

CUTTING A SCREW THREAD  
ON A 9-INCH JUNIOR LATHE

*Booklet Number 22  
Illustrating the ~*

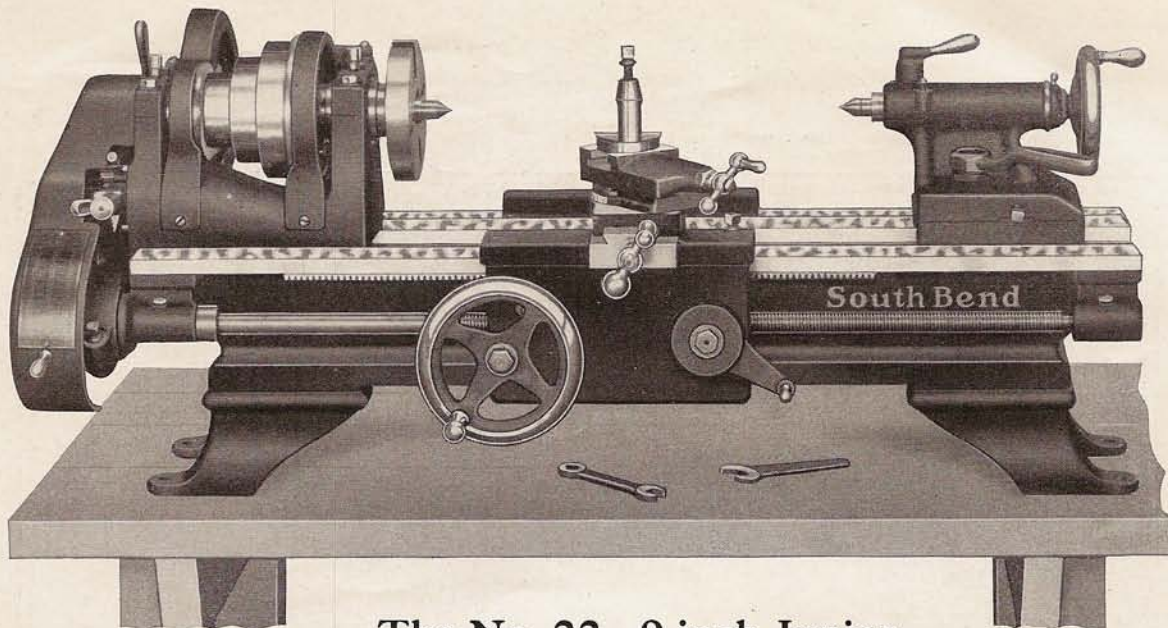
## **9-In. JUNIOR BACK GEARED SCREW CUTTING LATHE**

*In Various Types with Attachments,  
Tools and Accessories*

### **SOUTH BEND LATHE WORKS**

*425 East Madison Street, South Bend, Indiana*





## The No. 22—9-inch Junior Back Geared Screw Cutting Precision Bench Lathe

**A Practical Lathe.** The No. 22—9-inch Junior South Bend Screw Cutting Lathe with overhead countershaft drive is practical for general work in the machine shop, and for fine precision tool and instrument work. It is built of the same parts, has the same head stock, tail stock and bed as our 9-inch Standard and Quick Change Gear Lathe which we have been manufacturing for more than twenty years.

**Power Feed Carriage.** The carriage has power feed obtained by clamping the split nuts on the lead screw. This power feed can be adjusted from fine to coarse by the change gears included in the equipment of the lathe. The Quick Acting Latch Reverse provides instant changing of the direction of power feed either to the right or left.

**Cutting Screw Threads.** The following standard screw threads, including 11½ pipe thread, can be cut: 4, 5, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 36, 40.

**Types of Drives.** The No. 22—9-inch Junior Lathe may be driven by four types of drives: (1) Overhead Countershaft, (2) Self-Contained Unit Motor Drive, (3) Simplex Motor Drive, (4) Silent Chain Motor Drive with Floor Legs. These four types of drives are illustrated and described on pages fourteen and fifteen.

**Precision and Accuracy.** Each of the No. 22—9-inch Junior Lathes undergo thirty-three accuracy tests during the process of manufacture. In addition there are more than fifteen inspection tests made on the various parts of this Lathe. Before the Lathe is shipped it is set up and operated under a belt for the final tests and inspection.

**Attachments.** Draw-in Collet Chuck, Milling Attachment, Taper Attachment and many other practical labor saving attachments have been developed for use with South Bend Lathes. These attachments are interchangeable and may be ordered with the lathe or later. See pages 10, 11 and 12. Tools, chucks and accessories are fully illustrated, described and priced on page 13.

**Equipment.** The prices listed below include the Double Friction Reversing Countershaft, Change Gears for cutting right or left hand screw threads and all equipment illustrated on the opposite page.

**Power.** The power required to drive the No. 22—9-inch Junior Lathe is ¼-horsepower, which may be driven by overhead countershaft or by motor drive from an ordinary electric lamp socket. This gives sufficient power to enable the Lathe to reduce a steel shaft from 2¾" to 2" in one cut. See page five.

### Features

- Back geared head stock gives six spindle speeds.
- Cone pulley balanced for operating at high speeds.
- Hollow spindle, made of special carbon steel, accurately ground.
- Quick acting spring latch reverse for power feeds and thread cutting.
- Phosphor bronze spindle bearings, adjustable for wear.
- Patent oil cups protect spindle bearings from dust and grit.
- Graduated compound rest swivels to any angle for turning bevels.
- Tail stock is arranged for set over for taper turning.
- Improved plug type binder for locking tail stock spindle.
- Self-ejecting hardened tool steel tail stock center.
- Carriage locks to lathe bed for accurate facing.
- Micrometer collar on cross feed screw and compound rest screw.
- All V-ways and dovetails accurately hand scraped.
- All shafts and spindles accurately finished by grinding.
- Precision lead screw for cutting accurate screw threads.
- Bull gear clamp quick acting, no wrench required.

### Specifications

- Swing over Bed..... 9¼ in.
- Swing over Carriage..... 6⅜ in.
- Size of Head and Tail Spindle Centers..... No. 2 Morse Taper
- Size of Spindle Nose..... 1½ in. diam., 8 Threads
- Size of Hole through Spindle..... ¾ in.
- Width of Cone Pulley Belt..... 1 in.
- Back Gear Ratio..... 5.4 to 1
- Spindle Speeds..... 48, 78, 134, 248, 403 and 714 R. P. M.
- Countershaft Speed..... 300 R. P. M.
- Maximum Draw-in Collet Chuck Capacity..... ½ in.
- Countershaft Friction Clutch Pulley size..... 6½ in. x 1¾ in.
- Travel of Tail Stock Spindle..... 2⅜ in.
- Angular Travel of Compound Rest Top..... 2 in.
- Size of Lathe Tool Shank..... ⅝ in. x ¾ in.
- Size of Cutter Bit for Patent Tool Holder..... ⅜ in. x ⅜ in.
- Thread Cutting Range..... 4 to 40 per in.

### Specifications and Net Factory Prices of Lathe Including Overhead Countershaft and Equipment

Catalog No. of Lathe	Swing Over Bed	Length of Bed	Between Centers	Power Required	Countershaft Speed	Weight Crated	Price F. O. B. South Bend
22-YB	9¼ in.	3 ft.	18 in.	¼ H. P.	300 R. P. M.	375 lbs.	\$150.00
22-ZB	9¼ in.	3½ ft.	23 in.	¼ H. P.	300 R. P. M.	400 lbs.	156.00
22-AB	9¼ in.	4 ft.	29 in.	¼ H. P.	300 R. P. M.	425 lbs.	162.00

If floor legs are wanted instead of bench legs, add to prices listed above \$10.00



## Features of the No. 22—9-inch Junior Lathe

### Steel Head Stock Spindle and Bronze Bearings

The spindle is made of special carbon steel with all bearing surfaces accurately finished by grinding. A  $\frac{3}{4}$ -inch hole permits the machining of bars or rods through the draw-in collet chuck or lathe chuck. The spindle nose is  $1\frac{1}{2}$ -inch diameter, 8 threads per inch and can be fitted with a 6-inch lathe chuck.

The Phosphor Bronze Spindle Bearings are designed for heavy duty service and are adjustable for wear. They are hand scraped to both the spindle and the bearing housings insuring perfect alignment, long wear and accuracy of the spindle.

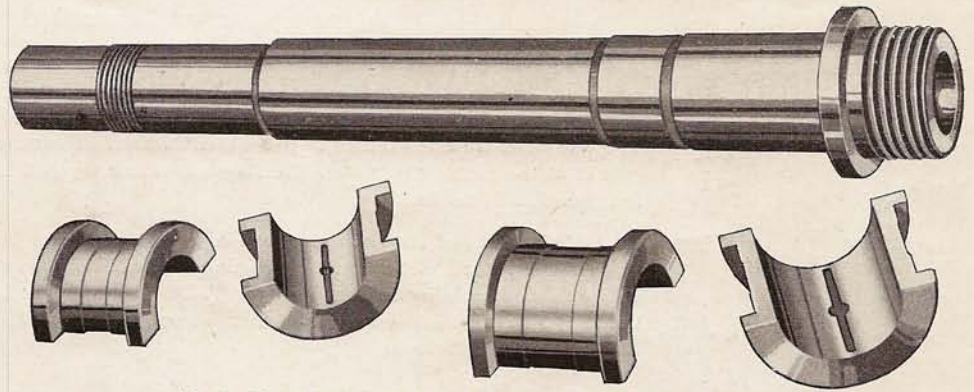
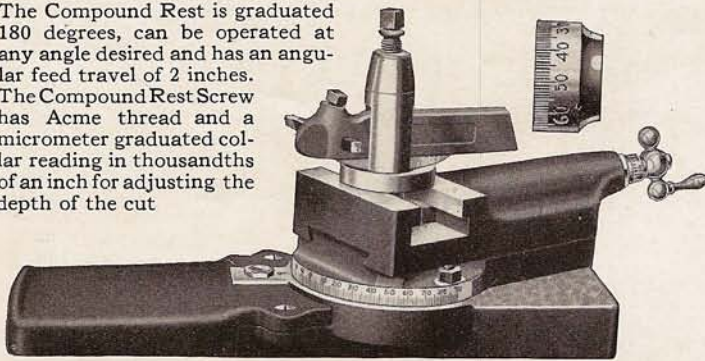


Fig. 3. Head Stock Spindle and Phosphor Bronze Spindle Bearings

### Graduated Compound Rest

The Compound Rest is graduated 180 degrees, can be operated at any angle desired and has an angular feed travel of 2 inches. The Compound Rest Screw has Acme thread and a micrometer graduated collar reading in thousandths of an inch for adjusting the depth of the cut



### Index for Cutting Screw Threads

A Metal Index Plate attached to the No. 22—9-inch Junior Lathe shows the arrangement of the change gears for cutting standard screw threads, right or left hand, from 4 to 40 per inch including  $11\frac{1}{2}$  pipe thread. Change gears for cutting the various pitches of thread shown on the index plate are included in the equipment of the lathe.

PIITCH OR	STUD	SCREW
4	64	32
5	64	40
6	64	48
7	64	56
8	64	64
9	64	72
10	32	40
11	32	44
11 1/2	32	46
12	32	48
13	32	52
14	32	56
15	32	64
16	32	72
20	16	80
22	16	44
24	16	48
26	16	52
28	16	56
30	16	60
32	16	64
36	16	72
40	16	80

Index Plate

### Turning Feeds

A Compound Idler Gear is used with the change gears for fine turning and boring feeds. By using various combinations of change gears with the compound idler gear a wide range of fine and coarse power turning feeds can be obtained.

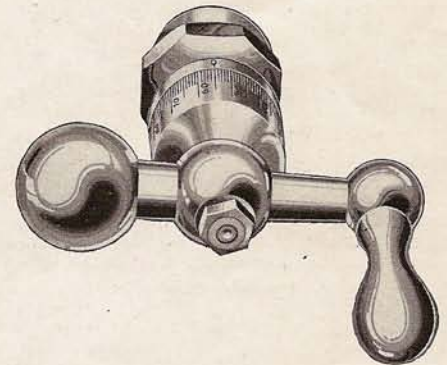
### Acme Thread Precision Lead Screw



The illustration shows a section of the lead screw  $\frac{3}{4}$ -inch diameter, (actual size) used on the No. 22—9-inch Junior Lathe. The lead screw is guaranteed to be accurate so that the finest precision thread gauges, taps and dies can be made to meet the most exacting requirements.

### Micrometer Cross Feed Collar

The Cross Feed Screw of the carriage has coarse pitch Acme Thread and is equipped with a micrometer collar reading in thousandths of an inch for accurate adjustment of the cutting tool. The graduated collar is adjustable and can be set at zero whenever desired.



