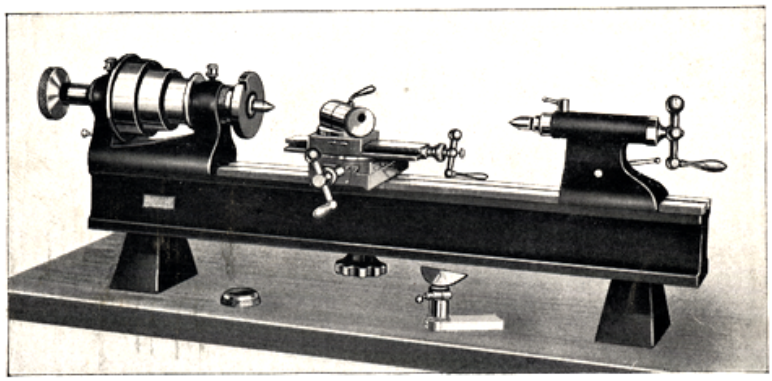
The Rivett

Plain Precision Bench Lathe No. 505



Bulletin No. 505-A

Rivett
LATHE AND GRINDER CORPORATION
BRIGHTON DISTRICT OF BOSTON MASS
U.S.A.

Introduction

TO own a Rivett Lathe is the natural ambition of every true mechanic. Rivett has long been recognized the world over for its supreme line of Precision Bench Lathes, and its right to the use of the word "Precision" has never been questioned. Rivett Precision Lathes are in very truth the master tools not only of industry, but of science as well. They are instruments themselves—finely wrought and finely finished.

The Rivett Plain Precision Bench Lathe No. 505 is, as its name indicates, a true Precision Lathe capable of very accurate work. Each feature of its design has been determined only after careful study of the function of the part and in the light of experience and knowledge gained during over forty years of precision tool making. Great care is taken in each step of its manufacture to assure the highest quality attainable. Owners of the Rivett No. 505 Precision Lathe will find it a tool worthy of its name, of remarkable rigidity, power and accuracy, with attachments for every operation and exceedingly economical to maintain,—in fact, the finest plain precision bench lathe made.

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The Rivett Plain Precision Bench Lathe No. 505 and attachments are warranted to be as described in this Bulletin, and free from all defects of workmanship and material. Should any hidden faults become apparent, prompt replacement or adjustment will be made on receipt of notification in writing within ninety days of shipment.

We invite correspondence concerning any points that may not be perfectly clear, and shall be glad to give prospective buyers the benefit of our experience in solving any special machining problems for which a bench lathe can be used. We extend to all a cordial invitation to visit our works.

The Rivett Plain Precision Bench Lathe No. 505

The Rivett Plain Precision Bench Lathe No. 505 is built to meet the demand for a plain bench lathe suitable for precision toolmaking and accurate light manufacturing. The variety of work that can be done on it; the small floor or bench space it occupies; the slight amount of power required to drive it as well as its high speed and the ease and fineness of its adjustments make it more economical to use on small parts within its range than a larger lathe. In batteries, or singly, Rivett Bench Lathes are long-lived, uniform, and efficient producers. Correct in proportions they hold their accuracy—generous in size they withstand heavy cuts at high speeds.

The tool maker already appreciates the advantages of the bench lathe, which with its attachments may readily be set up for turning, drilling, boring, milling, grinding and other machine shop operations. Where a toolroom is

