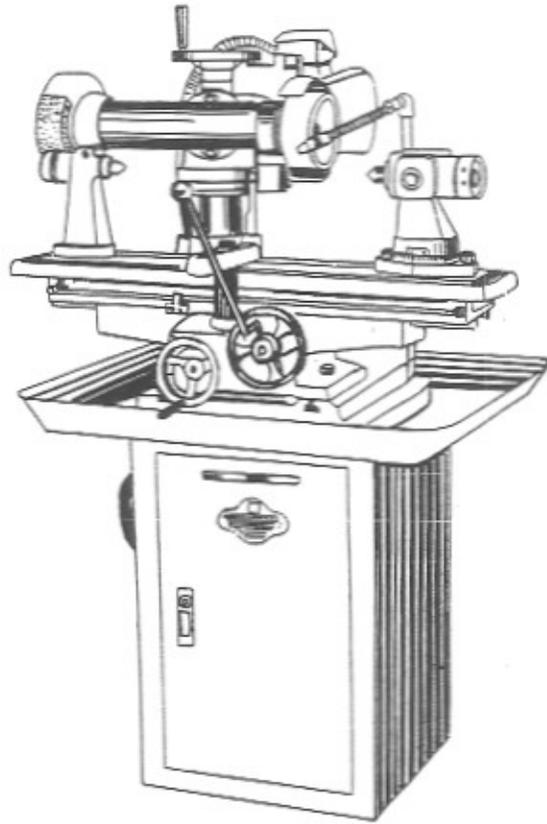


09519141

# UNIVERSAL TOOL & CUTTER GRINDER



MODEL CT-457

## *SERVICE MANUAL*

READ THIS MANUAL CAREFULLY

It is essential to give the Serial Number of your machine in any order of repair parts to assure prompt and accurate service.

Order repair parts by part numbers, description and machine serial number.

# PARTS LIST

## INDEX

Cabinet / Coolant .....	1
Table / Saddle .....	2
Elevating Column .....	4
Spindle .....	5
Tail Stock .....	6
Accessories .....	7

# SPECIFICATIONS

## MODEL CT-457

Distance between centers.....	8" 16 1/2"
Swing over table.....	8 1/4 10 3/4"
Table travel, longitudinal.....	17"
Saddle cross travel.....	5-15/16"
Cross adjustment of saddle.....	6"
Table, swivelling angle.....	15°
Wheelhead vertical adjustment.....	6"
Wheelhead swivelling range.....	360°
Workhead swivelling range.....	360°
Tilt adjusting of workhead.....	+ 30° - 30°
Wheel diameter, max.....	6"
Spindle speed.....	3600 RPM
Motor, wheel spindle drive.....	1/2 H.P.
Machine weight.....	396LBS

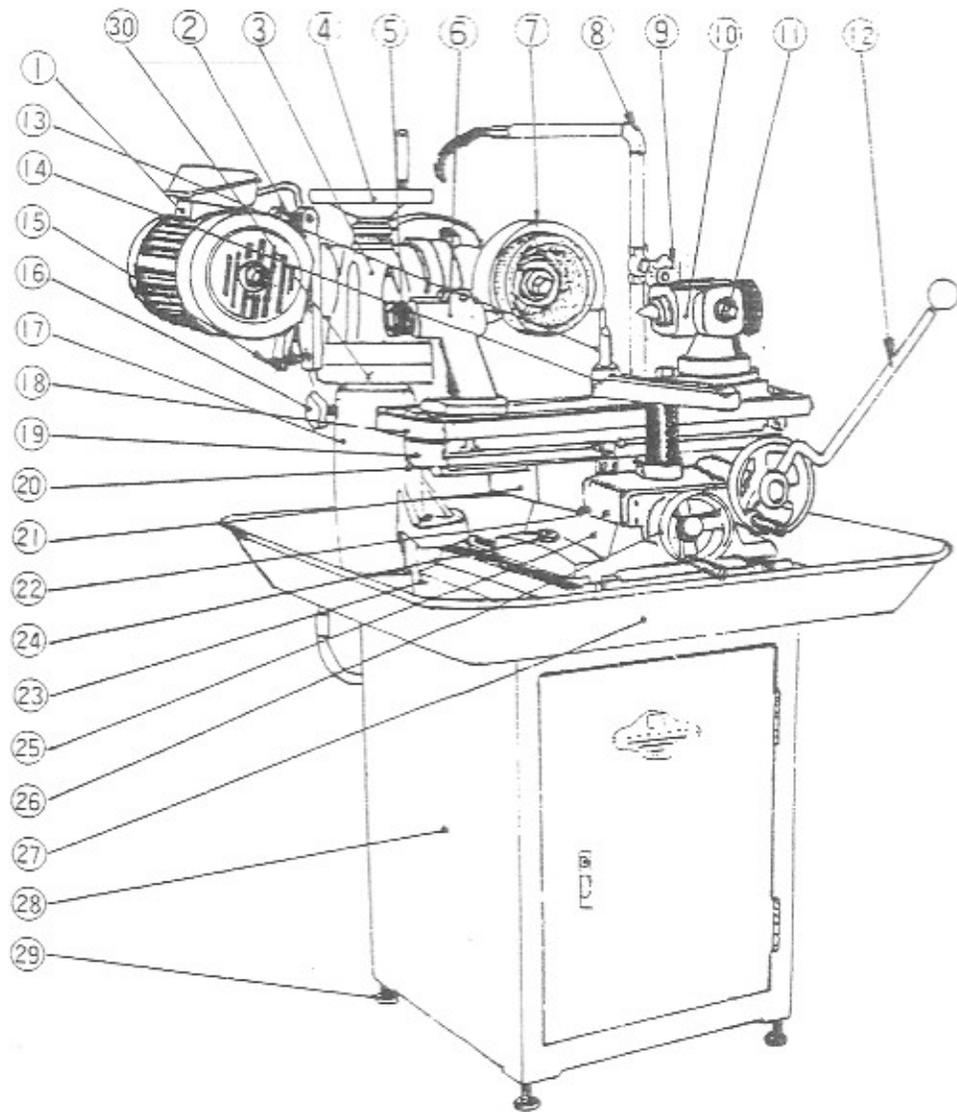
### STANDARD EQUIPMENT

Cup wheel-----	2pcs
Tool-bit grinding attachment-----	1set
Face-mill holder-----	1set
Cutter arbor 1" OD-----	1set
Coolant system 1/8HP-----	1set
Tooth rest-----	1set
Center M.T. No.3-----	1pc
Adjusting tools-----	1set

### EXTRA ATTACHMENTS

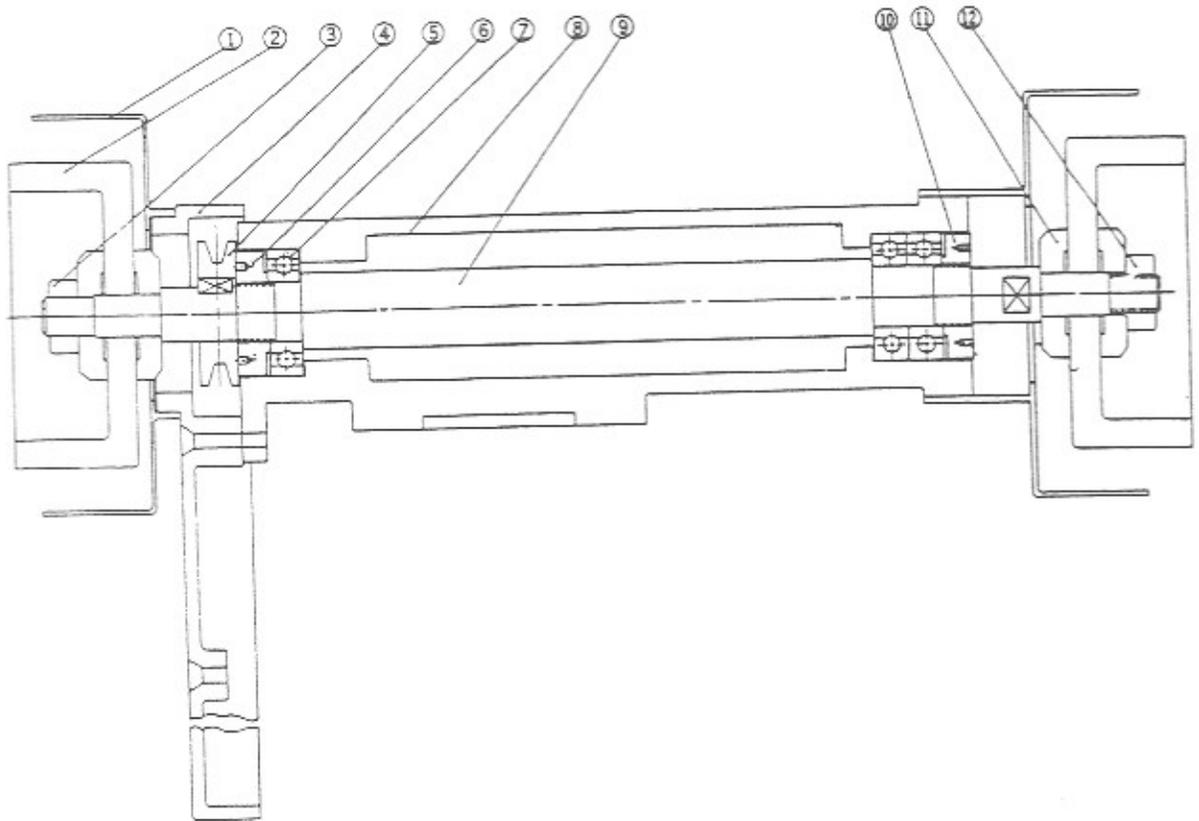
Diamond wheel 4" OD-----	1pc
Drill grinding attachment-----	1set
Collect chuck-----	1pc
Diamond dresser-----	1pc
Disk wheel 6"-----	1pc

## NAMES OF OPERATING PARTS AND OTHERS



- |                           |                               |
|---------------------------|-------------------------------|
| 1. Motor                  | 16. Elevating lock bolt       |
| 2. Motor adjusting base   | 17. Elevating column base     |
| 3. Angle base             | 18. Swivelling table          |
| 4. Handwheel              | 19. Sliding table             |
| 5. Center cap             | 20. Stop base                 |
| 6. Left hand tailstock    | 21. Saddle                    |
| 7. Wheelhead              | 22. Adjusting screw           |
| 8. Coolant pipe           | 23. Base                      |
| 9. Pipe valve             | 24. Clamping bolts (saddle)   |
| 10. Right hand tailstock  | 25. Adjusting base            |
| 11. Hexagon bolt          | 26. Handwheel for saddle feed |
| 12. Handle for table feed | 27. Chip pan                  |
| 13. Tooth rest            | 28. Cabinet                   |
| 14. Tooth rest seat       | 29. Leveling bolt             |
| 15. Motor adjusting bolt  | 30. Elevating column          |

