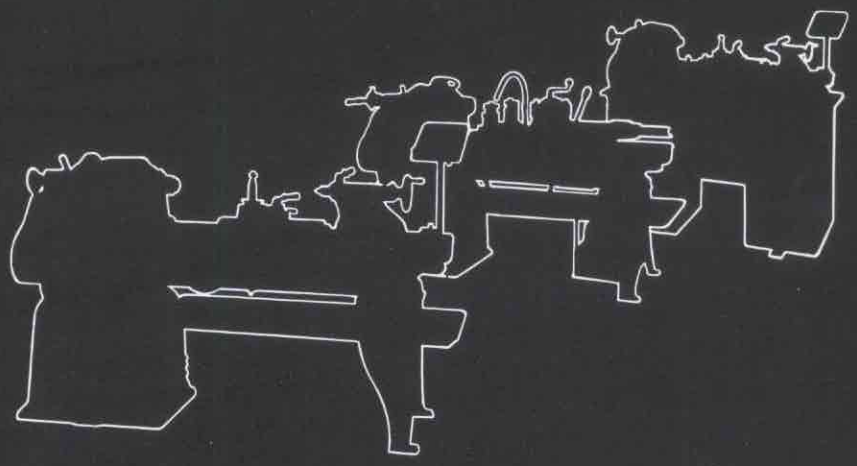
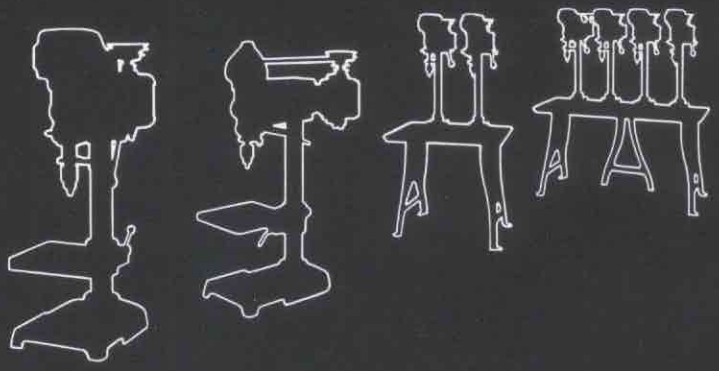
CATALOG 5205

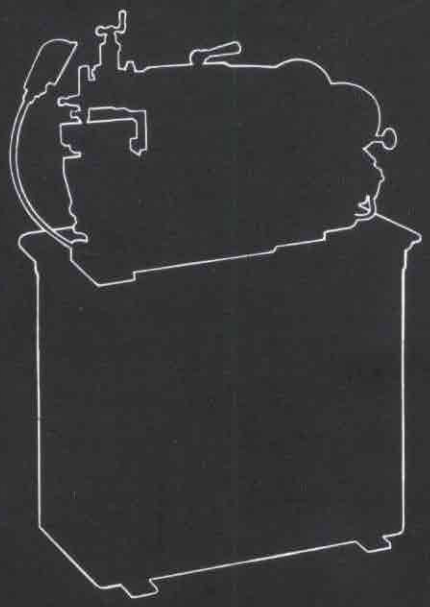
SOUTH BEND



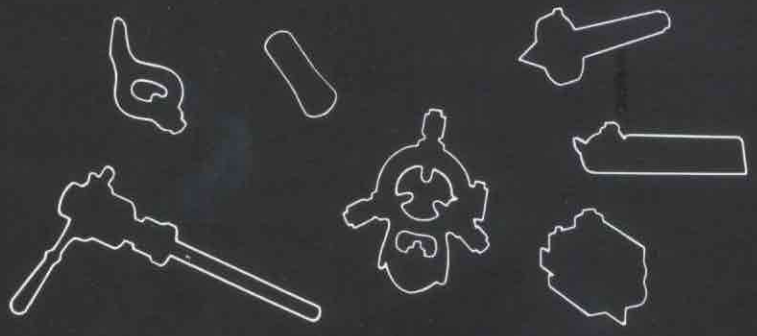
LATHES



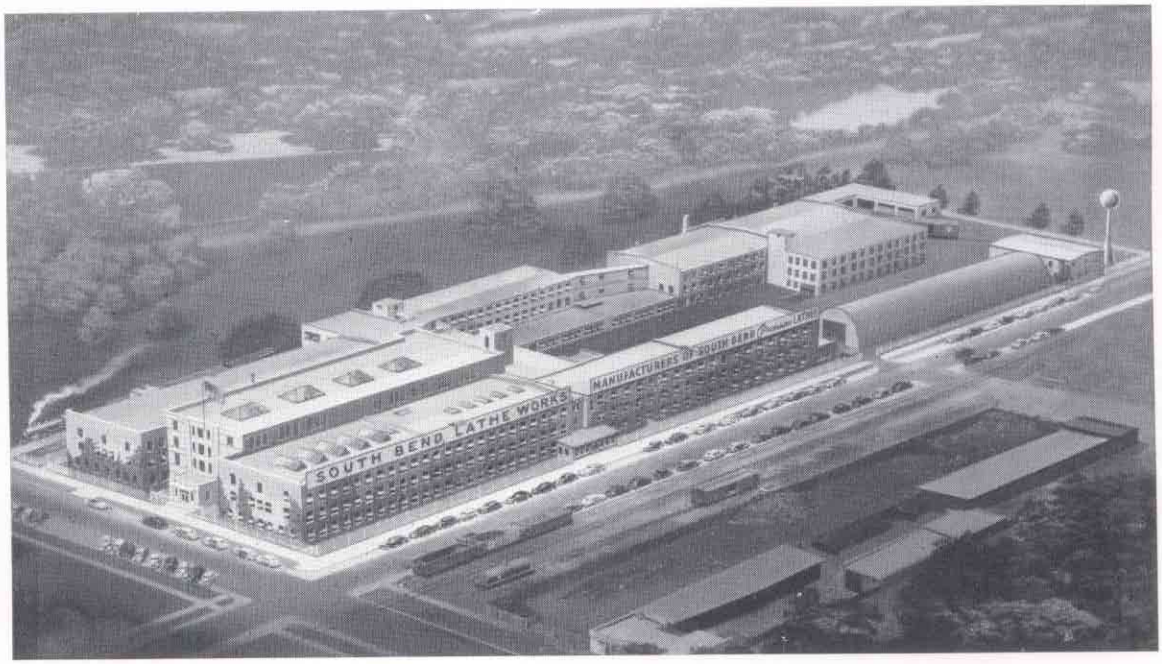
DRILL PRESSES



BENCH SHAPERS



ACCESSORIES



South Bend Lathe Works

The South Bend Lathe Works was founded in 1906 by John J. O'Brien and Miles W. O'Brien, twin brothers who had served toolmaker apprenticeships in some of the finest of the old New England shops. After supplementing their practical training with engineering courses at Purdue University, the O'Brien brothers established their factory at South Bend, on the banks of the beautiful St. Joseph river. Bringing to the midwest a rich heritage of Yankee ingenuity, their products were a success from the beginning.

Operated first as a partnership and incorporated in 1914, the business remained a closely held corporation until 1936 when its stock was first listed on a Chicago stock exchange. Currently listed on the Midwest Stock Exchange of Chicago, the stock is now owned by a diversified group of shareholders residing in all parts of the United States.

Recognizing the fact that there is no substitute for experience, it has been the policy of this company to employ well trained mechanics and to encourage promising young men to remain after their apprenticeship with the company has been completed. Today a large percentage of our workmen are "old timers" having service records of more than twenty-five years.

Catalog 5205

SOUTH BEND *Precision* LATHES
DRILL PRESSES - SHAPERS

Warranty

The South Bend Lathe Works warrants its products to conform to or excel the specifications set forth in the manufacturer's catalogs in use at the time of sale and reserves the right, at its own discretion, without notice and without making similar changes in articles previously manufactured, to make changes in materials, design, finish, or specifications. The South Bend Lathe Works warrants products of its own factory against defects of material or workmanship for a period of one year from the date of sale. The manufacturer's liability under this warranty shall be limited to replacing, free of charge, f.o.b. South Bend, Indiana, any such parts proving defective within the period of this warranty but the manufacturer will not be responsible for transportation charges or consequential damages. The South Bend Lathe Works makes no warranty with respect to electrical equipment or purchased extras as described in the manufacturer's catalogs.

Finish—Shipping Weights—Case Sizes

All sizes of South Bend Lathes, the Precision Model Drill Presses and the 7" Bench Shaper are attractively finished in the new South Bend light gray enamel. Accessories are finished to match. Shipping weights of all machines include an allowance for a normal amount of electrical equipment and accessories, and have been carefully estimated. However, they should be considered approximate as there is some variation due to the variation in the weight of the lumber and other packing materials used. Case sizes specified are based on current methods of packing and should be accurate within one cubic foot. However, we reserve the right to make changes in packing without notice, and such changes may alter the case size.

SOUTH BEND LATHE WORKS
Building Better Tools Since 1906
425 EAST MADISON STREET, SOUTH BEND 22, INDIANA, U.S.A.

CABLE ADDRESS "TWINS" SOUTH BEND

CODES USED

A. B. C. Fifth Edition Improved — Bentley's Complete Phrase and 2nd Editions
Western Union Five Letter Edition — Western Union Universal Edition
Acme — Lieber's — Standard — Our Own

SOUTH BEND *Precision* LATHES

Careful design and conscientious workmanship are combined in South Bend Lathes to give you a machine tool that you can depend on for years of satisfactory service. Continual research has resulted in many improvements and refinements which contribute to their accuracy, durability, and ease of operation. We know of no other lathe selling at anywhere near the price that can match the performance of South Bend.

