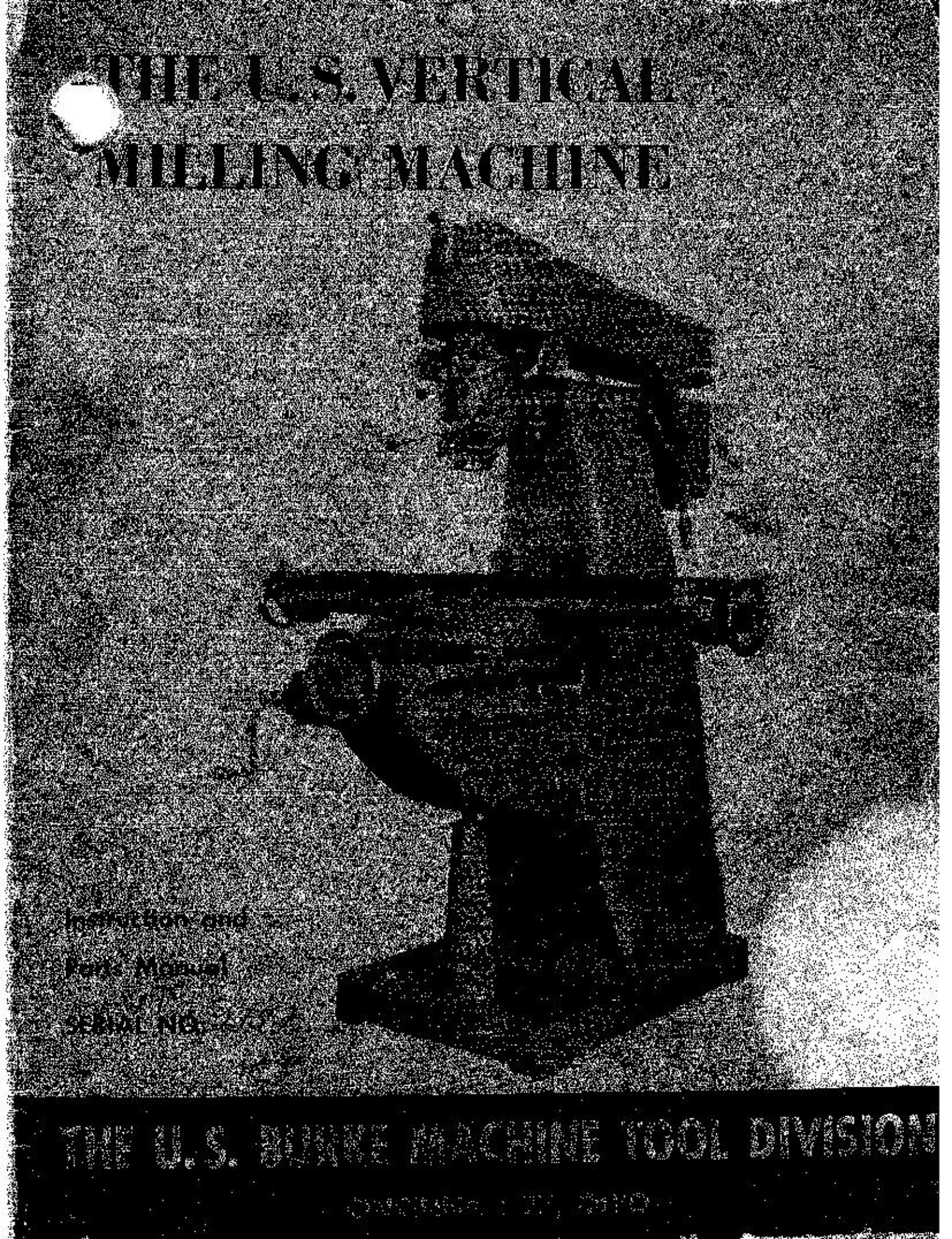
THE U.S. VERTICAL MILLING MACHINE



Instruction and
Parts Manual

SERIAL NO. [illegible]

THE U.S. BURKE MACHINE TOOL DIVISION

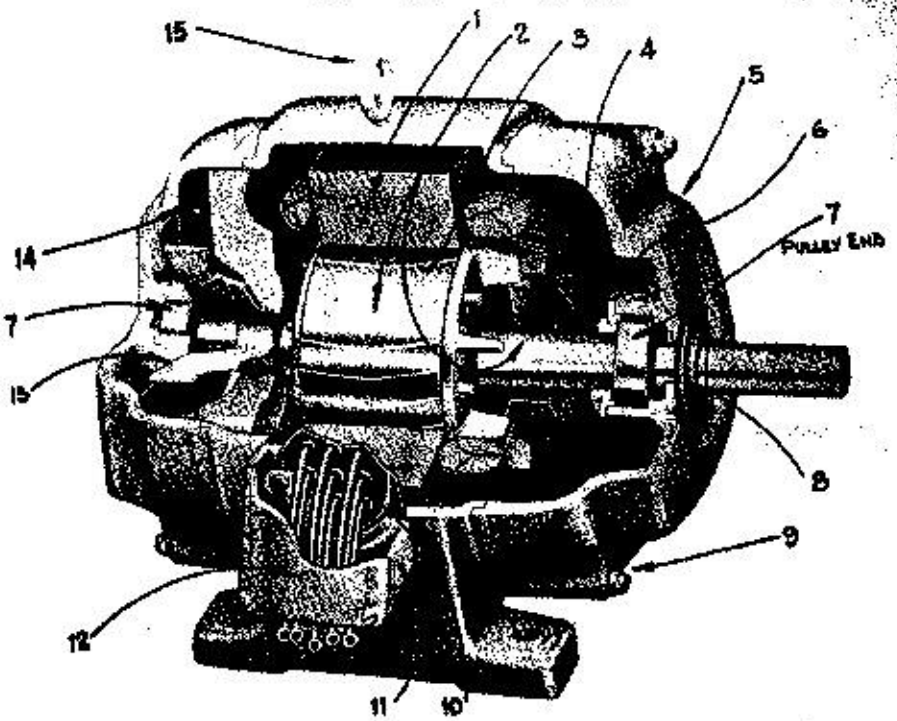
[illegible]

Sterling

REPLACEMENT PARTS LIST PRICES

AC SQUIRREL CAGE MOTORS

DRIP PROOF ("A" DESIGN)



ITEM NO	PART NAME	FRAME SIZE										
		182	184	213	215	254U	256U	284U	286U	324U	326U	364U
1	Wound Stator w/ Frame	$ 59	$ 75	$ * 89	$ 106	$ 149	$ 186	$ 224	$ 275	$ 314	$ 400	$ 495
2	Rotor Assembly	49	55	59	69	87	99	119	131	148	163	255
3	⊕Finished Rotor Core	39	43	46	56	62	74	91	103	106	114	147
4	Shaft-Standard	18	18	18	20	29	31	39	43	54	65	73
	Close Coupled Pump	25	25	25	27	45	47	60	64	128	139	
5	Bracket	21	21	25	25	43	43	46	46	58	58	76
	Not 'C' Face	42	42	51	51	80	80	88	88	106	106	117
	Shown 'D' Flange	42	42	51	51	80	80	88	88	106	106	117
6	Bearing Cap	---	---	---	---	2.50	2.50	3.00	3.00	6.00	6.00	9.00
7	Bearings ; Motor End	6.00	6.00	12.00	12.00	15.00	15.00	23.00	23.00	30.00	30.00	35.00
	Pulley End	6.00	6.00	12.00	12.00	15.00	15.00	23.00	23.00	30.00	30.00	35.00
8	Seal, Labyrinth	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9	Thru Bolts/Caps	.65	.65	.65	.65	.85	.85	.85	.85	1.00	1.00	3.00
10	Seal, Lead Wire	---	---	---	---	1.00	1.00	1.00	1.00	1.00	1.00	1.00
11	Terminal Box	4.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	7.50	7.50	5.00
12	Terminal Box Cover	3.00	3.00	3.00	3.00	4.00	4.00	4.00	4.00	5.50	5.50	9.00
13	Fan	7	7	10	10	14	14	15	15	23	23	25.00
14	Deflector	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
15	Lifting Lug	---	---	---	---	2.00	2.00	2.00	2.00	2.00	2.00	3.00

BEARING NUMBERS/FRAME SIZE

FRAME SIZE		⊕182	⊕184	213	215	254U	256U	284U	286U	324U	326U	364U
(Bearing Size Double Shield)	Motor End	205	205	306	306	308	308	310	310	311	311	312
	Pulley End	205	205	306	306	308	308	310	310	311	311	312
Gyropoise Motors	Motor End	205	205	306	306	308	308					
	Pulley End	207	207	307	307	308	308					

Bearing Number/Frame Size

⊕ Face and flange mount brackets will utilize No. 305 Bearing. No 305 Bearing price - $10.00

▲ High torque, high slip, high resistance rotor - add difference between high torque or high slip mo (Section 121), and normal torque motor price (Section 121), based on same horsepower rating, speed frame size.