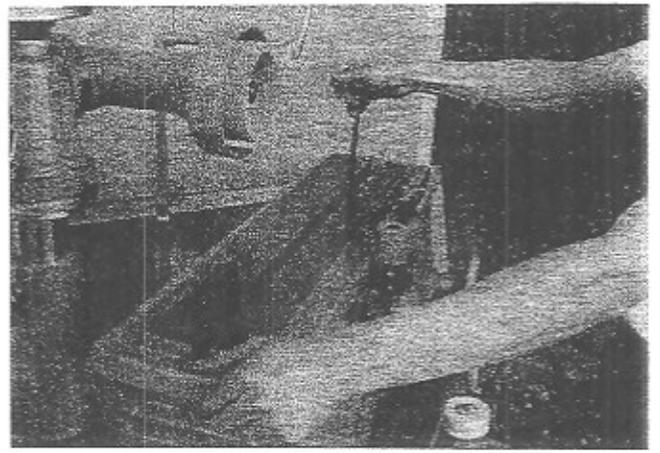
## STRUCTURE OF GRINDING WHEELHEAD



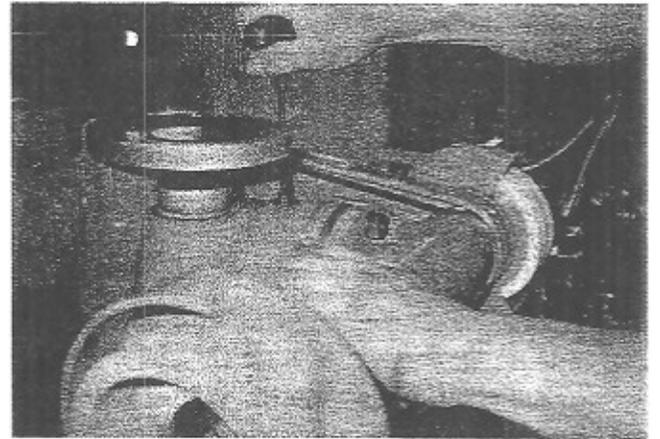
1. Wheel guard
2. Wheel
3. Nut (RH Thread)
4. Belt guard
5. Pulley
6. Dust cover for bearing  
(RH Thread)

7. Bearing
8. Spindle sleeve
9. Spindle
10. Dust cover for bearing  
(LH thread)
11. Wheel flange
12. Nut (LH thread)

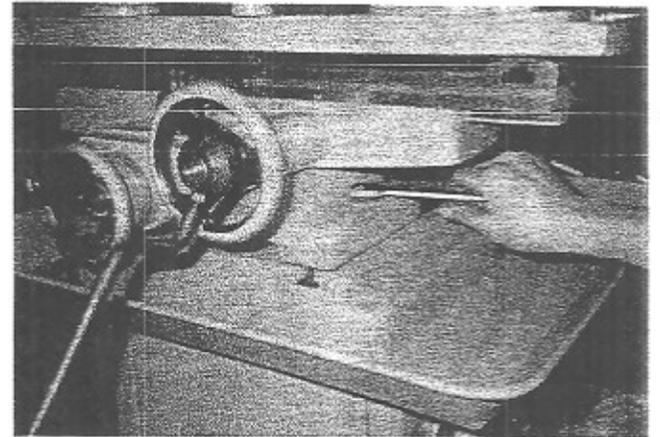
1. The angle of upper table can be adjusted by loosening or tightening the screws on each side.



2. The slanting angle of grinding/wheel spindle can be adjusted by loosening or tightening screws.

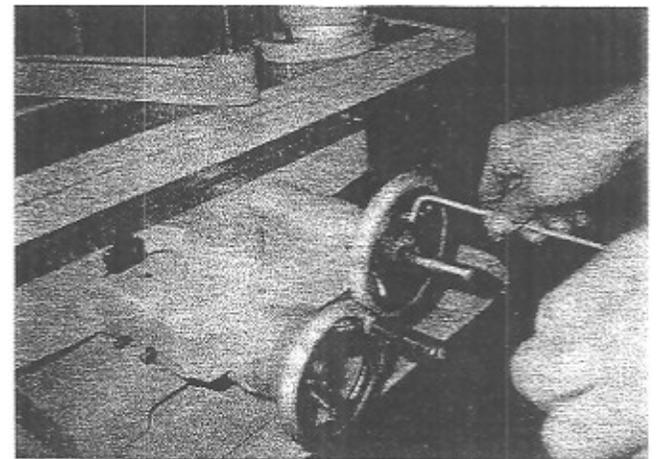
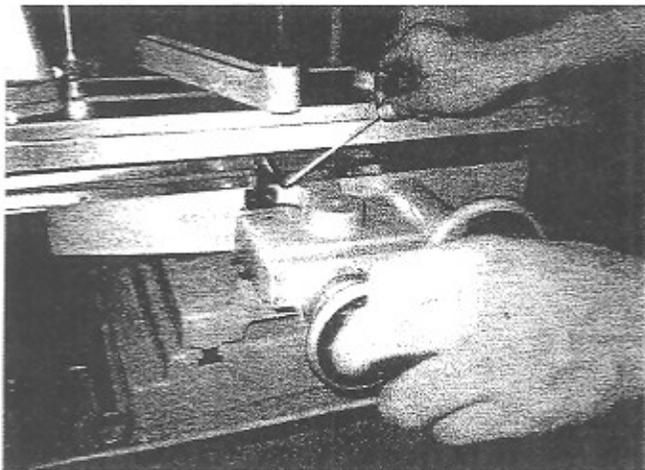


3. If saddle feed screw is not long enough for front & back use, we can utilize the forward & backward movement of saddle slide guide to enlarge the range for length.

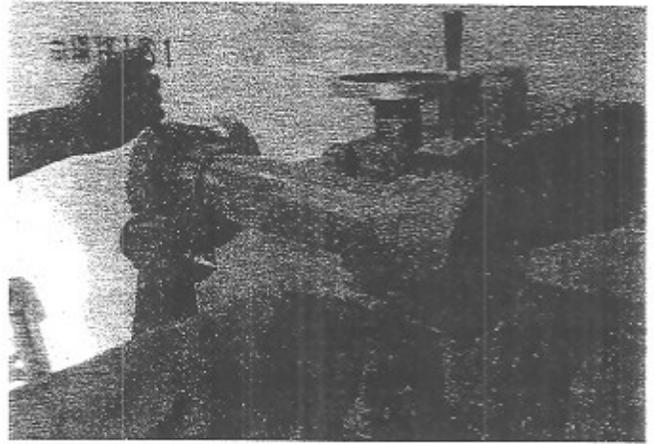


4. TABLE LONGITUDINAL TRAVEL  
The table is moved longitudinally by means of the table feed handle.

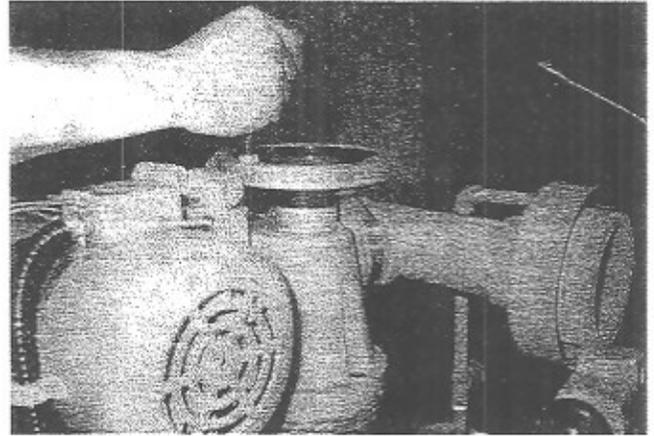
5. setting horizontal travel of table



1. SETTING UP CUP GRINDING WHEELS  
Loosen the hexagonal nuts from the both ends of the shaft. Then place the wheels on both sides. After they are set on the shaft, lock the hexagonal nuts on both ends.



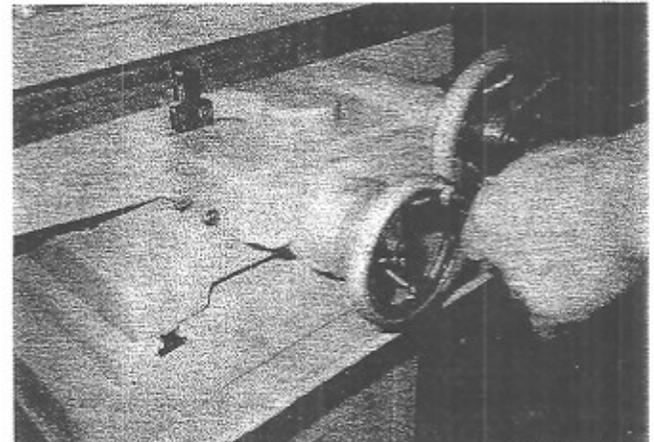
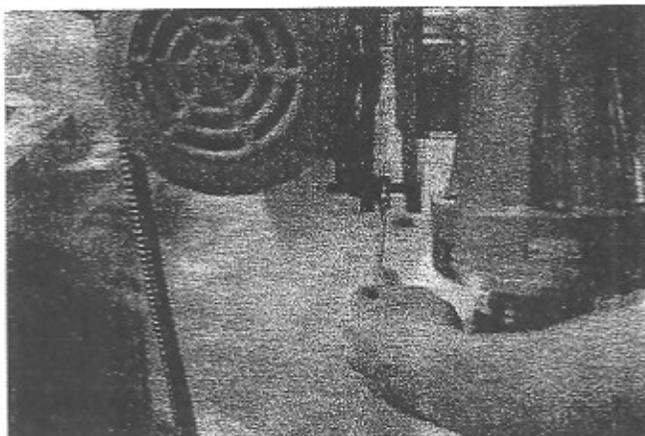
2. The vertical movement of the wheel head can be done by means of the clamp and handwheel.



3. TABLE TRANSVERSE MOVEMENT  
One revolution of the handwheel for transverse movement gives the saddle 1/8" movement. The fine adjustment of the graduated collar is one division corresponds to .001" movement.



4. Belt of grinding wheel spindle can be adjusted by forward and backward movement of motor.



## SETTING UP THE WORKHEAD

Adjust the hexagonal bolt on the side of the workhead.

## TRUING THE GRINDING WHEEL

For accurate dressing, the diamond dressing device, which is set in the upper hole of the tail stock, should be used as illustrated.

