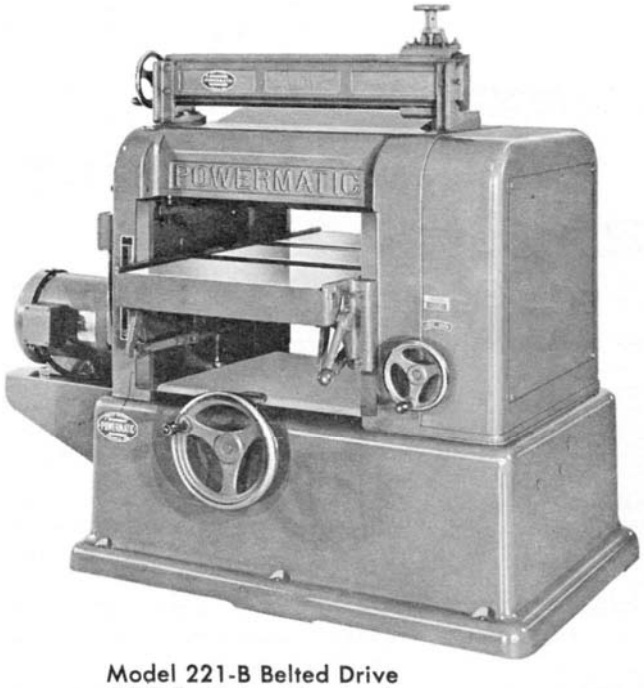
Model 221
20" Planer

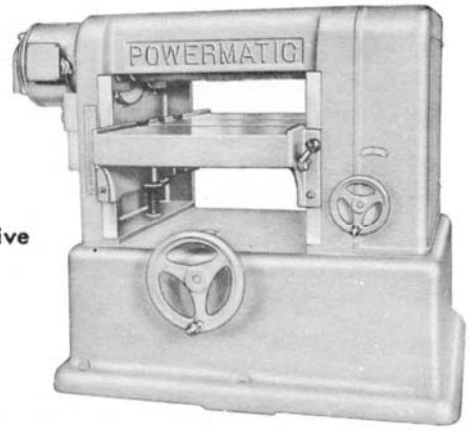
ALL MACHINES PERFORMANCE-TESTED BEFORE SHIPMENT

unexcelled performance for every surfacing job

Thousands of school, millwork and pattern shops, as well as hundreds of high production plants throughout America have discovered that the Powermatic 20" planer is unsurpassed for dependable, precision performance in an extremely wide variety of planing requirements. It incorporates every modern safety and operational feature for maximum efficiency.

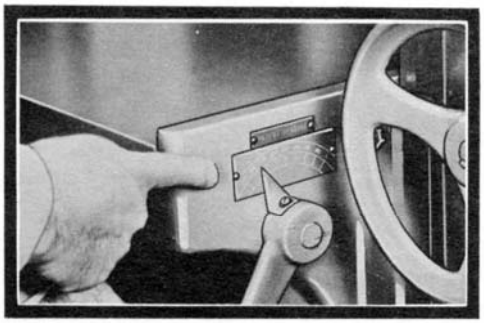


Model 221-B Belted Drive
T.E.F.C. Motor Standard

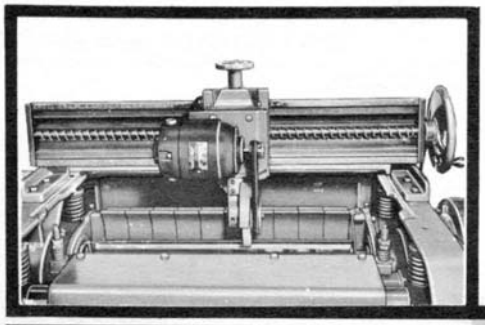


Model 221-D Direct Drive

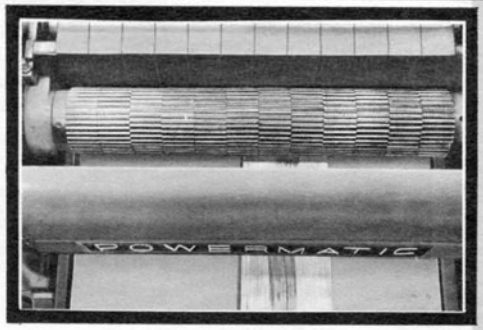
Quik-Set® Table Roll Adjustment . . .
It's standard equipment!
Adjust all rolls from 0" to .040" with a flick of the finger. Just move the Quik-Set lever at right of the table from rough to semi-finished stock.



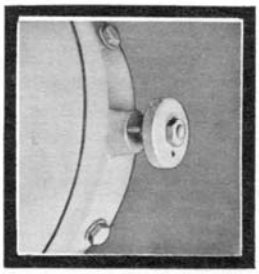
Knife Grinding and Jointing Attachment
(Optional) Keeps knives with a perfect edge always! Permanently mounted, extra heavy 6" grinder bar is precision ground for smooth, accurate operation. Grinder and jointer are belt driven by ¼-HP 1-phase, 110 Volt motor and are easily removed from bar when not in use.



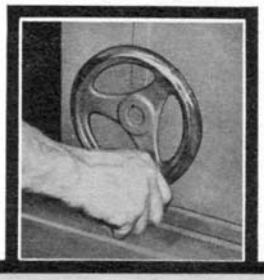
2" Sectional Infeed Rollers
(Optional on Model 221), have milled surfaces. 4" in diameter, roller offer maximum feeding accuracy especially important in working rough, uneven stock.



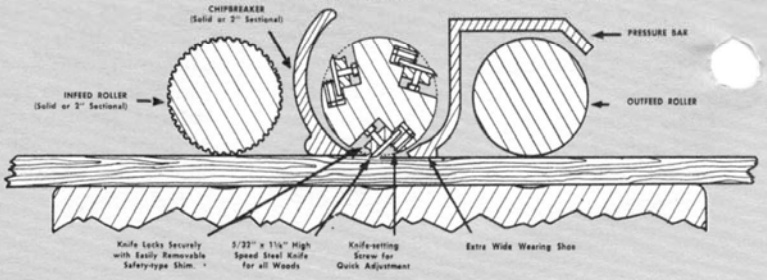
Knife Indexer
Quick acting plunger type indexing finger locks cutterhead securely for grinding knives. Predetermined and pre-set stops properly position knife.



Variable Speed Control
hand-wheel is easy to reach . . . easy to set. Adjusts rate of feed from 20 to 50 FPM.



CUTTING—ROLLER ASSEMBLY (SIDE VIEW)



Model 221
20" Planer

FEATURES

FRAME: Precision machined from extra heavy cast iron. Extra wide side panels with gibs offer rigid bed support and perfect alignment. One-piece 34" x 44¾" cast iron base.

BED: 20⅛" x 40", accurately machined with extra heavy rib-reinforcing for perfect alignment and maximum strength. Bed raises and lowers on large acme-thread screws, mounted on enclosed thrust bearings.

Convenient handwheel adjusts bed through full 8" range with 1/16" movement upon each complete turn. Adjacent front-mounted gauge is calibrated for quick, easy reading.

CUTTERHEAD: Safety-type, milled from carbon tool steel and fitted with 3 high-speed knives, 5/32" x 1¼" x 20". Mounted in over-size, sealed ball bearings, the entire cutterhead unit may be lifted free by removing feed drive pulley and locking screws from flange mounting. 4¼" cutting circle.

Operating speed is 4600 RPM (belted) with 13,800 cuts-per-minute (50 knife-cuts-per-inch) at 20 feet-per-minute feed rate. Direct drive operating speed of 3600 RPM yields 10,800 cuts-per-minute (40 knife-cuts-per-inch) at 20 feet-per-minute feed rate.

See knife adjustment feature on opposite page.

FEED ROLLS: Milled from tool steel. Extra large, 4" in diameter with mounting yield of ¼". Mounted in sealed-for-life ball bearings and plunger-type coil springs. Feed rolls fully reversible on 3-phase current only.
Infeed roll: corrugated, solid type is standard. Sectional type optional.
Outfeed roll: smooth, 4" diameter, solid type with two adjustable, 2¾" table idler rollers. Fully adjustable, with drive through over-size cut gears by V-belts from cutterhead spindle.

PRESSURE BAR: Mounted concentric to cutterhead and fitted extremely near knife cutting circle. The bar has extra wide foot for long wear (see side view drawing) and can be adjusted while machine is in operation.

CHIPBREAKER SOLID TYPE: (Sectional Optional) Swings concentric to cutterhead and mounted just forward of the knife-cutting circle. Has ⅜" yield with extra wide, accurately machined foot to assure longer wear and top grade finishing.

POWER FEED CONTROL: Variable speed pulley affords complete range of feed from 20 to 50 feet-per-minute. Driven by 1-HP totally enclosed motor mounted in base. Controlled by side mounted instantly reversing drum switch.

STOCK CAPACITY: Surfaces stock up to 20" wide and from ⅛" to 8" thick.

GUARDS: Designed for complete operating safety, guards enclose all moving parts. Easily removed for quick access.

LUBRICATION: All bearings either sealed-for-life type or equipped with easy-to-reach Alemite fittings.

DRIVES: Belted drive (Model 221-B) cutterhead is driven by V-Belts from motor mounted on the side of machine.

Direct Drive (Model 221-D) cutterhead is driven by motor mounted directly to cutterhead shaft.

POWER: 5-HP motor is recommended for light and medium work loads. For heavier requirements and high production use, the 7½ or 10-HP motor is recommended.

Direct drive (Model 221-D) cannot be furnished with 5-HP 1-phase motor.

ELECTRICALS: Machine standard equipped with magnetic controls protecting **both** feed and drive motor. With this exclusive safety feature, **both** motors shut off instantly after power failure.

