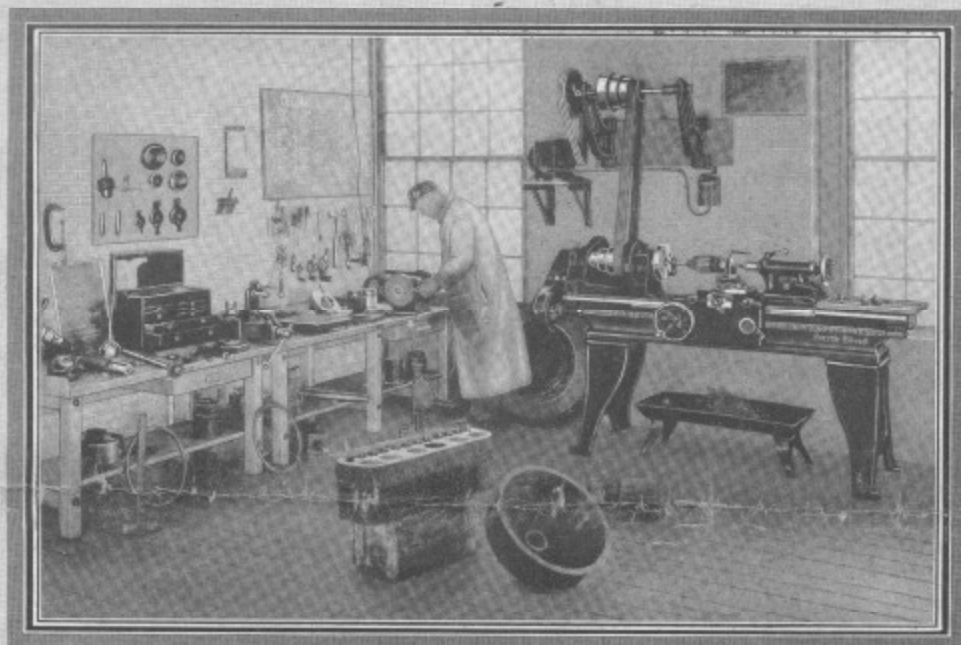


# South Bend Lathes *for* Auto Service Shops



The No. 16 Automotive Service Shop. See pages 6 and 7

## Circular No. 36

### Modern Service Methods and Shop Equipment

This Circular outlines the latest shop practice and methods used in the large service shops for the maintenance of the mechanical parts of automobiles, trucks and buses, of all makes and types, with accuracy and precision.

The back-geared screw cutting lathe, being a precision tool, is employed in the manufacture of automotive parts, therefore, it is logical that when these parts are to be repaired, the work should be done on the lathe.

NOVEMBER, 1932

## South Bend Lathe Works

335 East Madison St.,                      South Bend, Indiana

Lathe Builders for 26 Years . . . More than 55,000 Users



Fig. 1. Grinding a Valve Face in the Auto Shop Lathe, using Electric Valve Grinder.

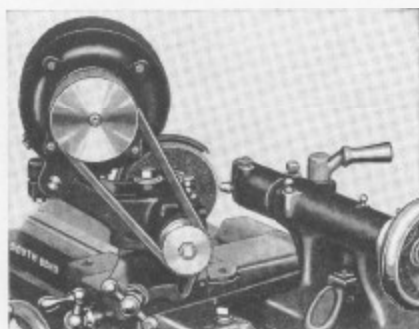


Fig. 2. Truing a Grinding Wheel Using Tailstock Diamond Holding Fixture.

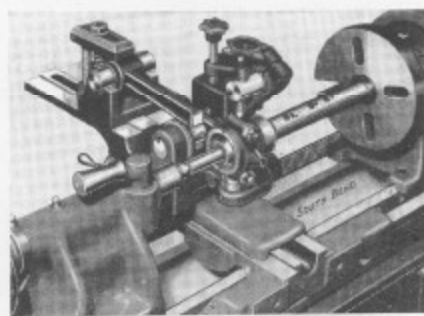


Fig. 3. Boring, Facing and Filletting a Rebab-bitted Connecting Rod in the Lathe.



Fig. 7. Sharpening a Valve Seat Reamer using Holding Fixture with Spring Stop.

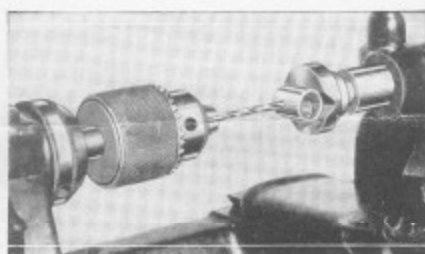


Fig. 9. Drilling Round Work using Crotch Center in Tailstock of Lathe.



Fig. 11. Lathe used as Drill Press for Drilling Hole in Flat Piece of Work.

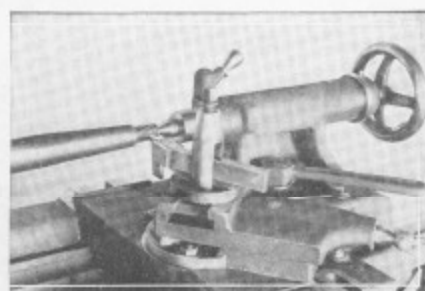


Fig. 13. Cutting a Screw Thread on an Axle. Screw Thread Range of Lathe, 4 to 96 per inch.



Fig. 19. The No. 9 Automotive Service Shop with Lathe Equipment for Servicing Automobiles, Buses and Trucks. Lathe Operates from Electric Lamp Socket.

### 9-in. x 3-ft. Junior Motor Driven Bench Lathe—\$182<sup>90</sup> \$40.00 Down Payment - - - \$13.00 Per Month

The 9-inch Junior Horizontal Motor Driven Bench Lathe, illustrated in the shop above, is the Back-Gear, Screw Cutting Precision Lathe that has become so popular in the auto repair shops, garages, electrical shops and truck service shops. This 9-inch Lathe has the power to reduce the diameter of a steel shaft  $\frac{1}{4}$ -inch in one cut.

**Features of Lathe Include:**  $\frac{1}{4}$  H.P. reversing motor, start-and-stop type (1-phase, 60-cycle, A. C.) and drum reversing switch; swing over bed  $9\frac{1}{4}$ "; distance between centers  $16\frac{3}{8}$ "; swing over carriage  $6\frac{3}{8}$ "; six spindle speeds, 39 to 596 R.P.M.; hole through spindle  $\frac{3}{4}$ ", No. 2 Morse Taper Centers; phosphor bronze bearings; screw thread cutting range 4 to 96 per inch; power feed range .020" to .005"; precision lead screw  $\frac{3}{4}$ " diam., 8 Acme threads per inch; automatic longitudinal screw feed to carriage; tailstock set-over for taper turning, graduated compound rest; micrometer collars on compound rest feed screw and cross feed screw; weight of lathe crated for shipment 435 lbs.

**Regular Equipment Included in Price** consists of: Horizontal motor drive unit; compound tool rest; face plate; tool post, ring and wedge; two 60° lathe centers; spindle sleeve; change gears for screw thread cutting and automatic longitudinal feeds; wrenches; lag screws; washers; belting; installation plan and book, "How to Run a Lathe."

**Other Types Available.** The above described lathe may also be had in bed lengths from  $2\frac{1}{2}$  ft. to  $4\frac{1}{2}$  ft.; in countershaft drive and other motor drives; also in Standard Change Gear type and Quick Change Gear type, Bench or Floor Legs. Write for Bulletin.

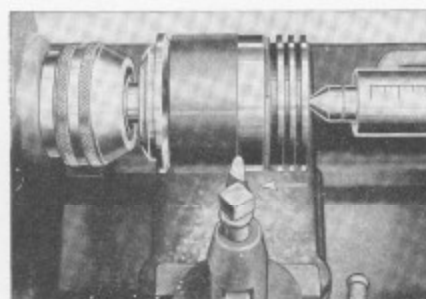


Fig. 14. Finishing a Semi-Machined Cast Iron Piston Mounted on the Piston Adapter.

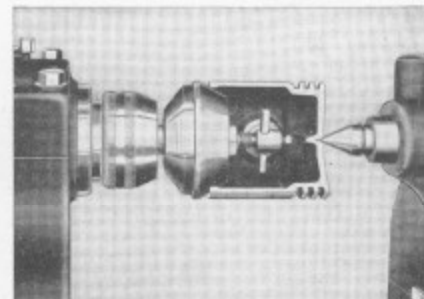


Fig. 15. Cross Section View showing Application of the Piston Adapter.

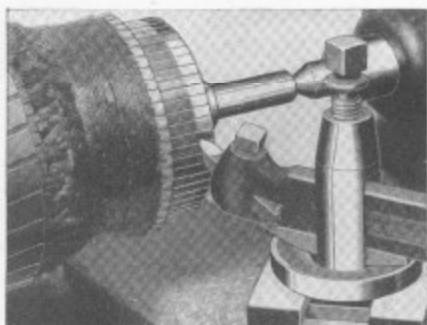


Fig. 4. Armature Commutators of Generators and Starting Motors are Quickly Trued.

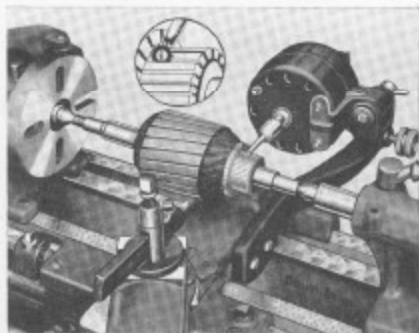


Fig. 5. Undercutting Mica with Rotary Electric Mica Undercutting Attachment.