## ILLUSTRATION OF GRINDING A FACE MILL (SHELL MILL)

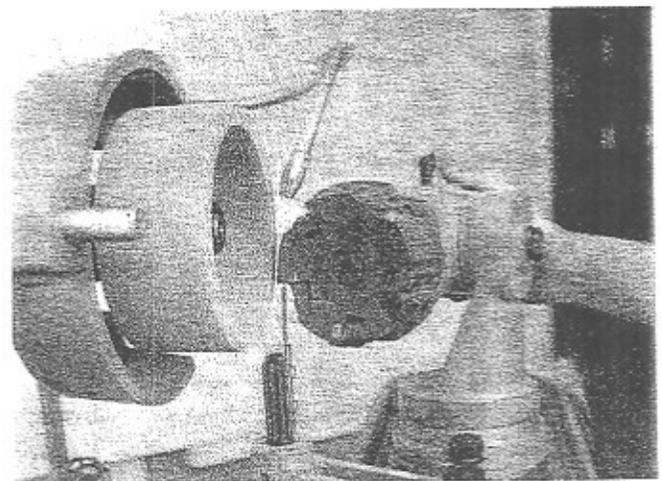
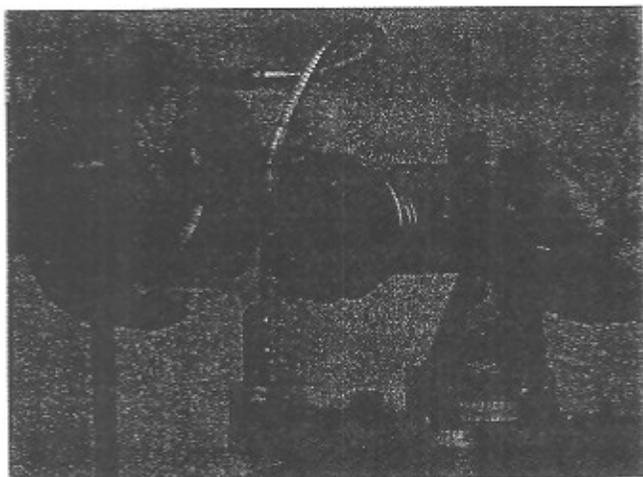
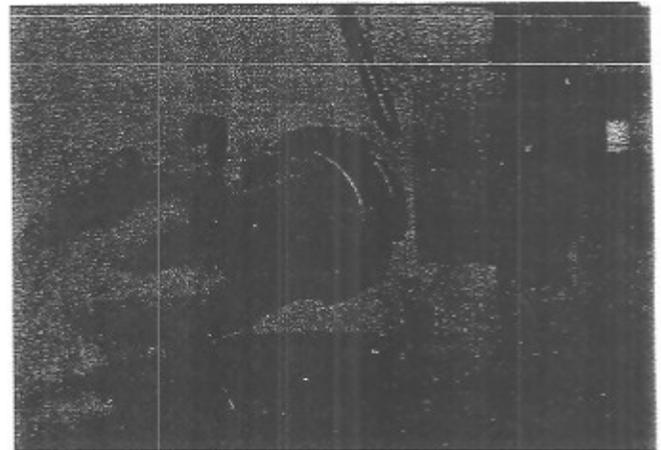
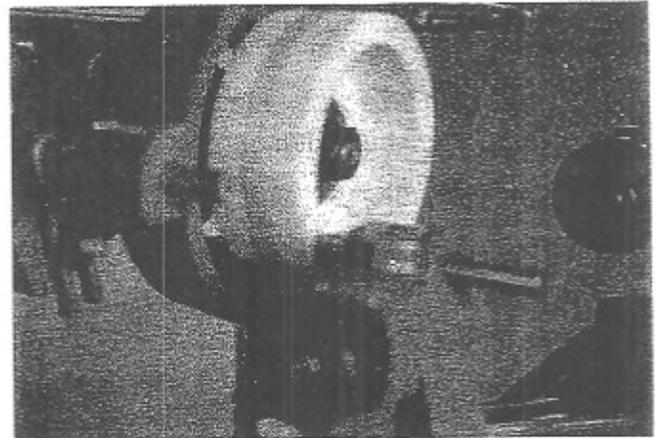
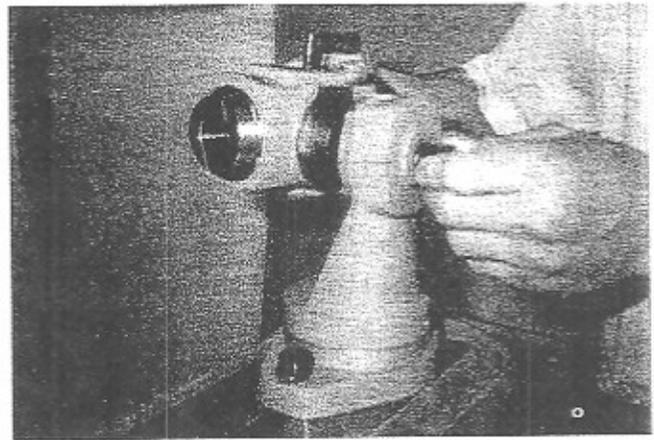
Face mill holder, 1 set  
(Standard equipment)

Fix the cutter on the holder, and insert it into the tapered hold of the workhead.

In another way, it can be ground by horizontally swiveling the workhead body.

## PERIPHERAL TOOTH ANGLE GRINDING OF FACE MILL

## FACE ANGLE GRINDING OF FACE MILL



## TOOTH REST BLADE AND USAGE

In accordance with the kind of operation, the blade is fixed on the tooth rest. The upper blade is for face mill, the medium blade is for shell & side milling cutter and the lower one is for end mill.

Ordinarily, 1/16" distance is desirable between the wheel and blade.

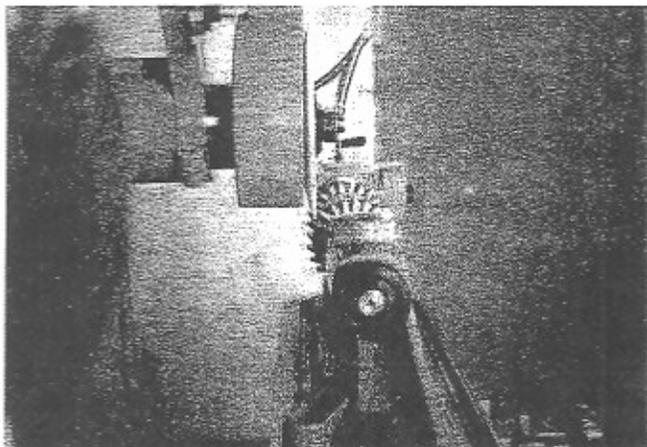
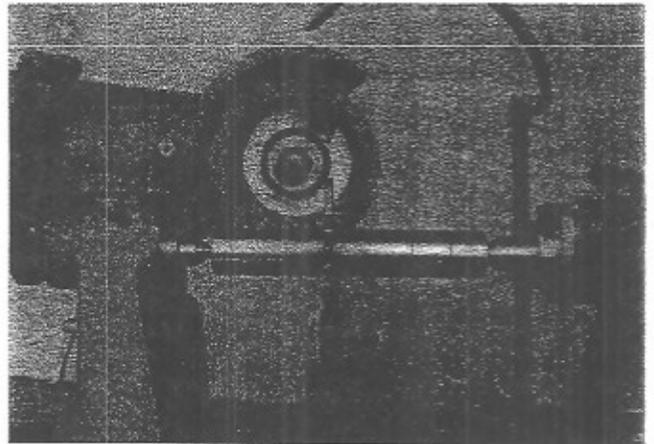
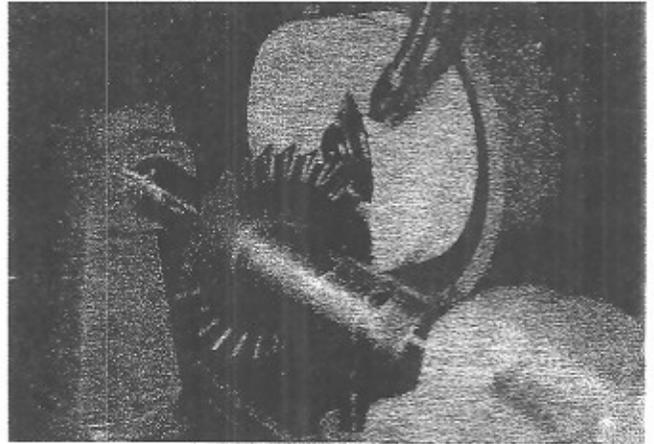
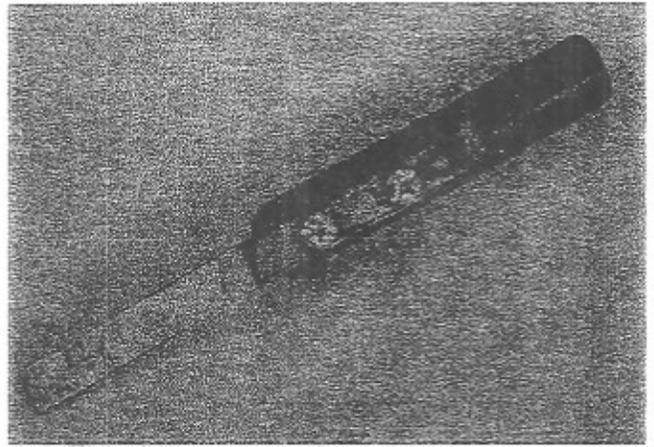
## GRINDING A METAL SLITTING SAW

Install the disc shaped wheel on the grinding wheel head. Mount the metal saw on the cutter arbor. Fasten it to a degree at which it can still be turned by hand.

Then, adjust the grinding spindle to set at the required height.

The tooth of metal saw is supported by the tooth rest, mounted on the table.

The grinding wheel should be moved up enough to furnish the corner with a required angle, which should be ground on every other tooth. The other teeth can be ground by turning over the metal saw.



## GRINDING A SIDE MILLING CUTTER

The side teeth on both sides of the cutter should be ground by means of swivelling of the grinding spindle.

## ILLUSTRATION OF GRINDING A STAGGERED TOOTH CUTTER

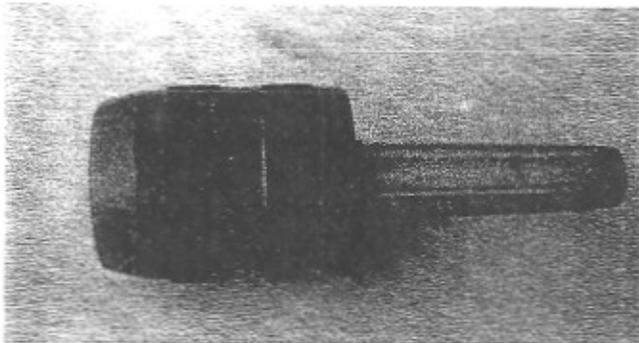
This is a kind of side mill.

The helix teeth of ordinary mills are spiralled to one side only, but the teeth of this mill are spiralled alternately.

Primary relief angle is obtained by means of swivelling the workhead.

The secondary relief angle is also ground in the same manner as above.