As a part of our policy of continual improvement, new ideas, new methods, and new materials are developed and tested in our research laboratory. The equipment of this laboratory includes precision gauge blocks accurate to five-millionths of an inch, an optical comparator for testing the form and lead of screw threads, a profilometer for checking the smoothness of surface finishes, hardness testing equipment to make sure that heat-treated steel surfaces have just the right degree of hardness, precision lead screw testing equipment accurate to .00005" in 30", a dynamic balancing machine, and many other precision measuring instruments, gauges, and tools.

Parts for South Bend Lathes are economically produced in our modern factory equipped with efficient production machinery. Measuring instruments and tools are constantly checked to maintain uniform accuracy. Hundreds of special machines, jigs, fixtures, and gauges are used to assure interchangeability of parts. This simplifies assembly, lowers the cost of manufacture, and insures precision. South Bend Lathes are reasonable in price because the savings effected by efficient quantity production are passed on to the customer.

A careful inspection of any South Bend Lathe will disclose the most expert workmanship. The superior quality of workmanship is made possible by the highly specialized skills of our experienced employees and the excellent equipment of our shops. An experienced machinist can see at a glance that only the finest craftsmanship enters into the construction of South Bend Lathes.

The best materials available are used in building South Bend Lathes. That is why they last a lifetime if given the proper care. The headstock spindles are made from a special quality of alloy steel manufactured to exacting specifications of analysis and heat treatment. The spindle bearings are the best quality phosphor bronze. The lathe beds are of a special grade of hard, close-grained iron having unusual tensile strength and wearing qualities.

The lead screws on South Bend Lathes are made of a special grade of steel that has proved to be most satisfactory for this purpose. The compound rest top, carriage, headstock, and other units of the lathe are made of the specific grades of iron that are the most suitable for the respective parts. Even the gray enamel used in finishing South Bend Lathes is made exclusively for us to our specifications.

The scientifically correct design, the generous proportions of bearing surfaces and the excellent facilities for oiling on South Bend Lathes assure permanent accuracy. We invite comparison with any other make of lathe, made either in this country or abroad. We are confident that you will find South Bend Lathes to be more accurate, and that they will retain their precision through years of service.

Fig. 2. Inspecting a Screw Thread with an Optical Comparator.

Fig. 3. Testing Laboratory and Research Department for Maintaining Uniformly High Standards of Workmanship and Materials for South Bend Lathes

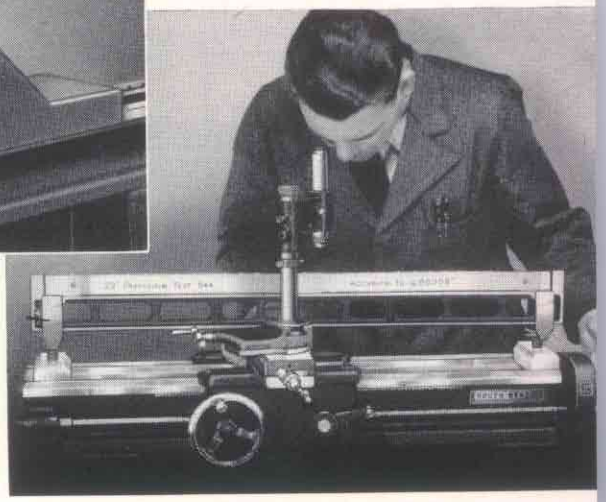
Fig. 4. Checking a Fixture with Precision Surface Plate and Lapped Gauge Blocks

Fig. 5. Testing the Hardness of a Carburized Headstock Spindle Bearing Surface

Fig. 6. Below—Testing Gears for Accuracy of Tooth Form, Pitch Diameter, and Concentricity

Fig. 7. Above—Testing the Saddle Cross Slide Dovetail for Squareness with V-Ways of the Lathe Bed

Fig. 8. Below—Testing a Lead Screw for Accuracy of Lead with Precision Optical Measuring Equipment



Underneath Motor Drive

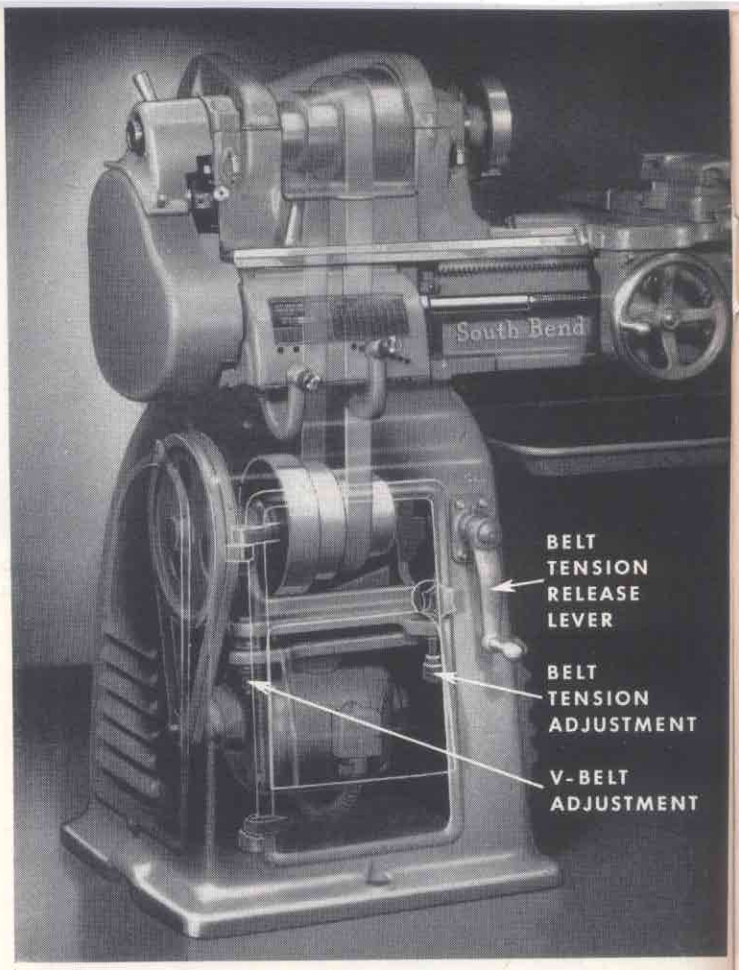
PROVIDES SMOOTH POWER

The patented South Bend Underneath Belt Motor Drive is unique and exclusive. This fully enclosed drive is unusually compact, silent in operation, powerful, and economical. Although several attempts have been made to imitate it, in our opinion no competitive drive has approached it in excellence of design or quality of construction.

The motor and driving mechanism are mounted in the cabinet leg under the lathe headstock. There are no exposed belts, pulleys or gears. This contributes to the neat appearance of the lathe, and is also noteworthy as a safety feature. V-belts transmit the power from the motor to the lower cone pulley. An endless flat leather belt running over the cone pulleys passes up through the lathe bed. Both the V-belts and the flat leather belt have convenient belt tension adjustments, "B" and "C", Figs. 10, 11, and 12.

The advantage of the smooth direct belt drive to the spindle for high speeds, combined with the powerful back-geared drive for slow speeds are almost too obvious to require explanation. The belt drive back-geared headstock construction has fewer parts and is, therefore, more rugged and durable than the geared head design. The few gears used for slow spindle speeds are of ample proportion to stand the shock of a heavy, interrupted cut; an operation that has proved the Waterloo of many geared head lathes. The noise and vibration of high speed gears (principal defect of the geared head design) are totally absent, thus eliminating the possibility of chatter marks on the work caused by headstock gear vibration. The speed range of a geared head lathe is limited by the gearing, but the belt drive operates smoothly at all speeds.

The quick acting belt tension release "A", Figs. 10, 11, and 12, and convenient headstock back gear change lever permit changing spindle speeds quickly, usually in five to ten seconds. The cover over the headstock cone pulley is hinged and may be raised for easy access to the cone pulley belt. The belt tension can be easily adjusted to transmit just the required amount of power. This feature can be used as a safety factor to prevent damage to the lathe by careless or inexperienced operators who often take too heavy a cut or otherwise stall the motor. When the full power of the motor is required for taking heavy cuts, the belt tension can be tightened quickly and easily to transmit full power. The lower cone pulley shaft assembly is mounted on prelubricated and sealed ball bearings which require no oiling. Pulleys are carefully balanced for smooth operation at all speeds.



Patented

Fig. 9. Phantom View Showing Construction of South Bend Underneath Belt Motor Drive

The control switch is conveniently located to permit the operator to start or stop the rotation of the lathe spindle from an easy working position. Wiring between the motor and the switch is enclosed in a flexible metal conduit. Pushbutton operated motor controls can be supplied for all ½ h.p. and larger motors, and are required for all two-speed motors and for motors operating on currents above 230 volts. Drum type across-the-line reversing switch is optional for 230 volts or less. See page 73 for complete information on motors and controls.

