

# INSTRUCTIONS AND PARTS LIST FOR ATLAS 6-INCH METAL TURNING LATHE

CATALOG NOS. 612 AND 618

## DESCRIPTION

This lathe is designed to be run by  $\frac{1}{4}$  or  $\frac{1}{3}$  H.P. 1740 R.P.M. motor.

After removing the lathe from the crate, clean it thoroughly. Remove the rust-proof coating from all unpainted surface with a cloth soaked in kerosene.

Floor legs and table boards make an ideal stand for the lathe. If the lathe is to be mounted on a bench, use one that is solidly built, well braced and with a good dry lumber top at least two inches thick. The precision of any lathe, regardless of size depends a great deal upon the rigidity of the base under the lathe bed.

**LEVELING THE LATHE**—Very Important—See mimeographed sheet. Also refer to mimeographed sheet for mounting the countershaft.

**LUBRICATION**—After lathe is correctly mounted, oil it completely at all points shown in lubrication chart, page 2.

## OPERATION AND CONTROLS

The operator should become familiar with the following controls.

1. The large handwheel on the front of the carriage propels the carriage along the lathe bed.

2. The ball crank is used for cross-feeding and the two handled crank operates the compound rest. Both have collars graduated in thousands of an inch. The compound feed can be turned in a complete circle, and it is graduated in degrees from 0 to 180, so that any angle can be cut.

3. The lever located on the right front side of the carriage operates the half-nut mechanism. When moved into the downward position, it engages the half-nut with the lead screw causing the carriage to move along the bed when the screw is turning. **CAUTION:** Before engaging the half-nut with the lead screw, be sure that the

square head cap screw located on the right top side of the carriage is loose, otherwise the carriage is locked and serious damage may result to the half-nut mechanism.

4. The reverse gear tumbler lever is located at the left end of the headstock. This lever is used to reverse or stop the rotation of the lead screw.

Three holes are drilled in the headstock giving three positions for the lever. The center hole is neutral position and the upper and lower holes are either forward or reverse position, depending upon the gear set-up used.

5. To engage the back gears, pull out the grooved pin which engages the large spindle gear with the spindle pulley. (Note: This can be readily accomplished with a screw driver or similar tool.)

The back gears are then brought into mesh by pulling the back gear lever forward. This lever is located on the extreme right end of the back-gear shaft.

To disengage the back gears, throw the back gear lever to the rear. Then engage the spindle gear pin into the pulley. This may readily be accomplished by pushing against the end of the pin with a screw driver and at the same time turning the spindle pulley by hand until the pin drops into one of the four recesses in the pulley.

6. The hand wheel on the tailstock operates the tailstock ram.

7. The ram clamp handle located on top of the tailstock securely locks the tailstock ram in place. Always loosen this clamp before proceeding to move the ram.

8. The belt tension lever located on the countershaft regulates the tension of the spindle belt. To tighten the belt move the lever backward. Move forward to loosen the tension, thereby allowing the belt to be easily changed to the different pulley steps.

## ADJUSTMENTS

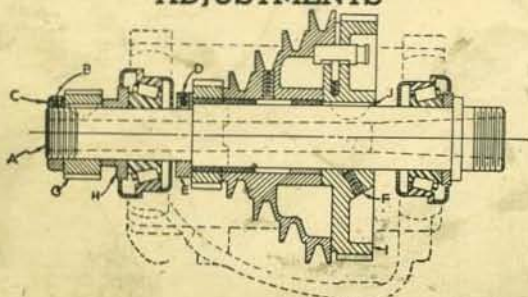


Fig. 2

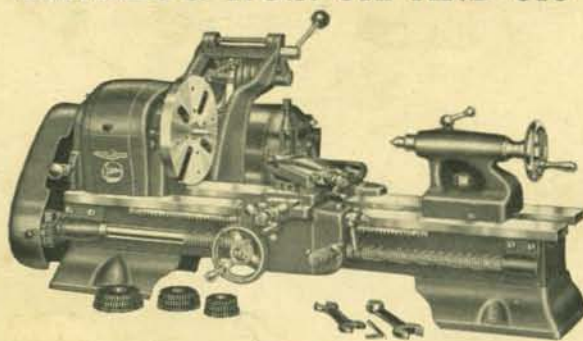


Fig. 1

## 1. ADJUSTMENTS OF TIMKEN BEARINGS. See Figure 2.

Adjustment of the Timken Bearing is not often necessary, but if the spindle spins too freely or play is noticeable when the spindle is pushed back and forth, the following simple procedure will adjust the headstock bearings:

Run the lathe between thirty minutes and an hour to warm up the spindle (a temperature rise of 50 degrees Fahr. increases the length of the spindle about .002 inch between

Bearings). Then loosen the set screw (B) on the thrust nut (C), at the extreme left end of the spindle, (A), and turn it up to a point where no play can be detected in the spindle. Advance this thrust nut  $\frac{1}{32}$  turn (equal to one tooth of the spindle gear) past that point in order to provide the correct pre-load. Tighten the set screw.