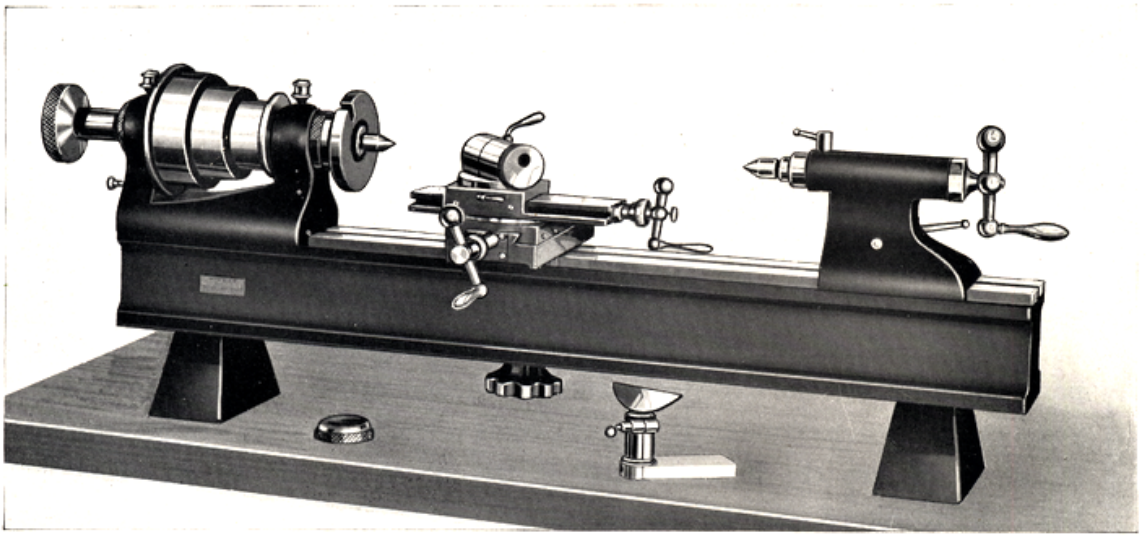

Fig. 1. Rivett Plain Precision Bench Lathe No. 505 with standard equipment, except less countershaft and treadles.

adequately equipped with Rivett Precision Bench Lathes, each tool maker is frequently able, by the use of the various attachments, to make a complete jig, fixture, or other device on the bench lathe under his personal control without waiting his turn to gain access to the lathes, milling machines, drill presses and other equipment installed for general use.

The manufacturer of small interchangeable parts, will find the Rivett Precision Bench Lathe economical for innumerable operations, such as drilling, finish turning, facing, burring, polishing, tapping and for second operations on screw machine parts. By proper tooling with the turret attachment and the cutting off and forming slide, many pieces may be manufactured completely with an ease of setup and manipulation particularly desirable on comparatively small quantities for the manufacture of which it does not pay to set up an automatic screw machine.

Scientists use the Rivett Precision Bench Lathe for making various instruments required in their work, and inventors will find it particularly desirable for building models. When completely equipped with attachments, no other machine tool equipment is required in many cases.

The Headstock is of the design which first made Rivett Bench Lathes famous throughout the world for long-lived performance. The spindle and both bearings are of tool steel, hardened, ground, and lapped. The front bearing is a double cone having angles of 3° and 45°. The rear bearing has a straight hole, but is tapered on the outside, and split, so that when drawn into the headstock casting by its adjusting screw, it is compressed, thus providing a

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take-up for side shake. Thrust is taken by the 45° taper in the front bearing, adjustment being accomplished by a nut inside the large end of the pulley. The mouth and chuck seat of the spindle, as well as the threads on the nose, are ground after the headstock assembly is completed to insure the highest degree of accuracy. The spindle of a Rivett Precision Lathe will be found to run dead true. The three-step pulley has steps 3″, 4″, and 5″ diameter, each step 1½″ wide for belt 1⅜″ wide. The face of the large flange has 60 drilled holes, engaged by a pin for indexing and to prevent the spindle from turning when chucks are being tightened. With each headstock is included a soft male center with center chuck, a screw draw-in-spindle and a driving plate.

