# OPERATOR'S HANDBOOK

## INSTALLATION AND OPERATING INSTRUCTIONS

*for*

## STEPTOE SHAPERS

*including*

## REPAIR PARTS LIST

SERIAL No. E.B. 42722 T.B.S.

Handbook No. 4620-H

**WESTERN MACHINE TOOL WORKS**
Holland, Michigan, U. S. A.
Cable Address "WESTERN" Holland

## Index of Line Drawings

# INSTALLATION AND OPERATING INSTRUCTIONS FOR STEPTOE SHAPERS

## Moving the Machine

Remove all crating and waterproof wrapping paper from machine; also lagscrews holding machine base to skids.

Pass rope slings around rear projection on column and under projection at front of machine directly adjacent to under side of ram sliding surface. Care should be taken to avoid lifting with slings under ram, and adequate protection provided to prevent bruising of finished surfaces if chain slings are used. If crane service is not available, rollers may be used under the machine base, being careful to avoid all unnecessary shocks due to dropping off rollers.

## Foundation

A solid concrete foundation, of a depth to provide a firm base for the machine, and with foundation bolts grouted into place, is recommended wherever possible. Bolt locations can be obtained from a certified foundation plan, and should be provided with ample clearance around them to make easy positioning of the machine in its location. Level machine with a reliable spirit level, parallel, and at right angles to direction of ram travel before grouting into place.

## Cleaning

Clean off all slushing compound with kerosene or any reliable petroleum solvent. Refrain from moving any part of machine until all bearings not provided with automatic lubrication have been oiled and are ready for operation. On machines with Automatic Forced Feed Lubrication, add oil through the elbow filler cup, located in rear side of base, until oil stays in cup. See lubrication diagram for specifications on page 24.

## Automatic Forced Feed Lubrication (See Fig. 20)

When so ordered, Automatic Forced Feed Lubrication is provided to major points of wear on rotating or reciprocating parts, such as

Timken bearings, closures, ramways, rocker arm block, crank pin, gears, etc. No attention or maintenance is required except, before starting the machine, to see that the elbow filler cup, located on the side of the base, is filled with oil. After a long period of time, renew the filter element on the left side of the machine column. A pressure gauge is visible from the operator's side to indicate the oil pressure in the oiling system, and being set at the factory to the proper pressure (3 pounds per square inch), requires no maintenance. Should this gauge fail to function at any time, the machine should be stopped immediately and the source of trouble located before resuming operations. Any oil additions made to the pumping supply should be a high quality, straight mineral oil having a viscosity S.U.V. of 200-300 seconds at 100° F. For a complete oil change refill to top of elbow cup, provided on left hand side of machine, after all feed lines have drained back to the sump.

## Plain Lubrication (Fig. 18)

When so ordered, plain oil fitting lubrication is provided. These fittings, conspicuously placed on the machine, should be supplied with a straight mineral oil of the same specification as used in the forced feed system, every working shift. In addition, miscellaneous points of wear on all machines should receive periodic lubrication attention, such as: elevating and horizontal traverse screw; column and crossrail sliding ways; table support slide, harp slide and gears inside column. (See page 25.)

The four oil distributing pipes protruding from the top of the ram at the locking handle, should all receive shots of oil frequently during the machine's daily operation. The ram sliding block and the rocker arm shaft near the base of the machine should be well oiled periodically on every shift, through door on side of machine column.

## Gear Box Lubrication

The gear box is supplied at the factory with 4 pints of spindle grease #4473, Summer grade, from the Viscosity Oil Co. of Chicago, Ill. This is an aluminum stearate grease of a quite stringy adhesive nature of about #2½ consistency. Refill to a level so that largest gear just dips into the grease. Be careful not to overfill, or bearing overheating and leakage may result. (See page 24.)

3 PINTS S.A.E. 140 OIL

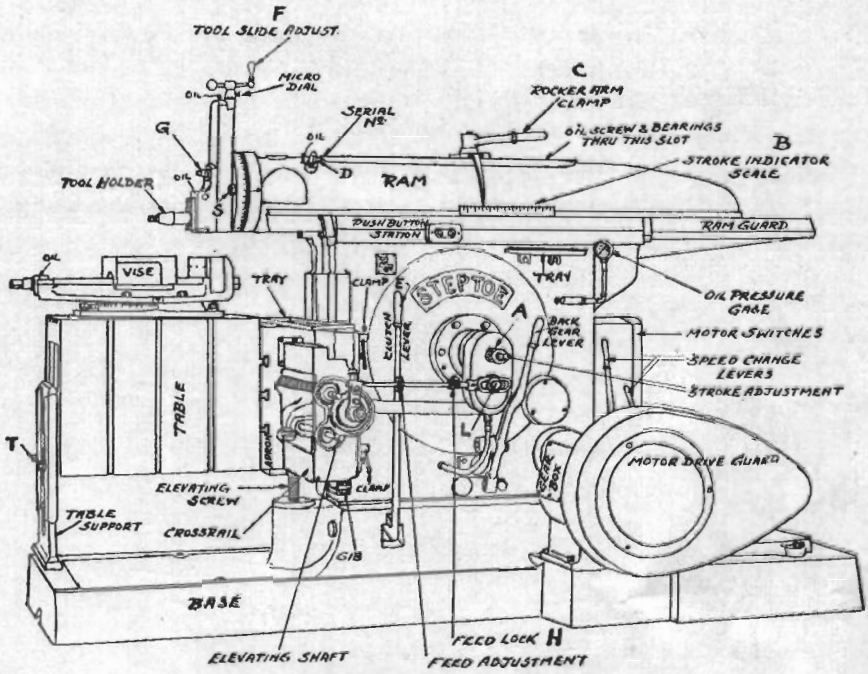


*Fig. 1*
*Front View of Steptoe Shaper*

## Ram Stroke Adjustment

Loosen knurled knob at A (Fig. 1), place crank on squared shaft, and rotate in either direction until desired ram stroke is indicated on scale B, by pointer attached to clamp handle C. It may be done with ram in motion or at rest. To regulate stroke of ram across vise top, loosen clamp lever at C, place crank on squared shaft at D, and rotate in either direction until desired setting is obtained. Clamp in position with lever C. To test suitability of tool setting, ram may be jogged by operating clutch lever E intermittently.

## Tool Slide Adjustment

Loosen tool slide lock on left hand side of tool slide (Fig. 2), and rotate slide adjustment handle F in suitable direction. When required the micrometer collar may be set to zero by loosening knurled lock screw in collar and setting to scribed zero line. For angular settings of clapper block, loosen clamp screw at G, and rotate block to setting

required. For angular settings of tool slide, loosen screws at S and rotate head to graduation desired. Be sure to tighten all clamp bolts before using tools.

## Feed Adjustment

Place ram in operation by pushing clutch lever E (Fig. 3) towards the machine; loosen feed lock nut at H and rotate feed adjustment collar until desired ratchet displacement is obtained. See feed index

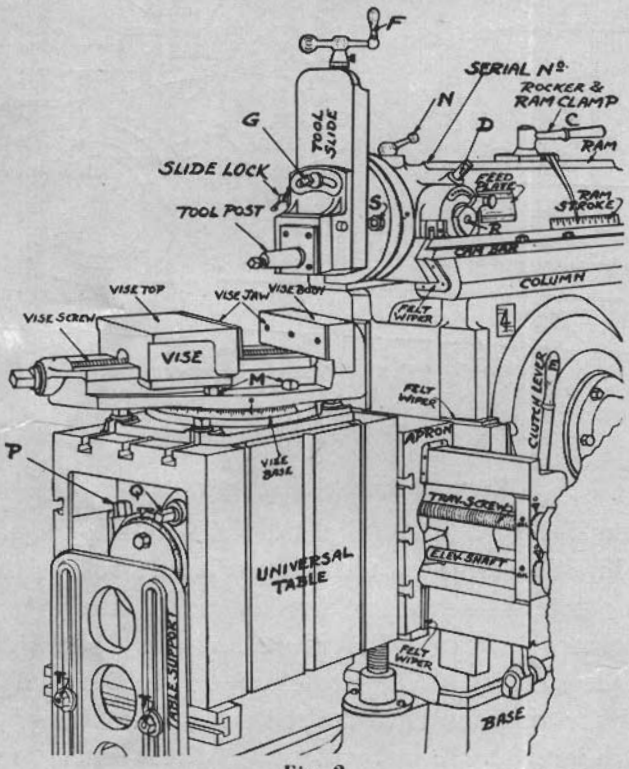


*Fig. 2*
***Universal Table and Power Down Feed***

plate on machine. Lock setting before continuing in operation to prevent mechanism getting out of adjustment. To disengage table feed without disturbing setting, pull up on knob K and give a 90° turn, snapping back into neutral position; to reverse direction of table feed, pull up on knob K and give a 180° turn, then let snap into position in slot.