STANDARD EQUIPMENT

PLANER LESS MOTOR: Set of 3 high-speed steel knives, 3 knife round cutterhead mounted in sealed ball bearings, Jack screws, cutterhead pulley, SOLID infeed and clip-brakes, motor mount base, 1 HP feed drive motor, set of wrenches, and quik-set table roll adjustment—Less motor, motor pulley, belts, switches, wiring, and belt guard.

PLANER WITH MOTOR: Same as Less Motor Unit, except with cutterhead, motor pulley, belts, belt guard, magnetic controls with overload, low voltage and no voltage protection, separate push button station and reversing drum switch (for 3-phase operation only.)

Brooks 10HP K213T Belts - B42 3450 RPM

STANDARD MACHINES

221-01—221-D, 20" x 8" Single Surfacer, Direct Drive, 5-HP, 3-phase, 220/440 or 550-volt, 50/60 cycle motor. Motor includes magnetic starter under and overload voltage protection and push-button station, solid infeed roll and chipbreaker.

221-03—221-D, same as 221-01, except with 7½-HP, 3-phase, 220/440-volt, 60 cycle, Direct Drive motor.

221-04—221-D, same as 221-01, except with 10-HP, 3-phase, 220/440-volt, 60 cycle, Direct Drive motor.

221-05—221-B, same as 221-01, except less cutterhead motor. With V-pulley on cutterhead shaft. Specify feed motor voltage.

221-06—221-B, same as 221-01, except with 5-HP, 3-phase, 220/440-volt, 60 cycle Belted Drive motor.

221-07—221-B, same as 221-01, except with 5-HP, 1-phase, 220-volt, 60 cycle Belted Drive motor.

221-08—221-B, same as 221-01, except with 7½-HP, 3-phase, 220/440-volt, 60 cycle Belted Drive motor.

221-09—221-B, same as 221-01, except with 10-HP, 3-phase, 220/440-volt, 60 cycle Belted Drive motor.

OPTIONAL ACCESSORIES

221-15—KNIFE GRINDING AND JOINTING ATTACHMENT. Wt. 100 lbs.

221-16—SECTIONAL TOP INFEED ROLLS. (In lieu of standard) 4" diameter, 2" sections of cast steel mounted on milled carbon tool steel shaft. Wt. 50 lbs.

221-17—SECTIONAL CHIPBREAKER. (In lieu of standard). Made of 2" cast steel sections. ⅜" yield. Wt. 45 lbs.

221-18—SHAVING HOOD. 6" outlet. Wt. 25 lbs.

221-19—FOUR-KNIFE CUTTERHEAD. (In lieu of standard).

221-20—Set of Three High-Speed Steel Knives. Wt. 3½ lbs.

221-21—Set of Four High-Speed Steel Knives. Wt. 4 lbs.

221-22—3 Groove B-Section 5.45" pulley for 3450 RPM motor.

221-23—Switch for 5-HP, 1-phase, 220-volt, 60 cycle motor with magnetic starter and push-button station.

221-24—Same as 221-23, except for 5-HP, 3-phase, 220/440-volt motor.

221-25—Same as 221-23, except for 7½-HP, 3-phase, 220/440-volt motor.

221-26—Same as 221-23, except for 10-HP, 3-phase, 220/440-volt motor.

221-27—3 Groove B-Section 9.40" Dia. pulley for 1725 RPM motor.

221-28—JIC Electricals for 5 to 7½-HP. Wt. 25 lbs.

221-29—JIC Electricals for 10-HP. Wt. 30 lbs.

221-30—Belt Guard for 3450 RPM motor.

221-31—Belt Guard for 1725 RPM motor.

OPERATING INSTRUCTIONS

AND

PARTS LIST

Model 221-20 Planer

★

For Serial Numbers From 5525 Up

★

POWERMATIC INC.

McMINNVILLE, TENNESSEE

Feb. 1965

I. GENERAL SET-UP AND ALIGNMENT

1. RECEIVING

Uncrate and check for shipping damage. Clean all coated and greased surfaces. Read instructions thoroughly. Locate all lubrication points; adjustment; methods of drive.

2. MOUNTING

Mount machine securely to solid foundation. Concrete base mounting preferred. Locate in clean, dry and well ventilated building if possible. Motor and electrical connections should be protected when not in operation or if exposed to weather elements.

3. EXHAUST SYSTEM

Recommended as a must if efficient production operation is required. Not a necessity where limited amount of operation being performed and machine can be kept clean of shavings.

4. INSPECTION

The above machine requires the minimum amount of attention in service. Periodic or regular inspections are recommended to insure machine is in proper adjustment, positive electrical connections; worn or loose "V" belts and bearings heating or loose.

5. BEFORE OPERATING

Check motor nameplate date or wiring diagram of motor and switch for proper voltage connection before wiring into line. Run motor without load to check the connections and direction of rotation. Always refer to motor nameplate for rotation connections.

II. LUBRICATION

A. Feed rollers are mounted in sealed ball bearings and do not require any lubrication.
Chains and drive sprockets should be lubricated every 8 hours of operation with a heavy grade of oil or light weight grease.

GREASE LUBRICATION

12 - 14 - 16 ..... Feed drive sprockets
15 ..... Variable drive pulley
13 ..... Variable speed shaft
17 ..... Cutterhead Bearings

B. OIL LUBRICATION

The following points are to be lubricated regularly every ten (10) hours of operation with oil equivalent to SAE 10 with Viscosity index of 200 at 100 Degrees.

Surface Fittings: Bed Ways
Handwheel drive shaft gears and thrust screws

III. OPERATING ADJUSTMENTS

PLANER BED:

The planer bed mounts in the main frame panels and is held rigid by the shims and adjusting screws located in front of machine. The bed is raised and lowered by the gears and thrust screw operated by the large handwheel on front of machine. Keep shims adjusted to hold the planer bed rigid in ways but not tight enough to restrict freedom of raising and lowering with handwheel. The planer bed must be level with cutterhead. Check this by lowering the bed to allow placing a small jackscrew type gauge (or small square block) between one extreme end of cutterhead. Slide the gauge to opposite end of cutterhead to determine if the same measurement exists. If the bed is out of level, adjust in the following manner: Loosen set screw (3) that locks adjusting nut (4) in bed. Turn nut (4) to the right or left to raise or lower the bed in the desired amount, and lock in place with set screw (3).

PLANER BED IDLER ROLLS

The bed rollers (2) Fig. 2 are adjusted to proper height with a "quikset" handle mounted on right hand side of planer bed. The height of the rollers in relation to table surface is indicated by a graduated dial and a pointer on the "quikset" handle. If the table roller height does not correspond with height indicator scale adjustment can be made by: Loosening the set screws (1) Fig. 2 in the roller adjusting arms. Set the indicator pointer at zero on the gauge and turn adjusting screws until bed rollers are level with planer table. Tighten the set screws in adjusting arms. To plane rough sawn lumber, the indicator should be set on .030 inches. For medium rough, .010 to .015 and for fine finish, .000 to .010. Set rollers high enough that the lumber will feed through the machine without hesitation.

PLANER BED HANDWHEEL DRIVE ASSEMBLY:

The planer bed thrust screws are powered by the gears and handwheel arrangement and do not require any adjustment other than keeping gears in proper mesh and tight on handwheel drive shaft.

POWER DRIVEN FEED ROLLERS:

The sectional infeed roller (6) Fig. 3 and smooth outfed roller (5) are driven with roller chain and sprockets from 1 HP motor mounted in base of machine. The rollers are mounted on sealed ball bearings that require no lubrication. The rollers are mounted in floating type bearing boxings that are held down with pressure springs on top that can be regulated with adjusting screw (10) Fig. 4. The height adjustment of the feed rollers (from the bed) are adjusted with set screws (7) Fig. 3. The feed rollers should be approximately 1/8" lower than the arc cut of the cutterhead knife. A Jackscrew type gauge or a square block should be used to set the rollers. The feed roller pressure springs should be adjusted by trial and error method to determine necessary pressure for proper feeding. Too much pressure on infeed corrugated roller will leave markings on material if light cuts are being made. Rough sawed and green material will require more pressure than smooth dry material. Adjust to where material will feed steadily without hesitation or slippage of rollers.

CHIP BREAKER:

The chip breaker (9) Fig. 4 is sectional type with 2" sections mounted on a spring loaded bar that swings concentric with the cutterhead. The sections have approximately 3/8" yield and should be adjusted with set screws (8) Fig. 4 1/16" below infeed rollers.

PRESSURE BAR:

The pressure bar is adjusted with adjusting screws (11) Fig. 4 and can be individually adjusted from either end by turning adjusting screws (11) Fig. 4 to the right to lower and to the left to raise. The pressure bar should be set the same height as the arc of the cutterhead knife or so there will be a slight pressure on the cutterhead knife or so there will be a slight pressure on the board as it leaves the cutterhead. If the pressure bar is too high it will cause a dip in the end of the board. If it is too low the board will stick. The spring pressure on the bar is regulated with the lock nuts on the adjusting screws.