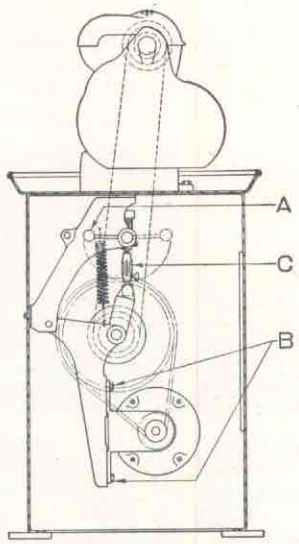


Fig. 10. Underneath Motor Drive Arrangement for 9″ and Light Ten South Bend Lathes

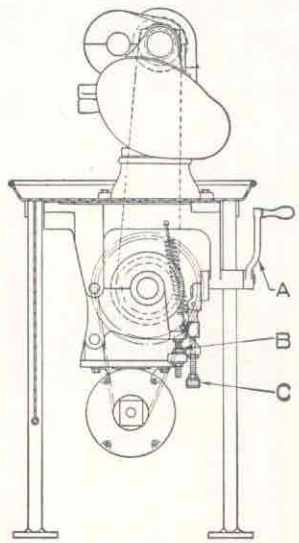


Fig. 11. Underneath Motor Drive Arrangement for 10″-1″ Collet Bench Lathes

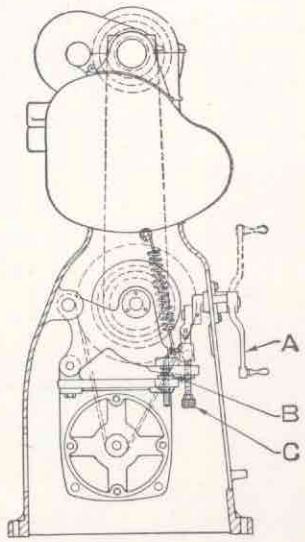


Fig. 12. Underneath Motor Drive Arrangement for 10″ and Larger Floor Type Lathes

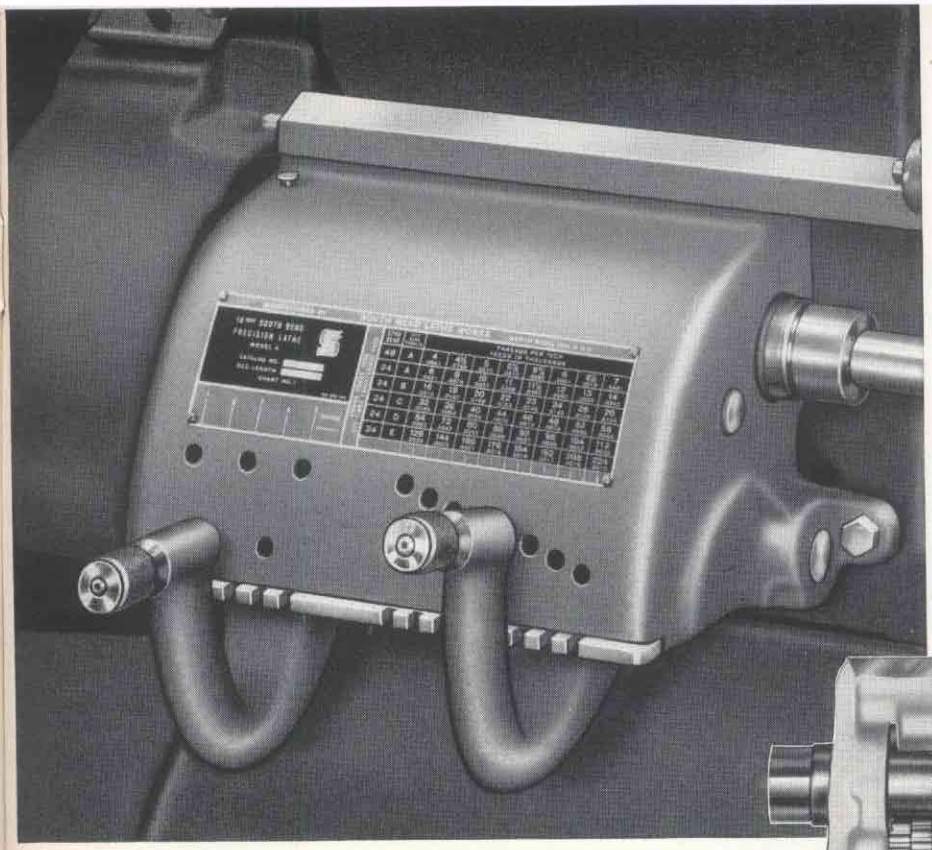


Fig. 13. Improved Quick Change Gear Box for South Bend Lathes

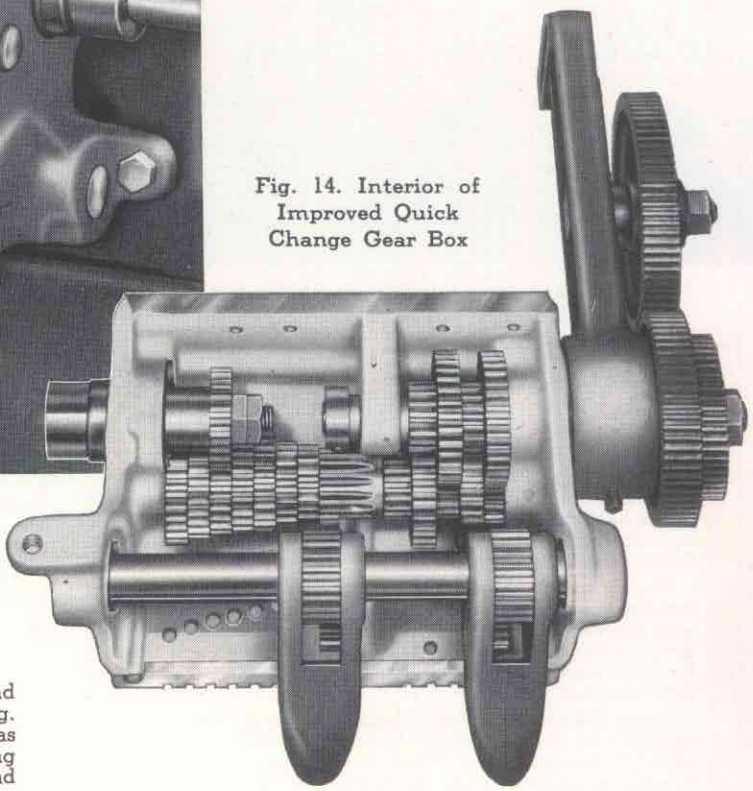


Fig. 14. Interior of Improved Quick Change Gear Box

Improved Quick Change Gear Mechanism

The improved quick change gear mechanism for South Bend Lathes is the result of careful research and thorough testing. Before this new gear box was approved for production, it was used for years on lathes in our own shops which were operating continuously on tough production jobs. Only after it had proved to be rugged, foolproof, and entirely satisfactory from the operator's standpoint was the final OK given. Designed to save time and give long dependable service, we are convinced that this new quick change gear equipment is the most convenient and durable available regardless of price.

A direct reading index chart shows positions in which the two conveniently located tumbler levers are placed for each of 48 screw thread pitches, 48 power longitudinal feeds, and 48 power cross-feeds. (For metric threads see page 46.) There are no sliding clutches or sliding primary end gears to change. Shifting a single lever changes feed instantly from coarse to fine, for roughing or finishing cuts.

Standard screw threads from 8 to 224 per inch are obtained by shifting the two tumbler levers on the gear box. The stud gear is changed for an additional series of coarse pitches ranging from 4 to 7 threads per inch. Provision is made for the use of special stud and intermediate gearing needed to cut metric screw threads, diametrical pitch worm threads, or other special screw threads. Metric transposing gears are listed on page 47. Prices of extra stud gears for special threads will be quoted on request. State pitches of threads to be cut.

The main frame of the gear box consists of a heavy one-piece casting which is attached to the lathe bed near the headstock. Special quality alloy steel is used for all gears and shafts. Gears are precision-cut for maximum accuracy and quiet operation. Shafts are carefully ground and fitted. The lead screw shaft revolves in an annular ball bearing and has a precision thrust bearing to eliminate end play and cam action. Tumbler gears are fitted with needle bearings. A single oil reservoir lubricates the entire quick change gear box.

MANUFACTURED BY **SOUTH BEND LATHE WORKS** SOUTH BEND, IND. U. S. A.

14½ & 16 INCH SOUTH BEND PRECISION LATHE
MODEL A
CATALOG NO.
BED LENGTH
CHART NO. 1

A B C D E POSITION

POWER CROSS FEED .375 TIMES LONGITUDINAL FEED

STUD GEAR	LEFT HAND TUMBLER	THREADS PER INCH / FEEDS IN THOUSANDTHS							
48	A	4 .0841	4½ .0748	5 .0673	5½ .0612	5½ .0585	6 .0561	6½ .0518	7 .0481
24	A	8 .0421	9 .0374	10 .0337	11 .0306	11½ .0293	12 .0280	13 .0259	14 .0240
24	B	16 .0210	18 .0187	20 .0168	22 .0153	23 .0146	24 .0140	26 .0129	28 .0120
24	C	32 .0105	36 .0093	40 .0084	44 .0076	46 .0073	48 .0070	52 .0065	56 .0060
24	D	64 .0053	72 .0047	80 .0042	88 .0038	92 .0037	96 .0035	104 .0032	112 .0030
24	E	128 .0026	144 .0023	160 .0021	176 .0019	184 .0018	192 .0017	208 .0016	224 .0015

Fig. 15. Direct Reading Index Chart Showing Threads and Feeds Provided by Quick Change Gear Mechanism on 16-inch Swing Lathe