For manual positioning of table and vise horizontally, first place power feed in neutral as before, and rotate traverse screw by square shaft and crank handle provided. For manual vertical positioning, rotate elevating shaft in desired direction by squared shaft and crank as before. To raise table by power feed, remove pull pinion on traverse screw and place same on elevating shaft, directly below it, and engage feed at K, similarly to horizontal feed. Before operating vertical feed, be sure saddle clamp bolts are loose enough to prevent clamping, also, loosen two clamp screws on front of table support at T (Fig. 1).

The machine is shipped with the feed mechanism adjusted to feed at the end of the stroke of the ram. Should it be desirable to feed on the opposite end of the stroke of the ram, operator should pull out on knob L (Fig. 1), while machine is running, then immediately let it

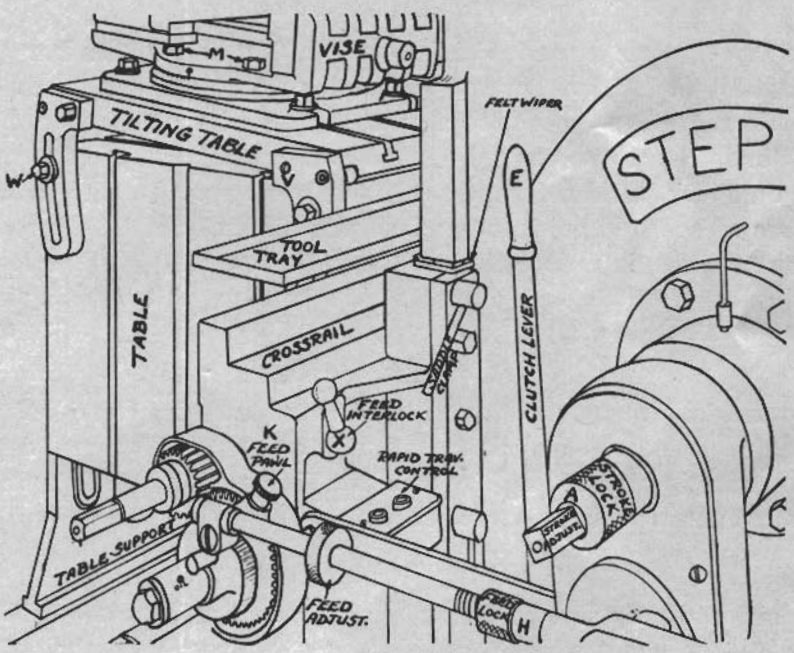


*Fig. 3*
*Tilting Table and Rapid Traverse Control*

snap back, from where it will take up the proper position on the eccentric, automatically. If this adjustment is made while machine is stationary knob L is pulled out as before, and rotated through 180° on the feed eccentric and plunger inserted in hole provided.

## Speed Changing

Whenever it becomes necessary or desirable to change ram speeds, either through the back gears or the speed box, it is recommended that the clutch be thrown out during the shifting process, allowing the machine to coast momentarily. By judicious "inching" of the clutch lever and the gear shift lever involved, concurrently, unnecessary clashing of gear teeth is avoided and the desired speed change accomplished in a minimum time.

## Vise Adjustment

Loosen four clamp bolts at M (Fig. 2), and rotate vise to desired angular position indicated on circular graduated base. Tighten clamping bolts before using tools.

## Power Down Feed

To place power down feed in operation, first adjust cam bar (Fig. 2) by slot and clamp screws provided, so that inclined front edge contacts roller as ram reciprocates, then rotate handle N (Fig. 2), to right or left from its central neutral position, after first unclamping tool slide lock. Select desired feed from plate provided and mounted on ram adjacent to index lever; then place index lever R in necessary location. Feed is automatic, and may be reversed in direction by moving handle N through a partial turn; or stopped, by placing index pin at R in hole No. 9.

## Universal Table

Loosen table support clamping bolts T and trunnion clamp bolt at P (Fig. 2). Rotate squared shaft at Q with crank provided until desired angular setting is indicated by pointer. Tighten bolt P before placing tools in operation, to preserve setting.

## Tilting Table Top

Remove two cap screws V from wing brackets as indicated in Figure 3, at the end about which the table top is to pivot; loosen bolts W on opposite sides of the table and pivot table to desired angular setting. Clamp in position by tightening bolts at W before using.

## Power Rapid Traverse

Place feed interlock lever X (Fig. 3) in correct angular position, throwing feed pinion on traverse screw out of operation and making

push button station operable for starting motor. Table continues to traverse in selected direction as long as "forward" or "reverse" push button is pressed down. Two safety limit switches, underneath cross rail, stop table at either end to prevent damage to mechanism. If table over-travels, it may be returned to its field of operation on the crossrail by pressing the opposite push button.

## Motor Drive

### 1. Vee Belt

The Vee belt drive generally supplied requires a minimum of attention and service. However after some initial service, a slight stretch may develop in the belts causing unnecessary looseness on the slack side. This may be easily and quickly taken up by moving the motor back on the base provided. An occasional shot of grease into the fittings of the large driven sheave hub, with the pressure gun provided, is all the attention required. Keep all lubrication or belt dressing off the Vee belts, as it has a deteriorating effect on rubber, and shortens the belt life. When the time comes for belt replacement, it is recommended that a complete new set of belts, matched for length, be obtained. To replace belts, slide motor forward on its base and remove old belts. Do not try to replace belts by prying over sheaves without first moving motor forward. When new belts are in position, take up slack by moving motor rear-ward on its base, by means of screw adjustment.

CAUTION — Care should be exercised in replacing belts or taking up slack on old ones. The screw adjustment gives a powerful means for this purpose and unless discretion is used, irreparable damage can result from too great an initial tension being imposed on the belts.

### 2. Geared Motor Drive

When so ordered a geared motor drive is provided, through a non-metallic pinion on the motor shaft. No adjustment is provided or necessary on this type, and no maintenance except occasional greasing — i.e. every three or four months — of the large mating gear, is required.

**NOTE — Always include machine size and serial number, found on top surface of ram adjacent to D, Figure 1, in all inquiries or repair orders.**

# REPAIR PARTS LIST

NOTE: — When ordering parts, specify parts wanted by name and number, size and serial number of machine for which they are intended. Serial number is located on top of Ram.

1 Bull Gear Block
3 Base
4 Bull Gear
6 Bull Gear Bushing
7 Door Catch
11 Column
17 Ram Block Handle
20 Door
21 Gear Box Cover
22 Door Knob
31 Feed Yoke Cover
32 Feed Yoke
37 Input Shaft Ball Bearing
39 Back Gear—Large
40 Back Gear—Small
41 Bull Gear Roller Bearings
43 Column Bushing Oil Seal
44 Bull Gear Bearing Lock Nut
45 Vee Belt Motor Sheave (give hole dia., No. of grooves, belt size and length, keyway and approx. outside dia.)
47 Vee Belt Guard
48 Ram Block Washer
50 Rocker Arm
51 Friction Clutch Complete
52 Rocker Arm Block
53 Ram Screw Nut
54 Feed Gear on Bull Gear
55 Clutch Cover
60 Ram Block
75 Back Gear Shifter Shaft
97 Gear Box and Column Bushing
104 Sleeve Gear
107 Stroke Index Pointer
120 Gear Box
121 Gear Box Pad
122 Crank Pin Washer
150 Ram
151 Ram Gib
206 Bull Gear Shaft
207 Bull Gear Shaft Bushing
214 Bull Gear Screw
221 Bull Gear Pinion
224 Back Gear Shaft—Motor Drive
226 Single Gear Shaft—Motor Drive
251 Column Bearing Cover—L.H.
360 —Oil Seal
361 Tapered Roller Bearing
362 Tapered Roller Bearing
363 Oil Seal
367 Bearing Lock Nut
368 Bearing Lock Nut
369 Bearing Lock Nut
385 Motor Pinion (when ordering, give hole dia., keyway size and approx. outside diameter)
391 Vee Belt Sheave—Driven
401 Bull Gear Block Slat
402 Back Gear—Small
406 Bull Gear Shaft Bevel Gear
415 Ram Block Stud
417 Oil Screen Ring—In Column
425 Bull Gear Pinion Shaft
449 Bevel Gear—Bull Gear Screw
462 Purolator
466 Pump Sprocket
468 Pump Drive Chain
506 Ram Adjust. Shaft
509 Ram Screw
510 Ram Screw Bevel Gears
512 Bull Gear Shaft Lock Nut
519 Rocker Arm Tension Bolt
525 Column Bearing Cover—R.H.
529 Clutch Control Shaft
533 Ram Shaft Collar
1474 Feed Index Plunger Knob
1475 Feed Index Plunger
1476 Feed Index Plunger Housing
1477 Feed Eccentric
1478 Guide Collar—Outside
1479 Guide Collar—Inside
1480 Eccentric Feed Gear
1483 Feed Rod Link
1499 Feed Eccentric Washer
1763 Stroke Index Plate
20630 Pump Bracket
20879 Oil Pump
20880 Oil Return Hose—Feed Yoke
R-20841 Sprocket—Bull Gear Pinion Shaft

