



OPERATOR'S
* MANUAL *

**CINCINNATI
SHAPERS**

*

The Cincinnati Shaper Co.
CINCINNATI OHIO

CINCINNATI SHAPERS.

INSTALLATION.

1 **FOUNDATION PLANS** ARE FURNISHED WITH EACH MACHINE TO SHOW THE MAXIMUM SPACE REQUIRED & THE LOCATION OF FOUNDATION BOLTS.

2 **FOUNDATION.** A SOLID FOUNDATION OF CONCRETE IS DESIRABLE, BUT IF NOT PRACTICABLE, THE MACHINE CAN BE SET ON A GOOD SOLID WOOD FLOOR & HELD WITH LAG SCREWS.

3 **LEVELING.** THE BASE IS PROVIDED WITH A THREE POINT BEARING (FIG. 1). LEVEL MACHINE IN BOTH DIRECTIONS BY PACKING AT THESE POINTS. AFTER MACHINE IS LEVELED, PACK UP AT A, B, C, & D TO INSURE AGAINST VIBRATION.

4 **DRIVE.** THE DRIVING PULLEY RUNS COUNTER-CLOCKWISE (SEE FIG. 2) & THE PULLEY SPEEDS ARE -

500 R.P.M. FOR

- 16" UTILITY
- 16" HEAVY
- 20" UTILITY
- 20" STANDARD

550 R.P.M. FOR

- 20" HEAVY
- 24" STANDARD
- 24" HEAVY
- 28" HEAVY
- 32" HEAVY
- 36" HEAVY

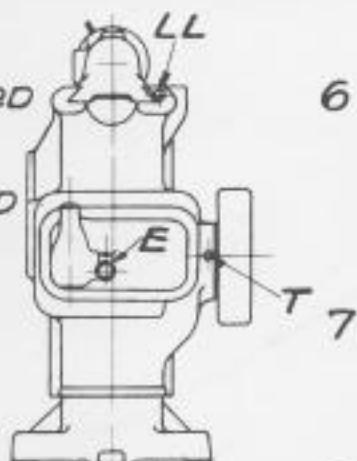


FIG. 3

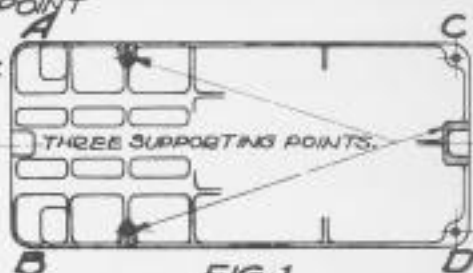


FIG. 1

6 **BEFORE STARTING,** WASH THE MACHINE THOROUGHLY WITH KEROSENE OR GASOLINE TO REMOVE ALL SLUSH & GRIT, & OIL THOROUGHLY, AS PER PARAGRAPH 10 TO 16 INCLUSIVE.

OPERATION.

OILING. THE ENTIRE DRIVE, INCLUDING RAM & ROCKER ARM BEARINGS ARE OILED AUTOMATICALLY FROM THE MAIN OIL RESERVOIR (INDICATOR & FILLER PLUG AT E, FIG. 3).

8 A PLUNGER PUMP IN THIS RESERVOIR SUPPLIES OIL TO STATION F (FIG. 2), WHERE IT IS DISTRIBUTED THRU TUBES TO FOUR POINTS ON THE RAM BEARING, ALSO TO THE ROCKER ARM & LINK BEARINGS THRU THE TELESCOPIC TUBES G. THE OVERFLOW PASSES THRU THE CRANK-WHEEL BEARING & FEED MECHANISM ON ITS RETURN TO THE MAIN RESERVOIR. DISTRIBUTING STATION F IS PROVIDED WITH SIX CAPILLARY WICKS, MADE FROM CANDLE WICKING, FOR SUPPLYING THE RAM & ROCKER ARM TUBES. OIL SHOULD DROP AT THESE POINTS AT THE RATE OF ONE TO TWO MINUTES BETWEEN DROPS AFTER MACHINE HAS BEEN IN OPERATION A FEW MINUTES.

9 WHEN FIRST PUTTING MACHINE INTO OPERATION, REMOVE LID OF STATION "F" & OIL THE SIX WICK HOLES LIBERALLY. SCREW DOWN LID. PUMP WILL TAKE CARE OF THIS POINT THEREAFTER.

10 **OILING POINTS.** MAIN RESERVOIR E (FIG. 3), ONCE A WEEK - USE HIGH GRADE MACHINE OIL OF POCKET H (FIG. 4) ON FEED CONTROL, ONCE A WEEK. APPROX. 220 RECOND. AT 100° SAYBOLT VISCOSITY.

11 ADJUSTING MECHANISM FOR RAM, RAIL, HEAD & SPEED CHANGE LEVERS, (SEE J, K, L, (FIG. 4); M (FIG. 2); N, O, P (FIG. 4), ONCE A WEEK.

12 CLEAN & OIL SLIDING SURFACE, RAIL Q, TABLE SUPPORT R, TOOL HEAD S DAILY.

13 CLUTCH PULLEY T (FIG. 3) CUP GREASE, ONCE A MONTH.

14 IDLER PULLEY U (FIG. 2) (WHEN BELTED MOTOR DRIVE IS SUPPLIED), CUP GREASE, ONCE A MONTH.

15 HOLES K & L CONTAIN CAPILLARY FEEDERS THUS PREVENTING DIRT FROM REACHING BEARINGS.

16 **SPEEDS.** EIGHT SPEEDS ARE PROVIDED, AS INDICATED BY DIRECT READING PLATE.

17 FOUR SPEEDS ARE OBTAINABLE THRU LEVER V (FIG. 4): THESE ARE DOUBLED BY SLIDING BACK GEARED LEVER X TO POSITION A OR B AS DESIRED.

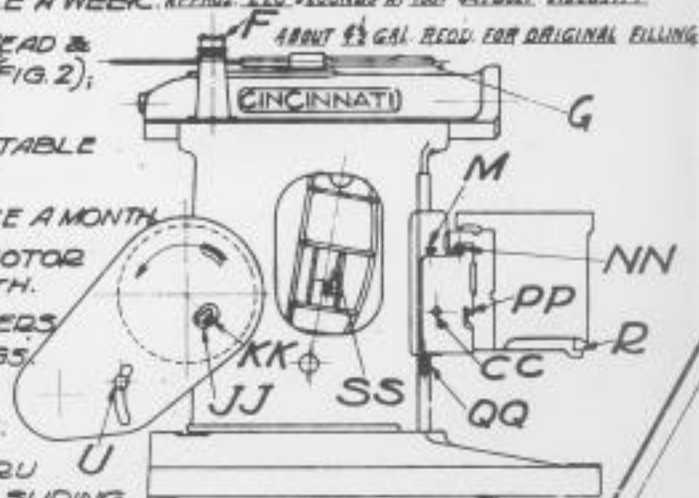


FIG. 2

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19 **STROKE.** THE STROKE ADJUSTING SHAFT Y (FIG. 4), IS SELF CLAMPING & THE LENGTH OF STROKE IS ALWAYS INDICATED BY DIAL Z WHETHER THE SHAPER IS RUNNING OR STOPPED.

20 **POSITION OF RAM.** THE RAM IS POSITIONED BY ADJUSTING SHAFT AA (FIG. 4), & CLAMPED BY BB.

21 **VERTICAL ADJUSTMENT OF TABLE.** IS EFFECTED BY SHAFT CC (FIG. 2). CLAMP NUTS DD AT EACH SIDE, ALSO EE (FIG. 4) CLAMPS THE TABLE SUPPORTING MEMBERS.

22 **TABLE FEED.** THE AMOUNT OF FEED IS REGULATED BY LEVER FF (FIG. 4), & FEED ENGAGEMENT IS BY LEVER GG, WHICH INDICATES THE DIRECTION OF TABLE MOVEMENT.

23 A SAFETY CLUTCH IS PROVIDED FOR FEED TRANSMISSION TO PREVENT BREAKAGE SHOULD TABLE BE RUN AGAINST AN OBSTRUCTION.

24 WHEN FEED IS TO BE APPLIED TO CIRCULAR FEEDING ATTACHMENTS, REMOVE COVER HH (FIG. 4), SLIDE GEAR OVER TO PERMIT CIRCULAR FEEDING BRACKET TO BE PLACED IN POSITION. THIS DISCONNECTS FEED TO CROSS SCREW & MAKES IT AVAILABLE IN EITHER DIRECTION FOR CIRCULAR FEEDING ATTACHMENTS.

CARE OF THE SHAPER.

25 **DRIVE CLUTCH ADJUSTMENT.** TO ADJUST CLUTCH, LOOSEN LOCK NUT JJ & TURN SCREW KK (FIG. 2). THIS IS ACCOMPLISHED THRU OPENING IN BELT GUARD FOR THIS PURPOSE.

26 **GIB ADJUSTMENT.** ALL SLIDES ARE PROVIDED WITH ADJUSTABLE TAPER GIBS.

27 THE GIBS WHICH CONTROL THE ALIGNING OF THE DIFFERENT MEMBERS UPON WHICH ACCURACY DEPENDS ARE ~

RAM GIB	LL
TOOL SLIDE GIB	MM
UPPER APRON GIB	NN
LOWER APRON GIB	PP
RAIL GIB	QQ

28 GIBS WHICH AFFECT THE SMOOTH ACTION OF THE SHAPER ARE ~

CRANK BLOCK GIB	RR
SLIDING BLOCK GIB	SS

29 THE KNOCK MAY ALSO RESULT FROM IMPROPER ADJUSTMENT OF NUTS TT (FIG. 5).

TOOL CHATTER.

30 WHEN THE TOOL LEAVES CHATTER MARKS ON THE WORK, DON'T PUT THE BLAME ON THE MACHINE. REMEMBER THAT A VERY LIGHT CUT WITH A BROAD FINISHING TOOL WAS TAKEN ACROSS THE TOP OF THE TABLE BEFORE THE SHAPER WAS SENT OUT, & LEFT NO CHATTER MARKS. LOOK FOR THE TROUBLE IN YOUR TOOL, YOUR CLAMPING, OR IN THE NATURE OF THE JOB YOU ARE DOING.

31 CARE SHOULD BE TAKEN WHEN ADJUSTING THE RAM GIB LL (FIG. 3) & SLIDING BLOCK GIB SS (FIG. 2), AS THE MACHINE WILL CHATTER IF THE FIT IS EITHER TOO LOOSE OR TOO TIGHT. IN ORDERING REPAIR PARTS, ALWAYS GIVE SERIAL CONSTRUCTION NUMBER OF MACHINE, WHICH WILL BE FOUND ON TOP OF COLUMN, OPERATOR'S SIDE.