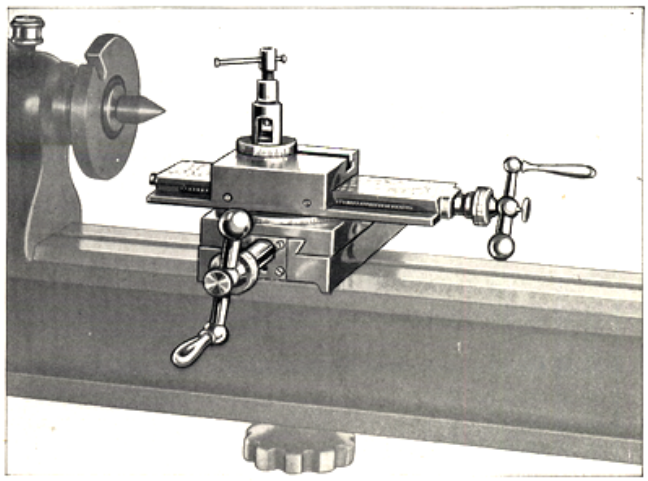

Fig. 2. Compound Slide Rest with Rocker Tool Post.

The Bed is made of close grained cast iron in heavy box section, strongly ribbed to give maximum strength. The top and beveled-edge guideways are carefully hand-scraped after machining. The legs, also of box section, are cast separately and fastened to the bed by long studs which also serve to hold the lathe on the bench. The leg for the tailstock end has a shallow spherical depression in its top in which fits a spherical washer on which the bed rests. This gives the lathe, in effect, a three-point mounting, preventing any possibility of distortion.

The Tailstock is of the standard type. The spindle is made of tool steel, hardened and ground to 1″ diameter. The hole in the spindle is ground to our special center taper gauge, which has approximately 3° taper included angle. The diameter of the hole at the mouth is .541″. The travel is 3¼″ and is effected by means of a ball handle and screw working in a bronze nut. The screw and spindle are so proportioned that when the spindle is fully drawn into the tailstock, the center or other attachment in the spindle is automatically pushed out. The spindle is locked by a small lever on the top of the tailstock. The tailstock is scraped to perfect alignment with the headstock, and is clamped to the bed of the lathe in any position by means of a T-bolt working in a T-slot in the bed and operated by an eccentric binder. The standard equipment of the tailstock includes a hardened male center.

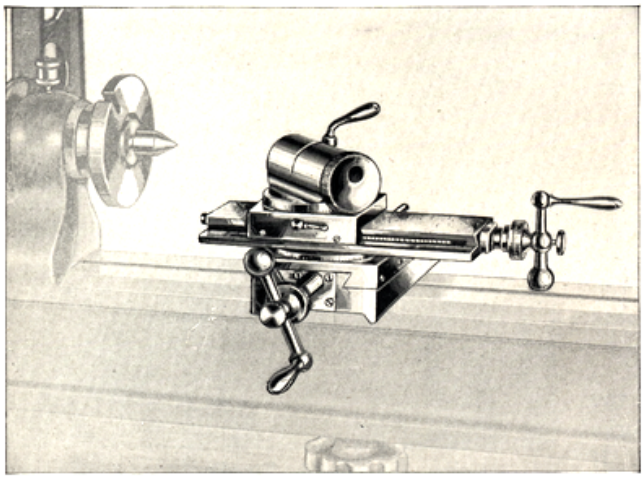

Fig. 3. Compound Slide Rest with Eccentric Tool Holder.

The Compound Slide Rest consists essentially of two slides with a graduated swivel between them, feed screws to provide the slide movement, and a tool holder. The bottom of the base is machined and hand scraped in the form of a dovetail and rests on a shoe having corresponding angles. As the shoe is accurately scraped to fit the ways of the bed, the slide rest can be quickly set and reset in perfect alignment, no matter how many times the rest is removed from the lathe. The slide rest is clamped in the desired position by means of a clamping bolt and hand wheel.

The swivel is locked in position at the desired angle by means of a small binder lever and is graduated on the dial 360° on the full circumference.