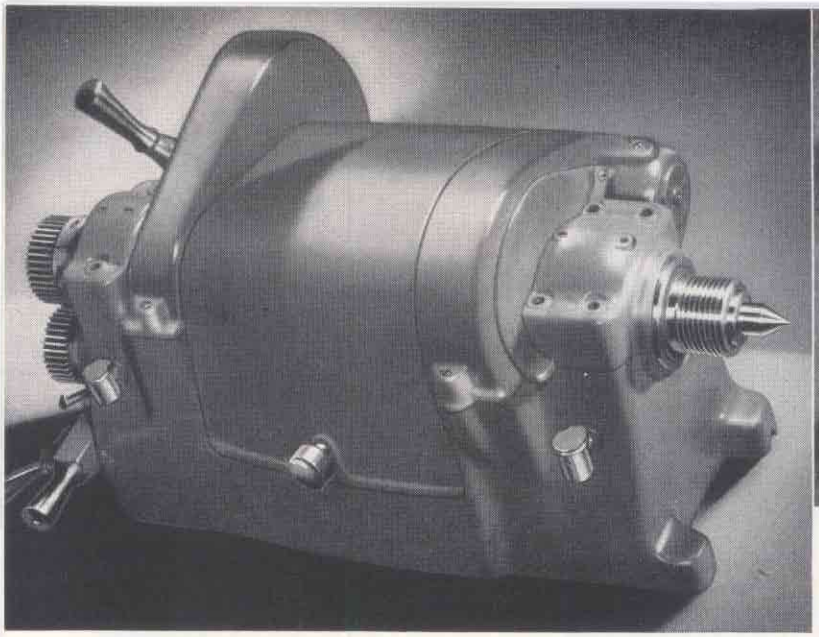


Fig. 16. Headstock for 16-inch Swing South Bend Lathe

Fig. 17. Headstock Spindle and Bearings

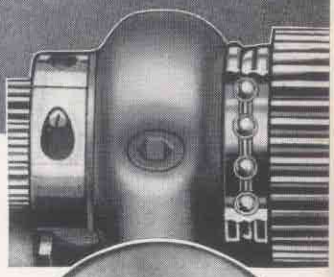


Fig. 18. Ball Thrust Bearing and Take-up Nut for Spindle

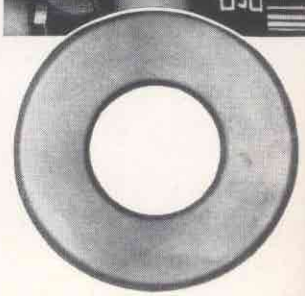


Fig. 19. Cross Section of Spindle Showing Thickness (3/64") of Carburized and Hardened Bearing Surfaces

Headstock and Spindle Construction

The headstock is the most important unit of the lathe, and it might be said that the life of the lathe is determined by the life of the headstock. Sturdy design, high quality materials, large bearings and excellent oiling facilities assure unusual life for South Bend Headstocks.

The main casting for the headstock is heavily reinforced and webbed for rigidity and permanent alignment of the spindle with the V-ways of the bed. The headstock base has unusually long bearings which are carefully hand-scraped and fitted to the bed ways. All moving parts (except spindle nose) are fully enclosed.

Direct belt drive to the spindle for high speeds assures smooth operation on small diameter work. Slow speeds for heavy cuts on large diameters are driven through the back gears. The threaded spindle nose shown is regularly supplied, but type L Long Taper Key Drive or type D1 Cam Lock Spindle can be supplied to order. See page 40.

The wrenchless bull gear lock permits engaging the headstock back gears without the use of a wrench. A quick acting spring latch reverse on the left end of the headstock enables the operator to change from right-hand to left-hand feeds or threads instantly. These two convenient features will appeal to any busy mechanic for they save a lot of time.

Much time, thought and care have gone into the design and development of the headstock spindle and bearings for South Bend Lathes. Hundreds of different designs have been tested, including many with ball and roller bearings.

Two plain bearing designs were selected as the most satisfactory. For 10-inch and larger lathes, a heat-treated spindle and replaceable bronze sleeve bearings were adopted. Preliminary research and testing of this bearing construction were so thorough that during the five years following its introduction not one spindle bearing was replaced because of wear. The spindle and bearing construction for the 9" lathe is similar, except that the spindle runs in integral cast-iron bearings.

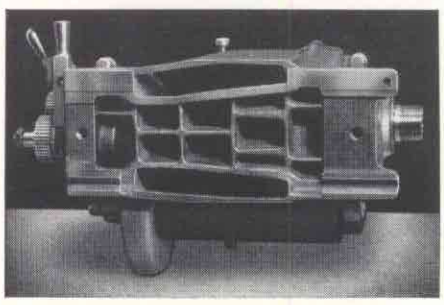


Fig. 20. Bottom View of Headstock Showing Rigid Cross-Ribbed Construction

The bearing surfaces on the spindle are carburized, hardened to Rockwell C 56 to 61, ground and superfinished to a smoothness of 5 microinches (.000005") r.m.s. The extreme smoothness and accuracy of the superfinished spindle bearing surface eliminates wear, reduces friction, permits higher spindle speeds and assures precision.

The bearings in which the spindle revolves are unusually large, and are precision bored and burnished to a smoothness of ten microinches (.000010") r.m.s. by the bearingizing process. The design permits using a large diameter spindle providing extreme rigidity and reducing the possibility of chatter. The bearings are accurately adjusted at the factory and should require no further adjustment for years. Provision is made for take-up when required.

Large oil reservoirs and an improved circulating capillary oiling system provide a complete film of clean filtered oil which separates the rotating spindle from the bearings. As long as sufficient oil is supplied to maintain an adequate oil film, there can be no metal to metal contact in this bearing, no wear and no friction other than the fluid friction of the lubricant. An efficient oil return system retains the oil so that only an occasional replenishing is required.

There is prevalent much misunderstanding and misinformation relative to the respective merits of so-called anti-friction bearings. Certainly they are unequalled for certain applications where low cost or low starting torque are of greater importance than precision and durability. However, it has been our experience that for the spindles of precision lathes such as we manufacture, properly designed and fitted plain bearings are superior, and even though more costly than other types of bearings, their performance justifies the added expense.

The principal advantages of the plain bearing are that it provides better support for the spindle, permits using a larger diameter spindle, eliminates the possibility of chatter marks in the work due to vibration set up by balls or rollers, runs more smoothly and quietly, wears longer, and is adjustable.

On the other hand, a spindle revolving in a ball bearing can only run as true as the combined eccentricity of the outer and inner surfaces of both the outer and inner races, and is supported only by the point of contact between the ball or roller and the bearing race. A slight pit, worn spot, or other imperfection in the bearing race will cause vibrations which result in the familiar chatter marks so often encountered on lathes with ball or roller bearings. The frequent replacement of ball or roller bearings is an annoyance to say nothing of the expense.

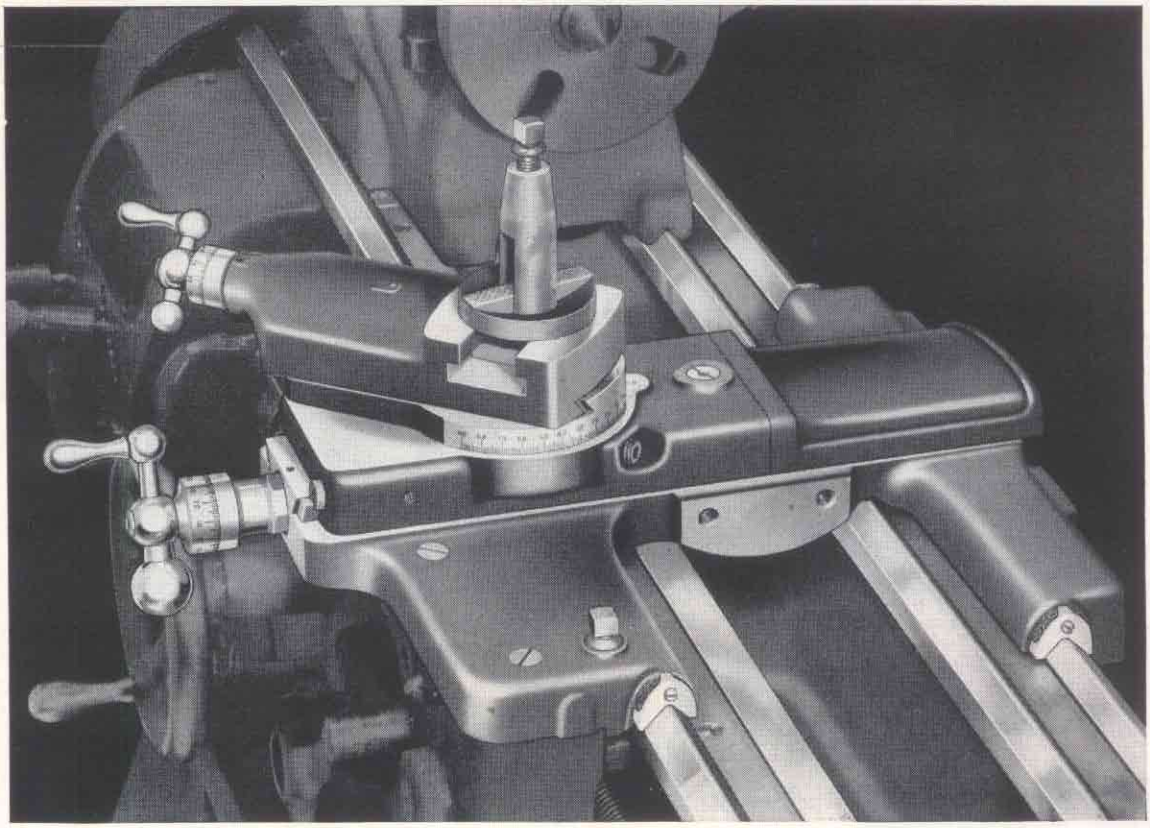


Fig. 21. Improved Saddle and Compound Rest for South Bend Lathes

Improved Saddle and Compound Rest

The saddles for South Bend Lathes have unusually long bearings carefully hand-scraped to conform with the outer V-ways of the lathe bed. Felt pad wipers are attached to each end of the saddle to clean and oil the V-ways of the bed. The cross slide bridge is wide and deep, providing a rigid support for the tool rest. The cross slide dovetail is hand-scraped square with the V-ways of the saddle.

The back of the saddle is machined to receive the taper attachment. A carriage lock screw, conveniently located on the right-hand front wing of the saddle, is provided for locking the carriage securely to the lathe bed for cutting-off and for precision facing operations.