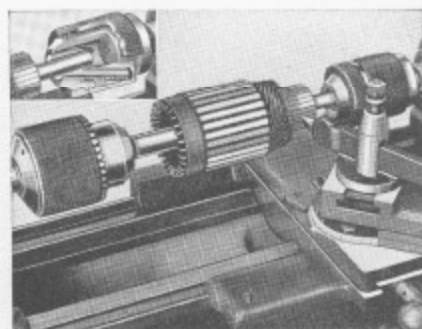


Fig. 6. Centerless Armature Mounted in Lathe using Tailstock Adjustable Bushing.

## No. 9 Automotive Service Shop

For Small Service and Repair Jobs on the Automobile, Truck and Bus

All the jobs illustrated and described on pages 2 and 3 were machined on the 9-inch Lathe illustrated in the shop at the left as well as hundreds of other small machine jobs.

For regular machine work of all kinds the special equipment required with the lathe consists of the lathe chucks, drill chucks and cutting tools. These chucks and tools may also be used on many special jobs such as valve grinding, armature servicing, making bushings, piston finishing, etc. For prices of chucks, tools and attachments, see Catalog No. 93.

### Lathe Is the Ideal Service Tool

Thousands of machinists during the past three years have entered the automotive service field as workmen or have established shops of their own. Many of these machinists received their training in the automobile plants and they know the back-gear, screw cutting lathe is the ideal tool for the motor service shop, because the parts to be serviced were originally made on the lathe, it is obvious therefore, that the lathe is the ideal tool to service these parts.

### 5,000 Shops Equipped

Over 5,000 of the 9-inch Junior Lathes are in use in garages, repair and machine shops in servicing the automobile, bus and truck in the United States and numerous overseas countries. Some of these shops specialize in valve grinding, some in piston work, etc. Many shops do all this work. Tools and equipment for each class of work may be purchased separately to suit the individual needs of any shop.

### Write Us for Complete Information

The list at the right shows a few of the hundreds of jobs for which this lathe can be used. If you will use the blank on page 12 to check off the class of work you wish to do in your shop and mail it to us, we will send you Service Bulletins covering this work and will include an itemized quotation on the lathe, chucks, tools and fixtures that are practical for doing this work.

### Instructions Furnished with Lathe

Included with each 9-inch South Bend Lathe, free of charge, are four instruction manuals consisting of blueprints and job instruction sheets, covering Valve Servicing, Armature Servicing, Piston Servicing and Bushing Servicing. These Instruction Manuals are further described and explained in the Service Bulletins listed on page 10 of this circular.

### A Few Automotive Jobs Machined on the 9-Inch South Bend Lathe

#### Valve Servicing

- Grinding a Valve Face
- Testing a Valve
- Straightening Valve Stems
- Centering a Valve
- Making a Valve Guide Bushing
- Truing Rocker Arms
- Grinding Tappets
- Grinding Tappet Adjusting Screws
- Grinding Valve Seat Reamer
- Grinding Valve Stem Clearance
- Grinding Valve Seat Narrowing Reamers
- Making Valve Replacement Seats

#### Armature Servicing

- Truing Commutators, both Centered and Centerless Shaft Type
- Undercutting Mica
- Testing Armature Shafts
- Straightening Armature Shafts
- Restoring Damaged Center Holes
- Cutting Old Wire from Armatures
- Centering Armature Shafts

#### Piston Servicing

- Finishing Semi-Machined Pistons
- Regrooving Pistons
- Honing Piston Pin Bushings
- Lapping Piston Pin Bushings
- Reaming Piston Pin Bushings
- Grinding Pistons
- Reaming Piston Skirts
- Centering Pistons

#### Bushing Servicing

Making Bushings of all kinds, including plain bushings, threaded bushings, etc., of bronze, steel, cast iron, fibre, bakelite, etc.

#### Connecting Rod Servicing

- Boring a Rebabbed Connecting Rod
- Aligning Connecting Rods
- Reaming Connecting Rod Pin Bushing
- Honing Connecting Rod Pin Bushing
- Lapping Connecting Rod Pin Bushing

#### General Machine Work

Thread Cutting and Tool Work



Fig. 8. Truing up a Piece of Brass in Chuck, Preparatory to Making a Bushing.

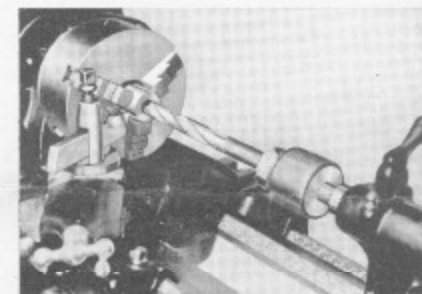


Fig. 10. Drilling Hole in Bushing. Drilling of All Kinds can be Done in the Lathe.

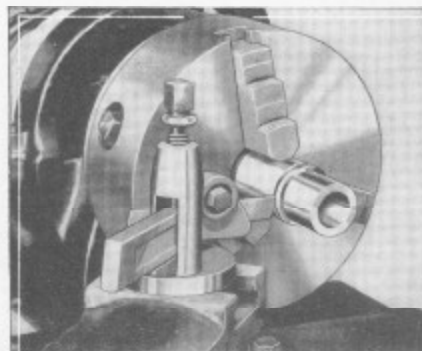


Fig. 12. Cutting-off a Bushing, made complete, in one set-up, in Chuck.

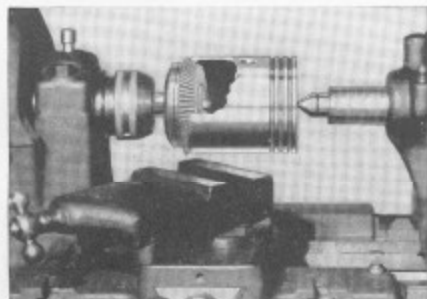


Fig. 16. Reaming the Skirt of a Piston. Reamer is Held on Piston Adapter Shank.

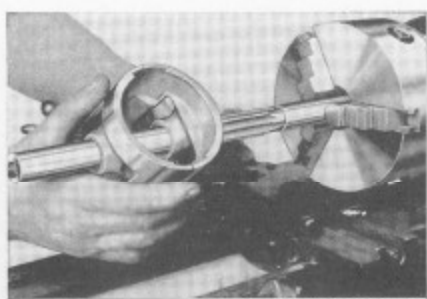


Fig. 17. Lathe may be Used at Variable Speeds for Reaming, Lapping and Honing.



Fig. 18. Lathe is Practical for Filing, and Polishing Bushings, Shafts, Parts, etc.



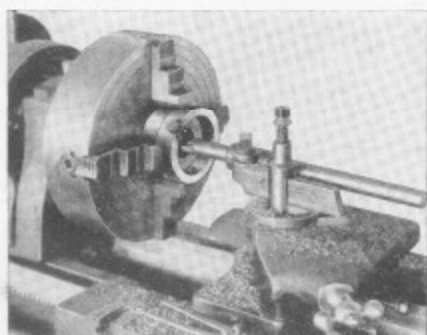


Fig. 20. Making a Replacement Part for an Orphan Car in the Auto Shop Lathe.



Fig. 21. Making a Bushing Complete, in one set-up, in the Lathe.

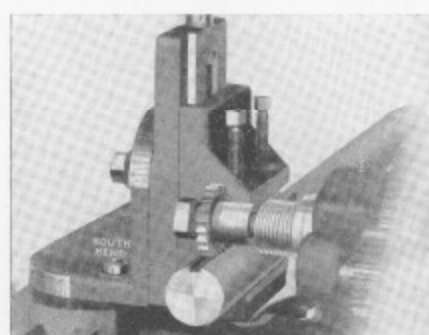


Fig. 22. Cutting Keyway on the Lathe equipped with a Milling Attachment.

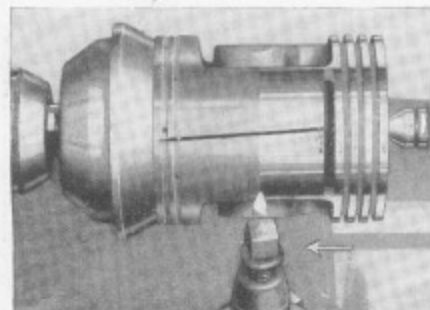


Fig. 26. Semi-Machined Pistons of all Types are Finished Quickly in the Lathe.

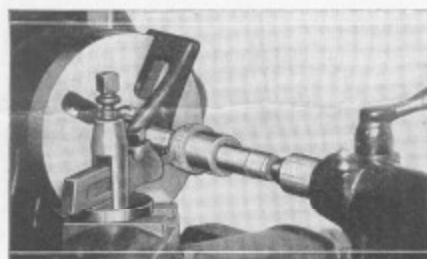


Fig. 28. Cutting a Screw Thread on a Replacement Water Pump Bushing.

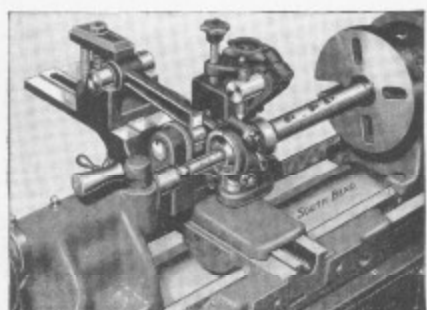


Fig. 30. Boring, Facing and Filleting a Rebabbed Connecting Rod in the Lathe.

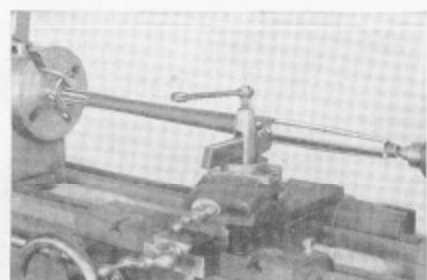


Fig. 32. Testing and Straightening a Bent Axle Shaft Between the Lathe Centers.