MATERIAL THICKNESS GAUGE:

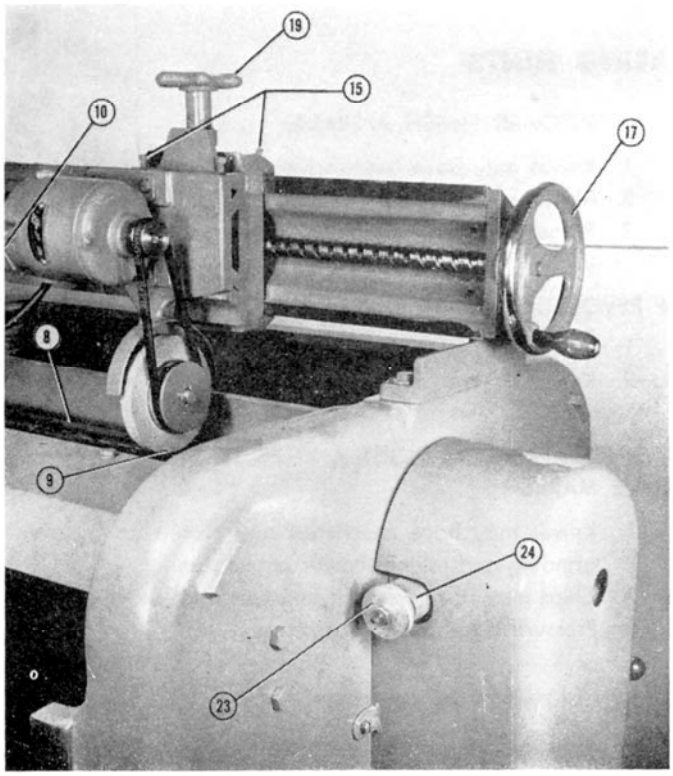
To set the indicator on the material thickness scale to indicate properly after changing knives, loosen the screw in the planer bed which holds the brass pointer and set to the thickness the material measures when planed or fed through the machine. The hole which mounts the brass pointed is slotted and will permit proper adjustment.

CUTTERHEAD:

The Cutterhead is equipped with three knives held in position with the lock shims and set screws. Knives must be adjusted to set evenly and level in the cutterhead. Before removing knives from cutterhead, the knife gauge should be set to knives in order that the height of the knives will not be changed relative to the other parts of the machine. The feed rollers, chipbreaker and hold down bar are adjusted to the arc of the knife cut, and if the height of the knives are raised or lowered, the feed rollers, chipbreaker, and hold down bar should be adjusted accordingly. Knives should **not** protrude more than 1/8" beyond radius of cutterhead. When replacing knives after sharpening, place the knife slot together allowing the knife to protrude 1/4" to 3/8". Tighten the lock shim set screw in each end just enough to hold knife firmly. Using a hard block of wood the knife can be lightly tapped into slot to proper setting. The feeler type gauge furnished with machine will permit setting knives accurately, however, a dial type indicator gauge is recommended if finest finish required. Improper knife setting will cause vibration and leave knife marking on material.

KNIFE CARE:

IMPORTANT: Knives should be kept sharp. The knives do all of the work and they will not do satisfactory work if they are DULL. The set of knives are matched and balanced at the factory. When the knives are sharpened, care should be taken that they are kept in balance.



JOINTING AND GRINDING PROCEDURE

The first and most important step is to JOINT the knives, then GRIND them. Jointing knives first assures uniform knife height. Knives are fastened in a round head and the cutting is done in an arc by the front edge of the knife. Even though knives are installed with a micrometer gauge, an absolute uniformity of height cannot be obtained. Knives should be jointed until all edges of knives are uniform. This jointing process actually sharpens the knives. After jointing, the jointer head is removed and grinding head installed. The excessive joint is then ground from the bevel of the knife edge.

INSTALLATION OF BAR AND ADJUSTMENT OF JOINTER

1. First carefully study illustrated numbers on pictures.
2. Remove cover screws and cover guard from top of planer.
3. Place Jointer bar in position and bolt down with cap screws. Cap screws should be tightened very snugly.
4. Place Jointer bracket on jointer bar head and fasten with set screws (15).
5. Rotate cutterhead until the edge of the cutter-head knife slot lines up with the edge of the jointer stone (16).
6. Move jointing head back and forth on the jointing bar with handwheel (17) for parallel alignment. If the bar does not move in exact parallel with the knife edge, the holes in the jointer bar base (18) are large enough to permit alignment of bar.
7. After jointer bar is in line, base cap screws (14) should be securely tightened. To level jointer bar with cutterhead, rotate cutterhead until jointer stone is between two of the knives. Adjust the jointer stone with Handwheel (19) until it just clears the cutterhead.
8. Operate Jointer head back and forth, and check with thickness gauge (20) or piece of paper to see if Jointer bar is level with cutterhead.
9. To level bar with cutterhead, loosen cap screws on jointer bar bracket and adjust with adjusting screws.

JOINTING CUTTERHEAD KNIVES

10. TO JOINT PLANER KNIVES: adjust jointer stone until it just clears knives EVENLY. Now lower Jointer stone until just touching knives.
11. Move the jointer head to a position past the cutterhead. With the planer running at full speed, operate jointer head back and forth RAPIDLY, lowering jointer head if necessary until knives are properly jointed. Take care not to OVERJOINT knives.

GRINDING CUTTERHEAD KNIVES

Mount the grinding attachment on jointer bar and secure in place with set screws (15) fig. 5. Lock the cutterhead in place for knife grinding with cutterhead lock (23) fig.

7. Turn the knob (23) until the pin in the casting (24) enters the hole in the knob (23). Revolve the cutterhead by hand until the cutterhead is locked in place. Lower the grinding wheel (9) fig. 7 with the handwheel (19) fig. 7 until the wheel very lightly touches the knife (8). Move the grinder (9) fig. 7 to a position past the cutterhead knives with handwheel (17). Start grinder motor with switch (10), set grinding wheel to take cut and rapidly move grinder back and forth with handwheel (17). Be sure to move grinder fast enough to prevent burning the knives. The knives should always be ground after jointing, leaving a very slight joint on the knife edge. Each knife should be finished before moving to the next knife. Knives out of balance will cause excessive vibration of the cutterhead; therefore, care should be taken to keep all knives the same weight.

Before operating the grinder, the ways on the grinder bar and the lead screw should be lubricated with a light film of oil. The gib screws on the head should be adjusted to keep any excessive wear or motion out of the head.

IV. PLANER OPERATING HINTS

IF CLIP OR SNIPE APPEARS AT BEGINNING OF BOARD:

1. Pressure bar may be set too low.
2. Chipbreaker may be set too high.
3. Upper infeed sectional roll may be set too high.
4. Lower infeed roll may be set too high.
5. Spring tension may be too light on pressure bar.

IF CLIP OR SNIPE APPEARS ON END OF LUMBER:

1. Pressure bar may be set too high.
2. Lower outfeed roll may be set too high.
3. Upper outfeed roll may be set too low.
4. Lumber may not be butted.
5. Grain may be running against knives.

IF KNIVES TEAR OUT LUMBER:

1. Feed may be too fast.
2. Moisture content may be too high.
3. Head may be running too slowly.
4. Cut may be too heavy.
5. Cutting angle may be too large.
6. Grain may be running against knives.

IF KNIVES RAISE THE GRAIN:

1. Feed may be too fast.
2. Cutting angle may be too large.
3. Head may be running too slowly.
4. Moisture content of lumber may be too high.
5. Cut may be too heavy.

IF CHIP MARKS APPEAR ON LUMBER:

1. Blower system may not be strong enough.
2. Feed may be too fast.
3. May be loose connection in blower system—no suction.
4. Exhaust pipe may join at too large an angle to main blower pipe.

IF PANELS ARE TAPERED ACROSS THE WIDTH:

1. Planer bed out of level with cutterhead.
2. Knives not set even with cutterhead.

IF UNDESIRED POUNDED GLOSSY FINISH APPEARS:

1. Knives may be dull.
2. Feed may be too slow.

IF WASHBOARD FINISH APPEARS:

1. Knives may have been driven back into the head.
2. Machine may be completely out of adjustment.
3. Planer bed loose and rocking in ways.

IF REVOLUTION MARK SHOWS UP:

1. Knives may be ground poorly.
2. Knives not set properly or evenly.

IF LINES APPEAR AT RIGHT ANGLES TO THE KNIFE MARKS:

1. Knives may have checkered and nicked up by over-grinding and taking temper out of steel.
2. Chips may have wedged between rolls and tables.
3. Pressure bar may be dragging.

IF STOCK TWISTS IN MACHINE:

1. Pressure bar may be cocked.
2. Upper outfeed roll may be cocked.
3. Upper outfeed roll may have uneven spring tension on it.
4. Lower rolls may be cocked.

IF STOCK STICKS OR HESITATES IN MACHINE:

1. Pressure bar may be set too low.
2. Lower rolls may be set too low.
3. Upper rolls may not be set low enough.
4. Cut may be too heavy.
5. Coaxer board may help lumber through machine.

IF MACHINE IS NOISY AND VIBRATES AND POUNDS:

1. Knives may be too dull.
2. Machine may not be leveled up correctly.
3. Machine may not be on solid foundation.
4. Pressure bar may be set too low.

IF MOTOR KICKS OUT:

1. Knives may be dull, thus overloading motors.
2. Pressure bar may be set too low, putting drag on motors.
3. Motors may be drawing high current because other machinery in the plant in use has pulled down the voltage.
4. Machine may be out of adjustment.
5. Lower rolls may be set too low.