2. Three set screws are located on the back of the carriage for adjusting horizontal play between the carriage and the bed. These screws should be tightened just enough to give a firm sliding fit between carriage and bed.

Bearing plates on the carriage, which bear on the underside of both the front and the back of the bed ways, anchor the carriage firmly to the bed in a vertical direction. These bearings have laminated shims for adjustment of possible wear.

3. The gibs on the cross feed slide and the compound feed slide should be adjusted at regular intervals.

The cross slide gibs should always fit snugly, because the cross slide is in almost continual use. The compound slide gibs should be kept tight unless using the compound feed.

4. The ball and crank handles on the cross feed screw and the compound feed screw can be adjusted for play with the two nuts on the hubs of the handle. Turn the inner nut and lock with the outer nut. An extremely tight fit is likely to result in a jerky feed—the turning force keeps these slides firm against the screw, and play in the handles does not effect the accuracy of the work, a nice working snug fit is ideal.

5. The side tailstock bearing on the rear bed way is gibbed for take-up adjustment.

Two gib screws on end of the gib, regulate the thickness of the tailstock between the bed ways. These two screws should be adjusted evenly so that both ends of the gib will bear against the way with the same amount of pressure.

The tailstock can be set over  $\frac{9}{16}$  inch for turning tapers. This is done by simply adjusting the two headless screws after loosening the tailstock clamp nut.

## PROPER CUTTING SPEEDS

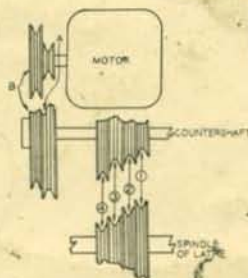


Fig. 3

Spindle Speed in Revolutions per Min.				
DIRECT CONE DRIVE				
Motor Belt Position	Spindle Belt Position			
	1	2	3	4
A	365	550	820	1250
B	940	1925	2125	3225

BACK GEAR DRIVE				
Motor Belt Position	Spindle Belt Position			
	1	2	3	4
A	54	82	122	187
B	140	287	317	481