The top slide is made in two forms—one to take a tool post of the standard rocker type and the other to take the Rivett eccentric toolholder. The rocker tool post permits the use of small forged lathe tools or small forged tool holders, which may be furnished in the four shapes of straight, right hand offset, left hand offset and boring. These

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tool holders accommodate high speed steel bits 3/16″ square. The eccentric tool holder requires the use of round tools ½″ diameter, which we furnish in carbon or high speed steel in the following shapes: centering or diamond point, right and left hand side turning, boring, cutting off, external threading and internal threading. This type of tool holder must be used when the milling attachments or grinding attachments are desired, as these attachments are designed to fit only in place of the eccentric toolholder.

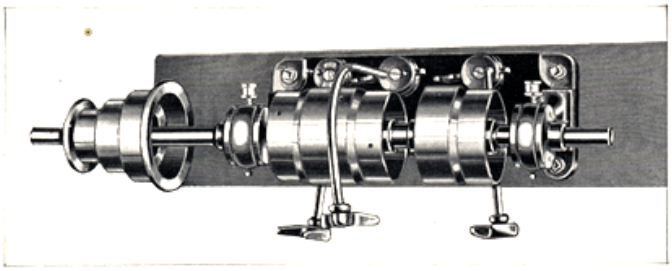


Fig. 4. Three-Speed Countershaft.

The feed screws are of machine steel and work in bronze nuts of ample size. The thread is 10 pitch special 29°. Means of adjustment are provided.

The dials on the feed screws are 1-3/16″ diameter, each graduation representing a slide movement of .001″, and they can be set at any desired graduation to maintain original tool setting, or for calculation, and are locked in place by the knurled thumb screws in the centers of the ball handles.

The ball handles are of convenient size for rapid movement and are sensitive to the touch.

An adjustable stop for the cross slide is provided for convenience in thread cutting, grinding and for maintenance of settings in duplicate work.

All surfaces of every part of the slide rest are machined; non-working surfaces are polished; working surfaces are hand scraped to an accurate fit. The slides are provided with gibs for adjustment, the gib for the top slide being placed in front so that the thrust in usual work is taken by the ungibbed surface. The opening for the upper nut is also on the front side to reduce the chance entrance of chips. The slide rest is a sturdy, versatile and accurate unit built for maximum service.

A metric slide rest exactly the same as the above except that it has feed screws of two millimeter pitch and dials on which each graduation represents a slide movement of 1/50 (.02) millimeter can be furnished to customers desiring it.

The Countershaft is a single unit which can be mounted in any one of the several desired positions with little change. It can be driven by belts approaching from above or below, and requires little attention.

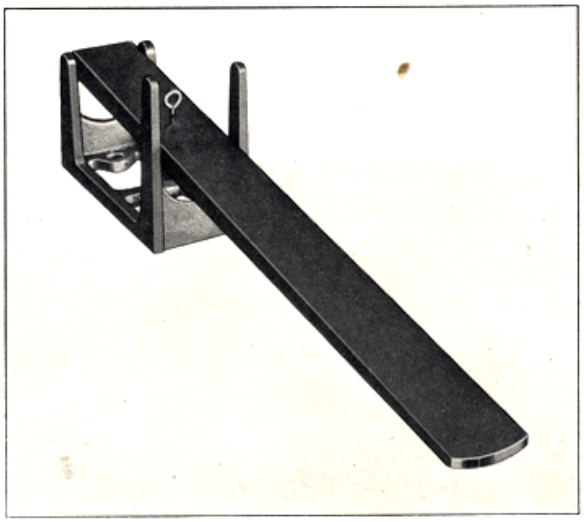


Fig. 5. Treadle.

The best location for the countershaft is on a wall, back of the lathe and three or four feet above the bench top or when the bench is away from the wall, on a plank supported by uprights to bring the countershaft in the same relative position. In those cases where the countershaft must be mounted on the ceiling, it is fitted with bevel crank levers to operate the belt shifters.

If the belt drive is from overhead, as from a line shaft, the countershaft should be mounted with the belt shifter forks upward, requiring two long fork rods and one short rod. If the belts approach from below, as with the motor drive arrangement, or from a line-shaft beneath the bench, the forks should be downward, requiring one long fork rod and two short rods. The countershaft is shipped with two long fork rods and one short rod unless it is clearly indicated on the order that the underneath drive is to be used. It is, however, a simple matter to cut off one of the long rods.