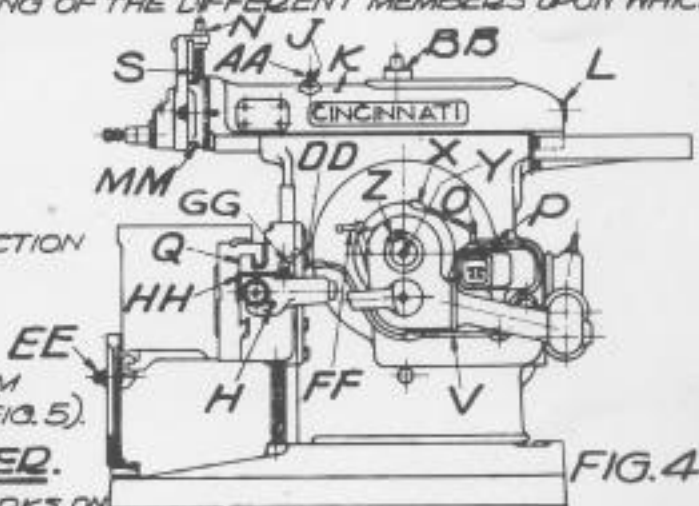


FIG. 4

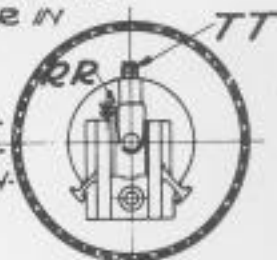


FIG. 5

OPERATION and MAINTENANCE MANUAL

36" H.D. Shaper

Serial #11680



YOUR Cincinnati Shaper
is an accurate tool. This
manual will help you in its
care and operation

THE CINCINNATI SHAPER COMPANY
CINCINNATI, OHIO

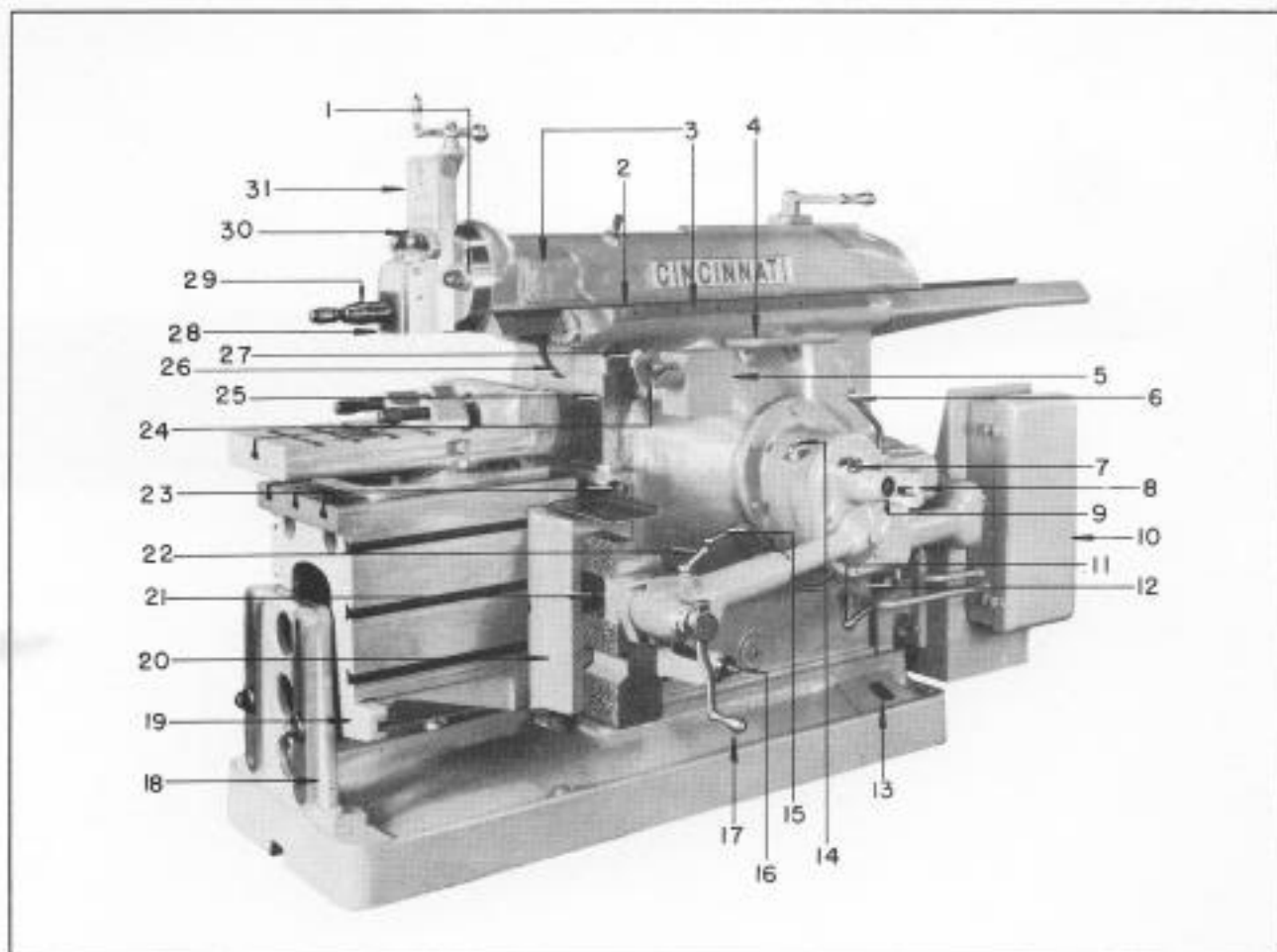


Fig. 1 Identification Cincinnati Shaper (Front View)

- | | |
|--|------------------------------------|
| 1. Tool slide clamp screw. | 17. Cross feed safety crank. |
| 2. Serial number. | 18. Table Support. |
| 3. Finished pads for attaching power feed to head. | 19. Table support bearing. |
| 4. Tool Shelf. | 20. Apron |
| 5. Start and stop button. | 21. Cross feed screw. |
| 6. Back gear lever. | 22. Cross feed engagement lever. |
| 7. Stroke indicator dial. | 23. Rail clamp control. |
| 8. Speed indicator plate | 24. Clutch and brake switch lever. |
| 9. Stroke adjusting shaft. | 25. Column rail bearing. |
| 10. Motor starter. | 26. Column throat chip guard. |
| 11. Gear shift lever. | 27. Oil pressure gauge. |
| 12. Transmission drain plug. | 28. Clapper. |
| 13. Oil sight gauge. | 29. Tool post. |
| 14. Power cross feed selector. | 30. Clapper box. |
| 15. Power rapid traverse lever. | 31. Tool slide. |
| 16. Rail elevating manual control. | |

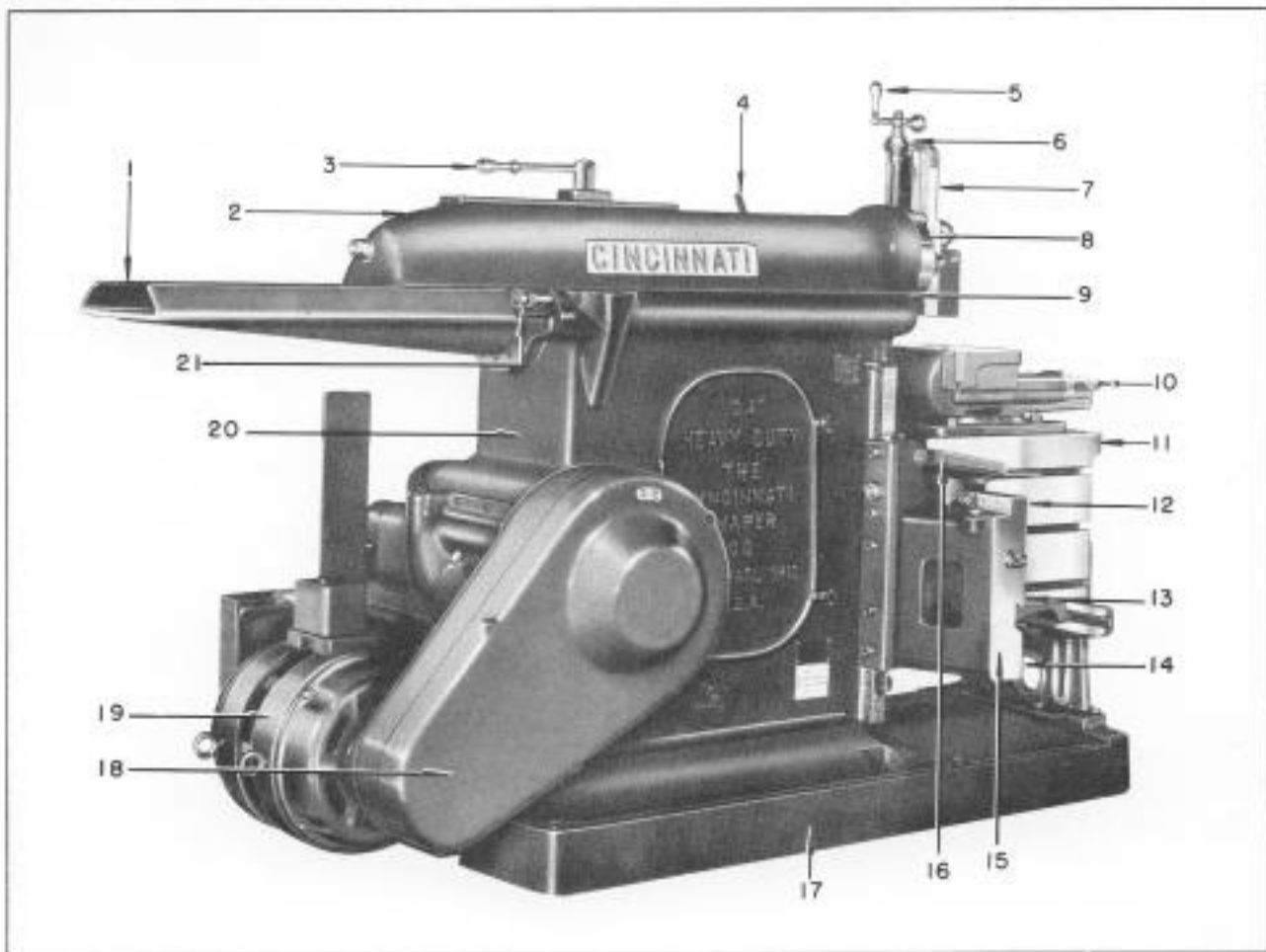


Fig. 2 Identification Cincinnati Shaper (Rear View)

- | | |
|---------------------------|----------------------------|
| 1. Ram guard. | 12. Rail top bearing. |
| 2. Ram. | 13. Rail guide bearing. |
| 3. Ram clamp lever. | 14. Rail support bearing. |
| 4. Ram positioning shaft. | 15. Cross rail. |
| 5. Ball crank. | 16. Cross rail chip guard. |
| 6. Feed screw dial. | 17. Base. |
| 7. Tool slide. | 18. Drive guard. |
| 8. Graduated head swivel. | 19. Motor. |
| 9. Ramway. | 20. Column. |
| 10. Vise. | 21. Ram gib adjustment. |
| 11. Table. | |

SECTION I

INSTALLATION

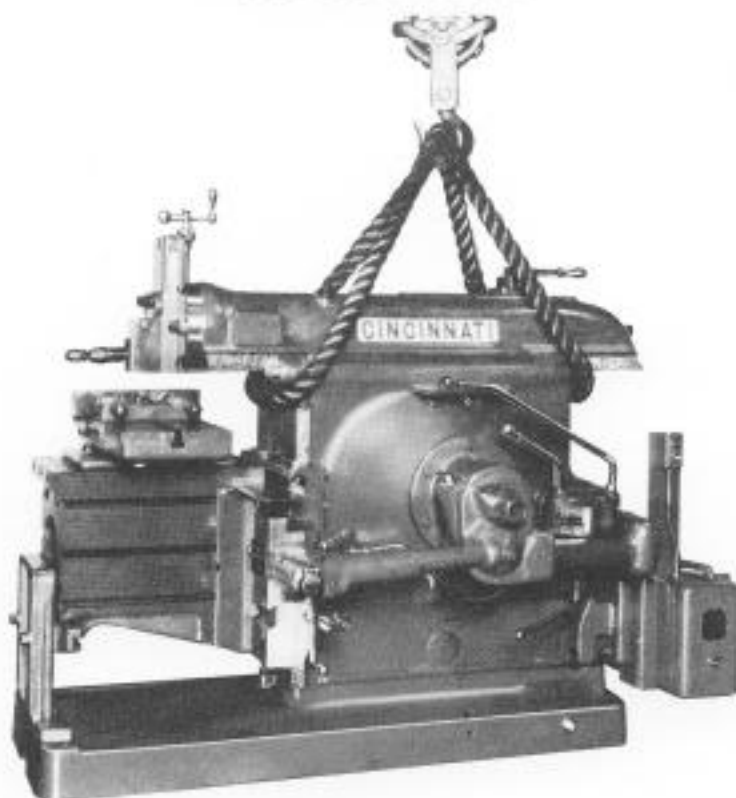


Fig. 3 Lifting Shaper

LIFTING

Lift your Cincinnati Shaper with a rope sling, properly placed. The rope should bear against the column, both front and rear as illustrated, and not against the scraped bearing of the ram. The ram bearing is a finely finished surface and must be carefully protected against damage. **DO NOT USE CHAIN OR CABLE.**

Adjust the sling to lift evenly. Use a Manila rope in good condition. A 1½" rope is large enough for 24" Standard and smaller. A 2" rope should be used for 24" Heavy Duty and larger. If Manila rope is not available, use Jute rope in diameters of 2" and 2½" respectively. If machine is equipped with power down feed to the head, remove power down feed bracket and guard before attaching sling.