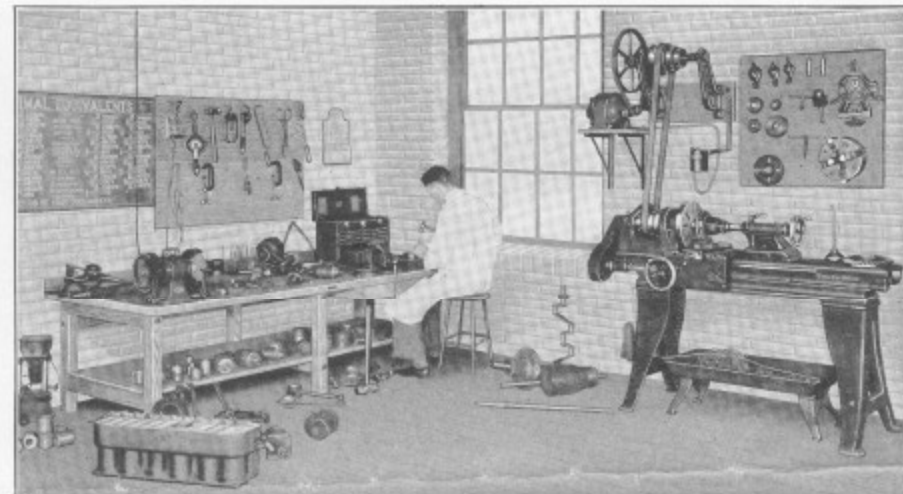


Fig. 38. The No. 13 Automotive Service Shop in Use on Precision Servicing Jobs for Automobiles, Buses, Trucks, Etc.

### 13-in. x 5-ft. South Bend Motor Driven Lathe—\$344<sup>20</sup> \$70.00 Down Payment - - - \$24.00 Per Month

**THE 13-inch South Bend Simplex Motor Driven Geared Screw Feed Lathe**, illustrated in the shop above, is a Back Geared, Screw Cutting Precision Lathe. It is widely used in the automotive servicing field for the medium size work coming up in the precision servicing of automobiles, buses, trucks, tractors, aero engines and electrical equipment. This Lathe has the power to reduce the diameter of a steel shaft  $\frac{1}{2}$ -inch in one cut.

**Features of Lathe Include:**  $\frac{3}{4}$  H.P. instant reversing motor (1-phase, 60-cycle, A.C.) and drum reversing switch; swing over bed  $13\frac{1}{4}$ "; distance between centers 28"; swing over carriage 9"; eight spindle speeds, 23 to 605 R.P.M.; hole through spindle 1"; No. 3 Morse Taper centers; phosphor bronze bearings; screw thread cutting range 2 to 96 per inch; power feed range .020" to .006" per revolution of lathe spindle; precision lead screw 1" diameter, six Acme threads per inch; automatic longitudinal screw feed to carriage; tailstock set-over for taper turning; graduated compound rest; micrometer collars on compound rest feed screw and cross feed screw; weight of lathe crated for shipment 1130 lbs.

**Regular Equipment Included in Price** consists of: Simplex V-Belt motor drive unit; compound tool rest; small face plate; tool post, ring and wedge; two 60° lathe centers; spindle sleeve; change gears for screw thread cutting and automatic longitudinal feeds; wrenches; belting; installation plan and book, "How to Run a Lathe."

**Other Types Available.** The above described lathe may also be had in bed lengths from 4-ft. to 8-ft., in countershaft drive and other motor drives, also in the Standard Change Gear type and Quick Change Gear type at correspondingly low prices. Write for Bulletin.

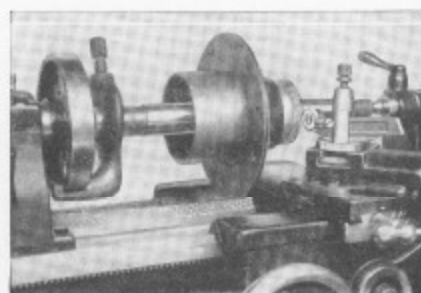


Fig. 33. Re-threading a Damaged Front Wheel Hub Mounted on a Mandrel.

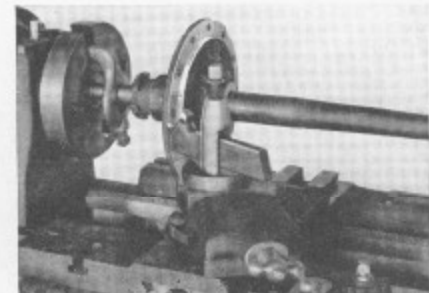


Fig. 34. Truing a Damaged Rear Wheel Hub Flange using Axle to Mount between Centers.

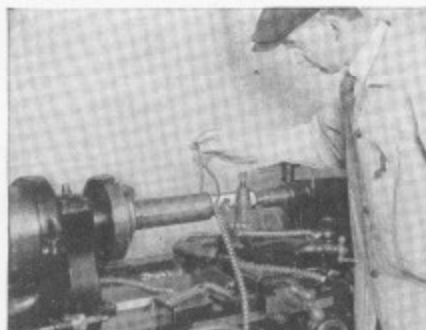


Fig. 23. Taking a Heavy Roughing Cut to Reduce the Diameter of a Steel Shaft.

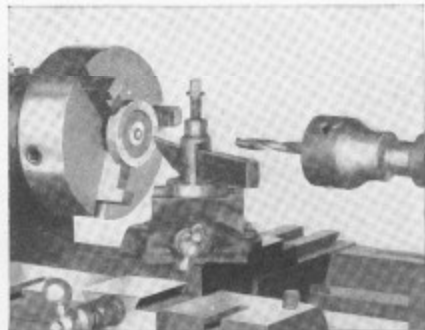


Fig. 24. Drilling and Facing a Replacement Part Held in a 3-Jaw Chuck.

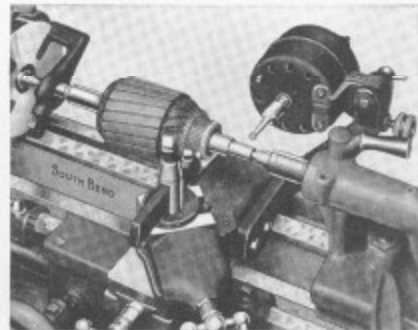


Fig. 25. Truing an Armature Commutator and Undercutting Mica in the Lathe.

## No. 13 Automotive Service Shop

For Medium Size Service and Repair Jobs on Automotive Equipment

All the jobs illustrated and described on this page and the opposite page were machined on the 13-inch Lathe illustrated in the shop at the left. In addition to handling all this work the 13-inch Lathe will also take care of the jobs shown on pages 2 and 3 with the same accuracy and precision. For regular machine work the extra equipment required with the lathe consists of lathe chucks, drill chucks and cutting tools, all of which may be used on many special jobs such as, hub flange work, axle shaft work, differential servicing, etc.

### Lathe is Ideal Service Tool

The No. 13 Shop Equipment, as shown here, is used by thousands of machinists in the Auto Service Shop, many of whom formerly worked in automobile plants. These men know that the lathe is the practical tool for the motor service shop, as the parts to be serviced were originally made on the lathe; therefore, it is the ideal tool for servicing these parts.

### 3,000 Shops Equipped

Over 3,000 of the 13-inch South Bend Lathes are used for servicing the automobile, bus, truck, tractor and aero engine. Some of these shops specialize in a few jobs only, therefore, they need a very limited equipment; while other shops desiring to do a number of different jobs will need more equipment. Tools and equipment for each class of work may be purchased separately to suit the individual needs of any shop.

### Instructions Furnished with Lathe

Included with each 13-inch South Bend Lathe, free of charge, are three instruction manuals consisting of blueprints and job instruction sheets, covering Differential Servicing, Connecting Rod Servicing and Piston Servicing. These instruction manuals are further described and explained in the Service Bulletins listed on page 10 of this circular.

### Write Us for Complete Information

The list at the right shows a few of the hundreds of jobs for which this lathe can be used. If you will use the blank on page 12 to check off the class of work you wish to do and mail it to us, we will send you service Bulletins covering this work.

## A Few Automotive Jobs Machined on the 13-inch South Bend Lathe

### Differential Servicing

- Truing Differential Case Flange
- Cutting Rivet Heads from Flanges
- Testing Trueness of New Ring Gear

### Hub Servicing

- Truing a Hub Flange
- Testing a Hub Flange
- Boring Damaged Hub
- Re-chasing Damaged Hub Thread

### Axle Shaft Servicing

- Making New Axle Shaft
- Straightening Bent Axle Shaft
- Re-chasing Damaged Shaft Threads

### Connecting Rod Servicing

- Boring a Rebabitted Connecting Rod
- Reaming, Honing or Lapping Connecting Rod Pin Bushings

### Milling and Keyway Servicing

- Cutting a Keyway
- Cutting a Woodruff Keyway
- Squaring End of a Shaft

### Valve Servicing

- Grinding a Valve Face
- Testing a Valve
- Straightening Valve Stems
- Making a Valve Guide Bushing
- Truing Rocker Arms
- Grinding Tappets
- Grinding Tappet Adjusting Screws
- Grinding Valve Seat Reamer
- Grinding Valve Stem Clearance

### Armature Servicing

- Truing Commutators
- Undercutting Mica
- Straightening Armature Shafts
- Restoring Damaged Center Holes

### Piston Servicing

- Finishing Semi-Machined Pistons
- Cutting Ring Groove in Piston
- Honing, Lapping or Reaming Piston Pin Holes
- Grinding Pistons
- Reaming Piston Skirts

### Bushing Servicing

- Making Bushings of all kinds, from bronze, steel, cast iron, fibre, bakelite, etc.

### Grinding

- Grinding Straight Reamers
- Grinding Spiral Reamers
- Grinding Valve Seat Reamers
- Grinding Bushings

### General Machine Work

### Thread Cutting and Tool Work

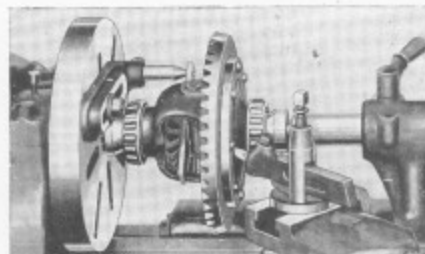


Fig. 27. Cutting-off Rivet Heads to Remove Old Ring Gear from Differential.