The usual location of the countershaft is with the three-step pulley on the left end of the shaft and this is necessary when the grinding attachments are used. In some cases, it is desired to set the lathe in front of a window with the countershaft on the wall at the left of the window opening. Then the shaft must be pushed through so that its extension is to the right.

The bearing brackets are bolted to the base of the countershaft and equipped with self-aligning babbitt bearing boxes. The loose pulleys are fitted with cast iron bushings and oil cups for lubrication. The pulleys are machined all over and balanced to run noiselessly and without vibration. Three loose pulleys are provided. It is customary to belt the left pulley to run forward at 350 RPM, the middle one backwards at 350 RPM and the right hand one forward at 700 RPM. These countershaft speeds give a range of headstock spindle speeds suitable for the average run of work. They may, of course, be varied to suit exceptional requirements.

Treadles are furnished for operating the belt shifters on the countershafts, except when the oak cabinet is used, in which case hand control shifters are built into the cabinet. Each treadle assembly consists of a cast iron bracket carrying a wooden foot piece, which is connected to the belt shifter by a soft iron wire or light chain. Three treadles are required for complete control of the countershaft.

The Method of Mounting and Driving the lathe is important and should be settled before the order is made out, to be sure that the correct equipment is specified. How and where a bench lathe or group of bench lathes should be mounted and driven is a question that must be decided by each individual customer to suit the conditions of his shop. To assist in selecting the method of mounting and driving which will suit the space and sources of power to the best advantage, we list below some of the more commonly used layouts:

Lathe on Wall Bench, Countershaft on Wall, Drive from Overhead Lineshaft.

Lathe on Wall Bench in front of Window, Countershaft on Wall, Drive from Overhead Lineshaft.

Lathe on Wall Bench, Countershaft on Wall, Drive from Lineshaft Underneath Bench.

Lathe on Bench away from Wall, Drive from Overhead Lineshaft.

Lathe on Bench away from Wall, Drive from Underneath Lineshaft.

Lathe on Wall Bench, Countershaft on Wall, Individual Motor Drive.

Lathe on Unit Bench, Individual Motor Drive.

Lathe on Cabinet, Individual Motor Drive.

Lathe on Pan and Floor Legs, Countershaft on Ceiling, Drive from Overhead Lineshaft.

Lathe on Pan and Floor Legs, Individual Motor Drive.

Group of Lathes on Double Bench, Drive from Overhead Lineshaft.

Group of Lathes on Double Bench, Drive from Underneath Lineshaft with One Motor for Group.

SPECIFICATIONS

BED

Length . . . . . 38″
Distance between centers, tailstock flush . . . . . 17″
Distance between centers, tailstock overhanging . . . . . 20″

HEADSTOCK

Diameter of hole in headstock spindle at its smallest portion . . . . . 1-1/16″
Diameter of largest piece of round stock that can be passed through headstock when held in jaw chuck . . . . . 15/16″
Maximum diameter of round hole in collet . . . . . 7/8″
Maximum size of square hole in collet . . . . . 5/8″
Maximum size across flat of hex. hole in collet . . . . . 3/4″
Height from top of bed to center line of spindle . . . . . 4″
Swing over bed, diameter . . . . . 8″
Swing over top slide of compound slide rest, diameter . . . . . 1 3/8″
Swing over top of bottom slide of compound rest, diameter . . . . . 4″
Diameter of steps of cone pulley . . . . . 3″, 4″, 5″
Number of index holes in headstock pulley 60
Threads on Spindle Hardened and Ground, 1 7/8″ diameter 10 pitch Special USF Thread.