## Countershaft and Equipment Included in Price of No. 22—9-inch Junior Lathe

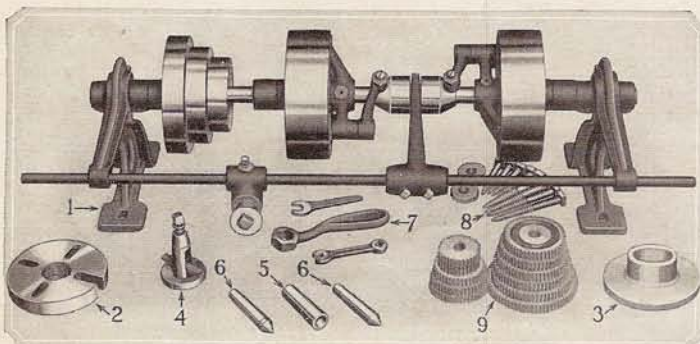


Fig. 8. Countershaft and Equipment Illustrated Above Are Included in Price of No. 22—9-inch Junior Lathe

1. Improved Double Friction Reversing Countershaft balanced for operating at high speed. The two drive pulleys are equipped with powerful rim-grip friction clutches. Pressure grease cups lubricate the clutch pulleys. Countershaft bearings have felt wick oils. Speed of Countershaft 300 R. P. M.
2. Face Plate, threaded and fitted to the spindle nose of lathe.
3. Semi-Machined Chuck Back, for fitting lathe chuck to the lathe, is threaded and fitted to spindle nose.
4. Tool Post, with ring and wedge, drop forged steel.
5. Spindle Sleeve, made of steel, ground inside and outside to fit taper in spindle and the taper of the lathe center.
6. Two Lathe Centers, No. 2 Morse Taper for head stock and tail stock spindle, made of tool steel. Tail stock center is hardened.
7. Wrenches, for tail stock, tool post and compound rest.
8. Lag Screws and Washers, for fastening lathe and countershaft.
9. Change Gears, for thread cutting and turning feeds.



# Construction of the No. 22—9-inch Junior Lathe

## Strong Accurate Lathe Bed



Fig. 108. Hand Scraping the Bearing Surfaces of the Lathe Bed

The accuracy and finish of the No. 22—9-inch Junior Lathe Bed is the finest it is possible to obtain. The Bed is made of a hard, close grained grey iron with a semi-steel mixture which resists wear, and is scientifically braced to withstand strains. The side walls are extra thick "I" beam construction. Note the heavy cross brace cast in at the center of the bed. Bed is planed both top and bottom and the legs are planed to fit the bed.

Three "V"-ways and one flat way afford large bearing surface for the carriage, head stock and tail stock. After rough machining, the lathe beds are thoroughly seasoned before finish machining and hand scraping. The No. 22—9-inch Junior Lathe beds are hand scraped and frosted by master craftsmen preparatory to fitting the carriage, head stock and tail stock.

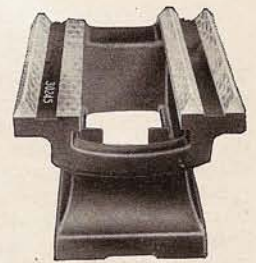


Fig. 109. End View of Lathe Bed Showing Serial No. of Lathe

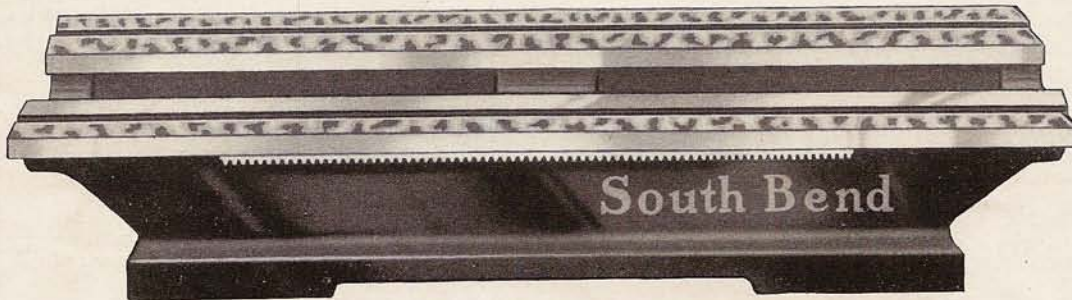


Fig. 110. Side View of Lathe Bed. Note the Large "V"-ways and the Heavy Cross Brace Cast in at the Center of the Bed

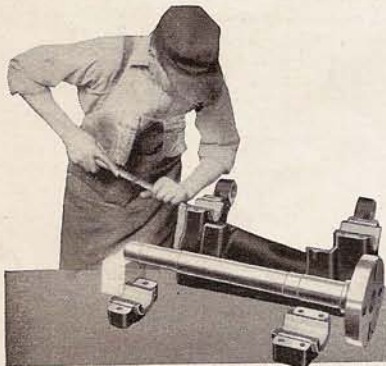


Fig. 111. Scraping Spindle Bearings to Spindle

The bronze head stock spindle bushings are hand scraped to both the ground bearing surfaces of the spindle and the bearing housings in the head stock. The scraping of these bearings insures accuracy.

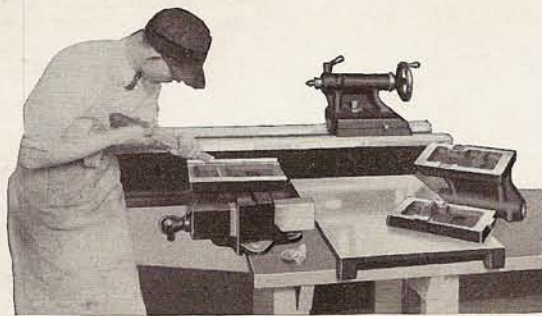


Fig. 112. Scraping Tail Stock Base to Lathe Bed

The tail stock top and base are first scraped true to a surface plate and then to each other. After the tail stock parts are accurately fitted together the base is scraped to a perfect contact with the lathe bed. The tail spindle is ground to a perfect fit in the barrel.

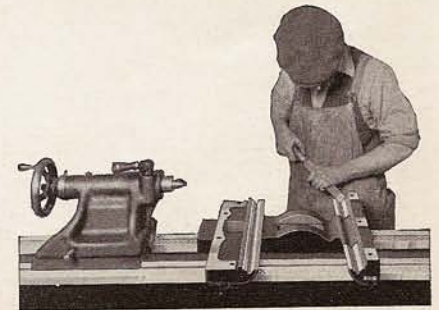


Fig. 113. Scraping Saddle to Lathe Bed

The saddle is carefully scraped to a perfect bearing on the outer "V"-ways of the lathe bed. The front "V"-way consists of a solid bearing the entire length of the saddle.

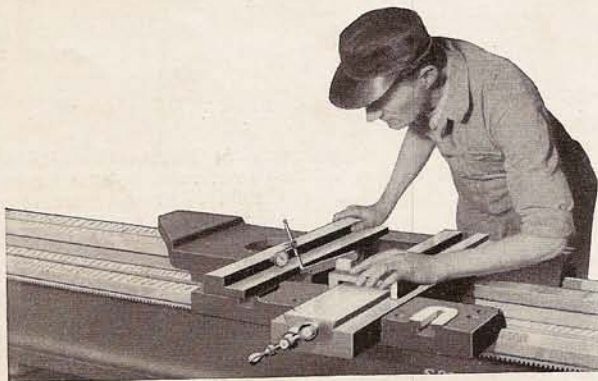


Fig. 114. Testing the Cross Slide of the Saddle

The accuracy and precision of a lathe depends upon the fit of the bearings, both revolving and sliding. The illustration above shows a mechanic testing the cross slide of the saddle to be sure that it is square with the ways of the lathe bed.

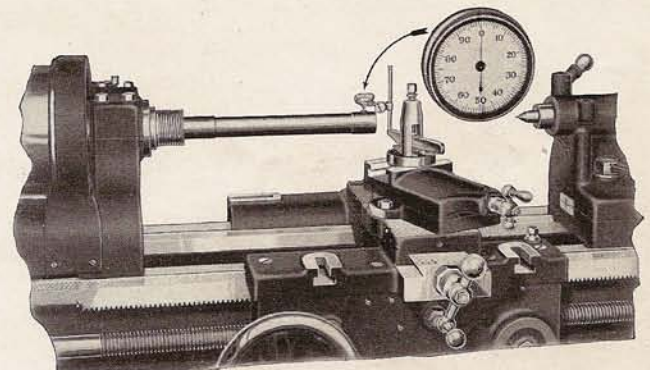


Fig. 115. Thirty-three Tests with Precision Instruments

The halftone shows one of the 33 tests which each South Bend No. 22—9-inch Junior Lathe must pass. The test bar is 12-inches long, is hardened and ground all over. The face of this dial is graduated in thousandths of an inch.



# Power and Capacity of the No. 22 — 9-inch Junior Lathe

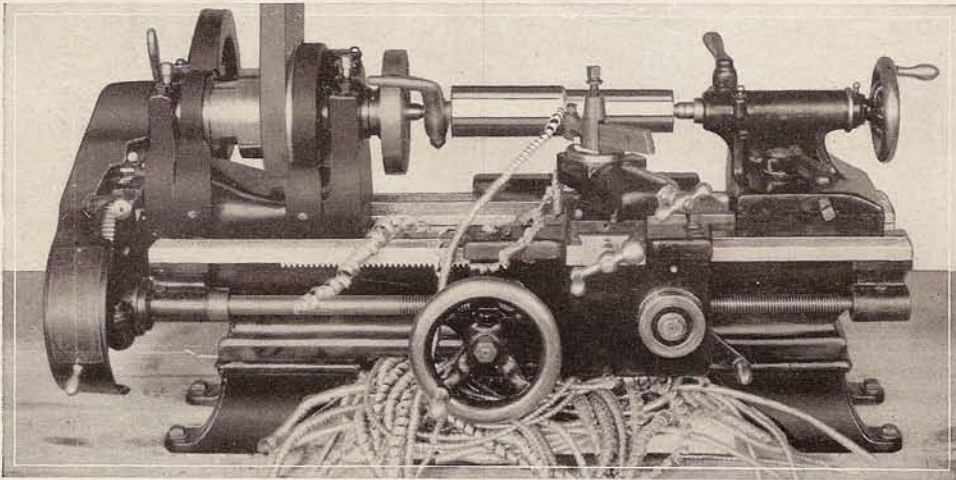


Fig. 116. The No. 22—9-inch Junior Lathe Reducing a Steel Shaft from 2  $\frac{3}{4}$ -inch Diameter to 2-inch Diameter in One Cut

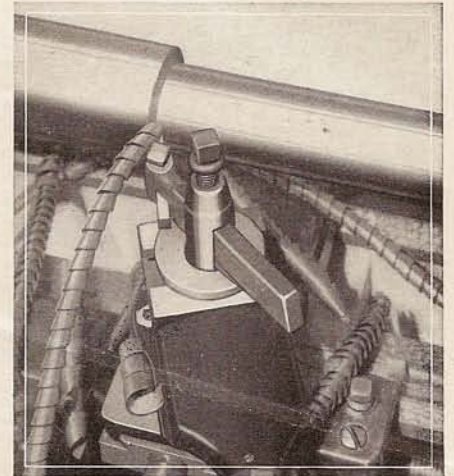


Fig. 117. Close-up of Lathe Taking a Heavy Chip Shown in Fig. 116

## Power for Heavy Cuts

The No. 22—9-inch Junior Lathe has the power for stiff, heavy work. Large bearing surfaces and generous proportions of the lathe assure unusual strength and rigidity. The back geared head stock provides power and the proper spindle speeds for taking heavy cuts or machining large diameters. The halftone above shows the No. 22—9-inch Junior Lathe taking a heavy chip on the steel shaft. The carriage is driven by power feed from the lead screw. The illustration in the upper right hand corner shows a close up of the Lathe taking this chip. The depth of the cut is  $\frac{3}{8}$  inch, the shaft being reduced  $\frac{3}{4}$  inch in diameter in one chip.