## Collet Chuck

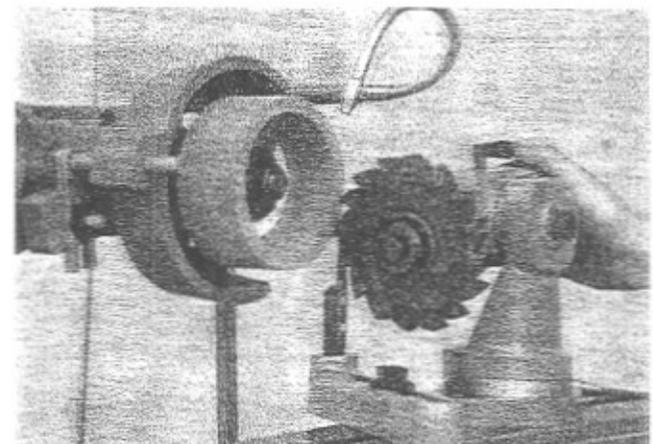
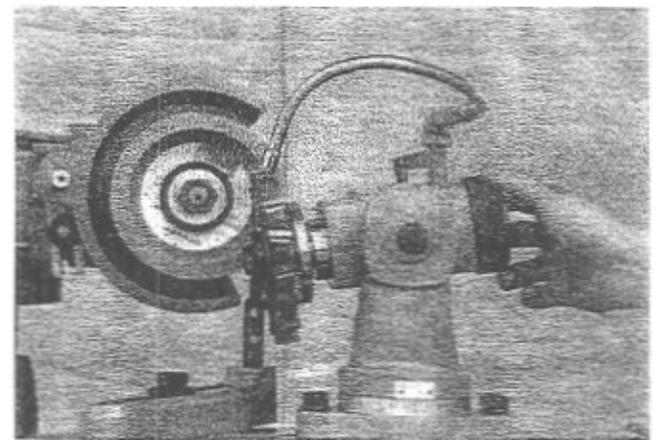
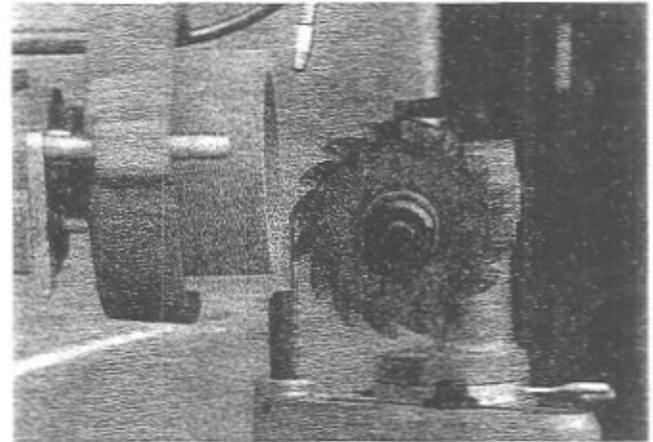
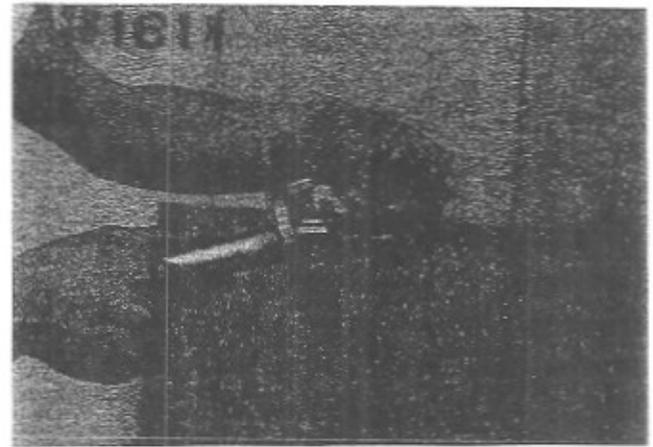


NT. Collet

Available size: 3/16" . 3/8" . 1/2"  
5/8" . 3/4" . 7/8" 1"



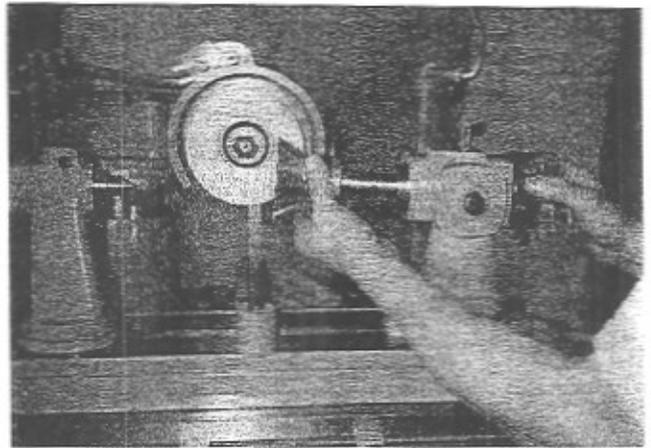
or 6.8.10.12.16.20.25mm



## ILLUSTRATION OF GRINDING AN ANGULAR CUTTER

Grinding an angular cutter is very similar to an end mill.

However, the workhead body must be swivelled horizontally in accordance with the angle of the cutter. Also the work head body has to be tilted vertically by the degree of the relief angle to be ground.

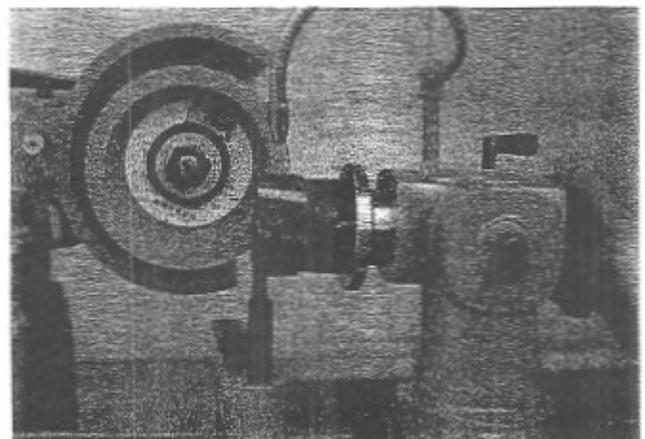
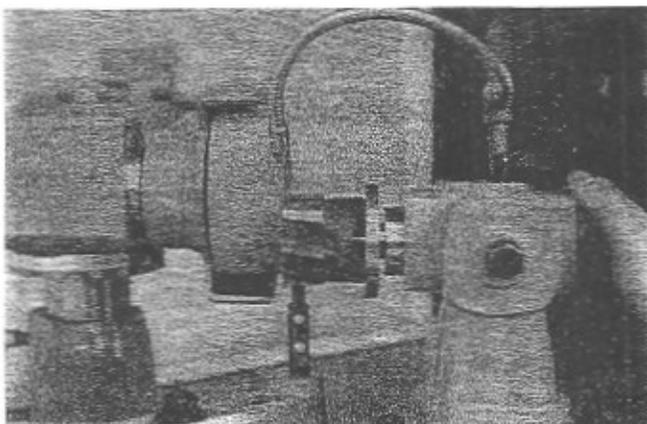
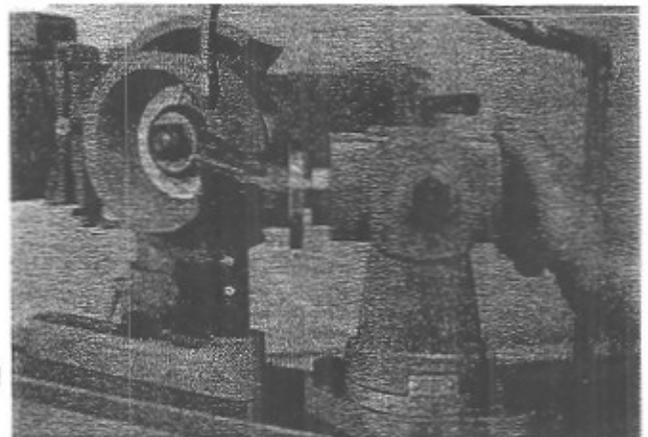
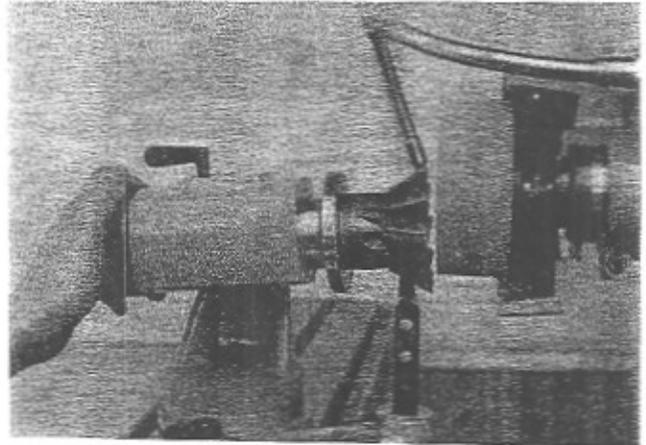


## GRINDING A SLAB MILLING CUTTER

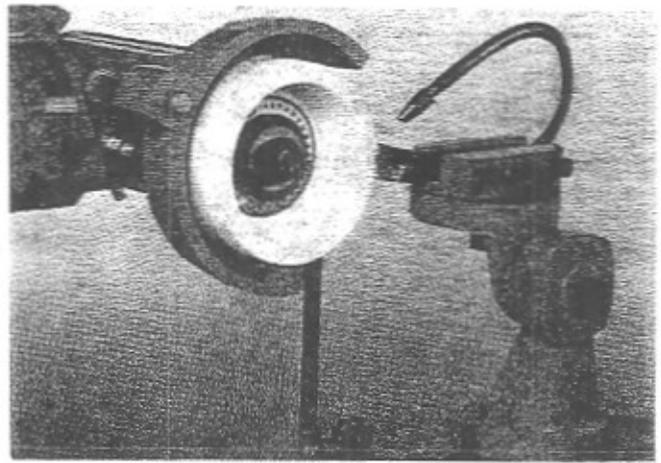
Mount the slab milling cutter on the cutter arbor. The mounting of slab milling cutter is similar to a side milling cutter.

In this case, care should be taken that the tooth rest face is inclined in accordance with the helix angle and the point on the wheel, where the tooth rest touches, will coincide.

After grinding one of the tooth edges, turn the cutter by 180 degrees to grind the edge on the opposite side and check whether or not it is tapered. If it is tapered, eliminate it by adjusting the weivel table. The remaining tooth edges should be ground after this inspection.