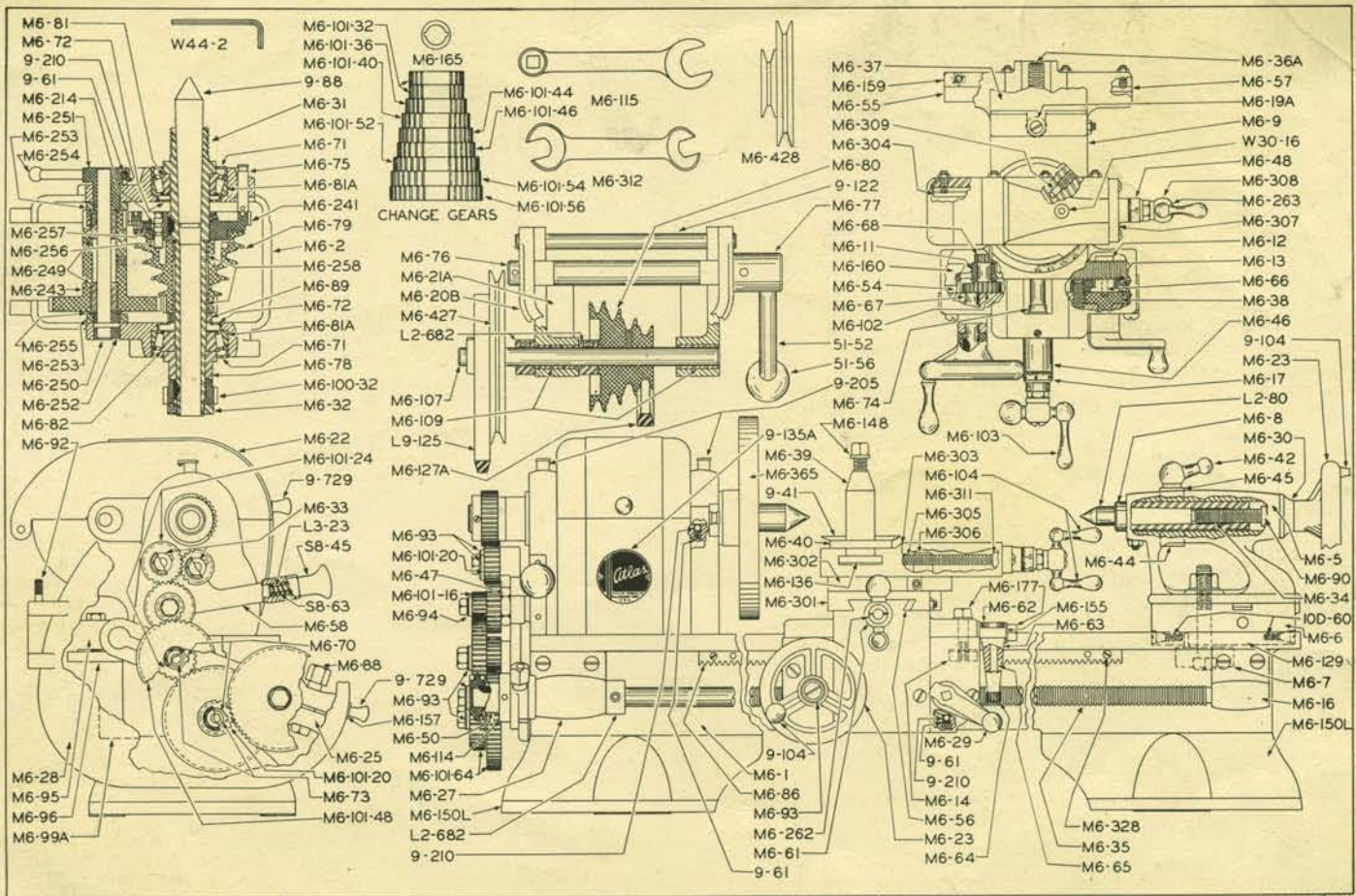
Much of the success in metal cutting depends upon the choice of the cutting speeds. Too slow a speed not only wastes time, but leaves a rough finish—too high a speed burns the tool. The chart above shows the different speeds available and the set-up for each.

## MOUNTING THE WORK

The most common methods of holding the work in the lathe are: between centers, in a chuck, on the face plate, in a collet and on a mandrel.

Whenever practicable, the work is held between centers. This method is usually more accurate and has the advantage of permitting removal and replacement of the work without affecting accuracy.

(Continued on Page 4)



ATLAS M6 LATHE DRAW SH 2-14-48 JB

Fig. 4

PART NO.	NAME	PRICE
<b>HEADSTOCK ASSEMBLY</b>		
M6-2	Headstock	\$10.30
M6-22	Headstock Cover	1.25
M6-31	Head Spindle	9.05
M6-32	Head Spindle Adj. Collar	.50
9-61	Spring	.12
M6-71	Dust Cover (Large) 2 Req. (ea.)	.25
M6-72	Dust Cover (Small) 2 Req. (ea.)	.25
M6-75	Index Pin	.30
M6-78	Rear Bearing Spacer	.45
M6-79	Spindle Pulley & Back Gear	2.60
M6-81B	Spindle Bearing Cone & Cup (front)	5.75
M6-82B	Spindle Bearing Cone & Cup (rear)	5.75
9-88	Center—No. 2 Morse Taper	1.55
M6-89	Spindle Pulley Gear Spacer	.45
M6-100-32	Spindle Gear	.55
9-196	No. 3 Woodruff Key	.12
9-205	Oiler (2 Req.) ea.	.20
9-210	3/16" Ball	.12
M6-214	1/8" Ball	.12
M6-241	Spindle Back Gear (large)	2.60
M6-243A	Back Gear with Bushings	6.55
M6-249	Back Gear Bushing (2 Req.) ea.	.30
M6-250	Back Gear Shaft	.60
M6-251	Back Gear Eccentric (Right)	.45
M6-252	Back Gear Eccentric (Left)	.45
M6-253	Back Gear Set Collar	.30
M6-254	Eccentric Handle	.40
M6-255	Back Gear Washer	.12
M6-256	Back Gear Lock Pin	.20
M6-257	Back Gear Plunger Spring	.12
M6-258	Spindle Pulley Bushing	.45
9-729	Bakelite Knob	.20
<b>TAILSTOCK ASSEMBLY</b>		
M6-5	Tailstock	5.30
M6-6	Tailstock Base	1.90
M6-7	Tailstock Clamp	.45
M6-8	Tailstock Ram	2.80
M6-23	Handwheel with Handle	1.25
L2-25	Tailstock Set-over Screw (2 Req.) ea.	.06
M6-30	Tailstock Screw Bearing	.55
M6-34	Tailstock Ram Screw	.95
M6-42	Tailstock Ram Lock Handle	.40
M6-44	Tailstock Ram Lock Sleeve	.20
M6-45	Tailstock Ram Lock Sleeve	.20
10D-60	Tailstock Base Gib Adj. Screw (2 Req.) ea.	.12
L2-80	Center—No. 1 Morse Taper	1.25
M6-90	Tailstock Ram Screw Thrust Nut	.20