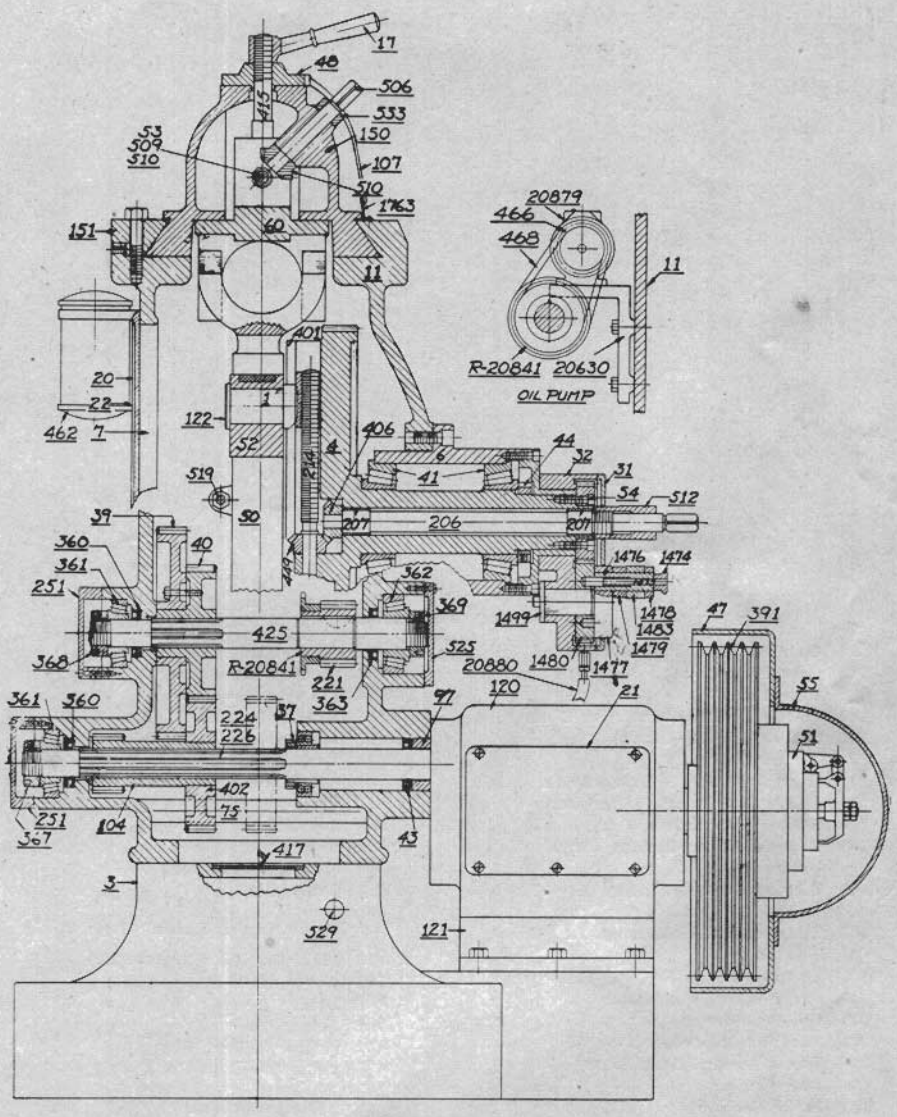


*Fig. 4*

*Sectional View of Steptoe Shapers*

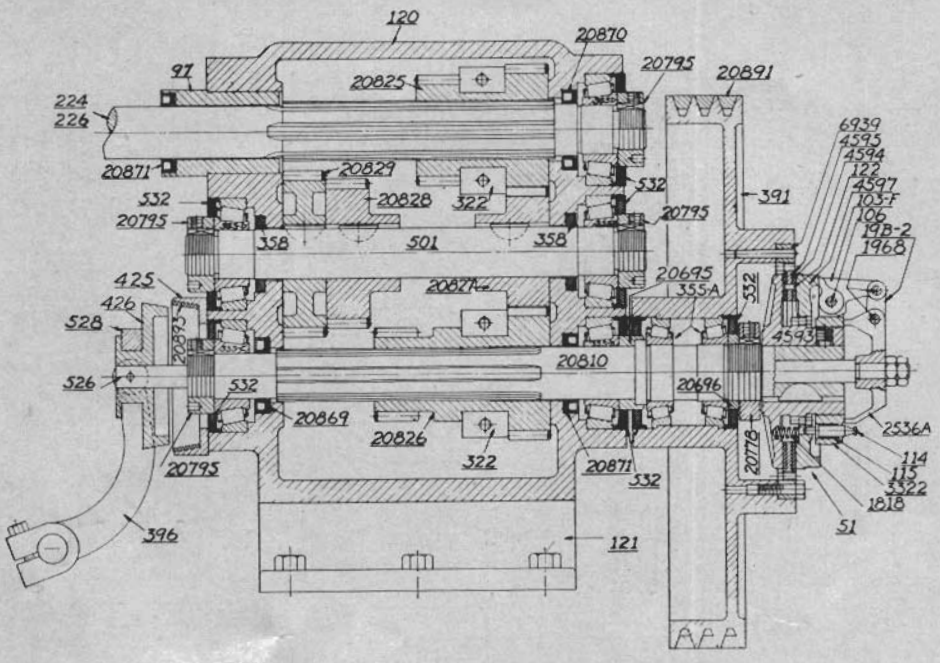


*Fig. 5*
*Steptoe Gear Box*

| | |
|---|---|
| 97 | Gear Box and Column Bushing |
| 120 | Gear Box |
| 121 | Gear Box Pad |
| 126 | Shifter Handle—Bent (Not Shown) |
| 127 | Shifter Handle—Straight (Not Shown) |
| 224 | Back Gear Shaft—Motor Drive |
| 226 | Single Gear Shaft—Motor Drive |
| 322 | Sleeve Gear Shifter |
| 355-A | Tapered Roller Bearing for Machine Sheave |
| 355-B | Tapered Roller Bearing for Clutch Shaft |
| 355-C | Tapered Roller Bearing for Clutch Shaft |
| 355-D | Tapered Roller Bearing for Interm. and Back Gear Shafts |
| 358 | Oil Seal—Inner |
| 391 | Vee Belt Sheave—Driven |
| 396 | Clutch Control Shaft Link |
| 425 | Brake Drum |
| 426 | Brake Cone |
| 501 | Intermediate Shaft |
| 526 | Clutch Control Rod |
| 528 | Clutch Control Shoe |
| 532 | Oil Seal—Outer |
| 20695 | Collar—Oil Seal |
| 20696 | Spacing Collar |
| 20778 | Locknut |
| 20795 | Locknut |
| 20810 | Input Shaft |
| 20825 | Sleeve Gear—Upper |
| 20826 | Sleeve Gear—Lower |
| 20827 | Intermediate Shaft Gear—Small |
| 20828 | Intermediate Shaft Gear—Center |
| 20829 | Intermediate Shaft Gear—Large |
| 20869 | Oil Seal—Input Shaft |
| 20870 | Oil Seal—Inner |
| 20871 | Oil Seal |
| 20891 | Vee Belts (State size, length and number required) |
| 20893 | Brake Lining |

**Following Parts for Multiple Disc Clutch**

| | |
|---|---|
| 51 | Multiple Disc Clutch—Complete |
| 19B-2 | Lever Link |
| 103-F | Lever |
| 106 | Lever Pin |
| 114 | Adjusting Lock Pin |
| 115 | Adjusting Lock Pin Spring |
| 122 | Rivets (6) |
| 1818 | Release Spring |
| 1968 | Lever Link Pin |
| 2536A | Sliding Sleeve |
| 3322 | Adjusting Yoke |
| 4593 | Hub & Back Plate |
| 4594 | Friction Discs |
| 4595 | Driving Plate |
| 4597 | Floating Plate |
| 6939 | Driving Ring |