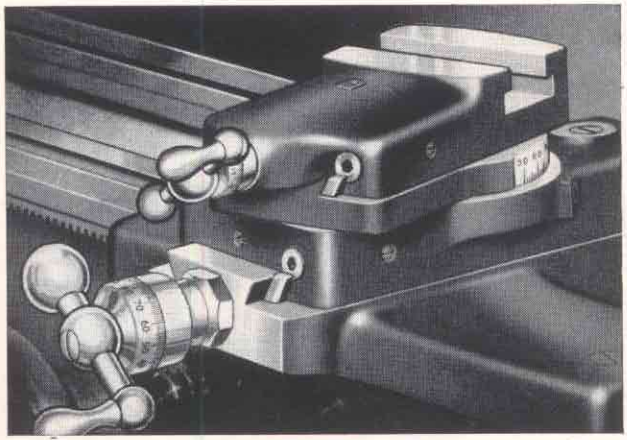


Fig. 22. Close-up Showing Adjustable Tapered Gibs Used on Compound Rest Base and Top Dovetails of 10"-1" Collet and larger South Bend Lathes

Both the compound rest base and the compound rest top dovetails are hand-scraped, and on 10-inch 1" collet lathes and larger sizes, the dovetails have adjustable tapered gibs. Dovetails on 9-inch and Light Ten Lathes have flat gibs with screw adjustment. The compound rest base is drilled and tapped for the thread cutting stop screw. The compound rest swivel bearing is accurately ground and fitted. The swivel is graduated 180-degrees and may be set at any angle for turning and boring bevels and tapers.

The cross-feed screw and compound rest screw have large diameter easy reading micrometer collars which are accurately graduated to read in thousandths of an inch advance of the cutting tool. Graduations reading in the metric system can be supplied to order. The graduated collars are adjustable and may be set at zero whenever desired. Crank handles for both the compound rest screw and cross-feed screw are nicely balanced and are made of polished steel.

The tool post, tool post ring, and tool post rocker are made of steel, heat-treated and hardened. Rocker adjustment is provided for adjusting the cutting edge of the tool to the desired height. A forged steel heat-treated tool post wrench is supplied as regular equipment. Wrench has box opening on one end and fits the carriage lock screw as well as the tool post screw.

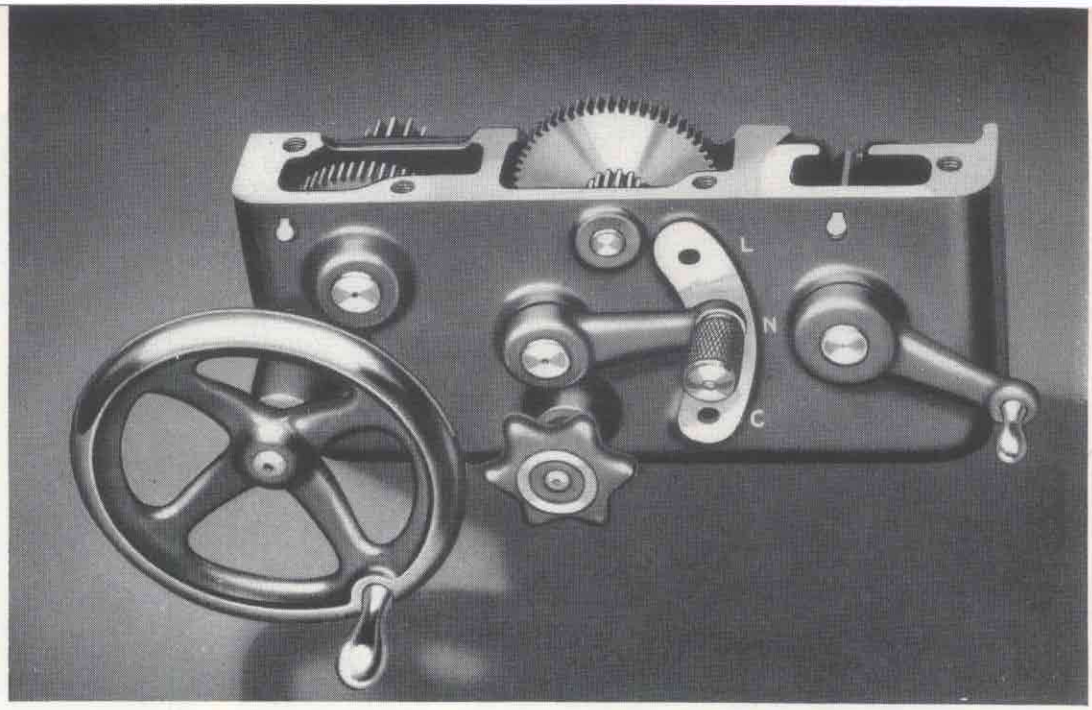


Fig. 23. Front View of Double Wall Apron Showing Rigid Box Type Construction

One-Piece Double Wall Apron

For 10″—1″ and Larger South Bend Lathes

The one-piece double wall apron supplied on all 10″—1″ Collet and larger lathes is rigidly constructed and provides substantial support for both ends of the gear shafts. A tumbler gear shift is used to change from power cross-feed to power longitudinal feed.

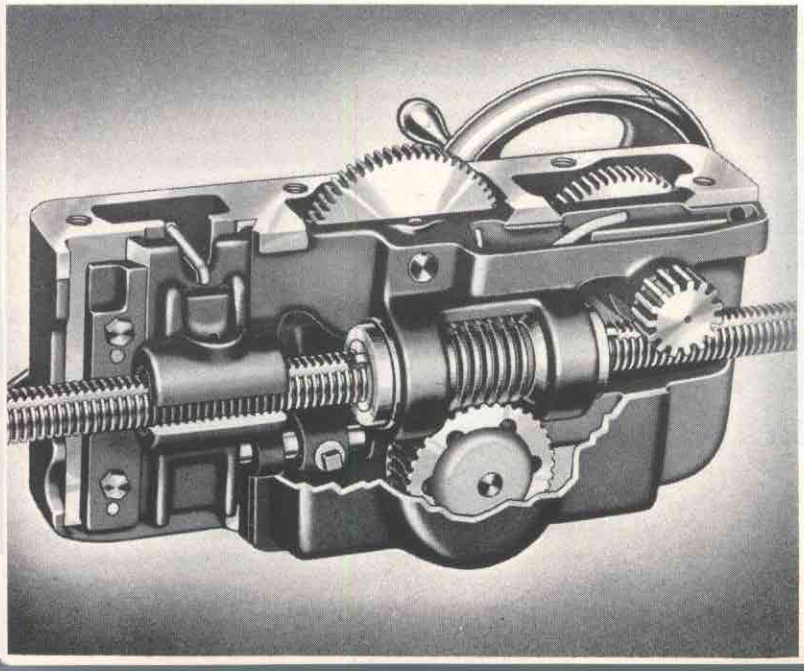
The multiple disc friction clutch used for operating both the power cross-feeds and the power longitudinal feeds is shown in Fig. 25. Alternate steel discs precision ground on both sides to close tolerances for flatness and thickness are keyed to the clutch shaft and worm wheel respectively. A slight turn of the clutch knob will engage the clutch, placing the power carriage feed in operation. Clutch will engage or release instantly, is smooth in operation and will not stick or slip under heavy cuts.

The half-nuts for thread cutting are close-coupled and are dovetailed into the back wall of the apron, as shown in Fig. 24. The half-nuts and threads of the lead screw are used only when cutting screw threads. A spline in the lead screw drives the worm which operates the power carriage feeds.

An automatic built-in safety device makes it impossible to engage the worm driven power feeds and half-nut feeds at the same time. When the feed lever is in either position "L" or "C", Fig. 23, the half-nuts are locked and cannot be engaged with the lead screw. To engage the half-nuts with the lead screw, the feed lever must be in the "N" or neutral position.

Gears in the apron are made of steel and have reservoir and felt wick oiling system. The rack pinion, shown at right end of apron, Fig. 24, is rigidly supported by substantial bearings in both the front wall and back wall of the apron.