UNPACKING

Remove crate and wrapping. Unpack ram guard, wrenches, and tool post in tool box. Use the enclosed packing list for checking all items.

CLEANING

Remove the vise from the table. Remove all covering. Thoroughly clean protective grease from all parts with kerosene. These parts include ram bearing, table support, bearings, on front of column, cross rail bearings, rocker arm, table, vise, head slide, down feed screw, dove tail in crank gear, dials and indicating plates, feed box bearing, control handles and levers, etc.

Go over the grease with a cloth wet with kerosene and allow to soak. Use a wiping cloth instead of waste. A stiff brush will get into the corners. Do not use an airhose--pressure will drive the dirt and grit into the bearing surfaces. After cleaning the ram, adjust it forward and remove from the ram bearing any grease that might have collected at the wiper.

After cleaning thoroughly, wipe dry and make sure no grease or grit is left. Oil bearing surfaces lightly with fresh oil. Clean machine periodically after installation.

Loosen head bolts and swivel head into vertical position. **DO NOT RUN RAM BACK INTO COLUMN WITH SLIDE SET AT AN ANGLE.** Be sure ram bearings are clean before installing ram guard at the rear of machine.

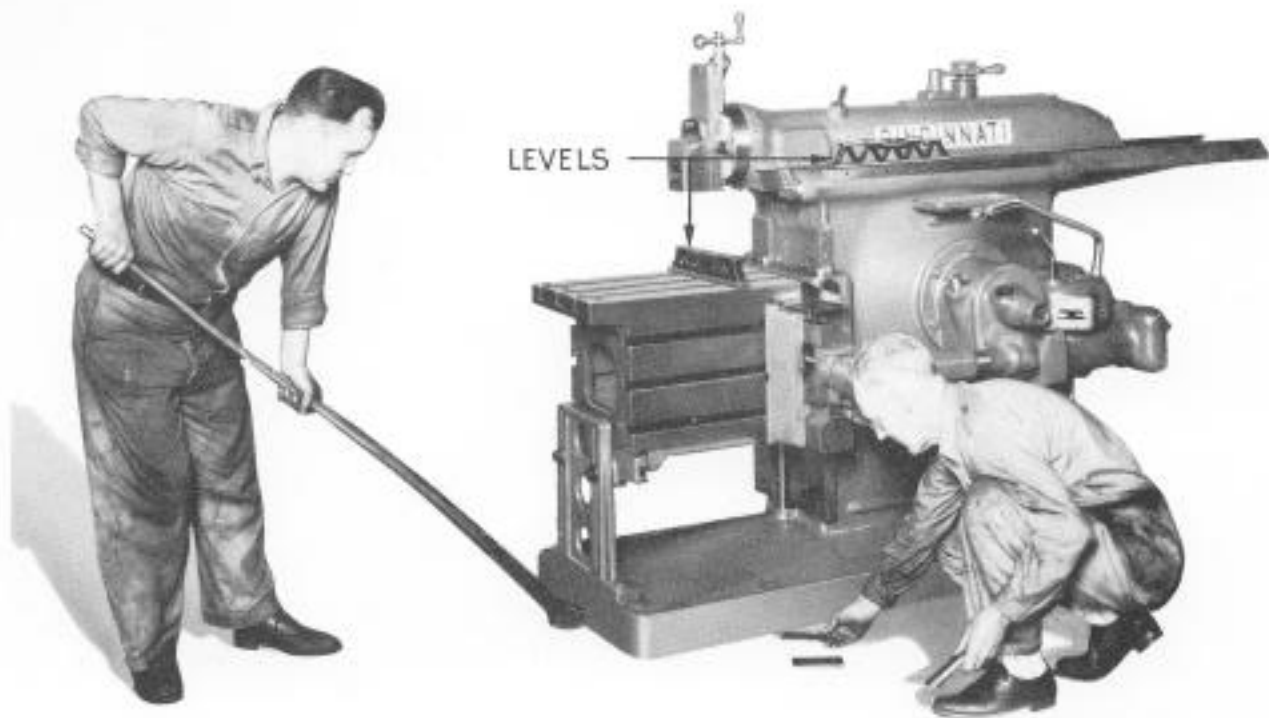


Fig. 4 Leveling Shaper

FOUNDATION

Remove skids and place machine on foundation. A solid concrete foundation is desirable, but if not practicable, the Shaper may be set on a solid wood floor and held with lag screws. Foundation plans are furnished with each Shaper, showing the space required and location of foundation bolts.

LEVELING

Level the machine with a precision level placed on top of the table and column as shown in Fig. 4. Always wipe both level and leveling surface clean. Level the machine with the level crosswise to the table and lengthwise on the column. Be sure rail is securely clamped during this operation.

The base is provided with three bearing points for easy leveling. The two front points coincide with the foundation bolt holes. The back point is halfway between the rear foundation bolt holes. Put flat steel shims at the three points as required to bring the Shaper level within a thousandth of an inch per foot. After the machine is level, grout under the base.

UNIVERSAL SHAPERS WITH TABLE SUPPORT

On universal machines equipped with an outboard table support, indicate the support guide bar before packing at the corners of the base. The indicator should be clamped to the front of the table. Table bolts should be drawn tight and rail securely clamped. The support guide bar should be indicated the full length of the rail. The support guide should be parallel with the top of the rail within .001" per ft. Pack under the

corners as required, to make the support level for the full length. After machine is level, grout under the base.

After three months of operation go over the machine and draw up screws holding the transmission cover, the rapid traverse arm, and the ram guard. After six months of operation, recheck your machine for level.

OILING

Before starting the Shaper, clean return basin. Return basin is accessible through column door.

Fill gear transmission chamber with a high grade, non-foaming machine oil (Viscosity 220 seconds at 100 degrees F.) according to instruction No. 1, Fig. 5.

Fill the return basin according to instruction No. 3, Fig. 5.

Oil should not be below sight gauge in the base when Shaper is stopped.

Check the motor lubrication.

For complete instruction, see Fig. 5 and Oiling Diagram, Fig. 7.

CHANGING OIL

Change oil 30 days after installation, thereafter once every 12 months. When changing oil, clean ring magnet and wipe out return basin and main reservoir with a cloth. Do not use waste.

SECTION II

LUBRICATION

LUBRICATION

The most important factor in the life of any machine tool is proper lubrication. Your Shaper is equipped with a pressure oiling system similar to your automobile's. A gauge shows normal operating pressure, when the clutch is engaged, and a filter is used to keep the oil clean. Strict conformance with the following instructions is required for long trouble-free service. Oil should be a high grade, non-foaming machine oil; viscosity 220 seconds at 100° F. Once a year remove all oil from Shaper and refill with fresh oil.

BEFORE STARTING MACHINE

Before starting the Shaper the following four items must be performed see Figure 5 and 6 for location of oiling points.

1. Fill Transmission Reservoir until oil overflows into Return Basin. See Figure 7.
2. Lubricate motor according to motor manufacturer's recommendations. Do not over-lubricate.

3. After filling Transmission Reservoir, open column door and fill Return Basin and Main Reservoir. See Figure 7. Fill until oil shows in sight window in base.
4. Observe Pressure Gauge in column near clutch control regularly. If gauge fails to show pressure, check oil level. Check oil filter every six months.

DAILY

5. Clean and oil sliding surface of tool head.
6. Clean surface of table support.
7. Clean sliding surfaces of rail.
8. Oil feed screw bearing.
9. Oil feed screw
10. Clean and oil sliding surfaces of vise. Fill oil holes on single screw vises.
11. Oil clapper pin; clean frequently.

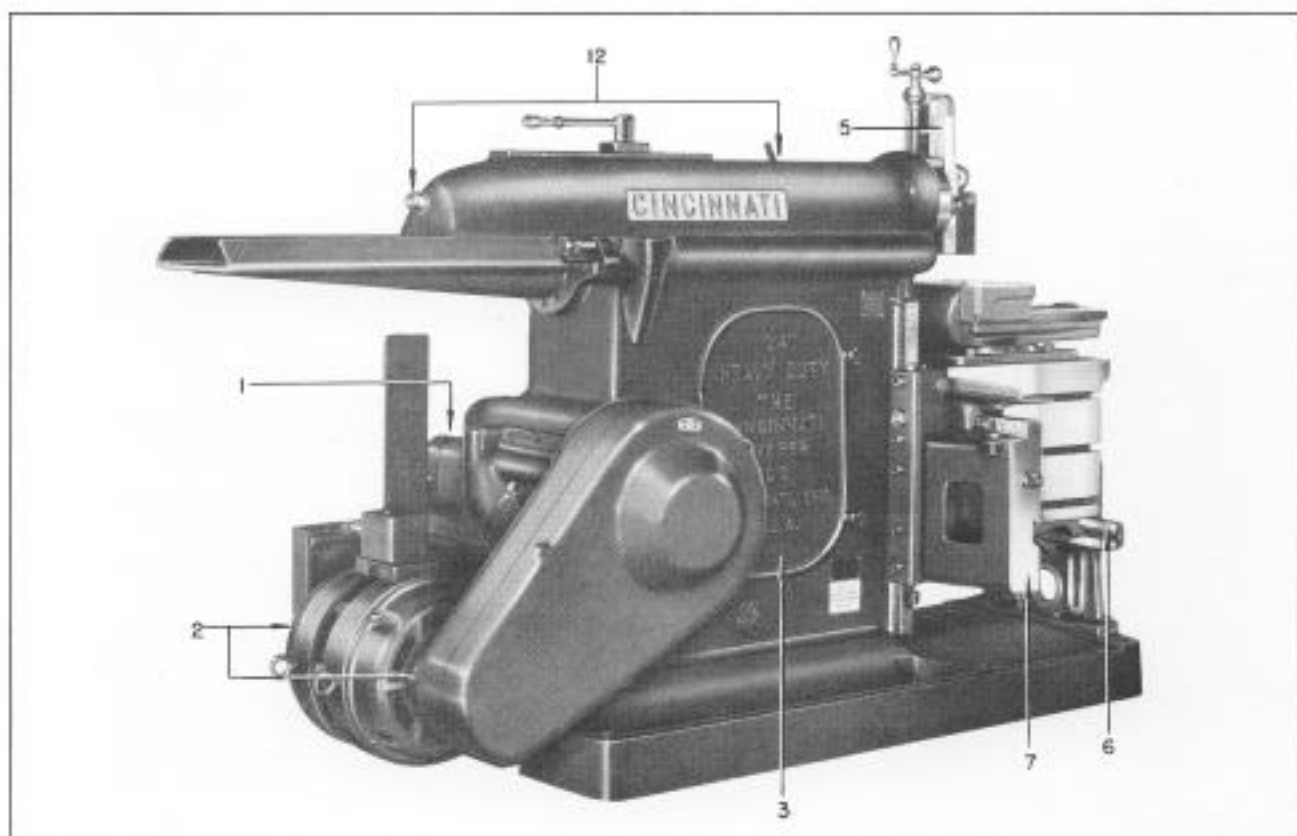


Fig. 5 Lubrication Points

WEEKLY

12. Fill oil hole at rear of ram and two oil holes near ram adjustment shaft.
13. Oil ram adjusting screw through opening in ram.
14. Oil speed change lever bearings.
15. Oil crank clutch.