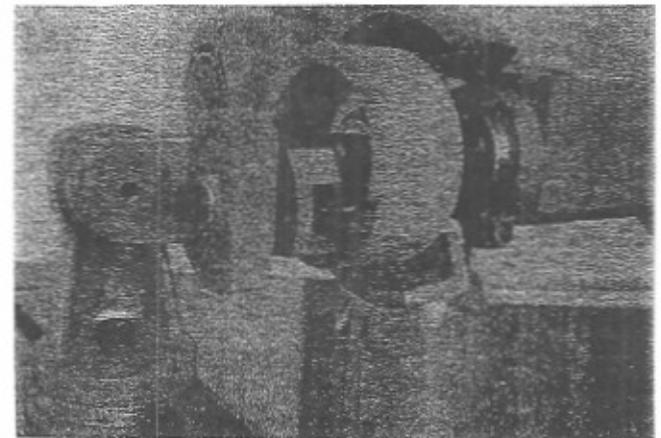
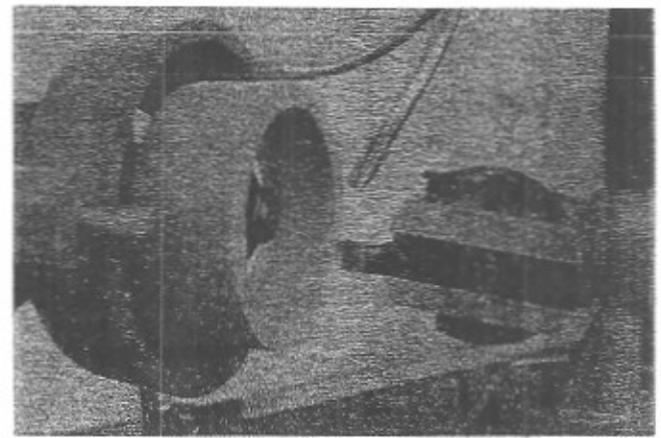
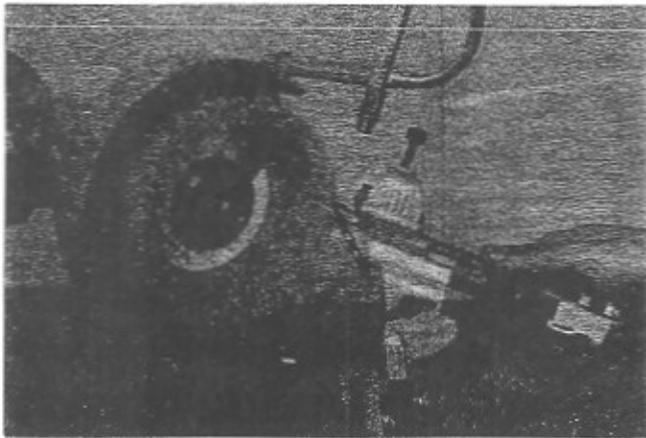
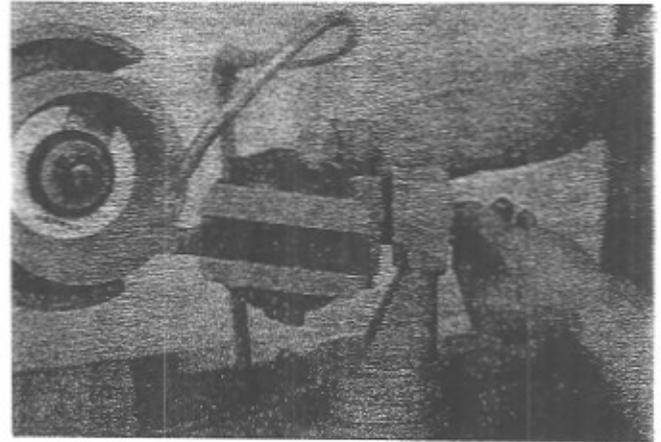
grinding, setting and operating  
for various tangalloy milling  
cutters



DRILL SHARPENING ATTACHMENT  
(EXTRA ATTACHMENT)

This attachment is used for preci-  
sion grinding of drill tip relief  
angles.

It can handle drills of 1/8" to  
1/2".



## ILLUSTRATION OF COLLET CHUCK (EXTRA ATTACHMENT)

### GRINDING A TWO FLUTED END MILL

Insert the collet chuck into the tapered hole of the workhead

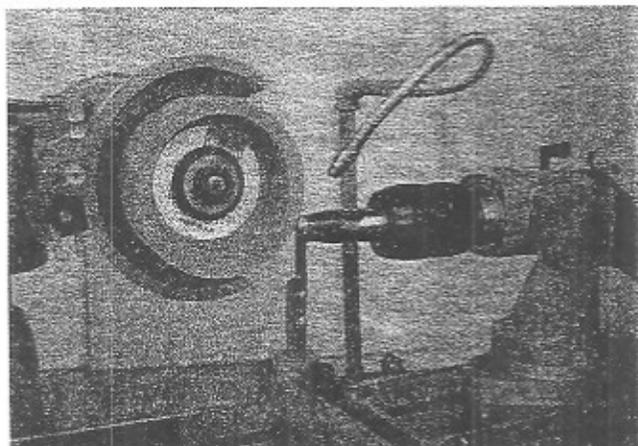
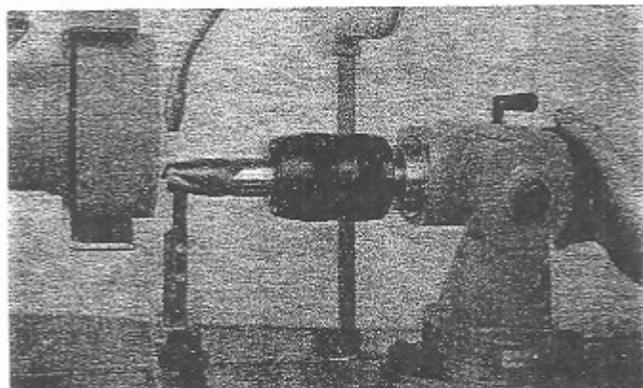
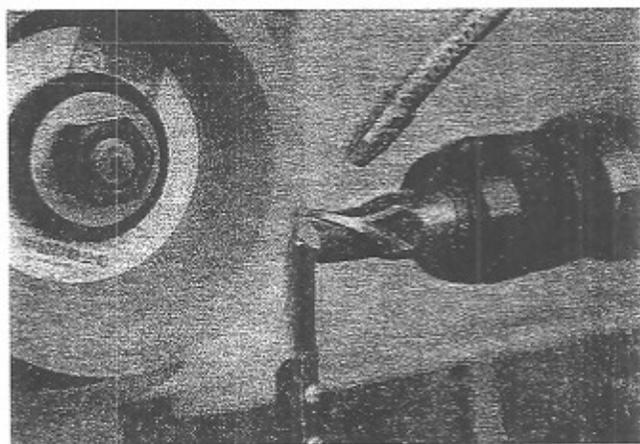
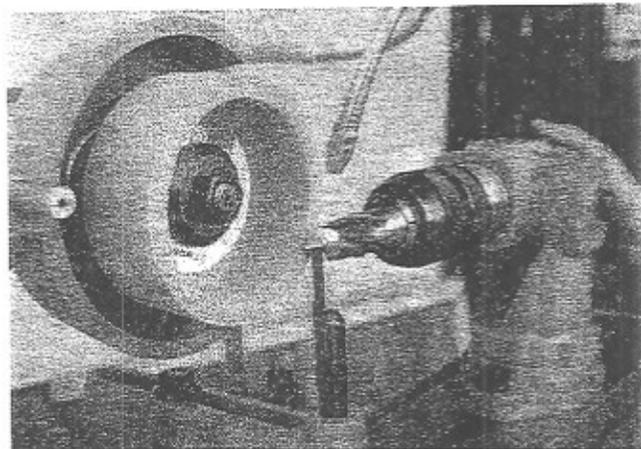
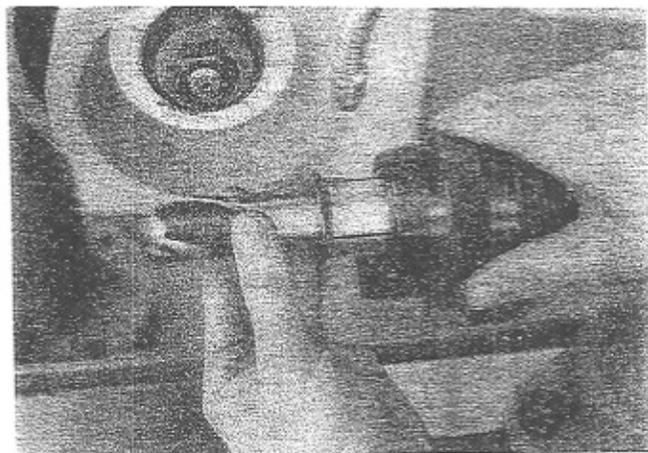
Insert the end mill into the collet chuck and fasten it, so that the cutter will not turn. Insert the tooth rest in the T-slot rest.

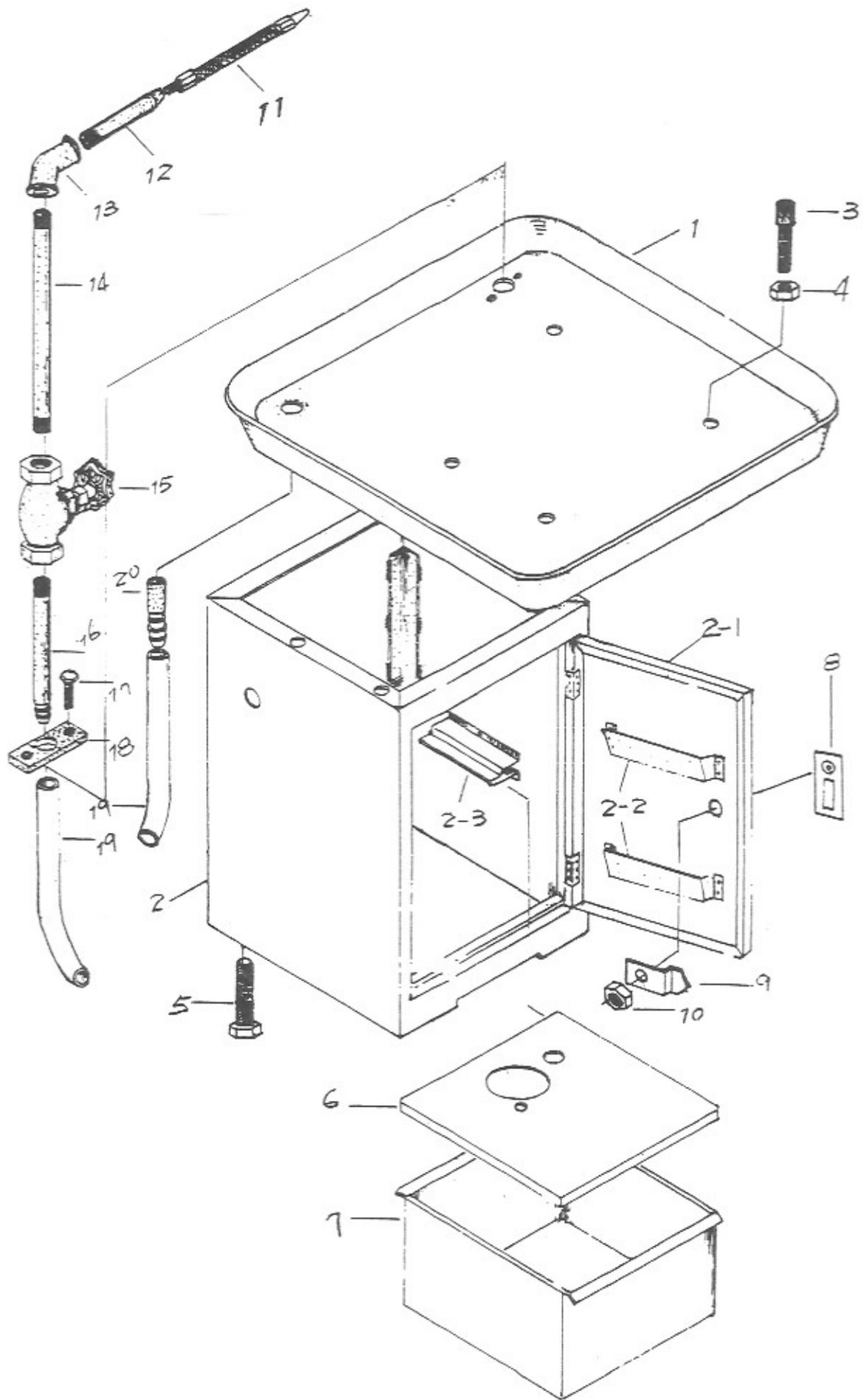
Set the center of the wheel head at the height of the work head spindle center.