Fig. 24. (Below) Back View of New Double Wall Apron



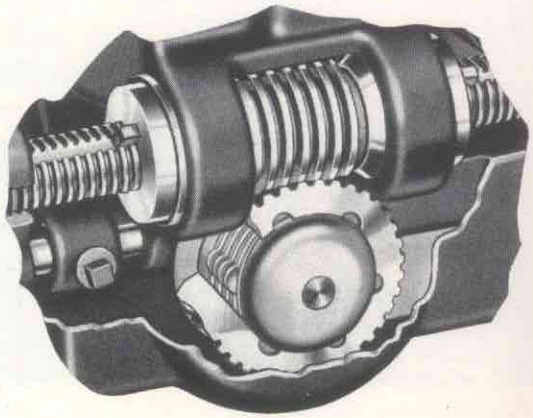


Fig. 25. (Above) Cut-away View Showing the Multiple Disc Friction Feed Clutch

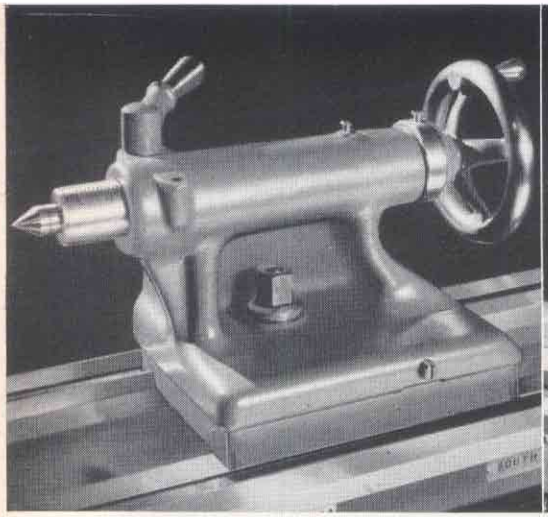


Fig. 26. Tailstock Design Used on 13″ and Larger Lathes

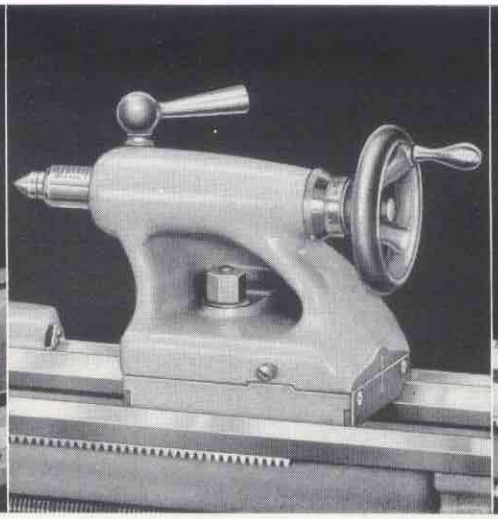


Fig. 27. Tailstock Design Used on 10″ Swing Lathes

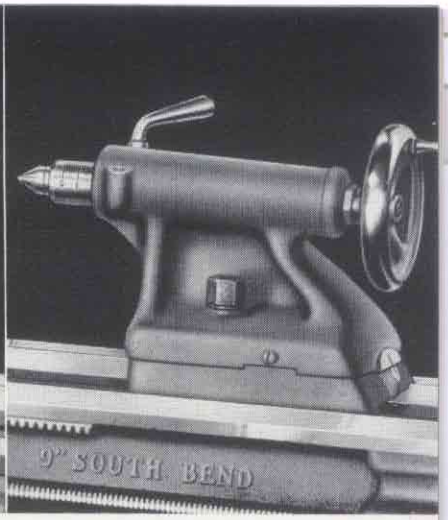


Fig. 28. Tailstock Design Used on 9″ Swing Lathes

Tailstocks for South Bend Lathes

Tailstocks for all South Bend Lathes are rigidly constructed to provide solid support for the work. Generous bearing surfaces are carefully fitted to assure precision alignment of the tailstock spindle with the bed ways and the headstock spindle. On all 10″ and larger lathes, felt wipers are attached to both ends of the tailstock base to clean and oil the bed ways. A substantial clamp and bolt with convenient box type wrench are provided for locking the tailstock securely at any point along the length of the lathe bed.

The tailstock top is offset to allow the compound rest to swivel over the tailstock base, parallel with the lathe bed. A sensitive screw adjustment is provided to set over the tailstock top for taper turning. Witness marks indicating the position of the tailstock top are conveniently placed on the right end of the tailstock where they can be seen with ease.

The tailstock screw has long wearing Acme thread and a large diameter handwheel which assure smooth and easy operation, especially important for drilling and reaming jobs. Graduations on the tailstock spindle indicate its movement for drilling to accurate depths and similar operations. Graduations read in sixteenths of an inch, except for the 10″ swing lathes which have graduations reading in tenths of an inch. Metric graduations can be supplied to order. Tailstock screws for 10″ lathes are fitted with graduated collars reading in thousandths of an inch advancement of the spindle.

Tailstocks for 10″ swing and larger lathes have an improved internal clutch device which securely locks the spindle without altering the alignment of the centers. Tailstocks for 9″ swing lathes have split barrel and binding lever for locking tailstock spindle. A witness mark is scribed on the tailstock spindle at center height for adjusting height of cutter bit. The tailstock center is made of tool steel, is hardened and precision ground all over, and is automatically ejected as the spindle is retracted.

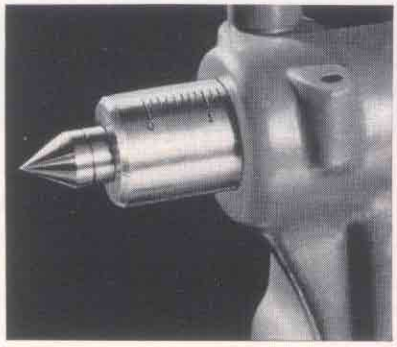


Fig. 29. Close-up of Tailstock Spindle Graduations and Witness Mark

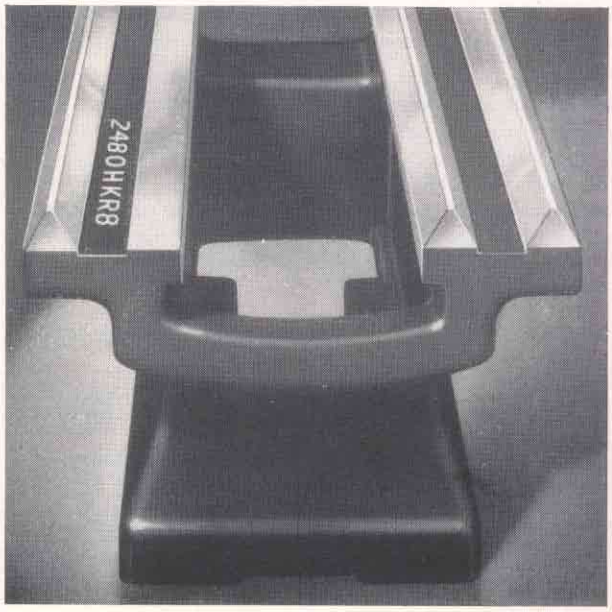
Rigidly Constructed Lathe Bed

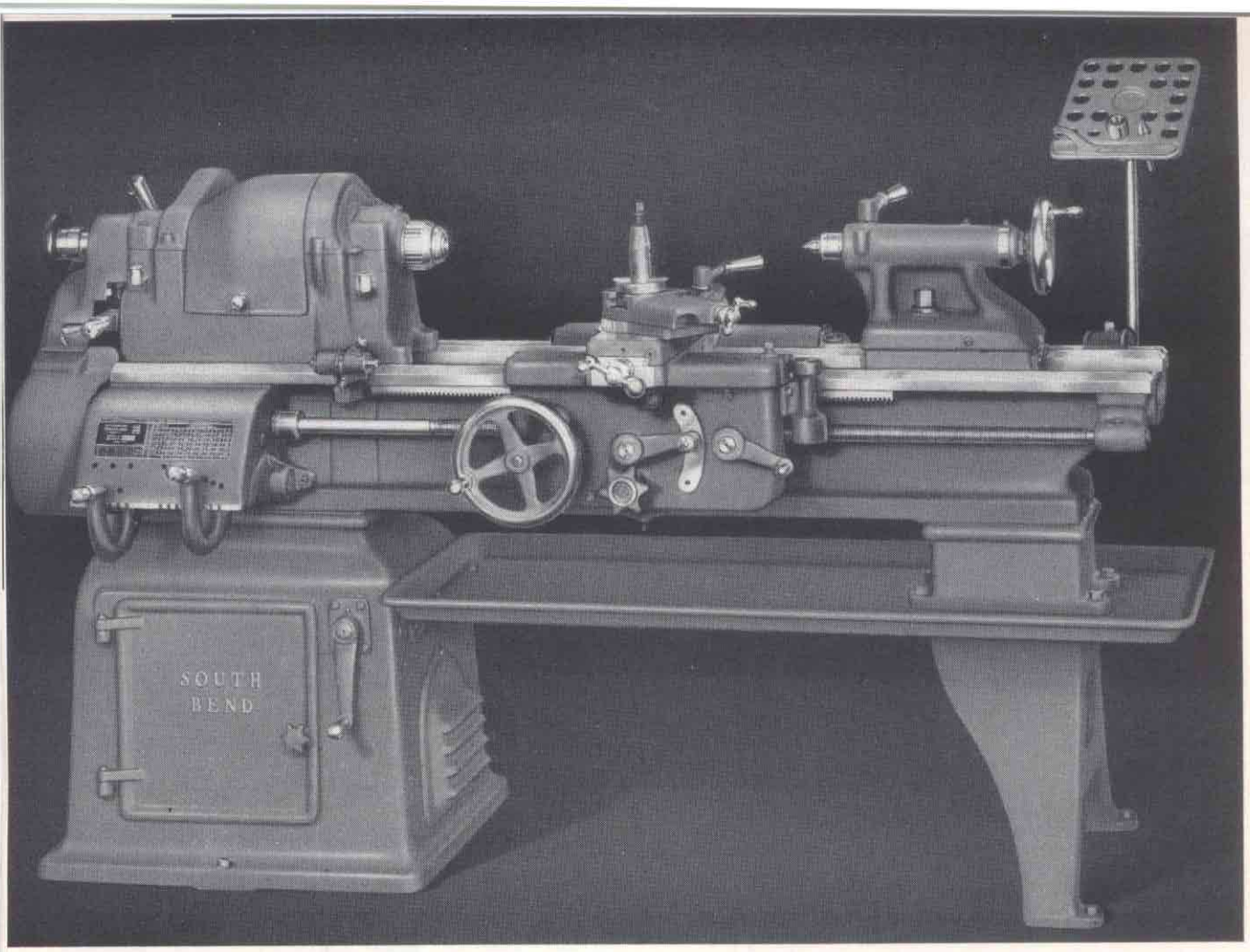
Three V-ways Assure Precision Alignment of Headstock, Tailstock, and Carriage

Beds for South Bend Lathes are heavily constructed with large braces cast in at short intervals. The beds are made of a special grade of iron with 30 to 70 per cent steel (depending on size) which produces a hard close-grained casting having unusual strength and long wearing qualities.