PART NO.	NAME	PRICE
9-104	Handwheel Handle	.25
M6-129	Tailstock Gib	.40
<b>BED ASSEMBLY</b>		
M6-1	Bed 24" long	Price on application
L9-1	Bed 30" long	Price on application
M6-150L	Bench Leg (2 Req.) ea.	1.55
<b>CARRIAGE AND RACK ASSEMBLY</b>		
M6-9	Carriage	8.55
M6-11	Carriage Traverse Gear Bearing	.40
M6-12	Split-nut (1 pair)	.95
M6-13	Split-nut Guide	.75
M6-14	Carriage Clamp	.45
M6-17	Carriage Graduated Collar	.60
M6-19A	Carriage Slide Nut	.75
M6-23	Handwheel with Handle	1.25
M6-29	Split-nut Lever	.75
M6-36A	Carriage Slide Screw	1.20
M6-38	Split-nut Cam	.40
M6-46	Carriage Slide-screw Bearing	.60
M6-54	Carriage Bearing Plate (front)	.50
M6-55	Carriage Bearing Plate (rear)	.50
M6-57	Carriage Gib	.45
9-61	Spring	.12
M6-61	Cross Feed Ball Crank	.95
M6-62	Threading Dial	.45
M6-63	Threading Dial Body	.50
M6-64	Threading Dial Pinion	.45
M6-65	Threading Dial Shaft	.25
M6-67	Carriage Handwheel Shaft & Pinion	1.20
M6-68	Carriage Traverse Shaft & Pinion	.95
M6-74	Carriage Screw Thrust Washer	.25
M6-86	Carriage Traverse Rack (for 24" Bed)	1.90
L9-86	Carriage Traverse Rack (for 30" Bed)	2.25
M6-93	Handwheel Washer	.12
M6-102	Carriage Traverse Gear	.70
M6-103	Ball Crank Handle (large)	.25
9-104	Handwheel Handle	.25
M6-155	Thrd'ing Dial Scr. Washer (not illus.)	.12
M6-159	Carriage Shim (rear)	.30
M6-160	Carriage Shim (front)	.30
M6-177	Threading Dial and Carriage Lock Screw	.25
9-210	3/16" Ball	.12
M6-262	Cross Feed Ball Crank Nut	.20
<b>COMPOUND REST ASSEMBLY</b>		
M6-37	Carriage Slide Guard	.45

PART NO.	NAME	PRICE
M6-48	Graduated Collar	.55
M6-56	Cross Feed Gib	.40
M6-104	Ball Crank Handle (small) (2 Req.) ea.	.25
M6-263	Compound Ball Crank Nut	.20
M6-301	Compound Rest Swivel (lower)	4.70
M6-302	Compound Rest Swivel (upper)	3.15
M6-303	Compound Rest Tool Post Slide	3.00
M6-304	Tool Post Slide Gib	.25
M6-305	Compound Rest Feed Screw	.75
M6-306	Tool Post Slide Nut	.75
M6-307	Compound Rest Thrust Plate	.55
M6-308	Comp. Rest Ball Crank	.95
M6-309	Compound Lock Plunger Pin (2 Req.) ea.	.25
M6-311	Compound Rest Feed Screw Collar	.25
W44-2	Allen Wrench 1/4"	.12
<b>LEAD SCREW AND FEED ASSEMBLY</b>		
M6-16	Lead Screw Bearing (right)	.95
L3-23	Reverse Tumbler Plunger	.50
M6-25	Change Gear Bracket	1.20
M6-27	Lead Screw Bearing (left)	1.50
M6-33	Tumbler Gear Bushing (2 Req.) ea.	.20
M6-35	Lead Screw (for 24" Bed)	2.30
L9-35	Lead Screw (for 30" Bed)	2.60
S8-45	Reverse Tumbler Knob	.30
M6-47	Spindle Gear Stud	.55
M6-50	Lead Screw Gear Spacer	.30
M6-58	Reverse Gear Tumbler	.75
S8-63	Plunger Spring	.20
M6-70	Compound Gear Bushing (2 Req.) ea.	.30
BD3-73	Change Gear Stud Bolt (2 Req.) each	.06
M6-73	Change Gear Stud Sleeve (2 Req.) ea.	.40
M6-88	Change Gear Bracket Nut	.20
M6-93	Change Gear Washer (6 Req.) ea.	.12
M6-101-16	Compound Tumbler Gear (16-32 teeth)	.95
M6-101-20	Change Gear—20 teeth (2 Req.) ea.	.30
M6-101-24	Change Gear—24 teeth (2 Req.) ea.	.50
M6-101-32	Change Gear—32 teeth (2 Req.) ea.	.55
M6-101-36	Change Gear—36 teeth	.60
M6-101-40	Change Gear—40 teeth	.70
M6-101-44	Change Gear—44 teeth	.75
M6-101-46	Change Gear—46 teeth	.80
M6-101-48	Change Gear—48 teeth	.90
M6-101-52	Change Gear—52 teeth	.95