Minimum billing $5.00 net.

IMPORTANT: When ordering, the following information must be submitted to the factory: Serial No., Frame size, Horsepower, Speed and Type.

SEPT. 10, 1964. SUPERSEDES ALL PRIOR PAGES.

OPERATION OF U.S. VERTICAL MILLING MACHINE

The U. S. Vertical Miller is an accurate, precision built machine tool. Attached to the skid is a check sheet which lists the tolerances allowed and an actual check of your particular machine.

Following are some suggestions which may prove of value. If normal maintenance care is exercised, the machine will provide accurate, dependable service for many years.

UNCRATING—Be sure that all items listed on the packing slip are contained in the crate. Report any shortages immediately. In the event of damage, please make a notation on the bill of lading, have the delivering trucker sign to this effect, and notify us.

INSTALLING—In order to avoid damage while moving the machine to its permanent position, it is suggested that you use a rope sling. The easiest way to balance the machine is to attach the rope both in front of and behind the column under the overarm.

Once the machine is moved to its proper location it should be leveled and securely bolted to the floor. This will eliminate tool chatter and undue strain on the component assemblies.

Before connecting the motor, read and verify the current characteristics contained on the motor plate. Be sure that the motor is wired correctly, so that when the drum type switch is turned to the "forward" position the spindle rotates in the proper direction.

The heavy shipping sludge used to protect the machine while in transit must be carefully removed with kerosene or other solvent. Thereafter lubricate all bearing surfaces, shafts, and screws with a good grade of medium viscosity machine oil.

GENERAL INSTRUCTIONS — Body of the Machine

GIB ADJUSTMENT—Adjustable gibs are located between the column and the knee, the knee and the saddle, and the saddle and the table. To adjust the saddle or knee gib, loosen the two jack screws with an allen wrench, and turn the indicated gib adjusting screws until the "drag" is slightly greater than desired. Then tighten the jack screws. This will compress the gib screw washers, holding the gib screws in position, and causing the movement of the assembly to be smooth.

To adjust the table gib, merely tighten or loosen the adjusting screws to provide the desired "drag". The tension on each gib screw should be approximately the same.

GIB LOCKS—A gib lock handle is located in front of the table, on the side of the saddle, and in the gib area between the knee and column.

When boring with the head feed all three gibs should be locked. When moving the table horizontally only the table gib handle should be loosened, etc. Best milling results are always obtained with the moving components not needed for the particular operation locked in position.

ADJUSTMENT OF SCREWS—The longitudinal, cross, and vertical feed screws are each equipped with thrust bearings and adjusting nuts.

To alter the "drag" on one of the screws, loosen the set screw in the adjusting nut. By turning the nut in a clockwise direction the "drag" will be increased. When the proper tension is felt, tighten the set screw to lock the adjusting nut in the desired position.

LUBRICATION—There is one oil cup and a number of alemite fittings located in conspicuous places around the machine base. The oil cup and each fitting should be lubricated every day with heavy machine oil, similar to Sunoco's "Way Lube."

The easiest way to apply the oil is by means of a small grease gun. CAUTION: Grease is not recommended as a lubricant because of its tendency to "cake" and adhere to the bearing surfaces.

The shear wipers located in front of and behind the saddle contain felt liners. The top of the knee should be regularly lubricated with a good grade of light machine oil, and the felt liners should be replaced after ea year of operation.

TABLE POWER FEED—If your machine is equipped with power table feed, be sure to keep the transmission lubricated with the special oil provided. The oil level gauge should be checked at least twice daily.

GENERAL INSTRUCTIONS -- Head (Hand Feed)

The head is equipped with both a coarse and a fine hand feed. To use the coarse feed, loosen the clutch handle located on the right side (facing the machine).

To use the fine feed handwheel engage the clutch by turning the indicated knob in a clockwise direction. The clutch may be engaged or disengaged at any time.

When milling with the quill in a fixed position, be sure to tighten the quill lock. This will reduce vibration, and keep the quill from moving.

If it is desired to lock the spindle while changing collets, insert a piece of ⅜" drill rod in the hole provided in the 6 step drive pulley above the head.

Please read carefully the directions for using the draw-in-bar. By using two wrenches on the draw-in-bar nuts it is not necessary to lock the spindle for this purpose.

When moving the head toward or away from the column, or re-setting to the vertical position, do not rely on the graduated collar to provide "dead" accurate alignment. Sweep the table with an indicator mounted in the spindle nose to assure accurate vertical setting .

LUBRICATION—The bearings in the head are pre-lubricated and sealed. No additional lubricant need be added. The quill, however, should be regularly lubricated with machine oil.

The alemite fittings on the head should be regularly lubricated with heavy oil similar to Sunoco's Way Lube in the same manner as the body of the machine. All exposed bearing surfaces should be lubricated each day with light machine oil.

GENERAL INSTRUCTIONS -- Head (Powerfeed)

1. (a) The powerfeed takeoff operates by means by a timing belt from the spindle to speed reducer located on the left side of the head (facing the machine from the front).

(b) The powerfeed is engaged by raising the indicated lever until it locks. This turns a pinion gear inside the speed reducer which is meshed to a short steel rack. When the rack is actuated, it moves the speed reducer unit toward the rear of its housing. This movement engages a positive clutch, connected to the V-belt pulley located behind the housing. The speed reducer contains a worm and wormwheel to reduce the input speed 20:1.

(c) An automatic feed kickout is provided. This is the steel bar with adjustable dog connected to the engaging lever assembly. The dog can be quickly reset for varying depth cuts. The powerfeed may be manually disengaged at any time.

(d) The down-thrust exerted on the quill, when the powerfeed is engaged, is approximately 800 lbs. This provides ample power for any boring operation within the capacity of the machine.

2. (a) To vary the feed rate turn the indicated handwheel protruding from the right side of the head. The feed rate may be changed *only* while the V-belts are turning. The rocker arm supporting the variable pitch V pulleys is spring loaded, and automatically provides proper tension on the V-belts at all times.

(b) A clutch is provided to engage the fine feed handwheel and/or the power feed. The clutch handle is located on the right side of the head. By releasing this clutch, and engaging the powerfeed, the V-belts will turn without lowering the quill.

(c) The feed rate handwheel permits infinitely varying the feed rate from .002" to .008" per revolution. Turning this wheel in a clockwise direction increases the feed rate. THE WHEEL MUST BE TURNED SLOWLY TO PERMIT THE BELTS TO SEAT THEMSELVES.

(d) Please note that the timing belt turns continually while the drive motor is in operation. The two powerfeed V-pulleys, however, turn only when the powerfeed is engaged.

3. (a) A 20:1 worm and wormwheel reduction mechanism is engaged by the clutch described in 2-b above. The natural position of the fine feed handwheel, located in front of the head on the right side, is in (toward the head). When powerfeed is to be used, this handwheel must be in the "in" position.

(b) When fine handfeed is desired, turn the indicated handle counter clockwise to push the fine feed handwheel out (away) from the head. This permits using the fine handfeed without "dragging" the powerfeed mechanism. To engage the powerfeed, turn this handle clockwise. A positive clutch is mounted on the rear of the shaft, and it may be necessary to turn the fine feed handwheel slightly to permit the clutch teeth to mesh properly.

4. The coarse handfeed lever is located on the left side of the head. As it is secured by a "slip" fit, it may be reset or removed as desired. The coarse feed may be used only when the clutch (2-b) is disengaged.