Swivel the grinding head horizontally by the degree of the relief angle.

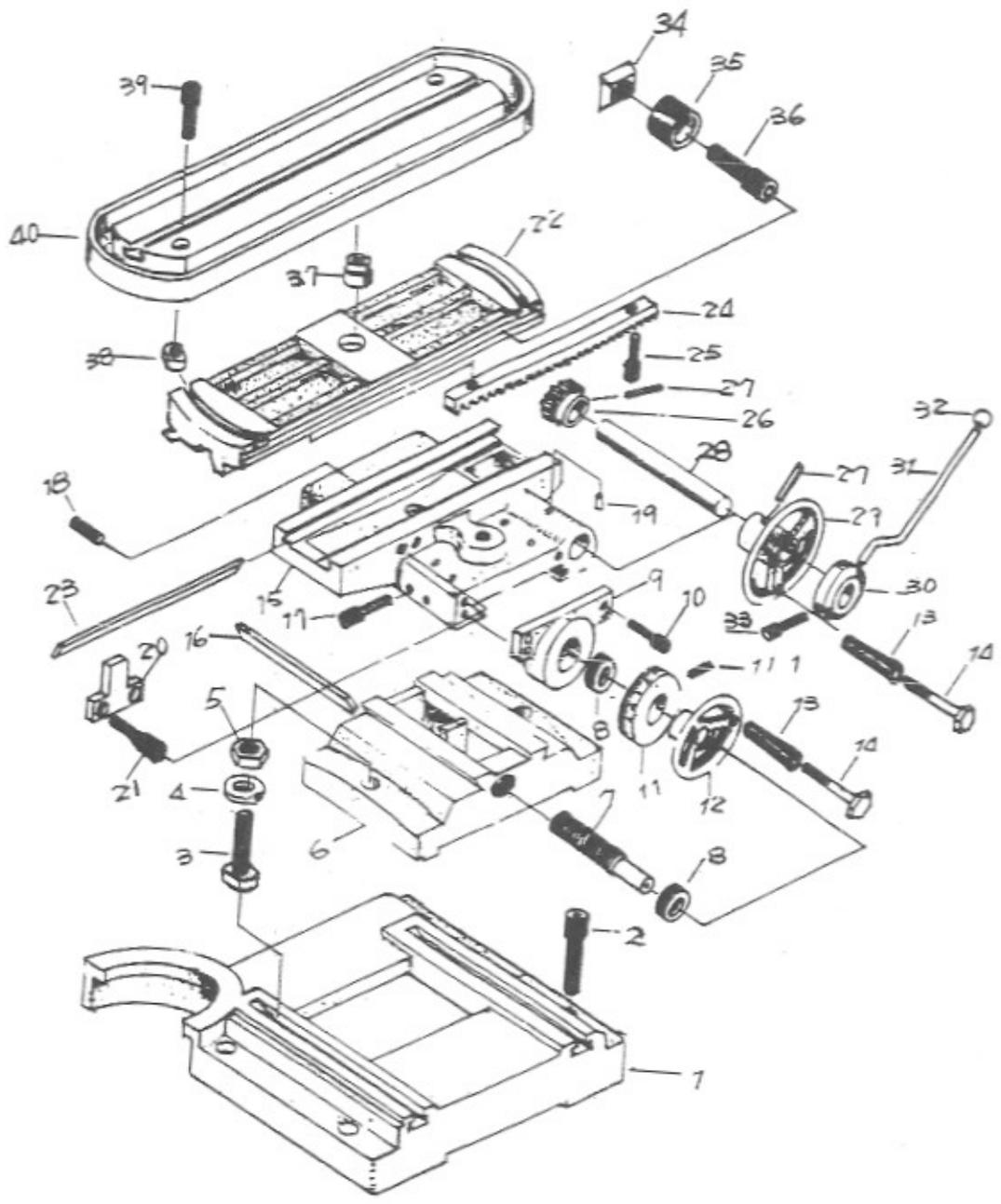
Grinding the primary relief angle of end mill is obtained by positioning the tooth rest blade inside end mill edge approximately  $1/8"$  and  $1/8"$  to  $3/16"$  below the center line of the cutter (Depending on the diameter of the cutter), and use the proper shape of the tooth rest blade

To grind secondary relief angle when the primary relief angle grinding is finished, raise the wheel head vertically, until the position is  $3/16"$  to  $3/8"$  higher than the tooth rest blade.