ORDERING INFORMATION: Please order all repair parts by Part Number and Name. Be sure to give Serial Number of lathe which is located on top face of front bed way at extreme right end. A minimum charge of 25c will be made on any order. Prices do not include postage or express charges.

**ATLAS PRESS COMPANY**

**KALAMAZOO, MICHIGAN**

Part No.	NAME	Price	Part No.	NAME	Price	Part No.	NAME	Price
M6-101-54	Change Gear—54 teeth	1.00	M6-76	Rocker Shaft	.95	M6-127A	Spindle Belt	.95
M6-101-56	Change Gear—56 teeth	1.05	M6-77	Rockershaft Handle Hub	.60	M6-365	Face Plate	2.50
M6-101-64	Change Gear—64 teeth (2 Req.) ea.	1.20	M6-80	Countershaft Pulley (4 step)	1.50	9-385A	Tool Bit (not illus.)	.20
M6-114	Lead Screw Collar	.40	M6-107	Countershaft Spindle	.75	M6-428	Motor Pulley	1.20
M6-165	Gear Spacer	.40	M6-109	Oilite Bearing (2 Req.) ea.	.30	METRIC FEED SCREWS (Accessory)		
M6-312	Wrench	.55	9-122	Hanger Hinge Pin	.20	M6-17M	Carriage Graduated Collar	.60
L2-682	Lead Screw Collar (Right)	.25	M6-427	Countershaft Pulley (2 step)	1.55	M6-19AM	Carriage Slide Nut	.75
CHANGE GEAR GUARD ASSEMBLY			L2-682	Collar (2 Req.) ea.	.25	M6-36AM	Carriage Slide Screw	1.20
M6-28	Change Gear Guard	2.20	TOOL POST ASSEMBLY			M6-48M	Graduated Collar	.55
M6-92	Change Gear Guard Hinge Pin	.25	M6-39	Tool Post	1.55	M6-305M	Compound Rest Feed Screw	.75
M6-95	Change Gear Guard Bracket	.95	M6-40	Tool Post Washer	.30	M6-306M	Tool Post Slide Nut	.75
M6-96	Change Gear Guard Bracket Plate	.40	9-41	Tool Post Rocker	.30	M6-311M	Compound Rest Screw Collar	.25
M6-157	Latch Spring	.20	M6-136	Tool Post Anchor	.30	REVERSING SWITCH (ACCESSORY)		
9-729	Bakelite Knob	.20	M6-148	Tool Post Set Screw	.25	M6-420	Reversing Switch	3.75
COUNTERSHAFT ASSEMBLY			MISCELLANEOUS			M6-421	Reversing Switch Bracket	2.05
M6-20B	Countershaft Bracket	3.95	M6-99A	Threading Chart	.40	9-424C	T and B Connector (2 Req.) ea.	.20
M6-21A	Countershaft Hanger	1.55	M6-115	Combination Wrench	.55	M6-425	Conductor Leads	.95
51-52	Rockershaft Handle	.40	L9-125	Motor Belt	.75	M6-426	Outlet Cord for Reversing Switch	1.25
51-56	Rockershaft Handle Ball	.20						

## LUBRICATION CHART

See Fig. 5

1. Place a few drops of oil on the rockershaft bearings and cams every time the lathe is in use.

2. Countershaft Bearings—Oil with No. 10 motor oil or equivalent every time lathe is used.

3. Motor Bearings—Sleeve-type motors have two oil cups which should be filled once a week with S.A.E. No. 10 motor oil or equivalent. Ball bearing motors have a sealed-in type bearing—every six months the small headless screw in these bearings should be removed and a moderate quantity of automotive cup grease forced around the bearings.

