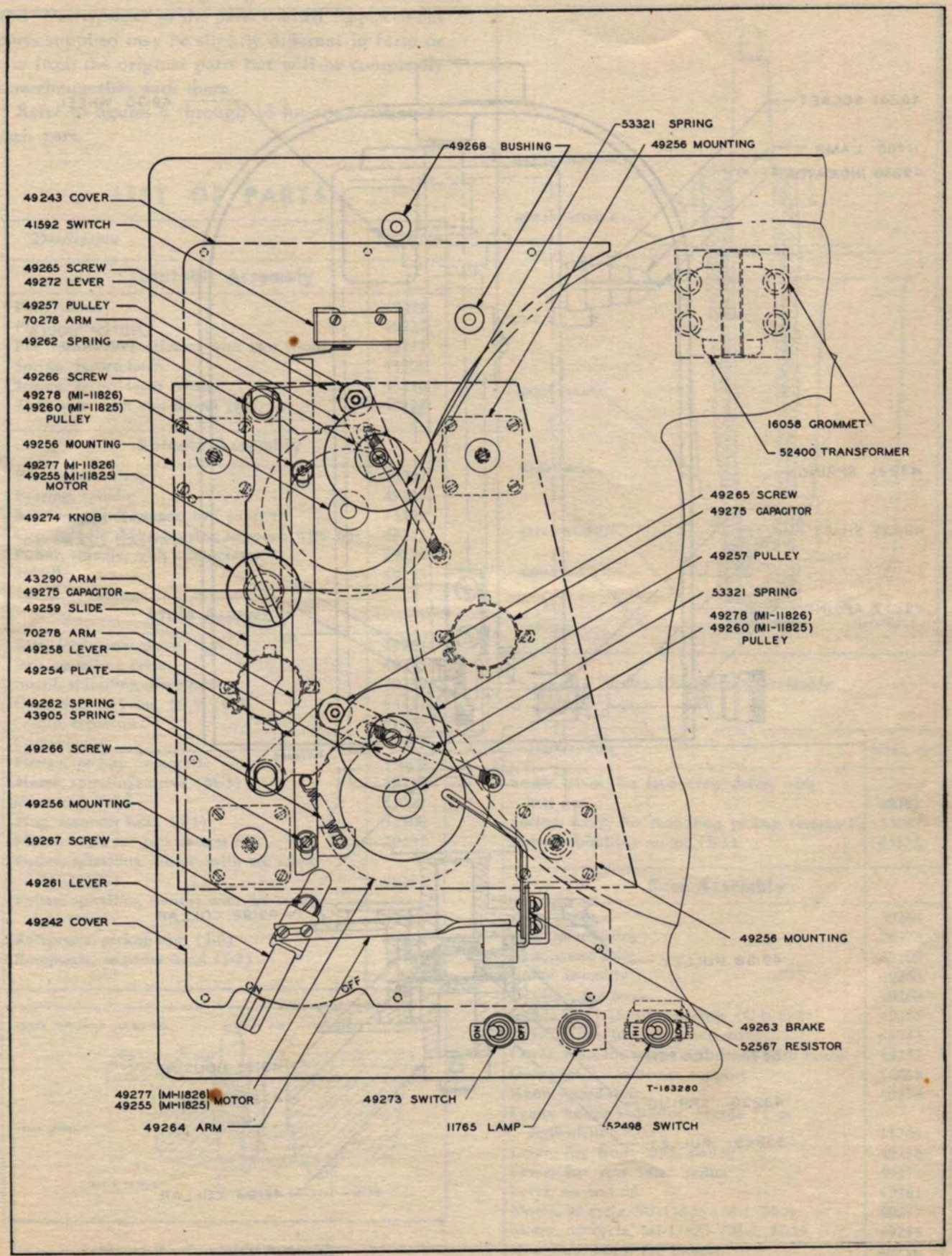

Figure 7—Base Assembly

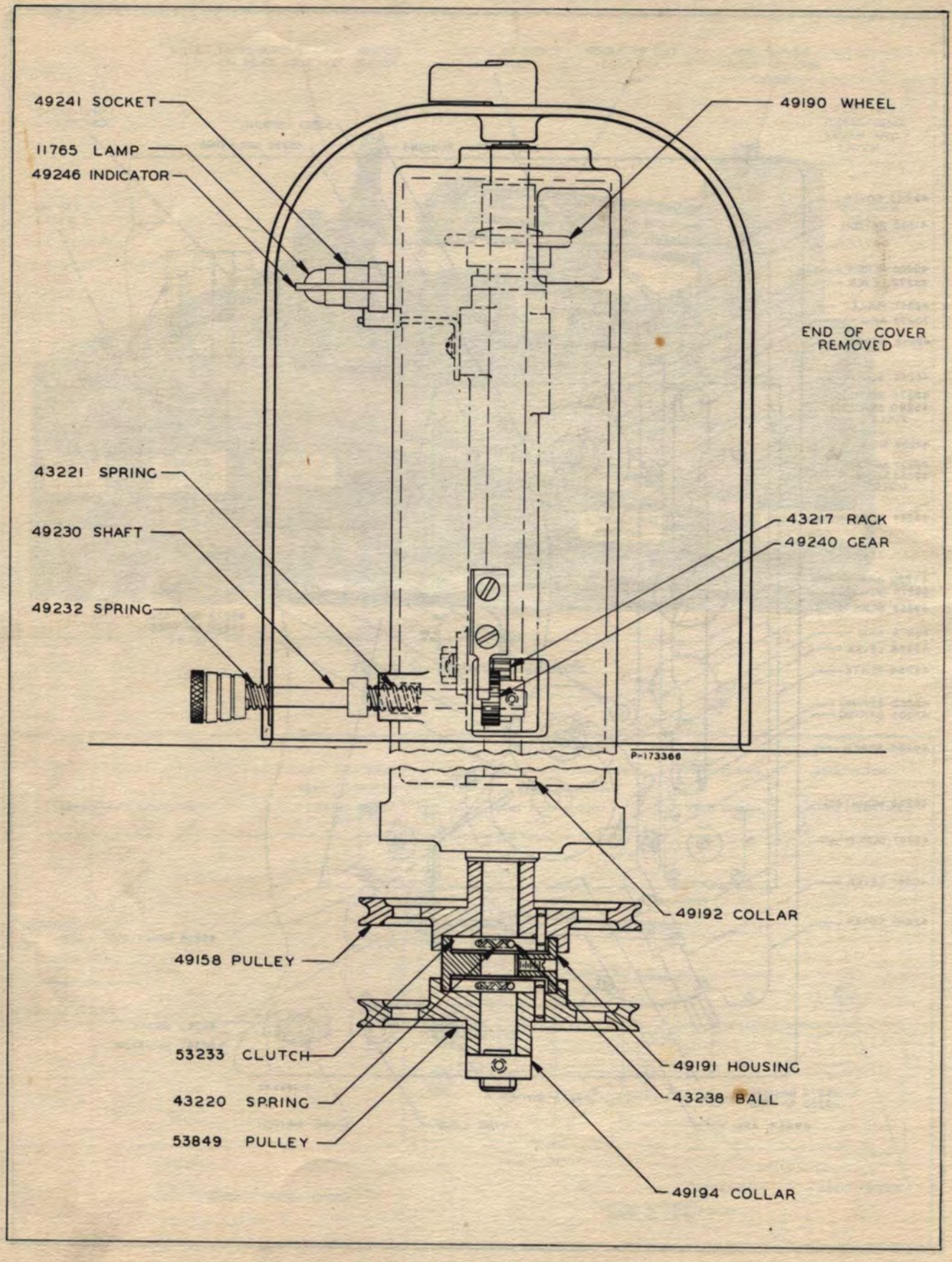

Figure 8—Recorder-Head Drive Assembly

Camden, New Jersey," giving the *"Stock Number"* and *"Description"* of the parts wanted. Replacement parts supplied may be slightly different in form or size from the original parts but will be completely interchangeable with them.