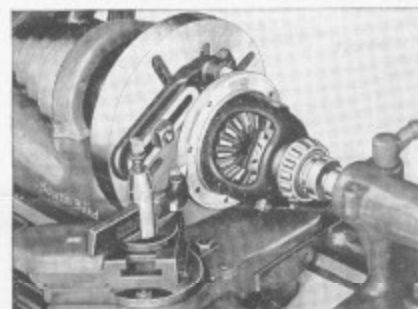


Fig. 29. Truing Differential Gear Case Flange for New Ring Gear.

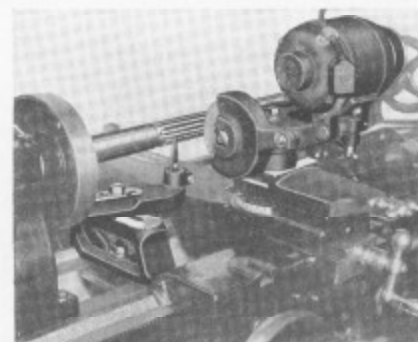


Fig. 31. Sharpening a Straight Reamer using a Grinding Attachment on the Lathe.

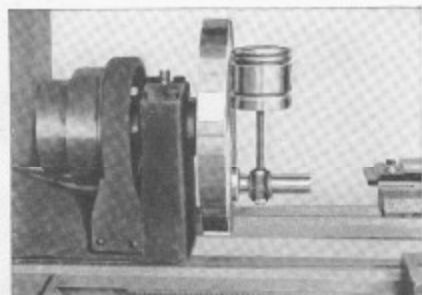


Fig. 35. Aligning Piston and Connecting Rod on Face Plate of Lathe.

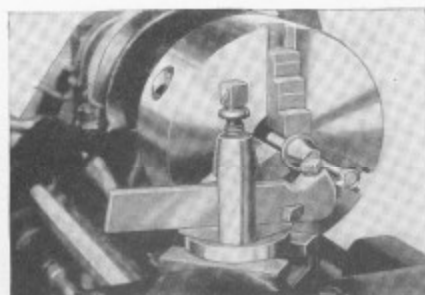


Fig. 36. Facing the end of Ford Mushroom end type Valve Stem for Clearance.

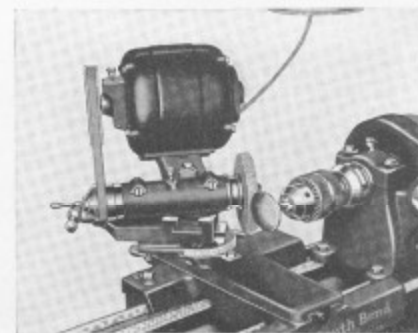


Fig. 37. Refacing a Valve in the Lathe using Grinding Attachment and Valve Chuck.

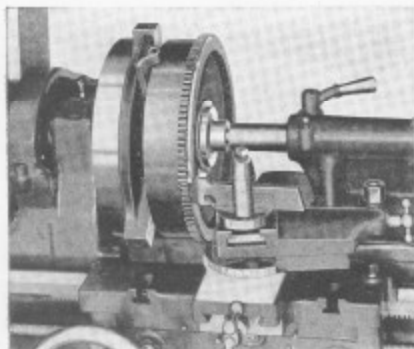


Fig. 39. Turning Teeth Off a Flywheel for New Steel Starter Gear.

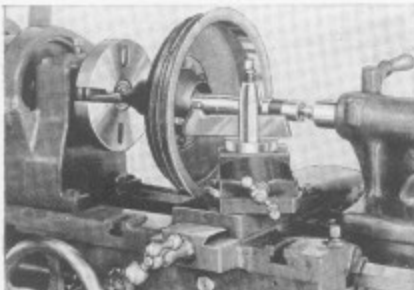


Fig. 45. Truing a Worn Brake Drum of a Demountable type Rear Wheel.

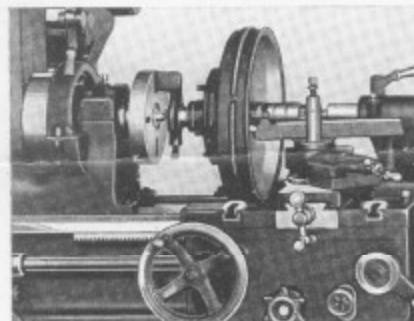


Fig. 47. Truing the Brake Drum of a Demountable type Front Wheel.



Fig. 49. Using the Center Rest to Hold a Long Shaft while taking a Heavy Cut.

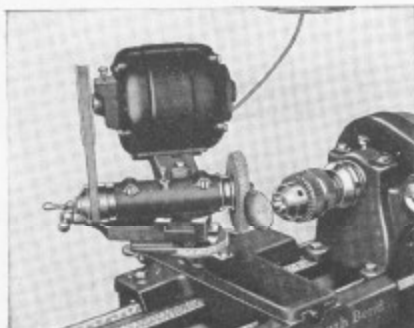


Fig. 51. Refacing a Valve in the Lathe. Grinder Operates from an Electric Lamp Socket.



Fig. 40. Flywheel machined to the exact diameter required for Starter Gear.

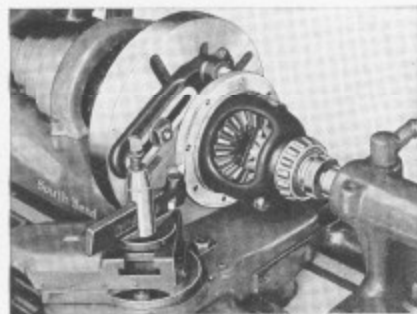


Fig. 41. Truing a Differential Gear Case Flange for New Ring Gear.

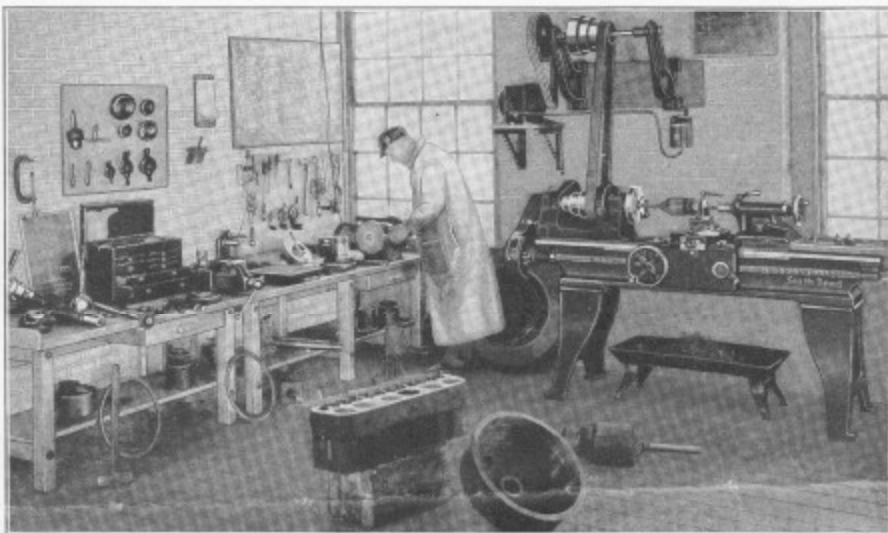


Fig. 57. The No. 16 Automotive Service Shop in Use on Precision Servicing Jobs for Automobiles, Trucks, Buses, Etc.

**16-in. x 6-ft. South Bend Motor Driven Lathe—\$488<sup>50</sup>**  
 \$95.00 Down Payment - - - \$34.00 Per Month

**THE 16-inch South Bend Simplex Motor Driven Geared Screw Feed Lathe**, illustrated in the shop above, is a Back-Geared, Screw Cutting Precision Lathe of the practical size and type for general all-round service work in the maintenance and repair of automobiles, buses, trucks, tractors, aero engines and electrical equipment. This 16-inch Lathe has the power to reduce the diameter of a steel shaft  $\frac{3}{4}$ -inch in one cut.

**Features of Lathe Include:** 1 H.P. instant reversing motor (1-phase, 60-cycle, A.C.) and drum reversing switch; swing over bed  $16\frac{1}{4}$ " ; distance between centers 34" ; swing over carriage  $11\frac{1}{8}$ " ; eight spindle speeds, 18 to 598 R.P.M. ; hole through spindle  $1\frac{1}{8}$ " , No. 3 Morse Taper centers; phosphor bronze bearings; screw thread cutting range 2 to 96 per inch; power feed range .020" to .006" per revolution of lathe spindle; precision lead screw  $1\frac{1}{8}$ " diam., 6 Acme threads per inch; automatic longitudinal screw feed to carriage; tailstock set-over for taper turning; graduated compound rest; micrometer collar on compound rest feed screw and cross feed screw; weight of lathe crated for shipment 1860 lbs.

**Regular Equipment Included in Price** consists of : Simplex V-Belt motor drive unit; compound tool rest; small face plate; tool post, ring and wedge; two 60° lathe centers; spindle sleeve; wrenches; belting; change gears; installation plan and book "How to Run a Lathe."

**Other Types Available.** The above described lathe may also be had in bed lengths from 6-ft. to 12-ft., in countershaft and other motor drives, also in the Standard Change Gear type and Quick Change Gear type at correspondingly low prices. Write for Bulletin.

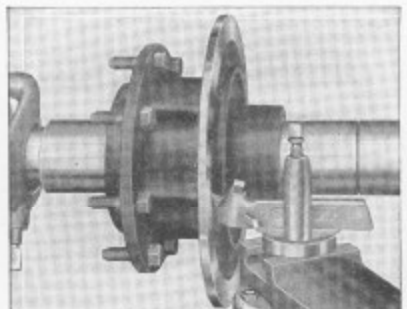


Fig. 52. Truing the Flange of a Heavy Duty Truck Wheel Hub.