5. An internal quill lock handle is located on the right front of the head. Its location can be set to the individual operator's preference by loosening the screw that secures it to the lock shaft.

6. If, in changing collets, it is considered desirable to lock the spindle, merely insert a piece of ⅜" drill rod in the hole provided in the six step drive pulley above the head. Please read carefully the directions for using the collet draw bar. By using two wrenches on the draw bar nuts, collets may be quickly changed without locking the spindle.

LUBRICATION

The spindle bearings are pre-lubricated and sealed, and will require no additional lubricant.

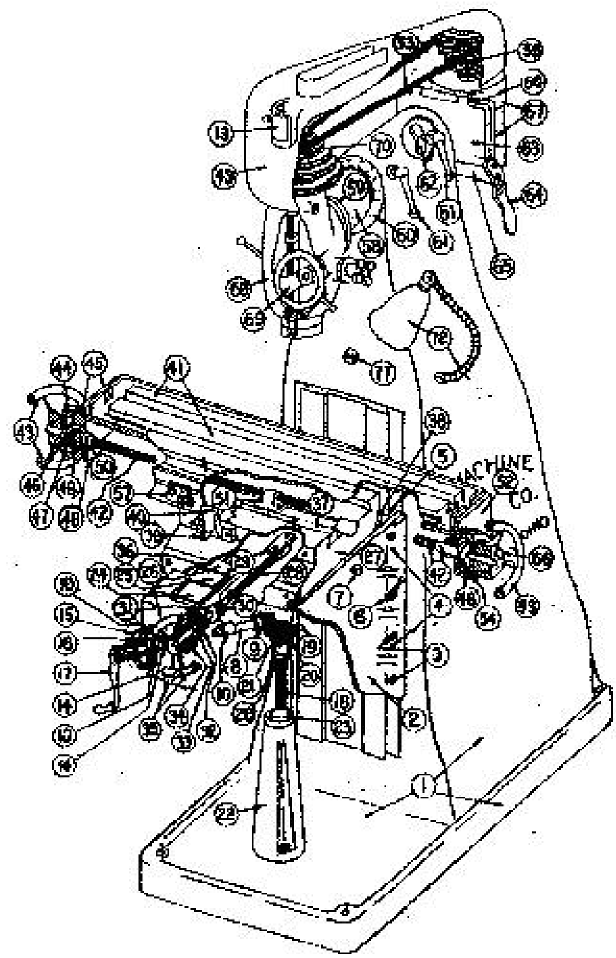
The grease fittings and oil cups on the head and body of the machine are in plain view. They should be regularly lubricated with heavy machine oil similar to Sunoco's Way Lube. The easiest way to apply the oil is with a small, conventional grease gun.

The quill, power feed engaging mechanism and other exposed moving parts should be lubricated regularly with any good grade of machine oil.

Additional bearing grease should be added to the speed reducer unit every 30 days of operation.

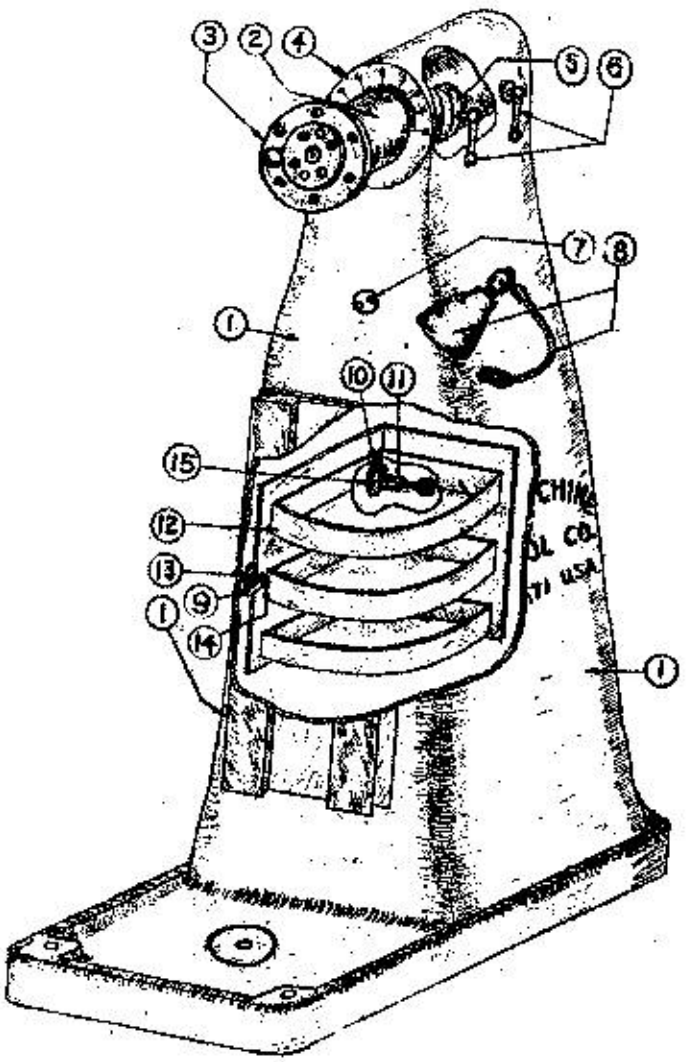
When ordering repair parts, be sure to include the serial number of your machine on the purchase order.

U. S. VERTICAL MILLING MACHINE ASSEMBLY



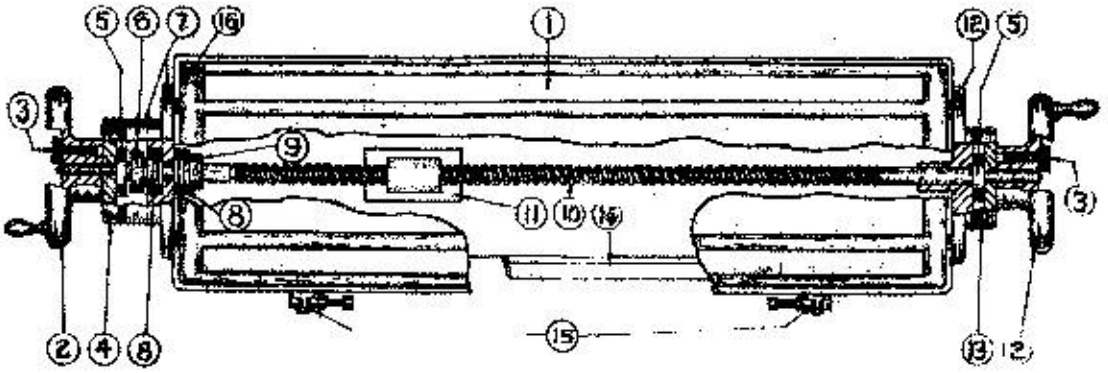
Location	NAME OF PART	No. Req.	Part No.	Location	NAME OF PART	No. Req.	Part No.
1	Column	1	U-100	37	Table Gib	1	U-176
2	Knee	1	U-120	38	Shear Wiper (Rear)	1	U-172
3	Gib Screws	3	M-533	39	Clamp Screw (Table Gib)	1	U-186
4	Gib Jack-Screws	2	U-176-A	40	Table Stop	1	U-185-P
5	Knee Gib	1	U-121	41	Table	1	U-175
6	Clamp Screw (Knee Gib)	1	U-146	42	Table Feed Screw	1	U-179
7	Oiler	1	U-221	43	Handwheel	2	U-184
8	Elevating Shaft	1	U-127	44	Table Dial (0-.200" Left)	1	U-187
9	Elevating Pinion Gear	1	U-123	45	Table Bracket (Left)	1	U-177
10	Oilite Bushing	2	U-145	46	Handwheel Nut	2	U-6
11	Plug (Coolant Pump Hose Opening)	1	U-95	47	Bearing Adj. Nut	1	U-181
12	Light Assy. (Opt.)	1	U-94-A	48	Thrust Bearing	2	U-180
13	Rev. Switch	1	U-501	49	Guard	1	U-111
14	Collar	2	U-126-C	50	Collar	1	U-126-C
15	Dial (Grad. 0-.100")	1	U-138	51	Table Feed Nut	1	U-156-P
16	Dial Friction Nut	1	U-138-N	52	Table Bracket (Right)	1	U-178
17	Crank Handle	1	U-124	53	V-Belt	1	U-40
18	Elevating Screw	1	U-125	54	Table Dial (0-.200" Right)	1	U-187
19	Bevel Gear	1	U-122	55	Pulley (6 Step)	1	U-3
20	Thrust Bearing	2	U-220	56	Dial Lock Screw	3	U-137-S
21	Oilite Bushing	1	U-143	57	Table Stop Nut	2	M-116-A
22	Elev. Screw Bracket	1	U-128	58	Overarm If Lima Drive U-102-A	1	U-102
23	Elev. Screw-Nut	1	U-129	59	Overarm Flange	1	U-103
24	Gear Cover (Bottom)	1	U-140	60	Overarm Collar 0-90° Right 0-90° Left	1	U-109
25	Gear Cover (Middle)	1	U-141	61	Overarm Handle Clamp	2	U-114-A
26	Gear Cover (Top)	1	U-142	62	Overarm Clamp	2	U-108
27	Saddle	1	U-150-P	63	Motor Bracket	1	U-104
28	Cross Feed Screw	1	U-126	64	Plate Lever	1	U-106
29	Cross Feed Nut	1	U-130	65	Motor Plate	1	U-107
30	Collar	1	U-222	66	Bracket Pin	1	U-105
31	Thrust Bearing	2	U-224	67	Motor (Spec. Type)	1	U-500
32	Cross-Feed Adj. Nut	1	U-136	68	Head	1	U-1
33	Adjusting Nut	1	U-6	69	Handwheel	1	U-18
34	Dial (Grad. 0-.200")	1	U-137	70	Spindle Pulley	1	U-2
35	Handwheel (8")	1	U-184-8				
36	Shear Wiper (Front)	1	U-171				