Refer to figures 6 through 13 for the location of each part.

LIST OF PARTS

Description	*Stock No.*
Turntable Assembly	
Pad, rubber	49229
Pin, record-latch	49227
Pin, record-latch release; with two washers	43211
Spring, record-latch	43208
Spring, record-latch release	43210
Turntable, with two dowel pins	49228
Spindle Assembly	
Ball, spindle-thrust	43237
Bearing, spindle	49234
Bearing, spindle thrust-ball support	43242
Cup, spindle thrust-bearing support; with nut	43243
Pulley, spindle; with 2 set screws	49236
Spindle	49235
Main Assembly	
Belt, feed-screw drive	49245
Belt, spiralling drive	49245
Board, spiralling-drive motor	49239
Capacitor, 1.75 mf, 50 v (C-3)	53432
Clamp, capacitor	91577
Compensator	19317
Flange, pickup receptacle	53080
Motor, spiralling drive (M-3)	49238
Mounting, Lord	44090
Plug, recorder head (J-1)	52500
Plug button, for pickup-arm rest	70407
Pulley, spiralling motor; with set screw (MI-11825)	49253
Pulley, spiralling motor; with set screw (MI-11826)	49276
Receptacle, pickup arm (J-6)	53082
Receptacle, recorder head (J-2)	52401