TAILSTOCK

Diameter of spindle . . . . . 1″
Taper in mouth of spindle, special . . . . . 3° approx.
Diameter of taper at mouth of spindle . . . . . .541″

SLIDE REST

Travel of top slide . . . . . 5 1/2″
Travel of cross slide . . . . . 4 3/4″

COUNTERSHAFT

Diameter of steps on 3-step pulley . . . . . 3″, 4″, 5″
Diameter of tight driven pulleys . . . . . 5″
Diameter of shaft . . . . . 1″

SPEEDS

Countershaft tight pulley, forward and reverse (RPM) 350
Countershaft tight pulley, high speed (RPM) 700
Headstock spindle (RPM) 216, 350, 420, 583, 700, 1166

WIDTH OF BELTS

From line or jack shaft to countershaft . . . . . 1 1/4″
From countershaft 3-step pulley to headstock pulley . . . . . 1 3/8″

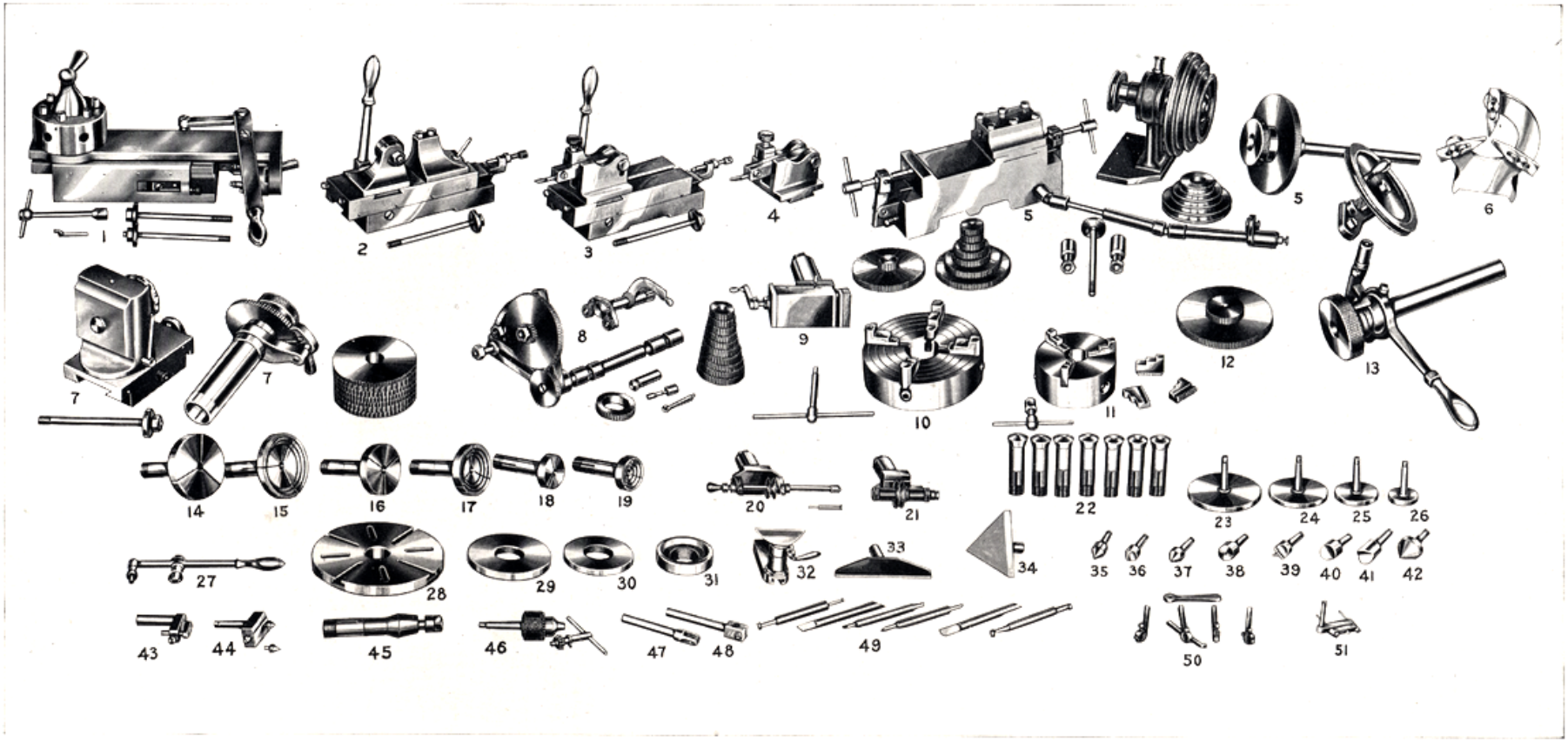
WEIGHT

Lathe with standard equipment—
Net . . . . . 260 lbs.
Gross . . . . . 390 lbs.
Dimensions of Shipping Case . . . . . 21 1/2″ x 16 1/2″ x 46 1/2″

SPECIFICATIONS—Continued

Standard Equipment includes

Bed
Two Pedestals
Two Pedestal bolts, nuts and washers
Spherical washer for tailstock end pedestal
Headstock
Screw draw-in-spindle
Center and center chuck
Driving Plate
Guard for spindle nose threads
Tailstock with center
Compound slide rest with either rocker toolpost or eccentric toolholder
Slide rest shoe, bolt and hand wheel
Tee Rest
Three-speed countershaft
Three treadles



Rivett Precision Attachments for Lathe No. 505

ATTACHMENTS

The value of the Rivett No. 505 Precision Bench Lathe in operation, is greatly increased by the many attachments which can be supplied. Among those illustrated are attachments for milling, grinding, thread cutting, backing-off, etc. In the complete list below the numbered items correspond with the figures in the cut on page eight. Customers requiring or interested in any of these attachments will be furnished with more complete illustrations and descriptions on request.