MONTHLY

16. Remove plug and add oil to feed box.

NOTE

17. Do not allow oil level to fall below sight gauge when Shaper is stopped.

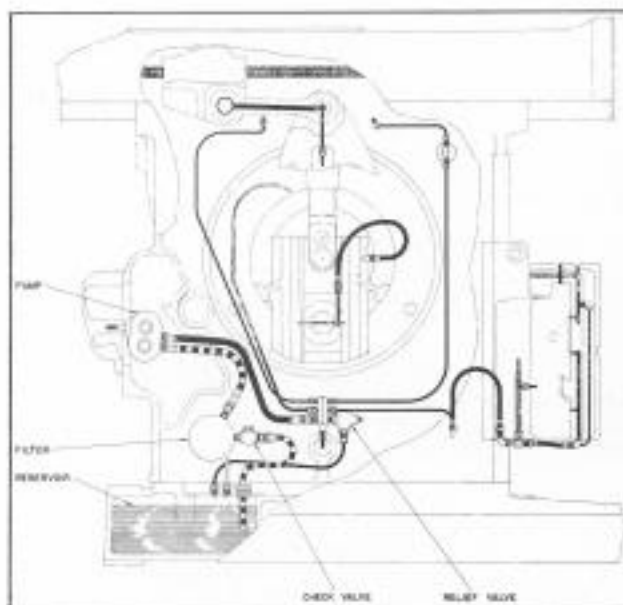


Fig. 7 Oiling Diagram

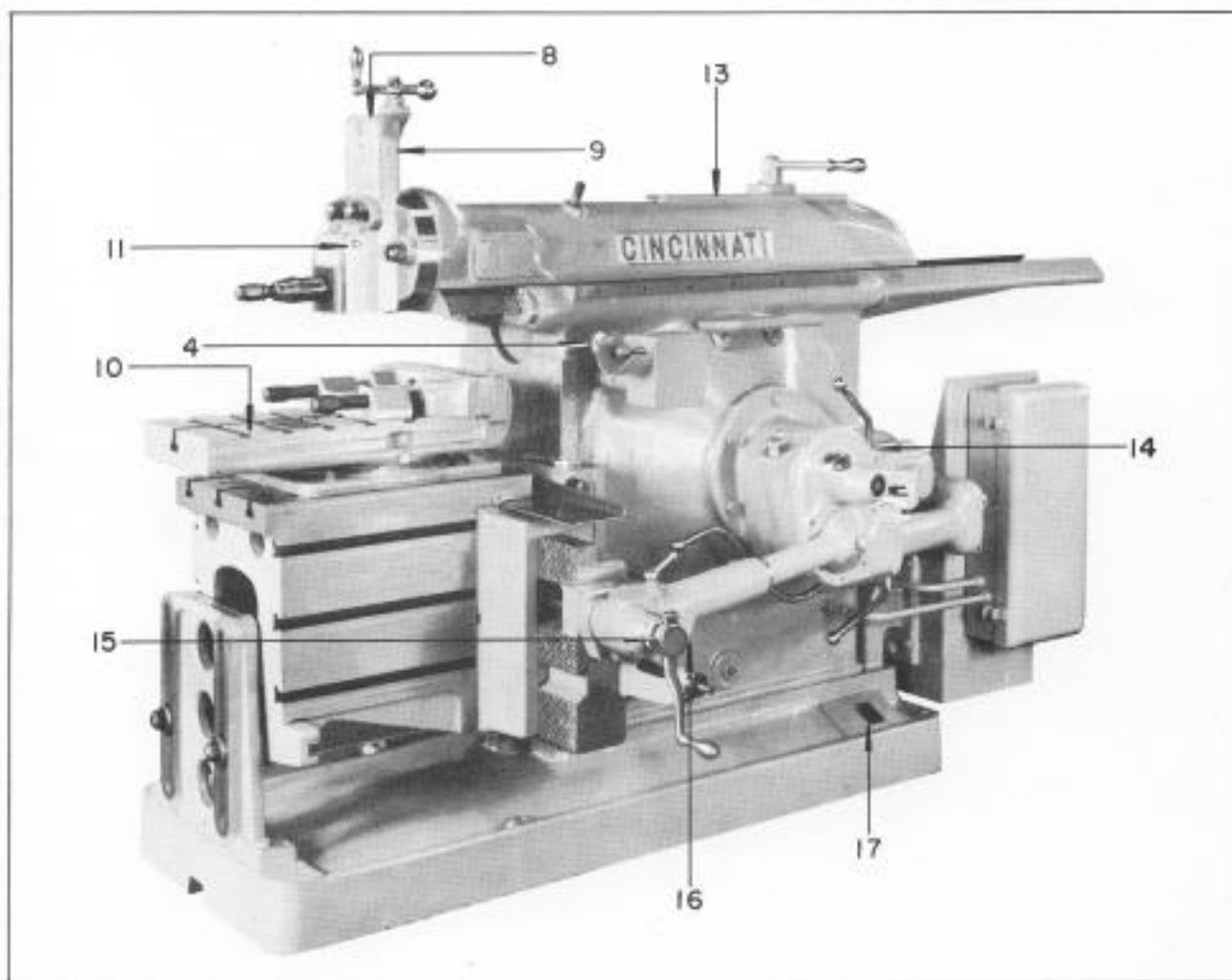


Fig. 6 Lubrication Points

SECTION III

OPERATION

STARTING

Put gear shift lever in neutral position and see that the stroke dial reads zero. Put feed lever in neutral. Start motor and make sure it is running in the proper direction. Arrows on the belt and pulley guard show the correct direction. Engage clutch lever with gears in neutral and stroke at zero. Inspect the rocker arm and sliding block to see that they are getting oil. Oil pressure gauge should read 50 lbs. when clutch is engaged.

OPERATION

Refer to Fig. 8 for the following reference numbers. The stroke is adjusted by turning the shaft #8 with the crank furnished with the machine.

The stroke adjusting shaft is self-locking. The length of the stroke is shown on dial #5, whether the Shaper is in motion or stopped.

The ram is unclamped by lever #6 and adjusted to the required position by turning shaft #2. The same crank

is used for positioning the ram and for adjusting the stroke.

CAUTION: DO NOT RUN RAM BACK INTO COLUMN WITH SLIDE SET AT AN ANGLE.

Your Cincinnati Shaper has eight speeds as shown on the direct reading selector plate. Four speeds are obtained through lever #9. Four additional speeds are obtained through the back gear control lever #7. For surface cutting speeds, refer to the tables on cutting speeds on pages 10 & 11.

The amount of feed to the table is regulated by lever #4. The automatic feed is engaged and disengaged by lever #3. This lever is directional, that is, it shows the direction of the table movement, whether for feed or for power rapid traverse.

A safety clutch is provided for feed and power rapid traverse to prevent breakage in the event the table should run against an obstruction.

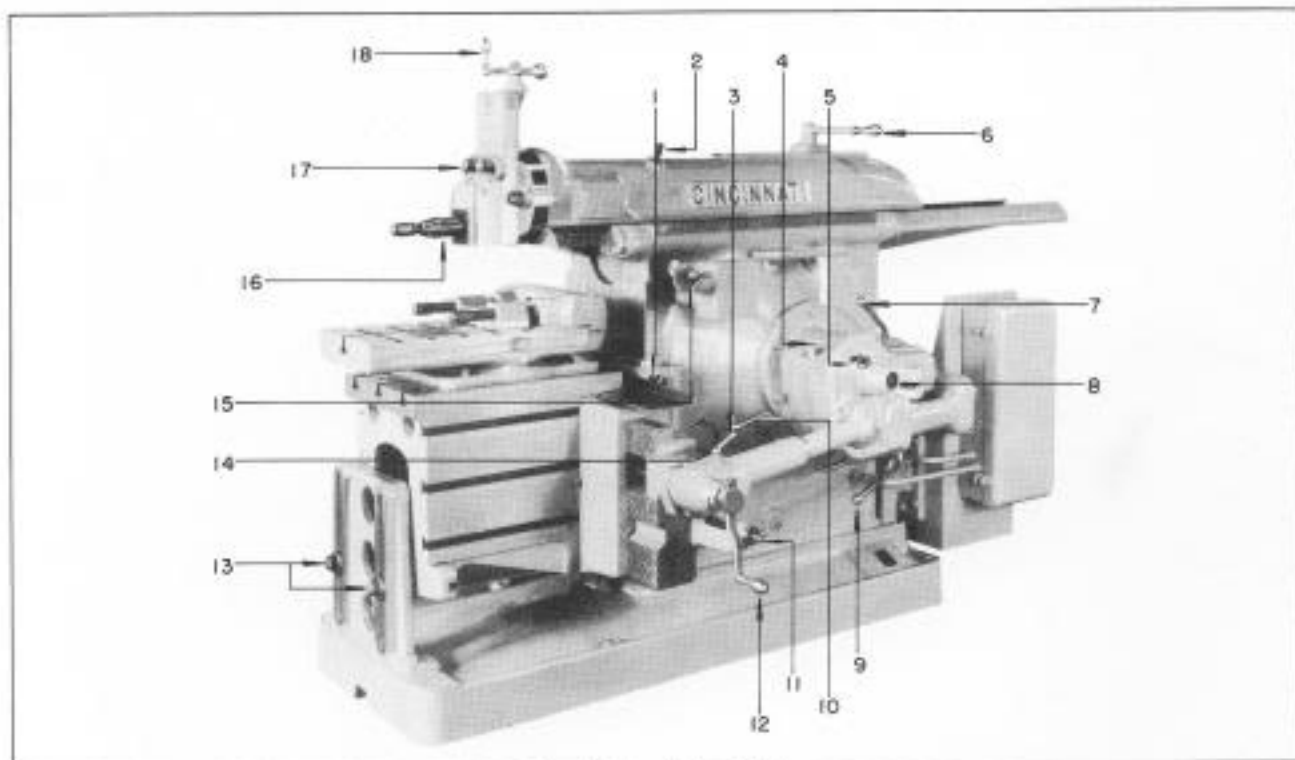


Fig. 8 Operating Points

- | | | |
|---------------------------------|------------------------------------|---------------------------------------|
| 1. Rail clamp control. | 7. Back gear lever. | 13. Table support clamping nuts. |
| 2. Ram positioning shaft. | 8. Stroke adjusting shaft. | 14. Power elevating engagement lever. |
| 3. Cross feed engagement lever. | 9. Gear shift lever. | 15. Clutch and brake switch lever. |
| 4. Power cross feed selector. | 10. Power rapid traverse lever. | 16. Tool post. |
| 5. Stroke indicator dial. | 11. Rail elevating manual control. | 17. Clapper clamping nuts. |
| 6. Ram clamp lever. | 12. Cross feed safety crank. | 18. Tool slide ball crank. |

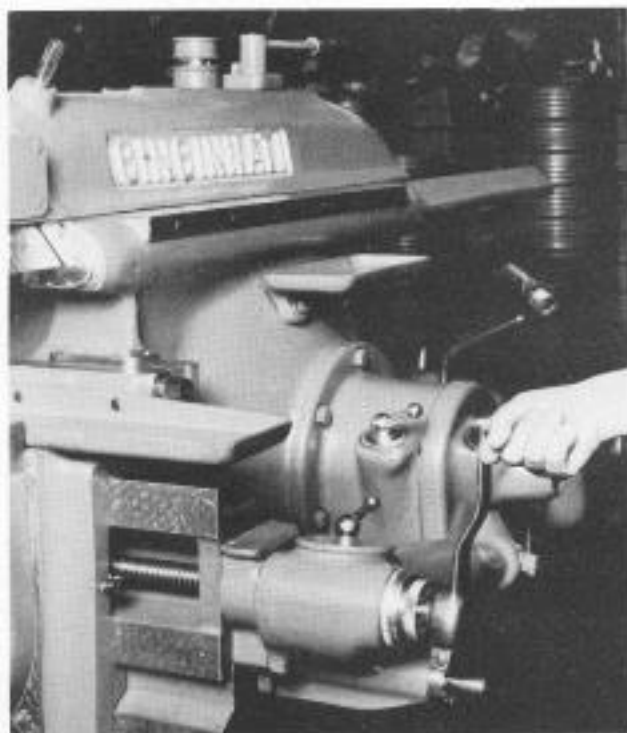


Fig. 9 Disengaging Safety Crank

VERTICAL ADJUSTMENT OF TABLE

Unclamp the rail by putting large wrench on shaft #1 and pulling towards the front of the machine. Loosen table support nuts #13. Remove safety crank #12 from cross feed shaft and engage it on elevating shaft #11. Remove crank by placing clutch teeth opposite each other and pushing crank. See Fig. #9.