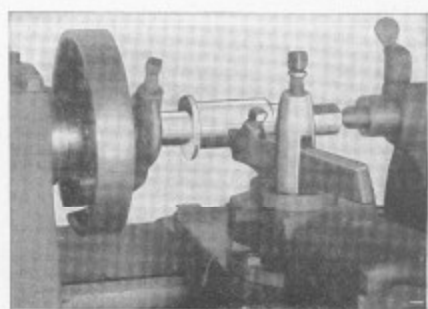


Fig. 53. Making a Replacement Bushing on a Mandrel between the Lathe Centers.



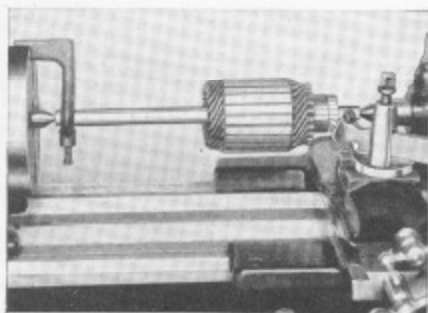


Fig. 42. Truing the Commutator of an Armature mounted Between Lathe Centers.

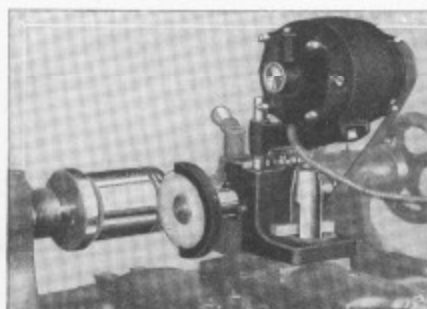


Fig. 43. Finishing a Semi-Machined Piston by Grinding in the Lathe.

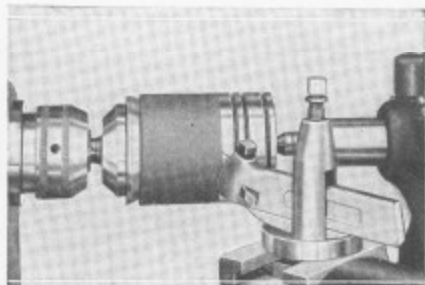


Fig. 44. Finishing a Semi-Machined Piston to fit a Rebores Cylinder.

## The No. 16 Automotive Service Shop

For General Service and Maintenance Jobs  
on All Kinds of Automotive Equipment

All the jobs illustrated and described on this page and the opposite page were machined on the 16-inch Lathe illustrated in the shop at the left. In addition to handling all this work the 16-inch Lathe will also take care of the jobs shown on pages 2, 3, 4 and 5 with the same accuracy and precision.

### 3,000 Shops Equipped

The 16" South Bend Lathe is very popular among the repair shops and auto service shops throughout the United States and over 3,000 are in actual use in dealers service stations, independent repair shops, machine shops and garages for turning out work on all makes and all kinds of automobiles, trucks and buses with accuracy and precision.

### Instructions Furnished with Lathe

Included with each 16-inch South Bend Lathe, free of charge, are three instruction manuals consisting of blueprints and job instruction sheets, covering Flywheel Servicing, Crankshaft Servicing and Brake Drum Servicing. These instruction manuals are further described and explained in the Service Bulletins listed on page 10 of this circular.

### Write for Service Bulletins

If you are interested in doing any or all of this work fill out the blank on the back cover of this circular and mail it to us. Details will be forwarded you immediately post-paid, without obligation.

### A Few Jobs Machined on the 16-Inch South Bend Lathe

#### Flywheel Servicing

Machining Off Old Gear Teeth  
Polishing Flywheel Clutch Face  
Balancing a Flywheel

#### Crankshaft Servicing

Testing Main Bearings  
Testing Throw Bearings  
Truing Main Bearings  
Truing Throw Bearings  
Facing Crankshaft Flange

#### Brake Drum Servicing

Truing Demountable Brake Drums  
Testing Demountable Brake Drums  
Grinding Demountable Brake Drums  
Testing Demountable Wheel Bearings  
Making Brake Drum Mandrels and Adapters

#### Hub Servicing

Truing a Hub Flange  
Testing a Hub Flange  
Boring Damaged Hub  
Re-chasing damaged Hub Thread

#### Differential Servicing

Truing Differential Flange  
Cutting Rivets from Flanges  
Testing Trueness of New Gear

#### Axle Shaft Servicing

Making New Axle Shaft  
Straightening Bent Axles  
Re-chasing Damaged Threads

#### Connecting Rod Servicing

Boring a Connecting Rod  
Aligning Connecting Rods  
Reaming, Honing or Lapping  
Connecting Rod Pin Bushing

#### Milling Work

Cutting All Keyways  
Squaring End of a Shaft

#### Grinding

Grinding Straight Reamers  
Grinding Spiral Reamers  
Grinding Valve Seat Reamers  
Grinding Bushings

#### Armature Servicing

Truing Commutators  
Undercutting Mica  
Testing Armature Shafts  
Straightening Armature Shafts  
Restoring Damaged Center Holes  
Cutting Wire from Armatures  
Centering Armature Shafts

#### Valve Servicing

Grinding a Valve Face  
Testing a Valve  
Straightening Valve Stems  
Centering a Valve  
Making a Valve Guide Bushing  
Truing Rocker Arms  
Grinding Tappet Screws  
Grinding Valve Seat Reamer  
Grinding Valve Stem Clearance  
Making Valve Replacement Seats

#### Piston Servicing

Finishing Semi-Machined Pistons  
Cutting Piston Ring Groove  
Honing, Lapping or Reaming  
Piston Pin Holes  
Grinding Pistons  
Reaming Piston Skirts  
Centering Pistons

#### Bushing Servicing

Making Bushings of all kinds, including plain bushings, threaded bushings, etc., of bronze, steel, cast iron, fibre, bakelite, etc.

#### General Machine Work Thread Cutting and Tool Work



Fig. 46. Making a Bushing Complete, in one set-up in the Lathe.

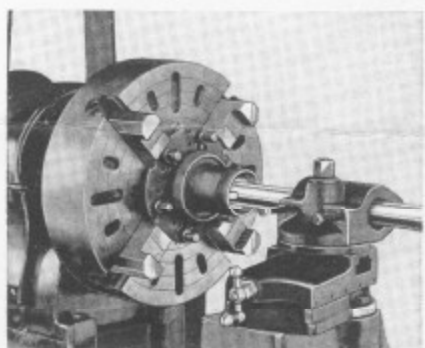


Fig. 48. Boring out a Welded Wheel Hub to Form New Bearing Cup Seat.

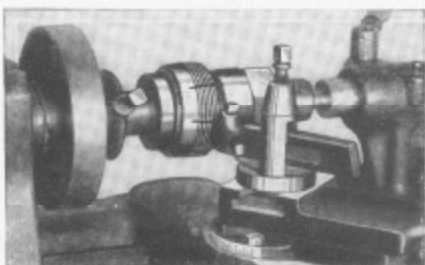


Fig. 50. Cutting a Screw Thread on a Replacement Part for an Orphan Car.

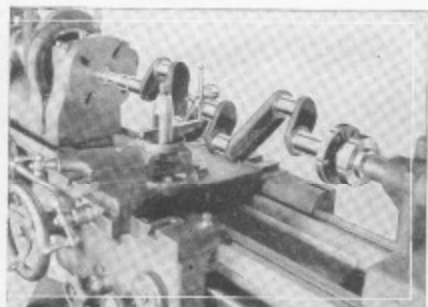


Fig. 54. Using a Dial Test Indicator to Test Main Bearings of a Crankshaft.



Fig. 55. Truing Main Bearings and Throw Bearings on Crankshaft in the Lathe.

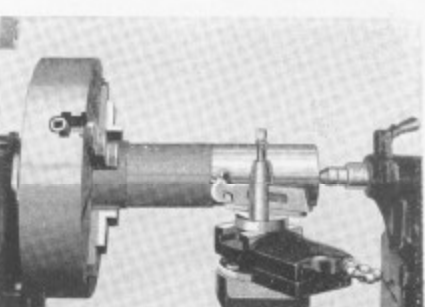


Fig. 56. Finishing a Cast Iron Cylinder Sleeve for press fit in Cylinder Block.



Fig. 58. Truing an Internal Brake Drum Without Removing Tire from Wheel. Drum size 17\"/>

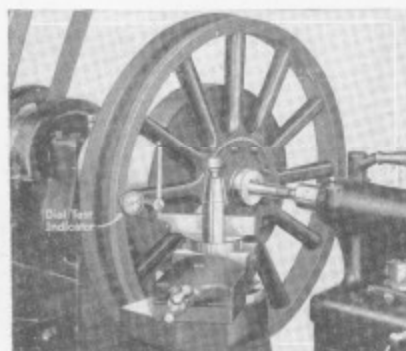


Fig. 64. Testing a Wheel Felly for Wobble Using a Dial Test Indicator.

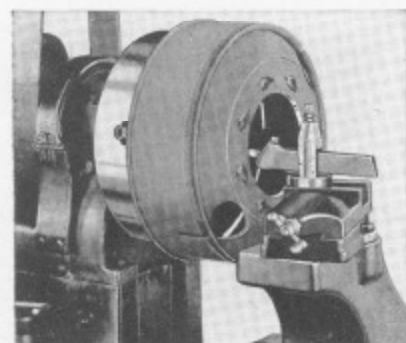


Fig. 68. Boring a Hole in a Replacement Truck Wheel to Fit the Old Hub.