Arbors—for milling attachment (Fig. 45).

Belts—Complete Set.
Bolt—Clamping Bolt for slide Rest and T Rest.

Cabinet—Oak Cabinet with belt shifters and countershaft plank only.
Cabinet—Oak Cabinet with motor drive jackshaft, countershaft plank, supports for countershaft plank, belt guard, and belt shifters (not including motor).
Center—Soft Male (Fig. 35).
Center—Soft Male with Center Chuck.
Center—Hard Male (Fig. 35).
Center—Blank (Fig. 38).
Center—Large Male—Hard (Fig. 42).
Center—Half Male—Hard (Fig. 36).
Center—Female—Hard (Fig. 37).
Center—Solid V (Fig. 40).
Center—Revolvable V (Fig. 41).
Center—Spur (Fig. 39).
Center—Adjustable Off Center (Fig. 44).
Chuck—Center Chuck for Headstock Center.
Chuck—Drill Chuck on Taper Arbor (Fig. 46).
Chuck—Drill Chuck on Straight Arbor 5/8″ dia.
Chuck—Drill Chuck on Taper Shank to fit Grinding Attachment.
Chuck—4″ 3 Jaw Geared Scroll Chuck with two sets of jaws—fitted to plate to fit lathe (Fig. 11).
Chuck—6″ 4 Jaw Independent Chuck with reversible jaws—fitted to plate to fit lathe (Fig. 10).
Chuck—Step Chuck—Blank
2″ (Fig. 18).
3″ (Fig. 16).
4″ (Fig. 14).
Chuck—Step Chuck—with standard steps
2″ (Steps 1″, 1½″, 2″). (Fig. 19).
3″ (Steps 2″, 2½″, 3″). (Fig. 17).
4″ (Steps 3″, 3½″, 4″). (Fig. 15).
Closer—Step Chuck Closing Ring (Fig. 31).
Closer—Lever Chuck Closer (Fig. 13).
Collets (Fig. 22).
Countershaft—Grinding Countershaft, for driving grinding attachments.
Cutting off and Forming Slide (Fig. 2).

Dog—Clamp Dog (Fig. 51).
Drawer—Bench Drawer.

Finger—Index Finger for Cutter Grinding.