COLUMN ASSEMBLY



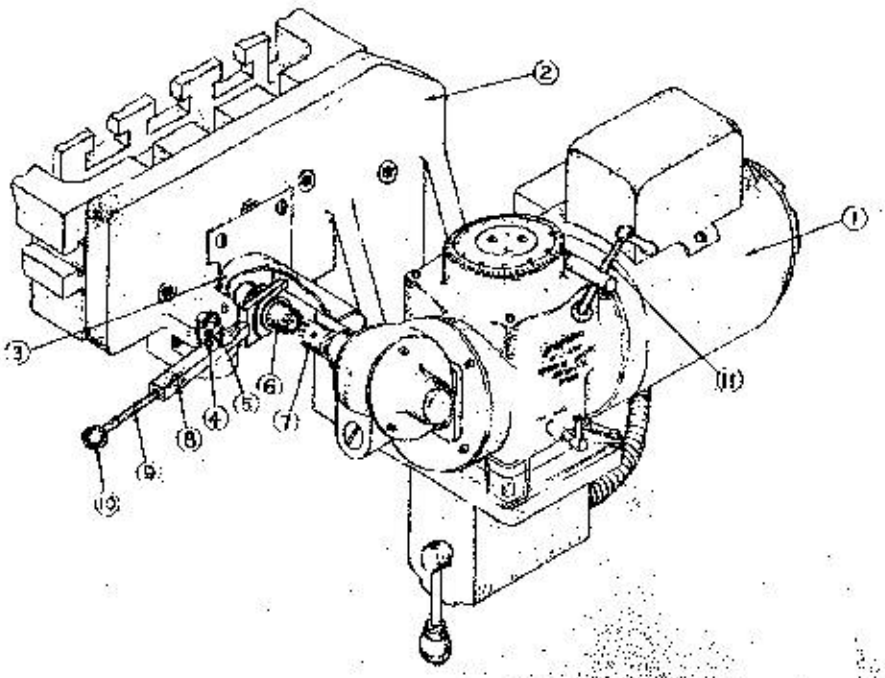
Location	NAME OF PART	No. Req.	Part No.
1	Column	1	U-100
2	Overarm If Lima Drive U-102-A	1	U-102
3	Overarm Flange	1	U-103
4	Overarm Collar (Grad. 0-90°)	1	U-109
5	Overarm Clamp	2	U-108
6	Overarm Clamp Handle	2	U-114-A
7	Plug (Coolant Pump Hose Opening)	1	U-95
8	Light Assy. (Opt.)	1	U-94-A
9	Door Latch	1	U-118
10	Bracket Pin	2	U-97-P
11	Door - Bottom Bracket	2	U-98
12	Swing-Out Door	1	U-101
13	Door Latch Knob	1	U-117
14	Door Latch Shaft	1	U-119
15	Door - Top Bracket	2	U-97

TABLE ASSEMBLY



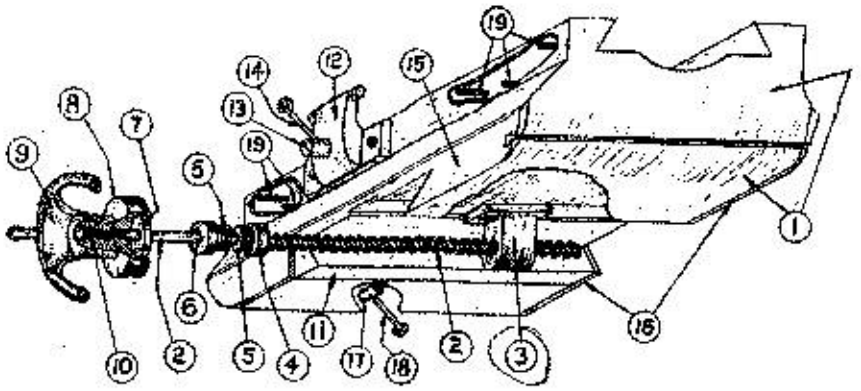
Location	NAME OF PART	No. Req.	Part No.	Location	NAME OF PART	No. Req.	Part No.
1	Table	1	U-175	9	Collar	1	U-126-C
2	Handwheel	2	U-184	10	Table Feed Screw	1	U-179
3	Dial Lock Screw	2	U-137-S	11	Table Feed Nut	1	U-156-P
4	Table Dial (0.200" Left)	1	U-187	12	Table Bracket (Right)	1	U-178
5	Handwheel Nut	2	U-6	13	Table Dial (0.200" Right)	1	U-187
6	Bearing Adj. Nut	1	U-181	14	Table Gib	1	U-176
7	Table Bracket (Left)	1	U-177	15	Table Stop	2	M-116-A
8	Thrust Bearing	2	U-180	16	Screen	1	U-188

POWER FEED ASSEMBLY



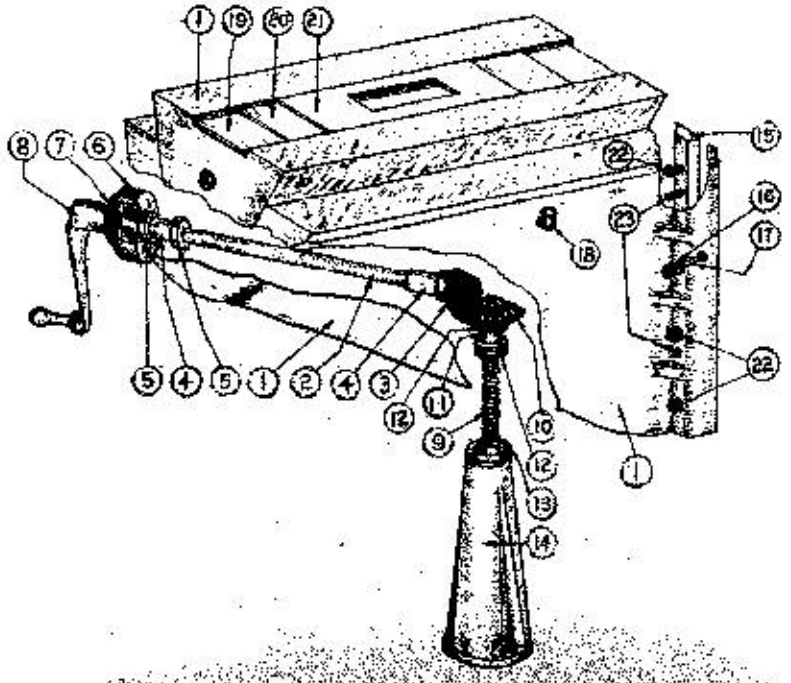
Location	NAME OF PART	No. Req.	Part No.	Location	NAME OF PART	No. Req.	Part No.
1	Transmission	1	U-700	6	½" Rear Half Coupling	1	U-701-RA
2	Bracket (Mounting)	1	U-702	7	½" Half Coupling	1	U-701
3	Guard (Coupling)	1	U-707	8	Lever (Throw-Out)	1	U-703
4	¼" Steel Ball (Lever Throw-Out)	1	U-705	9	Bracket	1	U-35
5	Spring (Lever Throw-Out)	1	U-707	10	[illegible]	1	U-37