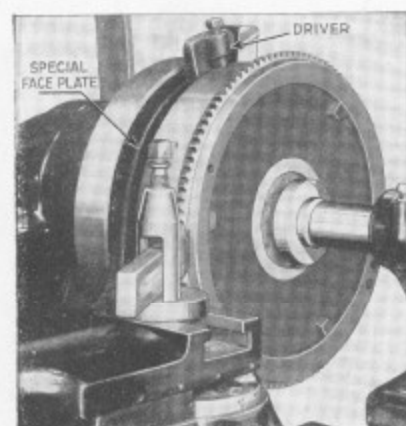


Fig. 70. Close-up of a Flywheel Being Machined for New Starter Ring Gear.

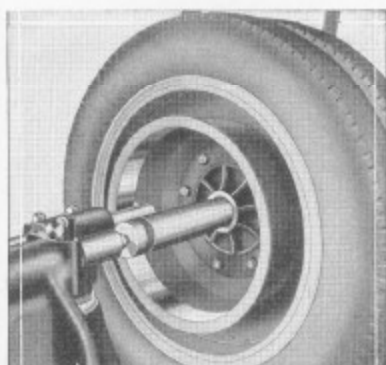


Fig. 59. Truing Brake Drum of a Rear Dual Truck Wheel Using Extra Long Tool.

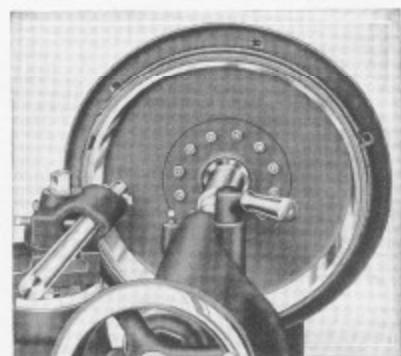


Fig. 60. A Lincoln Car Brake Drum Being Trued by Turning in the Lathe.

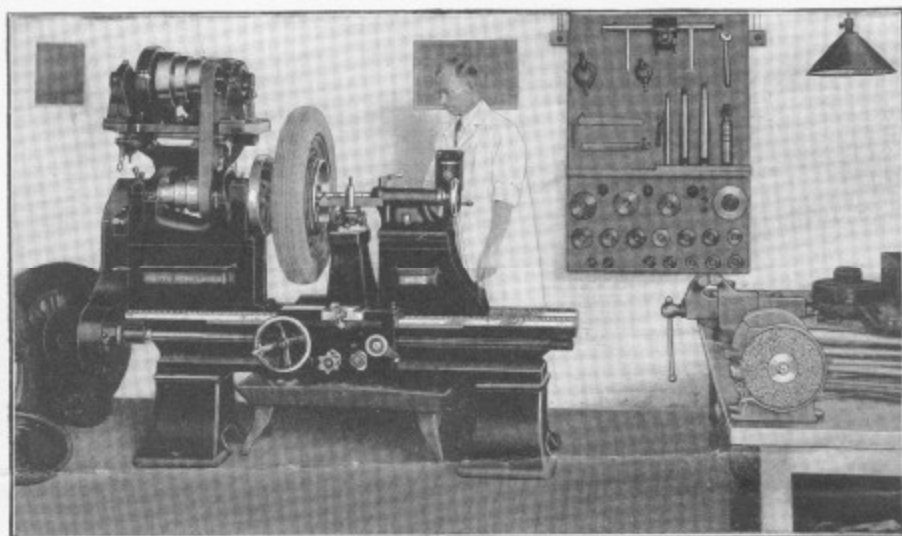


Fig. 76. The No. 36 Automotive Service Shop in Use on Brake Drum, Flywheel and General Wheel Servicing.

### 36-in. x 6-ft. South Bend Brake Drum Lathe—\$860<sup>00</sup>

\$175.00 Down Payment - - - \$63.00 Per Month

**THE 36-inch South Bend Silent Chain Motor Driven Brake Drum Lathe**, illustrated in the shop above, is a Standard Change Back-Geared, Screw Cutting Precision Lathe designed for brake drum, wheel and hub servicing and in addition will take care of all automotive servicing jobs requiring machining. This lathe is the practical size and type for handling passenger car, light truck and bus wheels with tire and rim attached. This 36-inch Lathe has the power to reduce the diameter of a steel shaft  $\frac{3}{4}$ -inch in one cut.

**Features of Lathe Include:** 1 H.P. instant reversing motor (1-phase, 60-cycle, A.C.) and drum reversing switch; swing over bed  $36\frac{1}{4}$ \"/>

**Regular Equipment Included in Price** consists of: Silent chain motor drive unit; tool post complete; large face plate; small face plate; driver for auto wheels; rubber belts and springs; two lathe centers; spindle sleeve; thread cutting stop; wrenches; leather belting; change gears; installation plan and complete instructions on "How to True Brake Drums."

**Other Types Available.** The above lathe may be had in bed lengths from 6-ft. to 12-ft., in countershaft and motor drive, also in Quick Change Gear type and Geared Screw Feed type.

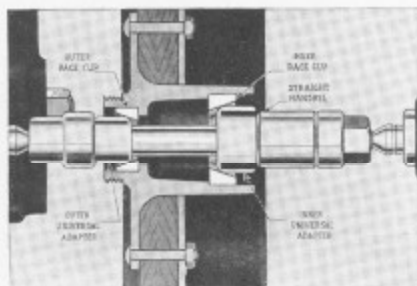


Fig. 71. Wheel Assembly with Timken Races Mounted on Mandrel and Adapters.

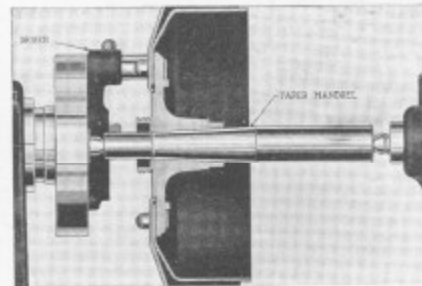


Fig. 72. Set up of a Rear Wheel Mounted Between Lathe Centers on a Taper Mandrel.



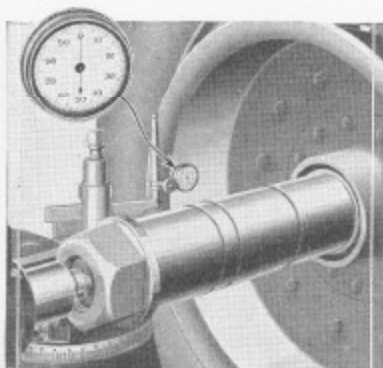


Fig. 61. Testing the Accuracy of a Brake Drum Using a Dial Test Indicator.

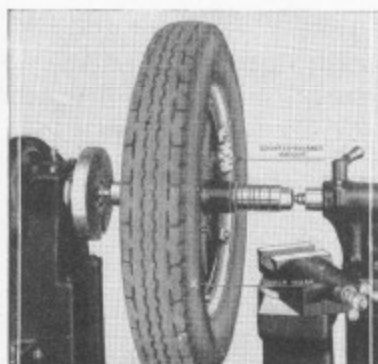


Fig. 62. Balancing Wheel and Tire Assembly to Eliminate Shimmy at High Speed.

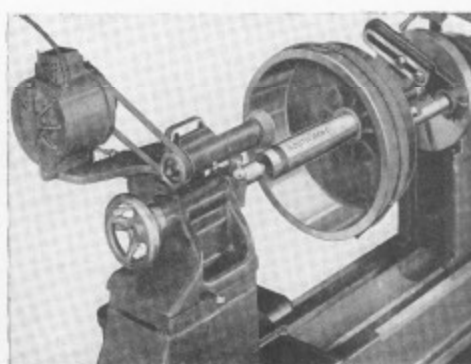


Fig. 63. Grinding a Brake Drum in the 36" Lathe Using the Electric Grinding Attachment.

## The No. 36 Automotive Service Shop

For Brake Drum, Hub and Wheel Servicing of All Kinds

All the jobs illustrated and described on this page and the page opposite were machined on the 36" South Bend Lathe illustrated in the shop at the left. In addition to handling all this work the 36" Lathe will also take care of the jobs shown on pages 2, 3, 4, 5, 6 and 7 with the same accuracy and precision. The extra large swing capacity of the lathe permits mounting the entire wheel assembly with tire, rim, felly, brake drum and hub for machining, checking and testing.

### Self-Centering Mandrels and Universal Adapters

The South Bend Self-Centering Mandrel and Adapter Method is used to mount the whole assembly in the lathe for machining. The adapters fit into the bearing races, therefore, any machining operation leaves the drum, wheel or hub true and concentric with the axle. This method is exclusive on the South Bend Brake Drum Lathe.

### Used for General Work

In addition to brake drum, wheel and hub work the South Bend Brake Drum Lathe can be used for general work because it is a back geared screw cutting general purpose lathe. Many shops use the brake drum lathe for machining flywheels for new starter gears, making drive shafts, making bushings, truing differential flanges, etc.

### Over 500 Brake Drum Lathes in Use

The service methods illustrated and described on these two pages covering brake drum, wheel and hub work have been adopted by most manufacturers of automobiles, buses and trucks for their own service stations and by the manufacturers of wheels and brake drums for their distributors. 500 South Bend brake drum lathes are now in use in shops throughout the country on brake drum and wheel servicing.

### Instructions Furnished with Lathe

Included with each 36-inch South Bend Lathe, free of charge, are two instruction manuals consisting of blueprints and job instruction sheets, covering Brake Drum Servicing, and Wheel Servicing. These instruction manuals are further described and explained in the Service Bulletins listed on page 10 of this circular.

### Write for Bulletin No. 4

If you are interested in doing any or all of the work listed at the right fill out the blank on the back cover requesting Bulletin No. 4 and send it to us. A copy will be forwarded you postpaid, without obligation.