MODEL 221—20" PLANER

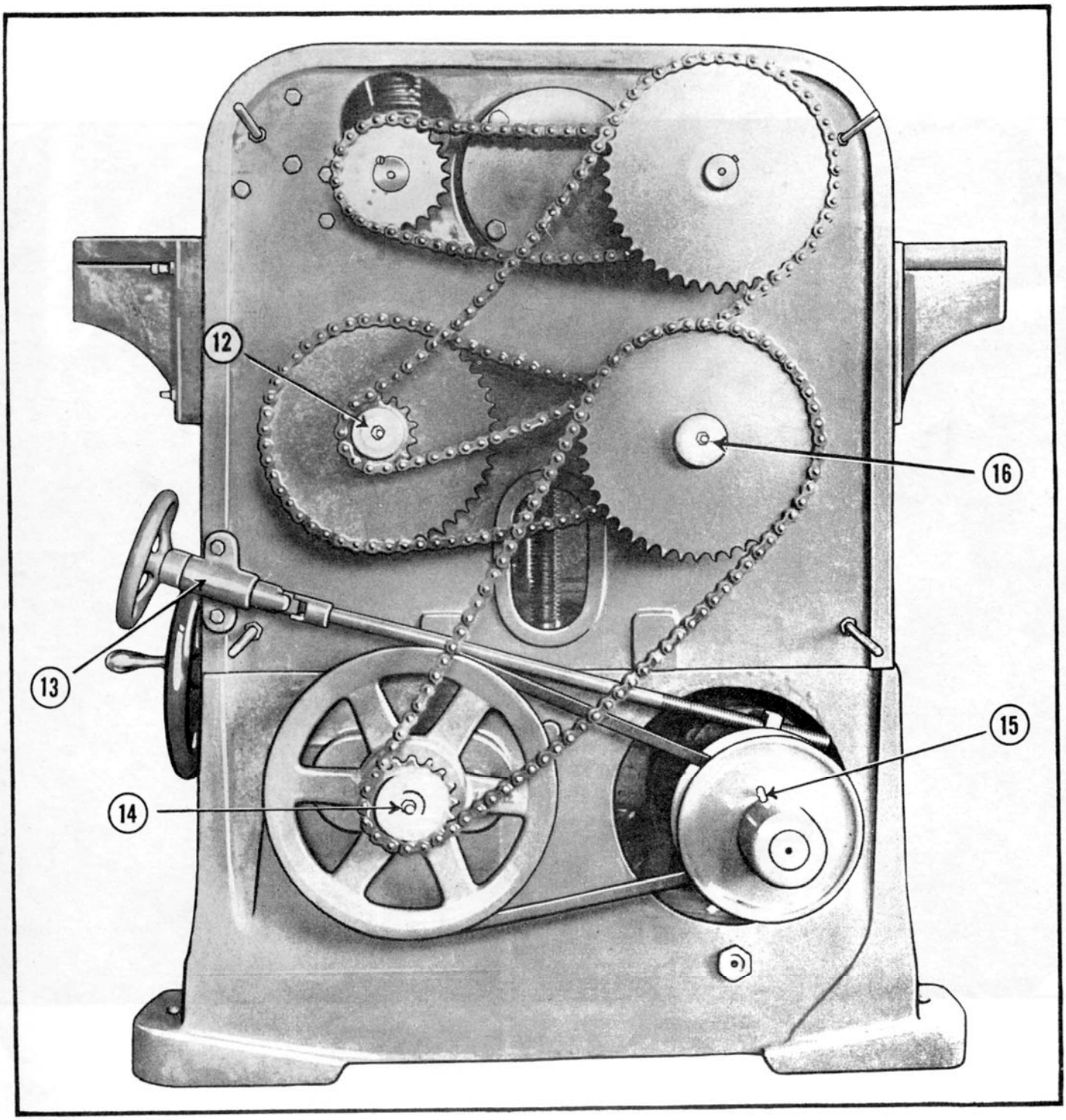


Figure 1. Lubrication

MODEL 221—20" PLANER

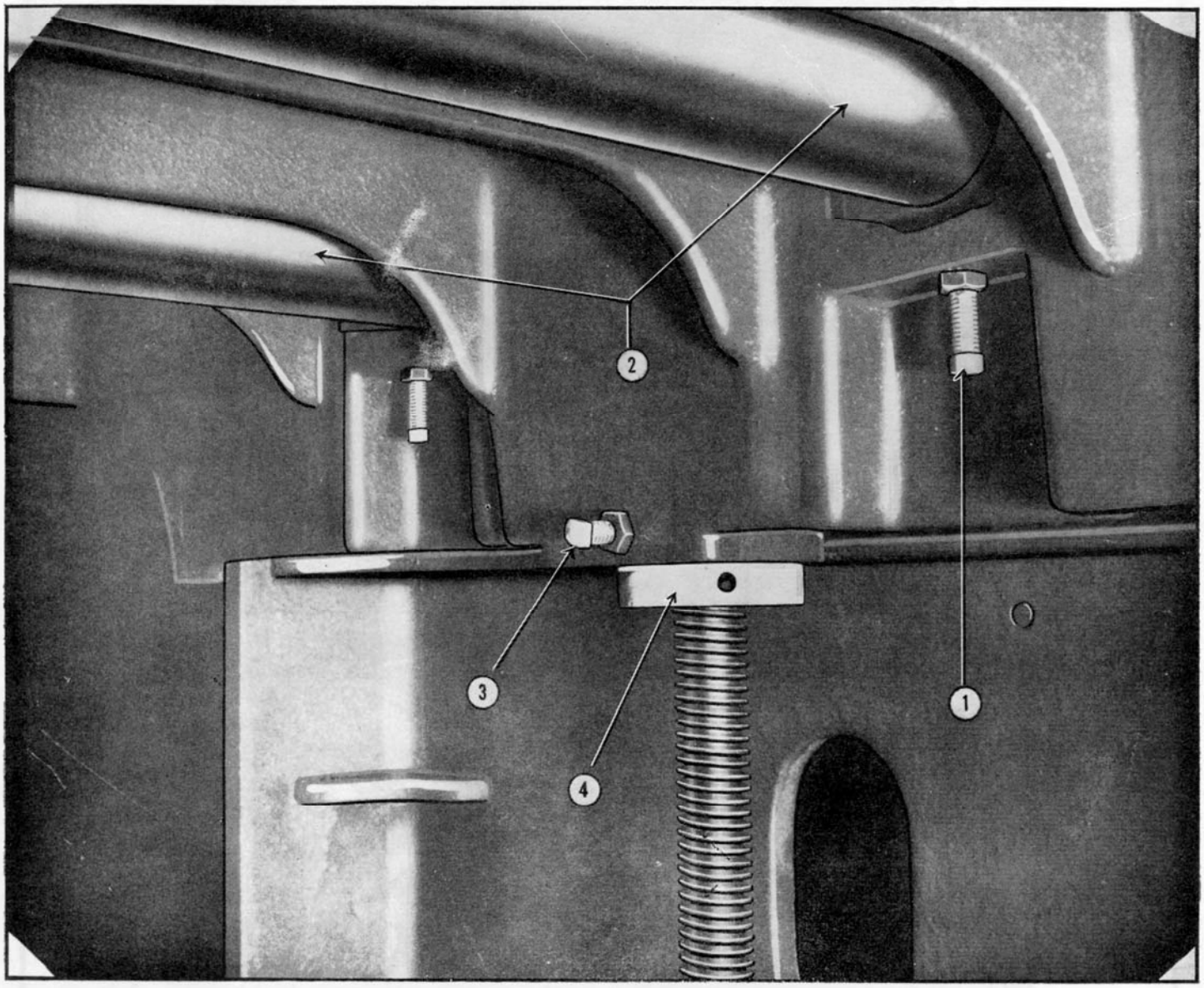


Figure 2