Gears—Translating Gears for Metric Threads 127T and 50T (Fig. 12).
Grinding Attachment—External* (Fig. 21).
Grinding Attachment—Internal* (Fig. 20).
Guard—Belt Guard.

Jackshaft—Motor Drive Jackshaft.
Jackshaft—Individual Motor Drive consisting of motor platform, jackshaft and pulleys, belt guard, and supports for countershaft plank (not including motor).

Knurling Attachment for cutting off and forming slide (Fig. 27).
Knurling Tool for Slide Rest (Fig. 47).
Knurling Tool for Turret.

Legs—Bench Legs.
Legs—Floor Legs for Oil Pan.
Legs—Floor Legs for Oil Pan and Individual Motor Drive.

Milling Attachment—Slide Rest Type with eight Index Plates* (Fig. 7).

Pan—Chip Pan.
Pan—Oil Pan.
Pan—Oil Pan with Floor Legs.
Plate—Slotted Face Plate 8″ (Fig. 28).
Plate—Plain Face Plate 4¼″ (Fig. 30), 5⅛″ (Fig. 29).
Plate—Driving Plate.
Plate—Drill Plate.
2″ (Fig. 26).
3″ (Fig. 25).
4″ (Fig. 24).
5″ (Fig. 23).
Pump—Oil Pump and Piping.

Relieving Attachment with Universal Joint, Gears and Pulley (Fig. 5).
Relieving Attachment for Lathe which is already fitted with Screw Cutting Attachment (Fig. 5).
Rest—L Rest (Fig. 43).
Rest—Steady Rest (Fig. 6).
Rest—Tee Rest (Fig. 32).
Rest—Triangle Rest (Fig. 34).

Slide Rest—With Rocker Tool Post and English screws and dials.
Slide Rest—With Rivett Eccentric Type Tool Holder for ½″ diameter tools, and English screws and dials.
Slide Rest—With Rocker Tool Post and Metric screws and dials.
Slide Rest—With Rivett Eccentric Type Tool Holder for ½″ diameter tools, and Metric screws and dials.

Note: A Compound Slide Rest is included in the standard equipment of all Precision Lathes except the No. 606 and No. 705. Customer should specify which of the above types he desires.

Slotting Attachment to be used on base of forming slide (Fig. 4).
Slotting Attachment mounted on base of forming slide (Fig. 3).
Support for Countershaft Plank.

Thread Cutting Attachment—English (Fig. 8).
Thread Cutting Attachment—Metric (Fig. 8).
Tool Holder—For internal threading tool ½″ diameter* (Fig. 48).

Note: Attachments marked (*) can be used only with the Compound Slide Rest having Rivett Eccentric Tool Holder.

Tool Holders with blank bit for Eccentric Type Tool Post* (Fig. 50).
- Straight
- Right Hand Offset
- Left Hand Offset
- Boring

Tool Holders with blank bit for Rocker Tool Post (Fig. 50).
- Straight
- Right Hand Offset
- Left Hand Offset
- Boring

Tools—For Slide Rest with Eccentric Type Tool Holder, 3/8" diameter—Carbon Steel* (Fig. 49).

Tools—For Slide Rest with Eccentric Type Tool Holder, 1/2" diameter—Carbon Steel* (Fig. 49).

Note: Tools can be furnished in following shapes: centering, cutting off, right side turning, external threading, internal threading, and boring.

Tools for Turret Attachment.
- Box Turning
- Tap Holder
- Die Holder
- Knurling

Tool—Blank Forming Tool for cutting off and forming slide-carbon steel.

Turret Attachment—Automatic Index (Fig. 1).

Vise for Slide Rest* (Fig. 9).

Note: Attachments marked (*) can be used only with the Compound Slide Rest having Rivett Eccentric Tool Holder.

Other Standard

Rivett

Products

"Junior" Bench Lathes
"Precision" Back Geared Screw Cutting Lathes
Internal Grinding Machines
Threading Tools
Collets

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