4. Left and Right Headstock Bearings—Oil with No. 10 motor oil or equivalent every time the lathe is used.

5. Spindle Pulley—Every time the lathe is used in back gear, remove the small screw in the bottom of the second step of the idler pulley and oil freely with No. 10 motor oil or equivalent. Replace screw.

6. Back Gears and Change Gears—A small amount of grease, preferably graphite grease, applied to the gear teeth will aid in obtaining smoother, more quiet operation.

7. Change Gear Bearings—Put a few drops of No. 10 motor oil or equivalent on the change gear bearings each time the lathe is used.

8. Lead Screw Bearing (left end of lathe)—Put a few drops of No. 10 motor oil or equivalent in the oil hole on top of the bearing every time the lathe is used.

9. Carriage Traverse Gear Bracket—Every time the lathe is in use, put a few drops of No. 10 motor oil in oil hole on top of gear bracket on back of carriage apron.

10. Carriage Handwheel Bearing—Put a few drops of No. 10 motor oil or equivalent in oil hole every time lathe is used.

11. Half-Nut Lever Bearing—Put a few drops of No. 10 motor oil or equivalent in the oil hole every time lathe is used.

12. Lead Screw—About once a month clean the lead screw threads with kerosene and a small stiff brush and apply a small amount of No. 10 motor oil or equivalent.

13. Rack (on bed, under front way)—About once a month apply a

small amount of cup grease to the rack after cleaning with kerosene and a small stiff brush.

14. Lead Screw Bearing (right end of lathe)—Put a few drops of No. 10 motor oil or equivalent in the hole on top of the bearing every time the lathe is used.

15. Place a few drops of oil between the handwheel and screw bearing whenever using lathe.

16. Tailstock Ram—Keep the outside surface of the tailstock ram well oiled.

17. Lathe Bed Ways—Keep the bed ways oiled at all times with No. 10 motor oil or equivalent and free from chips. Wipe off the ways before using and cover with fresh oil. Always leave a generous film of oil on the ways when the lathe is not in use. The lathe should be completely covered when not in use.

18. Compound Slide Screw—Every time lathe is used put a few drops of No. 10 motor oil or equivalent between the graduated collar and bearing plate and on the threads.

19. Cross Slide Screw—Put a few drops of No. 10 motor oil or equivalent in the oil hole above the front cross slide screw bearing after removing the small screw. Replace the screw. This should be done every time the lathe is used. Clean the cross slide screw regularly with a small stiff brush. Oil the screw threads by running compound rest back and forth.

20. Cross Slide Ways—Clean regularly and apply a liberal quantity of No. 10 motor oil or equivalent to the ways whenever the lathe is used.

21. Compound Slide Ways—Clean regularly and apply a liberal quantity of No. 10 motor oil or equivalent to the ways whenever the lathe is used.

22. Thread Dial—Once a week put a few drops of No. 10 motor oil or equivalent around the rim of the thread dial.

23. Back Gear Spindle—Every time the back gears are used, remove the small screw in the center of the back-gear spindle and oil freely with No. 10 motor oil or equivalent. Replace screw.

24. Back Gear Eccentrics (right and left)—Oil occasionally with No. 10 motor oil or equivalent.

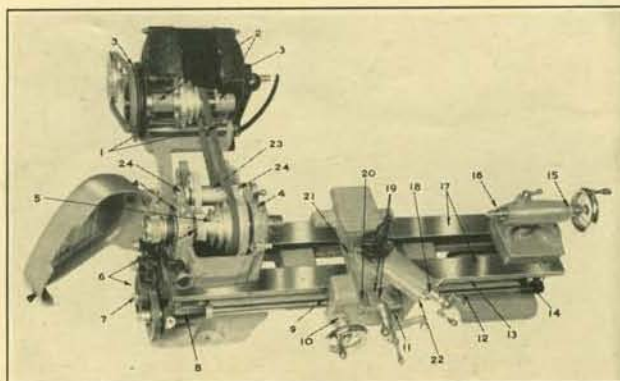


Fig. 5

# INSTRUCTIONS (Continued)

On round work, centers are usually located with either the hermaphrodite caliper or the center head attachment for a steel scale. In the centering of square, hexagon and other regular-sided stock, lines are scribed across the ends from corner to corner. The work is then center punched at the point of intersection. A little chalk rubbed over the end of the work before scribing makes the marks easily seen.