MODEL 221—20" PLANER

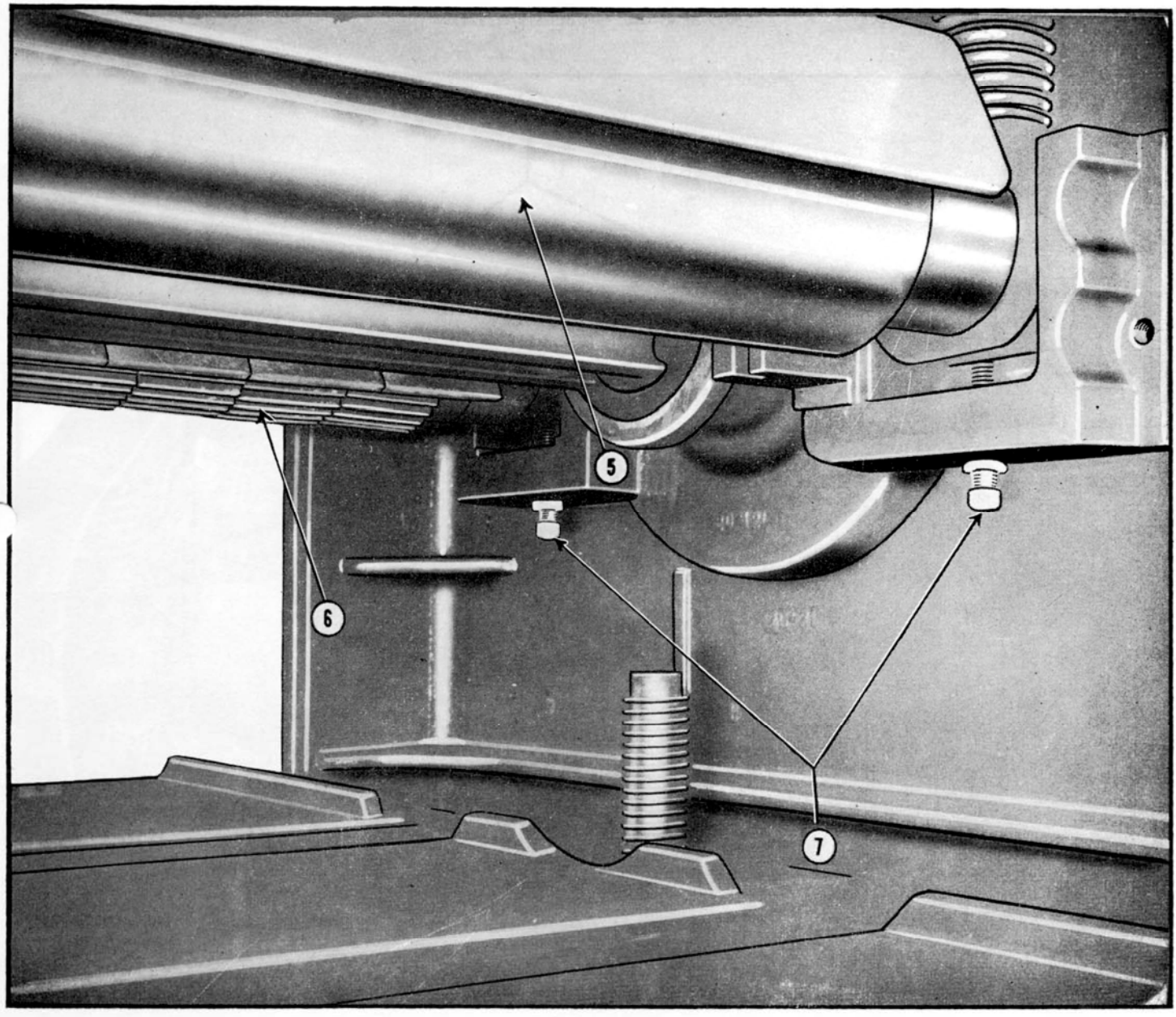


Figure 3

MODEL 221—20" PLANER

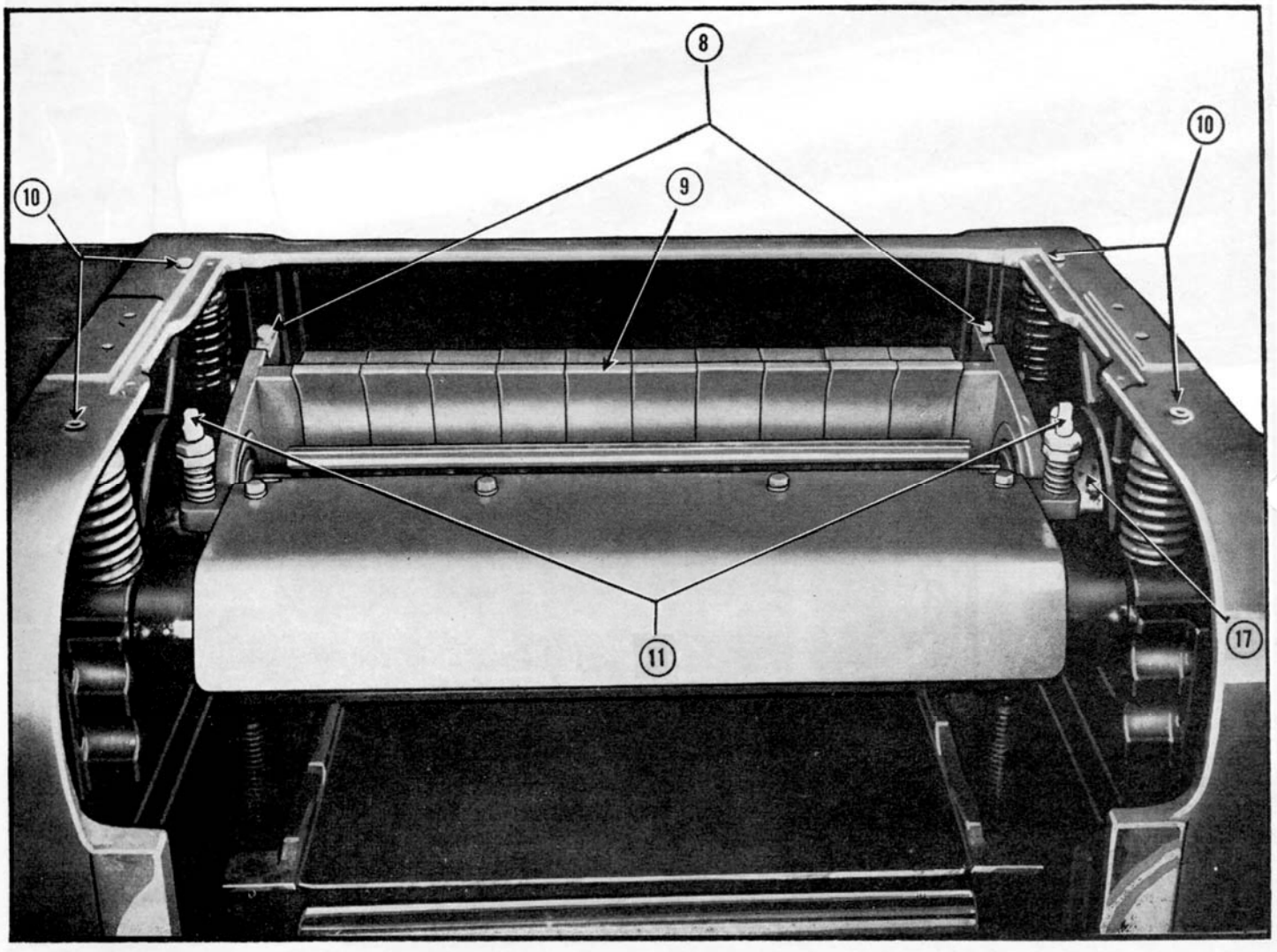
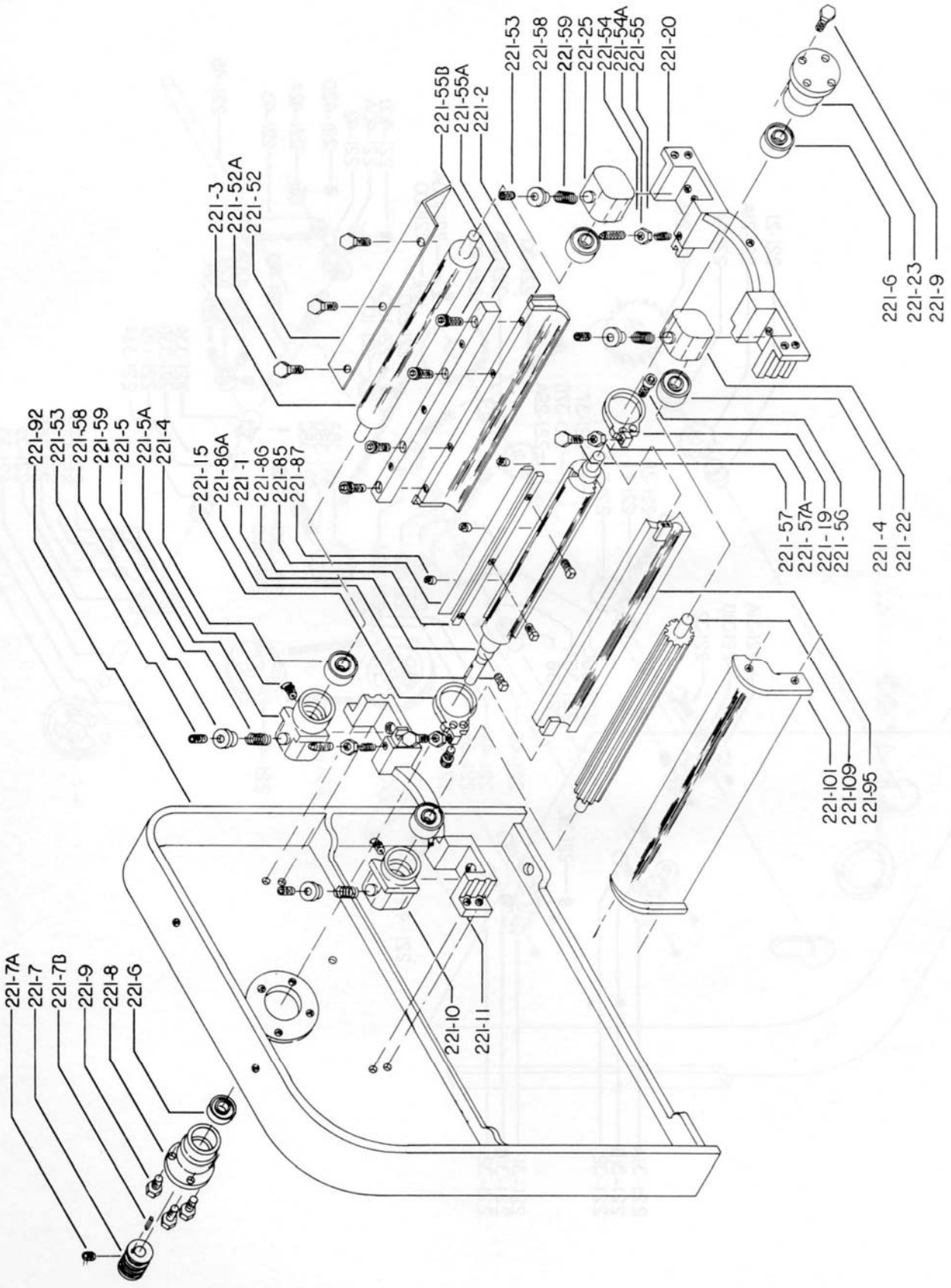