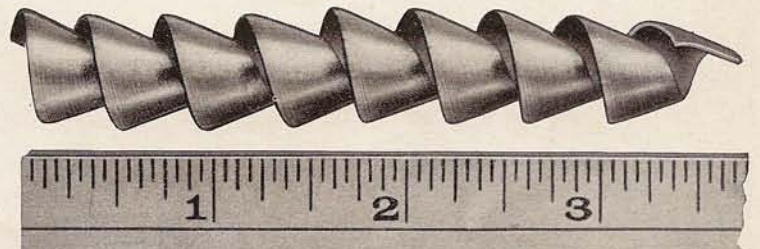


Fig. 118. A Section of the Steel Chip (actual size) Shown in Figs. 116 and 117

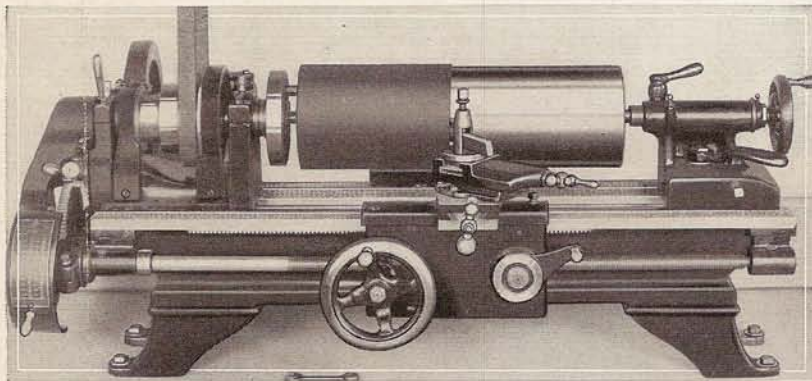


Fig. 119. Capacity over Carriage of the No. 22—9-inch, 3 foot Junior Lathe This is a steel roll  $6\frac{3}{4}$  inches in diameter and 18 inches long

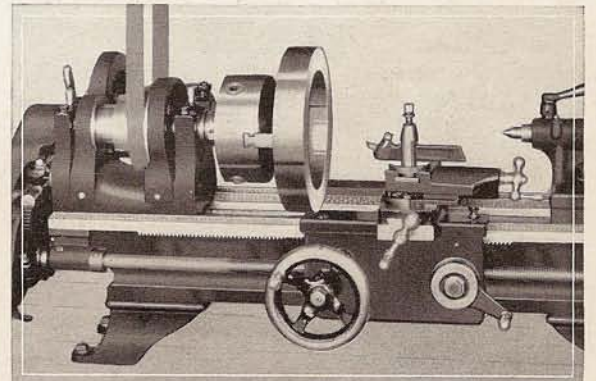


Fig. 120. Chucking Capacity of No. 22—9-inch Junior Lathe Machining Work  $9\frac{1}{4}$  inches in diameter

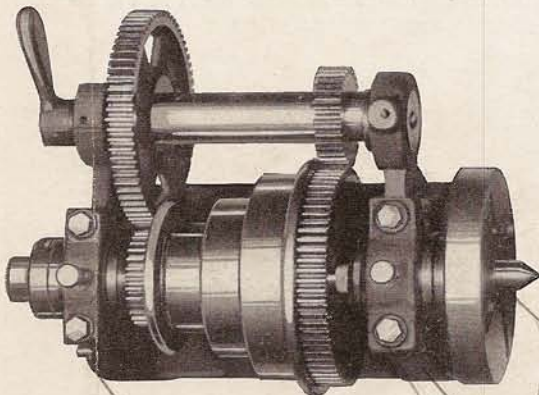


Fig. 121. Top View of Back Geared Head Stock with Gear Guards Removed Showing Back Gears

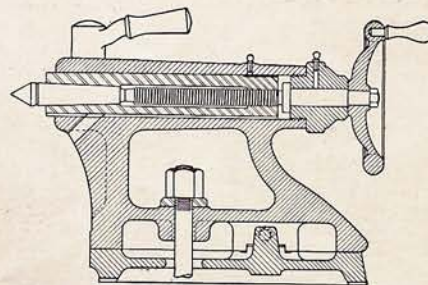
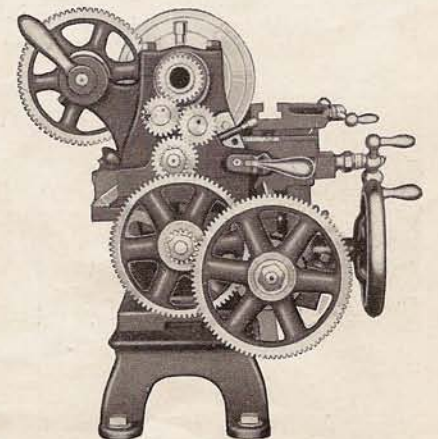


Fig. 122. Cross Section of Tail Stock

The above drawing shows the cross section of the tail stock and illustrates the construction of the tail stock spindle, feed screw, the tail stock top and the tail stock base. Tail stock top can be set over for taper turning.



End View of Lathe Showing Quick Acting Reverse and Back Gears



# Practical Jobs For The No. 22—9-inch Junior Lathe

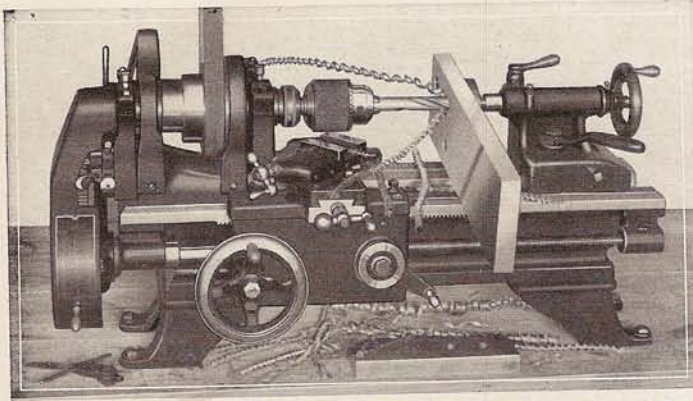


Fig. 44. Drilling a Piece of Flat Steel using a Drill Chuck in the Head Stock and Feeding by Hand Wheel of Tail Stock

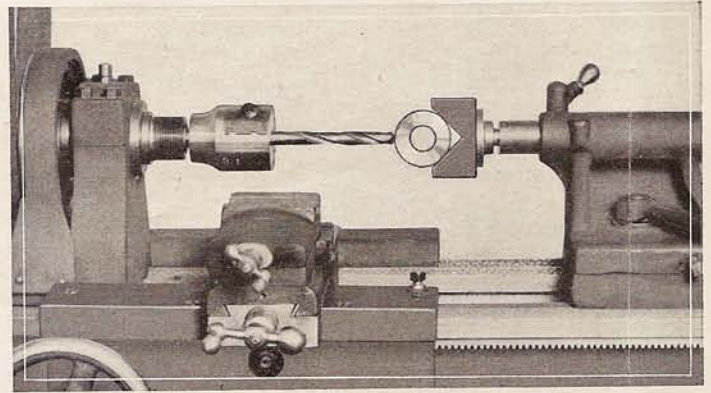


Fig. 45. Drilling Through a Round Collar using a Crotch Center in the Tail Spindle of the No. 22—9-inch Junior Lathe

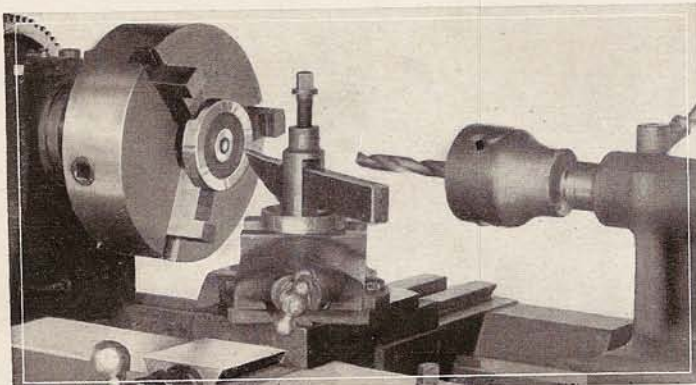


Fig. 46. Drilling and Facing a Cast Iron Gear Blank Held in a Lathe Chuck. Drill Chuck Mounted in the Tail Spindle

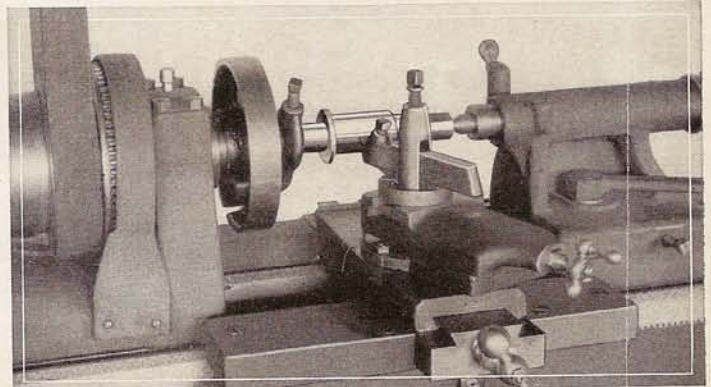


Fig. 47. Turning a Bronze Bushing on a Mandrel Mounted Between the Centers of a 9-inch Junior Lathe

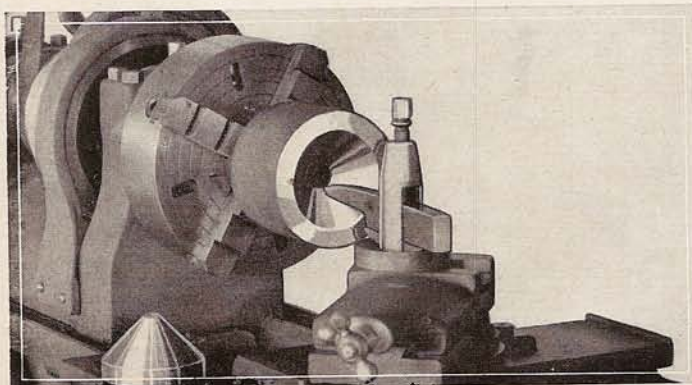


Fig. 48. Machining a Conical Punch and Die Using the Compound Rest for Correct Tapers of both Punch and Die

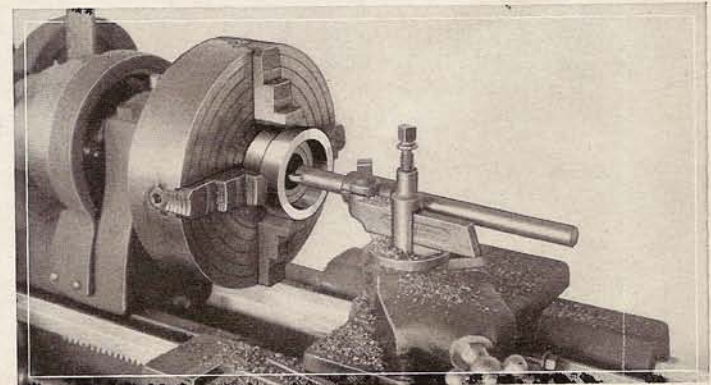


Fig. 49. Boring a Hole Through a Cast Iron Gear Blank held in the Chuck of a No. 22—9-inch Junior Lathe

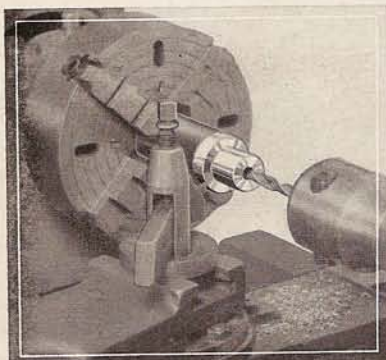


Fig. 50. Boring a Bushing in the Chuck on a No. 22—9-inch Junior Lathe

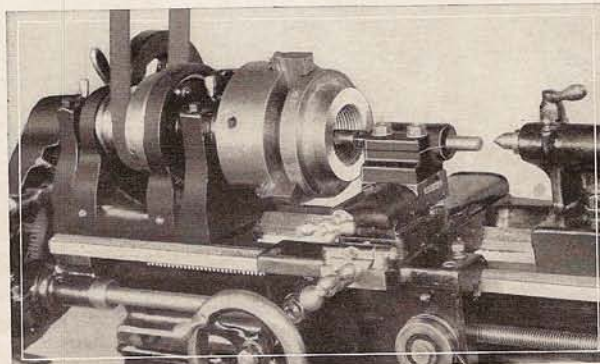


Fig. 51. Cutting an Internal Thread in a Large Cast Iron Flange Held in the Chuck on a No. 22—9-inch Junior Lathe

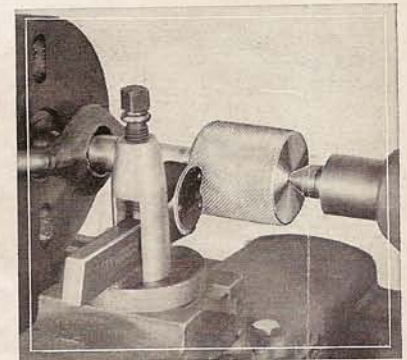


Fig. 52. Knurling a Large Handle Between Centers in the No. 22—9-inch Junior Lathe