### A Few Automotive Jobs Machined on the 36-inch South Bend Lathe

#### Brake Drum Servicing

Truing a Brake Drum  
Testing a Brake Drum  
Grinding a Brake Drum  
Testing Run-out of Wheel Bearings  
Making Brake Drum Mandrels and Adapters

#### Wheel Servicing

Turning a Wheel Felly  
Testing a Wheel  
Boring a Wheel  
Balancing a Wheel

#### Flywheel Servicing

Machining Off Damaged Gear Teeth  
Polishing Flywheel Clutch Face  
Balancing a Flywheel  
Making Flywheel Mandrels and Adapters

#### Crankshaft Servicing

Testing Main Bearings  
Testing Throw Bearings  
Truing Main Bearings  
Truing Throw Bearings  
Facing Crankshaft Flange

#### Hub Servicing

Truing a Hub Flange  
Testing a Hub Flange  
Boring Damaged Hub  
Re-chasing Damaged Hub Thread

#### General Machine Work

#### Thread Cutting and Tool Work

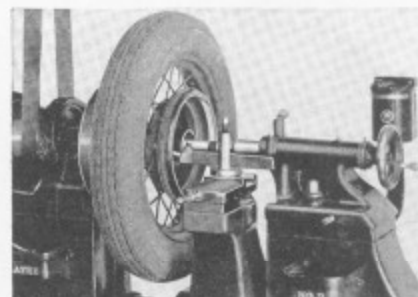


Fig. 65. Truing Brake Drum of a Wire Wheel with Tire Attached.

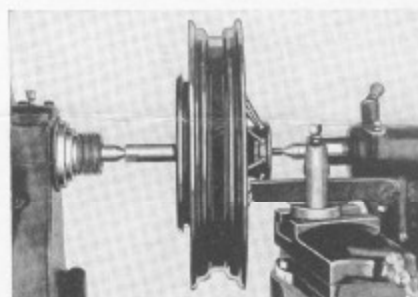


Fig. 67. Testing a Felly of a Wire Wheel to Determine if Out of True.

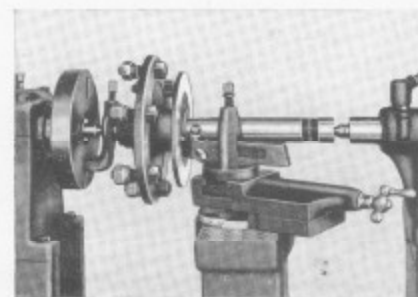


Fig. 69. Taking a Light Cut to True Up Bent Hub Flange Mounted Between Lathe Centers.

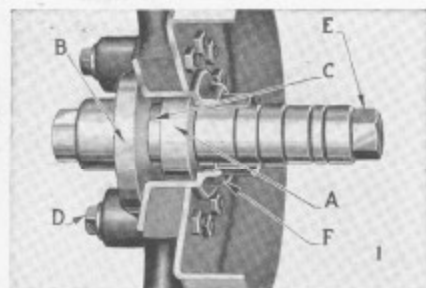


Fig. 73. Illustration above Shows Method of Mounting Wheels with Radial Ball Bearings.

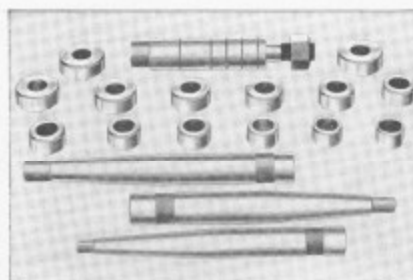


Fig. 74. Mandrels and Adapters Used for Mounting Wheels, Hubs and Drums.

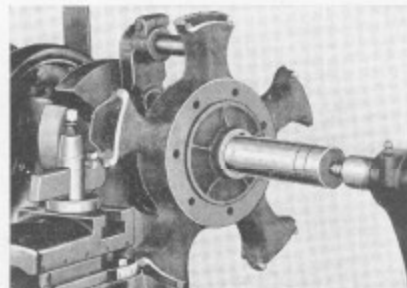


Fig. 75. Turning Down a Solid Tire Wheel for Dual Pneumatic Tire Rim Band.

# South Bend Bulletins on Automotive Service Work

Describing the Latest Methods and Shop Equipment

For the Maintenance of Automobiles, Trucks and Buses

THE illustration at the right shows nine Automotive Service Bulletins, size  $8\frac{1}{2}$ " x 11", 4 to 12 pages each, which describe and illustrate latest shop practice and methods for servicing the important mechanical units of automotive vehicles, of all makes, kinds and types. The information contained in the bulletins will be immensely valuable to any mechanic interested in servicing automotive parts in the modern and up-to-date way. If interested in receiving one or two of these bulletins, fill out the Information Blank on the back cover and they will be sent to you at once, postpaid, no charge.

**No. 1. How to Grind Valves.** This bulletin covers grinding valves, sharpening valve seat reamers, checking, testing, straightening valves and other valve servicing jobs. Contains over 25 illustrations.

**No. 2. How to Service Armatures.** The armature servicing bulletin shows the new South Bend Armature Lathe and contains complete information on truing commutators, undercutting mica, straightening shafts and doing all kinds of armature work.

**No. 3. How to Service Flywheels.** This bulletin shows how to remove damaged teeth from the flywheel gear, how to fit new starter gear, how to polish clutch faces, balance a flywheel, etc., also lists equipment for mounting and holding flywheels of all makes and types.

**No. 4. How to True Brake Drums.** This bulletin contains 12 pages and covers the entire service of brake drum, hub and wheel work, including the South Bend Self-Centering Mandrel and Adapter Method for mounting and the perfect centering of hubs and wheels. Contains information on tools, mandrels and equipment for handling all makes of cars and trucks.

**No. 5. How to Service Differentials.** This bulletin tells how to mount, test and check differential gears for accuracy, how to remove damaged gears, how to reface differential flange and how to mount new ring gears.

**No. 6. How to Bore Connecting Rods.** Illustrates and describes the new South Bend Connecting Rod Boring Attachment which is economical, accurate and practical for reboring all makes, types and sizes of rebabbitted connecting rods. Includes information on boring bars, filleting tools, measuring devices, etc.

**No. 7. How to Make Bushings.** Eight page bulletin covering the subject of bushings of all kinds and types and made of all kinds of materials. Also shows the equipment required for this work. The shop can make bushings at twice the profit obtained from stock bushings.

**No. 8. How to Service Crankshafts.** This bulletin tells more about the crankshaft than any bulletin ever before in print. It shows how to test and true crankshaft throw bearings and main bearings. This bulletin explains this difficult servicing job, simply and clearly.

**No. 9. How to Finish Pistons.** An eight page bulletin on fitting pistons and piston rings. Tells how to machine semi-finished pistons to fit individual cylinder bores by turning or grinding, or both, also reaming, honing and lapping piston pin holes. Contains information on proper clearances to allow in fitting pistons and rings.

## Manuals on How to Do the Work

We have prepared a number of instruction manuals, each consisting of from one to four blue prints and from one to four job sheets,  $8\frac{1}{2}$ " x 11", covering each of the major automotive jobs described in the nine service bulletins on this page. These manuals will assist the mechanic in starting the work and guide him step by step in each operation with accuracy, precision and economy. Manuals are fully described in each Service Bulletin listed above.

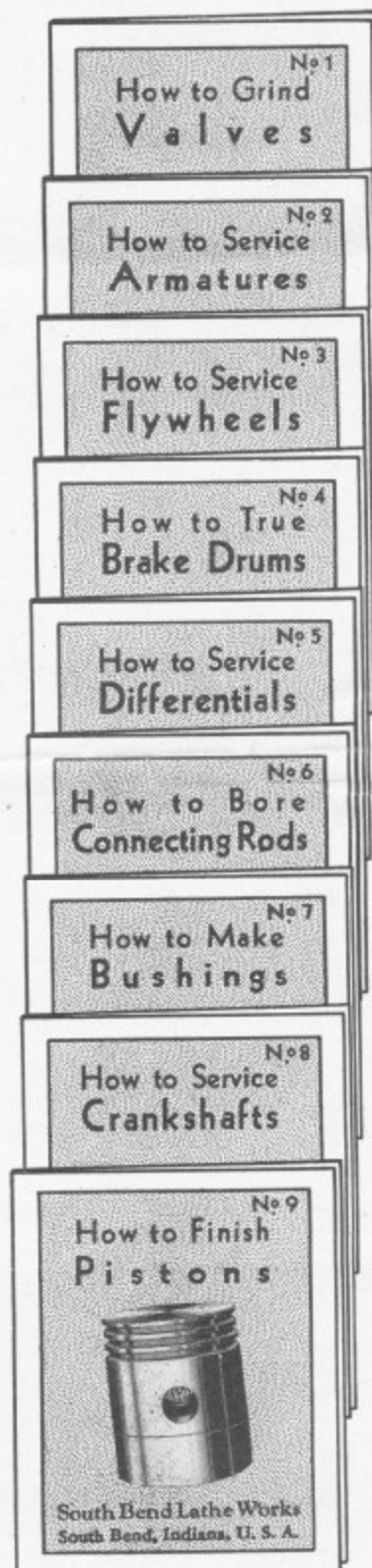
The purchaser of a 9-inch South Bend Lathe is entitled to four instruction manuals free of charge, consisting of No. 1-M "How to Service Valves," No. 2-M "How to Service Armatures," No. 7-M "How to Make Bushings," No. 9-M "How to Service Pistons." The purchaser of a 36-inch South Bend Brake Drum Lathe is entitled to two manuals on Brake Drum Servicing and Wheel Servicing.