After the ends have been countersunk, the work is mounted between centers. Be sure that the "Tail" or bent portion of the lathe dog fits into the face plate slot **WITHOUT RESTING** on face plate.

Bring the tailstock up close to the end of the stock and lock in place. Turn the tailstock center into the countersunk hole and lock in such a position that the play is taken up between centers, but not so tight that the work will not freely rotate. **PLACE PLENTY OF OIL AT THE POINT OF BEARING ON THE TAILSTOCK CENTER.**

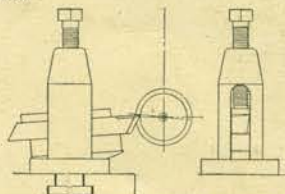
Much of the work to be turned or threaded on the lathe is not of a size or shape which permits mounting between centers. In such cases it is customary to mount the work on a face plate or hold it in a chuck.

If only one chuck is to be purchased, it should be the four-jaw independent chuck. The four jaws are adjusted separately and are reversible so that work of any shape can be clamped from the inside or the outside.

Mounting the work in the four-jaw chuck is largely a matter of centering. Determine the portion of the rough work that is to run true, then clamp the work as closely centered as possible, using as a guide the concentric rings on the face of the chuck. Test for trueness, marking the high spots with chalk rested against the tool post or a tool bit mounted in the tool post. The chuck jaws should be adjusted until the chalk or tool bit contacts the entire circumference of the work.

## CUTTING TOOL BITS

It is wise for the unskilled worker to purchase already formed tools for the particular operations he wishes to perform. Tool bits are not expensive and the purchase of a set of these will probably prove the cheapest and most satisfactory way out in the long run.



Cutting Brass or Soft Metal  
Fig. 7

## ANGLE OF TOOL TO WORK

The angle of the cutting tool to the work varies according to hardness of the metal being cut. The accompanying drawings show in general the proper angles to be used for the different classes of metals. Refer to these drawings before taking a cut until you are sure you know the proper angle for each metal.



Cutting Mild Steel or Cast Iron  
Fig. 8

## CUTTING SPEEDS

The speed a cut is taken varies according to the kind of metal being cut and the kind of cut—whether roughing or finishing. Brass may be cut faster than steel and a light cut faster than a heavy one.



Cutting Carbon Steel  
Fig. 9

## SETTING THE TOOL TO THE WORK

Cuts, especially heavy ones, should always be made toward the headstock. In this way most of the pressure is toward the live center which revolves with the work. Cutting toward the tailstock puts a heavy additional pressure on the tailstock center and is quite likely to damage the center.

The type of tool holder, and the way it is set to the work, should always be such that it tends to swing away from the work on heavy cuts. When cutting at an angle with the compound rest, the tool should be set at a right angle to the surface of the cut, not at a right angle to the center line of the lathe.

Facing cuts represent different cutting relations and tool angles, and tools should preferably be special ground for that purpose. Smoother cutting and a finer finish can be obtained generally by cutting toward the outside—that is, feeding from the center of the work out.

If the tool is ground properly, the point of the tool will not have to be set above or below the center line of the work, but should be set on the center line.

## FINISHING AND POLISHING

First, the work is filed until the tool marks disappear. Never hold the file stationary while the work is revolving. Take full-cutting strokes across the work with a slow spindle speed so that the "bite" of the file can be felt. Always file dry and keep the file perfectly clean and free from oil. Filing is also a favorite method for such jobs as rounding work corners, smoothing concave cuts, finishing off handwheels and similar jobs.

## INDEXING

The spindle pulley is provided with 60 indexing holes which may be engaged by means of the knurled pin on the upper right end of the headstock. These indexing holes are useful for such operations as spacing, fluting, reeding, serrating, sprocket—and spoke-spacing, etc.

Divisions desired	1	2	3	4	5	6	10	12	15	20	30	60
No. of Spaces	60	30	20	15	12	10	6	5	4	3	2	1
Degrees of Arc	360	180	120	90	72	60	36	30	24	18	12	6

## READING THE GEAR CHART

To simplify gear set-ups the three different gear bracket positions have been assigned letters. These designations will be found in Figure 1 on the Threading Chart as positions A, B, and C.

"Back position" means the position TOWARD the headstock. "Front position" is the position AWAY FROM the headstock.

Two representative set-ups are given in detail below.