# Practical Jobs for the No. 22 — 9-inch Junior Lathe

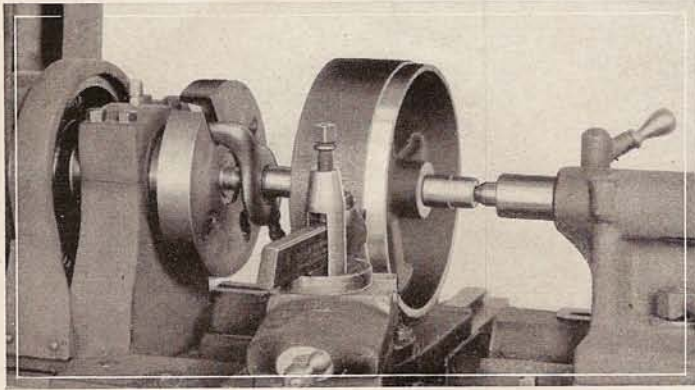


Fig. 55. Machining a Cast Iron Pulley on a Mandrel Mounted Between the Centers of the No. 22—9-inch Junior Lathe

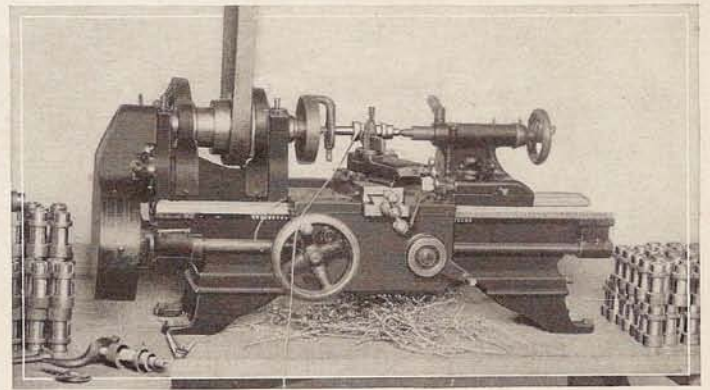


Fig. 56. Manufacturing Small Duplicate Parts in Quantity on a No. 22—9-inch Junior South Bend Lathe

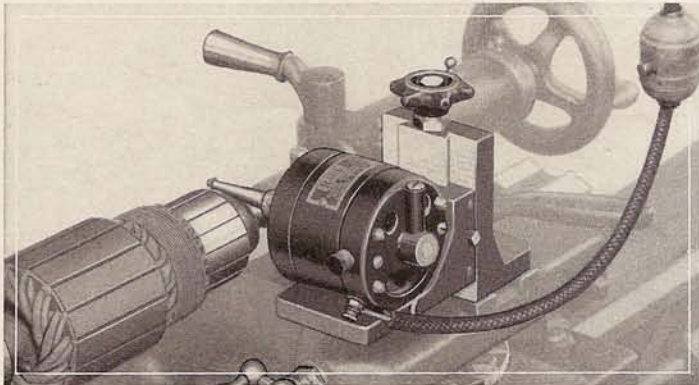


Fig. 57. A Rotary Electric Mica Undercutting Attachment Mounted on the Compound Rest of a No. 22—9-inch Junior Lathe

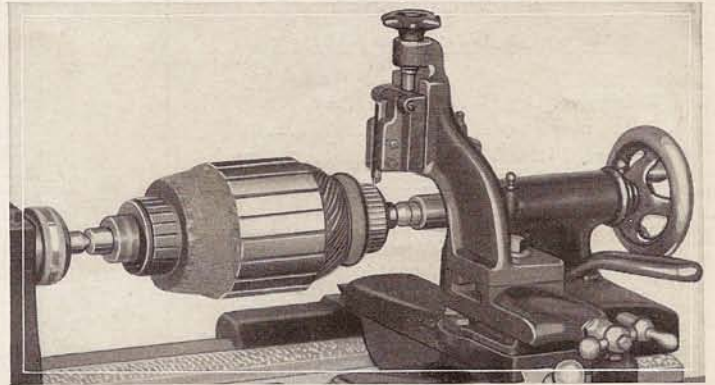


Fig. 58. Undercutting Mica Insulation using Planer Type Mica Undercutting Attachment on No. 22 Junior Lathe

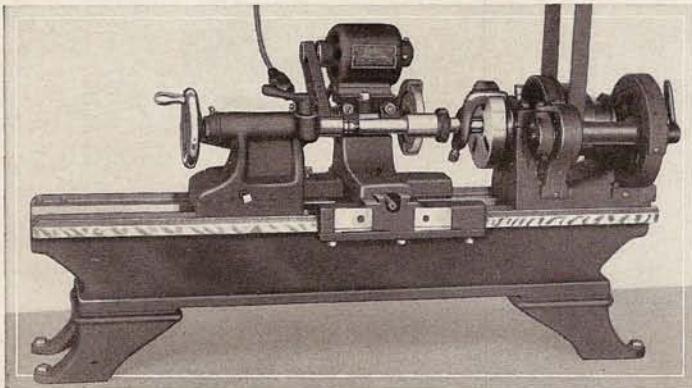


Fig. 59. Grinding a Hardened Steel Bushing to Exact Diameter on a 9-inch Junior Lathe Equipped with an Electric Grinding Attachment

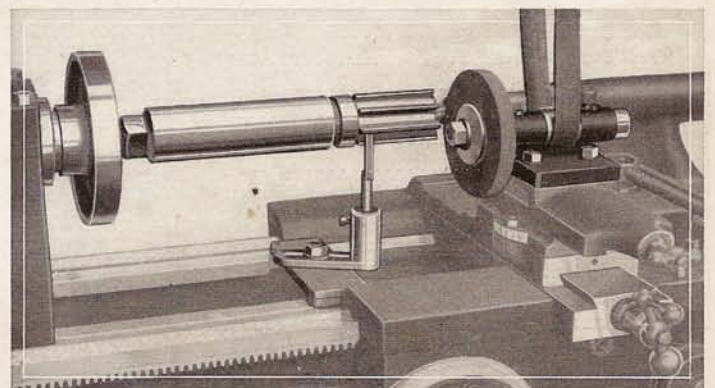


Fig. 60. Sharpening an Adjustable Blade Reamer on a No. 22—9-Inch Junior Lathe Equipped with Countershaft Drive Grinding Attachment

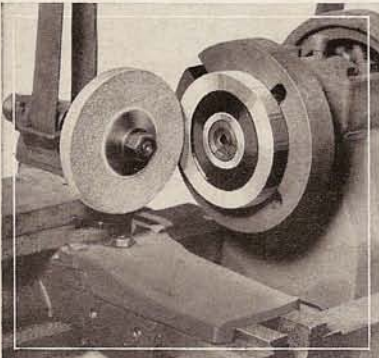


Fig. 61. Sharpening a Slitting Cutter on the Face Plate of a 9-in. Junior Lathe

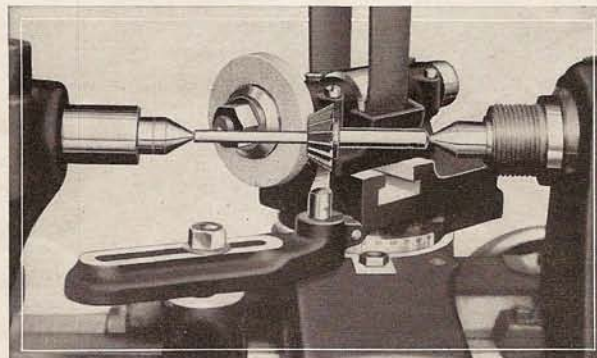


Fig. 62. Sharpening an Angular Milling Cutter on a No. 22—9-inch Junior Lathe

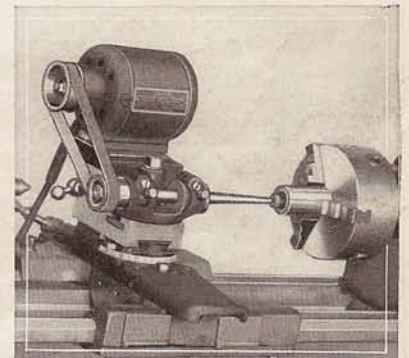


Fig. 63. Finishing the Inside Diameter of Hardened Steel Bushings by Grinding



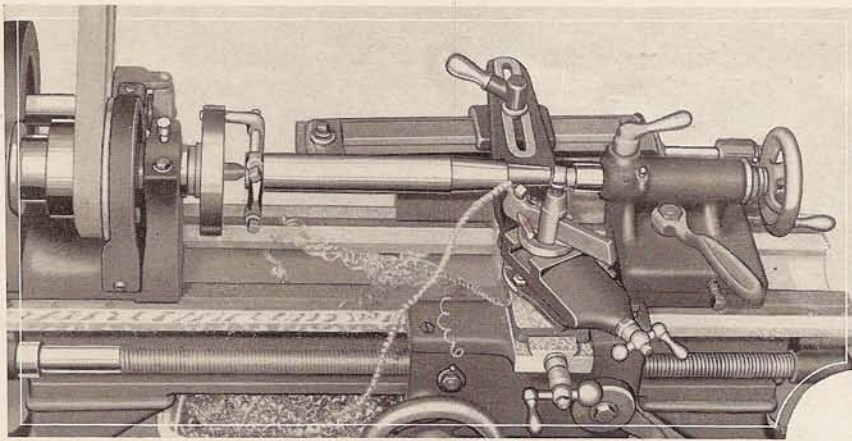


Fig. 36. No. 22-9-inch Junior Lathe Equipped with Graduated Taper Attachment for Machining Tapered Shafts. See Attachments Listed on Page 12

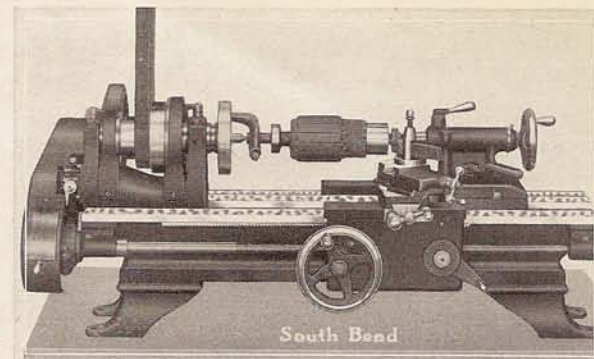
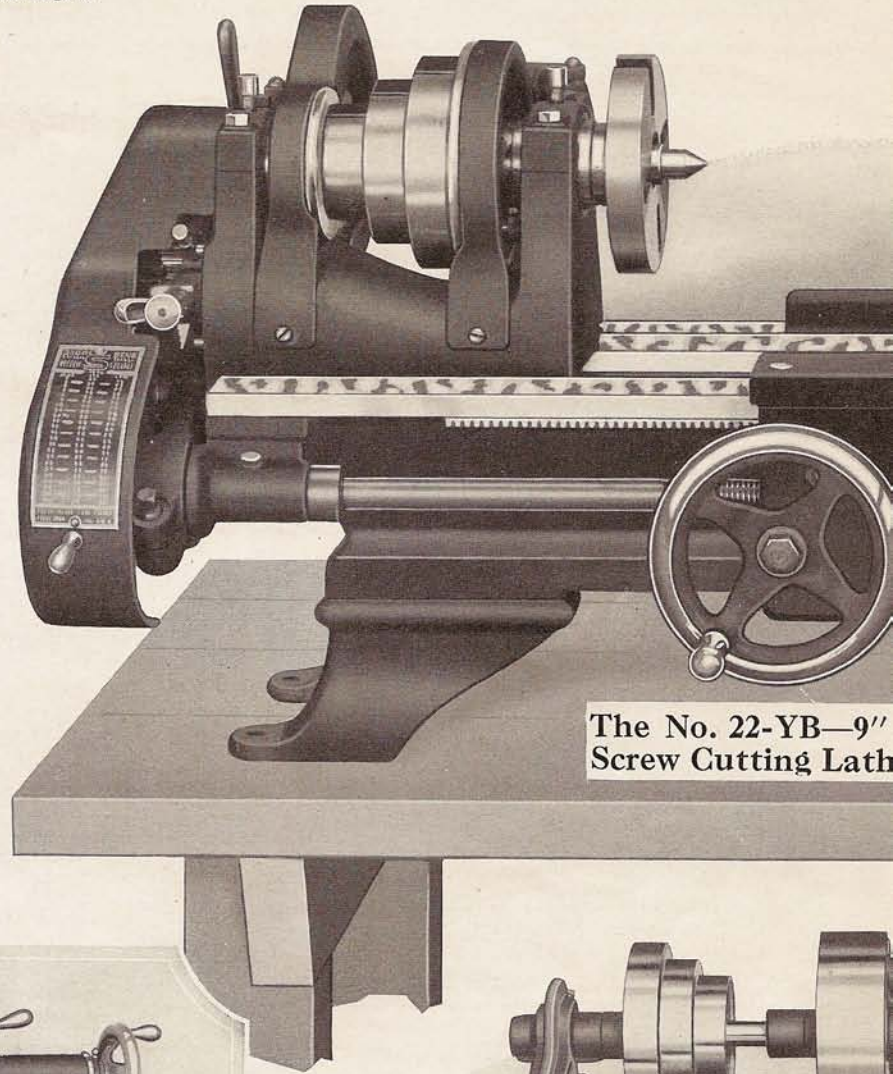


Fig. 37. Machining the Commutator of an Armature Mounted Between Centers of a No. 22-9-inch Junior Lathe

### Specifications of No. 22-9-Inch Junior Lathe

Swing over Bed.....	9¼"
Swing over Carriage.....	6⅜"
Centers, Morse Taper.....	No. 2
Spindle Nose Diameter.....	1½"
Hole through Spindle.....	¾"
Acme Lead Screw.....	¾" diam., 8 threads
Thread Cutting Range.....	4 to 40 per in.
Countershaft Speed.....	300 R. P. M.
Spindle Speeds.....	48 to 714 R. P. M.
Width of Belt.....	1"
Large Spindle Bearing.....	1⅜" x 1⅛"
Small Spindle Bearing.....	1⅛" x 1⅜"
Maximum Collet Capacity.....	½"
Back Gear Ratio.....	5.4 to 1
Power Required.....	¼ H. P.
Countershaft Pulleys.....	6½" x 1¾"
Tail Stock Spindle Travel.....	2⅜"
Angular Travel Comp. Rest.....	2"
Travel of Cross Slide.....	7"
Size Tool Holder Shank.....	⅝" x ¾"
Size of Cutter Bit.....	⅜" x ⅜"
Net Weight of Lathe with 3 ft. Bed, Countershaft and Equipment.....	311 lbs.
Motor Drives, Floor Legs, Chucks, Tools and Attachments of all kinds can be fitted to Lathe.	