SADDLE ASSEMBLY



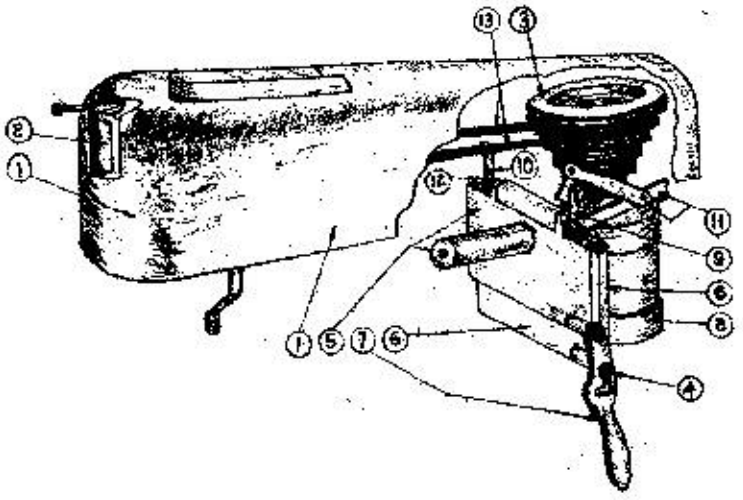
Location	NAME OF PART	No. Req.	Part No.
1	Saddle	1	U-150-P
2	Cross Feed Screw	1	U-126
3	Cross Feed Nut	1	U-130
4	Collar	1	U-222
5	Thrust Bearing	2	U-224
6	Cross-Feed Adj. Nut	1	U-136
7	Adjusting Nut	1	U-6
8	Dial (0.200" Grad.)	1	U-137
9	Handwheel (8")	1	U-184-S
10	Dial Lock Screw	1	U-137-S
11	Saddle Gib	1	U-151-P
12	Table Stop	1	U-135-P
13	Clamp Screw (Table Gib)	1	U-186
14	Lever	1	U-35
15	Shear Wiper (Front)	1	U-171
16	Shear Wiper (Rear)	1	U-172
17	Clamp Screw (Saddle Gib)	1	U-170
18	Lever	1	U-35
19	Gib Jack-Screws	6	U-176-A

KNEE ASSEMBLY



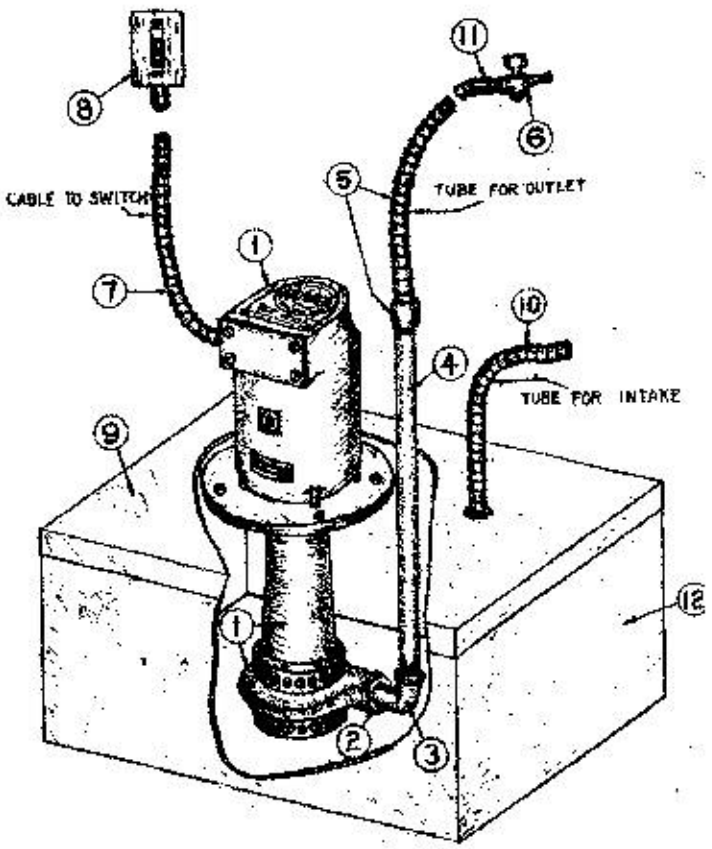
Location	NAME OF PART	No. Req.	Part No.
1	Knee	1	U-120
2	Elevating Shaft	1	U-127
3	Elevating Pinion	1	U-123
4	Oilite Bushing	2	U-145
5	Collar	2	U-126-C
6	Dial (Grad. 0.100")	1	U-138
7	Dial Friction Nut	1	U-138-N
8	Crank Handle	1	U-124
9	Elevating Screw	1	U-125
10	Bevel Gear	1	U-122
11	Oilite Bushing	1	U-143
12	Thrust Bearing	2	U-220
13	Ele. Screw Nut	1	U-129
14	Ele. Screw Bracket	1	U-128
15	Knee Gib	1	U-121
16	Clamp Screw (Knee Gib)	1	U-146
17	Clamp Screw Lever	1	U-35
18	Oiler	1	U-221
19	Gear Cover (Bottom)	1	U-140
20	Gear Cover (Middle)	1	U-141
21	Gear Cover (Top)	1	U-142
22	Gib Screws	3	M-533
23	Gib Jack-Screws	2	U-176-A

GUARD AND MOTOR MOUNT ASSEMBLY



Location	NAME OF PART	No. Req.	Part No.
1	Guard	1	U-111
2	Rev. Switch	1	U-501
3	Pulley (6 Step)	1	U-3
4	Stud	1	U-106-A
5	Motor Bracket	1	U-104
6	Motor Plate	1	U-107
7	Plate Lever	1	U-106
8	Motor (Specify Type)	1	U-500
9	Guard Support	1	U-113-R
10	Guard Support	1	U-113-L
11	Guard Hinge	1	U-112
12	Bracket Pin	1	U-105
13	V-Belt	1	U-40

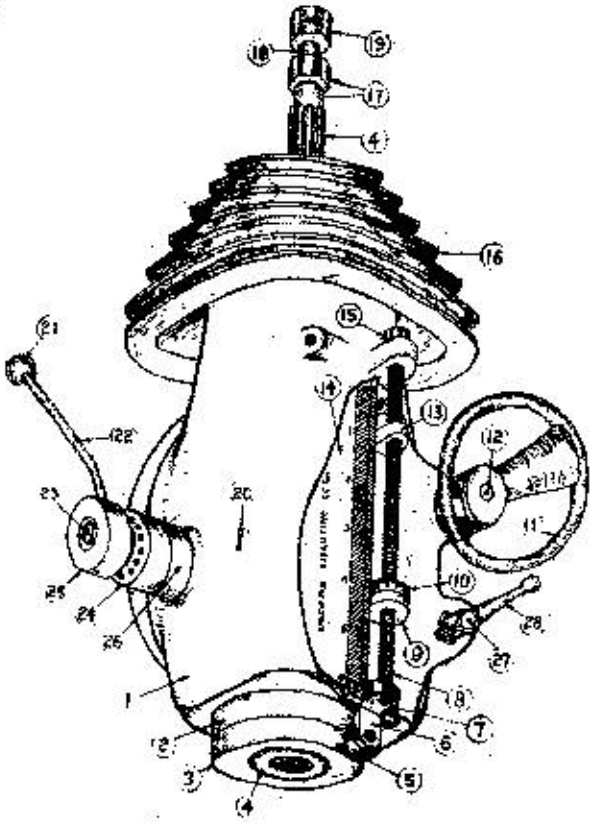
COOLANT PUMP ASSEMBLY



Location	NAME OF PART	No. Req.	Part No.
1	Gusher Pump (1 or 3 Phase)	1	M-260
2	Reducing Bushing	1	M-257-A
3	Street Elbow 90°	1	M-258
4	Nipple (⅜" x 11")	1	M-259
5	Flex-Tubing (Feed)	1	M-255
6	⅛" Feed Cock	1	M-519
7	Flex-Conduit (¾" x 5')	1	M-267
8	Pump Switch (A.B. Bul.-600)	1	M-263
9	Tank Lid	1	U-96-C
10	Flex-Tubing (Return)	1	M-256
11	Reducer (⅜" x ⅛")	1	M-257
12	Tank	1	U-96