**NOTE:** For adjustment of Twin Disc Clutch see Page 23, Fig. 17.

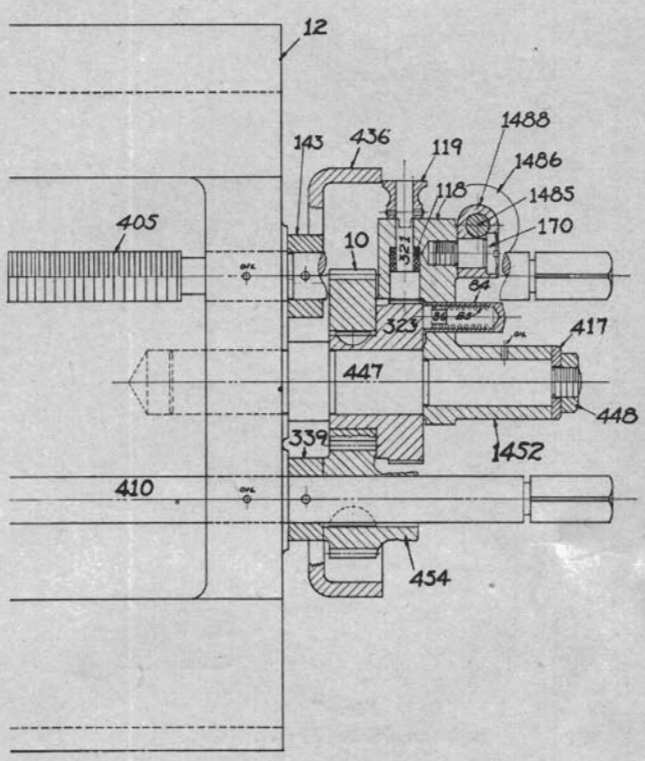


*Fig. 6*
*Steptoe Feed Mechanism on Cross Rail*

10 Feed Ratchet Gear
12 Cross Rail
84 Thimble for Feed Ratchet Friction Spring
85 Plunger Spring
86 Plunger for Feed Ratchet Friction
118 Jumper Pin Spring
119 Jumper Pin Knob
143 Graduated Collar on Screw
170 Feed Pawl Stud
321 Feed Ratchet Jumper Pin
323 Feed Ratchet
339 Graduated Collar on Elev. Shaft
405 Lead Screw
410 Elevating Shaft
417 Washer—Pawl Housing
436 Feed Gear Guard
447 Feed Pawl Shaft
448 Feed Pawl Shaft Nut
454 Feed Slip Gear
1452 Feed Pawl Housing (parts not sold separately)
1485 Feed Rod
1486 Feed Adjusting Collar
1488 Feed Rod Elbow

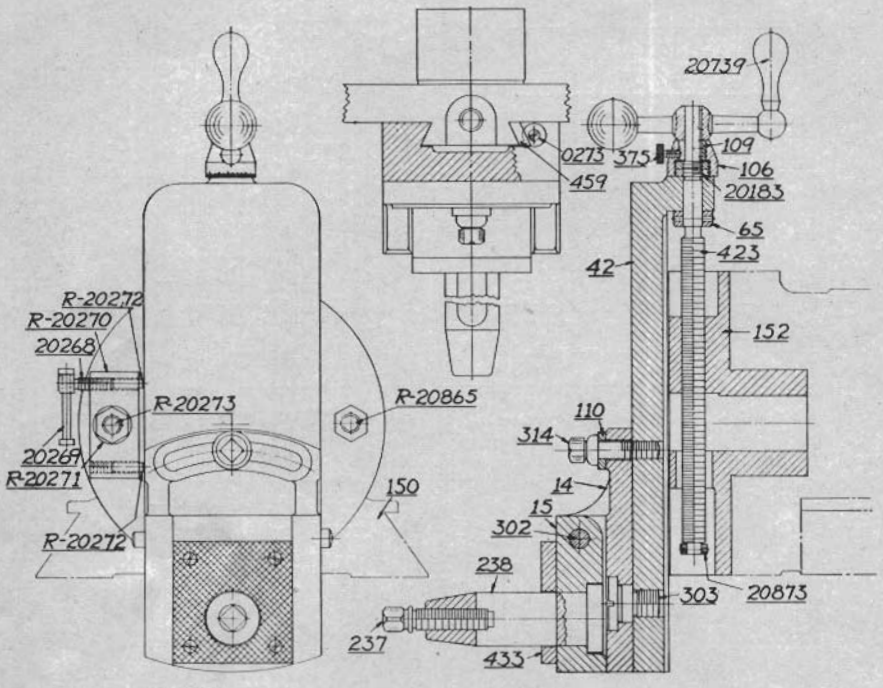


***Fig. 7***
***Steptoe Plain Harp Slide***

| | |
|---|---|
| 0273 | Harp Gib Adjusting Screw |
| 14 | Clapper Box |
| 15 | Clapper Box Block |
| 42 | Harp Slide |
| 65 | Harp Screw Collar |
| 106 | Graduated Collar |
| 109 | Graduated Collar Bushing |
| 110 | Clapper Box Clamp Washer |
| 150 | Ram |
| 152 | Harp |
| 237 | Tool Post Screw |
| 238 | Tool Post |
| 302 | Clapper Block Taper Pin |
| 303 | Clapper Box Swivel Stud |
| 314 | Clapper Box Clamp Screw |
| 375 | Graduated Collar Screw |
| 423 | Harp Slide Screw |
| 433 | Tool Post Plate |
| 459 | Harp Slide Gib |
| 20183 | Harp Screw Nut |
| 20268 | Harp Slide Clamp Screw |
| 20269 | Clamp Screw Handle |
| R-20270 | Harp Slide Clamp Block |
| R-20271 | Tee Bolt Sleeve |
| R-20272 | Clamp Screw Plugs |
| R-20273 | Tee Bolt—Long |
| 20739 | Harp Screw Ball Handle |
| R-20865 | Tee Bolt—Short |
| 20873 | Harp Screw Stop Collar |

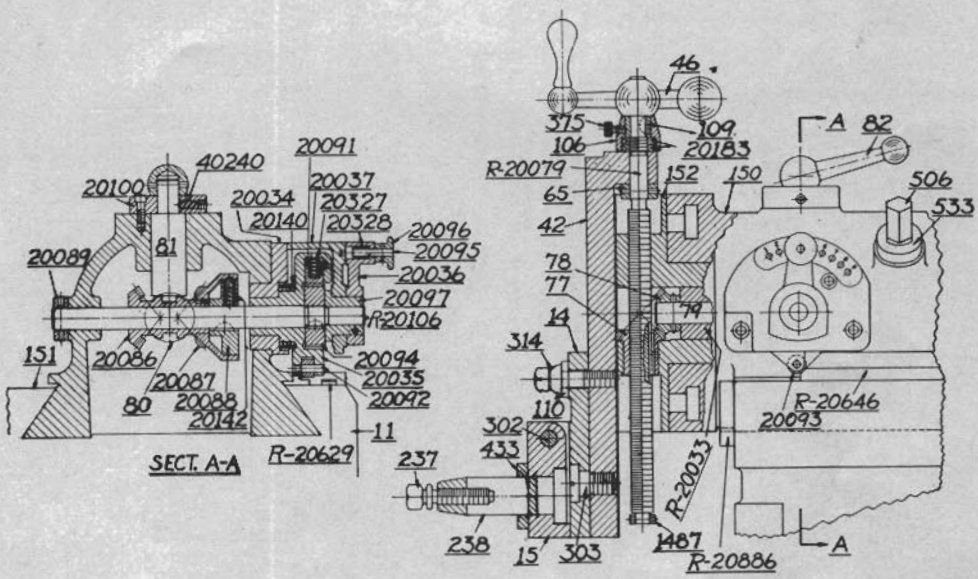


*Fig. 8*
***Steptoe Harp Slide with Power Down-Feed***

| | |
|---|---|
| 11 | Column |
| 14 | Clapper Box |
| 15 | Clapper Box Block |
| 42 | Harp Slide |
| 46 | Harp Slide Screw Handle |
| 65 | Harp Slide Screw Collar |
| 77 | Feed Mitre Gear—Vertical |
| 78 | Feed Mitre Gear—Horizontal |
| 79 | Mitre Gear Shaft |
| 80 | Feed Mitre Gear |
| 81 | Feed Control Shaft |
| 82 | Down Feed Control Handle |
| 106 | Micrometer Collar |
| 109 | Bushing—Micrometer Collar |
| 110 | Clamp Washer—Clapper Box |
| 150 | Ram |
| 151 | Ram Gib |
| 152 | Harp |
| 237 | Tool Post Screw |
| 238 | Tool Post |
| 302 | Taper Pin—Clapper Box |
| 303 | Swivel Stud—Clapper Box |
| 314 | Clamp Screw—Clapper Box |
| 375 | Screw—Graduated Collar |
| 433 | Tool Post Plate |
| 506 | Adjusting Shaft—Ram Screw |
| 533 | Collar—Adjusting Shaft |
| 1487 | Collar—Harp Screw |
| R-20033 | Harp Bushing |
| 20034 | Bracket—Down Feed |
| 20035 | Pawl Housing |
| 20036 | Index Lever |
| 20037 | Index Housing |
| R-20079 | Harp Slide Screw |
| 20086 | Bevel Gear—Clutch Shifter. Not sold separately. |
| 20087 | Bevel Gear—Safety Clutch. Not sold separately. |
| 20088 | Hub—Safety Clutch. Not sold separately. |
| 20089 | Collar—Ratchet Shaft |
| 20091 | Pawl |
| 20092 | Pin—Roller |
| 20093 | Roller |
| 20094 | Ratchet Gear |
| 20095 | Plunger—Index Lever |
| 20096 | Knob—Index Plunger |
| 20097 | Bushing—Index Lever |
| 20100 | Detent Plate—Clutch Shifter |
| R-20106 | Shaft—Ratchet Gear |
| 20140 | Spring—Pawl Housing |
| 20142 | Spring—Safety Clutch |
| 20183 | Nut—Harp Screw |
| 20327 | Spring—Feed Pawl |
| 20328 | Spring—Index Plunger |
| R-20629 | Key—Cam Bar |
| R-20646 | Cam Bar |
| R-20886 | Felt Wiper |
| 40240 | Spring—Detent Plate |