The No. 22-YB-9" Screw Cutting Lathe

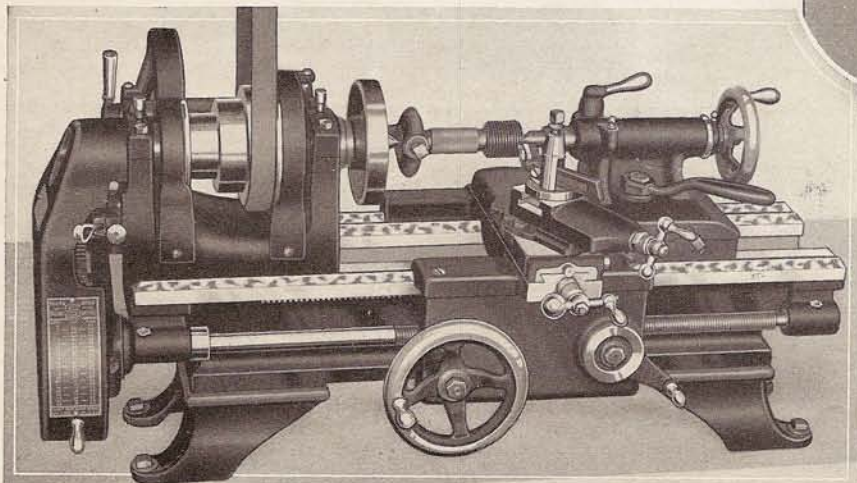


Fig. 41. Cutting a United States Screw Thread on a Plug Type Master Thread Gauge in the No. 22-9-inch Junior Lathe

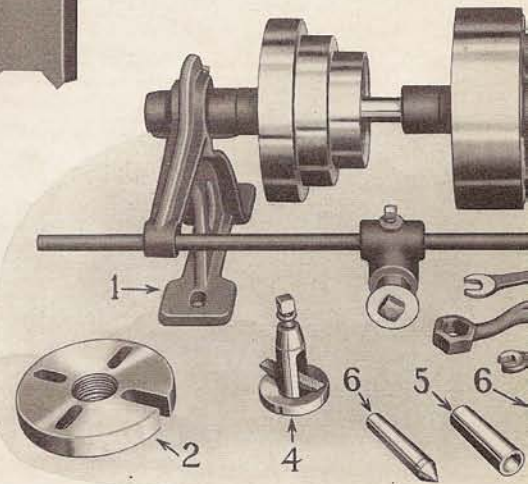


Fig. 42. Double Friction Reversing Countershaft No. 22-9-inch S



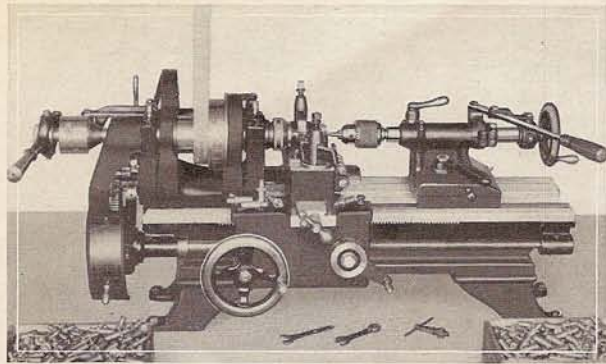


Fig. 38. No. 22-9-inch Junior Lathe Equipped with Lever Draw-in Chuck, Hand Lever Tail Stock and Double Tool Rest

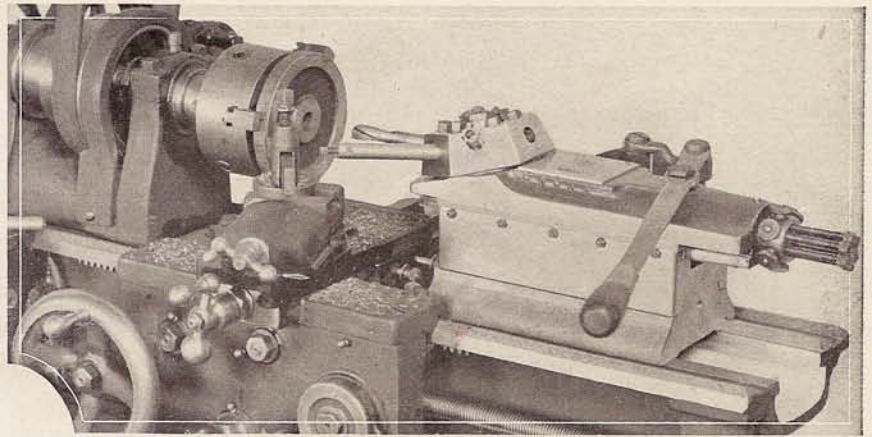
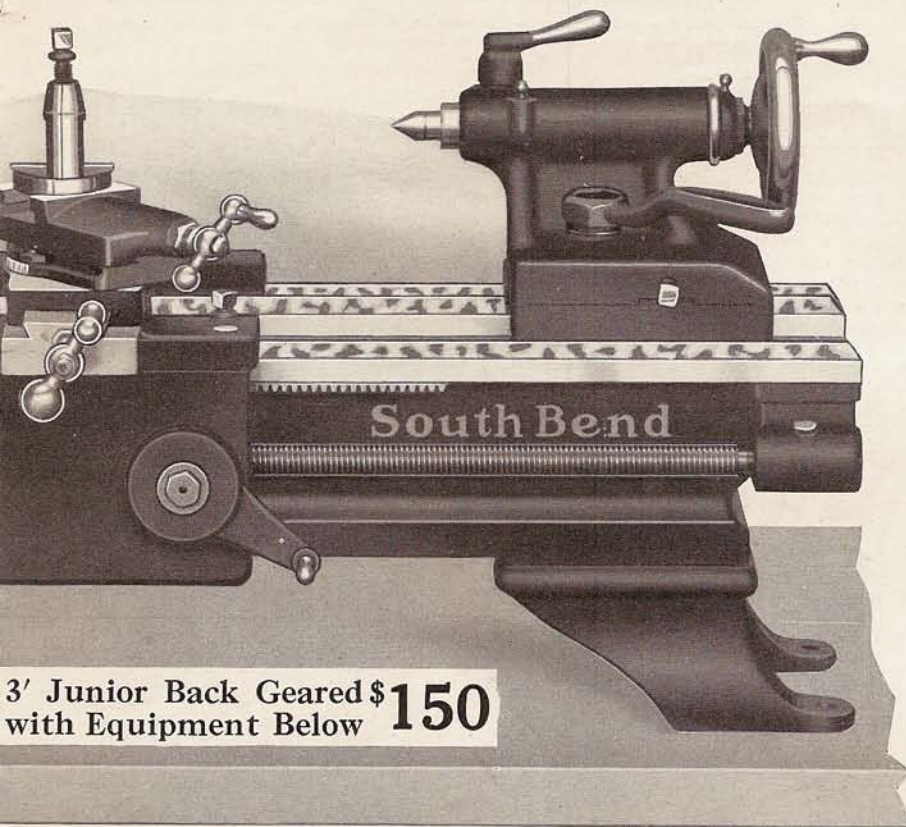


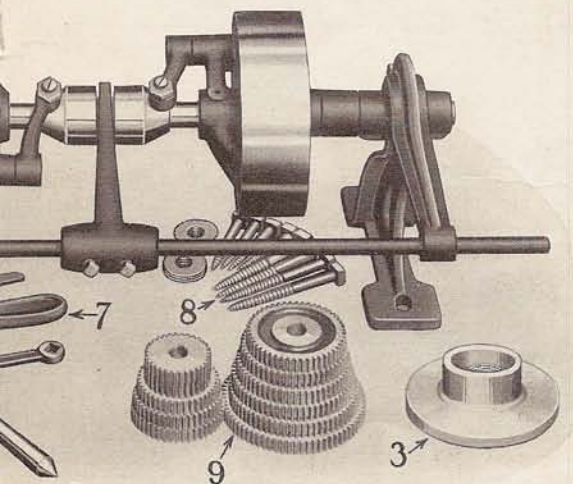
Fig. 39. Drilling, Boring and Reaming Cast Iron Gear Blanks on a No. 22-9-inch Junior Lathe Equipped with Semi-automatic Hand Lever Bed Turret



3' Junior Back Geared \$150  
with Equipment Below

### Features of No. 22-9-Inch Junior Lathe

- Back Geared Screw Cutting Lathe
- Power and Rigidity for Heavy Cuts
- Six Spindle Speeds for Turning, Polishing, Thread Cutting
- Cone Pulley Balanced for High Speeds
- Head Stock Spindle Hollow
- Tool Steel Lathe Centers
- Quick Acting Latch Reverse
- Phosphor Bronze Spindle Bearings
- Patent Oilers on Important Bearings
- Graduated Compound Rest
- Micrometer Compound Rest Feed Screw
- Micrometer Cross Feed Screw
- Set-over Tail Stock for Taper Turning
- Plug Type Tail Spindle Binder
- Tail Center Hardened, Self Ejecting
- Carriage Lock for Accurate Facing
- Micrometer Adjustment of Cutting Tool
- All Revolving Parts Accurately Ground
- V-ways and Dovetails Hand Scraped
- Constant Accuracy and Precision
- Large Convenient Hand Wheels
- Double Friction Reversing Countershaft
- Change Gears for Thread Cutting
- Power Feed Carriage



and Lathe Equipment Included in the Price of the South Bend Junior Lathe

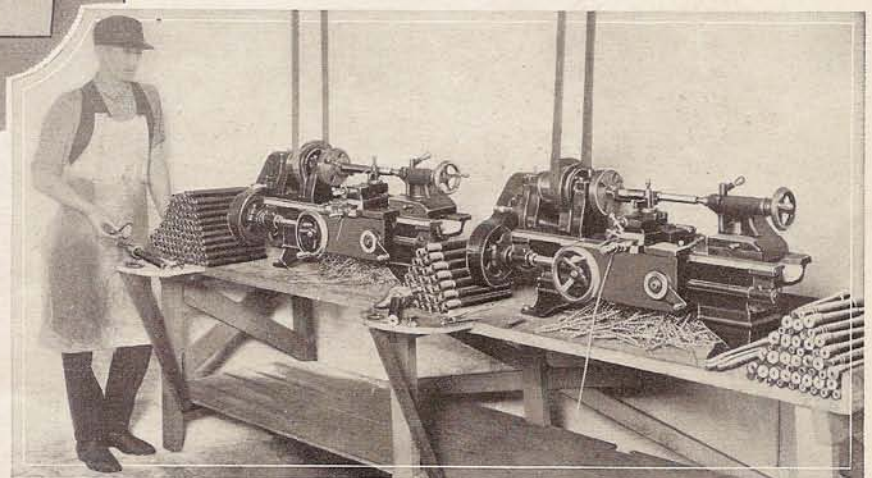


Fig. 43. One Man Operating Two 9-inch Junior Bench Lathes on Production Work in a Manufacturing Plant