Three large V-ways and one flat way on the bed assure permanent precision alignment of the headstock, carriage, and tailstock. Being cast integral with the bed, there is no possibility of the bed ways working loose and shifting in service. The carriage slides on the two outside V-ways and the headstock and tailstock are aligned by the inside V-way. The ways are carefully precision finished the entire length of the bed.

Careful inspection is made to be sure that a uniform bearing is obtained the full length of the bed and that all ways are straight and parallel. The serial number is stamped between the front ways at the tailstock end as shown. A record of each lathe is kept and is filed under this number. When attachments or parts are ordered, the serial number of the lathe should always be stated.





16-inch Toolroom *Precision* Lathe

Eight Spindle Speeds—Back-Geared—Belt Drive to Spindle

We sincerely believe that this is the finest lathe of this size and type that you can buy at anywhere near the price. Capable of the most exacting operations, it has ample power and capacity for most toolroom jobs. Special accuracy tests are made on each lathe during the assembling and testing to assure utmost precision. Husky castings and large, carefully fitted bearings provide the rigidity so essential to smooth operation and a durability that assures long life.

New two-lever gear box gives you quicker, easier changes for threads and feeds. Powerful multiple disc friction clutch in apron permits engaging or disengaging power turning and facing feeds instantly. Direction of feed is reversed by shifting the feed reverse lever conveniently located on the left end of the headstock. Apron has an automatic safety interlock which makes it impossible to damage the lathe or the work by engaging a second feed accidentally when one power carriage feed is already in operation.

Toolroom attachments included in price of lathe consist of: precision lead screw; handwheel type draw-in collet attachment (without collets); collet rack; telescopic taper attachment; thread dial indicator; chip pan; and micrometer carriage stop.

Regular equipment included in price of lathe consists of: 4 V-belts; flat leather belt; large and small face plates; heat-treated steel tool post; adjustable thread cutting stop; tool steel centers for headstock and tailstock spindles; headstock spindle sleeve; wrenches; quick change gear box; installation plan; and book "How to Run a Lathe." Electrical equipment is not included in the price of the lathe.

16-inch Toolroom Lathes with Eight-Speed Drive

Catalog Number	Bed Length Feet	Between Centers Inches	Cubic Feet Boxed	Boxed Weight Pounds	Crated Weight Pounds	
CL8117C	6	33 1/4	95	2925	2525	
CL8117D	7	45 1/4	101	3175	2605	
CL8117E	8	57 1/4	111	3375	2685	

Specifications of 16-inch Toolroom Lathes

CAPACITY OF LATHE
- Swing over bed and saddle wings ..... 16 1/4"
- Swing over saddle cross slide ..... 9 5/8"

SPINDLE SPEEDS
- Standard spindle speeds (approximate, not exact)
- r.p.m. of spindle, direct belt drive .. 980, 610, 390, 240
- r.p.m. of spindle, back-gear drive .. 125, 80, 50, 30

HEADSTOCK
- Hole through spindle ..... 1 3/8"
- Maximum collet capacity ..... 1"
- Spindle nose diameter and threads ..... 2 3/4"-6
- Size of center, Morse taper ..... No. 3
- Width cone pulley step ..... 2 1/4"
- Large face plate diameter ..... 13 1/4"
- Small face plate diameter ..... 8 1/16"
- Front spindle bearing, diameter ..... 2 1/8"

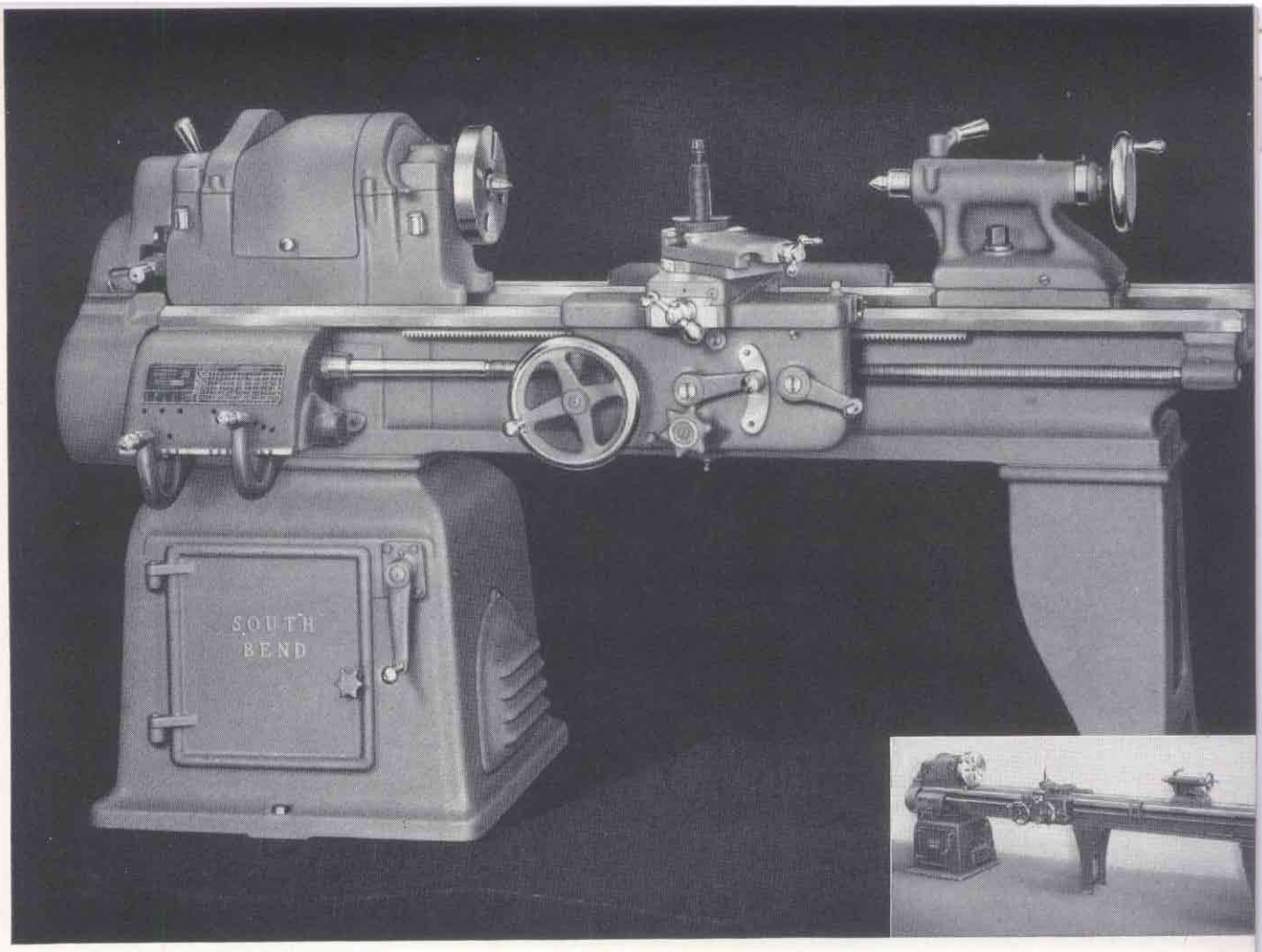
TAILSTOCK
- Size of center, Morse taper ..... No. 3
- Spindle travel ..... 5 3/4"
- Each graduation on tailstock spindle ..... 1/16"
- Tailstock top set-over for taper turning ..... 1"

COMPOUND REST
- Cross slide travel ..... 10 1/16"
- Angular hand feed of compound rest top slide .... 3 3/4"

THREADS AND FEEDS
- Thread cutting range—48 pitches R.H. or L.H. ..... 4 to 224 per inch
- Longitudinal feeds through friction clutch—48 feeds R.H. or L.H. ..... .0015" to .0841"
- Cross-feeds through friction clutch—48 feeds ..... .0006" to .0315"
- Lead screw, 29° Acme thread ..... 1 1/8" dia.-6 thrds.

TOOL POST
- Size of tool holder shank ..... 5/8" x 1 3/4"
- Size of cutter bit for tool holder ..... 3/8" sq.

MOTOR
- Standard size of motor required ..... 1 1/2 h.p.



16-inch Quick Change Gear *Precision* Lathe

Eight Spindle Speeds—Back-Geared—Belt Drive to Spindle

You get maximum lathe value per dollar of cost in this model. It is much the same as the toolroom lathe described on the preceding page, but does not have the taper attachment, collet attachment, and other toolroom accessories, which are usually not needed for general shop use. This reduces the cost, and any attachment needed can be selected from the accessory pages in the back of this catalog.

Having ample power and capacity for efficient production on almost any size or type of job, this lathe is one of the most popular for manufacturing and maintenance work. Large diameter easy reading graduated collars on cross-feed and compound rest screws save time and effort in positioning the cutting tool. Compound rest swivel also has clear cut graduations and may be set at any angle for machining bevels and short tapers. Tailstock spindle is graduated for drilling to accurate depths and witness mark is provided for adjusting tailstock top set-over for taper turning. Tailstock center is self-ejecting.

Regular equipment included in price of lathe consists of: 4 V-belts; flat leather belt; large and small face plates; heat-treated steel tool post; adjustable thread cutting stop; tool steel centers for headstock and tailstock spindles; headstock spindle sleeve; wrenches; quick change gear box; installation plan; and book "How to Run a Lathe." Electrical equipment is not included in price of lathe.

16-inch Quick Change Gear Lathes with Eight-Speed Drive

Catalog Number	Bed Length Feet	Between Centers Inches	Cubic Feet Boxed	Boxed Weight Pounds	Crated Weight Pounds	
CL117C	6	33¼	85	2700	2300	
CL117D	7	45¼	91	2950	2380	
CL117E	8	57¼	101	3150	2460	
CL117G	10*	81¼	117	3550	2800	
CL117H	12*	105¼	134	3900	2975	

*Center leg is supplied with 10' and 12' beds.