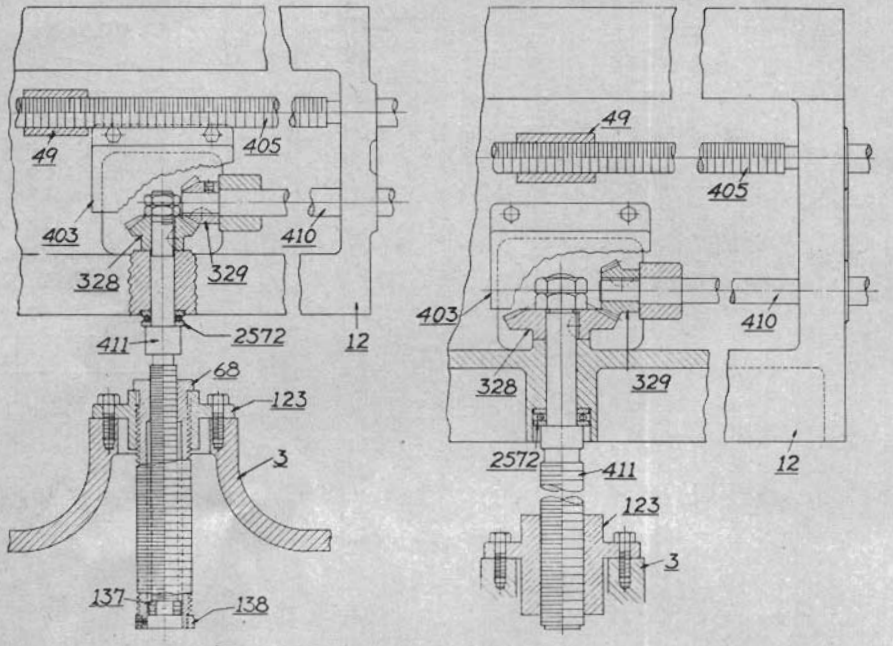


*Fig. 9*
***Steptoe Table Elevating Mechanism***

### 14″ and 16″ Shapers

| | |
|---|---|
| 3 | Base |
| 12 | Crossrail |
| 49 | Apron Nut |
| 68 | Screw—Telescopic Elevating |
| 123 | Nut—Elevating Screw |
| 137 | Collar—Elevating Screw |
| 138 | Collar—Telescopic Screw |
| 328 | Bevel Gear—Elevating |
| 329 | Bevel Pinion—Elevating |
| 403 | Guard—Bevel Gear |
| 405 | Lead Screw |
| 410 | Elevating Shaft |
| 411 | Elevating Screw |
| 2572 | Thrust Bearing—Elevating Screw |

### 20″ and 24″ Shapers

| | |
|---|---|
| 3 | Base |
| 12 | Crossrail |
| 49 | Apron Nut |
| 123 | Elevating Nut |
| 328 | Bevel Gear—Elevating |
| 329 | Bevel Pinion—Elevating |
| 403 | Guard—Bevel Gear |
| 405 | Lead Screw |
| 410 | Elevating Shaft |
| 411 | Elevating Screw |
| 2572 | Thrust Bearing |

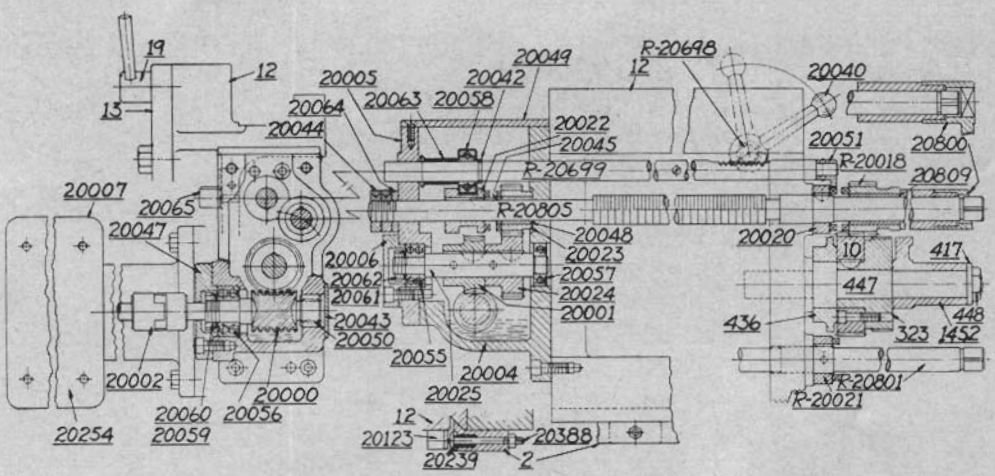


*Fig. 10*
***Steptoe Power Rapid Traverse to Table***

| | |
|---|---|
| 2 | Apron Slat |
| 10 | Feed Ratchet Gear |
| 12 | Crossrail |
| 13 | Slat—Crossrail |
| 19 | Clamp Screw—Crossrail |
| 323 | Feed Ratchet |
| 417 | Washer |
| 436 | Feed Gear Guard |
| 447 | Feed Pawl Shaft |
| 448 | Feed Pawl Shaft Nut |
| 1452 | Feed Pawl Housing (complete—parts not sold separately) |
| 20000 | Worm |
| 20001 | Wormwheel |
| 20002 | Flexible Coupling |
| 20004 | Worm Housing |
| 20005 | End Cover—Worm Housing |
| 20006 | Bearing Cap |
| 20007 | Motor Bracket |
| R-20018 | Slip Gear |
| 20020 | Clutch Collar—Lead Screw |
| R-20021 | Clutch Collar—Elevating Shaft |
| 20022 | Clutch Spool |
| 20023 | Clutch Gear |
| 20024 | Gear |
| 20025 | Worm Gear Shaft |
| 20040 | Ball Lever |
| 20042 | Retaining Ring |
| 20043 | Cover—Needle Bearing |
| 20044 | Round Nut—Lead Screw |
| 20045 | Spacer |
| 20047 | Bearing Cap—Worm Shaft |
| 20048 | Bushing—Clutch Gear |
| 20049 | Cover—Worm Housing |
| 20050 | Needle Bearing—Worm |
| 20051 | Shoe—Shifter Rod |
| 20055 | Ball Bearing—Wormwheel Shaft |
| 20056 | Ball Bearing—Worm Shaft |
| 20057 | Ball Bearing—Wormwheel Shaft |
| 20058 | Ball Bearing—Clutch Shifter |
| 20059 | Lock Washer |
| 20060 | Locknut |
| 20061 | Lock Washer |
| 20062 | Locknut |
| 20063 | Spring—Shifter Rod |
| 20064 | Thrust Washer |
| 20065 | Micro Limit Switch (Green Top) |
| 20123 | Micro Limit Switch (Red Top) |
| 20239 | Spring—Plunger |
| 20254 | Torque Motor |
| 20388 | Plunger—Limit Switch |
| R-20698 | Pinion—Shifter Rod |
| R-20699 | Shifter Rod |
| 20800 | Crank Handle |
| R-20801 | Elevating Shaft |
| R-20805 | Lead Screw |
| 20809 | Bushing—Slip Gear |