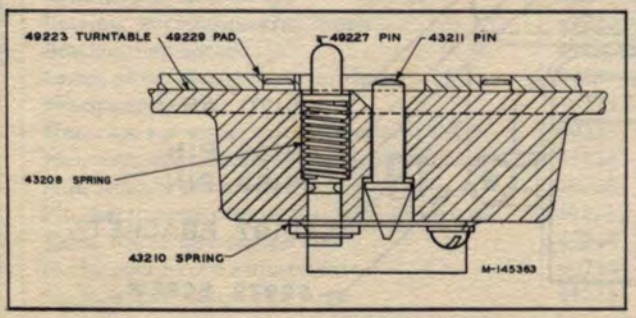

Figure 9—Turntable Assembly

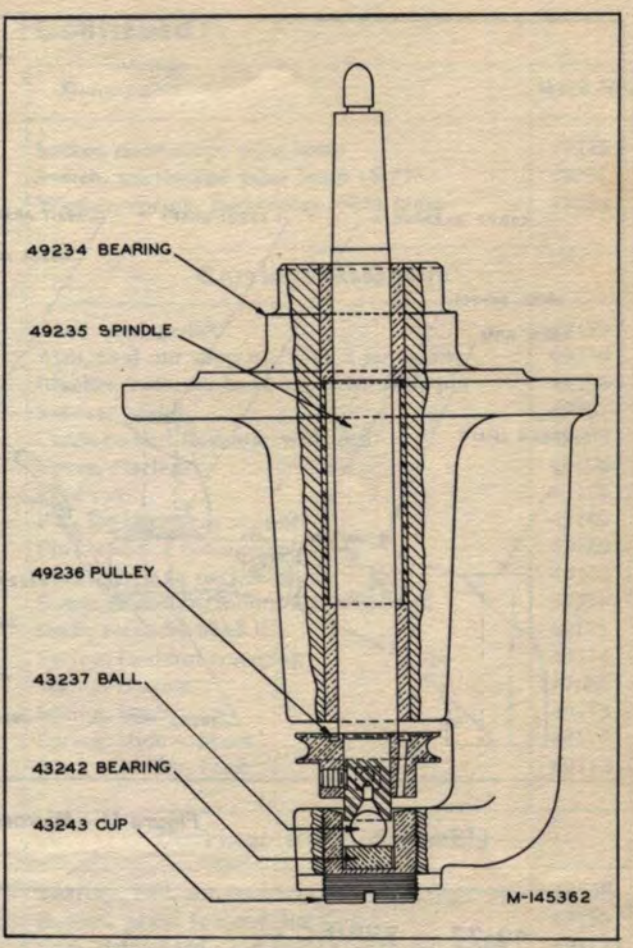

Figure 10—Spindle Assembly

Description	*Stock No.*
Screw, pivot, for feed-screw drive; with hex nut	49247
Spring, strap, for mounting pickup receptacle	53081
Switch, spiralling motor (S-3)	43173
Base Assembly	
Arm, brake	49264
Arm, idler pulley	70278
Arm, speed-shift	43290
Brake assembly	49263
Bushing, for leads	49268
Capacitor, 1.75 mf, 330 volt (C-1, C-2)	49275
Cover, front, for motor and drive	49243
Cover, rear, for motor and drive; with brace	49242
Grommet, transformer support	16058
Knob, speed-shift	49274
Lamp, heater indicator, Mazda 51 or equivalent (A-3)	11765
Lever, for front idler pulley	49258
Lever, for rear idler pulley	49272
Lever, on and off	49261
Motor, 50 cycle, MI-11826 (M-1, M-2)	49277
Motor, 60 cycle, MI-11825 (M-1, M-2)	49255
Mounting, Lord, for motors	49256