Raise or lower the table to the desired position and reclamp rail by turning shaft #1. Tighten front table support by pulling up nuts #13. **ALWAYS HAVE APRON CENTERED ON RAIL WHEN PULLING UP NUTS #13 TO PREVENT CRAMPING.**

The large hexagon head cap screw holding the rail clamp at each side of the column should always be tight. Do not disturb the socket cap screws.

POWER RAPID TRAVERSE

Horizontal

To operate the horizontal power rapid traverse, Fig. 10, place feed lever "J" in direction of desired movement and raise lever "KK".

Vertical

To operate the vertical power rapid traverse, loosen clamp shaft L, Fig. 10, loosen table support bolts #13, Fig. 8. Place feed lever "J" Fig. 10 in neutral, place lever "JJ" in direction of movement and raise lever "KK". **DO NOT USE VERTICAL POWER RAPID TRAVERSE FOR FEEDING THE TABLE. USE HEAD FEED.**

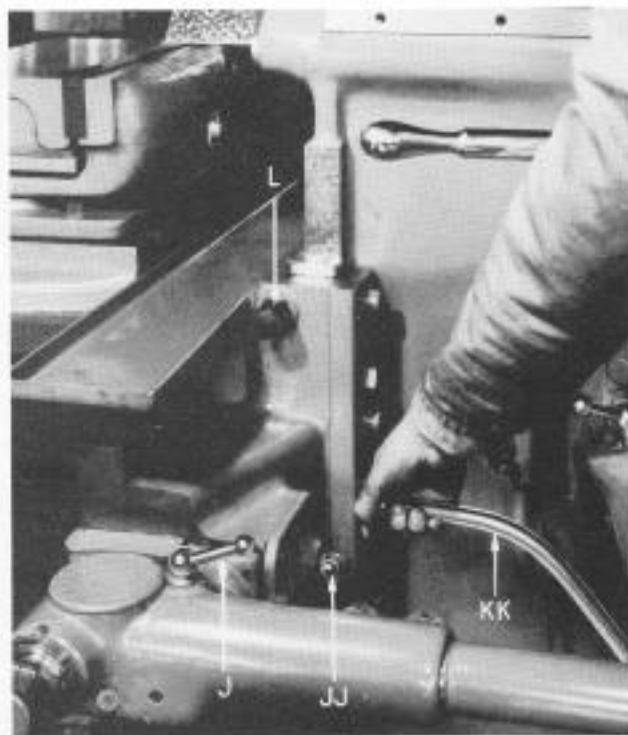


Fig. 10 Power Rapid Traverse

CLUTCH

Your Shaper is equipped with the most modern clutch and brake available on shapers today. Finger tip control of the ram movement makes for convenience and speed both in setup and operation. Stopping of the ram is also greatly improved. Operation remains consistent over very long periods of time. No adjustment is required on this electrically operated clutch and brake.

The control switch furnished is standard. You can add a duplicate control to the opposite side of the machine. You can do the same with a foot control or portable control if required.

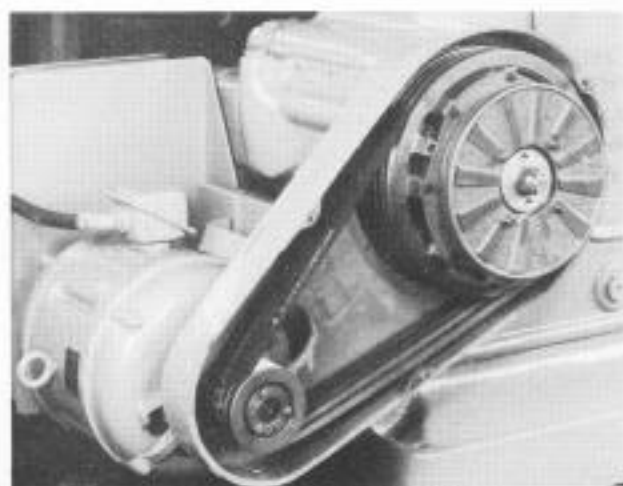


Fig. 11 Electric Clutch and Brake

CUTTING SPEED

The cutting speed on a shaper is governed by length of the stroke and the strokes per minute. For the same strokes per minute, the cutting speed increases as the stroke is lengthened. **AVOID OPERATING YOUR SHAPER ON EXCESSIVELY LONG STROKE AT HIGH SPEEDS.**

The proper chart on these pages gives the cutting speeds in feet per minute for the different strokes per minute and various lengths of strokes for your shaper. The cutting speed for a job is determined by the kind of material being cut and the type of finish desired.

Generally, Shapers are operated too slowly. The table below gives speeds for various metals.

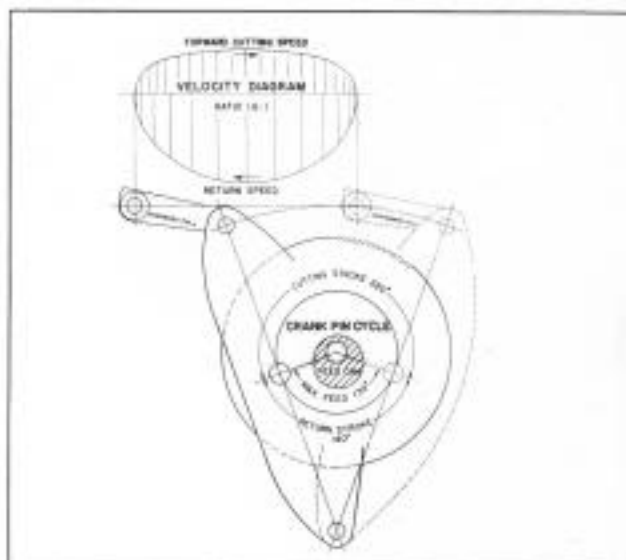


Fig. 12 Diagram For Typical Full Stroke

ALLOWABLE CUTTING SPEEDS - FEET PER MIN.

HIGH SPEED STEEL TOOLS

Material	Roughing	Finishing
Cast Iron	60	100
.10 to .20 C	80	120
.20 to .40 C	60	100
Die Steel	40	40
Hard Bro.	60	100
Brass	150	Max. Speed
Aluminum	150	Max. Speed

CUTTING SPEEDS IN FEET PER MINUTE

		16" HIGH SPEED LENGTH OF STROKE IN INCHES															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
STROKES PER MIN.	15	4	6	7	10	13	16	19	20	23	25	28	29	30	33	35	36
	22	6	9	12	15	17	20	23	26	29	32	35	38	41	43	46	49
	33	7	12	17	22	28	32	38	42	46	51	55	59	64	67	71	75
	45	9	16	22	29	36	42	49	55	61	67	74	80	84	90	96	101
	68	12	23	35	44	54	64	74	84	94	103	112	120	129	136	145	154
	99	16	33	48	64	78	93	107	120	135	146	159	172	185	197	208	220
	145	25	48	71	93	114	136	158	178	198	218	236					
200	34	65	97	127	158	187	216	245									



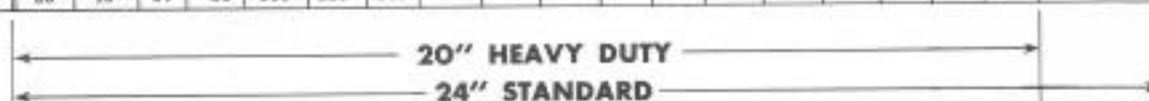
LENGTH OF STROKE IN INCHES

STROKES PER MIN.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	12	3	4	6	8	9	10	13	15	16	18	20	21	23	24	26	27	28	30	31	32
	17	4	6	8	11	13	16	18	21	23	25	28	30	32	34	36	38	40	42	44	46
	20	5	8	13	17	20	24	28	32	35	39	42	46	49	52	55	58	61	64	67	70
	36	6	12	17	23	28	34	39	44	49	54	59	63	68	72	77	81	85	90	93	97
	54	9	18	26	34	43	50	58	66	73	81	88	95	102	108	115	121	128	133	140	146
	77	13	25	37	49	61	72	83	94	105	115	125	135	145	154	164	172				
	115	19	37	56	73	91	108	124	140	156	172	188	202								
	157	26	51	76	100	127	147	170	192	214											



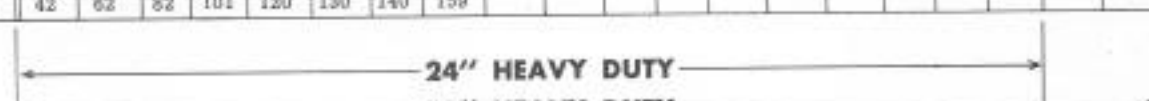
LENGTH OF STROKE IN INCHES

STROKES PER MIN.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	11	3	4	5	7	9	11	13	14	16	17	19	20	21	23	24	25	26	27	28	29
	15	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	35	37	39	40
	23	5	8	12	15	19	22	26	29	32	35	38	41	44	46	49	52	55	57	60	62
	31	6	11	15	20	25	29	34	38	42	46	51	55	58	62	66	70	73	76	80	83
	47	8	16	23	30	37	44	51	58	65	73	77	83	89	94	100	106	112	116	121	126
	68	11	23	33	44	54	64	74	83	93	101	110	119	128	136	144	152	161	168		
	100	17	33	49	64	79	94	109	123	137	150	163									
	138	23	45	67	88	109	129	149	169												



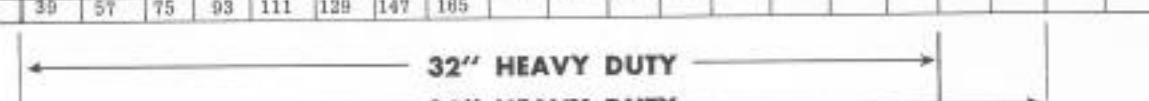
LENGTH OF STROKE IN INCHES

STROKES PER MIN.		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	22	24
	10	3	5	7	9	10	11	13	15	16	17	18	19	20	21	22	23	25	27	29	32
	14	5	7	9	11	13	15	17	19	21	23	24	26	28	30	32	33	35	39	42	45
	21	7	10	13	16	19	22	25	28	31	34	37	40	43	46	48	51	53	58	62	67
	29	10	14	19	23	27	32	36	40	44	48	51	55	59	63	67	70	73	79	86	92
	44	15	22	28	35	41	47	54	61	67	72	77	83	89	95	101	106	111	121	131	140
	64	21	31	41	51	60	70	79	88	97	105	113	121	129	136	147	154	161			
	94	30	45	60	74	88	102	116	129	142	154	165									
	129	42	62	82	101	120	130	140	150												