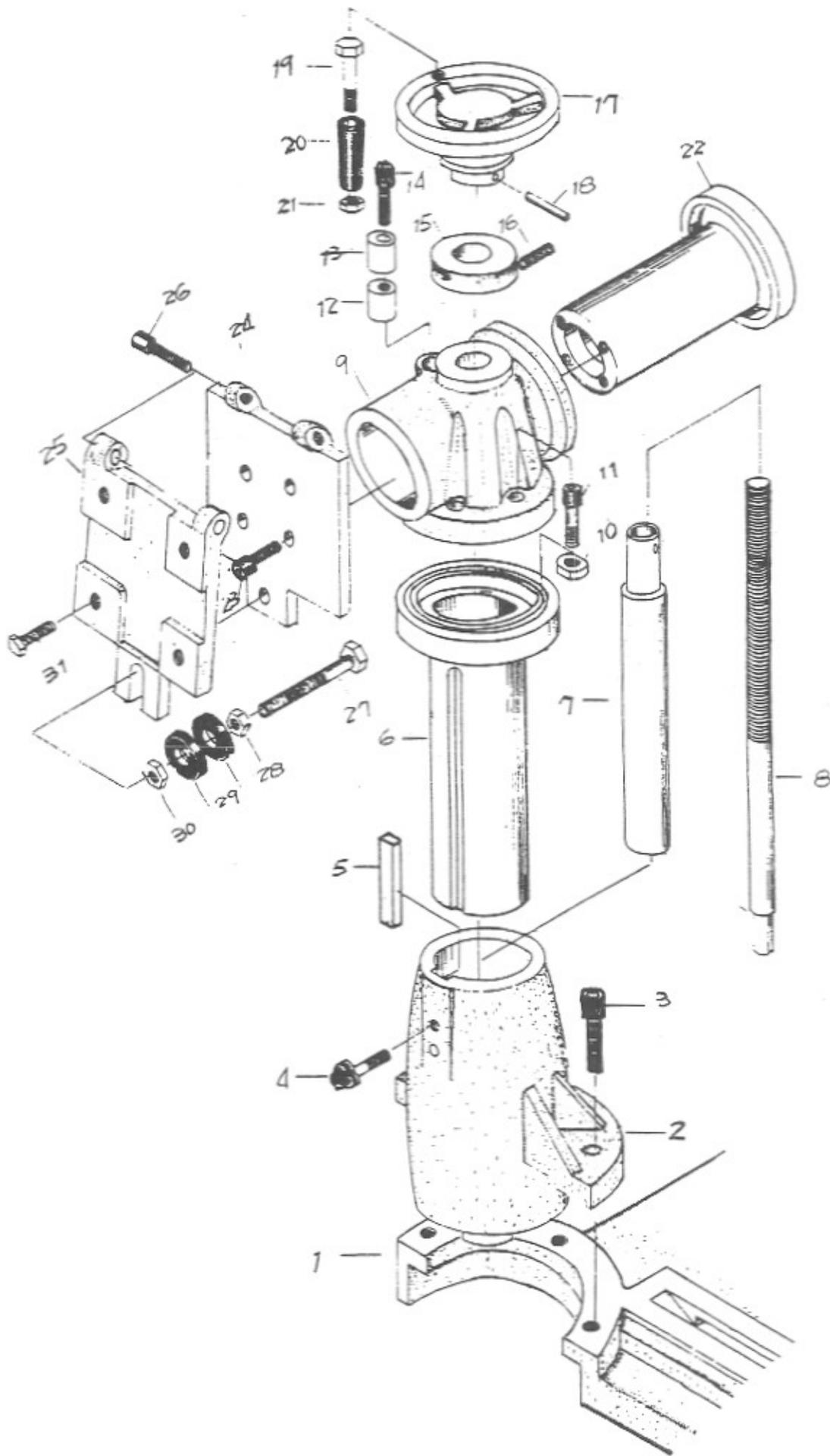




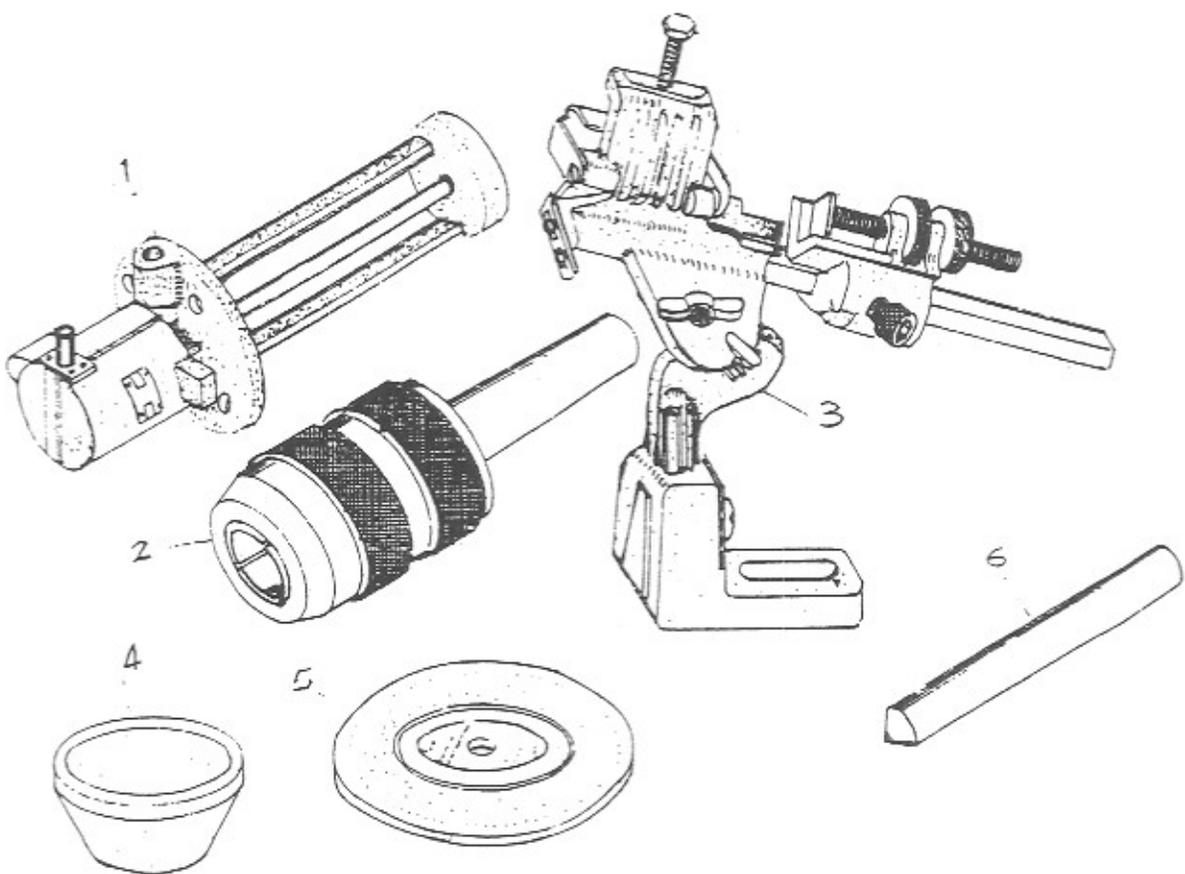
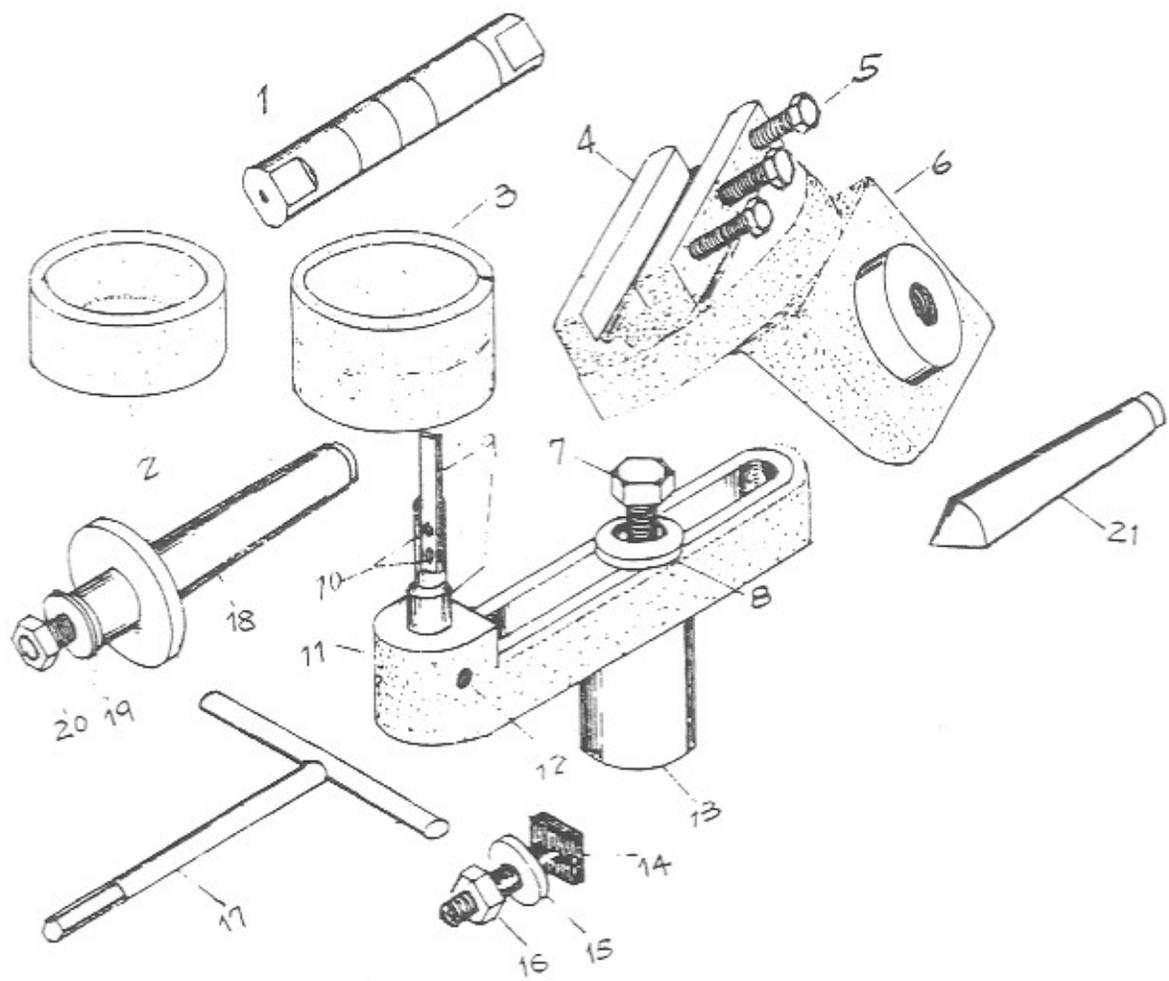
No.	Ser. No.	Description	Quantity	Remarks
1		Chip pan	1	
2		Cabinet	1	
2-1		One-way door	1	
2-2		Tool shelf	2	
2-3		Shelf	2	
3		Hex. socket bolt	4	W $\frac{1}{2}$ x2" <sup>L</sup>
4		nut	4	W $\frac{1}{2}$ -12NC
5	234	Levelling bolt	4	W $\frac{1}{2}$ -12NC
6		Tank lid	1	
7		Water tank	1	
8		Door handle	1	
9		Door latch	1	
10		Nut (Hex.)	1	W $\frac{3}{8}$ -16NC
11		Hose	1	$\phi$ 1/8
12		Water pipe	1	$\phi$ 3/8x140 <sup>L</sup>
13		Elbow	1	$\phi$ 3/8
14		Water pipe	1	$\phi$ 3/8x400 <sup>L</sup>
15		Bronze valve	1	$\phi$ 3/8
16		Water pipe	1	$\phi$ 3/8x190 <sup>L</sup>
17		Hex. bolt	2	W $\frac{1}{4}$ x1" <sup>L</sup>
18		Water pipe clamp	1	
19		Plastic hose	2	



No.	Ser. No.	Description	Quantity	Remarks
1	261	Base	1	
2		Hex. socket head bolt	4	W $\frac{1}{2}$ x2"L
3	215	T-bolt	2	W $\frac{1}{2}$ x2 $\frac{1}{4}$ L
4		Washer	2	$\phi\frac{1}{2}$
5		Hex. nut	2	W $\frac{1}{2}$
6	256,456	Saddle slide guide	1	
7	202	Saddle feed screw	1	W1"-8NC
8		Thrust bearing	2	NTM #2902
9	201	Guide plate	1	
10		Hex. socket head screw	4	M6x16 <sup>L</sup>
11	211	Graduation dial	1	
11-1		Hex. stud	1	M6x12 <sup>L</sup>
12	206	Hand wheel (small)	1	
13		Plastic handle	2	
14		Hex. screw	2	W5/16x3" <sup>L</sup>
15	257,457	Saddle	1	
16		Gib	1	
17		Hex.socket screw (cone-point)	4	W5/16x1 $\frac{1}{2}$ <sup>L</sup>
18		Hex. socket stud (cone-point)	5	W $\frac{1}{4}$ x1 $\frac{1}{2}$ <sup>L</sup>
19		Oiler	10	W $\frac{1}{4}$
20	214	Positive stop	1	
21		Hex. socket bolt	2	M6x12 <sup>L</sup>
22	258,458	Lower sliding table	1	
23		Gib	1	
24	205,405	Rack	1	
25		Hex. socket screw	2	M6x16 <sup>L</sup>
26	204	Table feed pinion	1	M2x18 <sup>T</sup>
27		Square pin	2	$\phi$ 5x32 <sup>L</sup>
28	203	Table feed shaft	1	
29	207	Hand wheel	1	
30	218	Washer	1	
31	212	Handle	1	
32		Plastic knob	1	W3/8 Thread
33		Hex. Socket screw	1	M8x16 <sup>L</sup>
34	220	Stop piece	2	
35	221	Sleeve	2	
36		Hex. socket screw	2	M5x10
37	213	Shaft	1	
38	246	Flat nut	2	M12
39		Hex. socket screw	2	M12x30 <sup>L</sup>
40	259,459	Upper table	1	