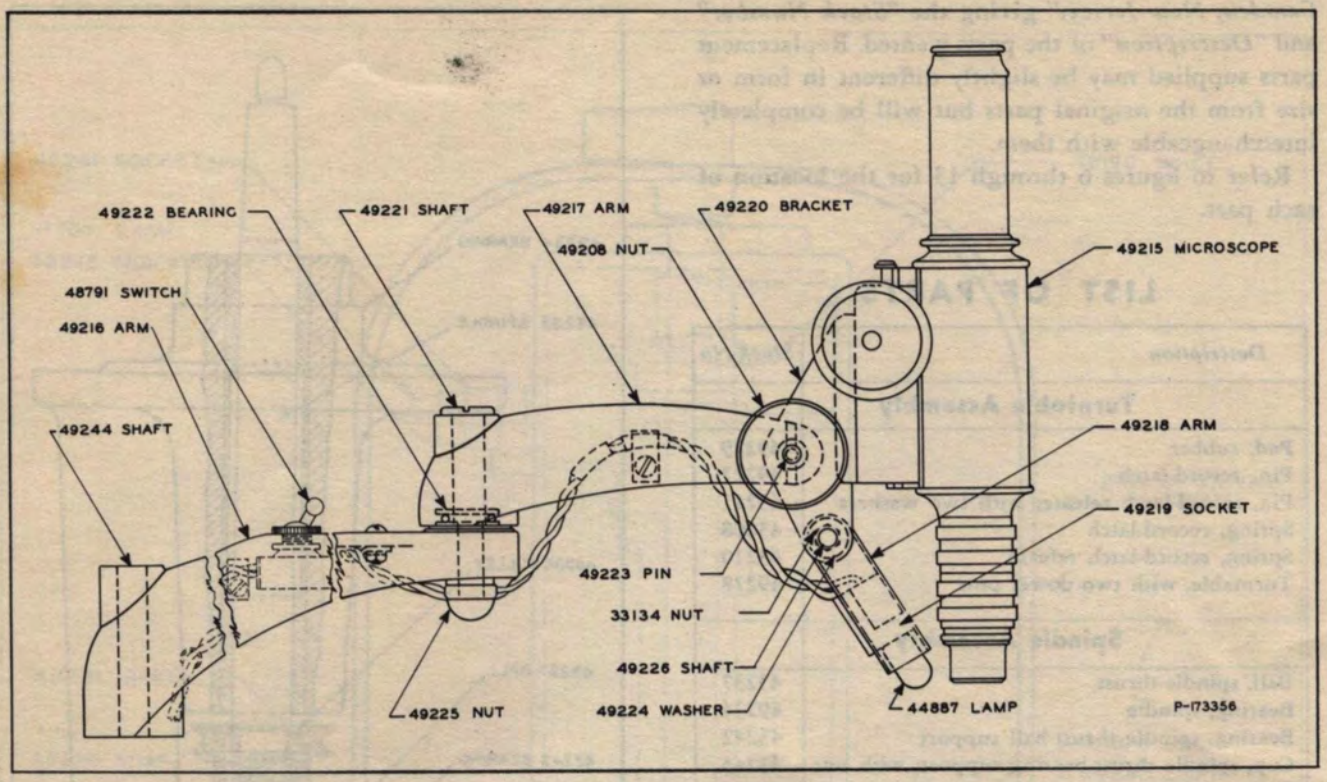

Figure 11—Microscope and Arm Assembly

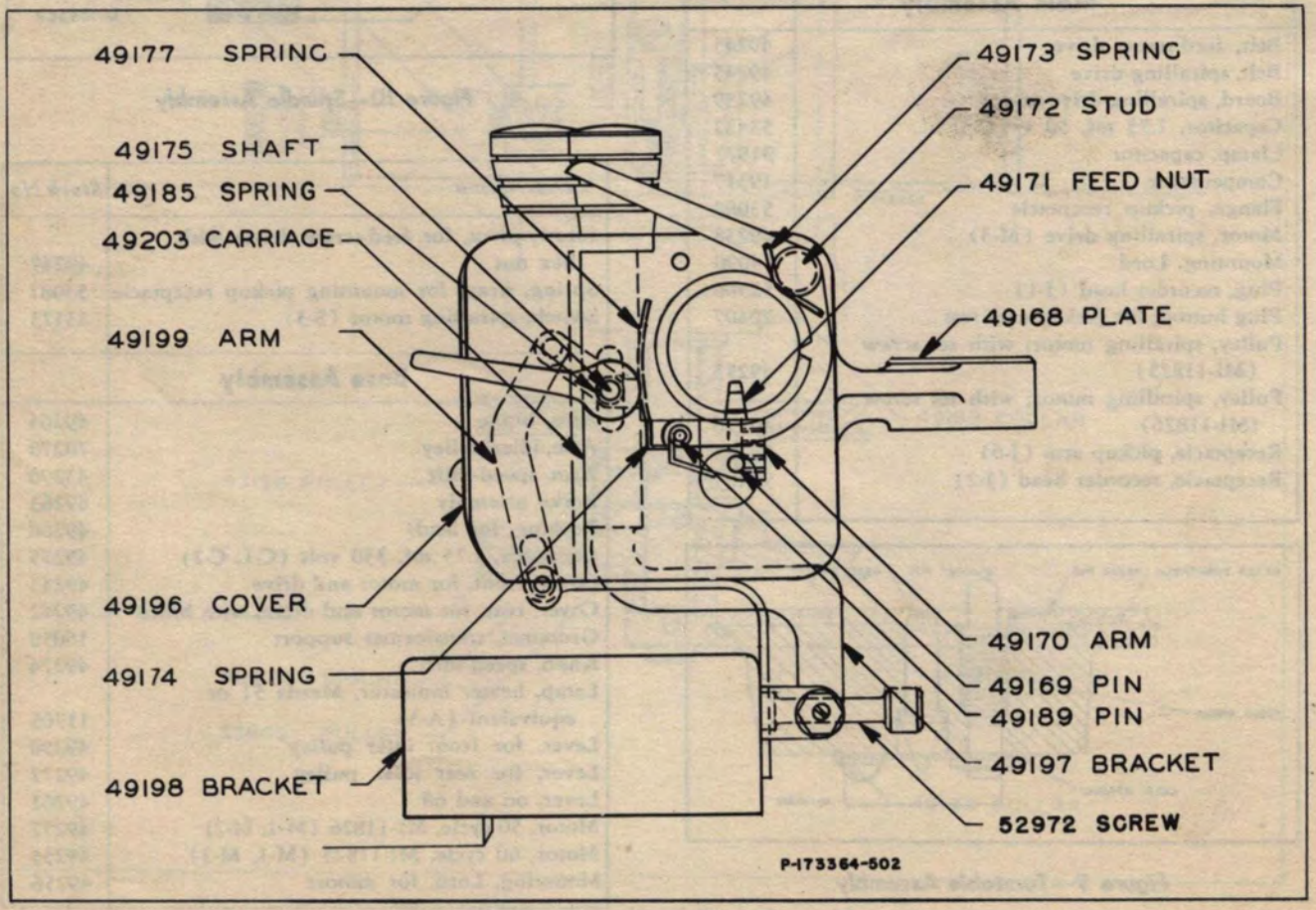

Figure 12—Carriage Assembly

LIST OF PARTS (Continued)