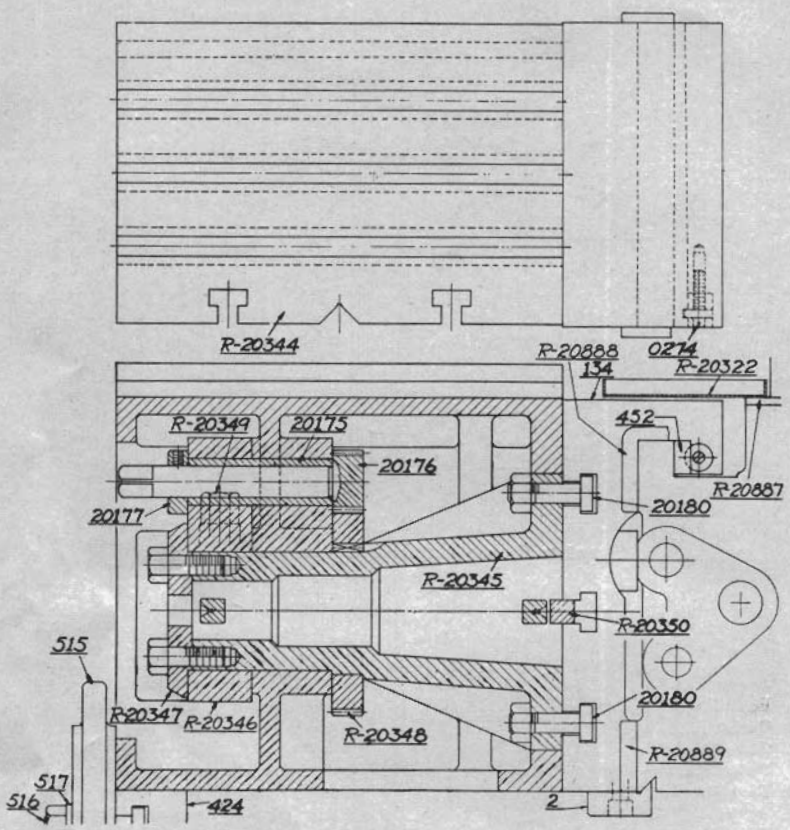


***Fig. 11***
***Steptoe Universal Table***

| | |
|---|---|
| 0274 | Adjusting Screw—Gib |
| 2 | Apron Slat |
| 134 | Apron |
| 424 | Crossbar—Table Support |
| 452 | Gib—Apron Taper |
| 515 | Table Support Bracket |
| 516 | Table Support Tee Bolt |
| 517 | Washer for Tee Bolt |
| 20175 | Sleeve—Pinion Shaft |
| 20176 | Pinion Shaft |
| 20177 | Collar—Pinion Shaft |
| 20180 | Tee Bolts |
| R-20322 | Pan—Crossrail |
| R-20344 | Universal Table |
| R-20345 | Stump—Universal Table |
| R-20346 | Clamp |
| R-20347 | Plate—Graduated Swivel |
| R-20348 | Gear—Table Stump |
| R-20349 | Clamp Bolt |
| R-20350 | Key—Stump |
| R-20887 | Felt Wiper—R & L—Cross Rail |
| R-20888 | Felt Wiper—R & L—Apron Top |
| R-20889 | Felt Wiper—R & L—Apron Bottom |

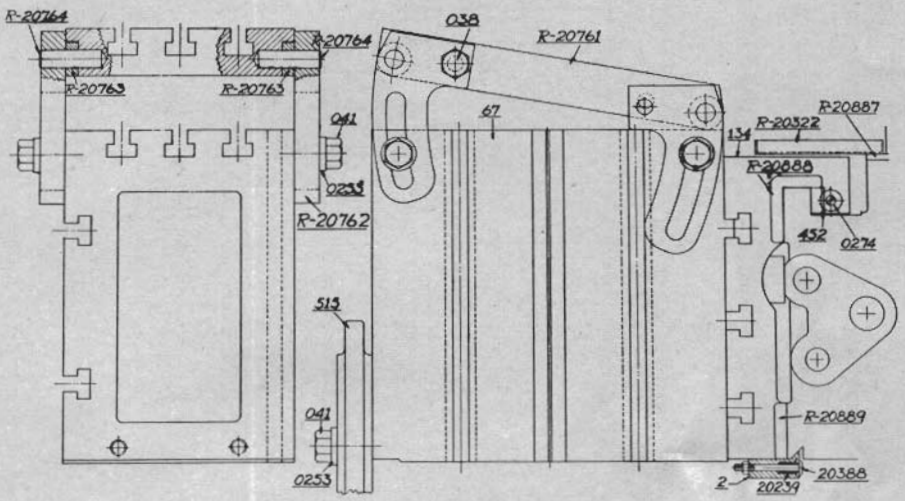


***Fig. 12***
***Tilting Table Top on Steptoe Shapers***

038 Clamping Bolts—Tilting Table
041 Clamp Bolt
0253 Washer—Clamp Bolt
0274 Adjusting Screw—Gib
2 Apron Slat
67 Table
134 Apron
452 Apron Gib—Tapered
515 Table Support Bracket
20239 Spring—Plunger (Furnished only with Rapid Traverse)

R-20322 Pan—Crossrail
20388 Plunger—Limit Switch (Furnished only with Rapid Traverse)
R-20761 Tilting Table Plate
R-20762 Arm—Tilting Table
R-20763 Rollers—Table
R-20764 Pin—Table Roller
R-20887 Felt Wiper—R & L—Cross Rail
R-20888 Felt Wiper—R & L—Apron Top
R-20889 Felt Wiper—R & L—Apron Bottom

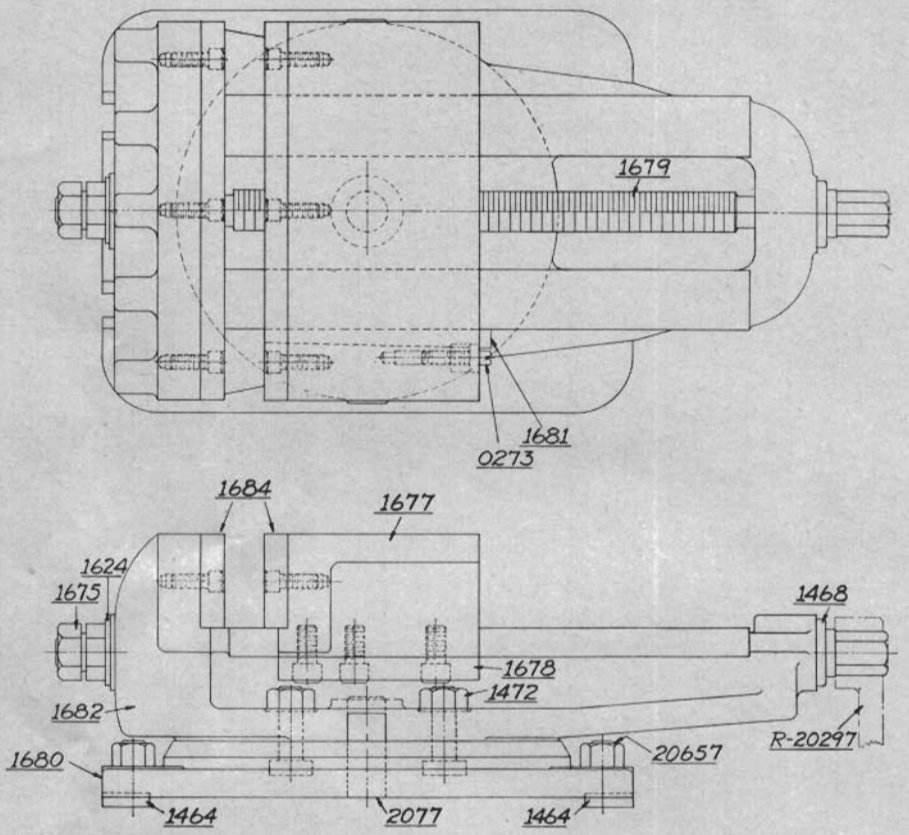


*Fig. 13*
***Steptoe Single Screw Vise***

0273 Adjusting Screw—Gib
1464 Tongue—Vise Base
1468 Washer—Vise Screw
1472 Tee Bolts
1624 Washer—Vise Screw
1675 Locknut—Vise Screw
1677 Vise Top
1678 Slat—Vise Top
1679 Screw—Vise
1680 Vise Base
1681 Gib—Vise Top
1682 Vise Body
1684 Vise Jaw
2077 Plug—Vise Swivel
R-20297 Vise Screw Wrench
20860 Wrench—For Tee Bolts
20657 Tee Bolts