Specifications of 16-inch Quick Change Gear Lathes

CAPACITY OF LATHE
- Swing over bed and saddle wings ..... 16¼"
- Swing over saddle cross slide ..... 9⅝"
- Swing over cross slide without chip guard ..... 11⅛"

SPINDLE SPEEDS
- Standard spindle speeds (approximate, not exact)
- r.p.m. of spindle, direct belt drive .. 980, 610, 390, 240
- r.p.m. of spindle, back-gear drive .. 125, 80, 50, 30

HEADSTOCK
- Hole through spindle ..... 1⅜"
- Maximum collet capacity ..... 1"
- Spindle nose diameter and threads ..... 2⅛"-6
- Size of center, Morse taper ..... No. 3
- Width cone pulley step ..... 2¼"
- Large face plate diameter ..... 13¼"
- Small face plate diameter ..... 8[illegible]"
- Front spindle bearing, diameter ..... 2⅞"

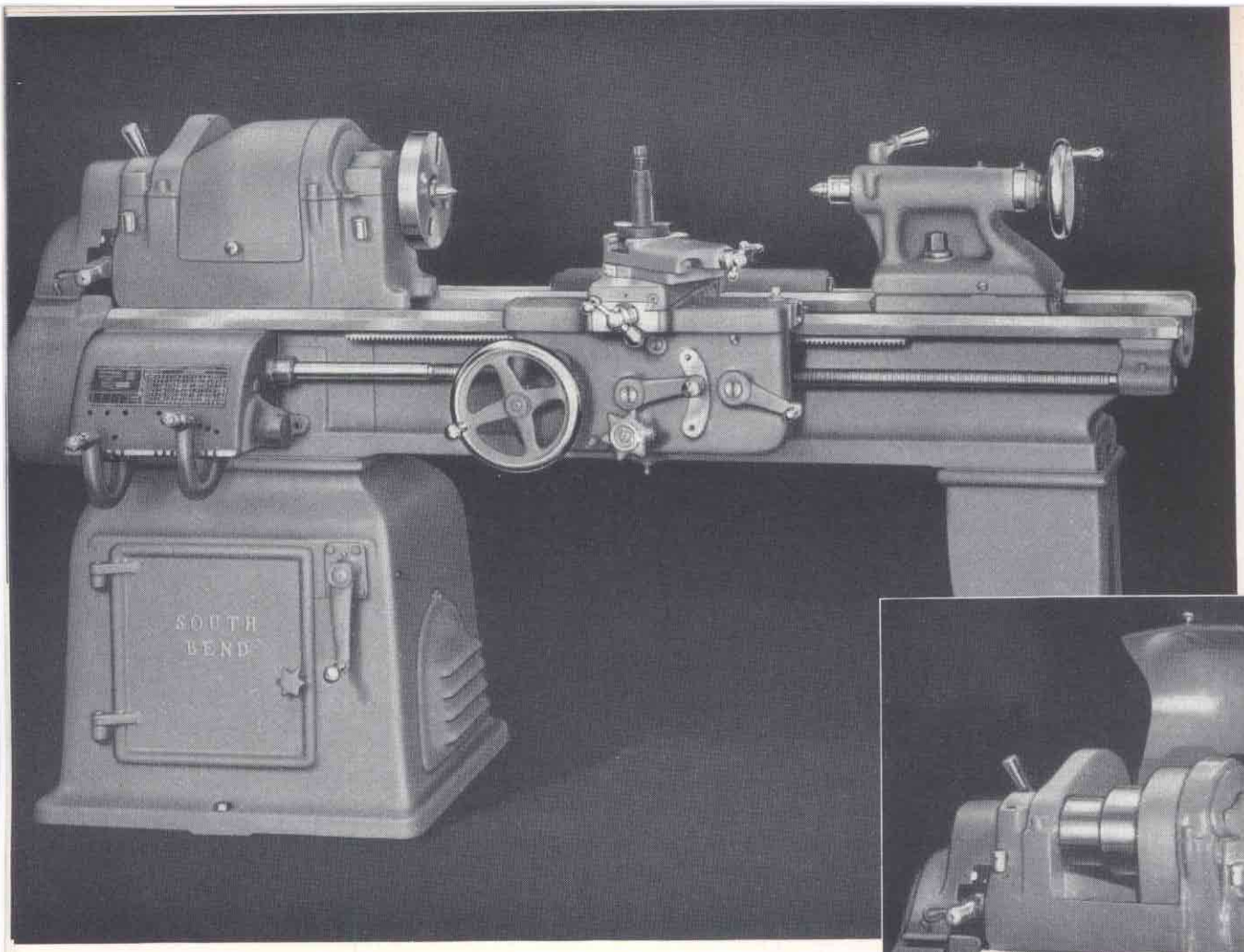
TAILSTOCK
- Size of center, Morse taper ..... No. 3
- Spindle travel ..... 5¾"
- Each graduation on tailstock spindle ..... [illegible]"
- Tailstock top set-over for taper turning ..... 1"

COMPOUND REST
- Cross slide travel without taper attachment ..... 10½"
- Cross slide travel with taper attachment ..... 10[illegible]"
- Angular hand feed of compound rest top slide ..... 3¾"

THREADS AND FEEDS
- Thread cutting range—48 pitches R.H. or L.H. ..... 4 to 224 per inch
- Longitudinal feeds through friction clutch—48 feeds R.H. or L.H. ..... .0015" to .0841"
- Cross-feeds through friction clutch—48 feeds ..... .0006" to .0315"
- Lead screw, 29° Acme thread ..... 1⅜" dia.-6 thrds.

TOOL POST
- Size of tool holder shank ..... ⅝" x 1⅜"
- Size of cutter bit for tool holder ..... ⅝" sq.

MOTOR
- Standard size of motor required ..... 1½ h.p.



Twelve-Speed 16-inch Lathes

Toolroom and Quick Change Gear Types

The new Twelve-Speed 16-inch Lathes are an important addition to the South Bend line. In the production shop, toolroom, maintenance department, or wherever maximum power and an extra wide range of spindle speeds are needed, these lathes will save time, labor, and money. Equipped with push-button control which provides instantaneous changes between corresponding high and low speeds, multiple operations requiring frequent speed changes such as drilling and tapping, boring and reaming or turning and facing can be performed with utmost efficiency. The low spindle speeds are approximately one-half the corresponding high speeds.

A two-speed three-phase A.C. reversing motor mounted in the base of the lathe develops two horsepower at high speed and one horsepower at low speed. The six-station pushbutton control conveniently mounted within easy reach of the operator permits starting, stopping, or reversing the motor instantly, either at high speed or low speed. Changes from high to low speed, forward or reverse, can be made without stopping the motor. The three step cone pulley permits using an extra wide (2 7/8") endless belt which efficiently and smoothly transmits power to the lathe spindle.

Except for the motor, controls, and necessary alterations in the driving mechanism, these lathes are the same as corresponding models shown on the preceding pages. They have the same equipment, and take the same chucks, tools, and accessories as the Eight-Speed 16-inch Lathes.

Catalog Number	Bed Length Feet	Between Centers Inches	Cubic Feet Boxed	Boxed Weight Pounds	Crated Weight Pounds
Twelve-Speed 16-inch Quick Change Gear Lathes					
CL155C	6	33 1/4	85	2775	2375
CL155D	7	45 1/4	91	3025	2455
CL155E	8	57 1/4	101	3225	2535
CL155G	10*	81 1/4	117	3625	2875
CL155H	12*	105 1/4	134	3975	3050
Twelve-Speed 16-inch Toolroom Lathes					
CL815SC	6	33 1/4	95	3000	2600
CL8155D	7	45 1/4	101	3250	2680
CL8155E	8	57 1/4	111	3450	2760

*Center leg is supplied with 10' and 12' beds.

Specifications of Twelve-Speed 16-inch Lathes

CAPACITY OF LATHE
- Swing over bed and saddle wings ..... 16 1/4"
- Swing over saddle cross slide ..... 9 5/8"

SPINDLE SPEEDS (approximate, not exact)

	Direct Drive	Back-Geared
High speeds, r.p.m.	945, 550, 300	118, 70, 32
Low speeds, r.p.m.	475, 278, 150	60, 33, 20

HEADSTOCK
- Hole through spindle ..... 1 3/8"
- Maximum collet capacity ..... 1"
- Spindle nose diameter and threads ..... 2 3/8"-6
- Size of center, Morse taper ..... No. 3
- Width cone pulley step, 12-speed drive ..... 3"
- Large face plate diameter ..... 13 1/4"
- Small face plate diameter ..... 8 1/16"
- Front spindle bearing, diameter ..... 2 7/8"

TAILSTOCK
- Size of center, Morse taper ..... No. 3
- Spindle travel ..... 5 3/4"
- Each graduation on tailstock spindle ..... 1/2"
- Tailstock top set-over for taper turning ..... 1"

COMPOUND REST
- Cross slide travel without taper attachment ..... 10 1/2"
- Cross slide travel with taper attachment ..... 10 1/2"
- Angular hand feed of compound rest top slide ..... 3 3/4"

THREADS AND FEEDS
- Thread cutting range—48 pitches R.H. or L.H. ..... 4 to 224 per inch
- Longitudinal feeds through friction clutch—48 feeds R.H. or L.H. ..... .0015" to .0841"
- Cross-feeds through friction clutch—48 feeds ..... .0006" to .0315"
- Lead screw, 29° Acme thread ..... 1 1/8" dia.—6 thrds.

TOOL POST
- Size of tool holder shank ..... 5/8" x 1 3/8"
- Size of cutter bit for tool holder ..... 3/8" sq.

MOTOR
- Standard size of motor required ..... 2-1 h.p.