Figure 4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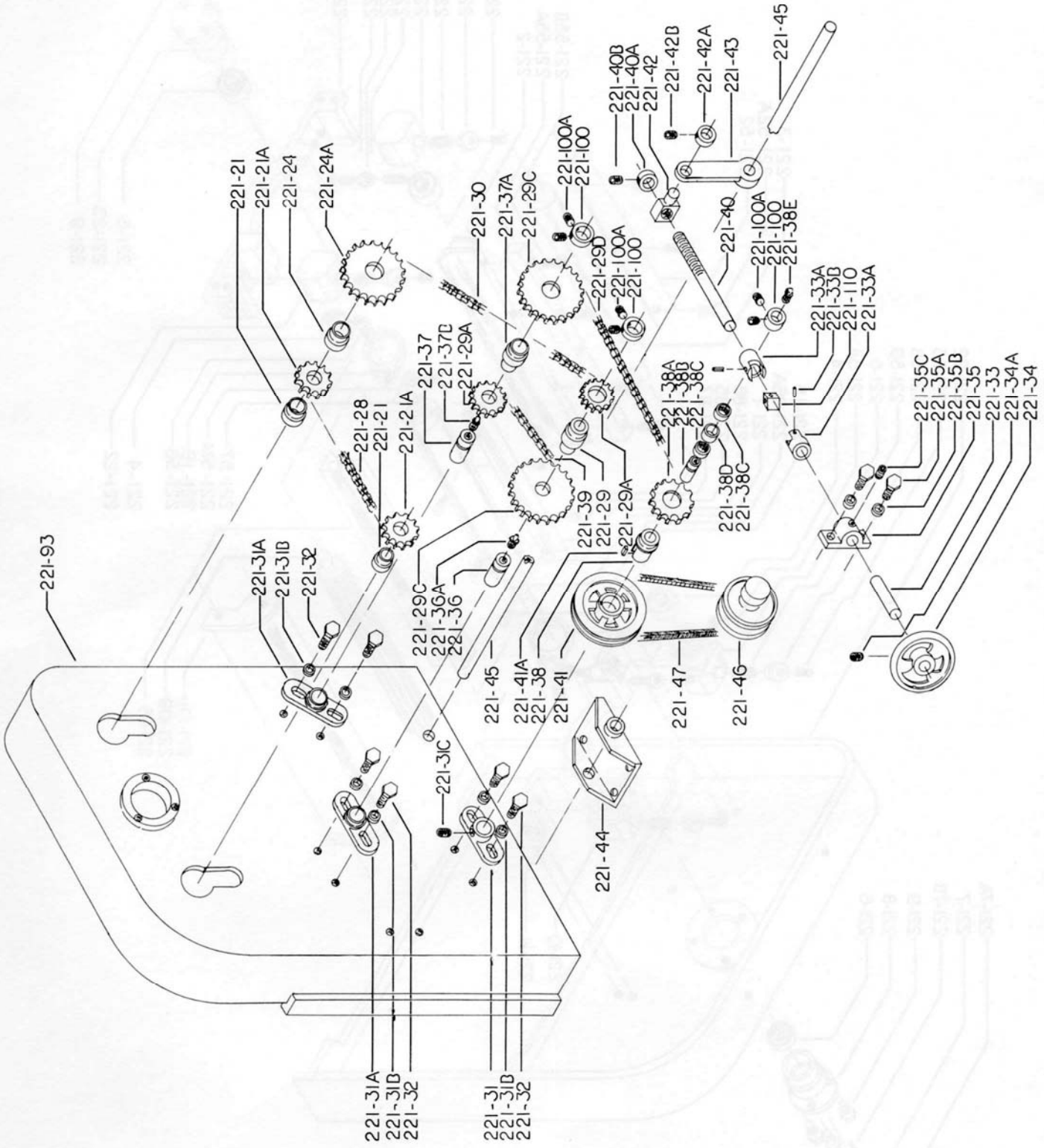
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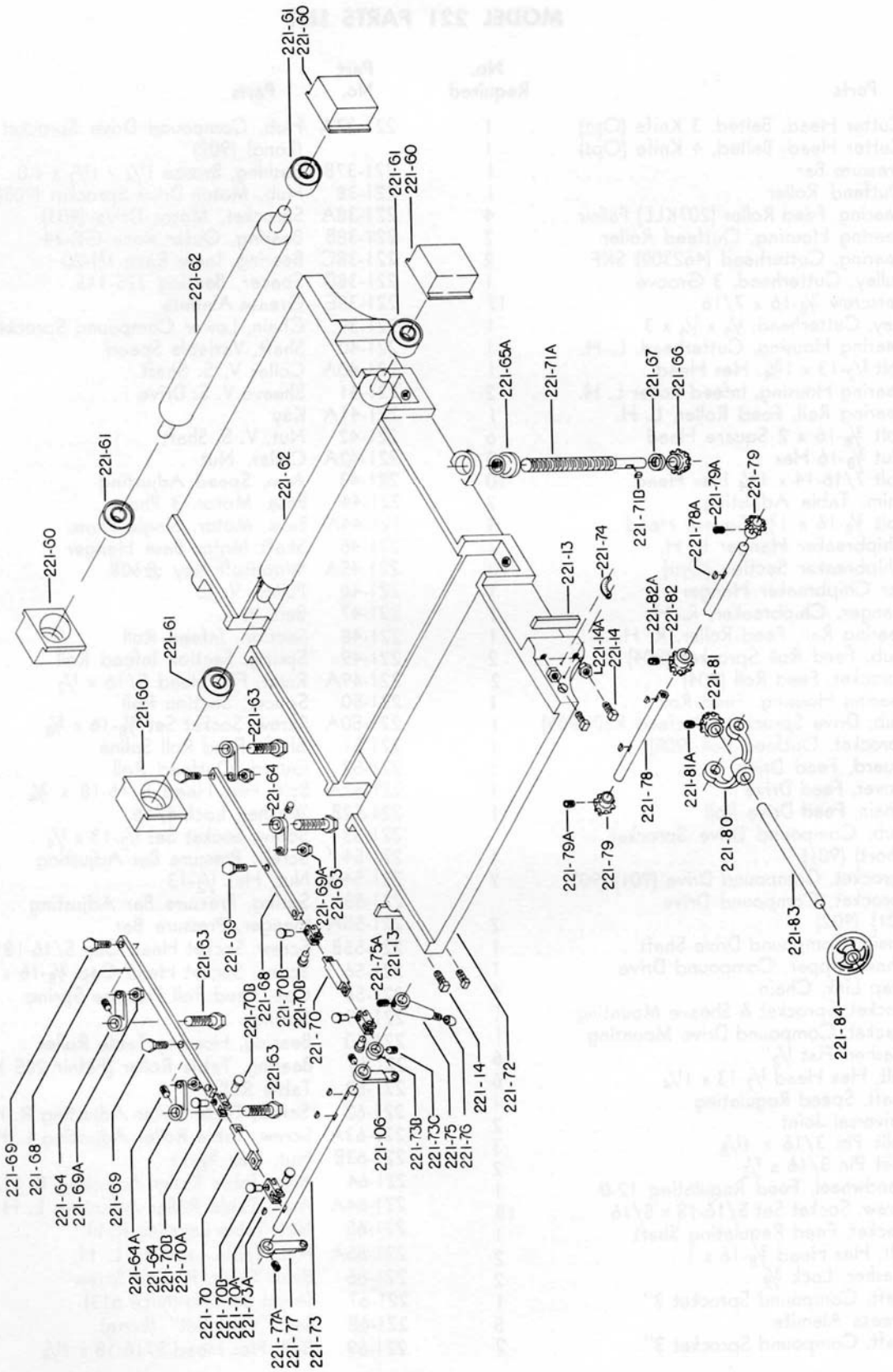
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MODEL 221 PARTS LIST

Part No.	Parts	No. Required
221-1	Cutter Head, Belted, 3 Knife (Opt)	1
221-1A	Cutter Head, Belted, 4 Knife (Opt)	1
221-2	Pressure Bar	1
221-3	Outfeed Roller	1
221-4	Bearing, Feed Roller (207KLL) Fafnir	4
221-5	Bearing Housing, Outfeed Roller	2
221-6	Bearing, Cutterhead (462309) SKF	2
221-7	Pulley, Cutterhead, 3 Groove	1
221-7A	Setscrew 3/8-16 x 7/16	17
221-7B	Key, Cutterhead, 1/4 x 1/4 x 3	1
221-8	Bearing Housing, Cutterhead, L. H.	1
221-9	Bolt 1/2-13 x 1 3/4, Hex Head	1
221-10	Bearing Housing, Infeed Roller L. H.	2
221-11	Bearing Rail, Feed Roller, L. H.	1
221-11A	Bolt 3/8-16 x 2 Square Head	6
221-11B	Nut 3/8-16 Hex	10
221-12	Bolt 7/16-14 x 1 3/4 Hex Head	10
221-13	Shim, Table Adjusting	2
221-14	Bolt 3/8-16 x 1 3/4 Square Head	4
221-15	Chipbreaker Hanger L. H.	1
221-16	Chipbreaker Section (Opt)	10
221-17	Bar Chipbreaker Hanger	1
221-19	Hanger, Chipbreaker, R. H.	1
221-20	Bearing Rail, Feed Roller, R. H.	1
221-21	Hub, Feed Roll Sprocket (904)	2
221-21A	Sprocket, Feed Roll (904)	2
221-22	Bearing Housing, Feed Roll	1
221-24	Hub, Drive Sprocket, Outfeed Roll (905)	1
221-24A	Sprocket, Outfeed Roll (905)	1
221-26	Guard, Feed Drive	1
221-27	Cover, Feed Drive	1
221-28	Chain, Feed Drive Roll	1
221-29	Hub, Compound Drive Sprocket (Short) (901)	1
221-29A	Sprocket, Compound Drive (901) (902)	2
221-29C	Sprocket, Compound Drive (901) (902)	2
221-29D	Chain, Compound Drive Shaft	1
221-30	Chain, Upper, Compound Drive	1
221-30A	Snap Link, Chain	4
221-31	Bracket, Sprocket & Sheave Mounting	1
221-31A	Bracket, Compound Drive Mounting	1
221-31B	Washer, Flat 1/2"	6
221-32	Bolt, Hex Head 1/2-13 x 1 1/4	6
221-33	Shaft, Speed Regulating	1
221-33A	Universal Joint	2
221-33B	Split Pin 3/16 x 1 1/8	3
221-33C	Split Pin 3/16 x 1/2	2
221-34	Handwheel, Feed Regulating 12-0	1
221-34A	Screw, Socket Set 5/16-18 x 5/16	18
221-35	Bracket, Feed Regulating Shaft	1
221-35A	Bolt, Hex Head 3/8-16 x 1	2
221-35B	Washer, Lock 3/8	2
221-36	Shaft, Compound Sprocket 2"	1
221-36A	Grease Alemite	5
221-37	Shaft, Compound Sprocket 3"	2
221-37A	Hub, Compound Drive Sprocket (Long) (902)	1
221-37B	Bushing, Bronze 1 1/4 x 1 1/2 x 1.0	2
221-38	Hub, Motor Drive Sprocket (903)	1
221-38A	Sprocket, Motor Drive (903)	1
221-38B	Bearing, Outer Race GR-24	2
221-38C	Bearing, Inner Race MI-20	2
221-38D	Spacer, Bearing 225-146	1
221-38E	Grease Alemite	1
221-39	Chain, Lower Compound Sprocket	1
221-40	Shaft, Variable Speed	1
221-40A	Collar V. S. Shaft	3
221-41	Sheave V. S. Drive	1
221-41A	Key	1
221-42	Nut, V. S. Shaft	1
221-42A	Collar, Nut	1
221-43	Arm, Speed Adjusting	1
221-44	Base, Motor, 3 Phase	1
221-44A	Base, Motor, Single Phase	1
221-45	Shaft Motor Base Hanger	1
221-45A	Woodruff Key #608	4
221-46	Pulley, V. S.	1
221-47	Belt, V. S.	1
221-48	Section, Infeed Roll	10
221-49	Spring, Section Infeed Roll	60
221-49A	Rivet, Fill. Head 5/16 x 1/2	70
221-50	Spacer, Section Roll	2
221-50A	Screw, Socket Set 3/8-16 x 5/8	4
221-51	Shaft, Feed Roll Spline	1
221-52	Guard, Outfeed Roll	1
221-52A	Bolt, Hex Head 5/16-18 x 3/4	4
221-52B	Washer, Lock 5/16	8
221-53	Screw, Socket Set 1/2-13 x 1/4	4
221-54	Screw, Pressure Bar Adjusting	2
221-54A	Nut, Hex 1/2-13	2
221-55	Spring, Pressure Bar Adjusting	2
221-55A	Hanger, Pressure Bar	2
221-55B	Screw, Socket Head Cap 5/16-18 x 3/4	4
221-56	Screw, Socket Head Cap 3/8-16 x 1 1/4	6
221-58	Cap, Feed Roll Pressure Spring	4
221-59	Spring	4
221-60	Bearing, Housing Table Roller	4
221-61	Bearing, Table Roller (Fafnir 205 KLL)	4
221-62	Table Roller	2
221-62	Screw, Table Roller Adjusting R. H.	2
221-63A	Screw, Table Roller Adjusting L. H.	2
221-63B	Nut, Hex 5/8-11	4
221-64	Arm, Table Roller Adjusting R. H.	2
221-64A	Arm, Table Roller Adjusting L. H.	2
221-65	Nut, Table Leveling R. H.	1
221-65A	Nut, Table Leveling L. H.	1
221-66	Bevel Gear, Raising Screw	2
221-67	Thrust Bearing (Nice 613)	2
221-68	Bar, "Quik-Set" (Long)	2
221-69	Bolt, Hex Head 5/16-18 x 1 1/4	4