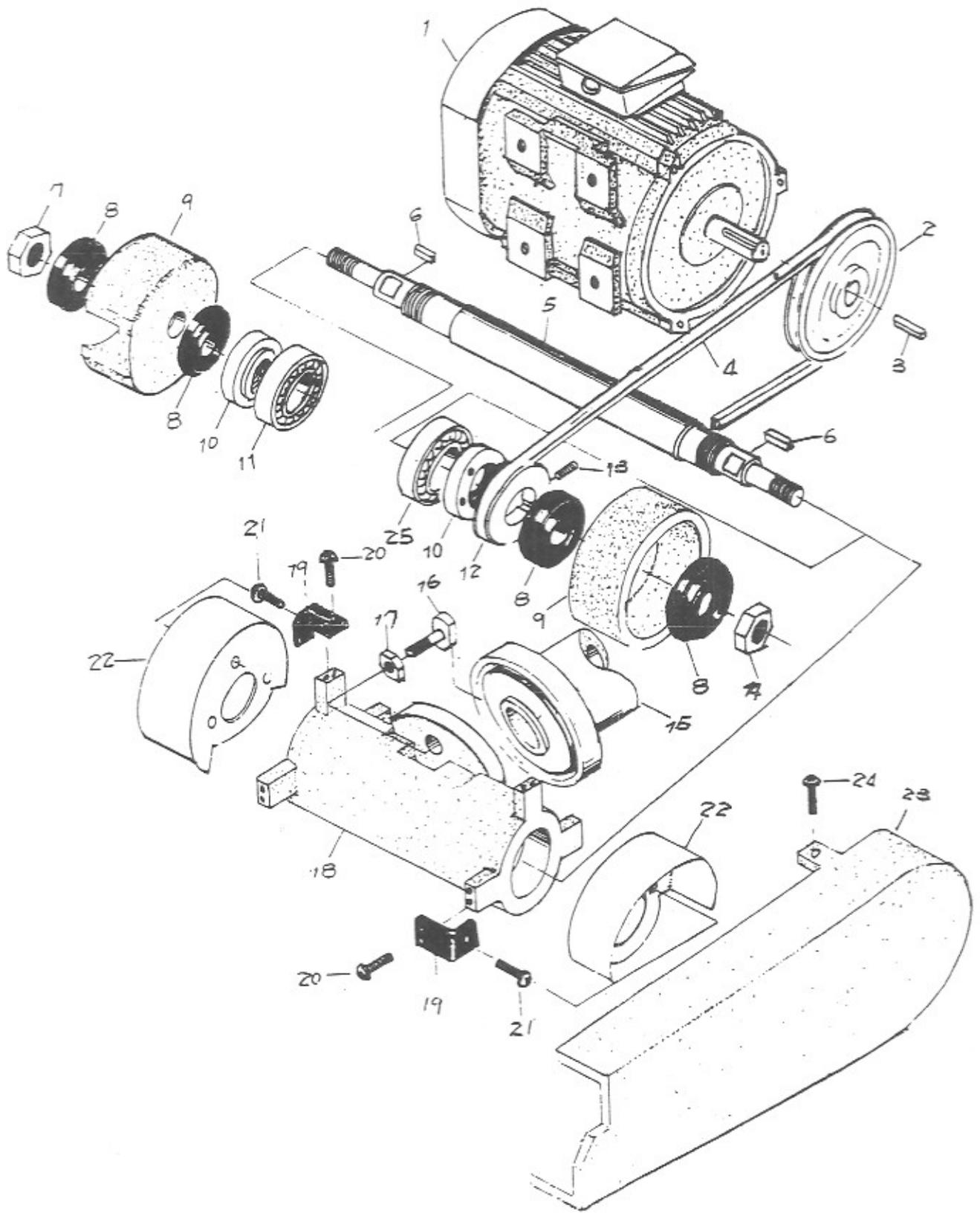


No.	Ser. No.	Description	Quantity	Remarks
1	(261)	Base	1	
2	253	Elevating column seat	1	
3		Hex. socket bolt	3	M12 x40 <sup>L</sup>
4		Plastic knob	1	W3/8
5		Key	1	M10x50 <sup>L</sup>
6	252	Elevating column	1	
7	209-1	Elevating sleeve	1	
8	209-2	Elevating screw	1	W3/4-16NC
9	254	Wheel head tilting seat	1	
10	265	Flat head nut	3	W $\frac{1}{2}$ Thread
11		Hex. socket bolt	3	W $\frac{1}{2}$ x25 <sup>L</sup>
12	285	Eccentric copper nut	1	M8-1.26P
13	286	Eccentric copper sleeve	1	
14		Hex. socket screw	1	M8x40 <sup>L</sup>
15	208-1	Elevating graduation dial	1	
16		Stud	1	M6x6 <sup>L</sup>
17	208-2	Elevating handwheel	1	
18		Pin	1	$\phi$ 5x40 <sup>L</sup>
19		Hex. bolt	1	W3/8x3" <sup>L</sup>
20		Plastic knob	1	$\phi$ 3/8
21		Hex. nut	1	W3/8
22	243	Angle column	1	
23		Hex. Socket screw	4	M6x16
24	244-1	Motor plate 30825947	1	
25	244-2	Motor plate 30826077	1	
26		Hex. Socket screw	2	M8x30 <sup>L</sup>
27		Hex. bolt	1	W3/8x3" <sup>L</sup>
28		Hex. nut	1	W3/8 Thread
29		Washer	2	$\phi$ 3/8
30		Hex. nut	1	W3/8
31		Hex. screw	4	W $\frac{3}{4}$ x3/4 <sup>L</sup>

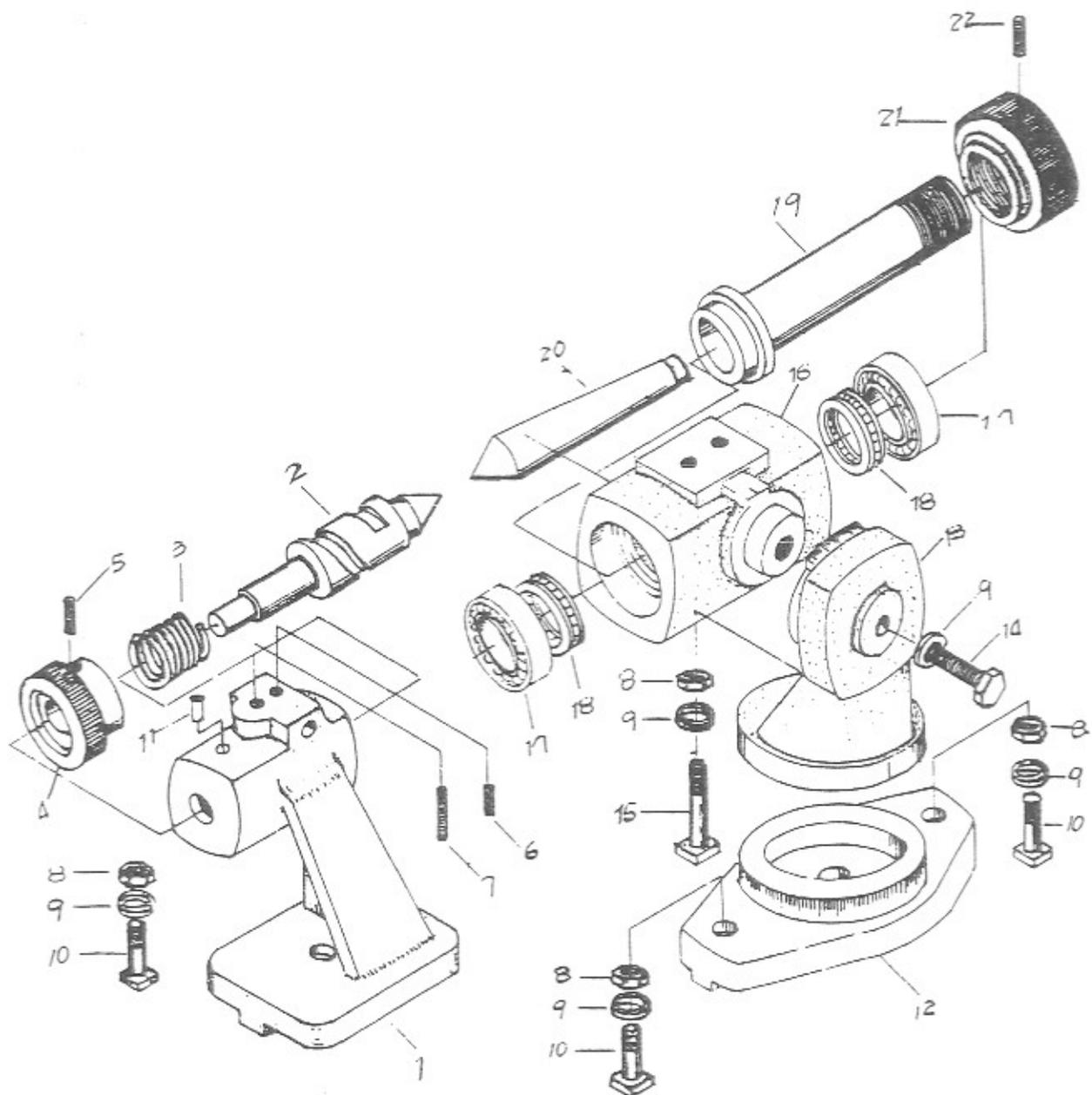


No.	Ser. No.	Description	Quantity	Remarks
1	235	Cutter arbor	1 set	1"
2		Grinding wheel (cup)	1	5"OD
3		Grinding wheel (cup)	1	
4	238-1	Tool-bit grinding attachment	1	
5		Hex. head screw	3	M8x40 <sup>L</sup>
6	238-2	Tool-bit grinding attachment base	1	
7	229	Hex. head bolt	1	W $\frac{1}{2}$ x4 $\frac{1}{2}$ <sup>L</sup>
8	224	Washer	1	$\phi\frac{1}{2}$
9	227,228	Tooth rest blade	1 set	
10		Phillips round head screw	2	W3/16x $\frac{1}{2}$ <sup>L</sup>
11		Tooth rest seat	1	
12		Stud	1	M8x10 <sup>L</sup>
13	226	Tooth rest base	1	
14	215,217	T-bolt	3	W $\frac{1}{2}$ -12NC
15		Washer	4	$\phi\frac{1}{2}$
16		Hex. nut	4	$\phi\frac{1}{2}$
17	237	T-handle allen wrench.	1	
18	236	Face-mill holder	1	
19		Washer	1	$\phi\frac{1}{2}$
20		Hex. nut	1	W $\frac{1}{2}$ -12NC
21	263	Center	1	MT#3

No.	Ser. No.	Description	Quantity	Remarks
1		Pump	1 set	
2		Collet chuck	1 set	
3		Drill grinding attachment	1 set	
4		Diamond grinding wheel	1set	4" OD
5		Disc grinding wheel	1	
6		Diamond dresser	1	



No.	Ser.No.	Description	Quantity	Remarks
1		Motor	1	½ HP
2	240	Pulley	1	
3		Square key	1	□5x30 <sup>L</sup>
4		Belt	1	No. 40
5	241-1	Grinding wheel spindle	1	
6		Square key	2	□6x14 <sup>L</sup>
7		Hex. nut	1	W5/8-11NC (left head)
8	225	Wheel flange	4	φ17
9		Grinding wheel (cup)	2	φ5"
10	241-2	Bearing lock nut	2	φ25-24NC
11		Bearing	1	#6205
12	239	Driven pulley	1	
13		Stud	1	M6x6
14		Hex. nut	1	W5/8-11NC
15	243	Angle column	1	
16	222	T-bolt	2	W½x40 <sup>L</sup>
17		Hex. nut	2	W½
18	242	Grinding wheel spindle housing	1	
19		Wheel guard clamp	6	
20		Phillips round head screw	12	W¼x½ <sup>L</sup>
21		Phillips round head screw	6	W3/16x3/8 <sup>L</sup>
22		Grinding wheel guard	2	
23		Belt guard	1	
24		Phillips round head screw	3	W¼x3/4 <sup>L</sup>
25		Bearing	1	#5205



No.	Ser. No.	Description	Quantity	Remarks
1	248	Tailstock (left)	1	
2	264	Tailstock center (left)	1	
3		Spring	1	$\phi 3/4$
4	232	Spring hand wheel	1	
5		Stud	1	M6 x 16 <sup>L</sup>
6		Stud	1	M6 x 10 <sup>L</sup>
7		Stud	1	M6 x 25L
8		Hex. nut	4	W $\frac{1}{2}$
9		Spring washer	5	W $\frac{1}{2}$ $\phi$
10	217	T-bolt	3	W $\frac{1}{2}$ x 40 <sup>L</sup>
11		Oiler	1	$\phi \frac{1}{4}$
12	249	Graduated collar base	1	
13	251	Swivel base	1	
14		Hex. head bolt	1	W $\frac{1}{2}$ x 1 $\frac{1}{2}$ <sup>L</sup>
15	215	T-bolt	1	W $\frac{1}{2}$ x 55L
16	250	Work head	1	
17		Bearing	2	#6006
18		Thrust bearing	2	#51106
19	231	Work head spindle	1	
20	263	Center	1	MT#3
21	233	Sleeve nut	1	
22		Stud	1	M8 x 20 <sup>L</sup>