LENGTH OF STROKE IN INCHES

STROKES PER MIN.		2	3	4	5	6	7	8	9	10	11	12	13	14	16	18	20	22	24	26	28
	9	3	4	5	7	8	9	11	12	13	15	16	17	18	21	23	25	27	29	31	33
	13	5	7	8	10	12	14	16	18	20	21	23	25	27	30	34	37	40	43	46	49
	20	7	10	13	16	19	22	25	28	31	33	36	39	42	47	52	57	61	66	70	74
	27	9	13	17	21	25	29	33	37	41	45	48	52	56	61	69	77	83	89	95	101
	41	13	20	26	32	38	44	50	56	62	68	73	79	84	94	105	115	125	135	144	152
	59	19	28	37	46	55	64	73	82	90	98	106	114	122	130	152	166				
	87	26	41	54	67	80	95	106	119	132	144	156	168								
	119	39	57	75	93	111	129	147	165												



LENGTH OF STROKE IN INCHES

STROKES PER MIN.		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36		
	8	3	5	8	10	12	14	16	18	20	23	25	27	29	31	33	35	37	39		
	11	5	7	11	14	18	20	24	27	30	33	35	37	39	41	43	45	48	50		
	17	6	11	16	21	26	31	36	40	44	48	52	56	60	64	68	71	75	78		
	23	8	15	22	29	36	43	49	55	61	67	72	77	82	87	92	96	101	105		
	35	12	23	34	45	55	65	74	83	92	101	110	118	125	133	140	147	153	159		
	50	17	32	48	64	78	92	106	119	131	145	157	168								
	74	25	49	72	95	116	136	156													
	102	33	65	97	129	160															

UNIVERSAL TABLES

Universal tables in combination with the swivel vise furnished with machines permit the work to be rotated around all three axes. This type of table is especially useful in tool and die shops. The table is rotated by first loosening four nuts at the front of the table and then operating the shaft AA, Fig. 13. The crank for this shaft is the same that is used for ram and stroke adjustment.

The plain face is brought into position by rotating table clockwise against stop. The tilting face is brought into the required working position using the graduations on the front of the table. After the table is rotated to the proper position, tighten the four nuts on the front of the table.

The tilting face is adjusted by first loosening clamp nuts BB and CC. Adjust the face to the desired angle by operating shaft DD with crank. Graduations on the side of the tilting face towards the front, show the angle of tilt. Secure tilting face in position by tightening nut CC first and nut BB last, as marked. Nut CC operates wedges to seat the tilting face in its full scraped bearing. Nut BB clamps it securely in position.

For unusually accurate work use an indicator, sine bar, or gauges for setting up. Each time before a check is made, draw up the nuts at the front of the table.

On universal shapers equipped with table support loosen four table nuts as before. Use socket wrench furnished with the shaper to loosen nuts between table support brackets. Adjust table in same manner as described in the preceding paragraphs.

OILING

Worm and wheel for rotating the table and gears for tilting face are packed with grease at factory.

Oil the sleeve around shaft AA at point marked and when needed. Oil other points daily.

Keep scraped bearing surfaces of tilting face and scraped bearing between apron and rotating table clean and oiled. On universal shaper with table support, keep slide clean and oil daily at the point provided near bottom of table support.

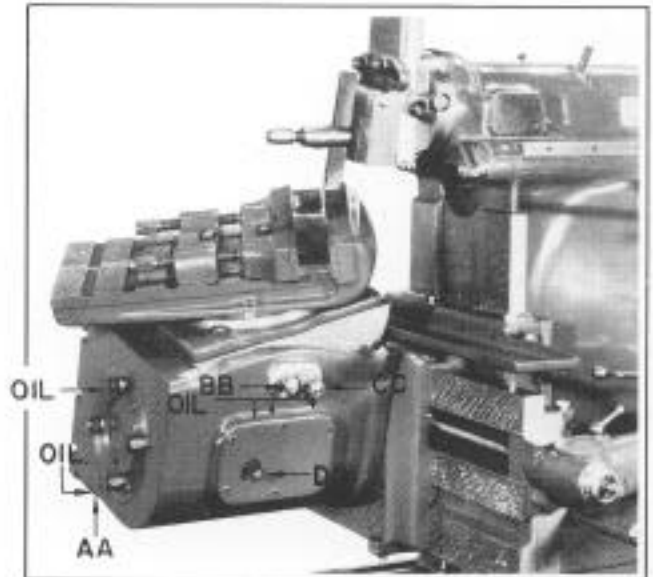


Fig. 13 Universal Table



Fig. 14 Automatic Power Down Feed to Head

AUTOMATIC POWER DOWN FEED TO THE HEAD

To set the automatic down feed to the head, Fig. 14, first set stroke for length and position. Stop ram at mid stroke. Locate cam bracket in approximate position on column at end of return stroke.

Alternately stroke ram and adjust cam bracket until required feed graduation coincides with zero mark on bracket mounted on ram. The zero mark and the desired feed graduation should coincide at the end of the return stroke. The small clutch lever starts and stops the power down feed.

For different depths of cut, use positive stop on the head.

OILING

Fill oil pocket in bracket mounted on ram daily if power down feed is used daily, otherwise as required.

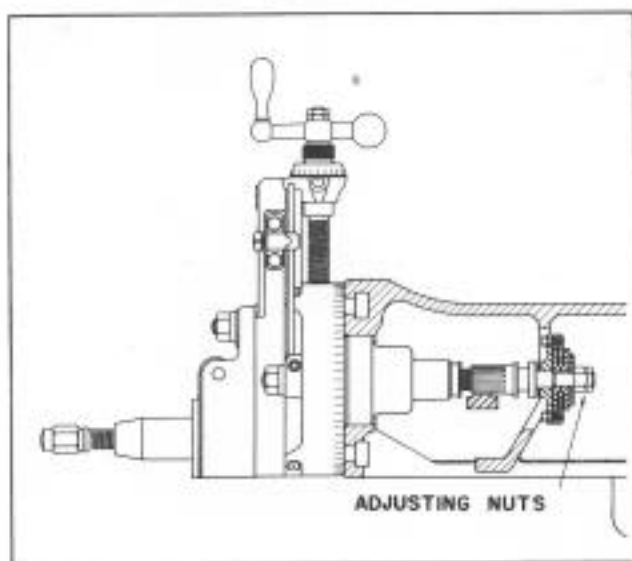


Fig. 15 Power Down Feed

ADJUSTMENTS

To adjust friction on power down feed, Fig. 15, move ram out of column so adjusting nuts are accessible. Loosen half-nut. Pull full nut up to tighten friction and re-lock with half-nut.

TOOL LIFTER

To make tool lifter inoperative pull out lever "LL" as shown in Figure 16.

To disconnect tool lifter for removal of head or using in near horizontal position remove screw "MM", and pull rod out of friction.

At high speeds of ram a slight friction on rod is necessary--at slow speeds increase friction adjustment.

An occasional drop of oil on the hardened bearing surfaces indicated, is desirable.



Fig. 16 Tool Lifter

AUXILIARY FRONT CROSS FEED

When using the auxiliary front cross feed, Fig. 17, the locking screw shown at "HH" should be loose and locking screw "II" on feedbox tight.

When using the conventional cross feed, loosen locking screw "II" on feed box and tighten locking screw "HH". This is also true when using the power rapid traverse.



Fig. 17 Auxiliary Front Cross Feed

SECTION IV

ADJUSTMENTS

GIB ADJUSTMENT

All slides with the exception of the table support are provided with adjustable taper gibs. The table support is provided with a flat gib.

ACCURACY DEPENDS A GREAT DEAL UPON THE PROPER ADJUSTMENTS OF GIBS, GIB ADJUSTMENT ALSO IS IMPORTANT IN SMOOTHNESS OF OPERATION AND CUTTING. ACCORDINGLY; KEEP ALL GIBS PROPERLY ADJUSTED TO ELIMINATE LOOSENESS AS A SOURCE OF CHATTER.

Cincinnati Shapers are gibbed throughout and illustrations 18 thru 22 show the points of adjustment.

In general, gibs should be adjusted with a minimum clearance. A small clearance on a properly fitted bearing is favorable to the formation of a strong oil wedge or film. When making adjustment, be sure that uneven wear has not taken place. That is, movements of the table, ram, and sliding block are usually confined to a certain portion of the entire travel. Accordingly, after a long period of time, there will be more wear in this portion than elsewhere. If a gib is adjusted for the worn portion it will be tight for the portion that is little used. This condition exists only after a long period of operation and eventually requires re-fitting. However, in the meantime the gibs are still useful in keeping proper clearance between the working parts.

When adjustment is necessary, taper gibs should be drawn up snugly. The gib should then be backed off or relieved until a clearance of not less than .002" is obtained between the glazed bearing surfaces. Further adjustment may be required, depending on conditions and operation of the Shaper.

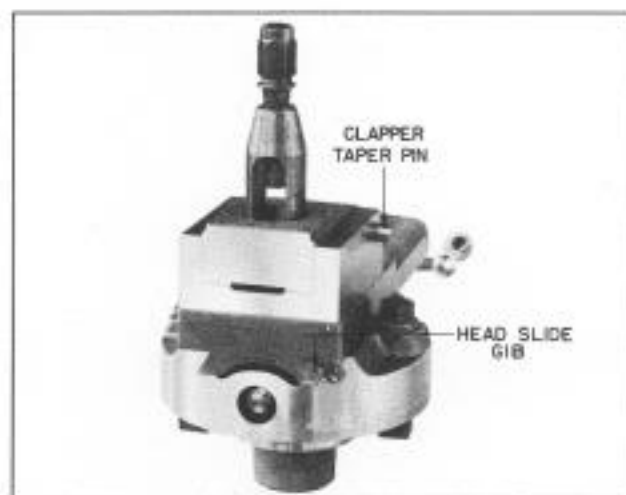


Fig. 18 Head Adjustments

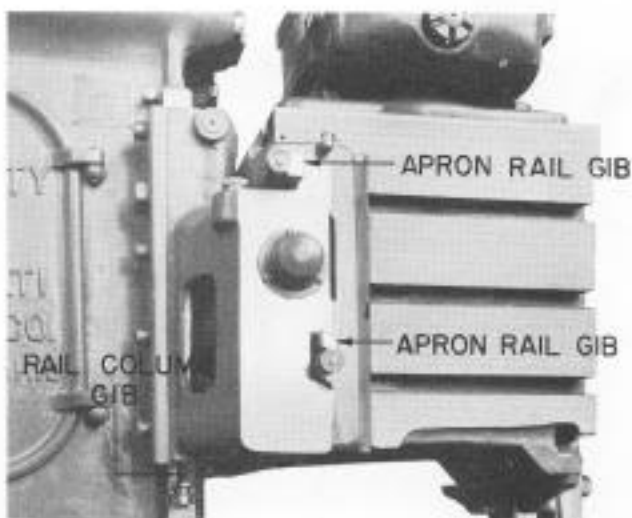


Fig. 19 Table Gib Adjustment

Head Gib Adjustment

Adjust gib, Fig. 18, by feel of slide movement. For proper adjustment slide should operate snugly. Lock gib with screw at bottom.

Sliding Block Gib Adjustment

With rocker arm in vertical position, move sliding block to bottom of rocker arm by operating stroke adjusting shaft. Draw up gib to point where it is tight enough to support its own weight that is, hang in position. Then back off approximately 1/3 turn and lock.