STANDARD HEAD ASSEMBLY

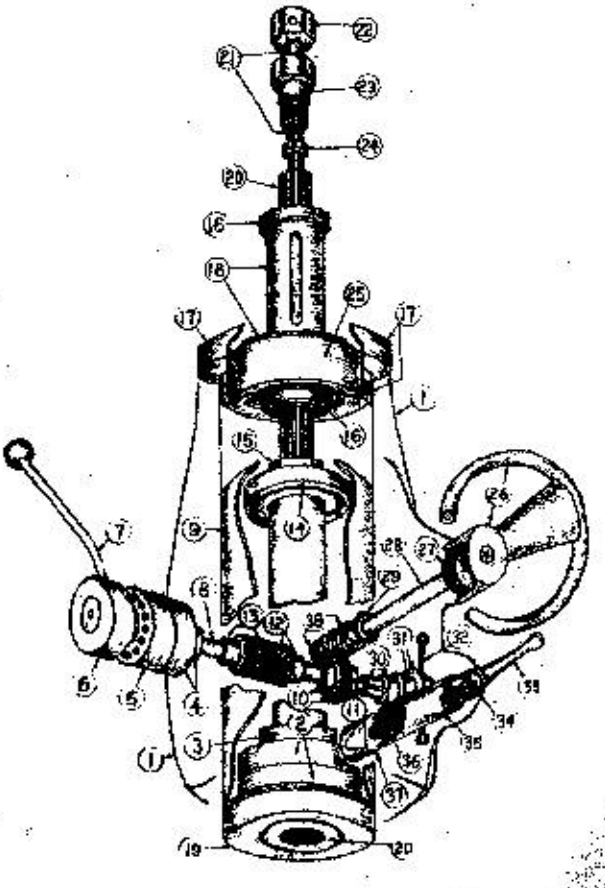
(Exterior Parts)



Location	NAME OF PART	No. Req.	Part No.
1	Head	1	U-1
2	Quill	1	U-7
3	Quill Nose (Bearing Retainer)	1	U-16
4	Spindle	1	U-4
5	Spacer-Collar	1	D-127-A
6	Stop Bar	1	D-127
7	Bracket	1	D-106
8	Quill Stop Screw	1	U-22
9	Nut (Stop)	1	U-30
10	Nut (Graduated .0-.050")	1	U-26
11	Hand Wheel (Fine Feed)	1	U-18
12	Shaft (Worm)	1	U-24
13	Stop (Quill)	1	U-25
14	Scale Plate (Graduated)	1	U-33
15	⅜" Jam Nut	1	M-583
16	Pulley (Spindle)	1	U-2
17	Spindle Pressure Nut	1	U-46
18	Draw-In Bar	1	U-28
19	Nut (Draw-In-Bar)	1	U-47
20	Screw (¼" x ½" Flat Head)	1	M-992
21	Knob (Plastic)	1	U-37
22	Handle	1	D-147
23	Shaft (Quick Return)	1	U-23
24	Plate	1	D-145
25	Ring	1	D-146
26	Spring-Housing	1	U-44-A
27	Screw	1	D-64
28	Clamp Screw Handle	1	M-151-A

STANDARD HEAD ASSEMBLY

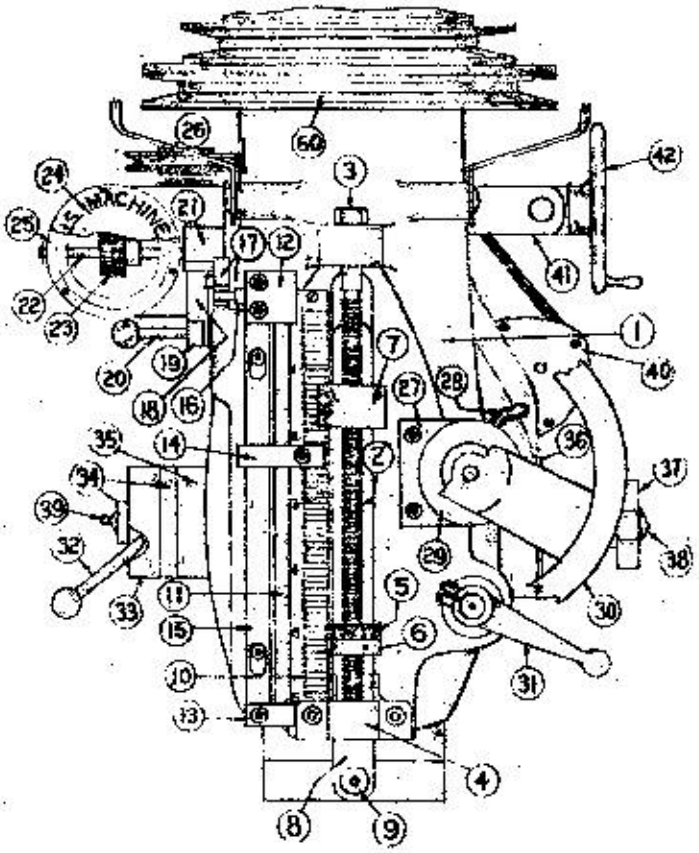
(Interior Parts)



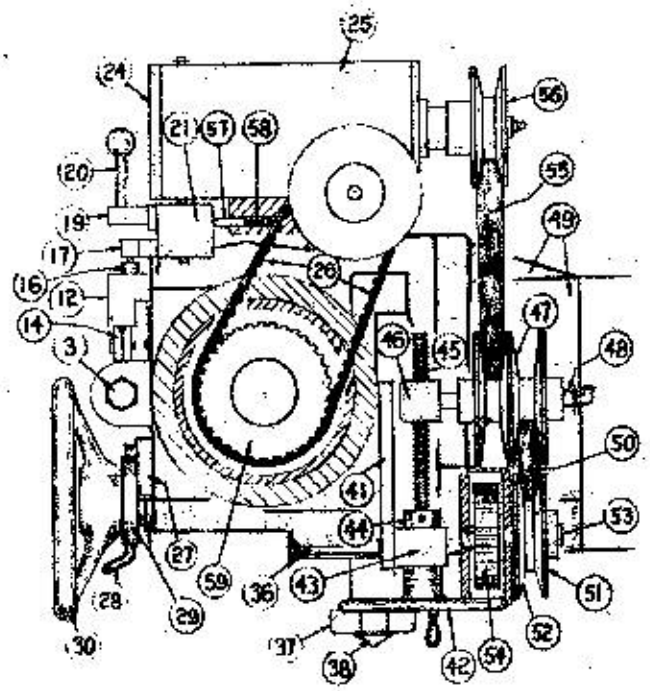
Location	NAME OF PART	No. Req.	Part No.
1	Head	1	U-1
2	Bearing (Lower)	2	U-45
3	Bearing Adj. Nut	1	U-8-A
4	Spring Housing	1	U-44-A
5	Plate	1	D-145
6	Ring	1	D-46
7	Handle	1	D-147
8	Quick-Return Shaft	1	U-23
9	Quill	1	U-7
10	Worm Gear	1	U-21
11	Clutch	1	U-20
12	Back-Lash Gear	1	D-149
13	Feed Gear	1	D-148
14	Bearing (Upper)	1	U-38
15	Spindle Nut	1	U-6
16	Sleeve Nut	2	U-12
17	Bearing Cage	1	U-9
18	Pulley Sleeve	1	U-11
19	Bearing Retainer	1	U-16
20	Spindle	1	U-4
21	Draw-In Bar	1	U-28
22	Draw-Bar Nut	1	U-47
23	Spindle Pressure Nut	1	U-46
24	Kick-Out Collar	1	U-48
25	Pulley-Sleeve Bearing	1	U-39
26	Hand Wheel	1	U-18
27	Thrust Bearing	1	B-105
28	Worm Shaft	1	U-24
29	Hardened Washer	1	U-24-C
30	Clutch Expander	1	U-29
31	Feed Clutch Nut	1	U-31
32	Clutch Lever	2	U-19
33	Handle	1	M-151-A
34	Screw	1	D-64
35	Clamp	1	D-162
36	Spring	1	D-64-A
37	Clamp	1	D-163
38	Worm	1	U-27