Description	*Stock No.*
Base Assembly (cont.)	
Plate, motor	49254
Pulley, idler	49257
Pulley, motor, MI-11825	49260
Pulley, motor, MI-11826	49278
Resistor, 7 ohm, 5 watt (R-1)	52567
Screw, shoulder, for idler-pulley arm	49265
Screw, shoulder, for on-and-off lever	49267
Screw, shoulder, for slide	49266
Slide, idler-pulley disengaging	49259
Spring, friction-drive tension	53321
Spring, slide	43905
Spring, speed-shift arm	49262
Switch, heater, three position (S-4)	52498
Switch, master, for all lamps (S-1)	49273
Switch, power, for drive motors (S-2)	41592
Transformer (T-1) (complete replacement unit for one or two transformers)	52400
Recorder-Head Drive Assembly	
Ball, clutch	43238
Collar, lower drive shaft; with two set screws	49194
Collar, upper drive shaft; with two set screws	49192
Clutch; less spring and ball	53233
Gear, pitch-change; with set screw	49240
Housing, clutch; with two set screws	49191
Indicator, pitch	49246
Lamp, pilot, pitch-change, Mazda 44 or equivalent (A-2)	11765
Pulley, assembly, spiralling-drive	53849
Pulley, feed-screw drive	49158
Rack, pitch-change gear	43217
Shaft, pitch-change; with knob, collar, groove pin, and spring	49230
Socket, pitch-change pilot lamp	49241
Spring, clutch	43220
Spring, pitch-change knob	49232
Spring, pitch-change locking	43221
Wheel, friction-drive	49190
Microscope and Arm Assembly	
Arm, lower, microscope	49216
Arm, microscope pilot lamp	49218
Arm, upper, microscope	49217
Bearing, microscope-arm thrust	49222
Bracket, microscope	49220
Lamp, pilot, Mazda 51 or equivalent (A-1)	44887
Microscope	49215
Nut, cap; for upper microscope arm shaft	49225
Nut, cap; microscope adjustment-shaft	33134
Nut, thumb, microscope	49208
Pin, microscope thumb-nut; with groove pin	49223
Shaft, lower microscope arm	49244
Shaft, microscope adjustment	49226
Shaft, upper microscope arm	49221

Description	*Stock No.*
Socket, microscope pilot lamp	49219
Switch, microscope pilot lamp (S-5)	48791
Washer, spring, microscope pilot lamp	49224
Carriage Assembly	
Arm, carriage-lift	49199
Arm, feed-nut support; with 2 set screws	49170
Bracket, recorder-head support; with pin	49198
Bracket, slide	49197
Carriage and bushing; with pin	49203
Cover, carriage	49196
Feed nut	49171
Pin, feed-nut arm support	49189
Pin, feed-nut disengaging	49169
Plate, carriage back-support	49168
Screw, thumb, to mount recorder head	52972
Shaft, recorder-head lift	49175
Spring, feed-nut engaging	49174
Spring, friction	49185
Spring, latch	49173
Spring, slide support	49177
Stud, shoulder, latch	49172
Carriage Drive Assembly	
Bearing, ball, for feed screw	49139
Button, plug, for end housing	49155
Cam, drive-head disengaging, with set screw	49212
Clamp, suction tube	49210
Collar, end bracket feed screw; with set screw	49160
Guide, left; with two machine screws	49201
Guide, right; with two machine screws	49202
Indicator, carriage position	49154
Lever, feed-nut disengaging	49166
Lever, drive-head disengaging; with two set screws	49213
Lever, stylus lowering	49167
Nut, thumb, for depth and angle adjustments	49204
Pin, end-bracket time-scale support	49151
Pin, time-scale support	49162
Plug, for connection to equalizer	53320
Post, drive-head spring	49211
Scale, pitch-indicator	49207
Scale, recording-time, 96, 104, 112, 120-78	49249
Scale, recording-time, 128, 136, 144, 152-78	49250
Scale, recording-time, 96, 104, 112, 120-33⅓	49251
Scale, recording-time, 128, 136, 144, 152-33⅓	49252
Screw, feed; with flange	49195
Screw, pivot, recorder head	48018
Spring, depth adjustment	49205
Spring, drive-head engaging	49214
Spring, end-bracket time-scale support	49152
Spring, slide tightening	19716
Stud, depth adjustment	49187
Tube, suction, shaving remover	49209
Washer, spring, end-bracket time-scale support	31608