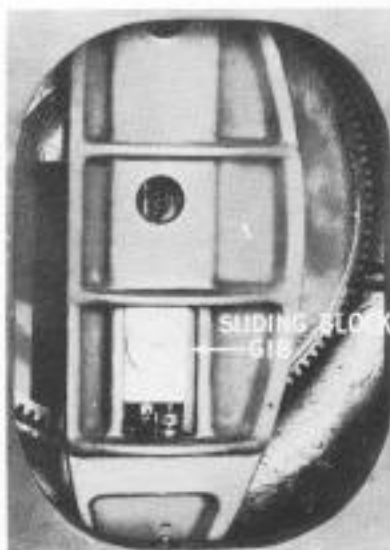


Fig. 20 Sliding Block Adjustment

Rail Column Gib Adjustment

Adjust gib, Fig. 19, by feel on rail elevating crank and lock. For proper adjustment elevating crank should operate stiffly.

Apron Rail Gib Adjustment

Adjust gib, Fig. 19, by feel on cross feed crank and lock. For proper adjustment cross feed crank should operate stiffly.

Ram Gib Adjustment

In general, maintain as small a clearance between ram and ram ways as possible. This will give the most accurate work and best finish. To tighten ram gib turn lock nut A Figure 21 to move gib toward the front of the ram. Draw up gib until snug. Back off 1/2 turn and lock with nut B. Engage clutch and feel for thump at either end of stroke by laying hand on top of ram. If thump occurs, back off ram gib in small steps until thump disappears. **STOP RAM WHEN MAKING ADJUSTMENT.**

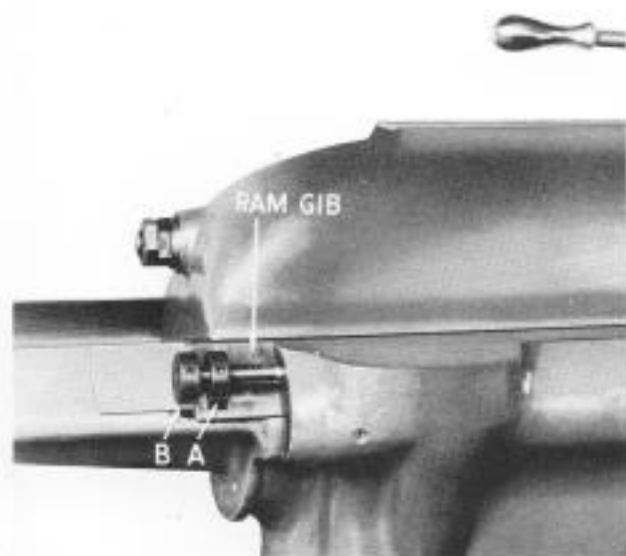


Fig. 21 Ram Gib Adjustment

Crank Block Gib Adjustment

Adjust Gib, Fig. 22, by feel on stroke adjusting shaft and lock. For proper adjustment stroke adjusting shaft should operate stiffly.



Fig. 22 Crank Block Adjustment

Stroke Adjusting Screw

Wear adjusting nuts on stroke adjusting screw Figure 22 should be kept tight. Tighten inner nut until tight, then lock outer nut and insert cotter pin. Finally back off inner nut against outer as far as possible.

Knocking

Knocking can result from poor adjustment. Check these points:

1. Stroke adjusting screw see previous paragraph.
2. Sliding block gib adjustment.
3. Crank Block gib adjustment.

Also see ram gib adjustment on "thump".

RAIL CLAMP ADJUSTMENT

Refer to Fig. 23

Remove the chip guard from the rail. Apply the wrench to the clamp shaft to loosen the mechanism. Traverse the table towards the left end of the rail to adjust the clamp at the right end. Turn the rail clamp adjusting screw up tight and back off one half turn. Make the same adjustment at the other end.

It may be necessary to make additional minor adjustments of the rail clamp adjusting screw for best clamping conditions due to the variations of limits and unequal wear on the mechanism.

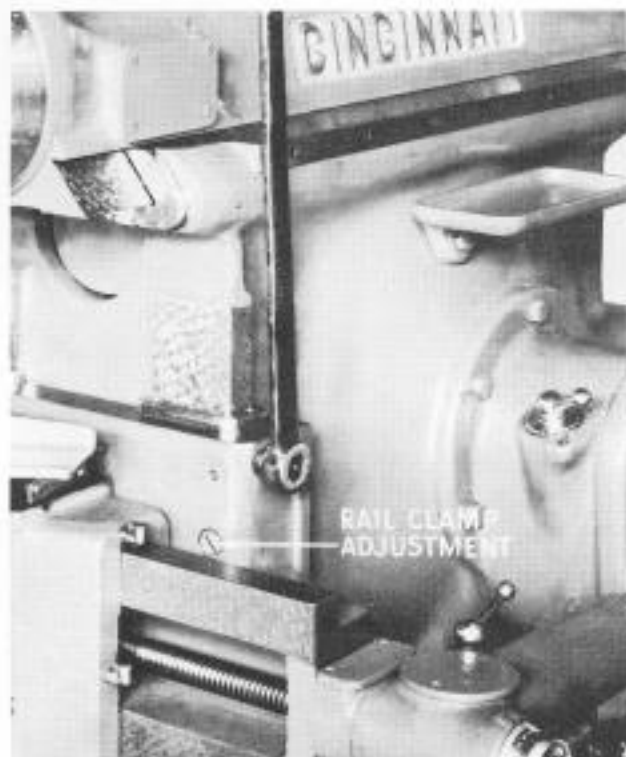


Fig. 23 Rail Clamp Adjustment

BELT ADJUSTMENT

Loosen the four nuts FF holding the motor base and tighten belts by backing off adjusting screw GG at the bottom of the base. See Figure 24.

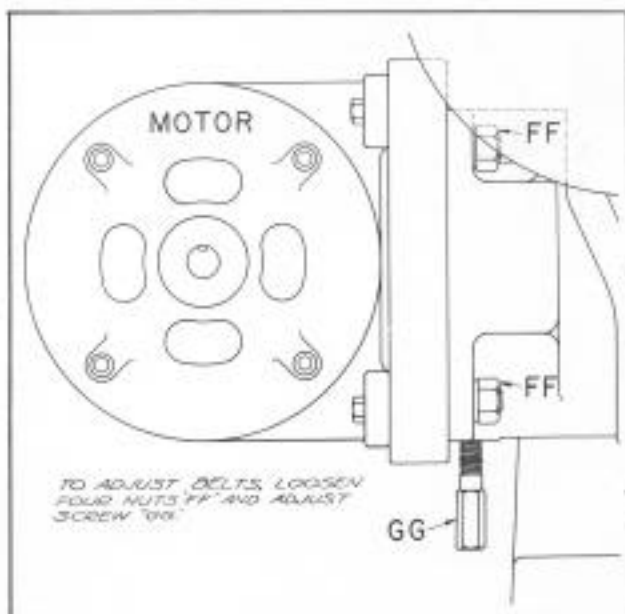
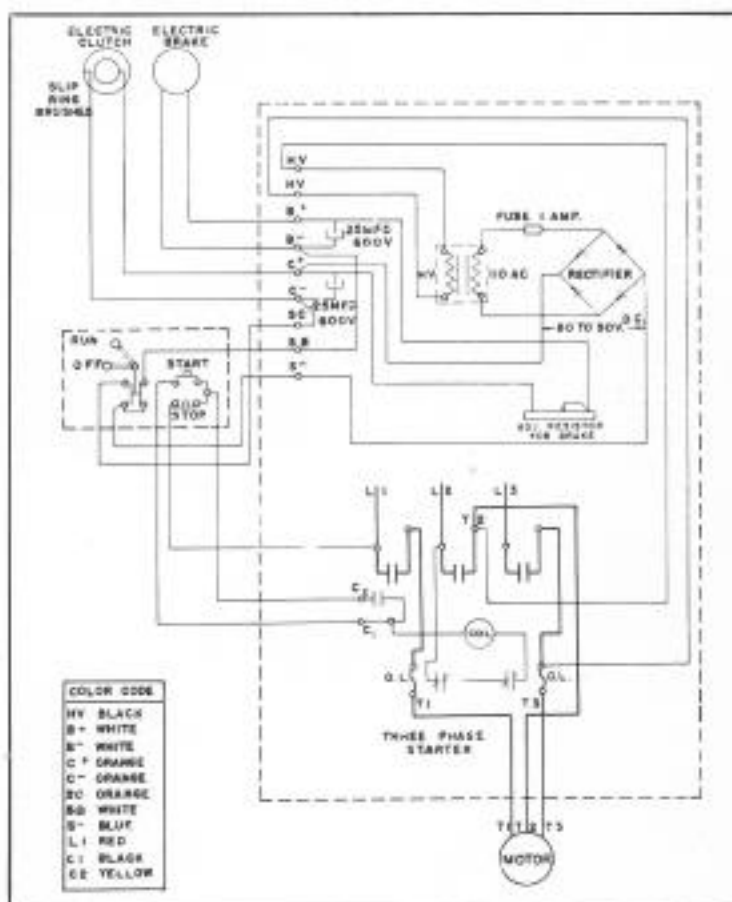


Fig. 24 Belt Adjustment

Fig. 25
Standard
Wiring Diagram



CLUTCH ADJUSTMENT

After your Shaper has been in use for some time, it may be necessary to tighten the clutch. Screw V shown in illustration 16 provides the adjustment. Loosen the lock-nut and turn screw V clockwise to tighten the clutch, counter clockwise to loosen it. A quarter of a turn is usually sufficient.

The simple adjustment furnished in screw V will take care of normal wear for a long period of time.

CLUTCH AND BRAKE ADJUSTMENT

After a long period of time, the clutch and brake assembly should be adjusted as a unit to give maximum performance. The instructions on this adjustment also apply when a replacement of parts should be required.

The procedure is:

Remove drain plug and drain oil from the transmission chamber. Remove starter bracket and back out screws which bolt the transmission cover Q, illustration 16, on the back of the column, about $\frac{1}{4}$ ". Back out three screws in flange R. Insert a bar and pry the cover loose until the joint is broken and dowels at flange R are disengaged. Remove screws S and take power rapid traverse arm off. Remove all screws from cover Q. When removing the cover, the clutch shifter lever must be disengaged from the brake spool. Also, the cover must be tilted in order to bring the non-metallic gear at the right end out through the hole in the pulley guard.

Remove the plug T in the column at the left end of the pulley shaft. Remove motor drive guard cover.

Remove cotter pin, castellated nut and washer from the left end of operating rod U. Loosen the lock-nut and back off the adjusting screw V at pulley end. Place a wooden wedge, chisel, or screw driver between the lever and

pulley shaft, as shown at the right in illustration 16. Adjust the wedge so that no more than .003" feeler can be passed through the point of smallest clearance between the expanding clutch ring and pulley. The wedge should be to one side and must not interfere with the adjustment of the screw. The clearance setting is correct when rotation of the pulley barely turns the clutch assembly.

Adjust screw V so that it rests on pin W and against roller X. These parts are shown in illustration 16. Turn screw V the amount necessary to barely raise the lever. The pressure on the wedge should still be sufficient to hold it snugly in place.

Back screw V off two full turns and tighten lock-nut. Turn round nut Y with the aid of a pointed tool, such as the scratch awl, through the plug hole T in the column. Adjust Y so that there is a slight clearance between the adjusting screw and roller X when the brake spool is seated. To make this adjustment, it will be necessary to slide the brake spool off the nut Y and to turn the nut until the key lines up with one of the keyways in the spool. For relative purposes, one-half turn is equal to .027".

Finally, turn nut Y clockwise one-half turn to remove end play. Replace washer and draw castellated nut tight. Then back off this nut to nearest cotter pin hole and replace cotter pin.

Preceding adjustments properly made will permit the wedge at the clutch end to be removed without force. The preceding adjustments are normal, however, if unusually heavy cutting is being done on the Shaper, a quarter turn clockwise of the adjusting screw V is usually sufficient.