POWER FEED HEAD ASSEMBLY

EXTERIOR PARTS



FRONT OUTSIDE VIEW



TOP OUTSIDE VIEW

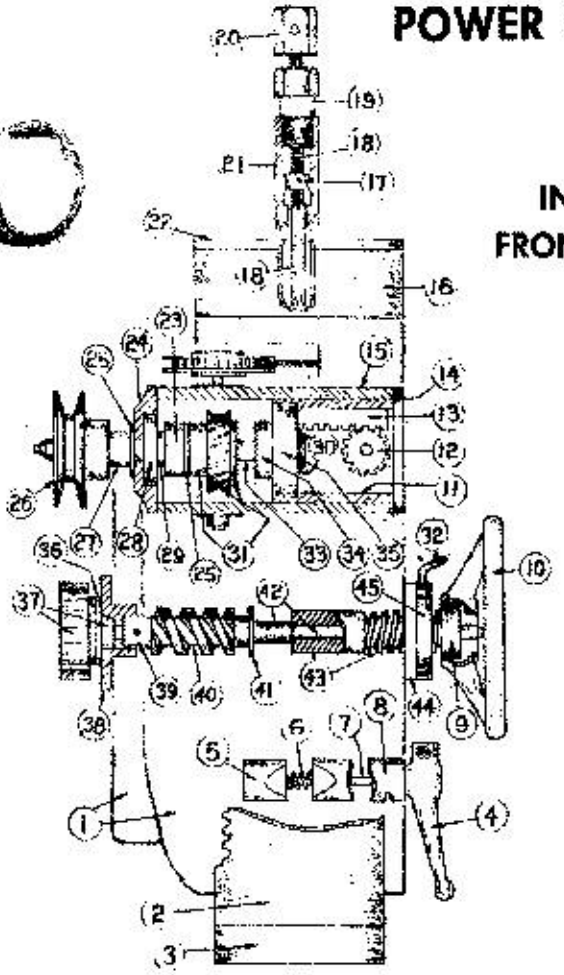
Location	NAME OF PART	No. Req.	Part No.
1	Head	1	U-1-A
2	Screw	1	D-131
3	⅜" Hex-Nut	1	M-505
4	Bracket	1	D-106
5	Stop Nut (Grad. 0-50)	1	U-26
6	Stop Nut	1	U-30
7	Stop	1	D-128
8	Stop Bar	1	D-127
9	Screw	2	D-131-A
10	Scale Plate	1	U-33
11	Trip-Rod	1	D-126
12	Bracket (Upper)	1	D-121
13	Bracket (Lower)	1	D-122
14	Trip-Dog	1	D-124
15	Trip Bar	1	D-123
16	Trip Pin	1	D-126
17	Latch	1	D-119
18	Lever	1	D-113
19	Lever Arm	1	D-116
20	Handle	1	D-118
21	Lever (Head)	1	D-112
22	Shaft	1	D-114
23	Gear	1	D-114-B
24	Plate	1	D-58
25	Gear Housing	1	D-103
26	Timing Belt	1	D-155
27	Keeper Nut	1	D-303
28	Nut Handle	1	D-302-H
29	Nut	1	D-302
30	Handwheel	1	U-18

Location	NAME OF PART	No. Req.	Part No.
31	Handle	1	M-151-A
32	Handle	1	D-147
33	Ring	1	D-146
34	Plate	1	D-145
35	Spring Housing	1	U-44-A
36	Gear Cover	1	D-150
37	Knob	1	D-153
38	Stop	1	D-144-A
39	Grease Fitting	1	U-32
40	Cover	1	D-105
41	Arm	1	D-137
42	Handwheel	1	D-154-A
43	Swivel-Bearing	1	D-10
44	Collar	2	D-19
45	Adjusting Screw	1	D-138
46	Arm	1	D-104
47	Pulley (Variable Speed)	1	D-154-B
48	Pulley Shaft	1	D-154-S
49	Flange Housing	1	D-102
50	V Belt	1	D-154-C
51	Pulley	1	D-156-A
52	Plate	1	D-156
53	Shaft	1	D-13
54	Gear	1	D-14
55	V-Belt	1	D-154-D
56	Pulley	1	D-157
57	Plunger	1	D-120-F
58	Spring	1	D-120-D
59	Driver Pulley	1	D-31
60	Spindle Pulley	1	U-2