### GEAR SET-UP FOR 36 THREADS PER INCH (See Figure 10)

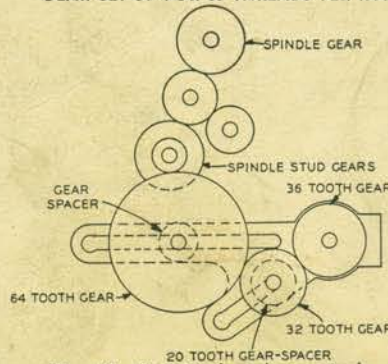


Fig. 10—For 36 threads per inch

When setting up the gear train be sure to allow sufficient clearance between two meshing gears. Gear clearance does not reduce the accuracy of a thread cutting operation because all the back lash in the gears is taken up in one direction.

(1) Place 36 tooth gear on front position of screw stub.

(2) Place 20 tooth gear and 32 tooth gear on sleeve and mount in Position C on gear bracket with 32 tooth gear in front position. Tighten so that 32 tooth gear meshes with gear in screw position. The 20 tooth gear is a spacer.

(3) Place 64 tooth gear and a steel spacer on sleeve and mount in Position A on gear bracket with 64 tooth in front position. Tighten so that 64 tooth gear meshes with 32 tooth gear in Position C.

(4) Swing entire gear bracket upward and tighten so that the 64 tooth gear meshes with the 16 tooth spindle gear.

## GEAR SET-UP FOR .0024" CARRIAGE FEED

See Fig. 11

(1) Place 64 tooth gear in front position on screw stub.

(2) Place 64 tooth gear and 20 tooth gear on sleeve in position C with the 20 tooth gear in front position. Tighten so that the 20 tooth gear meshes with the 64 tooth gear.

(3) Place 48 tooth gear and 24 tooth gear on sleeve in position A with 48 tooth gear in front position. Tighten in place so that 24 tooth gear meshes with 64 tooth gear in position C.

(4) Swing entire gear bracket upward and tighten so that the 48 tooth gear meshes with the 16 tooth spindle gear.

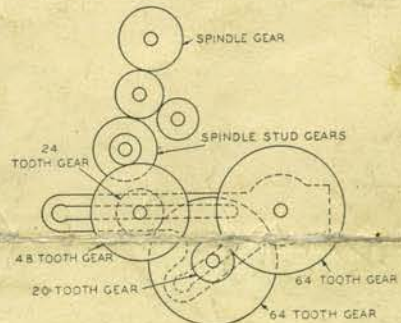


Fig. 11

## THREADING\*

Only the operation connected with the cutting of the 60 degree thread will be described. INFORMATION WITH REGARD TO THE OTHER VARIOUS TYPES OF THREADS CAN BE FOUND IN OUR "MANUAL OF LATHE OPERATIONS" WHICH WILL BE SENT POSTPAID UPON RECEIPT OF \$1.00.

After the work has been properly prepared for threading, set the compound rest at a 29 degree angle so that the tool bit faces in the direction the carriage will travel. Mount the tool holder in the tool post so that the point of the tool is exactly on the lathe center line—tighten the tool post screw just enough to hold the tool holder. Then use a center or thread gauge to set the tool point at an exact right angle to the work. Tap lightly on the back of the tool holder when bringing into position. With the tool point at an exact right angle to the work, retract center line position and tighten tool post screw.

Check the change gear assembly and the tumbler gear lever so that the carriage will move in the proper direction. Adjust belts for a speed of 54 R.P.M.

Set the compound rest approximately in the center of its ways and advance the cross feed so that it is set at 0 with the tool close to the work. With the point of the tool about an inch to the right of the start of the thread, advance the tool with the compound rest so that the first cut will be about .003 inch.

Start the lathe and engage the half-nut lever on the carriage. Apply plenty of lubricant to the work. When the tool point has traveled the desired length along the work, raise the half-nut lever, back out the cross feed a turn or two, and return the carriage by hand to the starting point. Advance the cross feed to its original position at 0, advance the compound rest for the desired depth of cut, and engage the half-nut lever for the second cut. All feeding is done with the compound rest. Follow the same routine on all succeeding cuts.

## RULES FOR THE USE OF THE THREADING DIAL

When cutting on even-numbered thread such as 8, 10, 12, 14, etc., (per inch), engage the half-nut lever when the stationary mark on the threading dial is in line with any one of the two opposing marks in the center portion of the dial.

When cutting any other threads (9, 11, 13 and 27 per inch) engage the half-nut lever when the stationary mark on the threading dial is in line with the same mark on the rotating dial.

Precautions: Never disengage the half-nut lever in the middle of the thread without first backing out the tool with the cross-feed.

NOTE: Complete information for thread cutting and coil winding operations are contained in the "Threading Information" booklet supplied with this lathe.