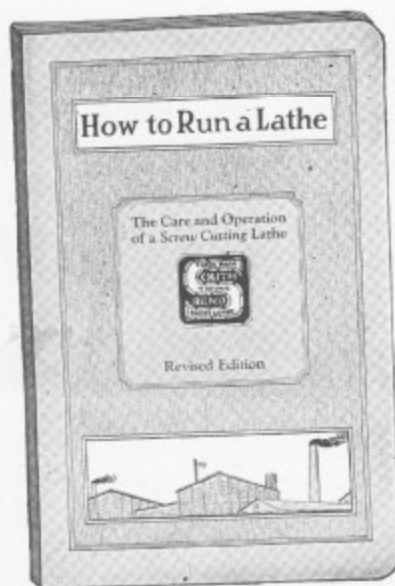
The Automotive Service Laboratory in the plant of the South Bend Lathe Works where automotive service problems and methods are worked out.

## Service Laboratory of the South Bend Lathe Works

A special department has been set aside in our plant where this work is carried on by practical engineers and men experienced in automotive servicing in order to give our trade the latest, most practical, accurate, and economical methods of automotive servicing.



The above illustrated service bulletins are  $8\frac{1}{2}$ " x 11" in size, ranging from four to twelve pages, profusely illustrated, describing the most modern methods of automotive servicing with precision and economy.



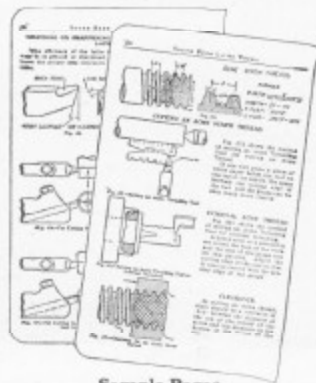
## "How to Run a Lathe"—30th Edition

For the Mechanic and Apprentice

"How to Run a Lathe" is an authoritative manual covering the fundamental operations of the modern screw cutting lathe. It contains 160 pages, 5 1/4" x 8", and more than 300 illustrations, all devoted to the erection, installation and operation of the screw cutting engine lathe. The modern methods for handling over 400 machine operations on the lathe are fully described and illustrated.

There are more than one million two hundred and fifty thousand copies in use throughout the world. Used as a text book in the shops of vocational schools, trade and industrial schools, also by apprentices in the machine shops of leading railroads and large industrial plants. A copy of this book is included with each lathe.

Mailed Anywhere in the World, Postpaid, 25 Cents.  
Coin or Stamps of any Country Accepted.



Sample Pages

How to Set Up the Lathe  
Care of the Lathe  
How to Lay Out a Shop  
How to Level a Lathe  
How to Hang a Countershaft  
Calculating Size and Speed of Pulleys  
How to Lace a Belt  
Grinding and Setting Lathe Tools

### PARTIAL LIST OF CONTENTS

Cutting Screw Threads  
Turning and Boring Tapers  
Grinding and Milling Work  
Chucks and Face Plates  
Cutting Speeds of Metals  
Cutting Feeds for Metals  
Operating Automatic Feeds  
Reading Micrometer Calipers

Using Outside and Inside Calipers  
Locating Center Holes  
Aligning Lathe Centers  
Drilling, Boring, Reaming, Tapping  
Use of Compound Rest  
Table of Decimal Equivalents  
Table of Metric Measures  
300 Other Shop Kinks

### Guarantee of Lathe

WE GUARANTEE every South Bend Lathe to be accurate and mechanically perfect; to give you entire satisfaction and the service you have a right to expect.

We will replace, free of charge, anywhere in the United States any part that proves defective, either in material or workmanship, within one year from the date of purchase.

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

### New Lathe Catalog No. 93

The new 72-page general Catalog, size 8 1/2" x 10 3/4", illustrates, describes and prices the 1933 line of New Model South Bend Back Geared Screw Cutting Lathes. Three types of lathes are shown—Quick Change Gear type; Standard Change Gear type; and Geared Screw Feed type, each available in countershaft and motor drives. A complete line of attachments, chucks, tools and accessories for each size and type of South Bend lathe is also illustrated, described and priced.

This valuable reference catalog will be mailed free, postpaid, upon request. The blank below is for your convenience.

(Tear Out Along Dotted Line)

USE THIS BLANK TO WRITE TO US

(Filling in this blank places you under no obligation whatever)

SOUTH BEND LATHE WORKS,  
335 East Madison Street  
SOUTH BEND, INDIANA, U. S. A.

Gentlemen:

Date

Name  
(See other side)



## South Bend Easy Payment Plan

### For the Purchase of Auto Shop Lathes and Equipment

For the convenience of our customers, we have an Easy Payment Plan which can be used when buying any Auto Shop Lathe and equipment described in this booklet. This plan gives you an opportunity to install and use a completely modern shop equipment while paying for it.

Easy Payment Terms are listed in the tabulation at the right. We ship the lathe and equipment you order immediately on receipt of your down payment. Your monthly payments begin one month from date of shipment. All accounts are carried in our own office and we have no connections with finance or collection agencies. You deal direct with us.

Here is an example showing how the Easy Payment Plan is used in buying the No. 9 Auto Shop Lathe shown in the illustration of the auto shop on page 2:

1—9-in. x 3-ft. South Bend Junior Horizontal Motor Driven Bench Lathe complete with $\frac{3}{4}$ H.P. reversing motor, drum reversing switch, belting and regular lathe equipment as described on page 2. Total Price	\$182.90
Finance Charge (see column 3 of Schedule)	11.50
<b>TOTAL</b>	<b>\$194.40</b>
Cash Down Payment (see column 4 of Schedule)	40.00
Balance to be paid Monthly (\$194.40 less \$40.00)	\$154.40
Monthly Payments, each (see column 5 of Schedule)	\$ 13.00

Auto Shop Equipments for handling any service job listed in this booklet or any attachment, chuck or tool shown in any South Bend catalog or literature may be added to your order and purchased on the South Bend Easy Payment Plan. Simply make out your order listing the lathe, equipment and tools you desire and add up the total; locate this amount in the schedule at right under the column, "If Total Price of your Order Amounts to." On the same line are listed the financing charge; down payment; and monthly payment.

If you are interested in knowing what the Easy Payment Terms would be on any Auto Shop Lathe and Equipment described in this booklet, use the request blank below; check the size lathe in which you are interested, also check Easy Payment

method of purchase and we will send you an itemized quotation listing the total cost of equipment, amount of down payment, monthly payment, etc., at no obligation to you.

#### Schedule of Easy Payment Terms

If Total Price of Your Order Amounts to	Add for Financing	Down Payment	Payment Each Month	Approx. No. of Monthly Payments
\$150.01 to \$175.00	\$10.00	\$36.00	\$11.50	12
175.01 to 200.00	11.50	40.00	13.00	12
200.01 to 225.00	13.00	45.00	15.00	12
225.01 to 250.00	14.50	50.00	17.00	12
250.01 to 275.00	16.00	55.00	18.50	12
275.01 to 300.00	17.50	60.00	19.50	12
300.01 to 325.00	19.00	65.00	22.00	12
325.01 to 350.00	20.50	70.00	24.00	12
350.01 to 375.00	22.00	75.00	26.00	12
375.01 to 400.00	24.00	80.00	28.00	12
400.01 to 450.00	25.50	85.00	31.00	12
450.01 to 500.00	29.00	95.00	34.00	12
500.01 to 550.00	32.50	105.00	38.00	12
550.01 to 600.00	35.50	115.00	42.00	12
600.01 to 650.00	38.00	125.00	45.00	12
650.01 to 700.00	41.50	135.00	49.00	12
700.01 to 750.00	44.50	145.00	52.00	12
750.01 to 800.00	47.50	155.00	57.00	12
800.01 to 850.00	50.00	165.00	60.00	12
850.01 to 900.00	52.50	175.00	63.00	12
900.01 to 950.00	55.50	185.00	67.00	12
950.01 to 1000.00	58.50	195.00	70.00	12
1000.01 to 1100.00	63.00	210.00	75.00	12
1100.01 to 1200.00	71.00	230.00	84.00	12
1200.01 to 1300.00	76.00	250.00	90.00	12

(Tear Out Along Dotted Line)

### REQUEST FOR INFORMATION

(Filling in this blank places you under no obligation whatever)

Date .....

Please send me, postpaid, no charge, the Service Bulletins I have checked below as these cover the principal classes of work I intend to do in my shop.

#### Service Bulletins—Check Classes of Work You Plan to Do

- |   |   |
|---|---|
| <input type="checkbox"/> No. 1 Valve Servicing        | <input type="checkbox"/> No. 6 Connecting Rod Service |
| <input type="checkbox"/> No. 2 Armature Servicing     | <input type="checkbox"/> No. 7 Bushing Servicing      |
| <input type="checkbox"/> No. 3 Flywheel Servicing     | <input type="checkbox"/> No. 8 Crankshaft Servicing   |
| <input type="checkbox"/> No. 4 Brake Drum Servicing   | <input type="checkbox"/> No. 9 Piston Servicing       |
| <input type="checkbox"/> No. 5 Differential Servicing | <input type="checkbox"/> Machine and Tool Work        |

I would like an itemized quotation on the size Auto Shop Lathe I have checked below, together with the chucks, tools and accessories necessary for handling the classes of work I have checked above in my request for Service Bulletins.

#### Auto Shop Lathes—Check Size on which You Desire Information

- ☐ 9" x 3' South Bend Horizontal Motor Driven Bench Lathe as illustrated and described on pages 2 and 3.
- ☐ 13" x 5' South Bend Simplex V-Belt Motor Driven Lathe as illustrated and described on pages 4 and 5.
- ☐ 16" x 6' South Bend Simplex V-Belt Motor Driven Lathe as illustrated and described on pages 6 and 7.
- ☐ 36" x 6' South Bend Silent Chain Motor Driven Lathe as illustrated and described on pages 8 and 9.

Check method of Payment you prefer ☐ Easy Payment Plan ☐ Cash With Order

Name .....

Kind of Business .....

Street and Number .....

City ..... State .....

Mail to

**SOUTH BEND LATHE WORKS**

335 E. Madison Street South Bend, Indiana

(See Other Side)