Replace plug T, cover Q, the power rapid traverse arm, and the starter bracket. Before replacing pulley guard cover, test the clutch for action. With ram stroking and clutch engaged, a light push on the clutch lever should automatically stop the machine.

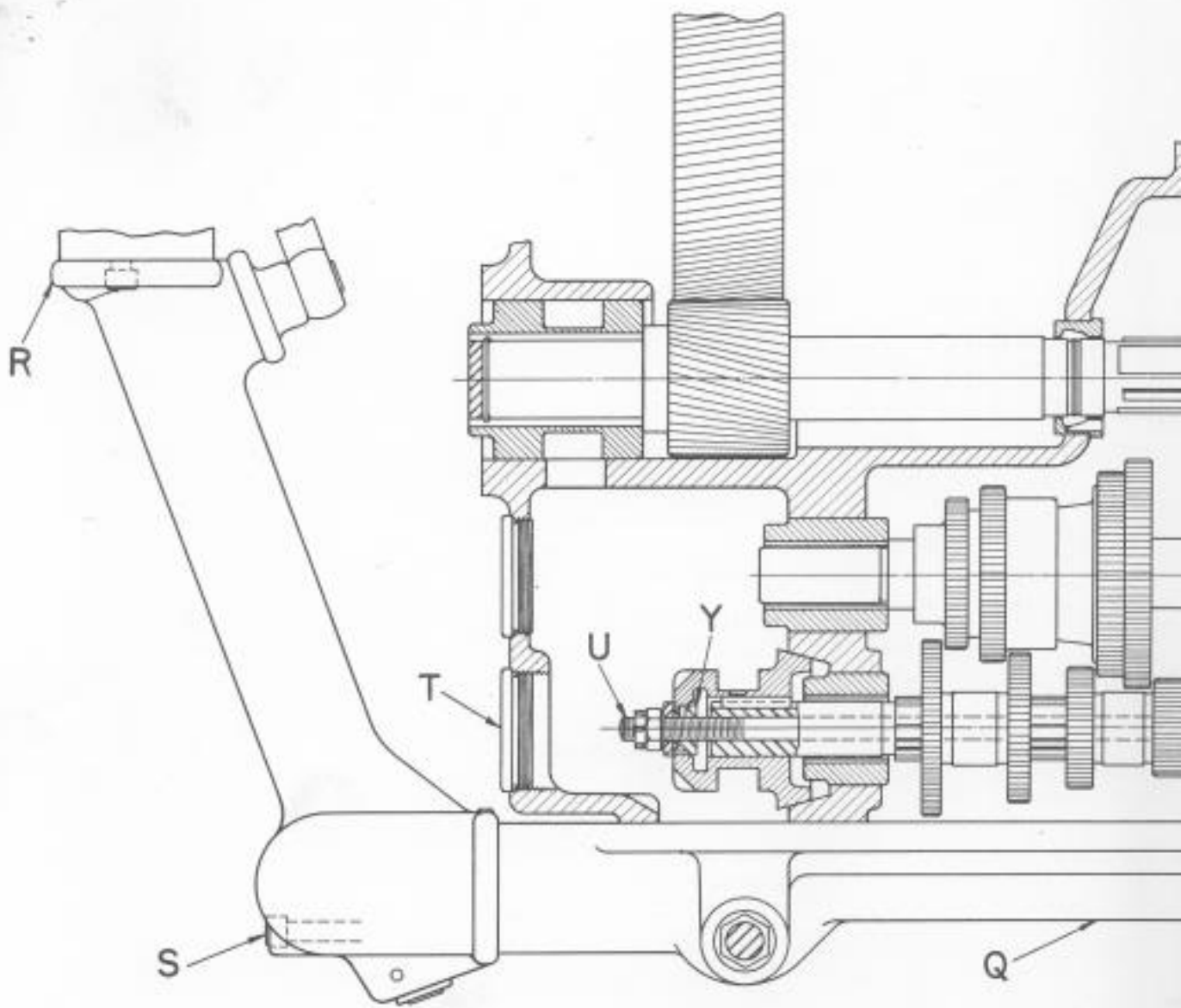
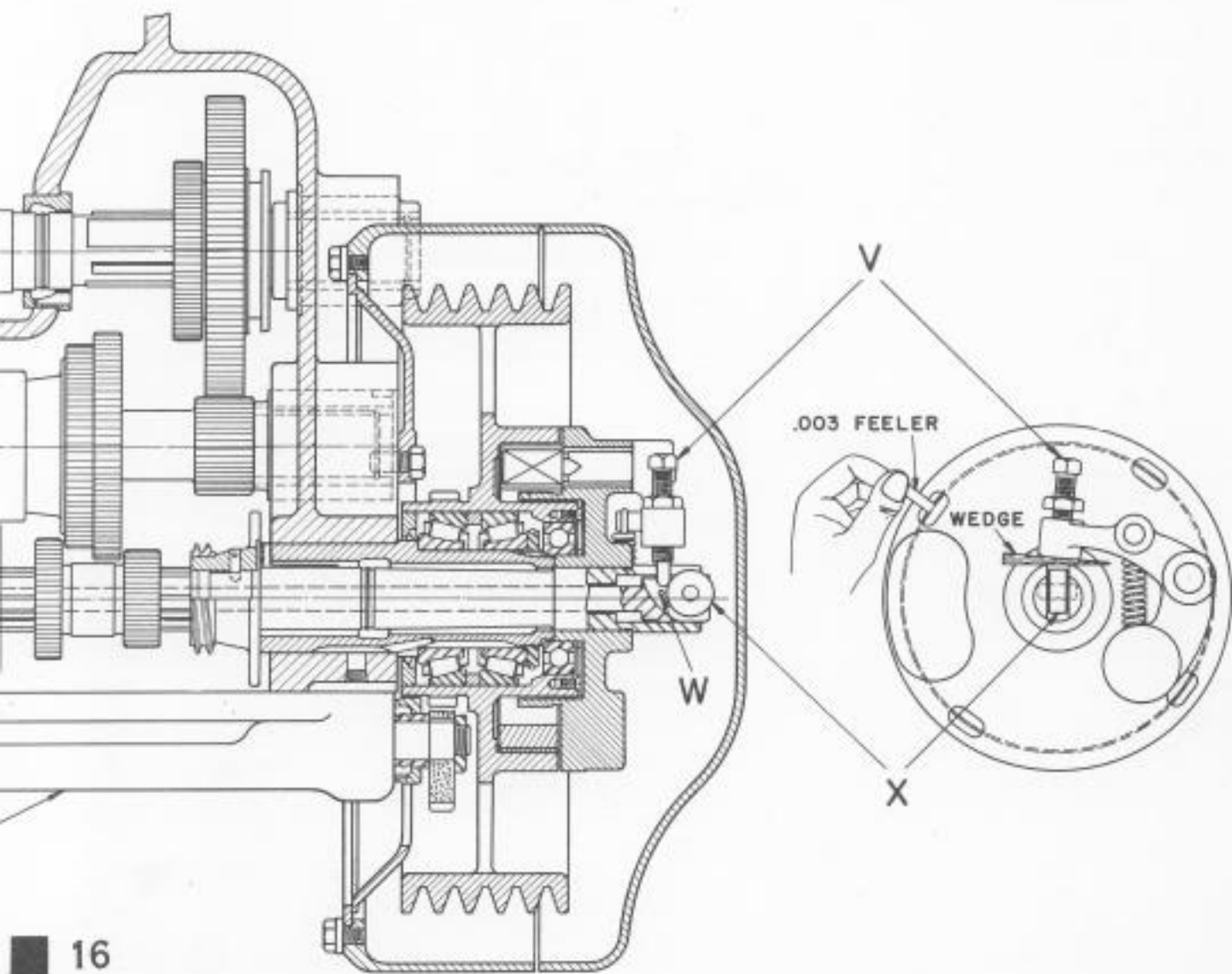


ILLUSTRATION ■ 16
CLUTCH & BRAKE ADJUSTMENT



■ 16
ADJUSTMENT

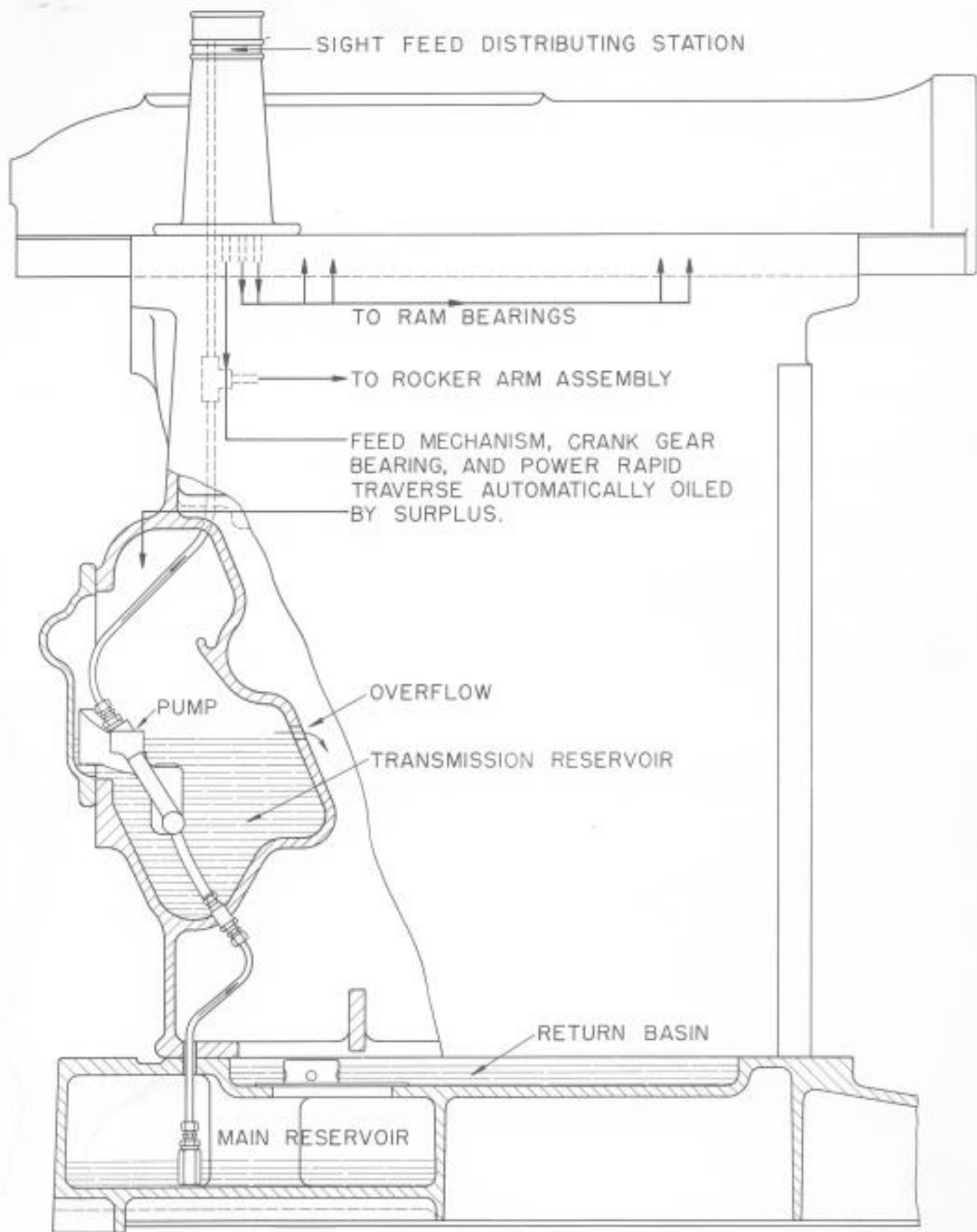


ILLUSTRATION 5
OILING DIAGRAM

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