# No. 22—9-inch Junior Lathe Equipped With Practical Attachments

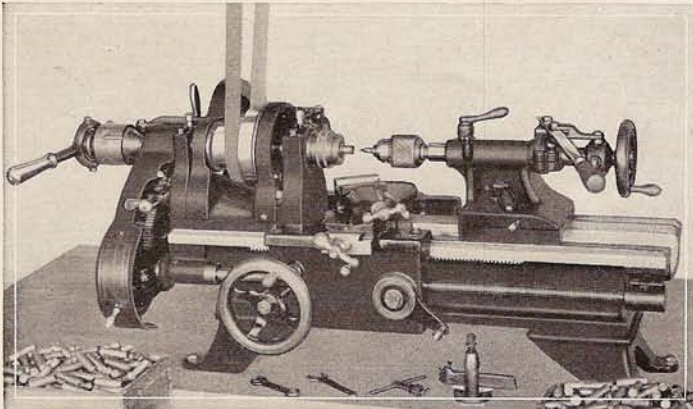


Fig. 26. No. 22—9-inch Junior Lathe Equipped with Lever Draw-in Collet Chuck and Hand Lever Feed Tail Stock for Rapid Production

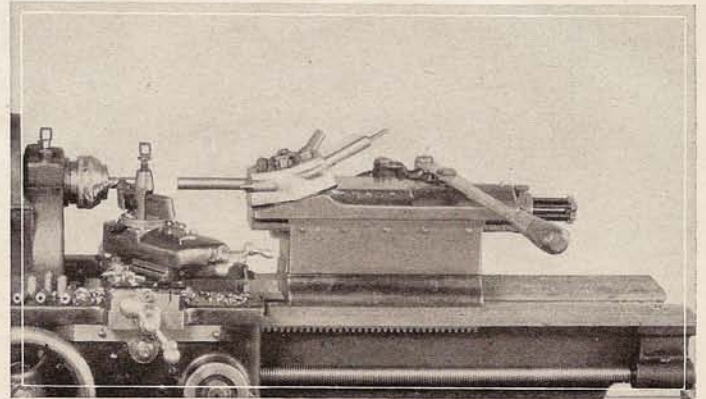


Fig. 27. No. 22—9-inch Junior Lathe Equipped with Draw-in Collet Chuck Attachment and Hand Lever Bed Turret for Screw Machine Work

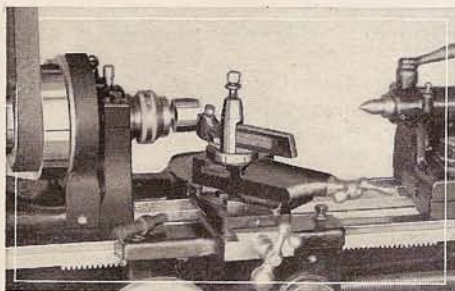


Fig. 28. Machining Jewelers' Plunger Blank in Hand Wheel Draw-in Collet Chuck.

## Practical Attachments Increase Usefulness of Lathe

The attachments shown on this page and those listed and priced on page 12 greatly increase the usefulness of the No. 22—9-inch Junior Lathe. These attachments are especially valuable to the small shop because they equip the lathe to take care of a wide variety of work that would otherwise require the installation of many expensive single purpose machines.

These attachments also enable the unskilled operator to easily perform operations that ordinarily require great skill and care.

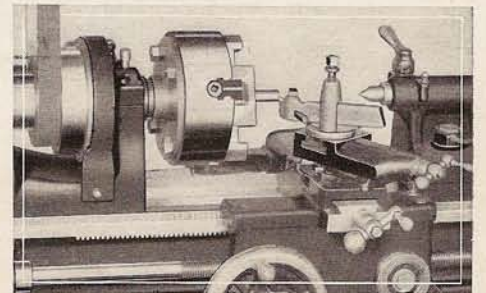


Fig. 29. Holding Jewelers' Punch Blank in the Chuck While Machining the Shank

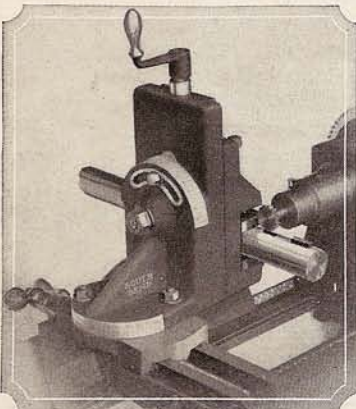


Fig. 30. Cutting a Woodruff Key-seat with Milling Attachment

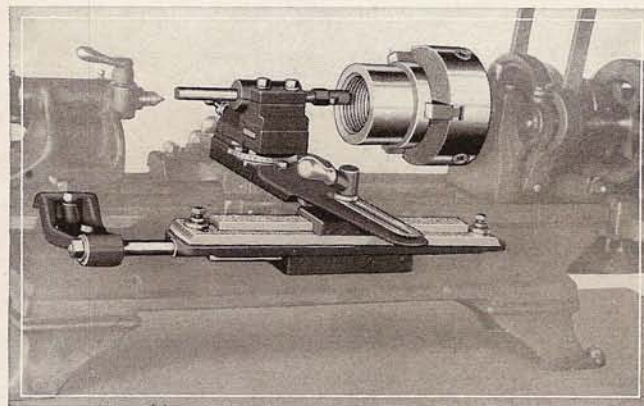


Fig. 31. Cutting an Internal Taper Thread on a No. 22—9-inch Junior Lathe Equipped with Taper Attachment

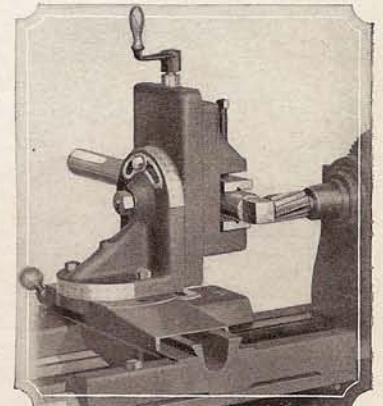


Fig. 32. Squaring the End of a Shaft with Milling Attachment

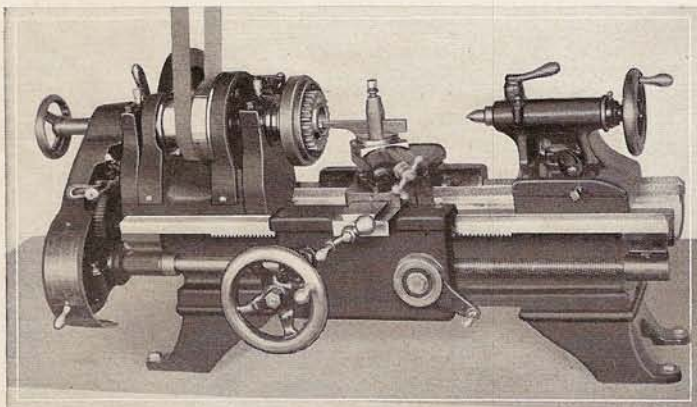


Fig. 33. Boring a Gear on a No. 22—9-inch Junior Lathe Equipped with Draw-in Collet, Step Chuck and Closer

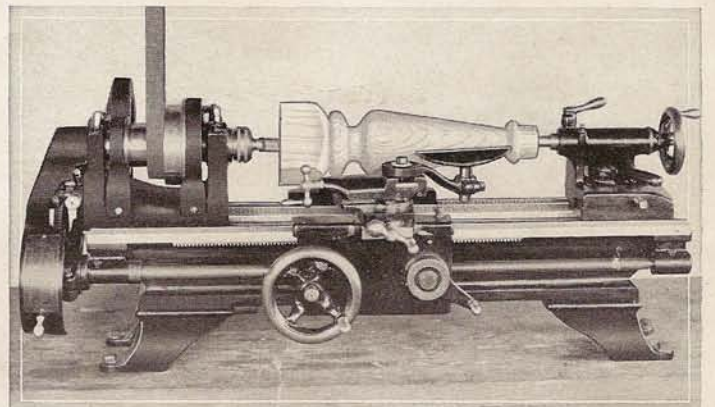


Fig. 34. The No. 22 Junior Lathe Equipped with Hand Rest, Spur Center and Cup Center for Wood Turning and Pattern Making



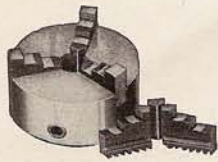
**Pages 11 and 12 are missing. If you happen to have a copy of these please notify.**

**Steve Wells**

**[wswells@earthlink.net](mailto:wswells@earthlink.net)**



# Chuck Equipment for the No. 22—9-inch Junior Lathe



## Three-Jaw Geared Scroll Chuck

3-Jaw Universal Geared Scroll Chuck is strictly a Universal Chuck, the jaws being moved simultaneously by the scroll threaded plate. Equipped with two sets of jaws. Price includes wrench.

### Net Factory Prices

Catalog Number	Rated Size of Chuck	Will Hold About	Shipping Weight	Price Chuck
3404	4 in.	4 1/4 in.	7 1/2 lbs.	\$24.75
3405	5 in.	5 in.	11 lbs.	27.00
3406	6 in.	6 1/2 in.	20 lbs.	30.75

## Four-Jaw Independent Chuck

Chuck has four independent, reversible jaws. The face of chuck is ground true. A chuck wrench is included in the price of each chuck.



### Net Factory Prices

Catalog Number	Rated Size of Chuck	Will Hold About	Shipping Weight	Price Chuck
1404	4 1/2 in.	6 in.	11 lbs.	\$20.25
1406	6 in.	7 1/2 in.	21 lbs.	24.00

## Semi-Machined Chuck Back

We recommend that all chucks be fitted to the lathe before they leave the factory because this will insure a true running chuck.

No. 840 Extra Semi-Machined Chuck Back, Price... \$3.50  
Fitting Chuck Back to Lathe Chuck..... 3.00



## Three-Jaw Drill Chuck



This is a practical and accurate drill chuck. The geared sleeve and key facilitate easy operation of the jaws. Price includes pinion key.

### Net Factory Prices

Cat. No.	Diameter	Length	Capacity	Weight	Price
32	1 3/4 in.	2 7/8 in.	0 to 3/8 in.	1 lb.	\$4.25
6	1 1/8 in.	3 1/8 in.	0 to 1/2 in.	1 1/4 lb.	7.00

## Finished Drill Chuck Arbor

Made of steel. Short taper fits drill chuck and long taper fits the head and tail spindles of the lathe. Price.....\$2.50



# Tool Equipment for the No. 22—9-inch Junior Lathe

## Patent Tool Holders



Straight Shank Turning Tool



Right Hand Cutting-Off Tool



Style "B" Boring Tool

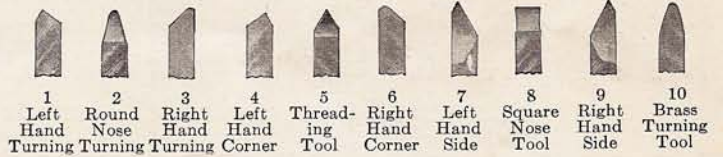


Formed Threading Tool

All prices listed below are net F. O. B. South Bend and include wrench and one high speed steel cutter bit. Size of shank, 5/16 x 3/4 inch.

- No. 00S Straight Turning Tool.....\$2.40
- No. 00L Left Hand Turning Tool..... 2.40
- No. 00R Right Hand Turning Tool..... 2.40
- No. 29R Right Hand Cutting-Off Tool 2.60
- No. 19S Straight Cutting-Off Tool.... 2.60
- No. 00T Formed Threading Tool..... 3.75
- No. 429 Style "B" Boring Tool..... 4.90
- No. 00K Knurling Tool..... 5.10

## High Speed Steel Cutter Bits



High Speed Steel Cutter Bits  
Ground to Shape—Ready for Use

High Speed Steel Cutter Bit Length  
Hardened Only—Not Ground



Cutter Bit hardened, ground to shape, ready to use. Give tool shape number and catalog number.

Cutter Bit Lengths, hardened but not ground to shape. Require grinding only to make them ready for use.

No. 1309 Ground Cutter Bits.  
Price each.....\$0.25

No. 1509 Cutter Bit Lengths.  
Price each.....\$0.1

## Head Spindle Center



No. 725-A Head Spindle Center for No. 22—9-inch Junior Lathe, Made of Tool Steel. Price....\$1.75

## Tail Spindle Center

No. 726-A Tail Spindle Center for No. 22—9-inch Junior Lathe, Hardened Tool Steel.....\$2.00



## Standard Lathe Dogs

Furnished in heavy malleable iron properly designed for strength and service. Price includes hardened tool steel set-screw.