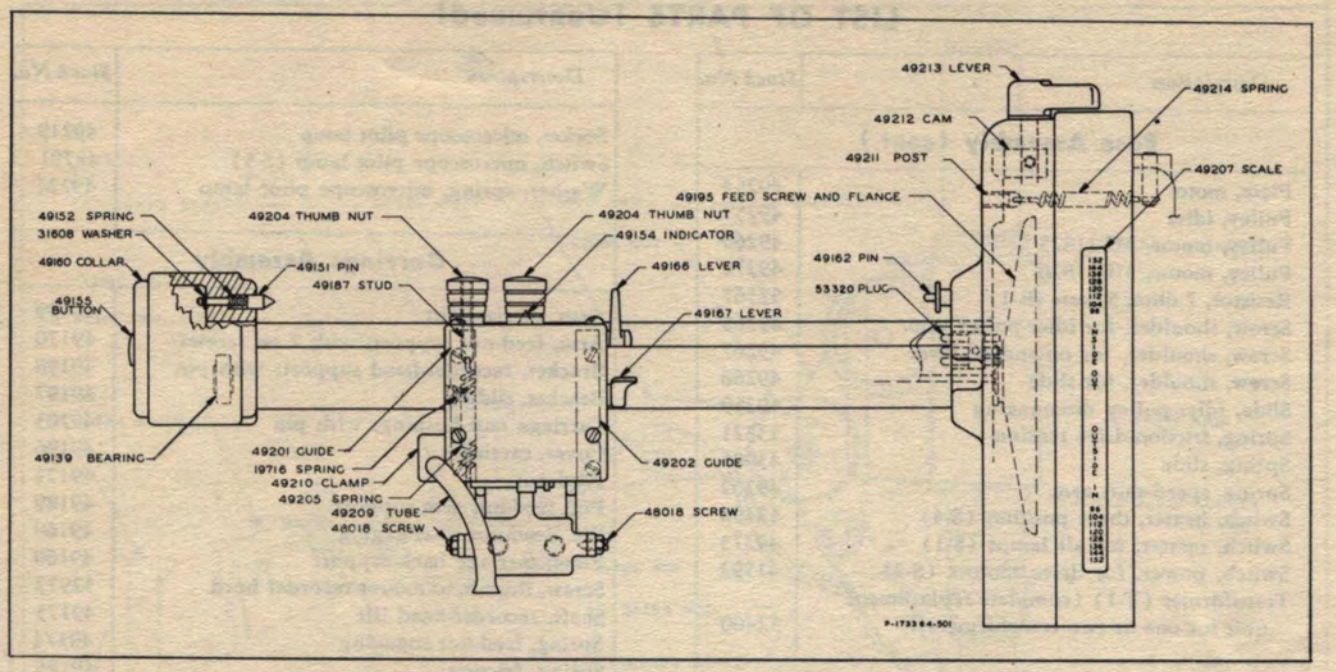

Figure 13—Carriage Drive Assembly