Part No.	Parts	No. Required
221-69A	Hex Nut 5/16-18	4
221-69C	Washer, Flat 5/16	4
221-70	Bar, "Quik-Set" (Short)	2
221-70A	Bar, Linkage	4
221-70B	Rivet, Flat Head 5/16 x 1	8
221-70C	Lock Ring 5305-31	8
221-71	Screw, Table Raising R. H.	1
221-71¾	Screw, Table Raising L. H.	1
221-71B	Woodruff Key #810	2
221-72	Table, Planer	1
221-73	Shaft "Quik-Set" Adjusting	1
221-73A	Collar	1
221-74	Gauge "Quik-Set"	1
221-75	Handle "Quik-Set"	1
221-76	Knob	1
221-76A	Screw, Socket Set 3/8-16 x 1	1
221-77	Arm, "Quik-Set" Adjusting L. H.	1
221-78	Countershaft, Table Raising	1
221-79	Miter Gear, Table Raising	3
221-80	Fork, Table Raising	1
221-82	Bevel Gear, Countershaft	1
221-83	Shaft, Table Raising Handwheel	1
221-84	Handwheel, Table Raising	1
221-84A	Handle	1
221-85	Knife, Cutterhead	¾
221-86	Shim, Cutterhead Knife	¾
221-86A	Screw, Square Head Set 3/8-16 x 1/2	30/40
221-87	Screw, Socket Set 5/16-18 x 1	6/8
221-88	Plate, Cutterhead Cover	1
221-89	Motor, 1 H.P., 3 Phase, 1800 rpm	1
221-90	Motor, 1 H.P., 1 Phase, 1800 rpm	1
221-91	Motor Base Cutterhead Drive	1
221-91A	Bolt, Hex Head 3/8-16 x ¾	4
221-91B	Washer, Flat 3/8	4
221-92	Side, Panel L. H.	1
221-92A	Bolt, Hex Head 1/2-13 x 1 1/2	12
221-92B	Washer, Lock 1/2	12
221-93	Side Panel R. H.	1
221-94	Cutterhead Direct Drive	1
221-94A	Key 5 H.P.	1
221-94B	Key 7 1/2 H.P.	1
221-94C	Key 10 H.P.	1
221-95	Chipbreaker, Solid	1
221-95A	Screw, Socket Cap (3/8-16 x 1 Myloc)	4
221-95B	Screw, Square Head Set (3/8-16 x 1 1/2)	2
221-96	Top Lid, Dust Cover Assembly	1
221-97	Cutterhead Direct Drive T.E.F.C. (Opt)	1
221-98	Hood Assembly Planner (Opt)	1
221-100	Collar Compound	1
221-100B	Collar Compound	2
221-101	Front Panel	1
221-101A	Bolt, Hex Head 7/16-14 x 3 1/2	4
221-102	Base	1
221-103	Bearing Housing, Direct Drive (Opt)	1
221-103A	Bearing Housing, Direct Drive T.E.F.C. (Opt)	1
221-105	Motor Pulley, 3 Groove, 1 1/8 Bore	1
221-105A	Motor Pulley, 3 Groove, 1 3/8 Bore Opt)	1
221-105B	Motor Pulley, 3 Groove, 5000 rpm (Opt)	1
221-106	Arm, "Quik-Set" Adjusting R. H.	1
221-107	Scale	1
221-108	Name Plate	1
221-109	Solid, Infeed Roller	1
221-110	Block, Universal	1
221-111	Collar, Indexing, 3 Knife, Belt Drive	1
221-112	Collar, Indexing, 3 Knife, Direct Drive (Opt)	1
221-113	Collar, Indexing, 4 Knife, Belt Drive (Opt)	1
221-114	Collar Indexing, 4 Knife, Direct Drive (Opt)	1
221-115	Handle	1
221-116	Rivet, 1/4 x 3	1
221-117	Rivet 3/8 x 4 1/4	1
221-118	Spring, Section Chipbreaker (Opt)	10
221-120	Housing, Index Plunger Belted (Opt)	1
221-121	Housing, Index Plunger Direct Drive (Opt)	1
221-122	Handle, Index Plunger (Opt)	1
221-123	Plunger, Indexing (Opt)	1
221-124	Screw, Socket Cap #10-24 x 1 (Opt)	1
221-125	Split Pin 3/16 x 7/8 (Opt)	1
221-126	Spring, Indexing Plunger (Opt)	1
221-127	Screw, Socket Set 1/4-20 x 1/4 (Opt)	1
221-147	Retainer Collar Direct Drive Motor Rotor	1
221-148	Stud, Guard Mounting	2
221-149	Dust Hood Assembly 8" (Opt)	1
221-150	Dust Hood Assembly 7" (Opt)	1
221-151	Dust Hood Assembly 5" (Opt)	1
221-152	Pointer Depth Adjusting	1
221-153	Pointer "Quik-Set"	1
221-154	Cutterhead, 4 Knife, Direct Drive 5 & 7 1/2 H.P. (Opt)	1
221-155	Cutterhead, 3 Knife, Direct Drive 10 H.P. (Opt)	1
221-156	Cutterhead, 4 Knife Direct Drive 10 H.P. (Opt)	1
221-157	Dust Pan	1
221-158	Guard Cutterhead Belt	1
221-161	Screw, Round Head #6-32 x 1/4	2
221-162	Belt, Cutterhead Drive 10 H.P. (Opt)	3
221-163	Belt, Cutterhead Drive 5 & 7 1/2 H.P. (Opt)	3
221-164	Screw, Fill. Head 1/4-20 x 1/2	8
221-174	Drive Screw #4 x 3/16	8
221-175	Motor 5 H.P.	1
221-176	Motor 1 1/2 H.P. (Opt)	1
221-177	Motor 10 H.P. (Opt)	1
221-3000-4	Motor Base Assembly 20" Opt)	1
221-3000-5	Motor Base Assembly 14" (Opt)	1
221-3000-7	Motor Base Assembly 22" (Opt)	1