### Net Factory Prices

Capacity	Catalog No.	Weight Each	Price Each
3/8 in.	1-M	1/4 lb.	\$0.40
1/2 in.	2-M	1/2 lb.	.50
3/4 in.	4-M	5/8 lb.	.60
1 in.	6-M	1 1/8 lb.	.70



# Extra Equipment for the No. 22 Junior Lathe



No. 40 Large Face Plate  
Price.....\$10.00



No. 125 Center Rest  
Price...\$10.00



No. 67 Adjustable Thread  
Cutting Stop Price...\$2.50



No. 130 Follower Rest  
Price..\$6.00



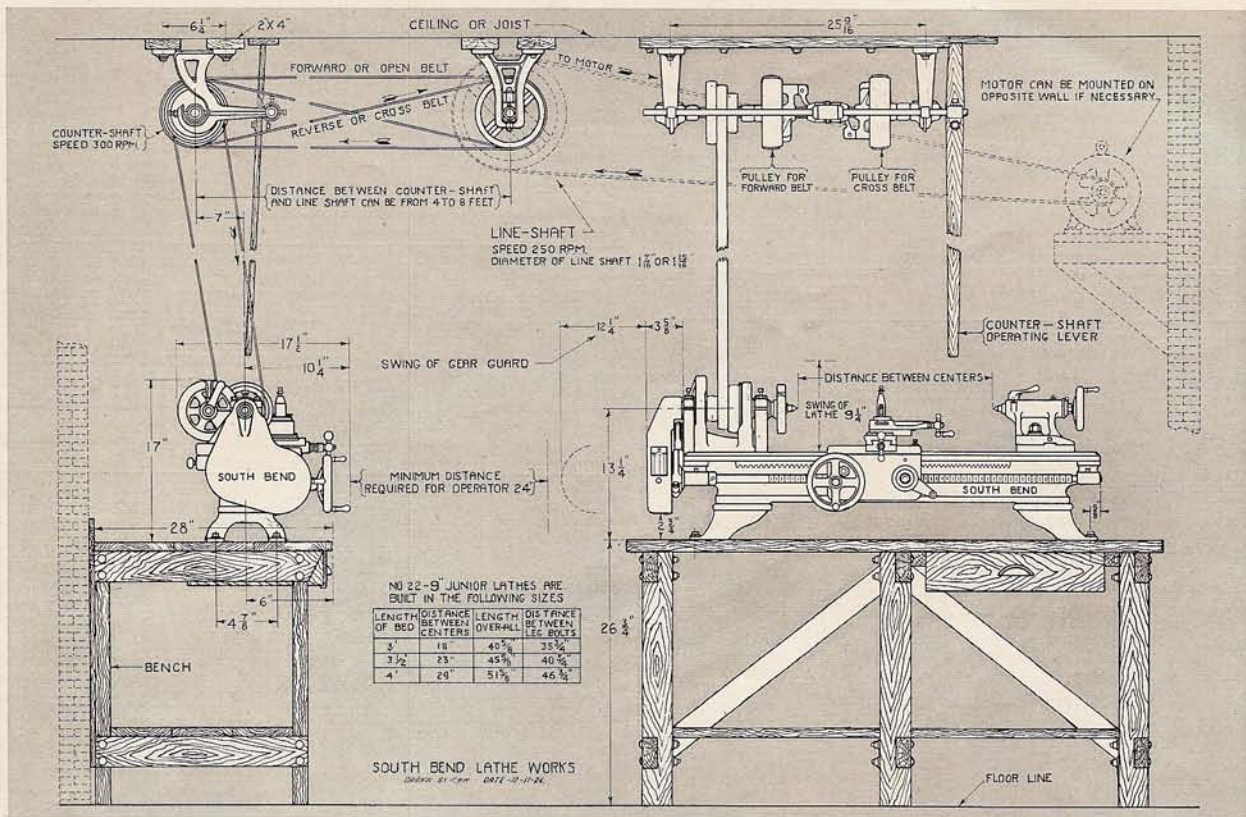


Fig. 9. Erection Plan of No. 22-9-Inch Junior South Bend Bench Lathe

## Overhead Countershaft Drive for the No. 22-9-Inch Junior Lathe

The above cut shows the erection plan of a No. 22-9-inch Junior Bench Lathe with overhead countershaft drive. The principal dimensions of the Lathe and bench are also given to show the space required for the lathe. The overhead countershaft drive is more popular in industry and in the manufacturing plants, because it calls for a lineshaft from which other machines may be operated in addition to the Lathe.

Instructions for the installation, erection and operation of the Lathe in the various types of drives will be found in the book entitled "How to Run a Lathe," copy of which is included in the equipment of each Lathe. The power required to drive the No. 22-9-inch Junior Lathe is 1/4-horsepower, whether driven by overhead countershaft or by motor drive, from an ordinary electric lamp socket.

## No. 722—Self Contained Unit Motor Drive 9-inch Junior Bench Lathe

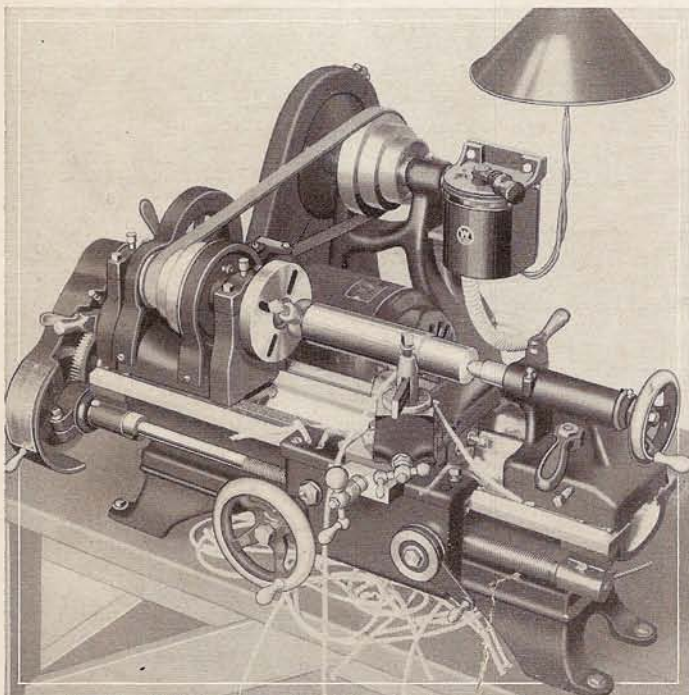


Fig. 10. Self Contained Unit Motor Drive Junior Bench Lathe

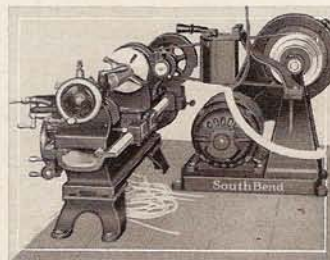


Fig. 11. End View of Self Contained Unit Motor Drive

The Self Contained Unit Motor Drive consists of a special motor drive countershaft arranged for mounting on the bench, back of the lathe and a motor to furnish power.

### Operates from Lamp Socket

A 1/4-horsepower motor driven from an ordinary lamp socket gives sufficient power to the lathe to reduce a 2" cold roll steel shaft to 1 1/4" in one cut.

### Current Specifications

When ordering a No. 722 Self-Contained Motor Drive Lathe Unit, be sure to specify the electric current. If alternating current, state voltage, phase, cycle, and number of wires. If direct current, state voltage.

### Equipment Included in Price

The prices below include one No. 22-9-inch Junior Bench Lathe with regular equipment, Unit Motor Drive Countershaft, Westinghouse drum type reversing switch, extension cord and an 1800 R. P. M., 1/4 H. P. reversing motor of Westinghouse, General Electric or equal.

Net Factory Prices of Lathe with Reversing Motor and Reversing Switch

Catalog Number of Lathe	Swing Over Bed	Length of Bed	Weight Crated	Three Phase 60 Cycle Motor	Single Phase 60 Cycle Motor	Direct Current Motor
722-Y	9 1/4 in.	3 ft.	470 lbs.	\$206.00	\$222.00	\$210.00
722-Z	9 1/4 in.	3 1/2 ft.	500 lbs.	212.00	228.00	216.00
722-A	9 1/4 in.	4 ft.	530 lbs.	218.00	234.00	222.00

NOTE—Above prices include 110 volt, 220 volt or 440 volt motor 32 volt motor can be supplied.



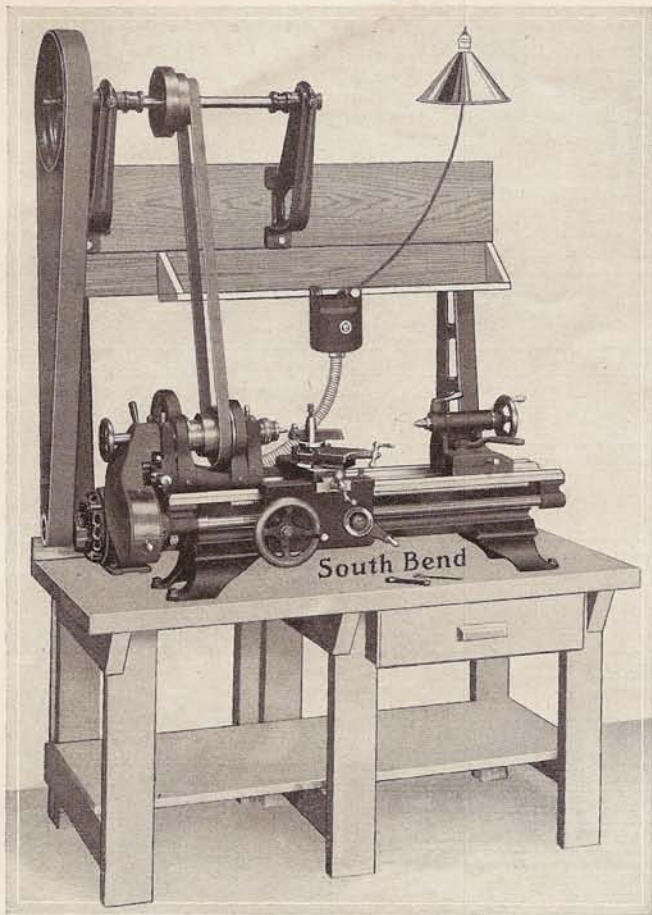


Fig. 11. Simplex Motor Drive Bench Lathe

## No. 522—9-inch Junior Simplex Motor Drive Bench Lathe

The Simplex Motor Drive illustrated at the left consists of a special Simplex Countershaft arranged for mounting on uprights bolted to the back of the bench, a  $\frac{1}{4}$  H. P. motor, reversing switch, and two leather belts to deliver the power from the motor to the lathe. The motor is connected direct to an electric lamp socket.

### No. 129—Wooden Bench

The Wooden Bench is not included in the price of the Simplex Motor Drive Unit but is extra. Dimensions of Bench Top—72 inches long, 28 inches wide,  $1\frac{1}{4}$  inches thick. Shipped knocked down to take lowest freight rate.

No. 129. Simplex Bench, hard maple, complete with two upright metal standards for supporting countershaft base.....\$50.00  
NOTE: If customer prefers to build bench, blue print plans will be furnished free with lathe. It will be necessary to purchase the two upright metal standards for supporting countershaft base.  
Price of Standards per pair, F. O. B. South Bend.....\$13.50

### Operates from Lamp Socket

A  $\frac{1}{4}$ -horsepower motor driven from an ordinary lamp socket gives sufficient power to operate the lathe at maximum capacity.

### Current Specifications

When ordering a No. 522 Simplex Motor Drive Bench Lathe Unit, be sure to specify the electric current. If alternating current, state voltage, phase, cycle and number of wires. If direct current, state voltage. This information can be obtained from your electric light company.

### Equipment Included in Price

The prices below include one No. 22—9-inch Junior Bench Lathe with the lathe equipment, Simplex Drive Countershaft, two leather belts, Westinghouse reversing switch, extension cord and  $\frac{1}{4}$  H. P., 1800 R. P. M. reversing motor, Westinghouse, General Electric or equal make.  
Net Factory Prices of Lathe with Reversing Motor and Reversing Switch but not including Bench

Catalog Number of Lathe	Swing Over Bed	Length Crated	Weight Crated	Three Phase 60 Cycle Motor	Single Phase 60 Cycle Motor	Direct Current Motor
522-Y	9 $\frac{1}{4}$ in.	3 ft.	475 lbs.	\$189.00	\$205.00	\$193.00
522-Z	9 $\frac{1}{4}$ in.	3 $\frac{1}{2}$ ft.	495 lbs.	195.00	211.00	199.00
522-A	9 $\frac{1}{4}$ in.	4 ft.	515 lbs.	201.00	217.00	205.00

NOTE—Above prices include 110 volt, 220 volt or 440 volt motor 32 volt motor can be supplied.

## No. 322.—9-inch Junior Silent Chain Motor Drive Lathe with Floor Legs

The Silent Chain Motor Drive is a practical and efficient drive for the No. 22—9-inch Junior Lathe equipped with floor legs. The Silent Chain Drive which connects the motor with the upper cone is as positive as though it were direct geared. It eliminates noise and vibration caused by gears, and is more efficient than either a gear or belt drive. A small lever allows the table on which the motor sets, to tilt and relieve the belt tension for easy shifting of belt. An independent adjustment is provided for taking up the stretch of the belt.

### The Control Switch

The Control Switch is conveniently located so that the operator can start, stop, or reverse the motor from an easy working position in front of the lathe. The switch has three positions: left, for forward motion of lathe spindle, center for neutral, and right for reverse.