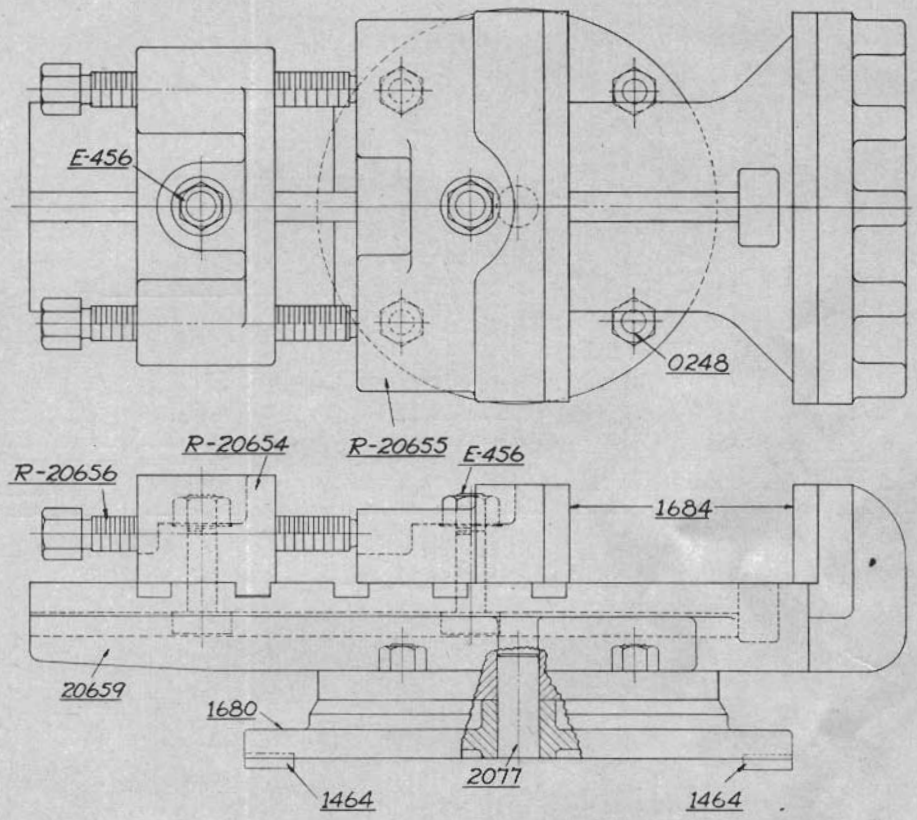


***Fig. 14***
***Steptoe Double Screw Vise***

0248 Tee Bolts
E456 Tee Bolt—Jaw Clamping
1464 Tongue—Vise Base
1680 Vise Base
1684 Vise Jaw
2077 Plug—Vise Swivel

R-20654 Screw—Jaw
R-20655 Swivel—Jaw
R-20656 Adjusting Screws
R-20659 Vise Body
20860 Wrench—For Tee Bolts

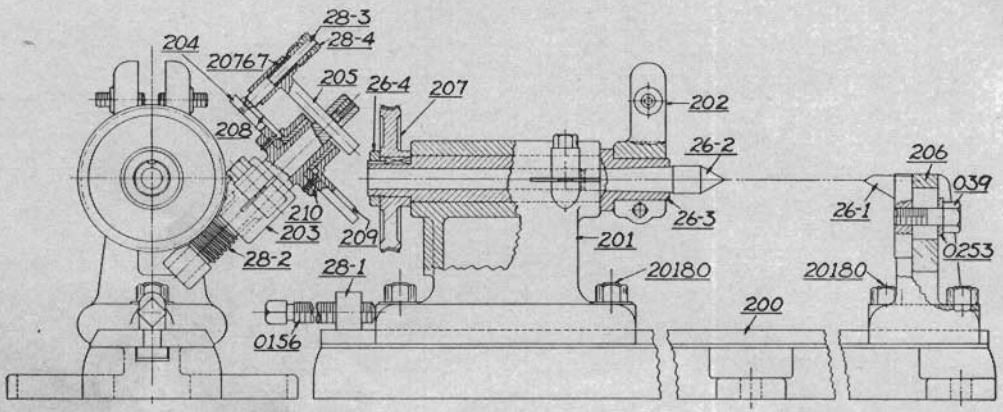


***Fig. 15***
***Steptoe 10-inch Index Center***

| | |
|---|---|
| 039 | Clamp Bolt—Tailstock Center |
| 0253 | Washer—Clamp Bolt |
| 0156 | Adjusting Screw—Headstock |
| 26-1 | Center—Tailstock |
| 26-2 | Center—Headstock |
| 26-3 | Spindle—Headstock |
| 26-4 | Nut—Spindle |
| 28-1 | Headstock Stop |
| 28-2 | Worm Shaft |
| 28-3 | Index Plunger |
| 28-4 | Knob—Index Pin |
| 200 | Base |
| 201 | Headstock |
| 202 | Face Plate |
| 203 | Worm Bracket |
| 204 | Index Dial |
| 205 | Handle—Index Plunger |
| 206 | Tailstock |
| 207 | Worm Wheel |
| 208 | Sector Blade—Inner |
| 209 | Sector Blade—Outer |
| 210 | Hub—Index Dial |
| 20180 | Tee Bolts |
| 20767 | Spring—Index Plunger |
| 20883 | Index Plate |

3 PINTS SAE 140 OIL

**Standard Index Table for STEPTOE 10 inch Index Center**

| No. of Divisions | Index Circle | No. of Turns | No. of Holes | No. of Divisions | Index Circle | No. of Turns | No. of Holes | No. of Divisions | Index Circle | No. of Holes | No. of Divisions | Index Circle | No. of Holes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Any | 40 | | 28 | 28 | 2 | 24 | 90 | 36 | 32 | 288 | 36 | 10 |
| 3 | 24 | 26 | 16 | 30 | 24 | 2 | 16 | 96 | 24 | 20 | 300 | 30 | 8 |
| 4 | Any | 20 | | 32 | 24 | 2 | 12 | 100 | 30 | 24 | 320 | 24 | 6 |
| 5 | Any | 16 | | 35 | 28 | 2 | 8 | 104 | 26 | 20 | 360 | 36 | 8 |
| 6 | 24 | 13 | 8 | 36 | 36 | 2 | 8 | 110 | 22 | 16 | 400 | 30 | 6 |
| 7 | 28 | 11 | 12 | 40 | Any | 2 | | 112 | 28 | 20 | 440 | 22 | 4 |
| 8 | Any | 10 | | 44 | 22 | 1 | 18 | 120 | 24 | 16 | 480 | 24 | 4 |
| 9 | 36 | 8 | 32 | 45 | 36 | 1 | 28 | 130 | 26 | 16 | 520 | 26 | 4 |
| 10 | Any | 8 | | 48 | 24 | 1 | 16 | 140 | 28 | 16 | 560 | 28 | 4 |
| 11 | 22 | 7 | 6 | 50 | 30 | 1 | 18 | 144 | 36 | 20 | 600 | 30 | 4 |
| 12 | 24 | 6 | 16 | 52 | 26 | 1 | 14 | 150 | 30 | 16 | 720 | 36 | 4 |
| 13 | 26 | 6 | 4 | 55 | 22 | 1 | 10 | 160 | 24 | 12 | 880 | 22 | 2 |
| 14 | 28 | 5 | 20 | 56 | 28 | 1 | 12 | 176 | 22 | 10 | 960 | 24 | 2 |
| 15 | 30 | 5 | 10 | 60 | 24 | 1 | 8 | 180 | 36 | 16 | 1040 | 26 | 2 |
| 16 | Any | 5 | | 64 | 24 | 1 | 6 | 200 | 30 | 12 | 1120 | 28 | 2 |
| 18 | 36 | 4 | 16 | 65 | 26 | 1 | 6 | 208 | 26 | 10 | 1200 | 30 | 2 |
| 20 | Any | 4 | | 70 | 28 | 1 | 4 | 220 | 22 | 8 | 1440 | 36 | 2 |
| 22 | 22 | 3 | 14 | 72 | 36 | 1 | 4 | 224 | 28 | 10 | | | |
| 24 | 24 | 3 | 8 | 75 | 30 | 1 | 2 | 240 | 24 | 8 | | | |
| 25 | 30 | 3 | 6 | 80 | Any | 1 | | 260 | 26 | 8 | | | |
| 26 | 26 | 3 | 2 | 88 | 22 | | 20 | 280 | 28 | 8 | | | |

20883

*Fig. 16*
*Standard Index Table for Steptoe 10-inch Index Centers*


*Fig. 17*
*Instruction Plate for Adjusting Twin Disc Clutch on Steptoe Gear Box*
*(See Page 12)*

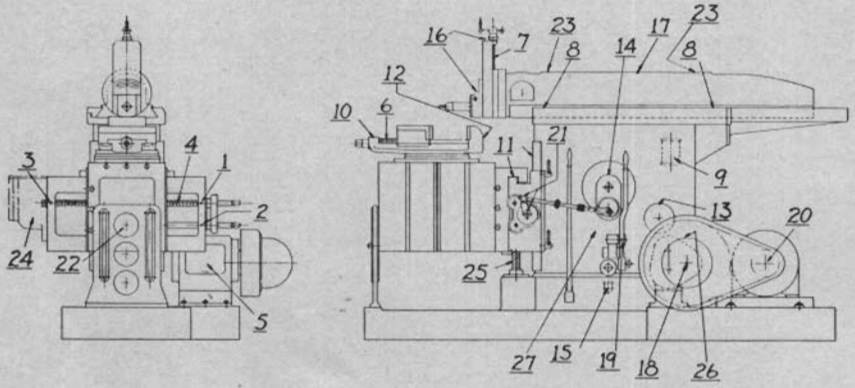


***Fig. 18***
***Lubrication Diagram of Steptoe Shapers***

## Lubrication Specifications

1. **For Pressure Grease Fittings:**
   Use a high quality sodium or mixed base anti-friction bearing grease having N.L.G.I. classification #1 or #2.
2. **For Hand Oiling and Oil Circulating Systems:** Use a high quality, straight mineral oil having a viscosity S.U.V. at 100° F. of 200-300 seconds. HAYNOMY 53
3. **For Gear Box Lubrication:** Use an aluminum stearate grease of a quite stringy adhesive nature of about #2½ consistency or a high quality sodium or mixed base grease having N.L.G.I. classification #0. (See page 4.)
   3 PINTS S.A.E. 140 OIL