SUB-ASSEMBLIES 221 PLANER

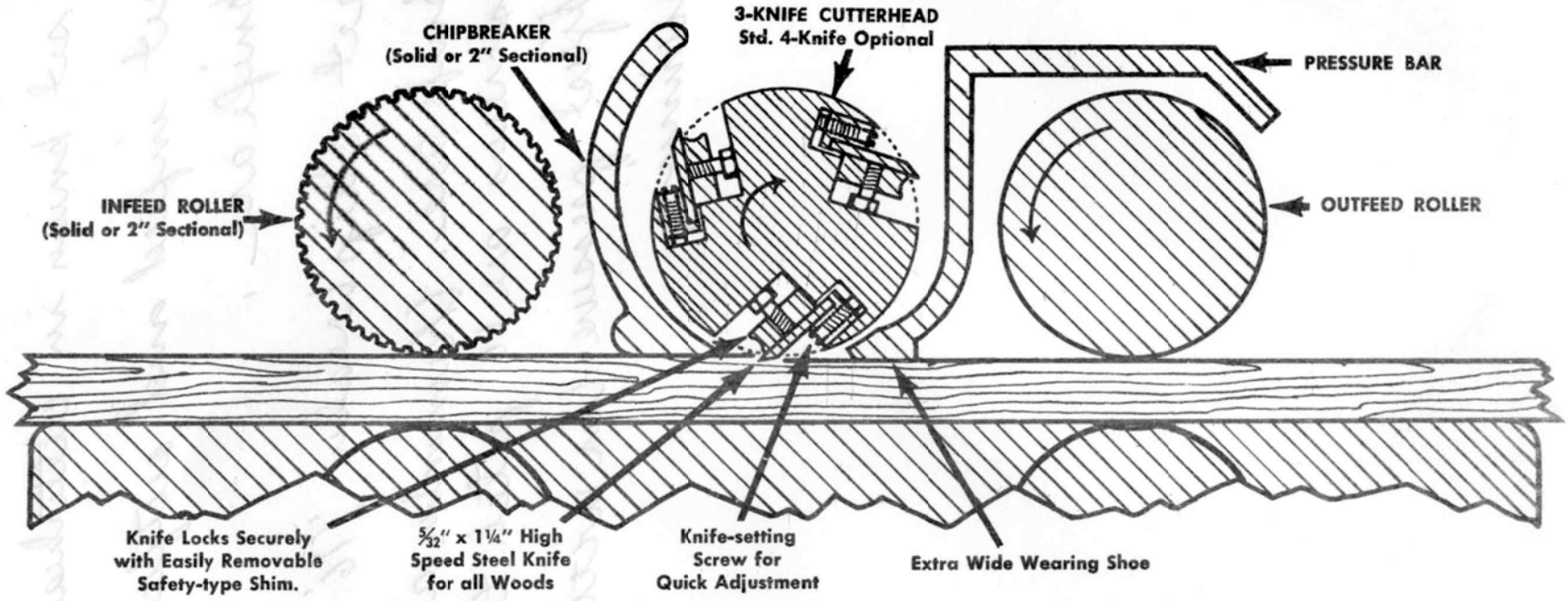
Part No.	Parts	No. Required
221-901	Compound Drive Sprocket Assembly (short)	1
221-902	Sprocket Assembly Compound Drive (Long)	1
221-903	Motor Drive Sprocket Assembly (923)	1
221-904	Sprocket Assembly Feed Drive	2
221-905	Sprocket Assembly	1
221-910	Solid Infeed Roller Assembly (Opt)	1
221-911	Pressure Bar Assembly	1
221-912	Sectional Infeed Roller Assembly (Opt)	1
221-913	Table Roller Assembly	2
221-914	Outfeed Roller Assembly	1
221-915	Cutterhead Assembly	1
221-916	Solid Chipbreaker Assembly (Opt)	1
221-917	Sectional Chipbreaker Assembly (Opt)	1
221-918	"Quik-Set" Assembly L. H. & R. H.	1 Ea.
221-919	Handwheel Assembly	1
221-920	Miter Gear Assembly	3
221-921	Countershaft Assembly	1
221-922	V.S. Adjusting Bracket Assembly	1
221-923	Compound Sheave Drive Assembly	1
221-924	Mounting Bracket Assembly	1
221-925	Mounting Bracket Assembly	1

PARTS LIST ON MODEL 221-30" PLANER

PART NO.	DESCRIPTION	NO.	PRICE
221-1	Cutterhead	1	200.00
221-2	Pressure Bar	1	22.50
221-3	Outfeed roll	1	50.00
221-4	Bearing, outfeed roll, N. D. 88507 or equal	2	4.00 Ea.
221-5	Bearing housing, outfeed roll, L. H.	2	4.00 Ea.
221-6	Bearing, cutterhead, N. D. 87609 or equal	2	6.50 Ea.
221-7	Sheave, cutterhead, 3 groove	1	14.00
221-8	Bearing housing, cutterhead, L. H.	1	20.00
221-9	Cap screw, bearing housing	4	.15 Ea.
221-10	Bearing housing, infeed roller, L. H.	1	4.00
221-11	Bearing rail, feed roller, L. H.	1	16.50
221-12	Cap screw, bearing rail	5	.10 Ea.
221-13	Shim, table adjusting	2	.50 Ea.
221-14	Screw, table shim adjusting	4	.15 Ea.
221-15	Chipbreaker hanger, L. H.	1	4.50
221-16	Chipbreaker section	10	2.50 Ea.
221-17	Bar, chipbreaker hanger	1	12.50
221-18	Sectional infeed roll, complete	1	180.00
221-19	Hanger, chipbreaker, R. H.	1	4.50
221-20	Rail, feed roller bearing, R. H.	1	16.50
221-21	Sprocket, infeed roller	1	10.00
221-22	Bearing housing, infeed roller, R. H.	1	4.00
221-23	Bearing housing, cutterhead, R. H.	1	20.00
221-24	Drive sprocket, outfeed roller	1	12.50
221-25	Bearing housing, outfeed Roll, R. H.	1	4.00
221-26	Guard, feed drive	1	60.00
221-27	Cover, feed drive guard	1	3.00
221-28	Chain, feed roller drive	1	4.50
221-29	Sprocket, compound drive	1	12.50
221-30	Chain, upper compound drive	1	5.25
221-31	Bracket, compound mounting	3	3.00 ea.
221-32	Cap screw, compound mounting bracket	4	.25 ea.
221-33	Speed regulating shaft and universal joint	1	1.50
221-34	Handwheel, feed regulating	1	2.50
221-35	Bracket, feed regulating shaft	1	3.00
221-36	Shaft, compound sprocket, 2"	1	.75
221-37	Shaft, compound sprocket, 3"	1	1.25
221-38	Bearing, compound sprocket & sheave McGill GR 26 or equal	2	3.50
221-39	Chain, lower compound sprocket	1	5.00
221-40	Variable speed shaft & nut	1	6.50
221-41	Sheave, variable speed driven (with sprocket)	1	15.00
221-42	Nut, variable speed shaft	1	3.50
221-43	Hanger, Motor base	1	1.50
221-44	Base, Motor	1	6.00

PART NO.	DESCRIPTION	NO.	PRICE
221-45	Shaft, motor base hanger	1	2.00
221-46	Pulley, Variable speed, Reeves # 870 or equal	1	35.00
221-47	Belt, variable speed, 5L520	1	3.00
221-48	Section, infeed roll	10	4.00 Ea.
221-49	Springs, feed roll section	60	.10 Ea.
221-50	Washer, feed roll section	2	2.00 Ea.
221-51	Shaft, feed roll spline	1	80.00
221-52	Guard, outfeed roller	1	4.50
221-53	Screw, outfeed roll pressure spring adjusting	4	.15 Ea.
221-54	Bolt & Nut, pressure bar adjusting	2	2.00 Ea.
221-55	Spring, pressure bar	2	.30 Ea.
221-56	Cap Screw, chipbreaker hanger	4	.30 Ea.
221-57	Bolt, chipbreaker hanger adjusting	2	.10 Ea.
221-58	Cap, feed roll pressure spring	4	.65 Ea.
221-59	Spring, feed roll pressure	4	1.00 Ea.
221-60	Bearing housing, table roll	4	4.00 Ea.
221-61	Bearing, table roll, ND88506 or equal	4	3.00 Ea.
221-62	Table roller	2	25.00 Ea.
221-63	Screw, table roll adjusting	4	2.00 Ea.
221-64	Arm, Table roll adjusting	4	2.00 Ea.
221-65	Nut, table leveling, Right Hand	1	3.50
221-66	Bevel Gear, table raising	2	18.00 Ea.
221-67	Bearing, table screw thrust (Nice Ball Thrust bearing 1-1/8" bore)	2	2.50 Ea.
221-68	Bar, table adjusting screw, long	2	2.00 Ea.
221-69	Pin, adjusting arm	4	.15 Ea.
221-70	Bar, table adjusting screw, short	2	2.00 Ea.
221-71	Screw, bed raising, R. H.	1	6.00
221-71A	Screw, bed raising, L. H.	1	6.00
221-72	Planer Table	1	160.00
221-73	Shaft, "Quik-Set" adjusting	1	2.50
221-74	Gauge, "Quik-Set" adjusting	1	.50
221-75	Handle, "Quik-Set" adjusting	1	1.00
221-76	Knob, "Quik-Set" adjusting handle	1	.50
221-77	Arm, "Quik-Set" adjusting	2	1.00
221-78	Countershaft, table raising	1	4.00
221-79	Miter gear, table raising countershaft	2	8.00 Ea.
221-80	Fork, table raising	1	8.00
221-81	Miter gear, table raising handwheel shaft	1	8.00
221-82	Bevel gear, table raising countershaft	1	18.00
221-83	Shaft, table raising handwheel	1	2.00
221-84	Handwheel, table raising	1	10.00
221-85	Knife, cutterhead, set of 3	1	11.00
221-86	Shim, knife, set of 3	1	3.00
221-87	Jack Screw, cutterhead	9	.35 Ea.
221-88	Plate, cutterhead cover	1	2.00
221-89	Feed drive motor, 1 HP, 3 phase, 1800 RPM Totally Enclosed	1	
221-90	Feed drive motor, 1 HP, 1 phase, 1800 RPM Totally Enclosed	1	
221-91	Motor base, cutterhead drive	1	20.00

CUTTING–ROLLER ASSEMBLY (SIDE VIEW)



POWERMATIC COMPANY
A DIVISION OF Houdaille Industries, Inc.
McMINNVILLE, TENNESSEE 37110

MODEL 221 20" SINGLE SURFACER

(over)

1. check bed to see if it is tight
2. checks bed for parallel to cutterhead
3. set knives in cutterhead
4. set infeed and outfeed 1/16" below knife are.
5. set chipbreaker 1/16" below knife are. (Remember all adjusting screws are 16 pitch thread)
6. adjust pressure bar with machine running.