### Operates from Lamp Socket

A  $\frac{1}{4}$ -horsepower motor driven from an ordinary lamp socket gives sufficient power to operate the lathe at maximum capacity.

### Current Specifications

When ordering a No. 322 Silent Chain Motor Drive Lathe, be sure to specify the electric current. If alternating current, state voltage, phase, cycle and number of wires. If direct current, state voltage. This information can be obtained from your electric light company.

### Equipment included in Price

Prices below include one No. 22—9-inch Junior Lathe with floor legs and lathe equipment (except countershaft), Westinghouse reversing switch, one leather belt, complete wiring between motor and switch and a 1200 R. P. M.,  $\frac{1}{4}$  H. P. reversing motor of Westinghouse, General Electric or equal make.

Net Factory Prices of Lathe with Reversing Motor and Reversing Switch

Catalog Number of Lathe	Swing Over Bed	Length of Bed	Weight Crated	Three Phase 60 Cycle Motor	Single Phase 60 Cycle Motor	Direct Current Motor
322-Y	9 $\frac{1}{4}$ in.	3 ft.	650 lbs.	\$245.00	\$261.00	\$257.00
322-Z	9 $\frac{1}{4}$ in.	3 $\frac{1}{2}$ ft.	670 lbs.	251.00	267.00	263.00
322-A	9 $\frac{1}{4}$ in.	4 ft.	690 lbs.	257.00	273.00	269.00

NOTE—Above prices include 110 volt, 220 volt or 440 volt motor 32 volt motor can be supplied.

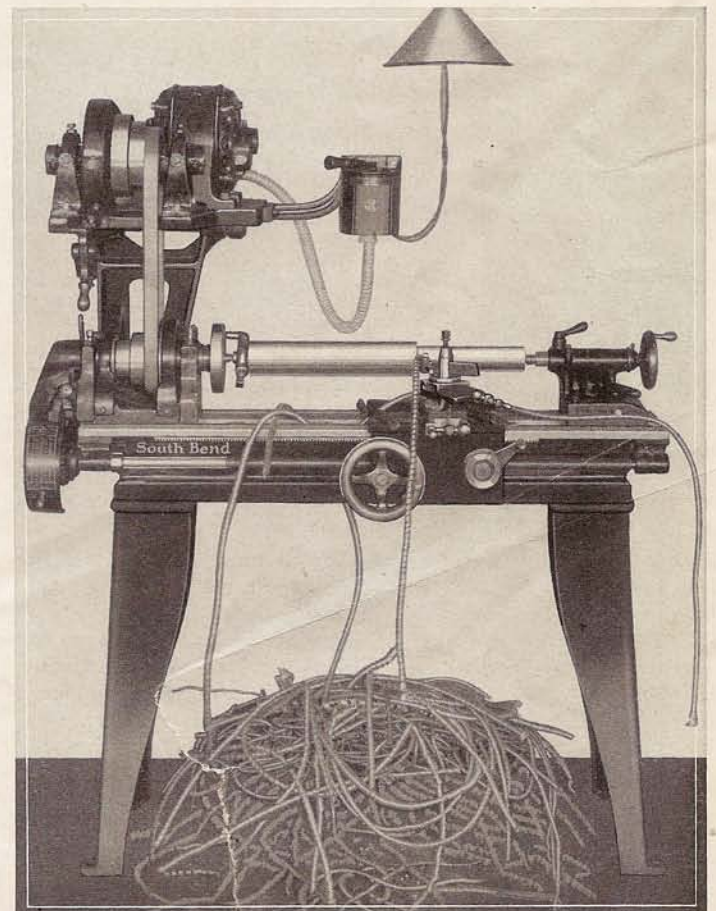
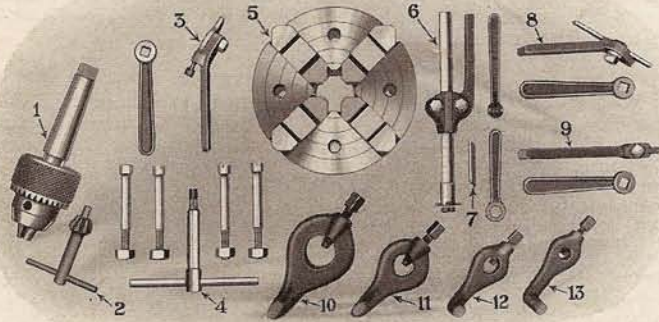


Fig. 12. Silent Chain Motor Drive Lathe with Floor Legs



## Special Tool Equipment For the No. 22—9-inch Junior Lathe

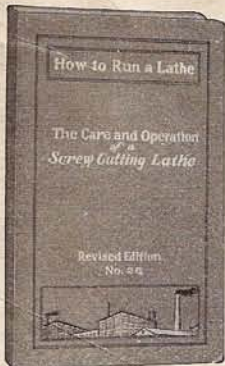


The special tool equipment illustrated above shows the proper type and size of chucks and tools for the No. 22 9-inch Junior Lathe for handling a variety of work that will come up in the shop. These special tools are not included in the regular lathe equipment but are extra and are supplied for the prices shown in the tabulation below. Any one of these tools may be ordered or the entire equipment may be ordered as desired.

- |            |  |         |
|------------|--|---------|
| 1 No. 1406 | 6-in. 4-Jaw Independent Lathe Chuck with Reversible jaws and wrench..... | \$24.00 |
|            | Fitting Chuck to Lathe, using Chuck Back Furnished with Lathe.....       | 3.00    |
| 1 No. 6    | 3-Jaw Drill Chuck, 1/2-in. Capacity.....                                 | 7.00    |
| 1 No. 709  | Drill Chuck Arbor, fitted to Chuck and Lathe.....                        | 2.50    |
| 1 No. 00-S | Patent Turning Tool (Straight).....                                      | 2.40    |
| 1 No. 00-T | Patent Threading Tool.....   | 3.75    |
| 1 No. 429  | Patent Boring Tool, Style B.....   | 4.90    |
| 1 No. 29-R | Patent Cutting-Off Tool (R. H.).....                                     | 2.60    |
| 1 Set (4)  | Malleable Lathe Dogs, 3/8" to 1".....                                    | 2.20    |

Net Factory Price, F. O. B. South Bend, Total.....\$52.35

### Valuable Reference Book "How to Run a Lathe"



"How to Run a Lathe" is an authoritative manual covering the fundamental operations of the modern screw cutting lathe. It is a very valuable book for the mechanic as it contains complete instructions on the setting up, the care and operation of the screw cutting lathe. This 144-page book contains over 300 practical illustrations and is offered at less than cost of printing alone. We make this low price in order to place the book within the reach of all apprentices and mechanics in machine shops. A copy of this book is included with the equipment of each No. 22—9-inch Junior Lathe.

#### Partial List of Contents

- |                                 |                                 |
|---------------------------------|---------------------------------|
| How to Set Up the Lathe         | How to Finish Turn Work to Size |
| How to Hang the Countershaft    | How to Turn Tapers              |
| How to Care for the Lathe       | How to Cut External Threads     |
| How to Operate the Lathe        | How to Cut Internal Threads     |
| How to Read a Micrometer        | How to Cut a Left-hand Thread   |
| How to Locate Centers           | How to Cut an Acme Screw Thread |
| How to Test Work on Centers     | How to Cut a Square Thread      |
| How to Mount Work on Centers    | Table of Decimal Equivalents    |
| How to Determine Cutting Speeds | Table of Metric Linear Measure  |

Price each, postpaid (coin or stamps of any country accepted) 25c

## 96 Sizes and Types of South Bend Lathes

There are more than 35,000 South Bend Screw Cutting Lathes in use in industry in the United States and 64 foreign countries. These Lathes are built in 96 sizes and types, ranging from 9-inch swing to 24-inch swing inclusive. We list below the Standard and Quick Change Gear types with floor legs and overhead countershaft drive. Further information may be obtained from our Catalog No. 87.

### Quick Change Gear and Standard Change Gear Lathes with Floor Legs and Overhead Countershaft Drive

Net Factory Prices, Crated for Domestic Shipment F. O. B. South Bend, Ind.

Swing over Bed Inches	Length of Bed Feet	Distance Between Centers Inches	Approx. Weight Crated Pounds	Quick Change Gear		Standard Change Gear	
				No. of Lathe	Price	No. of Lathe	Price
<b>9-inch Swing—Quick Change Gear and Standard Change Gear Lathes</b>							
9 1/4	2 1/2	11	470	82-X	\$ 252.00	31-X	\$ 222.00
9 1/4	3	18	490	82-Y	258.00	31-Y	228.00
9 1/4	3 1/2	23	510	82-Z	263.00	31-Z	233.00
9 1/4	4	29	530	82-A	270.00	31-A	240.00
<b>11-inch Swing—Quick Change Gear and Standard Change Gear Lathes</b>							
11 1/4	3	12	675	84-Y	300.00	33-Y	260.00
11 1/4	3 1/2	18	700	84-Z	304.00	33-Z	264.00
11 1/4	4	24	725	84-A	308.00	33-A	268.00
11 1/4	5	36	805	84-B	320.00	33-B	280.00
<b>13-inch Swing—Quick Change Gear and Standard Change Gear Lathes</b>							
13 1/4	4	16	1060	86-A	375.00	35-A	325.00
13 1/4	5	28	1110	86-B	387.00	35-B	337.00
13 1/4	6	40	1160	86-C	399.00	35-C	349.00
13 1/4	7	52	1210	86-D	411.00	35-D	361.00
13 1/4	8	64	1260	86-E	427.00	35-E	377.00
<b>15-inch Swing—Quick Change Gear and Standard Change Gear Lathes</b>							
15 1/4	5	24 1/2	1475	88-B	452.00	39-B	397.00
15 1/4	6	36 1/2	1550	88-C	468.00	39-C	413.00
15 1/4	7	48 1/2	1625	88-D	484.00	39-D	429.00
15 1/4	8	60 1/2	1735	88-E	500.00	39-E	445.00
15 1/4	10	84 1/2	1900	88-G	536.00	39-G	481.00
<b>16-inch Swing—Quick Change Gear and Standard Change Gear Lathes</b>							
16 1/4	6	34	1875	92-C	521.00	41-C	461.00
16 1/4	7	46	1955	92-D	537.00	41-D	477.00
16 1/4	8	58	2035	92-E	553.00	41-E	493.00
16 1/4	10	82	2195	92-G	585.00	41-G	525.00
16 1/4	12	106	2355	92-H	633.00	41-H	573.00
<b>18-inch Swing—Quick Change Gear and Standard Change Gear Lathes</b>							
18 1/4	6	29 1/2	2440	94-C	650.00	43-C	585.00
18 1/4	7	41 1/2	2540	94-D	671.00	43-D	606.00
18 1/4	8	53 1/2	2640	94-E	693.00	43-E	628.00
18 1/4	10	77 1/2	2840	94-G	746.00	43-G	681.00
18 1/4	12	101 1/2	3140	94-H	806.00	43-H	741.00
18 1/4	14	125 1/2	3540	94-K	870.00	43-K	805.00
<b>21-inch Swing—Quick Change Gear and Standard Change Gear Lathes</b>							
21 1/4	7	36	3490	96-D	953.00	49-D	870.00
21 1/4	8	48	3690	96-E	979.00	49-E	896.00
21 1/4	10	72	3940	96-G	1032.00	49-G	949.00
21 1/4	12	96	4300	96-H	1116.00	49-H	1033.00
21 1/4	14	120	4520	96-K	1182.00	49-K	1099.00
<b>24-inch Swing—Quick Change Gear and Standard Change Gear Lathes</b>							
24 1/4	8	43	4490	98-E	1279.00	57-E	1180.00
24 1/4	10	67	4740	98-G	1340.00	57-G	1241.00
24 1/4	12	91	5140	98-H	1437.00	57-H	1338.00
24 1/4	14	115	5410	98-K	1503.00	57-K	1404.00
24 1/4	16	139	5690	98-M	1573.00	57-M	1474.00

### CERTIFICATE OF GUARANTY

Each South Bend Lathe is guaranteed to be accurate, mechanically perfect, and to give entire satisfaction and the service you have a right to expect because you pay for reliable lathe value.

We will ship a lathe anywhere in the United States for a thirty-day trial in your own shop. If you are dissatisfied with the lathe in any way, within that time, ship it back to us, and we will pay the return freight charges and refund your money.

**South Bend Lathe Works**  
South Bend, Indiana

### Certificate of Guaranty

Our policy is outlined in the above Guaranty, which has been in use for the past 15 years, and applies to the No. 22—9-inch Junior South Bend Lathe as well as to all other sizes and types of South Bend Lathes. Each South Bend Lathe is given forty-four accuracy tests in the process of manufacture, and tested under its own power under belt on an actual machine job after assembly.

## SOUTH BEND LATHE WORKS

425 E. Madison St.

South Bend, Indiana

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