# Lubrication Instructions for Steptoe Shapers

| Location | Frequency | Type Lubrication | Bearings Oiled | Type of Fitting |
|---|---|---|---|---|
| 1, 3 | Daily | Oil | Lead Screw Brg's. | Oil Hole |
| 2 | Daily | Oil | Elevating Shaft | Oil Hole |
| 4 | Weekly | Oil | Leadscrew | ..... |
| 5 | Yearly | #140 OIL ~~Grease~~ | Gear Box | Interior—Through Cover (~~4~~ 3 Pts.) |
| 6 | Weekly | Oil | Vise Screw | ..... |
| 7 | Weekly | Oil | Harp Screw | ..... |
| * 8 | Twice Daily | Oil | Ram Slide | Sight Feed Wick Oiler |
| ‡ 9 | Yearly | Oil | All Pressure Oil Lines | Oil Filter |
| 10 | Daily | Oil | Vise Screw | Oil Hole |
| 11 | Weekly | Oil | Column and Saddle Ways | Plane Surface |
| 12 | Daily | Oil | Vise Screw | Oil Hole |
| *13 | Three Months | Grease | Timken Closures | Zerk |
| *14 | Monthly | Grease | Bull Gear Bush | Zerk |
| ‡15 | Inspect Filler Cup Weekly | Oil | Pump Reservoir | Oil Filler Cup |
| 16 | Daily | Oil | Harp Screw & Clapper Block | Oil Hole |
| *17 | Four Times Daily | Oil | Rocker Arm Fork | 4 Pipe Header (Thru Ram Slot) |
| 18 | Three Months | Grease | Timken Closures on Box and Sheave | Zerk |
| 19 | Weekly | Oil | Back Gear Handle | Oil Hole |
| 20 | Manufacturers' Recommendation | | Motor Bearings | ..... |
| 21 | Daily | Oil | Feed Ratchet | Oil Hole |
| 22 | Weekly | Oil | Elevating Shaft | Oil Hole |
| 23 | Daily | Oil | Ram Screw | Oil Hole |
| 24 | Inspect Level Yearly | Grease | Rapid Traverse Gearbox | Interior—Thru Cover |
| 25 | Weekly | Oil | Elevating Screw | ..... |
| 26 | Twice Daily | Oil | Gear Shift Handles | Wick Feed Snap Oiler |
| *27 | Twice Daily | Oil | Rocker Arm Block and Shaft | Felted Oil Well and Oil Cup in Column |

* Plain Lubrication Machines Only.
‡ Forced Feed Lubrication Machines Only.

| Steptoe Shapers<br>Number of Strokes per Minute | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Size | Input Speed RPM | Gear Box Levers | | ↘ | ↙ | ↘ | ↙ | Type of Shaper |
| 14" | 450 | Back Gear | in | — | — | — | — | Single Gear |
| | | | out | 30 | 45 | 64 | 97 | |
| 16" & 20" | 450 | Back Gear | in | — | — | — | — | Plain Lubrication |
| | | | out | 33 | 46 | 69 | 98 | |
| 14" | 600 | Back Gear | in | — | — | — | — | Single Gear |
| | | | out | 41 | 59 | 86 | 130 | |
| 16" & 20" | 600 | Back Gear | in | — | — | — | — | Forced Feed Lubrication |
| | | | out | 44 | 62 | 92 | 131 | |
| 14" | 480 | Back Gear | in | 14 | 19 | 27 | 41 | Back Gear Plain Lubrication |
| | | | out | 33 | 48 | 70 | 100 | |
| 16" | 450 | Back Gear | in | 12 | 18 | 27 | 40 | |
| | | | out | 33 | 46 | 69 | 98 | |
| 20" | 450 | Back Gear | in | 9 | 12 | 18 | 27 | |
| | | | out | 33 | 46 | 69 | 98 | |
| 24" | 450 | Back Gear | in | 8 | 12 | 18 | 26 | |
| | | | out | 33 | 45 | 68 | 97 | |
| 14" | 632 | Back Gear | in | 18 | 25 | 37 | 53 | Back Gear Forced Feed Lubrication |
| | | | out | 43 | 62 | 91 | 130 | |
| 16" | 600 | Back Gear | in | 17 | 25 | 37 | 53 | |
| | | | out | 44 | 62 | 92 | 131 | |
| 20" | 600 | Back Gear | in | 12 | 17 | 25 | 36 | |
| | | | out | 43 | 62 | 91 | 131 | |
| 24" | 600 | Back Gear | in | 11 | 16 | 23 | 34 | |
| | | | out | 43 | 61 | 90 | 130 | |

*Fig. 19*

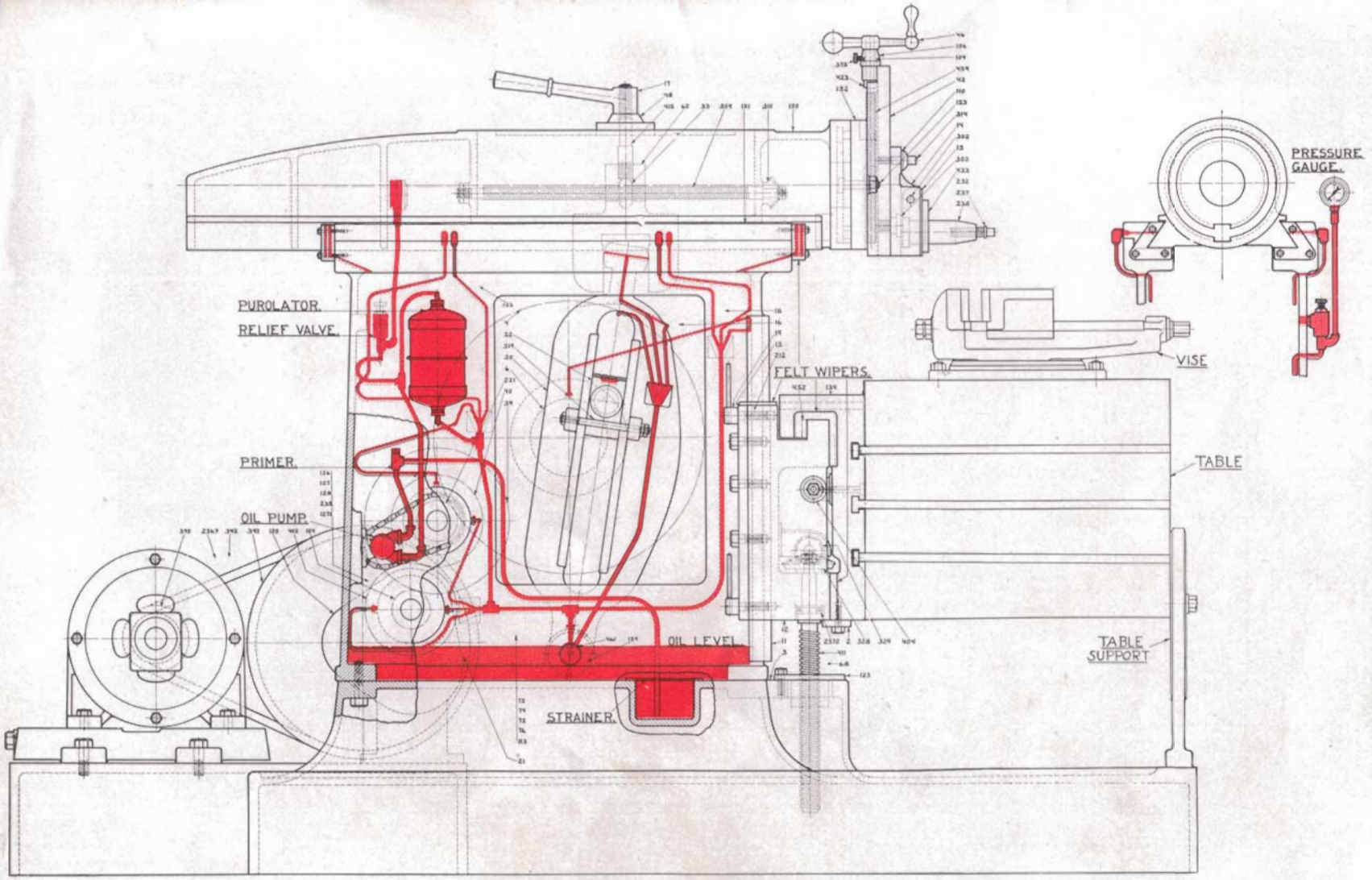


*Fig. 20—Forced Feed Continuous Lubricating System for Steptoe Shapers*