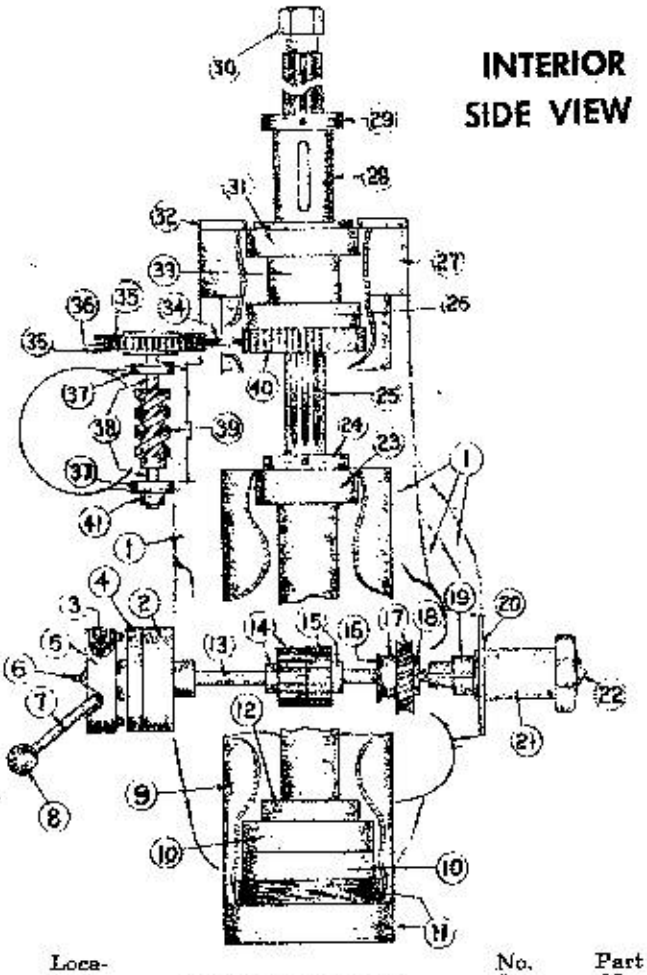
POWER FEED HEAD ASSEMBLY

INTERIOR PARTS

INTERIOR FRONT VIEW



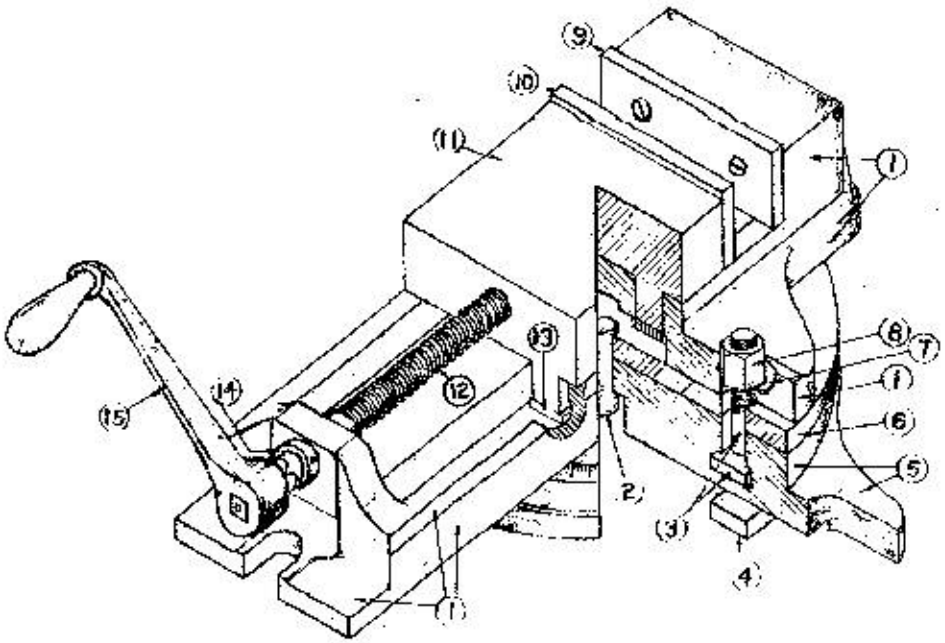
INTERIOR SIDE VIEW



Location	NAME OF PART	No. Req.	Part No.
1	Head	1	U-1-A
2	Quill	1	U-7
3	Bearing Retainer	1	D-129
4	Handle	1	M-151-A
5	Clamp	1	D-163
6	Spring	1	D-64-A
7	Screw	1	D-64
8	Clamp	1	D-162
9	Collar	1	D-19
10	Hand Wheel	1	U-18
11	Retainer (Bearing)	1	D-107
12	Gear	1	D-114-B
13	Rack	1	D-109
14	Cover	1	D-58
15	Housing	1	D-103
16	Bearing Cage	1	D-27
17	Draw-Bar Collar	1	U-48
18	Draw-In-Bar	1	U-28
19	Spindle Pressure Nut	1	U-46
20	Draw-Bar Nut	1	U-47
21	Spindle	1	U-4
22	Bearing Cage Cover	1	D-29
23	Collar	1	D-43
24	Bearing Cap	1	D-108
25	Spacer	1	D-157-A
26	Driver Pulley	1	D-157
27	1/8" Washer	1	U-24-C
28	Bearing	1	D-51
29	Sleeve	1	D-46
30	Ring	1	D-110-A
31	Worm Gear	1	D-59
32	Nut Handle	1	D-302-H
33	Shaft	1	D-115
34	Clutch	1	D-110
35	Bearing	1	D-110-B
36	Bronze Washer	1	D-135-B
37	Gear	1	D-161
38	Sleeve	1	D-135
39	Clutch Coupling	1	D-160
40	Worm	1	U-27
41	Washer	1	U-24-C
42	Shaft	1	D-132
43	Pull Out Bushing	1	D-301
44	Nut Keeper	1	D-303
45	Pull Out Nut	1	D-302

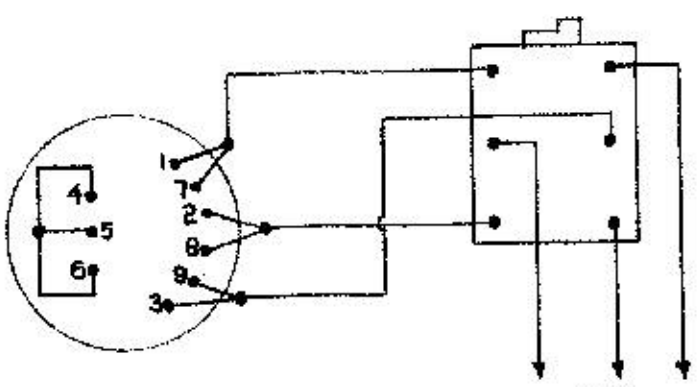
Location	NAME OF PART	No. Req.	Part No.
1	Head	1	U-1-A
2	Spring Housing	1	U-44-A
3	Plunger	1	D-152
4	Plate	1	D-145
5	Ring	1	D-146
6	Grease Fitting	1	U-32
7	Handle	1	D-147
8	Knob	1	U-37
9	Quill	1	U-7
10	Ball Bearing (Lower)	2	U-45
11	Bearing Retainer	1	D-129
12	Bearing Nut (Adj.)	1	U-8-A
13	Shaft	1	D-144
14	Gear (Feed)	1	D-148
15	Gear (Back-Lash)	1	D-149
16	Washer	1	U-24-C
17	Worm Gear	1	U-21
18	Clutch	1	U-20
19	Expander	1	U-29
20	Gear Cover	1	D-150
21	Knob	1	D-153
22	Stop	1	D-144-A
23	Bearing (Upper)	1	U-38
24	Spindle Nut (Adj.)	1	U-6
25	Spindle	1	U-4
26	Bearing	1	D-31-A
27	Bearing Cage	1	D-27
28	Pulley Sleeve	1	D-28
29	Pulley Sleeve Nut	1	U-12
30	Spindle Pressure Nut	1	U-46
31	Bearing	1	D-31-B
32	Bearing Cage Cover	1	D-29
33	Spacer (Bearing)	1	D-28-A
34	Timing Belt	1	D-155
35	Plate	2	D-32
36	Driven Pulley	1	D-30
37	Bearing	2	D-33-B
38	Shaft	1	D-42
39	Worm	1	D-33-A
40	Driving Pulley	1	D-31
41	Sleeve	1	D-46

VISE ASSEMBLY



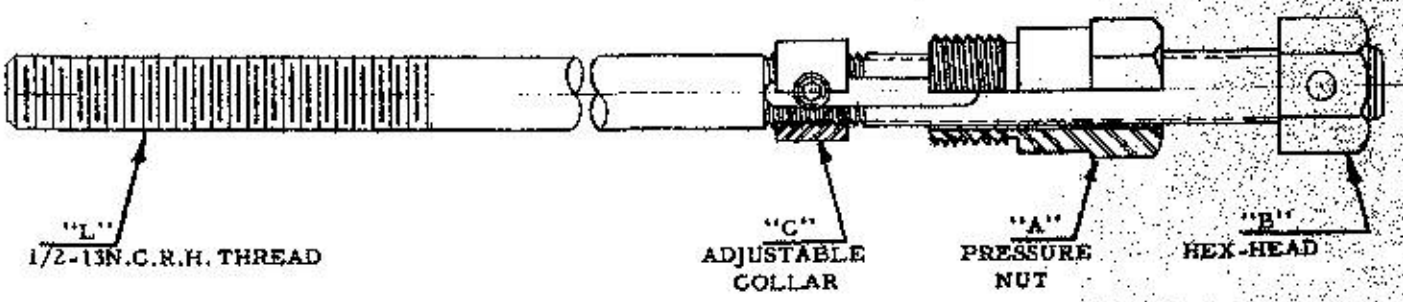
Location	NAME OF PART	No. Req.	Part No.
1	Vise Body	1	M-300
2	Swivel Plug	1	M-332
3	T-Bolt	2	M-562
4	Tongue Strip	2	M-308
5	Graduated Swivel Base	1	M-330-S
6	Swivel Plate	1	M-331
7	Washer (Hard.)	2	M-563
8	Nut	2	M-564
9	Body Jaw	1	M-304
10	Slide Jaw	1	M-305
11	Vise Slide	1	M-306
12	Vise Screw	1	M-307
13	Slide Clamp	2	M-301
14	Collar	1	M-544
15	Handle (Broached)	1	M-309

WIRING DIAGRAM



220 VOLTS
3 PHASE

LINE
220 VOLTS
3 PHASE



HOW TO USE DRAWBAR TO TIGHTEN AND RELEASE CUTTER ARBORS AND COLLETS ON U. S. VERTICAL MILLING MÁCHINE

Insert drawbar into hollow spindle. Screw pressure-nut "A" into threaded portion on top of spindle. Drawbar is free to slide thru pressure nut; its length of slide is limited by the fixed hex-head "B" and adjustable collar "C". Threaded end "L" of drawbar engages internal thread of cutter arbor. Use wrench on hex-head "B" to tighten arbor in spindle nose. To release arbor from spindle nose, unscrew drawbar until collar "C" bears against pressure nut "A". One additional counter-clockwise turn will release arbor taper from spindle nose taper. Adjustable collar "C" is set at the factory to release standard length #9 B. & S. taper arbors. To release different length arbors, re-position adjustable collar "C".